River Bend Updated Final Safety Analysis Report

Revision 19, dated 7/12/06

Section 2.5, "GEOLOGY, SEISMOLOGY, AND GEOTECHNICAL ENGINEERING"

Appendices: 2G, 2H, 2I, 2J, 2K

This document has been reviewed by the NRC staff on 1/29/08 for sensitive information. No sensitive information was identified. This document is publicly available.

2.5 GEOLOGY, SEISMOLOGY, AND GEOTECHNICAL ENGINEERING

This section provides information regarding the geologic, seismologic, and geotechnical engineering characteristics of the River Bend Station site and the region surrounding the site, based on the criteria provided in Appendix A, Seismic and Geologic Siting Criteria for Nuclear Power Plants, of 10CFR100, Reactor Site Criteria.

The River Bend Station site in West Feliciana Parish is located 3 mi southeast of St. Francisville, Louisiana, and approximately 24 mi northwest of Baton Rouge. The site lies within the Southern Hills section of the Gulf Coastal Plain physiographic province approximately 85 mi from the Gulf of Mexico. The plant area is situated on the uplands adjacent to the Mississippi Alluvial Valley. These uplands are composed of the fluvial deposits of the Pliocene-Pleistocene Citronelle Formation and the Pleistocene Port Hickey Terrace Formation with a thin blanket of overlying loess. The Citronelle Formation is underlain by hard Pascagoula clay.

The geologic history and stratigraphy of the site region indicate that the Gulf Coast geosyncline consists of a wedge-shaped mass of sediments which thicken gulfward and were deposited in seas that encroached upon the continental margin, possibly beginning in Late Jurassic time with renewed submergence in Early Cretaceous and Late Cretaceous time. The sedimentary beds dip gulfward and exceed a thickness of 50,000 ft along the geosynclinal axis. The site is underlain by approximately 27,000 ft of predominantly unindurated sand, clay, gravel, and marl of Mesozoic and Cenozoic age, unconformably overlying Paleozoic rocks.

The site is situated within the Gulf Coast Basin tectonic province. Significant structural features within the site region include the Sabine, Monroe, Jackson, and Wiggins Uplifts, the Mississippi Embayment, and the Desha Basin. The site is located in a relatively domeless area between the Interior Salt Basin and the Coastal Salt Basin. South of the site, the sedimentary beds are interrupted by numerous east-west trending growth and slump faults, which become less steep with depth and become bedding plane slips. These faults are activated by compaction and subsidence of the sediments and are not derived from basement tectonic structures. Some movement may be continuing on several of these growth faults. The northernmost surface fault identified in the nearsite area is the Zachery Fault located approximately 8.0 mi southeast of the plant. A westward projection of this fault would pass about 5.5 mi south of the plant.

The River Bend Station site is located in an area of infrequent and low seismicity, typified by shallow focus earthquakes. Twenty-eight earthquakes of epicentral MM Intensity III-IV or greater have occurred within 200 mi (322 km) of the site. Of these, only four have occurred within 100 mi (161 km) of the site since 1811. The maximum historical earthquake in the Gulf Coast Basin tectonic province, for design purposes, is considered to be the Donaldsonville earthquake of epicentral MM Intensity VI. The Mississippi embayment tectonic province, in which the large New Madrid earthquakes occurred, is a distinct region from the site based on differences in structure and geologic history. This province extends southward to the South Arkansas and Pickens-Gilbertown fault systems along the Ouachita tectonic belt.

Significant faulting associated with the New Madrid fault zone, which is located approximately 360 mi (579 km) north of the site, trends southwest to about 31 mi (50 km) northwest of Memphis, Tennessee. The southern extent of this fault zone is regarded to be a point near Memphis, which is 310 mi (499 km) north of the site. The Donaldsonville and New Madrid earthquakes are considered to be the only earthquakes important to the site and were felt at the site with MM Intensity IV and IV-V, respectively. No surface faulting was found within a 5 mi radius of the site. Consequently, a safe shutdown earthquake (SSE) is selected at 0.10 g at the foundation grade based on the seismicity of both the Mississippi embayment and the Gulf Coast Basin tectonic provinces.

Investigations and studies for this project include: a review of published literature, unpublished data and reports and published geologic maps, aerial photographic and topographic interpretations, geologic reconnaissance, a detailed seismicity study, borings made both for in situ testing and the recovery of representative and undisturbed samples for identification and laboratory testing, cross-hole seismic surveys, installation of piezometers, observations of natural groundwater fluctuations, onsite pumping tests, and laboratory testing of representative and undisturbed soil samples.

All of the Seismic Category I structures are founded on granular fill, placed directly on the dense sands and gravels of the Citronelle Formation which overlie hard clays and compacted to an average relative density of

93.8 percent. Thus, soils on which the Seismic Category I structures are founded are strong, statically and dynamically stable materials. They are not susceptible to loss of strength, subsidence, or liquefaction (minimum factor of safety 2.6) as a result of the motions associated with the SSE. The foundation soils are predominantly silica sands which are inert under the influence of the groundwater and climatic conditions at the site. Maximum differential settlement expected is less than one inch. The slopes adjacent to the plant pose no hazard to the Seismic Category I structures.

There is no mineral extraction occurring within a wide area surrounding the site. The nearest oil and/or gas production, located about 7 mi southeast of the plant, is from the Upper Cretaceous Tuscaloosa Formation at a depth of about 3 mi.

Several freshwater-bearing aquifers exist beneath the site. The uppermost of these is the Upland Terrace Aquifer, which is an unconfined aquifer at the site. Underlying the Upland Terrice Aquifer and separated from it by a clay confining bed are three artesian aquifers of Tertiary age. Water level and hydraulic head measurements indicate that flow in the Upland Terrace Aquifer is toward the Mississippi River from the upland area at the site. These measurements also show that practically no vertical gradient exists between the Upland Terrace Aquifer and the underlying Tertiary aquifers. As a result, no vertical leakage should exist between the two aquifer systems. There are no industrial or municipal wells within a 5-mi (8-km) radius of the site using water from the Upland Terrace Aquifer. There are more than 30 domestic wells in the Upland Terrace Aquifer within 2 mi (3 km) of the site. Many of these wells are shut in, abandoned, or only used for farm purposes. Many residents of the area obtain water from local water supply systems which extract water from the deeper Tertiary aquifers. No domestic wells lie directly down hydraulic gradient from the plant. Extrapolation of pumpage data indicates that maximum subsidence in the site area would be less than 0.1 ft from groundwater withdrawal and would be generally uniform. Calculations show that no impact would occur to any down gradient wells due to postulated groundwater contamination from the plant.

The investigations, studies, and testing were carried out either by the geotechnical personnel of SWEC or companies and consultants retained by SWEC. Eustis Engineering Corporation, Incorporated, was retained to make the soil borings and install the piezometers. SWEC personnel supervised all of the borings in the immediate plant site area. Layne-Louisiana was retained to install the pump well and operate the pump for the pump test, with the data collected and interpreted by SWEC personnel. Weston Geophysical Engineers, Incorporated, was retained to make the seismicity study for the River Bend Station and to do the field work and interpretation of the data for the cross-hole seismic surveys.

Dr. R.T. Saucier, acting as independent consultant, was retained for the high altitude imagery, aerial photographic, and topographic interpretation and participation in the structural geology studies. Dr. Saucier is Research Geographer in the Geology Branch, U.S. Army Engineer Waterways Experiment Station. Laboratory testing and identification and classification of soil samples was done in SWEC's geotechnical laboratory and in the laboratory of Geotechnical Engineers, Incorporated, retained for this purpose. Seismic "Vibroseis" surveys were conducted in the vicinity of Memphis, Tennessee, by Petty-Ray Geophysical, Incorporated.

For the FSAR, SWEC updated or revised portions of the previous study text, tables and figures on geology and seismology. Dr. C.O. Durham, Jr., consulting geologist from Houston, Texas, was retained and worked closely with SWEC personnel in the detailed study of the regional and site geology, including a review of the site excavation mapping. Dr. Durham was Director of the School of Geoscience at Louisiana State University in Baton Rouge.

During the excavation for plant structures, the walls and floors of the excavation were geologically mapped in detail by SWEC. No evidence of faulting, folding, or other geologic hazards was found in the main excavation.

Various seismic reflection survey data were reviewed and no surface faulting was identified within 5 miles of the plant. Oil and gas exploration information was evaluated, and it is estimated that no significant hazard is presented to the plant. Site seismicity was updated through recent earthquake catalogs and no change in the seismic design basis for the plant was required. A probabalistic assessment performed for the OBE showed that the probability of a seismic event greater than the OBE was less than 20 percent. Subsidence due to groundwater withdrawals was reevaluated and it was concluded that subsidence would not affect the stability, operation, or safety of the plant.

During the course of updating and revising the geology, seisimicity, and geotechnical engineering sections of the FSAR nothing was identified that would preclude the safe operation of the plant.

2.5.1 Basic Geologic and Seismic Information

2.5.1.1 Regional Geology

This section discusses the regional physiography, tectonics, geomorphology, stratigraphy, lithology, geologic and structural history, and geochronology of the region surrounding the site. Specific terms have been used throughout Section 2.5.1 to conveniently define specific areas within the study region as follows:

1. Plant area - the area of buildings and Seismic Category I structures

2. Site - the area within the property bounds including the plant area

3. Near-site area - the area within approximately 12 mi of the plant

4. Site region - the area within a 200-mi radius of the plant

2.5.1.1.1 Geologic Setting

The River Bend Station site is located in the Southern Hills section of the Gulf Coastal Plain physiographic province. This province extends 500 mi inland from the coast to include the Mississippi Embayment Section north of the site, as shown in Fig. 2.5-1. The physiographic provinces nearest the site are the Ouachita province located 250 mi to the northwest and the Appalachian Plateaus, Valley and Ridge, and Piedmont provinces located approximately 275 mi to the northeast.

Coastal Plain sediments, which unconformably overlie the Paleozoic rocks, consist of unconsolidated deposits of Mesozoic and Cenozoic age. The site is situated in southern Louisiana near the axis of the Mississippi Structural Trough, which trends essentially north-south through the Gulf Coastal Plain near the present Mississippi River course. Deposition is continuing in the Gulf Coast basin, particularly near the axis of the Gulf Coast geosyncline which extends along the coastal area of Louisiana and Texas.

The sedimentary thickness exceeds 50,000 ft along the geosynclinal axis.

The older sedimentary formations dip gulfward beneath the present reach of petroleum drillholes because of the pronounced gulfward thickening of the sequence. The entire sedimentary sequence has not been penetrated to the Paleozoic rocks at any point gulfward from northernmost Louisiana. Drillholes nearly 20,000 ft deep terminate in Lower Cretaceous sedimentary deposits at the latitude of the site. Interpretation of available data suggests a depth of approximately 27,000 ft to Paleozoic rocks in the site area.

The Coastal Salt basin is located generally south of the site and the Interior Salt basin lies generally to the north as shown in Fig. 2.5-2. A 90-mi wide relatively domeless belt, extending east-southeast and west-northwest, separates these two salt basins. Consequently, a thinning or absence of salt in the domeless area has been inferred, and this has been attributed to a rise in the basement separating the two salt basins. The site is located on the southwest side of the relatively domeless belt, 7 mi northwest of the nearest deep-seated salt dome at Port Hudson and 29 mi north of the nearest shallow piercement salt dome at Bayou Choctaw.

South from the site the beds are interrupted by east-west trending shear planes caused by gulfward slumping and spreading of the sedimentary masses during deposition and subsequent consolidation. These ground ruptures are termed growth and slump faults in technical literature. The failure surfaces are curved, steepen near the ground surface and flatten with depth to become bedding plane slips. Thus, these structures are contained entirely within the sedimentary sequence.

The Interior Salt basin is flanked by shallow crystalline basement rocks where the Appalachian orogenic belt rises to the northeast and the Ouachita orogenic belt rises to the north and west. Progressively thinner Coastal Plain sediments partially overlap these orogenic belts and extend northward onto the Paleozoic craton in the Mississippi Embayment. A regional geologic map of the north-central Gulf Coastal Plain is included as Fig. 2.5-3.

2.5.1.1.2 Regional Physiography

The Gulf Coastal Plain is a generally flat-lying to gently sloping sedimentary plain of low relief except for erosional escarpments. It is comprised of the Holocene Mississippi River flood plain and other flood plains, terraces and terrace remnants, erosion channels and gulleys associated with other rivers, streams, and bayous. The ground surface gradually rises northward from the Gulf of Mexico toward the site, which has a maximum elevation of +147 ft msl. The predominant physiographic feature is the Mississippi River with its flood plain which trends south through the Gulf Coastal Plain and is approximately 45 mi wide in the southern Mississippi-Louisiana area.

The River Bend Station site is located in the Southern Hills physiographic section of the Gulf Coastal Plain physiographic province, as shown in Fig. 2.5-4. The plant area is situated 1.9 mi northeast of the east bank of the Mississippi River on the uplands adjacent to the Deltaic Plain physiographic section in West Feliciana Parish, Louisiana.

The submerged area immediately seaward of the Gulf Coastal Plain province consists of the Texas-Louisiana shelf and West Florida shelf, which compose the offshore continental shelf(1). This shelf is a gently sloping platform between the beach and the continental slope and is about 125 mi wide. Its surface is locally irregular to rounded in places, possibly due to topographic expressions of salt domes. The present Mississippi River delta extends across the shelf nearly to the continental slope. Some depressions and alignments along the shelf are attributed to faulting. Several erosional features, including the Mississippi and DeSoto submarine canyons, have been found within the shelf area(1). The maximum depth of the seaward edge of the continental shelf is about 600 ft.

The Gulf Coastal Plain physiographic province is characterized by alluvial valleys and three major physiographic embayments which coincide with structural-stratigraphic embayments: the East Texas, Rio Grande, and Mississippi embayments.

The emerged segment of the Gulf Coastal Plain physiographic province consists of a belt of coastwise and deltaic plains, a band of step-like Pleistocene depositional terraces, and an inner zone of cuestas or wolds developed in belts on the differentially eroded surface materials. This belted topography is characteristic of the region from Texas to Florida(1).

The terrace surfaces are found between the Tertiary outcrops and the seacoast as broad step-like depositional surfaces. The landward terrace surfaces and the underlying deposits are more dissected than the coastwise surfaces. Seaward, the deposits represent successively younger coastal lowlands which are composed of deltaic plains, coastal marshes, and coastwise plains.

The Gulf Coastal Plain physiographic province is dissected by numerous rivers that flow into the Gulf of Mexico. The main streams which drain into the Mississippi River consist of the Ohio, Missouri, Arkansas, and Red Rivers. Other important surface drainage includes the Alabama, Pascagoula, Pearl, Amite, Calcasieu, Sabine, Trinity, Brazos, Colorado, and Nueces Rivers, which eventually flow into the Gulf of Mexico.

The most significant physiographic feature within this province is the Mississippi Alluvial Valley. This valley is a broad gulfward-sloping lowland bordered by abrupt escarpments which extends generally north-south from near Cape Girardeau, Missouri to the Gulf of Mexico for a distance of over 600 mi(2). The alluvial plain is made up of the floodplain and the dissected alluvial plains of the tributary valleys.

The streams which are located within the area subjected to seasonal flooding, the floodplain, are characterized by highly sinuous courses that constantly shift about to form meander loops and bends within meander belts. The periodic flooding of these streams forms alluvial ridges or natural levees which rise above the adjacent swamps. The present Mississippi River meander belt sweeps across the valley in great arcs and impinges against the alluvial ridges and valley slopes as it blocks off large basins. Periodic floodwaters enter these basins, dropping their suspended sediment load, thereby aggrading the valley surfaces(2).

A similar meander belt parallels the western margin of the floodplain. This course, now occupied by Bayou Teche, was abandoned several thousand years ago when the river shifted to the eastern side of the valley. Natural levees on the modern Mississippi River and on the Bayou Teche-Mississippi reach elevations of +35 to +46 ft msl at the latitude of the site. Between these higher meander belts, the Atchafalaya Basin forms the central part of the floodplain. It contains backswamps with elevations between +20 and +25 ft msl. Thus, the total relief of the floodplain approaches 20 ft.

The Atchafalaya River exits the Mississippi River as a distributary channel some 30 mi upstream to the northwest of the site and flows southward through the Atchafalaya Basin. This river has captured a progressively greater volume of the Mississippi River in recent decades. Several years ago the Corps of Engineers successfully controlled this flow in order to avoid a complete diversion of the Mississippi River into the Atchafalaya River course.

The foregoing is characteristic of the manner in which a meandering river such as the Mississippi River is continuously changing its position. Erosion and caving are cutting away the banks on the outside of its bends and deposition is building up sediments on the inside of bends. Hence, the meander loops gradually change orientation and usually enlarge and diverge more from the gulfward direction of the stream valley until the process is interrupted by neck cutoffs.

Thus, any particular orientation of the river at any particular location is transitory. Fisk's(2) study clearly demonstrates this changing pattern by delineating the position of the historically mapped river courses back to 1765 and of earlier prehistoric river courses based on interpretation of meander scrolls and other alluvial features that denote former bank lines and channels. Plate 22 by Fisk(2), Sheets 14 and 15, includes the site and part of the near-site area. Fisk's Sheet 15 demonstrates that the 1765 river course in the area west of Scotlandville trended west-northwest and east-southeast, the subsequent 1820 river course had meandered into an east-west position, and the present river course is somewhat west-southwest and east-northeast(2). This progressive change is a typical and expected sequence in meander development. In recent years the Corps of Engineers has reveted the outside southwest bank of the bend, inhibiting migration of the bend still further from an east-west orientation. At the site, the river meander is still within the floodplain, so there is no upland slope river erosion.

The width of the Mississippi Alluvial Valley ranges from approximately 25 mi south of Natchez, Mississippi to 125 mi near Helena, Arkansas. Surface elevations vary from +350 ft msl at the northern end near Cape Girardeau, Missouri to an elevation of about +30 ft msl where it merges with the deltaic plains. The valley surface is broken by two prominent narrow ridges which are aligned with the valley axis. Crowleys Ridge rises more than 200 ft above the alluvial plain; it extends southwest-northeast for a distance of about 200 mi. Another ridge, called Macon Ridge, rises about 20 to 40 ft above the floodplain and extends north-south for a distance of about 100 mi.

The deltaic plain is separated from the northern floodplain by a low alluvial ridge formed by natural levees which trend westward across the valley. The plain extends gulfward from the head of the Atchafalaya River. The Pontchartrain and the Atchafalaya basins, which are separated by the Mississippi River and the Metairie Ridge, comprise most of the Deltaic Plain physiographic subprovince. Surface elevations of the deltaic plain range from about +30 ft msl at the northern end to sea level at the southern end.

Other significant topographic features of the deltaic plain consist of Teche Ridge on the west edge of the Atchafalaya basin, LaFourche Ridge, and St. Bernard Ridge. A broad coastal marsh containing numerous shallow lakes and bays is found along the Louisiana coast and is part of the deltaic plain. Stranded beach ridges (cheniers) rise to elevations of about +12 ft msl within the marsh region and constitute the only inhabitable dry land in this marsh area. In other areas, coastal features consist of bays and lagoons with offshore bars or islands which trend parallel to the coast.

2.5.1.1.3 Geologic History

A discussion of the geologic history of the region surrounding the site is presented chronologically from the Late Paleozoic Era to the present time. A regional stratigraphic column is included as Fig. 2.5-5.

2.5.1.1.3.1 Late Paleozoic Era, Triassic and Jurassic Periods

Prior to Late Pennsylvanian time, a geosyncline extended along the present trend of the Marathon and Ouachita mountain systems. During the Paleozoic Late Pennsylvanian Period, thrust from the south caused intense folding and faulting which resulted in extensive mountain building within the former geosyncline. Evidence of the Ouachita orogenic belt has been found from western Alabama across Misissippi, southern Arkansas, Oklahoma, and into southwest Texas. In addition, folded and faulted rocks in eastern Mexico suggest a southward extension of the Paleozoic orogenic belt. Studies indicate that the uplift and fracturing of the eastern North America continental margins occurred throughout the Permian, Triassic, and Early Jurassic Periods(1).

The Gulf Coast sedimentary basin was probably initiated by the southward epeirogenic downwarping which occurred contemporaneously with the uplift of the adjacent continental platform following the Late Paleozoic orogenies that transformed the geosynclines into mountain systems(1). The subsequent Triassic normal faulting and fracturing associated with the downwarping resulted in the development of low submerged areas subjected to sedimentation. The loading of sediments contributed to further downwarping.

The presence of some continental redbed sediments of the Eagle Mills Formation in the northern Gulf Coastal Plain region has been considered by Scott et al(3) to be probably related to fault graben development which occurred in the Triassic Period. In southern Arkansas, the Eagle Mills Formation was deposited unconformably upon Paleozoic rocks. Some igneous activity also occurred.

The seas transgressed northward in early Jurassic time and widespread evaporites, redbeds, and carbonates of the Louann, Louark, and Cotton Valley Groups accumulated within the Gulf Coastal Plain. Salt deposits ranging up to 5,000 ft thick were formed. The pattern of salt basins in this region suggests that the initial salt accumulation occurred in regional grabens(1). The Louann salt beds are the source of the salt domes and other salt structures within the Gulf Coast region.

Normal graben-type faulting which began at this time was related to the subsidence of the continental margin on the seaward side of the Paleozoic orogenic belt. These faults limit the inner extent of thick Jurassic sediments, including salt. Such faulting included the South Arkansas Pickens-Gilbertown fault zones. Scattered structural features developed intermittently throughout the Gulf Coastal Plain from local uplift and/or subsidence during the Mesozoic and Cenozoic Eras.

2.5.1.1.3.2 Cretaceous Period

In Early Cretaceous time, general subsidence of the Gulf Coast region resulted in deposition of the Coahuilan and Comanchean Series unconformably over the Upper Jurassic beds as the Appalachian and Ouachita highlands were eroded. Over 10,000 ft of such sediments were deposited in central and southern Mississippi during this time. At the end of Comanchean deposition, the sedimentary depocenters had gradually shifted southward into central Louisiana and southern Mississippi as the seas withdrew(1). The region was uplifted and partially eroded at the end of Early Cretaceous time.

In Late Cretaceous time, the Gulfian seas transgressed the region and unconformably overlapped the Early Cretaceous and older sediments along the shelf edge near the site. This invasion extended into the northern Mississippi Embayment during Middle Tuscaloosa deposition. The character of the sediments reflects strand line fluctuations but shows that a gradual northward transgression occurred. Elevation of the Sabine, Jackson, and Monroe Uplifts occurred during the advance of the Gulfian sea, accompanied by extensive intrusion and extrusion of igneous materials. Several growth faults may have originated in these Late Cretaceous Sediments.

The upward movement of salt from the parent Louann Formation possibly occurred from late Jurassic time into the Cretaceous Period as a considerable thickness of sediments had accumulated over the salt. The weight differential and other differences in physical properties between the salt and the more dense overlying materials caused the salt to move upward and pierce the younger overlying sediments. Thinning of some stratigraphic units over the salt domes proves that some salt movement occurred contemporaneously with deposition(1). Uplift of the region at the close of Late Cretaceous time caused a retreat of the sea and extensive erosion of the emerged surface. Normal faulting occurred intermittently from Cretaceous time into the Quaternary Period. Generally, the faults are found on the updip side of the thicker accumulated masses of sediments.

2.5.1.1.3.3 Tertiary Period

The Paleocene Midway sediments were deposited disconformably over the erosional surface as subsidence was renewed. The Tertiary sediments are characterized by predominantly deltaic deposits with thin widespread marine sediments between these thick deltaic beds. The sediments occurred in arcuate, lenticular masses with the axes of maximum deposition subparallel to the present coast(1). During the Eocene Epoch, the seas advanced northward into the Mississippi embayment as the subsidence of the Gulf Coast geosyncline allowed extensive sedimentation. The last major inundation of the Gulf Coastal Plain is indicated by the presence of the marine Vicksburg sediments of the Oligocene Epoch. Later, the seas withdrew from the region and widespread deltaic deposits characterize the Miocene and Pliocene Epochs.

The extensive sediment loading within the Gulf Coast geosyncline initiated normal faulting in the western and central areas of the US Gulf Coastal province. Younger fault systems occurred progressively coastward, updip of the areas of maximum deposition. The faults trend approximately parallel to the regional strike and the downthrown blocks are generally toward the coast. These features are similar to large-scale slump structures. The faulting generally occurred from Cretaceous time into the Quaternary Period and some faults indicate recurrent slumping contemporaneously with later deposition. Fault displacements range up to several thousand feet(1).

2.5.1.1.3.4 Quaternary Period to the Present Time

Studies by Matson suggest that the nonmarine Citronelle Formation of Pliocene Age was deposited unconformably upon the eroded Pascagoula and older formations(4). Doering(5), however, considers the Citronelle Formation to be of preglacial Pleistocene age. This formation was originally deposited as fluvial sediments in a series of gently sloping plains under changing conditions of sedimentation as uplift occurred inland, with downwarping of the coastal margin. Further uplift resulted in some erosion of the Citronelle Formation.

During the Pleistocene Epoch, the Gulf Coastal Plain was successively eroded and covered by fluvial sands and gravels, which were related to the eustatic rise and fall of sea level accompanying the four glacial and three interglacial stages of the northern part of the continent. These terrace deposits overlie the eroded Citronelle Formation or older beds within river channels. River entrenchment has produced progressively younger terraces at decreasing elevations within the Mississippi Alluvial Valley.

Loess deposits of eolian origin were draped across the uplands during the Late Pleistocene Epoch in part of the Gulf Coastal Plain. These deposits are found along the eastern margin of the Mississippi River Valley and accumulated during the Wisconsin glacial stage as the Farmdale and younger Peorian loess sheets(6).

The Holocene Epoch was characterized by erosion of the Gulf Coastal plain with streams entrenched initially to considerable depth in a braided stream system. As the sea level rose, substratum sediments were deposited within the vast Mississippi Alluvial Valley. Then valley gradients decreased and finer top-stratum sediments were deposited within the floodplain of the meandering river system which developed.

Migration of rivers within meander belts resulted in diversion to several new river courses and development of new meander belts within the vast river valley. A series of successive subdeltas were formed along the coast in the past and subsequently abandoned as the Mississippi River course changed. Portions of the Gulf Coastal Plain have experienced downwarping accompanied by normal faulting during the Holocene Epoch, and compaction of sediments and downwarping continue in some coastal areas at the present time(7).

2.5.1.1.4 Regional Stratigraphy

A dicussion of the regional stratigraphy is presented ranging from the oldest known sedimentary strata in the site region to the youngest. The regional stratigraphic column is included as Fig 2.5-5. A generalized regional thickness map of the Cenozoic deposits in the Gulf Coastal Plain is submitted as Fig. 2.5-6. A geologic cross-section from Tennessee to the Gulf of Mexico showing the stratigraphic and structural relationships of the coastal sedimentary sequence in the Gulf Coastal province is included as Fig. 2.5-7.

2.5.1.1.4.1 Pre-Jurassic to Upper Jurassic Systems

The oldest known sedimentary strata of the Gulf Coastal Plain are probably of Late Paleozoic to Late Jurassic age(1). The Eagle Mills and Werner-Louann deposits (Louann Group) are found in the subsurface deposits of Alabama through Texas. The Eagle Mills Formation consists of red arenaceous materials and is nearly 7,000 ft thick in southern Arkansas. The overlying Werner Formation is composed of a basal conglomerate and an upper anhydrite member. The Louann Formation consists of salt ranging up to about 5,000 ft thick.

The Louark Group, composed of the Norphlet-Smackover-Haynesville sequence, is exposed in northeastern Mexico and is considered to be continuous with equivalent facies in the US coastal plain. The Norphlet Formation consists of red clastic material which appears to grade basinward into darker, finer marine facies(1). In northern Louisiana the overlying Smackover Formation is nearly 2,000 ft thick and is composed predominantly of black carbonates with interbedded shale. In eastern Texas this formation contains some dolomitic beds. The Haynesville Formation overlies the Smackover beds and is characterized by carbonates and evaporites, as well as some sandy and silty materials.

The Cotton Valley Group is predominantly an arenaceous-argillaceous sequence which grades downdip into dark argillaceous-calcareous materials. This group, consisting of the basal Bossier Formation and the younger Schuler

Formation, overlies the older beds unconformably. The Cotton Valley Group exceeds a thicknesss of 4,000 ft in the Gulf Coastal Plain(1).

2.5.1.1.4.2 Cretaceous System

The Coahuilan Series composes the oldest Cretaceous strata in the Gulf Coastal Plain and is divided into the basal Hosston Formation and the upper Sligo Formation. The Hosston Formation was deposited unconformably over older beds and consists of arenaceous materials updip which grade gulfward into dark shales and carbonates. Its maximum known thickness is about 3,000 ft. The overlying Sligo Formation grades from argillaceous-arenaceous strata to fossiliferous limestones and interbedded shales(1).

The Comanchean Series of the Gulf Coastal Plain has been subdivided into the Washita-Fredricksburg Stage and the underlying Trinity Stage. The Trinity Stage is known to exceed a thickness of 4,000 ft in the coastal province and the subsurface section is divided, in ascending order, into the Pine Island, James, Rodessa, Ferry Lake, Mooringsport, and Paluxy Formations. In northern Louisiana, southern Arkansas, and northeastern Texas, the Trinity Stage is predominantly composed of calcareous-argillaceous strata. The Washita-Fredricksburg Stage has not generally been subdivided in Mississippi and adjacent areas. These sediments grade from the updip clastics to partly sandy and crystalline limestones gulfward. The thickness of this stage is considered to range up to about 2,500 ft in the Gulf Coastal Plain.

The Upper Cretaceous beds of the Gulfian Series rest unconformably on older rocks in the Gulf Coastal Province. This series has been subdivided, in ascending order, into the Woodbine, Eagle Ford, Austin, Taylor, and Navarro Stages by Murray(1). The maximum thickness of the Gulfian Series is considered to be over 6,000 ft in southern Texas but generally averages about 2,500 ft thick in much of the northern Gulf Coastal Plain. The Gulfian Series in the updip areas of the Mississippi embayment and in Alabama consist of predominantly arenaceous-argillaceous facies compared to the argillaceous-calcareous facies in the downdip areas.

2.5.1.1.4.3 Tertiary System

2.5.1.1.4.3.1 Paleocene Series

In the Gulf Coastal Province, the Tertiary deposits are part of a geosynclinal sedimentary complex consisting of continental, deltaic, and marine deposits. The Paleocene Series is characterized by the Midway Stage which was deposited with disconformity or unconformity on the Gulfian Series throughout most of the Gulf Coastal Plain. The Midway Stage consists of the basal Clayton Formation and the upper Porters Creek Formation in Louisiana. The maximum known thickness of the Midway Stage is about 1,200 ft in the Gulf Coastal Plain, and the strata are predominantly calcareous sands, silts, and clays.

2.5.1.1.4.3.2 Eocene and Oligocene Series

The Eocene deposits consist of the Sabine, Claiborne, and Jackson Stages in ascending order. The Sabine Stage is predominantly arenaceous-argillaceous strata with lesser amounts of carbonaceous materials and includes the Wilcox Group. The maximum known thickness of the Sabine Stage is about 5,000 ft in southeast Texas, Louisiana, and southern Mississippi.

The Claiborne Stage includes a variety of lithologic types characterized by fossil content of a common age. In Louisiana, this sequence includes the Tallahatta, Cane River, Sparta, Cook Mountain, and Cockfield Formations in ascending order. Maximum thickness of the Claiborne Stage in the Gulf Coastal Plain is approximately 6,000 ft. Updip facies of this stage are predominantly arenaceous-argillaceous in nature while gulfward the materials consist of argillaceous-calcareous facies.

The youngest Eocene deposits are defined as the Jackson Stage and include all sediments deposited during the advance and retreat of the Late Eocene sea. These strata are predominantly calcareous in the eastern part of the Gulf Coast Province, argillaceous in the central part, and arenaceous in Texas. The Jackson Stage is known to be over 1,700 ft thick in southern Texas.

The Oligocene Vicksburg Stage includes limestone, clay, and arenaceous-argillaceous strata in the Gulf Coastal Plain. These sediments grade downdip into marine argillaceous beds which thicken in a gulfward direction. The Vicksburg sediments are approximately 300 ft thick along the regional strike near the site.

2.5.1.1.4.3.3 Miocene and Pliocene Series

The Miocene-Pliocene sediments are composed of the Grand Gulf-Fleming group. The basal Catahoula Formation of Miocene age consists of nonmarine sandstones and clays in Louisiana, Texas, and Mississippi and conformably overlies the Vicksburg Stage. Maximum thickness exceeds 5,000 ft in some areas. The Miocene Hattiesburg Formation is a nonmarine clay with thin sands overlying the Catahoula Formation conformably. Maximum thickness of the Hattiesburg Formation is reported to be about 450 ft(4). The Grand Gulf-Fleming Group sediments are essentially deltaic with marine fingers and contain extensive microfauna.

Gulfward, the Catahoula and Fleming sediments of the Gulf Province are replaced by marginal and marine deposits which indicate widespread cyclic strand fluctuations. In western Florida and eastern Alabama, equivalent beds consist of calcareous-arenaceous marine beds. The Pascagoula Formation overlies the Hattiesburg clay unconformably and consists of blue, green, and gray clay with sand. Maximum thickness of the Pascagoula Formation is greater than 1,000 ft(4).

The Grand Gulf-Fleming Group is over 8,000 ft thick in southern Louisiana. Stratigraphic units are numerous for the later Miocene sediments in the Gulf Coastal province, with some tentative correlations. Also, certain Pliocene deposits of the Grand Gulf-Fleming Group have been given local formation names, such as Graham's Ferry Formation in southern Mississippi and Foley Formation in southwestern Louisiana. The lack of stratigraphic refinement in the Grand Gulf-Fleming Group is due to the similarity of lithology within the group as a whole.

The extensive microfossils of the Miocene-Pliocene sediments have enabled a subdivision of many subsurface deposits into biostratigraphic zones based on key microfossils within the Gulf Coastal Province. The downdip sequences thicken tremendously from a few hundred feet to tens of thousands of feet and much of the thickness occurs gulfward in short distances across normal faults. Howe reports that the Discorbis, Heterostegina, and Marginulina microfossil zones are gulfward marine equivalents of the Catahoula deltaic deposits(8). The Tatum limestone member of the Catahoula Formation was formerly referred to in the Louisiana-Texas coastal area as the Heterostegina zone(9).

2.5.1.1.4.3.4 Pliocene-Pleistocene Series

The Citronelle Formation of the Pliocene-Pleistocene age rests unconformably on the older Tertiary beds and consists chiefly of nonmarine sand, clay, and some gravel. Maximum thickness is about 400 ft in Louisiana and Mississippi. The Citronelle Formation forms a fairly continuous east-west belt 25 mi or more wide extending from the eastern valley wall of the Mississippi River floodplain eastward into Florida. Northward in southern Mississippi, the Citronelle Formation is partially or completely removed by erosion so that underlying Pascagoula clays and sands of the Upper Grand Gulf sequence are exposed.

The Citronelle Formation is virtually flat-lying in southern Mississippi, but southward from the east-west Mississippi-Louisiana state line it dips gulfward at an average rate of 12 ft/mi. The zone along which the increased gulfward dip occurs was designated the South Mississippi Uplift by Fisk(2). The Citronelle Formation caps the uplands near the state line and determines the regional topography. Surface elevations which exceed 400 ft msl occur in southern Mississippi but the ground surface slopes southward to el 150 ft msl in the site area and to el 120 ft msl farther south where the Citronelle Formation dips beneath younger Pleistocene terraces. Still farther south in the Baton Rouge area, the Citronelle Formation contains important aquifers at depths of 400 ft and 600 ft beneath the Pleistocene sediments.

2.5.1.1.4.4 Quaternary System

2.5.1.1.4.4.1 Pleistocene Series

In the Gulf Coastal Plain, four depositional coastal terrace deposits have been mapped by Fisk(10) and have been revised and renamed by Doering(5). Fisk's type Pleistocene section, based on the terrace deposits of the Red River valley in Louisiana, consisted of a basal Williana terrace, succeeded by the Bentley, Montgomery, and youngest Prairie terrace formations(10). Doering considered the coastal Williana terrace to be the Citronelle Formation and renamed the terraces the Lissie, Oberlin, Eunice, and Holloway Prairie Formations from oldest to youngest, respectively(5). Laterally continuous but thinner equivalent deposits are found in the Texas Coastal Plain. These sediments are similar in facies to the Louisiana-Mississippi sediments.

Matson(4) reported correlative Pleistocene terraces from eastern Texas to Alabama which consisted of St. Elmo, Port

Hickey, Hammond, and Pensacola Formations, from oldest to youngest, respectively.

Two coastwise terraces have been identified by Durham et al south of the Citronelle Formation terrain(11). The older Irene terrace was mapped by Durham et al(11) as part of the Montgomery terrace named by Fisk(10); the younger Port Hickey terrace, located farther south and overlapping the Irene terrace, was previously labeled Coastwise Prairie by Fisk(10). Doering identified three terraces in the same area where he interpreted fault scarps to be terrace boundaries(5). Of these two terraces, the Port Hickey terrace is distributed more extensively and has been modified less by erosion. It not only occurs as a broad deltaic surface through the Baton Rouge area and far to the southeast, but extends up the Mississippi River and tributary streams as a discontinuously preserved fluviatile terrace. This terrace is related to the last prolonged interglacial age, the Sangamon, and is generally considered to be at least 70,000 yr old and possibly much older(12).

A younger fluviatile terrace, called sub-recent by Fisk, is discontinuously preserved along Thompson Creek, Alexander Creek, and other tributaries of the Mississippi River(10). It does not have a visible coastwise equivalent and probably correlates to the Fluviatile Prairie of Fisk and to some of the Deweyville terraces recognized on other trunk streams(10). This terrace is probably of Mid-Wisconsin age and hence 15,000 to 35,000 yr old.

In the site study, terraces are important in recognizing the presence and age of slump faults, as evidenced by vertical displacements that cause scarps to interrupt the otherwise continuous slope of the terrace surfaces. Also, local terrace names, such as Irene and Port Hickey, have been used to avoid the difficulties inherent in earlier miscorrelations over long distances. Another important aspect is the proper correlation within the near-site area and the relation of these terraces to the proper Pleistocene cycles so that their ages can be ascertained.

Murray indicates that the regional terrace correlations are not resolved and need further clarification(1).

Late Pleistocene deposits in the region consist of eolian loess. In the Gulf Coastal Plain, the loess deposits blanket the uplands on the margin of the Mississippi alluvial valley and range up to 50 ft thick in some places. The loess in central Mississippi generally overlies the Citronelle Formation unconformably. In southern Louisiana, the loess overlies the Pleistocene terrace formations in many places. In the site region, the loess sediments are considered to be equivalent to the Farmdale and Peoria loess sheets of Illinois, which were deposited during the Wisconsin glacial stage of the Pleistocene Epoch(6).

2.5.1.1.4.4.2 Holocene Series

Holocene deposits in the region are composed of the braided-stream substratum and topstratum deposits. The substratum sediments are generally medium-grained sands which grade downward into coarser sands and gravels and were deposited in the entrenched valleys as sea level rose after the Pleistocene Epoch. As the braided regimen changed to the present meandering regimen, the floodplain was created and the topstratum sediments of fine sands, silts, and clays were deposited within the alluvial plain. Typical topstratum environments of deposition include natural levees, backswamps, abandoned courses, alluvial aprons, point bars, and abandoned channel deposits(13).

2.5.1.1.5 Regional Structure and Tectonic Features

The structural geology discussion includes the basement structures, major graben-type fault zone, Mississippi embayment, surface features, sedimentary sequence, minor growth and slump faulting, and salt structures. A map showing the major structural features of the Gulf Coastal Plain is presented as Fig. 2.5-8.

2.5.1.1.5.1 Basement Structures

The major structural feature of the site region is the Gulf Coast geosyncline, a great elongate downwarp whose axis trends generally east-west near the present Texas-Louisiana coastline, approximately normal to the axis of the generally north-south trending Mississippi structural trough.

Because of the great depth of sediments deposited within the Gulf Coast geosyncline beneath the Gulf Coastal Plain, these sediments have been penetrated by drilling only on the inland periphery so that the nature of only part of the underlying basement rock can be well defined. A map of basement structures is presented as Fig. 2.5-9. Gravity and magnetic data in a broad and general way may indicate basement structure. A portion of the 1964 Bouguer Gravity Anomaly Map of the United States published by the USGS is presented in Fig. 2.5-10. These data are discussed with respect to the interpretation of basement structure in this section.

Aeromagnetic data are not available for the state of Louisiana. Some data exist for the Mississippi embayment to the north. The most detailed data are available for the state of Missouri(14). However, seismic VIBROSEIS(15) data acquired for this study form a more definitive basis for interpretation of geologic structure in this area. The northern periphery of the coastal plain roughly coincides with or overlaps the trend of the Paleozoic Appalachian and Ouachita orogenic belts from Georgia to northeast Mexico. The maximum overlap occurs in the Mississippi embayment, where coastal plain sediments extend over 200 mi northward beyond the Ouachita trend onto the Paleozoic craton. However, the Ouachita belt can be traced by drilling information from the outcrop in central Arkansas eastward into eastern Mississippi.

East-west through southern Arkansas, the Ouachita belt is bounded on the south or gulfward side by a large basement graben-type fault zone. Thick Late Triassic clastics occur on the downthrown fault blocks. These sediments have been interpreted as graben fill similar to the Newark Series of the same age and lithology, which extends discontinuously along the Appalachian trend(3). This basement fault zone extends southwestward into eastern Texas, and a similar but later fault, the Phillips fault, extends southeastward through central Mississippi where it is bordered on the south by thick Late Jurassic clastics(16).

The Interior Salt basin, located north of the site, is recognized as a discontinuous trend present in eastern Texas, north-central Louisiana, and, as the Mississippi Salt Basin, from eastern Louisiana through southern Mississippi and Alabama to western Florida. The Mississippi Salt Basin is bounded on the southern (gulfward) side by a relatively domeless belt 90 mi wide that separates it from the Coastal Salt Basin farther south. Consequently, a thinning or absence of salt in the domeless area has been inferred and attributed to a rise in the basement separating the two salt basins.

The foregoing interpretation is substantiated by a deep seismic section, extending north-south through Mississippi, commissioned by the US Atomic Energy Commission (Fig. 2.5-2 and 2.5-11)(17). This section revealed coastal plain sediments which are 33,000 ft thick in the Interior Salt basin of southern Mississippi. The Philips fault forms the abrupt northern boundary of the thick sediments. The sediments thin southward across the basin to only 20,450 ft in the domeless area of the Hancock Ridge, 110-mi east-southeast of the site.

The Hancock Ridge was also shown to have a thick sialic crust of continental character in contrast to a much thinner sial beneath the Interior Salt basin to the north. Although the AEC seismic section did not extend southward into the Coastal Salt basin, a thin crust is also postulated in that area. The gravity map, Fig. 2.5-10, depicts a negative gravity anomaly on the Hancock Ridge and positive gravity anomalies to the north and south, which reinforces this interpretation. The combination of the Hancock Ridge and the adjacent Gulf Coast basin has affected the geology of the overlying sediments.

The effect of the Hancock Ridge appears to be less pronounced westward in the site area along the Mobile-Tunica Flexure than along the AEC seismic line in Hancock County, Mississippi where a mid-Tertiary unconformity places the Tatum Limestone, (considered to be of Early Miocene age), directly on the Wilcox Formation of Paleocene-Lower Eocene age(8). Westward at the site, however, nearly 4,000 ft of the Eocene and Oligocene beds are found between these deposits. Additionally, there is a westward component to the structural dip of the younger beds overlying the crest of the Hancock Ridge. This evidence suggests a westward plunge to the ridge, making it less pronounced in the site area than it is farther east in coastal Mississippi.

2.5.1.1.5.2 Tectonic Features of Mississippi Embayment and Adjacent Region

The relationship of Paleozoic and basement features to the Mississippi embayment is depicted in Fig. 2.5-8. The embayment is underlain by the Pascola arch, a broad domal feature with a northwest-southeast orientation, midway between the Ozark and Nashville domes. Eroded Cambrian formations are present on the crest of the arch in the "bootheel" of Missouri. From this area the Paleozoic beds dip gently northeastward and also southwestward into the Arkoma basin. In the Memphis area, the southwesterly dip steepens and progressively younger and thicker Paleozoic beds are preserved southward into the basin. The Arkoma basin is terminated on the south by the Ouachita tectonic front which forms the north boundary of the Ouachita tectonic belt. All of these buried features, the Pascola arch, the Arkoma basin, and the Ouachita tectonic belt, have a general west-northwest and east-southeast trend beneath the coastal plain sediments. This same trend is also exhibited by the basement features farther south, such as the Interior Salt basin, the South Mississippi Uplift and, the Coastal Salt basin, all of which trend generally west-northwest and east-southeast.

In addition to the Mississippi Embayment, Fig. 2.5-8 depicts other coastal plain features including the Desha basin, the Monroe uplift, and the Jackson dome. The major Mississippi structural trough, as depicted by Fisk, is a line drawn through the negative portions of the region following the axis of the Mississippi embayment, the axis of the Desha basin, and the negative area between the Monroe uplift and the Jackson dome(2).

The Mississippi Embayment is superimposed on the Pascola Arch as a gentle but narrow downwarp with a north-northeast and south-southwest axial orientation, as shown by the structural contours on the top of the Cretaceous sediments on Fig. 2.5-8. The embayment commences in southernmost Illinois on the north flank of the Pascola arch with a prominent south-southwesterly plunge that flattens over the crest of the arch in the Missouri "bootheel" and southwestward. In the Memphis area along the south margin of the Pascola arch, the Mississippi embayment broadens and the southward dip develops into the Desha basin. This basin has a characteristic west-northwest to east-southeast trend concordant with the underlying Paleozoic structure.

The Monroe uplift, which borders the Desha basin on the south, is a broad, relatively flat-topped dome. According to Murray, structural contours drawn on the base of the Gulfian (Upper Cretaceous) and younger horizons disclose a northwest trending axis(1). This has caused some geologists to suggest that the uplift is related to rejuvenation of part of the subsurface extension of the Ouachita structural belt. Intermittent positiveness and relative upwarping are indicated by gentle angular unconformities within the Mesozoic sequence. Emplacement of igneous masses produces other variations. A biostromal limestone of Late Mesozoic and Early Cenozoic age suggesting abnormally shallow water deposition is the youngest evidence of uplift activity. Overlying subsurface and outcropping Cenozoic formations are unaffected by the uplift(18).

Conversely, the Jackson dome is reflected on the surface as an inlier of Middle Eocene sediments surrounded by Upper Eocene beds. Biostromal limestone of Late Mesozoic and Early Cenozoic age is also present on this dome. Murray concludes that it is similar in general geologic history to the Monroe uplift, the Sabine uplift of east Texas and northwestern Louisiana, and the Ocala uplift of central Florida, but it may be due, in part, to igneous intrusion followed by drape folding(1).

Along the northern periphery of the Mississippi embayment many faults displace Paleozoic beds in southernmost Illinois and western Kentucky(19). These faults generally trend south-southwest into the embayment, where recent mapping by the USGS (Table 2.5-1) documents Cretaceous, Tertiary, and even Pleistocene displacement on some of them as shown on Fig. 2.5-12. Southwestward, their identity is lost in the Holocene alluvium, late Pleistocene alluvial terraces, and surficial loess that form the embayment surface. However, scattered surface scarps and subsurface well control suggest evidence for faulting in the New Madrid-Reelfoot Lake area and possibly into Crittenden County, Arkansas, about 15 mi northwest of Memphis. An east-west seismic line in the Blytheville, Arkansas area shows a fault displacing the Middle Cretaceous erosional surface on the Paleozoic rocks and extending upward into overlying Cretaceous and Tertiary strata with diminishing effect(15). A network of similar seismic lines extending across the embayment south of Memphis does not depict any faults in the coastal plain sediments(15).

Thus, the faults are prominent in the northern part of the Mississippi embayment on the northern flank of the Pascola arch. They decrease in number southward, dying out within the southern flank of the Pascola arch. They terminate north of the Paleozoic Arkoma basin, north of the area where the Mississippi embayment broadens and where south dip commences into the Desha basin.

This fault distribution conforms closely to the pattern of epicenters of earthquakes, as shown in Fig. 2.5-36. Furthermore, surface manifestations of the New Madrid and older earthquakes, including sand blows and fissures, as mapped by Fuller, are identified only in the area of the embayment that extends north from the vicinity of Marked Tree, Arkansas, approximately 35 mi west-northwest of Memphis(20).

2.5.1.1.5.3 Structural Geology of the Sedimentary Sequence

In the history of investigation of the sediments of the Gulf Coastal Plain and Mississippi embayment, many forms of surface features have been studied in an attempt to obtain surface indications of subsurface structures. The importance of identifying faulting within the sediments intensified with the discovery of oil and gas associated with some of these geologic structures. Surficial studies, geophysical investigations, and deep borings have now covered much of the region. A map showing the approximate updip limit of slump fault zones in Louisiana is included as Fig. 2.5-13.

2.5.1.1.5.3.1 Surface Features

Previous geological studies in this area have demonstrated beyond question that the structural features associated with salt domes and the east-west slump faults can and frequently do exhibit discernible surface evidence. Because of the nature of the terrain, interpretations of aerial photography and surface topography have proven to be the most effective methods of mapping surface features indicative of structural movements.

Faults and fractures are evidenced at the surface in a variety of ways, including regional lineaments, linear and/or parallel drainage lines, abrupt or anomalous changes in stream direction, vegetation changes, soil changes, changes in drainage density, abrupt topographic changes or scarps, and changes in land use. Salt structures, including associated faults, are evidenced by similarly anomalous but slightly different surface features. However, it must be emphasized that any or all of these features can and sometimes do result from situations and processes completely unrelated to faulting, fracturing, or structural movements. Subsurface investigations are usually necessary to establish definitively whether or not structural movements were responsible for the surface features.

The presence of numerous faults or fractures in the Lower Mississippi River Valley area has been postulated or inferred by various workers using varying combinations of surface or physiographic evidence and subsurface evidence. A review of the literature reveals a distinct evolution in thought with time regarding the relationship between certain types of surface features and faulting as the causal process. This evolution strongly reflects the growing body of knowledge regarding fault mechanisms in these sediments and the rapidly expanding volume of subsurface data.

In some of the earlier work, notably that of Fisk, numerous faults and fault zones were postulated almost exclusively on the basis of regional lineaments and other surface features, as shown in Fig. 2.5-14(2). The concept of a strong relationship between the orientation of postulated faults and the northeast-southwest and northwest-southeast fracture pattern projected from the region beyond the Mississippi embayment, as evidenced in Fig. 2.5-15, is apparent in his work.

More recent studies, particularly those of Durham and Peeples and of Parsons, identify faults with a general east-west trend in the area south of the site(21 ,22). For these faults only, there is confirming subsurface evidence in some cases. In the following paragraphs, all evidence for possible structural features contained in these and other references are evaluated and the results of additional specific investigations conducted for the purpose of this study are presented and discussed.

From his identification of lineaments in the Lower Mississippi River Valley area, Fisk postulated the presence of eight principal fault zones and several lesser ones, as shown in Fig. 2.5-14(2). The postulated Red River Fault Zone, which is shown trending northwest-southeast through Alexandria and Baton Rouge, Louisiana is of further interest from the standpoint of the site location. Fifteen postulated faults were delineated in this zone by Fisk, extending down the Red River Valley and into southeastern Louisiana(2). Several additional postulated faults which are of secondary interest are shown northeast of and parallel to this trend and include the fault shown trending from near Monroe, Louisiana, to near Natchez, Mississippi.

One of the postulated faults in the Red River Fault Zone is shown trending southeastward from the vicinity of the site along the erosional escarpment separating the upland terraces from the Mississippi River Alluvial Plain. It is concluded that Fisk's evidence for this fault was the linear nature of this escarpment and its general directional trend in relation to the similar trends of features to the northwest and the southeast(2). No subsurface evidence of faulting is known to exist along the indicated trend.

An examination of the photographs and photograph mosaics confirmed the roughly linear nature of the escarpment; however, it failed to reveal any additional surface evidence for faulting. Aerial photography studies are discussed in Section 2.5.1.2.3.1. It is considered that formation of the linear escarpment is simply a result of lateral erosion by the Mississippi River at various times during the Quaternary Period. The formation of linear escarpments by the lateral movement of the river, while flowing in either a braided or a meandering regimen, can be demonstrated at numerous points in the Lower Mississippi River valley area.

Since 1944, a tremendous volume of detailed subsurface data on the Lower Mississippi River alluvial valley deltaic plain and nearby adjacent uplands has become available. These data are not known to substantiate faulting as the causal process in creating any of the lineaments shown in Fig. 2.5-14 with the exception of a portion of a lineament which coincides with a part of the Baton Rouge fault zone. The absence of subsurface evidence for faulting is particularly significant for the lineaments mentioned above, some of which occur in areas that have been intensely explored by borings such as the one trending between Monroe and Natchez.

The failure to be able to confirm many faults as having caused lineaments extends equally into the deltaic plain area of the Mississippi River. For example, none of the faults postulated on the basis of lineaments or physiographic features by Saucier south of the Baton Rouge fault in the Pontchartrain Basin area of Louisiana have been confirmed by subsurface exploration in spite of voluminous data and subsequent detailed investigations in the area(7).

Many of the lineaments appear to be better explained as being the result of such processes as differential erosion, beach ridge formation, or deltaic distributary growth. The only faults in the area that have been confirmed by subsurface evidence (both shallow and deep seismic reflection and refraction surveys) are growth and slump faults which depart from the regional pattern identified by Fisk and which trend approximately east-west(2).

Lineaments were the principal evidence, if not virtually the sole evidence, used by Fisk in interpreting the regional fracture pattern of the central Gulf Coastal Plain portrayed in Fig. 2.5-15. According to Fisk, the postulated fault systems mentioned above are but a part of his regional fracture pattern, and many of his fractures are what he calls faults(2).

The evidence indicates that the Fisk lineaments are simply erosion and deposition patterns(2). The Mississippi River flows generally southward to the gulf and its alluvial valley has an overall north-south orientation. However, considering the dynamic tendency of running water to vary from its true course during the long erosional and depositional history of this alluvial valley, expected variations from the north-south orientation produce northeast-southwest and northwest-southeast trends which Fisk mapped as lineaments(2). North-south orientations are neglected as normal, and east-west orientations are rare or absent because of the wide divergence from the overall gulfward slope of the valley. Also, first-order tributaries to the north-south trunk stream typically would have either a northeast-southwest or northwest-southeast orientation.

2.5.1.1.5.3.2 Slump and Growth Faults

Fault zones trending east-west are known to exist regionally through southern Louisiana. These are predominantly normal faults, downthrown to the south. Fault plane dips are steepest at shallow depths and flatten with increasing depth. The faults are interpreted to flatten into bedding plane displacements, but dips flatter than 30 deg are difficult to detect and occur at such depths that subsurface information is generally lacking. Nevertheless, there is virtual unanimity among investigators that these faults are contained entirely in the sedimentary sequence and do not extend into the basement.

On the downthrown side, the beds commonly dip northward into the fault plane in reverse of normal regional dip. This produces a "rollover" structure, a gently plunging elongate anticline whose axis parallels the fault. These characteristics resemble the features of gigantic slump blocks thought to occur as the result of sedimentary loading rather than due to a tectonic origin. Because petroleum is commonly entrapped in the "rollover" structures, these faults have been extensively studied using geophysical data, subsurface well control, and correlations based on paleontological and paleoenvironmental interpretation.

In spite of the common characteristics of these faults, two different categories have been generally recognized in this area: growth faults and slump faults. Growth and slump faults are also discussed in Section 2.5.3 with respect to the potential for faulting in the plant area.

The growth faults typically occur within the limits of the outer shelf environment, an unstable position susceptible to gulfward slumping under sedimentary load. The tendency to slump is accentuated by the gulfward lateral movement of the underlying shale and salt as the sedimentary load is emplaced from the north. As the shelf builds gulfward, the outer shelf zone of growth fault slumping shifts; older faults die out upward as the local environment shifts through a stable inner shelf to a deltaic and ultimately a fluviatile environment. Sediments of these types, 5,000 ft thick or more, overlie and bury the inactive faults.

This great depth of unfaulted overlying sediments delayed general recognition of growth faults until the advent of deep drilling in the 1950s. They are characterized by a thicker sedimentary sequence on the downthrown side, in some cases exceeding 3,000 ft. They typically die out upward and are overlain by unfaulted deposits that do not vary in thickness across the top of the fault. By determining a ratio based on the contrasting thicknesses of equivalent beds on each side of the fault, the time and degree of "growth" can be ascertained. A bar graph plot of this growth on a typical fault demonstrates increasing movement through time to a maximum, followed by decreasing movement until the fault movement ceases(23).

Micropaleontologic data not only provide correlations across the faults but permit interpretations of sedimentary environments and water depths. The overall upper Tertiary depositional pattern is a regressive deltaic plain across southern Louisiana. The foregoing depositional pattern requires a deep water basin into which the unstable shelf can build and slump. Similar patterns existed in earlier regressive sequences such as the lower Tertiary Wilcox and the Middle Cretaceous Tuscaloosa formations. This explains why there is an inner northward limit to the south Louisiana growth faults. This area is underlain by the Mobile-Tunica Flexure designated by Howe(8). The thick Middle to Late Cenozoic clastics accumulated in the deeper basin south of the flexure where instability led to slumping and the development of growth faults south of the hinge line which divided the shallow, more stable shelf area from the deep southern basin. The thick Tuscaloosa sediments also accumulated in the deep basin south of the shelf edge.

Slump faults are very similar to growth faults in geometry and physical characteristics. In the area of previous growth faulting, they may even be positioned along the growth faults and represent reactivation of growth faults. The designation of slump faults is made to distinguish the causes and period of maximum movement of this type of fault. Slump faults have occurred on the inland periphery of the main sedimentary mass due in part to differential compaction and in part to flexing gulfward into the area of subsidence and maximum sedimentary thickness.

On the inner margin of the growth fault area, several slump faults have been identified in the Baton Rouge area. These faults are upward extensions of the deep Tuscaloosa Group growth faults and are distributed generally east and west subparallel to regional strike along the inner periphery of the Coastal Salt basin. These faults were active primarily during the Pleistocene Epoch. The later movement is associated with the relatively rapid accumulation of sedimentary load to the south during the Pleistocene Epoch and possibly with the low eustatic levels during periods of maximum glaciation. Since they were active during the Pleistocene Epoch, these faults do exhibit growth characteristics within the Pleistocene sequence. However, they are not the true growth faults associated with the unstable outer shelf environment.

The Tepetate-Baton Rouge fault system is one of the best known of these slump fault zones and was recognized independently both from subsurface and geomorphic evidences(2, 21). One fault in this system, the Baton Rouge fault, forms a prominent scarp exceeding 20 ft in relief through southern Baton Rouge, where it displaces the Port Hickey terrace surface of Sangamon interglacial age. This fault system has been mapped on the surface as a narrow zone of en echelon faults trending east-southeast along the northern margin of the Lake Pontchartrain Basin to the Pearl River. West of Baton Rouge, it cannot be recognized on the Holocene Mississippi River floodplain but the fault system extends fairly continuously across southern Louisiana into Texas(1). There is displacement on the Deweyville terrace surface (mid-Wisconsin age) at the Amite River, 18 mi east of the Mississippi River. Murray reports that some movement along the Baton Rouge fault zone is recent(1).

Fig. 2.5-16 is a cross section presenting the subsurface evidence for the dip and throw of the Baton Rouge fault. The dip is typical, being steepest near the surface and flattening with depth. As shown in Fig. 2.5-16, the subsurface fault displacement ranges from 220 to 460 ft with an average vertical displacement of 345 ft. In the Baton Rouge area, a total displacement of approximately 250 ft affects the 400-ft and 600-ft aquifers. These are the downdip subsurface projections of the Citronelle Formation aquifers. On this evidence, the interpretation is made that the fault commenced its activity after deposition of the Citronelle Formation (late Pliocene Epoch). Recent activity has been documented by cracking of pavement and structures in Baton Rouge as well as by a first-order leveling survey that showed 0.20 ft of displacement in the interval between 1939 and 1969(24). On-going geologic mapping in the Baton Rouge area for the Louisiana Geologic Survey has confirmed more surface damage along the fault than was previously known.

The typical rollover effect is present on the Baton Rouge Fault. The maximum terrace surface elevation of the Port Hickey terrace surface south of the fault exceeds an elevation of 40 ft msl and trends discontinuously about 1 1/2 to 2 mi south of the escarpment. The ground surface has a perceptible northward slope near the fault escarpment. This pattern becomes more pronounced with depth and results in anticlinal structures productive of petroleum at the

Baton Rouge, Siegen, Nesser, and Mallets Bluff oil fields. The fault is also an important barrier to northward migration of saltwater into the 400-ft and 600-ft aquifers in the Baton Rouge area(25).

2.5.1.1.5.3.3 Salt Structures

Salt structures are found within the Gulf coastal province as domal or anticlinal to ridge-like diapiric folds. These features vary in magnitude, height, and areal extent. In the Gulf Coastal Plain, two separate salt basins have been defined as the Northern or Interior Salt basin and the Southern or Coastal Salt basin (Fig. 2.5-2)(26). These two basins have been subdivided into smaller basins(27). The Interior Salt basin consists of the East Texas (Tyler), North Louisiana, and Mississippi Salt basins. The Coastal Salt basin subdivisions are the South Texas and Houston Embayment Salt basins, as well as the South Louisiana and Outer Shelf Salt Dome basins. Over 300 separate salt features are known in the Gulf Coastal province(1).

In the United States Gulf Coastal Plain, the upper part of many salt structures is circular in shape with the lateral diameter ranging up to 6 mi. At times, the domal mass rises as a spine from deeper anticlinal ridges. Some domes are mushroomed at the top, and some have cap rock consisting of anhydrite, calcite, and gypsum. The salt domes with appreciable relief have pierced the lower overlying beds, flowed upward and may possibly have penetrated all of the younger beds near the surface. Many salt domes in Louisiana have had recurrent growth which sometimes modifies relict structures as the salt moves upward through them(1). Some salt masses within the gulf region have penetrated upward through more than 25,000 ft of overlying sediment.

Numerous salt structures control accumulations of hydrocarbons, sulfur, and gypsum. Faulting is commonly found associated with salt structures and is generally interpreted as normal faulting. Simple doming of sediments is found over salt stocks but is sometimes restricted to beds immediately overlying the top of the salt or cap rock. The salt structures are not found on the higher portion of major uplifts within the Gulf Coastal Plain. Murray(1) suggests that their absence is caused by salt flowage from structurally or topographically high regions to lower areas and/or positive relief of the uplift during or just after deposition of the salt.

2.5.1.1.6 Petroleum Production and Mineral Extraction

The River Bend Station site is located on the northern margin of the South Louisiana petroleum province. Production nearest the site is from older and deeper formations rather than from the Upper Tertiary formations which produce father south. The primary target for exploration in the area is the Tuscaloosa formation at the base of the Upper Cretaceous sequence at an approximate depth of 3 or more mi. The nearest Tuscaloosa production to the plant area is at Port Hudson Field, 7 mi southeast, and at Freeland Field, 7 mi east-northeast, as shown in Fig. 2.5-17. The nearest production, now abandoned, from the Wilcox Formation of Lower Tertiary age at a depth of about 2 mi was at Alsen Field, 11 mi southeast of the plant area. A marginal well was completed in the Upper Cretaceous Austin Formation, superjacent to the Tuscaloosa Formation. This well is located 3 mi southeast of the plant area at a depth of about 3 mi. The well never produced, and in March 1982 it was plugged and abandoned.

The first Tuscaloosa Formation field in the area was False River, discovered in 1975 at a depth exceeding 19,000 ft and located 12 mi southwest of the site. Since then, nearly 20 fields have been discovered along a 15-mi wide trend extending west-northwest to east-southeast over 150 mi through central and southeastern Louisiana. The high production rate of gas and condensate coupled with deregulated gas prices exceeding $6.00/mcf have resulted in rapid exploratory and development drilling activity of these expensive deep wells. Table 2.5-2 lists the field data.

The Tuscaloosa Formation consists of sand and shale deposited on top of the Lower Cretaceous limestone following the development of a regional unconformity. It has long been productive in shallow fields updip to the north through Mississippi and central Louisiana where it overlies the Lower Cretaceous shelf. The present "play" occurs where deposition of the clastics has been extended southward across the shelf edge into the basin. Basinward slump in these sediments initiated growth faulting which has produced parallel fault blocks on the southern margin of the Lower Cretaceous shelf edge, each successive block deeper and with thicker Tuscaloosa Formation sands. Geologists differ as to the sedimentary environment of the sand, whether it is deltaic or deep water turbidites. Freeland Field, the northernmost field, is actually located on the shelf crest. Port Hudson Field, located farther basinward, is sited on a deep-seated salt structure. Irene Field, situated still farther south, was discovered on the south side of the growth fault whose surface expression is the Zachary fault. False River Field is situated on the next fault block basinward. Sand depth and thickness increase markedly basinward across these faults, as do geopressures, indicating closed sand systems with fault boundaries on the north. Conversely, Port Hudson sands display normal pressure.

The Austin Formation is a thick chalk and marl, generally geopressured, with low permeability and production resulting from fracture porosity. It has not been a principal production target in the area, but can be a secondary target if the underlying Tuscaloosa Formation is not productive.

The Wilcox Group production at Alsen Field is in the rollover structure associated with the Zachary Fault at a shallower depth and hence north of the Irene Field previously discussed. Several other fields, similarly producing from rollover anticlines, are present southwest of the site in Point Coupee Parish. These fields are associated with the northwestward extension of the Scotlandville-Denham Springs Fault trend. The nearest of these fields is Livonia-Frisco, 19 mi southwest of the site, which produces from the Wilcox Group as well as from the shallower Cockfield and Sparta Formation sands of the Claiborne Group (Middle Eocene.)

The nearest petroleum production north of the site is the south-western Mississippi where there are numerous fields producing from the Wilcox Group and Tuscaloosa Formation. Regional dip in that area is slight and compaction over irregular fluviatile sand bodies produces slight structural closures in the overlying beds to produce petroleum entrapment. South of the Tunica Flexure, the regional dip is sufficiently great to eliminate closure in such compaction structures. Consequently, the petroleum has migrated updip to the north. This pattern persists southward across the shelf edge to the growth fault region on the basinward side of the shelf as previously described. Figure 2.5-17 shows the relationship of the shelf and the productive fields.

The site is located in a zone of uninterrupted gulfward dip on the southern flank on the Tunica Flexure. This zone is north of the coastal slump fault area where these faults and associated rollover structures result in shallow petroleum entrapment.

North of the Zachary Fault petroleum does not accumulate in the Wilcox Group and younger formations because of the continuous southward dip of the formations and the absence of entrapment structures. The uninterrupted gulfward dip through this area is further confirmed by the October 1970 north-south seismic section located less than 1.5 mi east of the plant area (Fig. 2.5-26 and 2.5-35) and by the 1982 seismic sections located in the site area (Section 2.5.1.2.3.2). Test wells in the area, including the three old wells immediately west and south of the site, confirm this pattern. Some were drilled before this geologic structure was fully understood.

The northern boundary of this zone of unproductive, continuous gulfward dip in which the site is located, is formed by the Tunica Flexure in the vicinity of the East-West portion of the Mississippi-Louisiana state line, approximately 16 mi north of the site. North of the flexure, relatively low regional dip is present so that irregularities related to differential compaction over localized sand bodies result in petroleum entrapment in Wilcox Group Sands in these subdued structures.

Petroleum production south of the site is shown in Fig. 2.5-17. Toward the south, the Morrisville, Manchac Point, Sardine Point, and Burtville Fields are productive due to rollover structure south of the Burtville Fault. This fault has not been recognized on the surface in the region. Addis Field may be a trap formed on the western extension of the Burtville Fault. The alignment of the Baton Rouge, Siegen, Nesser, Hope Villa, and Mallets Bluff Fields is a result of rollover on post-Wilcox Group sediments along the south side of the Baton Rouge Fault. The western extension of this fault accounts for the production in the Rosedale East, Grosse Tete, and Port Allen Fields from the Tertiary sediments.

The Bayou Choctaw, University, and Port Hudson Fields are traps formed by salt domes. The Scotlandville-Denham Springs Fault has formed productive rollover structures in the Tertiary sediments at the Livonia, Rebecca Bayou, Lobdell, and Denham Springs Fields. The newly-discovered False River Field, which produces gas and condensate from the Tuscaloosa Group sediments, may be a rollover structure along the south side of a northwest-trending bifurcation of the Scotlandville-Denham Springs Fault.

The Zachary Fault accounts for the production from the Wilcox Group sediments forming a rollover structure south of the fault at the Alsen Field. Farther south, this fault forms the productive Tuscaloosa Irene Field and, most likely, the Tuscaloosa Moore-Sams Field to the west.

The Louisiana Land and Exploration Crown Zellerbach well in Sec 48, T.4S., R.2W., West Feliciana Parish, located 3 mi south-southeast of the site, was the closest petroleum production to the site. This well was drilled to the Tuscaloosa with no success. Consequently the well was plugged back and completed in the Austin Chalk at a depth of 15,500 to 15,749 ft in October 1980. It tested a minimal 40 barrels of oil and 32 mcf of gas per day and was never produced(28). It was plugged and abandoned March 5, 1982.

Production in the Austin Chalk is generally from fractures. The chalk rock is usually impermeable unless fractured; but, it fractures readily because it is relatively brittle. It is not uncommon for operators who drill dry holes to the Tuscaloosa to plug back to the Austin and attempt completion to regain some of the exorbitant costs of the well. In this case the extremely low production test indicated insufficient fracturing to support production, and the well was plugged and abandoned.

Twenty-one petroleum test holes have been drilled within about 6 mi of the site area. These wells are shown on Fig. 2.5-18. Two of these wells are productive and 19 are dry holes.

Three tests drilled several decades ago investigated the shallow sedimentary sequence within the site property (Fig. 2.5-18). These are:

1. Tunica-Homer No. 1 Perkins (Map No. 13S, Fig. 2.5-18), drilled in 1921 approximately 1 mi south of the plant site to a depth of 3,162 ft.
2. Tunica-Homer No. 2 Perkins (Map No. 12S, Fig. 2.5-18), drilled over a period from 1924 to 1926 approximately 1 mi south-southwest of the plant site to a depth of 4,324 ft.
3. Cavalier No. 1 Mackie (Map No. 8S, Fig. 2.5-18), drilled in 1937 approximately 1/2 mi west of the plant site to a depth of 4,529 ft. The Cavalier test was drilled soon after electrical logs were developed, and an electrical log is consequently available and presented for it.

Logs of these wells are presented in Appendix 2N. None of these tests were successful, although numerous "shows" of oil and gas were reported in the Tunica-Homer No. 1 Perkins test, and the company later drilled a deeper second test unsuccessfully 1/4 mi away (Tunica-Homer No. 2 Perkins).

The only known log of this second test, which is written on the back of the drillers' permit, did not report any shows. This raises the question as to the credibility of the shows reported for the first test, suggesting their possibile promotional nature.

The shows in the Tunica-Homer No. 1 Perkins test are further challenged. The upper six of these shows (from 551 to 1,110 ft) occur within the freshwater sands, a highly unlikely situation. Four additional shows reported between 1,956 and 1,982 ft occur near the base of the freshwater sequence.

It is also pertinent that shallow production from this particular Upper Miocene sequence is not known except in association with major domal structures, usually salt domes, which have disturbed the overlying beds and permit vertical migration upward of the petroleum into shallow beds. Such structures are located gulfward from the site in the coastal province. The nearest examples are:

1. University Field, 26 mi south-southeast with production at 3,900 ft in depth

2. Bayou Choctaw, 30 mi south with production at 1,693 ft in depth

3. Bayou Bleu, 33 mi south with production at 1,238 ft in depth.

These are all pronounced shallow domal structures with salt having been confirmed by drilling in the latter two. The site area is free from any salt structures.

Additional evidence of the absence of shallow petroleum in the site area was provided by the Cavalier No. 1 Mackie which was drilled to 4,529 ft in depth approximately 1 mi north-northwest of the two Tunica-Homer(29) (Appendix 2N) tests. As noted by W.A. Roman, well-site geologist, the Cavalier No. 1 Mackie was one of five shallow tests drilled by Cavalier, designed to determine regional structural relationships but without any anticipation of encountering shallow petroleum. By the time of the Cavalier drilling program, the general absence of conditions conducive to shallow petroleum in the region was being appreciated and no shallow tests were drilled in the entire area after 1937.

In recent years exploration attention has turned to the possibility of deep Cretaceous production along the shelf edge on the south flank of the Tunica Flexure. This

Cretaceous trend is thought to extend west-northwest to east-southeast through the Felicianas from southwestern Mississippi westward into Texas. This has led to seismic exploration which is definitive at such depths (below 15,000 ft) because of modern computational processing techniques, and to some deep drilling.

In the site area one such seismic profile by Phillips Petroleum Corporation (Fig. 2.5-35), the north-south line passed about 1.5 mi east of the plant site. The Philips company provided the upper portion of this record which depicts the unbroken character of the sequence down to the Upper Wilcox Group but reserved as proprietary (in accordance with industry policy), the lower portion of the record pertinent to Lower Cretaceous exploration. This was the only one of several north-south lines the company shot that was near the site. It is noted that on the basis of their interpretation of the data obtained, the company ultimately drilled an unsuccessful Lower Cretaceous test, Philips No. 1 Jones, much further east, some 20 mi from the site.

The north-south seismic line (Fig. 2.5-35) passing approximately 1.5 mi east of the plant site clearly indicates the absence of faulting in this interval. Faulting would be requisite for the development of a rollover structure at the site at the Wilcox level or at shallower depths.

Subsequent seismic work by Philips was done in 1972 in Township 1 south, Range 1 East and Range 1 West over 20 mi northeast of the site. Teledyne also shot north-south seismic lines: one west of the Mississippi River in Pointe Coupee Parish and another through Livingston and East Feliciana Parishes, as part of their Gulf Coastwide speculative shooting program. Other companies that have conducted limited seismic work in the general area are Chevron, Arco, Texaco, Shell, Amoco, and Consolidated Gas. These seismic data have proven useful in interpreting site geology.

Figure 2.5-95 shows all commercial seismic survey work available for the site area. Figure 2.5-18 shows the seismic lines that were used to evaluate the geology of the site area. The most important of these seismic lines are those shot by Amoco in 1982 (Seismic Survey Lines 277, 278, 279, and 280, Figure 2.5-18). The Amoco lines were made using modern profiling techniques and modern techniques for data processing. They traverse the site with two lines approximately parallel to regional dip and two lines approximately parallel to regional strike. The Amoco seismic lines are the best situated of the available lines to study the site geology. Further discussion of the Amoco data is found in Section 2.5.1.2.3.4.

The potential for geopressured-geothermal energy in coastal Louisiana and Texas has been the subject of speculation for more than a decade. Three types of energy are theoretically available from such a source, namely, geothermal (heat) energy, geopressure (hydraulic) energy, and solution methane gas. The existence of these three energy sources in geopressured-geothermal reservoirs and the technological means to produce them and harness their energy is no longer in question. However, the capability of reservoirs for large flow over sustained periods required for commercial development is seriously doubted by many, although others are equally optimistic.

All of the well testing to date has been sponsored by the U.S. Department of Energy, beginning with the Tigre Lagoon test in 1977 in Vermilion Parish, Louisiana, a reentry of an old well which confirmed the existence of solution gas. Subsequent tests during the past four years have involved the drilling of four design wells, one in Texas and three in Louisiana, specifically for the purpose of producing geopressured-geothermal energy. In addition, meaningful tests have occurred on eight wells of opportunity, five in Louisiana, three in Texas (wells unsuccessfully drilled for petroleum that were converted to testing for geopressured-geothermal parameters). Due to reduced Federal funding, additional Federal-sponsored tests are unlikely.

The geopressured-geothermal energy resource presumably underlies the entire area within 35 kilometers of the River Bend Station site. The temperature gradient in the area increases from 1.3°F to 1.5°F per 100 ft of depth below near surface temperatures of 70°F. Hence, temperatures of 300°F, suitable for use in binary systems for electricity generation are found as shallow as 16,000 ft (data from selected well logs). Geopressure occurs beneath a depth from 15,000 to 17,000 ft in the central and northern portion of the area to as shallow as 10,000 ft in depth in the southern portion(94). Solution gas may be expected in quantities dependent on temperature, pressure and salinity and may range from 35 cu ft per barrel of water at 15,000 ft to 100 cu ft per barrel below 20,000 ft.

The economic drawback to development is not the absence of suitable temperatures, pressures and solution gas, but in the occurrence of deeply buried sand bodies of sufficient extent, porosity, and permeability to produce voluminous water over prolonged periods. Although results vary considerably, none of the DOE tests have proven commercially viable, particularly in terms of potential payback of the multimillion dollar costs of such wells. DOE efforts have primarily focused on solution gas production, but ultimate utilization of heat and pressure requires costly generating equipment which also requires prolonged production for payout. Although commercial development of the geopressured resource may ultimately occur, the current consensus is not optimistic for early development, and no private sector plans for additional drilling have been announced.

Within the near-site area, sand formations which conceivably have the potential for requisite flow from oldest (deepest) to youngest are the Tuscaloosa formation, the Wilcox formation, and the lower portion of the Catahoula sequence. None of these are geopressured north of the slump fault area which occurs in the southern part of the area. The Tuscaloosa is geopressured south of the Irene fault, the Wilcox is geopressured south of the Scotlandville fault and the lower portion of the Catahoula (Frio) sequence may be marginally geopressured farther south than the Baton Rouge fault. Regarding productive capacity, the Tuscaloosa was tested by DOE in a well of opportunity approximately 37 miles southeast of River Bend Station(92) in Livingston Parish, Louisiana, in the Crown Zellerbach well. Two sands at depths of 16,718-53 ft and 16,462-90 ft were tested with bottom hole pressure of approximately 10,000 psi, temperature of 327°F and 33 cu ft of methane per barrel. Although these are acceptable parameters, the formation was relatively tight (low permeability) and the maximum flow rate was 2,832 barrels of water/day (compared to the requisite minimum of 30,000 barrels/day for an economically viable test). The Wilcox formation has not been tested but is believed to have permeability problems also.

In view of the marginal results from geopressured tests so far, an alternate possibility recently advanced concerns the potential for high-volume water production from watered-out geopressured gas fields. The procedure would not only provide solution gas but would also reactivate migration of bypassed gas to the well bore thus providing more gas production than that of a "conventional" geopressured well; hence, being potentially economically acceptable(90). Although this concept has not been tried, an analogous experiment in the shallow hydropressured zone has proven successful in South Texas(89). No watered-out gas fields exist in the River Bend Station area now, although active

Tuscaloosa gas fields may ultimately become candidates for this procedure.

Finally, conventional geothermal production at lower temperature is possible throughout the area for space and process heating. Suitable temperatures exist at shallow depths in the permeable Upper Tertiary sands ranging from 100°F at 3,000 ft to 150°F at 6,500 ft to 200°F at 10,000 ft, etc. Dependent on future energy costs such utilization is certainly within the realm of possibility. An additional possibility involves the production of solution gas from these waters, a procedure that is being seriously considered farther south in younger formations.

In relation to geologic hazards such as subsidence resulting from petroleum production or geopressured-geothermal energy production, the interest in the general region now focuses on the deep Cretaceous and, to some extent, in the East Baton Rouge Parish area south of the site, on the Wilcox Group. Older and deeper formations with possible petroleum or geopressured-geothermal energy production potential are sandstones of the Tuscaloosa Group at the base of the Upper Cretaceous sequence and limestones in the Lower Cretaceous sequence, at depths of about 16,000 ft or deeper. Therefore, even if some future production were established near the site from these depths, it would not result in surface subsidence problems.

Because of the depth of burial, exceeding 3 mi, and the age of the formations, exceeding 100 million yr, both limestones and sandstones have reduced porosity and permeability and would not be susceptible to additional significant compaction associated with fluid or gas withdrawal.

This latter conclusion is based in part on recent research on the phenomenon of surface subsidence due to petroleum withdrawal published by members of the Shell organization, which is a major operator in Lake Maracaibo, Venezuela, and which also has been particularly concerned about the potential effects of subsidence in Groeningen Field in Holland, where canal and dike systems would be adversely affected by surface subsidence.

Geertsma(30) concluded that some or all of the following conditions are fulfilled when considerable subsidence is observed above producing hydrocarbon reservoirs:

1. A significant reduction in reservoir pressure takes place during the production period.

2. Production is effected from a large vertical interval.
3. Oil or gas, or both, are contained in loose or weakly cemented rock.
4. The reservoirs have a rather small depth of burial.

Van der Knaap and van der Vlis(31) conclude that "a comparison of various examples of subsidence in the world shows that compaction causes a noticeable subsidence only when the formation material consists of clay and uncemented sand and is of post-Eocene age."

Examples of surface subsidence due to petroleum production, such as at Goose Bay, Texas; Lake Maracaibo, Venezuela; and Wilmington (Long Beach) and Inglewood, California, are related to petroleum withdrawals from shallower than 5,000 ft in depth.

In terms of Geertsma's(30) conditions for ground subsidence due to petroleum withdrawal, the evidence is conclusive that there is no possibility of ground subsidence. The major deficiency in terms of Geertsma's conditions is the lack of potential petroleum for production at shallow depth. Sand beds of younger Tertiary age are indeed present beneath the site interbedded with clays and silts to the control depth of approximately 5,000 ft or greater, but the requisite petroleum is not. It should further be emphasized that not only would petroleum have to be present but also the amount of petroleum production requisite to cause subsidence must be large (over 100 million barrels in the case of the Goose Creek field), and derived from a large vertical interval.

In consideration of the amount of production, even the Alsen Field has produced only approximately one million barrels and is at this time nearly depleted.

Any potential for production in the near-site area is from the underlying Upper and Lower Cretaceous sands and coarse grained limestones 100 million yr or more in age. These sediments are so ancient and deeply buried that fluid withdrawal from their relatively low porosity would not result in surface subsidence.

Therefore, there is no potential for petroleum production in this area which could prove a hazard to the plant.

2.5.1.2 Site and Near-Site Geology

2.5.1.2.1 Physiography of Site and Near-Site Area

The River Bend station site is bounded by the Mississippi River on the southwest and, except for the floodplain bordering the river, the site is comprised of the dissected uplands formed by the Pleistocene terrace deposits and the Citronelle Formation. Within the site, the average elevation of the floodplain is about +38 ft msl and the average upland elevation is about +95 ft msl. A map of the site showing topography is presented as Fig. 2.5-19.

In the site area, the Mississippi River floodplain is characterized by a natural levee located at the river's edge. The levee has a maximum elevation of approximately +46 ft msl and the ground surface slopes down away from the river to an elevation of +36 ft msl near the valley wall. The floodplain surface is flat and only very slightly eroded. Consequently, drainage is poor and swampy conditions are widespread.

The Mississippi River floodplain extends into the site on the southwest. At this point the entire floodplain is 45 mi wide. The trend of the valley downstream is toward the southeast. Near the site the Mississippi River meanders close to the northeastern margin of the floodplain at the base of the bluffs forming the eastern valley wall. The amplitude of the Mississippi River meander loops usually exceeds 6 mi. Consequently, the river impinges directly against the valley wall at Tunica Bluff, which is located 18 airline miles upstream from the site, and at Port Hickey located 6 mi downstream. It approaches the valley wall at St. Francisville, located 2 to 3 mi upstream from the site, and meanders westward into the floodplain at Iowa Point, between Tunica and St. Francisville, where it is 9 mi from the east valley wall.

The main uplands in the site are formed by the Citronelle Formation of Late Pliocene to Early Pleistocene age covered by a thin blanket of loess. Its surface is generally of higher elevation and much more sculptured than the younger terraces which overlap its former erosional slopes. Natural drainage is generally good with most surface water collecting in deep erosional gullies, which form the principal relief in the otherwise gently sloping surface. Localized swamp conditions exist in some depressed areas, although most runoff is collected in the various forks of Grants Bayou, a small perennial stream which flows through the area east and south of the site. Within the immediate vicinity around the plant, the uplands rise to an average of about el +125 ft msl. A maximum elevation of el +147 ft msl is found in isolated locations within the site area, particularly to the east. A site geologic map is included as Fig. 2.5-20.

Remnants of terraces of Pleistocene age are found between the elevation of the Holocene floodplain and the elevation of the older Citronelle Formation. These terraces, which were formed during the interglacial stages, are generally flattopped at definitive elevations between the elevation of the Citronelle Formation and the elevation of the Holocene floodplain. The Port Hickey terrace is the only terrace which has been identified in the site area.

The late Pleistocene Port Hickey terrace is of Sangamon age, the last interglacial stage. The sections of this terrace along the Mississippi River in the site area are typified by flat areas at elevations of about +103 to +105 ft msl, whereas the Port Hickey terraces along Grants Bayou are slightly higher in elevation at about el +107 to +110 ft msl, due to the higher gradient of the bayou during the depositional stage. This terrace is much less eroded than the Citronelle Formation which it overlaps, but is deeply dissected by drainage gulleys originating in the Citronelle Formation. Drainage is only fair, with some swampy areas found in localized depressions.

The ground surface in the immediate plant area is the flat top of the Port Hickey terrace at el 108.5 ft msl. The ground surface gradually rises to the north and the Citronelle Formation is exposed above the level of the Port Hickey terrace. The terrace is dissected to the west by an erosion feature, a seasonal tributary of Grants Bayou. East of the plant area, the terrace is interrupted by another tributary and the main channel of Grants Bayou. The terrace is continuous to the south for 3,000 ft where it is again interrupted by Grants Bayou. The very gentle south slope of the terrace surface along Grants Bayou is evident with a change in elevation from +108.5 ft msl to +104 ft msl over the distance of 3,000 ft. Some other very gentle changes in elevation occur where drainage features extend back into the essentially undissected area of the terrace.

2.5.1.2.2 Stratigraphy of Site and Near-Site Area

Oil and gas drilling near the site has provided reliable subsurface information to a depth exceeding 3.5 mi, including data for the Lower Cenozoic beds. Data from three oil and gas tests near the site have been used to help develop the Site Stratigraphic Column, presented as Fig. 2.5-21, from the surface beds into the Paleocene stage. These wells are:

1. Moncrief No. 1 Rosedown Plantation with total depth of 18,760 ft

2. Cotton No. 1 McGill with total depth of 15,700 ft

3. Amoco No. 1 Smith with total depth of 17,126 ft.

A northwest-southeast cross section through the site, which includes stratigraphic data from the No. 1 Rosedown Plantation well and the No. 1 Smith well, and two other wells, is shown in Fig 2.5-22. The No. 1 Rosedown Plantation well is the only nearby well to penetrate Lower Cretaceous beds (1,340 ft of this interval). Hence, interpretations of the Lower Cretaceous sequence are based on two test holes approximately 140 mi apart located east and west of the site.

The nature and thickness of the Jurassic and Pre-Jurassic sediments must be inferred from data obtained farther north. The entire Mesozoic sequence has not been completely penetrated to the Paleozoic rocks in the southern parts of Mississippi and Louisiana. The nearest updip data are found more than 150 mi north. Additional data have been correlated from deep test holes approximately along strike within the Coastal Plain province. Two important test holes are the Shell No. 1 Moreau, located 52 mi west-northwest of the site, and the Hunt No. 1 Currie test, which was drilled 90 mi east southeast of the site.

2.5.1.2.2.1 Pre-Jurassic and Jurassic Systems

Based on the regional stratigraphy, Eagle Mills sediments along with the Werner and Louann Formations may possibly exist in the vicinity of the site. These sediments are known only from well data in northern Louisiana and adjacent states and from subsurface data in northeastern Mexico. The Late Jurassic Louark and Cotton Valley groups have been encountered in the subsurface from Florida to Mexico and are assumed to be present in the site area.

The thickness of the Pre-Jurassic and Jurassic sequence is based on the AEC seismic cross-section in Hancock County, Mississippi(17). A test well, the Humble Oil No. 3 International Alexander, located in the Ansley area of Hancock County, Mississippi, bottomed in the Cretaceous James-Sligo limestone. This limestone was observed to be

1,430 ft thick in the Hunt test; thus, the base of the James-Sligo limestone is estimated to be at an elevation of -16,700 ft msl at Ansley. Since the AEC seismic cross-section depicts the basement at an elevation of -20,450 ft msl at Ansley, a thickness of 3,750 ft of Lower Cretaceous Hosston Formation, Jurassic, and Pre-Jurassic sediments are postulated on the Hancock Ridge. If a similar thickness is postulated for these formations in the site area along a west-northwest trend from Ansley, the basement is estimated to be at an elevation of approximately -27,000 ft msl.

2.5.1.2.2.2 Cretaceous System

A nearby deep test, the Phillips No. 1 Jones located 16 mi east-northeast of the site, was abandoned early in 1972 at a total depth of 18,819 ft. This test drilled 1,073 ft of the Lower Cretaceous Glen Rose limestone. The Shell No. 1 Moreau test well and the Hunt No. 1 Currie test well also provide subsurface data. The electric logs of these two test holes display similar log characteristics even though the tests are some distance apart. This confirms the interpretation that the depositional strike extended west-northwest-east-southeast during the Cretaceous Period in the area northwest of Hancock Ridge.

The Cretaceous sequence encountered in these two oil tests is summarized in Fig. 2.5-21. The Lower Cretaceous sediments of the Comanchean and Coahuilan Series are estimated to be about 7,650 ft thick at the site from the Dantzler Formation into the Hosston Formation. The Dantzler Formation is considered to be the uppermost beds of the Washita Stage in southern Mississippi(1). The Lower Cretaceous sediments consist of limestone with lesser amounts of sand and clay.

Upper Cretaceous beds of the Gulfian Series consist of undifferentiated chalk and marl about 1,900 ft thick overlying the Tuscaloosa Group. The Tuscaloosa Group is predominantly sand and clay approximately 480 ft thick.

2.5.1.2.2.3 Tertiary System

In the site area, the Tertiary system is predominantly composed of the Wilcox Group, of the Paleocene to the Lower Eocene age, and the Grand Gulf Group of the Miocene to the Pliocene age. These groups are both regressive sand and clay deposits and are approximately 3,600 and 6,500 ft thick, respectively. The Midway and Claiborne-Jackson-Vicksburg sequences are relatively thin, having a total thickness of about 3,300 ft at the site.

2.5.1.2.2.3.1 Paleocene, Eocene, and Oligocene Series

The Midway deposits of the Paleocene age consist of dark clays and are approximately 1,400 ft thick at the site. The Upper Paleocene-Lower Eocene Wilcox sequence contains interbedded sands and shales that are difficult to subdivide. However, two prominent shales, the Baker Shale and the Big Shale, can be traced regionally and provide a convenient middle unit near the Paleocene-Eocene Series contact. In the area of abundant Wilcox Group petroleum production, located about 25 mi north of the site, individual productive sands are named but do not persist far laterally. These sands are predominantly fluviatile, but some beach and marine sands are also present. The Wilcox sequence has an estimated thickness of 3,600 ft at the site with its base at an elevation of approximately -12,000 ft msl.

Twenty-one oil tests have been drilled within about 6 mi of the site. The discussion of petroleum production in the area surrounding the site is found in Section 2.5.1.1.6. The three Wilcox Group test wells near the site were utilized to prepare part of the Site Stratigraphic Column, Fig. 2.5-21. The LeGrange test terminated in the Upper Wilcox Group. Several deep test wells were recently drilled northwest and southeast of the site. Data from these test wells have also been used to determine thicknesses of subsurface sediments at the site (Fig. 2.5-22).

The overlying Claiborne sequence of Middle Eocene age is about 1,300 ft thick at the site. The lowermost formation of this sequence, the Tallahatta Formation, is a lithified silica ash which thickens eastward into Alabama. Additionally, the Claiborne sequence consists of two regressive sands, the Cockfield and Sparta Formations, which are interbedded with marine clay and lime of the Cook Mountain and Cane River Formations. The site is sufficiently far basinward so that the Cockfield and Sparta sands are also intertongued with marine clays. Beneath the site, the Jackson-Vicksburg sequence consists of marine clay and marl of Late Eocene and Oligocene age, with a combined thickness of about 500 ft.

2.5.1.2.2.3.2 Miocene and Pliocene Series

The Grand Gulf-Fleming Group of Miocene-Pliocene age is approximately 6,500 ft thick at the site. It contains predominantly fluviatile and deltaic sediments with some interbedded shallow-water marine deposits. The lower Catahoula Formation is generally undivided except for the

Tatum limestone member, which forms a prominent subsurface marker zone in the site area at a depth of about 5,000 ft. This limestone member is thinner and more clayey compared to its occurrence farther southeast.

North of the site, the upper 2,000 ft of the Grand Gulf-Fleming Group at the site have been subdivided into the Hattiesburg and Pascagoula Formations. The Hattiesburg Formation consists of nonmarine clay with thin sands. The Pascagoula Formation is subdivided into an unamed lower member of the Miocene age, a middle Homochitto member of the Miocene-Pliocene age, and an upper Fort Adams member of the Pliocene age. The Pascagoula Formation was the oldest formation encountered by the borings in the site area. A boring plan showing the boring locations within the site is included as Fig. 2.5-23. The boring plan showing the boring locations in the plant area is presented as Fig. 2.5-24. Geologic Section A-A' shown in Fig. 2.5-25 indicates the shallow site stratigraphy based on boring data.

In the site area, the uppermost stratum of the Pascagoula Formation is predominantly clay, as determined by the borings; in the immediate plant area, the upper 50 ft contain only occasional very thin sand layers. The upper surface of the Pascagoula Formation is irregular due to post-depositional channeling. Generally, this surface varies between elevations of +13 ft msl and -60 ft msl in the site area. It has been eroded beneath the Holocene alluvium located in the floodplain approximately 10,000 ft south of the plant area, where borings did not encounter it to an elevation of -117 ft msl, and beneath nearby Boring 70, which penetrated to an elevation of -220 ft msl as shown in Fig 2.5-25.

2.5.1.2.2.3.3 Pliocene-Pleistocene Series

The uplands in the site area were formed predominantly by fluvial sand and gravel deposits which Matson designated as the Pliocene Citronelle Formation(4). Fisk subdivided the uplands deposits into three Pleistocene terrace formations: Williana, Bentley, and Montgomery(10). Doering challenged this interpretation, identifying the deposits as a single formation which he considered to be the Citronelle Formation(5). His conclusions were verified by Parsons, who mapped the area in detail and constructed well-defined cross-sections based on numerous drill holes and outcrops(22). These varied interpretations were previously discussed in Section 2.5.1.1.4.4.1 and by Durham et al(11).

Rosen presented additional evidence based on heavy minerals analyses confirming the preglacial age of the Citronelle Formation(32,33). Modifications of Parson's geologic map and cross section are presented as Fig. 2.5-26 and 2.5-27, respectively(22). Durham et al have identified the Port Hickey terrace in the site and near-site area(11).

Citronelle sediments are found stratigraphically between the overlying Port Hickey terrace deposits and the underlying Pascagoula Formation both along the Mississippi River and along Grants Bayou. Along the Mississippi River, it is possible to distinguish the Port Hickey terrace sediments by their different heavy mineral suite of Pleistocene origin, which has been derived from glacial outwash to the north and transported downstream by the Pleistocene Mississippi River. Identification of heavy minerals did not distinguish between the two deposits along Grants Bayou because the Port Hickey terrace sediments are considered to be reworked materials from the Citronelle Formation uplands. Nevertheless, there is sufficient evidence to distinguish between Port Hickey terrace sediments and the underlying Citronelle Formation.

The continuity of the gravelly layers and the overall stratigraphy to the north below an elevation of approximately +50 ft msl in each of the detailed soil profiles developed from the site borings in Fig. 2.5-28 through 2.5-30 indicate that these strata are all one deposit, which is interpreted to be the Citronelle buried channel deposit. The southern limit of the channel, which extends east-west through the immediate plant area, is indicated by the rising surface of the underlying Pascagoula Formation clays, as shown in Fig. 2.5-31. This deposit of sand with varying percentages of gravel is interpreted to be the Citronelle Formation because the updip ground surface to the north is at an elevation of +125 ft msl, which is higher than the elevation of the Port Hickey terrace.

The detailed geologic mapping of the site excavation (Section 2.5.1.2.9) afforded the opportunity to view continuous exposures ranging from the younger Port Hickey topstratum and substratum into the Citronelle Formation and enabled definition of the formation contact. Evidence of the turbulent fluvial depositional environment was characterized by the presence of subrounded coarse clay fragments, found within the Citronelle channel deposit, which had been eroded from previous clay deposits and were now frequently armored with sand and/or gravel.

The boundary between the Citronelle Formation and the overlying Port Hickey terrace deposits is indicated on the cross sections through the plant area, Fig. 2.5-28 through 2.5-30.

2.5.1.2.2.4 Quaternary Stratigraphy

2.5.1.2.2.4.1 Pleistocene Series

The Port Hickey terrace, the only Pleistocene terrace identified in the site area, was deposited during the last interglacial stage, the Sangamon stage. The Port Hickey terrace surface along the Mississippi River west of the plant area is at a maximum elevation of +103.5 ft msl and gradually rises to the north along the river at a rate of 2.5 ft/mi. Another terrace of Port Hickey age is also found along Grants Bayou, but here it slopes more steeply because of the steeper gradient on the bayou during deposition.

In the immediate plant area, the Port Hickey terrace surface is found at an elevation of approximately +108.5 ft msl and has the typical clayey terrace topstratum which is underlain, in part, by the Port Hickey terrace sand substratum. Where the Port Hickey substratum is absent, the topstratum is underlain by the fine sands and clayey sands of the Citronelle Formation. Typically, the Port Hickey topstratum silts and clays are approximately 10 ft thick and the substratum terrace sands are approximately 6 ft thick in the plant area. Near the Mississippi River floodplain the Port Hickey terrace deposits are approximately 50 ft thick, as indicated by boring data.

The topstratum silts and clays at the surface of the Port Hickey terrace and the underlying Port Hickey substratum sands are clearly indicated in the southern part of the plant area cross sections shown on Fig. 2.5-28 and 2.5-29. In this area, the combined depth of loess, stratified silts and clays, and the terrace sands is more than 30 ft. However, to the north where the ground surface is higher than the surface of the Port Hickey terrace, the cross sections show the Port Hickey stratified silts, clays, and terrace sands to be missing in some borings where the loess overlies the sands and clayey sands of the Citronelle Formation. Therefore, the lateral boundary between the Port Hickey and the Citronelle Formations can be seen in these upper strata and it can be interpreted that the boundary continues to slope downward to the south through the immediate plant area. The color of the sediments was a significant factor in identifying the Citronelle and Port Hickey sediments. Generally, the Citronelle Formation deposits were orange, brown, or reddish while the Port Hickey terrace deposits were yellow, brown, and gray.

As previously stated in Section 2.5.1.1.4.4.1, Pleistocene Series Regional Stratigraphy, terrace deposits younger in age than the Port Hickey terrace deposits have been recognized by Fisk(10). These deposits were noted in the near-site area east of the site along Thompson Creek as the Deweyville terrace; the terrace profile is shown in Fig. 2.5-32.

The entire uplands in the site area are blanketed by eolian deposits (loess) 10 ft or less in thickness. Spicer has mapped the loess in a portion of West Feliciana Parish and demonstrated its greater thickness farther northwest adjacent to the valley wall of the Mississippi River floodplain, as shown in Fig. 2.5-33(34). In that area where the loess thickness exceeds 14 ft, local snails and other calcareous materials are still preserved. Snowden and Priddy dated these deposits with radiocarbon as 18,000 to 25,000 yr old(6).

2.5.1.2.2.4.2 Holocene Series

The Holocene floodplain is immediately adjacent to the Mississippi River. A natural levee borders the river and achieves an elevation of approximately +46 ft msl. In the backswamp area, elevations as low as -31 ft msl are found. The Holocene topstratum silts and clays extend to an elevation of approximately -50 ft msl in the site area. These silts and clays are underlain by deep deposits of alluvial sands extending below an elevation of -117 ft msl, the maximum penetration of borings in this area, as shown in Fig. 2.5-25.

Extensive data are available concerning the floodplain as a result of the classic study of the Mississippi River Alluvial Valley by Fisk under the auspices of the Mississippi River Commission(2). A recent detailed study by Saucier published by the same agency deals with the eastern portion of the floodplain, including the site area(35).

The floodplain marks the surface of a thick sequence of alluvium deposited in an entrenched valley which varies in elevation from -100 ft msl to -250 ft msl in the latitude of the site (compared to elevations exceeding +100 ft msl on the uplands at the top of the bounding valley walls). The entrenched valley was formed by the vertical and lateral erosion by the Mississippi River during the first two or more lowered stands of sea level coinciding with maximum glaciation.

The upper part of the Grand Gulf Group was deposited during the Pliocene Epoch and underlies the alluvial valley in the near-site area. A thick layer of fluvial sand and gravel is found in the bottom of the valley to an average elevation of -50 to -80 ft msl. Where the underlying valley is deepest, this layer attains a thickness of nearly 200 ft. Fisk called this zone the substratum(2). It is regarded variously as Early Holocene to late Pleistocene in age by different investigators.

The substratum is overlain by the topstratum of clay, silt, and sand deposited during and since the postglacial rise in sea level. Compared to the substratum, the subsequent topstratum deposits are relatively fine-grained, consisting of clay, silt, and sand, and can be subdivided according to the environment of deposition into backswamp deposits, point bar deposits, natural levee deposits, and abandoned channel deposits. Saucier states that backswamp deposits are by far the thickest and the most extensive in the area(35).

Initial deposition began about 12,000 yr ago, when the Mississippi River followed a course along the western side of its alluvial valley, and continued uniformly across the eastern part of the western floodplain until about 4,000 yr ago, when the river shifted to a course along the eastern side of the valley. Backswamp deposits continued to accumulate along the flanks of the new meander belt; however, meandering of the river within the new meander belt caused erosion and removal of large areas of backswamp deposits. These deposits were replaced largely with point bar deposits, and deposits that accumulated in abandoned channel environments.

2.5.1.2.2.5 Summary of Surface and Near-Surface Stratigraphy at the Site

For engineering purposes, the soil stratigraphy in the site uplands may be subdivided into five well-defined zones beginning at the ground surface. Detailed stratigraphic profiles through the plant area have been developed from the boring data. These profiles define the five zones and are presented as Sections C-C' through I-I' in Fig. 2.5-28 through 2.5-30. These zones, as determined in the plant area, are described as follows.

Loess

A blanket of loess approximately 10 ft in thickness covers most of the site area and generally follows the contours, except that it has been eroded away in the erosion gulleys associated with Grants Bayou. This soil is a clayey silt with well-developed soil horizons within the top 5 ft. Weathering within the soil horizons has destroyed much of this original structure and increased the clay content in the top 5 ft; however, below 5 ft it retains the typical root hole structure and other characteristics of loess.

Port Hickey Topstratum Silts and Clays

In the area underlain by the Port Hickey terrace, a topstratum of stratified silts and clays approximately 10 ft thick is found immediately underlying the loess blanket.

Port Hickey and Citronelle Sands and Clayey Sands

These soils are found beneath the topstratum silts and clays in the area of the Port Hickey terrace and immediately beneath the loess in the upland area of the Citronelle Formation. The boundary between the Citronelle Formation and the Port Hickey terrace passes through this zone and is shown on the plant cross sections, (Fig. 2.5-28 through 2.5-30). These soils consist of silty sands, stratified fine to medium sands, and clayey sands with occasional very thin layers and lenses of silty clay, clayey silt, and gravelly partings.

Citronelle Buried Channel Deposits

Below elevations of approximately +50 to +20 ft msl, variably over the site, the soil is coarser and consists of fine to medium sands with varying portions of gravel. This deposit is interpreted to be a buried channel deposit of the Citronelle Formation within the underlying Pascagoula Formation. In the plant founding area, the deeper sand with occasional gravelly sand extends down to the Pascagoula clays. A limited number of thin clay lenses were encountered in the borings drilled in this deposit, and clay lenses are indicated on the profiles. Immediately overlying the Pascagoula clays, the gravel content generally increases.

In some areas gravel-size particles of clay are contained in the sand and gravelly sand. These are interpreted to have been eroded from the Pascagoula clays and redeposited within the channel deposits. On the southern side of the channel, a stratum of pink clayey sand is found between the sand and gravelly sand deposits and the underlying Pascagoula clays.

Pascagoula Clays

Hard greenish-gray Pascagoula clays are found within the plant area beneath the sands and gravelly sand of the Citronelle Formation. Continuous undisturbed samples of these clays were obtained in two borings to an elevation of -100 ft msl, with a thickness of at least 50 ft of clay. The soil is composed almost completely of hard stratified silty clay with occasional sand partings and very thin sand layers making up a very small percentage of the samples within this thickness.

This deposit, where it exists at higher elevations such as outside the immediate plant area, contains somewhat more sand in the upper part of the soil profile. However, in Boring P-9, which extended down to an elevation of -284.6 ft msl, over 240 ft of primarily stratified clays were encountered. The upper 5 to 15 ft of the Pascagoula clay in most borings is yellowish with brown stains and some near-vertical fissures can be identified. It is interpreted that this surface was exposed to weathering and dessication at some time in the past.

Contours of the Top Pascagoula Formation have been developed from the borings made in a part of the site area and are presented in Fig. 2.5-31. Contours were not developed for the surface of the Citronelle Formation because the silty and clayey sands of the Citronelle deposit and the substratum overlying terrace sands of the Port Hickey deposits are very similar over much of the area. The structure contours of the Top Pascagoula Formation define the erosion channel in which the Citronelle channel deposits were laid down. The ground surface contours shown in Fig. 2.5-31 are the most definitive available and were obtained from 1973 aerial photography mapping.

2.5.1.2.3 Geologic Structure of Site and Near-Site Area

As part of the investigation of the structural geology of the site vicinity, a review of previously reported studies relating to this area has been made. Records of deep subsurface investigations (petroleum well logs and seismic reflection profiles) in the area have been reviewed, and high altitude imagery, aerial photograph and topographic map interpretations of the site and surrounding area have been made. A discussion of the geologic structures in the site and near-site area is presented in the following sections.

2.5.1.2.3.1 Surface Features

In order to investigate the site and near-site area for surface indications of structural features, a study of high altitude imagery, aerial photographs, and drainage features within the site vicinity was conducted. The aerial photo-graph interpretation was performed using US Department of Agriculture (USDA) photographs and index mosaics on file in the Map Library of the School of Geoscience, Louisiana State University in Baton Rouge, Louisiana. The specific aerial photograph coverages at West Feliciana Parish, Louisiana, were at a scale of 1:20,000, and were taken in April, 1952 and between March and July, 1941.

In addition, USDA index photograph mosaics of East Feliciana Parish, Louisiana (dated March 1941 and April 1957), West Feliciana Parish, Louisiana (dated May 1959), and East Baton Rouge Parish, Louisiana (dated March 1941 and April 1959), were examined in the files of the US Army Engineers Waterways Experiment Station, Vicksburg, Mississippi. Stereoscopic examination of the photography was employed where individual contact print coverage was available.

Two sets of high altitude imagery were studied(97). The first consisted of color infrared (IR) photography flown by the National Aeronautics and Space Administration (NASA) in September 1974 under the designation "Mission 289." This coverage was at an approximate scale of 1:120,000. The second set consisted of Landsat multispectral scanner (MSS) imagery taken in January, 1976, and February and November, 1978. The scale of this imagery is 1:1,000,000.

Prior to inspecting aerial photographs of the site vicinity, the site location was plotted on each of 1:62,500 scale and 1:24,000 scale topographic maps. All upland drainage lines within an approximate 5-mi radius of the site were traced on a transparent overlay on the 1:24,000 scale maps. An interpretation of the geology of the site area and surrounding vicinity was made, based primarily on the topography of the area and prior data for the region by Saucier, 1969(35). The major formational contacts were delineated on the same overlay and on the 1:62,500 scale maps. The units which were identified and delineated consisted of the Holocene alluvium of the Mississippi River and major tributary creeks, a low fluvial terrace identified variously as the Port Hickey or Prairie terrace, and an upland, dissected blanket of sand and gravel alluvium considered to be the Citronelle Formation.

A thorough review of the literature was carried out to establish all known or suspected surface or subsurface faults within a 10- to 15-mi radius of the site including publications by Durham et al, 1967; Fisk, 1944; Murray, 1961; Parsons, 1967; and Winner et al, 1968(11 ,2 , 1, 22, 36). Consideration was also given to similar features located farther from the site area which had a line of projection toward the vicinity of the site. One such fault was shown on the Tectonic Map of the Gulf Coast Region(27). This northwest-southeast trending fault parallel to the Pearl River has been investigated and has been concluded to be nonexistent (Appendix 2I)(37).

During the aerial photography interpretation, attention was devoted to both evaluating those evidences for faulting cited in literature and to locating possible evidence for faulting not previously recognized or reported. Based on this investigation, no surface features or evidence were discerned that might indicate the presence of structural features not previously noted. The reported evidence has been evaluated and the results of this study are presented in Sections 2.5.1.1.3 and 2.5.1.2.2.

Fisk mapped several lineaments or "fractures" in the vicinity of the site, as shown in Fig. 2.5-15(2). However, his map is of such a generalized nature as to preclude positive locations of these features. As discussed in detail in Section 2.5.1.1.5.3.1, the aerial photography interpretation and the analysis of drainage lines in the vicinity of the site suggest that he might have considered such things as the trend of Thompson Creek (northeast-southwest), the trend of Alexander Creek (northwest-southeast), and the trend of Chaney Creek (northwest-southeast) between Louisiana State Highways 964 and 965 as evidence for the lineaments.

It is difficult to find an area of several tens of square miles anywhere in the Pleistocene or Tertiary uplands bordering the Lower Mississippi River Valley that does not exhibit lineaments such as the ones referred to above. Moreover, it is usually possible to discern numerous smaller lineaments in the form of linear stream segments several hundred to several thousand feet long paralleling the larger or regional lineaments. Such minor lineaments were observed within several miles of the site; however, they are neither more numerous nor more highly developed than elsewhere in the Lower Mississippi River Valley area. There is no evidence to suggest that any of these lineaments are manifestations of faults.

Photograph index mosaic coverage, high altitude imagery, and topographic map coverage were examined for topographic or surface evidence of faulting in the areas of the Baton Rouge, Scotlandville-Denham Springs, postulated Baker, Zachary, and Jackson Faults, as reported by Parsons and Durham et al and/or as discussed in Section 2.5.1.1.5(22 11).

A variety of surface evidence of faulting is readily discernible along the Baton Rouge Fault in East Baton Rouge and Livingston Parishes, Louisiana. In fact, the evidence is sufficiently strong that faulting, as the causal process, could be reasonably ascertained solely by way of aerial photography interpretation. The topographic evidence for the Scotlandville-Denham Springs Fault suggests that surface evidence would be discernible on aerial photographs were it not for the fact that urbanization and industrialization obliterated or altered natural surface features or have otherwise complicated the interpretation.

Surface features indicative of faulting are not nearly as apparent along the postulated Baker and Zachary Faults; however, evidence principally in the form of topographic changes or irregular scarps is discernible in certain areas. The abrupt 1-mi sharp bend of White Bayou to the east coincides with the mapped position of the postulated Baker Fault east of the town of Baker, Louisiana.
In the case of the Zachary Fault, topographic evidence is present in some areas except along that portion which crosses the Port Hickey terrace near Port Hudson, Louisiana, where no break in these terrace deposits can be identified. The Zachary fault was mapped along its south-facing escarpment on the Irene Terrace in the Zachary area by Parsons, 1967. It was recognized as a growth fault similar to the Scotlandville-Denham Springs and Baton Rouge faults farther to the south. Although the Scotlandville-Denham Springs fault displaces the Port Hickey Terrace by up to 7 ft as measured by the offset along its escarpment and the Baton Rouge fault by up to 20 ft, the escarpment of the Zachary fault is due to the displacement of the old Irene Terrace surface by 15 ft or more. Westward toward Port Hudson where the fault projects into the Port Hickey Terrace of the Mississippi River, no displacement has been recognized visually on the surface nor does a change of elevation appear on the USGS Port Hudson quadrangle (with a contour interval of 5 ft). Similarly, to the east, the fault has not been mapped across the Port Hickey Terrace of the Comite River.

The original flat floodplain depositional surface is still preserved over most of the Port Hickey Terrace area. This surface is overlain by a thin blanket of loess. The only erosional effects are narrow, V-shaped valleys; consequently, any fault displacement should be preserved except in such valleys.

The Port Hickey surface was formed during the last interglacial stage (Sangamon), generally considered to be at least 70,000 years ago (Section 2.5.1.1.4.4.1), and the loess blanket during the last glacial stage (Wisconsin), which has been dated farther north as 18,000 to 25,000 years old (Section 2.5.1.2.2.4.1). The lack of faulting evidence on the terrace can be interpreted as indicating that no structural movement has taken place at least since deposition of the fluvial terrace. It is possible that a minor escarpment on the Port Hickey surface caused by fault displacement could have been concealed by subsequent loess deposition, but any such escarpment exceeding a foot or more would probably reflect in a subdued manner on the top of the loess. At any rate, absence of a recognizable escarpment discounts significant fault displacement since deposition of the loess. With regard to the postulated Jackson Fault of Parsons, no surface features of any type were identified on the aerial photographs that would suggest the presence of a fault at that location(22).

A particularly detailed examination was made for possible evidence indicative of slump faults within an approximate 5-mi radius of the site. Observations were made of the upland formations, the fluvial terraces, and the Holocene alluvium. Special attention was devoted to the late Pleistocene terraces. Logic dictates that surface evidence for faulting in the older formations could be obscured by erosion and that faulting evidence could be masked by quite recent sedimentation in the floodplain areas. Consequently, if faulting has occurred within the last several tens of thousands of years, evidence for it should be most apparent on the late Pleistocene terraces. However, no such evidence was found as a result of the aerial photography or high altitude imagery interpretations.

2.5.1.2.3.2 Slump Faults

The Baton Rouge Fault zone has been discussed as part of the regional structure in Section 2.5.1.1.5.3.2. Several faults or postulated faults close to the site are discussed in the following paragraphs. A diagrammatic cross section in a north-south direction through the site and near-site area is included as Fig. 2.5-34. This figure shows the relationship of the near-site faults to the site.

The Denham Springs Fault parallels the Baton Rouge Fault about 6 mi farther north. Displacement of the Port Hickey terrace surface averages 5 to 7 ft and indicates lesser magnitude of late Pleistocene activity than indicated along the Baton Rouge Fault. Remapping by Durham(11) indicated a probable extension of the Denham Springs Fault called the Scotlandville Fault, which extends east from the Mississippi River for approximately 4 mi where it dies out on the surface as shown in Fig. 2.5-26. The Denham Springs Fault continues eastward from a point approximately 1/2 mi north of the Scotlandville Fault. Detailed subsurface information is lacking for this fault, and water levels are not disturbed across it in the 400-ft and 600-ft aquifers, suggesting a smaller displacement than on the Baton Rouge Fault.

Recent displacement has been observed on the ground surface along the Scotlandville Fault. In particular, one building that straddles the fault at the Glen Oaks High School campus, located in northeastern Baton Rouge, reportedly had 4 in of displacement by 1971 in the 10 yr since its construction and has since been abandoned. There are other evidences of cracked pavement and structures along this fault, which is located north of the main Baton Rouge industrial area. On-going geologic mapping for the Louisiana Geologic Survey in the Baton Rouge area has confirmed more surface damage than was previously known.

It is noted that the east-west oriented Scotlandville-Denham Springs Fault zone is at the present time approximately coextensive with the Mississippi River channel west of Scotlandville, Louisiana. This is probably nothing more than a coincidence because, although it is oriented now, it was not in the past and, except for man's control of the river, it probably would not be in the future. Therefore, such river orientations at other locations where they occur are not necessarily diagnostic of faulting.

A 10 to 15 ft high east-west escarpment, which marks the Irene-Port Hickey terrace boundary located 5 mi north of the Denham Springs Fault, has been cited as surface evidence for a postulated fault called the Baker Fault(22 ,11). This interpretation places the Irene terrace on the upthrown side with the downthrown side at the elevation of the Port Hickey terrace. West of this escarpment, the Port Hickey terrace deposits along the Mississippi River extend north across the fault trend and do not show displacement. Similarly, east of the escarpment the Port Hickey terrace of the Comite River extends north across the fault trend without displacement, although White Bayou, which is entrenched in the Port Hickey terrace, makes an abrupt sharp eastward bend 1 mi east of the town of Baker, Louisiana. Smith does not recognize this fault and to date there is no subsurface evidence to substantiate the existence of it(25). The escarpment may simply be the erosional boundary of the Irene terrace.

The Zachary Fault, extending east-west 4 to 5 mi farther north, displaces the Irene terrace surface 10 to 15 ft but does not affect the surface of the Port Hickey terrace. The topographic feature is lost on the surface to the west at a point 8.0 mi southeast of the site, where the Port Hickey terrace surface of the Mississippi River extends northward across the fault trend. Similarly, it does not displace the Port Hickey terrace deposits at the Comite River 1 mi east of the town of Zachary, Louisiana.

Approximately 2 mi south of the Zachary Fault escarpment and 11 mi southeast of the site, the Alsen oil field, discovered in 1957, was produced from the top of the Wilcox formation at approximately 10,000 ft deep from the "rollover" structure on the downthrown side of an east-west fault. This fault is considered as the subsurface extension of the Zachary Fault and has been described informally by the petroleum geologists as the Alsen fault. Hence the two names are synonymously applied to the same fault.

Interest in the Tuscaloosa "trend" in the past few years resulted in the discovery of the Irene field, approximately 2 mi south of the Alsen field. Discovered in 1978, it produces hydrocarbons from rollover structure at the Tuscaloosa Group depth near 17,500 ft on the downturn side of the Zachary Fault.

Figure 2.5-96 depicts the relationship of the surface of the Zachary Fault, the fields to the south of it, and the wells used in determining the subsurface position of the fault. The fault has been identified in eight wells drilled south of the Zachary Fault escarpment south to the Irene Field. On Figure 2.5-97, the fault picks are plotted in profile, showing the depth of the fault and distance south of the surface escarpment of the fault. They also provide a cross section of the fault plane displaying the characteristic steep southward dip in the shallow subsurface, flattening gradually to less than a 45° dip below 10,000 ft. This conforms closely with the shape of the Baton Rouge fault surface as shown in Figure 2.5-16. The fault is also shown at a depth of approximately 17,200 ft in Exhibit No. 2 - Ted Hoz Testimony in the 1982 Louisiana Department of Conservation Hearing Docket No. 82-742. As depicted on the map, Figure 2.5-96, at this depth the arcuate bend southeastward closely conforms to the same arcuate bend on the surface escarpment 3 mi to the north.

In addition to these eight wells drilled south of the known escarpment, nine wells drilled farther west in the Port Hudson field also cut the fault. Well 19C has a 40-ft missing section at the depth of 7,065 ft. The fault dips southward through the field and has a depth exceeding 2 mi in the southern part of the field. Using the same fault plane profile from Figure 2.5-97, the fault's projection to the surface is possible in the Port Hudson area, where the fault has not been identified on the Port Hickey and Mississippi flood plain surfaces. It was determined that the surface projection of the Zachary Fault trends west-northwest and east-southeast along the northern portion of the Port Hudson field. This projection is shown on the map, Figure 2.5-96, and is also shown on Figure 2.5-18 extending west-northwest just south of well 18C to its westernmost limit of control, about 1 mi east of the Mississippi River. A straight line projection westward would place the fault approximately 5,500 ft north of well 16C. This position should place the fault at approximately 8,000 ft in depth at that well. However, no fault has been located in that well from 3,500 ft (top of the log) to an 18,200-ft total depth. Therefore, it is concluded that the fault has either died out westward at shallow depth or has a surface position at least south of a point 1,500 ft north of well 16c. In the latter case, the well would intercept the fault above the top of the log.

The Zachary Fault possibly corresponds with an eastward extension of the Bancroft Fault zone that Murray mapped through western Louisiana and into Texas(1). In a groundwater investigation of Pointe Coupee Parish, Louisiana, west of the Mississippi River, Winner et al tentatively identified an east-west trending fault with maximum vertical displacement of about 50 ft on the fresh-water bearing sands which they interpreted as part of the Bancroft Fault zone(36). Their subsurface correlations indicate the presence of a possible fault along the western trend of the Zachary Fault but no displacements were interpreted above a depth of 2,200 ft and no surface fault manifestation was indicated. The lack of surficial evidence was confirmed by the aerial photography interpretation conducted as part of the near-site fault study. The Zachary Fault is the northernmost of the slump faults identified on the surface in the near-site area. The deep faulting found in the Port Hudson dome is indicated to have a vertical displacement of about 230 ft with the downthrown side on the north.

A seismic reflection survey profile, extending 8.5 mi in a north-south direction and located about 1.5 mi east of the site, was made in October 1970, and is included as Fig. 2.5-35; the location is shown in Fig. 2.5-26. The profile clearly depicts the Cenozoic sequence from the surface to the Austin Stage at approximately 9,000-ft depth. The beds are shown to dip gulfward continuously and without interruption from a point 5 mi north of the site to a point 3.5 mi south of the site. This indicates the absence of slump faults beneath the site and near-site area in the subsurface interval shown. Additional seismic reflection survey data in the site and near-site areas were also reviewed with no evidence of faulting above a depth of 13,500 ft.(87 ,88 ,96).

Figure 2.5-18 shows all petroleum test holes that have been drilled within 5 mi of the site. Electric logs have been reviewed for all wells shown on the Figure except well numbers 7s, 12s, 13s, and 15s. Well numbers 7s, 12s, and 13s predate electric logging. Consequently no electrical logs are available for these wells. Well number 15s is very old (drilled in 1937). As a result, attempts to obtain the electrical log through public log libraries have been unsuccessful. These electric well logs have been correlated to ascertain whether indications of faulting might be present. This was done in two stages:

1. Key stratigraphic horizons and intervals as shown on the cross section (Fig. 2.3-34) were identified on each available log. Subsea elevations of these horizons have been tabulated together with the thickness intervals between each horizon. These horizons are generally consistent time markers over the subregion studied with the exception of the top of the Tatum limestone, which occurs at 160 to 80 ft higher in the section in the southern part of the subregion compared to the northern part, due to facies loss of the limestone stringers inland to the north. The other horzions affected regionally by facies are the base of the Grand Gulf and the base of the Wilcox, both of which become younger southward into the basin. However, within the subregion studied they are recognized at a consistent stratigraphic position.

2. Adjacent well logs have also been correlated on much smaller stratigraphic intervals using all available log signatures in an effort to identify missing sections indicative of fault cutouts. None have been identified. Repeated sequences likewise have not been found and are totally unexpected since they would be due to reverse or thrust faults which are not characteristically present in the region.

Although the log for 14C begins at 100 ft in depth, no adjacent logs are shallower than 3,000 ft in well 17C or 3,500 ft in well 22C. Due to lack of correlation in adjacent well logs, no fault shallower than these depths would be noted in well 14C, a near-surface fault could occur as far as 1,500 ft north of well 14C and not be observed in the log of the well. However, if such a fault were to exist, its surface position would not be at the site.

No faults were observed at a total depth of 17,126 ft in well 17C. A deeper fault would surface approximately 17,000 ft away. If such a fault were to have a strike orientation of northwest-southeast (the normal strike of regional fault patterns), it would intersect the log of well 14C. No faulting was identified in the well log. A strike orientation of northeast-southwest at right angles to the typical orientation will not intersect the 14C well log; however, such an orientation is contrary to regional fault patterns.

Fig. 2.5-32 presents the longitudinal profile of the terraces along Thompson Creek. This profile demonstrates continuously sloping terrace profiles and therefore indicates the absence of any vertical offsets from a point 3 mi southeast of the site to an upstream point 12 mi northeast of the site. An east-west trending fault through the site surface would be expected to have some surface expression along strike in the sediments exposed along Thompson Creek.

Parsons postulated a fault which he called the Jackson Fault to explain the lower elevations of the base of the Citronelle Formation on an east-west trend through the town of Jackson, Louisiana located about 5 mi north of the site, as shown in Fig. 2.5-27(22). The seismic reflection survey data and the terrace profiles show no evidence for such a fault. This subsurface evidence is more definitive than that on which Parsons based his interpretation(22). It is concluded that what Parsons observed is simply an erosion

feature since the surface of the Pascagoula Formation is an erosional surface.
Detailed data on the surface of the Pascagoula clays in the site area indicate that this surface was dissected by channels prior to deposition of the Citronelle Formation sediments. Also, Parsons' data also indicate several major erosion channels in the top of the Pascagoula Formation(22).

Therefore, available surface and subsurface data show that the site area is free of any growth or slump faults to depths of approximately 13,500 ft.

2.5.1.2.3.3 Salt Structures

The Coastal Louisiana Salt basin lies south of the site. The nearest proven deep-seated salt dome is the Port Hudson Dome, 7 mi southeast of the plant area. The University domal structure, 25 mi to the south-southeast, is probably another deep-seated salt dome. The nearest shallow piercement salt dome is Bayou Choctaw, located 29 mi south of the plant area. Other more distant salt domes are shown in Fig. 2.5-2.

Piercement salt domes are prominent subsurface structures with associated normal faults in the Gulf Coastal Plain. These salt structures become progressively more pronounced southward as both the overburden on the deeply buried salt and the salt itself thicken. The amount of structural relief is due to the uplift of salt domes and to the subsidence in adjacent areas from lateral salt movement into the domes. They are readily detected by gravity and seismic surveys and frequently by geomorphic features. The examination of aerial photographs for evidence of surface features indicative of salt structures was extended to a distance of 10 to 15 mi in all directions from the site. No surface evidence of any type of such salt features was discerned on the aerial photographs or photograph mosaics.

2.5.1.2.3.4 Conclusions of Investigations of Structural Features in the Site and Near-Site Area

Detailed investigations of the site area included:

1. Careful and detailed photogeologic studies of the site and surrounding area

2. Careful surface examination of terrace profiles along streams which trend in approximately north-south directions and cross the latitude of the site

3. A deep reflection seismic profile made in 1970 by modern profiling techniques. This profile clearly shows that reflections considered to be the mid-Tertiary Tatum limestone, Wilcox Group, have no offsets from 3.5 mi south of the site to 5 mi north of the site. A review of additional seismic reflection survey data for the site and near-site extending to depths of approximately 13,500 ft has also been made(87 ,88).

4. Four deep reflection seismic profiles made in 1982 which traverse the site area. These data provide a clearer picture of the deep Cretaceous than previously was possible.

5. Correlation of available electric well logs to ascertain whether indications of faulting might be present has been performed as described in Section 2.5.1.2.3.2.

These studies have identified no slump fault structures to a depth of about 13,500 ft in the sedimentary sequence underlying the site nor within a 5-mi radius of the site. The site lies to the north of the major east-west trending slump faults. A westward projection of the Zachery fault, which is the slump fault nearest the site, would pass about 5.5 mi south of the site. The site is also located in a relatively domeless area and no evidence of any type of salt structure was discerned on the aerial photographs within a radius of 10 mi from the site.

Fisk in 1944 postulated a system of faults trending northwest-southeast and northeast-southwest in the sediments of the embayment(2). His hypothesis was based principally on possible lineaments such as stream patterns. Since then, detailed surface and subsurface investigations have failed completely to substantiate his fault hypothesis.

Instead, it has been found that the sediments of the Louisiana Gulf Coast area are cut by east-west trending shears termed growth and slump faults. These have resulted from subsidence and differential compaction of the sediments under the weight of later deposits. Physically, they are characterized by large scale rotary movement, with the shear surface being steepest near the surface and flattening with depth. These faults frequently form oil traps and therefore have been the object of an exhaustive search by petroleum exploration companies. The northern limit of the slump faulting corresponds approximately with the northern extent of the Coastal Salt basin.

The 1982 seismic lines reveal two deep structures that previously had not been identified. These data show that the shallow Tertiary horizons, such as the Miocene reflector in a depth bracket of 7,000 to 9,000 ft are excellent reflectors that do not reflect faulting. The top of the Cretaceous in a depth bracket of 13,500 to 15,000 ft is also an excellent reflector. There is slight indication of a possible down to the south growth fault at this horizon as well as in the underlying Austin chalk reflector. This indication is not seen in the shallow Tertiary reflectors nor the deeper lower Cretaceous reflector. This indication strikes N80°W at the top of the Upper Cretaceous horizon beneath the site.

The top of the Lower Cretaceous in a depth bracket of 18,000 to 22,000 ft is also readily identifiable in these data. This horizon shows the shelf edge and southward thickening wedge of Tuscaloosa sediments above it and below the Austin chalk. The Lower Cretaceous appears to have an indication of a fault downthrown to the south with a possible fault strike of N80°E at the Lower Cretaceous horizon approximately 3,000 ft north of the site at a depth of approximately 20,000 ft. The indication dies out upward and does not appear to offset Upper Cretaceous reflectors.

These features are shown in Figures 2.5-18, 2.5-22, and 2.5-34, designated FA and FB, respectively.

Figure 2.5-18 shows the location of FA at the top of the Cretaceous (depth of 13,500 ft) and the location of FB at the lower Cretaceous horizon (depth of 18,000 ft). Since these features are evident only on the 1982 seismic lines, they are shown on Figure 2.5-18 to terminate prior to intersecting any other seismic lines.

These possible ancient growth faults exhibit an east-west trend consistent with typical regional growth faulting. They represent the gulfward slumping of sediments which occurred during the early stages of southward buildout of the shelf. As growth faults, they die out upward and are overlaid by unfaulted deposits as described in Section 2.5.1.1.5.3.2. There is no evidence of movement along either fault within the last 60 million years.

A corollary study has consisted of examining all of the available electric logs within 5 or more miles of the site for faulting. The earlier examination for the PSAR has been greatly enhanced by the addition of the new deep Tuscaloosa wells that were available for the FSAR.

This study which is described in Section 2.5.1.2.3.2 included all available logs of wells shown on Fig. 2.5-18.

Insofar as upward and lateral extensions of the identified faults FA and FB identified on the Amoco seismic line (Figure 2.5-18) are concerned, the only well propitiously located to test such occurrence is No. 6 (South Louisiana Production Witter) which would encounter the eastward extension of fault FA at a depth of approximately 13,000 ft. However, no fault has been identified on this well for the entire log depths from 4,500 ft to 17,800 ft, a vertical distance of 13,300 ft.

The well logs of the four wells southwest of the site (Nos. 10, 11, 21, 22) are especially pertinent because they are situated on the regional trend of any potential fault that would surface near the site.

The absence of identifiable faults in the post Cretaceous sequence to a depth of approximately 2 1/2 miles conforms to the interpretation that the northernmost shallow, young fault is the Zachary fault which has been mapped on the surface extending west-northeastward to a point approximately 7 miles southeast of the site.

There are three and possibly four slump faults, which are recognized at the surface, that extend in an east-west trend through the Baton Rouge area south of the site. The Zachary Fault is closest to the site. The displacements along these faults have occurred mainly during the Pleistocene Epoch but ceased on the two northern faults, Zachary and Baker (if it exists), prior to the late Sangamon interglacial stage, more than 70,000 yr before present (B.P.), because the Port Hickey terrace surface is not displaced. The Zachary Fault displaces the Old Irene Terrace on Section B-B' of Fig. 2.5-27, but it has not been recognized at the younger Port Hickey Terrace to the west or east of its Irene escarpment. Hence its post-Port Hickey displacement has not been noticeable. However, even if modern displacement were to occur on this fault, it would be similar to such displacement now occurring along the Scotlandville-Denham Springs and Baton Rouge Faults with an absence of seismicity. The Burtville Fault, located approximately 25 mi south of the plant area, is south of the Baton Rouge Fault and has not been recognized on the surface. It is a slump fault, downthrown to the south, with vertical displacement of about 300 to 400 ft at a depth of 9,000 ft.

Movement is continuing on the Scotlandville-Denham Springs and the Baton Rouge Faults. However, major groundwater withdrawal is also causing subsidence in the Baton Rouge area and the fault movements may be only near-surface-related movements(24). Maximum subsidence in the Baton Rouge area for the period 1964 to 1976 is reported as 0.49 ft according to Smith and Kazmann(38).

Progressive flattening of the fault planes with depth results in the faults becoming bedding plane slip in the lower part of the sedimentary sequence at depths below 20,000 ft. Here, the faults dissipate into the sediments as plastic movement. Most importantly, these faults neither reach the basement nor arise from basement tectonic movement. Instead, they are activated by the compaction and settling of the tremendous geosynclinal sedimentary thickness to the south. Their Pleistocene movement is related to the rapid rate of sedimentation during the Pleistocene Epoch.

Because these slump faults occur completely within a relatively yielding sedimentary mass, they move without accumulating large strain and large sudden displacement. If the movements are more than near-surface adjustments due to groundwater withdrawal, then a good example is provided by the 1971 recognition of a reported 0.3-ft vertical movement of the Scotlandville Fault beneath the Glen Oaks High School building during the last decade. The absence of an abrupt movement or perceptible shocks indicates the gradual nature of these fault displacements. Evidence in support of this reasoning was presented by Eargle and Herbst(9). They noted, in conjunction with the AEC Salmon event at the Tatum dome in southern Mississippi, that "the Rayleigh wave pattern and the absence of Love waves show that the Salmon event produced no tectonic release...that the rocks were not under excessive strain...whereas such releases have customarily resulted from explosions at the Nevada Test Site." This evidence relates not only to the sedimentary sequence but also to the basement rocks.

Regional warping is recognized as being associated with development of the Gulf Coast geosyncline and the related development of slump and growth faults and salt structures within the sedimentary sequence. However, the detailed study of the regional and site geology has not identified any growth and slump faults and salt structures to a depth of 13,500 ft in the site area. There are no adverse factors associated with the regional warping present in the site area.

2.5.1.2.3.5 Seismic Lines

Seismic brokers have identified a total of 59 seismic lines as available in the general site area. These lines are in addition to the lines already evaluated in the FSAR (Section 2.5.1.2.3.4). Although specific dates for these surveys have not been obtained, it is presumed that most or all of them were shot during the interest in the Tuscaloosa trend petroleum play beginning in the early to mid-seventies.

GSU obtained this list following the June, 1983 conference with NRC personnel in Bethesda, Maryland. The brokers have listed only lines that are available for purchase, most presumably placed on the market now that drilling in the trend has abated. GSU has interpreted the lines shown on Figure 2.5-18, but has not examined any of the 59 lines recently identified as available.

All of the available electric well logs from the area depicted on Figure 2.5-18 have been correlated and examined for missing sections that might be indicative of fault displacement, and no faults have been identified outside the immediate Port Hudson structure except for the Zachary fault. Seismic data shown on Figure 2.5-18 (Amoco lines) interpreted in the site area depicts no faulting except the two faults that terminate upwards in the Cretaceous-Midway sequence at depths below 13,500 feet in beds older than 60 million years.

Faults other than the Zachary fault have been identified on the Port Hudson salt dome. They are restricted to the Port Hudson structure and the shallowest such fault identified occurs in well No. 38 at a depth of 9,400 feet in the Claiborne sequence of Eocene age.

Elsewhere in the area, any unidentified faulting also would expectedly terminate upward at depth.

The northernmost growth fault extending through the shallower younger beds has been identified as the Zachary fault, the surface position of which is shown on Figure 2.5-17. Surface mapping has not identified shallow faults north of this position, nor do any of the well logs or seismic lines shown on Figure 2.5-18 yield any evidence of post-Cretaceous-Midway faulting in the study area.

The foregoing discussion provides the rationale for concluding that no post-Cretaceous-Midway faults exist north of the Zachary fault. Even if such a fault were to exist, the four Amoco seismic lines (277 to 280) indicate that its surface position would not be at the site. In addition, evidence is presented in Section 2.5.1.1.5.3.2 that such faults do not present seismic risk even though actively undergoing surface displacement.

2.5.1.2.4 Site Geologic Map

A geologic map of the site at a scale of 1:24,000 is presented as Fig. 2.5-20. This map shows the location of the major structures of the plant and also indicates the site boundaries. Surface geology of the area within a radius of 1 to 2 1/2 mi of the plant area is presented excluding the surficial loess deposits.

2.5.1.2.5 Geologic History of Site

The geologic history of the site and the region surrounding the site is presented in Section 2.5.1.1.3.

2.5.1.2.6 Potential Hazards From Natural Features

Consistent with regional and site geology described in Sections 2.5.1.1, 2.5.1.2.2, and 2.5.1.2.3 there are no natural features such as tectonic depressions, cavernous conditions, or karstic terrain in the site area which would present potentially hazardous conditions. The siting and foundation preparation for all Seismic Category I structures is designed to preclude any potential for landslides or any loss of ground support for any Seismic Category I structure. A detailed discussion of the potential for landslides is presented in Section 2.5.5.

2.5.1.2.7 Boring Location Plan and Boring Logs

Fig. 2.5-23 shows the location of all borings in the overall site area. Fig. 2.5-24 shows the location of major structures of the nuclear power plant, including all Seismic Category I structures, and the locations of all borings in the immediate plant area. The detailed logs of all borings are presented in Appendix 2H.

2.5.1.2.8 Geologic Conditions Affecting the Site

2.5.1.2.8.1 Behavior of Soil Strata in Site Area During Prior Earthquakes

Based on the seismicity study (Section 2.5.2.5) the historical record of earthquakes in the southern and central United States indicates that probably only four earthquakes would have been felt at the site. These include the Donaldsonville earthquake of 1930, which had an epicenter 50 mi south-southeast of the site and an epicentral MM Intensity VI , and the three New Madrid earthquakes of 1811-1812, located approximately 400 mi north of the site with epicentral MM Intensities XI, X-XI, and XI-XII. The maximum MM Intensity felt at the site from these four earthquakes would have been IV to V corresponding to approximately 0.015 g to 0.03 g.

The limit of river bank caving as described by Fuller due to the New Madrid event, corresponds to a felt MM Intensity VII, based on the isoseismal map by Nuttli and occurred about 200 mi north of the site(20 ,39). There would have been no river bank caving associated with the Donaldsonville earthquake. On this basis, therefore, it would not be expected that there would be any bank caving or landslides associated with the lower intensities which have been felt at the site.

If a New Madrid event were to occur at the southern limit of the New Madrid seismic zone near Memphis, Tennessee, the limit of bank caving would move proportionately farther south but would still be at least 150 mi north of the site. Thus, the potential for large landslides from large New Madrid events exists at locations still remote from the site. This is not to suggest that a landslide could not be triggered by even a very minor seismic event. Wherever slopes exist in a condition on the verge of failure (e.g., riverbanks being eroded and undercut), a variety of natural phenomena could be the triggering factor(40).

Stearns describes a landslide on a small tributary of the Mississippi River approximately 335 mi north of the River Bend Station site in the Mississippi embayment near Blytheville, Arkansas(41). Whether or not this landslide was triggered by an earthquake is not definitely known. However, the bank had been steepened by erosion and even if the failure can be correlated to an earthquake it need only have been the triggering factor.

The sediments in the area consist of the Jackson Formation, of the Upper Eocene age, and are brackish water clays. Brackish water clays when leached may become extra sensitive to quick. Sterns' description of the flowing clays is typical of the behavior of leached brackish water clays in the St. Lawrence valley as reported by Meyerhof and Conlon(41 ,42 ,43). Furthermore, commonly during the leaching of the clays of the Jackson Formation, iron sulphides are oxidized to sulphuric acid which is a strong leaching agent.

No such leached sensitive clays exist in the site area, and therefore no such potential for landslides exists at the site. The landslide which occurred near Blytheville was caused primarily by an oversteepened bank in sensitive clay(41). Furthermore, a detailed examination of aerial photographs of the Grants Bayou area and the exposures of the Port Hickey terrace deposits and the Citronelle Formation in the vicinity of the site revealed no evidence of flow slides or sand boils or any other phenomena indicative of a disturbance of soil strata during earthquakes. One large landslide was noted 23 mi upstream along the Mississippi River at Fort Adams(44). It took place on October 8, 1933, and is interpreted to be a conventional failure associated with the oversteepening of the high bluff in the area by the erosion of the Mississippi River.

The topography in the Fort Adams area is characterized by pronounced relief. The valley wall rises steeply to elevations on the order of +300 ft msl from the Holocene floodplain at approximately el +50 ft msl. In some areas the upper part of the slopes stands near vertical, 100 ft or more in height. These conditions are probably indicative of the conditions existing before the landslide, although the slope may have been even steeper with the river impinging against the toe of the bluff. The slopes cut down through about 30 ft of loess, at least 200 ft of Citronelle Formation sands and bottom in the Pascagoula Formation.

Conditions for a similar landslide do not exist in the site area; the relief in the site area is very subdued, the slopes at the valley wall are only about 75 ft high rising from the backswamp area of approximately el +35 ft msl, and even these slopes have become less steep from prolonged erosion. Furthermore, these slopes are more than a mile from the plant area.

2.5.1.2.8.2 Deformation Zones

No faults have been identified within the sedimentary sequence within 5 mi of the site to a depth of about 13,500 ft (Section 2.5.1.2.3.4). Furthermore, there are no shears, joints, fractures, or folds in the sediments immediately beneath or in the area surrounding the plant area (Section 2.5.1.1.5).

2.5.1.2.8.3 Zones of Alteration, Irregular Weathering Profiles, and Zones of Structural Weakness

The various soils comprising five clearly defined stratigraphic zones underlying the site are described in Section 2.5.1.2.2, and their detailed engineering properties are presented in Section 2.5.4.2. There are no significant zones of alteration underlying the plant area.

2.5.1.2.8.4 Unrelieved Residual Stress

The Paleozoic basement rock in the site area is estimated to be at a depth of approximately 27,000 ft. Within the deep soil deposits underlying the site and particularly those within the excavations and the zones of influence of the structural foundations, residual stresses are not a practical consideration.

2.5.1.2.8.5 Stability of Soils

The loess, Port Hickey top-stratum clays, the sand and clayey sands, and the variable upper portion of the Citronelle buried channel deposits were excavated to approximately the elevation of +20 ft msl to remove them from the site beneath the foundations of the Seismic Category I structures (Section 2.5.4.5). These soils contain some fine sand and clayey sand layers below the founding grades with relatively low standard penetration test (SPT) blow counts and it was judged that the necessary assurance could not be provided that they could withstand the assumed SSE without liquefaction. Therefore, it was concluded that the subsurface materials above el +20 ft msl beneath all Seismic Category I structures should be replaced. Slope stability in the plant area is discussed in Section 2.5.5.

The Seismic Category I structures are founded on compacted, well-graded granular fill placed over dense Citronelle buried channel sands and gravelly sand and the underlying hard Pascagoula clays. These foundation soils which were left in place are considered to be competent to support the Seismic Category I structures (Sections 2.5.4.3 and 2.5.4.8). The materials that were removed and the extension of these same strata beneath the other structures of the power plant present no problems because of their mineralogy. Furthermore, the net foundation loads are small and no significant settlements are expected based on the founding grades proposed.

2.5.1.2.8.6 Effects of Man's Activities on Site Conditions

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As described in Section 2.5.1.1.6, petroleum is being produced both north and south of the site, but the combination of conditions resulting in these occurrences of oil do not exist in an east-west band through the site. Therefore, the site area is completely free from petroleum production. No mineral extraction is presently occurring within 7 mi of the site.

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Subsidence due to groundwater withdrawal in the Baton Rouge area is discussed in Section 2.5.1.2.3.4. Discussions and conclusions relating to groundwater withdrawal in the site vicinity are presented in Section 2.5.4.1.1.

2.5.1.2.9 Site Geology of Seismic Category I Excavations

In order to comply with certain requirements, the walls and floors of the plant excavations for Seismic Category I foundations were geologically mapped in detail. This geologic mapping was done in stages from July 26, 1976, to February 24,1977. Four geologic units were reportedly encountered within the main excavation as follows in increasing order of age:

1. Loess
2. Top-stratum silts and clays of the Port Hickey terrace
3. Silty sands of the Port Hickey terrace
4. Generally fine to coarse-grained Citronelle Formation deposits.

The detailed geologic mapping found no evidence of faulting, folding, or other geologic hazards in the main excavation. The exposed geometric features were determined to be erosional and/or depositional in origin. A complete licensing report discussing this geologic mapping was submitted to the NRC in December 1977 entitled Report on Geologic Mapping of the Excavation for Category I Structures and Buried Pipeline.

2.5.1.2.10 Site Groundwater Conditions

The regional and site groundwater conditions are presented in detail in Section 2.4.13.

2.5.2 Vibratory Ground Motion

This section provides information regarding the seismic and geologic characteristics of the site and the region surrounding the site. Included is a discussion of the seismic design basis for vibratory ground motion at the site, based on historical regional seismicity.

2.5.2.1 Regional Seismicity

The River Bend Station site is located in an area of infrequent and low seismicity within the Gulf Coast Basin tectonic province. The largest earthquake within this tectonic province not considered to be associated with geologic structure is the Donaldsonville, Louisiana earthquake which occurred on October 19, 1930, with epicentral Modified Mercalli (MM) Intensity VI. The historical earthquake nearest to the site occurred on November 19, 1958. The epicenter was located 19 mi (31 km) southeast of the site with an epicentral MM Intensity V.

2.5.2.1.1 Earthquake Catalog

A chronological catalog of earthquakes that have occurred within 200 mi (322 km) of the site with an epicentral Modified Mercalli Intensity greater than IV, or magnitude (m) greater than 3.0, is provided in Table 2.5-3. The earthquake of May 7, 1842, is included in the listing because of its close proximity to the site (45 mi or 72 km), even though the epicentral MM Intensity was III-IV. For each earthquake, Table 2.5-3 lists the date, origin time in Greenwich Mean Time (GMT), location, depth of focus (if available), epicentral MM Intensity, magnitude (m) (where available), felt area and moment (if available), epicentral distance from the site in kilometers, and the source of the earthquake's data.

Additional chronological catalogs of other significant earthquakes beyond the 200-mi (322-km) radius of the site are also presented. Table 2.5-4 lists the earthquakes that have occurred within the zone ranging from 200 mi (322 km) to 310 mi (499 km) from the site with epicentral MM Intensity V or greater. Table 2.5-5 lists the earthquakes that have occurred within the zone ranging from 310 mi (499 km) to 480 mi (772 km) northward from the site with epicentral MM Intensity VI or greater. A map showing the epicentral locations of all listed earthquakes is included as Fig. 2.5-36.

2.5.2.1.2 Reliability of Earthquake Catalogs

The earthquake catalogs show earthquake events dating back to the early 1800s. The record of past earthquakes was based on population distribution and seismograph network coverage. Accuracy of epicentral coordinates and assigned maximum intensities for earthquakes prior to the 1900s in the southeastern United States is dependent on the accuracy of the felt reports.

Variable construction practices and the tendency of early settlers to build along rivers may have resulted in oversized intensities. From the 1900s to the 1960s, most of the seismographs located in the eastern United States were operated by the Jesuit Seismological Association.

Dense seismograph networks have been implemented in the eastern United States since the 1960s. Seismic data are now recorded at numerous universities and observatories, such as those operated in the central United States by St. Louis University, the University of Missouri, the University of Arkansas, and the University of Mississippi. In the United States, the earthquake arrival times reported by seismograph stations are processed by computer, and readings from a minimum of five seismograph stations are deemed essential for an acceptable epicentral solution by the National Oceanic and Atmospheric Administration (NOAA).

The cumulative historical seismicity data, especially prior to 1960, used for this seismicity study, are considered to be the best available and were used with judgment.

2.5.2.1.3 Earthquake Data Sources

The major data sources for the listed earthquakes include the Historical Earthquake Data File of the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce(45); "Earthquake History of the United States," Publication 41-1, with Supplement through 1980 by the U.S. Department of Commerce(46); "Seismic History and Seismicity of the Southeastern Region of the United States," 1970, by McClain and Myers(47), and "Seismicity of the Central United States" by O.W. Nuttli(48). The earthquakes listed range from the year 1811 through April 1981. Earthquake intensities in these seismicity discussions refer to the Modified Mercalli (MM) Intensity Scale of 1931, and an abridged form of this scale is included as Table 2.5-6.

In addition to the preceding sources, the historical seismic activity of the site region has been determined by a literature search in the following libraries:

1. Library of Congress, Washington, D.C.
2. Mississippi Department of Archives and History, Jackson, Mississippi
3. Judge George J. Armstrong Public Library, Natchez, Mississippi
4. Louisiana Room and Genealogical Room, Louisiana State University, Baton Rouge, Louisiana
5. Louisiana State Library, Baton Rouge, Louisiana.

The recent seismic activity of the region has been investigated through published data and by personal communications with the following seismologists: Dr. F. E. Followill, University of Mississippi; Dr. E. Herrin, Southern Methodist University; and Rev. K. A. Maring, S.J., Loyola University (New Orleans).

2.5.2.1.4 Historical Earthquakes

Twenty-nine earthquakes of epicentral MM Intensity III-IV or greater have occurred within 200 mi (322 km) of the River Bend Station site from 1812 through April 1981. Of these, only four have occurred within 100 mi (161 km) of the site. Those earthquakes which have occurred within 100 mi (161 km) of the site include: the Donaldsonville Louisiana earthquake of October 19, 1930 the Catahoula, Louisiana earthquake of May 7, 1842; the New Orleans, Louisiana earthquake of November 6, 1958; and the Baton Rouge earthquake of November 19, 1958. The epicentral MM Intensities of these four earthquakes were VI, III-IV, IV, and V, respectively, and their respective distances from the River Bend Station site were 50 mil (80 km), 45 mi (72 km), 94 mi (152 km), and 19 mi (31 km).

Following is a discussion of the effects of some of the significant earthquakes felt or observed within the site region.

May 7, 1842: The epicenter of this earthquake was located 45 mi (72 km) southwest of the site with an MM Intensity of III-IV. The earthquake was lightly felt for a duration of 2 to 3 sec over a 1,350-sq mi area in the Gulf Coast Basin southwest of Baton Rouge, near the town of Catahoula. The isoseismal of the felt area is shown in Fig. 2.5-37. Fluctuations were noted in the water level of a lake located east of Catahoula and along the banks of Bayou Teche(49). The earthquake was also felt at St. Martinsville, Louisiana, and Opelousas, Louisiana, but was not felt at the River Bend Station site. Due to its proximity to the River Bend Station site, this earthquake has been included in the earthquake catalog (Table 2.5-3).

November 13, 1927: The epicenter of this earthquake was located near Jackson, Mississippi, 125 mi (202 km) northeast of the site. Descriptions from the Jackson Daily News, Jackson, Mississippi, on November 14, 1927, indicate an epicentral MM Intensity V-VI for this event as shown in the following citation:

> "Three distinct earth tremors lasting 30 seconds were felt here and in neighboring sections...at 10:31.
>
> Several buildings in the city trembled and in some houses dishes and glasses crashed to the floor. The shocks, although not strong, were noticeable generally over the city."

Tremors were also reported in Hinds, Jeff Davis, Rankin, and Simpson Counties, Mississippi, but the only damage reported was a chimney knocked down at the Mississippi Hospital for the Insane and a cracked wall in a Jackson residence. Based on the MM Intensity V-VI and its distance from the site, it is doubtful that this earthquake was felt at the site.

October 19, 1930: The epicenter of this MM Intensity VI earthquake was located near Donaldsonville, Louisiana, approximately 50 mi (80 km) south-southeast of the River Bend Station site. The epicentral location could not be determined from instrumental data, since the nearest seismograph stations at Loyola University, New Orleans, and Spring Hill College, Mobile, Alabama, were inoperative at the time of the earthquake. The earthquake was strong enough to be recorded on the seismograph at Georgetown University, Washington, DC.

The assigned epicentral location appears to be consistent with the macroseismic data. The earthquake was felt over a 15,000-sq mi area of southeastern Louisiana as shown in Fig. 2.5-38, which also shows approximate isoseismals based upon the plotted intensity data. The epicentral MM Intensity VI was assigned based upon scattered instances of damage within the MM Intensity V-VI area. At Napoleanville, chimneys were damaged and windows broken; at White Castle, plaster cracked and small objects were overturned; at Gonzales, "brick chimneys of several residences were damaged, some being cracked almost from the top to bottom while parts of others, above the roof, were knocked down" (The Donaldsonville Chief, Donaldsonville, Louisiana, November 1930).

At other towns within the MM Intensity V area, such as Morgan City, Elemans, Donaldsonville, Franklin, Berwick, and Plaquemine, small objects were overturned, doors and windows rattled, pictures fell, hanging objects swung, walls and houses creaked, and trees and bushes were shaken. At New Orleans, this earthquake caused floors and beds to rock for 6 to 15 sec. "In some instances, beds were rolled two or three ft, causing their occupants to awaken startled, pictures to loosen from walls, dishes to rattle, and house foundations to creak loudly" (The Times Picayune, New Orleans, Louisiana, October 20, 1930). The preceding description corresponds to MM Intensity IV. The earthquake was also felt by many people in the Baton Rouge area as a brief undulating or rolling motion which shook walls, lights, and windows (Baton Rouge Morning Advocate, October 20, 1930). It is likely that the effects of this earthquake were similar at the River Bend Station site and were felt as MM Intensity IV.

<u>December 17, 1931</u>: The earthquake epicenter of MM Intensity VI-VII was located 195 mi (313 km) north of the River Bend Station site. The earthquake was felt over a 65,000-sq mi area of northern Mississippi, as far south as Jackson, northwestern Alabama, southwestern Tennessee, and eastern Arkansas. The original epicentral location was placed at 34.1°N and 89.3°W by the U.S. Coast and Geodetic Survey. The revised epicentral location at 33.4N and 90.5°W is based upon a detailed reanalysis of the instrumental and macroseismic data by Dr. Fred E. Followill (Appendix 2I)(50). The isoseismal map of this earthquake (Fig. 2.5-39) indicates that the maximum effects of MM Intensities VI-VII were noted between Belzoni and Charleston in northwestern Mississippi and consisted of damaged chimneys, cracked and fallen plaster, and cracked walls and foundations. This earthquake was not felt at the River Bend Station site.

<u>February 1, 1955</u>: This earthquake of epicentral MM Intensity V was felt along a 30-mi stretch of the gulf coastline of Mississippi from Bay St. Louis on the west to Biloxi on the east as shown by the isoseismal map of the felt area included as Fig. 2.5-37. Although the U.S. Coast and Geodetic Survey has reported the intensity of this

earthquake as MM V, the maximum effects consisted of objects, windows, and doors rattling; buildings creaking; and rumbling sounds and light fixtures vibrating, all of which are more consistent with MM Intensity IV. The effects of this earthquake were more noticeable in Gulfport, accounting for the epicentral location (Times Picayune, New Orleans, February 2, 1955). The earthquake was not felt at the River Bend Station site located 135 mi (217 km) west of the epicenter.

November 6, 1958: This MM Intensity IV earthquake was confined to an area within a 5- to 7-mi radius of downtown New Orleans, extending from Lake Pontchartrain on the north to Gretna on the south and from Harahan on the west to Arabi on the east as shown by the isoseismal shown on Fig. 2.5-37. The earthquake was recorded as a 15-sec vibration on the seismographs at Loyola University in New Orleans. The assigned MM Intensity IV is based on reports of maximum effects as windows shook and doors rattled (Times Picayune, New Orleans, November 8, 1958, and New Orleans States and Items, November 7, 1958). This earthquake was not felt at the River Bend Station site located 94 mi (152 km) northwest of the epicenter.

November 19, 1958: This earthquake with an epicentral MM Intensity V was felt at Baton Rouge, at Baker, 5 mi to the north, and at Denham Springs, about 10 mi to the east as shown by the isoseismal of the felt area on Fig. 2.5-37 (Baton Rouge Morning Advocate, Baton Rouge, November 20, 1958). The earthquake was not strong enough to be recorded on the seismographs at Loyola University in New Orleans. The 10-sec vibration was not immediately recognized as an earthquake; many thought it was an explosion or sonic boom. Although this earthquake has been assigned MM Intensity V, the maximum effects, which consisted of houses shaken and windows rattled, are more consistent with MM Intensity IV. The earthquake was not felt at the River Bend Station site located approximately 19 mi (31 km) northwest of the epicenter.

October 15, 1959: The isoseismal of the felt area for this earthquake of MM Intensity IV at the epicenter is shown on Fig. 2.5-37. This earthquake was felt over approximately 3,000 sq mi in southwestern Louisiana, extending from Cameron on the southwest to DeQuincy on the north to Lake Arthur on the east. Maximum effects were noted at Creole and Grand Chenier on the southern Louisiana coast, where objects and windows rattled, accounting for the MM Intensity IV at the epicentral location. This earthquake was not felt at the River Bend Station site located 125 mi (201 km) northeast of the epicenter.

March 27, 1964: The Prince William Sound, Alaska, earthquake, magnitude 8.3, although not felt, produced long-period surface waves which set up seiches or periodic oscillations of the surface of closed bodies of water in the Gulf Coast region. The effects of the seiches were noticed in the rivers and bayous of the New Orleans area, where considerable damage was done to many boats and barges, which slammed against piers or were torn from their moorings. Most accounts indicate that water oscillations had a peak-to-peak amplitude of approximately 6 ft, with a period of oscillation on the order of 5 sec. The Amite River, east of Baton Rouge, had peak-to-peak oscillations on the order of 4 ft for a duration of 20 min. In Baton Rouge, the water in swimming pools, including the pool on the fourth floor of the Capitol House Hotel, was disturbed. Water disturbances "were not particularly noticeable" along the Mississippi River (Baton Rouge Morning Advocate, March 28, 1964).

April 24, 1964 to August 16, 1964: Within this time span, a series of at least ten earthquakes occurred near the Texas-Louisiana border, generally between the Toledo Bend Reservoir and the Sam Rayburn Reservoir and are shown in Table 2.5-3 and on Fig. 2.5-36. Epicentral MM Intensities ranged from IV to VI, and body-wave Magnitudes ranged from 3.0 to 4.0. These earthquakes were felt over small areas, and the epicenters appear to be shallow(51). At the time of these events, the Sam Rayburn Reservoir was being filled, and the Toledo Bend Dam was being constructed. More than 70 micro-earthquakes were recorded on seismic instrumentation, which was established in July 1964; however, earthquake activity in this area abruptly decreased in frequency, intensity, and magnitude after a three-month period(51). No local earthquakes were recorded after September 1964. Those earthquakes which had epicentral MM Intensity IV or greater, or magnitude (m) greater than 3.0, are listed in Table 2.5-3. These earthquake epicenters were located approximately 155 mi (250 km) northwest of the site and were not felt at the River Bend Station site.

June 4, 1967 and June 29, 1967: Two earthquakes, one with epicentral MM Intensity VI, followed by one of epicentral MM Intensity V, were felt in an area located 198 mi (318 km) north of the site. The June 4 earthquake was felt over a 25,000-sq mi area, including extreme southwestern Tennessee, southeastern Arkansas, northeast Louisiana, and northwest Mississippi as shown on the isoseismal map included as Fig. 2.5-40. Maximum effects near the epicenter, located approximately 18 mi northeast of Greenville, Mississippi, consisted of cracked plaster and a reported crack in the ground. The aftershock of June 29 was felt in Boliver, Sunflower, and Washington Counties, Mississippi. These earthquakes were not felt at the River Bend Station site.

2.5.2.1.5 New Madrid Earthquakes

The area of greatest seismic activity in the southern and central United States is located approximately 400 mi (644 km) north of the River Bend Station site, in the northern portion of the Mississippi Embayment. Earthquakes have been reported in this area since 1699.

The most significant events occurred in the vicinity of New Madrid, Missouri, on December 16, 1811, and January 23 and February 7, 1812. These earthquakes had reported epicentral MM Intensities XI, X-XI, and XI-XII, respectively. They were felt over most of the eastern United States, producing considerable earth disturbances along the Mississippi River as far south as its confluence with the Arkansas River (210 mi north of the site). The town of New Madrid, Missouri, suffered complete destruction. The shock was felt within an area of 2,000,000 sq mi, including Boston, Washington, DC, and from Canada to New Orleans.

An area of approximately 30,000 to 50,000 sq mi was characterized by raised and sunken land, sand blows, sinks, fissures, and large landslides. This area extended over more than 100 mi from near Cairo, Illinois, to the latitude of Memphis, Tennessee, and for a distance of 50 mi in an east-west direction(20). Visible waves with depressions and swells rolled across the earth and caused open fissures ranging up to 5 mi in length. Some vertical faulting of the ground surface occurred, possibly forming falls in the Mississippi River(46).

Water, sand, mud, and gas were ejected by the earthquake activity. Sand blows were common, with crater-like depressions in the center. Several lakes reportedly were formed by subsided land areas. Submergence depths generally ranged from 5 to possibly 20 ft. Other areas reportedly were uplifted by as much as 15 to 20 ft above the highest flood level(46).

While the New Madrid earthquakes were widely felt over the southern Mississippi Valley, no reports were found to indicate how these earthquakes affected the River Bend Station site and the Baton Rouge area. Accordingly, the determination of the earthquake's effects at the site is based upon reports from Natchez, Mississippi, 55 mi north of the site, and from New Orleans, 90 mi southeast of the site.

The following excerpt is the most complete account of the effects of these earthquakes at Natchez. A letter dated December 18, 1811, published in the Natchez Weekly Chronicle, states: "...several clocks stopped at two or at about 10 minutes after. Several articles were thrown off the shelves; crockery was sent rolling about the floor, articles suspended from the ceiling of stores vibrated rapidly without any air to disturb them for about nine inches; the plastering in the rooms of some houses was cracked and injured" (Reprinted in Louisiana Gazette and New Orleans Daily Advertiser, December 31, 1811).

In the letter, it was estimated that the duration of the shaking was 1 1/2 min and that suspended objects vibrated in an east-west direction. It was also noted that the river was agitated both above and below Natchez, and that trees were made to vibrate in a number of the smaller towns outside Natchez. Evaluation of the foregoing account by examination of the Modified Mercalli Intensity Scale (Table 2.5-6) indicates that the maximum MM intensity of the New Madrid earthquakes in the vicinity of Natchez was probably MM Intensity V, with a maximum MM Intensity VI.

There is no indication in any of the New Orleans newspapers that the New Madrid earthquake of December 16, 1811, was felt in New Orleans. Fuller reports that the earthquake was felt in New Orleans, but was weak(20). The earthquake of January 23, 1812 was reported as a slight shock which: "...lasted but a few seconds and but few felt it. At that time all is bustle in the city--many proofs, such as clocks stopping, glass shades, and different kinds of glassware and crockery shaking, the feelings of many who were either writing or reading, proved the fact..." (Louisiana Gazette and New Orleans Daily Advertiser, January 24, 1812).

The earthquake of February 7, 1812 was felt in New Orleans as a slow oscillatory motion, rather than a strong shaking (Moniteur de la Louisiane, February 11, 1812). The foregoing account is indicative of MM Intensity IV to V in the New Orleans area.

The historical earthquakes of the New Madrid seismic zone which occurred within the zone ranging from 310 mi (499 km) to 480 mi (772 km) of the River Bend Station site and having epicentral MM Intensity VI or greater have been tabulated chronologically in Table 2.5-5, and are shown on the epicenter map included as Fig. 2.5-36.

Nuttli has correlated the isoseismal map of the December 16, 1811 earthquake, included as Fig. 2.5-41, with recent earthquakes for which ground motion data are available(39). He estimates the body-wave magnitude (m) of the December 16, 1811 earthquake to be 7.2. In addition, Nuttli has estimated the body-wave magnitudes (m) of the other principal earthquakes, those of January 23, 1812 and February 7, 1812, to be 7.1 and 7.4, respectively(39).

The unusually large areas of damage and perceptibility of these three Mississippi Valley shocks are due to both the surficial geologic conditions and the relatively low attenuation of surface wave energy in eastern North America(39). It is significant that the area of strong earthquake activity is characterized by Paleozoic rocks overlain by thick unconsolidated sediments of Mesozoic and Cenozoic age. The surficial deposits consist of Quaternary alluvium, including saturated sands and clay. Such subsoils are highly susceptible to landslides and liquefaction.

Algermissen has assigned a seismic risk Zone 3 classification to the Mississippi Valley region made up of southern Illinois, southeastern Missouri, northeastern Arkansas, and western Tennessee due to its high historic seismicity as shown in Fig. 2.5-42(52). In contrast, the major part of the site region is historically an area of low seismicity, as indicated by a Zone 1 classification by Algermissen(52).

2.5.2.2 Geologic Structures and Tectonic Activity

2.5.2.2.1 Geologic Structure and Tectonic Provinces of the Site Region

The region within 200 mi (322 km) of the site is predominantly within the Gulf Coast Basin tectonic province as shown in Fig. 2.5-36. The most northern and northeastern portion of the site region is considered to be within the Ouachita tectonic belt of the Mississippi Embayment tectonic province. Structures within the basement rock are covered by thick unconsolidated sediments of the Gulf Coast Basin and the Mississippi Embayment. Rises in the buried basement rock surface are found in the vicinity of the Ouachita tectonic belt located approximately 190 mi north and northwest of the site and extending in a northwest-southeast direction through Arkansas and Mississippi.

2.5.2.2.1.1 Gulf Coast Basin Tectonic Province

The River Bend Station site is located within the Gulf Coast Basin tectonic province. Historical earthquake activity in this province has been infrequent and was typified by predominantly shallow focus earthquakes of low MM intensity and magnitude.

Typical geologic structures within the Gulf Coast Basin tectonic province consist of growth and slump faults which trend for considerable distances subparallel to the regional strike. The growth and slump faults of southern Louisiana are described in detail in Section 2.5.1.1.5.3.2. The Baton Rouge and Scotlandville-Denham Springs Faults are active, as evidenced by measurements of movement across the Baton Rouge Fault and cracking of buildings straddling the Scotlandville-Denham Springs Fault. The conclusion that these faults are minor geologic structures and are not capable of generating strong earthquakes is based, in part, on the following:

1. The Baton Rouge and other growth and slump faults are contained entirely in the relatively yielding sedimentary sequence. They extend to a depth of about 20,000 ft, dying out as bedding plane slips in the sediments near that depth.

2. These faults are subsidence features which are the result of a concentration of differential settlement in the sedimentary sequence and have the characteristics of large landslides. The slump faults were active during the rapid sedimentation of the Pleistocene Epoch.
3. These faults have no similarity to the faults or other structures in the crystalline basement, which may generate large earthquakes.

4. These faults are neither derived from, nor do they indicate the existence of, any basement tectonic structures.

Microseismic data in regions of growth faulting has recently become available due to investigations in association with geopressured-geothermal energy wells in coastal Louisiana and Texas(91 ,93). These data are used "(1) to assess normal ambient regional seismicity characteristics prior to high-volume brine production, and (2) to evaluate the seismological impact of high-volume brine production and disposal from these geothermal wells."(91)

Data are available from Brazoria County, Texas, in conjunction with the Pleasant Bayou No. 2 well, approximately 270 miles west-southwest of River Bend Station, from Vermilion Parish, Louisiana, in conjunction with the Bayou Parcperdue well, approximately 63 miles southwest of River Bend Station(91), and from Cameron Parish, Louisiana, in conjunction with the Sweet Lake well, approximately 120 miles southwest of River Bend Station(93). Similar data are to be obtained in Cameron Parish in conjunction with the Gladys McCall well, approximately 117 miles southwest of River Bend Station and approximately 28 miles southeast of the Sweet Lake site.

Natural microearthquake activity at the Brazoria and Parcperdue sites is very low and the size (magnitude) of the events is very small. No events have been recorded with magnitude larger than 1.5(92). At Sweet Lake, all detected events are small in magnitude (probably less than magnitude 1.0)(93). The spatial distribution of events at Pleasant Bayou and Parcperdue show a strong correlation with known growth fault locations in the area. At Sweet Lake, however, no events occurred within the network.

Only the Pleasant Bayou and Sweet Lake wells have been flowed to date with the Sweet Lake well having produced the most fluid, over one million barrels between June 1981 and January 1982 with the major production occurring in the first half of the period. At Pleasant Bayou, small events occurred 30 to 60 days after shut-in and appeared to migrate outward and upward with time(91). At Sweet Lake, several microseismic events occurred in July 1981 during the early period of well production within about 25 kilometers of the seismic network. "Although a striking time coincidence between pumping activities and the detection of microseismic events within the area exists, there appears to be no correlation between them"(93).

The foregoing microseismic data strongly support the thesis previously advanced in the Waterford FSAR as well as other Gulf Coast SAR documents, namely, that subsurface adjustments along growth faults and elsewhere frequently occur; however, they do not result in strong ground motion. Instead, because of yielding character of the sedimentary mass, movements occur frequently with a minimum of seismicity. These recent data provide additional evidence for this conclusion.

The conclusion that the Baton Rouge Fault and the other growth and slump faults are not capable of generating strong earthquakes is further substantiated in Section 2.5.2.3.

2.5.2.2.1.2 Mississippi Embayment Tectonic Province

The Mississippi Embayment tectonic province is considered to be a distinct province based on differences in structure and geologic history when compared to the Gulf Coast Basin province. The principal fracture zones within the embayment are oriented in northwest-southeast and northeast-southwest directions. These orientations are aligned rather closely with similar fracture trends in pre-coastal rocks, suggesting that some fracture zones are related to deep-seated features, while others appear to be associated with strains affected by the stresses of the Paleozoic Ouachita deformation(1).

The Mississippi Embayment is located within a great landward convex arc of the Ouachita tectonic belt. According to Murray, it appears probable that the shape and form of the southern part were partly controlled by the structure and related stresses of this part of the tectonic belt(1). The absence of pre-Gulfian sediments in the northern part of the embayment indicates that subsidence and subsequent deposition of the major sequence of sediments did not commence in this northern part until the late Cretaceous Period. In addition, there are no post-Jacksonian Tertiary sediments known to be present in the Mississippi Embayment north of the Monroe Uplift. Thus, the subsidence appears to have ended in the embayment by the Oligocene Epoch, accompanied by the withdrawal of the Tertiary seas(1). In contrast, the Gulf Coast Basin province began to subside in the early Jurassic Period and is experiencing subsidence in the present time.

The Pascola Arch is a prominent tectonic feature of the Mississippi Embayment and trends in a northwest-southeast direction in southern Missouri, northeastern Arkansas, and northwestern Tennessee. The arch was uplifted in late Paleozoic time with some associated faulting and was subsequently eroded prior to the invasion by the Gulfian sea.

The southern extent of the Mississippi Embayment tectonic province corresponds to the South Arkansas and Pickens-Gilbertown Fault systems which trend northwest-southeast through southern Arkansas and central Mississippi along the Ouachita tectonic belt. The Ouachita tectonic belt comprises a major tectonic structure within the southern Mississippi Embayment and is a system of Paleozoic thrust faults and folds which extends beneath the embayment from the Ouachita Mountains of Arkansas to eastern Mississippi.

Significant faulting associated with the New Madrid Fault zone has been defined within the Mississippi Embayment. This fault zone trends southwest-northeast through the northern embayment area and may extend into the Wabash Valley Fault zone within the Central Stable region. The New Madrid Fault zone displaces the surficial sediments within the embayment and trends nearly parallel to the structural axis of the embayment. Recent geophysical techniques employed by the U.S. Geological Society have revealed important data on the New Madrid Fault zone which indicate that the basement rocks have been offset vertically with a displacement of as much as 900 m along a northeast-southwest direction and that movement within this fault zone is continuing(53).

2.5.2.3 Correlation of Earthquake Activity with Geologic Structures or Tectonic Provinces

2.5.2.3.1 Gulf Coast Basin Tectonic Province

The historical earthquake activity of the Gulf Coast Basin tectonic province within the 200-mi (322-km) radius of the River Bend site indicates infrequent occurrence of randomly scattered earthquakes for the period from 1812 to September 1978, except in one area. This exception is apparent on the epicenter map (Fig. 2.5-36) which shows where a group of at least 10 earthquakes occurred near the Texas-Louisiana border approximately 155 mi (250 km) west-northwest of the site. As discussed in Section 2.5.2.1.3, these earthquakes occurred from April 24, 1964 through August 16, 1964, in the vicinity of two reservoirs that were either being constructed or filled. The earthquake epicenters occurred just south of the Sabine Uplift between the Mount Enterprise Fault System of eastern Texas and the growth faults of the Bancroft Fault System. As mentioned previously, no earthquake activity has been recorded in the vicinity of these earthquakes since September 1964. No structural features which can be associated with this localized seismicity are known.

Several observations are of interest with regard to the seismic events in southern Louisiana. Although it is not known whether any of these minor shallow-focus earthquakes were associated with the growth and slump faults of southern Louisiana, two observations are of interest - one by Dr. C. O. Durham: "...fault displacements in the relatively unconsolidated sediments of the Gulf Coastal province occur gradually, imperceptibly, and without the release of energy capable of producing shock waves and vibrations(54).

Another observation by Rev. K. A. Maring, S. J. states: "...we record a great many relatively high frequency disturbances. I surmise that some of these at least owe their origin to minor dislocations occurring in our deep alluvial. I cannot be certain of that, because we have no instruments of high enough frequency and recorders fast enough to allow certain interpretation of these seismograms. Perhaps some oil company or prospecting company could give you better information concerning these events than I can. I hear the oil companies complaining about certain dislocations that have occurred in some of their drillholes. To make a definite study of these occurrences would require instruments and recorders of higher frequency and speed than are available to me (Appendix 2I)(55)."

The preceding two observations are not contradictory, since Dr. Durham is speaking of perceptible motion and Rev. Maring is referring to the motion detected on highly-sensitive instruments that are capable of measuring motions far below the threshold of human perceptibility.

Some of the seismic events in southern Louisiana are considered to be due to growth or slump faults. It is at least debateable that they are associated with basement tectonic features because of their limited area of perceptibility and their low intensities. Such minor energy releases are all that might be expected from these landslide-like phenomena in the sediments above the basement rock. In support of this is a statement by Eargle and Herbst, after the United States AEC Salmon event, that the explosion produced no characteristics of excessive strain; whereas, such releases have customarily resulted from explosions at the Nevada Test Site(9).

2.5.2.3.2 Mississippi Embayment Tectonic Province

The seismicity of the Mississippi Embayment is shown on Fig. 2.5-36, and a listing of these earthquakes is given in Tables 2.5-3 through 2.5-5. The predominance of earthquake activity in the northern end of the embayment diminishes in frequency and size of earthquakes toward the south and ends near Memphis, Tennessee. There is a general northeasterly trend of epicenters in the northern end of the embayment which intersects an east-southeast trend in an area where the series of large New Madrid earthquakes occurred in 1811 and 1812.

Street, et al, have determined fault plane solutions for many earthquakes in the vicinity of the Mississippi Embayment(56). Focal mechanism solutions suggest normal, thrust, and strike-slip faulting in two main groups: 1) the normal faulting shows a near-vertical compressive stress axis with nodal planes oriented essentially north-south in the embayment south of New Madrid and oriented east-west in the region northwest of New Madrid; and 2) a less-defined group of reverse and strike-slip motions with a nodal plane orientation suggesting a near-horizontal east-west compressive stress north of New Madrid.

There is definitely a spatial relationship between historic earthquakes in the New Madrid area and the New Madrid fault zone. Thus, these large earthquakes can be associated with geologic structures which are considered capable along the New Madrid Fault zone. As discussed in Section 2.5.2.2.1.2, this fault zone has been defined to extend southwest along a vertical offset of the basement rocks. Based on these new investigations by the Office of Earthquake Studies of the USGS, the maximum southwestern extent of the basement offset is approximately 100 km (62 mi) southwest of Caruthersville, Missouri(53). This would place it about 50 km (31 mi) northwest of Memphis, Tennessee, along a line toward Jonesboro, Arkansas.

The southern terminus of the large earthquakes in the Mississippi Embayment is defined by a line between Memphis, Tennessee, and Jonesboro, Arkansas (310 mi north of the River Bend Station site), on the southern flank of the Pascola arch. In the vicinity of Memphis, seismic "Vibroseis" information(15) confirms the absence of secondary faulting since Paleozoic time and large ground disturbances which were associated with the New Madrid earthquakes to the north. Only scattered earthquake activity has occurred southward from Memphis toward the buried Ouachita tectonic belt.

Ouachita Tectonic Belt

Infrequent earthquakes of low to moderate MM Intensity appear to be associated with the Ouachita tectonic belt in the southern part of the Mississippi Embayment. The epicentral locations of historical earthquakes in this tectonic belt are observed to align in a northwest-southeast trend, which is approximately at a right angle to the New Madrid seismic zone.

The largest historical earthquake in the Ouachita tectonic belt occurred on December 17, 1931 near Greenville, Mississippi, approximately 195 mi north-northeast of the River Bend Station site, and reportedly had an epicentral MM Intensity of VI to VII. This earthquake has been reanalyzed by Dr. Followill, and the epicentral location was revised from the previously reported location(50). Accordingly, this earthquake is considered to be the maximum event within the Mississippi Embayment, except for the New Madrid seismic zone and, therefore, would be placed at the closest boundary of the province to the site, which is a distance of about 145 mi (233 km).

2.5.2.3.3 Other Important Earthquakes

Additional historical earthquakes which were reportedly located within the Gulf Coast Basin province were evaluated due to their possible effect upon the River Bend Station site. One such earthquake occurred on October 22, 1882, with epicentral MM Intensity VII and magnitude (m) 5.5 at a location approximately 550 km (342 mi) northwest of the site. A study of the published report of the felt area for this earthquake was made to resolve the uncertainty of the epicentral locations as given by the NOAA Historical Earthquake Data File(45).

The published felt area included northeast Texas, eastern Oklahoma, western Arkansas, eastern Kansas, and southern Missouri. In addition, damage was reported in Sherman, Texas, and shaking was reported in Fort Smith, Arkansas. After defining the felt area on a map, the most probable reported epicentral location, from the source data, appears to be located in eastern Oklahoma within the Central Stable region just north of the Ouachita Mountains. Therefore, this earthquake has no effect on the River Bend Station site seismic design.

Another earthquake which was evaluated occurred on January 9, 1891, in the Gulf Coast Basin province near Rusk, Texas, approximately 383 km (238 mi) west-northwest of the River Bend Station site, with an epicentral MM Intensity VII and Magnitude 3.8. No structural feature is known in the earthquake area that might suggest an association of the earthquake to a local or regional feature. It is noteworthy that the measure of energy (m = 3.8) was less than the energy released by an average earthquake of MM Intensity VI.

Significantly, it was concluded in a previous licensing review that the Rusk earthquake of January 9, 1891 was much smaller than a typical earthquake of epicentral MM Intensity VI, because of its small felt area(57). Therefore, since the seismic design earthquake for the River Bend Station site is based on an earthquake of MM Intensity VI occurring at the site, the Rusk earthquake has no significance to the seismic design.

2.5.2.4 Maximum Earthquake Potential

2.5.2.4.1 Mississippi Embayment Tectonic Province

The maximum earthquakes which have occurred within the New Madrid seismic zone of the Mississippi Embayment tectonic province consist of the New Madrid events of MM Intensity XI and XII which occurred in 1811 and 1812. The epicenters of these earthquakes ranged from 370 mi (596 km) to 409 mi (658 km) from the River Bend Station site.

The maximum estimated historical intensity felt at the site is MM Intensity IV to V, which resulted from these New Madrid earthquakes of 1811 and 1812. This value is based on observations of MM Intensity V to VI at Natchez, Mississippi, MM Intensity IV to V at New Orleans, and estimations from attenuation data.

Where no description of an earthquake is available from local records, the resulting intensity at a site from a distant earthquake can be determined from the attenuation of the earthquake intensity with distance. The intensity-attenuation relation with distance for the maximum earthquake in the Mississippi Valley area is based on the New Madrid series of earthquakes of 1811 and 1812 and is included as Fig. 2.5-43. The attenuation curve for the New Madrid earthquakes along the Mississippi River Valley was developed by evaluating available damage descriptions and felt reports. The southern limit of major ground disturbances in the vicinity of the latitude of Memphis, Tennessee, is evaluated as MM Intensity X(20). The southern limit of the caving of riverbanks near the confluence of the Mississippi and Arkansas Rivers is evaluated as MM Intensity VII(20). The reports of the earthquake effects at Natchez and New Orleans have been previously evaluated as MM Intensity V to VI and MM Intensity IV to V, respectively.

The preceding intensity values and the attenuation curve developed for these earthquakes, as well as attenuation curves developed for several other earthquakes of lower intensity, are shown in Fig. 2.5-43. Based on this attenuation curve, the New Madrid earthquakes of 1811 and 1812, which occurred approximately 400 mi north of the site, with estimated epicentral MM Intensities XI to XII, would have resulted in an MM Intensity V at the site.

This compares closely with Nuttli's isoseismal map of the December 16, 1811 earthquake, which is included as Fig. 2.5-41(39). However, estimates of Nuttli's MM intensities felt at Vicksburg, Fort Pickering (Memphis), Natchez, and New Orleans have been reevaluated from reported damage(39). In addition, several locations on Nuttli's tabulation were relocated as follows: Washington, Louisiana, should probably be Washington, Mississippi; Fort St. Stephens and Fort Stoddart, Louisiana, should probably both be in Alabama(39). These changes alter the isoseismals in some cases.

As required in Appendix A of 10CFR100, the maximum earthquake of the New Madrid seismic zone must be placed at the point of closest approach of this zone to the site. Accordingly, this point is considered to be near Memphis, Tennessee, approximately 310 mi (499 km) north of the site, based on the southern extent of known faulting and greatest earthquake activity as discussed in Section 2.5.2.3. An MM Intensity XI to XII earthquake occurring at this southern limit, approximately 310 mi north of the site, would result in an MM Intensity VI at the site, using the attenuation curves for the New Madrid earthquakes of 1811 and 1812 as shown in Fig. 2.5-43. Thus, the felt intensity at the site would be the same intensity as the MM Intensity VI which results from placing the Donaldsonville earthquake at the River Bend Station site.

The maximum historical earthquake associated with the Mississippi Embayment tectonic province, outside of the New Madrid seismic zone, is considered to be the December 17, 1931 earthquake in Northwestern Mississippi with epicentral MM Intensity VI-VII. Since the closest approach of this province to the site is 145 mi (233 km), this MM Intensity VI-VII earthquake is considered to have occurred 145 mi (233 km) from the River Bend Station site.

Based on attenuation-intensity relationships for the Mississippi Valley as shown in Fig. 2.5-43 an epicentral MM Intensity VI-VII earthquake would be felt as MM Intensity IV at a site located 145 mi (233 km) distant. Thus, the MM Intensity IV considered to have been felt at the River Bend Station site would be less intensity than the epicentral MM Intensity VI Donaldsonville earthquake now moved to the site and, therefore, would have no effect on the seismic design.

2.5.2.4.2 Gulf Coast Basin Tectonic Province

The largest historical earthquake known to have occurred within the Gulf Coast Basin tectonic province not associated with a geologic structure or otherwise reevaluated as previously discussed was the Donaldsonville, Louisiana earthquake of epicentral MM Intensity VI and magnitude (m) 4.7, which occurred on October 19, 1930. The earthquake epicenter was located 50 mi (80 km) southeast of the River Bend Station site. Based on the isoseismal contour of the felt area shown in Fig. 2.5-38, this earthquake was felt at the site as an estimated MM Intensity IV.

In compliance with 10CFR100, Appendix A, Seismic and Geologic Siting Criteria for Nuclear Power Plants, the maximum intensity earthquake within the tectonic province of the site must be considered to occur at the site. Therefore, this maximum intensity earthquake is the MM Intensity VI Donaldsonville earthquake placed at the River Bend Station site.

2.5.2.4.3 Resultant Ground Motion at the Site

2.5.2.4.3.1 New Madrid Earthquakes

The earthquake intensity attenuation relationship presented in Fig. 2.5-43 has been derived empirically. A more theoretical approach in an effort to determine the effect of a repeat of the 1811-1812 New Madrid earthquake sequence has been made by Nuttli(39,58). Theoretical attenuation curves were fitted to the arrivals at eastern North American seismograph stations from Upper Mississippi Valley earthquakes in the magnitude (mb) 4.7 to 5.5 range.

Using these empirical data for an estimated New Madrid earthquake of magnitude (mb) 7.2, Nuttli's Table 7 would result in the following ground motion(58):

MAXIMUM HORIZONTAL RESULTANT GROUND MOTION
(Eastern North America)

	3-Sec Period			1-Sec Period			0.3-Sec Period		
Dist: (mi)	Vel. (in/ sec)	Displ. (in)	Accel. (g)	Vel. (in/ (sec)	Displ. (in)	Accel. (g)	Vel. (in/ (sec)	Displ. (in)	Accel. (g)
310	1.68	0.80	0.009(1) 0.014(2)	1.0	0.16	0.016(1) 0.024(2)	0.067	0.003	0.004(1) 0.006(2)
400	1.02	0.48	0.006(1) 0.009(2)	0.84	0.13	0.014(1) 0.021(2)	0.029	0.001	0.002(1) 0.003(2)

---

(1) Hard rock site

(2) Alluvial site

These maximum horizontal resultant ground motions were derived from Nuttli Table 7, which shows estimates of the vertical component of Rayleigh-wave motion for hard rock sites and does not take account of body-wave motion(39). Factors of 2 and the square root of 2 were applied to convert from vertical to horizontal motion and to obtain the horizontal resultant motion, respectively. Nuttli has reported that unconsolidated sediments can increase the acceleration by a factor of 1 to 1.5; hence, a factor of 1.5 was applied to the hard rock site acceleration (g) to convert to an alluvial site(59). Conversion from metric to English units was made.

As a check on the preceding results, Nuttli extrapolated the 3-sec period wave data from the November 9, 1968, magnitude (m) 5.5 earthquake to the data from the December 16, 1811, New Madrid earthquake by keeping a constant particle velocity versus MM intensity relationship as shown in Nuttli, Fig. 11(39). Two separate curves were needed to fit the observed intensity data, the north-south curve indicating a greater attenuation than the curve for the eastern data. These curves fitting the 1811 data result in the following values:

MAXIMUM HORIZONTAL RESULTANT GROUND MOTION
(New Madrid Earthquakes)

	North-South Particle			East Particle		
Dist. (mi)	Velocity (in/sec)	Displ. (in)	Accel. (g)	Velocity (in/sec)	Displ. (in)	Accel. (g)
310	0.84	0.40	0.005	1.10	0.53	0.006
400	0.40	0.19	0.002	0.72	0.34	0.004

These ground motion values were derived from Nuttli Fig. 11, which shows A/T versus epicentral distance in degrees of the vertical component of Rayleigh-wave motion for the earthquakes of December 16, 1811, and November 9, 1968, where A/T is the amplitude (A) of the vertical ground motion in microns over the period (T) in seconds(39). The north-south and east curves at distances of 4.5 and 5.8 degrees, respectively (310 and 400 mi, respectively), were used to find the A/T value for the 3-second period. This value was converted to displacement, particle velocity, and acceleration in English units where desired. Factors of 2 and the square root of 2 were applied to convert from vertical to horizontal motion and to determine the resultant horizontal motion, respectively.

Based on these studies, the largest resultant horizontal ground acceleration at a 310 mi (499 km) distance from a New Madrid earthquake of magnitude (m) 7.2 is 0.014 g for an alluvial site, if we consider the 3-sec period waves, which historically had the maximum particle velocities. This is due to surface wave motion which will have a duration of approximately 2 minutes.

These conclusions of low ground motion at the site are further supported using recently published relationships for the central United States by Nuttli and Herrmann (100) which, for a New Madrid sized event occurring 310 mi (499 km) from the site, establish the resultant peak horizontal ground acceleration to be equal to 0.01 g.

2.5.2.4.3.2 Donaldsonville Earthquake

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The earthquake which occurred near Donaldsonville, Louisiana, on October 19, 1930 was felt by many in the Baton Rouge area as a brief undulating or rolling motion which shook walls, lights, and windows (Baton Rouge Morning Advocate, October 20, 1930). As shown on the isoseismal map for this earthquake (Fig. 2.5-38), the earthquake would have been felt at the site with an intensity equal to or less than MM Intensity IV.

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Significantly, the soil materials in the immediate vicinity of Donaldsonville consist of Holocene flood plain deposits compared to the Pleistocene deposits found at the plant site, and this comparison is shown in Fig. 2.5-44(31). The foundation materials at the site are considered to be better founding materials than most areas that felt the Donaldsonville earthquake and certainly better than the Holocene floodplain deposits in the vicinity of Donaldsonville. Therefore, the intensity felt at Donaldsonville due to the Donaldsonville event would be more highly amplified than a similar event occurring adjacent to the site. It is, therefore, conservative to apply a Donaldsonville MM Intensity VI earthquake adjacent to the site to determine the acceleration at the site.

As required, the Donaldsonville earthquake is considered to occur at the River Bend Station site with epicentral MM Intensity VI. Since the underlying soil conditions at the site are average to good, as evidenced by the average seismic shear wave velocity values of 1,000 ft/sec to 1,220 ft/sec (increase with depth) at the site, as discussed in Section 2.5.4, the resulting ground motion is estimated to be 0.07 g using Neumann's maximum curve for soil foundation conditions, as shown in Fig. 2.5-45(60).

Coulter, et al, have published acceleration-intensity relationships for different geologic conditions, as shown in Fig. 2.5-46(61). A broad range of possible acceleration for any given intensity is indicated, depending on foundation conditions. The acceleration is increased with decreasing quality of foundation conditions to include amplification effects. They assume "that the earthquake intensities and acceleration determined for the site" (of a felt report) "were recorded on, or calculated to have occurred on competent foundation materials such as bedrock or other well-consolidated materials(61)." There are no felt reports on bedrock in southern Louisiana due to the great depth to bedrock.

If the acceleration (g) for an MM Intensity VI event is taken from the Coulter, et al, relationship, taking the amplification in the band of "average foundation conditions," the acceleration is in the range of 0.055 g to 0.085 g, which they define as being provisionally valid for short epicentral distances(61).

Murphy and O'Brien have recently published an analysis of acceleration-intensity correlations which used a world-wide data base and a variety of statistical methods(62). This correlation equation relating MM Intensity (I_{MM}) to peak horizontal ground acceleration (A_H) is:

$$\log A \ = 0.25\ I_{MM} + 0.25$$

for A_H given in cm/sec^2.

For an MM Intensity VI earthquake, this equation results in an average horizontal component peak acceleration of 56 cm/sec-, or 0.06 g. This compares closely to the acceleration value of 0.07 g determined by using Newmann's maximum curve for soil foundation conditions and the Coulter, et al, values as determined previously in this section(60 ,61). Significantly, approximately 75 percent of the Murphy and O'Brien data was recorded at sites located on alluvium(62).

2.5.2.5 Seismic Wave Transmission Characteristic of the Site

Investigations of the compressional and shear wave velocities and material properties, as well as calculations of pertinent dynamic moduli, have been made for subsurface materials at the plant site. The results of these studies and discussions of the methods used to determine these properties are presented in Section 2.5.4.

The effects of near-surface materials on ground motion at the site, resulting from the maximum potential earthquakes of the Mississippi Embayment and the Donaldsonville event moved to the site, can be identified to some extent from historic earthquake data within the Mississippi Valley. The ground motion resulting at the site from a large earthquake in the New Madrid seismic zone would result, essentially, from the low-frequency (less than 1 Hz) components of surface waves which have nearly sinusoidal motion with a duration of several minutes according to Nuttli(35). This is due to the dispersion of surface waves at increased epicentral distances of a few hundred km or more.

Maximum potential earthquake ground motion at the site from an MM Intensity VI event placed adjacent to the site has been estimated to be 0.07 g peak horizontal acceleration as shown in Section 2.5.2.4. This acceleration is essentially due to body-wave motion, associated with high frequencies of about several cycles per second or more and should be of short duration, on the order of several seconds.

2.5.2.6 Safe Shutdown Earthquake (SSE)

The maximum horizontal ground acceleration value for the SSE of MM Intensity VI at the foundations of the River Bend Station is 0.07 g, as determined in Section 2.5.2.4. This acceleration is essentially due to body-wave motion, associated with high frequencies of about several cycles per second or more and should be of short duration, on the order of several seconds. The maximum horizontal ground acceleration value for the SSE is assumed to be 0.10 g for design purposes, which is the minimum value as established by the NRC (10CFR100). The smoothed response spectra for the SSE are presented in Section 3.7.1.1. The time history of the horizontal and vertical synthetic earthquake as used in the analysis of structures and equipment are shown in Fig. 3.7A-5 and 3.7A-6, and Fig. 3.7A-7, respectively. Comparisons of design response spectra for the horizontal SSE and spectra derived from the horizontal synthetic earthquake for 0.5, 1, 2, 5, 7, and 10 percent damping are shown in Fig. 3.7A-8 through 3.7A-19. Comparisons of design response spectra for the vertical SSE and spectra derived from the vertical synthetic earthquake for 0.5, 1, 2, 5, 7, and 10 percent damping are shown in Fig. 3.7A-20 through 3.7A-25.

2.5.2.7 Operating Basis Earthquake (OBE)

The operating basis earthquake (OBE) required by Appendix A to 10CFR100, Seismic and Geologic Siting Criteria for Nuclear Power Plants, for River Bend Station is selected to be one-half the design safe shutdown earthquake (1/2 SSE), or 0.05 g. For review purposes, the terms OBE and 1/2 SSE are synonymous.

2.5.2.7.1 Probability of Exceeding the OBE

An engineering seismic risk analysis was performed using probabilistic techniques in order to quantify the level of risk of the site experiencing a horizontal ground acceleration of more than 0.05 g during an assumed 40 yr life of the River Bend Station. The results of this analysis are presented in Table 2.5-7. The probability of exceeding the specified OBE of 0.05 g at the site for the plant life is calculated to be 18.3 percent using an upper-bound random earthquake of MM Intensity VII specified within an area of 310 mi radius from the site and an upper-bound random earthquake of MM Intensity XII for the New Madrid zone, as discussed in Section 2.5.2.7.1.2.

Reliability of the seismicity data used in the probabilistic evaluation is discussed in Section 2.5.2.1.2. Uncertainty in the analysis is considered by appending an error term to the attenuation relationship described in Section 2.5.2.7.1.1. Conservatisms incorporated into the analyses are expected to compensate for any additional uncertainties.

The conservatism of these results is supported by probabilistic estimates of maximum accelerations published by Algermissen et al(98). Their preliminary map shows the site to be located in an area where a 0.04 g horizontal acceleration has a 90 percent probability of not being exceeded in 50 yrs.

2.5.2.7.1.1 Analytical Procedure for Seismic Risk

The procedure used for investigating the seismic risk at the River Bend site was developed by Cornell(63), Cornell and Merz(64), and Merz and Cornell(65). The computer program used was developed by McGuire(66). A brief summary of the procedure is included in the following discussion.

The geographical region surrounding the site was divided into three independent seismic zones. One zone was considered to include the area within a 200-mi radius of the site and a second seismic zone consisted of the area within 200 to 310 mi (322 to 499 km) of the site. The third zone specified the area encompassing the most active earthquake activity near New Madrid, Missouri.

Next, estimates of the annual rate of occurrence of earthquakes within each of these three zones were made using all recorded events with epicentral MM intensities equal to or greater than the chosen minimum value which was considered to be MM Intensity IV for this analysis. Then, the decay of the annual rate of occurrence of the earthquakes, with increasing epicentral MM intensity levels, was described by specifying empirical constants, and , in the recurrence equation:

$$\ln N = \alpha - \beta I_o$$

where:

N = Number of earthquakes with epicentral MM intensities equal to or greater than I

I_o = Epicentral MM intensity

Also, an upper and lower bound to the epicentral MM intensities that could occur within the zones must be prescribed. Thus, the annual probability of an earthquake with a given epicentral MM intensity and with its epicenter within the zone can be computed.

The attentuation of earthquake ground motion over the distance from the epicenter to the site must also be considered using the equation:

$$I = C_1+C_2I_0 +C_2\ln(R+R_0)+C_4(R+R_0)$$

where:

I = MM intensity at the site

R = Distance from the epicenter to the site

C_1,C_2,C_2,C_4,R_0 = Empirical constants

R can be in any units provided these constants are chosen accordingly. Due to uncertainty in attenuation relationships an error term is appended to the attenuation relation and is expressed as the standard deviation of the error, σ_I.

Three attenuation relationships were used as derived by Brazee(67), Gupta and Nuttli(68), and Howell and Schultz(69). The attenuation relationship was combined with the recurrence relation for each zone to give the annual probability of observing an earthquake of a given MM intensity at the site due to seismic activity in that zone.

The computer program(66) evaluated the contribution of each zone to the annual seismic risk at the site and computed their total effect. The output included not only the composite probability of observing a range of MM intensities at the site but also the contribution of each zone to that overall value. The historical seismicity of the site region indicates that the highest MM intensity for earthquakes not associated with specific structures has been MM Intensity VII so the upper bound for the zones within 310 mi (499 km) was placed at MM Intensity VII. However, in order to account for the statistical possibility of larger epicentral MM intensities occurring in the New Madrid zone, calculations were made for upper bound MM Intensities of XII because of the high intensities experienced in that zone.

2.5.2.7.1.2 Probability and Return Period

The results of the calculations using the three attenuation laws are summarized in Table 2.5-7. An average value of seismic risk for different site intensities was calculated. The results using attenuation laws by Gupta and Nuttli and Howell and Shultz are in good agreement. The analysis using Brazee attenuation laws yielded results much higher than the others. The original Brazee paper presented curves that were not describable as a single equation of the prescribed form for use in the analysis. Derivation of such a single equation to approximate the Brazee relationship is believed to have caused a distortion in the results, hence the calculation using the Brazee attenuation is considered less appropriate. However, since the results give higher probabilities, the Brazee results have been included in the average probability for conservatism. These calculations were made using a random earthquake of maximum MM Intensity VII within a radius of 310 mi (499 km) of the site and a random earthquake of maximum MM Intensity XII for the New Madrid zone.

Christian et al(70), have stated that the probability (P) of exceeding the OBE for a particular nuclear plant site during the life of the power plant is determined by:

$$P = 1-\exp[-t/T]$$

where:

t = Life of the power plant in years

T = Mean return period in years for the earthquake of interest

Based on this equation, the probability of exceeding the OBE at the River Bend Station site for the 40-yr plant operating life is 18.3 percent.

2.5.3 Surface Faulting

2.5.3.1 Geologic Conditions of the Site

The geologic history, lithology, stratigraphy, and structural geology of the site and region surrounding the site are presented in Sections 2.5.1.1.3, 2.5.1.1.4, 2.5.1.1.5, and 2.5.1.2. Regional and site geologic maps are presented as Fig. 2.5-3 and 2.5-20, respectively. Geologic profiles illustrating the regional and site structure are included as Fig. 2.5-7 and 2.5-25, respectively.

2.5.3.2 Evidence of Fault Offset

Geologic investigations were performed to determine evidence of faulting and fault offset at or near the ground surface at or near the site. These investigations included photogeologic interpretation of aerial photographs, high altitude imagery, and index mosaics for lineaments and drainage features, and detailed geologic mapping of the plant excavation. These evaluations are discussed in Sections 2.5.1.2.3 and 2.5.1.2.9, respectively.

There are no faults at or near the ground surface in the sedimentary sequence within 5 mi of the site. The nearest surface fault to the site is the east-west trending Zachary Fault. Its surface fault trace ends 8.0 mi southeast of the site. A westward projection of this fault would pass 5.5 mi south of the site. The known faults within the near-site area are considered to be growth and slump faults. Slump faults are interpreted, principally, to be a reactivation of old growth faults.

The slump faults had their maximum movement during the Pleistocene Epoch when there was a period of relatively rapid accumulation of sediment load over a broad area of the Coastal Plain. The slump faults allowed a concentration of relative deformation along the inner margin of this area of deposition resulting from the settlement associated with this loading. The possibility that one or more of the slump faults occurred as a new fault plane generated late during this period of rapid sediment loading has not been totally discounted. However, it is more likely that they resulted from the reactivation of preexisting planes of weakness along old growth faults.

The 1982 seismic reflection survey indicates the presence of two deep structures which may be interpreted as ancient growth faults. There is no indication of offsets within the sediments above a depth of approximately 13,500 ft (i.e., above the top of the Upper Cretaceous). As a result, it appears that the most recent movement along either structure is on the order of 60 million years old.

No such rapid sedimentation and deformation is occurring in the present near-site geologic environment. Furthermore, there has been no movement on the northernmost fault of these existing slump faults at least since the last interglacial stage, more than 70,000 yr ago. This indicates that there are greatly reduced concentrations of deformation which need to be relieved. Such relief would probably result in creep along preexisting planes of weakness and would not generate a new failure plane through the stronger intact sediments. Therefore, there is no reason to expect the development of a slump fault in the plant area. Furthermore, the seismic reflection survey profiles indicate that there are no preexisting slump faults in the plant area.

Based on the study of existing conditions and the understanding of the origin and occurrence of slump and growth faults in the sedimentary sequence within the near-site area, it is concluded that there is no hazard of surface faulting at the River Bend Station site.

2.5.3.3 Earthquakes Associated with Capable Faults

The study of historical earthquakes in the site region indicates that there are no reported earthquakes that can be reasonably associated with faults, any part of which is within 5 mi of the River Bend Station site. An earthquake epicentral map showing tectonic and structural features of the site region is presented as Fig. 2.5-36.

2.5.3.4 Investigation of Capable Faults

No capable faults are known to exist within 5 mi of the site, based on the geological investigations at the River Bend Station site and near-site area.

2.5.3.5 Correlation of Epicenters with Capable Faults

There are no known capable faults in the site and near-site area. The nearest area of known faulting associated with high historical seismic activity is considered to be the New Madrid fault zone, located over 300 mi north of the site.

In order to investigate the southwestward extent of the New Madrid fault zone, a seismic reflection survey was conducted in portions of the Mississippi embayment between Helena, Arkansas, and Memphis, Tennessee(15). These data indicate that the Cretaceous and the top of the Paleozoic strata are not offset by faults south and west of Memphis, thereby limiting the extent of the New Madrid fault zone in a southwest direction.

2.5.3.6 Description of Capable Faults

Investigations have determined that no capable faults exist at the site.

2.5.3.7 Zone Requiring Detailed Faulting Investigation

As defined in 10CFR100, Appendix A, no zone has been identified requiring detailed faulting investigations at the site.

2.5.3.8 Results of Faulting Investigation

Investigations have determined that no capable faults exist at the River Bend Station site.

2.5.4 Stability of Subsurface Materials

2.5.4.1 Geologic Features

2.5.4.1.1 Areas of Actual or Potential Surface or Subsurface Subsidence

Natural Features

There are no natural features (e.g., tectonic depressions or cavernous or karstic terrain) which could cause subsidence at this site (Section 2.5.1.2.6).

Man's Activities

Oil and gas production are common in southern Louisiana. Section 2.5.1.1.6 discusses this subject for the site area. There is no mineral extraction from the area surrounding the site.

Groundwater withdrawals in the area surrounding the site are described in Section 2.4.13.

Subsidence of ground resulting from groundwater withdrawal in the Baton Rouge area has been observed and was identified in reports by Davis and Rollo(71), and Wintz, et al(72). These papers present the results of the 1964-65 National Geodetic Survey (NGS) level survey in the Baton Rouge area and compare them with earlier survey data by the U.S. Coast and Geodetic Survey (USCGS) and the Army Corps of Engineers. Their findings identified an area of subsidence centered in the industrial section of Baton Rouge. The subsidence was attributed to groundwater withdrawal because a comparison of plots of potentiometric surfaces and subsidence agreed in shape and general extent. The Slaughter area was taken to be stable and not affected by Baton Rouge pumping in these reports. Maximum subsidence attributed to groundwater withdrawals was measured to be on the order of 0.9 ft (about 11 in) at the center of withdrawal (i.e., the Baton Rouge water supply wells near the Mississippi River west of the city) between 1938 and 1964. A releveling survey was conducted by the NGS in 1976, and the results of that survey were presented in a paper by Smith and Kazmann(73). When compared to earlier data, the 1976 information showed continued subsidence at Baton Rouge as expected.

Because the previously referenced papers contain slightly varying assumptions, simplifications, and datum points, the distant subsidence effect from Baton Rouge pumping is unclear; therefore, all available data have been reanalyzed on a common basis and presented in the Report on Land Subsidence Centered in Baton Rouge, Louisiana(74). Fig. 2.5-47 through 2.5-49 are taken from this report, which developed profiles of subsidence vs. distance due to groundwater withdrawal in Baton Rouge. Differential regional subsidence was subtracted from the data. Fig. 2.5-47, which presents subsidence along a north-south profile, indicates the northern limit of subsidence to be in the area of Slaughter, 13 mi east of the River Bend Station site. This limit has been constant since 1935. Fig. 2.5-48 presents subsidence along a northwest-south profile following the Mississippi River. This profile defines the limit of subsidence to be near Torras, and this point has been constant since 1935. There appears to be no measurable increase in the areal extent of subsidence resulting from pumping in Baton Rouge since 1935. Total differential subsidence is measured at the pumping center in Baton Rouge to be 1.14 ft since 1935.

Fig. 2.5-49 presents subsidence contours developed from the profiles of Fig. 2.5-47 and 2.5-48. The contours projected to the site suggest subsidence on the order of 0.05 ft in the 41 yr between 1935 and 1976. Not only is this amount of subsidence along the northwest-south profile small, it is considered very conservative in relation to subsidence at River Bend Station for the following reasons:

1. The river profile is located on Quaternary alluvium sediments, of late Pleistocene and Recent epochs, deposited in an entrenched valley which varies in elevation from -100 ft msl to -250 ft msl in the latitude of River Bend Station; whereas, River Bend Station and the Slaughter end of the north-south profile are immediately underlain by older Quaternary and Tertiary sediments that have been subjected to preconsolidation stresses during periods of glacial maxima that the Quaternary alluvium has not experienced.

2. Most of the benchmarks are along the Mississippi River levee which is causing compaction of the alluvium due to local loading.

3. Benchmarks in proximity to the river experience fluctuations in elevation in connection with river-level fluctuations which give rise to increased uncertainties in the determination of elevation changes for a benchmark between leveling epochs, and to increased uncertainties in the determination of relative elevation differences between benchmarks within a particular leveling epoch.

The north-south profile is considered more representative of site conditions and indicates no subsidence at the site due to groundwater pumping in Baton Rouge.

Differential rather than total movements are of primary concern as they relate to building connections. In order to develop an estimate of the extreme upper bound of differential subsidence over the plant area, a mathematical evaluation was performed on the survey data in the north-south direction for 1965-1976. The procedure maximized the possible error along the survey line, extrapolated the data for a 40-yr plant life, and determined the maximum slope for the profile, using six benchmarks at the end of the survey line (at Slaughter). The analysis results show this extreme upper bound slope of subsidence to be 1.36 x 10-- or 0.0136 ft per 100 ft. This extreme upper bound of differential subsidence at the River Bend Station site area is very small as it relates to differential movements across the plant and does not affect the integrity of the structures or connections between structures.

Measurable subsidence resulting from groundwater use in Pointe Coupee and West Feliciana Parishes is not anticipated. Their groundwater usage when compared to Baton Rouge is very small (approximately 2 percent for the years 1976, 77, 78) and projected groundwater usage for West Feliciana Parish is less than 2.5 percent of Baton Rouge pumpage through 1990 (Section 2.4.13.2). Additionally, Parish groundwater usage is well dispersed throughout the parish so that there is no distinct pumping center. Therefore, the absence of both heavy pumping and concentrated pumping precludes subsidence of measurable magnitudes.

Any subsidence resulting from groundwater withdrawal would be generally uniform over a large area since the site area is relatively distant from the closest source of significant withdrawal. Therefore, any subsidence would be extremely small, would be generally uniform across the site area, and would not cause differential settlements between structures; nor would it affect the stability, operation, or safety of the plant.

Based on the Report on Land Subsidence, the results of which have been summarized herein, the licensing commitment requiring annual reports of groundwater usage is no longer considered necessary to monitor subsidence effects at River Bend Station.

Regional Warping

Regional warping is recognized as being associated with development of the Gulf Coast geosyncline and the related development of slump and growth faults and salt structures within the sedimentary sequence. However, the detailed study of the regional and site geology (Section 2.5.1) has established that the site area is completely free from growth and slump faults and salt structures. There are no regional warping-related problems in the site area.

2.5.4.1.2 Deformation Zones

There are no deformation zones in the site area, such as faults, shears, joints, fractures, or folds, nor any combination of these features (Section 2.5.1.2.8).

2.5.4.1.3 Zones of Alteration or Structural Weakness

There are no zones of alteration or structural weakness in the site area (Section 2.5.1.2.8).

2.5.4.1.4 Residual Stresses in Bedrock

There is no bedrock within the excavation or zone of influence of the foundations for the power plant (Section 2.5.1.2.8).

2.5.4.1.5 Soil Stability

Those soils of doubtful SSE stability were excavated from the area of influence of the foundations of seismic Category I structures and replaced with compacted granular fill (Sections 2.5.1.2.8, 2.5.4.2, 2.5.4.5, and 2.5.4.8).

2.5.4.2 Properties of Subsurface Materials

The various soil deposits at the site are described in the detailed site geology in Section 2.5.1.2. The soils fall into five stratigraphic units with respect to their engineering properties. A detailed description of each unit is given in Section 2.5.1.2.2. The results of the field and laboratory testing on each of these stratigraphic units are presented herein in summary form and discussed in detail. The laboratory and field data are presented in Appendices 2H, 2J, 2K, and 2L.

2.5.4.2.1 Loess

The loessal blanket which covers much of the site area was removed from the foundation area of all Seismic Category I structures. Nevertheless, this material was used in the overall site development as non-structural fill and therefore limited laboratory testing was performed. Grain size curves for each of the samples in borings 112, 114, and 115 are given in Fig. 2.5-50 through 2.5-52. These data indicate the soil to be a silty clay. Atterberg limits performed on other portions of these same samples are summarized in Table 2.5-8. The data indicate the soil to be of medium plasticity and are consistent with what would be expected for a thin weathered loessal blanket.

2.5.4.2.2 Port Hickey Top-Stratum Silts and Clays

The Port Hickey top-stratum silts and clays were removed from beneath all of the major structures of the power plant. Because this material was used as random fill in the site development, some laboratory testing was performed. Grain size curves for each of the samples in borings 112, 114, and 115 are presented in Fig. 2.5-50 through 2.5-52. The data show this stratified soil to vary considerably from layer to layer over the range from a fine sandy silt to a silty clay. Atterberg limits performed on clayey samples are summarized in Table 2.5-8. The data indicate the clay to vary from low to medium plasticity.

2.5.4.2.3 Sands and Clayey Sands

Except where they are removed within the area of influence of the Seismic Category I structures and related excavations, the sands and clayey sands are left in place beneath the founding grade of all other structures. This distinct stratigraphic zone has been extensively tested in situ by standard penetration tests, and the samples described in detail. The logs of all the borings in the immediate plant site area are presented in Appendix 2H. The procedures for the standard penetration tests and sample recovery and description are the same as those described for the buried channel sands and gravels in Section 2.5.4.2.4. Grain size curves for each of the samples in borings 112, 114, and 115 are presented in Fig. 2.5-50 through 2.5-52. These gradation curves are representative of the materials in this zone. Additional grain size data are presented in Appendix 2J.

The sand portion of practically all samples from this zone is a uniform fine sand, and many of the samples contain small amounts of fines (material passing the No. 200 sieve). The grain size curves for these samples generally show in excess of 10 percent clay size particles; hence, this material is called a clayey sand. The fines appear to be distributed throughout the soil and do not occur as layers or pockets.

Some layers within this stratigraphic zone, particularly those below the water table, exhibit relatively low Standard Penetration Test N-values. The lowest values generally occur in the clayey sand layers below the water table. These materials were excavated from beneath the area of influence of all Seismic Category I foundations.

2.5.4.2.4 Buried Channel Sands and Gravelly Sands

The buried channel sand and gravelly sand deposits of the Citronelle formation are the primary natural founding strata for the Seismic Category I structures and therefore were subjected to careful and thorough investigation. The density of these granular soils was measured in situ by standard penetration tests with the entire split spoon sample retained for visual identification. Selected samples were used for laboratory grain size determinations. Grain size curves for each sample in borings 112, 114, and 115 are presented in Fig. 2.5-50 through 2.5-52. These granular soils generally consist of a clean fine to medium sand with varying amounts of gravel. The permeability indicated by this gradation is consistent with that determined from the pump tests and described in Section 2.4.13.2; that is, 10^{-1} to 10^{-2} cm/sec. Lenses and layers of silty clay were encountered in borings 113 and 114 in the buried channel deposits within the limits of the area of the seismic Category I founding strata. Also, immediately overlying the Pascagoula clays in most of the borings in the buried channel area, coarser layers consisting primarily of gravel are found. Gravel-size clay balls form a portion of this coarse textured soil. Grain size curves on these soils would be misleading without an awareness of the presence of these clay balls.

Because it is important to have complete confidence in the in situ density measurements, the standard penetration tests were carefully performed in the following manner. AX-rods were used in all tests in the immediate plant site area. The drill holes were cased and drilling mud was used as the drilling fluid. The washing jets on the chopping bits were directed in an upward direction. The wash rods were withdrawn slowly to preclude an upward suction on the soil below the bottom of the hole. When the split spoon was placed into the hole, a check was made to see that it went right to the bottom of the casing (i.e., that the hole had been properly cleaned and that no soil had moved into the hole subsequent to cleaning). Caving of the hole wall was not a problem in the buried channel deposits in the seismic Category I founding area. The standard penetration test was performed by counting the number of blows of a 140-lb hammer falling freely for 30 in required to advance the standard split spoon sampler each of three consecutive 6-in increments. The N-value reported is the sum of the values for the second and third increments.

Fig. 2.5-24 is a boring location plan for the main plant area. The SPT N-values for these borings are plotted versus depth in Fig. 2.5-53 through 2.5-65. Also shown in these figures is the depth of excavation, the location of all silt and clay layers within the buried channel deposits, and the depth to the underlying Tertiary clay. To the left of the plots are graphic summaries of the complete borehole stratigraphy. Lines of equal relative density relate the N-values to the relative density of the soil after Seed and Idriss(75). These lines are based on a soil unit weight of 115 pcf above the water table (el +57 msl) and 60 pcf below the water table to convert from a stress to a depth relationship. Within the area where the buried channel deposits form a founding stratum for Seismic Category I structures, the relative density of these granular soils is generally greater than 70 percent. In most cases where the N-value indicates a relative density lower than 60 percent, there are explanations other than lower density. Silty clay layers within the deposit (el +15 ft and -20 ft msl), indicated by the shaded areas across the N-value plots in borings 111, 112, 113, and 114, lie below some of the sands exhibiting low N-values. When the standard penetration test is performed in granular soil immediately above a clay layer, the N-value is often reduced. The clay enters into the failure mechanism of the soil below the split spoon and thus reduces the penetration resistance.

Some of the lower N-values occur in the gravel immediately over the Tertiary clays (approximately el -40 ft msl) where clay balls are present as some of the gravel size particles. When the presence of this clay is taken into account, only a few N-values indicating less than 60 percent relative density remain and these are randomly scattered throughout the deposit. Furthermore, with one exception, these values never indicate a relative density less than 50 percent.

The exception to this pattern was in boring 111 where between el -25 and -40 ft msl, four N-values indicated relative densities less than 50 percent, with one value less than 40 percent. The soil samples indicate the presence of clay balls in these zones. Furthermore, the sample with less than 40 percent relative density was classified as a clayey sand. Nevertheless, to check this possible anomaly, boring 154 was put down 25 ft away. In this check boring, the sampling interval was doubled in the critical zone. This boring showed no relative density values less than 50 percent. It also indicated that some of the values from boring 111 were for material containing clay layers. The N-value plots of borings 111 and 154 are shown side by side on Fig. 2.5-58.

Additional sampling and testing of the buried channel sands and gravelly sands was accomplished via 15 additional borings. This investigation program is described in Appendix 2L. It included undisturbed and SPT sampling in the immediate vicinity of boring 111. This investigation program showed that the relatively loose condition in boring 111 is of very limited lateral extent (radius less than 5 or 10 ft inferred from adjoining borings) and is at considerable depth below founding grade (approximately el -25 to -45 ft msl). The difficulty in recovering undisturbed samples was taken as further evidence of the overall dense nature of the deposit.

The results of crosshole shear wave velocity measurements are presented in Section 2.5.4.4. Shear wave velocities in the buried channel deposits are consistently 1100 to 1200 fps. This verifies the compact condition of these sands and gravelly sands.

In summary, all of the data show that the buried channel sands and gravelly sands below the excavation are dense. The relative density is generally greater than 70 percent with only a few values less than 60 percent, and these are randomly scattered throughout the deposit; there are no values less than 50 percent relative density.

2.5.4.2.5 Tertiary (Pascagoula) Clays

The Tertiary (Pascagoula) clays were used as a marker bed in the drilling. Therefore, most of the borings in the investigation program were carried down to encounter this deposit and split spoon samples were recovered. In the main plant area, the top of the Tertiary (Pascagoula) clays is generally encountered around el -45 ft msl. Grain size curves for these samples in borings 112, 114, and 115 are presented in the overall gradation profile (Fig. 2.5-50 through 2.5-52). This soil is primarily a silty clay with layers of clayey silt and occasional thin fine sand layers and partings.

To study the engineering properties of the Tertiary (Pascagoula) clays in detail, continuous sampling through the upper 55 to 60 ft of this deposit was carried out in borings 136, 138, 163, 164, and 167 with 3-in diameter thin-wall tubes. The samples were taken with an Osterberg piston sampler in a cased hole filled with drilling mud. One hundred seven samples were recovered and the following tests were performed:

Natural water content determination
Atterberg limits tests
Specific gravity determination
Unconsolidated-undrained (Q) triaxial tests
Consolidation tests

The results of these tests are summarized in Table 2.5-9. Fig. 2.5-66 shows a summary plasticity chart for the Pascagoula samples of borings 136, 138, 163, and 167 and a profile of water contents, liquid limits, strength test results, and preconsolidation pressures for Pascagoula samples in boring 136. Similar profiles for borings 138, 163, and 167 are in Appendix 2K.

The stress-strain curves for the triaxial tests and the consolidation tests are presented in the laboratory report (Appendix 2K) together with detailed descriptions of the methods of preparing and testing the samples.

The average specific gravity for the Pascagoula clay, based on the nine values listed in Table 2.5-9, is 2.72. From the plasticity chart (Fig. 2.5-66), it can be seen that most of the data points lie above the A-line and between 30 and 50 percent liquid limit, representing a clay of medium plasticity. Table 2.5-9 shows that the natural water contents generally range between 20 and 30 percent and the liquidity index averages approximately 0.4.

The soil profiles (Fig. 2.5-66 and Appendix 2K) show the failure strain for each strength test result. Many of the lower strengths correspond to the higher failure strains, indicating some sample disturbance. In some cases, these higher failure strains correspond to less cohesive specimens, which are more susceptible to sample disturbance. Also, in boring 138 the higher failure strains tend to occur near the bottom of the hole consistent with the greater tendency for sample disturbance with depth and, in this case, consistent with an increase in occurrence of silt and fine sand layers with depth.

Most of the tests on the Pascagoula clays were run at a cell pressure of 2 kg/sq cm. However, calculations indicated that the degree of saturation was sometimes less than 100 percent and as low as 86 percent. Therefore, several additional tests were run on comparable specimens from the same samples at a higher cell pressure of 7 kg/sq cm. These tests all gave correspondingly higher strengths as would be expected and indicated that the soil in situ probably has a higher strength than indicated by the majority of the test results. Therefore, it is concluded that the undrained compressive strength of the Tertiary (Pascagoula) clays can be conservatively taken as 5 to 6.5 kg/sq cm. There is some indication that the strengths are slightly higher in the upper 5 to 10 ft near the surface of the deposit. This is consistent with the interpretation that the surface was weathered and desiccated prior to the deposition of the Citronelle Formation.

The consolidation test results show the clay to be stiff and overconsolidated with low values for virgin compression ratio (CR) and recompression ratio (RR). These results are summarized in Table 2.5-9 and in the graphic profiles (Fig. 2.5-66 and Appendix 2K) where preconsolidation pressure (p - determined from each consolidation curve) versus depth is_ plotted, together with the existing overburden pressure ($\bar{\sigma}_y$) at the time of sampling. A best-estimate line parallel to this existing overburden pressure line is drawn through the preconsolidation pressure data. This preconsolidation pressure line is consistent with the geologic history of the area, corresponding to a ground surface of approximately el 200 ft msl with the groundwater at its present level. El 200 is the estimated maximum level of the Citronelle terrace in this area prior to erosion (Fig. 2.5-27).

The results of crosshole shear wave velocity measurements are presented in Section 2.5.4.4. Shear wave velocities in the Tertiary (Pascagoula) clays are consistently 1,200 to 1,300 fps. This is indicative of the hard consistency of these clays.
Dynamic moduli values for the clays are similar to values for the overlying saturated Citronelle "buried channel" granular materials. These moduli are based on measured seismic wave velocities along direct paths at each level of measurement and thereby correspond to the stratum at the level of measurement; refraction was not observed. It is common to measure similar seismic velocity values in dense granular soils and stiff clays even though the penetration resistance (N-values) may vary markedly.

Laboratory measurements of shear modulus and damping were made on Tertiary (Pascagoula) clay samples from borings 163 and 164. These resonant column test results are discussed in Section 2.5.4.7. The results are consistent with the values from the in situ testing when compared at similar strain levels.

In summary, the Tertiary clays underlying the site are hard overconsolidated clays of medium plasticity.

2.5.4.3 Exploration

The exploration program for River Bend Station consisted of four basic types of exploration:

1. A boring exploration program
2. A geophysical survey program
3. A groundwater investigation
4. A geologic mapping of the excavation.

The boring program consisted of some 400 borings in the general site area. About 100 of these borings fall within the main plant area. Twenty-five of the borings in the general site area included undisturbed sampling, and eight of these borings are within the main plant area. Fig. 2.5-67 is a boring location plan for the general site. Fig. 2.5-24 is a boring location plan for the main plant area. The boring program was conducted to obtain samples and information about the subsurface materials. While borings were distributed across the site to provide uniform coverage, a higher concentration of borings was made in the area of the main plant structures. The majority of the borings were of the SPT split-spoon type. These borings provided disturbed samples of the subsurface materials and an N-value indication of their density or consistency. The undisturbed sampling was accomplished with 3-in diameter thin-wall tubes and stationary piston samplers of the activating rod type. A hydraulic push was used to advance the sampler. A detailed description of the undisturbed sampling procedure is presented in Appendix 2L, Section 3. The undisturbed sampling was carried out to provide samples for triaxial strength, consolidation, and resonant column testing.

The geophysical exploration program consisted of seismic refraction, seismic crosshole, downhole, and uphole velocity measurements. A limited amount of refraction profiling, one line 400 ft in length, was surveyed because of the great depths to bedrock in the area of the site. The crosshole velocity measurement of "P" waves and "S" waves were made at 10-ft interval positions between depths of 60 to 200 ft below ground surface. These velocity values were used to calculate dynamic engineering properties of the foundation soils, such as Young's modulus, shear modulus, bulk modulus, and Poisson's ratio. The various seismic survey techniques and the results of the seismic surveys are discussed in Section 2.5.4.4.

The groundwater investigation included piezometric level monitoring and aquifer pumping tests. A detailed description and the results of the investigation are presented in Section 2.4.13.

All walls and floors of the excavation for Seismic Category I (nuclear safety-related) structures were geologically mapped in detail. This mapping proceeded in stages as the excavation deepened. The results of this exploration program are presented in the Report on Geologic Mapping of the Excavation for Category I Structures and Buried Pipeline submitted to the NRC in December 1977(76). Included in the report are color photographs of the excavation. This program was carried out in order to provide a more detailed soil profile than was revealed by the boring program and to identify any geologic features uncovered during the excavation operation. The geologic mapping program confirmed the stratigraphy defined by the test boring investigation and presented in the PSAR. No evidence of faulting, flooding, or other geologic hazards was found on site. The bearing surface for the compacted fill is in the dense sands and gravelly sands of the Citronelle buried channel deposits.

2.5.4.4 Geophysical Surveys

2.5.4.4.1 Refraction Profiling

The 12-point, seismic refraction method was used for the single-line refraction survey made in this study. Interpretations are based on the measurement of the time required for elastic waves, generated at a point source, to travel to a series of 12 geophones spaced at 20-ft or 40-ft intervals along a straight line on the ground surface, called a seismic spread. Seismic energy is generated with small buried charges of explosives at first one end and subsequently at the other end of each spread. In addition, intermediate shot point determinations were made for additional velocity and depth information. A portable, 12-channel seismograph was used in this study. The seismograph amplifies and filters the seismic signals detected by the individual geophones and provides a photographic recording for each of the 12 channels. Timing lines are provided across the entire recording at 2 msec (0.002 sec) intervals.

The seismic refraction method was used to determine near-surface velocity values and velocity layering. The basic time-distance data for the refraction survey are presented in Fig. 2.5-69. Results of these refraction measurements also are shown in profile form. The location of the seismic line is shown in plan on Fig. 2.5-24 as Section S-S'. In the plant site area, the seismic refraction survey was limited in coverage because it was only desirable to penetrate the water table and correlate with drill hole data. The high-velocity refractors were anticipated to be beyond the necessary depth of investigation.

2.5.4.4.2 Crosshole and Downhole Velocity Measurements

Two locations were surveyed using the seismic crosshole procedure. Initially, in situ measurements of "P" (compressional) and "S" (shear) wave velocity values were made across an array of 6 drill holes near the location of the reactor building. Drill holes 113, 135, 136, 137, 138, and 109 were used for these measurements. The location of these boreholes is shown in Fig. 2.5-24. Additional in situ seismic crosshole techniques were utilized in borings 251, 252, 253, 254, and 280. Three component geophones (2 horizontal and 1 vertical detector) were positioned in four of the holes at the same level as the shot point in a fifth hole; recording holes and shot holes were interchanged thereby providing a multiplicity of recorded data at each level of measurement. The shot point and recording geophones were maintained at the same elevation for each shot. Measurements were made at 10-ft intervals from a depth of approximately 60 to over 200 ft below ground surface and repeated shots were made at each level to achieve the best obtainable records. The wave arrivals detected with the three component geophones, enhanced by amplification and/or filtering, were displayed on a photographic recording oscillograph (the same instrumentation used for the refraction work). Seismic energy was generated with small charges of explosives, usually blasting caps.

This method of measurement assumes that layers are continuous across all or part of the array and that a uniformity of materials exists for each layer. It is further assumed that each layer is thick enough to allow transmission of both "P" waves and "S" waves. It also assumes that a sequence of alternating thin, hard, and soft layers does not exist. The validity of these assumptions is demonstrated by the drill hole information in Section 2.5.4.2.

The downhole velocity measurements were made by generating energy, either by hammer blow or explosives, near the surface or at a location within a boring at a higher elevation than the receiver geophone, which receives the seismic energy. Generally, the geophone is then placed at successively deeper elevations within the materials to be surveyed, usually within the same boring. The average downhole velocity is then determined from the inverse of the slope of the time-depth plotted data. Downhole velocity surveys were made in borings 109 and 136 in the plant area, and the data are shown in Fig. 2.5-70.

The results obtained from the crosshole in situ measurements are shown in Table 2.5-10. The basic time-distance data for the crosshole seismic survey is presented in Fig. 2.5-71. The "S" waves are source generated, as evidenced by the time intercept of the time-distance plots. The computed "S" wave velocity values for each of the four geologic zones in which measurements were made are also indicated in Table 2.5-11. The dynamic moduli, corresponding to each geologic zone, also are presented in Table 2.5-11. The water table elevation (+57 ft msl) at the time of the investigation is the same as the expected future water table elevation and is the elevation shown in this table. Shear wave velocity and shear moduli data are available for only materials below the water table. It is assumed that, because of the similarity of material above and below the water table, the shear wave velocity and shear moduli values would remain nearly constant; other moduli would, of course, vary with "P" wave velocity values specifically due to water saturation.

To demonstrate the reliability of the values presented in Tables 2.5-10 and 2.5-11 throughout the site area, additional seismic crosshole measurements were made in another array of borings located approximately 1,400 ft north-west of the original array. These borings include 251, 252, 253, 254, and 280. A summary of the data obtained utilizing these holes is presented in Table 2.5-12. These new data are presented in the same geological correlation format as Table 2.5-11. The data are similar in these widely separated locations. The shear wave velocity and shear moduli values for the Pascagoula clays, in the data of Table 2.5-11 (plant site area), are slightly higher than in the location of the new data of Table 2.5-12. The comparison indicates a close similarity of the physical properties of these geologic zones over an extensive area, and a high degree of reliability for the values presented in Table 2.5-10.

2.5.4.4.3 Uphole Velocity Measurements

The uphole velocity measurements utilize a method whereby the generated-energy source is at a lower elevation than the receiver geophone. Generally, the geophone is fixed at some point on the surface or within a boring, and the energy is generated at successively greater or more shallow depths below the geophone but within the materials to be investigated, usually within the same boring. The average uphole velocity is then determined by plotting the time of arrival versus the travel distance and calculating the inverse of the slope of such a plot. The uphole velocity survey was conducted at the plant site by placing a geophone on the ground surface at boring 135 and generating energy by explosives at intervals of 10 ft from depths of 50 to 190 ft within boring 135. The uphole velocity data are presented in Fig. 2.5-70.

Uphole velocity measurements were determined in order to complement the downhole and crosshole velocity measurements.

The velocities determined from the downhole and uphole measurements are approximately equal to or greater than the velocities determined by the crosshole measurements.

With regard to the reliability of downhole and uphole velocity data, the uphole velocity measurements appear to be more reliable because of the greater length of measurement path. Also, the uphole velocity data are in excellent agreement with the crosshole velocity data.

2.5.4.5 Excavation and Backfill

2.5.4.5.1 Siting of Seismic Category I Structures and Extent of Excavation and Backfill Relative to Foundation Stratigraphy

Plan and profile drawings showing the extent of the excavation and backfill planned for the plant structures are presented in Fig. 2.5-67, 2.5-68, and 2.5-72.

As discussed in Section 2.5.1.2.8.5, the loess, the Port Hickey top-stratum clays, the sands and clayey sands, and the variable upper portion of the buried channel deposits were excavated from the area beneath the foundations of the Seismic Category I structures. Therefore, all Seismic Category I structures are founded on dense compacted granular fill overlying dense buried channel sands and gravelly sands and hard overconsolidated Tertiary clays. Other major structures of the power plant are founded directly on the sands and clayey sands, except where they are located within the extent of the excavations for the Seismic Category I granular fill. In these areas, the other major structures are founded on variable thicknesses of compacted granular fill overlying some sand and clayey sand and/or the upper portion of the buried channel deposits.

The layout of the power plant has been selected so that all Seismic Category I structures are founded on compacted granular fill overlying dense Citronelle buried channel sands and gravels and hard overconsolidated Pascagoula clays. A zone of influence has been defined by imaginary slopes of 2 horizontal to 1 vertical from the outer limits of the foundations at founding elevation through the sands and gravels to the Pascagoula clays. The location in plan of the station was fixed so that the zone of influence of the Seismic Category I structures did not include any soils of questionable seismic stability.

To the south, a layer of pink clayey fine sand immediately overlying the Pascagoula clay is shown on the sections (Fig. 2.5-67 and 2.5-68). The northern limit of this layer was taken as the toe of the 2:1 slope, and on that basis the limit of the acceptable foundation area at el 60 was established. This layer of pink clayey fine sand exhibits some relatively low N-values. However, taking the 2:1 slope from the extreme northern limit of this layer is very conservative because the layer is very thin near its northern limit and the last borings which encounter the layer near its northern limit do not indicate any low N-values associated with the layer.

To the north of the area for the Seismic Category I structures, a clayey sand layer at approximately el +5 msl was identified in borings 100 and 130, and then its limit was better defined by borings, 142, 143, 156, and 159. A 2:1 slope up from the southern limit of this layer was used to establish the northern limit of the area suitable for Seismic Category I structures. These limits and slopes are shown in Fig. 2.5-67, 2.5-68, and 2.5-72.

All site excavations made for Seismic Category I structures were geologically mapped in detail. The mapped surfaces included the excavation walls and floor. A complete discussion of the results of the geologic mapping program may be found in Section 2.5.1.2.9.

The excavation was accomplished using scrapers and bulldozers. Care was taken as the excavation reached within 3 ft of the required depth to assure that the excavation procedures did not disturb the material below and outside the limits of the excavation. Prior to the placement fill, the soil at founding grade was proofrolled in order to densify any material that was loosened during excavation.

This proofrolling of the excavation bottom was witnessed by the Geotechnical Liaison Engineer and a representative of the NRC. Any material that would not densify during this operation was removed by local excavation to firm in situ material. These additional excavations were backfilled with Seismic Category I fill.

2.5.4.5.2 Dewatering

In order to accomplish excavation and backfill below the water table, dewatering was required to lower groundwater levels throughout the area of the excavation. The design and layout of the dewatering system are described in Section 2.4.13.2.3. To ensure continuous operation of the pumping equipment during construction, a completely redundant power supply was installed and maintained in full operating condition at the site at all times. To minimize the risk of any disturbance to the in situ soils, a fully redundant dewatering system with additional wells, redundant discharge lines from the system, redundant power supply lines to each pump, and an independent auxiliary power supply for each pump was provided. The system was designed so that portions of it could be isolated for routine maintenance or in the event of accidental damage without affecting the operation of the remainder of the system. This redundant system prevented any accidental shutdown of the dewatering program, thereby eliminating any adverse effects on the stability of the foundation soils.

The contractor performed operational testing to demonstrate the capability of his dewatering systems prior to commencement of the work, and the required minimum drawdown beneath the excavation was established on the basis of these tests. Based on the observed rate of rebound and the time required to activate the standby power system, it was decided to maintain groundwater at least 10 ft below the excavation or backfill surface. This was required to ensure that the water level stayed at least 3 ft below the lowest point in the excavation or backfill surface at all times.

The general competence of the foundation strata in the excavated area is directly dependent on the proper functioning of the dewatering system. Should the dewatering system fail and groundwater flow into the excavation, it might loosen and otherwise disturb the in situ or backfill soil. Therefore, drawdown was monitored continuously throughout the construction program by means of a series of observation wells. Thirty-eight observation wells were located around and within the excavation area, and 8 wells were located at approximately 1,000 ft distance away from the excavation edge to monitor drawdown. All of the excavation area wells were installed prior to excavation below the water table. Observation wells that were located within the excavation area were moved as necessary to avoid interference with the excavation and backfill work. Groundwater level readings were reported on a daily basis during the time that the dewatering system was operating. The dewatering system was shut down after the lowest ground surface point in the excavation reached above normal water table elevation. Fig. 2.5-73 shows superimposed plots of ground elevation and groundwater elevation versus time during the period of excavation and backfill. This figure demonstrates that the groundwater level was effectively maintained a safe distance below the lowest ground surface point in the excavation area at all times during which the excavation or backfill surface was below the normal water table elevation.

2.5.4.5.3 Backfill

Prior to the start of excavation and backfill activities, a test fill program was conducted at Lambert Sand and Gravel Company's main plant area on the west bank of Bayou Sara. This program primarily was conducted to determine the compaction characteristics of the proposed backfill materials, to evaluate the effectiveness of the various compaction equipment used, and to develop a reasonable procedure for achieving the required density of the backfill material. In addition, the program provided an opportunity to develop and compare testing methods for field control and to predetermine and solve problems associated with the planned methods for hauling, placement, compaction, and testing of the backfill.

The test fill program involved placing and compacting fill material using various procedures and evaluating each procedure by developing a density-versus-depth profile for each fill section. The results of this program were the basis for establishing maximum lift thickness, specifications for compaction equipment, minimum number of roller passes, and testing depth.

Many potential sources of Seismic Category I backfill were identified in Appendix 2J of the PSAR. The Site Development Specification for River Bend Station permitted the Contractor to select his preferred source(s) of backfill from the list of suitable borrow pits in the vicinity. Upon award of the contract, the Contractor selected the Bayou Sara pit owned by Lambert Sand and Gravel Company as the sole source of Seismic Category I backfill. Thirteen soil borings were drilled throughout the Bayou Sara pit to verify that a sufficient quantity of acceptable material would be available. It was determined that approximately 5 million cu yd of granular soils were available at this source. Since the quantity of Seismic Category I backfill required for River Bend Station is approximately 1.6 million cu yd, the Bayou Sara pit was more than adequate as the sole backfill source.

The processing operations at the Bayou Sara pit consisted of a suction dredge, which pumped the excavated parent materials through an inclined rotary drum fitted with jets and coarse screens. This first wash-and-sort process removed coarse gravel particles, wood, clay balls, and other trash. The remaining sand and fine gravel was then pumped up to a sedimentation classifier, where the materials were further washed and sorted into the gradation band specified for use as Seismic Category I backfill at River Bend Station. After exiting the second wash and screen equipment, the remaining materials were then either moved by conveyors to a stock pile at the borrow pit or directly loaded into trucks for delivery to the River Bend Station stockpile. This process produced a clean granular fill possessing a narrow band of grain size distributions. Fig. 2.5-74 shows the entire range of gradations for all Seismic Category I backfill samples falling within the acceptable gradation band. Engineering characteristics of the plant backfill are presented herein. A comprehensive discussion of the engineering characteristics of the plant backfill as they relate to compaction may be found in the Report on Engineering Characteristics of the Granular Fill(77). A discussion of the engineering characteristics of the fill as they relate to strength and stability may be found in the Report on the Liquefaction Potential of the Plant Backfill(78).

The fill material was wetted in the hauling units at the source to the extent necessary to prevent drying during hauling and to minimize segregation of the grain sizes in the hauling unit. The fill material was wetted in the hauling units upon arrival at the site if the material was to be placed directly in the fill, or when taken from the site stockpile directly to the fill. Additional in-place wetting during the compaction process was provided as required to achieve the moisture necessary for optimum compaction of the materials.

It was desired to use a density control method in the field which was simple, allowed for rapid evaluation, and ensured a dense granular fill. This was done by specifying a minimum acceptable in-place density, where that value had been set by a laboratory program to correspond to some value of relative density.

It has been demonstrated that maximum density correlations can be developed with a gradational index(79). A gradational index is a numerical value relating to gradation based on a partial grain size determination which exhibits a consistent and predictable relationship to density. It was believed at the outset of construction that a gradational index would provide a rapid means of determining an estimate of the maximum density of a particular sample. It was intended to develop one or more density/gradation correlations for the actual materials used in the Seismic Category I backfill. These correlations were to be used to expedite the evaluation of the density of the fill as placed. However, because the range of gradations for the Seismic Category I backfill is relatively narrow, it was impossible to develop a gradation index that was consistent and reliable.

Several relationships were investigated in searching for a reliable gradational index, based both on test results from stockpile samples and on results of control testing of the actual backfill in place. In both instances, it was attempted to establish a relationship between maximum dry density and each of the following:

1. Percent passing the No. 16 sieve
2. Percent passing the No. 30 sieve
3. Percent passing the No. 40 sieve
4. Percent passing the No. 50 sieve
5. D_{10}
6. D_{50}
7. Coefficient of uniformity, $Cu = D_{60}/D_{10}$
8. Range of gradation, $Cr = 2 \log (D_{100} /D_0)$.

Fig. 2.5-75 and 2.5-76 show plots of maximum dry density versus Cu and versus Cr, respectively. The scatter shown in these figures is typical of all the relationships investigated. Because it was impossible to develop a predictable gradational index for the material, this approach was abandoned.

The results of the laboratory testing previously reported indicated that the maximum density by the modified Proctor density test procedure is a comparatively difficult test to perform on this particular backfill material due to relatively low percent fines and would present moisture control problems if used as a field control test. Therefore, maximum density was determined by the vibratory table method. This test is a simple, single data point test and, as can be seen from the test data, has good reproducibility. It was planned that all Seismic Category I structural backfill be compacted to obtain 70 percent relative density (with the minimum acceptable relative density being 60 percent). The final verification of backfill density in terms of relative density was computed from the results of complete relative density testing. However, the day-to-day field control was accomplished using a minimum acceptable in-place density. This acceptance criteria was a conservative evaluation of the in-place density that corresponds to a relative density of 60 percent. The criteria was derived from a data base which consisted of the 50 most recent relative density determinations.

For each of the 50 relative density determinations, the maximum density and minimum density points were plotted on a log dry density versus relative density (0-100 percent) plot. From this composite plot, the highest value of dry density corresponding to 60 percent relative density was chosen as the minimum acceptable in-place density. Use of this conservative acceptance criteria ensures that all of the results are greater than 60 percent relative density and the majority are, in fact, greater than 70 percent relative density.

The data base was generally updated after every 10 new relative density determinations. In this manner, the data base was kept up-to-date with the material being placed, automatically accounting for the effects of variations in gradation on the minimum and maximum densities. To further control the effects of gradational changes, minimum and maximum densities were determined and included in the data base for any material that showed a gradation outside the range of previous results. By this method a quick means was available to evaluate test results and minimize time delay between the field test and a density comparison.

All field testing was located by the plant grid coordinates and elevation at each test location. Separate samples for sieve analysis and minimum/maximum density determinations were taken at each test location in close proximity to each other to provide sufficient materials so that each of the required tests could be run concurrently.

The location of any test which failed to meet prescribed relative density criteria was known. Where gradation of these materials was acceptable, additional compaction was required. In cases where the gradation failed to meet specifications, the materials were removed and replaced as necessary. The limits of such areas were defined by testing in adjacent areas.

The following QA program was used to ensure the specified backfill properties are met.

To ensure a continuous supply of fill material as required for construction, a stockpile was maintained onsite. The gradation of the fill was checked at the source, at the stockpile, and in the fill. The fill was placed in lifts not exceeding 10 in loose thickness and compacted with a minimum of four passes with an 8-ton minimum vibratory roller. A continuous count of the number of passes of the compaction unit was made and continuous surveillance of lift thickness was maintained to ensure uniform compaction throughout the fill. Density measurements in the fill were made on a regular and systematic basis on every lift of the fill.

The laboratory and field testing requirements, including the frequency of testing for the QA program, for the select granular backfill for the River Bend Station is presented in Table 2.5-13.

Sieve analyses (ASTM-C136) were performed on samples of selected backfill materials at the source, at the onsite stockpiles, and after placement in the fill. ASTM C136 was modified to delete Section 5.3 and substitute, instead, a minimum mechanical sieving duration of 15 min. The select granular fill material was tested to determine minimum-maximum densities according to ASTM-D2049, with the following two modifications: first, maximum densities were determined using an electromagnetic vibratory table operating in the amplitude range of 0.005 to 0.015 in at its maximum rheostat setting; second, minimum densities were determined by placing the sand in the mold, maintaining the spout as close as practical to the sand surface (i.e., maintaining a zero height of fall).

Control tests of in-place density and moisture content were performed according to ASTM-D2167 (Washington Dens-o-meter) to ensure that required densities and moisture contents were achieved.

The effectiveness of this program can be seen in Fig. 2.5-77 and 2.5-78, which summarize the results of relative density and degree of compaction determinations performed on the Seismic Category I backfill. These figures account for all of the Seismic Category I backfill placed as of May 1977 at which time top of fill elevation had reached el +67 ft msl (above founding elevation of all Seismic Category I structures). It can be seen that the average relatively density (93.8 percent) is well above the target value of 70 percent. Furthermore, the average degree of compaction is 98.7 percent of the maximum density as determined by vibratory table. The uniformity of the plant backfill resulted in a degree of compaction that was above 92 percent in all cases.

The soil parameters used in the preliminary evaluation of the static stability of the major structures were developed from results of the test fill program and from laboratory testing on the test fill material. Subsequent testing was performed on the actual plant backfill material in order to confirm the parameters. Fig. 2.5-74 shows the results of testing on backfill samples that were densified to a nominal relative density of 90 percent. Based on the results of these tests and the results of the in-place density testing, static design parameters were taken conservatively as follows:

Dry unit weight = 111.8 pcf
Moist unit weight = 120.0 pcf
Saturated unit weight = 130.0 pcf
Angle of internal friction = 36 deg
Cohesion intercept = 0.

A complete report on the testing is presented in Appendix I of the Report on the Liquefaction Potential of the Plant Backfill(78). Dynamic properties of the plant backfill are presented in Section 2.5.4.7.

2.5.4.6 Groundwater Conditions

The history of the groundwater fluctuations at the site including piezometric observations is described in detail in Section 2.4.13.2.

During construction, the removal and replacement of material beneath the Seismic Category I structures required an excavation to el +20. A dewatering system was installed to lower the groundwater level in the terrace aquifer from el 57 to el 0. The design and performance of the dewatering system is discussed in detail in Sections 2.4.13.2 and 2.5.4.5.

Groundwater used for the operation of the power plant will be obtained from the Zone 3 Tertiary aquifer (Section 2.4.13.2). Two wells each capable of pumping 150 gpm were installed. Flow requirements for the plant are described in Section 9.2.3. Groundwater for fire protection will be supplied by one 800 gpm well tapping the Terrace aquifer. This groundwater production is insignificant with respect to the other regional uses. The future groundwater conditions anticipated in the plant site area are described in Section 2.4.13.2. The program for monitoring of groundwater levels during the life of the plant is also described in Section 2.4.13.

With respect to liquefaction considerations, a maximum groundwater level of el +70 msl was used. This is the design basis for subsurface hydrostatic loading derived in Section 2.4.13.5.

2.5.4.7 Response of Soil and Rock to Dynamic Loading

As described in Section 2.5.1.2.2, the River Bend Station site is underlain by a great thickness of sediment. The depth to crystalline bedrock is approximately 27,000 ft. The thickness of soil-like material is at least 5,000 ft.

The shear modulus for the buried channel deposits and the Pascagoula clays was determined from a crosshole seismic survey, as described in Section 2.5.4.4. Shear modulus for the Seismic Category I backfill was determined by laboratory testing as described in this section. On the basis of these data, the nominal shear modulus was taken as 18 ksi to represent the average value for the Seismic Category I backfill, the buried channel deposits, and the Pascagoula clay.

Values of modulus as determined from the seismic survey are appropriate for very low strain levels. In order to account for the higher strain magnitude associated with SSE ground motion, the shear modulus values from the seismic survey were adjusted in accordance with Seed and Idriss (80).

A series of laboratory tests was performed to determine the shear modulus of the Seismic Category I backfill using the resonant column method. The measurements of shear modulus were performed using similar relative densities and confining stresses as for the geophysical tests on the in situ soils. This resonant column testing was done in lieu of a seismic refraction survey of the in-place fill. The results of these tests are presented in Fig. 2.5-74 and Appendix 2M. These tests provide shear modulus values over a range of strains, including those associated with the SSE.

Resonant column tests were performed on representative tube samples of Tertiary clay from borings 163 and 164. Test results are presented in Appendix 2K and summarized in Fig. 2.5-66. Samples were isotropically consolidated to different values of effective confining pressure. The shear modulus was measured to define a G_0 versus $\overline{\sigma}_v$ relationship for the clay. The variation of shear modulus and damping versus shear strain was also measured and results are presented in Appendix 2G and in Fig. 2.5-66.

It has been observed that the shear modulus of clay increases with consolidation time and that the increase approximates a constant value per log cycle of time(81). The lab data, which correspond to a consolidation time of 20 yr, were extrapolated to the geologic age of the clay ($\approx 10^6$ yr) and the G_0 versus $\overline{\sigma}_v$ plots were adjusted accordingly. The corrected plot is presented in Fig. 2.5-66.

Test results indicate that G_0 for the Seismic Category I backfill is of the same order of magnitude as for the in situ soils. In order to determine average shear modulus, G_0 values are reduced to account for the shear strain levels associated with SSE ground motion by means of a one-dimensional wave propagation analysis. This is accomplished using the computer program SHAKE (Reference 101) and earthquake time histories from three different seismic events. Table 2.5-21 shows a summary of the calculated shear strain levels and resultant shear moduli as well as the computed average values of shear modulus. The average shear modulus is computed as the thickness-weighted average of the strain adjusted moduli for the backfill, buried channel deposits, and Pascagoula clay. Using this method, 18 ksi is determined to be the nominal shear modulus.

For the purpose of structural analysis, the soil shear modulus is varied by plus or minus 33 percent to allow for variation in the actual shear modulus that may result from variations in confinement, soil properties, or strain level. Consequently, all Seismic Category I structures are analyzed for soil shear modulus values of 12, 18, and 24 ksi. The soil/structure interaction analysis is presented in detail in Sections 3.7.1 and 3.7.2.

2.5.4.8 Liquefaction Potential

As discussed in Section 2.5.1.2.8, the sands and clayey sands stratigraphic zone was excavated from the area beneath all Seismic Category I structures, as was the variable upper portion of the buried channel deposit. These materials were removed because layers of sand and clayey sand with low N-values were identified below the water table. Adequate assurance could not be provided that these materials would not be subject to liquefaction in the event of an SSE.

The materials which support the Seismic Category I structures include compacted granular fill, dense buried channel sands and gravels, and the hard Pascagoula clays. Liquefaction potential must be considered for granular materials. With hard clays of low sensitivity, however, liquefaction considerations are not applicable.

Because of the gradation and high density of the buried channel deposits, sampling techniques do not yield sufficiently undisturbed samples to justify laboratory cyclic load testing. Attempts to recover undisturbed samples of the buried channel sands and gravels, described in Section 2.5.4.2 and in Appendix 2L, were unsuccessful. Because of the conservatism in the selection of the design earthquake loading, it is adequate to demonstrate the margin of safety against liquefaction using the procedure developed by Seed and Idriss(75).

This procedure involves determining the shearing stresses at various elevations in the soil under the structures or under the yard area and comparing these values with the shearing stresses necessary to cause liquefaction of these soils, as determined from cyclic loading triaxial tests. The average shearing stress at any depth can be determined from the following expression:

$$^{\tau}ave = 0.65\ r_d\ \gamma z\ \frac{^{A}max}{g}$$

where:

τ_{ave} = Average uniform shear stress at depth Z for some given number of loading cycles

Z = Depth

a_{max} = Maximum (peak) ground acceleration

g = Acceleration due to gravity

= Unit weight of soil

0.65 = Reduction coefficient for equivalent uniform average shear stress

r_d = Stress reduction coefficient to account for deformability

The average shear stress at a depth for a given number of cycles of loading is less than that corresponding to the peak acceleration because of two factors. First, the average of the larger peaks is less than the single maximum peak. Seed and Idriss recommend a value of 0.65 for this reduction factor(75). Second, the column of soil above the point under consideration behaves as a deformative body. The actual shear stress at a given depth is less than that determined on the basis of a rigid column. Seed and Idriss designate a reduction factor, r , to account for deformability and provide plots of the values of r versus depth for different soil profiles(75).

Using this relationship and accounting for the weight of the soil and overlying structures, the average shear stress at various depths in the soil profile can be determined. The results of these calculations are presented in Table 2.5-14.

The shearing stress at which liquefaction occurs is a function of the number of cycles of loading and of the effective confining pressures on the planes of shear. To determine the available shearing resistance of the soil, cyclic load triaxial tests with isotropic consolidation are commonly run. In this case, the effective stresses in the sample under the applied chamber pressure are equal in all directions. However, in situ stresses in the horizontal directions are somewhat less than in the vertical direction, the ratio being on the order of 0.45. To allow for this in comparing in situ conditions with laboratory test results, Seed and Idriss introduced a correction factor, Cr(75). For relative densities in the range of 70 percent, the value of Cr is 0.65. For relative densities of 80 to 90 percent, Cr varies between 0.68 and 0.74. Castro((82) relates Cr to octahedral stress and obtains for K_o= 0.45, a stress correction factor of 0.73. A value of K_0= 0.45 would be appropriate for the RBS backfill for this particular type of analysis. Other recent research suggests that the stress correction factor varies with the overconsolidation ratio; for K_0= 0.4, Cr = 0.63. Additionally, it has been noted that multi-directional shaking conditions would reduce the value of Cr by approximately 10 percent. It can be seen that the alternative methods for evaluating Cr yield fairly similar values.

As stated in Section 2.5.4.9, the earthquake used for design is assumed to have 10 large cycles of motion. From the grain size curves in Fig. 2.5-50 through 2.5-52, the Mean Grain Size, D_{50}, of the finer strata in buried channel deposits is approximately 0.5 to 0.4 mm. With these data, a value of 0.26 for the triaxial stress ratio causing liquefaction in 10 cycles at 50 percent relative density can be obtained from Seed and Idriss Fig. 6(75). This stress ratio can be corrected for the actual relative density of 70 percent by direct proportionality with respect to relative densities.

Using the Seed and Idriss procedure as described, analyses have been performed for the yard area and several structures. These structures include the reactor, the radwaste building, and the control building. The results of the analysis are presented in Table 2.5-14. They show a minimum factor of safety of 3 with respect to initial liquefaction for the buried channel sands and gravels.

Actually, the margin of safety with respect to liquefaction is greater than these numbers indicate. The buried channel deposits contain much well-graded material which reduces the overall susceptibility to liquefaction; whereas, much of the data presented in Seed and Idriss Fig. 6 is based on granular soils with a more uniform gradation(75). All of the data clearly indicate a large margin of safety with respect to liquefaction for the in situ foundation soils under the Seismic Category I structures at River Bend Station.

For the Seismic Category I backfill, 89 consolidated undrained cyclic triaxial (CR) tests were performed on representative samples from the site backfill stockpiles. The cyclic triaxial test specimens were prepared in a manner modeling field compaction to relative densities of 60, 70, 80, and 90 percent and consolidated to effective pressures of 1.5, 3.0, and 4.5 kg/sq cm. The Report on the Liquefaction Potential of the Plant Backfill, submitted to the NRC in February 1978(78), is a complete report on this test program. A gradation profile for the Seismic Category I backfill and a summary of the cyclic load test results are shown in Fig. 2.5-74. Also shown on the summary figure are the corresponding values of stress ratio causing liquefaction in 10 cycles from Seed and Idriss (Fig. 6)(75).

The data clearly show that the backfill sand at any given relative density has a high resistance to liquefaction.

In Table 2.5-15, the factor of safety with respect to liquefaction for the compacted granular fill has been calculated for relative densities of 60, 70, 80, and 90 percent. The analyses were performed in the same way as for the naturally occurring foundation soils, except that the shearing resistance of the backfill at a given relative density and confining pressure is obtained from the test results on the backfill sand as presented in Fig. 2.5-74 and Reference 78. The cyclic stress ratio was chosen at a double amplitude strain of 2.5 percent. This is conservative because it generally preceded the onset of liquefaction in the cyclic tests. These data clearly demonstrate a large margin of safety with respect to liquefaction for the compacted granular fill at 70 percent relative density (F.S. -4.1), and even at 60 percent relative density (F.S. -2.6). Because compaction of the Seismic Category I backfill was specified at a relative density of 70 percent with a minimum acceptable relative density of 60 percent, the backfill has a large margin of safety against liquefaction. Test results of in-place density of the backfill indicate an average relative density in excess of 90 percent (Section 2.5.4.5).

Because of the high relative density of the backfill and in situ sands, the large safety factor against liquefaction, and the conservatism in the use of low-strain (2.5 percent double amplitude) cyclic stress ratio, dynamically induced strains are not considered a potential threat to plant stability or settlement.

Liquefaction analyses were similarly performed for the soils under the turbine building under an OBE loading and indicated large margins of safety against liquefaction.

2.5.4.9 Earthquake Design Basis

As described in Section 2.5.2.6, the maximum vibratory acceleration associated with an earthquake at the site would be 0.07 g; however, the SSE is assumed to be 0.10 g, since this is the minimum value in accordance with 10CFR100, Appendix A. The design response spectra for the SSE and 1/2 SSE are presented in Section 3.7.1.1. For liquefaction analyses, the design basis earthquake is defined as having a long duration with 10 large cycles of motion. This corresponds to the number of large cycles observed for such earthquakes as Tehachapi 1952 and El Centro 1940. The design basis earthquake is discussed in more detail in Sections 2.5.2.6 and 2.5.2.7.

The Operating Basis Earthquake (OBE) for River Bend Station is one-half the SSE. For review purposes, the terms OBE and 1/2 SSE are synonymous.

2.5.4.10 Static Stability

Bearing capacity and sliding and overturning stability are discussed in Section 2.5.4.11.

Lateral earth pressures on buried walls depend upon the rigidity of the structure, the backfill material characteristics, and adjacent surcharge loads. Backfill consists of cohesionless granular fill. The maximum size of the backfill material is limited to 4-in diameter. The fill between structures was placed in layers and compacted to the same density criteria as the Seismic Category I backfill.

Because the Seismic Category I structures are relatively unyielding, the static earth pressure is essentially the "at rest" condition. The coefficient of earth pressure at rest for the granular backfill has been taken at 0.45 for depths greater than about 20 ft. Within 20 ft of the ground surface, the K is increased to account for the influence of compaction. For depths up to 6 ft, K_0 due to compaction was taken as 1.5. For depths below 6 ft, the lateral at-rest pressure was kept constant at the value corresponding to 6 ft until it reached the pressure line for $K_{0=}$ = 0.45. This K increase due to compaction is shown in Fig. 2.5-79. This distribution is consistent with the work of Broms (1971)(95).

Net settlements of the foundations of the major structures of the power plant under the static design loads are small and occur almost immediately on the application of the loads. The net settlements are small because the net foundation loads at el +60 ft msl are reduced by the pressure of approximately 5.5 ksf of excavated overburden (40-50 ft of soil). Furthermore, all Seismic Category I structures are founded on dense granular soils and hard Pascagoula clays. Most of the settlement occurs almost immediately in the granular soils and the hard overconsolidated Pascagoula clays. None of the loadings exceed the preconsolidation pressure of the clays. Even the heaviest loaded structure, the reactor building, has a net foundation pressure of only 2 ksf, whereas the difference between the preconsolidation pressure of the clays and the existing overburden pressure is at least 10 ksf. Total settlements of major structures are evaluated at points of interest using elastic theory. The analysis accounts for the influences of adjacent loads. Elastic moduli used in the analysis are consistent with strain levels that result from static loading. Settlements of structures are monitored as described in Section 2.5.4.13.

A comparison of the results of the settlement monitoring program with the predicted settlements from the elastic theory analysis is presented in Section 2.5.4.13.

The stresses and deformations associated with the excavation, dewatering, and backfill operations have been calculated by analysis utilizing the finite element program FEECON(83). This program computes the stresses and deformations within continuous bodies due to internal and external loads acting on the body.

The analyses were performed on a typical east-west section taken through the plant site area. The finite element grid was constructed with 469 nodes and 423 elements (Fig. 2.5-80). The behavior of the soil was simulated by using an undrained hyperbolic shear stress-strain relationship as the model for the cohesive soils and a hyperbolic axial stress-strain model for the free-draining granular soils. The possible effects of soil yielding were also considered. The analysis indicate that no yielding occurred as a result of the excavation and backfilling.

The results of consolidation effects in the Pascagoula clay were not taken into account in the computer analysis. However, deformations due to this behavior were calculated using Terzaghi's consolidation theory and included in the overall analysis.

The heave and recompression deformation patterns calculated in the analysis for the various stages of excavation and backfill are presented in Fig. 2.5-81. These data indicate the heave and recompression associated with excavation and backfill. Since the backfill is placed to elevations between +60 and +70 before foundation construction for Seismic Category I structures is commenced, only the incremental deformation for fill placement above this elevation is significant and may affect the structures. This uniform deformation pattern across the area is shown at the bottom of Fig. 2.5-81.

The foundation mats, including the reactor mat, are small relative to the overall size of the excavation and are located away from the outer limits of the excavation

(Fig. 2.5-67 and 2.5-68). Therefore the resultant deformation pattern beneath any Seismic Category I foundations due to excavation and backfill is essentially uniform.

The actual heave and recompression deformation and individual Seismic Category I foundation deformations are monitored by the instrumentation program presented in Section 2.5.4.13 and compared with predicted deformations therein.

2.5.4.11 Design Criteria

The major plant buildings were analyzed to assess their sliding and overturning stability during the SSE and OBE. The analyses included the effects of the Unit 2 excavation and ponded water levels that result from the accumulation of runoff in the Unit 2 excavation as discussed in Section 2.4. Although the groundwater level will be slightly affected by ponding, the stability analyses conservatively consider the groundwater level equal to the ponded water level to simplify the analyses.

For the sliding and overturning analyses, a structure is assumed to be driven by the seismic response of the structure and dynamic soil and water pressures. Resistance is assumed to be provided by base friction, wall friction and soil pressure, where appropriate, in the case of sliding and by the dead weight of the structure and soil pressure, where appropriate, in the case of overturning. In no case is deflection considered to mobilize full passive pressure as a resisting force, since many of the structures will have a shake space adjacent to them (for seismic isolation from other structures), full passive soil pressure is not relied upon for resistance in this stability analysis. The compacted sand backfill was modeled with a friction angle of 36 deg and no cohesion. Test results on the backfill indicate this friction angle to be conservative (refer to Fig. 2.5-74 and to Report on Engineering Characteristics of Granular Fill(77)). The friction angle for backfill against formed concrete is taken as 50 percent of the soil friction angle. The base friction angle for concrete poured on compacted fill was taken as the soil friction angle reduced in accordance with the laboratory test results of Potyondy(84), except in the case of the service water tunnel where the coefficient of friction was taken as 0.55. For the sliding analysis, the base shear resistance is based on the effective stress during the seismic event.

The seismic responses of the structures are the results of the dynamic analyses described in Section 3.7.2. The seismic structural analyses were made for the SSE and OBE cases for soil shear moduli of 12, 18, and 24 ksi. The dynamic analyses provide the axial forces, shear forces, moments, and the three components of acceleration at the foundation level. From these data, the forces and moments acting at the base of the foundations were computed. The critical sliding or overturning situation for a given structure is then based on the least favorable direction of the earthquake in combination with the least favorable soil shear modulus.

For the stability analysis, the soil- and water-driving pressures were computed as shown on Fig. 2.5-79 except for the analysis of the service water tunnel. Toward the east end of this tunnel, the backfill is placed to the same elevation on the north and south sides of the tunnel. Therefore, it is assumed that at-rest earth pressures act near the east end of the tunnel. Toward the west end of the tunnel, the backfill on the north side is 28 ft higher than the backfill on the south side. It is assumed that near the west end of the tunnel sufficient movement of the tunnel occurs to reduce driving earth pressure from at-rest to a condition that approaches active earth pressure (K = 0.25). In order to approximate driving earth pressure under this assumption, a lateral earth pressure coefficient of K = 0.45 is used only for 100 ft at the east end of the tunnel and a coefficient of K = 0.35 is used for the remaining length on the north side of the tunnel. On the south side of the tunnel, a coefficient of K = 0.45 is used throughout the length of the tunnel. Note that the increased K due to compaction was included for the at-rest condition. Dynamic water pressures were evaluated according to Westergaard(85). The dynamic soil pressures are calculated as suggested by Seed and Whitman(86).

The static load per foot of wall expression (Fig. 2.5-79) is derived by computing the area of the leftmost pressure distribution:

Area of triangular portion Area of trapezoidal portion

$$\frac{H_1 - H_2}{2} K_0 \gamma_T Z_W \quad + \quad \frac{H_2}{2} [K_0 \gamma_T Z_W + K_0(\gamma_T H_1 - \gamma_W H_2)]$$

Since

$$Z_W = H_1 - H_2,$$

this simplifies to become

$$\frac{K_0}{2} \left[H_1^2\gamma_T - H_2^2\gamma_W\right]$$

The dynamic increment of soil load per foot of wall is a modification of the static load by the ratio

$$\frac{K_{AE}}{K_{STATIC}}$$

per Seed and Whitman (1970)(86).

Standing water is ignored in computing soil loads since effective soil stress is independent of standing water. The static water load per foot of wall corresponds to the area of the triangle shown. The base is the hydrostatic pressure at the base of the wall or $H_2\gamma_w$, and the height is H_2. The resulting load is $1/2(\gamma_w H_2^2)$. The expression for dynamic water force per foot of wall is found in Seed and Whitman (1970)(86), modified by statement (b), page 127.

For sliding and overturning, the factor of safety is taken as the ratio of the sum of the resisting forces (or moments) to the sum of the driving forces (or moments) due to the structural response and the seismic soil and water pressures.

Section 3.8.5 specifies that, for sliding and overturning, the minimum required factors of safety are 1.1 for SSE and 1.5 for OBE. The results of the sliding and overturning analysis are presented in Table 2.5-16, which is a listing of the calculated factors of safety. Note that even with the conservative loading conditions and soil properties used in the analysis, all factors of safety for overturning are above 1.8 and all those for sliding are above 1.7. All major structures have adequate sliding and overturning stability for OBE and SSE loading.

The stability of the major structures against flotation was evaluated by comparing maximum buoyant pressure during PMF with total average distributed dead load for a given structure. Table 2.5-17 lists both of these quantities and the ratio of the two. The lowest factor of safety against flotation is 2.6, well above the minimum acceptable of 1.1

which is set forth in Section 3.8.5. Hence, flotation is not a realistic possibility for the plant structures, even under flood conditions.

2.5.4.12 Techniques to Improve Subsurface Conditions

The only techniques used to improve subsurface conditions were the excavation and backfill beneath all Seismic Category I structures (Section 2.5.4.5). In addition, the surface of the excavation was thoroughly compacted with the same vibratory equipment planned for the fill before any backfill was placed.

2.5.4.13 Subsurface Instrumentation

The instrumentation program is intended to measure the magnitude and distribution of vertical soil movements caused by unloading of the foundation soils during excavation and by settlement or reconsolidation of these soils during and subsequent to placement of the structural backfill and foundation loads. The locations of instruments have been chosen to measure both the vertical and horizontal distribution of soil movements, permitting construction of profiles of vertical movements.

The information obtained from this program is used to assess the changes in the subsoils caused by excavation and backfilling, the effects of these changes on the structural foundations, and the long term time-dependent behavior of the foundations.

2.5.4.13.1 Instrumentation Systems

The program consists of a system of benchmarks, soil extensometers, telltale or settlement rods, and settlement markers. The data from these various installations are supplemented by groundwater level monitoring piezometers and observation wells described in Section 2.4.13.

2.5.4.13.1.1 Benchmarks

A system of permanent benchmarks is located around the site area for the purpose of maintaining vertical control. Three remote benchmarks are positioned away from the main plant excavation to ensure that they are not influenced by ground movements associated with the construction. These benchmarks are tied by first order survey to the National Geodetic Survey (NGS) benchmark system.

In addition to the remote locations, a series of benchmarks are positioned around the main plant excavation. These benchmarks are used for day-to-day vertical control and to monitor plant area movement relative to the remote benchmarks. Fig. 2.5-82 shows the locations of all permanent benchmarks. The remote benchmarks consist of a brass rod driven into the ground to refusal surrounded by a steel casing with cap. The plant area benchmarks consist of a stamped brass plug embedded in a concrete pad. Benchmark elevations are monitored by first level survey.

2.5.4.13.1.2 Soil Extensometers and Telltale Rods

Seven multiple-position rebound extensometers are located along the approximate centerlines of the main plant excavation area as shown on Fig. 2.5-83. Three instruments are located at the top of the east, north, and west slopes (E1, E7, and E3), one near the bottom of the east slope (E5), one at the middle of the north slope (E6), and two within the excavation (E2 and E4). Although no instruments are located specifically at the center of the excavation, the results of the finite element analyses indicate that instruments E2 and E4 are far enough from the excavation slopes so as to be unaffected by the stress variation near the toe. Thus, locations E2 and E4 are representative of conditions at the center of the excavation.

Each extensometer is comprised of a common basal anchor and three sensors. All basal anchors are set at a depth of over 300 ft (el -200) in the tertiary clay deposit as shown in Fig. 2.5-84. The individual sensors for each instrument are typically set at the top of the tertiary clay (el -45), at the midpoint of the founding sand stratum (el -15), and within 5 ft of the bottom of the excavation (el +15).

The basal anchors are mechanically fastened and grouted in place at the bottom of a 6-in OD borehole.

Hydraulically expandable metal bladders (coiled tubing) are used to provide the mechanical anchorage.

Each of the three sensors is secured in position at the various depths below the excavation by a pair of the bladder-type anchors. The borehole is grouted to the surface with a very weak mix consisting of three parts hydrated lime and one part Portland cement. The weak mix permits easy expansion or compression of the grout column thereby eliminating interference with sensor movement. The sensors themselves are precision linear potentiometers with an 18-in total range of movement and are preset to their midpoints prior to anchorage. The potentiometer element is anchored to the soil and moves in relation to the wiper rod which is connected to the basal anchor. Hence, all movements are measured with respect to the basal anchor. The sensors are read electronically, with an accuracy of 10^{-2} in, at the surface using a portable readout instrument via a signal cable extending from the sensor to the ground surface encased in PVC tube. The plastic pipe and signal cable are shortened or lengthened as required during the excavation and backfilling. The entire system is sealed against moisture intrusion and all tubing filled with a nonconductive oil.

Because significant strain is expected to originate from strata below the basal anchor at el -200 ft, telltale rods encased in PVC risers are attached to the basal anchors. The telltale consists of 0.25-in stainless steel rods extending from the basal anchor to the ground surface. First-order level surveys from distant benchmarks are used to monitor the movement of the basal anchor with an accuracy of approximately 0.02 in. Above the final excavation level, the rods are machined to 5.000-ft length and are removed or attached as required.

2.5.4.13.1.3 Settlement Markers

There are two types of settlement markers used to monitor building settlements, a 6- to 12-in square x 1/2-in steel plate with a vertical 1-in diameter bar placed in the foundation mats, and embedment plates installed in the exterior face of the finished walls. Locations of the settlement markers are shown on Fig. 2.5-85.

Initially, the settlement markers consist of the metal plates with risers placed on the soil or mud mat at the founding grade. The risers extend above the top of the concrete mat. These markers were used until the mats of the structures were poured, after which embedment plates were installed on the exterior face of the buildings. Due to the changing level of backfill at the building face, a number of the embedment plates are installed extending up the face to a point above the finished plate grade. Settlement markers are monitored by first-order level survey.

2.5.4.13.2 Monitoring Results

2.5.4.13.2.1 Extensometer Monitoring Results

Fig. 2.5-86 through 2.5-88 present typical results of the deformation measurements of the extensometers plotted versus time together with plots of ground-water and excavation elevation to provide a complete representation of the construction effects and foundation response. The measurements show good response to the construction activities. Initiation of movements corresponds to start of activities (or load steps) and rates of movement accelerate during loading and decrease upon cessation of loading. A cross section (Fig. 2.5-89) showing vertical movement across the excavation section illustrates the same shape as the plots of induced stresses lending further evidence of the general validity of the measured movements. Fig. 2.5-90 shows plots of heave versus elevation for locations E1 and E4 at the end of the excavation. It shows that:

1. Soils below el -200 account for at least three-quarters of the measured movements, and

2. As expected, the clays from el -40 to -200 contribute much more deformation than the dense sands above (from el -40 to +20).

Fig. 2.5-86 through 2.5-88 which present measured deformations and construction history also show computed estimates of movement for comparison. The estimates, developed from analysis described in Section 2.5.4.10, represent the sum of initial and consolidation deformations.

Initial examination reveals that the overall computed estimates generally follow the shape of the measured data and respond to the stress changes induced by the construction; i.e., both estimated and measured movements show heave during excavation and settlement during backfill.

The plots show a good level of agreement. All measured deformations are less than the plots representing initial (ρ_i) plus 100 percent (final) consolidation (ρ_{cf}) heave ($\rho_i + \rho_{cf}$) indicating that reloading (backfilling) occurred prior to complete consolidation heave. The detailed estimates ($\rho_i + \rho_c$), which account for partial consolidation, generally follow the measured data through the stripping, dewatering, excavation, and backfilling stages of construction showing excellent agreement.

Concentrating on instrument locations E2 and E4 within the excavation where the majority of the stress changes occur, the plots show that the estimates of final consolidation and measured deformation agree closely at the end of 1978. The measurements also show little movement during recharge. Both these facts infer that actual consolidation may be nearly complete.

The detailed estimates, however, indicate greater net movements than measured at the end of 1978. The detailed estimates also slightly underestimate the maximum heave. It is reasoned that if the rate of consolidation were increased in the analysis, the estimate would more closely follow the plots of measured deformation and lie between the detailed estimate and the 100 percent consolidation estimate. From these comparisons it is concluded that the behavior of the foundation soils during excavation and backfilling was as expected. The theoretical analysis, soil modeling, and soil parameters used in the analysis were sufficient to define the behavior. The foundation soils are expected to continue to behave in a manner consistent with the design assumptions.

2.5.4.13.2.2 Category I Structure Settlement Monitoring Results

The results of the ongoing Category I structure settlement monitoring program are shown on Figures 2.5-98 through 2.5-106. Figure 2.5-106a shows the location of settlement markers in the Unit 1 area. These settlement history plots are presented on a building-by-building basis. All markers for a given structure are included on the plot for the structure. Each plot shows the date of completion of the structure's roof. Although the percentage of load in place at that time varies with each structure, the roof completion date may be taken as indicating the time at which approximately 90 percent of load was in place.

The plots indicate that most of the settlement occurred during the time period in which there was relatively rapid application of load. By the end of 1983 (Day 1187), when most of the loading (structural and backfill) was in-place, the plots generally show a leveling-off in the rate of settlement. The observed magnitudes and time rates of settlement indicate that the estimated values are conservative and that the performance of the foundation systems is satisfactory. Furthermore, the settlement history plots all show a general flattening which indicates that the additional settlement due to secondary compression will be small. This is consistent with conclusions drawn by Swiger (Ref. 102) that secondary compression will be small where material has been preloaded to values in excess of the structure load. Based on information provided in Section 2.5.4.2.5, the natural material in the site area has experienced a geologic preload in excess of the present loadings. Additionally, the engineered backfill experienced heavy preloading during compaction. Consequently, it is expected that secondary compression effects will be small, and the observed settlement of plant structures confirms this position.

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A comparison of predicted and measured values for total settlement of Seismic Category I structures is shown on Table 2.5-19. In all cases, the measured values are less than the totalpredicted. A conparison of predicted and measured differential settlements is shown on Table 2.5-20. For all points of interest, measured differentials ate within the predicted range.

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As can be seen from Table 2.5-19, both predicted and measured settlements are essentially uniform across the plant site. This is expected because of the extensive zone of influence of the main excavation area. As is shown in Section 2.5.14.13.2.1, approximately 75 percent of the movement that occurred during the excavation and backfilling operation through 1978 was attributable to strain of the soils below elevation 200 ft. Similarly it is expected that the majority of settlement in the plant area will be the result of strain in the deep soils. Consequently, it is anticipated that differential settlement between adjacent points in the plant area will be small.

This hypothesis is confirmed by the values for measured differential settlement presented in Table 2.5-20. In the case of directly buried Seismic Category I piping, no significant differential settlement between a building and the surrounding soil is expected. Since settlement is a result of strain in the deeper soils, settlement of the soil adjacent to a building will take place essentially as the building settles.

This may be demonstrated by examining the settlement records for BF tunnel (Figure 2.5-103). BF tunnel exerts a bearing pressure of approximately 2.3 ksf at an average elevation of 65 ft msl. The load that would be exerted by an equivalent volume of backfill is approximately 3.6 ksf. As shown in Table 2.5-17, bearing pressures for the fuel, diesel generator, and reactor buildings vary from 6 to 8 ksf.

Figure 2.5-103 shows that settlement of the BF tunnel (markers 9 and 10) has been essentially uniform. The differential settlement over the length of the tunnel is 0.24 in. In the period between September 1981 and January 1985, markers 9 and 10 settled approximately 0.61 in. and 0.84 in., respectively. In the same period of time, the west side of the diesel generator building, markers 3 and 4 (Figure 2.5-98) settled 0.62 and 1.02 in., respectively, and marker 12 on the east side of the fuel building (Figure 2.5-101) settled 1.08 in. The differential settlement between the east end of BF tunnel and the diesel generator building may be computed as the difference between the average settlements of markers 3 and 4 and the settlement at marker 9, or (0.62 + 1.02)/2 - 0.61 = 0.21 in. Between the west end of BF tunnel and the fuel building, differential settlement is 1.08 - 0.84 = 0.24 in.

Predicted differential settlement can be determined using the values presented in Table 2.5-19 and the observed settlements as of September 1981. For markers 3 and 4, the the observed settlements in September 1981 were 1.6 in and 1.5 in, respectively. Settlement remaining after September 1981 is therefore the predicted total minus the measurement, or 3.8 - 1.6 = 2.2 in for marker 3 and 4.0 -1.5 = 2.5 in for marker 4. The average for markers 3 and 4 is 2.35 in.

For marker 9, settlement remaining after September 1981 equals total settlement or 2.4 in. Therefore, predicted differential settlement equals 2.4 - 2.35 = 0.05 in, which compares favorably with the observed differential settlement of 0.31 in.

Similarly for marker 12, settlement remaining after September 1981 is 4.5 - 1.5 = 3.0 in. For marker 10, post-September 1981 settlement equals total settlement or 3.0 in. Predicted differential therefore equals zero, which compares favorably with 0.27 in observed differential.

In the case of the remote air intake line HVC-018-7-3 (Figure 2.5-107), similar behavior may be expected. As shown on Figure 2.5-107, sheet 2, the soil profile below this line is equivalent to the soil profile below BF tunnel. Predicted settlement for a point on the line 50 ft east of the fuel building has been calculated as 3.9 in. As shown on Table 2.5-19, predicted total settlement is 2.4 in for marker 9 and 4.1 in for marker 11. The predicted settlement for marker 9, however, includes a correction for construction schedule. Settlement readings were initiated in September 1981 for marker 9 as compared to March 1980 for adjacent marker 3. Between March 1980 and September 1981, the settlement at marker 3 was 1.6 in. This value was deducted from the prediction for marker 9 so that a more meaningful comparison between observation and prediction could be made. Similar corrections were made to the predictions for markers 10, 38, 29, 33, and 34 for which initial readings were delayed in relation to other markers due to construction schedule.

The uncorrected prediction of total settlement at marker 9 is 2.4 + 1.6 = 4.0 in. Maximum differential settlement between marker 9 and a point on the remote air intake line 50 ft from the fuel building is 4.1 - 3.9 = 0.2 in. Maximum differential settlement between the same point on the remote air intake and marker 9 is 4.1 - 4.0 = 0.1 in. In both cases, the structure moves down relative to the pipe. To account for uncertainties in the analysis, the pipe is designed for 0.5 in. of differential settlement.

Given the good agreement between the prediction and the observation of settlement of BF tunnel and the similarity of soil profiles and loadings between BF tunnel and the remote air intake, it is concluded that predicted differential settlement is a conservative estimate of the real differential settlement. Consequently, differential settlement between buried pipes and structures is not monitored.

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RBS will continue to monitor deformations on a quarterly basis until there is essentially no evidence of settlement for 3 successive quarters or until construction is complete, whichever is longer. No evidence of settlement shall mean no movement greater than the allowable tolerances for a first order level survey. Once no evidence of settlement has been achieved, a confirmatory program of monitoring will be initiated. This confirmatory program will monitor one marker on each Seismic Category I building on a once-per-2-yr basis for the first 10 yr.

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After any seismic event greater than or equal to an operating basis earthquake (OBE) an additional set of confirmatory readings will be taken.

Settlement monitoring is performed as described above. The results of this program will be used to verify that actual settlements do not result in excessive differential settlements between structures.

2.5.4.14 Construction Notes

Problems associated with compaction control for the Seismic Category I backfill are as described in detail in Section 2.5.4.5. There were no other significant problems during construction.

2.5.5 Stability of Slopes

The slopes in the site area are the cut slopes around the immediate plant site (from plant grade to the surrounding original ground surface), the cut slopes in the Unit 2 excavation area, the backfill slopes between Unit 1 and the Unit 2 excavation, and those along Grants Bayou and its seasonal tributaries.

Section 2.5.5.1 describes slopes in the site area excluding those slopes in the immediate vicinity of the Unit 2 excavation. Section 2.5.5.2 describes the slopes that result from the cancellation of construction on Unit 2.

2.5.5.1 Plant Area Slopes

2.5.5.1.1 Slope Characteristics

The permanent slopes adjacent to the plant are shown in plan on Fig. 2.5-91 and in cross section on Fig. 2.5-92. The slopes along Grants Bayou and its tributaries are shown by the contours on Fig. 2.5-91 and by the survey cross sections on Fig. 2.5-93.

The relationship of the original topography to finish grade and to plant structure locations is shown on Fig. 2.5-91 and 2.5-92, cross sections X-X' and Y-Y'.

Both field and laboratory information is available for the soils composing the plant area slopes. Fig. 2.5-23 and 2.5-24 are boring location plans. Test boring information is included on Fig. 2.5-53 through 2.5-65 and in Appendix 2H. Table 2.5-8 is a summary of Atterberg limits testing for the loessal deposits and the Port Hickey topstratum silts and clays. Sieve analysis results are shown on Fig. 2.5-50 through 2.5-52.

The soil stratigraphy for the cut slopes surrounding the site is shown on Fig. 2.5-28 and 2.5-29. The soil stratigraphy and properties are described in Section 2.5.4.2.

2.5.5.1.2 Design Criteria and Analyses

The maximum groundwater level within the cut slopes around the plant site, coincident with the SSE, has been conservatively estimated at el 68.7 ft msl (Section 2.4). The cut slopes have an overall maximum height of 30 ft, which occurs only to the north of the plant site. The slopes are cut at a slope of three horizontal to one vertical. This corresponds to a slope of 18 deg with the horizontal. The overall distance between the top of the slope to the north and the nearest Seismic Category I structure is 480 ft. The cut slope west of the plant is 900 ft from the nearest Seismic Category I structure.

The stability of the slope to the north of the plant was evaluated both for static conditions and under the SSE loading. For the dynamic analysis, it was conservatively assumed that a 20-ft thick layer of fine sand and clayey sand below the water table might liquefy. The analysis showed that even if this should happen, the shearing resistance of the soil above the liquefied zone would be sufficient to preclude major ground movement, and thus prevent a lateral movement of the soil mass into the plant area. Liquefaction, if it were to occur, could cause settlement and cracking within the slope and sand boils. However, this would not present any hazard to the plant.

The static and dynamic analyses for the slope to the north of the plant was based on computer-assisted simplified Bishop and Morgenstern-Price methods (Lease II). Since an extensive liquefied zone was postulated for the dynamic case, and since the simplified Bishop Method is more applicable to circular-type failure geometries which are typical for the static case, the Morgenstern-Price method was used to model the sliding-block or wedge-type geometry.

The slope geometry, including the failure surface, is presented in Fig. 2.5-94 together with the soil parameters used in the analyses. The soil unit weights and friction angles shown on Fig. 2.5-94 are based on the field and lab testing described in Section 2.5.4.2. The resulting factors of safety are 1.3 for SSE loading with the conservative assumption of a liquefied layer and greater than 5 for the static case. In summary, even considering SSE loading and assuming liquefaction, the permanent slopes remain stable. Analyses were also done for the temporary excavated construction slopes using the stability number method. This provided a conservative stability estimate for these relatively homogeneous, slightly cohesive slopes. The analyses indicated that the slopes had more than adequate stability. No excavation slope failures occurred during construction. These excavation slopes are shown on Fig. 2.5-72.

Cross sections of the valley of Grants Bayou are presented in Fig. 2.5-93. It can be seen that except for the small channel of the present stream in the bottom of the valley, the slopes are very shallow, generally flatter than 20:1. The stream bed in the reach of the bayou adjacent to the plant site is above el +70 ft msl, indicating that the groundwater flow is generally from the stream to the terrace aquifer.

It was conservatively assumed that the small channel in the bottom of the valley would be filled by landslides, either due to static instability or due to SSE liquefaction of any low density layers of fine sand and clayey fine sand below the water table. This is is a conservative assumption since a large portion of the soil mass of the slopes is above the water table and the overall valley slopes are very flat; hence, flow slides are not probable. In the event of a recurrence of the maximum historic earthquake, as discussed in Section 2.5.1.2.8, liquefaction would not take place and hence blockage of the valley by landslides would not occur. Nevertheless, for design purposes a partial blockage of the Grants Bayou valley was assumed. This blockage is based on an assumed soil displacement such that no slopes would remain shallower than 20:1. The blockage condition is shown in Fig. 2.5-94. A similar blockage was assumed for West Creek. These assumed blockages would have no effect on the plant except as it relates to the site flooding discussed in Section 2.4.4.

2.5.5.2 Unit 2 Excavation Slopes

2.5.5.2.1 Slope Characteristics

The slopes and berm location in the Unit 2 excavation are shown in plan on Fig. 2.5-72a. The slopes located to the north, west, and south of the Unit 2 area are cut slopes in natural soils. The slopes located east of the Unit 2 area are constructed of backfill.

Laboratory test data for the backfill soils are described in Section 2.5.4.5, Appendix 2M, and Fig. 2.5-74. Information for the natural soils is located as described in Section 2.5.5.1.1.

The soil stratigraphy for the cut slopes surrounding the Unit 2 excavation is shown on Figs. 2.5-28 and 2.5-29. As described in Section 2.4, a berm is used to control the ponded water levels in the Unit 2 excavation. For the 1/2 PMP + OBE and for the 1/2 PMP followed by the PMP (which is considered without a seismic event) the berm is required in order to maintain a ponded water level below the design basis ponding level (el 80 ft msl) in the excavation. However, the berm is not required to be stable under the SSE because analysis of the 25-yr rainfall event + SSE without the berm in place indicates that a maximum ponded water level of el 69.5 ft msl would result in the Unit 2 excavation. Should an SSE result in disruption of the berm, the berm will be restored.

The backfill slopes were analyzed for the following combinations of seismic events and ponded water levels:

Static	Ponded water to el 80 ft msl
OBE	Ponded water to el 73 ft msl
SSE	Ponded water to el 68.7 ft msl

As described later in this section, site flooding studies have been revised to show a slightly lower water level for the OBE case. Analysis of the backfill slopes was not revised to reflect this change since the water levels used are conservative.

For the stability analyses of the backfill slopes, the level of groundwater is conservatively assumed to equal the level of ponded water. In reality, this does not occur. Since the normal groundwater level is 8 ft or more below the bottom of the Unit 2 area, ponded water tends to infiltrate vertically until a mound of groundwater is formed on the top of the normal water table. The height of the groundwater mound attenuates with distance from the excavation and, hence, is always less than the ponded height. For slope stability analysis it is conservative to assume that the groundwater level equals the level of ponding for two reasons. First, the real unbalanced hydrostatic force acts toward the slope tending to resist sliding. Second, seepage into the slope creates seepage forces that also tend to stabilize the slopes. The analyses of the Unit 2 backfill slopes conservatively does not consider these stabilizing influences.

The approach used to model water levels in the analysis of the cut slopes differs somewhat from the approach described above for the backfill slopes. As described in Section 2.4, maximum ponded water level is calculated assuming that no seepage out of the Unit 2 excavation occurs during the event. If seepage is considered, the maximum calculated water level in the excavation is reduced significantly.

In the static stability analysis of the cut slopes, both seepage and no seepage have been analyzed. For the no seepage case, groundwater is taken at its normal level of elevation +57 ft, with ponded water to elevation +80 ft in the excavation. In this case, soil between the groundwater and ponded water is not saturated. As a result, the ponded water has a stabilizing influence on the slopes. For the seepage case, the groundwater level is assumed equal to the level of ponding in the excavation. This assumption results in a lower factor of safety.

For OBE and SSE analyses, groundwater level is taken equal to the maximum ponding level assuming no seepage.

The cut slopes in the Unit 2 area were analyzed for the following combinations of seismic events and water levels:

Case	Ponded Water Level	Groundwater Level
Static (no seepage)	el 80 ft	el 57 ft
Static (no seepage)	el 73 ft	el 73 ft
OBE	el 70 ft	el 70 ft
SSE	el 69 ft	el 69 ft

2.5.5.2.2 Design Criteria and Analyses

The static and dynamic analyses for slopes in the Unit 2 area were based on computer-assisted simplified Bishop and Morgenstern-Price methods (LEASE II). The simplified Bishop Method was used to analyze the slopes east of Unit 2, which are constructed of backfill and are reasonably homogeneous, and the face of the west excavation slope. The Morgenstern-Price Method was used to model the sliding-block geometry, which is appropriate where a weak layer can be postulated, as for the cut slopes.

In the case of the cut slopes, either the massive failure of the west slope or a localized failure of the slope face could impact the safe operation of Unit 1. A massive failure of the west slope would impact the safety of Unit 1 if West Creek was breached and its flow diverted into the excavation. Similarly, if a localized slope failure breached the berm, the drainage characteristics of the site would be altered, creating the possibility of excessive ponding in the excavation. Therefore, these events were analyzed to show that:

1. A massive failure of the west slope does not occur under static, OBE, or SSE conditions.

2. The berm is not breached under static or OBE conditions.

For analysis of cut slopes, the effect of the berm constructed to elevation +98 ft is included. Surcharge loads at the top of the slopes will take one of two possible forms:

1. Live load due to traffic on roadways, or

2. Live load due to water ponded to elevation +98 ft.

Since the load imposed from Case 2 exceeds that from Case 1, loads due to traffic on adjacent roadways were not included in the analyses. Cut slopes were analyzed considering the surcharge due to water ponded to elevation +98 ft behind the berm.

In order to evaluate stability of the cut slopes, it was necessary to evaluate the potential for liquefaction of the natural soils. This was accomplished by comparing the results of standard penetration testing to acceptance criteria established using the method of Seed and Idriss(75) previously described in Section 2.5.4.8. Seventeen borings (209 through 214 and 218 through 230) are located between West Creek and the west slope of the Unit 2 excavation. In these borings between the elevations 30 and 65 ft msl, approximately 120 standard penetration (blowcount) tests were performed. All blowcounts exceeded the Seed and Idriss criteria for the OBE. For the SSE, all but six of the blowcounts exceeded the Seed and Idriss criteria. Of those six, two were associated with cohesive material and, therefore, are not indicative of liquefaction. It was concluded that liquefaction of a continuous soil layer would not occur during an OBE and is highly unlikely during an SSE.

The impact of liquefaction of localized inclusions of loose sand was evaluated in the SSE stability calculations by varying the strength parameters for soils below el 40 and 50 ft msl. Cut slopes were analyzed using angle of internal friction values of 10 deg, 20 deg, and 35 deg for soil in that zone which corresponds to approximately 75 percent, 50 percent, and 0 percent liquefaction, respectively. Fig. 2.5-72b shows the geometry that was used to model the west slope.

Since all blowcounts exceeded the Seed and Idriss criteria for the OBE, no liquefaction was postulated in the OBE analysis.

Since the berm is not required during a 25-yr storm + SSE, the berm is located so that it is stable during the OBE. The berm location based on the OBE analysis is then used in subsequent analyses of slope stability.

The local stability of the face of the cut slopes under the OBE loading was evaluated using the simplified Bishop Method. The geometry analysed and typical results of the computerized calculation are shown on Fig. 2.5-72d. Also shown in that figure is the factor of safety against an infinite slope failure under all loading conditions. A supplementary analysis was performed on the cut slopes to evaluate the impact of slope erosion on stability. The geometry analyzed, and the results of the analysis, are shown on Fig. 2.5-72e. The soil in the designated eroded zone is modeled in the calculations as having 50 percent of its normal unit weight to account for loss of material by erosion. It is concluded that the face of cut slopes is stable under the OBE and static conditions. Under SSE loading, analysis shows instability at the face of the slope which may breach the berm. However, as stated in Section 2.5.5.2.1, safe operation of Unit 1 would not be affected.

The slopes located east of Unit 2 were analyzed using the simplified Bishop Method. Since these slopes are constructed of engineered backfill as described in Section 2.5.4.5.3, no liquefaction was postulated. The geometry analyzed and typical results of the computerized calculation are shown on Fig. 2.5-72c. In general, for trial circles at the same center, the factor of safety decreases with decreasing radius, indicating that the critical factor of safety corresponds to an infinite slope type failure. Analysis of the infinite slope problem under SSE loading gives a factor of safety of 1.12 which corresponds to minor surficial sloughing at the face of the slope. This analysis is based on a friction angle of the backfill material equal to 36 deg. Laboratory testing of backfill samples (Appendix 2M - Triaxial S Tests) indicate that for backfill compacted to 89 percent relative density a friction angle of 42 deg can be justified. Using a friction angle of 42 deg in the infinite slope analysis results in a factor of safety of approximately 1.4. Failure surfaces large enough to breach the berm have factors of safety in excess of 3. It is concluded that the backfill slopes east of the Unit 2 excavation are stable.

The massive stability of the west slope was evaluated using the Morgenstern-Price Method. In this case, the critical factor of safety corresponds to the SSE loading; therefore, results are presented only for the SSE case.

Given the adequate factors of safety for these two conditions, it is concluded that the safe operation of Unit 1 is not impacted by the slopes associated with the Unit 2 excavation. The results of the Morgenstern-Price analysis for SSE loading are summarized on Fig. 2.5-72b. The analysis shows that for the extremely unlikely event of liquefaction of 75 percent of the soils at el 50 ft msl (corresponding to ∅III = 10 deg) the factor of safety against sliding is approximately 1.3. Given the conservatism of the analysis that results in a factor of safety of 1.3, it is concluded that the cut slopes of the Unit 2 area are stable.

2.5.5.3 Logs of Borings

Soil investigations, borings, and testing are described in Sections 2.5.4.2 and 2.5.4.3.

2.5.5.4 Compacted Fill

The only slopes in the plant area are in natural soils.

2.5.6 Embankments and Dams

There are no earth, rock, or earth and rock fill embankments used for plant flood protection or for impounding cooling water required for the operation of the plant.

References - 2.5

1. Murray, G.E. Geology of the Atlantic and Gulf Coastal Province of North America. Harper and Bros., New York, NY, 1961.

2. Fisk, H.N. Geological Investigation of the Alluvial Valley of the Lower Mississippi River. Mississippi River Commission, U.S. Army Corps of Engineers, December 1944.

3. Scott, K.R.; Hayes, W.E.; and Fietz, R.P. Geology of the Eagle Mills Formation. Transactions Gulf Coast Association of Geological Societies, Vol. 11, 1961, p 1-13.

4. Matson, G.C. The Pliocene Citronelle Formation. U.S. Geological Survey Professional Paper No. 98, 1916, p 167-191.

5. Doering, J.A. Citronelle Age Problem. Bulletin of the American Association of Petroleum Geologists, Vol. 42, No. 4, April 1958, p 764-786.

6. Snowden, J.O., Jr. and Priddy, R.R. Loess Investigations in Mississippi. Mississippi Geological, Economic and Topographical Survey Bulletin 111, 1968.

7. Saucier, R.T. Recent Geomorphic History of the Ponchartrain Basin. Louisiana State University Studies, Coastal Studies Series No. 9, Baton Rouge, LA, 1963.

8. Howe, H.V. Louisiana Petroleum Stratigraphy. Louisiana Department of Conservation, Bulletin No. 27, 1936.

9. Eargle, D.H. and Herbst, E.L. Regional Geology and the Salmon Event. Proceedings of the Symposium on the Geology and Technology of Gulf Coast Salt. Louisiana State University, Baton Rouge, LA, May 1967, p 87-107.

10. Fisk, H.N. Depositional Terrace Slopes in Louisiana. Journal of Geomorphology, Vol. 2, No. 3, 1939, p 181-199.

11. Durham, C.O. Jr.; Moore, C.H. Jr.; and Parsons, B. An Agnostic View of the Terraces: Natchez to New Orleans. Geological Society of America Field Trip Guidebook. New Orleans, LA, 1967, p E1-E22.

12. Frye, J.C.; Willman, H.B.; Rubin M.; and Black, R.F. Definition of Wisconsinan Stage. U.S. Geological Survey Bulletin 1274-E, Contributions to Stratigraphy, 1968.

13. Kolb, C.R. and Steinrude, W.B. Jr. Geological Notes on Vicksburg and Vicinity. Geological Society of America Field Trip Guidebook. New Orleans, LA, 1967, p B1-B14.

14. Zietz, I. and Kirby, J.R. Transcontinental Geophysical Survey (35°-39°N) Magnetic Map from 87° to 100° W. Longitude, Map I-534A. U.S. Geological Survey, 1968.

15. Seismic VIBROSEIS survey conducted by Petty-Ray Geophysical, Inc., 1973. (VIBROSEIS is a registered trademark of Continental Oil Company.)

16. Oxley, E.M. and Ridgeway, J.M. A study of the Jurassic Sediments in Portions of Mississippi and Alabama. Transactions Gulf Coast Association of Geological Societies, Vol. 17, 1967, p 24-48.

17. Warren, D.H.; Healy, J.H.; and Jackson, W.H. Crustal Seismic Measurements in Southern Mississippi, Journal of Geophysical Research, Vol. 71, No. 14, July 15, 1966, p 3437-3458.

18. Durham, C.O., Jr. Iron Ore of Central North Louisiana. State Department of Conservation, Geological Bulletin 41, November 1964, p 11.

19. Heyl, A.V.; Brock, M.R.; Jolly, J.L.; and Wells, C.L. Regional Structure at the Southeast Missouri and Illinois-Kentucky Mineral District. U.S. Geological Survey Bulletin 1202B, Plate 2, 1965.

20. Fuller, M.L. The New Madrid Earthquake. U.S. Geological Survey Bulletin 494, 1912.

21. Durham, C.O., Jr. and Peeples, E.M., III. Pleistocene Fault Zone in Southeastern Louisiana. Transactions Gulf Coast Association of Geological Societies, Abstracts, Vol. 5, 1956, p 65-66.

22. Parsons, B.E. Geological Factors Influencing Recharge to the Baton Rouge Ground-Water Systems, with Emphasis on the Citronelle Formation. Louisiana State University, Master's Thesis, 1967.

23. Thorsen, C.E. Age of Growth Faulting in Southeast Louisiana. Transactions Gulf Coast Association of Geological Societies, Vol. 13, 1963.

24. Wintz, W.A., Jr.; Kazmann, R.G.; and Smith, C.G. Jr. Subsidence and Ground-Water Offtake in the Baton Rouge Area. Louisiana Water Resources Research Institute Bulletin 6, Louisiana State University, Baton Rouge, LA, October 1970.

25. Smith, C.G., Jr. Geohydrology of the Shallow Aquifers of Baton Rouge, Louisiana. Louisiana Water Resources Research Institute, Bulletin GT-4, Louisiana State University, October 1969.

26. Hawkins, M.E. and Jirik, C.J. Salt Domes in Texas, Louisiana, Mississippi, Alabama, and Offshore Tidelands: A Survey. U.S. Department of the Interior, Bureau of Mines, Information Circular 8313, Figure 22, 1966.

27. Tectonic Map of Gulf Coast Region U.S.A., Gulf Coast Association of Geological Societies and American Association of Petroleum Geologists, 1972.

28. Southeastern Oil Review, Jackson, MI, October 27, 1980.

29. Letter from W.A. Romans to C.O. Durham, June 11, 1974.

30. Geertsma, J. Land Subsidence Above Compacting Oil and Gas Reservoirs, Journal of Petroleum Technology, 1973, pp 734-744. (Paper presented at SPE-AIME European Spring Meeting, held in Amsterdam, May 16-18, 1972.)

31. van der Knapp, W. and van der Vlis, A.C. On the Cause of Subsidence in Oil Producing Areas, Proceedings 7th World Petroleum Cong., Mexico City, Mexico, 1967, p 3, 85.

32. Rosen, N.C. Heavy Minerals of the Citronelle Formation of the Gulf Coastal Plain. Louisiana State University, Doctoral Dissertation, 1968.

33. Rosen, N.C. Heavy Minerals and Size Analysis of the Citronelle Formation of the Gulf Coastal Plain. Journal of Sedimentary Petrology, Vol. 39, No. 4, December 1969, p 1552-1565.

34. Spicer, B.E. Characteristics of the Loess Deposits and Soils in East and West Feliciana Parishes, Louisiana. Louisiana State University, Master's Thesis, 1969.

35. Saucier, R.T. Geological Investigation of the Mississippi River Area, Artonish to Donaldsonville, Louisiana. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS, Technical Report No. 5-69-4, 1964.

36. Winner, M.D., Jr.; Forbes, M.J., Jr.; and Broussard, W.L. Water Resources of Pointe Coupee Parish, Louisiana. Louisiana Department of Conservation, Louisiana Geological Survey and U.S. Geological Survey, Water Resources Bulletin No. 11, March 1968.

37. Letter from C.O. Durham, Consulting Geologist, to R.J. Conlon, Stone & Webster Engineering Corp, Boston, MA, January 31, 1973.

38. Smith, C.G. and Kazmann, R.G. Subsidence in the Capital Area Ground Water Conservation District - An Update. Capital Area Ground Water Conservation Commission, Bulletin No. 2, March 1978.

39. Nuttli, O.W. The Mississippi Valley Earthquakes of 1811 and 1812; Intensities, Ground Motion and Magnitudes. Bulletin of the Seismological Society of America, Vol. 63, No. 1, February 1973, p 227-248.

40. Terzaghi, K. Mechanisms of Landslides. Application of Geology to Engineering Practice, Berkey Volume, Geological Society of America, 1950, p 83-123.

41. Stearns, R.G. Earthquake Damage in Lauderdale County, Tennessee. The Tennessee Conservationist, Vol. 37, 1971, p 4-5.

42. Meyerhof, G.G. The Mechanism of Flow Slides in Cohesive Soils. Geotechnique, Vol. 7, No. 41, 1957, p 9.

43. Conlon, R.J. Landslides on the Toulmestone River, Quebec. Canadian Geotechnical Journal, Vol. III, No. 3, 1966.

44. Russell, R.J. Discussion of Fort Adams Landslide. Proceedings of the Geological Society of America for 1934, Abstract, June 1935, p 58.

45. National Oceanic and Atmospheric Administration. Historical Earthquake Data File. National Geophysical and Solar Terrestrial Data Center, U.S. Department of Commerce, Boulder, CO.

46. National Oceanic and Atmospheric Administration. Earthquake History of the United States. Publication No. 41-1 (with Supplement), U.S. Department of Commerce, 1982.

47. McClain, W.C. and Myers, O.H. Seismic History and Seismicity of the Southeastern Region of the United States. Publication No. ORNL-4582, Oak Ridge National Laboratory, Oak Ridge, TN, June 1970.

48. Nuttli, O.W. The Seismicity of the Central United States. Geology in the Siting of Nuclear Power Plants, Geological Society of America, Reviews in Engineering Geology, Vol. 4, 1979, p 67-93.

49. Daily Picayune. New Orleans, LA, May 9, 1842.

50. Followill, Dr. F.E., personal communication, 1972.

51. Henley, A.D. Seismic Activity Near the Texas Gulf Coast. Association of Engineering Geologists, National Convention, Denver, CO, 1965.

52. Algermissen, S.T. Seismic Risk Studies in the United States. Proceedings of the Fourth World Conference on Earthquake Engineering, Santiago, Chile, 1969.

53. Wesson, R. Seismological Society of America Meeting, Blacksburg, Virginia, October 15-17, 1979, Geotimes, Vol. 24, No. 12, December 1979.

54. Durham, C.O., personal communication, 1970.

55. Maring, Rev. K.A., S.J., personal communication, 1972.

56. Street, R.L.; Herrmann, R.B.; and Nuttli, O.W. Earthquake Mechanics in the Central United States. Science, Vol. 184, June 1974, p 1285-1287.

57. U.S. Nuclear Regulatory Commission. Safety Evaluation of the Blue Hills Nuclear Station, Units 1 and 2. Docket Nos. 50-510/511, 1977.

58. Nuttli, O.W. Seismic Wave Attenuation and Magnitude Relationships for Eastern North America. Journal of Geophysical Research, Vol. 78, No. 5, February 1973, p 876-885.

59. Nuttli, O.W. Design Earthquakes for the Central United States. Misc. Paper S-73-1, U.S. Army Waterways Experiment Station, Vicksburg, MS, 1973, p 1-45.

60. Neumann, F. Earthquake Intensity and Related Ground Motion. University of Washington Press, Seattle WA, 1954.

61. Coulter, H.W.; Waldron, H.H.; and Devine, J.F. Seismic and Geologic Siting Considerations for Nuclear Power Facilities. Fifth World Conference on Earthquake Engineering, Rome, Italy, 1973.

62. Murphy, J.R. and O'Brien, L.J. The Correlation of Peak Ground Acceleration Amplitude with Seismic Intensity and Other Physical Parameters. Seismological Society of America Bulletin, Vol. 67, No. 3, June 1977, p 877-915.

63. Cornell, C.A. Engineering Seismic Risk Analysis. Seismological Society of America Bulletin, Vol. 58, No. 5, 1968, p 1583-1606.

64. Cornell, C.A. and Merz, H.A. A Seismic Risk Analysis of Boston. Structural Division Procedure, American Society of Civil Engineers, Vol. 101, No. ST10, 1974, p 1017-1043.

65. Merz, A.H. and Cornell, C.A. Seismic Risk Analysis Based on a Quadratic Magnitude - Frequency Law. Seismological Society of America Bulletin, Vol. 63, No. 6, 1973, p 1999-2006.

66. McGuire, R. FORTRAN Computer Program for Seismic Risk Analysis. U.S. Geological Survey Open File Report 76-67, 1976.

67. Brazee, R.J. Attenuation of Modified Mercalli Intensities with Distances for the United States East of the 106-W, Earthquake Notes, Vol. 43, 1972, p 41-52.

68. Gupta, I.N. and Nuttli, O.W. Spatial Attenuation of Intensities for Central U.S. Earthquakes. Seismological Society of America Bulletin, Vol. 66, No. 3, June 1976, p 743-751.

69. Howell, B.F., Jr.; and Schultz, T.R. Attenuation of Modified Mercalli Intensity with Distance from the Epicenter. Seismological Society of America Bulletin, Vol. 65, No. 3, June 1975, p 651-665.

70. Christian, J.T.; Borjeson, R.W.; and Tringale, P.T.; Probabilistic Evaluation of the OBE for Nuclear Plants. Preprint 2913, The Use of Probabilities in Earthquake Engineering. American Society of Civil Engineers Fall Convention and Exhibit, San Francisco, CA, October 1977.

71. Davis, G.H. and Rollo, J.R. Land Subsidence Related to Decline of Artesian Head at Baton Rouge, Lower Mississippi Valley, U.S.A. International Symposium on Land Subsidence, International Association of Scientific Hydrology, Tokyo, Japan, 1969, p 174-184.

72. Wintz, W.A.; Kazmann, R.G.; and Smith, C.G. Subsidence and Ground-Water Offtake in the Baton Rouge Area. Louisiana Water Resources Research Institute, Bulletin No. 6, Louisiana State University, Baton Rouge, LA, 1970.

73. Smith, C.G. and Kazmann, R.G. Subsidence in the Capitol Area Ground Water Conservation District - An Update. Capital Area Ground Water Conservation Commission Bulletin No. 2, March 1978.

74. Report on Land Subsidence Centered in Baton Rouge, Louisiana.

75. Seed, H.B. and Idriss, I.M. Simplified Procedure for Evaluating Soil Liquefaction Potential. Journal of the Soil Mechanics and Foundations Division, ASCE, Vol. 97, No. SM9, 1971, p 1249-1273.

76. Report on Geologic Mapping of the Excavation for Category I Structures and Buried Pipeline, submitted to NRC December 1977.

77. Report on Engineering Characteristics of Granular Fill, submitted to NRC September 1976.

78. Report on the Liquefaction Potential of the Plant Backfill, submitted to NRC February 1978.

79. Burmister, D.M. Physical, Stress-Strain and Strength Responses of Granular Soils. ASTM Special Technical Publication No. 322, 1962.

80. Seed, H.B. and Idriss, I.M. Soil Moduli and Damping Factors for Dynamic Response Analyses. University of California, Berkeley, Earthquake Engineering Research Center, Report EERC 70-10, 1970.

81. Trudeau, P.J. Shear Wave Velocity and Modulus of a Marine Clay. Journal of Boston Society of Civil Engineers, Vol. 61, No. 1, 1974.

82. Castro, G. Liquefaction and Cyclic Mobility of Saturated Sands. Journal of the Geotechnical Engineering Division, ASCE, Vol. 101, No. GT6, Proc. paper 11388, June 1975, p 551-569.

83. Christian, J.T. and La Plante, F. (1978), Finite Element Analysis of Embankment Construction (FEECON). Revised from Simon et al, 1972, Ref. No. -GT-022, Unpublished.

84. Potyondy, J.G. Skin Friction Between Various Soils and Construction Materials. Geotechnique, Vol. 11, 1961, p 331-353.

85. Westergaard, H.M. Water Pressures on Dams During Earthquakes. Trans. of ASCE, Vol. 98, 1933, p 418-433.

86. Seed, H.B. and Whitman, R.V. Design of Earth Retaining Structures for Dynamic Loads. ASCE Spec. Conf. Lateral Stresses in the Ground and the Design of Earth Retaining Structures, 1970, p 103-147.

87. Varibus Corp. Seismic Reflection Data - Proprietary.

88. Phillips Corp. Seismic Reflection Data - Proprietary.

89. Chesney, T.P.; Lewis, R.C., and Trice, M.L. Jr. Enhanced Gas Recovery from a Moderately Strong Water Drive Reservoir, Fifth Conference Geopressured-Geothermal Energy, Louisiana State University, Baton Rouge, LA, 1981, p 267-272.

90. Geer, Ernest C. and Sharer, John C. An Industry Oriented Geopressured Program, 1981 International Gas Research Conference Proceedings, p 613-620.

91. Mauk, J.; Sorrels, Gordon C., and Kimball, Billie C. Microseismiscity Associated with Development of Gulf Coast Geopressured-Geothermal Energy Wells, Fifth Conference Geopressured-Geothermal Energy, Louisiana State University, Baton Rouge, LA, 1981, p 105-108.

92. Peterson, Kim P. Structrual Geology of "Wells of Opportunity" Tested During 1980 and 1981, Fifth Conference Geopressured-Geothermal Energy, Louisiana State University, Baton Rouge, LA, 1981, p 163-170.

93. Statton, C.T.; Agnew, J.; and Houlday, M. Ground Deformation Monitoring of the Sweet Lake Geopressured Well, 1981 International Gas Research Conference Proceedings, p 1613-1627.

94. Wallace, R.H. Jr.; Wesselman, J.B.; and Kraemer, T.F. Map of the Occurrence of Geopressure in the Northern Gulf of Mexico Basin, Fifth Conference Geopressured-Geothermal Energy, Louisiana State University, Baton Rouge, LA, 1981, Pocket Inside Back Cover.

95. Broms, B. Lateral Earth Pressures Due to Compaction of Cohesionless Soils, Proceedings, Fourth Conference on Soil Mechanics, Budapest, 1971, p 373-384.

96. AMOCO Seismic Reflection Data. Proprietary.

97. Saucier, R.T. Analysis of Lineaments Using Small-Scale Remote Sensing Imagery, prepared for Stone & Webster Engineering Corporation, Cherry Hill, NJ, November 1982.

98. Algermissen, S.T.; Perkins, D.M.; Thenhaus, P.C.; Hanson, S.L.; and Bender, B.L. Probabilistic Estimates of Maximum Acceleration and Velocity in Rock in the Contiguous United States. U.S. Geological Survey Open-File Report 82-1033, 1982.

99. Nuttli, O.W. and Brill, K.G. Jr. Earthquake Source Zones in the Central United States Determined from Historical Seismicity. NUREG CR-1577, 1981.

100. Nuttli, O.W. and Herrmann, R.B. Consequences of Earthquakes in the Mississippi Valley. Preprint 81-519 A.S.C.E. Mtg., 1981.

101. Users Manual, SHAKE, Version 5, Level 1, Earthquake Response Analysis of Horizontally Layered Sites, Stone & Webster Reference No. ST-211. Reissued August 1981 by P. J. Trudeau.

102. Swiger, W.F. Evaluation of Soil Moduli, Proceedings of the Conference on Analysis and Design in Geotechnical Engineering, Volume II, ASCE, 1974.

APPENDIX 2G

HYDRAULIC HEAD FLUCTUATIONS IN THE UPLAND TERRACE AQUIFER

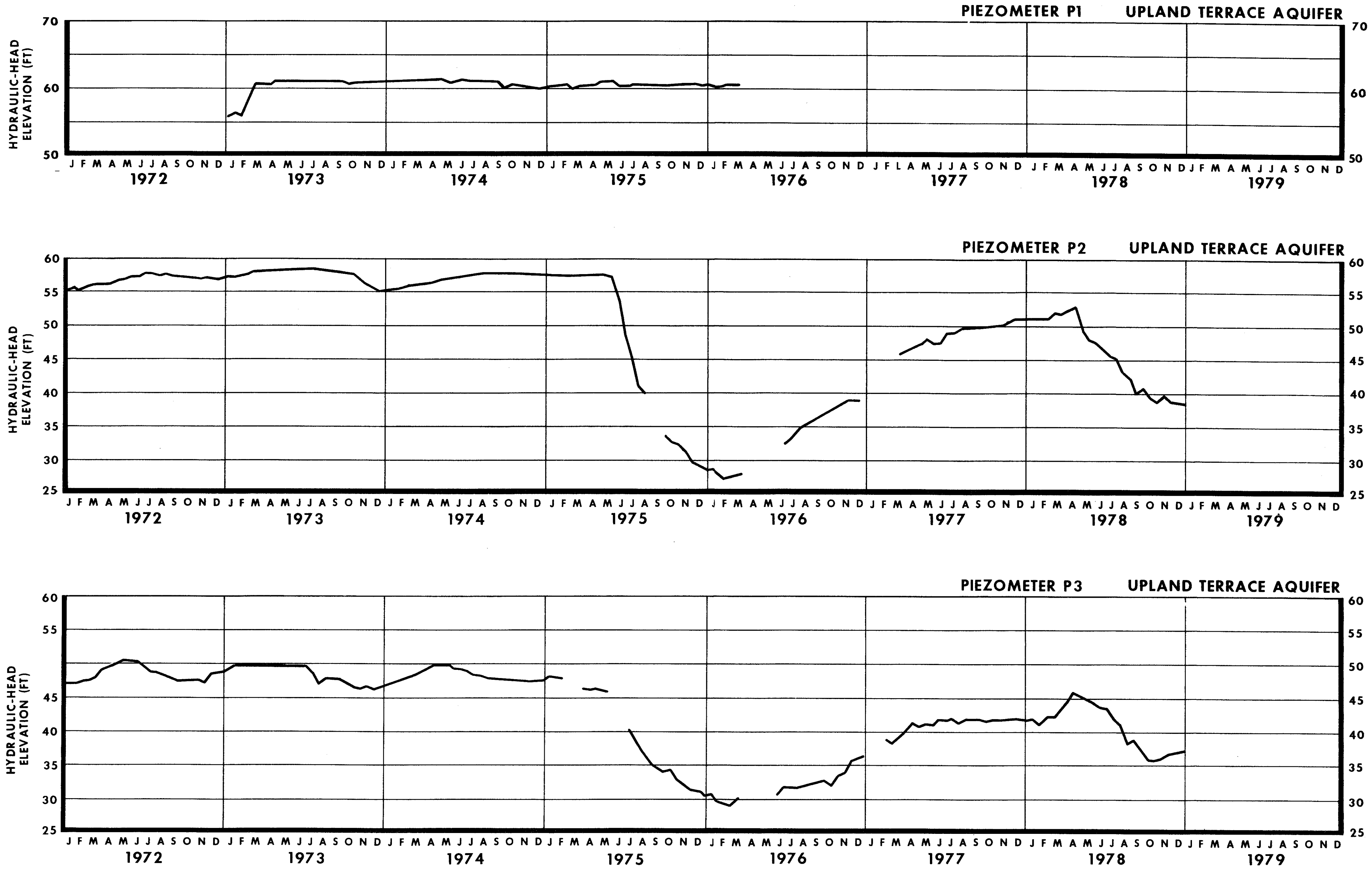

FIGURE 2G-1

HYDRAULIC-HEAD FLUCTUATIONS
IN THE UPLAND TERRACE AQUIFER

RIVER BEND STATION
UPDATED SAFETY ANALYSIS REPORT

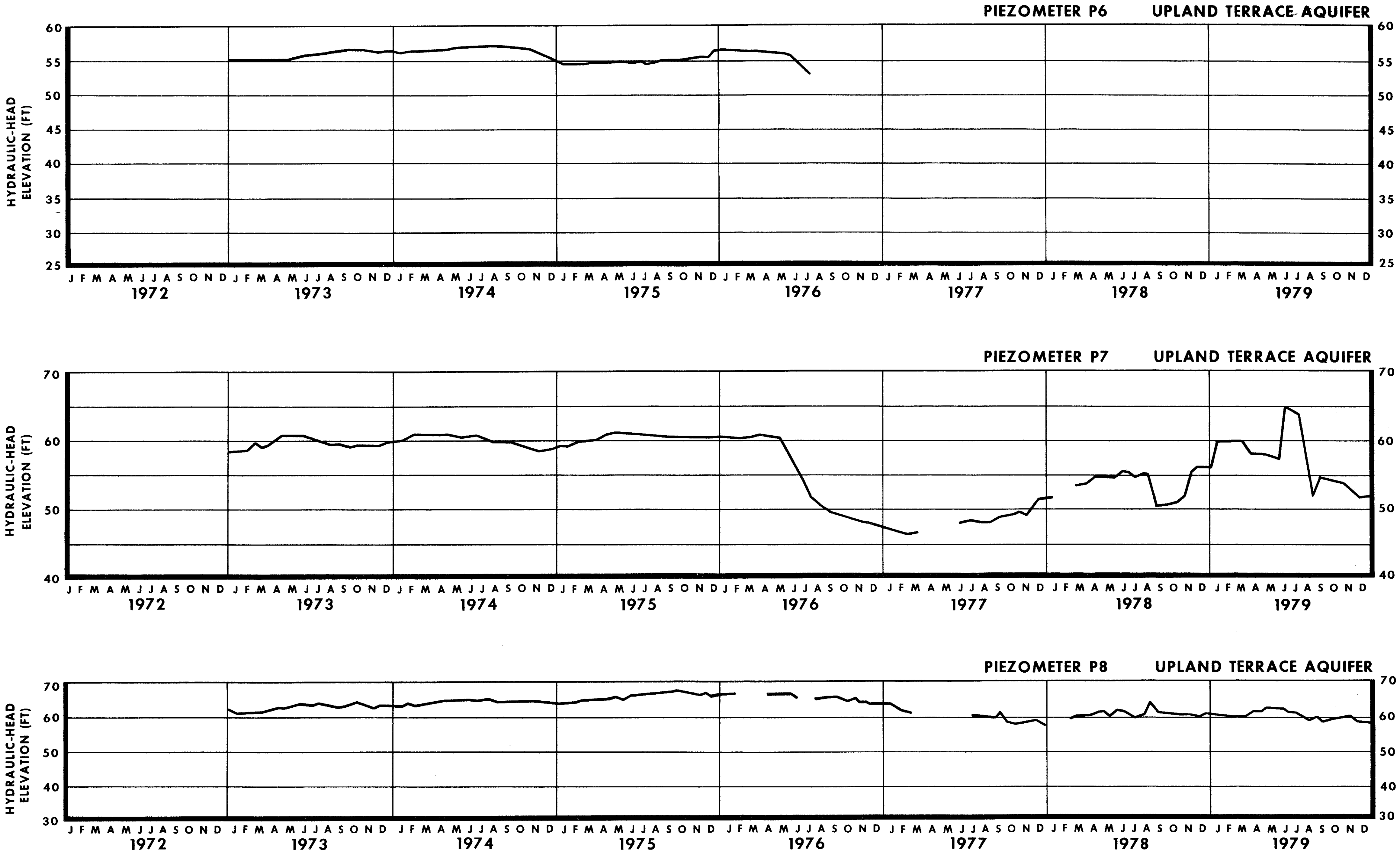

FIGURE 2G-2

HYDRAULIC-HEAD FLUCTUATIONS IN THE UPLAND TERRACE AQUIFER

RIVER BEND STATION

UPDATED SAFETY ANALYSIS REPORT

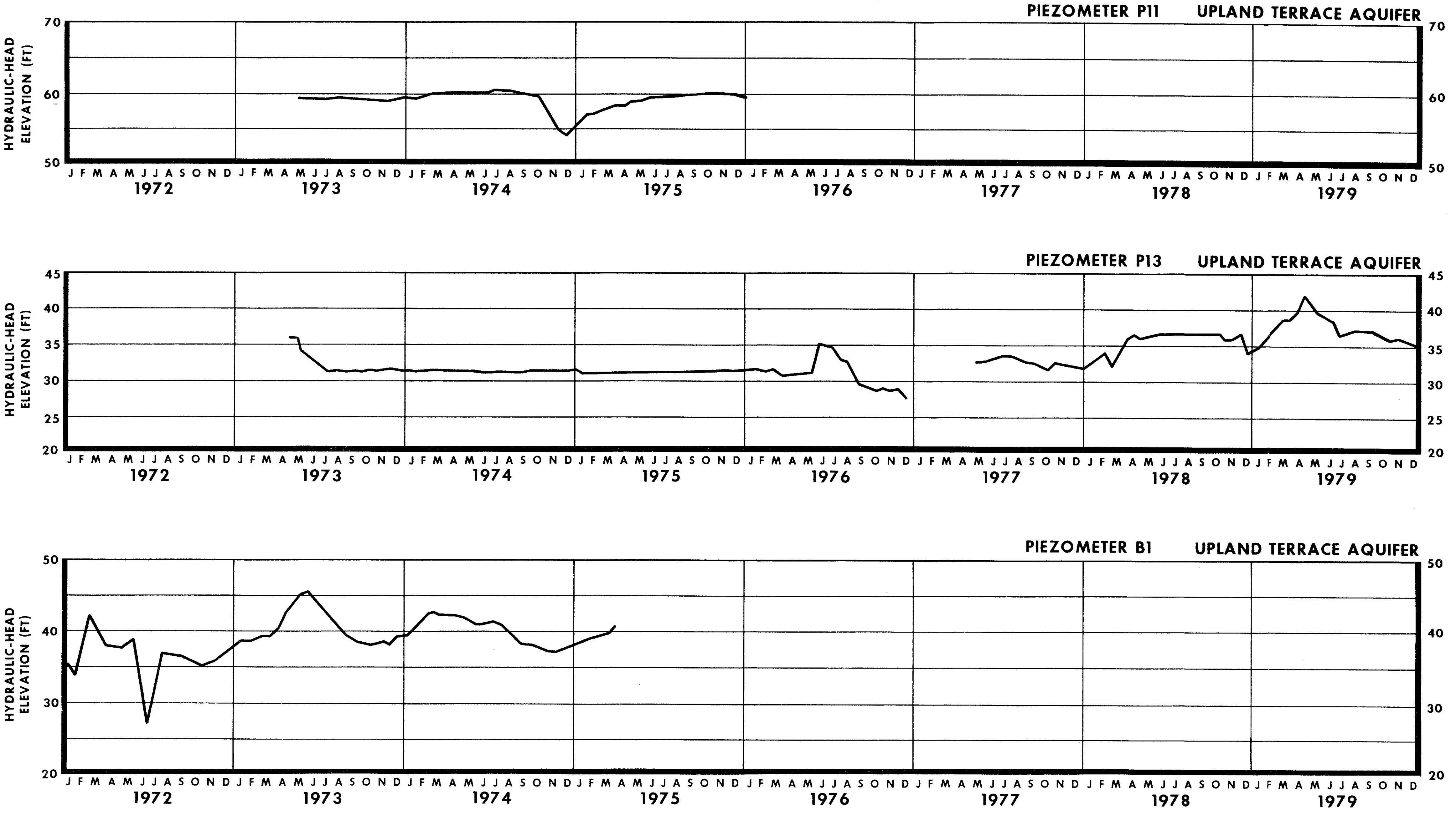

FIGURE 2G-3

HYDRAULIC-HEAD FLUCTUATIONS IN THE UPLAND TERRACE AQUIFER

RIVER BEND STATION

UPDATED SAFETY ANALYSIS REPORT

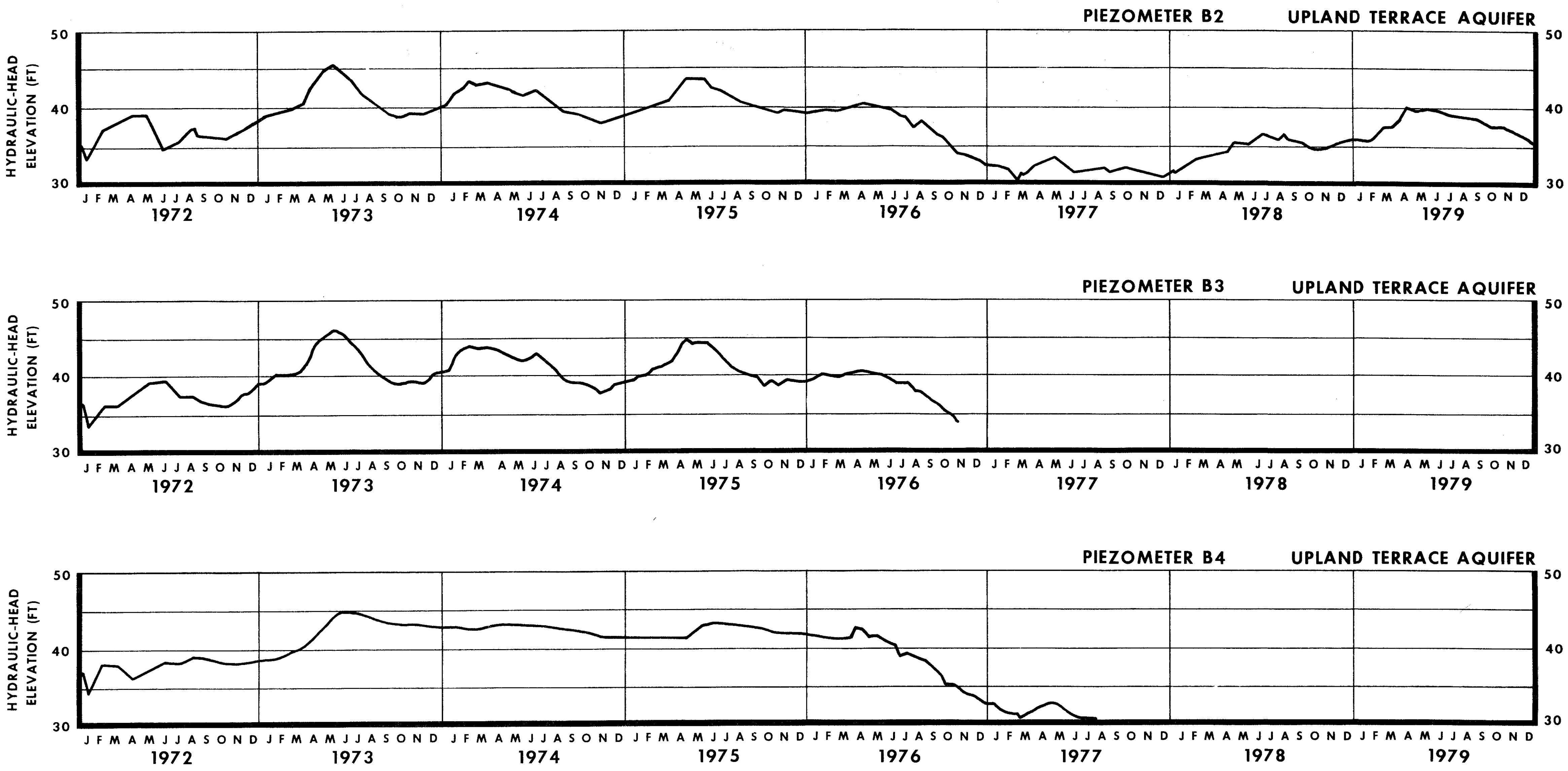

FIGURE 2G-4

HYDRAULIC-HEAD FLUCTUATIONS IN THE UPLAND TERRACE AQUIFER

RIVER BEND STATION

UPDATED SAFETY ANALYSIS REPORT

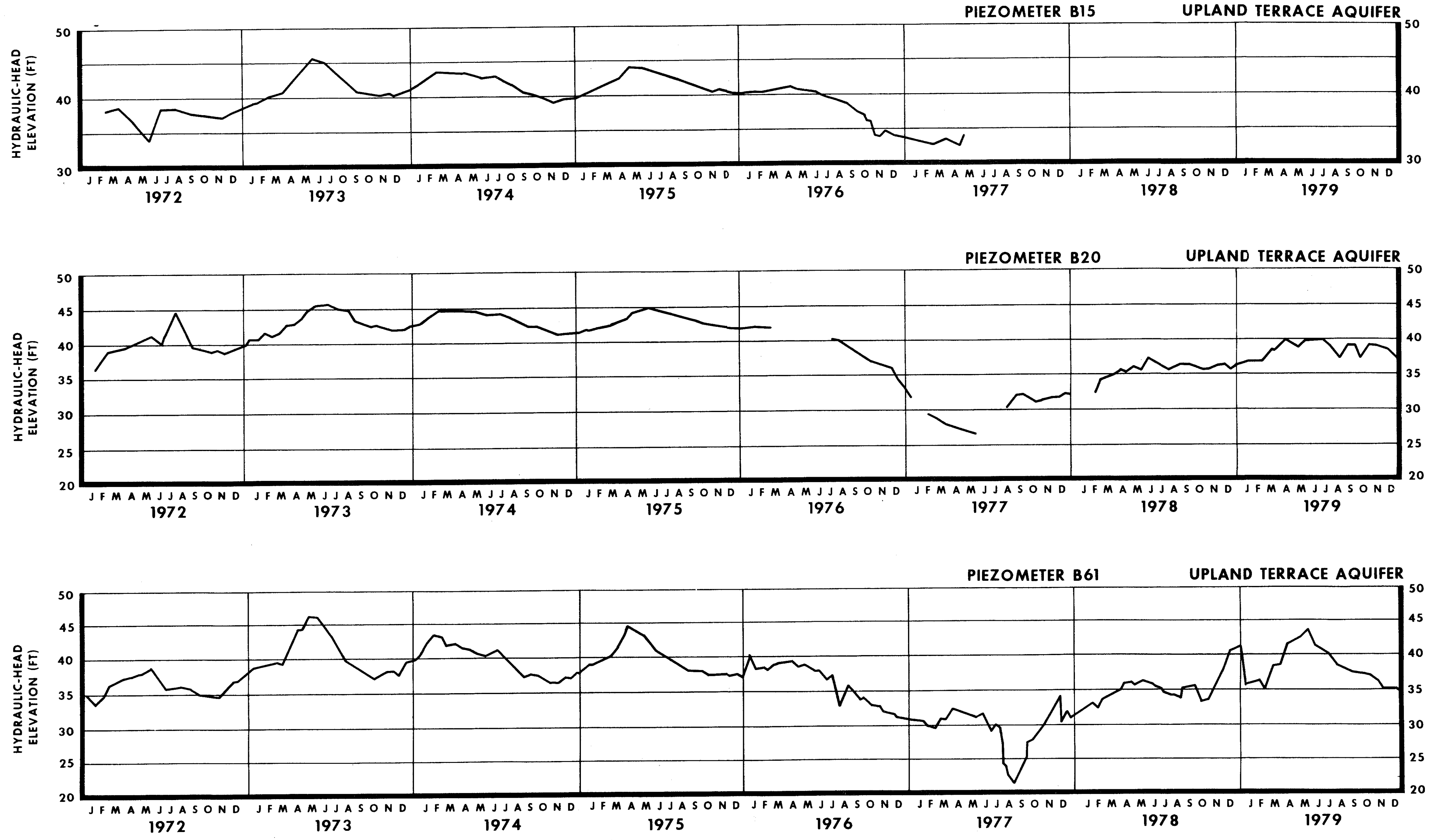

FIGURE 2G-5

HYDRAULIC-HEAD FLUCTUATIONS
IN THE UPLAND TERRACE AQUIFER

RIVER BEND STATION
UPDATED SAFETY ANALYSIS REPORT

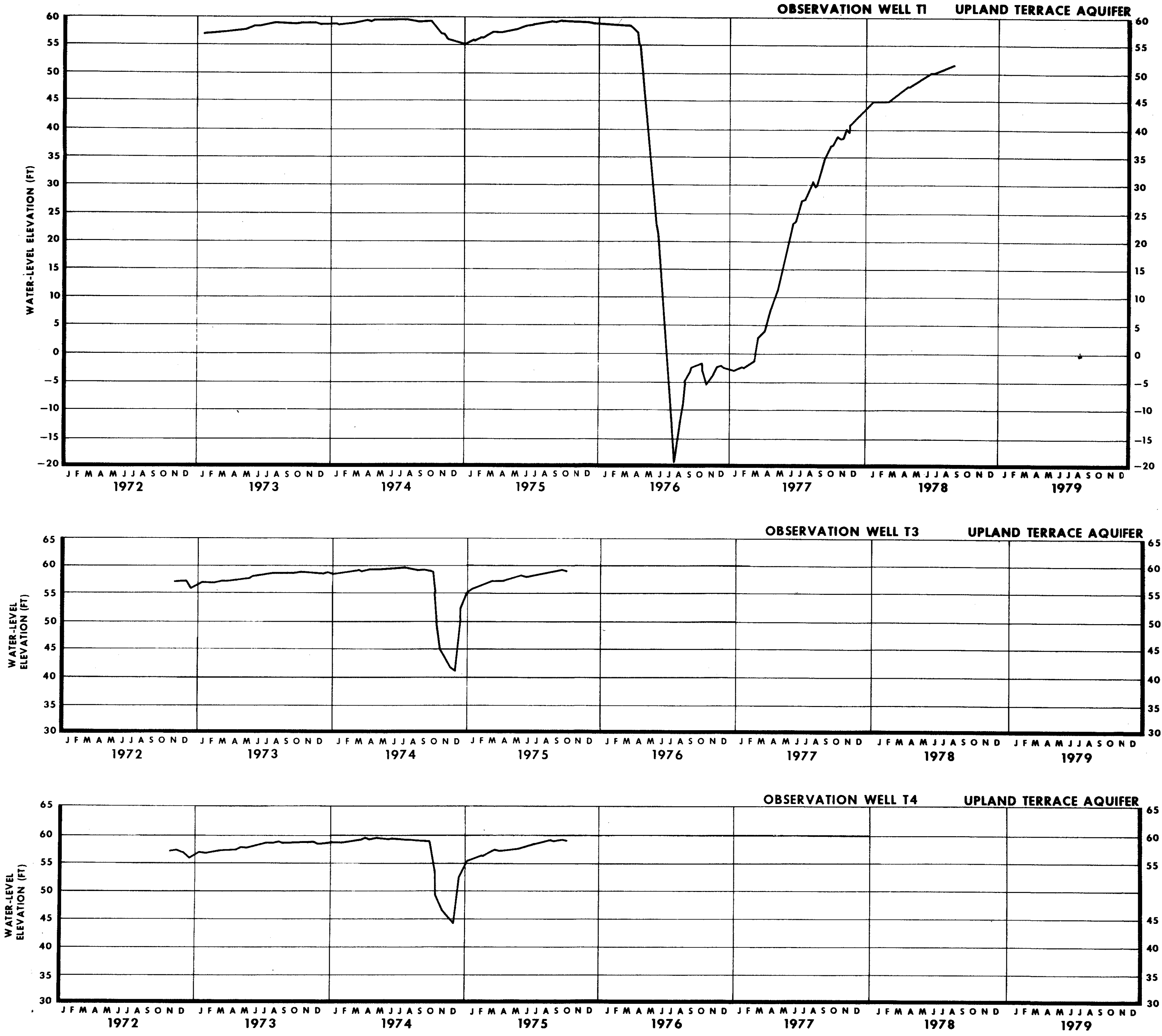

FIGURE 2G-6

HYDRAULIC-HEAD FLUCTUATIONS
IN THE UPLAND TERRACE AQUIFER

RIVER BEND STATION
UPDATED SAFETY ANALYSIS REPORT

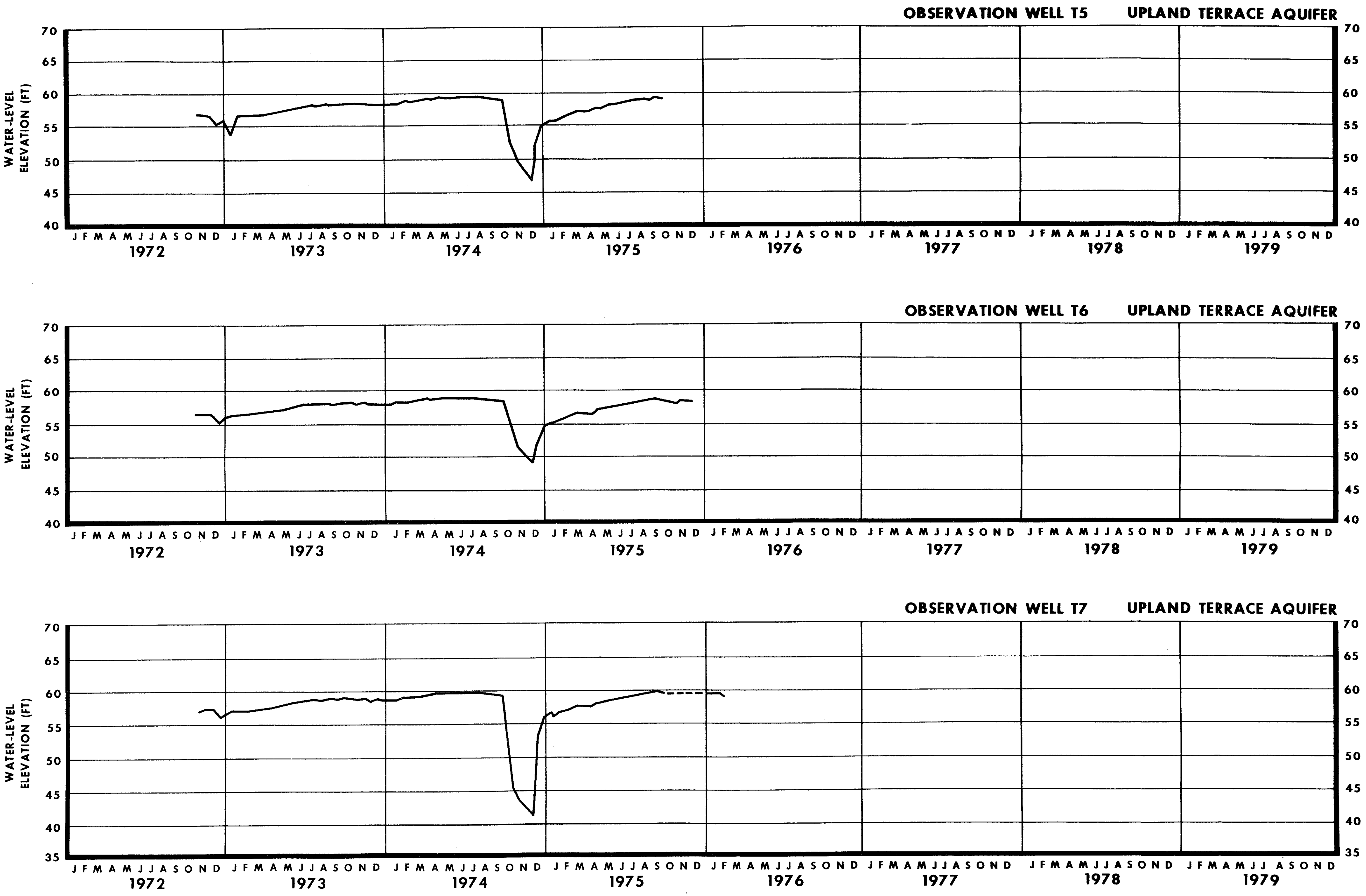

FIGURE 2G-7

HYDRAULIC-HEAD FLUCTUATIONS IN THE UPLAND TERRACE AQUIFER

RIVER BEND STATION
UPDATED SAFETY ANALYSIS REPORT

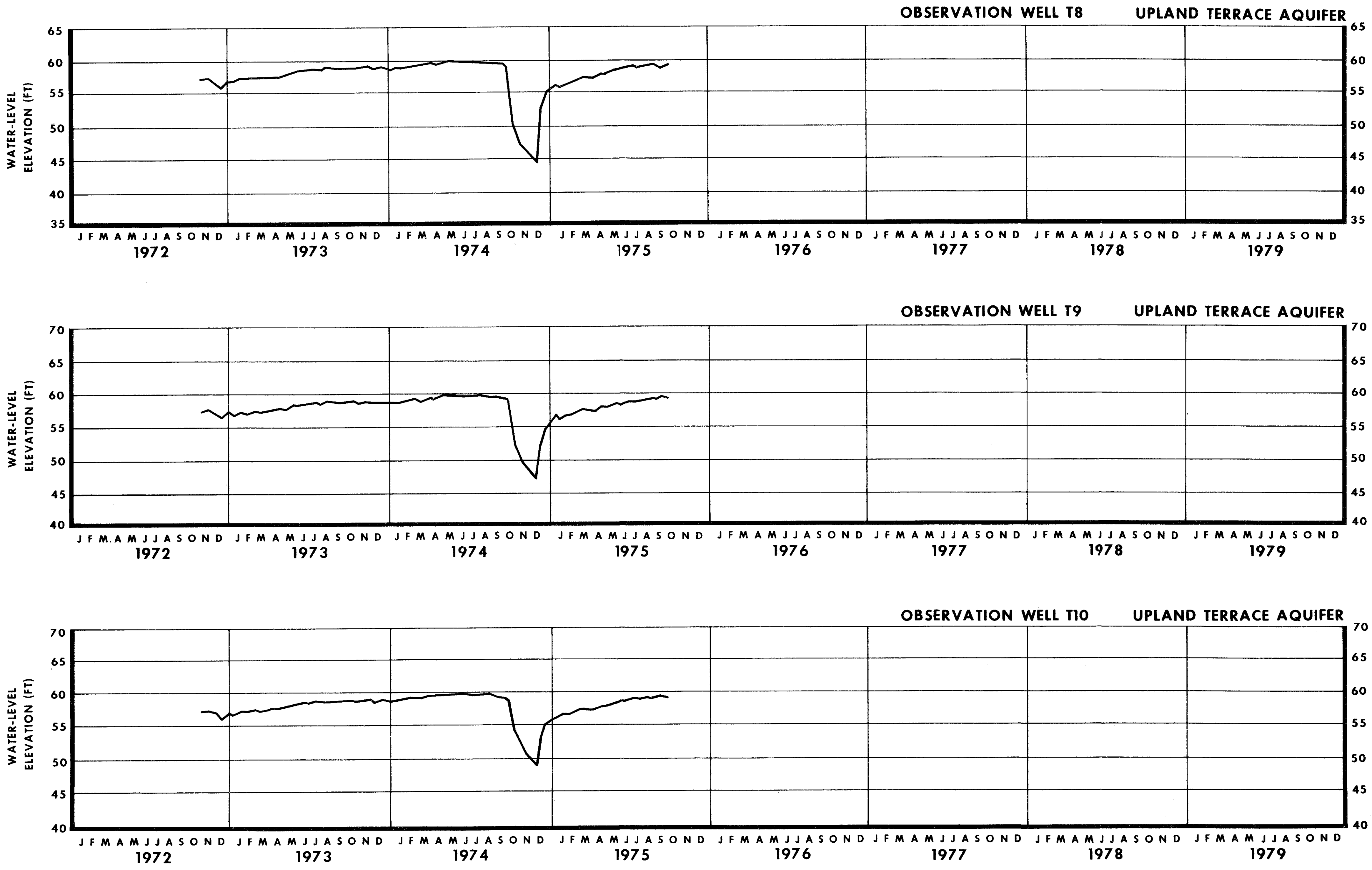

FIGURE 2G-8

HYDRAULIC-HEAD FLUCTUATIONS
IN THE UPLAND TERRACE AQUIFER

RIVER BEND STATION
UPDATED SAFETY ANALYSIS REPORT

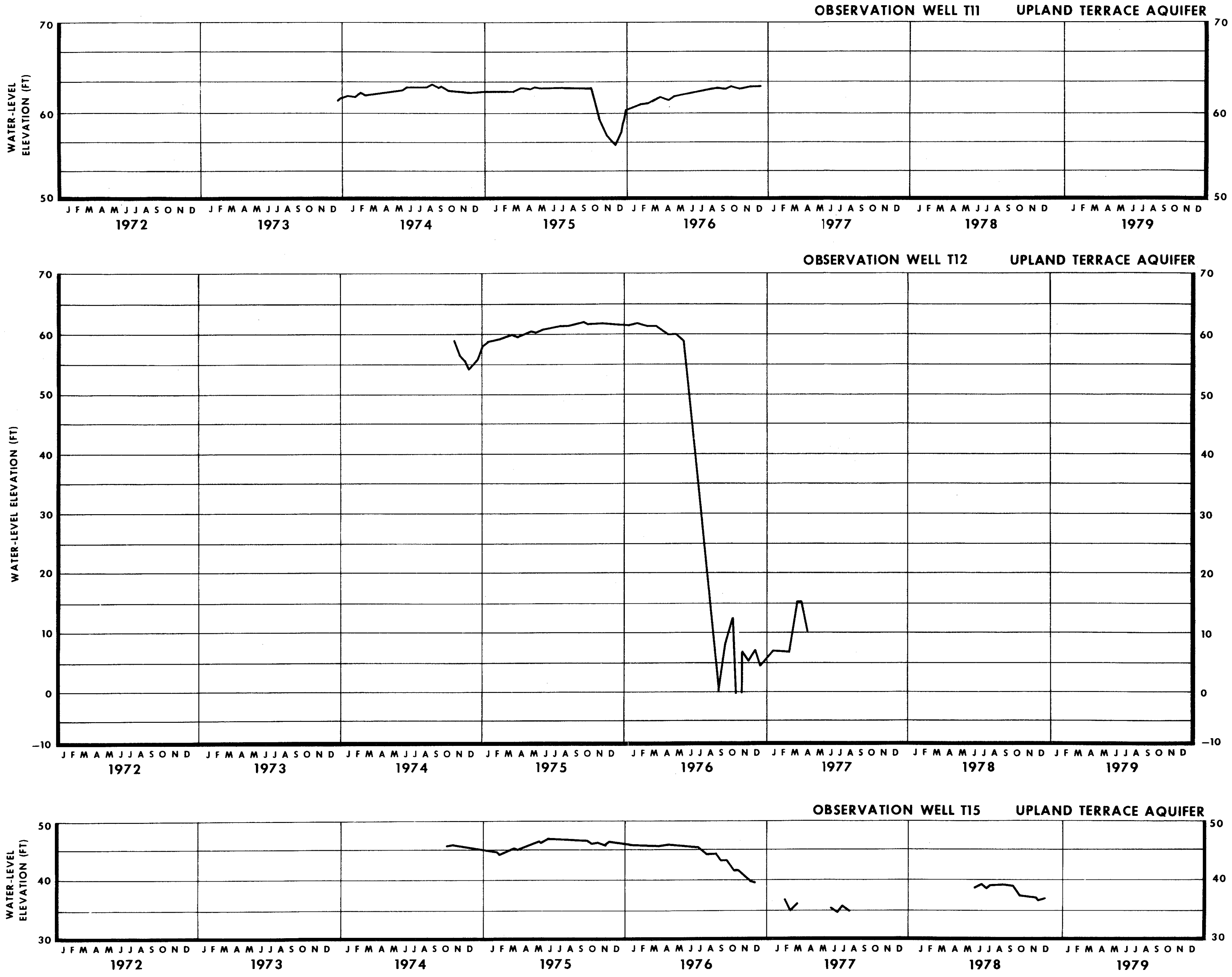

FIGURE 2G-9

HYDRAULIC-HEAD FLUCTUATIONS
IN THE UPLAND TERRACE AQUIFER

RIVER BEND STATION

UPDATED SAFETY ANALYSIS REPORT

APPENDIX 2H

BORING LOGS

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. 9 | TYPE OF BORING DRIVE | SHEET 1 OF 2
DATE DRILLED DEC. 12-14, 1971 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY
COORDINATES, NORTH 12,828.5 | EAST 11,480.0 | GROUND SURFACE ELEVATION 101.7'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
100		1	◤		7			LOOSE BROWN CLAYEY SILT
		2	◤		11			LOOSE BROWN CLAYEY SILT
	10	3	◤		42			VERY COMPACT TAN AND GRAY CLAYEY SILT
		4	◤		24			VERY STIFF TAN AND GRAY SILTY CLAY WITH CLAYEY SILT POCKETS
	20	5	◤		22			VERY STIFF TAN AND GRAY SILTY CLAY WITH CLAYEY SILT POCKETS
		6	◤		15			VERY STIFF GRAY AND TAN CLAY WITH SILT POCKETS
	30	7	◤		39			DENSE TAN AND GRAY CLAYEY SAND WITH SANDY CLAY POCKETS
		8	◤		22			VERY STIFF TAN AND GRAY SANDY CLAY WITH CLAYEY SAND LAYERS
	40	9	◤		50/10"			VERY DENSE TAN AND GRAY SAND WITH PEA GRAVEL AND SOME CLAY
		10	◤		40			DENSE TAN AND GRAY CLAYEY SAND
	50	11	◤		26			DENSE PINK AND TAN CLAYEY SAND
		12	◤		38			DENSE PINK AND TAN CLAYEY SAND
	60	13	◤		35			DENSE PINK AND TAN CLAYEY SAND
		14	◤		36			DENSE PINK SAND
	70	15	◤		38			DENSE PINK SAND
		16	◤		55			DENSE PINK SAND
	80	17	◤		50/7"			VERY DENSE PINK AND TAN SAND

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6-INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL
5. ALL DATA TAKEN FROM EUSTIS ENG. FIELD LOGS

ISSUED BY D. P. GREENWOOD
DATE JANUARY 18, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 9 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO 9 | TYPE OF BORING DRIVE | SHEET 2 OF 2
DATE DRILLED DEC. 12-14, 1971 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY
COORDINATES, NORTH 12,828.5 | EAST 11,480.0 | GROUND SURFACE ELEVATION 101.7'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		18	◤		50/7"			VERY DENSE TAN AND GRAY SAND WITH TRACE OF PEA GRAVEL
	90	19	◤		50/6"			VERY DENSE TAN AND GRAY SAND WITH TRACE OF PEA GRAVEL
		20	◤		50/8"			VERY STIFF PINK SANDY CLAY WITH CLAYEY SAND LAYERS
	100	21	◤		42			DENSE PINK SAND
		22	◤		41			DENSE PINK SAND
	110	23	◤		49			DENSE PINK SAND
		24	◤		33			DENSE PINK SAND
	120	25	◤		50/6"			VERY DENSE TAN SAND AND GRAVEL
		26	◤		50			VERY DENSE TAN SAND AND GRAVEL
	130	27	◤		60			VERY DENSE TAN SAND AND GRAVEL
		28	◤		50/6" SEAT			VERY DENSE TAN SAND AND GRAVEL
	140	29	◤		50/7" SEAT			VERY DENSE TAN SAND AND GRAVEL
		30	◤		50/3" SEAT			VERY DENSE TAN SAND AND GRAVEL
-48.3	150	31	◤		50/2" SEAT			VERY DENSE TAN SAND AND GRAVEL
								END OF BORING AT 150.0'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4. DATUM IS MEAN SEA LEVEL
5. ALL DATA TAKEN FROM EUSTIS ENG. FIELD LOGS

ISSUED BY D. P. GREENWOOD
DATE JANUARY 18, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 9 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. 23 | TYPE OF BORING DRIVE | SHEET 1 OF 2
DATE DRILLED MARCH 15, 1972 | DRILLING COMPANY - EUSTIS ENGRG. CO | LOGGED BY FPM, RIB, GAC
COORDINATES, NORTH 12,427.5 | EAST 10,697.5 | GROUND SURFACE ELEVATION 96.3'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		1	◤		7		CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, FIRM, MOIST, MEDIUM YELLOWISH BROWN (10 YR 4/4).
		2	◤		6		CL	SILTY CLAY, SIMILAR TO ABOVE, EXCEPT THIN LENSES LIGHT GRAYISH BROWN (10 YR 6/4), SLIGHTLY PLASTIC SILT.
	10	3	◤		11		CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, VERY STIFF, LIGHT GRAYISH BROWN (10 YR 6/4), VEINS LIGHT GRAY (N 7) HIGHLY PLASTIC SILTY CLAY, DOTS OF VERY LIGHT GRAY (N 8) SILT, 0.2" DIAMETER PARTIALLY DECOMPOSED BLACK AND RUSTY ORGANIC MATERIAL, SWEET ORGANIC ODOR, LOWER HALF INCREASE BLACK ORGANIC CONTENT.
		4	◤		16		CH	SILTY CLAY, HIGHLY PLASTIC, TRACE VERY FINE SAND, VERY STIFF, LIGHT OLIVE GRAY (5 Y 6/1), MOTTLED YELLOWISH BROWN (10 R 5/4), MOTTLED EXTENSIVELY BLACK ORGANIC MATERIAL.
	20	5	◤		22		CH	SILTY CLAY, HIGHLY PLASTIC, LESS THAN 5% FINE SAND, LIGHT OLIVE GRAY (5 Y 6/1), POCKETS YELLOWISH BROWN (10 YR 5/4) AND MEDIUM BROWN (5 YR 3/6) SILT, 0.3" BLACK PLATE COMPRESSED ORGANIC MATTER; LAYER SANDY SILT, SLIGHTLY PLASTIC, 25-30% FINE SAND, LIGHT OLIVE-GRAY (5 Y 6/1) & MEDIUM YELLOWISH BROWN (10 YR 6/4), TRACE MICA, TRACE BLACK ORGANIC MATERIAL.
		6	◤		14		CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, VERY WET, LIGHT OLIVE GRAY (5 Y 6/1), VEINS LIGHT YELLOWISH GRAY (5 Y 8/1), HIGHLY PLASTIC CLAY, MANY SMALL LUMPS MEDIUM BROWN (5 YR 3/6) SILT, POCKETS SANDY SILT, SLIGHTLY PLASTIC, 20-30% VERY FINE SAND, LIGHT OLIVE GRAY (5 Y 6/1).
	30	7	◤		23		ML	CLAYEY SILT, NONPLASTIC TO SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, DRY, LIGHT OLIVE GRAY (5 Y 6/1), LUMPS DARK YELLOWISH BROWN (10 YR 4/2), CLAYEY SILT, SWEET ORGANIC ODOR, TRACE MICA.
		8	◤		25		CH	CLAY, HIGHLY PLASTIC, TRACE VERY FINE SAND, STIFF, LIGHT OLIVE GRAY (5 Y 6/1), BOTTOM SAMPLE CLAY WITH VERY THIN LAMINATIONS, VERY FINE SAND, POCKETS YELLOWISH BROWN (10 YR 5/4) AND MEDIUM BROWN (5 Y R 3/6) SILT, 0.3" BLACK PLATE COMPRESSED ORGANIC MATTER, TRACE MICA.
	40	9	◤		22		ML	CLAYEY SILT, NONPLASTIC TO SLIGHTLY PLASTIC, LESS THAN 5% VERY FINE SAND, MOIST, LIGHT OLIVE GRAY (5 Y 6/2), LAYERED CLAY AND VERY FINE SAND, TRACE MICA.
		10	◤		27		CL ML	VARVED CLAY, MODERATELY PLASTIC, WITH FINE SAND, LIGHT OLIVE GRAY (5 Y 6/1). LAYERED SILT, LESS THAN 5% VERY FINE SAND, MOIST, GRAYISH TO YELLOWISH BROWN (10 YR 6/4).
	50	11	◤		27		ML-CL ML	LAYERED CLAYEY SILT, SLIGHTLY PLASTIC, LIGHT OLIVE GRAY (5 Y 6/1) TO MEDIUM YELLOWISH BROWN (10 YR 5/4). SANDY SILT, NONPLASTIC, 15-20% VERY FINE SAND, MEDIUM YELLOWISH BROWN (10 YR 5/4).
		12	◤		28		SP-SM	SILTY SAND, UNIFORM, FINE, 8-12% FINES, YELLOWISH GRAY (5 Y 8/1).
	60	13	◤		49		SP-SM	SAND, UNIFORM, FINE, 5-10% NONPLASTIC FINES, VERY WET, DARK YELLOWISH BROWN (10 YR 4/6).
		14	◤		50/9"	N.R.		
	70	15	◤		50/8"		SM-SP	SILTY SAND, FINE TO MEDIUM, MOSTLY FINE, 5-12% NONPLASTIC FINES, SATURATED, MODERATE YELLOWISH BROWN (10 YR 5/4), NODULES SILT.
		16	◤		50/10"		SM-SP	SAND, UNIFORM, FINE, 5-10% NONPLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4), LAYER SILTY SAND, MODERATE RED (5 R 5/4), SATURATED.
	80	17	◤		25		SP-SC	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, (COHESIVE), PALE REDDISH BROWN (10 R 5/4), MOIST.

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. P. GREENWOOD
DATE OCTOBER 31, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 23A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO 23 | TYPE OF BORING DRIVE | SHEET 2 OF 2
DATE DRILLED MARCH 15, 1972 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY FPM, RIB, GAC
COORDINATES, NORTH 12,427.5 | EAST 10,697.5 | GROUND SURFACE ELEVATION 96.3'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		18	◤		47		SP	SAND, UNIFORM, FINE, LESS THAN 5% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 5/6), TWO PIECES SUBROUNDED GRAVEL TO 0.4" MAX.
	90	19	◤		54		SP-SM	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 4-8% NONPLASTIC FINES, SATURATED, LIGHT PINKISH BROWN (5 YR 6/4).
		20	◤		67		SP-SM	SAND, UNIFORM, FINE, 5-10% NONPLASTIC FINES, LIGHT PINKISH BROWN (5 YR 6/4).
	100	21	◤		19			SAND, CLAY LAYERS, MEDIUM DENSE, PINK AND TAN. (D.L.)
		22	◤		53		SP-SM	SAND, UNIFORM, FINE, 5-10% NONPLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), DRY.
	110	23	◤		80		SP-SM	SAND, POORLY GRADED, 5-10% SUBANGULAR AND SUBROUNDED GRAVEL TO 0.7" MAX., FINE TO COARSE SAND, MOSTLY FINE, 5-10% NONPLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
		24	◤		73		SP	SAND, POORLY GRADED, LESS THAN 5% GRAVEL 0.3" MAX., FINE TO COARSE SAND, MOSTLY FINE, LESS THAN 5% NONPLASTIC FINES, LIGHT YELLOWISH BROWN (10 YR 6/4).
	120	25	◤		90		SP	SAND, POORLY GRADED, 10-20% GRAVEL TO 0.7" MAX., FINE TO COARSE SAND, MOSTLY FINE, LESS THAN 5% NONPLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
		26	◤		50/7"		SP	SAND, POORLY GRADED, LESS THAN 5% GRAVEL TO 0.5" MAX., FINE TO COARSE SAND, MOSTLY FINE, LESS THAN 5% NONPLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
	130	27	◤		50/7"		SP	SAND, SIMILAR TO SS-26, EXCEPT 5-10% GRAVEL TO 0.6" MAX., WET.
		28	◤		50/10"		SP	SAND, SIMILAR TO SS-27, EXCEPT MOIST, LIGHT YELLOWISH BROWN (10 YR 5/4).
	140	29	◤		50/7"		SP	SAND, UNIFORM, FINE, LESS THAN 5% NONPLASTIC FINES, SATURATED, MODERATE YELLOWISH BROWN (10 YR 5/4).
		30	◤		50/7"		SP-SM	SAND, UNIFORM, FINE, LESS THAN 5% GRAVEL TO 0.5" MAX., 5-10% NONPLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4), SATURATED.
-53.7	150	31	◤		31		SP	SAND, POORLY GRADED, 10-15% GRAVEL TO 0.3" MAX., FINE TO COARSE SAND, MOSTLY COARSE, LESS THAN 5% NONPLASTIC FINES, SATURATED MODERATE YELLOWISH BROWN (10 YR 5/4).
								END OF BORING AT 150.0'

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4. DATUM IS MEAN SEA LEVEL
5. DRILLER'S LOG (D.L.)

ISSUED BY D. P. GREENWOOD
DATE OCTOBER 31, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 23B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO 25 TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED APRIL 13, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY RIB, TIB, AND
COORDINATES, NORTH 12,360.0 EAST 10,572.5 GROUND SURFACE ELEVATION 89.4'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		1	◤		19		ML	SILT, NON TO SLIGHTLY PLASTIC, LESS THAN 2% VERY FINE SAND, GRAYISH ORANGE, (10 YR 7/4).
		2	◤		17		ML	CLAYEY SILT, SLIGHTLY PLASTIC, LESS THAN 2% FINE SAND, GRAYISH ORANGE (10 YR 6/4), SOME BLACK ORGANIC MATERIAL.
80	10	3	◤		23		CH	SILTY CLAY, HIGHLY PLASTIC, LESS THAN 3% VERY FINE SAND, LIGHT OLIVE GRAY (5 Y 6/2)
		4	◤		24		ML	CLAYEY SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, MEDIUM YELLOWISH GRAY (5 Y 6/2), MOTTLED WITH DARK YELLOWISH ORANGE.
70	20	5	◤		18		ML	SANDY SILT, NONPLASTIC TO SLIGHTLY PLASTIC, 10-15% VERY FINE SAND, GRAYISH YELLOW (5 Y 7/4).
		6	◤		24		CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, LESS THAN 3% VERY FINE SAND, DUSKY YELLOW (5 Y 6/4).
60	30	7	◤		25		ML	CLAYEY SILT, SLIGHTLY PLASTIC, 10-15% VERY FINE SAND, DUSKY YELLOW (5 Y 6/4), LAYERS HIGHLY PLASTIC LIGHT OLIVE GRAY SILTY CLAY.
		8	◤		14		CH	CLAY, HIGHLY PLASTIC, STIFF, YELLOWISH GRAY (5 Y 6/2).
50	40	9	◤		25		SM	SILTY SAND, UNIFORM, FINE, 10-20% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 6/2).
		10	◤		28		SM-SP	SILTY SAND, UNIFORM, FINE, 8-12% NONPLASTIC FINES, MEDIUM GRAYISH ORANGE (10 YR 6/4).
40	50	11	◤		36		SM-SP	SILTY SAND, SIMILAR TO SS-10, EXCEPT DARK YELLOWISH ORANGE (10 YR 7/6).
		12	◤		21		SP-SM	SAND, UNIFORM, FINE, 5-10% SLIGHTLY TO MODERATELY PLASTIC FINES, MODERATE YELLOW (5 Y 6/6) LAYERS HIGHLY PLASTIC, YELLOWISH GRAY, SILTY CLAY.
30	60	13	◤		100/4" SEAT		SM	SILTY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 10-20% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 5/6).
		14	◤		50/6"		SP-SM	SAND, POORLY GRADED, LESS THAN 5% GRAVEL TO 0.3" MAX., FINE TO COARSE SAND, MOSTLY MEDIUM, 3-8% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 5/6).
20	70	15	◤		50/7"		SP-SM	SAND, POORLY GRADED, 5-10% GRAVEL TO 0.5" MAX., FINE TO COARSE SAND, MOSTLY FINE, 3-8% NONPLASTIC FINES, DARK GRAYISH ORANGE (10 YR 6/4).
		16	◤		50/9"		SM	SILTY SAND, POORLY GRADED, 3-8% GRAVEL TO 0.5" MAX., FINE TO COARSE SAND, MOSTLY FINE, 10-15% NONPLASTIC FINES, MEDIUM YELLOWISH BROWN (10 YR 6/4).
10	80	17	◤		50/9"		SM	SILTY SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, 10-15% SLIGHTLY PLASTIC FINES, LIGHT BROWN (5 YR 5/6).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 1, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 25A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO 25 TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED APRIL 13, 1972 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY RIB, TIB, AND
COORDINATES, NORTH 12,360.0 EAST 10,572.5 GROUND SURFACE ELEVATION 89.4'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		18	◤		30		SM	SILTY SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, 15-20% SLIGHTLY PLASTIC FINES, MEDIUM REDDISH ORANGE (10 R 5/5).
0	90	19	◤		42		SM	SILTY SAND, UNIFORM, FINE, 10-15% NONPLASTIC TO SLIGHTLY PLASTIC, DARK REDDISH ORANGE (10 R 5/6).
		20	◤		50/6"		SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, LESS THAN 5% NONPLASTIC FINES, MEDIUM GRAYISH ORANGE (10 YR 6/4).
-10	100	21	◤		18			NO SAMPLE.
		22	◤		19		SM	SILTY SAND, UNIFORM, FINE, 20-25% SLIGHTLY PLASTIC, FINES, MEDIUM REDDISH BROWN (10 R 5/6).
-20	110	23	◤		41		SP-SM	SAND, FINE TO MEDIUM, MOSTLY FINE, 3-8% NONPLASTIC FINES, MEDIUM YELLOWISH BROWN (10 YR 6/4).
		24	◤		50/9"		SP-SM	SAND, SIMILAR TO ABOVE, EXCEPT GRAYISH ORANGE (10 YR 7/4).
-30	120	25	◤		50/4"		SP-SM	SAND, POORLY GRADED, LESS THAN 5% GRAVEL 0.4" MAX., FINE TO COARSE SAND, MOSTLY FINE AND MEDIUM, 3-8% NONPLASTIC FINES, MEDIUM GRAYISH ORANGE (10 YR 6/4).
		26	◤		50/5"		SP	SAND, POORLY GRADED, FINE TO MEDIUM, LESS THAN 5% NONPLASTIC FINES, MEDIUM GRAYISH ORANGE (10 YR 6/4).
-40	130	27	◤		50/4"		SM-SP	SILTY SAND, POORLY GRADED, FINE TO MEDIUM, 8-12% NONPLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
		28	◤		50/6"		SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, LESS THAN 5% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
-50	140	29	◤		50/6"		SP	SAND, POORLY GRADED, LESS THAN 5% GRAVEL TO 0.4" MAX., FINE TO COARSE, MOSTLY FINE AND MEDIUM, LESS THAN 5% NONPLASTIC FINES, MEDIUM GRAYISH YELLOW (5 Y 5/4).
		30	◤		50/5"		SP-SM	SAND, POORLY GRADED, 5% GRAVEL TO 0.6" MAX., FINE TO COARSE, MOSTLY FINE TO MEDIUM, 3-8% NONPLASTIC FINES, DARK GRAYISH ORANGE (10 YR 6/4).
-60.6	150	31	◤		22		SC	CLAYEY SAND, UNIFORM, VERY FINE, 30-40% SLIGHTLY TO MODERATELY PLASTIC FINES, MEDIUM REDDISH ORANGE (10 R 5/6).
								END OF BORING AT 150.0'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 1, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 25B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 27 TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED MARCH 30, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY GAC & PFM
COORDINATES, NORTH 12,292.5 EAST 10,447.5 GROUND SURFACE ELEVATION 93.1'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
90		1	◤		10		CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, DARK YELLOWISH BROWN (10 YR 4/4).
		2	◤		18		CL	SILTY CLAY, SLIGHTLY PLASTIC, MODERATE YELLOWISH BROWN (10 YR 5/4)
	10	3	◤		18		CH	CLAY, HIGHLY PLASTIC, VERY STIFF, HOMOGENEOUS, DARK YELLOWISH GRAY (5 Y 6/2).
80		4	◤		17		CH	CLAY, SIMILAR TO SS-3.
							CL-ML	SILTY CLAY, MODERATELY PLASTIC, LIGHT OLIVE GRAY (5 Y 6/1).
	20	5	◤		27		ML	CLAYEY SILT, SLIGHTLY TO MODERATELY PLASTIC, LIGHT OLIVE GRAY (5 Y 6/1) MOTTLED WITH DARK YELLOWISH ORANGE (10 YR 6/6) CLAYEY SILT.
70		6	◤		34		ML	SILT, SLIGHTLY PLASTIC, 5% VERY FINE SAND, DARK YELLOWISH GRAY (5 Y 6/2).
	30	7	◤		36		ML	SANDY SILT, NONPLASTIC, 10-20% VERY FINE SAND, DARK YELLOWISH GRAY (5 Y 6/2), ONE 0.2" LAYER OF LIGHT OLIVE GRAY (5 Y 6/1) SILTY CLAY.
60		8	◤		40		CL-ML	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, LIGHT OLIVE GRAY (5 Y 6/1), COATED WITH DARK YELLOWISH ORANGE (10 YR 6/6) SANDY SILT.
	40	9	◤		40		CL-ML	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, LIGHT OLIVE GRAY (5 Y 6/1), WITH LAYERS OF SILT, TRACE OF VERY FINE SAND, MODERATE BROWNISH ORANGE (10 YR 5/6).
50		10	◤		34		SM	SILTY SAND, POORLY GRADED, 8-12% NON TO SLIGHTLY PLASTIC FINES, FINE TO COARSE SAND, MOSTLY FINE AND MEDIUM, LESS THAN 5% GRAVEL TO 0.4" MAX., MODERATE BROWNISH ORANGE (10 YR 5/6).
	50	11	◤		48		SP-SM	SAND, POORLY GRADED, 3-8% NONPLASTIC FINES, FINE TO COARSE SAND, MOSTLY FINE AND MEDIUM, MEDIUM YELLOWISH BROWN (10 YR 6/4).
							CH	CLAY, HIGHLY PLASTIC, VERY SOFT, LIGHT OLIVE GRAY (5 Y 6/1), IN 0.5" POCKETS.
40		12	◤		44		SC	CLAYEY SAND, POORLY GRADED, 15-25% SLIGHTLY TO MODERATELY PLASTIC FINES, FINE TO COARSE SAND, MOSTLY FINE, 5-10% GRAVEL TO 0.6" MAX., MEDIUM REDDISH BROWN (10 R 5/6).
	60	13	◤		30		GC	CLAYEY GRAVEL, POORLY GRADED, 8-12% SLIGHTLY PLASTIC FINES, FINE TO COARSE SAND, MOSTLY COARSE, GRAVEL SIZE TO 0.7" MAX., MEDIUM BROWNISH ORANGE (10 YR 5/6).
30		14	◤		50/10"		SP-SM	GRAVELLY SAND, POORLY GRADED, 3-8% NONPLASTIC FINES, FINE TO COARSE SAND, MOSTLY FINE, 15-20% GRAVEL TO 0.7" MAX., MODERATE YELLOWISH BROWN (10 YR 5/4).
	70	15	◤		50/8"		SP	SAND, POORLY GRADED, LESS THAN 5% NONPLASTIC FINES, FINE TO COARSE SAND, MOSTLY FINE, 5-10% GRAVEL TO 0.8" MAX., LIGHT YELLOWISH BROWN (10 YR 6/4).
20		16	◤		50/10"		SP-SM	SAND, POORLY GRADED, 3-8% NONPLASTIC FINES, FINE TO COARSE SAND, MOSTLY FINE, LESS THAN 5% GRAVEL TO 0.3" MAX., DARK YELLOWISH ORANGE (10 YR 6/6).
	80	17	◤		50/11"		SP	SAND, POORLY GRADED, LESS THAN 5% NONPLASTIC FINES, FINE TO MEDIUM SAND, MOSTLY FINE, LESS THAN 5% GRAVEL TO 0.3" MAX., LIGHT YELLOWISH BROWN (10 YR 6/4).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 1, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 27A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 27 TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED MARCH 30, 1972 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY GAC & PFM
COORDINATES, NORTH 12,292.5 EAST 10,447.5 GROUND SURFACE ELEVATION 93.1'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
10		18	◤		50/10"		CH	CLAY, HIGHLY PLASTIC, VERY SOFT, MODERATE RED (5 R 5/4), THIN VEIN OF BROWN SILT AND A SMALL LAYER OF LIGHT BROWN SILTY SAND.
	90	19	◤		50/10"		SM-SP	SILTY SAND, POORLY GRADED, 8-12% NON TO SLIGHTLY PLASTIC FINES, FINE TO MEDIUM SAND, MOSTLY FINE, MEDIUM REDDISH BROWN (10 R 5/6).
0		20	◤		46		SM-SP	SILTY SAND, UNIFORM, FINE, 8-12% NONPLASTIC FINES, MEDIUM REDDISH BROWN (10 R 5/6).
	100	21	◤		26		SM	SILTY SAND, UNIFORM, FINE, 10-15% SLIGHTLY PLASTIC FINES, MEDIUM REDDISH BROWN (10 R 5/6), SATURATED.
-10		22	◤		41		SM-SP	SILTY SAND, SIMILAR TO SS-20.
	110	23	◤		44		SP	SAND, UNIFORM, FINE, LESS THAN 5% NONPLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6).
-20		24	◤		34		SM-SP	SILTY SAND, UNIFORM, FINE, 5-10% NON TO SLIGHTLY PLASTIC FINES, MEDIUM REDDISH BROWN (10 R 5/6).
	120	25	◤		50/10"		SP-SM	SAND, POORLY GRADED, 3-8% NONPLASTIC FINES, FINE TO COARSE, MOSTLY FINE, ONE PIECE GRAVEL TO 0.3" MAX., MEDIUM YELLOWISH BROWN (10 YR 6/4).
-30		26	◤		50/6"		SP	SAND, POORLY GRADED, LESS THAN 5% NONPLASTIC FINES, FINE TO MEDIUM, MOSTLY FINE, ONE PIECE GRAVEL TO 0.3" MAX., MODERATE YELLOWISH BROWN (10 YR 5/4).
	130	27	◤		50/6"		SP-SM	SAND, POORLY GRADED, 3-8% NONPLASTIC FINES, FINE TO COARSE, MOSTLY FINE, LESS THAN 5% GRAVEL TO 0.4" MAX., MEDIUM YELLOWISH BROWN (10 YR 6/4).
-40		28	◤		60/5"		SP	SAND, POORLY GRADED, LESS THAN 5% NONPLASTIC FINES, FINE TO COARSE, MOSTLY FINE AND MEDIUM, 8-12% GRAVEL TO 0.8" MAX., MEDIUM YELLOWISH BROWN (10 YR 6/4).
	140	29	◤		61/4"		SP	SAND, POORLY GRADED, LESS THAN 5% NONPLASTIC FINES, FINE TO COARSE, MOSTLY FINE AND MEDIUM, LESS THAN 5% GRAVEL TO 0.4" MAX., MODERATE YELLOWISH BROWN (10 YR 5/4).
-50		30	◤		50/8"		SP	SAND, SIMILAR TO SS-29.
-56.9	150	31	◤		50/10"		CH	CLAY, HIGHLY PLASTIC, LIGHT OLIVE GRAY (5 Y 6/1) MOTTLED WITH DARK YELLOWISH ORANGE (10 YR 6/6) CLAYEY SILT AND BROWN SILT AND SILTSTONE.
								END OF BORING AT 150.0'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 1, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 27B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 43
TYPE OF BORING DRIVE
SHEET 1 OF 2
DATE DRILLED APRIL 3, 1972
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY P.P.M.
COORDINATES, NORTH 12,292.5 EAST 10,260.0
GROUND SURFACE ELEVATION 78.9'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		1	◤		14		CH	CLAY, HIGHLY PLASTIC, VERY HARD, MEDIUM YELLOWISH BROWN (10 YR 5/2).
		2	◤		8		CH	CLAY, HIGHLY PLASTIC, VERY STIFF, TRACE OF SILT AND VERY FINE SAND, LIGHT OLIVE GRAY (5 Y 5/2).
70	10	3	◤		24		ML-CL	CLAYEY SILT, SLIGHTLY TO MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, MODERATE YELLOWISH GRAY (5 Y 6/2), ONE 0.4" LAYER AND VEINS THROUGHOUT OF HIGHLY PLASTIC LIGHT OLIVE GRAY CLAY (5 Y 6/1).
		4	◤				ML	CLAYEY SILT, NONPLASTIC, 3-8% VERY FINE SAND, MODERATE YELLOWISH GRAY (5 Y 6/2).
60	20	5	◤		16		CL-ML	SILTY CLAY, MODERATELY PLASTIC, STIFF, 3-8% VERY FINE SAND, MODERATE YELLOWISH GRAY (5 Y 6/2).
		6	◤		50		SM	SILTY SAND, UNIFORM, FINE, 15-20% SLIGHTLY PLASTIC FINES, MODERATE OLIVE YELLOW (5 Y 5/4).
50	30	7	◤		50/11"		SP-SM	GRAVELLY SAND, POORLY GRADED, 20-30% GRAVEL TO 0.7" MAX., FINE TO COARSE SAND, MOSTLY COARSE, 3-8% NONPLASTIC FINES, YELLOWISH OLIVE GRAY (5 Y 6/2).
		8	◤		38		SM-SP	SILTY SAND, POORLY GRADED, LESS THAN 5% GRAVEL TO 0.6" MAX., FINE TO MEDIUM SAND, MOSTLY FINE, 5-10% NON TO SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2).
40	40	9	◤		40		SP-SM	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, 3-8% NONPLASTIC FINES, YELLOWISH ORANGE (10 YR 7/6).
		10	◤		50/11"		SC	CLAYEY SAND, POORLY GRADED, FINE AND MEDIUM, 5-10% SLIGHTLY TO MODERATELY PLASTIC, LIGHT YELLOWISH BROWN (10 YR 6/4), POCKETS OF RED CLAYEY SAND AND OF GRAY SILT.
30	50	11	◤		50/11"		SC	CLAYEY SAND, POORLY GRADED, LESS THAN 5% GRAVEL TO 0.5" MAX., FINE TO COARSE SAND, MOSTLY FINE, 12-18% MODERATELY PLASTIC FINES, MODERATE YELLOWISH ORANGE (10 YR 5/6), POCKETS OF MODERATE RED HIGHLY PLASTIC SANDY CLAY AND OF LIGHT GRAY CLAYEY SILT.
		12	◤		50/7"		SC	SAND, POORLY GRADED, LESS THAN 5% GRAVEL TO 0.4" MAX., UNIFORM FINE SAND, TRACE MEDIUM, LESS THAN 5% NONPLASTIC FINES, LIGHT YELLOWISH BROWN (10 YR 6/4), POCKET OF MODERATE RED SANDY CLAY.
20	60	13	◤		50/6"		SP	SAND, POORLY GRADED, LESS THAN 5% GRAVEL TO 0.5" MAX., FINE TO MEDIUM SAND, MOSTLY FINE, LESS THAN 5% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		14	◤		50/7"		SP	GRAVELLY SAND, POORLY GRADED, 20-25% GRAVEL TO 0.5" MAX., FINE TO COARSE SAND, MOSTLY FINE, LESS THAN 5% NONPLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
10	70	15	◤		50/10"		SM	SILTY SAND, UNIFORM, FINE, TRACE MEDIUM, 10-15% NON TO SLIGHTLY PLASTIC FINES, MEDIUM REDDISH BROWN (10 R 5/6).
		16	◤		50/6"		SP	SAND, POORLY GRADED, ONE PIECE OF GRAVEL TO 0.3" MAX., UNIFORM FINE, TRACE MEDIUM, LESS THAN 5% NON TO SLIGHTLY PLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
0	80	17	◤		50/6"		SP	GRAVELLY SAND, POORLY GRADED, 10-15% GRAVEL TO 0.5" MAX., FINE TO COARSE SAND, MOSTLY FINE, LESS THAN 5% NONPLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE OCTOBER 21, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 43A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 43
TYPE OF BORING DRIVE
SHEET 2 OF 2
DATE DRILLED APRIL 3, 1972
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY P.P.M.
COORDINATES, NORTH 12,292.5 EAST 10,260.0
GROUND SURFACE ELEVATION 78.9'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		18	◤		50/7"		SC	CLAYEY SAND, POORLY GRADED, ONE PIECE GRAVEL TO 0.6" MAX., FINE TO COARSE SAND, MOSTLY FINE AND MEDIUM, 15-20% MODERATELY PLASTIC FINES, PALE REDDISH BROWN (10 R 5/4), LENSES OF HIGHLY PLASTIC MODERATE RED CLAY.
-10	90	19	◤		50/10"		SM	SILTY SAND, POORLY GRADED, TRACE GRAVEL, FINE TO MEDIUM SAND, MOSTLY FINE, 10-15% SLIGHTLY PLASTIC FINES, MEDIUM REDDISH BROWN (10 R 5/6).
		20	◤		40		SM	SILTY SAND, UNIFORM, FINE, 10-15% NON TO SLIGHTLY PLASTIC FINES, PALE REDDISH BROWN (10 R 5/4).
-20	100	21	◤		50/9"		SM	SILTY SAND, SIMILAR TO ABOVE, EXCEPT POCKET OF RED SLIGHTLY PLASTIC CLAY.
		22	◤		50/6"		SM-SP	SILTY SAND, UNIFORM, FINE, 5-10% NONPLASTIC FINES, MEDIUM REDDISH BROWN (10 R 5/6).
-30	110	23	◤		50/6"		SM-SP	SILTY SAND, FINE TO MEDIUM, MOSTLY FINE, 5-10% NONPLASTIC FINES, LESS THAN 5% GRAVEL TO 0.4" MAX., MODERATE YELLOWISH BROWN (10 YR 5/4).
		24	◤		50/4"		SM-SP	SILTY SAND, SIMILAR TO ABOVE, EXCEPT NO GRAVEL.
-40	120	25	◤		50/3"		SM-SP	SILTY SAND, SAME AS ABOVE.
		26	◤		63/6"		SM-SP	SILTY SAND, SAME AS ABOVE.
-50	130	27	◤		100/3"		SM-SP	SILTY SAND, SAME AS SAMPLE SS-23.
		28	◤		100/4"		SM-SP	SILTY SAND, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 5-10% NONPLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
-60	140	29	◤		100/4"		SM-SP	SILTY SAND, SAME AS ABOVE.
		30	◤		100/6"		SM-SP	SILTY SAND, SAME AS ABOVE.
-71.1	150	31	◤		50/8"		CL	GRAVELLY CLAY, MODERATELY PLASTIC, 20-30% GRAVEL, FINE TO COARSE SAND, MODERATE RED (5 R 5/4).
								END OF BORING AT 150.0'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE OCTOBER 21, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 43B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 54
TYPE OF BORING DRIVE
SHEET 1 OF 2
DATE DRILLED APRIL 24, 1972
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY RIB & PPM
COORDINATES, NORTH 12,165.0 EAST 9,880.0
GROUND SURFACE ELEVATION 37.3'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		1	◤		7		CH	SILTY CLAY, HIGHLY PLASTIC, 1-3% FINE SAND, FIRM, OLIVE GRAY (5 Y 5/1), MANY VEINS DARK YELLOWISH ORANGE CLAYEY SILT.
		2	◤		4		ML-CL	CLAYEY SILT, SLIGHTLY TO MODERATELY PLASTIC, 20-40% FINE TO MEDIUM SAND, MOSTLY FINE, OLIVE GRAY (5 Y 5/1).
30	10	3	◤		4		ML	CLAYEY SILT, SLIGHTLY TO MODERATELY PLASTIC, 15-30% FINE TO MEDIUM SAND, MOSTLY FINE, LIGHT OLIVE GRAY (5 Y 5/1), FEW VEINS DARK YELLOWISH ORANGE CLAYEY SILT.
		4	◤		7		CH	SILTY CLAY, HIGHLY PLASTIC, 2-4% FINE TO MEDIUM SAND, FIRM, GREENISH GRAY (5 G 5/1), FEW VEINS DARK YELLOWISH ORANGE CLAYEY SILT.
20	20	5	◤		5		ML	CLAYEY SILT, SLIGHTLY TO MODERATELY PLASTIC, 5-10% FINE TO MEDIUM SAND, LIGHT OLIVE GRAY (5 Y 5/1), SOME MODERATE YELLOWISH BROWN CLAYEY SILT.
		6	◤		6			NO SAMPLE.
10	30	7	◤		31		SM-SP	SILTY SAND, POORLY GRADED, 3-8% GRAVEL TO 0.8" MAX., FINE TO MEDIUM SAND, MOSTLY FINE, 5-10% NONPLASTIC TO SLIGHTLY PLASTIC FINES, DUSKY YELLOW (5 Y 6/4).
		8	◤		24		GP-GC	SANDY GRAVEL, POORLY GRADED, GRAVEL TO 0.8" MAX., 30-40% FINE TO COARSE SAND, MOSTLY FINE, 3-8% SLIGHTLY PLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/3) POCKET LIGHT OLIVE GRAY SANDY CLAY.
0	40	9	◤		38		SP-SM	SAND, UNIFORM, FINE, 3-8% NONPLASTIC TO SLIGHTLY PLASTIC FINES, MEDIUM YELLOWISH ORANGE (10 YR 7/6).
		10	◤		46		SP-SM	SAND, SIMILAR TO SS-9, EXCEPT 2-4% MEDIUM SAND.
-10	50	11	◤		45		SP-SM	SAND, SIMILAR TO SS-19, EXCEPT 5-10% NONPLASTIC TO SLIGHTLY PLASTIC FINES.
		12	◤		36		SM	SAND, UNIFORM, FINE, 1-3% GRAVEL 0.4" MAX., 2-4% MEDIUM SAND, 10-15% NONPLASTIC TO SLIGHTLY PLASTIC FINES, MEDIUM REDDISH ORANGE (10 R 5/6).
-20	60	13	◤		27		SM	SILTY SAND, UNIFORM, FINE, 10-15% SLIGHTLY PLASTIC FINES, DARK GRAYISH ORANGE (10 YR 6/4).
		14	◤		27		SM	SILTY SAND, SIMILAR TO SS-13, EXCEPT LIGHT BROWN (5 YR 5/4).
-30	70	15	◤		30		SM-SP	SILTY SAND, UNIFORM, FINE, 8-12% NONPLASTIC TO SLIGHTLY PLASTIC FINES, MODERATE YELLOW (5 Y 6/6).
		16	◤		50/7"		SM-SP	SILTY SAND, POORLY GRADED, 10-20% GRAVEL TO 0.8" MAX., FINE TO COARSE SAND, MOSTLY MEDIUM AND COARSE, 8-12% NONPLASTIC TO SLIGHTLY PLASTIC FINES, DARK YELLOWISH BROWN (10 YR 4/4).
-40	80	17	◤		50/7"		SM	SILTY SAND, POORLY GRADED, 2-4% GRAVEL TO 0.4" MAX., FINE TO MEDIUM SAND, MOSTLY FINE, 15-20% SLIGHTLY PLASTIC FINES, MEDIUM YELLOWISH BROWN (10 YR 6/4).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 20, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 54A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 54
TYPE OF BORING DRIVE
SHEET 2 OF 2
DATE DRILLED APRIL 24, 1972
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY RIB & PPM
COORDINATES, NORTH 12,165.0 EAST 9,880.0
GROUND SURFACE ELEVATION 37.3'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		18	◤		50/7"		SP-SM	SAND, POORLY GRADED, 2-4% GRAVEL TO 0.4" MAX., FINE TO MEDIUM SAND, MOSTLY FINE, 3-5% COARSE SAND, 3-8% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 5/6).
-50	90	19	◤		50/8"		SP	SAND, POORLY GRADED, 5-10% GRAVEL TO 0.7" MAX., FINE TO MEDIUM SAND, MOSTLY FINE, 1-3% COARSE SAND, LESS THAN 5% NONPLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
		20	◤		50/7"		SP-SM	SAND, POORLY GRADED, 3-5% GRAVEL TO 0.8" MAX., FINE TO MEDIUM SAND, MOSTLY FINE, 3-8% NONPLASTIC FINES, MEDIUM YELLOWISH ORANGE (10 YR 7/6).
-60	100	21	◤		32		GP	SANDY GRAVEL, POORLY GRADED, GRAVEL TO 1.0" MAX., 10-20% FINE TO COARSE SAND, MOSTLY COARSE, LESS THAN 3% NONPLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/5).
		22	◤		40		GP	GRAVEL, POORLY GRADED, GRAVEL 0.9" MAX., 1-3% FINE TO COARSE SAND, LESS THAN 1% NONPLASTIC FINES.
-70	110	23	◤		28			NO SAMPLE.
		24	◤		45		CH	SILTY CLAY, HIGHLY PLASTIC, 3-8% FINE SAND, HARD, LIGHT OLIVE GRAY (5 Y 6/1).
-80	120	25	◤		21		SC	CLAYEY SAND, UNIFORM, FINE, 15-25% SLIGHTLY TO MODERATELY PLASTIC FINES, PALE REDDISH BROWN (10 R 5/4), LAYER LIGHT OLIVE GRAY SANDY CLAY.
		26	◤		23			NO SAMPLE.
-90	130	27	◤		17		SC	CLAYEY SAND, SIMILAR TO SS-25, EXCEPT FOR SANDY CLAY LAYER.
		28	◤		30		SC	CLAYEY SAND, SIMILAR TO SS-27.
-100	140	29	◤		18		SC	CLAYEY SAND, SIMILAR TO SS-27.
		30	◤		31		SM-SP	SILTY SAND, UNIFORM, FINE, SOME GRAVEL, DARK YELLOWISH ORANGE (10 YR 6/6), EXTREMELY SMALL SAMPLE.
-110 -112.7	150	31	◤		50		SM	SILTY SAND, UNIFORM, FINE, 10-20% NONPLASTIC TO SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE REDDISH ORANGE.
								END OF BORING AT 150.0'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 20, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 54B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 55
DATE DRILLED JANUARY 18, 1971
COORDINATES, NORTH 12,155.1
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 9,655.2
SHEET 1 OF 2
LOGGED BY R.T. & A.D.
GROUND SURFACE ELEVATION 33.3

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		1	◤		3		CH	SILTY CLAY, HIGHLY PLASTIC, SOFT, MOIST, OLIVE GRAY, (5 Y 4/1) MOTTLED, WITH MODERATE BROWN, FEW ROOTS AND ORGANIC FIBERS.
30		2	◤		2		CH	CLAY, MODERATELY TO HIGHLY PLASTIC, 1-3% FINE SAND, SOFT, SATURATED, OLIVE GRAY (5 Y 3/2), MANY ROOTS AND TWIGS.
	10	3	◤		2		CH	CLAY, HIGHLY PLASTIC, SOFT, MOIST, LIGHT OLIVE GRAY (5 Y 5/2), MOTTLED WITH MODERATE BROWN, MANY ROOTS AND LARGE TWIGS.
20		4	◤		2		CH	CLAY, MODERATELY TO HIGHLY PLASTIC, FIRM, MOIST, DARK GREENISH GRAY (5 GY 4/1), FEW ROOTS.
	20	5	◤		3		CH	CLAY, SAME AS ABOVE.
10		6	◤		5		ML	SANDY SILT, SLIGHTLY PLASTIC, 25-35 % VERY FINE SAND, FIRM, MOIST, OLIVE GRAY (5 Y 3/2).
	30	7	◤		5		ML	SILT, SLIGHTLY PLASTIC, FIRM, MOIST, DUSKY YELLOWISH BROWN, (10 YR 3/2), MANY ROOTS, PIECES OF WOOD.
0		8	◤		3		ML	SANDY SILT, SLIGHTLY TO MODERATELY PLASTIC, 15-25 % FINE SAND, FIRM, MOIST, MOTTLED MODERATE YELLOWISH BROWN (10 Y 6/4), AND MODERATE BROWN (5 Y 4/6).
	40	9	◤				ML	CLAYEY SILT, SLIGHTLY PLASTIC, 5-10 % FINE SAND, FIRM, MOIST, MODERATE BROWN (5 YR 4/4), POCKET LIGHT OLIVE GRAY SANDY SILT.
-10		10	◤		3		ML	SILT, SLIGHTLY PLASTIC, 5-10 % VERY FINE SAND, SOFT, SATURATED, MODERATE YELLOWISH BROWN (10 YR 4/4).
	50	11	◤		6		ML	SILT, SLIGHTLY PLASTIC, 3-5% VERY FINE SAND, FIRM, DAMP, MODERATE YELLOWISH BROWN (10 YR 4/4).
-20		12	◤		30		SM	SILTY SAND, POORLY GRADED, FINE TO COARSE, 10-15 % SLIGHTLY PLASTIC FINES, MOIST, MOTTLED MODERATE BROWN (5 YR 4/4), AND LIGHT OLIVE BROWN (5 Y 5/6), LAYERS GRAYISH OLIVE SILTY CLAY.
	60	13	◤		8		ML	CLAYEY SILT, SLIGHTLY PLASTIC, 3-5 % FINE SAND, FIRM, MOIST, DARK GREENISH GRAY (5 GY 4/1).
-30		14	◤		16		ML	SILT, SLIGHTLY PLASTIC, 5-10 % FINE SAND, STIFF, MOIST, OLIVE GRAY (5 Y 5/1).
	70	15	◤		30		SP	SAND, POORLY GRADED, FINE TO COARSE, 3-8% NONPLASTIC FINES, SATURATED, DUSKY YELLOW (5 Y 6/4), LAYERS GREENISH GRAY SILTY CLAY.
-40		16	◤		18		SP	SAND, POORLY GRADED, 1-3 % GRAVEL TO 0.3 INCH MAXIMUM, MOSTLY FINE SAND, 3-8 % NONPLASTIC FINES, MODERATE GREENISH GRAY (5 GY 5/1).
	80	17	◤		27		ML	SILT, NONPLASTIC, 5-10 % FINE SAND, STIFF, MODERATE OLIVE GRAY (5 Y 4/2).

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 8, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 55 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 55
DATE DRILLED 1/18/71
COORDINATES, NORTH 12,155.1
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 9,655.2
SHEET 2 OF 2
LOGGED BY A.D.
GROUND SURFACE ELEVATION 33.3

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-50		18	◤		20		ML	SILT, NONPLASTIC, STIFF, SATURATED, OLIVE-GRAY (5Y 3/2).
	90	19	◤		7		CL	SILTY CLAY, SLIGHTLY PLASTIC, FIRM, OLIVE-GRAY (5Y 4/1).
-60		20	◤		10		SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 3-8% SLIGHTLY PLASTIC FINES, MODERATE YELLOWISH-BROWN (10YR 5/5), LAYERS SANDY SILT.
	100	21	◤		14		SM	SILTY SAND, UNIFORM, VERY FINE, 12-15% NONPLASTIC FINES, LIGHT OLIVE-BROWN (5Y 5/5).
-70		22	◤		15		ML	SILT, SLIGHTLY PLASTIC, 5-10% FINE SAND, STIFF, MODERATE YELLOWISH BROWN (10YR 5/4).
	110	23	◤		32		SP-SC	SAND, UNIFORM, FINE, 8-12% SLIGHTLY PLASTIC FINE, SATURATED, MODERATE REDDISH ORANGE (10 R 6/6).
-80		24	◤		24		SP-SC	SAND, SAME AS ABOVE.
	120	25	◤		50/8"		SP-SC	SAND, UNIFORM, FINE, 8-12% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10R 6/6), FEW POCKETS PALE RED CLAY.
-90		26	◤		22		SC	CLAYEY SAND, UNIFORM, FINE, 12-15% SLIGHTLY PLASTIC FINES, GRAYISH PINK (5YR 7/2), MOTTLED WITH MODERATE REDDISH BROWN.
	130	27	◤		30		SP	SAND, UNIFORM, FINE, 3-8% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10YR 6/6).
-100		28	◤		22		SC	CLAYEY SAND, UNIFORM, VERY FINE, 15-20% SLIGHTLY PLASTIC FINES, SATURATED, MODERATE REDDISH BROWN (10R 4/6), WITH BANDS OF PALE OLIVE.
	140	29	◤		17		SC	CLAYEY SAND, SIMILAR TO ABOVE, EXCEPT 12-15% SLIGHTLY PLASTIC FINES.
-110		30	◤		22		SC	CLAYEY SAND, SIMILAR TO ABOVE, EXCEPT MOTTLED MODERATE REDDISH-BROWN (10R 4/6), AND YELLOWISH-GRAY (5Y 7/2).
-116.7	150	31	◤		40		SP	SAND, UNIFORM, FINE, 3-8% SLIGHTLY PLASTIC FINES, MOIST, MODERATE REDDISH-BROWN (10R 4/6), WITH FEW SPECKS DARK YELLOWISH-ORANGE.
								END OF BORING AT 150.0'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DATE FEBRUARY 8, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 55 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 61
DATE DRILLED APRIL 24, 1972
COORDINATES, NORTH 11,552.9
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO
EAST 10,012.4
SHEET 1 OF 2
LOGGED BY JEP,RIB,PPM
GROUND SURFACE ELEVATION 58.5'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		1	◤		8		ML	CLAYEY SILT, SLIGHTLY TO MODERATELY PLASTIC, 5-15% FINE SAND, LIGHT OLIVE GRAY (5 Y 5/2).
		2	◤		17		GP	SANDY GRAVEL, POORLY GRADED, GRAVEL 0.6" MAX., FINE TO COARSE SAND, MOSTLY COARSE, LESS THAN 5% NONPLASTIC FINES, LIGHT OLIVE GRAY (5 Y 6/1).
50	10	3	◤		18		SM	SILTY SAND, UNIFORM, FINE, 1-3% GRAVEL TO 0.5" MAX., 3-5% MEDIUM AND COARSE SAND, 10-15% SLIGHTLY PLASTIC FINES, LIGHT DUSKY YELLOW (5 Y 7/4), MANY POCKETS VERY LIGHT GRAY SILTY SAND.
		4	◤		14		SM	SILTY SAND, SIMILAR TO SS-3, EXCEPT NO GRAVEL.
40	20	5	◤		14		SC	CLAYEY SAND, UNIFORM, VERY FINE, 3-8% GRAVEL TO 0.6" MAX., 20-25% SLIGHTLY TO MODERATELY PLASTIC FINES, MODERATE REDDISH BROWN (10 R 4/6).
		6	◤		36		SM	SILTY SAND, POORLY GRADED, 3-8% GRAVEL TO 0.5" MAX., FINE TO COARSE SAND, MOSTLY MEDIUM, 10-15% SLIGHTLY PLASTIC FINES, DUSKY YELLOW (5 Y 5/4).
30	30	7	◤		30		SM	SILTY SAND, POORLY GRADED, 5-10% GRAVEL TO 1.1" MAX., FINE TO COARSE SAND, MOSTLY FINE, 10-15% SLIGHTLY PLASTIC FINES, MEDIUM BROWN (5 YR 4/6).
		8	◤		44		SP-SM	SAND, POORLY GRADED, FINE TO MEDIUM, 3-8% NONPLASTIC TO SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 5/6), MOTTLED REDDISH ORANGE.
20	40	9	◤		28		SM	SILTY SAND, UNIFORM, FINE, 10-15% NONPLASTIC TO SLIGHTLY PLASTIC FINES, LIGHT BROWN (5 YR 5/6).
		10	◤		29		SM	SILTY SAND, POORLY GRADED, FINE TO MEDIUM, 5-15% NONPLASTIC FINES, REDDISH ORANGE (10 R 5/6), MOTTLED DARK YELLOWISH ORANGE.
10	50	11	◤		50		SM	SILTY SAND, POORLY GRADED, 3-5% GRAVEL TO 0.3" MAX., FINE TO COARSE SAND, MOSTLY FINE, 8-12% NONPLASTIC TO SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 5/6).
		12	◤		33		SM	SILTY SAND, POORLY GRADED, FINE TO MEDIUM SAND, 10-15% NONPLASTIC FINES, REDDISH ORANGE (10 R 5/6).
0	60	13	◤		30		SM-SP	SILTY SAND, UNIFORM, FINE, 5-10% NON TO SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6).
		14	◤		42		SM-SP	SILTY SAND, UNIFORM, FINE, 1-2% GRAVEL TO 0.4" MAX., 1-3% MEDIUM TO COARSE SAND, 8-12% SLIGHTLY PLASTIC FINES, DARK REDDISH ORANGE (10 R 5/6).
-10	70	15	◤		50/10"		SP-SM	SAND, POORLY GRADED, 5-15% GRAVEL TO 0.6" MAX., FINE TO COARSE SAND, MOSTLY FINE AND MEDIUM, 3-8% NONPLASTIC FINES, MEDIUM YELLOWISH BROWN (10 YR 6/4).
		16	◤		50/6"		SP-SM	SAND, POORLY GRADED, FINE TO COARSE SAND, MOSTLY FINE, 3-8% NONPLASTIC FINES, MEDIUM YELLOWISH BROWN (10 YR 6/4).
-20	80	17	◤		50/11"		SP-SM	SAND, UNIFORM, FINE, 1-2% GRAVEL TO 0.3" MAX., 1-2% MEDIUM TO COARSE SAND, 3-8% NONPLASTIC TO SLIGHTLY PLASTIC FINES, LIGHT BROWN (5 YR 5/6).

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DATE NOVEMBER 20, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 61A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 61
DATE DRILLED APRIL 24, 1972
COORDINATES, NORTH 11,552.9
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 10,012.4
SHEET 2 OF 2
LOGGED BY JEP,RIB,PPM
GROUND SURFACE ELEVATION 58.5'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		18	◤		50/10"		SP-SM	SAND, POORLY GRADED, 5-10% GRAVEL TO 0.4" MAX., FINE TO MEDIUM SAND, 3-8% NONPLASTIC FINES, LIGHT BROWN (5 YR 6/6)
-30	90	19	◤		50/7"		SP-SM	SAND, POORLY GRADED, 5-10% GRAVEL TO 0.5" MAX., FINE TO COARSE SAND, MOSTLY FINE, 3-8% NONPLASTIC FINES, DUSKY YELLOW (5 Y 5/4).
		20	◤		50/6"		SP-SM	SAND, SIMILAR TO SS-19, EXCEPT 3-8% GRAVEL TO 0.4" MAX.
-40	100	21	◤		50/6"		SP-SM	SAND, POORLY GRADED, 3-5% GRAVEL TO 0.4" MAX., FINE TO COARSE SAND, MOSTLY FINE AND MEDIUM, 5-10% NONPLASTIC TO SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 5/6).
		22	◤		53 SEAT		GP	SANDY GRAVEL, POORLY GRADED, GRAVEL TO 0.7" MAX., FINE TO COARSE SAND, MOSTLY COARSE, LESS THAN 5% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/5)
-50	110	23	◤		51 SEAT		GP	SANDY GRAVEL, POORLY GRADED, GRAVEL TO 0.7" MAX., FINE TO COARSE SAND, MOSTLY COARSE, LESS THAN 5% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/5).
		24	◤		50/4"		SP	GRAVELLY SAND, POORLY GRADAD, 10-20% GRAVEL TO 0.3" MAX., FINE TO COARSE, MOSTLY COARSE, LESS THAN 5% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/5).
-60	120	25	◤		39		CH	SANDY CLAY, MODERATELY TO HIGHLY PLASTIC, 15-20% FINE SAND, VERY STIFF, LIGHT OLIVE GRAY (5 Y 7/1).
		26	◤		48		SC	CLAYEY SAND, UNIFORM, VERY FINE, 15-25% SLIGHTLY TO MODERATELY PLASTIC FINES, MODERATE RED (5 Y 4/6), LAYER YELLOWISH GRAY CLAYEY SAND.
-70	130	27	◤		32		SC	CLAYEY SAND, UNIFORM, VERY FINE, 15-25% SLIGHTLY PLASTIC FINES, MODERATE REDDISH BROWN (10 R 4/6).
		28	◤		43		SM-SP	SILTY SAND, UNIFORM, FINE, 8-12% NONPLASTIC TO SLIGHTLY PLASTIC FINES, PALE REDDISH BROWN (10 R 5/5).
-80	140	29	◤		42		SM-SP	SILTY SAND, UNIFORM, FINE, 8-12% NONPLASTIC TO SLIGHTLY PLASTIC FINES, PALE REDDISH BROWN (10 R 5/5), VERY SMALL POCKET GRAYISH ORANGE SILTY SAND.
		30	◤		49		SC	CLAYEY SAND, UNIFORM, VERY FINE, 10-20% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 8/2) AND LAYER MODERATE ORANGE PINK SILTY SAND.
-91.5	150	31	◤		50		SM	SILTY SAND, UNIFORM, VERY FINE, 10-15% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 8/2), MANY SMALL LAYERS SANDY CLAY, SOME SMALL LAYERS DARK YELLOWISH ORANGE SILTY SAND.
								END OF BORING AT 150.0'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DATE NOVEMBER 20, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 61B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 62
DATE DRILLED NOVEMBER 4, 1971
COORDINATES, NORTH 11,648.5
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 9,262.2
SHEET 1 OF 2
LOGGED BY A.M.D.
GROUND SURFACE ELEVATION 33.2'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		1	◤		4		CH	CLAY, MODERATELY TO HIGHLY PLASTIC, 1-3% VERY FINE SAND, FIRM, MOIST, MEDIUM LIGHT GRAY (N 6) MOTTLED WITH MODERATE BROWN (5 YR 4/4), SOME ROOTS AND WOOD FIBERS.
30		2	◤		1		OL	ORGANIC SILT, SLIGHTLY TO MODERATELY PLASTIC, SOFT, HIGHLY COMPRESSIBLE, OLIVE-GRAY (5 Y 3/2), LARGE PIECE WOOD.
	10	3	◤				OL	ORGANIC SILT, SIMILAR TO ABOVE, EXCEPT SMALL PIECES PARTIALLY DECOMPOSED WOOD.
20		4	◤		4		CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 1-2% VERY FINE SAND, FIRM, MOIST, DARK GRAYISH-GREEN (5 GY 4/1), MANY ROOTS, TWIGS, AND ORGANIC FIBERS.
	20	5	◤		2		CH	SILTY CLAY, HIGHLY PLASTIC, STIFF, MOIST, MODERATE OLIVE-GRAY (5 Y 4/2), SOME ROOTS AND ORGANIC PARTICLES.
10		6	◤		2		CH	SILTY CLAY, SAME AS ABOVE.
	30	7	◤		16		ML	SANDY SILT, SLIGHTLY PLASTIC, 20-30% FINE SAND, STIFF, MOIST, MODERATE OLIVE-GRAY (5 Y 4/2), FEW ROOTS AND ORGANIC FIBERS.
0		8	◤		3		ML	CLAYEY SILT, SLIGHTLY PLASTIC, 3-8% FINE SAND, FIRM, MOIST, MODERATE OLIVE-GRAY (5 Y 4/2).
	40	9	◤		4		ML	SANDY SILT, SLIGHTLY PLASTIC, 15-25% FINE SAND, FIRM, MOIST, MEDIUM GRAY (N 5).
-10		10	◤		12		ML	SANDY SILT, SLIGHTLY PLASTIC, 10-20% FINE SAND, STIFF, MOIST, MODERATE OLIVE-GRAY (5 Y 4/2) WITH FEW SMALL POCKETS MODERATE BROWN (5 YR 4/4).
	50	11	◤		5		ML	CLAYEY SILT, SLIGHTLY PLASTIC, 10-15% FINE SAND, STIFF, MOIST, MODERATE OLIVE-GRAY (5 Y 4/2) MOTTLED WITH MODERATE BROWN (5 YR 4/4).
-20		12	◤		6		ML	SANDY SILT, SLIGHTLY PLASTIC, 10-20% FINE TO MEDIUM SAND, FIRM, MOIST, GREENISH-GRAY (5 GY 6/1).
	60	13	◤		12		ML	CLAYEY SILT, SLIGHTLY TO MODERATELY PLASTIC, 8-12% FINE SAND, STIFF, MOIST, GREENISH-GRAY (5 GY 6/1) MOTTLED WITH MODERATE OLIVE-GRAY (5 Y 4/2) AND LIGHT OLIVE-BROWN (5 Y 5/6).
-30		14	◤		37		SP	SILTY SAND, UNIFORM, FINE, 10-15% NONPLASTIC TO SLIGHTLY PLASTIC FINES, MOIST, DUSKY YELLOW (5 Y 6/4) MOTTLED WITH DARK YELLOWISH-ORANGE (10 YR 6/6).
	70	15	◤		28		SP-SM	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 5-10% NONPLASTIC FINES, SATURATED, MODERATE OLIVE-GRAY (5 Y 4/2).
-40		16	◤		15		OL	ORGANIC SILT, NONPLASTIC, HIGHLY COMPRESSIBLE, FIRM, DUSKY YELLOWISH-BROWN (10 YR 2/2).
	80	17	◤		21		CL	SILTY CLAY, SLIGHTLY PLASTIC, 10-20% FINE SAND, SOFT, MOIST, MODERATE OLIVE-GRAY (5 Y 4/2), MANY SHELL FRAGMENTS.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 11, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 62 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 62
DATE DRILLED NOVEMBER 4, 1971
COORDINATES, NORTH 11,648.5
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 9,262.2
SHEET 2 OF 2
LOGGED BY A.M.D.
GROUND SURFACE ELEVATION 33.2'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-50		18	◤		15		SP-SM	SAND, UNIFORM, VERY FINE, 5-10% NONPLASTIC FINES, MOIST, LIGHT OLIVE-BROWN (5 Y 5/5) BANDED WITH LIGHT BROWN (5 YR 5/4).
	90	19	◤		50		SM	SILTY SAND, UNIFORM, VERY FINE, 10-20% NONPLASTIC FINES, SATURATED, OLIVE-GRAY (5 Y 3/2).
-60		20	◤		50		SM	SILTY SAND, SIMILAR TO ABOVE, EXCEPT MODERATE YELLOWISH-BROWN (10 YR 5/3).
	100	21	◤		50		SP	SAND, UNIFORM, FINE, 3-8% NONPLASTIC FINES, SATURATED, MODERATE YELLOWISH-BROWN (10 YR 5/3).
-70		22	◤		41		SP	SAND, UNIFORM, FINE, 3-6% NONPLASTIC FINES, SATURATED, OLIVE-GRAY (5 Y 3/2).
	110	23	◤		39		SP	SAND, SIMILAR TO ABOVE, EXCEPT LIGHT OLIVE-GRAY (5 Y 5/2).
-80		24	◤		18		ML	SANDY SILT, NONPLASTIC, 10-20% FINE SAND, STIFF, LIGHT OLIVE-GRAY, (5 Y 5/2), POCKET MODERATELY TO HIGHLY PLASTIC SILTY CLAY.
	120	25	◤		19		ML	SANDY SILT, NONPLASTIC TO SLIGHTLY PLASTIC, 25-40% FINE SAND, LIGHT OLIVE-GRAY (5 Y 5/2).
-90		26	◤		18		SM-SP	SILTY SAND, UNIFORM, FINE, 8-15% NONPLASTIC FINES, LIGHT OLIVE-BROWN (5 Y 5/4).
	130	27	◤		29		SP	SAND, UNIFORM, FINE, 3-8% NONPLASTIC FINES, LIGHT OLIVE-BROWN (5 Y 5/4).
-100		28	◤		31		SP	SAND, SAME AS ABOVE.
	140	29	◤		44		SP	SAND, SIMILAR TO ABOVE, EXCEPT DARK YELLOWISH-BROWN (5 YR 4/6).
-110		30	◤		48		SP	SAND, UNIFORM, FINE, 2-5% NONPLASTIC FINES, MODERATE YELLOWISH-BROWN (10 YR 5/5).
-116.8	150	31	◤		50		SP	SAND, SIMILAR TO ABOVE, EXCEPT MODERATE OLIVE-GRAY (5 Y 4/2).
								END OF BORING AT 150.0'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 11, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 62 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 63
DATE DRILLED NOVEMBER 4, 1971
COORDINATES, NORTH 11,850.6
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO
EAST 8,683.5
SHEET 1 OF 2
LOGGED BY A.M.D.
GROUND SURFACE ELEVATION 33.3'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		1	◤		4		CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 1-2% FINE SAND, FIRM, DAMP, LIGHT OLIVE-GRAY (5 Y 5/3), FEW ROOTS AND SMALL POCKETS BLACK ORGANIC MATERIAL.
30		2	◤		1		CH	CLAY, HIGHLY PLASTIC, FIRM, MOIST, MODERATE OLIVE-GRAY (5 Y 4/2), MANY SMALL POCKETS MODERATE BROWN (5 YR 3/4) CLAYEY SILT.
	10	3	◤		0		OL	ORGANIC SILT, HIGHLY COMPRESSIBLE, SOFT, MANY ROOTS AND TWIGS, OLIVE-GRAY (5 Y 3/2).
20		4	◤		0		CH	SILTY CLAY, HIGHLY PLASTIC, 1-2% VERY FINE SAND, VERY SOFT, MOIST, DARK YELLOWISH-BROWN (10 YR 4/2) MOTTLED WITH OLIVE-GRAY (5 Y 4/1), MANY ROOTS AND TWIGS.
	20	5	◤		2		CH	SILTY CLAY, HIGHLY PLASTIC, 3-5% FINE SAND, SOFT, MOIST, DARK GREENISH GRAY (5 GY 4/1), FEW ROOTS AND TWIGS.
10		6	◤		2		CH	SILTY CLAY, HIGHLY PLASTIC, 1-2% FINE SAND, SOFT, MOIST, MEDIUM LIGHT GRAY (N 5).
	30	7	◤		15		SM	SILTY SAND, UNIFORM, FINE, 15-20% NONPLASTIC TO SLIGHTLY PLASTIC FINES, DAMP, MEDIUM YELLOWISH-GRAY (5 Y 6/2) BANDED WITH LIGHT BROWN (5 YR 5/6).
0		8	◤		7		ML	SANDY SILT, NONPLASTIC TO SLIGHTLY PLASTIC, 10-20% VERY FINE SAND, SOFT, SATURATED, SMALL POCKETS HIGHLY PLASTIC SILTY CLAY, OLIVE-GRAY (5 Y 4/2), FEW ROOTS AND TWIGS.
	40	9	◤		3		ML	CLAYEY SILT, SLIGHTLY PLASTIC, 2-5% FINE SAND, SOFT, WET, FEW SMALL POCKETS HIGHLY PLASTIC CLAY, LIGHT OLIVE-GRAY (5 Y 5/2), FEW TWIGS.
-10		10	◤		11		ML	SANDY SILT, SLIGHTLY PLASTIC, 15-20% VERY FINE SAND, FIRM, DAMP, OLIVE-GRAY (5 Y 4/2), FEW TWIGS AND ROOTS.
	50	11	◤		5		ML	SANDY SILT, SLIGHTLY PLASTIC, 15-20% VERY FINE SAND, FIRM, DAMP, DUSKY YELLOW (5 Y 5/4) AND OLIVE-GRAY (5 Y 4/2).
-20		12	◤		21		SM	SILTY SAND, UNIFORM, FINE, 15-25% NONPLASTIC TO SLIGHTLY PLASTIC FINES, SATURATED, OLIVE-GRAY (5 Y 4/2), SOME TWIGS.
	60	13	◤		4		ML	SANDY SILT, SLIGHTLY TO MODERATELY PLASTIC, 15-30% FINE SAND, SOFT, MOIST, OLIVE-GRAY (5 Y 3/2).
-30		14	◤		31		SM	SILTY SAND, UNIFORM, FINE, 20-30% NONPLASTIC FINES, SATURATED, DARK GREENISH-GRAY (5 GY 4/1), SMALL POCKETS CLAYEY SILT.
	70	15	◤		20		OL	ORGANIC SILT, SLIGHTLY TO MODERATELY PLASTIC, HIGHLY COMPRESSIBLE, MODERATE ORGANIC ODOR, MOIST, OLIVE-BLACK (5 Y 2/1), LAYER UNIFORM FINE SAND.
-40		16	◤		28		OL	ORGANIC SILT, SIMILAR TO ABOVE, EXCEPT FIRM, W. SAND LAYER.
	80	17	◤		34		ML	CLAYEY SILT, SLIGHTLY PLASTIC, 3-5% VERY FINE SAND, FIRM, MOIST, POCKET SOFT MODERATELY PLASTIC CLAYEY SILT, OLIVE-GRAY (5 Y 5/1).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 9, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 63A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 63
DATE DRILLED NOVEMBER 4, 1971
COORDINATES, NORTH 11,850.6
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 8,683.5
SHEET 2 OF 2
LOGGED BY A.M.D.
GROUND SURFACE ELEVATION 33.3'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-50		18	◤		35		ML	SILT, NONPLASTIC TO SLIGHTLY PLASTIC, 3-5% VERY FINE SAND, FIRM, DAMP, LIGHT OLIVE-GRAY (5 Y 5/3).
	90	19	◤		32		ML	SILT, SLIGHTLY PLASTIC, 3-5% VERY FINE SAND, SOFT, SATURATED, OLIVE-GRAY (5 Y 4/2).
-60		20	◤		50/6"		SP	SAND, UNIFORM, FINE, 3-8% NONPLASTIC FINES, SATURATED, OLIVE-GRAY (5 Y 3/2).
	100	21	◤		50/7"		SP	SAND, UNIFORM, FINE, 3-5% NONPLASTIC FINES, DAMP, DUSKY YELLOW (5 Y 6/3).
-70		22	◤		50/6"		SP	SAND, SIMILAR TO ABOVE, EXCEPT OLIVE-GRAY (5 Y 4/2).
	110	23	◤		50/11"		SP	SAND, SIMILAR TO ABOVE, EXCEPT SATURATED
-80		24	◤		50/8"		SP	SAND, UNIFORM, VERY FINE, 3-5% NONPLASTIC FINES, MODERATE OLIVE-BROWN (5 Y 4/3).
	120	25	◤		50/7"		SP	SAND, UNIFORM, FINE, 3-5% NONPLASTIC FINES, SATURATED, MODERATE OLIVE-BROWN (5 Y 4/3).
-90		26	◤		50/6"		SP	SAND, SIMILAR TO ABOVE, EXCEPT OLIVE-GRAY (5 Y 4/2).
	130	27	◤		50/9"		SP	SAND, SAME AS ABOVE.
-100		28	◤		50		SP	SAND, SAME AS ABOVE.
	140	29	◤		50/7"		SP	SAND, SAME AS ABOVE.
-110		30	◤		50/11"		SP	SAND, SAME AS ABOVE
	150	31	◤		50/5"		SP	SAND, SAME AS ABOVE.
								END OF BORING AT 150.0'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 9, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 63 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 64
DATE DRILLED NOVEMBER 3, 1971
COORDINATES, NORTH 12,114.5
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 8,140.4
SHEET 1 OF 2
LOGGED BY A.H.D.
GROUND SURFACE ELEVATION 33.0'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"¹	SAMPLE "N" VALUE	SAMPLE RECOVERY³	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		1	◤		3		CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 1-2% VERY FINE SAND, FIRM, DAMP, LIGHT OLIVE GRAY (5 Y 4/2), SOME ROOTS AND TWIGS.
30		2	◤		0		CH	CLAY, MODERATELY TO HIGHLY PLASTIC, SOFT, MOIST, OLIVE-GRAY (5 Y 3/2), MANY SMALL POCKETS CLAYEY SILT, SOME ROOTS AND WOOD FIBERS.
	10	3	◤		3		CH	CLAY, MODERATELY TO HIGHLY PLASTIC, VERY SOFT, MOIST, OLIVE-GRAY (5 Y 3/2), MANY ROOTS ANS LARGE WOOD FIBERS.
20		4	◤		2		CH	CLAY, SIMILAR TO ABOVE, EXCEPT LIGHT OLIVE-GRAY (5 Y 5/2).
	20	5	◤		5		CH	CLAY, SIMILAR TO ABOVE, EXCEPT MOSTLY LARGE WOOD FIBERS.
10		6	◤				CH	CLAY, MODERATELY TO HIGHLY PLASTIC, SOFT, MOIST, OLIVE-GRAY (5 Y 4/2) MOTTLED WITH MODERATE OLIVE-BROWN (5 Y 4/4), MANY ROOTS AND WOOD FIBERS.
	30	7	◤		6		CH	SILTY CLAY, MOSERATELY TO HIGHLY PLASTIC, 1-2% FINE SAND, FIRM, MOIST, OLIVE-GRAY (5 Y 3/2).
0		8	◤		22		CL	SILTY CLAY, SLIGHTLY PLASTIC, 1-2% FINE SAND, STIFF, MOIST, LIGHT OLIVE-GRAY (5 Y 6/2).
	40	9	◤		20		SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 1-3% NONPLASTIC FINES, LIGHT OLIVE-GRAY (5 Y 6/1), LENSES OLIVE-GRAY CLAY, FEW TWIGS.
-10		10	◤		6		CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 1-3% VERY FINE SAND, FIRM, MOIST, OLIVE-GRAY (5 Y 4/1).
	50	11	◤		25		ML	SANDY SILT, NONPLASTIC, 30-40% FINE SAND, STIFF, MOIST, DARK GREENISH-GRAY (5 GY 4/1).
-20		12	◤		11		ML	CLAYEY SILT, NONPLASTIC TO SLIGHTLY PLASTIC, 3-8% VERY FINE SAND, STIFF, MOIST, OLIVE-GRAY (5 Y 4/1).
	60	13	◤		12		CL	SILTY CLAY, SLIGHTLY PLASTIC, 1-3% VERY FINE SAND, FIRM, MOIST, OLIVE-GRAY (5 Y 4/1).
-30		14	◤		8		CL	SILTY CLAY, SAME AS ABOVE.
	70	15	◤		27		CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 1-3% FINE SAND, STIFF, MOIST, DARK GREENISH-GRAY (5 GY 4/1), MANY SHELL FRAGMENTS.
-40		16	◤		21		CL	SILTY CLAY, SIMILAR TO ABOVE, EXCEPT FEW SHELL FRAGMENTS, LIGHT OLIVE-GRAY (5 Y 5/2).
	80	17	◤		32		OL	ORGANIC SILT, SLIGHTLY PLASTIC, HIGHLY COMPRESSIBLE, FIBROUS, EARTHY ODOR, OLIVE-BLACK (5 Y 2/1).

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6-INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 9, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 64 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 64
DATE DRILLED NOVEMBER 3, 1971
COORDINATES, NORTH 12,114.5
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 8,140.4
SHEET 2 OF 2
LOGGED BY A.H.D.
GROUND SURFACE ELEVATION 33.0'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"¹	SAMPLE "N" VALUE	SAMPLE RECOVERY³	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-50		18	◤		27		ML	SILT, NONPLASTIC TO SLIGHTLY PLASTIC, 1-3% VERY FINE SAND, VERY STIFF, SATURATED, OLIVE-GRAY (5 Y 5/1), FEW ORGANIC FIBERS.
	90	19	◤		50/10"		SP	SAND, UNIFORM, FINE, 3-5% NONPLASTIC FINES, SATURATED, MODERATE OLIVE-GRAY (5 Y 4/2).
-60		20	◤		50/9"		SP	SAND, SAME AS ABOVE.
	100	21	◤		50/3"		SP	SAND, UNIFORM, FINE, 3-5% NONPLASTIC FINES, SATURATED, MODERATE OLIVE-GRAY (5 Y 4/2).
-70		22	◤		50/5"		SP	SAND, SAME AS ABOVE.
	110	23	◤		50/8"		SP	SAND, SAME AS ABOVE.
-80		24	◤		50/4"		SP	SAND, SAME AS ABOVE.
	120	25	◤		50/7"		SP	SAND, SAME AS ABOVE.
-90		26	◤		50/7"		SP	SAND, SAME AS ABOVE.
	130	27	◤		50/4"		SP	SAND, SAME AS ABOVE.
-100		28	◤		50/3"		SP	SAND, SAME AS ABOVE.
	140	29	◤		50/5"		SP	SAND, SAME AS ABOVE.
-110		30	◤		50/3"		SP	SAND, SAME AS ABOVE.
-117.0	150	31	◤		50/3"		SP	SAND, SAME AS ABOVE.
								END OF BORING AT 150.0'

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6-INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 9, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 64 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 65
DATE DRILLED NOVEMBER 2, 1971
COORDINATES, NORTH 12,309.0
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 7,583.1
SHEET 1 OF 2
LOGGED BY B.E.H.
GROUND SURFACE ELEVATION 35.4'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"¹	SAMPLE "N" VALUE	SAMPLE RECOVERY³	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		1	◤		8		CH	SILTY CLAY, HIGHLY PLASTIC, STIFF, DAMP, MODERATE OLIVE-GRAY (5 Y 4/2).
30		2	◤		3		CH	SILTY CLAY, HIGHLY PLASTIC, FIRM, DAMP, LIGHT OLIVE-GRAY (5 Y 5/2), FEW ROOTS.
	10	3	◤		3		CH	SILTY CLAY, HIGHLY PLASTIC, FIRM, MOIST, MODERATE OLIVE-GRAY (5 Y 4/2), FEW ROOTS.
20		4	◤		2		CH	SILTY CLAY, HIGHLY PLASTIC, FIRM, MOIST, MODERATE OLIVE-GRAY (5 Y 4/2), SOME ROOTS AND WOOD FIBERS.
	20	5	◤		2		CH	SILTY CLAY, HIGHLY PLASTIC, FIRM, MOIST, OLIVE-GRAY (5 Y 3/2), SOME ROOTS.
10		6	◤		3		CH	CLAY, HIGHLY PLASTIC, FIRM, MOIST, MEDIUM BLUISH GRAY (5 B 5/1), MOTTLED WITH LIGHT OLIVE-GRAY, FEW PIECES WOOD AND ROOTS.
	30	7	◤		2		CH	SILTY CLAY, HIGHLY PLASTIC, SOFT, MOIST, MOTTLED MEDIUM DARK GRAY (N 4), AND MODERATE OLIVE-BROWN (5 Y 4/4), MANY ROOTS AND TWIGS.
0		8	◤		16		ML	SILT, NONPLASTIC TO SLIGHTLY PLASTIC, 3-8% FINE SAND, FIRM, MOIST, OLIVE-GRAY (5 Y 4/1), 1.0 IN. LAYER SILTY SAND.
	40	9	◤		4		ML	SANDY SILT, SLIGHTLY PLASTIC, 12-15% FINE SAND, FIRM, MOIST, LIGHT OLIVE-GRAY (5 Y 5/2).
-10		10	◤		9		ML	SILT, SLIGHTLY PLASTIC, 1-3% FINE SAND, FIRM, MOIST, MODERATE OLIVE-BROWN (5 Y 4/4), LARGE POCKET DARK GREENISH-GRAY SILTY CLAY.
	50	11	◤		2		ML	SANDY SILT, NONPLASTIC TO SLIGHTLY PLASTIC, 12-15% FINE SAND, LIGHT OLIVE-GRAY (5 Y 5/2).
-20		12	◤		42		SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 3-5% NONPLASTIC FINES, MODERATE YELLOWISH-BROWN (10 YR 5/5).
	60	13	◤		13		ML	SANDY SILT, NONPLASTIC, 15-20% VERY FINE SAND, FIRM, MOIST, OLIVE-GRAY (5 Y 4/1).
-30		14	◤		7		CL	SILTY CLAY, SLIGHTLY PLASTIC, FIRM, MOIST, OLIVE-GRAY (5 Y 4/1).
	70	15	◤		9		CH	CLAY, MODERATELY TO HIGHLY PLASTIC, FIRM, MOIST, OLIVE-GRAY (5 Y 3/2), MANY PIECES PARTIALLY DECOMPOSED WOOD.
-40		16	◤		14		CH	CLAY, SIMILAR TO ABOVE, EXCEPT NO DECOMPOSED WOOD.
	80	17	◤		24		OL	ORGANIC SILT, NONPLASTIC TO SLIGHTLY PLASTIC, FIRM, FIBROUS, EARTHY ODOR, OLIVE-BLACK (5 Y 2/1).

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6-INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 6, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 65 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 65
DATE DRILLED NOVEMBER 2, 1971
COORDINATES, NORTH 12,309.0
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 7,583.1
SHEET 2 OF 2
LOGGED BY B.E.H.
GROUND SURFACE ELEVATION 35.4'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"¹	SAMPLE "N" VALUE	SAMPLE RECOVERY³	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-50		18	◤		50		ML	SILT, NONPLASTIC, 5-10% FINE SAND, OLIVE-GRAY (5Y 3/2), SOME PIECES [illegible] AND ROOTS.
	90	19	◤		50/10"		SM-SP	SILTY SAND, UNIFORM, VERY FINE, 10-15% NONPLASTIC FINES, MOIST, MODERATE OLIVE-GRAY (5 Y 4/2).
-60		20	◤		50/8"		SP	SAND, UNIFORM, FINE, 3-5% NONPLASTIC FINES, SATURATED, MODERATE OLIVE-GRAY (5 Y 4/2).
	100	21	◤		50/6"		SP	SAND, SAME AS ABOVE.
-70		22	◤		50/6"		SP	SAND, SAME AS ABOVE.
	110	23	◤		50/6"		SP	SAND, UNIFORM, FINE, 3-5% NONPLASTIC FINES, MOIST, DARK YELLOWISH-BROWN (10 YR 3/2).
-80		24	◤		50/5"		SP	SAND, SIMILAR TO ABOVE, EXCEPT MODERATE OLIVE-GRAY (5 Y 4/2).
	120	25	◤		50/5"		SP	SAND, SAME AS ABOVE.
-90		26	◤		50/4"		SP	SAND, SAME AS ABOVE.
	130	27	◤		50/5"		SP	SAND, POORLY GRADED, 3-5% GRAVEL TO 0.7 IN. MAX., UNIFORM FINE SAND, 3-5% NONPLASTIC FINES, SATURATED, OLIVE-GRAY (5 Y 4/2).
-100		28	◤		50/5"		SP	SAND, SAME AS ABOVE.
	140	29	◤		52 SEAT		SP	SAND, SAME AS ABOVE.
-110		30	◤		63 SEAT		SP	SAND, SAME AS ABOVE.
-114.6	150	31	◤		50/11"		SP	SAND, SAME AS ABOVE.
								END OF BORING AT 150.0'.

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6-INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 6, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 65 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 66
TYPE OF BORING DRIVE
SHEET 1 OF 2
DATE DRILLED NOVEMBER 1-2,1971
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY A.M.D.
COORDINATES, NORTH 12,510.1
EAST 7,007.2
GROUND SURFACE ELEVATION 38.8'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		1	◤		5		ML	**SILT**, NONPLASTIC TO SLIGHTLY PLASTIC, 1-3% FINE SAND, STIFF, DAMP, OLIVE-GRAY, (5 Y 3/2), MANY ROOTS.
		2	◤		4		CH	**SILTY CLAY**, HIGHLY PLASTIC, FIRM, DAMP, MODERATE OLIVE-GRAY (5 Y 4/2) MOTTLED WITH LIGHT BROWN (5 YR 5/6) POCKETS CLAYEY SILT.
30	10	3	◤		3		ML	**CLAYEY SILT**, SLIGHTLY PLASTIC, 2-5% FINE SAND, FIRM, DAMP, LIGHT OLIVE-GRAY (5 Y 4/2), FEW SMALL POCKETS MODERATE BROWN SANDY SILT.
		4	◤		7		CH	**SILTY CLAY**, HIGHLY PLASTIC, SOFT, MOIST, OLIVE-GRAY (5 Y 3/2), MANY SMALL ROOTS AND ORGANIC PARTICLES, LARGE PIECE WOOD.
20	20	5	◤		2		CH	**SILTY CLAY**, HIGHLY PLASTIC, SOFT, MOIST, OLIVE-GRAY (5 Y 3/2), SOME ROOTS AND SMALL POCKETS ORGANIC MATERIAL.
		6	◤		4		CH	**SILTY CLAY**, SIMILAR TO ABOVE, EXCEPT LARGE PIECE WOOD.
10	30	7	◤		4		CH	**SILTY CLAY**, SIMILAR TO ABOVE, EXCEPT FEW SMALL PIECES WOOD.
		8	◤				CH	**SILTY CLAY**, SAME AS ABOVE.
0	40	9	◤		10		ML	**CLAYEY SILT**, SLIGHTLY PLASTIC, FIRM, DAMP, MODERATE OLIVE-GRAY (5 Y 5/1), POCKETS, FINE SILTY SAND, FEW ROOTS.
		10	◤		5		CH	**SILTY CLAY**, HIGHLY PLASTIC, FIRM, MOIST, MODERATE OLIVE-GRAY (5 Y 4/2) MOTTLED WITH MODERATE BROWN (5YR 5/4), FEW NODULES ORGANIC MATERIAL.
-10	50	11	◤		8		CH	**SILTY CLAY**, MODERATELY TO HIGHLY PLASTIC, FIRM, MOIST, MODERATE OLIVE-GRAY (5 Y 4/2), SOME ROOTS AND LARGE PIECES WOOD.
		12	◤		–		SP-SM	**SAND**, UNIFORM, FINE, 5-10% NONPLASTIC FINES, MOIST, LIGHT OLIVE-GRAY (5 Y 4/2), SMALL POCKETS AND LENSES FINE SILTY SAND, FEW ROOTS.
-20	60	13	◤		7		SM	**SILTY SAND**, UNIFORM, FINE, 10-20% SLIGHTLY PLASTIC FINES, SATURATED, DUSKY YELLOW-GREEN (5 GY 5/2).
		14	◤		4		CL	**SILTY CLAY**, SLIGHTLY PLASTIC, 3-8% FINE SAND, MOIST, FIRM, MODERATE OLIVE-GRAY (5 Y 4/2).
-30	70	15	◤		9		ML	**CLAYEY SILT**, NONPLASTIC TO SLIGHTLY PLASTIC, 1-2% FINE SAND, FIRM, SATURATED, MODERATE OLIVE-GRAY (5 Y 4/2).
		16	◤		18		OL	**ORGANIC SILT**, NONPLASTIC TO SLIGHTLY PLASTIC, HIGHLY COMPRESSIBLE, DARK YELLOWISH-BROWN (10 YR 4/3).
-40	80	17	◤		20		CL	**SILTY CLAY**, SLIGHTLY PLASTIC, FIRM, MOIST, OLIVE-GRAY (5 Y 3/2) SPECKED WITH MODERATE BROWN (5 YR 4/4), SOME ORGANIC FIBERS.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 9, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 – GSK – 66 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO 66
TYPE OF BORING DRIVE
SHEET 2 OF 2
DATE DRILLED NOVEMBER 1-2,1971
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY A.M.D.
COORDINATES, NORTH 12,510.1
EAST 7,007.2
GROUND SURFACE ELEVATION 38.8'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		18	◤		26		CH	**SILTY CLAY**, MODERATELY TO HIGHLY PLASTIC, FIRM, MOIST, MODERATE OLIVE-GRAY (5 Y 4/2), POCKETS AND THIN LENSES FINE SAND.
-50	90	19	◤		50/9"		ML	**SANDY SILT**, NONPLASTIC, 20-30% FINE SAND, FIRM, DAMP, MODERATE OLIVE-GRAY (5 Y 4/2), SOME NODULES ORGANIC MATERIAL.
		20	◤		50/6"		SP	**SAND**, UNIFORM, FINE, 3-8% NONPLASTIC FINES, MOIST, MODERATE OLIVE-GRAY (5 Y 4/2).
-60	100	21	◤		50/8"		SP	**SAND**, UNIFORM, FINE, 3-5% NONPLASTIC FINES, MOIST, MODERATE OLIVE-GRAY (5 Y 4/2), SOME ORGANIC PARTICLES.
		22	◤		50/6"		SP	**SAND**, SIMILAR TO ABOVE, EXCEPT SATURATED.
-70	110	23	◤		50/3"		SP	**SAND**, SAME AS ABOVE.
		24	◤		50/4"		SP	**SAND**, SAME AS ABOVE.
-80	120	25	◤		50/3"		SP	**SAND**, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 3-5% NONPLASTIC FINES, 1-2% GRAVEL TO 0.2 IN MAX., MODERATE OLIVE-GRAY (5 Y 4/2).
		26	◤		50/5"		SP	**SAND**, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 3-5% NONPLASTIC FINES, 1-4% GRAVEL TO 0.3 IN. MAX., MODERATE OLIVE-GRAY (5 Y 4/2).
-90	130	27	◤		50/7"		SP	**SAND**, UNIFORM, FINE, 1-2% MEDIUM TO COARSE SAND, 3-8% NONPLASTIC FINES, SATURATED, MODERATE OLIVE-GRAY (5 Y 4/2)
		28	◤		50/6"		SP	**SAND**, UNIFORM, FINE, 1-3% NONPLASTIC FINES, SATURATED, LIGHT OLIVE-GRAY (5 Y 5/3).
-100	140	29	◤		50/6"		SP	**SAND**, SIMILAR TO ABOVE, EXCEPT LIGHT OLIVE-GRAY (5 Y 4/2).
		30	◤		50/11"		SP	**SAND**, SIMILAR TO ABOVE, EXCEPT DARK YELLOWISH-BROWN (10 YR 4/3).
-110 -111.2	150	31	◤		50/9"		SP	**SAND**, SAME AS ABOVE.
								END OF BORING AT 150.0'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 9, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 – GSK – 66 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 67
TYPE OF BORING DRIVE
SHEET 1 OF 2
DATE DRILLED NOVEMBER 1, 1971
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY
COORDINATES, NORTH 12,717.5
EAST 6,412.4
GROUND SURFACE ELEVATION 43.4

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		1	◤		5		ML	**SANDY SILT**, NON PLASTIC, 12-15 % VERY FINE SAND, DAMP, DARK YELLOWISH BROWN (10 YR 4/2).
40		2	◤		3		SM	**SILTY SAND**, UNIFORM, VERY FINE, 15-20 % NON PLASTIC FINES, MOIST, GRAYISH OLIVE (10 Y 4/2), FEW ROOTS.
	10	3	◤		2		SM	**SILTY SAND**, SIMILAR TO ABOVE, EXCEPT DARK YELLOWISH BROWN (10 YR 4/2), NO ROOTS.
30		4	◤		2		SM	**SILTY SAND**, SAME AS ABOVE.
	20	5	◤		1		ML	**SANDY SILT**, SLIGHTLY PLASTIC, 15-20 % VERY FINE SAND, SATURATED, MODERATE OLIVE BROWN (5 Y 4/4).
20		6	◤		4		ML	**SANDY SILT**, SLIGHTLY PLASTIC, 20-25 % VERY FINE SAND, SATURATED, OLIVE GRAY (5 Y 3/2), FEW TWIGS AND ORGANIC FIBERS.
	30	7	◤		2		CH	**CLAY**, HIGHLY PLASTIC, FIRM, MOIST, DARK GREENISH GRAY (5 GY 4/1), SOME ROOTS AND ORGANIC FIBERS.
10		8	◤		2		CH	**CLAY**, SAME AS ABOVE.
	40	9	◤		4		CH	**CLAY**, HIGHLY PLASTIC, FIRM, MOIST, GRAYISH BROWN (5 YR 3/2), FEW ROOTS AND TWIGS.
0		10	◤				CH	**CLAY**, HIGHLY PLASTIC, SOFT, DAMP, OLIVE GRAY (5 Y 3/2), FEW ROOTS AND TWIGS.
	50	11	◤		10		CH	**SILTY CLAY**, HIGHLY PLASTIC, FIRM, MOIST, LIGHT OLIVE GRAY (5 Y 5/2) FEW ROOTS AND ORGANIC FIBERS.
-10		12	◤		16		CL	**SILTY CLAY**, MODERATELY PLASTIC, 2-5 % FINE SAND, STIFF, DAMP, MEDIUM BLUISH GRAY (5 B 4/1).
	60	13	◤		39		SP-SM	**SAND**, UNIFORM, FINE, 5-10 % NON PLASTIC FINES, MOIST, LIGHT OLIVE GRAY (5 Y 4/2).
-20		14	◤		50/7		SP	**SAND**, UNIFORM, FINE, 3-5 % NON PLASTIC FINES, 1-3 % GRAVEL TO 0.3 IN. MAX., MOIST, LIGHT OLIVE GRAY (5 Y 4/2).
	70	15	◤		16		ML	**SILT**, NON PLASTIC, 3-5 % FINE SAND, FIRM, MOIST, OLIVE GRAY (5 Y 3/2).
-30		16	◤		16		CL	**SILTY CLAY**, SLIGHTLY PLASTIC, FIRM, MOIST, OLIVE GRAY (5 Y 3/2).
	80	17	◤		14		ML	**CLAYEY SILT**, SLIGHTLY PLASTIC, 3-8 % FINE SAND, FIRM, MOIST, MODERATE OLIVE BROWN (5 Y 4/4).

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 10, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 – GSK – 67 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 67
TYPE OF BORING DRIVE
SHEET 2 OF 2
DATE DRILLED NOVEMBER 1, 1971
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY
COORDINATES, NORTH 12,717.5
EAST 6,412.4
GROUND SURFACE ELEVATION 43.4

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-40		18	◤		19		ML	**CLAYEY SILT**, SLIGHTLY PLASTIC, FIRM, MOIST, DUSKY YELLOWISH BROWN (10 YR 2/2), MANY ORGANIC FIBERS.
	90	19	◤		50		ML	**SILT**, NON PLASTIC, 1-3 % FINE SAND, FIRM, DAMP, OLIVE GRAY (5 Y 4/1).
-50		20	◤		50/10		SP	**SAND**, UNIFORM, VERY FINE, 3-5 % NON PLASTIC FINES, MOIST, LIGHT OLIVE GRAY (5 Y 4/2).
	100	21	◤		50/6 (SEAT)		SP	**SAND**, SAME AS ABOVE.
-60		22	◤		55 (SEAT)		SP	**SAND**, UNIFORM, FINE, 3-5 % NON PLASTIC FINES, DAMP, DARK YELLOWISH BROWN (10 YR 5/2).
	110	23	◤		61 (SEAT)		SP	**SAND**, UNIFORM, FINE, 3-8 % NON PLASTIC FINES, MOIST, MODERATE OLIVE GRAY (5 Y 4/2).
-70		24	◤		82 (SEAT)		SP	**SAND**, SIMILAR TO ABOVE, EXCEPT 3-6 % NON PLASTIC FINES.
	120	25	◤		80 (SEAT)		SP	**SAND**, SAME AS ABOVE.
-80		26	◤		50/6		SP	**SAND**, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 3-5 % NON PLASTIC FINES, 5-10 % GRAVEL TO 1.0 IN. MAX., MODERATE OLIVE GRAY (5 Y 4/2).
	130	27	◤		50/6		SP	**SAND**, UNIFORM, FINE, 3-5 % NON PLASTIC FINES, MOIST, MODERATE OLIVE GRAY (5 Y 4/2).
-90		28	◤		50/7		SP	**SAND**, UNIFORM, VERY FINE, 3-5 % NON PLASTIC, MOIST, MODERATE OLIVE GRAY (5 Y 4/2).
	140	29	◤		50/8		SP	**SAND**, SAME AS ABOVE.
-100		30	◤		50/10		SP	**SAND**, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 3-5 % NON PLASTIC FINES, 1-3 % GRAVEL TO 0.3 IN., SATURATED, MODERATE OLIVE GRAY (5 Y 4/2).
-106.6	150	31	◤		50/11		SP	**SAND**, POORLY GRADED, FINE TO COARSE, 1-3 % NON PLASTIC FINES, 3-8 % GRAVEL TO 0.3 IN., SATURATED, DARK YELLOWISH BROWN (10 YR 5/2).
								END OF BORING AT 150.0'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 10, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 – GSK – 67 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO. 69
DATE DRILLED APRIL 25, 1972
COORDINATES, NORTH 12,243.0
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO
EAST 10,052.3
SHEET 1 OF 2
LOGGED BY TIB,JEP,RIB
GROUND SURFACE ELEVATION 54.6'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		1	◤		6		ML	CLAYEY SILT, SLIGHTLY PLASTIC, LESS THAN 5% VERY FINE SAND, OLIVE GRAY (5 Y 4/1) MOTTLED WITH DARK GRAYISH ORANGE, FEW ROOTS AND FIBRES.
50		2	◤		11		ML	SANDY SILT, NON-PLASTIC TO SLIGHTLY PLASTIC 10-20% VERY FINE SAND, MODERATE YELLOWISH BROWN (10 YR 5/4).
	10	3	◤		15		ML	SANDY SILT, NONPLASTIC, 35-45% FINE TO MEDIUM SAND, MOSTLY FINE, LIGHT OLIVE GRAY (5 Y 6/1), MOTTLED DARK YELLOWISH ORANGE SANDY SILT.
40		4	◤		37		SC	CLAYEY SAND, UNIFORM, FINE, 8-12% MODERATELY PLASTIC FINES, DUSKY YELLOW (5 Y 6/4).
	20	5	◤		31		SC SM	CLAYEY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 10-15% SLIGHTLY TO MODERATELY PLASTIC FINES, YELLOWISH ORANGE (10 YR 7/6). SILTY SAND, POORLY GRADED, 5-10% GRAVEL TO 0.7 IN. MAX. FINE TO COARSE SAND, 10-15% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
30		6	◤		46		SM-SP	SILTY SAND, FINE TO MEDIUM, MOSTLY FINE, 1-3% COARSE SAND, 8-12% NONPLASTIC TO SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2), MOTTLED DARK YELLOWISH ORANGE.
	30	7	◤		50		SM-SP	SILTY SAND, POORLY GRADED, 1-4% GRAVEL TO 0.5 IN. MAX., FINE TO COARSE SAND, MOSTLY FINE, 5-10% NONPLASTIC TO SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/5).
20		8	◤		43		SP	GRAVELLY SAND, POORLY GRADED, 5-10% GRAVEL TO 0.7 IN. MAX. FINE TO COARSE SAND, MOSTLY FINE, LESS THAN 5% NONPLASTIC FINES, DUSKY YELLOW (5 Y 6/4).
	40	9	◤		50/7"		SM-SP	SILTY SAND, POORLY GRADED, 3-8% GRAVEL TO 0.5 IN. MAX., FINE TO COARSE, MOSTLY FINE, 3-8% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/5)
10		10	◤		50/7"		SM-SP	SILTY SAND, POORLY GRADED, 3-8% GRAVEL TO 0.5 IN. MAX. FINE TO COARSE, MOSTLY FINE TO MEDIUM, 8-12% NON TO SLIGHTLY PLASTIC FINES, LIGHT BROWN (5 YR 5/6).
	50	11	◤		39		SM	SILTY SAND, UNIFORM, FINE, 1-2% MEDIUM, 10-15% SLIGHTLY PLASTIC FINES, MEDIUM REDDISH BROWN (10 R 5/6), VEINS MODERATE RED SANDY CLAY.
0		12	◤		50/8"		SM-SP	SILTY SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, 8-12% NONPLASTIC FINES LIGHT BROWN (5 YR 5/6), LENSE GRAYISH ORANGE.
	60	13	◤		50/8"			TOO SMALL A SAMPLE TO CLASSIFY.
-10		14	◤		50/8"		SP-SM.	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 3-8% NONPLASTIC FINES, DARK GRAYISH ORANGE (10 YR 6/4), ONE PIECE GRAVEL TO 0.5 IN. MAX.
	70	15	◤		33		SC	CLAYEY SAND, UNIFORM, FINE, 10-20% SLIGHTLY PLASTIC FINES, PALE REDDISH BROWN (10 R 5/6), MOTTLED DARK YELLOW ORANGE AND LIGHT GRAY.
-20		16	◤		35		CH SM	CLAY, HIGHLY PLASTIC, VERY SOFT PALE RED (10 R 6/2), MOTTLED MEDIUM RED. SILTY SAND, UNIFORM, FINE 10-15% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 5/6), MOTTLED PALE REDDISH BROWN.
	80	17	◤		50/10"		SM	SILTY SAND, UNIFORM, FINE, 10-15% NON TO SLIGHTLY PLASTIC FINES, PALE REDDISH BROWN (10 R 5/4).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 20, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 69A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO 69
DATE DRILLED APRIL 25, 1972
COORDINATES, NORTH 12,243.0
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO
EAST 10,052.3
SHEET 2 OF 2
LOGGED BY TIB,JEP, RIB
GROUND SURFACE ELEVATION 54.6'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-30		18	◤		35		SM	SILTY SAND, UNIFORM, FINE, 10-15% NON TO SLIGHTLY PLASTIC, DARK REDDISH ORANGE (10 R 5/6) WITH POCKETS LIGHT GRAY AND PALE YELLOWISH ORANGE.
	90	19	◤		50/7"		SP-SM	SAND, POORLY GRADED, 1-3% GRAVEL TO 0.4" MAX., FINE TO COARSE, MOSTLY FINE, 3-8% NONPLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
-40		20	◤		50/5"		SP-SM	SAND, POORLY GRADED, 3-5% GRAVEL TO 0.6" MAX., FINE TO MEDIUM, MOSTLY FINE, 3-8% NONPLASTIC FINES, MEDIUM YELLOWISH ORANGE (10 YR 7/6).
	100	21	◤		50/4"		SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, LESS THAN 5% NONPLASTIC FINES, PALE YELLOWISH BROWN (10 YR 6/3).
-50		22	◤		50/4"		SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, LESS THAN 5% NONPLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
	110	23	◤		100/6" SEAT		SP	SAND, SAME AS ABOVE.
-60		24	◤		50/6" SEAT		SP-SM	SAND, POORLY GRADED, 2% GRAVEL TO 0.4" MAX., FINE TO COARSE SAND, MOSTLY MEDIUM, 3-8% NONPLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/5).
	120	25	◤		50/5"		SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, LESS THAN 5% NONPLASTIC FINES, PALE YELLOWISH BROWN (10 YR 6/3).
-70		26	◤		50/9"		GC	CLAYEY GRAVEL, POORLY GRADED, GRAVEL TO 0.8" MAX., 8-12% FINE TO COARSE SAND, MOSTLY COARSE, 10-15% MODERATELY PLASTIC FINES, LIGHT REDDISH BROWN (10 R 5/6).
	130	27	◤		50/9"		GP	SANDY GRAVEL, POORLY GRADED, GRAVEL TO 1.1" MAX., 10-15% FINE TO COARSE SAND, MOSTLY COARSE, LESS THAN 5% SLIGHTLY PLASTIC FINES, PALE REDDISH BROWN (10 R 5/4).
-80		28	◤		50/9"		GW	SANDY GRAVEL, WELL GRADED, GRAVEL 0.9" MAX., 10-20% FINE TO COARSE LESS THAN 5% SLIGHTLY TO MODERATELY PLASTIC FINES, PALE REDDISH BROWN (10 R 5/4).
	140	29	◤		50/11"		GC	CLAYEY GRAVEL, POORLY GRADED, GRAVEL TO 1.1" MAX., 1-4% FINE SAND, 10-15% MODERATELY TO HIGHLY PLASTIC FINES, MODERATE RED (5 R 5/4).
-90		30	◤		50/8"		GP	SANDY GRAVEL, POORLY GRADED, GRAVEL TO 0.8" MAX., 20-30% FINE TO COARSE SAND, MOSTLY COARSE, LESS THAN 5% NONPLASTIC FINES, MODERATE GRAYISH ORANGE (10 YR 6/4).
-95.4	150	31	◤		50/7"		SP	GRAVELLY SAND, POORLY GRADED, 10-20% GRAVEL TO 0.5" MAX., FINE TO COARSE SAND, MOSTLY COARSE, LESS THAN 5% NONPLASTIC TO SLIGHTLY PLASTIC FINES, MODERATE GRAYISH ORANGE (10 YR 6/4).
								END OF BORING AT 150.0'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 20, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 69B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO. 70
DATE DRILLED DECEMBER 20-21, 1971
COORDINATES, NORTH 12,257.2
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO
EAST 10,021.3
SHEET 1 OF 2
LOGGED BY
GROUND SURFACE ELEVATION 53.7

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-94.3	148							WASH
								REDDISH-BROWN CLAYEY SAND
	152							
-100								SAND
	163							
-110								SAND WITH SOME PEA GRAVEL
-120								
-130	185							
								REDDISH TAN SAND WITH MUCH PEA GRAVEL
-140								
-150	205							

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 9, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 70 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 70
DATE DRILLED DECEMBER 20-21, 1971
COORDINATES, NORTH 12,257.2
TYPE OF BORING
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 10,021.3
SHEET 2 OF 2
LOGGED BY
GROUND SURFACE ELEVATION 53.7

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-160								
-170								
-180								
-190								TAN SAND WITH MUCH PEA GRAVEL
-200								
-210								
-220	275							
-220.3								END OF BORING AT 275.0'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 9, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 70 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION – UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 84 TYPE OF BORING DRIVE SHEET 1 OF 4
DATE DRILLED MAY 17-19, 22-23, 1972 DRILLING COMPANY – EUSTIS ENGRG. CO LOGGED BY
COORDINATES, NORTH 13,282.7' EAST 10,840.8' GROUND SURFACE ELEVATION 97'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		1	◤	2 3 4	7	10		LOOSE TAN AND GRAY CLAYEY SILT
90								
	10	2	◤	3 7 9	16	14		STIFF TAN AND GRAY SILTY CLAY WITH IRON OXIDE CONCRETIONS
		3	◤	3 6 7	13	15		STIFF TAN AND GRAY SILTY CLAY WITH IRON OXIDE CONCRETIONS
80								
	20	4	◤	6 9 9	18	13		MEDIUM COMPACT TAN AND GRAY CLAYEY SILT
		5	◤	6 6 11	17	14		MEDIUM COMPACT TAN AND GRAY SANDY SILT
70								
	30	6	◤	6 7 8	15	12		MEDIUM COMPACT TAN AND GRAY SANDY SILT
		7	◤	3 7 8	15	16		STIFF GRAY AND TAN CLAY WITH SILT LENSES
60								
	40	8	◤	2 5 7	12	14		STIFF GRAY AND TAN CLAY WITH SILT LENSES
		9	◤	6 7 8	15	12		MEDIUM COMPACT TAN AND GRAY SANDY SILT WITH SILTY SAND
50								
	50	10	◤	7 11 15	26	10		MEDIUM DENSE TAN AND GRAY SILTY SAND WITH SOME CLAY
		11	◤	3 5 5	10	6		LOOSE TAN AND GRAY SILTY SAND WITH PINK CLAY POCKETS
40								
	60	12	◤	8 8 10	18	10		MEDIUM DENSE TAN AND GRAY SILTY SAND
		13	◤	20 50 52	102	8		VERY DENSE TAN AND GRAY SAND
30								
	70	14	◤	22 33 49	82	10		VERY DENSE TAN AND GRAY SAND
		15	◤	6 4 9	13	11		LOOSE TO MEDIUM DENSE TAN AND GRAY CLAYEY SAND WITH PEA GRAVEL AND CLAY POCKETS
20								
	80	16	◤	6 12 18	30	10		DENSE TAN AND GRAY SAND

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL
5. ALL DATA TAKEN FROM EUSTIS ENG. FIELD LOGS

ISSUED BY D. F. GREENWOOD
DATE JANUARY 19, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 – GSK – 84 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION – UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 84 TYPE OF BORING DRIVE SHEET 2 OF 4
DATE DRILLED MAY 17-19, 22-23, 1972 DRILLING COMPANY – EUSTIS ENGRG CO LOGGED BY
COORDINATES, NORTH 13,282.7' EAST 10,840.8' GROUND SURFACE ELEVATION 97'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		17	◤	7 10 14	24	8		MEDIUM DENSE PINK AND TAN CLAYEY SAND
10								
	90	18	◤	6 7 9	16	7		MEDIUM DENSE PINK AND TAN CLAYEY SAND
		19	◤	5 7 11	18	8		MEDIUM DENSE TAN AND GRAY SAND
0								
	100	20	◤	8 18 17	35	8		MEDIUM DENSE TAN AND GRAY SAND
		21	◤	7 12 15	27	7		MEDIUM DENSE TAN AND GRAY SAND
-10								
	110	22	◤	6 6 10	16	10		MEDIUM DENSE TAN AND GRAY SILTY SAND
		23	◤	9 14 17	31	8		DENSE TAN SAND WITH GRAVEL
-20								
	120	24	◤	4 5 6	11	10		STIFF PINK AND TAN CLAY
		25	◤	3 6 6	12	8		STIFF PINK AND TAN CLAY
-30								
	130	26	◤	4 5 6	11	10		LOOSE PINK AND TAN CLAYEY SAND
		27	◤	3 6 11	17	12		MEDIUM DENSE PINK AND TAN CLAYEY SAND
-40								
	140	28	◤	11 14 18	32	10		MEDIUM DENSE TO DENSE TAN AND GRAY SAND
		29	◤	8 20 25	45	10		DENSE TAN AND GRAY SAND
-50								
	150	30	◤	11 24 28	52	11		VERY DENSE TAN AND GRAY SAND
		31	◤	13 20 25	45	6		DENSE TAN AND GRAY SAND
-60								
	160	32	◤	13 26 33	59	6		VERY DENSE TAN AND GRAY SAND WITH TRACE GRAVEL

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL
5. ALL DATA TAKEN FROM EUSTIS ENG. FIELD LOGS

ISSUED BY D. F. GREENWOOD
DATE JANUARY 19, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 – GSK – 84 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION – UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 84 TYPE OF BORING DRIVE SHEET 3 OF 4
DATE DRILLED MAY 17-19, 22-23, 1972 DRILLING COMPANY – EUSTIS ENGRG CO LOGGED BY
COORDINATES, NORTH 13,282.7' EAST 10,840.8' GROUND SURFACE ELEVATION 97'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		33	◤	14 27 34	61	6		VERY DENSE TAN AND GRAY SAND
-70								
	170	34	◤	12 25 30	55	8		VERY DENSE TAN AND GRAY SAND WITH CLAY POCKETS AND TRACE OF GRAVEL
		35	◤	20 40 60	100	7		VERY DENSE TAN AND GRAY SAND WITH GRAVEL
-80								
	180	36	◤	12 20 33	53	9		VERY DENSE TAN AND GRAY SAND WITH GRAVEL
		37	◤	14 22 40	62	8		VERY DENSE TAN AND GRAY SAND WITH GRAVEL
-90								
	190	38	◤	15 23 42	65	9		VERY DENSE TAN AND GRAY SAND WITH GRAVEL
		39	◤	15 27 45	72	6		VERY DENSE TAN AND GRAY SAND
-100								
	200	40	◤	15 30 47	77	6		VERY DENSE TAN AND GRAY SAND WITH GRAVEL
		41	◤	20 32 50	82	6		VERY DENSE TAN AND GRAY SAND WITH GRAVEL
-110								
	210	42	◤	18 30 45	75	7		VERY DENSE TAN AND GRAY SAND WITH GRAVEL
		43	◤	17 29 43	72	8		VERY DENSE TAN AND GRAY SAND WITH GRAVEL
-120								
	220	44	◤	19 34 50	84	7		VERY DENSE TAN AND GRAY SAND WITH GRAVEL
		45	◤	12 21 40	61	8		VERY DENSE TAN SAND
-130								
	230	46	◤	13 27 41	68	8		VERY DENSE TAN SAND
		47	◤	10 28 44	72	8		VERY DENSE TAN SAND
-140								
	240	48	◤	12 26 35	61	7		VERY DENSE TAN SAND

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL
5. ALL DATA TAKEN FROM EUSTIS ENG. FIELD LOGS

ISSUED BY D. F. GREENWOOD
DATE JANUARY 19, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 – GSK – 84 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION – UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 84 TYPE OF BORING DRIVE SHEET 4 OF 4
DATE DRILLED MAY 17-19, 22-23, 1972 DRILLING COMPANY – EUSTIS ENGRG CO LOGGED BY
COORDINATES, NORTH 13,282.7' EAST 10,840.8' GROUND SURFACE ELEVATION 97'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		49	◤	20 21 28	49	16		VERY STIFF GRAY AND TAN SILTY CLAY
-150								
	250	50	◤	9 14 20	34			VERY STIFF GRAY AND TAN CLAY WITH SILT POCKETS
-154.5	251.5							
								END OF BORING AT 251.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL
5. ALL DATA TAKEN FROM EUSTIS ENG. FIELD LOGS

ISSUED BY D. F. GREENWOOD
DATE JANUARY 19, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 – GSK – 84 D

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 85
DATE DRILLED 5/24,25,26,29,30/72
COORDINATES, NORTH 13,524.7
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 11,140.0
SHEET 1 OF 3
LOGGED BY
GROUND SURFACE ELEVATION 97.6'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
90		1	◤	4 5 5	10	14		MEDIUM COMPACT TAN AND GRAY CLAYEY SILT WITH SILTY CLAY.
	10	2	◤	8 9 12	21	15		STIFF TAN AND GRAY SILTY CLAY WITH IRON OXIDE CONCRETIONS.
80		3	◤	4 6 8	14	15		DITTO.
	20	4	◤	5 7 8	15	14		DITTO.
70		5	◤	6 6 6	12	14		MEDIUM COMPACT TAN AND GRAY SANDY SILT.
	30	6	◤	5 7 8	15	13		DITTO.
60		7	◤	3 7 8	15	12		MEDIUM DENSE TAN AND GRAY SILTY SAND WITH SANDY SILT.
	40	8	◤	3 6 8	14	13		MEDIUM COMPACT TAN AND GRAY SANDY SILT WITH SILTY SAND.
50		9	◤	4 7 5	12	12		DITTO.
	50	10	◤	6 6 9	15	12		DITTO.
40		11	◤	5 6 7	13	11		LOOSE TAN AND GRAY CLAYEY SILT WITH SANDY SILT.
	60	12	◤	3 4 5	9	10		LOOSE TAN AND GRAY SILTY SAND.
30		13	◤	6 9 7	16	14		DITTO.
	70	14	◤	4 5 5	10	8		LOOSE TAN AND GRAY CLAYEY SAND WITH SILT.
20		15	◤	7 9 7	16	6		LOOSE TAN AND GRAY CLAYEY SAND WITH SILT.
	80	16	◤	8 10 17	27	6		MEDIUM DENSE TAN AND GRAY SAND WITH SOME CLAY.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

5 ALL DATA TAKEN FROM EUSTIS ENG. FIELD LOGS.

ISSUED BY D.P.GREENWOOD
DATE JANUARY 16, 197

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 85A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 85
DATE DRILLED 5/24,25,26,29,30/72
COORDINATES, NORTH 13,524.7
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 11,140.0
SHEET 2 OF 3
LOGGED BY
GROUND SURFACE ELEVATION 97.6'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
10		17	◤	6 17 20	37	5		DENSE TAN SAND WITH PEA GRAVEL.
	90	18	◤	4 6 10	16	13		MEDIUM DENSE PINK AND TAN CLAYEY SAND.
0		19	◤	6 6 10	16	10		DITTO.
	100	20	◤	4 5 8	13	13		LOOSE PINK AND TAN CLAYEY SAND.
-10		21	◤	6 9 15	24	6		MEDIUM DENSE PINK AND TAN CLAYEY SAND WITH GRAVEL.
	110	22	◤	20 -40 55	95	6		VERY DENSE TAN SAND AND GRAVEL.
-20		23	◤	18 2 29	50	8		DITTO.
	120	24	◤	21 22 29	51	8		DITTO.
-30		25	◤	6 7 8	15	6		STIFF PINK AND TAN CLAY WITH GRAVEL.
	130	26	◤	4 6 9	15	6		DITTO.
-40		27	◤	6 11 8	19	12		MEDIUM DENSE TAN AND GRAY SILTY SAND WITH SOME CLAYEY SILT.
	140	28	◤	14 17 16	33	10		DENSE TAN AND GRAY SAND.
-50		29	◤	14 20 30	50	8		DITTO.
	150	30	◤	15 24 36	60	8		VERY DENSE TAN AND GRAY SAND.
-60		31	◤	22 33 50	83	10		DITTO.
	160	32	◤	14 18 30	48	6		DENSE TAN AND GRAY SAND WITH SOME PEA GRAVEL.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

5 ALL DATA TAKEN FROM EUSTIS ENG. FIELD LOGS.

ISSUED BY D.E.GREENWOOD
DATE JANUARY 16, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 85B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 85
DATE DRILLED 5/24,25,26,29,30/72
COORDINATES, NORTH 13,524.7
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 11,140.0
SHEET 3 OF 3
LOGGED BY
GROUND SURFACE ELEVATION 97.6'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-70		33	◤	14 20 26	46	7		DENSE TAN AND GRAY SAND.
	170	34	◤	12 18 20	38	8		DENSE PINK AND TAN SAND
-80		35	◤	18 22 36	58	10		DENSE PINK AND TAN SAND
	180	36	◤	15 22 37	59	12		DENSE PINK AND TAN SAND
-90		37	◤	14 23 38	61	11		DENSE PINK AND TAN SAND
	190	38	◤	10 18 27	45	10		DENSE PINK AND TAN SAND
-100		39	◤	12 22 30	52	10		DENSE PINK AND TAN SAND
	200	40	◤	9 20 29	49	9		DENSE PINK AND TAN SAND
-110		41	◤	8 9 10	19	13		STIFF PINK AND TAN SANDY CLAY WITH SAND POCKETS
	210	42	◤	5 10 14	24	12		STIFF PINK AND TAN SANDY CLAY WITH SAND POCKETS
-120		43	◤	6 11 12	23	11		STIFF PINK AND TAN SANDY CLAY
	220	44	◤	5 9 15	24	10		STIFF PINK AND TAN SANDY CLAY
-130		45	◤	15 17 28	45	12		VERY STIFF GRAY AND TAN CLAY WITH SILT LENSES
-133.9	230	46	◤	10 15 20	35			VERY STIFF GRAY AND TAN CLAY WITH SAND POCKETS
								END OF BORING AT 231.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

5 ALL DATA TAKEN FROM EUSTIS ENG. FIELD LOGS

ISSUED BY D. E. GREENWOOD
DATE JANUARY 16, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 85 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 87
TYPE OF BORING DRIVE
SHEET 1 OF 3
DATE DRILLED JUNE 9-16, 1972
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY T.I.B.
COORDINATES, NORTH 15,451.8
EAST 14,075.1
GROUND SURFACE ELEVATION 137.4'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
130		1	◤	2 2 2	4	14	ML	CLAYEY SILT, MODERATELY PLASTIC, 1-2% FINE SAND, DARK BROWN.
	10	2	◤	2 4 6	10	18	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 5-10% FINE SAND, SOME DARK BROWN SAND CONCRETIONS MODERATE TO COARSE SAND SIZE, LIGHT BROWN.
120		3	◤	6 15 12	27	18	ML	SANDY SILT, SLIGHTLY PLASTIC, 15-20% FINE SAND, LIGHT BROWN WITH RED BROWN MOTTLES.
	20	4	◤	3 5 8	13	18	CL	SANDY CLAY, SLIGHTLY PLASTIC, 10-20% FINE SAND, BROWN WITH RUST COLORED MOTTLES.
110		5	◤	4 5 6	11	18	CL	SANDY CLAY, MODERATELY PLASTIC, 10-15% FINE SAND, REDDISH BROWN WITH LIGHT BROWN MOTTLES.
	30	6	◤	4 9 16	25	16	SC	CLAYEY SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, DECREASING AMOUNT OF FINES FROM 15-25% AT TOP TO 3-8% AT BOTTOM, MOTTLED LIGHT BROWN, ORANGE AND REDDISH BROWN.
100		7	◤	5 9 12	21	18	CH	SILTY CLAY, HIGHLY PLASTIC, 3-8% FINE SAND, LIGHT GRAY AT TOP, TO RUST ORANGE WITH LIGHT GRAY MOTTLES BELOW.
	40	8	◤	2 5 5	10	18	CL-CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, LOCALLY WITH 5-10% FINE SAND, LIGHT GRAY WITH ORANGE AND RED MOTTLES AND VERY THIN RED LAYERS IN MIDDLE OF SAMPLE.
90		9	◤	3 3 5	8	18	CH	SILTY CLAY, HIGHLY PLASTIC, LIGHT GRAY, WITH LAYERS OF REDDISH BROWN AND ORANGE.
	50	10	◤	6 6 6	12	15	SC	CLAYEY SAND, UNIFORM, FINE, 8-12% SLIGHTLY PLASTIC FINES, PINK WITH ORANGE LAYERS, POCKET OF REDDISH BROWN SILTY CLAY IN MIDDLE OF SAMPLE.
80		11	◤	4 5 6	11	16	SC-SP	CLAYEY SAND, UNIFORM, FINE, 5-12% SLIGHTLY PLASTIC FINES, PINK AT TOP TO LIGHT BROWNISH GRAY WITH THIN YELLOWISH BROWN LAYERS.
	60	12	◤	6 6 5	11	17	SC-SP CH	CLAYEY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 5-10% SLIGHTLY PLASTIC FINES, WITH POCKET OF HIGHLY PLASTIC RED CLAY. CLAY, HIGHLY PLASTIC, RED. (BOTTOM 12")
70		13	◤	8 12 15	27	12	CH SC SP	TOP TO BOTTOM: CLAY, HGIHLY PLASTIC, 1-3% FINE SAND, RED (ALMOST PURPLE). CLAYEY SAND, FINE TO MEDIUM, MOSTLY FINE, 8-12% SLIGHTLY TO MODERATELY PLASTIC FINES, THINLY BANDED PINK AND YELLOWISH BROWN. TWO INCH LAYER (CLAY BALL?) OF HIGHLY PLASTIC CLAY, AS ABOVE. SAND, UNIFORM, FINE, 1-2% GRAVEL TO 1.5" MAX., 1-3% NONPLASTIC FINES, YELLOW.
	70	14	◤	10 14 15	29	12	SP	SAND, UNIFORM, FINE, 1-2% COARSE, 2-4% NONPLASTIC FINES, DECREASING DOWN SAMPLE, MEDIUM BROWN AT TOP TO LIGHT YELLOWISH BROWN BELOW.
60		15	◤	14 21 18	39	15	SP	SAND, UNIFORM, FINE, 3-6% NON TO SLIGHTLY PLASTIC FINES, LIGHT BROWN.
	80							

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DFG
DATE DECEMBER 12, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 87A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 87
TYPE OF BORING DRIVE
SHEET 2 OF 3
DATE DRILLED JUNE 9-16, 1972
DRILLING COMPANY - EUSTIS ENGRG. CO
LOGGED BY T.I.B.
COORDINATES, NORTH 15,451.8
EAST 14,075.1
GROUND SURFACE ELEVATION 137.4'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		16	◤	14 18 18	36	11	SP-SC	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, MOSTLY CLAY, THINLY BANDED, PINK AND YELLOWISH BROWN.
50		17	◤	20 17 15	32	12	SC	CLAYEY SAND, UNIFORM, FINE, 8-12% SLIGHTLY PLASTIC FINES (MOSTLY CLAY) INCREASING DOWN SAMPLE, PINK WITH YELLOW BANDS AT BOTTOM.
	90	18	◤	9 12 13	25	11	SC	CLAYEY SAND, UNIFORM, FINE, 8-12% SLIGHTLY PLASTIC FINES, PINK.
40		19	◤	13 19 25	44	10	SP	SAND, UNIFORM, FINE, 1-3% MEDIUM TO COARSE, 3-5% NONPLASTIC TO SLIGHTLY PLASTIC FINES, PINKISH BROWN.
	100	20	◤	14 28 31	59	14	SP	SAND, POORLY GRADED, FINE TO MEDIUM, 3-4% NONPLASTIC FINES, PINKISH BROWN.
30		21	◤	23 44 53	97	11	SP	SAND, POORLY GRADED, FINE TO MEDIUM, 2-4% NONPLASTIC FINES, LIGHT PINKISH BROWN.
	110	22	◤	14 18 17	35	7	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 5-7% GRAVEL TO 0.6" MAX., 3-4% SLIGHTLY PLASTIC FINES (MOSTLY CLAY), ORANGE.
20		23	◤	13 17 20	37	9	SP	SAND, UNIFORM, FINE, 1-2% GRAVEL TO 0.75" MAX., 3-6% SLIGHTLY PLASTIC FINES, PINKISH BROWN WITH THIN PURPLE HIGHLY PLASTIC CLAY LAYER.
	120	24	◤	13 16 17	33	10	SP	SAND, UNIFORM, FINE, 1-2% GRAVEL TO 0.5" MAX., 1-3% NONPLASTIC FINES, LIGHT BROWN. SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 1-2% GRAVEL TO 0.6" MAX., 1-4% SLIGHTLY PLASTIC FINES, (MOSTLY CLAY), PINKISH BROWN WITH YELLOWISH BROWN MOTTLES (CLAY % HIGHER IN PINKISH ZONES).
10		25	◤	53 50/5"	50/5"	12	SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, LESS THAN 1% FINES, LIGHT BROWN.
	130	26	◤	3 4 4	8	18	CH	CLAY, HIGHLY PLASTIC, (STICKY), 1-6% SILT, RED, WITH FEW VERY THIN REDDISH BROWN SILTY LAYERS, WITH SMALL POCKETS OF UNIFORM, FINE, YELLOW SAND.
0		27	◤	11 14 17	31	12	SP-SC	SAND, UNIFORM, FINE, 3-7% SLIGHTLY PLASTIC FINES (CLAY), PINKISH BROWN.
	140	28	◤	8 11 14	25	10	SP-SC	SAND, SAME AS ABOVE.
-10		29	◤	13 24 28	52	12	SP	SAND, UNIFORM, FINE, 1% MEDIUM, 3-5% NONPLASTIC FINES, PINKISH BROWN WITH SMALL RED CLAYEY POCKETS. SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, 1-3% COARSE SAND, 3-4% NONPLASTIC FINES, LIGHT BROWN.
	150	30	◤	17 16 20	36	9	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 1% GRAVEL TO 0.7" MAX., 2-4% NONPLASTIC FINES, LIGHT BROWN TO YELLOWISH BROWN.
-20		31	◤	42 51 63	114		GP	SANDY GRAVEL, POORLY GRADED, GRAVEL TO 0.7" MAX., 40-45% FINE TO COARSE SAND, MOSTLY MEDIUM TO COARSE, 2-4% NONPLASTIC FINES, MEDIUM BROWN (COLOR LIKELY AFFECTED BY DRILLING MUD)
	160							

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DFG
DATE DECEMBER 12, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 87B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 87
TYPE OF BORING DRIVE
SHEET 3 OF 3
DATE DRILLED JUNE 9-16, 1972
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY T.I.B.
COORDINATES, NORTH 15,451.8
EAST 14,075.1
GROUND SURFACE ELEVATION 137.4'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		32	◤	65 80/6"	80/6"	9	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 15-25% GRAVEL TO 0.6" MAX., 1-3% NONPLASTIC FINES, BROWN.
-30		33	◤	53 75/6"	75/6"	8	SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, 1-2% NONPLASTIC FINES, LIGHT BROWN.
	170	34	◤	51 42/3"	42/3"	9	SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, WITH LESS THAN OR EQUAL TO 1% COARSE, LESS THAN OR EQUAL TO 1% NONPLASTIC FINES, LIGHT BROWN.
-40		35	◤	32 51 63	114	11	SP	SAND, SAME AS ABOVE.
	180	36	◤	32 50/5"	50/5"	8	SP	SAND, SAME AS SS-34.
-50		37	◤	36 50/3"	50/3"	10	SP	SAND, APPROXIMATELY WELL GRADED, FINE TO COARSE, WITH 10-15% GRAVEL TO 0.6" MAX., LESS THAN 1% NONPLASTIC FINES, LIGHT BROWN.
	190	38	◤	32 35 35	70	14	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 5-10% GRAVEL TO 1.0" MAX., 1% NONPLASTIC FINES, LIGHT BROWN.
-60		39	◤	38 50/3"	50/3"	7	SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, 5-10% GRAVEL TO 1.1" MAX., LESS THAN 1% NONPLASTIC FINES, LIGHT BROWN.
	200	40	◤	41 50/6"	50/6"	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 3-5% GRAVEL TO 0.8" MAX., LESS THAN 1% NONPLASTIC FINES, LIGHT BROWN.
-70		41	◤	12 31 36	67	10	GP	SANDY GRAVEL, POORLY GRADED, GRAVEL TO 0.6" MAX., 15-20% FINE TO COARSE SAND, 1-3% NONPLASTIC FINES, LIGHT BROWN.
	210	42	◤	14 24 26	50	12	SC-SP	CLAYEY SAND, POORLY GRADED, , FINE TO COARSE, MOSTLY FINE, 5-10% GRAVEL TO 0.6" MAX., 8-12% SLIGHTLY PLASTIC FINES, YELLOWISH BROWN, WITH 2" THICK LAYER OF LIGHT GRAY CLAY AND GRAVEL AT BOTTOM.
-80		43	◤	8 7 7	14	18	CH	SILTY CLAY, HIGHLY PLASTIC, WITH TWO PIECES OF CHERT GRAVEL TO 1.0" MAX. (LONG DIMENSION AT GRAVEL FRAGMENTS IS VERTICAL), LIGHT GRAYISH GREEN, WITH FEW ORANGE AND BLACK SPOTS.
	220	44	◤	8 10 12	22	18	CH	SILTY CLAY, HIGHLY PLASTIC, LIGHT GRAYISH GREEN, WITH FEW ORANGE AND BLACK SPOTS.
-89.1	226.5	45	◤	7 11 13	24		CH	SILTY CLAY, HIGHLY PLASTIC, LIGHT GRAYISH GREEN, WITH FEW ORANGE AND BLACK SPOTS.
								END OF BORING AT 226.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DFG
DATE DECEMBER 12, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 87C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 88 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED 6/19-23/72 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY F.O. BRAGG
COORDINATES, NORTH 14,068.4 EAST 12,413.6 GROUND SURFACE ELEVATION 122.1'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
120								
		1	◤	4 6 6	12	12		COMPACT LIGHT BROWN CLAYEY SILT.
	10							
		2	◤	12 20 26	46	15		HARD BROWN AND GRAY SILTY CLAY WITH SAND LENES.
110								
		3	◤	6 12 19	31	13		HARD BROWN AND GRAY SILTY CLAY.
	20							
		4	◤	3 10 18	28	14		VERY STIFF GRAY, TAN AND RED SANDY CLAY.
100								
		5	◤	12 13 12	25	14		MEDIUM DENSE RED SAND WITH SMALL TAN AND GRAY CLAY LAYERS.
	30							
		6	◤	5 6 7	13	15		MEDIUM DENSE TAN, PINK AND GRAY SAND.
90								
		7	◤	6 6 7	13			DITTO.
	40							
		8	◤	5 7 7	14			MEDIUM DENSE YELLOW SAND.
80								
		9	◤	6 12 12	24	11		DITTO.
	50							
		10	◤	11 12 13	25	12		MEDIUM DENSE YELLOW AND TAN SAND.
70								
		11	◤	3 4 7	11	18		LOOSE TO MEDIUM DENSE TAN AND RED SAND WITH 7" RED CLAY LAYERS.
	60							
		12	◤	4 6 8	14	18		LOOSE TO MEDIUM DENSE TAN AND RED SAND WITH SOME CLAY.
60								
		13	◤	3 8 10	18	14		MEDIUM DENSE TAN AND RED SAND WITH SOME CLAY.
	70							
		14	◤	8 13 15	28	11		MEDIUM DENSE WHITE SAND.
50								
		15	◤	8 8 8	16	5		MEDIUM DENSE TAN AND PINK SAND WITH THIN RED CLAY LAYERS.
	80							
		16	◤	6 6 6	12	12		MEDIUM DENSE TAN AND PINK SAND.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.
5 ALL DATA TAKEN FROM EUSTIS ENG. FIELD LOGS.

ISSUED BY D.F.GREENWOOD
DATE JANUARY 16, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 88 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 88 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED 6/19-23/72 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY F.O. BRAGG
COORDINATES, NORTH 14,068.4 EAST 12,413.6 GROUND SURFACE ELEVATION 122.1'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
40								
		17	◤	3 3 8	11	18		MEDIUM DENSE TAN AND PINK SAND WITH SOME CLAY.
	90							
		18	◤	8 15 15	30	9		DENSE TAN SAND.
30								
		19	◤	2 2 3	5	18		LOOSE PINK AND TAN CLAYEY SAND.
	100							
		20	◤	13 11 10	21	18		MEDIUM DENSE PINK AND TAN SAND WITH CLAY LAYERS.
20								
		21	◤	5 6 7	13			MEDIUM DENSE PINK AND TAN SAND.
	110							
		22	◤	4 5 9	14	18		MEDIUM DENSE PINK AND TAN CLAYEY SAND.
10								
		23	◤	9 13 22	35	9		DENSE TAN SAND.
	120							
		24	◤	17 27 30	57	9		DITTO.
0								
		25	◤	27 50/7"	50/7"	9		VERY DENSE TAN SAND.
	130							
		26	◤	13 22 23	45	8		DENSE TAN SAND,
-10								
		27	◤	13 21 27	48	8		DITTO.
	140							
		28	◤	17 28 32	60	8		VERY DENSE TAN SAND.
-20								
		29	◤	15 23 28	51	9		DITTO.
	150							
		30	◤	13 20 21	41	8		DENSE TAN SAND.
-30								
		31	◤	10 14 15	29	9		MEDIUM DENSE TAN AND PINK SAND WITH TRACE OF CLAY.
	160							
		32	◤	50/6"	50/6"	6		VERY DENSE TAN SAND.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.
5 ALL DATA TAKEN FROM EUSTIS ENG. FIELD LOGS.

ISSUED BY D.F.GREENWOOD
DATE JANUARY 16, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 88 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 88 TYPE OF BORING DRIVE SHEET 3 OF 3
DATE DRILLED 6/19-23/72 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY F.O. BRAGG
COORDINATES, NORTH 14,068.4 EAST 12,413.6 GROUND SURFACE ELEVATION 122.1'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-40								
		33	◤	75/6"	75/6"	6		DITTO.
	170							
		34	◤	56/6"	56/6"	6		DITTO.
-50								
		35	◤	23 57/6"	57/6"	5		VERY DENSE TAN SAND WITH MUCH SMALL PEA GRAVEL.
	180							
		36	◤	26 21 23	44	8		SOFT TO MEDIUM STIFF PINK AND TAN CLAY WITH SAND LENSES.
-60								
		37	◤	12 12 13	25	4		MEDIUM DENSE BROWN COARSE SAND WITH SOME GRAVEL.
	190							
		38	◤	15 22 26	48	8		DENSE PINKISH-TAN SAND.
-70								
		39	◤	15 22 28	50	8		DENSE PINKISH-TAN SAND.
	200							
		40	◤	28 25 25	50	6		VERY DENSE TAN SAND.
-80								
		41	◤	23 27 29	56	7		DITTO.
	210							
		42	◤	15 23 28	51			DITTO.
-90								
		43	◤	15 26 42	68	8		DITTO.
	220							
		44	◤	17 27 39	66	8		DITTO.
-100								
		45	◤	8 11 11	22	18		VERY STIFF GREENISH-GRAY AND TAN SILTY CLAY.
	230							
		46	◤	15 19 20	39			VERY STIFF GREENISH-GRAY AND TAN SILTY CLAY WITH SANDY SILT LAYERS.
-110								
		47	◤					COMPACT TAN CLAYEY SILT WITH SAND POCKETS.
-114.4	236.5							
								END OF BORING AT 236.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.
5 ALL DATA TAKEN FROM EUSTIS ENG. FIELD LOGS.

ISSUED BY D.F.GREENWOOD
DATE JANUARY 16, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 88 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 89
TYPE OF BORING DRIVE
SHEET 1 OF 4
DATE DRILLED JUNE 26-30, 1972
DRILLING COMPANY - EUSTIS ENGRG CO.
LOGGED BY
COORDINATES, NORTH 13400.6
EAST 12140.5
GROUND SURFACE ELEVATION 107.7'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		1	◤	4 4 8	12	17		VERY STIFF TAN AND GRAY SILTY CLAY.
100								
	10	2	◤	3 3 5	8	16		STIFF TAN SILTY CLAY WITH SAND LENSES.
		3	◤	4 6 8	14	18		VERY STIFF TAN, RED AND GRAY SILTY CLAY WITH SAND LENSES.
90								
	20	4	◤	9 10 11	21	18		MEDIUM DENSE TAN CLAYEY SAND.
		5	◤	6 7 7	14	18		MEDIUM DENSE TAN CLAYEY SAND.
80								
	30	6	◤	5 8 10	18	13		MEDIUM DENSE WHITE SAND.
		7	◤	5 6 7	13	14		MEDIUM DENSE TAN AND PINK SAND.
70								
	40	8	◤	5 6 7	13	15		MEDIUM DENSE TAN AND PINK SAND WITH TRACE OF CLAY.
		9	◤	8 8 8	16	15		MEDIUM DENSE YELLOW AND BROWN SAND.
60								
	50	10	◤	6 7 8	15	14		MEDIUM DENSE YELLOW AND BROWN SAND.
		11	◤	4 4 4	8	12		LOOSE TAN AND PINK SAND WITH CLAY LAYERS.
50								
	60	12	◤	7 9 10	19	12		MEDIUM DENSE TAN AND PINK SAND.
		13	◤	2 2 2	4	18		VERY LOOSE RED CLAYEY SAND.
40								
	70	14	◤	3 3 5	8	18		LOOSE RED CLAYEY SAND.
		15	◤	3 4 5	9	18		LOOSE RED CLAYEY SAND.
30								
	80	16	◤	3 12 19	31	14		DENSE TAN AND RED SAND.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ALL DATA TAKEN FROM EUSTIS ENG. FIELD LOGS.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 9, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 89 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 89
TYPE OF BORING DRIVE
SHEET 2 OF 4
DATE DRILLED JUNE 26-30, 1972
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY
COORDINATES, NORTH 13400.6
EAST 12140.5
GROUND SURFACE ELEVATION 107.7'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		17	◤	13 17 19	36	10		DENSE BROWN SAND.
20								
	90	18	◤	6 10 7	17	15		MEDIUM DENSE TAN AND PINK CLAYEY SAND WITH CLAY BALLS AND GRAVEL.
		19	◤	27 50/8"	50/8"	10		VERY DENSE YELLOW AND BROWN SAND WITH PEA GRAVEL.
10								
	100	20	◤	6 11 13	24	8		MEDIUM DENSE TAN AND PINK SAND.
		21	◤	13 25 38	63	8		VERY DENSE TAN SAND.
0								
	110	22	◤	12 14 18	32	8		DENSE TAN AND PINK SAND.
		23	◤	13 18 25	43	8		DENSE TAN AND PINK SAND.
-10								
	120	24	◤	12 17 23	40	7		DENSE TAN AND PINK SAND.
		25	◤	52/6"	52/6"	6		VERY DENSE TAN SAND.
-20								
	130	26	◤	8 12 13	25	8		MEDIUM DENSE TAN SAND.
		27	◤	3 7 18	25	12		MEDIUM DENSE PINK AND TAN CLAYEY SAND.
-30								
	140	28	◤	15 25 31	56	8		VERY DENSE TAN COARSE SAND WITH PEA GRAVEL.
		29	◤	21 26 32	58	8		VERY DENSE TAN COARSE SAND WITH PEA GRAVEL.
-40								
	150	30	◤	15 17 25	42	8		DENSE TAN COARSE SAND WITH PEA GRAVEL.
		31	◤	24 20 24	44	8		DENSE TAN COARSE SAND WITH PEA GRAVEL.
-50								
	160	32	◤	9 23 50	73	7		VERY DENSE TAN SAND.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

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◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ALL DATA TAKEN FROM EUSTIS ENG. FIELD LOGS.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 9,1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 89 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 89
TYPE OF BORING DRIVE
SHEET 3 OF 4
DATE DRILLED JUNE 26-30, 1972
DRILLING COMPANY - EUSTIS ENGRG. CO
LOGGED BY
COORDINATES, NORTH 13400.6
EAST 12140.5
GROUND SURFACE ELEVATION 107.7'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		33	◤	50/6"	50/6"	7		VERY DENSE TAN SAND.
-60								
	170	34	◤	8 15 22	37	18		STIFF RED CLAY WITH SAND LENSES.
		35	◤	8 14 18	32	18		DENSE TAN SAND WITH 6" RED CLAY LAYERS.
-70								
	180	36	◤	8 17 23	40	16		DENSE YELLOW AND TAN SAND.
		37	◤	8 15 21	36	18		STIFF RED CLAY WITH SAND POCKETS.
-80								
	190	38	◤	8 15 25	40	10		DENSE PINK AND TAN CLAYEY SAND.
		39	◤	9 16 23	39	10		DENSE PINK AND TAN CLAYEY SAND.
-90								
	200	40	◤	12 15 18	33	14		DENSE PINK AND TAN CLAYEY SAND.
		41	◤	13 21 26	47	10		DENSE PINK AND TAN CLAYEY SAND.
-100								
	210	42	◤	14 23 48	71			VERY DENSE TAN AND PINK SAND.
		43	◤	15 27 30	57	11		VERY DENSE TAN AND PINK SAND.
-110								
	220	44	◤	11 34 48	82	12		VERY DENSE TAN AND PINK SAND.
		45	◤	11 29 45	74	14		VERY DENSE TAN SAND WITH SOME PEA GRAVEL.
-120								
	230	46	◤	39 50 60	110	10		VERY DENSE TAN SAND WITH SOME PEA GRAVEL.
		47	◤	27 35 34	69	9		VERY DENSE TAN SAND AND GRAVEL WITH CLAY POCKETS.
-130								
	240	48	◤	10 17 19	36	15		VERY STIFF GRAY AND TAN CLAY WITH SILTY SAND LAYERS.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ALL TAKEN FROM EUSTIS ENG. FIELD LOGS.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 9, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 89 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 89
TYPE OF BORING DRIVE
SHEET 4 OF 4
DATE DRILLED JUNE 26-30, 1972
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY
COORDINATES, NORTH 13400.6
EAST 12140.5
GROUND SURFACE ELEVATION 107.7'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-138	246.5	49	◤	15 27 31	58	10		VERY STIFF GRAY AND TAN CLAY WITH SILTY SAND LAYERS.
								END OF BORING AT 246.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

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ALL TAKEN FROM EUSTIS ENG. FIELD LOGS.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 9, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 89 D

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 90
TYPE OF BORING DRIVE
SHEET 1 OF 3
DATE DRILLED 6/14-16,19-21/72
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY C.EUSTIS
COORDINATES, NORTH 16,979.3
EAST 15,593.4
GROUND SURFACE ELEVATION 129.1'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		1	◤	2 3 3	6	13		MEDIUM STIFF BROWN AND GRAY SILTY CLAY.
120	10							
		2	◤	3 7 11	18	16		VERY STIFF BROWN SILTY CLAY.
		3	◤	4 7 9	16	17		VERY STIFF GRAY AND TAN SILTY CLAY WITH SAND LENSES.
110	20							
		4	◤	4 6 8	14	16		STIFF BROWN AND GRAY SILTY CLAY.
		5	◤	20 20 13	33	15		DENSE TAN SILTY FINE SAND.
100	30							
		6	◤	9 20 25	45	12		DENSE TAN AND BROWN SILTY FINE SAND WITH SANDY CLAY LAYERS.
		7	◤	17 23 14	37	9		DENSE TAN AND BROWN SILTY SAND.
90	40							
		8	◤	5 8 8	16	18		MEDIUM DENSE TAN AND GRAY SANDY CLAY WITH SILTY SAND LENSES.
		9	◤	3 4 5	9	15		LOOSE GRAY CLAYEY SAND WITH SILTY SAND LENSES.
80	50							
		10	◤	2 4 4	8	20		MEDIUM STIFF TAN AND GRAY SANDY CLAY WITH CLAYEY SAND LAYERS.
		11	◤	1 3 4	7	22		MEDIUM STIFF TAN AND RED CLAY WITH SILTY SAND AT BOTTOM.
70	60							
		12	◤	10 14 16	30	15		MEDIUM DENSE TAN AND ORANGE CLAYEY SAND WITH SAND LAYERS.
		13	◤	8 11 11	22	12		MEDIUM DENSE RED AND BROWN CLAYEY SAND.
60	70							
		14	◤	1 5 6	11	15		LOOSE RED AND BROWN CLAYEY SAND WITH SILTY SAND LENSES.
		15	◤	3 3 4	7	18		LOOSE RED AND BROWN CLAYEY SAND WITH SILTY SAND LENSES AND SAND POCKETS.
50	80							
		16	◤	4 4 7	11	18		LOOSE RED AND BROWN CLAYEY SAND WITH SAND POCKETS AND LENSES.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

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4 DATUM IS MEAN SEA LEVEL.
5 ALL DATA TAKEN FROM EUSTIS ENG. FIELD LOGS.

ISSUED BY D.F. GREENWOOD
DATE JANUARY 10, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 90A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 90
TYPE OF BORING DRIVE
SHEET 2 OF 3
DATE DRILLED 6/14-16,19-21/72
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY C.EUSTIS
COORDINATES, NORTH 16,979.3
EAST 15,593.4
GROUND SURFACE ELEVATION 129.1'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		17	◤	4 13 13	26	15		MEDIUM DENSE BROWN CLAYEY SAND WITH SILTY SAND LENSES.
40	90							
		18	◤	4 5 5	10	16		LOOSE TAN AND GRAY CLAYEY SAND WITH PEA GRAVEL GRADED TO RED CLAY.
		19	◤	6 9 11	20	12		MEDIUM DENSE PINK CLAYEY SAND WITH SOME GRAVEL.
30	100							
		20	◤	7 10 13	23	16		MEDIUM DENSE PINK CLAYEY SAND WITH SILTY SAND LENSES.
		21	◤	12 14 20	34	11		DENSE BROWN SAND WITH TRACE OF CLAY.
20	110							
		22	◤	8 12 12	24	15		MEDIUM DENSE BROWN SAND WITH TRACE OF CLAY.
		23	◤	4 6 9	15	16		LOOSE BROWN CLAYEY SAND WITH CLAY POCKETS.
10	120							
		24	◤	4 7 9	16	16		LOOSE BROWN CLAYEY SAND.
		25	◤	25 26 50	76	16		VERY DENSE BROWN SAND WITH GRAVEL AND CLAY.
0	130							
		26	◤	43 51 58	109	13		DITTO.
		27	◤	25 64/6"	64/6"	9		VERY DENSE GRAY AND BROWN SAND WITH PEA GRAVEL AND TRACE OF CLAY.
-10	140							
		28	◤	57/5"	57/5"	5		VERY DENSE BROWN PEA GRAVEL WITH SAND AND TRACE OF CLAY.
		29	◤	26 29 27	56	10		VERY DENSE TAN SAND WITH PEA GRAVEL.
-20	150							
		30	◤	14 5 4	9	9		LOOSE TAN AND GRAY SAND AND GRAVEL WITH TRACE OF CLAY.
		31	◤	26 28 22	50	10		DENSE TAN AND GRAY SAND AND GRAVEL WITH TRACE OF CLAY.
-30	160							
		32	◤	33 23 24	47	8		DITTO.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

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4 DATUM IS MEAN SEA LEVEL.
5 ALL DATA TAKEN FROM EUSTIS ENG. FIELD LOGS.

ISSUED BY D.F. GREENWOOD
DATE JANUARY 10, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 90B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 90
TYPE OF BORING DRIVE
SHEET 3 OF 3
DATE DRILLED 6/14-16,19-21/72
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY C.EUSTIS
COORDINATES, NORTH 16,979.3
EAST 15,593.4
GROUND SURFACE ELEVATION 129.1'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		33	◤	7 16 18	34	18		HARD GRAY AND TAN SANDY CLAY WITH CLAYEY SAND LAYERS.
-40	170							
		34	◤	22 19 13	32	17		DENSE BROWN CLAYEY SAND WITH PEA GRAVL AND HARD SILTY CLAY LAYERS.
		35	◤	11 22 23	45	9		DENSE GRAY AND TAN CLAYEY SAND.
		36	◤	3 10 16	26	22		VERY STIFF GREENISH-GRAY SILTY CLAY.
-50	180							
-52.4	181.5	37	◤	11 14 23	37	22		DITTO.
								END OF BORING AT 181.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

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ISSUED BY D.F. GREENWOOD
DATE JANUARY 10, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 90C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 96
TYPE OF BORING DRIVE
SHEET 1 OF 4
DATE DRILLED JULY 20, 1972
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY T.I.B.
COORDINATES, NORTH 12,695.2
EAST 10,447.5
GROUND SURFACE ELEVATION 96.4'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
90		1	▼	5 7 8	15	11	ML	CLAYEY SILT, SLIGHTLY TO MODERATELY PLASTIC, MOTTLED DARK YELLOWISH ORANGE (10 YR 5/5) (FeOx.) AND LIGHT OLIVE GRAY (5 Y 5/1), SOME SMALL ROOTS.
	10	2	▼	6 10 15	25	12	ML	CLAYEY SILT, SLIGHTLY TO MODERATELY PLASTIC, LIGHT OLIVE GRAY (10 Y 5/1) WITH MANY YELLOWISH ORANGE SPOTS, TRACE SMALL SOFT FeOx. CONCRETIONS.
80		3	▼	3 5 7	12	17	CH	SILTY CLAY, HIGHLY PLASTIC, MOTTLED OLIVE GRAY (10 Y 5/1) WITH DARK YELLOWISH ORANGE (10 YR 6/6), TRACE OF SMALL TREE ROOTS.
	20	4	▼	5 6 7	13	11	ML	CLAYEY SILT, SLIGHTLY PLASTIC, LESS THAN 5% VERY FINE SAND, LIGHT OLIVE GRAY (5 Y 6/2) WITH DARK YELLOWISH ORANGE MOTTLES.
70		5	▼	6 10 15	25	14	CH & ML	THINLY INTERLAYERED HORIZONTALLY - SILTY CLAY AND SILT, SILTY CLAY - MODERATELY TO HIGHLY PLASTIC, SILT - NONPLASTIC, LESS THAN 5% VERY FINE SAND, LIGHT OLIVE GRAY (5 Y 6/2) WITH YELLOWISH ORANGE (FeOx.) LAYER AT BOTTOM.
	30	6	▼	8 9 12	21	12	ML & CH	THINLY INTERLAYERED HORIZONTALLY - SILT WITH FEW SILTY CLAY LAYERS, SILT - NONPLASTIC, SILTY CLAY - MODERATELY TO HIGHLY PLASTIC, LIGHT OLIVE GRAY (5 Y 6/2). SAMPLE BREAKS ALONG SILTY LAYERS LESS THAN 5% VERY FINE SAND IN SILT LAYERS.
60		7	▼	10 12 15	27	12	ML & CH	SAME AS SS-6, BUT WITH 4-8% VERY FINE SAND.
	40	8	▼	10 10 14	24	10	SP	SAND, UNIFORM, FINE, LESS THAN 1% FINES ("CLEAN"), YELLOWISH GRAY (5 Y 7/2) TO DARK YELLOWISH ORANGE (10 YR 6/6) WITH VERY THIN YELLOWISH GRAY CLAY LAYERS AT TOP AND A ONE INCH CLAY LAYER NEAR BOTTOM.
50		9	▼	14 12 15	27	10	SP W/ CH	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 3-6% GRAVEL TO 0.6" MAX., LESS THAN 1% FINES (EXCEPT WITH CLAY BALLS), VARIEGATED COLOR (DUE TO VARYING COLORS OF SAND AND GRAVEL PIECES), WITH OLIVE GRAY CLAY BALLS (ESPECIALLY IN 1" THICK ORANGE OXIDIZED ZONE), ONE FELDSPAR PEBBLE WEATHERED TO CLAY MINERALS.
	50	10	▼	12 13 15	28	13	SP	SAND, UNIFORM, FINE, LESS THAN 1% FINES, LIGHT YELLOWISH GRAY (5 Y 8/2).
40		11	▼	22 26 46	72	10	SP	SAND, SAME AS SS-10, WITH SOME GRAYISH YELLOW MOTTLING.
	60	12	▼	8 12 13	25	11	SP	SAND, UNIFORM, FINE, 1% FINES, DARK YELLOWISH ORANGE (10 YR 5/6).
30		13	▼	32 50/5"	50/5"	8	SP	SAND, UNIFORM, FINE, 6-9% MEDIUM, LESS THAN 1% FINES ("CLEAN SAND"), LIGHT YELLOWISH BROWN (10 YR 6/4) AT TOP TO DUSKY YELLOW (5 Y 6/4) AT BOTTOM.
	70	14	▼	18 50/6"	50/6"	7	SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, 1% FINES, DARK YELLOWISH ORANGE (10 YR 5/6)
20		15	▼	35 50/5"	50/5"	7	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 5% MEDIUM, LESS THAN 1% FINES, (CLEAN SAND), LIGHT DUSKY YELLOW (5 Y 7/4).
	80							

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. R. GREENWOOD
DATE NOVEMBER 28, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 96A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 96
TYPE OF BORING DRIVE
SHEET 2 OF 4
DATE DRILLED JULY 20, 1972
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY T.I.B.
COORDINATES, NORTH 12,695.2
EAST 10,447.5
GROUND SURFACE ELEVATION 96.4'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		16	▼	9 12 13	25	11	SP	SAND, UNIFORM, FINE, LESS THAN 1% GRAVEL TO 0.4" MAX., 1% FINES, DARK YELLOWISH ORANGE (10 YR 6/5) AT TOP TO MODERATE REDDISH ORANGE (10 R 5/6) AT BOTTOM, ONE SMALL HIGHLY PLASTIC PURPLE "CLAY BALL".
10		17	▼	15 27 22	49	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 4-10% MEDIUM TO COARSE, 4-6% GRAVEL TO 0.9" MAX., LESS THAN 1% FINES, YELLOWISH BROWN (10 YR 5/4), TWO SMALL HIGHLY PLASTIC PURPLE "CLAY BALLS".
	90	18	▼	12 17 22	39	10	SP	SAND, UNIFORM, FINE, 1-2% FINES, MODERATE REDDISH ORANGE (10 R 6/6) WITH VERY THIN PALE YELLOWISH ORANGE BAND.
0		19	▼	12 20 22	42	10	SP	SAND, UNIFORM, FINE, 1% FINES, MODERATE REDDISH ORANGE (10 R 6/5).
	100	20	▼	14 21 23	44	12	SP	SAND, UNIFORM, FINE, 3-5% MEDIUM, LESS THAN OR EQUAL TO 1% FINES, MODERATE ORANGE PINK (10 R 7/5).
-10		21	▼	8 23 27	50	12	SP	SAND, UNIFORM, FINE, 1-2% FINES, GRAYISH ORANGE (10 YR 7/4).
	110	22	▼	21 28 31	59	11	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 2-4% GRAVEL TO 0.7" MAX., YELLOWISH BROWN (10 YR 6/3).
-20		23	▼	14 29 33	62	10	SP	TOP TO BOTTOM: SAND, POORLY GRADED, FINE TO MEDIUM, LESS THAN OR EQUAL TO 1% GRAVEL TO 0.5", LESS THAN 1% FINES, YELLOWISH BROWN (10 YR 6/3). SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 1% GRAVEL TO 0.5", LESS THAN 1% FINES, MEDIUM YELLOWISH ORANGE (10 YR 7/6).
	120	24	▼	25 50/7"	50/7"	9	SP	SAND, UNIFORM, FINE, 1-3% MEDIUM TO COARSE, LESS THAN 1% GRAVEL TO 0.6" MAX., LESS THAN 1% FINES, GRAYISH ORANGE (10 YR 7/4).
-30		25	▼	20 18 22	40	10	SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, LESS THAN 1% COARSE, LESS THAN 1% GRAVEL TO 0.3" MAX., LESS THAN 1% FINES, YELLOWISH ORANGE (10 YR 6/3) AT TOP TO LIGHT REDDISH ORANGE (10 R 7/6) BELOW (NEARLY UNIFORM FINE AT BOTTOM).
	130	26	▼	14 21 32	53	9	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 3% MEDIUM TO COARSE, LESS THAN OR EQUAL TO 1% FINES, LIGHT REDDISH ORANGE (10 R 6/6).
-40		27	▼	15 22 35	57	9	SP	SAND, UNIFORM, FINE, LESS THAN 1% FINES, GRAYISH ORANGE (10 YR 7/4).
	140	28	▼	16 27 32	59	12	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 1% MEDIUM, LESS THAN 1% FINES, GRAYISH ORANGE (10 YR 6/4).
-50		29	▼	13 16 19	35	9	SP	SAND, UNIFORM, FINE, DARK YELLOWISH ORANGE (10 YR 6/6) AT TOP TO MEDIUM YELLOWISH ORANGE (10 YR 7/5) BELOW.
	150	30	▼	8 16 22	38	12	SP	SAND, UNIFORM, FINE, 1-2% FINES, GRAYISH ORANGE (10 YR 6/4).
-60		31	▼	10 17 22	39	12	SP	SAND, UNIFORM, FINE, 1-2% FINES, LIGHT REDDISH ORANGE (10 R 7/6).
	160							

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. R. GREENWOOD
DATE NOVEMBER 28, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 96B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 96
TYPE OF BORING DRIVE
SHEET 3 OF 4
DATE DRILLED JULY 20, 1972
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY T.I.B.
COORDINATES, NORTH 12,695.2
EAST 10,447.5
GROUND SURFACE ELEVATION 96.4'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		32	▼	8 15 25	40	11	SP	SAND, SIMILAR TO SS-31.
-70		33	▼	9 20 27	47	11	SP	SAND, SIMILAR TO SS-31 AND SS-32.
	170	34	▼	9 19 23	42	10	SP	SAND, UNIFORM, FINE, 1-2% FINES, MODERATE REDDISH ORANGE (10 R 6/6).
-80		35	▼	11 18 21	39	8	SP	SAND, SIMILAR TO SS-34.
	180	36	▼	11 17 22	39	11	SP	SAND, SIMILAR TO SS-34 AND SS-35.
-90		37	▼	13 18 23	41	12	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 1% FINES, LIGHT REDDISH ORANGE (10 R 7/6).
	190	38	▼	18 34 36	70	10	SP	SAND, SIMILAR TO SS-37.
-100		39	▼	16 22 28	50	10	SP	SAND, UNIFORM, FINE, LESS THAN 1% FINES, LIGHT YELLOWISH BROWN (10 YR 4/2) TO LIGHT REDDISH ORANGE (10 R 7/6).
	200	40	▼	19 29 44	73	8	SP	SAND, UNIFORM, FINE, 1% FINES, LIGHT BROWN (5 YR 6/4) WITH THIN BAND OF DARK YELLOWISH ORANGE (FeOx.).
-110		41	▼	15 29 29	58	10	SP	SAND, UNIFORM, FINE, 4-6% MEDIUM TO COARSE, 1-2% GRAVEL TO 0.4" MAX., 1-2% FINES, LIGHT REDDISH ORANGE (10 R 6/6).
	210	42	▼	16 29 40	69	9	SP	SAND, UNIFORM, FINE, 1% FINES, YELLOWISH ORANGE (10 YR 6/5).
-120		43	▼	18 23 32	55	8	SP	SAND, UNIFORM, FINE, 1% FINES AT TOP TO 2-4% AT BOTTOM, YELLOWISH ORANGE (10 YR 6/5) AT TOP TO MODERATE REDDISH ORANGE (10 R 6/6) AT BOTTOM.
	220	44	▼	10 15 18	33	5	SP	SAND, UNIFORM, FINE, 3-6% SLIGHTLY PLASTIC FINES (MOSTLY CLAY), MODERATE REDDISH ORANGE (10 R 6/6).
-130		45	▼	4 12 18	30	15	CH SP SC	CLAY, HIGHLY PLASTIC, MODERATE RED (5 R 4/4) WITH IRREGULAR ORANGE PINK MOTTLES (POSSIBLY LARGE CLAY BALLS IN SAND AND GRAVEL MATRIX.) WITH POCKETS OF SAND, UNIFORM, FINE, WITH FEW PIECES GRAVEL TO 0.8" MAX., LIGHT BROWN (5 YR 7/4) TO DARK YELLOWISH ORANGE (10 YR 6/6). WITH POCKET OF CLAYEY SAND, UNIFORM, FINE, 20-25% SLIGHTLY PLASTIC FINES, LIGHT RED (5 R 6/6).
	230	46	▼	10 15 22	37	10	CH SP-GP	CLAY, HIGHLY PLASTIC (STICKY), MODERATE RED (5 R 5/4), LARGE CLAY BALL. ABOVE GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 40-50% GRAVEL TO 1.3" MAX., 3-5% FINES (IN POCKETS, SMALL CLAY BALLS), LIGHT BROWN (5 YR 6/4).
-140		47	▼	38 50/6"	50/6"	4	SP W/ CH	SAND, UNIFORM, FINE, WITH 5-10% MEDIUM TO COARSE, 3-4% GRAVEL TO 0.4" MAX., BROWN (COLOR NOT ACCURATE DUE TO DISCOLORATION BY DRILLING FLUID) (10 YR 5/4) WITH MODERATE RED (5 R 5/4) CLAY BALL.
	240							

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. R. GREENWOOD
DATE NOVEMBER 28, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 96C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 96
TYPE OF BORING DRIVE
SHEET 4 OF 4
DATE DRILLED JULY 20, 1972
DRILLING COMPANY - EUSTIS ENGRG CO.
LOGGED BY T.I.B.
COORDINATES, NORTH 12,695.2
EAST 10,447.5
GROUND SURFACE ELEVATION 96.4'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		48	▼	10 18 28	46	9	SP	SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM TO COARSE, 5-10% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) TO DARK YELLOWISH ORANGE (10 YR 6/6).
-150		49	▼	18 32 44	76	9	SP	SAND, UNIFORM, FINE, 4-6% MEDIUM TO COARSE, LESS THAN OR EQUAL TO 1% GRAVEL TO 0.5" MAX., LESS THAN OR EQUAL TO 1% FINES, GRAYISH ORANGE (10 YR 7/4).
	250	50	▼	30 50/5"	50/5"	10	SP	SAND, UNIFORM, FINE, 1-4% MEDIUM TO COARSE, LESS THAN OR EQUAL TO 1% GRAVEL TO 0.5" MAX., LESS THAN OR EQUAL TO 1% FINES, GRAYISH ORANGE (10 YR 7/4).
-160		51	▼	29 50/5"	50/5"	7	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 1% FINES, GRAYISH ORANGE (10 YR 6/4).
	260	52	▼	29 31 31	62	12	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 15-20% GRAVEL TO 0.8" MAX., LESS THAN OR EQUAL TO 2% FINES, LIGHT YELLOWISH ORANGE (10 YR 7/6), (SOME GRAVEL POSSIBLY SETTLED CUTTINGS).
-170		53	▼	11 16 28	44	11	SP	SAND, UNIFORM, FINE, 3-8% NONPLASTIC TO SLIGHTLY PLASTIC FINES (SILT AND CLAY), LIGHT OLIVE GRAY (5 Y 7/1) SPECKLED WITH DARK YELLOWISH ORANGE.
	270	54	▼	14 22 26	48	13	SP CH	SAND, UNIFORM, FINE, LESS THAN 1% FINES, YELLOWISH GRAY (5 Y 7/2), WITH POCKETS, (BALLS?), THIN LAYERS: CLAY, HIGHLY PLASTIC, STICKY, YELLOWISH GRAY (5 Y 7/2), WITH THIN RIM OF DARK YELLOWISH ORANGE FeOx. STAIN AROUND POCKETS (BALLS?).
-180		55	▼	11 16 17	33	14	CH	SILTY CLAY, HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2) WITH SOFT DARK YELLOWISH ORANGE FeOx. CONCRETIONS AND THIN IRREGULAR ZONES OF YELLOWISH ORANGE FeOx. STAIN.
-185.1	280 281.5	56	▼	15 24 29	53	13	SP	SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM, LESS THAN 1-3% FINES, YELLOWISH GRAY (5 Y 7/2) WITH DARK YELLOWISH ORANGE FeOx. MOTTLES WITH THIN LAYER OF YELLOWISH GRAY (5 Y 7/2) HIGHLY PLASTIC CLAY.
								END OF BORING AT 281.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. R. GREENWOOD
DATE NOVEMBER 28, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 96D

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 100
DATE DRILLED AUGUST 23, 1972
COORDINATES, NORTH 17,516.2
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG CO
EAST 17,732.9
SHEET 1 OF 2
LOGGED BY R.A.J.
GROUND SURFACE ELEVATION 122.7'

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
L	120								
L/PH			1	◤	1 2 5	7	12	ML	CLAYEY SILT, SLIGHTLY PLASTIC, MODERATE YELLOWISH BROWN (10 YR 5/4)
		10							
PH/S			2	◤	6 15 26	41	14	CL SM	SILTY CLAY, SLIGHTLY PLASTIC, LESS THAN 5% VERY FINE SAND, VERY LIGHT GRAY (N8) MODERATE REDDISH ORANGE (10 R 6/6) AND GRAYISH ORANGE (10 YR 7/4), BECOMES SILTY SAND, VERY FINE 15-25% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	110								
			3	◤	11 16 23	39	13	SC	CLAYEY SAND, UNIFORM, VERY FINE SAND, 10-20% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2) WITH SOME DARK YELLOWISH ORANGE (10 YR 6/6) MOTTLING.
		20							
			4	◤	15 37 42	79	10	SP	SAND, UNIFORM, VERY FINE, CLEAN, WHITE .
	100								
			5	◤	2 4 5	9	16	SC	CLAYEY SAND, UNIFORM, VERY FINE, 15-25% SLIGHTLY PLASTIC FINES, VERY LIGHT GRAY (N 8) AND DARK YELLOWISH ORANGE (10 YR 6/5), FAT MODERATE RED (5 R 4/6), CLAY INTERLAYERED WITH SAND CLAY FOR 7.0 IN., 2.0 IN. FAT CLAY IN TIP.
		30							
			6	◤	2 4 7	11	15	CH	CLAY AND SANDY CLAY, HIGHLY PLASTIC, 10-15% VERY FINE SAND, MODERATE RED (5 R 4/6) AND LIGHTLY GREENISH GRAY (5 GY 8/1), WITH LAYERS AND LAMINATIONS OF FINE SAND AND FINE CLAYEY SAND BRIGHT YELLOWISH ORANGE (10 YR 6/6) AND MODERATE RED.
	90								
			7	◤	5 6 6	12	10	SC	CLAYEY SAND, UNIFORM, VERY FINE, 10-20% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6) AND DARK YELLOWISH ORANGE (10 YR 6/6) WITH HORIZONTAL STRATIFICATION.
		40							
			8	◤	2 6 6	12	14	SC	SIMILAR TO SS7 BUT ONLY MODERATE REDDISH ORANGE(10 R 6/6).
	80								
			9	◤	4 5 5	10	8	SC	SIMILAR TO SS8 WITH LESS THAN 5% MEDIUM AND COARSE SAND.
		50							
			10	◤	8 8 10	18	10	SP	SAND, UNIFORM, FINE, 5-10% MODERATE PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6) CHANGES TO YELLOWISH ORANGE (10 YR 6/5).
	70								
			11	◤	6 7 9	16	12	SP	SIMILAR TO SS10
		60							
			12	◤	28 67/6"	67/6"	13	SP	SAND, MOSTLY UNIFORM, FINE-MEDIUM, 5-10% COARSE SAND AND FINE GRAVEL TO 0.4 IN., LESS THAN 5% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6), FEW 0.75 IN. CLAYEY SAND POCKET.
	60								
			13	◤	13 20 23	43	10	SP	SIMILAR TO SS12, BUT LESS THAN 3% SLIGHTLY PLASTIC FINES, ONE 2.0 IN CLAYEY SAND BALL.
S/BC		70							
			14	◤	4 6 6	12	9	SP	SAND, UNIFORM, FINE, LESS THAN 3% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), TWO 1.0 IN. LAYERS WITH 5-10% MODERATE PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) WITH SOME MODERATE PINK (5 R 7/4).
	50								
				■	2 8 17	25	10	CL SP&SC	CLAY AND SANDY CLAY, MODERATE PLASTIC, SOME WITH 10-20% VERY FINE SAND, MODERATE RED (5 R 4/6) AND LIGHT GREENISH GRAY (5 GY 8/1), MANY SAND LAMINATIONS, BECOMES CLEAN UNIFORM FINE SAND AND CLAYEY FINE SAND, DARK YELLOWISH ORANGE (10 YR 6/6) WITH SOME PINK.
		80							

THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 29, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 100 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 100
DATE DRILLED AUGUST 23, 1972
COORDINATES, NORTH 17,516.2
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG CO
EAST 17,732.9
SHEET 2 OF 2
LOGGED BY R.A.J.
GROUND SURFACE ELEVATION 122.7'

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			16	◤	7 8 9	17	18	SP	SAND, UNIFORM, FINE, LESS THAN 7% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10 YR 7/6) WITH SOME MODERATE REDDISH ORANGE (10 R 6/6).
	40								
			17	◤	3 9 10	19	14	SP	SIMILAR TO SS16 WITH 7.0 IN. HIGHLY PLASTIC GRAYISH YELLOW (5 Y 8/4) CLAY.
		90							
			18	◤	9 22 31	53	10	SP	SAND, UNIFORM FINE, CLEAN, VERY SLIGHTLY PINK, FEW 0.25 IN. LIGHT RED (5 R 6/6) CLAY SAND BALLS.
	30								
			19	◤	6 12 15	27	10	SP	SAND, UNIFORM, FINE, CLEAN, LESS THAN 5% SLIGHTLY PLASTIC FINES, MODERATE ORANGE PINK (10 R 7/4).
		100							
			20	◤	14 24 39	63	9	SP	SAND, UNIFORM, FINE, CLEAN, LESS THAN 5% COARSE SAND AND VERY FINE GRAVEL TO 0.3 IN., YELLOWISH ORANGE (10 YR 7/6).
	20								
			21	◤	8 8 25	33	12	SP	SAND, UNIFORM, FINE, CLEAN TO 15% MODERATE PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) WITH SOME PINK.
		110							
			22	◤	12 9 17	26	13	SP	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), OCCASIONAL COARSE SAND PARTICLE.
	10								
			23	◤	2 5 9	14	18	SC	CLAYEY SAND, UNIFORM, VERY FINE SAND, 20-30% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
		120							
			24	◤	5 10 20	30	14	SP	SAND, FINE, LESS THAN 3% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), FEW COARSE SAND AND VERY FINE GRAVEL PARTICLES.
	0								
			25	◤	27 34 43	77	15	SP	SIMILAR TO SS24 WITH ONE 1.0 IN. POCKET CLAYEY SAND.
		130							
			26	◤	33 120/6"	120/6"	10	SP	SAND, UNIFORM, FINE, CLEAN, GRAYISH ORANGE (10 YR 7/4), FEW 0.25 IN. CLAYEY SAND POCKETS.
	-10								
			27	◤	31 80/5"	80/5"	12	SP	SIMILAR TO SS26 BUT NO POCKETS.
		140							
			28	◤	48 80/5"	80/5"	10	SP	SIMILAR TO SS27
	-20								
			29	◤	51 109/6"	109/6"	10	SP	SIMILAR TO SS26
		150							
			30	◤	53 50/6"	50/6"	10	SP	GRAVELLY SAND, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 20-30% FINE GRAVEL TO 0.75 IN., LESS THAN 3% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) AND DARK YELLOWISH ORANGE (10 YR 6/6), FEW 0.5 IN. CLAYEY SAND BALLS.
BC/PC	-30								
			31	◤	5 11 14	25	18	CH	CLAY, HIGHLY PLASTIC, YELLOWISH ORANGE, (10 YR 7/6) AND GRAYISH YELLOW (5 Y 8/4), 0.75 IN. POCKET BLACK CARBON.
	-38.8	161.5	32	◤	8 12 15	27	18	CH	CLAY, HIGHLY PLASTIC, YELLOWISH ORANGE (10 YR 7/6), BECOMES PALE OLIVE (10 Y 6/2) FEW MEDIUM SAND SIZED DARK YELLOWISH ORANGE (10 YR 6/6). CONCRETIONS. BOTTOM OF BORING
									END OF BORING AT 161.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 29, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 100B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 101
DATE DRILLED AUGUST 29, 1972
COORDINATES, NORTH 17,416.9
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG CO
EAST 17,709.4
SHEET 1 OF 2
LOGGED BY R.A.S.
GROUND SURFACE ELEVATION 122.2

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
L	120								
			1	◤	5 7 8	15	12	ML	SILT, NONPLASTIC, GRAYISH ORANGE (10YR 7/4), AND MODERATE YELLOWISH BROWN (10YR 5/4) WITH SOME WHITE..
L/S		10							
			2	◤	6 10 13	23	13	SP	SAND, UNIFORM, VERY FINE, LESS THAN 5% NONPLASTIC FINES, VERY PALE ORANGE (10YR5/2), FEW SANDY CLAY BALLS TO 0.5 INCH.
	110								
			3	◤	200/5"	200/5"	5	SP	SAND, UNIFORM, VERY FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, WHITE.
		20							
			4	◤	22 50/9"	50/9"	14	SP-SC	SAND, UNIFORM, VERY FINE, LESS THAN 5-10% SLIGHTLY PLASTIC FINES, WHITE, BECOMING FINE SAND AND ORANGE.
	100								
			5	◤	3 5 6	11	14	SC	CLAYEY SAND, UNIFORM, FINE, 10-15% SLIGHTLY PLASTIC FINES, VERY PALE ORANGE (10YR 8/2).
		30							
			6	◤	3 6 9	15	13	SP-SC	SAND, UNIFORM,FINE, 10-15% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10YR 8/6), AND GRAYISH YELLOW (5Y 8/4).
	90								
			7	◤	2 5 7	12	14	SC + CH	CLAYEY SAND, UNIFORM, FINE, 10-15% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10YR 7/6), INTERLAYERED AND LAMINATED WITH CLAY, HIGHLY PLASTIC, LIGHT RED (5R 6/6), AND LIGHT GRAY GRAY (N7).
		40							
			8	◤	3 4 7	11	12	SP-SC	SAND, UNIFORM, FINE, 5-10% MODERATE PLASTIC FINES, MODERATE REDDISH ORANGE (10R 6/6), WITH YELLOWISH ORANGE (10YR 7/6), BANDING.
	80								
			9	◤	3 5 13	18	14	SC	CLAYEY SAND, UNIFORM, FINE, 10-20% MODERATE PLASTIC FINES, MODERATE RED (5R 4/6), AND DARK YELLOWISH ORANGE (10YR 6/6), BECOMES LESS THAN 5% PLASTIC FINES AND DARK YELLOWISH ORANGE.
		50							
			10	◤	4 7 10	17	15	SP	SAND, UNIFORM, FINE, 5-10% MODERATE PLASTIC FINES, YELLOWISH ORANGE (10YR 7/6), WITH SOME PINK.
	70								
			11	◤	6 10 14	24	10	SP	SAND, MOSTLY UNIFORM, FINE, 5-10% MODERATE PLASTIC FINES, MODERATE REDDISH ORANGE (10R 6/6), WITH SOME YELLOWISH ORANGE (10YR 7/6), FEW COARSE SAND PARTICLES.
		60							
			12	◤	20 50/6"	50/6"	12	SP	SAND, UNIFORM, FINE, LESS THAN 5% MODERATE PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10YR 6/6), FEW CLAYEY SAND POCKETS TO 0.75 INCH.
	60								
			13	◤	19 50/6"	50/6"	11	SP	SAND, UNIFORM, FINE-MEDIUM, LESS THAN 5% MEDIUM AND COARSE SAND, LESS THAN 5% MODERATE PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10YR 6/6).
		70							
S/BC			14	◤	8 16 16	32	14	SP	GRAVELLY SAND, UNIFORM, FINE-MEDIUM SAND, AND COARSE SAND, 10-15% FINE GRAVEL TO 0.4 INCH, LESS THAN 3% MODERATE PLASTIC FINES, GRAYISH ORANGE (10YR 7/4), ONE 2.0 INCH, CLAYEY SAND BALL, BECOMING MOSTLY UNIFORM FINE-MEDIUM SAND.
	50								
			15	◤	2 3 6	9	16	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10YR 7/4), WITH FEW SMALL TRACES OF PINK.
		80							
			16	◤	2 2 5	7	14	SP	SIMILAR TO SS-15, BUT DARK YELLOWISH ORANGE (10YR 6/6), 6.0 INCH LAYER DUSKY YELLOW (5Y 6/4), CLAY THEN BACK TO SAND BUT YELLOWISH GRAY.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 4, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 101A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 101
DATE DRILLED AUGUST 31, 1972
COORDINATES, NORTH 17,416.9
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG CO
EAST 17,709.4
SHEET 2 OF 2
LOGGED BY R.A.S.
GROUND SURFACE ELEVATION 122.2

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
	40								
			17	◤	7 13 9	22	13	SP-SC	SAND, UNIFORM, FINE, 8-12% MODERATELY PLASTIC FINES, LIGHT BROWN (5YR 6/4), WITH A TOUCH OF PINK.
		90							
			18	◤	7 10 14	24	11	SP	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10YR 7/4).
	30								
			19	◤	7 12 18	30	12	SP	GRAVELLY SAND, UNIFORM, FINE SAND, 10-20% FINE GRAVEL TO 0.75 INCH, LESS THAN 5% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10YR 7/6), NO GRAVEL NEAR BOTTOM WITH 1.0 INCH LAYER CLAYEY SAND.
		100							
			20	◤	7 10 24	34	14	SP-SC	SAND, UNIFORM, FINE, 8-12% MODERATE PLASTIC FINES, YELLOWISH ORANGE (10YR 7/6).
	20								
			21	◤	16 50/9"	50/9"	11	SP	SAND, UNIFORM, FINE, LESS THAN 5% COARSE SAND AND FINE GRAVEL TO 0.4 INCH, LESS THAN 3% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10YR 7/4).
		110							
			22	◤	11 50/8"	50/8"	12	SP	SAND, UNIFORM, FINE-MEDIUM, LESS THAN 5% COARSE SAND, LESS THAN 3% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10YR 7/4), SEVERAL 0.5-1.0 INCH LAYERS OF CLAYEY SAND NEAR TOP.
	10								
			23	◤	9 21 29	50	14	SP	SAND, UNIFORM, FINE, LESS THAN 3% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5Y 7/2).
		120							
			24	◤	7 16 22	38	12	SP	SAND, UNIFORM, FINE LESS THAN 5% MODERATELY PLASTIC FINES, VERY PALE ORANGE (10YR 8/2).
	0								
			25	◤	13 21 27	48	12	SP	SAND, UNIFORM, FINE, LESS THAN 3% MODERATELY PLASTIC FINES, VERY PALE ORANGE (10YR 8/2), FEW MEDIUM SAND SIZED BALLS OF CLAYEY SAND.
		130							
			26	◤	13 25 32	57	13	SP	SAND, MOSTLY UNIFORM,FINE WITH UNIFORM MEDIUM NEAR TOP, CLEAN, GRAYISH ORANGE (10YR 7/4).
	-10								
			27	◤	33 100/5"	100/5"	10	SP	SAND, MOSTLY FINE AND MEDIUM, 5-10% COARSE SAND AND FINE GRAVEL TO 0.5 INCH, CLEAN, GRAYISH ORANGE (10YR 7/4), FEW 0.25 INCH CLAYEY SAND ZONES.
		140							
			28	◤	28 95/6"	95/6"	11	SP	SAND, MOSTLY UNIFORM FINE, LESS THAN 5% FINE GRAVEL TO 0.75 INCH, CLEAN, GRAYISH ORANGE (10YR 7/4), FEW CLAYEY SAND BALLS TO 0.5 INCH
	-20								
			29	◤	55 80/3"	80/3"	9	SP	SAND, UNIFORM, FINE-MEDIUM, CLEAN, GRAYISH ORANGE (10YR 7/4).
		150							
			30	◤	17 21 20	41	10	GP	SANDY GRAVEL, FINE GRAVEL TO 0.5 INCH, 20-30% FINE TO COARSE SAND, 5-10% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10YR 6/6), THREE CLAYEY SAND GRAVEL BALL WITH CLAY CENTERS 1.0 INCH.-3.0 INCH.
BC/PC	-30								
			31	◤	9 12 17	29	18	CL-CH	SILTY CLAY, MODERATELY PLASTIC, DUSKY YELLOW (5Y 6/4), AND PALE YELLOWISH ORANGE (10YR 7/6), ONE 5.0 INCH SEAM BLACK CONCRETED MATERIAL, MANY MEDIUM SAND SIZED SILT POCKETS.
	-39.3	161.5	32	◤	7 14 20	34	14	CL-CH	CLAY, ~~MODERATELY~~ PLASTIC, DUSKY YELLOW (5Y 6/4), MOTTLED WITH DARK YELLOWISH ORANGE (10YR 6/6), LIGHT GREENISH GRAY (5GY 8/1) TIP.
									END OF BORING AT 161.5'

THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 4, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 101B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 102 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED AUGUST 25, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY T.I.B.
COORDINATES, NORTH 17,232.8 EAST 18,086.9 GROUND SURFACE ELEVATION 105.5'

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
L									
L PH	100		1	▼	10 13 20	33	16	ML	CLAYEY SILT, SLIGHTLY PLASTIC, MODERATE YELLOWISH BROWN (10 YR 5/4) WITH GRAYISH ORANGE (10 YR 7/4) AND MODERATE BROWN (5 YR 3/4) MOTTLES, WITH FEW SMALL ROOTS.
		10	2	▼	9 15 22	37	18	ML	CLAYEY SILT, SLIGHTLY TO MODERATELY PLASTIC, 8-12% UNIFORM FINE SAND, MOTTLED LIGHT OLIVE GRAY (5 Y 6/1) WITH BRIGHT YELLOWISH ORANGE (10 YR 6/6).
	90		3	▼	8 14 16	30	15	CL	SANDY CLAY, MODERATELY PLASTIC, 15-20% UNIFORM FINE SAND, LIGHT OLIVE GRAY (5 Y 6/1) WITH POCKETS LIGHT GRAY CLAYEY SILT.
PH S		20	4	▼	8 12 14	26	15	SP	SAND, UNIFORM, FINE, 4-8% SLIGHTLY PLASTIC FINES (MOSTLY CLAY), MOTTLED LIGHT OLIVE GRAY (5 Y 7/1) AND GRAYISH ORANGE (10 YR 7/4) WITH SOME BRIGHT YELLOWISH ORANGE.
	80		5	▼	12 12 17	29	15	SP	SAND, UNIFORM, FINE, 3-8% SLIGHTLY PLASTIC FINES, THINLY LAYERED SUBHORIZONTALLY BRIGHT YELLOWISH ORANGE (10 YR 6/6) WITH (10 YR 7/6).
		30	6	▼	5 7 8	15	17	SP	SAND, UNIFORM, FINE, 4-8% SLIGHTLY PLASTIC FINES, THINLY INTERLAYERED SUBHORIZONTALLY, DARK YELLOWISH ORANGE (10 YR 6/6) WITH MODERATE REDDISH ORANGE (10 R 6/6).
	70		7	▼	4 6 9	15	15	SP-SC	SAND, UNIFORM, FINE, 6-10% SLIGHTLY PLASTIC FINES (MOSTLY CLAY), THINLY INTERLAYERED HORIZONTALLY MODERATE RED (5 R 4/6) WITH BRIGHT YELLOWISH ORANGE (10 YR 6/6) ALSO WITH PALE YELLOWISH ORANGE MOTTLED.
		40	8	▼	5 5 7	12	N.R.		
			9	▼	6 7 7	14	14	SP	SAND, UNIFORM, FINE, LESS THAN 5% MEDIUM, 3-8% SLIGHTLY PLASTIC FINES, VERY THINLY LAYERED, DIPPING ABOUT 5°, DARK YELLOWISH ORANGE (10 YR 6/6).
	60		10	▼	60 50/9"	50/9"	7	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 2-3% GRAVEL TO 0.5" MAX., 1-3% FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/8).
S BC		50	11	▼	18 26 32	58	8	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 25-35% GRAVEL TO 0.8" MAX. (TO 1.1" MAX. IN WASH JUST BELOW SAMPLE), 1-4% FINES, EXCLUDING FEW VERY THIN SUBHORIZONTAL GRAY CLAYEY SAND LAYERS, BRIGHT YELLOWISH ORANGE (10 YR 6/6).
	50		12	▼	8 17 12	29	15	SP SP	TOP 4±" - SAND, UNIFORM, FINE, 3-6% SLIGHTLY PLASTIC FINES, LIGHT GRAYISH ORANGE (10 YR 8/4), WITH 1.0" THICK LAYER CLAYEY SAND. BOTTOM 11±" - SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 3-5% GRAVEL TO 0.5" MAX., 1-3% FINES (EXCLUDING CLAY BALLS), BRIGHT YELLOWISH ORANGE (10 YR 6/6), WITH HIGHLY PLASTIC GRAYISH ORANGE CLAY BALL AND LIGHT YELLOWISH GRAY CLAYEY SAND POCKET/LAYER.
		60	13	▼	2 5 8	13	18	SP CH SP CH SP	2.0" - SAND, UNIFORM, FINE, 4-9% SLIGHTLY PLASTIC FINES (MOSTLY CLAY) BRIGHT YELLOWISH ORANGE (10 YR 6/6). 25°-30° CONTACT 9.0" - CLAY, HIGHLY PLASTIC, STICKY (FAT), YELLOWISH GRAY (5 Y 7/2), WITH 4.0" DEEP 6° RED CRACK FILLED WITH FINE BLACK SAND. 1.0" - SAND, UNIFORM, FINE, 2-5% FINES, YELLOWISH GRAY (5 Y 7/2). 2.0 IN. (CLAY SIMILAR TO 9.0 IN. THICK LAYER ABOVE. 4.0" - SAND, SIMILAR TO 1.0" LAYER ABOVE BUT GRAYISH ORANGE (10 YR 8/4
	40		14	▼	8 10 12	22	15	SP	SAND, UNIFORM, FINE, 1% FINES, PINKISH GRAY (5 YR 8/1), [illegible] DILATENT SILT.
		70	15	▼	7 12 25	37	15	SP	SAND, UNIFORM, FINE, 1% FINES, DUSKY YELLOW (5 Y 6/4) WITH THIN SUBHORIZONTAL YELLOWISH ORANGE LAYERS WITH WIDELY GRADED SAND AT BOTTOM, 5-10% GRAVEL TO 0.5" MAX., 1% FINES, YELLOWISH ORANGE.
	30		16	▼	33 50 56	106	5	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 1% FINES, YELLOWISH ORANGE (10 YR 6/5).
		80							

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY R. F. GREENWOOD
DATE NOVEMBER 29, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 102 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 102 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED AUGUST 25, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY T.I.B.
COORDINATES, NORTH 17,232.8 EAST 18,086.9 GROUND SURFACE ELEVATION 105.5'

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
			17	▼	15 25 32	57	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 2-3% GRAVEL TO 0.5" MAX., 1-2% FINES, YELLOWISH ORANGE (10 YR 6/5), WITH VERY THIN CLAY LAYER (APPROXIMATELY 1/8" THICK).
	20		18	▼	12 24 32	56	9	SP	SAND, UNIFORM, FINE, 2-3% MEDIUM TO COARSE, 1% FINES, YELLOWISH ORANGE (10 YR 6/6 TO 7/6).
		90	19	▼	10 17 22	39	10	SP	SAND, POORLY GRADED, FINE TO COARSE, 10-20% MEDIUM TO COARSE, 1% FINES, YELLOWISH ORANGE (10 YR 7/5).
	10		20	▼	10 14 18	32	16	SP	SAND, UNIFORM, FINE, 2-4% FINES, GRAYISH ORANGE (10 YR 7/4) WITH SMALL ORANGE SPOTS.
		100	21	▼	16 22 22	44	16	SP	SAND, SIMILAR TO SS-20.
	0		22	▼	22 35 48	83	11	SP	SAND, UNIFORM, FINE, 1-2% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		110	23	▼	22 36 40	76	14	SP	SAND, SIMILAR TO SS-22.
	-10		24	▼	26 47 52	99	11	SP	SAND, UNIFORM, FINE, 1-2% MEDIUM TO COARSE, 3-5% GRAVEL TO 0.75" MAX. (IN TOP), LESS THAN OR EQUAL TO 1% FINES, LIGHT YELLOWISH BROWN (10 YR 6/4).
		120	25	▼	26 54 60	114	12	SP	SAND, UNIFORM, FINE, LESS THAN 1% FINES, LIGHT YELLOWISH BROWN (10 YR 6/3).
	-20		26	▼	8 15 19	34	15	SP	SAND, UNIFORM, FINE, 4-8% MEDIUM TO COARSE, 1% GRAVEL TO 0.3" MAX. 1-3% FINES, LIGHT GRAYISH ORANGE (10 YR 7/4), WITH YELLOWISH ORANGE (FeOx.) COATING ON SOME COARSE SAND AND GRAVEL PIECES.
		130	27	▼	11 19 24	43	14	SP	SAND, POORLY GRADED, FINE TO MEDIUM, 10-15% MEDIUM, 2-4% FINES, PALE YELLOWISH BROWN (10 YR 6/3).
	-30		28	▼	14 30 46	76	11	SP	SAND, POORLY GRADED, FINE TO COARSE, 8-12% MEDIUM TO COARSE, 10-15% GRAVEL TO 0.6" MAX., LIGHT GRAYISH ORANGE (10 YR 8/4), WITH ONE LAYER MEDIUM TO COARSE SAND WITH GRAVEL, AND ONE VERY THIN CLAYEY SAND LAYER.
BC PC		140	29	▼	20 19 16	35	18	SP	GRAVELLY SAND, POORLY GRADED, MEDIUM TO COARSE WITH LESS THAN 3% FINE SAND, 20-25% GRAVEL TO 0.8" MAX., 1-2% FINES, GRAYISH ORANGE (10 YR 7/4) WITH FEW SMALL POCKETS (BALLS) OF YELLOWISH GRAY CLAY, WITH CLAY COATING ON SOME PIECES GRAVEL.
	-40		30	▼	11 11 11	22	13	CH	GRAVELLY CLAY, HIGHLY PLASTIC MATRIX, 30-40% GRAVEL TO 20.8" MAX., LESS THAN 5% FINE SAND, YELLOWISH GRAY (5 Y 7/2) WITH BRIGHT YELLOWISH ORANGE STAINING, GRAVEL SPREAD HOMOGENEOUS THROUGH CLAY.
		150	31	▼	11 16 19	35	18	CL-CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, LESS THAN 5% UNIFORM VERY FINE SAND, OXIDIZED TO DARK YELLOWISH ORANGE (10 YR 6/6), SOME YELLOWISH GRAY (5 Y 7/2), FEW SOFT FeOx. NODULES.
	-50		32	▼	11 14 16	30	18	CH	SILTY CLAY, HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2) WITH FEW VERY SMALL ORANGE (FeOx.) SPOTS AND SMALL BLACK (MnO_2) SPOTS.
		160							

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY R. F. GREENWOOD
DATE NOVEMBER 29, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 102B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 102 TYPE OF BORING DRIVE SHEET 3 OF 3
DATE DRILLED AUGUST 25, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY T.I.B.
COORDINATES, NORTH 17,232.8 EAST 18,086.9 GROUND SURFACE ELEVATION 105.5'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-56.0	161.5	33	▼	14 21 30	51	18	CL SC CH	THINLY INTERLAYERED - SANDY CLAY, SLIGHTLY PLASTIC, 20-30% UNIFORM VERY FINE TO FINE SAND. CLAYEY SAND, UNIFORM, FINE, 15-20% SLIGHTLY PLASTIC FINES. SILTY CLAY, MODERATELY TO HIGHLY PLASTIC. ALL LAYERS A UNIFORM GREENISH GRAY (5 G 6/1). END OF BORING AT 161.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

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4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 29, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 102C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 103 TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED SEPTEMBER 7, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY T.I.B.
COORDINATES, NORTH 17,263.7 EAST 17,913.9 GROUND SURFACE ELEVATION 115.7'

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
L	110		1	◤	5 9 12	21	8	ML	CLAYEY SILT, NONPLASTIC TO SLIGHTLY PLASTIC, MOTTLED YELLOWISH BROWN (10 YR 6/4) WITH (10 YR 7/2).
L/PH		10	2	◤	4 8 13	21	14	CL	SANDY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 10-15% UNIFORM FINE SAND, MOTTLED, MODERATE REDDISH BROWN (10 YR 4/6) DARK YELLOWISH ORANGE (10 YR 6/5), WITH FEW SMALL POCKETS CLAYEY SAND.
PH/S	100		3	◤	42 50/5"	50/5"	9	SP	SAND, UNIFORM, FINE TO VERY FINE, LESS THAN 1% FINE MOTTLED YELLOWISH ORANGE (10 YR 7/6) AND PINKISH GRAY (5 YR 8/1) WITH 3.0" SILTY SAND (10-20% SILT) AT TOP.
		20	4	◤	5 8 12	20	14	SC-SM	CLAYEY SAND, UNIFORM, VERY FINE, 10-15% SLIGHTLY PLASTIC FINES, IRREGULAR HORIZONTAL LAYERING: LIGHT REDDISH ORANGE (10 R 7/6), DARK YELLOWISH ORANGE (10 YR 6/6), VERY LIGHT GRAY (N 8) WITH MANY SMALL YELLOWISH GRAY HORIZONTAL CLAY FLAKES, WITH THIN LAYER UNIFORM FINE SAND, 4-6% FINES.
	90		5	◤	6 7 9	16	9	SC-SM	CLAYEY SAND, UNIFORM, VERY FINE TO FINE, 10-12% SLIGHTLY PLASTIC FINES, MOTTLED YELLOWISH ORANGE (10 YR 6/6) WITH VERY LIGHT GRAY (N 8), WITH MODERATE RED (5 R 4/6) CLAY LAYER/FLAKE, AND SEVERAL SMALL RED AND GRAY CLAY FLAKES.
		30	6	◤	6 8 10	18	13	SC-SP	CLAYEY SAND, UNIFORM, VERY FINE - FINE, 10-12% SLIGHTLY PLASTIC FINES, MODERATE REDDISH BROWN (10 R 4/6) WITH YELLOWISH ORANGE (10 YR 6/6) MOTTLES.
	80		7	◤	10 12 17	29	11	SP	SAND, UNIFORM, FINE, 4-6% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		40	8	◤	12 23 34	57	8	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 2% MEDIUM, 3-6% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6).
	70		9	◤	9 15 16	31	9	SP	SAND, UNIFORM, FINE, 4-6% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		50	10	◤	15 19 18	37	14	SP	SAND, UNIFORM, FINE, 4-7% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 5/6).
	60		11	◤	22 36 51	87	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 1-2% GRAVEL TO 0.75" MAX., 3-6% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6).
S/BC		60	12	◤	10 25 25	50	7	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 3-6% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 5/5).
	50		13	◤	15 16 13	29	7	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, LESS THAN 1% GRAVEL TO 0.4" MAX., 5-8% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		70	14	◤	3 7 8	15	12	SC CH	INTERLAYERED, HORIZONTALLY - CLAYEY SAND, UNIFORM, FINE, 10-15% SLIGHTLY TO MODERATELY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2) WITH SOME YELLOWISH ORANGE. CLAY, HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2) TO GRAYISH YELLOW (5 Y 8/4) LAYERS 0.3" TO 4.0" THICK.
	40		15	◤	3 5 6	11	14	SC-SP	CLAYEY SAND, UNIFORM, FINE, 8-12% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) TO BRIGHT YELLOWISH ORANGE (10 YR 6/6), WITH SEVERAL HIGHLY PLASTIC YELLOWISH GRAY (5 Y 7/2) CLAY BALLS, RESEMBLES DILATENT SILT.
		80	16	◤	37 44 52	96	12	SP	SAND, UNIFORM, FINE, LESS THAN 1% FINES (CLEAN), LIGHT GRAYISH ORANGE (10 YR 8/4).

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 4, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 103A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 103 TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED SEPTEMBER 7, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY T.I.B.
COORDINATES, NORTH 17,263.7 EAST 17,913.9 GROUND SURFACE ELEVATION 115.7'

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
	30		17	◤	28 42 47	89	11	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 4-6% GRAVEL TO 0.6" MAX., 1% FINES, GRAYISH ORANGE (10 YR 7/4).
		90	18	◤	15 22 20	42	10	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 5% MEDIUM, 1% FINES, GRAYISH ORANGE (10 YR 7/3) WITH MINOR DARK YELLOWISH ORANGE (10 YR 6/6) AND VERY PALE ORANGE (10 YR 8/2), WITH ONE THIN LAYER MEDIUM TO COARSE SAND.
	20		19	◤	18 28 31	59	13	SP	SAND, UNIFORM, FINE, 3-6% MEDIUM, 1-3% FINES, GRAYISH ORANGE (10 YR 7/4).
		100	20	◤	23 50/6"	50/6"	10	SP	SAND, UNIFORM, FINE, 1-3% MEDIUM, 1-3% GRAVEL TO 0.6" MAX., 1% FINES, MEDIUM LIGHT GRAY (N 6).
	10		21	◤	11 12 22	34	11	SP	SAND, UNIFORM, FINE, LESS THAN 1% GRAVEL TO 0.4" MAX., LESS THAN 1% FINES (CLEAN), LIGHT GRAYISH ORANGE (10 YR 8/4).
		110	22	◤	16 18 20	38	10	SP	SAND, UNIFORM, FINE, 1-2% FINES, PALE YELLOWISH BROWN (10 YR 7/2).
	0		23	◤	13 16 18	34	10	SP	SAND, SIMILAR TO SS-22.
		120	24	◤	36 50/4"	50/4"	10	SP	SAND, UNIFORM, FINE, 1-2% MEDIUM TO COARSE, LESS THAN 1% FINES, PALE YELLOWISH BROWN (10 YR 7/2).
	-10		25	◤	39 66/6"	66/6"	8	SP	SAND, SIMILAR TO SS-24.
		130	26	◤	26 60/8"	60/8"	10	SP	SAND, POORLY GRADED, FINE TO COARSE, 10-20% MEDIUM TO COARSE, LESS THAN 1% GRAVEL TO 0.4" MAX., LESS THAN 1% FINES, PALE YELLOWISH BROWN (10 YR 7/2).
	-20		27	◤	26 50/6"	50/6"	4	SP	SAND, UNIFORM, FINE, 4-8% MEDIUM, LESS THAN 1% FINES, PALE YELLOWISH BROWN (10 YR 7/2).
		140	28	◤	50 83/6"	83/6"	7	SP	SAND, UNIFORM, FINE, 1-3% GRAVEL TO 0.5" MAX., LESS THAN 1% FINES, LIGHT YELLOWISH BROWN (10 YR 6/4).
	-30		29	◤	11 21 21	42	12	GC	CLAYEY GRAVEL, POORLY GRADED, GRAVEL TO 0.75" MAX., 10-15% MEDIUM TO COARSE SAND, 35-40% HIGHLY PLASTIC YELLOWISH GRAY (5 Y 7/2) CLAY MATRIX.
BC/PC		150	30	◤	8 9 10	19	12	CH	CLAY, HIGHLY PLASTIC, LESS THAN 10% SILT, PALE ORANGE (10 YR 7/2) WITH FEW YELLOWISH ORANGE (FeOx.) AND BLACK (MnO_2) SPOTS.
	-40		31	◤	11 15 16	31	18	CH	SILTY CLAY, HIGHLY PLASTIC, MOTTLED YELLOWISH ORANGE (10 YR 6/6) AND YELLOWISH GRAY (5 Y 7/2) WITH MANY SOFT FeOx. NODULES AND BLACK MnO_2 SPOTS.
	-45.8	161.5	32	◤	11 18 24	42	18	CH	SILTY CLAY, HIGHLY PLASTIC, HARD, MOTTLED YELLOWISH ORANGE (10 YR 6/6) AND GREENISH GRAY (5 GY 6/1) WITH BLACK (MnO_2) SPOTS AND FEW SOFT FeOx. NODULES. END OF BORING AT 161.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 4, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 103B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 104 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED AUGUST 18-22, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY R.A.J.
COORDINATES, NORTH 17,324.6 EAST 17,684.4 GROUND SURFACE ELEVATION 119.0'

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
L			1	◤	5 6 7	13	14	ML	SILT, NONPLASTIC, 5-10% VERY FINE SAND, MODERATE YELLOWISH BROWN (10 YR 5/4).
L/PH	110	10	2	◤	3 7 10	17	16	CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, DARK YELLOWISH ORANGE (10 YR 6/6) MOTTLED MODERATE RED (5 R 4/6).
			3	◤	2 4 7	11	16	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, LIGHT BROWN (5 YR 5/6).
PH/S	100	20	4	◤	16 20 10	30	9	SP	SAND, UNIFORM, VERY FINE, 5-10% SLIGHTLY PLASTIC FINES, LIGHT BROWN (5 YR 6/4) AND MODERATE ORANGE PINK (5 YR 8/4).
			5	◤	5 5 7	12	12	SC	CLAYEY SAND, UNIFORM, VERY FINE, 10-20% SLIGHTLY PLASTIC FINES, MODERATE ORANGE PINK (5 YR 8/4), 8.0" LAYER HIGHLY PLASTIC MODERATE RED (5 R 4/6) AND LIGHT GRAY (N 7) CLAY AND SANDY CLAY.
	90	30	6	◤	3 7 10	17	14	CH SM	CLAY, HIGHLY PLASTIC, MODERATE RED (5 R 4/6) AND LIGHT BROWN (5 YR 5/6), CHANGES TO SILTY SAND, UNIFORM, VERY FINE, 10-20% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6).
			7	◤	4 5 6	11	16	SC	CLAYEY SAND, UNIFORM, VERY FINE, 10-20% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE RED (5 R 4/6).
	80	40	8	◤	5 6 7	13	16	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6) AND DARK YELLOWISH ORANGE (10 YR 6/6).
			9	◤	8 8 7	15	10	SP	SAND, FINE TO COARSE, MOSTLY MEDIUM, LESS THAN 5% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), WITH 1.0-2.0" POCKETS DUSKY RED (5 R 3/4) CLAY.
	70	50	10	◤	12 9 8	17	12	SP	SIMILAR TO SS-8.
			11	◤	6 13 19	32	12	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH SOME MODERATE RED (5 R 7/6), BECOMING LESS THAN 5% SLIGHTLY PLASTIC FINES.
	60	60	12	◤	15 50/9"	50/9"	10	SP	SAND, FINE TO COARSE, MOSTLY UNIFORM FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/4).
			13	◤	9 13 19	32	10	SP	SAND, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, LESS THAN 5% VERY FINE GRAVEL TO 0.3", 5-10% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6), FEW 0.5" CLAYEY SAND BALLS.
S/BC	50	70	14	◤	10 9 9	18	10	SP	GRAVELLY SAND, FINE TO COARSE SAND, MOSTLY UNIFORM FINE, 10-20% FINE GRAVEL TO 0.5", 5-10% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10 YR 7/6), SEVERAL 0.25-2.0" CLAY AND CLAYEY SAND BALLS.
			15	◤	6 7 8	15	16	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) AND DARK YELLOWISH ORANGE (10 YR 6/6), CRUSTY IRON OXIDE LAMINATION FOLLOWED BY 7.0" LAYER YELLOWISH GRAY (5 Y 7/2) MODERATELY PLASTIC CLAY.
	40	80							

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 11, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 104A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 104 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED AUGUST 18-22, 1972 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY R.A.J.
COORDINATES, NORTH 17,324.6 EAST 17,684.4 GROUND SURFACE ELEVATION 119.0'

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			16	◤	8 9 15	24	10	SC	CLAYEY SAND, UNIFORM, FINE, 10-15% MODERATELY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2) WITH LAMINATIONS OF DARK YELLOWISH ORANGE (10 YR 6/6) EVERY 0.5".
			17	◤	8 10 16	26	14	SP	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2).
	30	90	18	◤	13 13 16	29	13	SP	SAND, UNIFORM, FINE, LESS THAN 5% COARSE SAND AND FINE GRAVEL TO 0.3", LESS THAN 5% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10 YR 7/6), 4.0" CLAY LAYER, SEVERAL 0.5" CLAYEY SAND ZONES.
			19	◤	13 15 19	34	10	SP	SAND, UNIFORM, FINE, LESS THAN 3% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10 YR 7/6).
	20	100	20	◤	10 14 22	36	10	SP	SAND, UNIFORM, FINE, LESS THAN 3% SLIGHTLY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4).
			21	◤	21 14 23	37	11	SP	SAND, UNIFORM, FINE, CLEAN, FEW COARSE SAND AND VERY FINE GRAVEL PARTICLES, GRAYISH ORANGE (10 YR 7/4).
	10	110	22	◤	18 50/7"	50/7"	9	SP	SIMILAR TO SS-21.
			23	◤	17 50/8"	50/8"	10	SP	SIMILAR TO SS-21, BUT VERY PALE ORANGE (10 YR 8/2).
	0	120	24	◤	21 26 37	63	12	SP	SIMILAR TO SS-23.
			25	◤	15 50/8"	50/8"	10	SP	SIMILAR TO SS-23.
	-10	130	26	◤	19 50/7"	50/7"	11	SP	SAND, UNIFORM, FINE - MEDIUM, CLEAN, GRAYISH ORANGE (10 YR 7/4), FEW GRAVEL PARTICLES UP TO 1.0".
			27	◤	31 60/6"	60/6"	10	SP	SAND, MOSTLY MEDIUM, CLEAN, LESS THAN 5% FINE GRAVEL TO 0.5", YELLOWISH ORANGE (10 YR 7/6) FEW SAND SIZED CLAY BALLS OR POCKETS.
	-20	140	28	◤	36 80/6"	80/6"	12	SP	SAND, FINE TO MEDIUM, CLEAN, LESS THAN 5% COARSE SAND AND VERY FINE GRAVEL, GRAYISH ORANGE (10 YR 7/4).
			29	◤	24 70/6"	70/6"	11	SP	SAND, UNIFORM, FINE - MEDIUM, CLEAN, LESS THAN 5% COARSE SAND AND FINE GRAVEL TO 0.4", VERY PALE ORANGE (10 YR 8/2).
	-30	150	30	◤	18 25 25	50	9	SP	SAND, FINE TO COARSE, MOSTLY MEDIUM, CLEAN, 5-10% FINE GRAVEL TO 0.5", GRAYISH ORANGE (10 YR 7/4).
BC/PC			31	◤	5 10 14	24	18	CL-CH	CLAY, MODERATELY PLASTIC, GRAYISH YELLOW GREEN (5 GY 7/2), MOTTLED WITH BRIGHT YELLOWISH ORANGE (10 YR 6/6) AND DUSKY BROWN (5 YR 2/2), LESS THAN 5% VERY FINE SAND NEAR TOP.
	-40	160							

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 11, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 104B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. 104
DATE DRILLED AUGUST 18-22, 1972
COORDINATES, NORTH 17,324.6
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 17,684.4
SHEET 3 OF 3
LOGGED BY R.A.J.
GROUND SURFACE ELEVATION 119.0'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-40		32	◤	8 13 19	32	18	CL-CH	SIMILAR TO SS-31, ALSO MOTTLED GRAYISH YELLOW (5 Y 8/4).
-47.5	166.5	33	◤	10 14 17	31	18	CL-CH	SIMILAR TO SS-31, WITH ONLY SLIGHT MOTTLING, LAST TWO INCHES BECOMES GRAYISH GREEN (5 G 5/2).
								END OF BORING AT 166.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 11, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 104C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. 105
DATE DRILLED 9/8/72
COORDINATES, NORTH 17,342.7
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG CO
EAST 17,509.3
SHEET 1 OF 3
LOGGED BY T.I.B.
GROUND SURFACE ELEVATION 113.7'

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
L									
	110								
			1	◤	7 12 12	24	14	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 8-12% FINE TO MEDIUM SAND, MODERATE YELLOWISH BROWN (10 YR 5/4).
L/PH		10							
			2	◤	8 15 21	36	18	CL	SILTY CLAY, MODERATELY PLASTIC, 5-10% FINE SAND, MOTTLED MODERATE REDDISH BROWN (10 R 4/6) AND LIGHT GRAY (N7).
PH/S	100								
			3	◤	12 18 20	38	16	SC	CLAYEY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 40-50% SLIGHTLY PLASTIC FINES, MOTTLED REDDISH BROWN (10 R 4/6), YELLOWISH ORANGE (10 YR 6/6) AND VERY LIGHT GRAY (N8).
		20							
			4	◤	4 10 13	23	17	CH SC CL	BROKEN LAYERS, POCKETS CLAY, HIGHLY PLASTIC CLAYEY SAND, UNIFORM, FINE, 35-45% SLIGHTLY TO MODERATELY PLASTIC FINES. SANDY CLAY, MODERATELY PLASTIC, 35-45% UNIFORM FINE SAND. SAMPLE IS MOTTLED BRIGHT YELLOWISH ORANGE (10 YR 6/6), MODERATE RED (5 R 4/6), MODERATE REDDISH BROWN (10 R 4/6), VERY LIGHT GRAY (N8)
	90								
			5	◤	4 10 11	21	16	CH SC	10.0 IN. - THINLY INTERBEDDED, SUBHORIZONTALLY. CLAY, HIGHLY PLASTIC, MODERATE RED (5 R 4/6), WITH VERY THIN POCKETS/LAYERS YELLOWISH ORANGE SILTY SAND. 6.0 IN. - CLAYEY SAND, UNIFORM, FINE, 8-12% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10 YR 6/6).
		30							
			6	◤	6 8 8	16	16	SC	CLAYEY SAND, UNIFORM, FINE, 10-15% SLIGHTLY TO MODERATELY PLASTIC FINES, DARK REDDISH ORANGE (10 R 5/6) WITH SOME YELLOWISH ORANGE.
	80								
			7	◤	9 9 10	19	16	SC	CLAYEY SAND, UNIFORM, FINE, 10-15% SLIGHTLY TO MODERATELY PLASTIC FINES, THINLY BANDED SUBHORIZONTALLY MODERATE REDDISH BROWN (10 R 4/6) AND DARK YELLOWISH ORANGE (10 YR 6/6).
		40							
			8	◤	11 19 26	45	16	SP	SAND, UNIFORM, FINE, LESS THAN 1% GRAVEL TO 0.4 IN. MAX., 3-9% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6), WITH ONE VERY SMALL VERY DARK RED CLAY POCKET.
	70								
			9	◤	6 8 9	17	14	SC	CLAYEY SAND, UNIFORM, FINE, 10-14% SLIGHTLY TO MODERATELY PLASTIC FINES, VERY THINLY BANDED, SUBHORIZONTALLY, DARK REDDISH ORANGE (10 R 5/6) AND YELLOWISH ORANGE (10 YR 6/6).
		50							
			10	◤	7 9 9	18	14	SC-SP	CLAYEY SAND, UNIFORM, FINE, LESS THAN 3% MEDIUM, 8-12% SLIGHTLY PLASTIC FINES, DARK REDDISH ORANGE (10 R 5/6) TO DARK YELLOWISH ORANGE (10 YR 6/6).
	60								
			11	◤	16 22 35	57	11	SP	SAND, UNIFORM, FINE, 4-7% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6).
		60							
			12	◤	16 23 18	41	11	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 3-6% GRAVEL TO 0.75 IN. MAX., 1-3% FINES, GRAYISH ORANGE (10 YR 7/4) TO DARK YELLOWISH ORANGE (10 YR 6/6).
	50								
S/BC			13	◤	13 19 18	37	11	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 6-12% GRAVEL TO 0.75 IN. MAX., 1-3% FINES, GRAYISH ORANGE (10 YR 7/4), TO DARK YELLOWISH ORANGE (10 YR 6/6), WITH MANY SMALL POCKETS/BALLS OF HIGHLY PLASTIC CLAY AND WITH CLAY COATING ON SEVERAL PIECES OF GRAVEL.
		70							
			14	◤	2 3 5	8	18	SC CH	INTERLAYERED, SUBHORIZONTALLY: CLAYEY SAND, UNIFORM, FINE, 10-20% SLIGHTLY TO MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) TO DARK YELLOWISH ORANGE (10 YR 6/6) WITH CLAY, HIGHLY PLASTIC ("FAT"), STIFF, GRAYISH ORANGE (10 YR 6/4), LAYERS FROM 0.25 IN. TO 4.0 IN. THICK.
	40								
			15	◤	5 10 12	22	16	SP	SAND, UNIFORM, FINE, 1-3% FINES, GRAYISH ORANGE (10 YR 7/4), (WITH YELLOWISH ORANGE AND REDDISH ORANGE ABOVE CLAY LAYER) WITH 3.5 IN. LAYER - CLAY, HIGHLY PLASTIC, STICKY, PALE REDDISH BROWN (10 R 5/4) WITH IRREGULAR MOTTLES LIGHT DUSKY YELLOW (5 Y 7/4), WITH VERY SMALL IRREGULAR POCKETS OF FINE SAND.
		80							
			16	◤	8 10 14	24	12	SP	SAND, UNIFORM, FINE, 1-3% FINES, MODERATE REDDISH ORANGE (10 R 6/ TRACE SUBHORIZONTAL LAYERING.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 4, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 105A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. 105
DATE DRILLED 9/8/72
COORDINATES, NORTH 17,342.7
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 17,509.3
SHEET 2 OF 3
LOGGED BY T.I.B.
GROUND SURFACE ELEVATION 113.7'

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
	30								
			17	◤	18 25 18	43	10	SP GP	TOP 6 IN. - GRAVELLY SAND, POORLY GRADED FINE TO COARSE, MOSTLY FINE, 15-20% GRAVEL TO 0.7IN. MAX., LESS THAN 1% FINES, GRAYISH ORANGE (10 YR 7/3). BOTTOM 4 IN. - SANDY GRAVEL, POORLY GRADED, GRAVEL TO 1.0 IN. MAX., 45-50% SAND, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 1% FINES, GRAYISH ORANGE (10 YR 7/4)., WITH TRACE VERY SMALL POCKETS CLAYEY SAND.
		90							
			18	◤	30 52 60	112	8	SP	SAND, POORLY GRADED, FINE TO COARSE, 10-15% MEDIUM TO COARSE, 1-2% GRAVEL, TO 0.4 IN. MAX., 1-2% FINES, GRAYISH ORANGE (10 YR 7/4).
	20								
			19	◤	24 41 49	90	11	SP	SAND, UNIFORM, FINE, 4-7% GRAVEL TO 0 8 IN. MAX., LESS THAN 1% FINES, GRAYISH ORANGE (10 YR 7/4).
		100							
			20	◤	21 24 27	51	N.R.		NO RECOVERY
			21	◤	100/ SEAT	100/ SEAT	6	SP	SAND, UNIFORM, FINE, 1-3% GRAVEL TO 0.7 IN. MAX., LESS THAN OR EQUAL TO 1% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
	10								
			22	◤	17 30 30	60	11	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 1% MEDIUM TO COARSE, 1-2% FINES, LIGHT GRAYISH ORANGE (10 YR 8/4).
		110							
			23	◤	16 34 37	71	10	SP	SAND, UNIFORM, FINE, 1-2% MEDIUM TO COARSE, LESS THAN 1% GRAVEL TO 0.3 IN. MAX., LESS THAN 1% FINES, LIGHT YELLOWISH BROWN (10 YR 6/4).
	0								
			24	◤	25 33 35	68	7	SP	SAND, UNIFORM, FINE, 1% GRAVEL TO 0.4 IN. MAX., 1% FINES, LIGHT YELLOWISH BROWN (10 YR 6/4).
		120							
			25	◤	18 37 40	77	11	SP	SAND, UNIFORM, FINE, LESS THAN 1% FINES, GRAYISH ORANGE (10 YR 7/4).
	-10								
			26	◤	14 30 39	69	11	SP	SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM, LESS THAN 1% FINES, GRAYISH ORANGE (10 YR 7/4).
		130							
			27	◤	34 38 45	83	8	SP	SAND, POORLY GRADED, FINE TO COARSE MOSTLY MEDIUM TO COARSE, 5-10% GRAVEL TO 0.7 IN. MAX., LESS THAN 1% FINES, LIGHT YELLOWISH BROWN (10 YR 6/4).
	-20								
			28	◤	26 22 21	43	8	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 35-45% GRAVEL TO 0.7 IN. MAX., 1-3% FINES, GRAYISH ORANGE (10 YR 7/4) TO DARK YELLOWISH ORANGE (10 YR 6/6).
		140							
			29	◤	29 40 29	69	11	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AT TOP, MOSTLY MEDIUM TO COARSE AT BOTTOM, 20-25% GRAVEL TO 0.8 IN. MAX., LESS THAN 1% FINES, MODERATE YELLOWISH BROWN (10 YR 6/4).
	-30								
			30	◤	31 28 27	55	8	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 30-45% GRAVEL TO 0.8IN. MAX., 1% FINES, MODERATE YELLOWISH BROWN (10 YR 6/4).
		150							
			31	◤	28 34 19	53	8	GP	SANDY GRAVEL, POORLY GRADED, GRAVEL TO 0.8 IN. MAX., 40-60% FINE TO COARSE SAND, MOSTLY MEDIUM TO COARSE, 1-3% FINES, MODERATE YELLOWISH BROWN (10 YR 6/4).
BC/PC	-40								
			32	◤	9 12 17	29	18	CL-CH	SILTY CLAY, MODERATELY PLASTIC, VERY THINLY BANDED SUBHORIZONTALLY, YELLOWISH ORANGE (10 YR 7/6-6/6).
		160							
			33	◤	10 16 14	30	18	CH	CLAY, HIGHLY PLASTIC, VERY STIFF, YELLOWISH GRAY (5 Y 7/2).

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 4, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 105B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 105
DATE DRILLED 9/8/72
COORDINATES, NORTH 17,342.7
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO
EAST 17,509.3
SHEET 3 OF 3
LOGGED BY T.I.B.
GROUND SURFACE ELEVATION 113.7'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-52.8	166.5	34	◤	18 21 20	41	18	CH	CLAY, HIGHLY PLASTIC, GREENISH GRAY (56 6/1)
								END OF BORING AT 166.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 4, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 105C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 106 | TYPE OF BORING DRIVE | SHEET 1 OF 3
DATE DRILLED AUGUST 25, 1972 | DRILLING COMPANY - EUSTIS ENGRG. CO | LOGGED BY R.A.J.
COORDINATES, NORTH 17,385.2 | EAST 17,313.7 | GROUND SURFACE ELEVATION 112.1'

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
L	110								
			1	◤	2 4 8	12	11	ML	SILT, NONPLASTIC, GRAYISH ORANGE (10 YR 7/4) AND MODERATE YELLOWISH BROWN (10 YR 5/4).
L/PH	100	10	2	◤	3 6 7	13	16	ML	CLAYEY SILT, SLIGHTLY PLASTIC, YELLOWISH BROWN (10 YR 6/4).
			3	◤	6 10 12	22	16	ML	CLAYEY SILT, SLIGHTLY PLASTIC, YELLOWISH GRAY (5 Y 7/2) MOTTLED WITH YELLOWISH GRAY (5 Y 8/1), WITH SILT SEAMS AND POCKETS.
	90	20	4	◤	5 8 16	24	19	CL	SANDY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 10-15% FINE SAND, DARK YELLOWISH ORANGE (10 YR 6/6) AND LIGHT GRAY (N 7), LIGHT GRAY SECTIONS ONLY SLIGHTLY PLASTIC.
PH/S			5	◤	16 11 8	19	12	SM & SC	SILTY SAND, UNIFORM, VERY FINE, 10-20% NONPLASTIC FINES, LIGHT GRAY (N 7), BECOMES CLAYEY SAND, UNIFORM, FINE, 10-20% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), 2.0" VERY LIQUID GRAY CLAY IN TIP.
	80	30	6	◤	6 8 9	17	12	SC	CLAYEY SAND, UNIFORM, FINE, 10-15% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) MOTTLED WITH LIGHT GRAY (N 7), FEW SMALL LAYERS AND POCKETS OF MODERATE RED (5 R 4/6) CLAY.
			7	◤	5 7 9	16	14	SM	SILTY SAND, FINE, 10-20% NONPLASTIC FINES, MODERATE RED (5 R 4/6) AND DARK YELLOWISH ORANGE (10 YR 6/6), SEVERAL 0.1-2.0" LAYERS OF CLAY.
	70	40	8	◤	5 4 9	13	14	SP	SAND, FINE, 5-10% MODERATELY PLASTIC FINES, MODERATE RED (5 R 4/6) 3.0" LAYER DARK YELLOWISH ORANGE (10 YR 6/6) FINE TO MEDIUM SAND WITH SIMILAR FINES.
			9	◤	7 7 8	15	12	SC	CLAYEY SAND, MOSTLY FINE, 10-20% GRAVEL TO 0.75", 10-15% MODERATELY PLASTIC FINES, MODERATE RED (5 R 4/6) THEN YELLOWISH ORANGE (10 YR 6/6), FEW SANDY CLAY AND CLAY LAMINATIONS AND LAYERS.
	60	50	10	◤	23 23 26	49	14	SP	SAND, UNIFORM, FINE, LESS THAN 5% COARSE SAND AND FINE GRAVEL TO 0.5", LESS THAN 5% MODERATELY PLASTIC FINES, MODERATE RED (5 R 4/6) TOP 2.0" THEN YELLOWISH ORANGE (10 YR 7/6).
			11	◤	14 21 24	45	10	SP	SAND, UNIFORM, FINE, LESS THAN 3% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), FEW CLAYEY SAND LAMINATIONS AND BALLS TO 0.25".
S/BC	50	60	12	◤	14 10 12	22	10	SP	GRAVELLY SAND, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 20-30% FINE GRAVEL TO 0.5", 5-10% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), 2.0" CLAYEY SAND BALL WITH GRAVEL AND 0.5" PALE PURPLE (5 P 6/2) CLAY CENTER.
			13	◤	3 4 6	10	13	SP	SAND, UNIFORM, VERY FINE, 5-10% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6) THEN YELLOWISH ORANGE (10 YR 7/6).
	40	70	14	◤	2 2 4	6	23	SP CH	SIMILAR TO SS-13, BUT ALSO LIGHT RED (5 R 6/6) AND LIGHT GRAY (N 7) WITH LIGHT RED CLAY LAYERS AND LAMINATIONS, BECOMES CLAY, HIGHLY PLASTIC, VERY LIGHT GRAY (N 5) AND MODERATE PINK (5 R 7/4)
			15	◤	5 7 10	17	12	SP	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) WITH SOME FINE, FEW 1.0" LIGHT GRAY (N 7) CLAY LAYERS.
		80	16	◤	12 20 28	48	12	SP	SAND, UNIFORM, FINE, LESS THAN 3% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10 YR 7/6), CHANGES TO FINE TO MEDIUM SAND, PALE YELLOWISH BROWN (10 YR 6/2), FEW 0.25" CLAYEY SAND POCKETS

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY R. F. GREENWOOD
DATE NOVEMBER 30, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 106A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 106 | TYPE OF BORING DRIVE | SHEET 2 OF 3
DATE DRILLED AUGUST 25, 1972 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY R.A.J.
COORDINATES, NORTH 17,385.2 | EAST 17,313.7 | GROUND SURFACE ELEVATION 112.1'

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
	30								
			17	◤	19 24 31	55	9	SP	SAND, UNIFORM, FINE, CLEAN, VERY PALE ORANGE (10 YR 8/2), OCCASIONAL MEDIUM SAND TO VERY FINE GRAVEL.
	20	90	18	◤	13 24 24	48	10	SP	SAND, MOSTLY UNIFORM, FINE SAND, 5-10% COARSE SAND AND FINE GRAVEL TO 0.5", LESS THAN 3% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
			19	◤	18 26 28	54	10	SP	SAND, UNIFORM, FINE, CLEAN, GRAYISH ORANGE (10 YR 8/2), OCCASIONAL MEDIUM AND COARSE GRAVEL PARTICLE.
	10	100	20	◤	17 22 23	45	13	SP	SAND, SIMILAR TO SS-19.
			21	◤	19 19 21	40	14	SP	SAND, UNIFORM, FINE, CLEAN, YELLOWISH ORANGE (5 Y 7/2).
	0	110	22	◤	20 20 27	47	12	SP	SAND, UNIFORM, FINE, CLEAN, GRAYISH ORANGE (10 YR 7/4), MANY MEDIUM SAND SIZED LUMPS OF FINE SAND BOUND TOGETHER BY WHITE CLAY.
			23	◤	20 40 50	90	11	SP	SIMILAR TO SS-22, WITH LESS THAN 2% MEDIUM AND COARSE SAND PARTICLES.
	-10	120	24	◤	15 24 37	61	10	SP	SIMILAR TO SS-23, WITH LESS THAN 5% FINE GRAVEL TO 0.4".
			25	◤	21 22 30	52	13	SP	SIMILAR TO SS-22.
	-20	130	26	◤	13 12 13	25	8	SP	GRAVELLY SAND, FINE TO COARSE SAND, MOSTLY MEDIUM AND COARSE, 10-20% FINE GRAVEL TO 0.75", CLEAN IN PLACES TO 5-10% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), TWO 2.0" CLAYEY SAND BALLS WITH SANDY CLAY CENTERS AND EMBEDDED FINE GRAVEL.
			27	◤	3 4 5	9	15	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2) WITH BRIGHT YELLOWISH ORANGE (10 YR 6/6) SPOTS OF MEDIUM SAND SIZED CHERT AND WEATHERED CHERT AND VERY SLIGHT MOTTLING OF LIGHT RED (5 R 6/6), INTERLAYERING OF SANDY CLAY AND A FEW FINE SAND LAMINATIONS.
	-30	140	28	◤	10 14 21	35	10	SP	SAND, UNIFORM, FINE-MEDIUM, LESS THAN 5% MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 7/2) WITH BRIGHT YELLOWISH ORANGE (10 YR 6/6), FEW SMALL LAYERS OF CLAYEY SAND, SEVERAL 0.4" CLAY BALLS, 3.0" YELLOWISH GRAY (5 Y 7/2) CLAY IN TIP.
			29	◤	11 17 15	32	14	SP	SIMILAR TO SS-28, BUT WITH ONLY ONE 2.0" CLAY BALL.
BC/PC	-40	150	30	◤	4 5 8	13	22	ML CL	SILT TOP AND SILTY CLAY BOTTOM, SLIGHTLY PLASTIC TOP, MODERATELY PLASTIC BOTTOM, BOTH 5-10% VERY FINE SAND, BOTH LIGHT GRAY AND GRAYISH YELLOW GREEN (5 GY 7/2), MOTTLED LIGHTLY AT TOP AND HEAVILY AT BOTTOM WITH GRAYISH YELLOW (5 Y 8/4) THEN DARK YELLOWISH BROWN (10 YR 4/3).
			31	◤	4 5 8	13	24	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, PALE OLIVE (10 Y 6/2), WITH SOME BRIGHT YELLOWISH ORANGE (10 YR 6/4), FINE TO COARSE SAND SIZED LUMPS OF SAME MATERIAL. (DRIER)
		160							

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY R. F. GREENWOOD
DATE NOVEMBER 30, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 106B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 106 | TYPE OF BORING DRIVE | SHEET 3 OF 3
DATE DRILLED AUGUST 25, 1972 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY T.I.B.
COORDINATES, NORTH 17,385.2 | EAST 17,313.7 | GROUND SURFACE ELEVATION 112.1'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-50		32	◤	6 7 7	14	21	ML-CL	CLAYEY SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, PALE OLIVE (10 Y 6/2), FINE TO COARSE SAND SIZED LUMPS OF SAME MATERIAL. (DRIER)
		33	◤	8 11 14	25	24	ML-CL	SIMILAR TO SS-32.
-60	170	34	◤	8 10 12	22	21	ML	SANDY SILT, SLIGHTLY PLASTIC, 15-20% VERY FINE SAND, GREENISH GRAY (5 G 6/1), SLIGHTLY MORE PLASTIC NEAR TOP, SILTY SAND SEAMS THROUGHOUT (MEDIUM LIGHT GRAY).
-64.4	176.5	35	◤	6 9 12	21	21	CL	SILTY CLAY, MODERATELY PLASTIC, 5-10% VERY FINE SAND, PALE OLIVE (10 Y 6/2).
								END OF BORING AT 176.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

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◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY R. F. GREENWOOD
DATE NOVEMBER 30, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 106C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 107 TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED AUGUST 21, 1972 DRILLING COMPANY – EUSTIS ENGRG. CO LOGGED BY TJB
COORDINATES, NORTH 17,035.9 EAST 18,058.8 GROUND SURFACE ELEVATION 103.5'

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
L									
L/PH	100		1	◤	8 10 15	25	14	CH ML	IRREGULAR POCKETS: SILTY CLAY, HIGHLY PLASTIC, LESS THAN 5% UNIFORM FINE SAND; CLAYEY SILT, NONPLASTIC, LESS THAN 5% UNIFORM FINE SAND; MOTTLED DARK YELLOWISH BROWN (10 YR 4/2) WITH PALE YELLOWISH BROWN (10 YR 6/2) WITH FEW FeOx NODULES TO 0.4" MAX.
PH/S	90	10	2	◤	12 18 23	41	18	CL CL-SC	TOP TO BOTTOM, INCREASING SAND - SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 5 TO 15% UNIFORM, FINE SAND, LIGHT GRAY (N 7) WITH IRREGULAR ZONES YELLOWISH ORANGE. SANDY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 40-50% POORLY GRADED SAND, FINE TO COARSE, MOSTLY FINE, SAME COLORS AS SILTY CLAY, WITH COARSE FELDSPAR SAND WEATHERING TO KAOLINITE.
			3	◤	6 9 12	21	15	SC	CLAYEY SAND WITH CLAY LAYERS AND BALLS. CLAYEY SAND, UNIFORM, FINE, 8-15% SLIGHTLY PLASTIC FINES, BANDED AND MOTTLED, MODERATE REDDISH BROWN (10 R 4/6) AND BRIGHT YELLOWISH ORANGE (10 YR 6/6).
	80	20	4	◤	5 7 4	11	14	CH SP-SM	CLAY, HIGHLY PLASTIC, BALLS AND LAYERS DARK RED AND YELLOWISH GRAY TO YELLOWISH ORANGE (5 Y 7/2 TO 10 YR 7/6). BOTTOM 2", SAND, UNIFORM, VERY FINE TO FINE, 2-4% FINES, WHITE (N 9) WITH YELLOWISH ORANGE BANDING. SAND/ SILTY SAND, UNIFORM, VERY FINE, 8-12% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10 YR 7/6) WITH VERY LIGHT GRAY (N 8) MOTTLED.
			5	◤	11 36 32	68	14	SP	SAND, UNIFORM, FINE, 1-2% FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6) WITH SOME DARK YELLOWISH ORANGE (10 YR 5/6).
		30	6	◤	12 15 14	29	14	SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, 1% FINES (EXCLUDING CLAYEY SAND LAYERS), BRIGHT YELLOWISH ORANGE (10 YR 6/6), WITH THIN HORIZONTAL LAYER MEDIUM TO COARSE SAND WITH ONE PIECE GRAVEL AT 0.6" DIAMETER NEAR TOP, AND SEVERAL THIN HORIZONTAL RED BROWN CLAYEY FINE SAND LAYERS NEAR BOTTOM.
	70		7	◤	4 5 8	13	18	SC	CLAYEY SAND, UNIFORM, FINE, 10-15% SLIGHTLY PLASTIC FINES, VERY THINLY BANDED, DIPPING 10° GRAYISH ORANGE (10 YR 6/4) WITH DARK YELLOWISH ORANGE (10 YR 6/6).
		40	8	◤	8 22 30	52	12	SP	SAND, UNIFORM, FINE, 1-2% FINES, ONE PIECE GRAVEL AT 0.4", VERY THINLY BANDED, MAX. DIP OF 30°, DARK YELLOWISH ORANGE (10 YR 6/6) WITH FEW VERY THIN MODERATE RED CLAYEY SAND LAYERS NEAR TOP AND THIN VERY PALE ORANGE CLEAN SAND AT BOTTOM.
	60		9	◤	7 6 16	22	11	SP	SAND, POORLY GRADED, FINE TO MEDIUM, 3-8% SLIGHTLY PLASTIC FINES, (VARYING WITHIN SAMPLE), VERY THINLY BANDED, DIPPING 10-20°, VERY PALE ORANGE (10 YR 8/6) WITH YELLOWISH ORANGE.
S/BC		50	10	◤	13 21 30	51	11	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 1% GRAVEL TO 0.4" MAX., LESS THAN 1% FINES, LIGHT YELLOWISH BROWN (10 YR 6/3).
	50		11	◤	1 5 7	12	15	SP-SC	SAND, POORLY GRADED, FINE TO MEDIUM, LESS THAN 5% COARSE, 1-2% GRAVEL TO 0.5" MAX., 8-12% SLIGHTLY PLASTIC FINES, VERY THINLY LAYERED, DIPPING 25-30°, MODERATE YELLOWISH ORANGE (10 YR 7/5) WITH DARK YELLOWISH ORANGE.
		60	12	◤	4 7 10	17	14	SP	SAND, UNIFORM, FINE, 4-6% MEDIUM, 3-5% FINES, MODERATE YELLOWISH ORANGE (10 YR 7/5) WITH VERY THIN DARK YELLOWISH ORANGE BANDS DIPPING 15-20°.
	40		13	◤	3 5 8	13	14	SP	SAND, UNIFORM, FINE, 4-7% SLIGHTLY PLASTIC FINES, MODERATE YELLOWISH ORANGE (10 YR 7/5).
		70	14	◤	6 7 22	29	15	SP	SAND, SAME AS SS-13.
	30		15	◤	20 30 50	80	12	SP	SAND, UNIFORM, FINE, LESS THAN 2% MEDIUM, LESS THAN 1-2% FINES, UNIFORM, DARK YELLOWISH ORANGE (10 YR 5/6) AT TOP TO YELLOWISH ORANGE (10 YR 6/6) WITH THIN BANDS DARK YELLOWISH ORANGE (10 YR 5/6) AT BOTTOM.
		80	16	◤	15 25 37	62	5	SP	SAND, UNIFORM, FINE, 1% FINES, DARK YELLOWISH ORANGE (10 YR 6/5).

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 3, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 – GSK – 107A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 107 TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED AUGUST 21, 1972 DRILLING COMPANY – EUSTIS ENGRG. CO LOGGED BY TJB
COORDINATES, NORTH 17,035.9 EAST 18,058.8 GROUND SURFACE ELEVATION 103.5'

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
	20		17	◤	13 30 38	68	11	SP	SAND, UNIFORM, FINE, 1-2% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	10	90	18	◤	18 31 38	69	8	SP	SAND, UNIFORM, FINE, 4-7% MEDIUM TO COARSE, 1% FINES, DARK YELLOWISH ORANGE.
			19	◤	10 20 32	52	15	SP	SAND, UNIFORM, FINE, 1% GRAVEL TO 0.5" MAX., NEAR BOTTOM, LESS THAN 1% FINES, LIGHT YELLOWISH ORANGE (10 YR 7/5) WITH DARK YELLOWISH ORANGE (10 YR 6/6).
		100	20	◤	13 22 24	46	12	SP	SAND, UNIFORM, FINE, 2-3% FINES, LIGHT YELLOWISH ORANGE (10 YR 7/5).
	0		21	◤	18 32 43	75	10	SP	SAND, UNIFORM, FINE, 1-3% FINES, LIGHT YELLOWISH ORANGE (10 YR 7/5), 1% GRAVEL TO 0.6" MAX.
		110	22	◤	32 75/6"	75/6"	11	SP	SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM TO COARSE, 1-3% GRAVEL TO 0.6" MAX., LESS THAN 1% FINES (CLEAN), LIGHT YELLOWISH BROWN (10 YR 6/3).
	-10		23	◤	35 100/4"	100/4"	10	SP	SAND, UNIFORM, FINE, 1-3% MEDIUM, 2-3% GRAVEL TO 0.9" MAX., LESS THAN 1% FINES (CLEAN), LIGHT YELLOWISH BROWN (10 YR 6/3).
		120	24	◤	33 75/6"	75/6"	8	SP SP	SAND, UNIFORM, FINE, (FINER THAN SS-22 AND SS-23), 1-4% FINES (MOSTLY SILT), LIGHT YELLOWISH BROWN (10 YR 6/3). SAND, POORLY GRADED, FINE TO MEDIUM, LESS THAN 2% COARSE, ONE PIECE GRAVEL AT 0.75", LESS THAN 1% FINES (CLEAN), LIGHT YELLOWISH BROWN (10 YR 6/3).
	-20		25	◤	23 50/6"	50/6"	6	SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, LESS THAN 1% COARSE, LESS THAN 1% FINES (CLEAN), LIGHT YELLOWISH BROWN (10 YR 6/3).
		130	26	◤	65 75/4"	75/4"	8	SP	SAND, UNIFORM, FINE, 8-12% MEDIUM, ONE PIECE GRAVEL, 0.4", 1% FINES, LIGHT YELLOWISH BROWN (10 YR 6/4) WITH YELLOWISH ORANGE.
	-30		27	◤	18 14 22	36	10	GP-GC	SANDY GRAVEL WITH CLAY BALLS, POORLY GRADED, GRAVEL TO 1.0" MAX., 25-35% FINE TO COARSE SAND, MOSTLY COARSE, 10-20% HIGHLY PLASTIC FINES, (IN CLAY BALLS AND CLAYEY SAND MATRIX), BROWN SAND AND GRAVEL WITH YELLOWISH GRAY CLAY (5 Y 7/3) AND WITH YELLOWISH ORANGE STAINS (10 YR 5/3).
BC/PC	-40	140	28	◤	13 15 16	31	10	GC	CLAYEY GRAVEL, POORLY GRADED, GRAVEL TO 0.75" MAX., 30% FINE TO COARSE SAND, MOSTLY COARSE, 30-40% HIGHLY PLASTIC FINES (CLAY IN BALLS, MATRIX LAYERS), YELLOWISH ORANGE (10 YR 6/6) AND YELLOWISH GRAY (5 Y 7/2), WITH CLAY LAYER IN BOTTOM 1".
			29	◤	16 50/6"	50/6"	6	SP	SAND, UNIFORM, FINE, BECOMING POORLY GRADED, FINE TO COARSE, MOSTLY FINE TOWARDS BOTTOM, 2-4% GRAVEL TO 0.6" MAX., 3-6% NONPLASTIC FINES, LIGHT GRAYISH ORANGE (10 YR 8/4).
		150	30	◤	16 20 22	42	18	CH	SILTY CLAY, HIGHLY PLASTIC, VERY STIFF TO HARD, MOTTLED YELLOWISH GRAY (5 Y 7/2), MODERATE BROWN (5 YR 6/4) AND BRIGHT YELLOWISH ORANGE (10 YR 6/6), BROWN AND YELLOWISH ORANGE MOTTLING DECREASES DOWN SAMPLE, WITH MANY SMALL FeOx NODULES.
	-50		31	◤	12 18 20	38	N.R.		NO RECOVERY.
			32	◤	13 14 18	32	18	CL-CH	SANDY CLAY, MODERATELY PLASTIC, 15-20% UNIFORM VERY FINE SAND (SILT), YELLOWISH GRAY (5 Y 7/2).
		160	33	◤	13 17 17	34	18	ML	SANDY SILT, SLIGHTLY PLASTIC, 20-35% UNIFORM VERY FINE SAND, GREENISH GRAY (5 Y 5/1) WITH SMALL IRREGULAR POCKETS OF DARK GREENISH GRAY CLAY. END OF BORING AT 161.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 3, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 – GSK – 107B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 108 TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED SEPTEMBER 1-7, 1972 DRILLING COMPANY – EUSTIS ENGRG. CO LOGGED BY R.A.J.
COORDINATES, NORTH 17,071.3 EAST 17,863.3 GROUND SURFACE ELEVATION 112.5'

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
L	110		1	◤	2 4 5	9	14	ML	SILT, NONPLASTIC, 5-10% VERY FINE SAND, MODERATE YELLOWISH BROWN (10 YR 5/4).
L/S	100	10	2	◤	2 5 8	13	15	SC	CLAYEY SAND, FINE, 30-40% SLIGHTLY TO MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE YELLOWISH BROWN.
			3	◤	21 50/8"	50/8"	19	SP SC	SAND, UNIFORM, FINE, LESS THAN 5% MODERATELY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6), BECOMES CLAYEY SAND, MOSTLY UNIFORM MEDIUM WITH 4.0" POCKET MODERATE REDDISH BROWN (10 R 4/6).
	90	20	4	◤	4 6 6	12	15	SC	CLAYEY SAND, UNIFORM, VERY FINE, 10-15% SLIGHTLY TO MODERATELY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6), FEW 0.75" POCKETS OF MODERATE RED (5 R 4/6) CLAY.
			5	◤	2 4 6	10	16	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6), WITH SEVERAL MODERATE RED (5 R 4/6) AND LIGHT ORANGE (N 7) 0.25-2.0" LAYERS CLAY AND SANDY CLAY NEAR TOP.
	80	30	6	◤	5 6 7	13	6	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10 YR 7/6).
			7	◤	6 5 8	13	10	SP	SAND, UNIFORM, FINE, 3-8% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10 YR 7/6).
	70	40	8	◤	6 7 9	16	13	SP	SAND, UNIFORM, FINE, 5-10% MODERATELY PLASTIC FINES, YELLOWISH ORANGE (10 YR 7/6), WITH FEW 0.2" POCKETS OF GRAY CLAYEY SAND.
			9	◤	8 22 28	50	15	SP	SIMILAR TO SS-8, FIRST 6.0" THEN SAND, MOSTLY UNIFORM FINE, LESS THAN 5% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH FEW 0.25" CLAYEY SAND BALLS.
	60	50	10	◤	13 18 26	44	14	SP	SAND, UNIFORM, FINE - MEDIUM, LESS THAN 5% FINE GRAVEL TO 0.5", LESS THAN 3% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10 YR 7/6).
			11	◤	14 19 19	38	15	SC-SP	CLAYEY SAND BALLS WITH GRAVEL, FINE TO COARSE SAND, MOSTLY FINE AND MEDIUM, 15-25% GRAVEL TO 1.4", 10-20% MODERATELY PLASTIC FINES IN 1.0-2.0" BALLS, BRIGHT YELLOWISH ORANGE (10 YR 6/6), CLEAN TOP 2.0".
S/BC	50	60	12	◤	13 15 18	33	10	SP	SAND, UNIFORM, FINE, LESS THAN 5% MODERATELY PLASTIC FINES, 5-10% COARSE SAND AND FINE GRAVEL TO 0.5", DARK YELLOWISH ORANGE (10 YR 6/6), FEW CLAYEY LAMINATIONS AND CLAYEY SAND BALLS TO 0.25".
			13	◤	5 6 12	18	15	SP SC	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), WITH TWO 2.0" GRAY SANDY CLAY LAYERS, CLAYEY SAND BOTTOM 6.0", FINE TO COARSE SAND, 15-25% FINE GRAVEL TO 0.5", 10-15% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	40	70	14	◤	9 10 13	23	15	SP	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 8/1) WITH FEW 0.25" BANDS OF YELLOWISH ORANGE (10 YR 7/6) DIPPING 30°-40°.
			15	◤	13 9 11	20	13	SP	SAND, UNIFORM, FINE, 3-8% SLIGHTLY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2), FEW CLAYEY LAMINATIONS AND VERY SMALL LENSES OF FINE
		80							

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 4, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 – GSK – 108A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 108 TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED SEPTEMBER 1-7, 1972 DRILLING COMPANY – EUSTIS ENGRG. CO LOGGED BY R.A.J.
COORDINATES, NORTH 17,071.3 EAST 17,863.3 GROUND SURFACE ELEVATION 112.5'

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
	30		16	◤	23 35 41	76	14	SP	SAND, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, LESS THAN 3% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6), FEW 0.25" CLAYEY SAND BALLS.
			17	◤	15 17 27	44	14	SP	SIMILAR TO SS-16, BUT MODERATELY PLASTIC FINES.
	20	90	18	◤	4 13 20	33	15	SP	SAND, MOSTLY MEDIUM, CLEAN, GRAYISH ORANGE (10 YR 7/4), FEW CLAYEY SAND AND CLAY BALLS 0.75-2.0".
			19	◤	9 18 20	38	14	SP	SIMILAR TO SS-15.
	10	100	20	◤	20 22 31	53	12	SP	SAND, UNIFORM, FINE - MEDIUM, LESS THAN 3% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10 YR 7/6).
			21	◤	36 50/8"	50/8"	13	SP	SAND, UNIFORM, FINE, LESS THAN 3% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10 YR 7/6), FEW MEDIUM AND COARSE SAND PARTICLES.
	0	110	22	◤	17 20 28	48	14	SP	SIMILAR TO SS-21 WITH LAMINATION OF MEDIUM SAND.
			23	◤	20 15 22	37	15	SP	SAND, UNIFORM, FINE, CLEAN, LIGHT OLIVE GRAY (5 Y 6/1) MANY FINE AND MEDIUM SAND SIZED BALLS OF WHITE CLAY, LESS THAN 2% OF SAMPLE.
	-10	120	24	◤	50 50/3"	50/3"	14	SP	SAND, UNIFORM, FINE - MEDIUM, CLEAN, YELLOWISH ORANGE (10 YR 7/6) ONE 0.75" GRAVEL.
			25	◤	22 50/8"	50/8"	14	SP	SAND, MOSTLY UNIFORM, MEDIUM, CLEAN, LESS THAN 5% FINE GRAVEL TO 0.4", LIGHT OLIVE GRAY (5 Y 6/1).
	-20	130	26	◤	30 58/6"	58/6"	16	SP	SAND, FINE TO COARSE, MOSTLY UNIFORM MEDIUM, CLEAN, GRAYISH ORANGE (10 YR 7/4).
			27	◤	13 18 21	39	14	SP	SAND, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, CLEAN GRAYISH ORANGE (10 YR 7/4), FEW CLAYEY SAND BALLS TO 0.5".
	-30	140	28	◤	17 50/10"	50/10"	15	SP	SAND, MOSTLY UNIFORM MEDIUM, LESS THAN 2% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
			29	◤	22 17 22	39	13	SP	GRAVELLY SAND, FINE TO COARSE, MOSTLY UNIFORM FINE, 10-20% FINE GRAVEL TO 0.6", LESS THAN 5% MODERATELY PLASTIC FINES, WHITE WITH DARK YELLOWISH ORANGE (10 YR 6/6) GRAVEL, FEW 0.25-1.0" CLAYEY SAND BALLS WITH CLAY CENTER.
BC/PC		150	30	◤	6 5 7	12	18	CL	SILTY CLAY, SLIGHTLY PLASTIC AT TOP TO MODERATELY PLASTIC BOTTOM, LESS THAN 5% VERY FINE SAND, PALE GREENISH YELLOW (10 Y 8/2) DISCOLORED WITH DARK YELLOWISH ORANGE (10 YR 6/6), ONE 0.75" GRAVEL PARTICLE.
	-44.0	156.5	31	◤	10 12 14	26	18	CH	CLAY, MODERATELY PLASTIC, PALE GREENISH YELLOW (10 Y 8/2) DISCOLORED WITH DARK YELLOWISH ORANGE (10 YR 6/6).
									END OF BORING AT 156.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 4, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 – GSK – 108B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. 109 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED AUGUST 10-20, 1972 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY R.A.J.
COORDINATES, NORTH 17,130.0 EAST 17,637.5 GROUND SURFACE ELEVATION 112.8'

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
L									
	110								
			1	◤	2 4 4	8	12	ML	SILT, NONPLASTIC, 5-10% VERY FINE SAND, MODERATE YELLOWISH BROWN (10 YR 5/4) WITH LIGHT GRAY (N 7) MOTTLING.
L/PH									
		10							
			2	◤	2 5 7	12	15	CL	SILTY CLAY, MODERATELY PLASTIC, 5-10% VERY FINE SAND, DARK YELLOWISH ORANGE (10 YR 6/6) MOTTLED WITH SOME MODERATE REDDISH ORANGE (10 R 6/6).
	100								
			3	◤	2 5 6	11	15	CL	SANDY CLAY, MODERATELY PLASTIC, 15-25% VERY FINE SAND, YELLOWISH GRAY (5 Y 8/1) WITH SOME DARK YELLOWISH ORANGE (10 YR 6/6) MOTTLING, SIMILAR TO SS-2 AT BOTTOM.
		20							
			4	◤	2 4 6	10	15	CL	SANDY CLAY, MODERATELY PLASTIC, 15-25% VERY FINE SAND, YELLOWISH GRAY (5 Y 8/1) AND DARK YELLOWISH ORANGE (10 YR 6/6).
PH/S	90								
			5	◤	5 6 5	11	10	SC	CLAYEY SAND, UNIFORM, FINE, 10-15% SLIGHTLY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2), MODERATE RED (5 R 4/6) AT BOTTOM TIP.
		30							
			6	◤	3 6 8	14	14	CH & SP	CLAY, HIGHLY PLASTIC, MODERATE RED (5 R 4/6), INTERLAYERED WITH UNIFORM FINE SAND, 5-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	80								
			7	◤	4 5 7	12	8	SC	CLAYEY SAND, UNIFORM, VERY FINE SAND, 10-20% SLIGHTLY PLASTIC FINES, MODERATE RED (5 R 4/6).
		40							
			8	◤	3 8 9	17	10	CL SP	SANDY CLAY, MODERATELY PLASTIC, 10-20% VERY FINE SAND, PALE YELLOWISH ORANGE (10 YR 8/6), BECOMES GRAVELLY SAND, FINE TO COARSE, 10-20% FINE GRAVEL TO 0.4", 5-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	70								
			9	◤	7 6 9	15	9	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		50							
			10	◤	5 7 8	15	12	SP	SIMILAR TO SS-9, WITH SLIGHT MODERATE RED (5 R 4/6) MOTTLING.
	60								
			11	◤	50 50/6"	50/6"	11	SP	SAND, MOSTLY FINE WITH 10-20% MEDIUM, LESS THAN 5% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), FEW 0.3" FINE GRAVEL.
		60							
			12	◤	8 7 10	17	14	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), BECOMING FINE TO MEDIUM SAND WITH LESS THAN 5% PLASTIC FINES, CHANGES TO FINE CLAYEY SAND WITH 10-20% PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), 1.0" LAYER GRAY CLAY AND CLAY POCKETS.
	50								
			13	◤	7 7 8	15	9	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
			14	◤	1 2 5	7	14	CL SC	CLAY, MODERATELY PLASTIC, GRAYISH YELLOW (5 Y 8/4), BECOMES CLAYEY SAND, UNIFORM, FINE, 10-15% MODERATELY PLASTIC FINES, SAME COLOR MOTTLED WITH DARK YELLOWISH ORANGE (10 YR 6/6).
		70							
			15	◤	4 8 7	15	12	SP	SAND, UNIFORM, VERY FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
S/BC	40								
			16	◤	4 7 21	28	13	SP	SIMILAR TO SS-15, WITH GRAVEL TO 1.2" AT BOTTOM.
		80							

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DFG
DATE JANUARY 11, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 109 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. 109 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED AUGUST 10-20, 1972 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY R.A.J.
COORDINATES, NORTH 17,130.0 EAST 17,637.5 GROUND SURFACE ELEVATION 112.8'

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			17	◤	13 17 27	44	8	SP	SAND, MOSTLY FINE AND MEDIUM CLEAN, LESS THAN 5% FINE GRAVEL TO 0.5", WHITE AND GRAYISH ORANGE (10 YR 7/4).
	30								
			18	◤	18 24 28	52	11	SP	SAND, FINE TO COARSE, MOSTLY MEDIUM, 5-10% FINE GRAVEL TO 0.5" CLEAN, DARK YELLOWISH ORANGE (10 YR 6/6), FEW SMALL ZONES WITH 5-10% SLIGHTLY PLASTIC FINES.
		90							
			19	◤	6 3 24	27	10	SC GP	CLAYEY SAND, FINE, UNIFORM, 10-20% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), WITH SOME DARK YELLOWISH ORANGE BANDING, BECOMES SANDY GRAVEL, GRAVEL TO 0.75", 20-30% MOSTLY MEDIUM AND COARSE SAND, FEW CLAY BALLS TO 0.75".
	20								
			20	◤	13 25 30	55	10	SP	SAND, UNIFORM, FINE, CLEAN, YELLOWISH ORANGE (10 YR 7/6).
		100							
			21	◤	12 16 28	44	12	SP	SIMILAR TO SS-20, BUT GRAYISH ORANGE (10 YR 7/4).
	10								
			22	◤	15 26 36	62	13	SP	SAND, MOSTLY FINE, CLEAN, LESS THAN 5% FINE GRAVEL TO 0.5", GRAYISH ORANGE (10 YR 7/4).
		110							
			23	◤	23 50/7"	50/7"	10	SP	SAND, FINE, CLEAN, GRAYISH ORANGE (10 YR 7/4), LESS THAN 5% MEDIUM AND COARSE SAND.
	0								
			24	◤	2 4 22	26	14	SC SP	CLAYEY SAND, UNIFORM, VERY FINE SAND, 10-20% SLIGHT TO MODERATELY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6) WITH SEAMS AND LAMINATIONS OF DARK YELLOWISH ORANGE (10 YR 6/6) FINE SAND, BECOMES CLEAN MOSTLY FINE PALE YELLOWISH ORANGE (10 YR 8/6) SAND.
		120							
			25	◤	22 50/8"	50/8"	10	SP	SAND, FINE, CLEAN, PALE YELLOWISH ORANGE (10 YR 8/6), FEW VERY FINE GRAVEL AND COARSE SAND PARTICLES.
	-10								
			26	◤	22 50/6"	50/6"	9	SP	SAND, FINE TO MEDIUM, CLEAN, DARK YELLOWISH ORANGE (10 YR 6/6) AND MEDIUM DARK GRAY. (N 4).
		130							
			27	◤	21 25 25	50	10	SP	SAND, FINE TO COARSE, MOSTLY FINE, CLEAN, PALE YELLOWISH ORANGE (10 YR 8/6), AND DARK YELLOWISH ORANGE (10 YR 6/6), LESS THAN 5% MODERATELY PLASTIC FINES BOTTOM 3.0 IN., FEW PARTICLES FINE GRAVEL TO 0.9 IN.
	-20								
			28	◤	17 20 22	42	10	SP	GRAVELLY SAND, MOSTLY MEDIUM TO COARSE, 10-15% FINE GRAVEL TO 0.4", LESS THAN 5% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
		140							
			29	◤	17 50/11"	50/11"	10	SP	SIMILAR TO SS-28, BUT DARK YELLOWISH ORANGE.
	-30								
			30	◤	16 17 20	37	8	SP	GRAVELLY SAND, MOSTLY MEDIUM AND COARSE SAND, 25-35% FINE GRAVEL TO 0.75", CLEAN, GRAYISH ORANGE (10 YR 7/4), FEW 0.25" BALLS OF CLAYEY SAND.
		150							
			31	◤	16 14 17	31	10	SP	SIMILAR TO SS-30, WITH LESS THAN 5% MODERATELY PLASTIC FINES AND 2.0" BALL OF CLAYEY COARSE SAND AND GRAVEL.
	-40								
BC/PC									
			32	◤	8 9 16	35	16	ML	CLAYEY SILT, SLIGHTLY PLASTIC, LESS THAN 5% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2) AND DARK YELLOWISH ORANGE (10 YR 6/6).
		160							

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DFG
DATE JANUARY 11, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 109 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. 109 TYPE OF BORING DRIVE SHEET 3 OF 3
DATE DRILLED AUGUST 10-20, 1972 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY R.A.J.
COORDINATES, NORTH 17,130.0 EAST 17,637.5 GROUND SURFACE ELEVATION 112.8'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		33	◤	6 8 13	21	17	ML	CLAYEY SILT, SLIGHTLY PLASTIC, LESS THAN 5% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2).
-50								
		34	◤	9 11 26	37	16	CL	SILTY CLAY, MODERATELY PLASTIC, 5-10% VERY FINE SAND, GREENISH GRAY (5 G 6/1), BECOMES SILTY SAND, UNIFORM, VERY FINE, 20-30% NONPLASTIC FINES, SAME COLOR.
	170							
		35	◤	12 43/12"	43/12"	18	CL	SANDY CLAY, MODERATELY PLASTIC, 10-15% VERY FINE SAND, GREENISH GRAY (5 G 6/1), FEW 1.0" POCKETS OF LIGHT GRAY (N 7) SILTY SAND.
-60								
		36	◤	8 10 14	24	18	CH	SILTY CLAY, HIGHLY PLASTIC, VERY STIFF, GREENISH GRAY (5 G 6/1), WITH MANY VERY SMALL SOFT CLAY PELLETS.
	180							
		37	◤	9 13 17	30	18	CL–CH	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, GREENISH GRAY (5 G 5/1).
-70								
		38	◤	8 14 20	34	18	CL SC	THINLY INTERLAYERED, SUBHORIZONTALLY: SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 5-10% UNIFORM, VERY FINE SAND, GREENISH GRAY (5 G 5/1) AND CLAYEY SAND, UNIFORM, FINE, 25-35% SLIGHTLY PLASTIC FINES, GREENISH GRAY (5 G 5/1).
	190							
		39	◤	9 12 14	26	18	CL W/ SC & SP	SANDY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 10-25% UNIFORM FINE SAND, DARK GREENISH GRAY (5 G 4/1), WITH POCKETS OF SAND AND CLAYEY SAND.
-80								
		40	◤	26 19 16	35	17	CL–CH W/ SP & SC	SILTY CLAY, MODERATELY PLASTIC, DARK GREENISH GRAY (5 GY 4/1), WITH POCKETS OF VERY FINE SAND AND CLAYEY SAND, WITH 2" LAYER OF BRIGHT YELLOWISH ORANGE (10 YR 6/6) SAND AT TOP, ALSO WITH 0.3" THICK FeOx. LAYER AT TOP.
	200							
		41	◤	15 26 30	56	2		TWO INCH CUTTINGS RECOVERED.
-90		42	◤	6 15 15	30	15	SM–SP W/ CH	SILTY SAND, UNIFORM, VERY FINE, 8-12% NONPLASTIC TO SLIGHTLY PLASTIC FINES, LIGHT OLIVE (5 Y 6/2), WITH THIN SUBHORIZONTAL SILTY CLAY LAYERS 202'0" TO 202'6". SAMPLE OVERDROVE TO AID IN RECOVERY.
		43	◤	9 11 20	31	18	CL	SILTY CLAY, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, DARK GREENISH GRAY (5 GY 4/1), WITH THIN LAYERS OF HIGHLY PLASTIC CLAY AND SILTY SAND (UNIFORM, FINE). NO RECOVERY FIRST ATTEMPT, SAMPLE REDRIVEN AT 205' AND RECOVERED SECOND ATTEMPT.
	210							
		44	◤	11 24 36	60	14	SM	SILTY SAND, UNIFORM, FINE, 10-15% NONPLASTIC TO SLIGHTLY PLASTIC FINES, VERY THIN LIGHT OLIVE GRAY (5 Y 6/2) AND YELLOWISH ORANGE (10 YR 6/6) LAYERS DIPPING 20-25°.
-100								
-103.7	215.5	45	◤	25 51/6"	51/6"	9	SP	SAND, UNIFORM, FINE, 4-8% NONPLASTIC FINES AT TOP DECREASING TO 1-3% AT BOTTOM, LIGHT OLIVE GRAY (5 Y 6/2) WITH TRACE OF YELLOWISH ORANGE LAYERING.
								END OF BORING AT 215.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DFG
DATE JANUARY 11, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 109 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO 110 | TYPE OF BORING DRIVE | SHEET 1 OF 2
DATE DRILLED AUGUST 31, 1972 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY T.I.B.
COORDINATES, NORTH 17,139.2 | EAST 17,463.8 | GROUND SURFACE ELEVATION 105.9

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
L									
	100		1	◤	5 7 9	16	13	ML	CLAYEY SILT, SLIGHTLY TO MODERATELY PLASTIC,DARK YELLOWISH ORANGE (10 YR 7/4) WITH FEW BRIGHT YELLOWISH ORANGE MOTTLES AT TOP AND WITH GRAYISH ORANGE MOTTLES AT BOTTOM
L/PH									
		10							
			2	◤	3 7 11	18	14	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN OR EQUAL TO 5% UNIFORM VERY FINE SAND, LIGHT GRAY (N7) AND DARK YELLOWISH ORANGE (10 YR 6/6) MOTTLES
PH/S									
	90		3	◤	7 8 11	19	13	ML SM	SANDY SILT, NONPLASTIC TO SLIGHTLY PLASTIC, 15-20% UNIFORM, VERY FINE TO FINE SAND, LIGHT OLIVE GRAY (5 Y 6/1) WITH SILTY SAND AT BOTTOM, UNIFORM, VERY FINE, 35-45% NONPLASTIC TO SLIGHTLY PLASTIC FINES LIGHT OLIVE GRAY (5 Y 6/1)
		20							
			4	◤	15 30 30	60	12	ML SP	5.0 IN. - . SANDY SILT, NONPLASTIC, 15-25% UNIFORM, VERY FINE SAND, VERY LIGHT GRAY (N8) WITH SMALL POCKETS OF LIGHT GRAY (N7) SILTY CLAY 7.0. INCH - SAND, UNIFORM, FINE, 1% FINES, MOTTLED PINKISH GRAY (5YR 8/1), AND BRIGHT YELLOWISH ORANGE (10YR 6/6).
	80		5	◤	11 13 13	26	11	ML SM	SILT, NONPLASTIC, 5-10% UNIFORM, VERY FINE SAND, LIGHT GRAY (N7 - N8) AT BOTTOM: SILTY SAND, UNIFORM, VERY FINE TO FINE, 35-45% NONPLASTIC TO SLIGHTLY PLASTIC FINES, LIGHT GRAY (N8) WITH YELLOWISH ORANGE BANDING NEAR BOTTOM
		30							
			6	◤	7 7 11	18	11	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 3-4% GRAVEL TO 0.8 IN. MAX. (ASSOCIATED WITH CLAY BALLS), 3-6% SLIGHTLY PLASTIC (EXCLUDING CLAY BALLS AND LAYERS AND CLAYEY SAND LAYERS), THINLY LAYERED HORIZONTALLY, BRIGHT YELLOWISH ORANGE (10 YR 6/6) AND DARK RED (5 R 3/6) WITH SEVERAL HIGHLY PLASTIC MODERATE TO DUSKY RED CLAY BALLS AND THIN LAYERS, ALSO WITH FEW VERY THIN CLAYEY SAND LAYERS
	70		7	◤	5 7 9	16	12	SP	SAND, UNIFORM, FINE, 7-10% SLIGHTLY PLASTIC FINES (MOSTLY CLAY) THINLY BANDED SUBHORIZONTALLY DARK REDDISH ORANGE (10 R 5/6) AND BRIGHT YELLOWISH ORANGE (10 YR 6/6)
		40							
			8	◤	4 6 7	13	11	SP-SC	SAND, UNIFORM, FINE, 8-12% SLIGHTLY PLASTIC FINES, THINLY LAYERED DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE RED (5 R 4/6)
	60		9	◤	12 17 21	38	13	SP	SAND, UNIFORM, FINE, 4-7% SLIGHTLY PLASTIC FINES, MODERATE BROWN (5 YR 4/6)
		50							
			10	◤	11 12 12	24	10	SP	SAND, UNIFORM, FINE, 1-3% FINES, DARK YELLOWISH ORANGE (10 YR 6/6)
S/BC	50		11	◤	4 8 16	24	9	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 4-7% GRAVEL TO 0.6 IN. MAX., 2-3% FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6) WITH FEW VERY THIN CLAY LAYERS AND ONE ZONE OF DARK ORANGE FeOx.
		60							
			12	◤	3 8 13	21	14	CH SP	TOP 6 IN. - CLAY, HIGHLY PLASTIC, STICKY, YELLOWISH GRAY (5 Y 7/2),WITH FEW HORIZONTAL VERY THIN YELLOWISH ORANGE SILTY SEAMS, ALONG WHICH SAMPLE BREAKS BOTTOM 8 IN. - SAND, UNIFORM, FINE, 4-10% SLIGHTLY PLASTIC FINES, VERY THINLY BANDED SUBHORIZONTALLY, YELLOWISH ORANGE (10 YR 7/6 - 6/6)
	40		13	◤	6 8 8	16	11	SP	SAND, UNIFORM, FINE, 2-4% FINES, ORANGE PINK (5 YR 7/4) TO GRAYISH ORANGE (10 YR 7/4) WITH TWO THIN SUBHORIZONTAL LAYERS DARK YELLOWISH ORANGE
		70							
			14	◤	10 14 18	32	11	SP	SAND, UNIFORM, FINE, 1% FINES, AT TOP YELLOWISH ORANGE (10 YR 7/5) TO GRAYISH ORANGE (10 YR 7/3), WITH THIN LAYER FINE TO COARSE SAND, TRACE HORIZONTAL LAYERING
	30		15	◤	5 11 18	29	12	SP	SAND, UNIFORM, FINE, 2-3% MEDIUM TO COARSE, 1-2% FINES, GRAYISH ORANGE (10 YR 7/4)
		80							

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 4, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 110 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO 110 | TYPE OF BORING DRIVE | SHEET 2 OF 2
DATE DRILLED AUGUST 31, 1972 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY T.I.B.
COORDINATES, NORTH 17,139.2 | EAST 17,463.8 | GROUND SURFACE ELEVATION 105.9

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
			16	◤	27 31 40	71	11	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 3-4% GRAVEL TO 1.0 INCH MAXIMUM, LESS THAN 1% FINES (CLEAN), GRAYISH ORANGE (10YR 7/3), WITH ZONES OF UNIFORM FINE SAND.
	20		17	◤	32 36 39	75	11	SP	GRAVELLY SAND, WIDELY GRADED, FINE TO COARSE, 35-45% GRAVEL TO 0.8 IN. MAX., 1-3% FINES, GRAYISH ORANGE (10 YR 7/4)
		90							
			18	◤	31 40 51	91	8	SP	GRAVELLY SAND, WIDELY GRADED, FINE TO COARSE, 40-45% GRAVEL TO 0.8 IN. MAX., 2-3% FINES, GRAYISH ORANGE (10 YR 7/4)
	10		19	◤	24 26 32	58	12	SP	SAND, UNIFORM, FINE, LESS THAN 1% FINES, GRAYISH ORANGE (10 YR 7/4), TRACE SUBHORIZONTAL BANDING
		100							
			20	◤	29 46 77	123	10	SP	SAND, UNIFORM, FINE, LESS THAN 1% FINES, GRAYISH ORANGE (10 YR 7/4)
	0		21	◤	37 50/5"	50/5"	9	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 5-8% GRAVEL TO 0.75 IN. MAX., LESS THAN 1% FINES, GRAYISH ORANGE (10 YR 7/4)
		110							
			22	◤	21 28 42	70	8	SP	SAND, UNIFORM, FINE, 5-10% MEDIUM TO COARSE, 1-3% GRAVEL TO 0.75 IN. MAX., LESS THAN 1% FINES, GRAYISH ORANGE (10 YR 7/3)
	-10		23	◤	20 26 36	62	9	SP	SAND, UNIFORM, FINE, LESS THAN 2% MEDIUM TO COARSE, LESS THAN 1% FINES, LIGHT GRAYISH ORANGE (10 YR 8/4)
		120							
			24	◤	15 20 22	42	8	SP	SAND, POORLY GRADED, MEDIUM TO COARSE, LESS THAN 3% FINE, 5-7% GRAVEL TO 0.7 IN. MAX., LESS THAN 1% FINES, YELLOWISH BROWN (10 YR 6/4)
	-20		25	◤	21 27 24	51	5	SP	SAND, POORLY GRADED, MEDIUM TO COARSE, LESS THAN 5% FINE SAND, 2-3% GRAVEL TO 0.4 IN. AMX., 1-3% FINES, GRAYISH ORANGE (10 YR 7/4)
		130							
			26	◤	24 29 31	60	6	SP	GRAVELLY SAND, POORLY GRADED, MEDIUM TO COARSE, LESS THAN 5% FINE SAND, 10-20% GRAVEL TO 0.8 IN. MAX., 1-3% FINES, GRAYISH ORANGE (10 YR 7/4)
	-30		27	◤	22 23 21	44	6	SP	GRAVELLY SAND, POORLY GRADED, MEDIUM TO COARSE, LESS THAN 5% FINE SAND, 10-20% GRAVEL TO 0.6 IN. MAX., 1% FINES, GRAYISH ORANGE (10 YR 7/4)
BC/PC									
		140							
			28	◤	17 11 11	22	14	CH	SILTY CLAY, HIGHLY PLASTIC, STIFF, MOTTLED YELLOWISH GRAY (5 Y 7/2) WITH SEVERE FeOx. (10 YR 6/6) DISCOLORATION, WITH FEW BLACK MOTTLES, WITH FEW SOFT FeOx. NODULES
	-40		29	◤	11 17 19	36	15	ML-MH CH	VERY THINLY INTERLAYERED, DIPPING 10-15° CLAYEY SILT, SLIGHTLY TO MODERATELY PLASTIC, LESS THAN OR EQUAL TO 5% VERY FINE SAND, BANDED YELLOWISH GRAY (5 Y 7/2) WITH BRIGHT YELLOWISH ORANGE (10 YR 6/6 - FeOx.) WITH FEW LAYERS - SILTY CLAY, HIGHLY PLASTIC, YELLOWISH GRAY WITH 0.75 IN. + THICK FeOx. LAYER AT TOP AND SOFT FeOx. NODULES THROUGHOUT SAMPLE
	-45.6	151.5	30	◤	8 9 13	22		CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2) WITH TRACE YELLOWISH ORANGE FeOx. (10 YR 6/6), WITH FEW POCKETS OF CLAYEY SILT
									END OF BORING AT 151.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

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◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 4, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 110 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO 111 | TYPE OF BORING DRIVE | SHEET 1 OF 3
DATE DRILLED AUGUST 18, 1972 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY R.A.J.
COORDINATES, NORTH 17,190.5 | EAST 17,275.8 | GROUND SURFACE ELEVATION 108.6'

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
L									
			1	◤	6 10 13	23	12	ML	SILT, NONPLASTIC, 5-10% VERY FINE SAND, MODERATE YELLOWISH BROWN (10 YR 5/4) MOTTLED VERY PALE ORANGE (10 YR 8/2).
	100								
		10							
			2	◤	5 10 16	26	14	ML	SIMILAR TO SS-1.
L/PH									
			3	◤	6 8 12	20	13	ML	CLAYEY SILT, SLIGHTLY PLASTIC, LESS THAN 5% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2) MOTTLED BRIGHT YELLOWISH ORANGE (10 YR 6/6).
	90								
		20							
			4	◤	18 10 50/ 4.5"	21.1	10	ML	SILT, NONPLASTIC, LESS THAN 5% VERY FINE SAND, GRAYISH YELLOW (5 Y 8/4), DARK YELLOWISH ORANGE (10 YR 6/6) AND YELLOWISH GRAY (5 Y 7/2).
PH/S									
			5	◤	26 20 29	49	16	SM	SILTY SAND, UNIFORM, VERY FINE, 10-20% NONPLASTIC FINES, SAME COLORS AS SS-4, CHANGES TO SAND, UNIFORM, FINE, CLEAN, WHITE, WITH LESS THAN .5% NONPLASTIC FINES NEAR BOTTOM.
	80								
		30							
			6	◤	8 9 8	17	15	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6) AND GRAYISH YELLOW (5 Y 5/4).
			7	◤	5 6 8	14	10	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, MODERATE RED (5 R 4/6) AND DARK YELLOWISH ORANGE (10 YR 6/6).
	70								
		40							
			8	◤	21 29 28	57	14	SP	SAND, UNIFORM, FINE, LESS THAN 3% SLIGHTLY PLASTIC FINES, LESS THAN 5% COARSE SAND AND FINE GRAVEL TO 0.4", DARK YELLOWISH ORANGE (10 YR 6/6) WITH FEW 0.5" BANDS OF MODERATE RED (5 R 4/6).
			9	◤	19 18 18	36	8	SP	GRAVELLY SAND, MOSTLY UNIFORM FINE SAND, 10-20% FINE GRAVEL TO 0.75", 5-10% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), BECOMES SAND, UNIFORM, FINE, LESS THAN 3% SLIGHTLY PLASTIC FINES, SAME COLOR, MANY 0.75" CLAYEY SAND BALLS.
	60								
		50							
			10	◤	22 40 50/4"	52.5	10	SP	SAND, UNIFORM, FINE, LESS THAN 5% COARSE SAND, LESS THAN 3% FINE BRIGHT YELLOWISH ORANGE (10 YR 6/6), ONE 0.25" MODERATE RED (5 R 4/6) CLAY BALL.
			11	◤	17 17 18	35	12	SP	SAND, FINE TO COARSE, MOSTLY FINE TO MEDIUM, MOSTLY CLEAN, LESS THAN 5% FINE GRAVEL TO 0.5", BRIGHT YELLOWISH ORANGE (10 YR 6/6), SEVERAL CLAYEY SAND BALLS UP TO 3.0".
S/BC	50								
		60							
			12	◤	24 24 35	59	13	SP	SAND, UNIFORM, FINE, CLEAN, LESS THAN 5% MEDIUM TO COARSE SAND, DARK YELLOWISH ORANGE (10 YR 6/6), SEVERAL 0.25-0.75" CLAYEY SAND AND SANDY CLAY BALLS.
			13	◤	4 6 7	13	10	CL-CH & SC	CLAY AND CLAYEY SAND, 1.0-4.0", MODERATELY PLASTIC CLAY BALLS WITH EMBEDDED SAND AND GRAVEL TO 1.0", CLAYEY SAND BETWEEN CLAY BALLS, FINE TO COARSE, MOSTLY FINE, 10-15% MODERATELY PLASTIC FINES, 5-10% FINE GRAVEL TO 0.5", YELLOWISH ORANGE (10 YR 7/6).
	40								
		70							
			14	◤	11 11 11	22	9	SP	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10 YR 7/6).
			15	◤	9 10 12	22	10	SP	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	30								
		80							

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 28, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 111A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 111
TYPE OF BORING DRIVE
SHEET 2 OF 3
DATE DRILLED AUGUST 18, 1972
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY R.A.J.
COORDINATES, NORTH 17,190.5
EAST 17,275.8
GROUND SURFACE ELEVATION 108.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		16	▼	12 19 20	39	12	SP	SAND, UNIFORM, FINE, LESS THAN 3% SLIGHTLY PLASTIC FINES, LESS THAN 5% COARSE SAND AND VERY FINE GRAVEL NEAR BOTTOM, PALE YELLOWISH ORANGE (10 YR 8/6) TOP WITH BRIGHT YELLOWISH ORANGE (10 YR 6/6) AND LIGHT OLIVE GRAY (5 Y 6/1) NEAR BOTTOM.
		17	▼	11 32 29	61	14	SP	SAND, FINE TO COARSE, MOSTLY MEDIUM TOP AND MOSTLY FINE BOTTOM, CLEAN, 5-10% FINE GRAVEL TO 0.5" WITH ONE 1.2" PARTICLE, GRAYISH ORANGE (10 YR 7/4) TOP AND OLIVE GRAY (5 Y 4/1) BOTTOM, ONE 2.0" CLAYEY SAND BALL TOP.
20	90							
		18	▼	24 36 51	87	10	SP	SAND, UNIFORM, FINE, CLEAN, LESS THAN 5% COARSE SAND AND FINE GRAVEL TO 0.4", VERY PALE ORANGE (10 YR 8/2), FEW 0.25" CLAYEY SAND BALLS.
		19	▼	21 32 49	79	10	SP	SAND, UNIFORM, FINE, CLEAN, LESS THAN 3% COARSE SAND AND VERY FINE GRAVEL, VERY PALE ORANGE (10 YR 8/2).
10	100							
		20	▼	17 18 32	50	9	SP	SAND, FINE TO COARSE, MOSTLY FINE AND FINE - MEDIUM, LESS THAN 3% SLIGHTLY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2), FEW GRAVEL PARTICLES UP TO 0.75".
		21	▼	20 21 32	53	12	SP	SAND, MOSTLY UNIFORM, FINE, CLEAN, FEW COARSE SAND AND VERY FINE GRAVEL, VERY PALE ORANGE (10 YR 8/2).
0	110							
		22	▼	24 34 55	89	13	SP	SAND, MOSTLY FINE TO FINE - MEDIUM, CLEAN, 5-10% COARSE SAND AND VERY FINE GRAVEL TO 0.5", VERY PALE ORANGE (10 YR 8/2), FEW 0.5" CLAYEY SAND BALLS.
		23	▼	33 43 57	100	18	SP	SIMILAR TO SS-22.
-10	120							
		24	▼	26 33 44	77	14	SP	SAND, UNIFORM, FINE, CLEAN, LESS THAN 5% COARSE SAND AND FINE GRAVEL TO 0.4", VERY PALE ORANGE (10 YR 8/2).
		25	▼	17 25 27	52	15	SP	GRAVELLY SAND, FINE TO COARSE, MOSTLY FINE AND FINE - MEDIUM CLEAN, 10-15% FINE GRAVEL TO 0.4", YELLOWISH ORANGE (10 YR 7/6), FEW CLAYEY SAND BALLS TO 0.75".
-20	130							
		26	▼	10 9 10	19	10	GC-GP & CL	CLAY AND SANDY GRAVEL, CLAY BALLS, WITH EMBEDDED GRAVEL AND SAND TO 2.0", MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), GRAVEL TO 1.0", 10-20% FINE TO COARSE SAND.
		27	▼	12 14 15	29	12	GP	SANDY GRAVEL, GRAVEL AND GRAVEL FRAGMENTS TO 0.75", 20-30% FINE TO COARSE SAND SIZED FRAGMENTS, LESS THAN 5% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), FEW 1.0" CLAY BALLS WITH EMBEDDED GRAVEL (LOST WATER).
-30	140							
		28	▼	9 8 12	20	10	GP & GC	SANDY GRAVEL, GRAVEL TO 0.75", 25-35% FINE TO COARSE SAND, 5-10% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), TWO 4.0" CLAYEY GRAVEL BALLS TOP (LOST WATER).
		29	▼	13 9 18	27	10	SP	SAND, UNIFORM, FINE, CLEAN, YELLOWISH ORANGE (10 YR 7/6), TWO 1.5" GRAY CLAYEY SAND, BLOWS QUESTIONABLE (SPOON FILLED WITH CUTTINGS).
-40	150							
		30	▼	3 4 5	9	10	SC	CLAYEY SAND, VERY FINE, 20-30% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2) WITH DARK YELLOWISH ORANGE (10 YR 6/6) SEAMS, MANY SMALL SAND LENSES, MICACEOUS.
		31	▼	4 5 7	12	18	SM CL	SILTY SAND, VERY FINE, 20-30% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2), CHANGES TO SILTY CLAY, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, SAME COLOR.
-50	160							

BC/PC

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DFG
DATE NOVEMBER 28, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 111B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 111
TYPE OF BORING DRIVE
SHEET 3 OF 3
DATE DRILLED AUGUST 18, 1972
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY R.A.J.
COORDINATES, NORTH 17,190.5
EAST 17,275.8
GROUND SURFACE ELEVATION 108.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		32	▼	4 4 8	12	18	CL ML	SANDY SILT, SLIGHTLY PLASTIC, 20-30% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2), SILTY CLAY TOP 4.0", MANY SAND LAMINATIONS BOTTOM, MICACEOUS, SOME DARK YELLOWISH ORANGE (10 YR 6/6), MOTTLING.
-58	166.5	33	▼	9 11 11	22		CL-CH	CLAY, MODERATELY PLASTIC, PALE OLIVE (10 Y 6/2) WITH SOME DARK YELLOWISH ORANGE (10 YR 6/6), BECOMES SANDY CLAY, MODERATELY PLASTIC, 10-20% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2).
								END OF BORING AT 166.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DFG
DATE NOVEMBER 28, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 111C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 112
TYPE OF BORING DRIVE
SHEET 1 OF 2
DATE DRILLED AUGUST 15, 1972
DRILLING COMPANY - EUSTIS ENGRG. CO
LOGGED BY RAJ
COORDINATES, NORTH 16,843.8
EAST 18,017.6
GROUND SURFACE ELEVATION 102.1'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
100								
		1	▼	6 13 19	32	15	ML	SILT, NONPLASTIC, LIGHT GRAY (N 7) WITH SOME DARK YELLOWISH ORANGE (10 YR 6/6) MOTTLING.
	10							
		2	▼	7 10 13	23	14	ML	SIMILAR TO SS-1 WITH SOME CLAYEY SILT LAYERS.
90								
		3	▼	18 18 16	34	14	SM ML	SILTY SAND, VERY FINE, 10-20% NONPLASTIC FINES, YELLOWISH GRAY (5 Y 7/2), BECOMING SANDY SILT, SLIGHTLY PLASTIC, 20-30% VERY FINE SAND, MOTTLED WITH DARK YELLOWISH ORANGE (10 YR 6/6).
	20							
		4	▼	27 14 19	38	15	SP	SAND, VERY FINE, 5-10% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) GRAYISH ORANGE (10 YR 7/4) AND LIGHT GRAY, 0.75" LAYER LIGHT GREENISH GRAY (5 GY 8/2), CLAY AT BOTTOM.
80								
		5	▼	5 10 17	27	9	SP	SAND, FINE, 5-10% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 8/2), FEW LAMINATIONS OF MEDIUM TO COARSE SAND AND VERY FINE GRAVEL.
	30							
		6	▼	5 7 8	15	10	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
70								
		7	▼	6 7 6	13	11	SP	SIMILAR TO SS-6 WITH SLIGHTLY PINK MOTTLING.
	40							
		8	▼	7 8 7	15	10	SP	SIMILAR TO SS-6.
60								
		9	▼	18 16 15	31	10	SP	GRAVELLY SAND, FINE TO COARSE SAND, MOSTLY FINE, 10-20% FINE GRAVEL TO 0.5" TO 0.5", LESS THAN 5% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), FEW 0.25-0.5" BALLS OF CLAY.
	50							
		10	▼	12 17 25	42	12	SP	SAND, MOSTLY FINE TO MEDIUM, LESS THAN 5% COARSE SAND AND FINE GRAVEL TO 0.4", CLEAN, GRAYISH YELLOW (5 Y 8/4), FEW CLAYEY SAND BALLS TO 0.5".
50								
		11	▼	14 26 16	42	10	SP	SAND, FINE, CLEAN, LESS THAN 5% MEDIUM AND COARSE SAND, GRAYISH ORANGE (10 YR 7/4).
	60							
		12	▼	5 6 8	14	15	SP	SAND, UNIFORM, VERY FINE, 2-7% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 8/1) AND YELLOWISH ORANGE (10 YR 6/6).
40								
		13	▼	7 8 7	15	15	SP	SIMILAR TO SS-12.
	70							
		14	▼	4 8 8	16	N.R.		NO RECOVERY.
30								
		15	▼	57 40 50	70	12	SP	SAND, UNIFORM, FINE, CLEAN, LESS THAN 5% COARSE SAND AND FINE GRAVEL TO 0.3", BECOMES 10-20% COARSE SAND AND FINE GRAVEL TO 0.5" AT BOTTOM, DARK YELLOWISH ORANGE (10 YR 6/6), FEW 0.4" CLAYEY SAND BALLS.
		16	▼	36 50/6"	52/6"	3	SP	SAND, FINE TO COARSE, MOSTLY FINE TO MEDIUM, CLEAN, DARK YELLOWISH ORANGE (10 YR 6/6).
	80							
		17	▼	12 12 18	30	11	SP	SAND, FINE TO COARSE, MOSTLY FINE AND MEDIUM, 5-10% FINE GRAVEL TO 0.4", GRAYISH ORANGE (10 YR 7/4), FEW 0.25-1.5" CLAYEY SAND BALLS.

L
L/PH
PH/S
S/BC

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DFG
DATE NOVEMBER 3, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 112A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 112
TYPE OF BORING DRIVE
SHEET 2 OF 2
DATE DRILLED AUGUST 15, 1972
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY RAJ
COORDINATES, NORTH 16,843.8
EAST 18,017.6
GROUND SURFACE ELEVATION 102.1'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
20								
		18	▼	8 12 13	25	15	SP CL	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6), WITH BALLS OF CLAY TO 0.75", CHANGES TO CLAY, MODERATELY PLASTIC, PALE YELLOWISH ORANGE.
	90							
		19	▼	9 22 37	59	12	SP	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
10								
		20	▼	21 43 55	98	10	SP	SAND, UNIFORM, FINE, CLEAN, LESS THAN 5% COARSE SAND AND FINE GRAVEL TO 0.3", GRAYISH ORANGE (10 YR 7/4).
	100							
		21	▼	27 36 45	81	3	SP	QUESTIONABLE RECOVERY - SIMILAR TO SS-20.
0								
		22	▼	15 30 35	65	10	SP	SAND, UNIFORM, FINE, CLEAN, LESS THAN 5% COARSE SAND AND VERY FINE GRAVEL, YELLOWISH ORANGE (10 YR 7/6).
	110							
		23	▼	65 100/3"	100/3"	9	SP	SAND, MOSTLY FINE, CLEAN, LESS THAN 5% COARSE SAND AND VERY FINE GRAVEL, DARK YELLOWISH ORANGE (10 YR 6/6), WITH ZONES OF 5-10% HIGHLY PLASTIC FINES AND SOME VERY SMALL CLAYEY POCKETS.
-10								
		24	▼	43 53 59	112	12	SP	SAND, UNIFORM, FINE TO MEDIUM, LESS THAN 5% FINE GRAVEL TO 0.4", DARK YELLOWISH ORANGE.
	120							
		25	▼	26 53 50/4"	50/4"	11	SP	SAND, UNIFORM, MEDIUM, CLEAN, LESS THAN 5% FINE AND COARSE SAND, DARK YELLOWISH ORANGE (10 YR 6/6).
-20								
		26	▼	24 36 37	73	10	SP	SAND, UNIFORM, FINE TO MEDIUM, CLEAN, YELLOWISH GRAY (5 Y 7/2), 1.5" LAYER MEDIUM TO COARSE SAND.
	130							
		27	▼	23 31 34	65	10	SP	SAND, MOSTLY MEDIUM TO COARSE, 5-10% FINE GRAVEL TO 0.4", LESS THAN 5% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10 YR 7/6), FEW 0.25" CLAYEY SAND ZONES.
-30								
		28	▼	18 23 23	46	8	SP	SIMILAR TO SS-27 BUT 10-20% FINE GRAVEL TO 0.6" FEW CLAYEY SAND BALLS TO 0.75".
	140							
		29	▼	16 16 17	33	6	GP-GC	SANDY GRAVEL, GRAVEL TO 1.0", 25-35% FINE TO COARSE SAND, SAND AND GRAVEL BOUND TOGETHER BY ZONES OF SANDY CLAY, GRAYISH ORANGE (10 YR 7/4), POSSIBLE 8.0" CLAYEY GRAVEL COBBLE-SIZE CLAY BALL BECAUSE OF LOOSE MATERIAL ON EITHER END.
-40								
		30	▼	13 11 13	23	10	GP-GC	SIMILAR TO SS-29 WITH ONE 9.0" CLAY BALL AND ONE 1.5" CLAY BALL.
	150							
		31	▼	10 14 17	31	18	CL-CH	CLAY, MODERATELY PLASTIC, PALE OLIVE (10 Y 6/2) MOTTLED WITH BRIGHT YELLOWISH ORANGE (10 YR 6/6) AND DARK YELLOWISH BROWN (10 YR 4/2).
-50								
		32	▼	6 9 14	23	18	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, PALE GREENISH YELLOW (10 Y 8/2).
	160							
		33	▼	11 15 16	31	18	CL	SILTY CLAY, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, PALE OLIVE (10 Y 6/2).
								END OF BORING AT 161.5'

BC/PC

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DFG
DATE NOVEMBER 3, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 112B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. 113 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED August 31, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY T.I.B.
COORDINATES, NORTH 16,879.8 EAST 17,826.4 GROUND SURFACE ELEVATION 108.1'

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
L			1	▼	10 12 15	27	12	ML-CL	CLAYEY SILT, SLIGHTLY PLASTIC, MODERATE YELLOWISH BROWN (10 YR 5/4) MOTTLED WITH GRAYISH ORANGE
L/PH	100	10	2	▼	9 18 19	37	11	ML	CLAYEY SILT, SLIGHTLY PLASTIC, GRAYISH ORANGE (10 YR 7/4)
			3	▼	7 11 17	28	15	CL ML	SMALL IRREGULAR POCKETS: SILTY CLAY, HIGHLY PLASTIC, MEDIUM LIGHT GRAY (N 6) CLAYEY SILT, NONPLASTIC TO SLIGHTLY PLASTIC, LIGHT GRAY (N 7)
PH/S	90	20	4	▼	12 10 11	21	15	SL SP	INTERLAYERED CLAYEY SAND, UNIFORM, FINE, 10-20% SLIGHTLY TO MODERATELY PLASTIC FINES, LIGHT GRAY (N 7) WITH BRIGHT YELLOWISH ORANGE (10 YR 6/6) MOTTLES WITH SAND, UNIFORM, FINE, 2-3% FINES, SAME COLORS AS CLAYEY SAND
			5	▼	7 8 9	17	12	SP	SAND, UNIFORM, FINE, 6-10% NONPLASTIC TO SLIGHTLY PLASTIC FINES, (SILT & CLAY), MOTTLED VERY LIGHT GRAY (N 8), LIGHT TO DARK YELLOWISH ORANGE (10 YR 7/6 TO 6/6)
	80	30	6	▼	7 9 12	21	16	SP W/CH	SAND, UNIFORM, FINE, 4-9% SLIGHTLY PLASTIC FINES (MOSTLY CLAY), BRIGHT YELLOWISH ORANGE (10 YR 6/6) WITH THREE (3) 1.0 IN. LAYERS OF HIGHLY PLASTIC PALE REDDISH BROWN (10 R 5/4) CLAY, SUBHORIZONTAL LAYERING
			7	▼	5 5 13	18	10	SP	SAND, POORLY GRADED, MEDIUM TO COARSE, 3-4% GRAVEL TO 0.7 IN. MAX., 2-3% FINES (EXCLUDING CLAY BALLS AND LAYERS), BRIGHT YELLOWISH ORANGE (10 YR 6/6), WITH SEVERAL VERY THIN YELLOWISH GRAY CLAY LAYERS AND SMALL CLAY BALLS
	70	40	8	▼	8 9 13	22	11	SP	SAND, UNIFORM, FINE, 3-6% FINES, DARK TO BRIGHT YELLOWISH ORANGE (10 YR 6/6), FAINT SUBHORIZONTAL LAYERING
			9	▼	15 22 22	44	15	SP	SAND, UNIFORM, FINE, 1-2% FINES, DARK YELLOWISH ORANGE (10 YR 6/6)
	60	50	10	▼	12 20 28	48	10	SP	SAND, UNIFORM, FINE, 3-4% MEDIUM TO COARSE, 1% GRAVEL TO 0.5 IN. MAX., LESS THAN OR EQUAL TO 1% FINES, LIGHT GRAYISH ORANGE (10 YR 8/4) TO PALE YELLOWISH BROWN (10 YR 6/2)
			11	▼	18 24 20	44	11	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 15-25% GRAVEL TO 0.8 IN. MAX., 1% FINES, YELLOWISH ORANGE (10 YR 6/6 TO 7/5)
S/BC	50	60	12	▼	29 28 27	55	11	SP	GRAVELLY SAND, WIDELY GRADED, FINE TO COARSE, 15-25% GRAVEL TO 0.6 IN. MAX., 5-7% SLIGHTLY PLASTIC FINES (POCKETS OF CLAYEY SAND), PALE YELLOWISH ORANGE (10 YR 8/5)
			13	▼	10 10 10	20	12	SP W/CH	SAND, UNIFORM, FINE, 3-6% SLIGHTLY PLASTIC FINES (MOSTLY CLAY), VERY THINLY BANDED SUBHORIZONTALLY, DARK YELLOWISH ORANGE (10 YR 6/6) WITH PALE YELLOWISH ORANGE AND MODERATE REDDISH BROWN, WITH THIN LAYERS MEDIUM TO COARSE SAND AND GRAVEL, WITH SMALL HIGHLY PLASTIC YELLOWISH ORANGE AND REDDISH BROWN CLAY BALLS
	40	70	14	▼	9 9 13	22	18	SP	SAND, UNIFORM, FINE, 4-6% FINES, GRAYISH ORANGE (10 YR 7/4), TRACE LAYERING, DIPPING 15-20°, WITH THIN CLAY LENS
			15	▼	9 11 13	24	16	SP	SAND, UNIFORM, FINE, 1-3% MEDIUM TO COARSE SAND, 4-5% GRAVEL TO 0.5 IN. MAX. (AT BOTTOM), 4-6% SLIGHTLY PLASTIC FINES, THINLY BANDED GRAYISH ORANGE (10 YR 7/4) AND DARK YELLOWISH ORANGE (10 YR 6/6)
	30	80							

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SA LE.
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY DAVID P. GREENWOOD
DATE JANUARY 11, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 113 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. 113 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED August 31, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY T.I.B.
COORDINATES, NORTH 16,879.8 EAST 17,826.4 GROUND SURFACE ELEVATION 108.1'

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			16	▼	[illegible] [illegible] 25	54	12	SP	SAND, FINE TO COARSE, 20-30% GRAVEL TO 0.7 IN. MAX., 2-3% FINES, GRAYISH ORANGE (10 YR 7/4) WITH LAYER OF DARK YELLOWISH ORANGE (10 YR 6/6) NEAR BOTTOM
			17	▼	2 3 6	9	12	SP-SC	SAND, UNIFORM, FINE, 8-12% SLIGHTLY PLASTIC FINES (MOSTLY CLAY), DARK YELLOWISH ORANGE (10 YR 6/6) WITH ONE VERY THIN SUBHORIZONTAL RED BAND, WITH ONE VERY THIN MODERATE BROWN CLAYEY LAYER, WITH ONE YELLOWISH ORANGE CLAY BALL, AT BOTTOM: THIN LAYER MEDIUM AND COARSE SAND WITH GRAVEL TO 0.8 IN. MAX.
	20		18	▼	9 11 13	24	10	SP W/CH	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 2-4% GRAVEL TO 0.5 IN. MAX., 3-5% FINES (EXCLUDING CLAY BALLS), YELLOWISH ORANGE (10 YR 7/6), WITH FEW SMALL YELLOWISH ORANGE CLAY BALLS
		90	19	▼	5 7 10	17	16	CH & SP	SAND AND CLAY BALLS - SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 3-4% GRAVEL TO 0.75 IN. MAX., 1-2% FINES, YELLOWISH ORANGE (10 YR 7/6) WITH SOME DARK YELLOWISH ORANGE FeOx STAIN; CLAY BALLS, HIGHLY PLASTIC, UP TO 3 IN. THICK, YELLOWISH ORANGE (10 YR 7/6-6/6)
			20	▼	84 33 34	67	14	SP	SAND, UNIFORM, FINE, LESS THAN 1% FINES, YELLOWISH ORANGE (10 YR 7/5) WITH CLAY AND GRAVEL IN TOP 1.0 IN.
			21	▼	12 20 26	46	10	SP	SAND, UNIFORM, FINE, LESS THAN 1% FINES, YELLOWISH ORANGE (10 YR 7/6)
	10	100	22	▼	19 25 28	53	10	SP	SAND, UNIFORM, FINE, LESS THAN 2% MEDIUM TO COARSE, 2-4% GRAVEL TO 0.75 IN. MAX. (ONLY IN TOP 1.0 IN.), 1% FINES, YELLOWISH ORANGE (10 YR 7/6)
			23	▼	40 57/6"	57/6"	9	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 1% GRAVEL TO 0.4 IN. MAX., LESS THAN 1% FINES, GRAYISH ORANGE (10 YR 7/4)
	0	110	24	▼	29 38 49	87	14	SP	SAND, UNIFORM, FINE, 4-6% MEDIUM TO COARSE, LESS THAN 1% GRAVEL TO 0.4 IN. MAX., LESS THAN OR EQUAL TO 1% FINES, YELLOWISH ORANGE (10 YR 6/6 - 7/6)
			25	▼	15 28 35	63	16	SP	SAND, UNIFORM, FINE, 2-3% MEDIUM, 1% FINES, DARK YELLOWISH ORANGE (10 YR 6/6)
	-10	120	26	▼	40 52 63	115	10	SP	SAND, UNIFORM, FINE AT TOP TO POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM AT BOTTOM, LESS THAN 1% GRAVEL AT TOP TO 10-15% GRAVEL AT BOTTOM, 0.5 IN. MAX., 1-3% FINES, GRAYISH ORANGE (10 YR 7/3) AT TOP TO DARK YELLOWISH ORANGE (10 YR 6/6) AT BOTTOM
			27	▼	27 40 51	91	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 2-4% GRAVEL TO 0.6 IN. MAX., LESS THAN OR EQUAL TO 1% FINES, YELLOWISH BROWN (10 YR 6/4) WITH SOME YELLOWISH ORANGE (10 YR 6/6)
	-20	130	28	▼	21 40 41	81	9	SP	SAND, POORLY GRADED, MEDIUM TO COARSE, 1-2% GRAVEL TO 0.4 IN. MAX., LESS THAN 1% FINES, YELLOWISH BROWN (10 YR 6/3)
			29	▼	20 22 25	47	8	SP	GRAVELLY SAND, POORLY GRADED, MEDIUM TO COARSE, MOSTLY COARSE, LESS THAN 3% FINE SAND, 25-35% GRAVEL TO 0.75 IN. MAX., LESS THAN OR EQUAL TO 1% FINES, YELLOWISH BROWN (10 YR 6/3)
	-30	140	30	▼	19 25 25	50	8	SP	GRAVELLY SAND, POORLY GRADED, MEDIUM TO COARSE, MOSTLY COARSE, 20-30% GRAVEL TO 0.5 IN. MAX., 1% FINES, YELLOWISH BROWN (10 YR 6/3)
			31	▼	15 28 36	64	8	GP W/GC	SANDY GRAVEL, POORLY GRADED, GRAVEL TO 0.9 IN. MAX., 20-25% FINE TO COARSE SAND, MOSTLY COARSE, 2-4% FINES EXCEPT IN POCKETS WITH HIGHLY PLASTIC YELLOWISH GRAY CLAY MATRIX, GRAYISH ORANGE (10 YR 7/4)
BC/PC	-40	150	32	▼	9 11 13	24	NR		NO RECOVERY
			33	▼	14 12 13	25	18	CL-CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, STIFF, SEVERELY OXIDIZED TO YELLOWISH ORANGE (10 YR 6/6 - 7/6) WITH MANY VERY SMALL BLACK (MnO2) SPOTS AND MANY VERY SMALL FeOx PELLETS/NODULES, WITH LESS THAN OR EQUAL TO 1% GRAVEL TO 1.0 IN. MAX.
			34	▼	11 13 18	31	18	CL-CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2) TO LIGHT OLIVE GRAY (5 Y 6/2) WITH VERY THIN SUBHORIZONTAL YELLOWISH ORANGE (FeOx) LAYERS, WITH FEW VERY SMALL FeOx NODULES, WITH FEW THIN LAYERS AND SMALL POCKETS OF CLAYEY SILT
	-50	160							

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY DAVID P. GREENWOOD
DATE JANUARY 11, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 113 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. 113 TYPE OF BORING DRIVE SHEET 3 OF 3
DATE DRILLED August 31, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY T.I.B.
COORDINATES, NORTH 16,879.8 EAST 17,826.4 GROUND SURFACE ELEVATION 108.1'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		35	▼	10 14 18	32	18	ML & CH	CLAYEY SILT, NONPLASTIC TO SLIGHTLY PLASTIC, GREENISH GRAY (5 G 5/1) WITH MANY VERY SMALL (1-2 MM. DIAM.) CONCRETIONS/PELLETS WITH SILTY CLAY, MODERATELY TO HIGHLY PLASTIC SAME COLOR AS CLAYEY SILT
		36	▼	21 26 29	55	16	CH	SILTY CLAY, MODERATELY PLASTIC, 1-2% VERY FINE SAND, GREENISH GRAY (5 G 6/1), CLAY POCKETS AND VERY FINE SAND LENSES VISIBLE
-60	170	37	▼	13 17 19	26	16	CH	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 1% FINE SAND, GREENISH GRAY (5 G 6/1), CLAY POCKETS AND LENSES IN SAMPLE
		38	▼	14 17 20	37	16	ML	CLAYEY SILT, MODERATELY TO HIGHLY PLASTIC, LESS THAN 1% VERY FINE SAND, DARK GREENISH GRAY (5 G 4/1), CLAY POCKETS AND SAND LENSES PRESENT
-70	180	39	▼	13 18 25	43	14	ML CH	CLAYEY SILT, TOP 10", MODERATELY PLASTIC, 1-3% FINE TO VERY FINE SAND, DARK GREENISH GRAY (5 G 4/1) BOTTOM 4" SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, VERY FINE SAND LENSES, DARK GREENISH GRAY (5 G 4/1)
		40	▼	14 14 14	28	15	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, LESS THAN 1% FINE SAND, DARK GREENISH GRAY (5 G 4/1), CLAYEY SILT POCKETS PRESENT
-80	190	41	▼	13 18 19	37	16	SM	SILTY SAND, UNIFORM, VERY FINE, 10-15% MODERATELY PLASTIC FINES, DARK GREENISH GRAY (5 G 4/1), SILTY CLAY POCKETS THROUGHOUT SAMPLE
		42	▼	19 23 25	48	15	SM CH	SILTY SAND TOP 10", UNIFORM, VERY FINE, 10-15% MODERATELY PLASTIC FINES, DARK GREENISH GRAY (5 G 4/1), MODERATELY TO HIGHLY PLASTIC CLAY POCKETS BOTTOM 5" SILTY CLAY, HIGHLY PLASTIC, FINE AND VERY FINE SAND LAYERING THROUGHOUT DARK GREENISH GRAY (5 G 4/1)
-90	200	43	▼	7 11 12	23	15	ML	CLAYEY SILT, HIGHLY PLASTIC, 3-6% FINE SAND, OLIVE GRAY (5 Y 4/1), HIGHLY PLASTIC CLAY POCKETS AND VERY FINE SAND LENSES AND POCKETS PRESENT
		44	▼	8 15 17	32	12	CH	SILTY CLAY, HIGHLY PLASTIC, 3-9% FINE SAND, OLIVE GRAY (5 Y 4/1), HIGHLY PLASTIC CLAYEY SILT POCKETS, FINE SAND POCKETS AND LAYERING PRESENT
-100	210 211.5	45	▼	6 11 18	29	8	CH	SILTY CLAY, HIGHLY PLASTIC, 3-7% FINE SAND, OLIVE GRAY (5 Y 4/1), CLAYEY SILT LENSES AND FINE SAND POCKETS AND LENSES PRESENT
								BOTTOM OF BORING AT 211.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY DAVID P. GREENWOOD
DATE JANUARY 11, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 113 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO. 114 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED AUGUST 3 & 4, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY RAJ
COORDINATES, NORTH 16,937.0 EAST 17,590.7 GROUND SURFACE ELEVATION 105.2'

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
L	100		1	▼		7	14	ML	SILT, NONPLASTIC, 5-10% VERY FINE SAND, MODERATE YELLOWISH BROWN (10 YR 5/4) WITH SOME LIGHT GRAY MOTTLING.
L/PH		10	2	▼		14	12	ML	CLAYEY SILT, SLIGHTLY PLASTIC, LIGHT OLIVE GRAY (5 Y 6/1) WITH SOME BRIGHT YELLOWISH ORANGE (10 YR 6/6) MOTTLING.
	90		3	▼	5 8 10	18	14	ML	SIMILAR TO SS-2.
PH/S		20	4	▼	7 10 11	21	15	SC	CLAYEY SAND, UNIFORM, FINE SAND, 10-20% MODERATELY PLASTIC FINES, LIGHT GRAY (N 7) WITH SOME BRIGHT YELLOWISH ORANGE (10 YR 6/6) MOTTLING.
	80		5	▼	2 4 4	8	15	CL-CH SP	CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 8/1) SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6); BOTH ARE INTERLAYERED WITH CLAY POCKETS AND SAND POCKETS AND SEAMS.
		30	6	▼	1 4 6	10	8	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6), SEVERAL 0.75" CLAY POCKETS OR BALLS.
	70		7	▼	4 5 6	11	8	SP-SC	SIMILAR TO SS-6 BUT NO CLAY POCKETS.
		40	8	▼	5 7 7	14	14	SP-SC	SIMILAR TO SS-7 WITH CLAYEY SAND POCKETS.
	60		9	▼	8 9 11	20	12	SP	SIMILAR TO SS-7 WITH SOME COARSE SAND NEAR BOTTOM.
		50	10	▼	5 7 10	17	10	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
	50		11	▼	6 8 7	15	10	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
		60	12	▼	3 5 9	14	12	SP	SIMILAR TO SS-12.
	40		13	▼	9 13 17	30	10	SP	SIMILAR TO SS-11 BUT LESS THAN 5% SLIGHTLY PLASTIC FINES.
S/BC		70	14	▼	8 14 29	38	10	SP	SAND, MOSTLY FINE WITH 5-10% MEDIUM AND COARSE SAND, LESS THAN 5% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
	30		15	▼	50/7"	50/7"	10	SP	SAND, FINE TO COARSE, MOSTLY FINE, LESS THAN 5% FINE GRAVEL TO 0.3", LESS THAN 5% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		80	16	▼	50/9"	50/9"	9	SP-SW	SAND, WIDELY GRADED, FINE TO COARSE SAND, 5-10% FINE GRAVEL TO 0.5", LESS THAN 5% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), ONE 1.0" GRAVEL PARTICLE.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

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▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 2, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 114A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO. 114 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED AUGUST 3 & 4, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY RAJ
COORDINATES, NORTH 16,937.0 EAST 17,590.7 GROUND SURFACE ELEVATION 105.2'

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
	20		17	▼	8 7 24	31	15	CL SC SP	CLAY, MODERATELY PLASTIC, PALE YELLOWISH ORANGE (10 YR 8/6), BECOMES CLAYEY SAND, MOSTLY UNIFORM, FINE SAND, 20-30% MODERATELY PLASTIC FINES, 5-10% FINE GRAVEL TO 0.4", SAME COLOR, 8" UNIFORM FINE SAND LAYER WITH 5-10% MODERATELY PLASTIC FINES, CHANGES TO GRAVELLY SAND AT BOTTOM.
		90	18	▼	16 50/9"	50/9"	7	SP	SAND, FINE, CLEAN, PALE YELLOWISH ORANGE (10 YR 8/6).
	10		19	▼	18 50/8"	50/8"	9	SP	SAND, MOSTLY FINE, CLEAN, LESS THAN 5% MEDIUM AND COARSE SAND, DARK YELLOWISH ORANGE (10 YR 6/6), FEW 0.25" POCKETS CLAYEY SAND.
		100	20	▼	23 50/8"	50/8"	8	SP	SIMILAR TO SS-19 BUT NO POCKETS.
	0		21	▼	26 50/6"	50/6"	8	SP	SIMILAR TO SS-20 WITH FEW LAMINATIONS OF MEDIUM SAND TO 0.3" GRAVEL.
		110	22	▼	27 50/5"	50/5"	10	SP	SAND, MOSTLY UNIFORM, FINE, CLEAN, GRAYISH ORANGE (10 YR 7/4), LAMINATION OF FINE TO COARSE SAND.
	-10		23	▼	17 50/9"	50/9"	10	SP	SAND, FINE, CLEAN, LESS THAN 5% MEDIUM AND COARSE SAND, LESS THAN 5% GRAVEL TO 0.75", WHITE.
		120	24	▼	14 26 30	56	11	SP	SIMILAR TO SS-27 BUT GRAVEL TO 0.3".
	-20		25	▼	24 28 27	55	10	SP-SW	SAND, FINE TO COARSE (MOSTLY FRAGMENTS), 5-10% GRAVEL AND GRAVEL FRAGMENTS TO 0.4", LESS THAN 5% NONPLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6), FEW CLAYEY SAND ZONES.
		130	26	▼	17 23 30	53	9	SP	GRAVELLY SAND, MOSTLY MEDIUM AND COARSE SAND, 10-20% FINES, GRAVEL TO 0.5", CLEAN, PALE YELLOWISH BROWN (10 YR 6/2), ONE LIGHT GRAY SAND CLAY BALL (0.25").
	-30		27	▼	20 50/7"	50/7"	N.R.		NO RECOVERY.
			28	▼	19 19 19	38	6	SP	SIMILAR TO SS-26 WITH FEW 0.5-1.0" CLAY AND SANDY CLAY BALLS, OILY ODOR.
		140	29	▼	20 50/12"	50/12"	8	SP	SAND, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 5-10% FINE GRAVEL TO 0.5", LESS THAN 5% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), FEW BALLS OF GRAY CLAY WITH IMBEDDED SAND TO 1.0".
	-40		30	▼	15 26 32	58	10	SP	GRAVELLY SAND, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 10-20% FINE GRAVEL TO 0.75", LESS THAN 5% SLIGHTLY PLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4), ONE 2.5" YELLOWISH GRAY (5 Y 8/1) CLAY BALL.
BC/PC		150	31	▼	5 4 8	12	15	CL ML	SILTY CLAY, SLIGHTLY PLASTIC, BECOMES SILT, NONPLASTIC, BOTH PALE OLIVE (10 YR 6/2) WITH FINE SAND SIZE BLACK SPECKLING, MICACEOUS.
	-50		32	▼	8 12 14	26	16	CL	SILTY CLAY, SLIGHTLY PLASTIC, PALE OLIVE (10 Y 6/2) WITH SOME BRIGHT YELLOWISH ORANGE (10 YR 6/6) MOTTLING, SILT SEAMS AND SOME MODERATE PLASTIC ZONES.
		160	33	▼	7 8 11	19	16	CL ML	SILTY CLAY, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, BECOMES SILT SLIGHTLY PLASTIC, BOTH ARE DARK GREENISH GRAY (5 GY 4/1) AND MICACEOUS.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 2, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 114B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 114 TYPE OF BORING DRIVE SHEET 3 OF 3
DATE DRILLED AUGUST 3 & 4, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY RAJ
COORDINATES, NORTH 16,937.0 EAST 17,590.7 GROUND SURFACE ELEVATION 105.2'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-60		34	▼	6 15 15	30	18	CL-CH	CLAY, MODERATELY PLASTIC, 5-10% VERY FINE SAND, MEDIUM GREENSIH GRAY (5 G 5/1).
-66.3	171.5	35	▼	6 10 15	25	18	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, DARK GREENISH GRAY (5 G 4/1).
								END OF BORING AT 171.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 2, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 114C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 115 | TYPE OF BORING DRIVE | SHEET 1 OF 2
DATE DRILLED AUGUST 31, 1972 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY R.A.J.
COORDINATES, NORTH 16,953.9 | EAST 17,415.8 | GROUND SURFACE ELEVATION 103.1'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
100		1	◤	5 8 8	16	11	ML	SILT, NONPLASTIC, GRAYISH ORANGE (10 YR 7/4) MOTTLED WITH LIGHT BROWN (5 YR 5/6).
	10	2	◤	6 12 15	27	16	ML	CLAYEY SILT, SLIGHTLY PLASTIC, LIGHT OLIVE GRAY (5 Y 6/1) WITH MANY SMALL POCKETS AND LENSES OF VERY LIGHT GRAY (N 8) NONPLASTIC SILT.
90		3	◤	12 20 44	64	17	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, PALE YELLOWISH BROWN (10 YR 6/2), MANY SMALL NONPLASTIC SILT LENSES, BECOMING VERY FINE SILTY SAND LAST 5.0".
	20	4	◤	9 12 10	22	13	SP	SAND, UNIFORM, FINE, 5-10% MODERATELY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6), MIDDLE SECTION WHITE AND LIGHT GRAY WITH LESS THAN 5% MODERATELY PLASTIC FINES, BOTTOM LIGHT GRAY (N 7) CLAYEY SAND WITH LESS THAN 5% COARSE SAND.
80		5	◤	9 12 10	22	8	SP	SAND, FINE TO MEDIUM, LESS THAN 3% MODERATELY PLASTIC FINES TO CLEAN, WHITE WITH SOME BRIGHT YELLOWISH ORANGE (10 YR 6/6) LAMINATIONS.
	30	6	◤	5 6 8	14	13	SP-SC	SAND, MOSTLY UNIFORM, FINE, 7-12% MODERATELY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6) TO BRIGHT YELLOWISH ORANGE (10 YR 6/6) THEN LIGHT GRAY (N 7) BOTTOM.
70		7	◤	7 4 8	12	9	SP-SC	SIMILAR TO SS-6, BUT ONLY BRIGHT YELLOWISH ORANGE (10 YR 6/6).
	40	8	◤	4 6 6	12	13	SP	SAND, MOSTLY UNIFORM FINE, 5-10% MODERATELY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6).
60		9	◤	3 5 8	13	10	SP	SIMILAR TO SS-8
	50	10	◤	14 21 28	49	13	SP	SAND, MOSTLY UNIFORM FINE - MEDIUM, CLEAN YELLOWISH ORANGE (10 YR 7/6).
50		11	◤	13 11 15	26	9	SP	SAND, MOSTLY FINE TO MEDIUM, CLEAN, LESS THAN 5% FINE GRAVEL TO 0.75", YELLOWISH ORANGE (10 YR 7/6), WITH FEW 0.25" CLAYEY SAND BALLS TOP AND TWO 2.0" CLAYEY SAND BALLS BOTTOM.
	60	12	◤	3 4 7	11	14	SP-SC	SAND, UNIFORM, VERY FINE, 7-12% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
40		13	◤	7 9 12	21	10	SP	SIMILAR TO SS-12, BUT 3-8% SLIGHTLY PLASTIC FINES.
	70	14	◤	7 9 11	20	13	SP	SIMILAR TO SS-13.
30		15	◤	12 20 27	47	10	SP	SAND, MOSTLY UNIFORM FINE - MEDIUM, 5-10% COARSE SAND, 3-8% FINE GRAVEL TO 0.5", CLEAN, GRAYISH ORANGE (10 YR 7/4).
	80	16	◤	14 15 15	30	7	SP-SW	GRAVELLY SAND, FINE TO COARSE SAND, MOSTLY FINE, 35-45% FINE GRAVEL TO 0.75", LESS THAN 5% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH SOME GRAYISH ORANGE (10 YR 7/4), ONE 2.0" CLAYEY SAND BALL WITH CLAY CENTER.

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. R. GREENWOOD
DATE DECEMBER 1, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 115 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 115 | TYPE OF BORING DRIVE | SHEET 2 OF 2
DATE DRILLED AUGUST 31, 1972 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY R.A.J.
COORDINATES, NORTH 16,953.9 | EAST 17,415.8 | GROUND SURFACE ELEVATION 103.1'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
20		17	◤	18 21 20	41	7	SP	GRAVELLY SAND, MOSTLY UNIFORM FINE SAND, CLEAN, 10-15% FINE GRAVEL TO 0.75", GRAYISH ORANGE (10 YR 7/4) AND DARK YELLOWISH ORANGE (10 YR 6/6), FEW 0.25-0.5" CLAYEY SAND BALL.
	90	18	◤	19 28 37	65	12	SP	SAND, UNIFORM, FINE, CLEAN, YELLOWISH ORANGE (10 YR 7/6), OCCASIONAL GRAVEL TO 0.75".
10		19	◤	27 37 52	89	9	SP	SIMILAR TO SS-18, BUT GRAVEL TO 0.5".
	100	20	◤	18 28 28	56	10	SP	SAND, UNIFORM, FINE, CLEAN, YELLOWISH GRAY (5 Y 7/2) WITH 1.0" BAND GRAYISH YELLOW (5 Y 8/4), FEW COARSE SAND AND VERY FINE GRAVEL PARTICLES.
0		21	◤	18 27 40	67	11	SP	SAND, FINE TO COARSE, MOSTLY UNIFORM MEDIUM, LESS THAN 5% FINE GRAVEL TO 0.4", CLEAN, YELLOWISH ORANGE (10 YR 7/6), FEW 0.25-0.5" CLAYEY SAND BALLS.
	110	22	◤	18 34 44	78	10	SP	SAND, FINE TO COARSE, MOSTLY FINE AND MEDIUM, CLEAN, 5-10% FINE GRAVEL TO 0.75", GRAYISH ORANGE (10 YR 7/4), FEW 0.25-0.75" CLAYEY SAND BALLS.
-10		23	◤	32 51/6"	51/6"	9	SP	SAND, FINE TO FINE - MEDIUM, CLEAN, LESS THAN 3% FINE GRAVEL TO 0.4", VERY PALE ORANGE (10 YR 8/2).
	120	24	◤	23 41 45	86	10	SP	SIMILAR TO SS-23.
-20		25	◤	26 30 37	67	14	SP	SIMILAR TO SS-23, BUT MOSTLY UNIFORM FINE - MEDIUM.
	130	26	◤	31 54/6"	54/6"	10	SP	SIMILAR TO SS-25.
-30		27	◤	27 58/6"	58/6"	9	SP	SAND, UNIFORM, FINE, CLEAN, VERY PALE ORANGE (10 YR 8/2), ONE 0.25" LAYER WITH 5-10% SLIGHTLY PLASTIC FINES.
	140	28	◤	20 23 30	53	10	SP GC	GRAVELLY SAND, MOSTLY FINE AND FINE - MEDIUM, CLEAN, 10-20% FINE GRAVEL TO 0.75" GRAYISH ORANGE (10 YR 7/4), BECOMES CLAYEY GRAVEL, WEATHERED AND DECOMPOSING GRAVEL AND FRAGMENTS FROM FINE SAND TO 0.75", LESS THAN 5% FINE TO COARSE SAND, 10-20% GRAY CLAY, TWO 2.0" MORE CLAYEY SECTIONS, POSSIBLE CLAY BALLS.
-40		29	◤	17 14 10	24	11	GC	CLAYEY GRAVEL, SIMILAR TO BOTTOM OF SS-28, WITH TWO 2.0" CLAY LAYERS FOR BALLS, LIGHT GRAY AND GRAYISH ORANGE (10 YR 7/4), LAST 5.0" BECOMES SILTY CLAY, SLIGHTLY PLASTIC, BRIGHT YELLOWISH ORANGE (10 YR 6/6), WITH SILT AND SAND LAMINATIONS.
	150	30	◤	8 10 12	22	16	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, PALE OLIVE (10 Y 6/2) DISCOLORED WITH BRIGHT YELLOWISH ORANGE (10 YR 6/6).
-50		31	◤	7 9 10	19	22	CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, PALE OLIVE (10 Y 6/2), MICACEOUS.
-58.4	161.5	32	◤	13 11 13	24	23	CL-ML	SILTY CLAY, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, GREENISH GRAY (5 G 6/1), MANY SMALL LENSES TO 0.5" POCKETS OF VERY FINE SAND AND SILTY SAND, FINE TO COARSE SAND SIZED NODULES OF SAME MATERIAL (MORE AT BOTTOM)
								END OF BORING AT 161.5'

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. R. GREENWOOD
DATE DECEMBER 1, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 115B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 116 | TYPE OF BORING DRIVE | SHEET 1 OF 2
DATE DRILLED AUGUST 14-17, 1972 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY R.A.J.
COORDINATES, NORTH 16,992.7 | EAST 17,232.4 | GROUND SURFACE ELEVATION 100.2'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
100		1	◤	7 12 16	28	12	ML	SILT, SLIGHTLY PLASTIC, YELLOWISH GRAY (5 Y 7/2).
90	10	2	◤	6 12 14	26	14	ML	SIMILAR TO SS-1 WITH SEAMS OF DARK YELLOWISH ORANGE (10 YR 6/6).
		3	◤	4 7 9	16	15	CL	SILTY CLAY, MODERATELY PLASTIC, DUSKY BROWN (5 YR 2/2), CHANGING TO OLIVE GRAY (5 Y 4/1) CLAYEY SILT WITH SILT LAYERS.
80	20	4	◤	16 36 25	61	15	ML SP	SANDY SILT, NONPLASTIC, 10-15% VERY FINE SAND, PALE BROWN (5 YR 5/2), BECOMES SILTY SAND THEN SAND, UNIFORM, FINE, CLEAN, WITH 1.0" LAYER CLAYEY SAND AND 5-10% GRAVEL TO 0.5".
		5	◤	8 8 8	16	8	SP	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2), BECOMING CLEAN, WITH 10-15% COARSE SAND AND FINE GRAVEL TO 0.4", ALSO BRIGHT YELLOWISH ORANGE (10 YR 6/6) FEW 0.4" BALLS, GRAY CLAY.
70	30	6	◤	3 6 5	11	10	SP-SC	SAND, UNIFORM, FINE, 5-15% MODERATELY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6), BALL OR LAYER OF GRAY CLAY WITH EMBEDDED MEDIUM AND COARSE SAND.
		7	◤	11 11 10	21	9	SP	SAND, UNIFORM, FINE, 5-10% MODERATELY PLASTIC FINES, BRIGHT AND DARK YELLOWISH ORANGE (10 YR 6/6), WITH 2.0" LAYER WITH 10-15% MODERATELY PLASTIC FINES AND FINE TO COARSE SAND.
60	40	8	◤	9 9 11	20	13	SP	GRAVELLY SAND, FINE TO COARSE SAND, MOSTLY FINE, 10-20% FINE GRAVEL TO 0.75", 5-10% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE, 0.2-0.5" BALLS OF CLAY AND CLAYEY SAND, TRACE OF PINK CLAY.
		9	◤	11 14 16	30	11	SP	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6), FEW PARTICLES GRAVEL TO 0.3".
50	50	10	◤	8 9 12	21	13	SP	SAND, FINE TO COARSE, MOSTLY FINE, 5-10% FINE GRAVEL TO 0.4", 5-10% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), SEVERAL BALLS OF GRAYISH ORANGE (10 YR 7/4) CLAY TO 2.0", ALSO CLAYEY SAND AND SANDY CLAY.
		11	◤	10 10 15	25	12	SP	SAND, MOSTLY FINE, LESS THAN 5% VERY FINE GRAVEL TO 0.4", CLEAN, DARK YELLOWISH ORANGE (10 YR 6/6), 3.0" BALL CLAY WITH EMBEDDED COARSE SAND AND FINE GRAVEL, 2.0" SANDY CLAY BALL, ONE 1.0" GRAVEL.
40	60	12	◤	4 9 9	18	13	CL SP	CLAY, MODERATELY PLASTIC, GRAYISH YELLOW (5 Y 7/4) AND LIGHT GREENISH GRAY (5 GY 8/1) WITH LAMINATIONS OF DARK YELLOWISH ORANGE (10 YR 6/6) SAND, BECOMES SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10 YR 7/6).
		13	◤	1 10 15	25	9	SP	SAND, MOSTLY FINE, LESS THAN 5% MODERATELY PLASTIC FINES, TOP, CLEAN BOTTOM, LESS THAN 5% COARSE SAND AND VERY FINE GRAVEL, DARK YELLOWISH ORANGE (10 YR 6/6).
30	70	14	◤	6 8 12	20	10	SP	SAND, MOSTLY FINE, CLEAN, GRAYISH ORANGE (10 YR 7/4), TWO 0.75" LAYERS, VERY PALE ORANGE (10 YR 8/2) CLAYEY SAND WITH 10-15% PLASTIC FINES, FEW PARTICLES COARSE SAND AND VERY FINE GRAVEL.
		15	◤	11 9 10	19	11	SP	GRAVELLY SAND, MOSTLY FINE SAND, 10-15% GRAVEL TO 0.75", LESS THAN 5% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), TWO 1.5" BALLS OF CLAY WITH SAND, BECOMES FINE SAND, LESS THAN 5% SLIGHTLY PLASTIC FINES, WITH 2.0" LAYER CLAYEY SAND.
	80							

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. R. GREENWOOD
DATE DECEMBER 11, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 116 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 116 | TYPE OF BORING DRIVE | SHEET 2 OF 2
DATE DRILLED AUGUST 14-17, 1972 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY R.A.J.
COORDINATES, NORTH 16,992.7 | EAST 17,232.4 | GROUND SURFACE ELEVATION 100.2'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
20		16	◤	23 28 29	57	11	SP	SAND, FINE, CLEAN, GRAYISH ORANGE (10 YR 7/4). IN WASH ALTERNATES WITH LAYERS OF FINE GRAVEL AND COARSE SAND.
		17	◤	27 45 50/5"	55	11	SP	SAND, UNIFORM, FINE, CLEAN, LESS THAN 5% COARSE SAND AND FINE GRAVEL TO 0.4" GRAYISH ORANGE (10 YR 7/4).
10	90	18	◤	24 27 58	85	12	SP	SIMILAR TO SS-17, WITH GRAVEL TO 0.75".
		19	◤	30 44 44	88	11	SP	SAND, UNIFORM, FINE, CLEAN, LESS THAN 5% MEDIUM AND COARSE SAND, DARK YELLOWISH ORANGE (10 YR 6/6), FEW GRAVEL PARTICLES UP TO 0.75".
0	100	20	◤	21 50/6"	50/6"	10	SP	SAND, UNIFORM, FINE, CLEAN, LESS THAN 5% FINE GRAVEL TO 0.75", GRAYISH ORANGE (10 YR 7/4).
		21	◤	15 30 38	68	12	SP	SAND, UNIFORM, FINE, CLEAN, LESS THAN 5% COARSE SAND AND FINE GRAVEL TO 0.4" GRAYISH ORANGE (10 YR 7/4).
-10	110	22	◤	17 33 13	46	4	SP	SECOND TRY: SAND, FINE TO COARSE, MOSTLY MEDIUM, CLEAN, 5-10% FINE GRAVEL TO 0.5", DARK YELLOWISH ORANGE (10 YR 6/6).
		23	◤	16 25 27	52	9	SP	SAND, MOSTLY MEDIUM AND COARSE, CLEAN, 5-10% FINE GRAVEL TO 0.4" GRAYISH ORANGE (10 YR 7/4) AND DARK YELLOWISH ORANGE (10 YR 6/6), FEW ZONES OF LESS THAN 5% PLASTIC FINES.
		24	◤	14 11 13	24	9	SP	SIMILAR TO SS-23, WITH LESS THAN 5% SLIGHTLY PLASTIC FINES AND FEW CLAYEY SAND BALLS OR POCKETS.
-20	120	25	◤	27 40 38	78	14	SP	SAND, FINE, CLEAN, 5-10% MEDIUM AND COARSE SAND NEAR BOTTOM, YELLOWISH GRAY (5 Y 7/2), 2.0" LAYER SANDY FINE GRAVEL FRAGMENTS IN [illegible].
		26	◤	17 32 43	75	12	SP	SAND, FINE TO FINE - MEDIUM, CLEAN, YELLOWISH GRAY (5 Y 7/2), 6.0" LAYER GRAVELLY SAND, FEW 0.1-0.25" CLAYEY SAND POCKETS.
-30	130	27	◤	16 24 34	58	11	SP	SIMILAR TO SS-26, BUT ONLY 2.0" LAYER.
		28	◤	26 35 52	87	15	SP	SAND, UNIFORM, FINE - MEDIUM, CLEAN, YELLOWISH GRAY (5 Y 7/2), 2.0" LAYER COARSE SAND AND FINE GRAVEL TO 0.5".
-40	140	29	◤	20 27 32	59	10	SP	GRAVELLY SAND, FINE TO COARSE, MOSTLY MEDIUM SAND, 10-20% FINE GRAVEL TO 0.75", CLEAN, GRAYISH ORANGE (10 YR 7/4), SEVERAL 0.25-0.5" BALLS OF CLAYEY SAND.
		30	◤	16 13 13	26	9	SP	GRAVELLY SAND, FINE TO COARSE SAND, MOSTLY MEDIUM AND COARSE, CLEAN, 25-35% FINE GRAVEL TO 0.5", GRAYISH ORANGE (10 YR 7/4), FEW BALLS OF CLAYEY SAND AND GRAVEL TO 0.75".
-50	150	31	◤	9 14 16	30	21	CL-CH	CLAY, MODERATELY PLASTIC, GRAYISH YELLOW GREEN (5 GY 7/2) DISCOLORED WITH BRIGHT YELLOWISH ORANGE (10 YR 6/6).
		32	◤	7 9 12	21	24	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2), FEW GRAVEL TO 1.0".
-60 -61.3	160 161.5	33	◤	7 8 10	18	8	ML CL-CH	CLAYEY SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, MEDIUM GREENISH GRAY (5 G 5/1), BECOMES CLAY, MODERATELY PLASTIC, SAME COLOR.
								END OF BORING AT 161.5'

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. R. GREENWOOD
DATE DECEMBER 11, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 116 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 117 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED AUGUST 21-25, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY T.I.B.
COORDINATES, NORTH 16,636.6 EAST 17,979.1 GROUND SURFACE ELEVATION 99.9'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
L								
		1	◤	4 6 10	16	14	ML	SILT, NONPLASTIC, DARK YELLOWISH BROWN (10 YR 4/4).
L/PH								
90	10							
		2	◤	9 9 9	18	10	SP-SM	SAND, UNIFORM, VERY FINE TO FINE, LESS THAN 5-10% NONPLASTIC FINES (MOSTLY SILT), GRAYISH ORANGE (10 YR 7/4) WITH IRREGULAR ZONES, MODERATE YELLOWISH BROWN (10 YR 5/4), WITH ZONES OF SILTY SAND, WITH SMALL BLACK SOFT CONCRETION.
		3	◤	7 10 12	22	12	SP	SAND, UNIFORM, FINE, 3-8% NONPLASTIC TO SLIGHTLY PLASTIC FINES (MOSTLY SILT), GRAYISH ORANGE (10 YR 7/4), WITH FEW VERY THIN HORIZONTAL SILTY LAYERS.
80	20							
		4	◤	7 5 4	9	13	SP CL-CH	TOP 6" SAND, UNIFORM, FINE, 5-8% SLIGHTLY PLASTIC FINES, LIGHT GRAY (N 7) WITH SOME YELLOWISH ORANGE (FeOx.) MOTTLING, WITH ONE VERY THIN CLAYEY LAYER DIPPING ABOUT 25°. BOTTOM 7" SANDY CLAY, MODERATELY PLASTIC, 10-15% UNIFORM, FINE, LIGHT GRAY (N 7) WITH FEW YELLOWISH ORANGE MOTTLES.
PH/S								
		5	◤	21 36 26	62	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 1% GRAVEL TO 0.5" MAX., LESS THAN 1% FINES, GRAYISH ORANGE (10 YR 7/4) WITH DARK YELLOWISH ORANGE LAYERS, WITH THIN LAYER GRAVEL WITH CLAY MOTTLES.
70	30							
		6	◤	6 8 9	17			NO RECOVERY.
		7	◤	7 7 10	17	9	SP	SAND, UNIFORM, FINE, 4-8% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6) WITH SOME VERY THIN MODERATE REDDISH ORANGE LAYERS (10 R 6/6) NEAR BOTTOM, DIP APPROXIMATELY 20°, FEW THIN LAYERS WITH HIGHER CLAY CONTENT.
		8	◤	7 8 10	18	12	SP	SAND, UNIFORM, FINE, 5-8% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH VERY THIN MODERATE YELLOWISH BROWN (10 YR 5/4) LAYERS NEAR TOP, DIP APPROXIMATELY 15°.
60	40							
		9	◤	6 8 10	18	11	SP	SAND, UNIFORM, FINE, 4-6% SLIGHTLY PLASTIC FINES, VERY THINLY BANDED GRAYISH ORANGE (10 YR 7/4) TO LIGHT YELLOWISH BROWN (10 YR 6/4).
		10	◤	14 26 28	54	13	SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, LESS THAN OR EQUAL TO 1% COARSE, 1-3% FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6).
50	50							
		11	◤	20 27 44	71	11	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 1-3% FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6).
S/BC								
		12	◤	16 23 21	44	9	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 10-20% GRAVEL TO 0.8" MAX., 2-4% FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6) WITH HIGHLY PLASTIC CLAY BALLS AND FEW THIN CLAYEY GRAVEL LAYERS.
●	60							
		13	◤	4 6 7	13	13	SP	SAND, UNIFORM, FINE, 5-8% SLIGHTLY PLASTIC FINES, WET, PALE YELLOWISH ORANGE (10 YR 8/6) WITH FEW VERY THIN SUBHORIZONTAL DARK YELLOWISH ORANGE BANDS, RESEMBLES DILATENT SILT.
		14	◤	4 7 12	19	12	SP	TOP 6" SIMILAR TO SS-13. BOTTOM 6" SAND, UNIFORM, FINE, 3-6% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10 YR 6/6 TO 7/6).
		15	◤	12 15 20	35	8	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY COARSE, 40-50% GRAVEL TO 0.8" MAX., 1% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
30	70							
		16	◤	20 22 24	46	5	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 15-25% GRAVEL TO 0.6" MAX., 1-3% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		17	◤	20 23 27	50	10	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 1% FINES, LIGHT YELLOWISH BROWN (10 YR 6/4) TO MODERATE YELLOWISH ORANGE (10 YR 7/6).
20	80							
		18	◤	21 35 40	75	12	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 2-3% GRAVEL TO 1.0" MAX. (AT TOP), 1-4% FINES INCREASING DOWN SAMPLE, LIGHT YELLOWISH BROWN (10 YR 6/4) AT TOP TO DARK YELLOWISH ORANGE (10 YR 6/6) AT BOTTOM.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ● INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE JANUARY 18, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 117 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 117 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED AUGUST 21-25, 1973 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY T.I.B.
COORDINATES, NORTH 16,636.6 EAST 17,979.1 GROUND SURFACE ELEVATION 99.9'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		19	◤	15 21 26	47	12	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 1-2% GRAVEL TO 0.5" MAX., 1-2% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
10	90							
		20	◤	33 49 44	93	12	SP	SAND, UNIFORM, FINE, 2-4% MEDIUM TO COARSE, LESS THAN 1% GRAVEL TO 0.5" MAX., 1% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		21	◤	21 38 55	93	11	SP SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, LESS THAN 5% COARSE SAND, LESS THAN OR EQUAL TO 1% FINES, DARK YELLOWISH ORANGE (10 YR 6/6). SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 5-6% GRAVEL TO 0.7" MAX., LESS THAN OR EQUAL TO 1% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
0	100							
		22	◤	34 50/5"	50/5"	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 4-9% GRAVEL TO 0.6" MAX., 1-2% FINES, LIGHT BROWN (5 YR 5/6) TO DARK YELLOWISH BROWN (10 YR 6/6).
		23	◤	27 34 48	82	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 2-4% GRAVEL TO 0.75" MAX., 1% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
-10	110							
		24	◤	27 34 40	74	10	SP	SAND, UNIFORM, FINE, 3-10% MEDIUM TO COARSE, INCREASING TOP TO BOTTOM, 1% GRAVEL TO 0.5" MAX., 1-3% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		25	◤	18 22 34	56	9	SP	SAND, UNIFORM, FINE, 1% MEDIUM TO COARSE, 1-3% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
-20	120							
		26	◤	57 50/5"	50/5"	6	GP	SANDY GRAVEL (MUCH OF COARSE SAND SIZE MATERIAL IN CUTTINGS: CHIPS ADDED TO GRAVEL PORTION, ENTIRE SAMPLE POSSIBLY CUTTINGS), POORLY GRADED, GRAVEL TO 0.75" MAX., 40-50% MEDIUM TO COARSE SAND, MOSTLY COARSE, 1% FINES, MODERATE BROWN (5 YR 4/4). 121'6" - 122'6" - MUCH DRILLING FLUID LOST, POSSIBLY SOLID GRAVEL LAYER, 2+ LOADS WATER TO ADVANCE CASING TO 124'0".
		27	◤	23 24 22	46	10	SP	GRAVELLY SAND, POORLY GRADED, MEDIUM TO COARSE, MOSTLY COARSE, 30-35% GRAVEL TO 0.6" MAX., LESS THAN 1% FINES, VARIEGATED BROWNS.
-30	130							
		28	◤	5 18 18	36	8	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY COARSE, 40-45% GRAVEL TO 0.7" MAX., 1-2% FINES (SOME THIN ZONES WITH CLAY CONTENT SLIGHTLY HIGHER) LIGHT YELLOWISH BROWN (10 YR 6/4).
		29	◤	56 50/3"	50/3"			NO RECOVERY.
		30	◤	40 19 21	40	7	SP	GRAVELLY SAND, POORLY GRADED, MEDIUM TO COARSE, MOSTLY COARSE, 25-35% GRAVEL TO 0.6" MAX., 1% FINES, GRAYISH ORANGE (10 YR 7/4).
-40	140							
		31	◤	11 14 20	34	8	GP	SANDY GRAVEL, POORLY GRADED, GRAVEL TO 0.8" MAX., FINE TO COARSE SAND, MOSTLY COARSE, 3-4% FINES IN CLAYEY SAND MATRIX, GRAYISH ORANGE (10 YR 7/4).
		32	◤	12 15 25	40	9	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 10-25% GRAVEL TO 0.75" MAX., 1-2% FINES (MOSTLY IN THIN 1.0" LAYER OF COARSE SAND WITH CLAYEY FINE SAND MATRIX), LIGHT YELLOWISH BROWN (10 YR 5/5), WITH BLACK (MnO₂) COATING ON SOME PIECES GRAVEL AND BLACK SPOTS IN 1.0" LAYER DESCRIBED ABOVE.
-50	150							
BC/S								
		33	◤	12 14 22	36	9	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY COARSE, 25-35% GRAVEL TO 0.7" MAX., 15-20% HIGHLY PLASTIC FINES IN MATRIX AND CLAY BALLS, GRAYISH ORANGE (10 YR 7/4) WITH YELLOWISH GRAY CLAY.
		34	◤	10 12 22	34	12	SP	SAND, UNIFORM, FINE, 1-4% FINES, GRAYISH ORANGE (10 YR 7/4) WITH YELLOWISH ORANGE (10 YR 7/6) AT BOTTOM.
●	160							
		35	◤	21 39 18	57	9	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 1% FINES, DUSKY YELLOWISH BROWN (10 YR 2/2) WITH TWO THIN HORIZONTAL CLAYEY GRAVEL LAYERS (10 YR 6/6) ORGANIC MATERIAL IN MATRIX.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D STANDARD SPLIT-SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ● INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE JANUARY 18, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 117 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 117 TYPE OF BORING DRIVE SHEET 3 OF 3
DATE DRILLED AUGUST 21-25, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY T.I.B.
COORDINATES, NORTH 16,636.6 EAST 17,979.1 GROUND SURFACE ELEVATION 99.9'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
S/PC								
		36	◤	8 10 14	24	10	[illegible]	CLAYEY SAND, UNIFORM, VERY FINE, 15-20% MODERATELY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2) WITH THIN LAYERS SILTY CLAY, HIGHLY PLASTIC, VERY STIFF, LESS THAN 5% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2) WITH YELLOWISH ORANGE (FeOx.) SPOTS.
-70	170							
		37	◤	8 9 11	20	15	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 5-10% UNIFORM VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2) WITH SMALL YELLOWISH ORANGE (FeOx.) SPOTS.
		38	◤	7 8 8	16	15	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 10-20% UNIFORM VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2) WITH SMALL POCKETS OF HIGHLY PLASTIC SILTY CLAY.
								END OF BORING AT 176.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ● INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE JANUARY 18, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 117 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. 118
TYPE OF BORING DRIVE
SHEET 1 OF 3
DATE DRILLED JULY 7-12, 1972
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY R.A.J.
COORDINATES, NORTH 16,671.5
EAST 17,834.9
GROUND SURFACE ELEVATION 106.1

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
L									
	100		1	◤	3 4 4	8	13	CL-ML	SILTY CLAY, SLIGHTLY PLASTIC, LESS THAN 5% VERY FINE SAND, MEDIUM BROWN WITH VERY SMALL ORANGE VEINS.
L/PH		10	2	◤	3 5 4	9	14	CL-ML	SILTY CLAY, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, LIGHT GRAY TO LIGHT BROWNISH GRAY WITH SOME SMALL ORANGE VEINS.
	90		3	◤	5 8 11	19	17½	CL	SILTY CLAY, SLIGHTLY PLASTIC, 5-10% FINE SAND, LIGHT TO MEDIUM GRAY WITH POCKETS OF BROWNISH ORANGE.
		20	4	◤	8 14 13	27	17	CL-ML	SIMILAR TO SS-2 BUT BROWNISH ORANGE CHANGING TO SILTY SAND, VERY FINE UNIFORM SAND, 40-50% NONPLASTIC FINES CHANGING TO 20-30% NON-PLASTIC FINES, LIGHT GRAY WITH BROWN ORANGE POCKETS.
PH/S	80		5	◤	22 27 29	56	13	SP	SAND, UNIFORM, FINE, LESS THAN 1% PLASTIC FINES, BRIGHT BROWNISH ORANGE CHANGING TO LIGHT GRAYISH BROWN.
		30	6	◤	12 22 24	46	13	SP	SIMILAR TO SS-5 BUT NO BROWNISH ORANGE.
	70		7	◤	9 10 12	22	13	SP-SC	SAND, UNIFORM FINE, 5-10% PLASTIC FINE BRIGHT BROWNISH ORANGE.
		40	8	◤	10 21 31	52	13	SP	SAND, UNIFORM, FINE, LESS THAN 5% PLASTIC FINES, SOME COARSE SAND PARTICLES, BRIGHT BROWNISH ORANGE.
	60		9	◤	8 11 13	24	13	SP	SAND, UNIFORM, FINE, LESS THAN 2% PLASTIC FINES, BRIGHT ORANGE.
		50	10	◤	8 16 25	41	13	SP	SAND, FINE, UNIFORM, LESS THAN 5% PLASTIC FINE, SOME COARSE SAND PARTICLES, BROWNISH ORANGE.
S/BC	50		11	◤	12 15 15	30	12	SP	GRAVELLY SAND, WIDELY GRADED, MOSTLY MEDIUM TO COARSE SAND, 15-25% SUBROUNDED AND ROUNDED GRAVEL TO 0.75 INCH, 5-10% PLASTIC FINES, FEW 1.0 INCH LAYERS CLAYEY SAND, BROWNISH ORANGE.
		60	12	◤	10 6 8	14	12½	SP	SAND, FINE TO COARSE SAND, MOSTLY FINE, LESS THAN 5% SUBROUNDED GRAVEL TO 0.4 INCH, LESS THAN 5% PLASTIC FINES, GRAY LAMINATIONS OF SANDY CLAY FOR 2.0 INCH, BROWNISH ORANGE AND LIGHT GRAYISH BROWN.
			13	◤	12 15 15	30	19	SP	SAND, FINE, CLEAN, 3.0 INCH LAYER GRAVELLY WIDELY GRADED SAND, LIGHT GRAYISH BROWN.
	40		14	◤	9 8 8	16	17	SP	SAND, UNIFORM, FINE, 5-10% PLASTIC FINES, LIGHT GRAYISH BROWN.
		70	15	◤	6 7 6	13	12	SP	SIMILAR TO SS-14, BUT LIGHT YELLOWISH BROWN.
			16	◤	23 30 35	65	10	SP SP	SAND, FINE TO COARSE, MOSTLY FINE SAND, 10-15% GRAVEL AND GRAVEL FRAGMENTS TO 1.0 INCH, LESS THAN 5% SLIGHTLY PLASTIC FINES, LIGHT GRAYISH BROWN WITH SOME ORANGE, CHANGING TO SAND, FINE, UNIFORM, LESS THAN 5% SLIGHTLY PLASTIC FINES, FEW GRAVEL PARTICLES TO 0.4 INCH, BROWNISH ORANGE.
	30		17	◤	30 33 30	63	12	SP	GRAVELLY SAND, WIDELY GRADED, MOSTLY MEDIUM AND COARSE SAND, 15-20% GRAVEL TO 1.0 INCH, 5-15% PLASTIC FINES, BROWNISH ORANGE.
		80	18	◤	17 26 26	54	13	SP	SAND, UNIFORM, FINE, LESS THAN 5% VERY FINE GRAVEL AND COARSE SAND, LESS THAN 5% PLASTIC FINES BROWNISH ORANGE.

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D.P. GREENWOOD
DATE DECEMBER 22, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 118 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. 118
TYPE OF BORING DRIVE
SHEET 2 OF 3
DATE DRILLED JULY 12, 1972
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY R.A.J.
COORDINATES, NORTH 16,671.5
EAST 17,834.9
GROUND SURFACE ELEVATION 106.1

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
	20		19	◤	26 32 43	75	13	SP	SIMILAR TO SS-18.
		90	20	◤	23 50/8"	50/8"	10	SP	SAND, UNIFORM, FINE, LESS THAN 5% VERY FINE GRAVEL AND COARSE SAND, LESS THAN 5% PLASTIC FINES, BROWNISH ORANGE.
	10		21	◤	43 50/7"	50/7"	6	SP	SAND, FINE TO COARSE, MOSTLY UNIFORM FINE SAND, LESS THAN [illegible] VERY FINE GRAVEL, LESS THAN 5% SLIGHTLY PLASTIC FINES, BROWNISH ORANGE.
		100	22	◤	17 18 23	41	15	SP	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, BROWNISH ORANGE.
	0		23	◤	33 34 [illegible]	[illegible]	16	SP	SAND, WIDELY GRADED, MOSTLY FINE SAND, 5-15% GRAVEL TO 0.5 INCH, LESS THAN 5% SLIGHTLY PLASTIC FINES, BROWNISH ORANGE.
		110	24	◤	21 34 28	62	13	SP	SAND, MOSTLY FINE SAND, 5-10% VERY COARSE SAND AND VERY FINE GRAVEL, LESS THAN 5% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE.
	-10		25	◤	38 50/7"	50/7"	13	SP	SAND, UNIFORM, FINE, 5-10% VERY COARSE SAND AND GRAVEL TO 0.4 INCH, VERY LIGHT GRAYISH BROWN.
		120	26	◤	31 37 39	76	16	SP	SAND, UNIFORM, FINE, CLEAN, 3.0 INCH GRAVELLY SAND LAYER, VERY LIGHT GRAYISH BROWN.
	-20		27	◤	23 50/7"	50/7"	12	SP	SAND, FINE TO MEDIUM SAND, MOSTLY UNIFORM AND FINE, CLEAN, VERY LIGHT GRAYISH BROWN.
		130	28	◤	17 22 15	37	11	SP SP	GRAVELLY SAND, FINE TO COARSE SAND, MOSTLY FINE, 15-25% GRAVEL TO 0.5 INCH, VERY LIGHT GRAYISH BROWN, CHANGING TO GRAVELLY SAND, FINE TO COARSE SAND, MOSTLY COARSE, 10-20% GRAVEL TO 0.6 INCH, LESS THAN 5% SLIGHTLY PLASTIC FINES, LIGHT BROWN.
	-30		29	◤	18 25 13	53	11	SP-SW	GRAVELLY SAND, FINE TO COARSE SAND, MOSTLY COARSE, 30-40% GRAVEL TO 0.6 INCH, 5-10% SLIGHTLY PLASTIC FINES, LIGHT GRAYISH BROWN.
		140	30	◤	19 18 13	31	9	SP-SW	SIMILAR TO SS-29, WITH FEW SMALL CLAYEY POCKETS.
	-40		31	◤	15 20 19	39	11	SP-SW	GRAVELLY SAND, FINE TO COARSE SAND, MOSTLY COARSE, 15-25% GRAVEL TO 0.4 INCH, LESS THAN 5% SLIGHTLY PLASTIC FINES, LIGHT GRAYISH BROWN.
		150	32	◤	15 16 13	29	11	GC	CLAYEY GRAVEL, WIDELY GRADED GRAVEL TO 1.0 INCH, 10-15% MOSTLY FINE SAND, 15-25% HIGHLY PLASTIC FINES, LIGHT GRAYISH BROWN.
BC/PC	-50		[illegible]	◤	5 8 12	20	16	CH	GRAVELLY CLAY, HIGHLY PLASTIC, 30-40% GRAVEL TO 1.0 IN., 5-10% FINE TO COARSE SAND, LIGHT GRAY MOTTLED ORANGE AND BROWN LAYERS AND POCKETS OF SAND AND GRAVELLY SAND.
		160	34	◤	21 21 17	38	15	SC	CLAYEY SILT, UNIFORM, FINE, 10-20% SLIGHTLY PLASTIC FINES, LIGHT GRAY, 4 INCH LAYER GRAY CLAY, 2 SMALL LAYER GRAVELLY SAND, CHANGING TO CLEAN FINE SAND.

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. P. GREENWOOD
DATE DECEMBER 22, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 118 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO 118
TYPE OF BORING DRIVE
SHEET 3 OF 3
DATE DRILLED JULY 6, 1972
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY R.A.J.
COORDINATES, NORTH 16,671.5
EAST 17,834.9
GROUND SURFACE ELEVATION 106.1

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
-60.4	166.5	35	◤	57 30 37	67	9	SP-SW	GRAVELLY SAND, WIDELY GRADED, MOSTLY FINE AND COARSE SAND, 20-30% GRAVEL TO 1.0 INCH, 5-10% SLIGHTLY PLASTIC FINE, GRAYISH BROWN AND ORANGE.
								END OF BORING AT 166.5'

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D.P. GREENWOOD
DATE DECEMBER 22, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 118 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 119
TYPE OF BORING DRIVE
SHEET 1 OF 3
DATE DRILLED JUNE 29, 1972
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY
COORDINATES, NORTH 16,696.1
EAST 17,732.0
GROUND SURFACE ELEVATION 108.4

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
L									
			1	◤	1 2 2	4	12	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 1-2 % FINE SAND, MOIST, YELLOWISH GRAY (5 Y 7/2).
	100								
L/PH		10	2	◤	3 6 8	14	18	CL	SILTY CLAY, SLIGHTLY PLASTIC, VERY STIFF, MOIST, DUSKY YELLOW (5 Y 5/4), SOME SMALL POCKETS LIGHT GRAY SILT.
			3	◤	3 5 6	11	17	CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, VERY STIFF, MOIST, YELLOWISH GRAY (5 Y 7/2) SOME POCKET AND VEINS LIGHT GRAY SILT.
	90	20							
			4	◤	2 3 4	7	20	CH	CLAY, MODERATELY TO HIGHLY PLASTIC, MOIST, STIFF, DARK OLIVE GRAY (5 Y 3/1), SOME POCKETS AND VEINS LIGHT GRAY SILT.
PH/S									
			5	◤	17 16 16	32	15	SM	SILTY SAND, UNIFORM, FINE, 30-40 % NONPLASTIC FINES, MOIST, LIGHT YELLOWISH GRAY (5 Y 8/2), FEW SMALL LENSES SANDY CLAY.
	80	30							
			6	◤	2 3 3	6	18	CH	CLAY, MODERATELY TO HIGHLY PLASTIC, 5-10 % FINE SAND, SOFT, MOIST, YELLOWISH GRAY (5 Y 7/2), SOME LAYERS DARK ORANGE AND LIGHT GRAY FINE SAND.
								SC	CLAYEY SAND, UNIFORM, FINE, 10-15 % SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 5/6) AND PALE YELLOWISH ORANGE (10 YR 7/6), FEW LAYERS YELLOWISH GRAY CLAY.
			7	◤	6 6 7	13	10	SP	SAND, UNIFORM, FINE TO MEDIUM, LESS THAN 5 % NONPLASTIC FINES, SATURATED, PALE YELLOWISH ORANGE (10 YR 7/6).
								SC	CLAYEY SAND, UNIFORM FINE TO MEDIUM, 10-15 % SLIGHTLY PLASTIC FINES, FEW 0.1 IN. LAYERS LIGHT GRAY SANDY CLAY.
	70	40							
			8	◤	5 8 12	20	13	SC	CLAYEY SAND, UNIFORM, FINE TO MEDIUM, 10-15 % SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), FEW THIN LAYERS LIGHT YELLOWISH GRAY SANDY CLAY.
			9	◤	17 32 39	71	14	SP	SAND, POORLY GRADED, 1-3 % SUBANGULAR GRAVEL TO 0.3 IN. MAX., FINE TO COARSE SAND, MOSTLY FINE AND MEDIUM, LESS THAN 5 % NONPLASTIC FINES, LIGHT YELLOWISH ORANGE (10 YR 7/6)
	60	50							
			10	◤	28 27 36	63	12	SP-SM	SAND, SIMILAR TO ABOVE, EXCEPT 5-10 % NONPLASTIC TO SLIGHTLY PLASTIC FINES.
			11	◤	16 20 23	43	11	SP-SM	SAND, SIMILAR TO ABOVE, EXCEPT 20-25 % SUBROUNDED AND FRESHLY BROKEN GRAVEL TO 0.6 IN. MAX., DARK YELLOWISH ORANGE (10 YR 6/6).
S/BC	50	60							
			12	◤	24 24 23	47	13	SC	CLAYEY SAND, WIDELY GRADED, 30-35 % SUBROUNDED AND FRESHLY BROKEN GRAVEL TO 0.8 IN. MAX., FINE TO COARSE SAND, 10-15 % SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
			13	◤	13 18 20	38	13	SC-SP	CLAYEY SAND, UNIFORM, FINE, 1-3 % FRESHLY BROKEN GRAVEL TO 0.6 IN. MAX., 8-12 % SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 7/6).
	40	70							
			14	◤	11 14 14	28	11	SC	CLAYEY SAND, UNIFORM, FINE, 5-10 % FRESHLY BROKEN GRAVEL TO 0.7 IN. MAX., 10-15 % SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), FEW LAYERS SANDY CLAY, FEW SMALL POCKETS HIGHLY PLASTIC CLAY.
			15	◤	15 25 39	64	13	SP-SC	SAND, POORLY GRADED, 3-5 % FRESHLY BROKEN GRAVEL TO 0.6 IN. MAX., FINE TO COARSE SAND, MOSTLY MEDIUM, 5-10 % SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	30	80							
			16	◤	16 21 22	43	8	SP-SC	SAND, WELL-GRADED, 25-35 % SUBROUNDED AND FRESHLY BROKEN GRAVEL TO 0.8 IN. MAX., FINE TO COARSE SAND, 5-10 % SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 7/6).

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 12, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 119 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 119
TYPE OF BORING DRIVE
SHEET 2 OF 3
DATE DRILLED JUNE 29, 1972
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY
COORDINATES, NORTH 16,696.1
EAST 17,732.0
GROUND SURFACE ELEVATION 108.4

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		17	◤	7 8 8	16	8	SP-SC	SAND, POORLY GRADED, 1-3 % SUBROUNDED GRAVEL 0-3 IN. MAX., MOSTLY FINE TO MEDIUM SAND, 8-12 % SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
20								
	90	18	◤	18 28 41	69	11	SP	SAND, SIMILAR TO ABOVE, EXCEPT 3-5 % NONPLASTIC TO SLIGHTLY PLASTIC FINES.
		19	◤	81=6"	81=6"	8	SP	SAND, UNIFORM, FINE AND MEDIUM, MOSTLY MEDIUM, LESS THAN 5 % NONPLASTIC FINES, GRAYISH YELLOW (5 Y 7/4).
10	100							
		20	◤	19 33 35	68	11	SP-SC	SAND, UNIFORM, FINE AND MEDIUM, 1-2 % SUBROUNDED GRAVEL TO 0.3 IN. MAX., 5-10 % NONPLASTIC TO SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 7/6).
		21	◤	13 16 20	36	10	SP-SC	SAND, SAME AS ABOVE.
0	110							
		22	◤	22 28 28	56	10	SP	SAND, POORLY GRADED, 10-15 % SUBROUNDED AND FRESHLY BROKEN GRAVEL TO 0.8 IN. MAX., FINE TO COARSE SAND, MOSTLY MEDIUM, 3-6 % NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		23	◤	22 37 46	83	11	SP	SAND, SIMILAR TO ABOVE, EXCEPT 5-10 % GRAVEL TO 0.4 IN. MAX., LESS THAN 5 % NONPLASTIC FINES, YELLOWISH GRAY (5 Y 6/3).
-10	120							
		24	◤	26 52=6"	52=6"	11	SP	SAND, SIMILAR TO ABOVE, EXCEPT 3-5 % GRAVEL.
		25	◤	40 50=4½	50=4½	10	SP	SAND, SIMILAR TO ABOVE, EXCEPT 1-3 % GRAVEL.
-20	130							
		26	◤	28 50=5"	50=5"	11	SP	SAND, SAME AS ABOVE.
		27	◤	28 51=6"	51=6"	11	SP	SAND, SIMILAR TO ABOVE, EXCEPT NO GRAVEL.
-30	140							
		28	◤	23 24 25	49	11	GP	SANDY GRAVEL, POORLY GRADED TO 0.9 IN. MAX., MOSTLY FRESHLY BROKEN FRAGMENTS, 40-45 % FINE TO COARSE SAND, MOSTLY MEDIUM AND COARSE, LESS THAN 5 % NONPLASTIC TO SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		29	◤	11 12 20	32	8	GP-GC	SANDY GRAVEL, SIMILAR TO ABOVE, EXCEPT 3-8 % SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 6/3), FEW LAYERS SANDY CLAY.
-40	150							
		30	◤	12 19 17	36	16	GC	CLAYEY GRAVEL, POORLY GRADED TO 0.9 IN. MAX., MOSTLY FRESHLY BROKEN FRAGMENTS, 20-25 % FINE TO COARSE SAND, MOSTLY COARSE, 10-15 % SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2).
		31	◤	14 17 21	38	11	GC-GP	CLAYEY GRAVEL, SIMILAR TO ABOVE, EXCEPT 5-10 % SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 6/2).
-50	160							
		32	◤	9 22 28	50	12	SC	CLAYEY SAND, UNIFORM, FINE AND MEDIUM, 3-8 % FRESHLY BROKEN GRAVEL TO 0.8 IN. MAX., 10-15 % SLIGHTLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 7/6), POCKET MODERATELY PLASTIC YELLOWISH GRAY CLAY.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 12, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 119 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 119
TYPE OF BORING DRIVE
SHEET 3 OF 3
DATE DRILLED JUNE 29, 1972
DRILLING COMPANY - EUSTIS ENGRG. CO
LOGGED BY
COORDINATES, NORTH 16,696.1
EAST 17,732.0
GROUND SURFACE ELEVATION 108.4

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
BC/PC			33	◤	29 21 14	35	14	SP-SM	SAND, POORLY GRADED, 3-8 % FRESHLY BROKEN GRAVEL TO 0.4 IN. MAX., FINE TO COARSE SAND, MOSTLY FINE AND MEDIUM, 5-10 % NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 5/6).
								CL	SANDY CLAY, MODERATELY PLASTIC, 30-35 % FINE SAND, YELLOWISH GRAY (5 Y 7/1), FEW 0.5 IN. LAYERS DARK YELLOWISH ORANGE FINE SAND, 0.5 IN. LAYER YELLOWISH GRAY HIGHLY PLASTIC CLAY.
	-60	170							
			34	◤	15 16 19	35	24	SM	SILTY SAND, UNIFORM, VERY FINE, 30-40 % SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2), SOME SMALL POCKETS BLACK ORGANIC MATERIAL.
								CL	SANDY CLAY, SLIGHTLY PLASTIC, 15-20 % VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2), SOME THIN LAYERS DARK YELLOWISH ORANGE SILT, FEW POCKETS BLACK ORGANIC MATERIAL.
			35	◤	8 15 26	41	12	SM	SILTY SAND, UNIFORM, VERY FINE, 15-20 % SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 6/2).
	-70 -71.35	179.75	36	◤	13 14 30	44	18	SM	SILTY SAND, SAME AS ABOVE.
									END OF BORING AT 179.75'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 12, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 119 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 120 | TYPE OF BORING DRIVE | SHEET 1 OF 2
DATE DRILLED AUGUST 22, 1972 | DRILLING COMPANY - EUSTIS ENGRG. CO | LOGGED BY
COORDINATES, NORTH 16,743.1 | EAST 17,543.1 | GROUND SURFACE ELEVATION 108.7

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		1	◤	2 3 4	7	15	ML	CLAYEY SILT, SLIGHTLY PLASTIC, LESS THAN 5 % FINE SAND, MOIST, MODERATE YELLOWISH BROWN (10 YR 4/4), POCKETS LIGHT BROWN SILTY CLAY, SMALL POCKETS BLACK ORGANIC MATERIAL.
100	10	2	◤	2 3 5	8	16	ML	CLAYEY SILT, SAME AS ABOVE.
		3	◤	4 5 6	11	20	ML	CLAYEY SILT, SIMILAR TO ABOVE, EXCEPT LIGHT OLIVE GRAY (5 Y 7/1). SOME SMALL NODULES CEMENTED SILT.
90	20	4	◤	6 19 23	42	15	CL	SANDY CLAY, SLIGHTLY PLASTIC, 35-40 % FINE SAND, MOIST, YELLOWISH GRAY (5 Y 6/3 TO 5 Y 7/2), LAYER CLAYEY SAND, LAYERS LIGHT GRAY CLAYEY SILT.
		5	◤	1 1 8	9	18	CL	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, FIRM, BROWNISH GRAY (5 YR 3/1), 1.5 IN. LAYER LIGHT OLIVE GRAY SANDY SILT, SOME POCKETS AND THIN LENSES LIGHT BROWNISH GRAY SILT, 0.5 IN. LAYER CLAYEY SAND.
80	30	6	◤	31 34 28	62	18	SM	SILTY SAND, UNIFORM, VERY FINE, 25-30 % NON PLASTIC TO SLIGHTLY PLASTIC FINES BECOMING 10-15 % NON PLASTIC FINES, YELLOWISH GRAY (5 Y 8/2).
		7	◤	9 12 11	23	13	SC	CLAYEY SAND, POORLY GRADED, 1-3 % SUBANGULAR GRAVEL TO 0.5 IN. MAX., MOSTLY UNIFORM FINE SAND, 10-15 % SLIGHTLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6), FEW SMALL POCKETS SANDY CLAY.
70	40	8	◤	3 1 6	7	22	SC	CLAYEY SAND, SIMILAR TO ABOVE, EXCEPT 25-30 % SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 5/6), SOME LAYERS MODERATELY TO HIGHLY PLASTIC CLAY.
		9	◤	12 12 13	25	10	SP-SC	SAND, UNIFORM, FINE, 5-10 % SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), FEW SMALL POCKETS SANDY CLAY.
60	50	10	◤	3 4 7	11	14	SC	CLAYEY SAND, UNIFORM, VERY FINE, 15-20 % SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), FEW LAYERS HIGHLY PLASTIC CLAY.
		11	◤	5 5 6	11	13	SP-SC	SAND, UNIFORM, VERY FINE, 8-12 % SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 7/6), SOME THIN LENSES CLAY.
50	60	12	◤	8 10 13	23	12	SP-SC	SAND, SIMILAR TO ABOVE, EXCEPT FINE TO MEDIUM, MOSTLY FINE.
		13	◤	9 11 13	24	12	SP-SC	SAND, SIMILAR TO ABOVE, EXCEPT FINE.
40	70	14	◤	6 5 6	11	16	SP-SC	SAND, SIMILAR TO ABOVE, EXCEPT VERY FINE.
		15	◤	6 7 10	17	8	SM	SILTY SAND, UNIFORM, FINE, 12 % NON PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
30	80	16	◤	20 19 18	37	14	SP	SAND, POORLY GRADED, 2-8 % GRAVEL TO 0.5 IN. MAX., MOSTLY FINE TO MEDIUM SAND, 2-7 % NON PLASTIC TO SLIGHTLY FINES, DARK ORANGE BROWN (10 YR 4/4), AND DARK YELLOWISH ORANGE (10 YR 6/6).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 10, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 120 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO 120 | TYPE OF BORING DRIVE | SHEET 2 OF 2
DATE DRILLED AUGUST 22, 1972 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY
COORDINATES, NORTH 16,743.1 | EAST 17,543.1 | GROUND SURFACE ELEVATION 108.7

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		17	◤	24 30 32	62	14	SP-SM	GRAVELLY SAND, GAP-GRADED, 38 % CHERT GRAVEL TO 0.5 IN. MAX, MOSTLY FINE QUARTZ SAND, 7 % SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
20	90	18	◤	19 28 34	62	12	SP-SM	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY UNIFORM FINE TO MEDIUM, 7-8 % NON PLASTIC FINES, MODERATE YELLOWISH ORANGE (10 YR 5/6), UPPER PORTION OF SAMPLE CONTAINS 16 % FRESHLY BROKEN CHERT GRAVEL.
		19	◤	32 43 50/4½	106	10	SP-SM	SAND, SIMILAR TO ABOVE, EXCEPT 2 % GRAVEL TO 0.5 IN. MAX.
10	100	20	◤	20 38 56	94	12	SP-SM	SAND, SIMILAR TO ABOVE, EXCEPT MOSTLY MEDIUM, MODERATE ORANGE BROWN (10 YR 6/4).
		21	◤	19 43 50/5	102	11	SP-SM	SAND, SIMILAR TO ABOVE, EXCEPT MOSTLY UNIFORM FINE TO MEDIUM.
0	110	22	◤	22 44 44	88	11	SP-SM	SAND, SAME AS ABOVE.
		23	◤	17 21 22	43	11	SW-SM	SAND, WELL-GRADED, 5-15 % CHERT GRAVEL TO 0.5 IN. MAX., FINE TO COARSE CHERT AND QUARTZ SAND, 5-7% NON PLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/5).
-10	120	24	◤	21 39 45	84	11	SW-SM	SAND, SIMILAR TO ABOVE, EXCEPT 5 % GRAVEL.
		25	◤	37 58/6	58/6	8	SP-SM	SAND, POORLY GRADED, 5 % CHERT GRAVEL TO 0.5 IN. MAX., FINE TO COARSE QUARTZ SAND, MOSTLY UNIFORM FINE TO MEDIUM, 7 % NON PLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
-20	130	26	◤	33 50/4½	50/4½	8	SP-SM	SAND, SIMILAR TO ABOVE, EXCEPT MODERATE GRAYISH ORANGE (10 YR 6/5).
		27	◤	35 50/4½	50/4½	8	SP-SM	SAND, SAME AS ABOVE.
-30	140	28	◤	32 50/5	50/5	8	SP-SM	SAND, SAME AS ABOVE.
		29	◤	21 37 50/4	104	10	SP-SM	SAND, SAME AS ABOVE.
-40	150	30	◤	20 25 17	42	13	GC	CLAYEY GRAVEL, GAP-GRADED, SUBANGULAR TO WELL-ROUNDED CHERT GRAVEL TO 1.0 IN. MAX., 30 TO 46 % MOSTLY FINE AND COARSE CHERT AND QUARTZ SAND, 12 TO 18 % MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4). BECOMING DARK GRAYISH ORANGE (10 YR 6/5).
		31	◤	15 20 32	52	26	CH	SILTY CLAY, HIGHLY PLASTIC, LIGHT OLIVE GRAY (5 Y 6/1) MOTTLED WITH DARK YELLOWISH ORANGE (10 YR 6/6), MANY VEINS AND LENSES YELLOWISH BROWN SILT, FEW SPECKS BLACK ORGANIC MATERIAL.
-50 -52.8	160	32	◤	8 11 12	23	21	CL	SILTY CLAY, SLIGHTLY PLASTIC, 1-3 % VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2), SOME VEINS YELLOWISH ORANGE SILT.
								END OF BORING AT 161.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 12, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 120 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO 121 | TYPE OF BORING DRIVE | SHEET 1 OF 2
DATE DRILLED JULY 11, 1972 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY R.A.J.
COORDINATES, NORTH 16,769.1 | EAST 17,445.4 | GROUND SURFACE ELEVATION 108.2'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		1	◤		6	8	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, MEDIUM BROWN.
100	10	2	◤		11	18	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, LIGHT GRAYISH BROWN.
		3	◤		34	14	ML	SANDY SILT, NONPLASTIC, 30-40% VERY FINE SAND, LIGHT BROWNISH GRAY.
90	20	4	◤		9	19	ML CL-CH	SIMILAR TO SS-3 WITH 2.0" LAYER SILTY SAND, CHANGING TO: SILTY CLAY, MODERATELY PLASTIC, LESS THAN 5% FINE SAND, DARK GRAY TO ALMOST BLACK.
		5	◤		40	16	SM	SILTY SAND, UNIFORM, FINE, 20-30% NONPLASTIC FINES, VERY LIGHT WHITISH GRAY.
80	30	6	◤		32	10	SP	SAND, MOSTLY UNIFORM AND FINE, LESS THAN 5% COARSE SAND AND VERY FINE GRAVEL, LESS THAN 5% NONPLASTIC FINES, VERY LIGHT WHITISH GRAY.
		7	◤		10	11	SC CL	CLAYEY SAND, UNIFORM, FINE SAND, 10-20% SLIGHTLY PLASTIC FINES, WHITE, CHANGING TO: SANDY CLAY, SLIGHTLY PLASTIC, 15-25% UNIFORM FINE SAND, WHITE.
70	40	8	◤		9	18	CL CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 5-10% VERY FINE SAND, DARK YELLOW, MANY FINE SAND LAMINATIONS, CHANGING TO: SANDY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 20-30% FINE SAND, DARK YELLOW AND BROWNISH ORANGE.
		9	◤		17	10	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, DULL YELLOW.
60	50	10	◤		58	10	SP	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, BROWNISH ORANGE.
		11	◤		9	18	CL SC	SANDY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 10-15% FINE SAND, GRAYISH WHITE AND BROWNISH ORANGE, LAYERS CLAYEY SAND, CHANGING TO: CLAYEY SAND, MOSTLY UNIFORM, FINE SAND, 20-30% SLIGHTLY PLASTIC FINES, GRAYISH WHITE AND BROWNISH ORANGE WITH SMALL LAYERS SANDY CLAY.
50	60	12	◤		25	18	CL SC	SANDY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 15-25% FINE SAND, DULL YELLOW, ONE 1.0" GRAVEL CHANGING TO: CLAYEY SAND, UNIFORM FINE SAND, 10-15% SLIGHTLY PLASTIC FINES, GRAYISH WHITE.
		13	◤		12	17	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, DULL YELLOW.
40	70	14	◤		13	18	SP	SIMILAR TO SS-13 BUT LIGHT GRAYISH BROWN.
		15	◤		34	15	SP	SAND, FINE TO COARSE, MOSTLY FINE, LESS THAN 5% FINE GRAVEL TO 0.4", 5-10% SLIGHTLY PLASTIC FINES, LIGHT GRAYISH BROWN.
30	80	16	◤		20	16	SP	SIMILAR TO SS-15.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 7, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 121A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO 121 | TYPE OF BORING DRIVE | SHEET 2 OF 2
DATE DRILLED JULY 11, 1972 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY R.A.J.
COORDINATES, NORTH 16,769.1 | EAST 17,445.4 | GROUND SURFACE ELEVATION 108.2'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		17	◤		23	12	SP	GRAVELLY SAND, FINE TO COARSE SAND, MOSTLY FINE, 15-25% GRAVEL TO 0.75", 5-10% PLASTIC FINES, LIGHT BROWNISH ORANGE, FEW POCKETS SANDY CLAY.
20	90	18	◤		39	17	SP	SIMILAR TO SS-15.
		19	◤	24 50/5"	50/5"	9	SP	SAND, FINE TO COARSE, MOSTLY UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, BROWNISH ORANGE, FEW FINE GRAVEL PARTICLES.
10	100	20	◤	30 50/4.5"	50/4.5"	9	SP	SAND, FINE TO COARSE, MOSTLY UNIFORM FINE, 5-10% SLIGHTLY PLASTIC FINES, DARK BROWNISH ORANGE, FEW FINE GRAVEL PARTICLES.
		21	◤	35 50/5"	50/5"	9	SP	SIMILAR TO SS-19.
0	110	22	◤	20 30 44	77	10	SP	SIMILAR TO SS-19 BUT NO GRAVEL.
		23	◤	16 20 19	39	10	SP	GRAVELLY SAND, WIDELY GRADED, MOSTLY MEDIUM AND COARSE SAND, 15-20% GRAVEL TO 1.0", LESS THAN 5% SLIGHTLY PLASTIC FINES, LIGHT GRAYISH BROWN, FEW 0.5" POCKETS AND OR BALLS OF GRAY CLAY AND CLAYEY SAND.
-10	120	24	◤	19 28 35	63	11	SP	SAND, WIDELY GRADED, MUCH FINE SAND, 5-10% FINE GRAVEL TO 0.5" LESS THAN 5% SLIGHTLY PLASTIC FINES.
		25	◤	27 50/6"	50/6"	9	SP	SIMILAR TO SS-24 WITH FEW 0.25" BALLS AND OR POCKETS OF GRAYISH CLAYEY SAND AND SANDY CLAY.
-20	130		◤			N.R.		NO RECOVERY, RESAMPLED.
		26	◤	42 50/4"	50/4"	10	SP	SAND, MOSTLY UNIFORM AND FINE, 5-10% FINE GRAVEL TO 0.5", LIGHT GRAYISH BROWN, SOME 0.5" POCKETS GREENISH GRAY CLAYEY SAND.
		27	◤	30 53/6"	53/6"	9	SP	SIMILAR TO SS-26.
-30	140	28	◤	39 50/4.5"	50/4.5"	12	SP	SIMILAR TO SS-26 BUT NO CLAYEY SAND POCKETS AND SOME MEDIUM SAND.
		29	◤	21 36 28	64	13	SP	GRAVELLY SAND, WIDELY GRADED, 10-15% GRAVEL TO 0.5", LIGHT GRAYISH BROWN, ONE 1.0" CLAYEY SAND POCKET AND ONE 1.0" SANDY GRAVEL LAYER.
-40	150	30	◤		25	26	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND; TOP-DARK BROWN; MIDDLE - DARK BROWN MOTTLED LIGHT GREENISH GRAY; BOTTOM - BROWNISH YELLOW WITH BROWNISH ORANGE LAYERING.
		31	◤	7 15 17	32	24	CH	CLAY, MODERATELY TO HIGHLY PLASTIC, LESS THAN 5% VERY FINE SAND, TOP - BROWNISH ORANGE MOTTLED WITH GREENISH GRAY, BECOMING GREENISH GRAY WITH SLIGHT BROWNISH ORANGE DISCOLORATION.
-50 -53.3	161.5	32	◤	9 12 14	26	23	CH	CLAY, HIGHLY PLASTIC, LESS THAN 5% VERY FINE SAND, LIGHT GREENISH GRAY.
								END OF BORING AT 161.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 71, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 121B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 122 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED JULY 12, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY R.A.J.
COORDINATES, NORTH 16,789.2 EAST 17,360.2 GROUND SURFACE ELEVATION 106.1'

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
L	100		1	◤	7 15 17	32	12	ML	CLAYEY SILT, SLIGHTLY PLASTIC, LESS THAN 5% VERY FINE SAND, LIGHT BROWN MOTTLED LIGHT GRAY, GRAYISH BROWN.
L/PH		10	2	◤	7 11 19	30	16	CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, LIGHT GRAY MOTTLED LIGHT BROWN, INTERBEDDED WITH FINE SAND.
	90		3	◤	10 17 21	38	17	CL	SIMILAR TO SS-2.
		20	4	◤	5 36 40	76	17	ML SM	5.0" SANDY SILT, SLIGHTLY PLASTIC, 5-10% FINE SAND, DARK BROWN, 4.0" LAYER HIGHLY PLASTIC DARK BROWN TO BLACK CLAY. 9.0" SILTY SAND, UNIFORM, VERY FINE SAND, 20-30% SLIGHTLY PLASTIC FINES, LIGHT GRAY.
PH/S	80		5	◤	28 35 39	74	12	SP	SAND, UNIFORM, VERY FINE, CLEAN, DRY, WHITE.
		30	6	◤	8 8 9	17	12	SC	CLAYEY SAND, VERY FINE SAND, 10-20% SLIGHTLY PLASTIC FINES, GRAYISH WHITE INTERLAYERED WITH VERY LIGHT YELLOWISH BROWN.
	70		7	◤	6 9 10	19	16	SC	SIMILAR TO SS-6 WITH SMALL SILTY CLAY LENSES FOR 2-3" AND SOME MOTTLED BROWNISH ORANGE.
		40	8	◤	27 17 18	35	10	SC-SP	CLAYEY SAND, WIDELY GRADED, 15-25% GRAVEL TO 0.5", 10-20% SLIGHTLY PLASTIC FINES, GRAYISH BROWN, MOTTLED MEDIUM GRAY, SMALL POCKETS OF SANDY CLAY AND SANDY CLAY STUCK TO GRAVEL.
	60		9	◤	13 21 25	46	11	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, BRIGHT BROWNISH ORANGE.
		50	10	◤	12 23 25	48			NO RECOVERY.
	50		11	◤	40 50/5"	50/5"	5	GP-GW	SANDY GRAVEL, WIDELY GRADED GRAVEL TO 1.0", 15-25% MOSTLY MEDIUM AND COARSE SAND, GRAYISH BROWN, POCKET AND OR BALLS OF CLAY AND SANDY CLAY.
S/BC		60	12	◤	8 9 13	22	16	SP	SAND, FINE, LESS THAN 5% PLASTIC FINES, GRAYISH AND ORANGY BROWN, FEW 1.0" POCKETS OF GRAY CLAY AND CLAYEY SAND.
	40		13	◤	11 13 13	26	12	SP	SIMILAR TO SS-12.
		70	14	◤	13 26 30	56	13	SP	SIMILAR TO SS-12, WITH FEW LAMINATIONS TO 2" LAYERS OF FINE AND MEDIUM BROWNISH ORANGE SAND.
	30		15	◤	23 30 38	68	12	SP	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, LIGHT GRAYISH BROWN; MANY 0.1" LAMINATIONS OF GRAY SANDY CLAY AND CLAYEY SAND AND BROWNISH ORANGE FINE TO MEDIUM SAND.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 22, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 122A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 122 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED JULY 14, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY R.A.J.
COORDINATES, NORTH 16,789.2 EAST 17,360.2 GROUND SURFACE ELEVATION 106.1'

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		80	16	◤	23 30 38	68	12	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, LIGHT GRAYISH BROWN.
			17	◤	27 50/7"	50/7"	9	SP	SIMILAR TO SS-16, WITH 0.5" LAYER, CLAYEY SAND AND 1.0" LAYER WIDELY GRADED SAND WITH SOME VERY FINE GRAVEL.
	20		18	◤	25 50/7"	50/7"	8	SP	SAND, MOSTLY FINE AND MEDIUM, LESS THAN 5% SLIGHTLY PLASTIC FINES, LIGHT GRAYISH BROWN, BOTTOM HAS SOME COARSE SAND AND VERY FINE GRAVEL.
		90	19	◤	19 42 50/3"	176/ 3"	10	SP	SAND, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, LIGHT BROWNISH YELLOW, SEVERAL LAMINATIONS OF MEDIUM SAND NEAR BOTTOM.
	10		20	◤	25 50/6"				NO RECOVERY.
			21	◤	24 50 80	130	12	SP	SAND, UNIFORM, FINE - MEDIUM, 5% COARSE SAND AND VERY FINE GRAVEL, LESS THAN 5% FINES, LIGHT BROWNISH ORANGE.
		100	22	◤	44 100/6"	100/6"	10	SP	SAND, FINE TO COARSE, MOSTLY FINE - MEDIUM, 5-10% GRAVEL TO 0.6". LIGHT BROWNISH ORANGE.
	0		23	◤	52 100/6"	100/6"	10	SP	SAND, MOSTLY UNIFORM, FINE, LIGHT GRAYISH BROWN, 2" LAYER MOSTLY COARSE SAND WITH SOME VERY FINE GRAVEL.
		110	24	◤	40 80/6"	80/6"	9	SP	SAND, MOSTLY UNIFORM, FINE, LIGHT BROWNISH GRAY, FEW COARSE SAND AND VERY FINE GRAVEL PARTICLES, ONE 1.0" GRAVEL.
	-10		25	◤	16 27 32	59	15	SP	SAND, UNIFORM, FINE, LESS THAN 5% COARSE SAND, LESS THAN 5% SLIGHTLY PLASTIC FINES, BROWNISH ORANGE BECOMING DEEP BROWNISH ORANGE.
		120	26	◤	17 29 32	61		SP	SAND, FINE, UNIFORM, BECOMING MOSTLY MEDIUM WITH SOME COARSE SAND AND VERY FINE GRAVEL, LESS THAN 5% SLIGHTLY PLASTIC FINES, LIGHT GRAYISH BROWN.
	-20		27	◤	28 34 36	70	6	SP	SAND, WIDELY GRADED, MOSTLY MEDIUM TO COARSE SAND, LESS THAN 5% VERY FINE GRAVEL, 5-10% SLIGHTLY PLASTIC FINES, LIGHT YELLOWISH BROWN.
		130	28	◤	17 23 30	53	7	SP-SW	SAND, WIDELY GRADED, FINE TO COARSE SAND, 5-10% FINE GRAVEL TO 0.5", LESS THAN 5% SLIGHTLY PLASTIC FINES, LIGHT BROWNISH ORANGE.
	-30		29	◤	29 37 31	68	10	SP-SW	SAND, WIDELY GRADED, MOSTLY MEDIUM, 5-10% FINE GRAVEL TO 0.5", LESS THAN 5% SLIGHTLY PLASTIC FINES, LIGHT BROWNISH ORANGE, FEW VERY SMALL POCKETS OF SLIGHTLY CLAYEY SAND.
		140	30	◤	10 15 20	35	9	SP	SAND, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 10-15% GRAVEL TO TO 0.75", LIGHT BROWN, FEW 0.5" CLAYEY BALLS OR POCKETS.
	-40		31	◤	20 22 25	47	8	SP-SW	SAND, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 5-10% GRAVEL TO 0.5", LESS THAN 5% SLIGHTLY PLASTIC FINES, LIGHT BROWNISH ORANGE.
BC/PC		150	32	◤	7 10 14	24	18	CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 5-10% VERY FINE SAND, TOP LIGHT YELLOWISH BROWN MOTTLED LIGHT GREENISH GRAY, SPECKLED WITH DARK BROWN BOTTOM - LIGHT GREENISH GRAY MOTTLED LIGHT YELLOWISH BROWN SPECKLED WITH DARK BROWN.
	-50		33	◤	17 29 42	71	18	GC	GRAVELLY CLAY (POSSIBLY GRAVEL WASHINGS IN WHICH CLAY WAS FORCED INTO WHEN SPOON FILLED), MODERATELY PLASTIC, 20-30% FINE GRAVEL TO TO 0.75", 10-15% MOSTLY MEDIUM AND COARSE SAND, GRAYISH BROWN, NO DEFINITE STRUCTURE, CHANGING TO SANDY CLAY, MODERATELY PLASTIC, 15-25% MOSTLY FINE SAND, YELLOWISH BROWN, CHANGING TO SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 5-10% VERY FINE SAND, LIGHT GREENISH GRAY MOTTLED ORANGE (SAND LENSES) AND SPECKLED AND MOTTLED DARK BROWN.
		160							

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 22, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 122B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 122 TYPE OF BORING DRIVE SHEET 3 OF 3
DATE DRILLED JULY 17, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY R.A.J.
COORDINATES, NORTH 16,789.2 EAST 17,360.2 GROUND SURFACE ELEVATION 106.1'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-55.6	161.5	34	◤	11 18 24	42	15	ML	SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, LIGHT GREENISH GRAY, 2.0" LAYER SILTY VERY FINE SAND.
								END OF BORING AT 161.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 22, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 122C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 123
DATE DRILLED AUGUST 28, 1972
COORDINATES, NORTH 16,823.5
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG CO
EAST 17,204.2
SHEET 1 OF 2
LOGGED BY T.I.B.
GROUND SURFACE ELEVATION 97.7

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		1	◤	11 15 11	26	10	ML	CLAYEY SILT, NONPLASTIC TO SLIGHTLY PLASTIC, LESS THAN 5% UNIFORM FINE SAND, LIGHT YELLOWISH BROWN (10YR 6/3), WITH SOME SMALL BROWN FeOx NODULES.
		2	◤	8 12 20	32	13	ML	CLAYEY SILT, NONPLASTIC, DARK YELLOWISH ORANGE (10YR 6/6), WITH VERY THIN DISCONTINOUS LAYERS AND POCKETS OF MEDIUM GRAY (N5) CLAY AND WITH 1.0 INCH THICK POCKET/LAYER OF VERY LIGHT GRAY (N8) UNIFORM VERY FINE SAND AT BOTTOM.
		3	◤	13 17 20	37	9	SP	SAND, UNIFORM, VERY FINE TO FINE, LESS THAN 1% FINES (CLEAN), DRY, LIGHT PINKISH GRAY (5YR 9/1).
		4	◤	8 14 21	35	10	SP	SAND, UNIFORM, FINE , LESS THAN 1% FINES, VERY THINLY LAYERED, DIP - 20 - 25°, PALE YELLOWISH BROWN (10YR 6/2), AND GRAYISH ORANGE PINK (5YR 7/2), TOP PORTION OF SAMPLE SHOWS NO COLOR BANDING.
		5	◤	6 6 6	12	8	SP-SM SP	TOP 4.0 INCH-GRAVELLY SAND, WIDELY GRADED, 10-20% GRAVEL TO 0.6 INCH MAXIMUM, LESS THAN 1% FINES (EXCLUDING CLAY BALL), LIGHT OLIVE GRAY (5Y 7/1), WITH HIGHLY PLASTIC YELLOWISH GRAY CLAY BALL. BOTTOM 4.0 INCH - SAND, UNIFORM FINE, 3-5% MEDIUM, 3-7% SLIGHTLY PLASTIC FINES, THINLY LAYERED BRIGHT YELLOWISH ORANGE (10YR 6/6), LIGHT GRAYISH ORANGE (10YR 8/4), WITH THIN IRREGULAR LAYERS YELLOWISH GRAY (5Y 8/1) CLAY.
		6	◤	5 5 8	13	12	SP	SAND, UNIFORM, FINE, 5-10% MEDIUM TO COARSE, LESS THAN 1% GRAVEL TO 0.4 INCH MAXIMUM 3-7% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10YR 6/6 TO 10YR 8/6). CLAY BALLS AND FLAKES, HIGHLY PLASTIC, STICKY, DARK YELLOWISH ORANGE (10YR 6/6), MIXED THROUGH SAMPLE.
		7	◤	5 8 7	15	14	SP	SAND, UNIFORM, FINE, 5-10% MEDIUM TO COARSE, 1-2% GRAVEL TO 0.6 INCH MAXIMUM, 3-6% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10YR 6/6), WITH VERY THIN LAYERS YELLOWISH GRAY (5Y 8/1), TO VERY LIGHT GRAY (N8), WITH VERY THIN TO THIN SUBHORIZONTAL LAYERS OF CLAYEY FINE SAND AND GRAVELLY MEDIUM TO COARSE SAND..
		8	◤	1 3 4	7	12	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES (MOSTLY CLAY), DARK YELLOWISH ORANGE (10YR 6/6), WITH THIN SUBHORIZONTAL LAYERS OF HIGHLY PLASTIC, YELLOWISH ORANGE OF MEDIUM SAND WITH LESS THAN 1% GRAVEL TO 0.5 INCH MAXIMUM.
		9	◤	13 19 10	29	10	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 10-20% GRAVEL TO 0.9 INCH MAXIMUM, 2-3% FINES, BRIGHT YELLOWISH ORANGE (10YR 6/6), WITH VERY THIN YELLOWISH ORANGE CLAY LAYER.
		10	◤	11 12 19	31	11	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 8-12% GRAVEL TO 0.7 INCH MAXIMUM, 3-4% FINES, BRIGHT YELLOWISH ORANGE (10YR 6/6).
		11	◤	6 9 11	20	14	SP	SAND, UNIFORM, FINE 1-3% FINES, GRAYISH ORANGE (10YR 7/5), SOMEWHAT RESEMBLES A DILATENT SILT.
		12	◤	11 22 29	51	11	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 8-12% GRAVEL TO 0.6 INCH MAXIMUM, GRAYISH ORANGE (10YR 7/5), 1-2% FINES.
		13	◤	16 43 53	96	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM AT TOP, TO MOSTLY FINE TO MEDIUM AT BOTTOM, 3-5% GRAVEL TO 0.8 INCH MAXIMUM, 1% FINES, MODERATE YELLOWISH BROWN (10YR 5/4).
		14	◤	21 55 60	115	9	SP SP	TOP 4.0 INCH ± - SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 20-30% GRAVEL TO 0.9 INCH MAXIMUM, LESS THAN 1% FINES, GRAYISH ORANGE (10YR 7/4). BOTTOM 5.0 INCH ± - SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, LESS THAN 1% FINES, SAME COLOR AS TOP 4 INCH.
		15	◤	18 37 41	78	4	SP	SAND, UNIFORM, FINE, 8-10% MEDIUM TO COARSE, 2-3% GRAVEL TO 0.4 INCH MAXIMUM, LESS THAN 1% FINES YELLOWISH ORANGE (10YR 7/6) WITH SOME (10YR 6/6).
		16	◤	29 54 60	114	9	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 25 TO 35% GRAVEL TO 0.9 INCH MAXIMUM, 1-3% FINES, MODERATE BROWN (5YR 3/4 TO 4/4).

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. E. GREENWOOD
DATE DECEMBER 15, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 123A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 123
DATE DRILLED
COORDINATES, NORTH 16,823.5
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG CO
EAST 17,204.2
SHEET 2 OF 2
LOGGED BY T.I.B.
GROUND SURFACE ELEVATION 97.7

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		17	◤	24 31 43	74	12	SP	SAND, UNIFORM, FINE , LESS THAN 1% MEDIUM TO COARSE, LESS THAN 1% FINES, YELLOWISH GRAY (5Y 7/2).
		18	◤	24 34 50	84	11	SP SP	TOP 7 INCH - SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 1-4% GRAVEL TO 0.4 INCH MAXIMUM, LESS THAN 1% FINES, YELLOWISH BROWN (10YR 6/3). BOTTOM 4 INCH - SAND, UNIFORM, FINE, 1-3% MEDIUM, LESS THAN 1% FINES, GRAYISH ORANGE (10YR 7/3).
		19	◤	28 44 56	100	11	SP	SAND, POORLY GRADED, FINE TO COARSE MOSTLY FINE TO MEDIUM, 2-5% GRAVEL TO 0.6 INCH MAXIMUM, LESS THAN 1% FINES (CLEAN) YELLOWISH GRAY (5Y 8/1).
		20	◤	25 50/5"	50/5"	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 5-10% GRAVEL TO 0.7 INCH MAXIMUM, LESS THAN 1% FINES, YELLOWISH GRAY (5Y 7/2), WITH SMALL MEDIUM BLUISH GRAY MOTTLES WITH TRACE OF ORGANIC MATERIAL.
		21	◤	38 50/5"	50/5"	7	SP	SAND, UNIFORM, FINE, 5-10% MEDIUM TO COARSE, 2-4% GRAVEL TO 0.5 INCH MAXIMUM, LESS THAN 1% FINES, YELLOWISH GRAY (5Y 7/2).
		22	◤	21 25 29	54	12	SP	SAND, UNIFORM, FINE, 3-5% MEDIUM, LESS THAN 1% FINES, YELLOWISH GRAY (5Y 6/2), WITH BLACK ORGANIC SPOTS AND MOTTLES (AT TOP) TO OLIVE GRAY (5Y 4/1), WITH MUCH BLACK ORGANIC MATERIAL.
		23	◤	19 25 28	53	10	SP	SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM TO COARSE, LESS THAN 1% GRAVEL TO 0.3 INCH MAXIMUM, 1-3% FINES, DARK TO BRIGHT YELLOWISH ORANGE (10YR 6/6).
		24	◤	11 22 21	43	7	GP-SP	SANDY GRAVEL, POORLY GRADED, 40-50% MEDIUM TO COARSE SAND, 1-2% FINES, (EXCLUDING POCKET OF CLAYEY SAND), YELLOWISH BROWN (10YR-6/4), WITH POCKET OF CLAYEY SAND. GRAVEL TO 0.8 INCH MAXIMUM.
		25	◤	12 16 18	34	8	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY COARSE, LESS THAN 3% FINE, 35-45% GRAVEL TO 0.8 INCH MAXIMUM, 2-4% FINES, YELLOWISH BROWN (10YR 6/4), WITH VERY THIN POCKET/LAYER OF CLAY.
		26	◤	11 21 25	46	9	GP-SP	SANDY GRAVEL, POORLY GRADED, GRAVEL TO 0.7 INCH MAXIMUM, 40-50% MEDIUM TO COARSE SAND, 3-5% FINES (EXCLUDING 1.0 ± INCH LAYER OF GRAVEL WITH HIGHLY PLASTIC YELLOWISH GRAY CLAY MATRIX), GRAYISH ORANGE (10YR 7/4).
		27	◤	14 11 23	44	11	CL GP	TOP ± 4.0 INCH: GRAVELLY CLAY, HIGHLY PLASTIC, 20-25% GRAVEL TO 0.75 INCH MAXIMUM, 4-6% FINE SAND, YELLOWISH GRAY (5Y 7/2), BOTTOM ± 7.0 INCH: SANDY GRAVEL, POORLY GRADED, GRAVEL TO 0.7 INCH MAXIMUM, 35-40% FINE TO COARSE SAND, MOSTLY MEDIUM TO COARSE, 3-5% FINES, GRAYISH ORANGE (10YR 7/3).
		28	◤	6 17 15	32	15	SC CH CL	6.0 INCH: CLAYEY SAND, UNIFORM, FINE, 10-15% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5Y 7/2), WITH VERY THIN YELLOWISH ORANGE BANDS, 4.0 INCH: SILTY CLAY, HIGHLY PLASTIC, YELLOWISH GRAY (5Y7/2) WITH VERY THIN SUBHORIZONTAL YELLOWISH LAYERS, 5.0 INCH: GRAVELLY CLAY, HIGHLY PLASTIC CLAY MATRIX, 25-35% GRAVEL TO 1.0 INCH MAXIMUM, 20-25% FINE SAND AND LESS THAN 5% MEDIUM TO COARSE SAND, (INCLUDING THIN LAYER CLAYEY SAND), YELLOWISH GRAY (5Y 7/2), WITH SOME YELLOWISH ORANGE MOTTLING.
		29	◤	10 16 23	39	16	CH	SILTY CLAY, HIGHLY PLASTIC, VERY STIFF, GREENISH GRAY (5GY 6/1), WITH MANY SMALL YELLOWISH ORANGE (FeOx) MOTTLES AND SOFT NODULES, WITH SMALL BLACK (MnO_2) MOTTLES.
		30	◤	11 17 20	37	16	CH	SILTY CLAY, HIGHLY PLASTIC, VERY STIFF, LIGHT OLIVE GRAY (5Y 6/1) WITH FEW SMALL YELLOWISH ORANGE (FeOx) MOTTLES AND NODULES AND TRACE OF BLACK (MnO_2) SPOTS.
-58.8	156.5	31	◤	14 18 23	41	16	CL-ML	SANDY CLAY - SANDY SILT, SLIGHTLY PLASTIC, 15-25% UNIFORM VERY FINE SAND GREENISH GRAY (5G 6/1).
								END OF BORING AT 156.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. E. GREENWOOD
DATE DECEMBER 16, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 123B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 124
DATE DRILLED 9-14-72
COORDINATES, NORTH 16,434.4
TYPE OF BORING DRIVE/CORE
DRILLING COMPANY - EUSTIS ENGRG CO
EAST 17,941.4
SHEET 1 OF 3
LOGGED BY D.F.F. & R.A.J.
GROUND SURFACE ELEVATION 103.7

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		1	◤	8 15 16	31	7	ML	SILT, NONPLASTIC, LIGHT BROWN (5YR 5/6), MOTTLED LIGHT GRAY (N7).
		2	◤	5 9 11	20	7	ML	CLAYEY SILT, SLIGHTLY PLASTIC YELLOWISH GRAY (5Y 7/2), WITH TRACE OF DARK YELLOWISH ORANGE (10YR 6/6), BECOMES SANDY SILT IN TIP, NONPLASTIC, 10-15% VERY FINE SAND, SAME COLOR.
		3	◤	4 5 6	11	12	CL	SILTY CLAY, MODERATE PLASTIC, MEDIUM BROWNISH GRAY (5YR 5/1), MOTTLED LIGHT GRAY (N7), SEAMS AND POCKETS OF NONPLASTIC SILT.
		4	◤	14 16 16	32	9	ML	SILT, NONPLASTIC AND COARSE, DRY, VERY LIGHT GRAY (N8).
		5	◤	13 23 23	46	13	SM SP	SILTY SAND, UNIFORM, VERY FINE, 10-15% NONPLASTIC FINES, YELLOWISH GRAY (5Y 7/2), BECOMES SAND, UNIFORM, FINE, CLEAN, GRAYISH YELLOW (5Y 8/4).
		6	◤	7 7 8	15	13	SP-SC	SAND, UNIFORM, FINE, 7-12% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10YR 7/6), WITH GRAYISH ORANGE (10YR 7/4) BANDING, FEW GRAVEL TO 0.4 INCH, CLAYEY SAND IN TIP.
		7	◤	4 6 6	12	13	SC	SIMILAR TO SS-7, BUT 10-15% MODERATE PLASTIC FINES.
		8	◤	6 7 8	15	12	SP	SAND, UNIFORM, FINE, 5-10% MODERATE PLASTIC FINES, DARK YELLOWISH ORANGE (10YR 6/6), WITH TRACE OF PINK.
		9	◤	7 7 9	16	10	SP	SIMILAR TO SS-8, BUT GRAYISH ORANGE (10YR 7/4), WITH TRACE OF PINK.
		10	◤	20 30 57	87	9	SP	SAND, MOSTLY UNIFORM FINE-MEDIUM, LESS THAN 5% GRAVEL TO 0.5 INCH, LESS THAN 5% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10YR 6/6).
		11	◤	24 25 45	70	9	SP	SAND, FINE TO COARSE, MOSTLY FINE-MEDIUM AND MEDIUM, LESS THAN 5% FINE GRAVEL TO 0.4 INCH, LESS THAN 5% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10YR 6/6), TO CLAYEY SAND BALLS TO 1.0 INCH.
		12	◤	5 17 18	35	10	SP	SAND, MOSTLY UNIFORM FINE-MEDIUM, 5-10% SLIGHTLY PLASTIC FINES, LESS THAN 5% COARSE SAND AND FINE GRAVEL TO 0.4 INCH, LIGHT BROWN (5YR-5/6), WITH TRACE OF PINK, ONE 3.0 INCH MODERATE RED (5R 4/6), SANDY-CLAY LAYER OR BALL AND SEVERAL SANDY CLAY BALL TO 0.5 INCH.
		13	◤	14 14 22	36	9	SP	SAND, UNIFORM, FINE, 3-8% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10YR 6/6) WITH A TRACE OF PINK, ONE LAMINATION OF GRAVEL FRAGMENTS TO 0.5 INCH.
		14	◤	26 22 22	44	11	SP	GRAVELLY SAND, FINE TO COARSE SAND, MOSTLY UNIFORM FINE, 25-35% FINE GRAVEL TO 0.6 INCH, 5-10% MODERATE PLASTIC FINES, DARK YELLOWISH ORANGE (10YR 6/6).
		15	◤	12 24 27	51	8	SP	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10YR 7/6), GRAVEL TO 1.0 INCH OCCURRING IN TWO 1.0 INCH LAYERS.
		16	◤	21 25 32	57	9	SP	SAND, UNIFORM FINE AND FINE-MEDIUM, LESS THAN 5% FINE GRAVEL TO 0.4 INCH, LESS THAN 5% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10YR-7/6).

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D.E. GREENWOOD
DATE DECEMBER 29, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 124 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 124
DATE DRILLED 9/15/72
COORDINATES, NORTH 16,434.4
TYPE OF BORING DRIVE/CORE
DRILLING COMPANY - EUSTIS ENGRG CO
EAST 17,941.4
SHEET 2 OF 3
LOGGED BY D.F.F.,R.A.J.
GROUND SURFACE ELEVATION 103.7

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		17	◤	20 30 35	57	9	SP	SAND, FINE TO COARSE MOSTLY MEDIUM, 5-10% FINE GRAVEL TO 0.5 INCH, LESS THAN 5% SLIGHTLY PLASTIC FINES WITH 10-15% MODERATE PLASTIC FINES IN ZONES NEAR BOTTOM, BRIGHT YELLOWISH ORANGE (10YR 6/6), ONE 2.0 INCH LAYER COARSE SAND.
		18	◤	30 43 38	81	13	SP	SAND, MOSTLY UNIFORM FINE AND FINE-MEDIUM, LESS THAN 5% COARSE SAND AND FINE GRAVEL TO 0.4 INCH, CLEAN, GRAYISH ORANGE (10YR 7/4).
		19	◤	40 40 40	80	15	SP	SIMILAR TO SS-18.
		20	◤	23 28 37	65	10	SP	SAND, UNIFORM, FINE, CLEAN, LESS THAN 3% FINE GRAVEL TO 0.4 INCH, YELLOWISH ORANGE (10YR 7/6).
		21	◤	17 28 38	66	10	SP	SAND, MOSTLY FINE-UNIFORM, CLEAN, GRAYISH ORANGE (10YR 7/4), FEW 0.25-.05" CLAYEY SAND BALLS.
		22	◤	25 28 26	54	10	SP	SAND, MOSTLY MEDIUM, LESS THAN 5% FINE GRAVEL TO 0.3 INCH, LESS THAN 3% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10YR 7/6), FEW CLAYEY SAND BALLS TO 0.8 INCH.
		23	◤	17 20 16	36	17	SP-SC	SANDY GRAVEL, POORLY GRADED, GRAVEL TO 0.5 INCH MAXIMUM, 15-20% MEDIUM SAND, 10-12% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10YR 6/6).
		24	◤	17 28 38	66	17	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 10-15% GRAVEL TO 0.4 INCH MAXIMUM, 8-12% MODERATELY PLASTIC FINES, PALE YELLOWISH ORANGE (10YR 8/6).
		25	◤	28 33 54	87	28	SP	SAND, POORLY GRADED, MOSTLY FINE TO MEDIUM, 5-7% SLIGHTLY PLASTIC FINES, 3% GRAVEL TO 0.5 INCH MAXIMUM, GRAYISH ORANGE (10YR 7/9).
		26	◤	23 50/6"	50/6"	23	SP	SAND, POORLY GRADED, FINE TO COARSE, LESS THAN 4% COARSE, 3% GRAVEL TO 0.5 INCH MAXIMUM, 6-11% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10YR 7/4).
		27	◤	6 6 10	16	6	SP	SANDY GRAVEL, POORLY GRADED, TO 1.0 INCH MAXIMUM, 15-20% FINE TO MEDIUM SAND, 10-15% HIGHLY PLASTIC FINES, DARK YELLOWISH ORANGE (10YR 6/6), CLAY COATING ON MOST PIECES OF GRAVEL.
		28	◤	7 8 11	19	10	SC	SANDY CLAY, MODERATELY TO HIGHLY PLASTIC, STIFF, 20-25% FINE TO MEDIUM SAND, GRAYISH ORANGE (10YR 7/4) AND MODERATE PINK (5R 7/4), WITH CLAY POCKETS.
		29	◤	11 12 15	27	14	SM	SILTY SAND, UNIFORM FINE, 2-3% MEDIUM SAND, 15-20% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10YR 6/6), GRAYISH PINK (5R 8/2), CLAY LAYER APPROXIMATELY 0.5 INCH THICK.
		30	◤	7 10 18	28	13	SM	SILTY SAND, UNIFORM, FINE, 15-20% MODERATELY PLASTIC FINES MOTTLED VERY PALE ORANGE (10YR 8/2), DARK YELLOWISH ORANGE (10YR 6/6).
		31	◤	6 7 11	18	14	SM	SAME AS SS-30.
		32	◤	4 6 8	14	21	ML	CLAYEY SILT, MODERATELY PLASTIC, 7-10% FINE SAND, FEW OXIDIZED IRON BALLS 0.1 INCH IN SIZE, MOTTLED LIGHT GRAY (N7), YELLOWISH GRAY (5Y 7/2).

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D.E. GREENWOOD
DATE DECEMBER 29,1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 124 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 124
TYPE OF BORING DRIVE/CORE
SHEET 3 OF 3
DATE DRILLED
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY D.P.P. & R.A.J.
COORDINATES, NORTH 16,434.4
EAST 17,941.4
GROUND SURFACE ELEVATION 103.7

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-60								
		33	◤	4 6 8	14	20	CL-CH	SILTY CLAY, MODERATELY PLASTIC, 1-2% VERY FINE SAND, YELLOWISH GRAY (5Y 7/2), WITH DARK YELLOWISH ORANGE (10YR 6/6) LENSES.
-67.8	171.5	34	◤	6 8 11	19	24	ML-MH	CLAYEY SILT, MODERATELY TO HIGHLY PLASTIC, 1-3% VERY FINE SAND, YELLOWISH GRAY (5Y 7/2), WITH PALE OLIVE CLAY (10Y 6/2) POCKETS.
								END OF BORING AT 171.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D.F. GREENWOOD
DATE DECEMBER 29, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 124 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 125
TYPE OF BORING DRIVE
SHEET 1 OF 3
DATE DRILLED AUG. 8-11, 14, 1972
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY R.A.J.
COORDINATES, NORTH 16,483.3
EAST 17,744.9
GROUND SURFACE ELEVATION 108.1'

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
L									
			1	◤	2 4 5	9	15	ML	SILT, SLIGHTLY PLASTIC, MODERATE BROWN (5 YR 4/4) AND LIGHT GRAY (N7).
	100								
L/PH		10							
			2	◤	3 3 4	7	16	ML	SILT, SLIGHTLY PLASTIC, LIGHT GRAY (N7) MOTTLED BRIGHT YELLOWISH ORANGE (10 YR 6/6).
			3	◤	4 7 9	16	16	CL	SILTY CLAY, SLIGHTLY PLASTIC, YELLOWISH GRAY (5 Y 7/2).
	90								
		20							
			4	◤	4 5 7	12	16	CL	SIMILAR TO SS3. ALSO LIGHT OLIVE GRAY (5 Y 6/1).
			5	◤	2 3 3	6	15	CL	SILTY CLAY, VERY SILTY YELLOWISH GRAY CLAY CHANGING TO DARK YELLOWISH BROWN (10 YR 4/2) SLIGHTLY TO MODERATELY PLASTIC SILTY CLAY, SOME BLACK MOTTLING.
	80								
PH/S		30							
			6	◤	40 36 25	61	14	SM	SILTY SAND, MOSTLY UNIFORM VERY FINE SAND, 10-20% NONPLASTIC FINES, LIGHT BROWNISH GRAY (5 YR 6/1).
			7	◤	5 10 6	16	10	SP	SAND, UNIFORM, FINE, LESS THAN 5 % SLIGHTLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6), ONE 4.0 IN. LAYER MEDIUM LIGHT GRAY (N6) SANDY CLAY.
	70								
		40							
			8	◤	6 8 9	17	10	SP	SAND, FINE TO COARSE, 5-10% FINE GRAVEL TO 0.4 IN., LESS THAN 5% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) FEW 0.5-0.75 IN. CLAYEY SAND AND CLAY BALLS.
			9	◤	15 42 50	92	12	SP	SAND, UNIFORM, MOSTLY FINE, CLEAN, BRIGHT YELLOWISH ORANGE (10 YR 6/6).
	60								
		50							
			10	◤	30 33 27	60	12	SP	SAND, MOSTLY UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), FEW CLAYEY SAND POCKETS.
			11	◤	24 33 36	69	6	SP	SAND, UNIFORM, FINE CLEAN, LESS THAN 5% MEDIUM AND COARSE SAND, GRAYISH ORANGE (10 YR 7/4), ONE 0.75 IN. GRAVEL.
	50								
S/BC		60							
			12	◤	25 56 49	105	10	SP	SAND, FINE TO COARSE, MOSTLY FINE, 5-10% GRAVEL TO 0.4 IN., LESS THAN 5% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6), FEW 0.5 IN. BALLS SANDY CLAY.
			13	◤	17 27 28	55	10	SP	SAND, FINE TO COARSE, MOSTLY UNIFORM FINE, LESS THAN 5% FINE GRAVEL TO 0.4 IN., LESS THAN 5% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), FEW 0.3 IN. POCKETS OR BALLS OF MODERATE ORANGE PINK (10 R 7/4) CLAY.
	40								
		70							
			14	◤	7 12 18	30	15	SP	SAND, FINE, UNIFORM, 5-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
			15	◤	10 14 13	27	15	SP	SIMILAR TO SS14 BUT LESS FINES, AND LESS THAN 5% MEDIUM SAND.
	30								
		80							
			16	◤	6 11 34	45	8	SP	SAND, UNIFORM, FINE, LESS THAN 5% MEDIUM SAND, LESS THAN 5% SLIGHTLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/7)

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE JANUARY 11, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 125 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 125
TYPE OF BORING DRIVE
SHEET 2 OF 3
DATE DRILLED AUG. 8-11, 14, 1972
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY R.A.J.
COORDINATES, NORTH 16,483.3
EAST 17,744.9
GROUND SURFACE ELEVATION 108.1'

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			17	◤	16 60/6"	60/6"	8	SP	SAND, UNIFORM, FINE, CLEAN, PALE YELLOWISH ORANGE (10 YR 8/7).
	20								
		90							
			18	◤	30 38 49	87	12	SP	SAND, UNIFORM, FINE, LESS THAN 5% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
			19	◤	40 76/6"	76/6"	9	SP	SIMILAR TO SS18 WITH SOME COARSE SAND AND VERY FINE GRAVEL AT TOP AND BOTTOM.
	10								
		100							
			20	◤	42 50/6"	50/6"	8	SP	SAND, UNIFORM, FINE, CLEAN, 10-15% COARSE SAND, YELLOWISH ORANGE (10 YR 7/6).
			21	◤	19 25 32	57	8	SP	SAND, MOSTLY UNIFORM FINE, CLEAN, LESS THAN 5% FINE GRAVEL TO 0.3 IN., YELLOWISH ORANGE (10 YR 7/6).
	0								
		110							
			22	◤	47 53/6"	53/6"	8	SP	SIMILAR TO SS21 BUT GRAYISH ORANGE (10 YR 7/4).
			23	◤	21 25 17	32	10	SP	SAND, MOSTLY FINE, CLEAN, GRAYISH ORANGE (10 YR 7/4), BECOMES GRAVELLY SAND, MOSTLY MEDIUM AND COARSE SAND, CLEAN 25-35% FINE GRAVEL TO 0.5 IN., SAME COLOR.
	-10								
		120							
			24	◤	20 19 23	42	8	SP	GRAVELLY SAND, MOSTLY MEDIUM AND COARSE SAND, 10-20% FINE GRAVEL TO 0.4 IN., LESS THAN 5% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), FEW CLAYEY ZONES.
			25	◤	21 19 19	38	6	SP	GRAVELLY SAND, MOSTLY MEDIUM AND COARSE SAND, 10-15% FINE GRAVEL TO 0.5 IN., LESS THAN 5% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
	-20								
		130							
			26	◤	21 26 29	55	8	SP	SAND, FINE TO COARSE, MOSTLY MEDIUM, CLEAN, GRAYISH YELLOW (5 Y 8/4), FEW VERY FINE GRAVEL PARTICLES.
			27	◤	30 37 39	76	6	SP	SAND, FINE TO COARSE, MOSTLY FINE, CLEAN, LESS THAN 5% FINE GRAVEL TO 0.4 IN., WHITE WITH SOME DARK YELLOWISH ORANGE (10 YR 6/6).
	-30								
		140							
			28	◤	17 18 19	37			NO RECOVERY
			29	◤	72 75/6"	75/6"			NO RECOVERY
			30	◤	28 27 22	49	8	SP	SAND, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, CLEAN, 5-10% FINE GRAVEL TO 0.4 IN., GRAYISH ORANGE (10 YR 7/4), 1.5 IN. CLAY BALL WITH IMBEDDED SAND AND GRAVEL.
	-40								
		150							
			31	◤	12 13 15	28	10	GC	CLAYEY GRAVEL, GRAVEL TO 0.75 IN., 10-15% FINE TO COARSE SAND, 30-40% MODERATELY PLASTIC FINES, GREENISH GRAY (5 GY 6/1), GRAVEL AND SAND IMBEDDED THROUGHOUT, POSSIBLE CLAY BOULDER.
BC/PC									
			32	◤	8 11 12	23	15	SP	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2), SPECKLED WITH BLACK FINE SAND.
	-50								
		160							
			33	◤	11 14 15	29	15	SP	SIMILAR TO SS32.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE JANUARY 11, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 125 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 125
TYPE OF BORING DRIVE
SHEET 3 OF 3
DATE DRILLED AUG. 8-11, 14, 1972
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY R.A.J.
COORDINATES, NORTH 16,483.3
EAST 17,744.9
GROUND SURFACE ELEVATION 108.1'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		34	◤	14 18 30	48			NO RECOVERY
		35	◤	15 19 26	45	16	CL	SANDY CLAY, MODERATELY PLASTIC, 10-20% FINE SAND, YELLOWISH GRAY (5 Y 7/1) HEAVILY MOTTLED WITH BRIGHT YELLOWISH ORANGE (10 YR 6/6).
-40								
	170							
		36	◤	8 13 14	27	18	CL	SANDY CLAY, SLIGHTLY PLASTIC, 10-20% VERY FINE SAND, PALE GREENISH YELLOW (10 Y 8/2).
		37	◤	7 14 18	32	18	SC	CLAYEY SAND, EXTREMELY FINE SAND, 15-25% SLIGHTLY PLASTIC FINES, PALE GREENISH YELLOW (10 Y 8/2), 2.0 IN. LAYER FINE SILTY SAND. END OF BORING.
								END OF BORING AT 176.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE JANUARY 11, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 125 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 126 | TYPE OF BORING DRIVE | SHEET 1 OF 3
DATE DRILLED JULY 17, 1972 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY R.A.J.
COORDINATES, NORTH 16,607.9 | EAST 17,617.9 | GROUND SURFACE ELEVATION 108.5'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		1	◤	2 6 9	15	13	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, MEDIUM BROWN MOTTLED LIGHT GRAY, 0.5-1.0", POCKETS AND LENSES OF GRAY SILTY CLAY, SOME SANDY LENSES.
		2	◤	8 9 10	19	12	ML	SILT, NON TO SLIGHTLY PLASTIC, LESS THAN 5% VERY FINE SAND, LIGHT GRAYISH BROWN MOTTLED WHITE.
		3	◤	7 11 14	25	16	CL	SILTY CLAY, SLIGHTLY PLASTIC, LIGHT GRAYISH GREEN MOTTLED ORANGE AND LIGHT GRAY.
		4	◤	7 10 10	20	16	ML	CLAYEY SILT, SLIGHTLY PLASTIC, LESS THAN 5% VERY FINE SAND, LIGHT BROWNISH GRAY.
		5	◤	3 22 50/2.5"	42	16	CL	CLAY, MODERATELY PLASTIC, DARK BROWN WITH SEAMS AND POCKETS OF LIGHT GRAY CLAYEY SILT AND SOME BLACK MOTTLING, BECOMES SANDY CLAY THEN VERY FINE SILTY SAND.
		6	◤	10 6 12	18	16	SC	CLAYEY SAND AND SAND, GRAY CLAYEY SAND TOP 14" WITH 20-30% SLIGHTLY PLASTIC FINES AND ONE 2-3" LAYER CLEAN FINE SAND WITH ONE 0.5" GRAVEL, WITH LAYER GRAY UNIFORM FINE SAND WITH ORANGE MOTTLING AND ONE 0.75" GRAVEL.
		7	◤	2 3 4	7	16	CL	CLAY AND SANDY CLAY INTERLAYERED WITH SAND, GREENISH GRAY CLAY LAYERS AND POCKET 0.1-1.0", ORANGE SAND LAMINATIONS BETWEEN CLAY LAYERS.
		8	◤	5 6 8	14	15	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, LIGHT YELLOWISH BROWN WITH LIGHT GRAY MOTTLING.
		9	◤	6 7 7	14	15	SP	SIMILAR TO SS-8 BUT LESS THAN 5% SLIGHTLY PLASTIC FINES.
		10	◤	5 5 6	11	12	SP	SIMILAR TO SS-8, BUT LIGHT GRAY WITH LIGHT YELLOWISH BROWN BANDING.
		11	◤	3 5 6	11	17	SC	CLAYEY SAND, MOSTLY FINE UNIFORM SAND, 15-20% SLIGHTLY PLASTIC FINES, LIGHT YELLOWISH BROWN BANDED WITH BROWNISH ORANGE AND LIGHT GRAY, LAMINATIONS OF SAND, VERY CLAYEY SAND AND CLAY.
		12	◤	11 14 17	31	17	CS-SP	TOP 6.0" SANDY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 5-10% EMBEDDED FINE GRAVEL 0.5", 20-30% FINE UNIFORM SAND, LIGHT YELLOWISH BROWN; BOTTOM SAND, FINE, UNIFORM, 5-10% SLIGHTLY PLASTIC FINES, LIGHT BROWNISH ORANGE, SOME MEDIUM SAND.
		13	◤	4 6 8	14	13	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, LIGHT YELLOWISH BROWN WITH BROWNISH ORANGE AND LIGHT GRAY MOTTLING AND BANDING.
		14	◤	4 7 9	16	18	SP	SIMILAR TO SS-13 WITH SLIGHTLY LESS FINES.
		15	◤	3 6 11	17	14	SP	SIMILAR TO SS-13.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 22, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 126A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 126 | TYPE OF BORING DRIVE | SHEET 2 OF 3
DATE DRILLED JULY 17, 1972 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY R.A.J.
COORDINATES, NORTH 16,607.9 | EAST 17,617.9 | GROUND SURFACE ELEVATION 108.5'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		16	◤	7 7 10	17	18	SP	SIMILAR TO SS-13 WITH DEFINITE BANDING OF LIGHT GRAY AND FEW PARTICLES COARSE AND MEDIUM SAND.
		17	◤	13 11 8	19	14	CL	CLAYEY GRAVEL (TOP POSSIBLY GRAVEL FROM WASHINGS WHEN CLAY WAS FORCED INTO DURING SAMPLING), WIDELY GRADED, FINE GRAVEL TO 0.75" 15-20% FINE TO COARSE SAND, 15-20% SLIGHTLY PLASTIC FINES, LIGHT BROWN ORANGE CLAY OCCURING IN BALLS OR POCKETS WITH EMBEDDED SAND, WITH 3" UNIFORM SAND LAYER WITH CLAY LAMINATIONS CHANGING TO SANDY CLAY WITH EMBEDDED GRAVEL, 10-20% MOSTLY FINE SAND, LIGHT GRAY AND YELLOWISH BROWN, 5-10% EMBEDDED COARSE SAND.
		18	◤	23 24 27	51	15	SP	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, BROWNISH ORANGE TO BRIGHT ORANGE.
		19	◤	34 50/4.5"	50/4.5"	8	SP	SIMILAR TO SS-18, WITH 5-10% MEDIUM AND COARSE SAND.
		20	◤	38 50/4"	50/4"	8	SP	SAND, FINE TO COARSE, MOSTLY FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, DARK BROWNISH ORANGE.
		21	◤	23 44 50/5"	54	11	SP	SAND, UNIFORM, FINE, SOME MEDIUM AND COARSE SAND, LESS THAN 5% GRAVEL TO 0.5", LESS THAN 5% SLIGHTLY PLASTIC FINES, BROWNISH ORANGE.
		22	◤	36 50/5"	50/5"	8	SP	SIMILAR TO SS-21, BUT NO GRAVEL.
		23	◤	19 19 12	31	10	SP	SAND, UNIFORM, FINE, LESS THAN 5% FINES, LIGHT BROWNISH GRAY MOTTLED WITH DARK BROWN AND BLACK, CHANGING TO GRAVELLY SAND, WIDELY GRADED, MOSTLY COARSE SAND, 25-35% FINE GRAVEL TO 0.5", 5-10% SLIGHTLY PLASTIC FINES, SIMILAR COLOR.
		24	◤	15 21 27	48	10	SP	SAND, WIDELY GRADED, MOSTLY MEDIUM AND COARSE, 5-10% FINE GRAVEL TO 0.5" GRAY AND ORANGE.
		25	◤	18 26 32	58	10	SP	SIMILAR TO SS-24 WITH SOME SMALL (0.25-0.5") POCKETS OF CLAYEY SAND, CHANGING TO SAND, WIDELY GRADED, MOSTLY MEDIUM, LESS THAN 5% VERY FINE GRAVEL, LESS THAN 5% SLIGHTLY PLASTIC FINES, LIGHT GRAYISH BROWN WITH ORANGE.
		26	◤	47 50/4"	50/4"	9	SP	SAND, FINE TO MEDIUM, MOSTLY UNIFORM, FINE, LIGHT GRAYISH BROWN, 0.5" LAYER MEDIUM AND COARSE SAND WITH SOME VERY FINE GRAVEL.
		27	◤	37 50/4.5"	50/4.5"	10	SP	SAND, FINE TO COARSE SAND, MOSTLY UNIFORM, FINE, LESS THAN 2% GRAVEL TO 0.75", LIGHT GRAYISH BROWN.
		28	◤	30 44 50	94	13	SP	SAND, FINE TO COARSE, MOSTLY FINE, LIGHT GRAYISH BROWN, TWO 0.5" LAYERS CLAYEY SAND, FEW 0.75" GRAVEL.
		29	◤	19 36 40	76	10	SP	SAND, WIDELY GRADED, MOSTLY FINE, UNIFORM, 5-10% GRAVEL TO 0.5" LIGHT GRAYISH BROWN, 4.0" LAYER MOSTLY COARSE AND MEDIUM SAND.
		30	◤	13 20 19	39	11	SP-SW	SAND, WIDELY GRADED, MOSTLY MEDIUM AND COARSE SAND, 5-10% GRAVEL TO 1.0", LESS THAN 5% SLIGHTLY PLASTIC FINES, GRAYISH BROWN, BOTTOM OF SAMPLE CONTAINS CLAYEY SAND ZONES OR POCKETS.
		31	◤	9 9 9	18	17	CH-GP	ALTERNATING ZONES OF SANDY CLAY, HIGHLY PLASTIC, 15-20% MOSTLY FINE SAND, LIGHT GREENISH GRAY; CLAY EMBEDDED WITH GRAVEL UP TO 1.0" AND COARSE SAND AND; CLAY.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 22, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 126B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 126 | TYPE OF BORING DRIVE | SHEET 3 OF 3
DATE DRILLED JULY 17, 1972 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY R.A.J.
COORDINATES, NORTH 16,607.9 | EAST 17,617.9 | GROUND SURFACE ELEVATION 108.5'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		32	◤	8 12 12	24	21	CL	CLAY, HIGHLY PLASTIC, 5-10% MOSTLY FINE SAND, TOP - LIGHT GREENISH GRAY MOTTLED WITH BROWN AND ORANGE, BOTTOM - BRIGHT BROWNISH ORANGE MOTTLED WITH LIGHT GREENISH GRAY, SOME SMALL SANDY CLAY SEAMS THROUGHOUT.
-58	166.5	33	◤	7 9 12	21		CL & CH	CLAY AND SILTY CLAY, SLIGHTLY TO HIGHLY PLASTIC, 0-10% VERY FINE SAND, LIGHT GRAYISH BROWN AND LIGHT GRAY MOTTLED BROWNISH ORANGE 3-4" ZONES OR POCKETS OF CLAYEY SAND AND SANDY CLAY.
								END OF BORING AT 166.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 22, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 126C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 127 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED SEPTEMBER 13, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY D.F.P.
COORDINATES, NORTH 16,519.5 EAST 17,548.9 GROUND SURFACE ELEVATION 107.9'

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
L			1	◤	9 13 15	28	14	CL	SILTY CLAY, SLIGHTLY PLASTIC, LESS THAN 1% FINE SAND, MOTTLED LIGHT GRAY (N 7) AND DARK YELLOWISH ORANGE (10 YR 6/5).
L/PH			2	◤	10 15 21	36	18	CL-CH	SILTY CLAY, MODERATE TO HIGHLY PLASTIC, MOTTLED DARK YELLOWISH BROWN (10 YR 4/2), PALE YELLOWISH BROWN (10 YR 6/2), LIGHT OLIVE GRAY (5 Y 6/1) AND LIGHT GRAY.
			3	◤	7 11 16	27	18	CL	SILTY CLAY, MODERATELY PLASTIC, MOTTLED YELLOWISH GRAY (5 Y 7/2) AND DARK YELLOWISH ORANGE (10 YR 6/6).
			4	◤	6 9 11	20	17	CL	CLAY, MODERATELY PLASTIC, 4-6% FINE SAND, MOTTLED DUSKY BROWN (5 YR 2/2) WITH APPROXIMATELY 9" VERTICAL SILT FILLED, LIGHT GRAY JOINT, APPROXIMATELY 1/16"-1/4" THICK.
PH/S			5	◤	28 50/6"	50/6"	12	SM	SILTY SAND, UNIFORM, FINE, 20-25% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
			6	◤	20 31 46	77	13	SP	SAND, UNIFORM, VERY FINE, 10-20% NONPLASTIC FINES, VERY LIGHT GRAY (N 8).
			7	◤	3 4 6	10	16	CL	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, VERY THIN SAND LAYERS DIPPING 15-20°, LESS THAN 5% FINES MOTTLED MODERATE BROWN (5 YR 3/4 AND 5 YR 4/4), DARK YELLOWISH ORANGE (10 YR 6/6) AND VERY LIGHT GRAY (N 8).
			8	◤	6 8 13	21	12	SP	SAND, UNIFORM, 5-10% FINES, SLIGHTLY PLASTIC, DARK YELLOWISH ORANGE (10 YR 6/6) WITH DARK YELLOWISH ORANGE CLAY LAYER AND POCKET HIGHLY PLASTIC..
			9	◤	11 13 13	26	13	SP	SAND, UNIFORM, FINE, 1% GRAVEL TO 0.3" MAX. 2-4% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
			10	◤	9 12 17	29	14	SP	SAND, UNIFORM, FINE, LESS THAN 1% GRAVEL TO 0.5" MAX., 2-3% FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6).
			11	◤	8 12 15	27	13	SP	SAND, UNIFORM, FINE, 1-3% FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6) WITH TWO VERY THIN HORIZONTAL CLAYEY SAND LAYERS.
			12	◤	16 20 28	48	14	SP	SAND, POORLY GRADED, FINE - COARSE, MOSTLY FINE 1-2% FINES, YELLOWISH ORANGE (10 YR 6/6 - 7/6).
			13	◤	12 24 25	49	12	SP	SAND, POORLY GRADED, FINE - COARSE, LESS THAN 3% COARSE, 1-4% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
			14	◤	12 25 43	68	10	SP-SW	GRAVELLY SAND, WIDELY GRADED, 25-35% GRAVEL TO 0.8" MAX., 3-4% FINES, DARK YELLOWISH ORANGE (10 YR 6/6 - 5/6) FEW PIECES OF GRAVEL COATED WITH CLAY.
S/BC			15	◤	40 63/6"	63/6"	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 10-15% GRAVEL TO 0.7" MAX., 2-3% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
			16	◤	15 27 31	58	12	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 5-10% GRAVEL TO 0.5" MAX., 3-5% FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6).

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 4, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 127A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 127 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED SEPTEMBER 13, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY D.F.P.
COORDINATES, NORTH 16,519.5 EAST 17,548.9 GROUND SURFACE ELEVATION 107.9'

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
			17	◤	12 20 23	43	12	SP	SAND, UNIFORM, FINE TO MEDIUM, MOSTLY MEDIUM, LESS THAN 2% GRAVEL TO 0.6" MAX., 2-5% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
			18	◤	53 64/6"	64/6"	7	GP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 20-30% GRAVEL TO 1.0" MAX., 2-3% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
			19	◤	51 63/6"	63/6"	8	SP	SAND, MEDIUM TO COARSE, MOSTLY UNIFORM MEDIUM, 1-2% GRAVEL TO 0.4" MAX., 1-3% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
			20	◤	31 52/6"	52/6"	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 2-3% GRAVEL TO 0.7" MAX., 2-4% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
			21	◤	53 66/6"	66/6"	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 1-3% GRAVEL TO 0.6" MAX., 1-2% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
			22	◤	30 36 57	93	8	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 15-25% GRAVEL TO 0.7" MAX., 3-4% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
			23	◤	33 61/6"	61/6"	8	SP	SAND, POORLY GRADED, FINE TO MEDIUM, LESS THAN 6% COARSE, ONE PIECE OF GRAVEL 0.4" MAX. IN SIZE, 2-3% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
			24	◤	38 60/6"	60/6"	8	SP	SAND, UNIFORM, MEDIUM, ONE PIECE OF GRAVEL 0.8" IN SIZE, 1-2% FINES, GRAYISH ORANGE (10 YR 7/4).
			25	◤	11 18 12	30	6	GP	GRAVEL, POORLY GRADED TO 1.1" MAX., 10-20% MEDIUM SAND, 8-10% MODERATELY PLASTIC FINES, DARK YELLOWISH BROWN (10 YR 4/2).
			26	◤	20 24 21	45	8	SP	SANDY GRAVEL, POORLY GRADED, GRAVEL TO 0.5" MAX., 10-25% FINE TO COARSE SAND, 10-11% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
			27	◤	14 16 16	32	7	GP	SANDY GRAVEL, POORLY GRADED TO 1.0" MAX., 10-20% MEDIUM SAND, 7-12% MODERATELY TO PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
BC/S			28	◤	13 21 28	49	10	GP-GC	GRAVEL, POORLY GRADED TO 0.5" MAX., 8-15% MEDIUM SAND, 10-12% HIGHLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6), TWO MODERATELY REDDISH BROWN (10 R 4/6) CLAY BALLS 0.3" IN SIZE.
			29	◤	12 16 18	34	8	GP	SANDY GRAVEL, POORLY GRADED TO 0.7" MAX., 20-25% FINE TO MEDIUM SAND, 8-10% MODERATELY TO HIGHLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) (CLAYEY GRAVEL AT TIP OF SPOON).
			30	◤	14 19 17	36	7	GC	CLAYEY GRAVEL, POORLY GRADED TO 0.8" MAX., 4-4% FINE TO MEDIUM SAND, 10-15% HIGHLY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2),
S/PC			31	◤	7 17 19	36	18	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2) MOTTLED WITH DARK YELLOWISH ORANGE (10 YR 6/6), AND DUSK YELLOWISH BROWN (10 YR 2/2).
			32	◤	11 15 17	32	18	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 5-10% VERY FINE SAND, FEW PIECES OF OXIDIZED IRON BALLS 0.1" IN SIZE, DUSKY YELLOW (5 Y 6/4), GREENISH GRAY (5 G 6/1).

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 4, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 127B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 127 TYPE OF BORING DRIVE SHEET 3 OF 3
DATE DRILLED SEPTEMBER 13, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY D.F.P.
COORDINATES, NORTH 16,519.5 EAST 17,548.9 GROUND SURFACE ELEVATION 107.9'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-58.6	166.5	33	◤	14 19 25	44	18	CH	SILTY CLAY, MODERATELY PLASTIC, 10-15% VERY FINE SAND, GREENISH GRAY (5 G 6/1).
								END OF BORING AT 166.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

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4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 4, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 127C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO. 128
TYPE OF BORING DRIVE
SHEET 1 OF 2
DATE DRILLED SEPTEMBER 6, 1972
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY R.A.J.
COORDINATES, NORTH 16,559.2
EAST 17,356.8
GROUND SURFACE ELEVATION 107.4'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		1	◤	4 8 12	20	11	ML	SILT, NONPLASTIC, YELLOWISH GRAY (5 Y 7/2) WITH DARK YELLOWISH ORANGE (10 YR 6/6) SEAMS.
		2	◤	5 14 18	32	15	ML	SIMILAR TO SS-1
		3	◤	5 10 12	22	14	CL	SILTY CLAY, SLIGHTLY PLASTIC, PALE OLIVE (10 Y 6/2) WITH SOME DARK YELLOWISH ORANGE (10 YR 6/6), MANY POCKETS OF NONPLASTIC SILT.
		4	◤	10 14 13	27	8	ML	SANDY SILT, SLIGHTLY PLASTIC, 20-30% FINE SAND, LIGHT OLIVE GRAY (5 Y 6/1).
		5	◤	20 28 32	60	14	SP	SAND, UNIFORM, FINE, CLEAN, WHITE WITH GRAYISH ORANGE (10 YR 7/4) BANDING.
		6	◤	4 3 4	7	12	CL	SANDY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 5-10% GRAVEL TO 0.6" 10-15% MOSTLY FINE SAND, GRAYISH YELLOW (5 Y 8/4) AND LIGHT GRAY (N 7), SEVERAL 0.1" CLAYEY SAND LAYERS, BECOMING FINE SAND IN TIP.
		7	◤	2 5 6	11	17	CL & SP	INTERLAYERED CLAY, MODERATELY PLASTIC, GRAYISH YELLOW (5 Y 8/4) AND SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2) AND SOME BRIGHT YELLOWISH ORANGE (10 YR 6/6), SEAMS AND LAMINATIONS OF FINE SAND WITHIN CLAY.
		8	◤	3 4 4	8	11	CL & SP	SIMILAR TO SS-7, EITHER CLAY AND SAND LAYERS, CLAY BALLS UP TO 3-6", OR CLAY WITH SAND SEAMS AND POCKETS.
		9	◤	4 7 11	18	10	SP	SAND, UNIFORM, FINE, 5-10% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) AND SOME DARK YELLOWISH ORANGE BANDING, FEW CLAYEY SAND LAYERS TO 1.0" AND FEW CLAY LAMINATIONS OR LENSES.
		10	◤	2 2 3	5	17	CL	CLAY, MODERATELY PLASTIC, PALE GREENISH YELLOW (10 Y 8/2) AND GRAYISH YELLOW (5 Y 8/4), SAND LAYERS WITH 5-15% SLIGHTLY PLASTIC FINES UP TO 6.0", FEW SAND LAMINATIONS.
		11	◤	2 6 10	16	15	CL & SP	INTERLAYERED CLAY AND SAND; CLAY, MODERATELY PLASTIC, PALE GREENISH YELLOW (10 Y 8/2) AND GRAYISH YELLOW (5 Y 8/4), SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), FEW 0.25-0.5" CLAY BALLS, 30-40° ANGLE OF CONTACT.
		12	◤	4 4 6	10	19	CL & SP	SIMILAR TO SS-11 BUT MOSTLY PALE YELLOWISH ORANGE (10 YR 8/6).
		13	◤	4 3 5	8	14	SC-SP	CLAYEY SAND, UNIFORM, FINE, 10-15% SLIGHTLY TO MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
		14	◤	4 7 13	20	11	SP-SC	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4).
		15	◤	24 24 30	54	10	GP	SANDY GRAVEL, GRAVEL TO 1.0", 25-35% MOSTLY UNIFORM FINE SAND, LESS THAN 5% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY B. F. GREENWOOD
DATE NOVEMBER 29, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 128A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 128
TYPE OF BORING DRIVE
SHEET 2 OF 2
DATE DRILLED SEPTEMBER 6, 1972
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY R.A.J.
COORDINATES, NORTH 16,559.2
EAST 17,356.8
GROUND SURFACE ELEVATION 107.4'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		16	◤	17 21 36	57	12	SP	GRAVELLY SAND, MOSTLY UNIFORM, FINE - MEDIUM AND MEDIUM, 10-20% FINE GRAVEL TO 0.75", LESS THAN 3% MODERATELY PLASTIC FINES, YELLOWISH ORANGE (10 YR 7/6).
		17	◤	38 50/6"	50/6"	12	SP	SAND, MOSTLY UNIFORM, FINE - MEDIUM, LESS THAN 3% MODERATELY PLASTIC FINES, YELLOWISH ORANGE (10 YR 7/6).
		18	◤	28 40 53	93	14	SP	SAND, MOSTLY UNIFORM FINE - MEDIUM AND MEDIUM, LESS THAN 3% SLIGHTLY PLASTIC FINES, LESS THAN 5% GRAVEL TO 1.0", BRIGHT YELLOWISH ORANGE (10 YR 6/6).
		19	◤	28 50/ 4.5"	50/ 4.5"	8	SP	SAND, MOSTLY UNIFORM FINE, CLEAN, 5-10% FINE GRAVEL TO 0.5", YELLOWISH ORANGE (10 YR 7/6), FEW 0.5" CLAYEY SAND AND SANDY CLAY BALLS.
		20	◤	19 30 57	87	10	SP	SAND, FINE TO COARSE, MOSTLY FINE - MEDIUM AND MEDIUM, LESS THAN 3% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10 YR 7/6), FEW 0.25" CLAYEY SAND BALLS.
		21	◤	14 24 31	55	10	SP	SAND, WIDELY GRADED, FINE TO COARSE SAND WITH MORE MEDIUM, 2-7% SLIGHTLY PLASTIC FINES, 5-10% FINE GRAVEL TO 0.5", BRIGHT YELLOWISH ORANGE (10 YR 6/6), FEW 1.0" GRAVEL.
		22	◤	45 50/ 4.5"	50/ 4.5"	7	SP	SAND, MOSTLY UNIFORM FINE - MEDIUM, LESS THAN 3% SLIGHTLY PLASTIC FINES, LESS THAN 2% FINE GRAVEL TO 0.4", YELLOWISH ORANGE (10 YR 7/6).
		23	◤	32 50/6"	50/6"	9	SP	SAND, FINE TO COARSE, MOSTLY UNIFORM FINE - MEDIUM, CLEAN, LESS THAN 5% FINE GRAVEL TO 0.4", GRAYISH YELLOW (5 Y 8/4).
		24	◤	35 50/6"	50/6"	9	SP	SIMILAR TO SS-23, BUT MOSTLY UNIFORM MEDIUM.
		25	◤	34 46 64	110	9	SP	SAND, MOSTLY UNIFORM FINE - MEDIUM, WITH SOME MEDIUM TO COARSE, CLEAN, LESS THAN 2% FINE GRAVEL TO 0.4", VERY PALE ORANGE (10 YR 8/2), FEW 0.2" ZONES WITH LESS THAN 5% MODERATELY PLASTIC FINES.
		26	◤	9 12 12	24	7	SP	GRAVELLY SAND, MOSTLY MEDIUM TO COARSE, 20-30% FINE GRAVEL TO 0.75", 5-10% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) WITH SLIGHTLY TRACE OF FINE, 1.0-2.0" CLAYEY SAND BALLS WITH LESS BINDING SAND BETWEEN.
		27	◤	15 15 16	31	7	SP	GRAVELLY SAND, FINE TO COARSE, MOSTLY UNIFORM FINE - MEDIUM, 10-20% FINE GRAVEL TO 0.75", LESS THAN 5% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
		28	◤	6 8 6	14	12	GC	CLAYEY GRAVEL, FINE GRAVEL TO 0.75", 10-20% MOSTLY FINE SAND, 20-30% MODERATELY PLASTIC FINES, MODERATE ORANGE PINK (10 R 7/4), MORE BINDING IN 2.0-5.0" SECTIONS INDICATING CLAY BALLS OR ELSE POSSIBLE CLAY BOULDER.
		29	◤	9 7 14	21	14	SP	SAND, UNIFORM, FINE, 5-10% MODERATELY PLASTIC FINES, LIGHT BROWN (5 YR 6/4) WITH A TRACE OF FINE, 8.0" MODERATE RED (5 R 5/4) CLAY BALLS OR LAYERS.
		30	◤	9 11 11	22	17	SP & CL	SAND, UNIFORM, FINE 3-8% SLIGHTLY PLASTIC FINES, LIGHT BROWN (5 YR 6/4) AND FINE, OCCURS IN TOP 8.0" AND BOTTOM 2.0", ABOUT 10.0" LAYER CLAY, MODERATELY PLASTIC, LESS THAN 5% FINE SAND, DARK YELLOWISH ORANGE (10 YR 6/6) AND PALE GREENISH YELLOW (10 Y 8/2).
		31	◤	7 10 12	22	24	CL-CH	CLAY, MODERATELY PLASTIC, PALE OLIVE (10 Y 6/2) WITH SOME DARK YELLOWISH ORANGE (10 YR 6/6) DISCOLORATION AND SOME BLACK SPECKLING.
		32	◤	8 10 14	24	23	CL-CH	SIMILAR TO SS-31.
-56.1	161.5							END OF BORING AT 161.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

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◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY B. F. GREENWOOD
DATE NOVEMBER 29, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 128B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO. 129
TYPE OF BORING DRIVE
SHEET 1 OF 2
DATE DRILLED 8/4/72
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY R.A.J.
COORDINATES, NORTH 16,593.3
EAST 17,141.7
GROUND SURFACE ELEVATION 107.6'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		1	◤	6 10 11	21	9	ML	SILT, NON PLASTIC, 5-10% VERY FINE SAND, MODERATE YELLOWISH BROWN (10 YR 5/4) WITH SOME LIGHT GRAY MOTTLING.
		2	◤	16 26 25	51	14	ML	SIMILAR TO SS1 BUT GRAYISH ORANGE (10 YR 7/4).
		3	◤	8 13 16	29	14	ML	CLAYEY SILT, SLIGHTLY PLASTIC, LIGHT GRAY (N7) WITH SOME BRIGHT YELLOWISH ORANGE (10 YR 6/6) MOTTLING.
		4	◤	12 21 27	48	13	ML	SIMILAR TO SS1 ALSO LIGHT GRAY (N7)
		5	◤	18 28 30	58	15	ML	SANDY SILT, NON PLASTIC, 20-30% VERY FINE SAND, VERY LIGHT GRAY (N8) WITH BRIGHT YELLOWISH ORANGE (10 YR 6/6) MOTTLING, REVERSES TO SILTY SAND NEAR BOTTOM.
		6	◤	12 13 9	22	14	ML SM SP	SIMILAR TO SS5 IN ALTERNATING LAYERS WITH CLEAN UNIFORM FINE SAND AT BOTTOM.
		7	◤	4 5 6	11	16	CL&SP	SILTY CLAY AND SAND: SAND - POORLY GRADED FINE TO COARSE SAND, LESS THAN 5% VERY FINE GRAVEL TO 0.3IN., 5-10% MODERATELY PLASTIC FINES, LIGHT GRAY (N7) AND BRIGHT YELLOWISH ORANGE (10 YR 6/6); CLAY - MODERATELY PLASTIC, PALE YELLOWISH ORANGE (10 YR 8/7), OCCURING IN 0.25-4.0 IN. POCKETS OR BALLS.
		8	◤	2 6 7	13	14	CL&SP	SIMILAR TO SS7 BUT NO COARSE SAND OR FINE GRAVEL.
		9	◤	2 6 8	14	15	CL SP	SILTY CLAY, MODERATELY PLASTIC, PALE YELLOWISH ORANGE (10 YR 8/7)— BECOMES SAND, UNIFORM, FINE, 5-10% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) FEW CLAYEY SAND LAYERS.
		10	◤	5 7 7	14	16	SP	SAND, UNIFORM, FINE, 5-10% MODERATELY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6) AND DARK YELLOWISH ORANGE (10 YR 6/6), FEW 0.75 IN. POCKETS PALE YELLOWISH ORANGE (10 YR 8/6) SILTY CLAY.
		11	◤	9 18 23	41	12	SP	SAND, FINE TO COARSE, MOSTLY FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, 5-10% FINE GRAVEL TO 0.5 IN., BRIGHT YELLOWISH ORANGE (10 YR 6/6), FEW CLAYEY SAND AND SANDY CLAY LUMPS TO 1.0 IN.
		12	◤	11 13 11	24	15	SP SC	SIMILAR TO SS10 BUT NO CLAY POCKETS, BECOMES CLAYEY SAND, UNIFORM, FINE, 10-20% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
		13	◤	5 5 10	15	14	SP	SAND, UNIFORM, VERY FINE, 5-10% SLIGHTLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/7).
		14	◤	8 9 20	29	10	SP CL	SIMILAR TO SS13, BECOMES SILTY CLAY, MODERATELY PLASTIC, PALE YELLOWISH ORANGE (10 YR 8/7), SOME IMBEDDED FINE GRAVEL.
		15	◤	27 50/6"	50/6"	10	SP	SAND, FINE TO COARSE SAND, MOSTLY UNIFORM FINE, 5-10% FINE GRAVEL TO 0.4 IN., LESS THAN 5% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY B. F. GREENWOOD
DATE DECEMBER 11, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 129A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS, 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 129
TYPE OF BORING DRIVE
SHEET 2 OF 2
DATE DRILLED 8/4/72
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY R.A.J.
COORDINATES, NORTH 16,593 3
EAST 17, 141.7
GROUND SURFACE ELEVATION 107.6'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		16	◤	38 50/2"	50/2"	7	SW	GRAVELLY SAND, WELL GRADED, 15-20% GRAVEL TO 1.4 IN., 5-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		17	◤	16 20 35	55	11	SP	GRAVELLY SAND, MOSTLY MEDIUM TO COARSE SAND, 15-25% FINE GRAVEL TO 0.75 IN., 5-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		18	◤	14 50/6"	50/6"	11	GW	SANDY GRAVEL, WELL GRADED, GRAVEL TO 1 0 IN., 30-40% FINE TO COARSE SAND, 5-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), 2.0 IN. CLAY BALL NEAR TOP.
		19	◤	24 22 36	58	12	SP	SAND, FINE TO COARSE, MOSTLY UNIFORM FINE PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), ONE LAMINATION OF 0.4 IN. GRAVEL.
		20	◤	40 50/4"	50/4"	9	SP	SAND, FINE TO COARSE, MOSTLY UNIFORM FINE, 5-10% FINE GRAVEL TO 0.5 IN., LESS THAN 5% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		21	◤	21 21 20	41	11	SP	SAND, MOSTLY MEDIUM AND COARSE, LESS THAN 5% FINE GRAVEL TO 0.4 IN., LESS THAN 5% NON PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		22	◤	23 20 21	41	9	SP-SW	SAND, WIDELY GRADED, FINE TO COARSE SAND, 5-10% FINE GRAVEL TO 0.5 IN., LESS THAN 5% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), FEW 0.5 IN., POCKETS CLAYEY SAND.
		23	◤	28 30 34	64	13	SP-SW	SIMILAR TO SS22 BUT 10-15% FINE GRAVEL TO 0 75 IN., NO CLAYEY POCKETS.
		24	◤	23 32 32	64	10	SP	SAND, MOSTLY MEDIUM AND COARSE, 5-10% FINE GRAVEL TO 0.5 IN., CLEAN, DARK YELLOWISH ORANGE (10 YR 6/6), BECOMES MOSTLY FINE SAND WITH 10-20% MEDIUM AND COARSE SAND.
		25	◤	24 37 47	84	11	SP	SAND, MOSTLY MEDIUM AND COARSE, CLEAN, LESS THAN 5% FINE GRAVEL TO 0.3 IN., DARK YELLOWISH ORANGE (10 YR 6/6), BECOMES MOSTLY FINE AND MEDIUM SAND WITH LESS THAN 5% PLASTIC FINES.
		26	◤	14 18 16	34	10	SP	SAND, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, LESS THAN 5% SLIGHTLY PLASTIC FINES BOTTOM FOOT, DARK YELLOWISH BROWN (10 YR 4/2) AT TOP, MODERATE YELLOWISH BROWN (10 YR 5/4) BOTTOM, (OILY SMELL AND BLACK DISCOLORATION TOP)
		27	◤	26 31 42	73	13	SP	SAND, MOSTLY MEDIUM, CLEAN, LESS THAN 5% FINE GRAVEL TO 0 3 IN. WHITE WITH SOME DARK YELLOWISH ORANGE (10 YR 6/6).
		28	◤	12 33 22	55	10	SP	SAND, MOSTLY UNIFORM FINE, CLEAN, GRAYISH ORANGE (10 YR 7/4) WITH DARK YELLOWISH ORANGE (10 YR 6/6) BANDING, ONE 0.75 IN. GRAVEL.
		29	◤	20 14 13	27	10	GC	CLAYEY GRAVEL, GRAVEL TO 0.75 IN., 20-30% FINE TO COARSE SAND, 10-15% SLIGHTLY PLASTIC FINES, MODERATE ORANGE PINK (10 R 7/4), LIGHT RED (5 R 6/6) 1.5 IN., BALL OF CLAY WITH IMBEDDED GRAVEL.
		30	◤	9 13 16	29	27	CL	SILTY CLAY, SLIGHTLY PLASTIC, LIGHT OLIVE GRAY (5 Y 5/2) AT TOP AND BOTTOM 3.0 IN., CLAY, MODERATELY PLASTIC, PALE OLIVE (10 Y 6/2) AND YELLOWISH GRAY (5 Y 7/2) DISCOLORED WITH DARK YELLOWISH ORANGE (10 YR 6/6).
		31	◤	8 12 14	26	18	CL-CH	CLAY, MODERATELY PLASTIC, GRAYISH YELLOW GREEN (5 GY 7/2), WITH SLIGHT DARK YELLOWISH ORANGE (10 YR 6/6).
53.9	161.5	32	◤	7 12 16	28	19	CL-CH	CLAY, MODERATELY PLASTIC, GRAYISH BLUE GREEN (5 BG 5/2), MEDIUM SAND SIZED CONCRETIONS OF SAME MATERIAL.
								END OF BORING AT 161.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY B.F. GREENWOOD
DATE DECEMBER 11, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 129B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 130 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED JULY 7-20, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY R.A.J.
COORDINATES, NORTH 16,285.9 EAST 17,705.4 GROUND SURFACE ELEVATION 108.4

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
L			1	◤	1 3 5	8	14	ML	SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, MOTTLED LIGHT GRAY AND BROWNISH ORANGE, TWO SMALL ROOTS.
L/PH	100	10	2	◤	3 4 5	9	14	ML	SIMILAR TO SS-1, BUT LIGHT GRAYISH BROWN MOTTLED GRAY.
			3	◤	8 11 16	27	13	ML	SIMILAR TO SS-1, BUT LIGHT GRAY MOTTLED WITH LIGHT GRAYISH BROWN AND SOME ORANGE.
	90	20	4	◤	6 9 11	20	19	ML CL	SIMILAR TO SS-3, CHANGING TO SILTY CLAY, MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, DARK GREENISH GRAY MOTTLED WITH LIGHT GRAY AND BROWISH ORANGE.
			5	◤	13 10 10	20	14	ML	SANDY SILT, NONPLASTIC, 10-20% VERY FINE SAND, PALE YELLOWISH BROWN (10YR 6/2), BECOMING CLAYEY AND MOTTLED WITH BRIGHT YELLOWISH ORANGE (10YR 6/6) SAND.
PH/S	80	30	6	◤	21 31 59	90	17	SP	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10YR 7/4), WITH SOME YELLOWISH GRAY (5Y 7/2) MOTTLING, BRIGHT YELLOWISH ORANGE (10YR 6/6), NEAR BOTTOM.
			7	◤	12 30 34	64	11	SP	SAND, UNIFORM, FINE, VERY PALE ORANGE (10YR 8/2), WITH LAYERING AND LAMINATIONS OF PALE YELLOWISH ORANGE (10YR 8/6).
	70	40	8	◤	6 5 8	13	13	SP	SAND, FINE, UNIFORM, LESS THAN 5-10% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5Y 7/2), WITH SEAMS OF BRIGHT YELLOWISH ORANGE (10YR 6/6) SAND, WITH 0.25-0.75 INCH BALLS OF MODERATE REDDISH BROWN (10R 4/6) CLAY, 5-10% GRAVEL TO 0.75 INCH.
			9	◤	9 12 9	21	12	SP	SAND, FINE TO COARSE, MOSTLY FINE AND UNIFORM, 5-10% GRAVEL TO 0.75 INCH, VERY LIGHT GRAY (N8), 0.25-0.75INCH BALLS OF MODERATE REDDISH BROWN (10R 6/6) CLAY, SEAMS OF BRIGHT YELLOWISH ORANGE (10YR 6/6) SAND.
	60	50	10	◤	3 4 5	9		SP	SAND, FINE TO COARSE, MOSTLY UNIFORM FINE SAND, LESS THAN 5% VERY FINE GRAVEL, 5-10% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5Y 7/2), AND BRIGHT YELLOWISH ORANGE (10YR 6/6), WITH 0.5-2.0 INCH BALLS OF MODERATE RED (5R 4/6) CLAY.
			11	◤	20 50/6"	50/6"	14	SP	SAND, UNIFORM, FINE, LESS THAN 5% MEDIUM AND COARSE SAND, LESS THAN 5% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10YR 6/6).
	50	60	12	◤	18 27 36	63	13	SP	SIMILAR TO SS-11, BUT 5-10% MEDIUM AND COARSE SAND, LESS THAN 5% FINE GRAVEL TO 0.5 INCH, FEW 0.5-1.0 INCH BALLS OF MODERATE RED (5R 4/6) CLAY.
S/BC			13	◤	39 50/6"	50/6"	12	SP	SAND, UNIFORM, FINE, 10-20% MEDIUM AND COARSE SAND, 5-10% GRAVEL TO 0.3 INCH, DARK YELLOWISH ORANGE (10YR 6/6), CHANGING TO SAND, UNIFORM, FINE LESS THAN 5% SLIGHTLY PLASTIC FINES, MODRATE BROWN (5YR 4/4).
	40	70	14	◤	4 8 11	19	13	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10R 6/6), FINELY SPECKLED WITH WHITE.
			15	◤	5 11 12	23	18	SP	SIMILAR TO SS-14, WITH PALE YELLOWISH ORANGE (10YR 8/6), TO BRIGHT YELLOWISH ORANGE (10YR 6/6) MOTTLING AND LAYERING, ALSO 2.0 INCH MODERATE RED (5R 4/6), CLAYEY LAYER OR CLAY BALL.
	30	80	16	◤	3 5 6	11	19	SP	SIMILAR TO SS-14, WITH FEW 0.1 INCH POCKET OF WHITE CLAYEY SAND.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. E. GREENWOOD
DATE DECEMBER 9, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 130A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 122.0

BORING NO 130 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY R.A.J.
COORDINATES, NORTH 16,285.9 EAST 17,705.4 GROUND SURFACE ELEVATION 108.4

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			17	◤	20 14 18	32	13	SP	SAND, FINE TO CARSE, MOSTLY FINE, LESS THAN 5% VERY FINE GRAVEL, GRAYISH ORANGE (10YR 7/4), WITH SAME, MODERATE REDDISH ORANGE (10R 6/6), LAYERING WITH LESS THAN 5% SLIGHTLY PLASTIC FINES, BECOMES SIMILAR TO SS-16, NEAR BOTTOM.
	20	90	18	◤	17 28 30	58	14	SP	SAND, FINE TO COARSE, MOSTLY FINE AND UNIFORM, PALE YELLOWISH ORANGE (10YR 8/6), MOTTLED WITH MODERATE REDDISH ORANGE (10R 6/6), CONTAINING 5-10% SLIGHTLY PLASTIC FINES.
			19	◤	57/6"	57/6"	6	SP	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10YR 6/6), 1.0 INCH LAYER OF FINE GRAVEL TO 0.5 INCH.
	10	100	20	◤	40 48/6"	48/6"	9	SP	SAND, FINE TO COARSE, MOSTLY FINE SAND, 5-10% FINE GRAVEL TO 0.5", LESS THAN 5% NONPLASTIC FINES, BRIGHT YELLOWISH ORANGE (10YR 6/6).
			21	◤	70/6"	70/6"	6	SP	SAND, UNIFORM, FINE, FEW MEDIUM SAND PARTICLES, DARK YELLOWISH ORANGE (10YR 6/6).
	0	110	22	◤	26 45 50/4"	50/4"	11	SP	SAND, FINE TO COARSE, MOSTLY MEDIUM, 5-10% FINE GRAVEL TO 0.4 INCH, LESS THAN 5% NONPLASTIC FINES, MODERATE YELLOWISH BROWN (10YR 5/4), BECOMES FINE - MEDIUM, MOSTLY UNIFORM SAND LESS THAN 5% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10YR 6/6).
			23	◤	32 50/4.5	50/4.5	10	SP	SAND, MOSTLY UNIFORM FINE SAND, LESS THAN 5% GRAVEL TO 0.3 INCH, LESS THAN 5% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10YR 6/6).
	-10	120	24	◤	46 50/3"	50/3"	9	SP	SAND, FINE TO COARSE, MOSTLY FINE-MEDIUM, CLEAN, BRIGHT YELLOWISH ORANGE (10YR 6/6).
			25	◤	15 14 16	30	9	SP-SW	GRAVELLY SAND, POORLY GRADED, MOSTLY MEDIUM AND COARSE SAND, 35-40% GRAVEL TO 0.5 INCH, GRAYISH ORANGE (10YR 7/4), ILL DEFINED POCKETS OR BALLS OF GRAY AND WHITE CLAYEY SAND WITH ONE PINK.
	-20	130	26	◤	17 12 11	23	9	SP	GRAVELLY SAND, POORLY GRADED 20-30% UNIFORM FINE SAND, 25-35% FINE GRAVEL TO 0.75 INCH, LESS THAN 5% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10YR 6/6), WITH 2.0 INCH VERY PALE ORANGE (10YR 8/2) CLEAN LAYER, 2-2.0 INCH BALLS OR ZONES OF PINK AND GRAY CLAYEY GRAVELLY SAND.
			27	◤	22 40 44	84	11	SP	SAND, FINE TO COARSE SAND, MOSTLY FINE, 5-10% GRAVEL TO 0.5 INCH, GRAYISH ORANGE (10YR 7/4), ONE 1.0 INCH CLAYEY SAND BALL.
BC/S	-30	140	28	◤	5 7 12	29	17	SC-SP	CLAYEY SAND, UNIFORM FINE SAND, 10-15% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE WITH MANY FINE SAND SIZED WHITE CLAY SPECKS ONE 1.0 INCH LAYER AND SEVERAL LAMINATIONS OF LIGHT GREENISH GRAY CLAY.
			29	◤	2 4 7	11	8	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, PALE YELLOWISH ORANGE (10YR 8/6), NEAR TOP 1.0 INCH LAYER MODERATE REDDISH ORANGE (10R 6/6), SANDY CLAY, NEAR BOTTOM, 2.0 INCH LAYER WHITE (N9) CLAY WITH BRIGHT YELLOWISH ORANGE (10YR 6/6), LAMINATIONS OF FINE SAND.
	-40	150	30	◤	2 7 14	21	18	SP-SC	SAND, UNIFORM, VERY FINE, MODERATE REDDISH ORANGE (10R 6/6), WITH GRAYISH YELLOW (5Y 8/4) BANDING, 10-15% PLASTIC FINES TOP TO 5-10% BOTTOM.
S/PC			31	◤	11 14 21	35	14	SP	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10YR 7/4), ONE 0.5 INCH VERY PALE ORANGE (10YR 8/2) CLAY POCKET, ONE ADJACENT 0.75INCH LIGHT BROWN (5YR 6/4), CLAY POCKET.
	-50	160	32	◤	10 13 19	32	13	SP	SIMILAR TO SS-31, BUT TWO CLAY LENSES AND TWO 0.75 INCH DARK YELLOWISH ORANGE (10YR 6/6) BANDING.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. E. GREENWOOD
DATE DECEMBER 9, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 130B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 130 TYPE OF BORING DRIVE SHEET 3 OF 3
DATE DRILLED DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY R.A.J.
COORDINATES, NORTH 16,285.9 EAST 17,705.4 GROUND SURFACE ELEVATION 108.4

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		33	◤	11 18 21	39	12	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10YR 7/4), MOTTLED DARK YELLOWISH ORANGE (10YR 6/6), REVERSES COLORS IN MIDDLE BECOMING YELLOWISH GRAY (5Y 7/2), AT BOTTOM.
-60	170	34	◤	6 9 13	22	23	CL	SANDY CLAY, SLIGHTLY PLASTIC, 15-25% VERY FINE SAND, GRAYISH YELLOW GREEN (56Y 7/2), WITH SOME BRIGHT YELLOWISH ORANGE (10YR 6/6), MOTTLING AND VEINS.
		35	◤	5 8 11	19	21	CL	SIMILAR TO SS-34.
-73.1	181.5	36	◤	7 11 19	30	20	SC	CLAYEY SAND, UNIFORM VERY FINE SAND, 20-30% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5Y 7/2).
								END OF BORING AT 181.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. E. GREENWOOD
DATE DECEMBER 9, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 130 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 131 TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED 7/31/72 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY R.A.J.
COORDINATES, NORTH 16,414.8 EAST 17,110 4 GROUND SURFACE ELEVATION 108.0'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		1	◤	6 10 11	21	14	ML	SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, MODERATE BROWN (5 YR 4/4) MOTTLED PALE YELLOWISH BROWN (10 YR 6/2).
		2	◤	7 13 20	33	15	ML	CLAYEY SILT, SLIGHTLY PLASTIC, LESS THAN 5% VERY FINE SAND, GRAYISH ORANGE (10 YR 7/4).
		3	◤	6 12 16	28	15	CL	SILTY CLAY, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2) MOTTLED YELLOWISH GRAY (5 Y 8/1), POCKETS OF SILT.
		4	◤	2 5 10	15	17	CL	SILTY CLAY, MODERATELY PLASTIC, 5-10% VERY FINE SAND, DARK YELLOWISH BROWN (10 YR 4/2) AND GRAYISH BROWN (5 YR 3/2) SOME SANDY AND SILTY LENSES.
		5	◤	6 14 24	38	16	ML	SANDY SILT, SLIGHTLY PLASTIC, 10-20% VERY FINE SAND, LIGHT GRAY (N7) MOTTLED WITH SILTY CLAY, SLIGHTLY PLASTIC, DARK YELLOWISH ORANGE (10 YR 6/6).
		6	◤	17 38 45	83	12	SP	SAND, UNIFORM, VERY FINE, WHITE.
		7	◤	13 14 16	30	14	SP	SAND, FINE TO COARSE, MOSTLY UNIFORM FINE, 5-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), SOME SMALL CLAYEY POCKETS.
		8	◤	12 15 18	33	10	SP	SIMILAR TO SS7 WITH LESS THAN 5% FINE GRAVEL TO 0.5 IN.
		9	◤	7 11 13	24			NO RECOVERY
		10	◤	7 9 15	24	12	SC SP	CLAYEY SAND, FINE TO COARSE SAND, MOSTLY UNIFORM FINE, 10-15% MODERATELY PLASTIC FINES, LESS THAN 5% GRAVEL TO 0 3 IN., DARK YELLOWISH ORANGE (10 YR 6/6), SANDY CLAY LAMINATIONS FOR 1 5 IN. THEN BECOMES SAND, UNIFORM, VERY FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6).
		11	◤	9 9 10	19	12	CH	CLAY, HIGHLY PLASTIC, LESS THAN 5% VERY FINE SAND, ALTERNATING PALE REDDISH BROWN (10 R 5/4) AND GRAYISH ORANGE (10 YR 7/4) LAYERS WITH SAND AND CLAYEY SAND INTERLAYERS AND LAMINATIONS.
		12	◤	4 3 3	6	15	SC	CLAYEY SAND, FINE TO COARSE SAND, 15-29% FINE GRAVEL TO 0 4 IN., 10-15% MODERATELY PLASTIC FINES, MODERATE ORANGE PINK (10 R 7/4) AND PALE YELLOWISH ORANGE (10 R 8/6) 0.5 - 2.0IN. CLAY AND SANDY CLAY BALLS.
		13	◤	1 2 6	8	16	SC	CLAYEY SAND, UNIFORM, VERY FINE, 10-20% MODERATELY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6) AND SOME PALE YELLOWISH ORANGE (10 YR 8/6) MOTTLING.
		14	◤	11 10 8	18	15	SC	SIMILAR TO SS12 BUT CLAY BALLS TO 1.0 IN.
		15	◤	2 8 9	17	12	SC	CLAYEY SAND, UNIFORM, VERY FINE, 10-20% SLIGHTLY PLASTIC FINES GRAYISH PINK (5 R 8/2) THEN MODERATE REDDISH ORANGE (10 R 6/6), FEW 0 . IN. CLAY POCKETS, CHANGING TO DARK YELLOWISH ORANGE (10 YR 6/6) WITH LESS THAN 5% SLIGHTLY PLASTIC FINES AND FEW PARTICLES FINE GRAVEL.
		16	◤	9 8 17	25	14	SC	CLAYEY SAND, UNIFORM FINE SAND, 10-20% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6) THEN PALE YELLOWISH ORANGE (10 YR 8/6).
		17	◤	14 15 15	30	7	SC	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 11, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 131A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 131 TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED 7/31/72 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY R.A.J.
COORDINATES, NORTH 16,414.8 EAST 17,110.4 GROUND SURFACE ELEVATION 108.0'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		18	◤	6 7 11	18	15	SP	SIMILAR TO SS17
		19	◤	34 36 29	65	12	SP	GRAVELLY SAND, FINE TO COARSE SAND, 10-15% FINE GRAVEL TO 0.5 IN., 5-10% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), 1.5 IN. LAYER FINE SAND
		20	◤	20 28 34	62	10	SP	SIMILAR TO SS19
		21	◤	33 32 35	67	12	SP	GRAVELLY SAND, FINE TO COARSE SAND, 20-30% FINE GRAVEL TO 0.75 IN., 5-10% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) (LOST WATER)
		22	◤	21 17 23	40	10	SP	SAND, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 5-10% FINE GRAVEL TO 0.4 IN., 5-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) (LOST WATER)
		23	◤	18 11 11	22	8	SP	SAND, MEDIUM TO COARSE, LESS THAN 5% FINE GRAVEL, TO 0.3, LESS THAN 5% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), MOSTLY ANGULAR CHERT FRAGMENTS WITH GAP IN THE FINE SAND RANGE, BOTTOM ABOUT 2.0 IN. GRAYISH ORANGE PINK (5 YR 7/2) CLAY WITH IMBEDDED GRAVEL TO 0.75 IN. (LOST WATER)
		24	◤	12 9 12	21			NO RECOVERY
		25	◤	13 19 10	29	5	SC CL	CLAYEY SAND, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 10-20% FINE GRAVEL TO 0.5 IN., 15-25% MODERATELY PLASTIC, FINES, DARK YELLOWISH ORANGE (10 YR 6/6) BECOMES PALE REDDISH BROWN (10 R 5/4) SANDY CLAY WITH IMBEDDED GRAVEL TO 0.75 IN.
		26	◤	14 15 19	34	6	SP	GRAVELLY SAND, FINE TO COARSE SAND, MOSTLY MEDIUM AND COARSE, 20-30% FINE GRAVEL TO 0.4 IN. WITH FEW 0.75 IN. PARTICLES, 5-10% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4)
		27	◤	9 20 19	39	6	SP	SIMILAR TO SS26
		28	◤	23 26 40	66	8	SP	SAND, FINE, CLEAN, GRAYISH ORANGE (10 YR 7/4)
		29	◤	7 10 13	23	14	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) AND MODERATE REDDISH ORANGE (10 R 6/6), CLAYEY SAND NEAR BOTTOM
		30	◤	6 10 15	25	14	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6), 0.75 IN. MODERATE RED (5 R 4/6) CLAY
		31	◤	4 9 10	19	18	CL-CH	CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 7/2) DISCOLORED WITH BRIGHT YELLOWISH ORANGE (10 YR 6/6)
		32	◤	13 15 20	35	18	CH	CLAY, HIGHLY PLASTIC, PALE OLIVE (10 Y 6/2), DISCOLORED WITH SOME DARK YELLOWISH ORANGE (10 YR 6/6) AND BLACK
-48.5	156.5	33	◤	16 19 23	42	18	CH	SIMILAR TO SS32 BUT VERY LITTLE DISCOLORATION AND NO BLACK
								END OF BORING AT 156.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY DAVID F. GREENWOOD
DATE DECEMBER 11, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 131B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 132 TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED 8/2/72 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY R.A.J.
COORDINATES, NORTH 16,138.2 EAST 17,472.3 GROUND SURFACE ELEVATION 108.2'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		1	◤	2 3 4	7	16	ML	SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, MODERATE YELLOWISH BROWN (10 YR 5/4) MOTTLED LIGHT OLIVE GRAY (5 Y 6/1).
		2	◤	2 4 5	9	18	ML	SIMILAR TO SS1, BUT GRAYISH ORANGE (10 YR 7/4) WITH SOME LIGHT OLIVE GRAY (5 Y 6/1) MOTTLING.
		3	◤	4 7 10	17	8	CL	SILTY CLAY, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2) WITH SOME BRIGHT YELLOWISH ORANGE MOTTLING (10 YR 6/6).
		4	◤	6 9 11	20	18	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND DARK YELLOWISH ORANGE (10 YR 6/6) WITH SOME LIGHT GRAY (N7) MOTTLING.
		5	◤	4 6 8	14	18	ML	SIMILAR TO SS4, BUT DARK YELLOWISH ORANGE (10 YR 6/6) AND LIGHT OLIVE GRAY (5 Y 6/1).
		6	◤	16 20 25	45	13	SP	SAND, POORLY GRADED, FINE, CLEAN, DARK YELLOWISH ORANGE (10 YR 6/6) CHANGING TO BRIGHT YELLOWISH ORANGE.
		7	◤	13 20 26	46	13	SP	SAND, FINE, UNIFORM, CLEAN, LESS THAN 5% COARSE SAND AND VERY FINE GRAVEL, GRAYISH YELLOW (5 Y 8/4).
		8	◤	6 6 5	11	15	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, 5-10% GRAVEL TO 0 5 IN. AT TOP, WHITE SLIGHTLY MOTTLED WITH DARK YELLOWISH ORANGE (10 YR 6/6) AT TOP, BRIGHT YELLOWISH ORANGE (10 YR 6/6), BANDED WITH GRAYISH ORANGE (10 YR 7/4) BOTTOM, TWO 1.5 IN. LAYERS GRAYISH ORANGE (10 YR 7/4) CLAY.
		9	◤	12 15 13	28	12	SP	GRAVELLY SAND, UNIFORM FINE SAND, 30-40% FINE GRAVEL TO 0.5 IN., 5-10% SLIGHTLY PLASTIC FINES, VERY LIGHT GRAY (N8) BECOMES JUST SAND AT BOTTOM.
		10	◤	6 9 10	19	11	SP	SAND, FINE, UNIFORM, 5-10% SLIGHTLY PLASTIC FINES, WHITE AND VERY LIGHT GRAY WITH PALE YELLOWISH ORANGE (10 YR 8/6) BANDED FOR 2.0 IN., LESS THAN 5% GRAVEL TO 0.5 IN.
		11	◤	7 9 13	22	12	SP	GRAVELLY SAND, MOSTLY UNIFORM FINE SAND, 10-15% GRAVEL TO 0.5 IN., 5-10 % SLIGHTLY PLASTIC FINES, LIGHT GRAY (N7).
		12	◤	7 12 12	24	12	SP	SAND, FINE AND MEDIUM, LESS THAN 5% GRAVEL TO 0.3 IN., 5-10% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6), ONE 0.75 IN., POCKET CLAY, NOTE - PINK CLAY CUTTINGS.
		13	◤	11 7 4	11	8	GC	CLAYEY GRAVEL, FINE GRAVEL TO 0.5 IN., 10-20% FINE SAND, 15-25% MODERATELY PLASTIC FINES, PALE REDDISH BROWN (10 R 5/4), MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), TWO 2.0IN. CLAY BALLS OR POCKETS.
		14	◤	22 21 15	36	11	SP	SAND, MOSTLY UNIFORM FINE, 5-10% MEDIUM AND COARSE SAND, 5-10% GRAVEL TO 0.5 IN., 5-10% NON PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6).
		15	◤	2 2 3	5	21	CH	CLAY, HIGHLY PLASTIC, MODERATE RED (5 R 4/6), INTERLAYERED WITH SANDY CLAY, NEAR BOTTOM CHANGES TO LIGHT RED (5 R 6/6), THEN DARK YELLOWISH ORANGE (10 YR 6/6) BOTH WITH FINE SAND LAMINATIONS.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 11, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 132A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 132 TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED 8/2/72 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY R.A.J.
COORDINATES, NORTH 16,138.2 EAST 17,472.3 GROUND SURFACE ELEVATION 108.2'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		16	◤	7 15	22	12	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6), CHANGING TO PALE YELLOWISH ORANGE (10 YR 8/6) WITH 10-20% GRAVEL TO 0.5 IN. NEAR BOTTOM.
		17	◤	4 13 16	29	12	SP	SAND, UNIFORM, FINE, LESS THAN 5% MEDIUM AND COARSE SAND, LESS THAN 5% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) FRAGMENTED GRAVEL AND SAND AT BOTTOM.
		18	◤	12 16 13	29	8	SP	GRAVELLY SAND, MOSTLY UNIFORM FINE AND COARSE SAND, 10-20% FINE GRAVEL TO 0.5 IN., 5-10% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), ONE 0.5 IN. SEAM OR POCKET OF MODERATE RED (5 R 4/6) CLAY.
		19	◤	20 20 19	39	9	SP	SIMILAR TO SS18 WITH FEW SMALL LIGHT RED (5 R 6/6) CLAYEY BALLS OR POCKETS, CHANGING TO UNIFORM FINE CLEAN SAND OF SIMILAR COLOR.
		20	◤	27 31 30	61	10	SP	SAND, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, LESS THAN 5% FINE GRAVEL TO 0.3 IN., CLEAN TOP, LESS THAN 5% SLIGHTLY PLASTIC FINES BOTTOM, DARK YELLOWISH ORANGE (10 YR 6/6) (LOST WATER).
		21	◤	13 16 16	32	9	SP	SIMILAR TO SS20 BUT 10-15% GRAVEL TO 0.5 IN. (LOST WATER).
		22	◤	7 7 6	13	16	SP SC	SIMILAR TO SS21, WITH 2.0IN. VERY DUSKY PURPLE (5 P2/2) CLAY, CHANGING TO CLAYEY SAND, UNIFORM, VERY FINE, 10-20% MODERATELY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6).
		23	◤	2 2 3	5	23	CH SP	CLAY, HIGHLY PLASTIC, MODERATE RED (5 R 4/6) WITH GRAYISH YELLOW (5 Y 8/4) LAMINATIONS FOR 2.0 IN., CHANGES TO SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6) WITH SOME WHITE MOTTLING.
		24	◤	3 3 4	7	6	SP	SAND, UNIFORM, FINE, 5-10% MODERATELY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6), WITH 2.0IN MODERATE RED (5 R 5/4) CLAY BALL OR LAYER WITH POSSIBLE IMBEDDED COARSE SAND AND FINE GRAVEL.
		25	◤	3 3 6	9	21	CL-CH	CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 7/2), 8.0 IN. LAYER OF GRAYISH YELLOW (5 Y 8/4) UNIFORM FINE SAND WITH 5-10% SLIGHTLY PLASTIC FINES.
		26	◤	10 4 7	11	13	CL-CH	CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 7/2) MOTTLED OLIVE GRAY (5 Y 5/2) LAMINATIONS OF SILTY CLAY, 2.0 IN. LAYER OF CLAYEY SAND, 2.0 IN. OF SANDY CLAY, BOTH LAYERS WITH FINE SAND AND MOTTLED WITH DARK YELLOWISH ORANGE (10 YR 6/6).
		27	◤	2 4 8	12	22	SP CL-CH	SAND, UNIFORM, VERY FINE, 5-10% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2), FEW 0.5 IN. POCKET CLAY, CHANGES TO CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 7/2) WITH FEW FINE SAND LAMINATIONS.
		28	◤	2 5 10	15	29	CL-CH	CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 7/2), WITH 2 0 IN. LAYER VERY FINE CLAYEY SAND, 2 1 IN. LAYER SANDY CLAY.
		29	◤	5 7 8	15	23	SP CL-CH	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2) MOTTLED WITH GRAYISH ORANGE (10 YR 7/4), SEVERAL 0 8 IN. POCKETS CLAY, CHANGING TO CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 7/2), FINE SAND LAMINATIONS AND LENSES AND SMALL SANDY CLAY LAYERS.
		30	◤	5 6 7	13	23	SP CL-CH SC	SIMILAR TO SS29 WITH CLAYEY SAND/15-29% MODERATELY PLASTIC FINES AT BOTTOM.
		31	◤	14 16 21	37	21	SP CH	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2), CHANGING TO CLAY, HIGHLY PLASTIC, PALE OLIVE (10 Y 6/2) WITH DARK YELLOWISH ORANGE (10 YR 6/6) AND BLACK DISCOLORATION.
-53.3	161.5	32	◤	11 13 16	29	21	CL-CH	CLAY, MODERATELY PLASTIC, PALE, OLIVE (10 Y 6/2).
								END OF BORING AT 161.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 11, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 132B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO 133 · TYPE OF BORING DRIVE · SHEET 1 OF 2
DATE DRILLED JULY 19-22, 1972 · DRILLING COMPANY - EUSTIS ENGRG CO · LOGGED BY R.A.J.
COORDINATES, NORTH 15,894.4 · EAST 17,626.7 · GROUND SURFACE ELEVATION 107.5'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		1	▼	2 4 6	10	16	ML	SANDY SILT, SLIGHTLY PLASTIC, 15-25% VERY FINE SAND, MEDIUM BROWN AND GRAY.
		2	▼	3 11 19	30	15	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, LIGHT GRAY MOTTLED GRAYISH BROWN.
		3	▼	5 11 14	25	16	ML CL	SIMILAR TO SS-2 FOR 6.0", CHANGING TO SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, LIGHT GREENISH GRAY, MOTTLED LIGHT BROWN.
		4	▼	10 9 10	19	16	SP SC CL-CH	SAND, UNIFORM, FINE, BECOMING CLAYEY SAND, UNIFORM FINE SAND, 10-20% SLIGHTLY PLASTIC FINES, LIGHT BROWN AND BECOMING CLAY, MODERATELY PLASTIC, DARK GRAY TO BLACK, SANDY CLAY ZONES, VERY SMALL VERTICAL SEAMS OF SANDY SILT.
		5	▼	15 24 24	48	16	SC	CLAYEY SAND, UNIFORM, VERY FINE SAND, 15-20% SLIGHTLY PLASTIC FINES, ORANGE MOTTLED LIGHT GRAY BECOMES SILTY NEAR BOTTOM.
		6	▼	24 27 27	54	6	SP	SAND, UNIFORM, FINE, WHITE.
		7	▼	16 22 20	42	12	SP	SAND, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES TO 5-10% NEAR BOTTOM, LIGHT BROWN TO BRIGHT BROWNISH ORANGE, FEW 0.25" LAYERS CLAYEY SAND NEAR BOTTOM.
		8	▼	5 11 12	23	8	SP	SAND, UNIFORM, FINE, 5-10% MODERATELY PLASTIC FINES, MEDIUM YELLOW, LESS THAN 5% MEDIUM AND COARSE SAND.
		9	▼	9 9 13	22	14	SP	SAND, UNIFORM, FINE, 6-10% SLIGHTLY PLASTIC FINES, LIGHT GRAYISH BROWN WITH SOME LIGHT GRAY MOTTLING, LESS THAN 5% MEDIUM AND COARSE SAND NEAR TOP, 2.0" CLAYEY SAND LAYER.
		10	▼	11 10 11	21	12	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, LIGHT GRAYISH BROWN WITH SOME LIGHT GRAY MOTTLING.
		11	▼	6 8 11	19	12	SP	SAND, MOSTLY FINE, 5-10% SLIGHTLY PLASTIC FINES, BROWNISH YELLOW TWO 1.0" LAYERS PURPLE HIGHLY PLASTIC CLAY.
		12	▼	7 11 12	23	12	SP	SAND, MOSTLY FINE, 5-10% SLIGHTLY PLASTIC FINES, BROWNISH YELLOW 10-20% MEDIUM AND COARSE SAND NEAR BOTTOM.
		13	▼	4 7 10	17	12	SP	SIMILAR TO SS-12, BUT 5-10% MEDIUM AND COARSE SAND, 5-10% GRAVEL TO 0.5" IN A 5.0" ZONE, ALSO 4.0" LAYER YELLOW SILTY CLAY AT TOP.
		14	▼	33 32 49	81	14	SP	SAND, MOSTLY FINE AND MEDIUM, LESS THAN 5% COARSE SAND AND VERY FINE GRAVEL, LESS THAN 5% SLIGHTLY PLASTIC FINES, DARK BROWNISH ORANGE, MORE FINES AND MORE FINE GRAVEL NEAR BOTTOM.
		15	▼	2 5 11	16	16	CH SP	CLAY, HIGHLY PLASTIC, 5-10% FINE SAND NEAR TOP, MOTTLED YELLOW, REDDISH PURPLE AND LIGHT GREENISH GRAY AT TOP, BECOMING REDDISH PURPLE MOTTLED LIGHT GREENISH GRAY, SAND AND CLAYEY SAND SEAMS AND LENSES AT TOP, FOLLOWED BY CLAYEY SAND LAYER EMBEDDED WITH FINE GRAVEL, BECOMES FINE AND MEDIUM SAND WITH 5-10% PLASTIC FINES AND FEW CLAYEY SAND LENSES.
		16	▼	6 5 5	10	14	CL-CH	SANDY CLAY, HIGHLY PLASTIC, 15-25% MOSTLY FINE SAND, PURPLE, MANY CLAYEY SAND SEAMS AND LENSES AT TOP, 1.0" LAYER MEDIUM AND COARSE SAND 2.0" LAYER OF BLACK ORANGE AND YELLOW CLAYEY SAND, VERY SANDY CLAY NEAR BOTTOM.
		17	▼	3 4 6	10		N.R.	
		18	▼	9 6 6	12	15	SC	CLAYEY SAND, UNIFORM, FINE, 10-15% SLIGHTLY PLASTIC FINES, YELLOW AT TOP, PINK SPECKLED WITH WHITE AT BOTTOM.
		19	▼	1 3 3	6	13	SC	CLAYEY SAND, UNIFORM, FINE, 15-25% SLIGHTLY PLASTIC FINES, REDDISH PINK, 3.0" LAYER LIGHT GREENISH GRAY CLAY, FEW FINE SAND LAMINATIONS.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. P. GREENWOOD
DATE NOVEMBER 29, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 133A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO 133 · TYPE OF BORING DRIVE · SHEET 2 OF 2
DATE DRILLED JULY 19-22, 1972 · DRILLING COMPANY - EUSTIS ENGRG CO · LOGGED BY R.A.J.
COORDINATES, NORTH 15,894.4 · EAST 17,626.7 · GROUND SURFACE ELEVATION 107.5'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		20	▼	1 3 6	9	14	SC	SIMILAR TO SS-18, BUT NO YELLOW, FEW 0.75" PURPLE CLAY BALLS OR POCKETS.
		21	▼	1 3 19	22	14	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, LIGHT PINK MOTTLED WITH OFF WHITE.
		22	▼	7 5 10	15	14	SP	SIMILAR TO SS-21, WITH 0.5" LAYER FINE GRAVEL.
		23	▼	4 5 7	12	16	CL-CH	CLAY, MODERATELY TO HIGHLY PLASTIC, LESS THAN 5% VERY FINE SAND, LIGHT GREENISH GRAY, ORANGE SWIRLING SEAMS OF VERY FINE CLAYEY SAND, ONE 1.0" GRAVEL.
		24	▼	1 3 3	6	14	CL	SANDY CLAY, SLIGHTLY PLASTIC, 25-35% FINE UNIFORM SAND, LIGHT GRAY, 15-25% FINE UNIFORM SAND NEAR BOTTOM.
		25	▼	2 3 6	9	14	SC-SP	CLAYEY SAND, UNIFORM, FINE, 10-20% SLIGHTLY PLASTIC FINES, LIGHT GRAY.
		26	▼	3 5 5	10	16	CL-CH	CLAY, MODERATELY PLASTIC, 5-10% VERY FINE SAND, LIGHT GREENISH GRAY.
		27	▼	3 4 6	10	16	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2), WITH SEAMS OF BRIGHT YELLOWISH ORANGE (10 YR 6/6) UNIFORM FINE SAND.
		28	▼	11 13 17	30	8	CL	SIMILAR TO SS-27 WITH 10-20% VERY FINE SAND.
		29	▼	11 19 16	35	8	CL	SIMILAR TO SS-28
		30	▼	8 14 17	31	9	CL	SIMILAR TO SS-27, BUT NO ORANGE.
		31	▼	6 9 14	23	15	CL	SANDY VERY SILTY CLAY, SLIGHTLY PLASTIC, 10-20% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2).
		32	▼	9 14 18	32	15	CH	SILTY CLAY, HIGHLY PLASTIC, LESS THAN 5% VERY FINE SAND, MODERATELY YELLOWISH BROWN (10 YR 5/4) AND GREENISH GRAY (5 GY 6/1).
		33	▼	10 12 18	30	15	CL	SILTY CLAY, MODERATELY PLASTIC, MODERATE YELLOWISH BROWN (10 YR 5/4) AND GREENISH GRAY (5 GY 6/1).
-44	151.5	34	▼	9 11 13	24	18	CL	SIMILAR TO SS-33, BUT NO MODERATE YELLOWISH BROWN.
								END OF BORING AT 151.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. P. GREENWOOD
DATE NOVEMBER 29, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 133B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO 134 · TYPE OF BORING DRIVE · SHEET 1 OF 2
DATE DRILLED JULY 26-27, 1972 · DRILLING COMPANY - EUSTIS ENGRG CO · LOGGED BY R.A.J.
COORDINATES, NORTH 16,010.0 · EAST 17,053.8 · GROUND SURFACE ELEVATION 107.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		1	▼	6 12 12	24	12	ML	SILT, NONPLASTIC, LESS THAN 5% VERY FINE SAND, MODERATE YELLOWISH BROWN (10 YR 5/4) MOTTLED WITH LIGHT OLIVE GRAY (5 Y 6/1).
		2	▼	6 8 12	20	15	ML	SIMILAR TO SS-1, BUT GRAYISH ORANGE (10 YR 7/4).
		3	▼	4 4 7	11	15	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, LIGHT OLIVE GRAY (5 Y 6/1), LAMINATIONS AND FINE VEINS OF BRIGHT YELLOWISH ORANGE (10 YR 6/6) VERY FINE SAND.
		4	▼	3 5 5	10	18	CL	SILTY CLAY, SLIGHTLY PLASTIC, 5-10% VERY FINE SAND, PALE YELLOWISH BROWN (10 YR 6/2), MANY VERY SMALL LENSES OF FINE SILTY SAND.
		5	▼	9 11 16	27	16	SC	CLAYEY SAND, UNIFORM, FINE SAND, 15-25% MODERATELY PLASTIC FINES, LIGHT OLIVE GRAY (5 Y 6/1) MOTTLED BRIGHT YELLOWISH ORANGE (10 Y. 6/6), MIDDLE SAMPLE SANDY CLAY.
		6	▼	11 14 12	26	11	SC	CLAYEY SAND, UNIFORM, VERY FINE SAND, 10-15% SLIGHTLY PLASTIC FINES BRIGHT YELLOWISH ORANGE (10 YR 6/6) MOTTLED DUSKY YELLOW (5 Y 6/4) LAMINATIONS OF GRAYISH YELLOW (5 Y 8/4) CLAYEY SILT FOR 0.75".
		7	▼	7 9 8	17	14	SP-SC	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, BRIGHT (10 YR 6/6) SPECKLED WITH FINE SAND SIZED POCKETS OF WHITE CLAY.
		8	▼	7 6 8	14	14	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6).
		9	▼	11 17 23	40	6	SC	CLAYEY SAND, UNIFORM, VERY FINE, 10-20% SLIGHTLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6), FEW 0.25" LAYERS OF LIGHT GRAY (N 7) SANDY CLAY.
		10	▼	9 6 8	14	15	SC	CLAYEY SAND, FINE TO COARSE SAND, MOSTLY UNIFORM FINE, 10-15% FINE GRAVEL TO 0.5", 10-15% MODERATELY PLASTIC FINES, VERY LIGHT GRAY (N 8), BECOMES UNIFORM FINE, SLIGHTLY PLASTIC CLAYEY SAND THEN BECOMES MODERATELY PLASTIC MODERATE ORANGE PINK (5 YR 8/4) SANDY CLAY.
		11	▼	5 5 9	14	18	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, BRIGHT TO DARK YELLOWISH ORANGE (10 YR 6/6), LAMINATIONS AND FINE SAND SIZED SPECKS OF WHITE CLAY.
		12	▼	9 7 5	12	15	SP CH	SAND, MOSTLY UNIFORM FINE SAND, 5-10% GRAVEL TO 0.75", LESS THAN 5% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6), BECOMES HIGHLY PLASTIC GRAYISH YELLOW (5 Y 8/4) CLAY MOTTLED WITH MODERATE RED (5 R 7/6), NEAR BOTTOM COLORS REVERSE WITH 10-15% VERY FINE SAND AND ONE 1.0" SAND LAYER.
		13	▼	1 4 6	10	15	SC	CLAYEY SAND, UNIFORM, VERY FINE, 10-20% MODERATELY PLASTIC FINES, MODERATE REDDISH ORANGE WITH WHITE SAND SIZED WHITE SPECKLES.
		14	▼	12 7 10	17	10	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6).
		15	▼	3 6 9	15	16	SP	SIMILAR TO SS-14.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. P. GREENWOOD
DATE DECEMBER 5, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 134A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO 134 · TYPE OF BORING DRIVE · SHEET 2 OF 2
DATE DRILLED JULY 26-27, 1972 · DRILLING COMPANY - EUSTIS ENGRG CO · LOGGED BY R.A.J.
COORDINATES, NORTH 16,010.0 · EAST 17,053.8 · GROUND SURFACE ELEVATION 107.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		16	▼	11 9 11	20	10	SP	SIMILAR TO SS-14 WITH LESS THAN 5% GRAVEL TO 0.5" AND SOME GRAYISH YELLOW (5 Y 8/4) MOTTLING.
		17	▼	3 3 6	9	14	SP-SC	SIMILAR TO SS-14.
		18	▼	2 4 7	11	15	SP	SIMILAR TO SS-14.
		19	▼	10 24 25	49	10	SP SP-SW	SIMILAR TO SS-14, CHANGING TO GRAVELLY SAND, WIDELY GRADED, FINE TO COARSE SAND, 10-20% FINE GRAVEL TO 0.5", LESS THAN 5% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
		20	▼	5 11 13	24	12	SP	SIMILAR TO SS-14 WITH TAN AND BROWN SWIRL COLORING FOR 1.0", LESS THAN 5% SLIGHTLY PLASTIC FINES IN 5.0" ZONE NEAR BOTTOM OF SAMPLE.
		21	▼	3 5 6	11	14	SC CH	CLAYEY SAND, UNIFORM, VERY FINE, 10-15% SLIGHTLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6); CHANGING TO CLAYEY SAND, UNIFORM VERY FINE, 20-30% SLIGHTLY PLASTIC FINES, MODERATE BROWN (5 YR 4/4) WITH MODERATE BROWN (5 YR 3/4) SAND LAMINATIONS; CHANGING TO CLAY, HIGHLY PLASTIC, LIGHT BROWN (5 YR 5/6) AND MODERATE REDDISH ORANGE (10 R 6/6) CHANGING TO LIGHT OLIVE GRAY (5 Y 6/1) AT BOTTOM.
		22	▼	2 2 4	6	18	CH	CLAY, HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2); WITH 8.0" LAYER CLAYEY SAND, UNIFORM VERY FINE SAND, 10-15% SLIGHTLY PLASTIC FINES, SAME COLOR.
		23	▼	3 4 4	8	12	CH SP	CLAY, HIGHLY PLASTIC, YELLOWISH ORANGE (5 Y 7/2), BECOMING CLAYEY SAND, UNIFORM VERY FINE SAND, 10-15% SLIGHTLY PLASTIC FINES, SAME COLOR.
		24	▼	3 3 4	7	13	CH SP-SC	CLAY, HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2); CHANGING TO SAND, UNIFORM FINE, 5-10% SLIGHTLY PLASTIC FINES, SAME COLOR WITH SOME DARK YELLOWISH ORANGE (10 YR 6/6) MOTTLING, FEW SMALL LAYERS CLAYEY SAND.
		25	▼	3 4 5	9	15	CH SP	SIMILAR TO SS-24, WITH SAND LAMINATIONS AND SMALL LAYERS IN CLAY.
		26	▼	2 5 9	14	18	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2), WITH 1.0" POCKET OR BALL OF HIGHLY PLASTIC CLAY.
		27	▼	3 12 15	27	15	SP CL-CH	SIMILAR TO SS-26 FOR 4.0", THEN CHANGES TO SILTY CLAY, MODERATELY PLASTIC YELLOWISH GRAY (5 Y 7/2) SOME BRIGHT YELLOWISH ORANGE (10 YR 6/6) MOTTLING AND VEINS AND SPECKLED WITH BLACK.
		28	▼	11 15 17	32	18	CH	CLAY, HIGHLY PLASTIC, PALE OLIVE (10 Y 6/2), SOME BRIGHT YELLOWISH ORANGE (10 YR 6/6) VERY SMALL VEINS.
-38.9	146.5	29	▼	10 22 30	52	18	CH	CLAY, HIGHLY PLASTIC, PALE OLIVE (10 Y 6/2) CHANGING TO GREENISH GRAY (5 G 6/1), LIGHT GRAY (N 7) CONCRETED SILT POCKETS SAND SIZED TO 0.25" WITH ONE 1.0" POCKET.
								END OF BORING AT 146.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. P. GREENWOOD
DATE DECEMBER 5, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 134B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 135 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED SEPTEMBER 28, 1972 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.P.P.
COORDINATES, NORTH 17,798.7 EAST 16,900.3 GROUND SURFACE ELEVATION 108.2

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		1	◤	7 13 16	29	13	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 10-15% FINE SAND, MOTTLED LIGHT GRAY (N7), MODERATE YELLOWISH BROWN (10 YR 5/4).
100								
	10	2	◤	6 11 14	25	13	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 8-10% FINE SAND, MOTTLED LIGHT GRAY (N7) AND GRAYISH YELLOW (5 Y 8/4), FeOx NODULES IN SAMPLE.
		3	◤	6 11 16	27	16	CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, LIGHT GRAY (N7), IRREGULAR CLAY POCKET WITH FeOx NODULES IN SAMPLE, DUSKY YELLOW (5 Y 6/4).
90								
	20	4	◤	7 9 11	20	18	CL	SANDY CLAY, MODERATELY PLASTIC, 25-30% FINE SAND, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), PALE YELLOWISH ORANGE (10 YR 8/6).
		5	◤	6 6 7	13	16	CH	SANDY CLAY, MODERATELY TO HIGHLY PLASTIC, 15-20% FINE SAND, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6), LIGHT GRAY (N7), AND MODERATE BROWN (5 YR 4/4), SAND IS VERY THINLY LAYERED IN THE CLAY.
80								
	30	6	◤	6 8 9	17	17	SC	CLAYEY SAND, UNIFORM, FINE, 10-15% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), WITH LIGHT GRAY (N7), 1/2" DIAMETER SPOT, CLAY SILVER APPROXIMATELY 3/8" LONG IN SAMPLE.
		7	◤	6 8 7	15	12	SC	CLAYEY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 20-25% MODERATELY PLASTIC FINES, 2-3% GRAVEL TO 0.7 INCH MAXIMUM, DARK YELLOWISH ORANGE (10 YR 6/6), **CLAY POCKET** IN SAMPLE.
70								
	40	8	◤	10 15 15	30	10	SC	CLAYEY SAND, UNIFORM FINE, 30-35% **SLIGHTLY TO MODERATELY PLASTIC** FINES, MOTTLED PALE YELLOWISH ORANGE (10 YR 8/6) AND MODERATE REDDISH BROWN (10 R 4/6).
		9	◤	19 43 51	94	12	SP	SAND, UNIFORM FINE, 2-4% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
60								
	50	10	◤	22 46 54	100		SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, 2-4% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), ONE PIECE OF GRAVEL 0.5 INCH IN SIZE.
		11	◤	16 45 36	81	8	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 25-30% GRAVEL TO 1.0 INCH MAXIMUM, 6-8% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), CLAY POCKET AND CLAYBALLS, WITH CLAY COATING ON SAME GRAVEL.
50								
	60	12	◤	12 17 18	35	11	SP	SAND, UNIFORM, FINE, **2-5% NONPLASTIC TO SLIGHTLY PLASTIC FINES, GRAYISH ORANGE** (10 YR 7/4), CLAY FLAKES THROUGHOUT SAMPLE.
		13	◤	14 13 12	25	13	SP	CLAYEY SAND, UNIFORM, FINE, 7-9% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), SILTY CLAY POCKET **WITH VERY THIN** FINE SAND LAYERING, ONE PIECE OF CLAY COATED GRAVEL 0.9 INCH IN SIZE.
40								
	70	14	◤	8 15 17	32	16	SC-SM	CLAYEY SAND, UNIFORM, FINE, 10-15% MODERATELY PLASTIC FINES, MOTTLED GRAYISH ORANGE (10 YR 7/4), MODERATE REDDISH ORANGE (10 YR 6/6).
		15	◤	8 19 21	40	12	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 3-6% GRAVEL TO 1.0 INCH MAXIMUM, 6-8% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
30								
	80							

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D.P. GREENWOOD
DATE DECEMBER 18, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 135A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO 135 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED SEPTEMBER 28, 1972 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.P.P.
COORDINATES, NORTH 17,798.7 EAST 16,900.3 GROUND SURFACE ELEVATION 108.2

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		16	◤	34 44 58	102	8	GS	SANDY GRAVEL, POORLY GRADED, GRAVEL TO 0.9 INCH MAXIMUM, 20-25% FINE TO COARSE SAND, 4-8% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
		17	◤	15 13 12	25	14	SC	CLAYEY SAND, UNIFORM, FINE, 10-15% MODERATELY TO HIGHLY PLASTIC FINES, MOTTLED PALE YELLOWISH ORANGE (10 YR 8/6), VERY PALE ORANGE (10 YR 8/2).
20								
	90	18	◤	19 38 52	90	10	SP	SAND, UNIFORM, FINE, 1-3% FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
		19	◤	15 28 40	68	12	SP	SIMILAR TO SS-18, EXCEPT SAMPLE CONTAINS LESS THAN 2% GRAVEL TO 0.3 INCH MAXIMUM.
10								
	100	20	◤	16 31 60	91	11	SP	SAND, UNIFORM, FINE, 2-3% FINES PALE YELLOWISH ORANGE (10 YR 8/6).
		21	◤	32 50 65	115	7	SP	SAND, UNIFORM, FINE, 2-3% FINES, PALE YELLOWISH ORANGE (10 YR 8/6), WITH TWO PIECES OF GRAVEL 0.3 INCH IN SIZE.
0								
	110	22	◤	25 47 60	107	8	SP	SAND, UNIFORM, FINE, 1-3% GRAVEL TO 0.9 INCH MAXIMUM, 2-4% FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
		23	◤	24 38 50	88	8	SP	SAND, UNIFORM, FINE, 1-3% GRAVEL TO 0.9 INCH MAXIMUM, 3-6% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
-10								
	120	24	◤	21 50/6"	50/6"	7	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 1-2% GRAVEL TO 1.0 INCH MAXIMUM, 3-5% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		25	◤	25 35 35	70	7	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 5-8% GRAVEL TO 1.1 INCH MAXIMUM, 4-8% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
-20								
	130	26	◤	25 35 35	70	7	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, LESS THAN 2% GRAVEL TO 0.5 INCH MAXIMUM, 1-3% FINES, PALE YELLOWISH ORANGE (10 YR 6/6).
		27	◤	15 18 21	39	7	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 15-20% GRAVEL TO 0.9 INCH MAXIMUM, 2-3% FINES, GRAYISH ORANGE (10 YR 7/4), MODERATELY PLASTIC CLAY POCKET.
-30								
	140	28	◤	16 23 23	46	6	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 4-6% GRAVEL TO 1.1 INCH MAXIMUM, 8-12% SLIGHTLY TO MODERATELY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2), CLAY COATING ON SOME GRAVEL.
		29	◤	16 30 35	65	8	GS	SANDY GRAVEL, POORLY GRADED, GRAVEL TO 1.2 INCH MAXIMUM, 30-35% MEDIUM TO COARSE SAND, 8-10% SLIGHTLY TO MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), CLAY COATING ON MOST GRAVEL PIECES.
-40								
	150	30	◤	12 12 10	22	6	GC	CLAYEY GRAVEL, POORLY GRADED TO 0.7 INCH MAXIMUM, 6-10% FINE TO MEDIUM SAND, 10-15% MODERATELY TO HIGHLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), CLAY COVERING ON MOST GRAVEL.
		31	◤	11 13 19	32	15	ML-CH	CLAYEY SITL, MODERATELY PLASTIC, FEW PIECES OF MEDIUM SAND, DUSKY YELLOW (5 Y 6/4), WITH FeOx LAYERING AND NODULES.
-50								
	160							

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D.P. GREENWOOD
DATE DECEMBER 18, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 135B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 135 TYPE OF BORING DRIVE SHEET 3 OF 3
DATE DRILLED SEPTEMBER 28, 1972 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.P.P.
COORDINATES, NORTH 17,798.7 EAST 16,900.3 GROUND SURFACE ELEVATION 108.2

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		32	◤	11 15 20	35	15	CL	SILTY CLAY, MODERATELY PLASTIC, GREENISH GRAY (5 G 6/1).
		33	◤	19 27 31	58	16	ML-CH	CLAYEY SILT, MODERATELY PLASTIC, CLAY POCKETS IN SAMPLE, GREENISH GRAY (5 G 6/1).
-60								
	170	34	◤	12 18 18	36	16	ML	CLAYEY SILT, MODERATELY PLASTIC, 3-6% FINE SAND, GREENISH GRAY (5 G 6/6).
		35	◤	13 21 33	54	15	ML	CLAYEY SILT, MODERATELY TO HIGHLY PLASTIC, 2-5% VERY FINE SAND, GREENISH GRAY (5 GY 6/1).
-70								
	180	36	◤	9 18 30	48	16	ML	CLAYEY SILT, MODERATELY PLASTIC, SILTY CLAY POCKET AND LENSES, GREENISH GRAY (5 Y 6/1).
		37	◤	11 20 20	40	16	ML	CLAYEY SILT, MODERATELY PLASTIC, SOME VERY FINE SAND, CLAY POCKETS, GREENSIH FRAY (5 GY 6/1).
-80								
	190	38	◤	11 11 14	25	13	CH	SILTY CLAY, MODERATELY PLASTIC, DARK GREENISH GRAY (5 GY 4/1).
		39	◤	16 20 22	42	15	ML	CLAYEY SILT, MODERATELY TO HIGHLY PLASTIC, 2-4% FINE SAND, DARK GREENISH GRAY (5 GY 4/1).
-90								
	200	40	◤	8 7 11	18	16	ML-CH	CLAYEY SILT, MODERATELY TO HIGHLY PLASTIC, 3-6% VERY FINE SAND, AND VERY FINE SAND LAYERING, OLIVE GRAY (5 Y 4/1), SILTY CLAY POCKET APPROXIMATELY 1/2"-3/4" THICK.
		41	◤	8 10 12	22	NR		NO RECOVERY.
-99.8	208	42	◤	9 11 13	24	16	CH	SILTY CLAY, HIGHLY PLASTIC, 2-4% FINE SAND, WITH FINE SAND POCKETS, SAMPLE, SPLINTER SIZE AND LARGER DECAYING WOODY MATERIAL, OLIVE GRAY (5 Y 4/1).
								END OF BORING AT 208.0'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D.P. GREENWOOD
DATE DECEMBER 18, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 135C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 136 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED SEPTEMBER 28, 1972 DRILLING COMPANY – EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,700.2 EAST 16,969.9 GROUND SURFACE ELEVATION 108.1'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		1	◤	4 6 6	12	5	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 5-10% FINE SAND, MODERATE YELLOWISH BROWN (10 YR 3/4).
100		2	◤	8 9 8	17	15	CH	SILTY CLAY, MODERATELY PLASTIC, 2-4% FINE SAND, MOTTLED YELLOWISH GRAY (5 Y 7/2), AND DARK YELLOWISH ORANGE (10 YR 6/6).
90	10	3	◤	5 6 7	13	18	SC	CLAYEY SAND, UNIFORM, FINE, 20-25% MODERATELY TO HIGHLY PLASTIC FINES, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), AND LIGHT GRAY (N7).
		4	◤	3 5 11	16	18	SC-SM CH	CLAYEY SAND, BOTTOM 6", UNIFORM, FINE, 25-30% MODERATELY PLASTIC FINES, LIGHT BROWN (5 YR 6/6), SILTY CLAY POCKET WITH HORIZONTAL COLOR BANDING, DARK YELLOWISH ORANGE (10 YR 6/6) AND LIGHT BROWN (5 YR 6/6). TOP 12", SANDY CLAY, MODERATELY PLASTIC, 20-25% FINE SAND, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), MODERATE RED (5 R 4/6), LIGHT GRAY (N7).
80	20	5	◤	6 8 10	18	15	SC	CLAYEY SAND, UNIFORM, FINE, 25-30% SLIGHTLY TO MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		6	◤	5 6 7	13	15	SC	CLAYEY SAND, SIMILAR TO SS-5, EXCEPT SAMPLE HAS MODERATELY TO HIGHLY PLASTIC CLAY POCKET WITH VERY THIN CLAYEY SAND LAYERS THROUGHOUT MOTTLED MODERATE REDDISH ORANGE (10 R 6/6), DUSK YELLOW (5 Y 6/4), DARK YELLOWISH ORANGE (10 YR 6/6).
70	30	7	◤	9 18 21	39	9	SC	CLAYEY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 20-25% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), MODERATELY TO HIGHLY PLASTIC CLAY POCKETS IN SAMPLE.
		8	◤	5 8 9	17	10	SC	CLAYEY SAND, UNIFORM, FINE, 30-35% MODERATELY TO HIGHLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
60	40	9	◤	25 35 41	76	9	SM	SILTY SAND, UNIFORM, FINE, 10-15% SLIGHTLY TO MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		10	◤	25 25 33	58	10	SP	SAND, UNIFORM, FINE, 8-10% SLIGHTLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
50	50	11	◤	5 5 8	13	10	SC	CLAYEY SAND, UNIFORM, FINE, 25-30% MODERATELY PLASTIC FINES, MOTTLED PALE ORANGE (10 YR 6/6), MODERATE ORANGE PINK (5 Y 8/4), MOD. REDDISH ORANGE (10 R 6/6), CLAY POCKETS 1/4"-1/2" THICK IN SAMPLE.
		12	◤	2 10 10	20	9	SC	CLAYEY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 15-20% MODERATELY PLASTIC FINES, MOTTLED MODERATE REDDISH ORANGE (10 R-6/6), DARK YELLOWISH ORANGE (10 YR 6/6), CLAY LENSES IN SAMPLE, ONE PIECE OF CLAY COATED GRAVEL 2.0" IN SIZE.
40	60	13	◤	10 10 10	20	5	SP	SAND, UNIFORM, FINE, 3-5% FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
		14	◤	8 9 9	18	12	SP	SAND, SIMILAR TO SS-13.
30	70	15	◤	15 25 31	56	11	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 4-6% FINES, 1-2% GRAVEL TO 0.6" MAXIMUM, DARK YELLOWISH ORANGE (10 YR 6/6).
		16	◤	25 50/7"	50/7"	9	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 12-15% SLIGHTLY TO MODERATELY PLASTIC FINES, 10-15% GRAVEL TO 1.2" MAXI. MOTTLED VERY PALE ORANGE (10 YR 8/2) AND DARK YELLOWISH ORANGE (10 YR 6/6). CLAY COATING ON SOME GRAVEL.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. E. GREENWOOD
DEF
DATE JANUARY 22, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 136A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 136 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED SEPTEMBER 28, 1972 DRILLING COMPANY – EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,700.2 EAST 16,969.9 GROUND SURFACE ELEVATION 108.1'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		17	◤	26 33 37	70	10	SC	CLAYEY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 10-15% MODERATELY PLASTIC FINES, 5-7% GRAVEL TO 1.0" MAX., DARK YELLOWISH ORANGE (10 YR 6/6).
20	90	18	◤	20 12 20	32	14	SC	CLAYEY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 12-15% MODERATELY PLASTIC FINES, 10-15% GRAVEL TO 1.3" MAX., DARK YELLOWISH ORANGE (10 YR 6/6), 4" CLAY LAYER IN MIDDLE PORTION OF SAMPLE.
10		19	◤	12 15 12	27	5	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 3-6% FINES, 2-3% GRAVEL 1.0" MAX., GRAYISH ORANGE (10 YR 7/4).
	100	20	◤	26 30 30	60	12	SP	SAND, UNIFORM, FINE, 2-5% MEDIUM AND COARSE SAND, 2-3% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
0		21	◤	27 50/5"	50/5"	5	SP	SAND, UNIFORM, FINE, 2-4% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	110	22	◤	18 38 41	79	9	SP	SAND, UNIFORM, FINE, 3-4% FINES, DARK YELLOWISH ORANGE (10 YR 6/6), CLAY LENSES AND CLAY BALLS PRESENT.
-10		23	◤	10 34 37	71	6	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 5-7% GRAVEL TO 1.1" MAXIMUM, 4-7% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	120	24	◤	35 51/6"	51/6"		SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, LESS THAN 2% GRAVEL TO 0.4" MAXIMUM, 2-4% NONPLASTIC TO SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		25	◤	40 63/6"	63/6"		SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 3-5% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), CLAY POCKET AND CLAY BALLS IN SAMPLE.
-20	130	26	◤	26 50/6"	50/6"		SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 5-6% GRAVEL TO 0.5" MAXIMUM, SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6). 5-7%
		27	◤	28 31 40	71	8	SP	SIMILAR TO SS-26.
-30	140	28	◤	20 19 20	39	7	SP GS	SANDY GRAVEL, POORLY GRADED TO 0.8" MAXIMUM, 35-40% MEDIUM AND COARSE SAND, 8-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		29	◤	16 19 25	44	8	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY COARSE, 20-25% GRAVEL TO 1.0" MAXIMUM, 7-9% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), CLAY COATING ON SOME GRAVEL.
-40	150	30	◤	4 5 7	12	18	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 2-4% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2), WITH FeOx NODULES.
		31	■					MOTTLED GRAY AND YELLOWISH-GRAY HARD CLAY WITH NUMEROUS STREAKS AND AND POCKETS OF ORANGE-BROWN CLAY, SEVERAL VERY SMALL POCKETS OF BLACK FINE TO MEDIUM SAND. CUTTING EDGE OF TUBE DENTED INWARDS BY 1/4". LOWER PART OF TUBE IS OVAL, 6.8 CM BY 4.0 CM. W = 29.5% LL = 43 PL = 20 PI = 23.
		32	■					GRAY HARD CLAY WITH NUMEROUS LAYERS AND POCKETS OF REDDISH-BROWN SILTY CLAY. SCATTERED GRAINS OF FINE TO MEDIUM SAND. MEDIUM SAND GRAINS ARE BLACK AND ANGULAR. W = 23.2% LL = 47 PL = 24 PI = 23
-50		33	■					YELLOWISH-GRAY CLAY, HARD. ORANGE STREAKS THROUGHOUT SECTION CONTAINING FINE SAND. LOWER PART OF TUBE IS OVAL SHAPE, 6.6 CM BY 7.6 CM W = 23.7% LL = 44 PL = 21 PI = 23
	160	34	■					YELLOWISH-BROWN FINE-SANDY CLAY. SCATTERED SMALL BLACK SPECKS OF SANDY SOIL. W = 21.7% LL = 32 PL = 17 PI = 15

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. E. GREENWOOD
DEF
DATE JANUARY 22, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 136B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 136 TYPE OF BORING DRIVE SHEET 3 OF 3
DATE DRILLED SEPTEMBER 28, 1972 DRILLING COMPANY – EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,700.02 EAST 16,969..9 GROUND SURFACE ELEVATION 108.1'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		35	■					FINE-SANDY SILTY CLAY. YELLOWISH-BROWN IN UPPER 4" AND GRAY IN LOWER ONE INCH. W = 22.8% LL = 29 PL = 18 PI = 11
		36	■					GREENISH-GRAY-FINE-SANDY CLAY. HARD AND BRITTLE, WITH SOFTER ZONES OF SANDIER CLAY. LOWER END OF TUBE IS DENTED BY ABOUT 1/2 OF THE TUBE DIAMETER. W = 31.1% LL = 43 PL = 20 PI = 23
-60		37	■					GREENISH-GRAY FINE-SANDY CLAY. POCKETS OF YELLOWISH-ORANGE SANDY CLAY. W = 20.4% & W = 20.2% LL = 38 PL = 17 PI = 21 LL = 42 PL = 24 PI = 18
	170	38	■					GREENISH-GRAY FINE-SANDY CLAY. INCLINED SEAM OF YELLOWISH-BROWN SANDY CLAY LAYERED WITH A SEAM OF ORANGE CLAYEY SILT. W = 23.2% & W = 25.4% LL = 40 PL = 17 PI = 23 & LL = 41 PL = 16 PI = 25
		39	■					GREENISH-GRAY FINE-SANDY CLAY. HARD AND BRITTLE. CUTTING END OF TUBE WAS COMPLETELY PINCHED SHUT. W = 27.4% LL = 38 PL = 17 PI = 21
		40	■					GREENSIH-GRAY FINE-SANDY CLAY. BLOCKY STRUCTURE. W = 24.9% LL = 34 PL = 16 PI = 18
-70		41	■					GRAY FINE-SANDY CLAY. CONTAINS SEVERAL PIECES OF COARSE SAND AND FINE GRAVEL WHICH ARE SOFTER IN THE OUTSIDE AND BECOME HARD TOWARDS THE CENTER. W = 26.7% LL = 38 PL = 18 PI = 20
	180	42	■					GRAY FINE-SANDY CLAY. SOME FINE SAND GRAINS APPEAR TO BE MICA. W = 26.1% & W = 26.9% LL = 36 PL = 15 PI = 21 & LL = 42 PL = 23 PI = 19
		43	■					GRAY FINE-SANDY CLAY. HARD. A VERTICAL SLIVER OF BROWNISH CLAY AT EDGE OF SECTION. W = 25.8% LL = 39 PL = 20 PI = 19 GRAY FINE-SANDY CLAY. ONE IRREGULARLY-SHAPED ZONE, LIGHT GRAY IN COLOR, ABOUT 1/2" IN THICKNESS, APPEARS HARDER WHEN TRIMMING. W = 28.4% LL = 44 PL = 18 PI = 26
		44	■					GRAY FINE-SANDY CLAY CONTAINING VERTICAL HAIRLINE CRACKS. A 2" LAYERER OF GRAY SILTY FINE SAND AT BOTTOM OF SECTION. W=27.9% LL = 32 PL = 20 PI = 12.
-80		45	■					GRAY-FINE-SANDCY CLAY. CONTAINS A SEAM OF REDDISH-BROWN SAND ABOUT 1/8" THICK. OCCASIONAL PIECES OF ANGULAR COARSE SAND. W = 25.6% LL = 37 PL = 16 PI = 21
	190	46	■					GRAY FINE-SANDY CLAY. VERY FRAGILE WHEN TRIMMING. W = 23.6% & W = 25.0% LL = 37 PL = 20 PI = 17 & LL = 26 PL = 23 PI = 3
		47	■					SLIGHTLY GREENISH GRAY FINE-SANDY CLAY. SOME ZONES OF MORE PLASTIC SOIL LOOK LIKE DRIED SHARDS OF CLAY INTERMIXED WITH THE SANDY CLAY. W=29.8% & W=24.5% LL=37 PL=23 PI=18 & LL=38 PL=20 PI=18
		48	■					GRAY FINE-SANDY CLAY. A FEW MEDIUM SAND SIZE GRAINS OF A BLACK MINERAL. OCCASIONAL SMALL FINE SAND POCKETS, SLIGHTLY LIGHTER IN COLOR W = 25.6% LL = 37 PL = 15 PI = 22
-90	200	49	■					GRAY FINE-SANDY CLAY. BOTTOM HALF OF SECTION IS SOMEWHAT MORE CLAYEY. A FEW SMALL POCKETS OF SILTY FINE SAND, SOME OF WHICH HAVE ORANGISH-BROWN STAINING. OCASSIONAL MEDIUM AND COARSE SAND GRAINS THROUGHOUT SECTION. LL = 34 PL = 17 PI = 17
		50	■					BROWN CLAY WITH PARTINGS AND 1 TO 2MM POCKETS OF FINE SAND, W=25.9% LL=43 PL=19 PI=24 GRAY SANDY CLAY W/1" TO 10MM LAYERS OF SILTY F. SAND INCLINED UP TO 30° TO HORZ. A FEW ANG. PIECES OF F. GRAVEL IN THICKEST SAND LAYER. W = 28.9% LL = 45 PL = 14 PI = 31
		51	■					
		52	■					GRAY FINE-SANDY CLAY. LAYERS OF LESS SANDY CLAY AND OCCASIONAL THIN LAYERS OF F. SAND. W=28.1% & W=26.5% LL=41 PL=16 PI=25 & LL=30 PL = 19 PI = 11
-98.9	207							TOP 1/2" IS A GRAY FINE-SANDY SILTY CLAY. LOWER 4 1/2" IS A YELLOWISH-BROWN FINE-SANDY SILTY CLAY. A FEW SCATTERED MEDIUM AND COARSE SAND GRAINS NEAR INTERFACE. W = 28.8% LL = 33 PL = 23 PI = 10
								END OF BORING AT 207.0'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. E. GREENWOOD
DEF
DATE JANUARY 22, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 136C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 137 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED OCTOBER 2, 1972 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY T.I.B.
COORDINATES, NORTH 17,710.1 EAST 16,966.8 GROUND SURFACE ELEVATION 109.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		1	◤	4 6 6	12	13	ML	CLAYEY SILT, NONPLASTIC TO SLIGHTLY PLASTIC, MOTTLED MODERATE YELLOWISH BROWN (10 YR 5/4) AND PALE ORANGE (10 YR 7/2).
100	10							
		2	◤	5 8 9	17	16	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 5-8% FINE SAND, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) AND VERY LIGHT GRAY (N 8), WITH SEVERAL SMALL FeOx. NODULES (MAY BE CRUSHED BY FINGERTIP).
		3	◤	5 8 11	19	18	CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 5-15% FINE SAND INCREASING TOWARDS BOTTOM OF SAMPLE, MOTTLED LIGHT GRAY (N 7) WITH DARK YELLOWISH ORANGE (10 YR 6/6), YELLOWISH ORANGE MOTTLING DECREASES DOWN SAMPLE.
90	20							
		4	◤	4 7 10	17	18	CL	SANDY CLAY, SLIGHTLY PLASTIC, 30-40% UNIFORM FINE SAND, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) AND LIGHT GRAY (N 7).
							CH	INTERLAYERED THINLY: SILTY CLAY, HIGHLY PLASTIC, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), LIGHT GRAY (N 7) AND MODERATE REDDISH BROWN (10 R 4/6).
		5	◤	4 8 12	20	14	SP-SC	SAND, UNIFORM, FINE, 8-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 5/6).
80	30							
		6	◤	4 6 8	14	10	SP-SC	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, 8-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 5/6), WITH 1.0" POCKET BALL OF HIGHLY PLASTIC SILTY CLAY.
		7	◤	4 7 8	15	11	GP-GC	SANDY GRAVEL, TO 0.7" MAX., 20-30% FINE TO COARSE SAND, 15-20% HIGHLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), CLAY COATING ON MANY PIECES OF GRAVEL.
70	40							
		8	◤	7 9 11	20	9	SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, 6-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		9	◤	6 13 18	31	9	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 4-6% GRAVEL TO 0.7" MAXIMUM, 3-5% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
60	50							
		10	◤	6 7 9	16	7	SP	SAND, UNIFORM, FINE, 3-5% FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6).
		11	◤	6 6 12	18	10	SP	SAND, UNIFORM, FINE, LESS THAN 1% GRAVEL TO 0.4" MAX., 2-4% FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6) WITH VERY THIN CLAYEY SAND LAYERS.
50	60							
		12	◤	9 9 10	19	6	SP	SAND, UNIFORM, FINE, 4-6% MEDIUM TO COARSE, 2-3% FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6).
		13	◤	5 5 8	13	9	SP	SAND, UNIFORM, FINE, 1% FINES, GRAYISH ORANGE PINK (5 YR 7/2) WITH MANY SMALL BLACK SPOTS, AND TRACE OF VERY THIN SUBHORIZONTAL YELLOWISH ORANGE LAYERS.
40	70							
		14	◤	7 13 16	29	9	SP	SAND, UNIFORM, FINE, 1% FINES, GRAYISH ORANGE PINK (5 YR 7/2), WITH FEW THIN YELLOWISH ORANGE BANDS, AND ONE THIN BAND OF SMALL BLACK SPOTS.
		15	◤	5 11 26	37	11	SP	TOP - SAND, UNIFORM, FINE, LESS THAN 5% MEDIUM, 1-3% FINES, VERY THINLY BANDED SUBHORIZONTALLY, MODERATE ORANGE PINK (10 R 7/4) AND YELLOWISH ORANGE (10 YR 6/6) BOTTOM - SAND, POORLY GRADED, FINE TO COARSE, 5-15% MEDIUM TO COARSE, 1% FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6).
30	80							

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6-INCH INCREMENTS ARE ALSO REPORTED.
2. ▨ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. E. GREENWOOD
DEG
DATE JANUARY 16, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 137A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 137 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED OCTOBER 2, 1974 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY T.I.B.
COORDINATES, NORTH 17,710.1 EAST 16,966.8 GROUND SURFACE ELEVATION 109.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		16	◤	6 15 33	48	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 2-4% GRAVEL TO 0.4" MAX., 1% FINES, VERY PALE ORANGE (10 YR 8/2) AND GRAYISH ORANGE (10 YR 7/4).
		17	◤	14 26 30	56	10	SP	GRAVELLY SAND, WIDELY GRADED, 35-45% GRAVEL TO 0.7" MAXIMUM, 1% FINES, VERY PALE ORANGE (10 YR 8/2) WITH THIN YELLOWISH ORANGE LAYERS (10 YR 6/6).
20	90							
		18	◤	18 33 43	76	9	SP	SAND, UNIFORM, FINE, LESS THAN 2% MEDIUM TO COARSE, LESS THAN OR EQUAL TO 1% FINES, YELLOWISH ORANGE (10 YR 8/6 TO 6/6).
		19	◤	13 20 25	45	8	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 1% FINES, YELLOWISH ORANGE (10 YR 7/6 - 6/6).
10	100							
		20	◤	7 16 31	47	10	SP	SAND, UNIFORM, FINE, 1% GRAVEL TO 0.7" MAX., 1% FINES, YELLOWISH ORANGE (10 YR 7/6) WITH THIN SUBHORIZONTAL LAYERS OF VERY PALE ORANGE AND DARK YELLOWISH ORANGE, WITH TRACE OF THIN LAYERS CLAYEY SAND.
		21	◤	18 35 51	86	9	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 2% MEDIUM TO COARSE, LESS THAN OR EQUAL TO 1% GRAVEL TO 0.4" MAX., LESS THAN OR EQUAL TO 1% FINES, YELLOWISH ORANGE (10 YR 7/6).
0	110							
		22	◤	30 46 50/4"	121	10	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 3% MEDIUM TO COARSE, LESS THAN OR EQUAL TO 1% GRAVEL TO 0.5" MAX., LESS THAN OR EQUAL TO 1% FINES, YELLOWISH ORANGE (10 YR 7/6 TO 6/6).
		23	◤	21 34 50	84	10	SP	SAND, UNIFORM, FINE, LESS THAN 1% GRAVEL TO 0.3" MAXIMUM, 1-2% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
-10	120							
		24	◤	22 50 50/4"	125	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 8-15% GRAVEL TO 0.4" MAX., LESS THAN 1-3% FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH LAYER OF FINE TO MEDIUM SAND AT BOTTOM.
		25	◤	27 37 39	76	7	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 4-7% GRAVEL TO 0.5" MAX., 2-4% FINES, DARK YELLOWISH ORANGE (10 YR 5/6).
-20	130							
		26	◤	21 39 41	80	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, [illegible] GRAVEL TO 0.[illegible] [illegible] FINES, DARK YELLOWISH ORANGE (10 YR 6/6) TO 5/6).
		27	◤	21 31 35	66	8	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 10-15% GRAVEL TO 0.7" MAX., 4-5% FINES, MODERATELY BROWN (5 YR 3/4).
-30	140							
		28	◤	12 20 17	37	8	GP	SANDY GRAVEL, POORLY GRADED TO 0.7" MAX., 30-40% MEDIUM TO COARSE SAND, 2-4% FINES, DARK YELLOWISH ORANGE (10 YR 5/6).
		29	◤	9 21 33	54	7	GP-GC	SANDY GRAVEL, POORLY GRADED TO 0.8" MAX., 25-35% FINE TO COARSE SAND, MOSTLY MEDIUM TO COARSE, 15-20% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), GRAVEL BOUND BY CLAYEY SAND MATRIX.
-40	150							
		30	◤	4 6 10	16	16	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2) WITH MUCH BRIGHT YELLOWISH ORANGE FeOx. AND BLACK MnOx MOTTLING, VERY STIFF.
		31	◤	6 8 12	20	21	CH	SILTY CLAY, SAME AS SS-30, EXCEPT MOTTLING IS LESS SEVERE.
-50	160							

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6-INCH INCREMENTS ARE ALSO REPORTED.
2. ▨ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. E. GREENWOOD
DEG
DATE JANUARY 16, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 137B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 137 TYPE OF BORING DRIVE SHEET 3 OF 3
DATE DRILLED OCTOBER 2, 1972 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY T.I.B.
COORDINATES, NORTH 17,710.1 EAST 16,966.8 GROUND SURFACE ELEVATION 109.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		32	◤	3 6 7	13	22	CH	CLAY/SILTY CLAY, HIGHLY PLASTIC, STIFF, MOTTLED OLIVE GRAY (5 Y 4/1) AND DARK GREENISH GRAY (5 GY 4/1).
		33	◤	4 6 8	14	21	CH	SILTY CLAY, MODERATELY PLASTIC, STIFF, DARK GREENISH GRAY (5 GY 4/1), WITH POCKETS OF CLAY AND CLAYEY SILT.
-60	170							
		34	◤	8 12 19	31	21	CL-CH	SILTY CLAY, MODERATELY PLASTIC, HARD, DARK GREENISH GRAY (5 GY 4/1), WITH ZONES OF SANDY CLAY.
		35	◤	8 12 12	24	21	CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 10-15% UNIFORM VERY FINE SAND, GREENISH GRAY (5 G 5/1 TO 4/1).
-70	180							
		36	◤	8 11 12	23	21	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 15-20% UNIFORM, VERY FINE SAND, DARK GREENISH GRAY (5 G 4/1), WITH THIN LAYERS OF SILTY VERY FINE SAND.
		37	◤	7 12 15	27	20	SM W/ ML	SILTY SAND, UNIFORM, VERY FINE, 30-40% NONPLASTIC TO SLIGHTLY PLASTIC FINES, DARK GREENISH GRAY (5 G 4/1) WITH ZONES OF CLAYEY SILT.
-80	190							
		38	◤	7 12 16	28	19	ML W/ SM & CL	SANDY SILT, NONPLASTIC, 20-30% UNIFORM VERY FINE SAND, DARK GREENISH GRAY (5 G 4/1), WITH POCKETS OF SILTY SAND AND SILTY CLAY
		39	◤	9 12 16	28	21	ML W/ SM & CL	SIMILAR TO SS-38, WITH INCREASING AMOUNT OF SILTY CLAY.
-90	200							
		40	◤	4 6 10	16	20	CL-CH W/ ML & SM	SILTY CLAY, MODERATELY PLASTIC, OLIVE GRAY (5 Y 4/1) TO DARK GREENISH GRAY (5 G 4/1), WITH POCKETS AND THIN LAYERS OF SANDY SILT AND SILTY SAND.
		41	◤	3 6 7	13	20	CL-CH W/ ML & SM	SILTY CLAY, WITH SANDY SILT AND SILTY SAND, SIMILAR TO SS-40.
		42	◤	10 11 12	23	21	CL-CH	SILTY CLAY: MODERATELY PLASTIC, OLIVE GRAY (5 Y 4/1), WITH SMALL POCKETS/LAYERS OF SANDY SILT AND SILTY SAND, WITH 1.0" LAYER OF YELLOWISH GRAY SILTY CLAY AT BOTTOM.
-100 -100.9	210							END OF BORING AT 210.0'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6-INCH INCREMENTS ARE ALSO REPORTED.
2. ▨ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. E. GREENWOOD
DEG
DATE JANUARY 16, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 137C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 138 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED OCTOBER 10, 1972 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,687.2 EAST 17,011.7 GROUND SURFACE ELEVATION 110.2'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		1	◤	3 4 5	9	16	ML	CLAYEY SILT, MODERATELY TO HIGHLY PLASTIC, 1-3% FINE SAND, MOTTLED, MODERATE YELLOWISH-BROWN (10 YR 5/4) AND GRAYISH-ORANGE PINK (5YR 7/2).
100	10	2	◤	4 7 10	17	18	CH	SILTY CLAY, MODERATELY PLASTIC, 5-8% FINE SAND, DARK YELLOWISH-ORANGE (10 YR 6/6), 3 FeOx NODULES.
		3	◤	3 3 6	9	18	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 5-10% FINE SAND, MOTTLED DARK YELLOWISH-ORANGE (10 YR 6/6) LIGHT GRAY (N 7) AND MODERATE RED, (5 R 4/6), HIGHLY PLASTIC CLAY POCKETS THROUGHOUT.
90	20	4	◤	3 6 9	15	16	SC	CLAYEY SAND, UNIFORM, FINE, 10-15% MODERATELY PLASTIC FINES, MOTTLED DARK YELLOWISH-ORANGE (10 YR 6/6), LIGHT GRAY (N 7), AND MODERATE REDDISH-BROWN (10 R 4/6), MODERATELY PLASTIC CLAY, AND SILTY CLAY POCKETS WITH THIN FINE SAND LAYERING, FeOx NODULES.
		5	◤	5 5 6	11	15	SC CH	CLAYEY SAND TOP 5", UNIFORM, FINE, 10-15% MODERATELY PLASTIC FINES, MOTTLED DARK YELLOWISH-ORANGE (10 YR 6/6) AND LIGHT GRAY (N 7). CLAY SLIVERS 1/8" TO 3/4" LONG. BOTTOM 10" SILTY CLAY, HIGHLY PLASTIC, FAT, MOTTLED, MODERATE REDDISH-BROWN (10 R 4/6), LIGHT GRAY (N 7) AND DARK YELLOWISH-ORANGE (10 YR 6/6), VERY FINE SAND AND SILTY SAND LAYERING IN CLAY, SAND COATING ON PORTION OF CLAY.
80	30	6	◤	4 5 7	12	11	SC	CLAYEY SAND, UNIFORM, FINE, 8-10% MODERATELY PLASTIC FINES, MOTTLED DARK YELLOWISH-ORANGE (10 YR 6/6) AND MODERATE RED (5 R 4/6).
		7	◤	4 5 6	11	10	SC	CLAYEY SAND, UNIFORM, FINE, 10-15% MODERATELY PLASTIC FINES, MOTTLED DARK YELLOWISH-ORANGE (10 YR 6/6) AND MODERATE REDDISH-BROWN (10 R 4/6).
70	40	8	◤	5 7 8	15	14	SP	SAND, UNIFORM, FINE, 5-8% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		9	◤	5 7 9	16	15	SP	SIMILAR TO SS 8 EXCEPT 4-6% MODERATELY PLASTIC FINES.
60	50	10	◤	14 13 12	25	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 3-6% GRAVEL TO 0.9 IN. MAX., 3-8% MODERATELY TO HIGHLY PLASTIC FINES, DARK YELLOWISH-ORANGE (10 YR 6/6), CLAY POCKET WITH GRAVEL, SOME CLAY COATED GRAVEL.
		11	◤	8 12 12	24	9	SP	SAND, UNIFORM, FINE, 1-3% PALE YELLOWISH ORANGE (10 YR 8/6).
50	60	12	◤	8 12 13	25	10	SP	SAND, UNIFORM, FINE, 1-3% FINES, MOTTLED MODERATE ORANGE-PINK (5 YR 8/4) AND PALE YELLOWISH-ORANGE (10 YR 8/6) CLAY LAYERING AND POCKETS MODERATELY TO HIGHLY PLASTIC PRESENT.
		13	◤	7 6 11	17	9	SP	SAND, UNIFORM FINE, 2-4% MODERATELY PLASTIC FINES, MOTTLED PALE YELLOWISH ORANGE (10 YR 8/6), GRAYISH ORANGE (10 YR 7/4).
40	70	14	◤	6 9 14	23	15	SP	[illegible] IN SIZE.
		15	◤	20 50/6"	50/6"	6	SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY MEDIUM, FOUR PIECES OF GRAVEL TO 0.8 IN. MAX., 2-4% NONPLASTIC TO SLIGHTLY PLASTIC FINES, MOTTLED DARK YELLOWISH-ORANGE (10 YR 6/6), LIGHT BROWN (5 YR 5/6), AND GRAYISH-ORANGE (10 YR 7/4).
30	80	16	◤	7 15 23	38	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 1-3% GRAVEL TO 0.8 IN. MAX., 2-3% SLIGHTLY PLASTIC FINES, GRAYISH-ORANGE (10 YR 7/4

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 18 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE JANUARY 29, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210-GSK-138A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 138 TYPE OF BORING DRIVE/THIN WALL TUBE SHEET 2 OF 3
DATE DRILLED OCTOBER 10, 1972 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,687.2 EAST 17,011.7 GROUND SURFACE ELEVATION 110.2'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		17	◤	36 31 37	68	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND COARSE, 5-10% GRAVEL TO 0.7 IN. MAX., 3-5% SLIGHTLY TO MODERATELY PLASTIC FINES, GRAYISH-ORANGE (10 YR 7/4), CLAY LENSE PRESENT.
20	90	18	◤	21 50/6"	50/6"	6	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, TWO PIECES OF GRAVEL 0.7 IN. IN SIZE, 1-3% FINES, GRAYISH-ORANGE (10 YR 7/4).
		19	◤	12 25 27	52	6	SP	SAND, UNIFORM FINE, LESS THAN 1% GRAVEL TO 0.7 IN. MAX., 1-3% FINES, MOTTLED PALE YELLOWISH ORANGE (10 YR 8/6) AND LIGHT BROWN (5 YR 5/6).
10	100	20	◤	16 26 29	55	6	SP	SAND, UNIFORM FINE, ONE PIECE CLAY COATED GRAVEL 0.9 IN. IN SIZE, 3-5% MODERATELY PLASTIC FINES, MOTTLED GRAYISH-ORANGE (10 YR 8/6) AND DARK YELLOWISH-ORANGE (10 YR 6/6).
		21	◤	21 27 32	59	5	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM. 1-2% GRAVEL TO 1.1 IN. MAX., 2-5% SLIGHTLY PLASTIC FINES, GRAYISH - ORANGE (10 YR 7/4).
0	110	22	◤	22 37 41	78	11	SP	SAND, UNIFORM FINE, 1-3% FINES, PALE YELLOWISH-ORANGE (10 YR 8/6).
		23	◤	16 31 39	70	12	SP	SAND, POORLY GRADED, FINE TO COARSE MOSTLY FINE, 2-4% FINES, DARK YELLOWISH-ORANGE (10 YR 6/6).
-10	120	24	◤	33 50/6"	50/6"	11	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 4-8% SLIGHTLY PLASTIC FINES, DARK YELLOWISH-ORANGE (10 YR 6/6).
		25	◤	18 23 28	51	9	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 1-3% GRAVEL TO 0.6 IN. MAX., 4-6% FINES, PALE YELLOWISH-BROWN (10 YR 6/2).
-20	130	26	◤	16 29 40	69	9	SP	SIMILAR TO SS-25.
		27	◤	31 31 34	65	6	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 3-5% GRAVEL TO 0.8 IN. MAX., 3-8% MODERATELY PLASTIC FINES, DARK YELLOWISH-ORANGE (10 YR 6/6).
-30	140	28	◤	13 17 28	45	6	GP	SANDY GRAVEL, POORLY GRADED TO 1.3 IN. MAX., 5-15% MEDIUM AND COARSE SAND, 5-10% MODERATELY PLASTIC FINES, MODERATE YELLOWISH-BROWN (10 YR 5/4). CLAY COVERING SOME PIECES OF GRAVEL.
		29	◤	18 31 40	71	7	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND COARSE 10-15% GRAVEL TO 0.9 IN. MAX 5-10% MODERATELY PLASTIC FINES, MODERATE YELLOWISH-BROWN (10 YR 5/4). CLAY POCKET MODERATELY PLASTIC, CONTAINED GRAVEL AND SANDS, CLAY COATING ON SOME PIECES OF GRAVEL.
-40	150	30	◤	12 15 18	33	7	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 1-2% GRAVEL TO 1.4 IN. MAX., YELLOWISH-GRAY (5 Y 7/2). SEVERELY MOTTLED WITH FeOx NODULES AND VEINING.
		31	■					MOTTLED YELLOWISH-GRAY AND YELLOW HARD CLAY WITH SPOTS AND STREAKS OF BLACK, ORANGE, AND BROWN COLOR. IT IS BRITTLE AND CRUMBLES AFTER BREAKING IT. W = 30.5% LL = 50 PL = 18 PI = 32
		32	■					MOTTLED YELLOWISH-GRAY AND YELLOW CLAY, HARD & BRITTLE. STREAKS, SPOTS AND HORIZ. SEAMS OF BROWN & ORANGE CLAY, SILTY F. SAND & SILT. IT IS BRITTLE & CRUMBLES. W = 32.6% LL = 58 PL = 16 PI = 42
		33	■					YELLOW HARD CLAY WITH STREAKS & SEAMS OF ORANGE, BLACK & BROWN COLORS. BRITTLE. W = 33.1% LL = 53 PL = 17 PI = 36
-50	160	34	■					GRAY CLAY WITH DK. STREAKS. A VERTICAL STREAK OF GREEN CLAY SEPARATES A SLICE OF LIGHTER GRAY & HARDER CLAY AT ONE SIDE OF SECTION. W = 29.4% LL = 46 PL = 17 PI = 29

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 18 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY DAVID F. GREENWOOD
DATE JANUARY 29, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210-GSK-138B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 138 TYPE OF BORING DRIVE/THIN WALL TUBE SHEET 3 OF 3
DATE DRILLED OCTOBER 10, 1972 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,687.2 EAST 17,001.7 GROUND SURFACE ELEVATION 110.2'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		35	■					GRAY HARD CLAY WITH A YELLOWISH STREAK RUNNING VERTICALLY THROUGH THE SECTION. CLAY IS BRITTLE. W=26.8%, LL=45 PL=18 PI=27.
		36	■					GRAY FINE-SANDY CLAY, SEVERAL SMALL LENSES OF F. SAND, A FEW 1/2 IN. POCKETS OF ORANGE-BROWN SILTY CLAY. W=27.5% LL=42 PL=18 PI=24
-60	170	37	■					GREEN FINE-SANDY CLAY WITH VEINS OF YELLOWISH COLOR. HARD AND BRITTLE. W=20.4% LI=42 PL=16 PI=26.
		38	■					GREENISH GRAY SANDY CLAY.. A POCKET OF MORE PLASTIC CLAY ABOUT 2 IN SIZE. W=22.2% LL=43 PI=17 PI=26. GRAY FINE-SANDY CLAY, TOP 3 IN. OF SECTION CONTAINS OCCASIONAL MEDIUM SAND GRAINS. W=24.7% LL=40 PL=15 PI=25.
		40	■					GRAY FINE-SANDY CLAY. SEVERAL 1/2-IN. TO 1-IN. POCKETS OF ORANGE BROWN SILTY CLAY. W=29.1% LL=41 PL=18 PI=23.
-70	180	42	■					W=27.7% LL=41 PL=19 PI=22 GREENISH-GRAY FINE-SANDY CLAY, STREAKS OF LESS SANDY CLAY. SOME FINE SAND GRAINS APPEAR TO BE MICA. W=28.2% LL=46 PL=16 PI=30.
		43	■					GREENISH-GRAY FINE-SANDY CLAY. HARD TO BRITTLE. W=28.8% LL=41 PL=15 PI=26
		44	■					GREENISH-GRAY FINE-SANDY CLAY. LESS SANDY IN TOP HALF OF SECTION. HARD, BRITTLE, AND CRUMBLY. W=24.2% LL=37 PL=14 PI=23.
		45	■					GREENISH-GRAY FINE-SANDY CLAY. A PARTING OF FINE SAND WITH AN IRREGULAR SURFACE ROUGHLY HORIZONTAL. W=27.5% LL=39 PL=18 PI=23. W=26.8% LL=38 PL=17 PI=21.
-80	190	46	■					GREENISH-GRAY VERY SANDY CLAY, BECOMING LESS SANDY TOWARD BOTTOM. A 1/2-IN. LAYER OF HARD BRITTLE CLAY. A ROUGHLY HORIZONTAL BLUISH STREAK AT BOTTOM OF SECTION. W=28.1% LL=34 PL=18 PI=16
		48	■					GRAY FINE-SANDY CLAY. SEVERAL VERY THIN ([illegible] 1 MM) PARTINGS OF FINE SAND IN BOTTOM 2 IN. OF SECTION. A 1/2-IN. PIECE OF GRAVEL AT BOTTOM OF SECTION. W=28.9% LL=42 PL=15 PI=27
		49	■					GRAY SANDY CLAY. CONTAINS GREENISH-GRAY ZONES WHICH ARE CLAYIER. SMALL LENSES ([illegible] 1MM THICK) OF FINE SAND. A SOFT ROOT OF ABOUT 1 MM IN DIA. W=27.4 LL=42 PL=17 PI=25. W=26/4% LL=40 PL=16 PI=24.
-90	200	50	■					GRAY FINE-SANDY CLAY. SAMPLE APPEARS HOMOGENEOUS. W=25.1% LL=37 PL=15 PI=22.
		51	■					GRAY FINE-SANDY CLAY. SOME STRATIFICATION WITH LAYERS OF DIFFERENT SAND CONTENT. A 2 MM THICK SILTY SAND PARTING. SEVERAL SCATTERED COARSE SAND GRAINS. W=23.0% LL-34 PL=16 PI=18.
		52	■					LIGHT BROWNISH-GRAY SILTY FINE SAND. GRAY HARD CLAY WITH IRREGULAR LAYERS OF SAND UP TO 1/4IN. THICK IN LOWER PART. W=32.4% LL=44 PL=15 PI=29.
-99.8	210	53	■					GRAY HARD SILTY CLAY WITH THIN F. SAND SEAMS. GRAY CLAYEY F. TO MED. SAND. YELLOWISH-BROWN STIFF CLAY WITH A TRACE OF F. SAND. SMALL POCKETS AND STREAKS OF ORANGE BROWN F. TO MED. SAND. ORANGE-BROWN SILTY F. TO MED. SAND. AT THE INTERFACE WITH THE CLAY THERE WAS A CEMENTED 1/8-IN. LAYER OF IRON OXIDE. W=27.8% LL=40 PL=16 PI=24.

END OF BORING AT 210.0'

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 18 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE JANUARY 29, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210-GSK-138C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO. 139 TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED OCTOBER 12, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY D.P.P.
COORDINATES, NORTH 17,365.3 EAST 17,922.3 GROUND SURFACE ELEVATION 113.3'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
110								
		1	◤	5 7 7	14	10	ML	CLAYEY SILT, MODERATELY TO HIGHLY PLASTIC, 3-5% FINE SAND, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), AND MODERATE YELLOWISH BROWN (10 YR 5/4), LARGE FeOx. BALLS IN SAMPLE.
	10	2	◤	5 9 12	21	20	CL	SANDY CLAY, MODERATELY TO HIGHLY PLASTIC, 3-8% FINE SAND, MOTTLED, MODERATE REDDISH BROWN (10 R 4/6), DARK YELLOWISH ORANGE (10 YR 6/6) LIGHT BROWN (5 YR 5/6) AND LIGHT GRAY (N 7), FINE SAND LAYERING IN CLAY.
100								
		3	◤	15 18 19	37	14	SM	SILTY SAND, UNIFORM, FINE, 10-20% MODERATELY TO HIGHLY PLASTIC FINES, MOTTLED VERY LIGHT GRAY (N 8), MODERATE REDDISH BROWN (10 R 4/6), AND PALE YELLOWISH ORANGE (10 YR 8/6).
	20	4	◤	2 5 5	10	16	ML	CLAYEY SILT, MODERATELY TO HIGHLY PLASTIC, 10-15% FINE TO VERY FINE SAND, MOTTLED WITH PALE YELLOWISH ORANGE (10 YR 8/6), DARK YELLOWISH ORANGE (10 YR 6/6) LAYERING, VERY NOTICEABLE, ONE VERY SOFT CLAY POCKET APPROXIMATELY 1/4" THICK.
90								
		5	◤	3 4 5	9	16	SM	SILTY SAND, UNIFORM, FINE, 8-12% MODERATELY PLASTIC FINES, MOTTLED LIGHT GRAY (N 7), DARK YELLOWISH ORANGE (10 YR 6/6), MODERATE BROWN (5 YR 4/4), HIGHLY PLASTIC CLAY POCKETS AND LAYERING, MODERATE RED (5 R 4/6), AND VERY PALE ORANGE (10 YR 8/2).
	30	6	◤	3 3 6	9	13	SM	SILTY SAND, UNIFORM, FINE, 10-15% MODERATELY PLASTIC FINES, MOTTLED LIGHT GRAY (N 7), LIGHT BROWN (5 YR 5/6), PALE YELLOWISH ORANGE (10 YR 8/6), DARK YELLOWISH ORANGE (10 YR 6/6), HIGHLY PLASTIC, MODERATE RED (5 R 4/6), CLAY POCKETS AND LAYERS.
80								
		7	◤	4 4 4	8	10	SM	SILTY SAND, UNIFORM, FINE, 15-20% MODERATELY PLASTIC FINES, LIGHT GRAY (N 7).
	40	8	◤	5 7 10	17	11	SM	SILTY SAND, UNIFORM, FINE, 10-15% SLIGHTLY TO MODERATELY PLASTIC FINES, MOTTLED GRAYISH YELLOW (5 Y 8/4) AND PALE YELLOWISH ORANGE (10 YR 8/6).
70								
		9	◤	5 9 10	19	10	SP	SAND, UNIFORM, FINE, 3-6% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), WITH SLIGHTLY TO MODERATELY PLASTIC SILTY SAND POCKETS.
	50	10	◤	11 14 23	37	12	SP-SM	SAND, UNIFORM, FINE, 8-10% SLIGHTLY TO MODERATELY PLASTIC FINES, LIGHT BROWN (5 YR 5/6), ONE PIECE OF GRAVEL 0.3" IN SIZE.
60								
		11	◤	56/6"	56/6"	5	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, LESS THAN 1% GRAVEL TO 0.6" MAX., 3-6% FINES, LIGHT BROWN (5 YR 5/6).
	60	12	◤	30 34 12	46	5	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 5-8% GRAVEL TO 0.8" MAX., 4-8% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
50								
		13	◤	7 8 8	16	9	SP	SAND, UNIFORM, FINE, 4-8% MODERATELY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4).
	70	14	◤	2 1 1	2	17	CL	SANDY CLAY, MODERATELY PLASTIC, 18-20% FINE SAND, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) AND GRAYISH YELLOW (5 Y 8/4).
40								
		15	◤	5 6 8	14	16	SP	SAND, UNIFORM, FINE, 3-5% FINES, GRAYISH ORANGE (10 YR 7/4).
	80							

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. P. GREENWOOD
DATE JANUARY 18, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 139 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 139 TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED OCTOBER 12, 1972 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY D.P.P.
COORDINATES, NORTH 17,365.3 EAST 17,922.3 GROUND SURFACE ELEVATION 113.3'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		16	◤	8 6 6	12	16	SP	SIMILAR TO SS-15, WITH MOTTLED COLORINGS OF GRAYISH ORANGE (10 YR 7/4) AND 30" BAND OF PALE YELLOWISH ORANGE (10 YR 8/6).
30								
		17	◤	36 38 38	76	13	SP	SAND, POORLY GRADED, FINE AND COARSE, MOSTLY FINE, LESS THAN 1% GRAVEL TO 0.5" MAX., 1-4% FINES, LIGHT BROWN (5 YR 5/6) AND DARK YELLOWISH ORANGE (10 YR 6/6)..
	90	18	◤	9 16 15	31	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 2-4% GRAVEL TO 1.1" MAX., 2-6% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) CLAY LAYERS, MODERATELY PLASTIC, CLAY COATING ON SOME GRAVEL.
20								
		19	◤	20 22 24	46	14	SP	SAND, UNIFORM, FINE, 2-4% FINES, DARK YELLOWISH ORANGE (10 YR 6/6) TWO PIECES OF COARSE SAND IN SAMPLE.
	100	20	◤	11 14 18	32	11	SP	SAND, UNIFORM, FINE, 1-3% SLIGHTLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6), ONE PIECE OF COARSE SAND, ONE PIECE OF GRAVEL 0.3" IN SIZE.
10								
		21	◤	8 9 12	21	13	SP	SAND, UNIFORM, FINE, 3-5% SLIGHTLY TO MODERATELY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
	110	22	◤	5 7 23	30	17	SP	SAND, UNIFORM, FINE, 4-8% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), 3" HIGHLY PLASTIC SILTY CLAY LAYER, WITH VERY FINE SILTY SAND LAYERING, TWO PIECES OF CLAY COATED GRAVEL, 0.8" MAX.
0								
		23	◤	12 20 33	53	14	SP	SAND, UNIFORM, FINE, 3-6% FINES, MOTTLED PALE YELLOWISH BROWN (10 YR 6/2) AND OLIVE GRAY (5 Y 4/1).
	120	24	◤	38 50/6"	50/6"	10	SP	SIMILAR TO SS-23, EXCEPT COLORING IS PALE YELLOWISH BROWN.
-10								
		25	◤	20 25 38	63	9	SP	SIMILAR TO SS-24 AND SS-23, EXCEPT ONE PIECE OF GRAVEL 0.4" MAX., GRAYISH ORANGE (10 YR 7/4).
	130	26	◤	23 33 50	83	10	SP	SAND, UNIFORM, FINE, 2-4% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), SANDY CLAY BALLS PRESENT.
-20								
		27	◤	33 60/6"	60/6"	7	SP	SAND, UNIFORM, FINE, 1-3% FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
	140	28	◤	19 23 18	41	7	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 3-6% GRAVEL TO 0.8" MAX., 5-10% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
-30								
		29	◤	13 16 22	38	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 2-5% GRAVEL TO 0.8" MAX., 3-6% FINES, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), GRAYISH ORANGE (10 YR 7/4), 3" HIGHLY PLASTIC CLAY POCKET FILLED WITH SAND AND GRAVEL.
	150	30	◤	5 6 9	15	24	CH	SILTY CLAY, MODERATELY PLASTIC, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), LIGHT GRAY (N 7), FeOx. VEINING THROUGHOUT SAMPLE AND VERY FINE SILTY SAND LAYERING.
-40								
		31	◤	8 10 14	24	23	CH	SILTY CLAY, MODERATELY PLASTIC, 1-3% VERY FINE SAND, MOTTLED YELLOWISH GRAY (5 Y 7/2), DARK YELLOWISH BROWN (10 YR 4/2), FeOx. VEINING AND BALLS PRESENT WITH FINE SILTY SAND POCKETS.
	160	32	◤	10 13 17	30	18	CH	SILTY CLAY, MODERATELY PLASTIC, TOP 8" IS YELLOWISH GRAY (5 Y 7/2) BOTTOM 10" IS GREENISH GRAY (5 G 6/1), ENTIRE SAMPLE HAS FeOx. BALLS AND VERY FINE SILTY SAND POCKETS.
								END OF BORING AT 161.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. P. GREENWOOD
DATE JANUARY 18, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 139 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO. 140 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED JAN. 4-6, 1973 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY E.M.W.
COORDINATES, NORTH 17,569.1 EAST 17,371.5 GROUND SURFACE ELEVATION 116.6

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
110		1	◤	3 7 16	23	13	ML	CLAYEY SILT, SLIGHTLY PLASTIC, LESS THAN 2% VERY FINE SAND, FIRM, MODERATE YELLOWISH-BROWN (10 YR 4/4). Loess.
	10	2	◤	7 15 19	34	15	ML	CLAYEY SILT, SLIGHTLY PLASTIC, LESS THAN 5% VERY FINE SAND, HARD, BRIGHT YELLOWISH-BROWN (10 YR 5/6), SEVERAL SMALL HARD NODULES DESSICATED CLAY.
110		3	◤	5 6 9	15	15	ML	CLAYEY SILT, SLIGHTLY PLASTIC, LESS THAN 5% VERY FINE SAND, FIRM, MODERATE YELLOWISH-BROWN (10 YR 5/5) AND MODERATE BROWN (5 YR 4/3).
	20	4	◤	4 6 12	18	16	SC	CLAYEY SAND, UNIFORM, FINE, 35-45% MODERATELY PLASTIC FINES, MEDIUM DENSE, LIGHT GRAY (N-7), STAINED DARK YELLOWISH-ORANGE (10 YR 6/6) AND LIGHT BROWN (5 YR 4/6).
90		5	◤	5 6 7	13	16	SC	CLAYEY SAND, SIMILAR TO SS-4.
	30	6	◤	6 12 16	28	13	SC	CLAYEY SAND, UNIFORM, FINE, 20-30% MODERATELY PLASTIC FINES, MEDIUM DENSE, LIGHT GRAY (N-7), HEAVILY STAINED MODERATE REDDISH-BROWN (10 R 4/6) WITH DARK YELLOWISH-ORANGE (10 YR 6/6), POCKET LIGHT GRAY SANDY CLAY.
80		7	◤	8 9 10	19	14	SP	SAND, UNIFORM, FINE, 3-5% SLIGHTLY PLASTIC FINES, MEDIUM DENSE, DARK YELLOWISH-ORANGE (10 YR 5/6) AND DARK REDDISH-BROWN (10 R 3/4) POCKETS DARK RED (5 R 3/6), HIGHLY PLASTIC CLAY.
	40	8	◤	10 11 11	22	8	SC	CLAYEY SAND, WIDELY GRADED COARSE TO FINE, 5-8% SUBROUNDED GRAVEL TO 0.5 IN. MAX., 10-20% PLASTIC FINES, DARK YELLOWISH-ORANGE. (10 YR 5/6) NOTE: CLAY TENDS TO BE CONCENTRATED WITH GRAVEL AND COARSE SAND.
70		9	◤	7 10 10	20	14	SP	SAND, UNIFORM, FINE, FEW GRAVEL TO 0.4 IN. MAX., LESS THAN 2% FINES, MEDIUM DENSE, BRIGHT YELLOWISH-ORANGE (10 YR 5/8), AND DARK RED (5 R 3/6).
	50	10	◤	7 10 12	22	10	SP	SAND, UNIFORM, FINE, LESS THAN 2% FINES, MEDIUM DENSE, BRIGHT YELLOWISH-ORANGE (10 YR 5/8) AND DARK RED (5 R 3/6).
60		11	◤	15 17 17	34	8	SP	SAND, UNIFORM, FINE, LESS THAN 2% FINES, DENSE, BRIGHT YELLOWISH-BROWN (10 YR 5/6) AND MODERATE REDDISH BROWN (10 R 5/6), POCKET DARK YELLOWISH-ORANGE (10 YR 6/6) STIFF CLAY.
	60	12	◤	10 16 25	41	9	SP	SAND, UNIFORM, FINE, LESS THAN 2% FINES, DENSE, BRIGHT YELLOWISH-BROWN (10 YR 5/6), POCKETS STIFF CLAY, BRIGHT YELLOWISH-ORANGE (10 YR 6/6) AND YELLOWISH-GRAY (5 Y 7/2) WITH DARK RED (5 R 3/6) STAINING.
50		13	◤	8 12 16	28	8	SP	SAND, GRADED FINE, LESS THAN 4% FINES, MEDIUM DENSE, MODERATE YELLOWISH-ORANGE (10 YR 7/6) WITH PINKISH CAST, MANY THIN (0.05 IN.) LAYERS YELLOWISH-GRAY (5 Y 8/1) CLAY.
	70	14	◤	4 6 8	14	8	SP-CH	SAND WITH CLAY MATRIX, WIDELY GRADED COARSE TO FINE, MOSTLY COARSE, BRIGHT YELLOWISH-BROWN (10 YR 5/6), WITH MATRIX OF CLAY, HIGHLY PLASTIC, SOFT, YELLOWISH GRAY (5 Y 7/2) AND DARK RED (5 R 3/6), ALSO BALLS OF HIGHLY PLASTIC CLAY.
40		15	◤	2 4 7	11	13	CH SP	TOP 8 IN.: CLAY, HIGHLY PLASTIC, FIRM, DUSKY RED (5 R 4/4) WITH PALE GRAYISH RED (5 R 7/2). BOTTOM 5 IN.: SAND, UNIFORM, VERY FINE, MEDIUM DENSE, PALE YELLOWISH-ORANGE (10 YR 8/6), MANY THIN (0.1 IN.) LAYERS MODERATE RED (5 R 5/6) HIGHLY PLASTIC CLAY.
	80	16	◤	12 17 20	37	9	SP	SAND, UNIFORM, VERY FINE, DENSE, CLEAN, PALE YELLOWISH-ORANGE (10 YR 8/6) AND MODERATE REDDISH ORANGE (10 R 5/6).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. P. GREENWOOD
DATE JANUARY 29, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 140 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O NO. 12210

BORING NO. 140 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED JAN. 4-6, 1973 DRILLING COMPANY - EUSTIS ENGRG CO. LOGGED BY E.M.W.
COORDINATES, NORTH 17,569.1 EAST 17,371.5 GROUND SURFACE ELEVATION 116.6

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
30		17	◤	18 20 24	44	9	SP	SAND, UNIFORM, FINE, DENSE, CLEAN, PALE REDDISH ORANGE (10 R 8/6).
	90	18	◤	9 9 10	19	8	SP	SAND, UNIFORM, FINE, MEDIUM DENSE, CLEAN, MODERATE YELLOWISH-BROWN (10 YR 5/5).
20		19	◤	8 12 13	25	7	SP	SAND, UNIFORM, FINE, LESS THAN 3% FINES, MEDIUM DENSE, DARK YELLOWISH-ORANGE (10 YR 6/5).
	100	20	◤	12 16 21	37	9	SP	SAND, UNIFORM, FINE, CLEAN, DENSE, GRAYISH-ORANGE (10 YR 7/4).
10		21	◤	11 15 22	37	9	SP	SAND, UNIFORM, FINE, CLEAN, DENSE, GRAYISH-ORANGE (10 YR 7/4) AND PALE YELLOWISH ORANGE (10 YR 8/6).
	110	22	◤	22 35 55	90	7	SP	SAND, UNIFORM, FINE, CLEAN, VERY DENSE, GRAYISH ORANGE (10 YR 7/4).
		23	◤	22 40 57	97	7	SP	SAND, SIMILAR TO SS-22.
	120	24	◤	23 45 62	107	7	SP	SAND, SIMILAR TO SS-22.
-10		25	◤	14 25 28	53	7	SP	SAND, UNIFORM, FINE, CLEAN, VERY DENSE, LIGHT GRAYISH ORANGE (10 YR 8/4) WITH MINOR FeOx STAINING AND SMALL POCKET BLACK SAND.
	130	26	◤	12 26 36	62	10	SP	SAND, UNIFORM, FINE, FEW GRAVEL TO 0.3 IN. MAX., CLEAN, VERY DENSE, MODERATE YELLOWISH-ORANGE (10 YR 7/6).
-20		27	◤	23 30 45	75		SW	SAND, WELL GRADED, COARSE TO FINE, 6-8% GRAVEL TO 0.4 IN. MAX., LESS THAN 3% FINES, DARK YELLOWISH-ORANGE (10 YR 5/6).
	140	28	◤	20 27 31	58	7	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY FINE, 6-8% GRAVEL TO 0.6 IN. MAX., LESS THAN 2% FINES, MODERATE YELLOWISH-BROWN (10 YR 5/4), POCKET YELLOWISH-BROWN SANDY CLAY.
-30		29	◤	19 19 21	40	7	SW	SAND, WELL GRADED COARSE TO FINE, 6-8% GRAVEL TO 0.5 IN. MAX., LESS THAN 2% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
	150	30	◤	25 33 37	70	4	SW	GRAVELLY SAND, WELL GRADED COARSE TO FINE, 15-20% GRAVEL TO 0.8 IN. MAX., LESS THAN 2% FINES, MODERATE YELLOWISH-BROWN (10 YR 5/4) NOTE: VERY SMALL RECOVERY THIS SAMPLE.
		31	◤	10 13 13	26	5	GP	SANDY GRAVEL, SUBROUNDED, 0.8 IN. MAX., 10-15% MOSTLY FINE SAND, LESS THAN 5% FINES, MODERATE YELLOWISH-BROWN (10 YR 5/4), ONE LARGE BALL, LIGHT YELLOWISH GRAY (5 Y 7/2) CLAY.
-40		32	◤	9 18 12	30	10	CL	SANDY CLAY, MODERATELY PLASTIC, STIFF, 35-45% MOSTLY COARSE SAND, 5-10% GRAVEL TO 0.4 IN. MAX., YELLOWISH GRAY (5 Y 7/2), SAND IS DARK YELLOWISH-ORANGE (10 YR 6/6).
	160	33	◤	12 17 22	39	11	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 3% VERY FINE SAND, FEW GRAVEL TO 0.6 IN. MAX., HARD, GREENISH GRAY (5 G 5/1), MODERATE FeOx STAINING, FEW BLACK MnO2 NODULES.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. P. GREENWOOD
DATE JANUARY 29, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 140 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 140 TYPE OF BORING DRIVE SHEET 3 OF 3
DATE DRILLED JAN. 4-6, 1973 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY E.H.W.
COORDINATES, NORTH 17,560.1 EAST 17,371.5 GROUND SURFACE ELEVATION 116.6

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-50		34	◤	10 12 18	30	16	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 3% VERY FINE SAND, HARD, MOTTLED GREENISH-GRAY (5 GY 6/1) AND YELLOWISH-GRAY (5 Y 8/1).
-54.9	170 171.5	35	◤	12 18 25	43	16	CL SP	TOP 2 IN.: SILTY CLAY, MODERATELY PLASTIC, HARD, GREENISH GRAY (5 G 5/1). BOTTOM 14 IN.: SAND, UNIFORM, VERY FINE, LESS THAN 2% FINES, DENSE, LIGHT OLIVE GRAY (5 Y 7/1).
								END OF BORING AT 171.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE JANUARY 29, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 140 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 141 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED JANUARY 5, 1973 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY D.F.P.
COORDINATES, NORTH 17,543.7 EAST 17,550.2 GROUND SURFACE ELEVATION 122.1

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
L	120								
			1	◤	3 6 12	18	15	ML	CLAYEY SILT, MODERATELY TO HIGHLY PLASTIC, LESS THAN 5% VERY FINE SAND, MODERATE BROWN (5 YR 4/4).
L/PH	110	10	2	◤	13 15 18	33	15	CH	SANDY CLAY MODERATELY TO HIGHLY PLASTIC, 30-35% FINE SAND, DARK YELLOWISH-ORANGE (10 YR 6/6).
			3	◤	12 16 26	42	17	CH	SANDY CLAY, HIGHLY PLASTIC, 30-35% FINE SAND, SEVERLY MOTTLED DARK YELLOWISH-ORANGE (10 YR 6/6), PALE YELLOWISH-ORANGE (10 YR 8/6) AND MODERATE REDDISH ORANGE (10 R 6/6).
PH/S	100	20	4	◤	13 17 25	42	11	SP	SAND, UNIFORM, FINE, 5-8% FINES, VERY PALE ORANGE (10 YR 8/2) AND PALE YELLOWISH-ORANGE (10 YR 8/6).
			5	◤	5 8 11	19	15	SC	CLAYEY SAND, UNIFORM, FINE, 10-15% HIGHLY PLASTIC FINES, MOTTLED DARK YELLOWISH-ORANGE (10 YR 6/6), LIGHT GRAY (N 7) WITH 2" THICK LAYERS OF HIGHLY PLASTIC CLAY THROUGHOUT SAMPLE.
	90	30	6	◤	6 7 9	16	11	SC	CLAYEY SAND, UNIFORM, FINE, 15-20% HIGHLY PLASTIC FINES, PALE YELLOWISH-ORANGE (10 YR 6/6) WITH A 1½" THICK CLAY POCKET AT TOP.
			7	◤	13 13 17	30	13	SP	SAND, UNIFORM, FINE, 5-15% HIGHLY PLASTIC FINES, MODERATE REDDISH-ORANGE (10 R 6/6).
	80	40	8	◤	6 13 14	27	15	SM SC	SILTY SAND, UNIFORM, FINE, 20-25% MODERATELY TO HIGHLY PLASTIC FINES, MODERATE REDDISH-BROWN (10 R 4/6) WITH SMALL CLAY FLAKES THROUGHOUT SAMPLE.
			9	◤	7 7 15	22	15	SM-SC	SILTY SAND, UNIFORM, FINE, 10-15% MODERATELY TO HIGHLY PLASTIC FINES MODERATE REDDISH-ORANGE (10 R 4/6).
	70	50	10	◤	4 7 8	15	15	SC	CLAYEY SAND, UNIFORM, FINE, 10-15% MODERATELY TO HIGHLY PLASTIC FINES, MOTTLED LIGHT BROWN (5 YR 5/6) AND MODERATE REDDISH-BROWN (10 R 4/6).
			11	◤	7 9 9	18	10	SC	CLAYEY SAND, UNIFORM, FINE, 15-20% MODERATELY TO HIGHLY PLASTIC FINES, DARK YELLOWISH-ORANGE (10 YR 6/6).
	60	60	12	◤	13 28 41	69	10	SP	SAND, UNIFORM, FINE, 3-6% SLIGHTLY TO MODERATELY PLASTIC FINES, DARK YELLOWISH-ORANGE (10 YR 6/6).
			13	◤	28 22 17	39	11	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE 2-4% FINES, PALE RED (10 R 6/2).
	50	70	14	◤	4 5 6	11	10	CH	CLAY, HIGHLY PLASTIC, PALE RED PURPLE (5 RP 6/2) WITH FINE SAND LAYERS THROUGHOUT SAMPLE, APPROX. 1/4" - 3/4" THICK. MODERATE REDDISH-BROWN (10 R 4/6).
S/BC			15	◤	5 7 12	19	15	SM	SILTY SAND, UNIFORM, FINE, 15-20% MODERATELY PLASTIC FINES, MODERATE REDDISH-ORANGE (10 R 6/6).
	40	80	16	◤	5 5 7	12	18	CH	CLAY, HIGHLY PLASTIC, PALE REDDISH-BROWN (10 R 5/4).

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE JANUARY 31, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 141 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 141 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED JANUARY 5, 1973 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY D.F.P.
COORDINATES, NORTH 17,543.7 EAST 17,550.2 GROUND SURFACE ELEVATION 122.1

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
	40								
			17	◤	13 21 25	46	15	SP	SAND, UNIFORM, FINE, 3-6% FINES, MOTTLED, PALE YELLOWISH-ORANGE (10 YR 8/6) AND MODERATE ORANGE-PINK (10 R 7/4) WITH A 3" LAYER OF HIGHLY PLASTIC CLAY AT BOTTOM OF SAMPLE.
	30	90	18	◤	12 16 23	39	10	SP	SAND, UNIFORM, FINE, 2-4% SLIGHTLY PLASTIC FINES, MOTTLED MODERATE ORANGE-PINK (10 R 7/4) AND GRAYISH ORANGE-PINK (5 YR 7/2).
			19	◤	15 25 42	67	8	SP	SAND, UNIFORM, FINE, 3-6% SLIGHTLY TO MODERATELY PLASTIC FINES. GRAYISH-ORANGE (10 YR 7/4).
	20	100	20	◤	20 30 41	71	8	SP	SAND, UNIFORM, FINE, CLEAN, 1-3% FINES PALE YELLOWISH-ORANGE (10 YR 8/6) WITH A ½" THICK SANDY CLAY POCKET.
			21	◤	20 29 42	71	7	SP	SAND, UNIFORM, FINE, 2-3% FINES, MOTTLED VERY PALE ORANGE (10 YR 8/2) AND GRAYISH ORANGE (10 YR 7/4).
	10	110	22	◤	17 27 41	68	7	SP	SAND, UNIFORM, FINE, 2-4% FINES, GRAYISH-ORANGE (10 YR 7/4) WITH TWO PIECES OF GRAVEL 0.5 IN. IN SIZE.
			23	◤	27 35 43	78	8	SP	SAND, UNIFORM, FINE, WITH LESS THAN 1% MEDIUM SAND, 2-4% FINES, GRAYISH-ORANGE (10 YR 7/4).
	0	120	24	◤	18 28 39	67	7	SP	SAND, UNIFORM, FINE, 2-5% FINES, MOTTLED, GRAYISH-ORANGE (10 YR 7/4) AND VERY PALE ORANGE (10 YR 8/2).
			25	◤	31 52/6"	52/6"	8	SP	SAND, UNIFORM, 3-5% FINES, GRAYISH-ORANGE (10 YR 7/4).
	-10	130	26	◤	27 53/6"	53/6"	7	SP	SAND, UNIFORM, FINE, 3-6% FINES, MOTTLED GRAYISH-ORANGE (10 YR 7/4) AND VERY PALE ORANGE (10 YR 8/2) WITH MINOR MnO_2 STAINING.
			27	◤	50 62/6"	62/6"	6	SP	SAND, UNIFORM, FINE, CLEAN, 1-3% FINES PALE YELLOWISH-ORANGE (10 YR 8/6).
	-20	140	28	◤	33 56/6"	56/6"	6	SP	SAND, UNIFORM, FINE, 3-5% FINES, GRAYISH-ORANGE (10 YR 7/4).
			29	◤	75 50/3"	50/3"	7	SP	SIMILAR TO SS 28.
	-30	150	30	◤	26 53/6"	53/6"	10	SP	SAND, UNIFORM, FINE, 2-4% FINES, GRAYISH-ORANGE (10 YR 7/4).
BC/PC			31	◤	27 38 49	87	7	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE 5-8% GRAVEL TO 1.0 IN. MAX., 5-10% MODERATELY PLASTIC FINES, DARK YELLOWISH-ORANGE (10 YR 6/6).
	-40	160	32	◤	50 19 17	36	15	CH	CLAY, MODERATELY TO HIGHLY PLASTIC, LIGHT GREENISH GRAY (5 GY 8/1) SEVERELY MOTTLED WITH SMALL FeOx AND MnO_2 NODULES.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE JANUARY 31, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 141 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO 141 TYPE OF BORING DRIVE SHEET 3 OF 3
DATE DRILLED JANUARY 5, 1973 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY D.F.P.
COORDINATES, NORTH 17,543.7 EAST 17,550.2 GROUND SURFACE ELEVATION 122.1

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-40								
		33	◤	15 15 16	31	16	CH	CLAY, MODERATELY PLASTIC, PALE GREENISH-YELLOW (10 Y 8/2) WITH FeOx NODULES.
-49.4	170 171.5	34	◤	17 17 17	34		CH	CLAY, MODERATELY PLASTIC, PALE GREENISH-YELLOW (10 Y 8/2), POCKETS OF DESSICATED CLAY THROUGHOUT SAMPLE.
								BOTTOM OF BORING AT 171.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
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3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE JANUARY 31, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 141 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 142
DATE DRILLED JANUARY 5, 1973
COORDINATES, NORTH 17,466.4
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG CO
EAST 17,949.3
SHEET 1 OF 2
LOGGED BY D.F.P.
GROUND SURFACE ELEVATION 111.9

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
L	110								
			1	◤	2 4 4	8	13	ML	CLAYEY SILT, HIGHLY PLASTIC, MODERATE BROWN (5 YR 4/4).
L/PH	100	10	2	◤	4 7 10	17	14	CH	SANDY CLAY, HIGHLY PLASTIC, 20-25 % FINE SAND, MOTTLED LIGHT BROWN (5 YR 5/6), AND DARK YELLOWISH ORANGE (10 YR 6/6).
			3	◤	3 5 11	16	13	CH	SANDY CLAY, HIGHLY PLASTIC, 10-15 % FINE SAND, MOTTLED, LIGHT GRAY (N7), PALE YELLOWISH ORANGE (10 YR 8/6), LIGHT BROWN (5 YR 5/6) AND MODERATE REDDISH BROWN (10 R 4/6).
	90	20	4	◤	7 8 6	14	13	CH	SANDY CLAY, HIGHLY PLASTIC, 35-40 % FINE SAND, DARK YELLOWISH ORANGE (10 YR 6/6).
PH/S			5	◤	2 3 4	7	18	SC	CLAYEY SAND, UNIFORM, FINE, 20-25 % HIGHLY PLASTIC FINES, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6), AND PALE YELLOWISH ORANGE (10 YR 8/6), WITH VERY THIN LAYERS OF CLAY.
	80	30	6	◤	7 10 10	20	7	SP	SAND, UNIFORM, FINE 3-6 % MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR [illegible]/6).
			7	◤	6 10 11	21	6	SP	SAND, UNIFORM, FINE, 4-8 % MODERATELY PLASTIC FINES, MOTTLED, PALE YELLOWISH ORANGE (10 YR 8/2), AND WHITE (N9).
	70	40	8	◤	7 11 12	23	6	SP	SIMILAR TO SS 7.
			9	◤	8 15 17	32	7	SP	SAND, UNIFORM FINE 3-6 % MODERATELY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
	60	50	10	◤	30 50/9	50/9	5	SP	SAND, UNIFORM, FINE, 2-4 % FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
			11	◤	37 50/11	50/11	6	SP	SAND, UNIFORM, FINE, LESS THAN 1 % MEDIUM SAND, 2-4 % FINES, DARK YELLOWSIH ORANGE (10 YR 6/6).
S/BC	50	60	12	◤	15 21 28	49	7	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 1-2 % GRAVEL TO 0.5 INCH MAXIMUM, 2-4 % FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH A 1" THICK, SANDY CLAY POCKET.
			13	◤	4 3 5	8	18	CH	CLAY, HIGHLY PLASTIC, GRAYISH YELLOW (5 Y 8/4) WITH LAYERS AND POCKETS OF FINE SAND THROUGHOUT SAMPLE.
	40	70	14	◤	5 6 8	14	13	SP	SAND, UNIFORM, FINE, 5-10 % MODERATELY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4).
			15	◤	7 11 14	25	7	SP	SAND, UNIFORM, FINE, 3-6 % SLIGHTLY TO MODERATELY PLASTIC FINES, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) AND VERY PALE ORANGE (10 YR 8/2) WITH A 3/4" THICK, HIGHLY PLASTIC CLAY POCKET.
	30	80	16	◤	8 11 18	29	10	SP	SAND, UNIFORM, FINE, 3-6 % SLIGHTLY TO MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. P. GREENWOOD
DATE FEBRUARY 14, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 142 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO 142
DATE DRILLED JANUARY 5, 1973
COORDINATES, NORTH 17,466.4
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG CO
EAST 17,949.3
SHEET 2 OF 2
LOGGED BY D.F.P.
GROUND SURFACE ELEVATION 111.9

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
	30								
			17	◤	4 24 50	74	6	SP	SIMILAR TO SS 16.
	20	90	18	◤	25 32 50/5	[illegible]	[illegible]	SP	SAND, UNIFORM, FINE, CLEAN 1-3 % FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
			19	◤	30 50/11	50/11	[illegible]	SP	SAND, UNIFORM, FINE, CLEAN, 1-3 % FINES, PALE YELLOWISH ORANGE (10 YR 8/6) WITH 2 SMALL CLAY BALLS.
	10	100	20	◤	10 9 17	26	10	SP	SAND, UNIFORM, FINE, 5-10 % MODERATELY TO HIGHLY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4).
			21	◤	12 20 27	47	11	SP	SAND, UNIFORM, FINE, 2-4 % FINES, VERY PALE ORANGE (10 YR 8/2).
	0	110	22	◤	2[illegible] 4[illegible] 50/4	11[illegible]	[illegible]	SP	SAND, UNIFORM, FINE, 2-4 % FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
			23	◤	27 47 50/3	126	7	SP	SIMILAR TO SS 22.
	-10	120	24	◤	[illegible] 50/10	50/10	6	SP	SAND, UNIFORM, FINE, 2-5 % FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
			25	◤	25 49 50/4	119	8	SP	SAND, UNIFORM, FINE, 2-4 % FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
	-20	130	26	◤	26 35 47	82	9	SP	SAND, UNIFORM, FINE, 3-5 % FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
			27	◤	37 50/11	50/11	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, 3-4% FINES, GRAYISH ORANGE (10 YR 7/4).
	-30	140	28	◤	30 38 48	86	9	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND COARSE, 6-8 % GRAVEL TO 1.0 INCH MAXIMUM, 5-10 % SLIGHTLY TO MODERATELY PLASTIC FINES, MOTTLED, VERY PALE ORANGE (10 YR 8/2) AND PALE YELLOWISH BROWN (10 YR 6/2). SOME PIECES OF GRAVEL ARE CLAY COATED.
BC/PC			29	◤	5 10 16	26	5	CH	CLAY, HIGHLY PLASTIC, MOTTLED PALE YELLOWSIN ORANGE (10 YR 8/6) AND LIGHT GREENISH GRAY (5 GY 8/1), HEAVILY MOTTLED WITH LARGE MnO_2 NODULES AND SMALL FeOx STAINING.
	-40	150	30	◤	10 16 20	36	18	CH	CLAY, MODERATELY PLASTIC, PALE YELLOWISH ORANGE (10 YR 8/6), MINOR FeOx STAINING, DESSICATED POCKETS THROUGHOUT SAMPLE.
	-44.6	156.5	31	◤	11 15 32	47	18	CH	CLAY, MODERATELY TO HIGHLY PLASTIC, PALE OLIVE (10 Y 6/2) WITH FeOx NODULES.
									BOTTOM OF BORING AT 156.5'

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. P. GREENWOOD
DATE FEBRUARY 14, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 142 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO 143
DATE DRILLED JANUARY 8-11, 1973
COORDINATES, NORTH 17,423.2
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG CO
EAST 18,143.5
SHEET 1 OF 2
LOGGED BY B.H.W.
GROUND SURFACE ELEVATION 109.4'

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
L			1	◤	13 50/11	50/11	15	ML	CLAYEY SILT, SLIGHTLY PLASTIC, HARD, DARK YELLOWISH ORANGE (10 YR 5/6), FEW WHITE DESSICATED POCKETS, ONE CRAYFISH TAIL. LOESS.
L/PH	100	10	2	◤	5 16 25	41	13	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 10-15% VERY FINE SAND, HARD, VARIGATED LIGHT GRAY (N-7), DARK YELLOWISH ORANGE (10 YR 6/6), AND MODERATE REDDISH-BROWN. (10 R 5/6).
			3	◤	19 17 19	36	15	ML	CLAYEY SILT, SIMILAR TO SS-2.
PH/S	90	20	4	◤	10 18 18	36	17	SP-SM	SAND - SILT, VERY FINE, NONPLASTIC, DENSE, DARK YELLOWISH ORANGE (10 YR 6/6) AND LIGHT GRAY (N-7), 2 IN. LAYER LIGHT GRAY SILTY CLAY, WITH SMALL POCKET MODERATE RED (5 R 4/6) HIGHLY PLASTIC CLAY.
			5	◤	7 9 11	20	13	SP	SAND, UNIFORM, VERY FINE, 6-8% MODERATELY PLASTIC FINES, MEDIUM DENSE, VERY LIGHT GRAY (N-8) AND GRAYISH-ORANGE (10 YR 7/4).
	80	30	6	◤	7 7 8	15	13	SM	SILTY SAND, UNIFORM, VERY FINE, 20-25% NONPLASTIC FINES, MEDIUM DENSE, DARK YELLOWISH ORANGE (10 YR 5/6).
			7	◤	5 6 7	13	16	SP	SAND, UNIFORM, VERY FINE, LESS THAN 5% FINES, MEDIUM DENSE, MODERATE YELLOWISH-ORANGE (10 YR 7/6).
	70	40	8	◤	7 8 12	20	8	SP	SAND, UNIFORM, VERY FINE, LESS THAN 2% FINES, MEDIUM DENSE, WHITE (N-9) AND PALE ORANGE (10 YR 8/4).
			9	◤	12 20 20	40	7	SP	SAND, UNIFORM, VERY FINE, FEW MEDIUM AND COARSE, CLEAN, DENSE, PALE ORANGE (10 YR 7/2).
	60	50	10	◤	4 8 8	16	2	SP	SAND, UNIFORM, VERY FINE, LESS THAN 5% FINES, MEDIUM DENSE, MODERATE YELLOWISH-ORANGE (10 YR 7/6).
S/BC			11	◤	5 15 17	32	10	SP SC	TOP 5 IN.: SAND, UNIFORM VERY FINE, FEW COARSE SAND AND GRAVEL TO 0.3 IN. MAX., LESS THAN 5% FINES, PALE YELLOWISH-ORANGE (10 YR 8/6) AND DARK YELLOWISH-ORANGE (10 YR 6/6). BOTTOM 5 IN.: CLAYEY SAND, WIDELY GRADED FINE TO COARSE, 25-30% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 5/6), POCKET PALE REDDISH-BROWN (10 R 5/5) FINE SAND, LARGE POCKET DARK YELLOWISH-ORANGE (10 YR 6/6) HIGHLY PLASTIC CLAY, FEW GRAVEL TO 0.4 IN. MAX.
	50	60	12	◤	41 44 46	90	10	SP	SAND, UNIFORM, FINE, FEW GRAVEL TO 0.5 IN. MAX., MODERATE YELLOWISH ORANGE (10 YR 7/6), LARGE POCKET MEDIUM AND COARSE SAND.
			13	◤	8 9 11	20	12	SP	SAND, UNIFORM, VERY FINE, LESS THAN 3% FINES, MEDIUM DENSE, LIGHT ORANGE-PINK (10 R 7/2), WITH PALE YELLOWISH-ORANGE (10 YR 8/6).
	40	70	14	◤	11 15 22	37	13	SP	TOP 6 IN.: SAND, SIMILAR TO SS-13. BOTTOM 7 IN.: SAND, UNIFORM, VERY FINE, LESS THAN 3% FINES, DENSE, DARK YELLOWISH ORANGE (10 YR 6/6) AND GRAYISH-ORANGE (10 YR 7/4).
			15	◤	12 18 20	38	14	SP	SAND, SIMILAR TO SS-13.
	30	80	16	◤	9 11 18	29	12	SP	SAND, SIMILAR TO SS-13.

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. P. GREENWOOD
DATE JANUARY 31, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 143 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO 143
DATE DRILLED JANUARY 8-11, 1973
COORDINATES, NORTH 17,423.2
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG CO
EAST 18,143.5
SHEET 2 OF 2
LOGGED BY B.H.W.
GROUND SURFACE ELEVATION 109.4'

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
			17	◤	19 27 53	80	10	SP	SAND, UNIFORM, FINE, CLEAN, VERY DENSE, DARK YELLOWISH-ORANGE (10 YR 6/6).
	20	90	18	◤	19 25 28	53	10	SP	SAND, UNIFORM, FINE, FEW COARSE SAND, ONE PIECE GRAVEL (0.5 IN.) VERY DENSE, GRAYISH-ORANGE (10 YR 7/4).
			19	◤	20 22 24	46	8	SP	SAND, MOSTLY UNIFORM, FINE, 6-9% GRAVEL TO 1.0 IN. MAX., FEW COARSE-MEDIUM SAND, PALE GRAYISH-ORANGE (5 YR 8/4), FEW POCKETS PLASTIC CLAY ASSOCIATED WITH GRAVEL.
	10	100	20	◤	16 24 54	78	7	SP	SAND, UNIFORM, FINE, LESS THAN 5% FINES, VERY DENSE, MODERATE YELLOWISH-ORANGE (10 YR 7/6).
			21	◤	30 35 72	107	8	SP	SAND, SIMILAR TO SS-20.
	0	110	22	◤	22 31 51	82	8	SP	SAND, SIMILAR TO SS-20, 1 PIECE GRAVEL TO 0.8 IN. MAX.
			23	◤	12 46 53	99	13	CH SP	TOP 8 IN.: CLAY, HIGHLY PLASTIC, STIFF, MOTTLED MODERATE ORANGE-PINK (10 R 7/4) AND GREENISH-GRAY (5 GY 6/1). BOTTOM 5 IN.: SAND, UNIFORM, FINE, CLEAN, VERY DENSE, VERY PALE ORANGE (10 YR 8/2).
	-10	120	24	◤	18 20 20	40	12	SP	SAND, UNIFORM, VERY FINE, CLEAN, DENSE, PALE GRAYISH-ORANGE (10 YR 8/4).
			25	◤	36 41 45	86	12	SP	SAND, UNIFORM, VERY FINE, CLEAN, VERY DENSE, PALE GRAYISH-ORANGE (10 YR 8/3).
	-20	130	26	◤	22 24 39	63	8	SW	SAND, WELL GRADED COARSE TO FINE, FEW GRAVEL TO 0.4 IN. MAX., LESS THAN 3% FINES, MODERATE YELLOWISH-ORANGE (10 YR 7/6), SOME SMALL POCKETS SANDY GRAY CLAY.
			27	◤	21 22 26	48	7	SW	SAND, SIMILAR TO ABOVE BUT WITH 8-10% GRAVEL TO 0.6 IN. MAX.
	-30	140	28	◤	18 24 32	56	8	SP	GRAVELLY SAND, WIDELY GRADED COARSE TO FINE, MOSTLY COARSE, 15-20% GRAVEL TO 0.8 IN. MAX., GRAYISH-ORANGE (10 YR 7/4), LARGE POCKET VERY FINE SAND, LIGHT YELLOWISH GRAY (5 Y 8/1), LARGE POCKET YELLOWISH-GRAY (5 Y 7/2) SILTY CLAY.
BC/PC			29	◤	10 19 24	43	18	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 3% VERY FINE SAND, HARD, PALE GRAYISH-OLIVE (10 Y 5/2) WITH MODERATE FeOx STAINING AND BLACK FLECKS MnO_2.
	-40	150	30	◤	12 18 28	46	16	CL	SILTY CLAY, SIMILAR TO SS-29.
	-46.9	156.5	31	◤	11 19 30	49	16	CL	SILTY CLAY, MODERATELY PLASTIC, HARD, GREENISH-GRAY (5 G 6/1), SOME HARD WHITE CONCRETIONS.
									END OF BORING AT 156.5'

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. P. GREENWOOD
DATE JANUARY 31, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 143 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 144 | TYPE OF BORING DRIVE | SHEET 1 OF 2
DATE DRILLED JANUARY 10, 1972 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY D.F.P.
COORDINATES, NORTH 17,356.5 | EAST 18,351.2 | GROUND SURFACE ELEVATION 114.0

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
L	110		1	◤	11 15 35	50	10	ML	CLAYEY SILT, MODERATELY PLASTIC, LESS THAN 5 % VERY FINE SAND, MOTTLED, MODERATE YELLOWISH BROWN (10 YR 5/4), AND LIGHT GRAY (N7).
L/PH		10	2	◤	9 19 20	29	10	ML	CLAYEY SILT, MODERATELY PLASTIC, 4-6 % FINE SAND, DARK YELLOWISH ORANGE (10 YR 6/6), WITH SMALL FeOx NODULES.
	100		3	◤	6 12 20	32	14	ML	SIMILAR TO SS 2.
		20	4	◤	7 10 17	27	15	CH	SANDY CLAY, HIGHLY PLASTIC, 20-25 % FINE SAND, MOTTLED LIGHT GRAY (N7), DARK YELLOWISH ORANGE (10 YR 6/6), AND MODERATE RED (5 R 4/6).
PH/S	90		5	◤	10 15 22	37	10	SC	CLAYEY SAND, UNIFORM, FINE, 5-10 % HIGHLY PLASTIC FINES, MODERATE REDDISH BROWN (10 R 4/6).
		30	6	◤	7 9 10	19	10	SP	SAND, UNIFORM, FINE, 6-8 % MODERATELY TO HIGHLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6).
	80		7	◤	3 6 10	16	11	SP	SAND, UNIFORM, VERY FINE, 6-10 % MODERATELY PLASTIC FINES, MOTTLED, GRAYISH ORANGE PINK (10 R 8/2), MODERATE REDDISH BROWN (10 R 4/6), AND LIGHT GRAY (N7).
		40	8	◤	5 7 9	16	12	SP	SAND, UNIFORM, FINE, 5-10 % SLIGHTLY TO MODERATELY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4), AND LIGHT GRAY (N7).
	70		9	◤	10 17 19	36	11	SP	SAND, UNIFORM, VERY FINE, 3-6 % SLIGHTLY TO MODERATELY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4).
		50	10	◤	9 14 22	36	10	SP	SAND, UNIFORM, FINE, 6-8 % MODERATELY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4), AND YELLOWISH GRAY (5 Y 7/2).
	60		11	◤	30 50/5"	50/5"	6	SP	SAND, POORLY GRADED, FINE AND MEDIUM, LESS THAN 1 % GRAVEL TO 0.5 INCH MAXIMUM, 3-5 % FINES, GRAYISH ORANGE (10 YR 7/4).
		60	12	◤	8 11 16	27	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, LESS THAN 1 % GRAVEL TO 0.5 INCH MAXIMUM, 4-6 % MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), WITH SANDY CLAY LAYER APPROXIMATELY 2 INCH THICK.
S/BC	50		13	◤	23 27 33	60	11	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, AND MEDIUM, 5-8 % GRAVEL TO 1.0 INCH MAXIMUM, 3-6 % MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), WITH A 1" SANDY CLAY LAYER, MOST GRAVEL IS CLAY COATED.
		70	14	◤	2 2 3	5	14	CH	SILTY CLAY, HIGHLY PLASTIC, 3-6 % FINE SAND, YELLOWISH GRAY (5 Y 7/2), CONTAINING A 3 INCH HIGHLY PLASTIC, FATTY CLAY LAYER.
	40		15	◤	10 12 14	26	15	CH SP	CLAY, TOP 4 INCH: HIGHLY PLASTIC, FATTY, MOTTLED YELLOWISH GRAY (5 Y 7/2), AND GRAYISH YELLOW (5 Y 8/4). BOTTOM 4 INCH: SAND, UNIFORM, FINE, 4-8 % MODERATELY PLASTIC, FINES, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), PALE YELLOWISH ORANGE (10 YR 8/6), AND VERY PALE ORANGE (10 YR 8/2).
		80	16	◤	15 19 36	54	14	SP	SAND, UNIFORM, FINE, 3-4% FINES, PALE YELLOWISH ORANGE (10 YR 8/6) AND GRAYISH ORANGE (10 YR 7/4).

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. P. GREENWOOD
DATE FEBRUARY 8, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 144 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO 144 | TYPE OF BORING DRIVE | SHEET 2 OF 2
DATE DRILLED 1/10/72 | DRILLING COMPANY - EUSTIS ENGRG. CO | LOGGED BY D.F.P.
COORDINATES, NORTH 17,356.5 | EAST 18,351.2 | GROUND SURFACE ELEVATION 114.0

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
	30		17	◤	12 25 25	50	12	SP	SAND, UNIFORM, FINE, 3-6% FINES, GRAYISH-ORANGE (10 YR 7/4), AND MODERATE ORANGE PINK (5YR 8/4).
		90	18	◤	27 50/8"	50/8"	10	SP	SAND, UNIFORM, FINE, LESS THAN 1% GRAVEL TO 0.9 INCH MAXIMUM, 3-6% FINES, DARK YELLOWISH-ORANGE (10YR 6/6).
	20		19	◤	15 23 28	51	14	SP	SAND, UNIFORM, FINE, 2-5% FINES PALE YELLOWISH-ORANGE (10YR 8/6).
		100	20	◤	57 50/6"	50/6"	6	SP	SAND, UNIFORM, FINE, 1-2% GRAVEL TO 1.0 INCH MAXIMUM, 3-6% FINES, PALE YELLOWISH-ORANGE (10YR 8/6), AND GRAYISH-ORANGE (10YR 7/4).
	10		21	◤	34 50/5"	50/5"	14	SP	SAND, UNIFORM, FINE, 1-3% FINES, PALE YELLOWISH-ORANGE (10YR 8/6), WITH A 4" HIGHLY PLASTIC, FATTY CLAY LAYER AT TOP.
		110	22	◤	20 50/8"	50/8"	6	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 1-2% GRAVEL TO 0.5 INCH MAXIMUM, 4-6% FINES, DARK YELLOWISH-ORANGE (10YR 6/6).
	0		23	◤	15 21 30	51	10	SP	SAND, UNIFORM, FINE, 2-3% FINES, PALE YELLOWISH-ORANGE (10YR 8/6).
		120	24	◤	18 50/10"	50/10"	10	SP	SAND, UNIFORM, FINE, 2-4% FINES, PALE YELLOWISH-ORANGE (10YR 8/6).
	-10		25	◤	20 40 40	80	14	SP	SAND, UNIFORM, FINE, 3-6% SLIGHTLY PLASTIC FINES, GRAYISH-YELLOW (5Y 8/4).
		130	26	◤	26 50/7"	50/7"	11	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, 5-8% GRAVEL TO 0.6 INCH MAXIMUM, 2-5% FINES, GRAYISH-ORANGE (10YR 7/4).
BC/PC	-20		27	◤	15 12 11	23	10	GP CL	TOP 2 INCH: GRAVEL, POORLY GRADED, TO 1.1 INCH MAXIMUM, 6-8% FINE TO COARSE SAND DARK YELLOWISH-ORANGE (10YR 6/6). BOTTOM 6 INCH: CLAY, MODERATELY PLASTIC, 3-6% FINE SAND, YELLOWISH-GRAY (5 Y 8/1) WITH VERY THIN SILT LENSES THROUGHOUT.
		140	28	◤	7 9 10	19	14	CH	CLAY, HIGHLY PLASTIC, FATTY YELLOWISH-GRAY (5Y 8/1), AND MODERATE RED (5R 4/6).
	-30		29	◤	5 11 15	26	16	CH	SANDY CLAY, HIGHLY PLASTIC, 20-25% FINE SAND, YELLOWISH-GRAY (5 Y 8/1) WITH VERY THIN SILT LENSES.
	-32.5	146.5							END OF BORING AT 146.5'

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D.P. GREENWOOD
DATE FEBRUARY 8, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 144 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 145 | TYPE OF BORING DRIVE | SHEET 1 OF 3
DATE DRILLED JANUARY 16, 1973 | DRILLING COMPANY - EUSTIS ENGRG. CO. | LOGGED BY D.F.P.
COORDINATES, NORTH 17,198.1 | EAST 18,287.8 | GROUND SURFACE ELEVATION 112.4

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
L	110		1	◤	8 13 25	38	10	ML	CLAYEY SILT, MODERATELY TO HIGHLY PLASTIC, MOTTLED LIGHT GRAY (N7), PALE YELLOWISH BROWN (10 YR 6/2) AND PALE YELLOWISH ORANGE (10 YR 8/6).
L/PH		10	2	◤	9 15 20	35	11	CL	SILTY CLAY, MODERATELY PLASTIC, LIGHT GRAY (N7), AND PALE YELLOWISH BROWN (10 YR 6/2).
	100		3	◤	9 14 19	33	10	CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, LIGHT GRAY (N7).
	90	20	4	◤	7 13 30	43	14	CH	SILTY CLAY, HIGHLY PLASTIC, 10-15 % VERY FINE SAND, LIGHT GRAY (N7), AND PALE YELLOWISH ORANGE (10 YR 8/6).
			5	◤	13 11 20	31	14	CL	SANDY CLAY, MODERATELY PLASTIC, 35-40 % FINE SAND, MOTTLED LIGHT GRAY (N7) AND DARK YELLOWISH ORANGE (10 YR 6/6).
PH/S	80	30	6	◤	6 10 17	27	12	SC	CLAYEY SAND, UNIFORM, FINE, 4-8 % MODERATELY PLASTIC FINES, LIGHT GRAY (N7) AND DARK YELLOWISH ORANGE (10 YR 6/6).
			7	◤	5 10 9	19	10	SM	SILTY SAND, UNIFORM, FINE, 12-15 % MODERATELY PLASTIC FINES MOTTLED, PALE YELLOWISH ORANGE (10 YR 8/6), LIGHT GRAY (N7), AND MODERATE REDDISH ORANGE (10 R 6/6).
	70	40	8	◤	6 9 11	20	11	SP	SAND, UNIFORM, FINE, 8-10 % MODERATELY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4).
			9	◤	9 10 15	25	13	SP	SAND, UNIFORM, FINE, 4-6 % SLIGHTLY TO MODERATELY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4).
	60	50	10	◤	14 19 29	48	16	SP	SAND, UNIFORM, FINE, 1-3 % FINES, VERY PALE ORANGE (10 YR 8/7).
			11	◤	20 39 44	83	10	SP	SAND, UNIFORM, FINE, 1-3 % MEDIUM SAND, 2-4 % FINES, GRAYISH ORANGE (10 YR 7/4).
	50	60	12	◤	14 50/7	50/7	2	GP	GRAVEL. POORLY GRADED TO 1.1 IN. MAX, (VERY SMALL RECOVERY).
S/BC			13	◤	5 16 23	39	10	SC	CLAYEY SAND, UNIFORM, FINE, 20-25 % HIGHLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) AND PALE YELLOWISH ORANGE (10 YR 8/6) CONTAINING A 2" POCKET OF FINE AND MEDIUM SAND, WITH A 3/4" HIGHLY PLASTIC FATTY CLAY LAYER.
	40	70	14	◤	11 13 15	28	10	SP	SAND, UNIFORM, FINE, 4-8 % FINES, GRAYISH YELLOW (5 Y 8/4).
			15	◤	7 12 15	27	11	SP	SIMILAR TO SS14.
	30	80	16	◤	13 50/8	50/8	8	SP	SAND, UNIFORM, FINE, 3-5 % FINES, DARK YELLOWISH ORANGE (10 YR 6/6)

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. P. GREENWOOD
DATE FEBRUARY 7, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 145 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 145 | TYPE OF BORING DRIVE | SHEET 2 OF 3
DATE DRILLED JANUARY 16, 1973 | DRILLING COMPANY - EUSTIS ENGRG. CO. | LOGGED BY D.F.P.
COORDINATES, NORTH 17,198.1 | EAST 18,287.8 | GROUND SURFACE ELEVATION 112.4

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
	30		17	◤	21 50/9	50/9	9	SP	SAND, POORLY GRADED, FINE TO COARSE, 2-3 % MEDIUM AND COARSE SAND, LESS THAN 1 % GRAVEL TO 1.0 IN. MAX., 4-6 % SLIGHTLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6) AND DARK YELLOWISH ORANGE (10 YR 6/6).
	20	90	18	◤	14 17 19	36	13	SP	SAND, UNIFORM, FINE, 1 % MEDIUM SAND, 3-6 % SLIGHTLY TO MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), WITH A 3/4" CLAYEY SAND POCKET.
			19	◤	12 27 35	62	7	SP	SAND, UNIFORM, FINE, LESS THAN 1 % MEDIUM AND COARSE SAND, 1-3 % FINES, GRAYISH ORANGE (10 YR 7/4).
	10	100	20	◤	9 14 21	35	10	SP	SAND, UNIFORM, FINE, 1-2 % MEDIUM SAND, 2-4 % FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
			21	◤	18 50/6	50/6	10	SP	SAND. UNIFORM, FINE, 1-3 % FINES, PALE YELLOWISH ORANGE (10 YR 8/6)
	0	110	22	◤	26 36 39	75	10	SP	SAND. UNIFORM, FINE, 1-2 % FINES, VERY PALE ORANGE (10 YR 8/7).
			23	◤	25 50/4	50/4	10	SP	SAND, UNIFORM, FINE, 1-2 % FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	-10	120	24	◤	25 50/7	50/7	11	SP	SAND, UNIFORM, FINE, 2-3 % FINES, PALE YELLOWISH ORANGE (10 YR 8/7), WITH LESS THAN 1 % GRAVEL TO 0.5 IN. MAX.
			25	◤	25 50/6	50/6	10	SP	SAND, UNIFORM, FINE, 2-4 % FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
	-20	130	26	◤	14 84/8	84/8	11	SP	SIMILAR TO SS 25.
			27	◤	34 50/2	50/2	12	SP	SAND, UNIFORM, FINE, 3-6 % SLIGHTLY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4).
	-30	140	28	◤	25 50/7	50/7	6	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, 3-5 % GRAVEL TO 0.7 IN. MAX., 4-6 % SLIGHTLY PLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4), SOME GRAVEL CLAY COATED.
BC/PC			29	◤	5 10 22	32	7	GC	GRAVELLY CLAY, HIGHLY PLASTIC, 10-15 % GRAVEL TO 1.9 IN. MAX., YELLOWISH GRAY (5 Y 8/1), WITH VERY THIN, FINE SAND LENSES.
	-40	150	30	◤	7 24 29	53	14	SP	SAND, UNIFORM, FINE, 5-8 % SLIGHTLY TO MODERATELY PLASTIC FINES, GRAYISH ORANGE PINK (5 YR 7/2).
			31	◤	15 14 20	34	16	CH	SILTY CLAY, HIGHLY PLASTIC, MOTTLED, YELLOWISH GRAY (5 Y 8/1), DARK YELLOWISH ORANGE (10 YR 6/6) SEVERLY MOTTLED WITH SMALL FeOx. NODULES.
	-50	160	32	◤	9 12 18	30	16	CL	SILTY CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 8/1), MOTTLED OCCASIONALLY WITH SMALL FeOx. NODULES, DESSICATED POCKETS OF CLAY THROUGHOUT SAMPLE.

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. P. GREENWOOD
DATE FEBRUARY 7, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 145 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. 145
DATE DRILLED JANUARY 16, 1973
COORDINATES, NORTH 17,198.1
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG CO
EAST 18,207.8
SHEET 3 OF 3
LOGGED BY D.F.P.
GROUND SURFACE ELEVATION 112.4

		SAMPLE						
ELEVATION FEET	DEPTH FEET	NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-50								
-54.1	166.5	33	◤	10 16 20	36	16	CL	SILTY CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 7/2).
								END OF BORING AT 166.5'

THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 7, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 145 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. 146
DATE DRILLED JANUARY 16, 1973
COORDINATES, NORTH 16,992.4
TYPE OF BORING
DRILLING COMPANY - EUSTIS ENGRG. CO
EAST 18,254.5
SHEET 1 OF 3
LOGGED BY D.F.P.
GROUND SURFACE ELEVATION 108.6

			SAMPLE						
	ELEVATION FEET	DEPTH FEET	NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
L									
			1	◤	9 17 24	41	13	ML	CLAYEY SILT, MODERATELY PLASTIC, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6), PALE YELLOWISH BROWN (10 YR 6/2), AND LIGHT GRAY (N7).
	100								
L/PH		10	2	◤	14 13 15	28	14	ML	CLAYEY SILT, MODERATELY PLASTIC, 2-3 % FINE SAND, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6), AND YELLOWISH GRAY (5 Y 8/1).
			3	◤	6 11 18	29	14	CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 2-3 % FINE SAND, MOTTLED, LIGHT GRAY (N7), DARK YELLOWISH ORANGE (10 YR 6/6), AND PALE YELLOWISH ORANGE (10 YR 8/6).
	90								
		20	4	◤	4 9 11	20	13	CL	SILTY CLAY, MODERATELY PLASTIC, 2-4 % FINE SAND, MOTTLED, GRAYISH YELLOW (5 Y 8/4) AND LIGHT GRAY (N7).
PH/S			5	◤	10 15 19	34	14	SC	CLAYEY SAND, UNIFORM, VERY FINE, 8-10 % MODERATELY PLASTIC FINES, MOTTLED LIGHT GRAY (N7), AND PALE YELLOWISH ORANGE (10 YR 8/6), WITH APPROX.,A 7 ½" THICK LAYER OF VERY FINE SAND.
	80								
		30	6	◤	10 12 13	25	12	SC	CLAYEY SAND, UNIFORM, FINE, 8-12 % MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
			7	◤	5 5 7	12	12	SC	CLAYEY SAND, UNIFORM, FINE, 10-15 % MODERATELY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4), AND MODERATE YELLOW (5 Y 7/6).
	70								
		40	8	◤	6 8 9	17	10	SC	CLAYEY SAND, UNIFORM, FINE, 10-15 % MODERATELY PLASTIC FINES, MODERATE YELLOW (5 Y 7/6).
			9	◤	6 10 14	24	12	SP	SAND, UNIFORM, FINE, 4-6 % SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), AND PALE YELLOWISH ORANGE (10 YR 8/6).
	60								
		50	10	◤	20 21 22	43	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, 6-10 % GRAVEL TO 0.9 IN. MAX., 8-10 % SLIGHTLY TO MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
			11	◤	7 4 5	9	13	CH	CLAY, HIGHLY PLASTIC, FATTY, PALE YELLOWISH ORANGE (10 YR 8/6) AND MODERATE RED (5 R 4/6) WITH A 4" HIGHLY PLASTIC SANDY CLAY LAYER AT BOTTOM.
	50								
S/BC		60	12	◤	17 14 15	29	13	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 2-4 % GRAVEL TO 0.7 IN. MAX., 5-8 % MODERATELY PLASTIC FINES, PALE YELLOWISH ORANGE (10YR 8/6) AND DARK YELLOWISH ORANGE (10YR 6/6).
			13	◤	6 8 10	18	13	SP	SAND, UNIFORM, FINE, 2-4 % FINES, VERY PALE ORANGE (10 YR 8/2), PALE YELLOWISH ORANGE (10 YR 8/6).
	40								
		70	14	◤	8 10 11	21	13	SP	SAND, UNIFORM, FINE, 2-5 % SLIGHTLY TO MODERATELY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2).
			15	◤	10 14 16	30	10	SP	SAND, UNIFORM, FINE, 2-5 % FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
	30								
		80	16	◤	16 17 20	37	8	SP	SAND, UNIFORM, FINE, WITH LESS THAN 1 % MEDIUM SAND, 4-6 % FINES, DARK YELLOWISH ORANGE (10 YR 6/6).

THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 9, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK 146 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. 146
DATE DRILLED JANUARY 16, 1973
COORDINATES, NORTH 16,992.4
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO
EAST 18,254.5
SHEET 2 OF 3
LOGGED BY D.F.P.
GROUND SURFACE ELEVATION 108.6

			SAMPLE						
	ELEVATION FEET	DEPTH FEET	NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			17	◤	12 20 25	45	8	SP	SAND, UNIFORM, FINE, 3-5 % FINES, DARK YELLOWISH ORANGE (10 YR 6/6
	20								
		90	18	◤	8 9 24	33	9	SP	SIMILAR TO SS 17
			19	◤	23 37 44	81	8	SP	SAND, UNIFORM, FINE, 2-5 % FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH ONE PIECE OF GRAVEL 0.6 IN. IN SIZE.
	10								
		100	20	◤	13 13 21	34	9	SP	SAND, UNIFORM, FINE, 1-4 % SLIGHTLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6) OCCASIONALLY MOTTLED WITH SMALL MnO_2 NODULES.
			21	◤	17 19 21	40	13	SP	SAND, UNIFORM, FINE, 2-4 % FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
	0								
		110	22	◤	54 50/3	50/3	7	SP	SAND, UNIFORM, FINE, 2-4 % FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
			23	◤	39 50/4	50/4	7	SP	SIMILAR TO SS 22
	-10								
		120	24	◤	55 50/3	50/3	6	SP	SAND, UNIFORM, FINE, 3-6 % FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
			25	◤	37 50/4	50/4	6	SP	SAND, UNIFORM, FINE, 2-3 % FINES, GRAYISH YELLOW (5 Y 8/4).
	-20								
		130	26	◤	41 48 52	100	7	SP	SAND, UNIFORM, FINE, WITH LESS THAN 1 % MEDIUM SAND, 2-3 % FINES, GRAYISH YELLOW (5 Y 8/4).
			27	◤	15 17 16	33	7	SP	SANDY GRAVEL, POORLY GRADED TO 0.9 IN. MAX., 8-12 % FINE TO COARSE SAND, 6-8 % MODERATELY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6),WITH A 2" GRAVELLY CLAY LAYER.
BC/PC	-30								
		140	28	◤	5 7 14	21	8	CH	SILTY CLAY, HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 8/1), WITH 3/4"-1" THICK LAYERS OF FINE SAND THROUGHOUT SAMPLE.
			29	◤	11 15 17	32	8	SP	SAND, UNIFORM, FINE, 3-6 % SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 8/1), WITH SMALL CLAY FLAKES.
	-40								
		150	30	◤	17 22 32	54	10	SP	SAND, UNIFORM, FINE, 3-5% SLIGHTLY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4), WITH SMALL CLAY FLAKES.
			31	◤	5 11 20	31	17	CL	CLAY, MODERATELY PLASTIC, SEVERLY MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6), PALE YELLOWISH BROWN (10 YR 6/2),AND PALE GREENISH YELLOW (10 YR 8/2) WITH SMALL FeOx. and MnO_2 NODUELS.
	-50								
		160	32	◤	8 13 16	29	16	CH	SILTY CLAY, HIGHLY PLASTIC, DUSKY YELLOW (5 Y 6/4) OCCASIONALLY MOTTLED WITH SMALL FeOx NODUELS.

THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 9, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 146 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 146
DATE DRILLED JANUARY 16, 1973
COORDINATES, NORTH 16,992.4
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 18,254.5
SHEET 3 OF 3
LOGGED BY D.F.P.
GROUND SURFACE ELEVATION 108.6

		SAMPLE						
ELEVATION FEET	DEPTH FEET	NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-57.9	166.5	33	◤	5 13 16	29		CL	CLAY, MODERATELY PLASTIC, 1-3 % VERY FINE SAND, MOTTLED, PALE BROWN (5 YR 5/2), DUSKY YELLOW (5 Y 6/4), YELLOWISH GRAY (5 Y 7/2)
								BOTTOM OF BORING AT 166.5'

THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

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◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 9, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 146 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 147
TYPE OF BORING DRIVE
SHEET 1 OF 3
DATE DRILLED JANUARY 18, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 16,796.9
EAST 18,210.8
GROUND SURFACE ELEVATION 104.2

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS[1]	"N" VALUE	RECOVERY[3]		
L	100		1	◤	18 38 40	78	11	ML	CLAYEY SILT, MODERATELY TO HIGHLY PLASTIC, 1-3 % FINES, PALE YELLOWISH ORANGE (10 YR 8/6), AND LIGHT GRAY (N7).
L/PH		10	2	◤	17 17 31	48	14	CH	SILTY CLAY, HIGHLY PLASTIC, 1-2 % FINE SAND, PALE YELLOWISH BROWN (10 YR 6/2).
	90		3	◤	10 12 10	22	11	CH	SANDY CLAY, HIGHLY PLASTIC, 20-25 % FINE SAND, LIGHT GRAY (N7).
		20	4	◤	12 16 12	28	12	CH	SANDY CLAY, HIGHLY PLASTIC, 35-20 % FINE SAND, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6), AND LIGHT GRAY (N7).
PH/S	80		5	◤	6 10 12	22	13	SC	CLAYEY SAND, UNIFORM, FINE, 8-12 % MODERATELY PLASTIC FINES, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6) AND PALE YELLOWISH ORANGE (10 YR 6/2).
		30	6	◤	6 12 13	25	11	SC	CLAYEY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 6-8 % GRAVEL TO 1.6 INCH MAXIMUM, 8-10 % MODERATELY PLASTIC FINES, MODEARTE REDDISH BROWN (10 R 4/6).
	70		7	◤	8 6 9	15	13	SM-SC	SILTY SAND, UNIFORM, FINE, 10-15 % MODERATELY PLASTIC FINES, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE ORANGE PINK (10 R 7/4).
		40	8	◤	5 7 8	15	13	SM-SC	SIMILAR TO SS 7.
	60		9	◤	9 8 10	18	13	SP	SAND, UNIFORM, FINE, 8-10 % MODERATELY TO HIGHLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 6/2).
		50	10	◤	10 17 18	35	8	SP	SAND, UNIFORM, FINE, 1-2% MEDIUM SAND, 3-5 % FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
S/BC	50		11	◤	6 13 16	29	9	SP	SAND, UNIFORM, FINE, LESS THAN 1 % GRAVEL TO 0.4 INCH MAXIMUM, 4-5 % SLIGHTLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 6/2), AND DARK YELLOWISH ORANGE (10 YR 6/6), WITH 3/4"-1" CLAY LAYERS THROUGHOUT SAMPLE.
		60	12	◤	3 4 6	10	13	SP	SAND, UNIFORM, FINE, 8-10 % MODERATELY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4).
	40		13	◤	7 4 10	14	12	SP	SAND, UNIFORM, FINE, 2-6 % SLIGHTLY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/7).
		70	14	◤	5 6 9	15	12	SP	SAND, UNIFORM, FINE, 4-6 % SLIGHTLY TO MODERATELY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/7).
	30		15	◤	17 31 45	76	10	SP	SAND, UNIFORM, FINE, 2-3 % FINES, GRAYISH ORANGE (10 YR 7/4).
			16	◤	9 12 18	30	8	SP	SAND, UNIFORM, FINE, 2-5 % MODERATELY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4), WITH LESS THAN 1 % GRAVEL TO 0.5 IN. MAX., AND SMALL CLAY SLIVERS THROUGHOUT SAMPLE.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 18 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 14, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 147 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 147
TYPE OF BORING DRIVE
SHEET 2 OF 3
DATE DRILLED JANUARY 18, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 16,796.9
EAST 18,210.8
GROUND SURFACE ELEVATION 104.2

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS[1]	"N" VALUE	RECOVERY[3]		
	20		17	◤	15 23 31	54	9	SP	SAND, UNIFORM FINE, 2-4 % FINES, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), AND GRAYISH YELLOW (5 Y 8/4), ONE PIECE OF GRAVEL 1.0 INCH IN SIZE.
		80	18	◤	13 16 29	45	8	SP	SIMILAR TO SS 17, EXCEPT NO GRAVEL.
	10		19	◤	22 40 55	95	8	SP	SAND, POORLY GRADED, FINE AND MEDIUM, MOSTLY FINE, 2-3 % FINES, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) AND GRAYISH YELLOW (5 Y 8/4).
		90	20	◤	25 34 41	75	8	SP	SAND, UNIFORM, FINE, 2-4 % FINES, DARK YELLOWISH ORANGE (10 YR 6/6), CONTAINING LESS THAN 1 % GRAVEL TO 0.6 INCH MAXIMUM.
	0		21	◤	25 36 48	84	8	SP	SAND, UNIFORM, FINE, 2-5 % SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), CONTAINING LESS THAN 1 % GRAVEL TO 0.6 INCH MAXIMUM.
		100	22	◤	18 50/3	50/3	7	SP	SAND, UNIFORM, FINE, 1-2 % GRAVEL TO 0.8 INCH MAXIMUM, 5-8 % FINES, LIGHT BROWN (5 YR 5/6).
	-10		23	◤	34 50/3	50/3	5	SP	SAND, UNIFORM, FINE, 2-8 % FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		110	24	◤	28 50/5	50/5	6	SP	SAND, UNIFORM, FINE, CLEAN, 1-2 % FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
	-20		25	◤	28 42 55	97	9	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, 1-2 % GRAVEL TO 0.9 INCH MAXIMUM, 1-3 % FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		120	26	◤	28 45 58	103	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 4-8 % GRAVEL TO 0.5 INCH MAXIMUM, CLEAN, 1-2 % FINES, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6) AND PALE YELLOWISH BROWN (10 YR 6/2).
	-30		27	◤	4 28 30	58	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY COARSE AND MEDIUM, 4-6 % GRAVEL TO 0. 9 INCH MAXIMUM, 1-3 % FINES, PALE YELLOWISH BROWN (10 YR 6/2).
BC/PC		130	28	◤	18 18 20	38	9	GC	CLAYEY GRAVEL, POORLY GRADED TO 1.8 INCH MAXIMUM, 6-10 % FINE TO COARSE SAND, 8-10 % MODERATELY TO HIGHLY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4).
	-40		29	◤	14 7 12	19	6	SM	SILTY SAND, UNIFORM, VERY FINE, 12-15 % MODERATELY PLASTIC FINES, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6) AND PALE YELLOWISH ORANGE (10 YR 8/6) WITH ONE PIECE OF GRAVEL 2 INCH IN SIZE.
		140	30	◤	6 11 15	26	18	SM	SIMILAR TO SS 29, EXCEPT GRAVEL IS OMITTED.
	-50		31	◤	8 12 18	30	20	CH	CLAY, MODERATELY TO HIGHLY PLASTIC, MOTTLED, YELLOWISH GRAY (5 Y 8/1) AND DARK YELLOWISH BROWN (10 YR 4/2), SEVERLY MOTTLED WITH THICK FeOx AND MnO_2 VEINS APPROXIMATELY 1/4-1/2" THICK.
			32	◤	16 22 27	49	20	CL	CLAY, MODERATELY PLASTIC, PALE GREENISH YELLOW (10 Y 8/2) WITH THIN, VERY FINE SAND LENSES 1/8"-1/4" THICK THROUGHOUT SAMPLE, MINOR FeOx STAINING.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 18 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 14, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 147 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 147
TYPE OF BORING DRIVE
SHEET 3 OF 3
DATE DRILLED JANUARY 18, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO
LOGGED BY D.F.P.
COORDINATES, NORTH 16,796.9
EAST 18,210.8
GROUND SURFACE ELEVATION 104.2

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS[1]	"N" VALUE	RECOVERY[3]		
-60 -62.3	166.5	33	◤	8 9 14	23	20	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 2-3 % VERY FINE SAND, DUSKY YELLOW (5 Y 6/4).
								BOTTOM OF BORING AT 166.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 18 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
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4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 14, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 147 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 148 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED JANUARY 22, 1973 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY R.B.T.
COORDINATES, NORTH 16,603.2 EAST 18,180.0 GROUND SURFACE ELEVATION 99.6'

L

L/PH

PH/S

S/BC

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		1	◤	6 13 19	32	10	ML	CLAYEY SILT, SLIGHTLY PLASTIC, LESS THAN 3 % VERY FINE SAND, DRY, MODERATE YELLOWISH BROWN (10 YR 5/5), LOESS.
90	10	2	◤	6 11 11	22	11	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 3-5 % FINE SAND, DRY, PALE YELLOWISH BROWN (10 YR 6/2).
		3	◤	11 50/10	50/10	10	SP-ML	TOP 6" SAND, POORLY GRADED FINE, 3-5 % NONPLASTIC FINES, DAMP, LIGHT BROWN (5 YR 5/6). BOTTOM 6" SILT, SLIGHTLY PLASTIC, LESS THAN 3 % FINE SAND, DRY, PALE YELLOWISH BROWN (10 YR 6/2).
80	20	4	◤	32 50/3"	50/3"	11	SP	SAND, POORLY GRADED FINE, CLEAN, LIGHT GRAYISH ORANGE (10 YR 8/4).
		5	◤	8 12 11	23	11	SP	SAND, POORLY GRADED FINE TO MEDIUM, MOSTLY FINE, LESS THAN 3 % GRAVEL TO 1.0 IN. MAX., LIGHT GRAYISH ORANGE (10 YR 8/4).
70	30	6	◤	7 10 11	21	12	SP	SAND, POORLY GRADED FINE TO MEDIUM, MOSTLY FINE, LESS THAN 3 % GRAVEL TO 0.3 IN. MAX., 5-8 % SLIGHTLY PLASTIC FINES, 1 IN. LAYERS OF HIGHLY PLASTIC CLAY, LIGHT BROWN (5 YR 5/6).
		7	◤	7 9 10	19	14	SM	SILTY SAND, POORLY GRADED FINE TO MEDIUM, MOSTLY VERY FINE, 10-15 % SLIGHTLY TO MODERATELY PLASTIC FINES, MOIST, LIGHT BROWN (5 YR 5/6).
60	40	8	◤	6 6 8	14	14	SP	SAND, UNIFORM, VERY FINE, LESS THAN 3 % SLIGHTLY PLASTIC FINES, MOIST, GRAYISH ORANGE (10 YR 7/4).
		9	◤	14 23	37	10	SP	SAND, UNIFORM, FINE, CLEAN, GRAYISH ORANGE (10 YR 7/4).
50	50	10	◤	10 8 6	14	14	SP-CL CL	TOP 4 " SAND, UNIFORM FINE, LESS THAN 3 % NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) MIDDLE 2 " CLAY, MODERATELY TO HIGHLY PLASTIC, LESS THAN 3 % GRAVEL TO 0.5 IN. MAX., POCKETS OF FINE SAND, MODERATE REDDISH BROWN (10 R 4/6). BOTTOM 8 " SANDY CLAY, MODERATELY -HIGHLY PLASTIC, 15-20 % VERY FINE SAND, MODERATE REDDISH BROWN (10 R 4/6).
		11	◤	6 8 13	21	7	SP	SAND, UNIFORM VERY FINE, LESS THAN 3 % SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6).
40	60	12	◤	4 8 12	20	15	SP	SAND, UNIFORM VERY FINE, 3-5 % SLIGHTLY PLASTIC FINES, SATURATED, MODERATE REDDISH BROWN (10 R 4/6).
		13	◤	8 5 11	16	14	SP	SAND, SAME AS ABOVE.
30	70	14	◤	17 17 19	36	13	SP	SAND, POORLY GRADED VERY FINE TO MEDIUM, MOSTLY FINE, LESS THAN 3 % NONPLASTIC FINES, MODERATE REDDISH BROWN (10 R 5/6)
		15	◤	5 14 17	31	6	SP	SAND, POORLY GRADED FINE TO COARSE, LESS THAN 3 % GRAVEL TO 1.0 IN. MAX., LESS THAN 3 % NONPLASTIC FINES, MODERATE REDDISH BROWN (10 R 4/6).
20	80	16	◤	13 14 15	29	6	SP	SAND, POORLY GRADED FINE TO MEDIUM, LESS THAN 3 % GRAVEL TO 0.5 IN. MAX., LESS THAN 3 % NONPLASTIC FINES, MODERATE REDDISH BROWN (10 R 5/6).

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DFG
DATE FEBRUARY 13, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 148 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 148 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED JANUARY 22, 1973 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY R.B.T.
COORDINATES, NORTH 16,603.2 EAST 18,180.0 GROUND SURFACE ELEVATION 99.6'

BC/PC

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		17	◤	20 37 50/4	107	12	SP	SAND, UNIFORM FINE, CLEAN, LIGHT BROWN (5 YR 5/6).
10	90	18	◤	19 20 33	53	12	SP	SAND, SAME AS ABOVE.
		19	◤	52 50/5	50/5	13	SP	SAND, POORLY GRADED FINE TO COARSE, MOSTLY FINE, LESS THAN 3 % GRAVEL TO 0.3 IN. MAX., LESS THAN 3 % NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
0	100	20	◤	43 50/5	50/5	14	SP	SAND, UNIFORM FINE, CLEAN, LESS THAN 3 % GRAVEL TO 0.5 IN. MAX., MODERATE REDDISH BROWN (10 YR 5/6).
		21	◤	27 49 50/4	119	11	SP	SAND, UNIFORM FINE, CLEAN, LESS THAN 3 % GRAVEL TO 0.3 IN. MAX., MODERATE YELLOWISH BROWN (10 YR 4/2).
-10	110	22	◤	16 29 50/6	79	10	SP	SAND, UNIFORM FINE, CLEAN, MODERATE YELLOWISH BROWN (10 YR 4/2).
		23	◤	17 39 50	89	10	SP	SAND, WIDELY GRADED FINE TO COARSE, MOSTLY FINE TO MEDIUM, LESS THAN 3 % NONPLASTIC FINES, LIGHT BROWN (10 YR 6/2).
-20	120	24	◤	12 29 30	59		NR	NO RECOVERY.
		25	◤	15 28 34	62	13	SP	SAND, WIDELY GRADED, FINE TO COARSE, MOSTLY COARSE, LESS THAN 1 % NONPLASTIC FINES, LIGHT BROWN (5 YR 5/6).
-30	130	26	◤	14 20 30	50	11	SP	SAND, SAME AS ABOVE.
		27	◤	10 22 25	47	10	SP	SAND, WIDELY GRADED, FINE TO COARSE, MOSTLY COARSE, 3-8 % GRAVEL TO 0.5 IN. MAX., LESS THAN 5 % NONPLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
-40	140	28	◤	14 18 19	37	10	SP	GRAVELLY SAND, WIDELY GRADED, FINE TO COARSE, MOSTLY COARSE, 10-20 % GRAVEL TO 1.0 IN. MAX., 3-5 % SLIGHTLY PLASTIC FINES, DENSE, LIGHT BROWN (5 YR 5/6).
		29	◤	12 18 24	42	16	SP	SAND, UNIFORM FINE, CLEAN, GRAYISH ORANGE (10 YR 7/4).
-50	150	30	◤	9 35 50/5	93	10	SP	SAND, UNIFORM FINE, CLEAN, LESS THAN 3 % GRAVEL TO 1.0 IN. MAX., GRAYISH ORANGE (10 YR 7/4).
		31	◤	9 17 23	40	16	CL	SANDY CLAY, SLIGHTLY-MODERATELY PLASTIC, STIFF, 25-35 % VERY FINE SAND, FeO DEPOSITS, PALE YELLOWISH BROWN (10 YR 7/2).
-60	160	32	◤	6 14 15	29	16	CL	SILTY CLAY, MODERATELY PLASTIC, STIFF, 25-35 % VERY FINE SAND, GRAYISH BLUE GREEN (5 BG 5/2).

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DFG
DATE FEBRUARY 13, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 148 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 148 TYPE OF BORING DRIVE SHEET 3 OF 3
DATE DRILLED JANUARY 22, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY R.B.T.
COORDINATES, NORTH 16,603.2 EAST 18,180.0 GROUND SURFACE ELEVATION 99.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		33	◤	7 21 37	58	16	CL	SILTY CLAY, SIMILAR TO ABOVE, WITH LAYER OF VERY FINE SAND.
-70 -71.9		34	◤	11 24 40	64	12	CL	CLAYEY SAND, UNIFORM VERY FINE, 20-30 % MODERATELY PLASTIC FINES, VERY DENSE, GRAYISH BLUE GREEN (5 BG 5/2).
	171.5							END OF BORING AT 171.5

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DFG
DATE FEBRUARY 13, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 148 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 149
DATE DRILLED JANUARY 23, 1973
COORDINATES, NORTH 16,676.6
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 17987.6
SHEET 1 OF 2
LOGGED BY E.M.W.
GROUND SURFACE ELEVATION 100.0'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"¹	"N" VALUE	RECOVERY		
								ADVANCED BORING TO 70.0FT. WITHOUT SAMPLING.
BC		1	◤	18 23 28	51	8	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY FINE, FEW GRAVEL TO 0.5 INCH MAXIMUM, 4-7% NONPLASTIC FINES, DARK YELLOWISH-ORANGE (10 YR 6/6).
		2	◤	10 20 28	48	7	SP	SAND, UNIFORM, FINE, LESS THAN 2% NONPLASTIC FINES, GRAYISH-ORANGE (10 YR 6/4).
20	80	3	◤	14 24 37	61	7	SP	SAND, SIMILAR TO SS-2.
		4	◤	27 44 50/5"	103	7	SP	SAND, UNIFORM, FINE, FEW COARSE SAND, LESS THAN 2% FINES, DARK YELLOWISH-ORANGE (10 YR 6/6).
10	90	5	◤	7 14 28	42	6	SP	SAND, SIMILAR TO SS-2.
		6	◤	24 37 50/4"	100	7	SP	SAND, MOSTLY GRADED FINE, FEW MEDIUM AND COARSE, FEW GRAVEL TO 1.2 INCH MAXIMUM, LESS THAN 2% FINES, MODERATE YELLOWISH-ORANGE (10 YR 7/6).
0	100	7	◤	27 43 50/4"	100	8	SP	SAND, MOSTLY GRADED FINE, FEW MEDIUM AND COARSE, 2-4% FINES, DARK YELLOWISH-ORANGE (10 YR 6/6).
		8	◤	38 38 50/4"	106	7	SP	SAND, MOSTLY UNIFORM, FINE, FEW COARSE, LESS THAN 3% FINES, DARK YELLOWISH-ORANGE (10 YR 6/6).
		9	◤	15 47 50/4"	116	5	SP	SAND, UNIFORM, FINE, LESS THAN 2% FINES, MODERATE YELLOWISH-ORANGE (10 YR 7/6).
		10	◤	23 50/5"	50/5"	4	SP	SAND, UNIFORM, FINE, FEW COARSE, 1 PIECE GRAVEL (0.4 INCH), LESS THAN 2% FINES, MODERATE YELLOWISH-ORANGE (10YR 7/6).
-10	110	11	◤	3 11 25	36	7	SP	SAND, UNIFORM, FINE, LESS THAN 2% FINES, MODERATE YELLOWISH-ORANGE (10 YR 7/6).
		12	◤	18 27 47	74	5	SP	SAND, SIMILAR TO SS-11.
		13	◤	26 38 50/5"	92	5	SP	SAND, SIMILAR TO SS-11.
		14	◤	20 30 28	58	2	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY MEDIUM, 8-10% GRAVEL TO 0.4 INCH MAXIMUM, 3-5% FINES, DARK YELLOWISH-ORANGE (10YR 6/6)
-20	120	15	◤	17 36 39	75	3	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY MEDIUM, 5-8% GRAVEL TO 0.5 INCH MAXIMUM, 5-8% FINES, DARK YELLOWISH-ORANGE (10 YR 6/6)

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 22, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 149 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 149
DATE DRILLED JANUARY 23, 1973
COORDINATES, NORTH 16,676.6
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 17,987.6
SHEET 2 OF 2
LOGGED BY E.M.W.
GROUND SURFACE ELEVATION 100.0'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"¹	"N" VALUE	RECOVERY		
		16	◤	21 44 50/5"	103	4	SP	SAND, WIDELY GRADED, COARSE TO FINE, MOSTLY COARSE, FEW GRAVEL TO 0.5 INCH MAXIMUM, LESS THAN 2% FINES, MODERATE YELLOWISH-BROWN (10 YR 5/5).
		17	◤	29 50/5"	50/5"	3	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY FINE, FEW GRAVEL TO 0.4 INCH MAXIMUM, 3-5% FINES, DARK YELLOWISH-ORANGE (10 YR 5/6).
		18	◤	11 21 22	43	3	SP	SAND, WIDELY GRADED COARSE TO FINE MOSTLY MEDIUM AND COARSE, FEW GRAVEL TO 0.4 INCH MAXIMUM, 4-7% FINES, GRAYISH-ORANGE (10YR 6/
-30	130	19	◤	17 16 17	33	4	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY MEDIUM AND COARSE, 7-10% GRAVEL TO 0.6 INCH MAXIMUM, LESS THAN 3% FINES, GRAYISH-ORANGE (10 YR 7/3).
		20	◤	30 50/5"	50/5"	—		NO RECOVERY. *
		21	◤	47 50/5"	50/5"	3	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY MEDIUM, FEW GRAVEL TO 0.4 INCH MAXIMUM, CLEAN, VARIGATED, MOSTLY LIGHT GRAYISH-ORANGE (10 YR 8/4).
		22	◤	39 50/4"	50/4"	4	SP	SAND, SIMILAR TO SS-21.
-40	140	23	◤	18 40 33	73	4	SP	GRAVELLY SAND, WIDELY GRADED COARSE TO FINE, MOSTLY COARSE, 15-20% GRAVEL TO 0.6 INCH MAXIMUM, 4-6% FINES, VARIGATED, MOSTLY MODERATE YELLOWISH-BROWN (10 YR 6/4).
		24	◤	37 50/5"	50/5"	—		NO RECOVERY.
		25	◤	16 24 23	47	5	SP	GRAVELLY SAND, WIDELY GRADED COARSE TO FINE, 25-35% GRAVEL TO 0.8 INCH MAXIMUM, 8-10% MODERATELY PLASTIC FINES, GRAYISH-ORANGE (10 YR 7/4).
		26	◤	22 21 26	47	4	GC	CLAYEY GRAVEL, WIDELY GRADED COARSE TO FINE, 15-20% WIDELY GRADED SAND, 15-20% MODERATELY PLASTIC FINES, YELLOWISH-GRAY (10YR 7/6), YELLOWISH-GRAY (5Y 7/2).
-50	150	27	◤	13 13 23	36	4	SP	SAND, UNIFORM, FINE, LESS THAN 2% FINES, VERY PALE ORANGE (10YR 8/2).
		28	◤	17 21 20	41	3	SP	SAND, SIMILAR TO SS-27, BUT WITH FEW COARSE SAND AND GRAVEL TO 0.5 INCH MAXIMUM.
BC/PC		29	◤	10 16 18	34	9	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 3% VERY FINE SAND, [illegible] HARD, GREENISH-GRAY (5 GY 6/1), MODERATE FeOx STAINING, BLACK SPECKS MnO2.
		30	◤	9 12 15	27	13	CL	SILTY CLAY, SIMILAR TO SS-29.
-60	160	31	◤	10 13 19	32	18	CL	SILTY CLAY, MODERATELY PLASTIC, 3-5% VERY FINE SAND, HARD, LIGHT GREENISH-GRAY (5 GY 7/1), MINOR FeOx STAINING, FEW BLACK SPECKS MnO2.
-61.5	161.5							END OF BORING AT 161.5'

* NOTE: SAMPLES GIVING NO RECOVERY, APPEAR TO BE(FROM WASH), SP, GRAVELLY SAND, MOSTLY COARSE, 20-30% GRAVEL TO 0.5 INCH, CLEAN, GRAYISH ORANGE.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 22, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 149 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 150
DATE DRILLED JANUARY 17-19, 1973
COORDINATES, NORTH 16,582.8
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 17,763.4
SHEET 1 OF 2
LOGGED BY E.M.W.
GROUND SURFACE ELEVATION 108.1'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"¹	"N" VALUE	RECOVERY		
								ADVANCED HOLE WITHOUT SAMPLING TO 75.0'
BC		1	◤	20 49 46	95	6	SP	GRAVELLY SAND, WIDELY GRADED COARSE TO FINE, MOSTLY FINE, 10-15% GRAVEL TO 0.7" MAX., LESS THAN 3% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
30		2	◤	39 32 35	67	4	SP	SAND, MOSTLY UNIFORM, FINE, FEW COARSE SAND, FEW GRAVEL TO 0.5" MAX., CLEAN, DARK YELLOWISH ORANGE (10 YR 6/6).
	10	3	◤	7 20 21	41	5	SP	SAND, UNIFORM, FINE, LESS THAN 2% FINES, DARK YELLOWISH ORANGE (10 YR 6/6), POCKET CLEAN, WHITE (N-9) FINE SAND.
20		4	◤	28 37 50/4"	104	6	SP	SAND, WIDELY GRADED, COARSE TO FINE, MOSTLY FINE TO MEDIUM, FEW GRAVEL TO 0.6" MAX., BRIGHT YELLOWISH BROWN (10 YR 5/6).
10	20	5	◤	29 50/5"	50/5"	6	SP	SAND, SIMILAR TO SS-4.
		6	◤	32 49 50/3"	132	9	SP	SAND, UNIFORM, FINE, LESS THAN 7% FINES, FEW GRAVEL TO 0.4" MAX., GRAYISH ORANGE (10 YR 7/4).
	30	7	◤	37 50/5"	50/5"	5	SP	SAND, UNIFORM, FINE, FEW COARSE SAND, CLEAN, MODERATE YELLOWISH ORANGE (10 YR 7/6).
0		8	◤	41 47 50/4"	118	5	SP	SAND, SIMILAR TO SS-7.
		9	◤	18 44 50/5"	103	4	SP	SAND, UNIFORM, FINE, CLEAN, MODERATE YELLOWISH ORANGE (10 YR 7/6).
	40	10	◤	35 50/5"	50/5"	5	SW-SP	SAND, WELL GRADED, COARSE TO FINE, FEW GRAVEL TO 0.5" MAX., DARK YELLOWISH ORANGE (10 YR 6/6), LARGE POCKETS UNIFORM, FINE SAND, PALE YELLOWISH ORANGE (10 YR 8/6).
		11	◤	22 31 47	78	5	SW	SAND, WELL GRADED, COARSE TO FINE, CLEAN, PALE GRAYISH ORANGE (10 YR 8/4).
-10		12	◤	29 36 43	79	4	SP	SAND, WIDELY GRADED, COARSE TO FINE, MOSTLY FINE AND MEDIUM, CLEAN, MODERATE YELLOWISH BROWN (10 YR 5/4).
		13	◤	18 36 50	86	2	SW	SAND, WELL GRADED, COARSE TO FINE, 4-6% GRAVEL TO 0.4" MAX., LESS THAN 3% FINES, DARK YELLOWISH BROWN (10 YR 4/2).
		14	◤	24 40 50/4"	108	3	SW	SAND, SIMILAR TO SS-13.
	50	15	◤	46 50/2"	50/2"	4	SP	SAND, MOSTLY UNIFORM, FINE, 10-15% MEDIUM AND COARSE SAND, FEW GRAVEL TO 0.8" MAX., CLEAN, LIGHT YELLOWISH BROWN (10 YR 6/4).
-20		16	◤	38 50/5"	50/5"	5	SP	SAND, MOSTLY UNIFORM, FINE, FEW MEDIUM AND COARSE SAND, CLEAN, LIGHT YELLOWISH BROWN (10 YR 6/4).
		17	◤	32 49 50/4"	119	5	SP	SAND, MOSTLY UNIFORM, FINE, FEW MEDIUM AND COARSE, 6-10% GRAVEL TO 0.6" MAX., CLEAN, LIGHT YELLOWISH BROWN (10 YR 6/4).

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 11, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 150 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 150
DATE DRILLED JANUARY 17-19, 1973
COORDINATES, NORTH 16,582.8
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 17,763.4
SHEET 2 OF 2
LOGGED BY E.M.W.
GROUND SURFACE ELEVATION 108.1'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"¹	"N" VALUE	RECOVERY		
		18	◤	30 46 48	94	5	SP	SAND, UNIFORM, FINE, FEW COARSE AND MEDIUM, CLEAN, LIGHT YELLOWISH BROWN (10 YR 6/4).
		19	◤	50/5"	50/5"			NO RECOVERY.
-30		20	◤	40 50/3"	50/3"	5	SP	SAND, MOSTLY UNIFORM, FINE, FEW COARSE AND MEDIUM, FEW GRAVEL TO 0.9" MAX., CLEAN, LIGHT YELLOWISH BROWN (10 YR 6/4).
	140	21	◤	43 50/4"	50/4"	4	SP	SAND, UNIFORM, FINE, FEW COARSE, FEW GRAVEL TO 0.3" MAX., CLEAN, LIGHT YELLOWISH BROWN (10 YR 6/4).
		22	◤	46 50/3"	50/3"			NO RECOVERY.
		23	◤	19 16 13	29	5	SP	GRAVELLY SAND, WIDELY GRADED COARSE TO FINE, MOSTLY COARSE, 35-45% SUBANGULAR GRAVEL TO 1.0" MAX., 3-6% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
-40		24	◤	50 50 50/3"	132	5	SP	GRAVELLY SAND, WIDELY GRADED COARSE TO FINE, MOSTLY COARSE, 30-35% SUBROUNDED GRAVEL TO 0.6" MAX., 3-6% SLIGHTLY PLASTIC FINES, MODERATE YELLOWISH ORANGE (10 YR 7/6), ONE LARGE POCKET YELLOWISH GRAY (5 Y 8/1) SANDY CLAY.
	150	25	◤	16 20 15	35	5	SC	CLAYEY SAND, WIDELY GRADED COARSE TO FINE, MOSTLY COARSE, 10-15% GRAVEL TO 0.5" MAX., 25-30% MODERATELY PLASTIC CLAY FORMING A MATRIX, GRAYISH ORANGE (10 YR 7/4) AND YELLOWISH GRAY (5 Y 7/2).
BC/PC		26	◤	9 11 11	22	13	CL	GRAVELLY CLAY, MODERATELY PLASTIC, 25-35% MOSTLY COARSE SAND AND GRAVEL TO 0.5" MAX., LIGHT GREENISH GRAY (5 GY 7/1) AND GRAYISH ORANGE (10 YR 7/4), MINOR FeOx. STAINING.
		27	◤	17 23 28	51	14	SP	SAND, UNIFORM, FINE, FEW COARSE SAND AND GRAVEL TO 0.4" MAX., CLEAN, VERY PALE ORANGE (10 YR 8/2).
-50		28	◤	11 18 24	42	9	SP	SAND, UNIFORM, FINE, CLEAN, VERY PALE YELLOWISH BROWN (10 YR 7/2) WITH MODERATE YELLOWISH ORANGE (10 YR 7/6).
	160	29	◤	11 20 19	39	5	SP	SAND, UNIFORM, FINE, CLEAN, FEW GRAVEL TO 0.4" MAX., VERY PALE YELLOWISH BROWN (10 YR 7/2).
		30	◤	13 16 23	39	4	SP	SAND, UNIFORM, FINE, CLEAN, VERY PALE YELLOWISH BROWN (10 YR 7/2).
		31	◤	24 14 24	38	18	SP CL	TOP 3" SAND, GRADED COARSE TO FINE, MOSTLY FINE, CLEAN, VERY PALE YELLOWISH BROWN (10 YR 7/2). BOTTOM 15" SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, LESS THAN 3% VERY FINE SAND, VERY STIFF, GREENISH GRAY (5 GY 6/1) HEAVY FeOx. STAINING, THICK (1.0") LAYER PARTIALLY DESSICATED CLAY, POCKET GRADED FINE SAND.
-60 -60.9	169.0	32	◤	6 10 12	22	18	CL	SILTY CLAY, MODERATELY PLASTIC, VERY STIFF, GREENISH GRAY (5 GY 6/1), WITH MINOR FeOx. STAINING AND BLACK SPECKS MnO_2.
								END OF BORING AT 169.0'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 11, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 150 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 151 TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED JANUARY 11, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY E.H.W.
COORDINATES, NORTH 16,642.2 EAST 17,548.3 GROUND SURFACE ELEVATION 108.6'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
								NOTE: ADVANCED HOLE TO 75.0' WITHOUT SAMPLING.
		1	◤	22 32 40	72	9	SP	SAND, UNIFORM, FINE, LESS THAN 2% FINES, VERY PALE ORANGE (10 YR 8/2) AND PALE YELLOWISH-ORANGE (10 YR 8/6), FEW GRAVEL TO 1.5 IN. MAX.
		2	◤	12 17 23	40	10	SP	SAND, UNIFORM, FINE, LESS THAN 2% FINES, PALE YELLOWISH-ORANGE (10 YR 8/6).

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE. ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 6, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 151 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 151 TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED JANUARY 11, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY E.H.W.
COORDINATES, NORTH 16,642.2 EAST 17,548.3 GROUND SURFACE ELEVATION 108.6'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		3	◤	9 15 21	36	6	SP	SAND, UNIFORM, FINE, 2-4% SLIGHTLY PLASTIC FINES, DARK YELLOWISH-ORANGE (10 YR 6/6) AND GRAYISH-ORANGE (10 YR 7/4), 1.0 IN. CLAY POCKET, FEW GRAVEL TO 1.2 IN. MAX.
		4	◤	23 41 50	91	9	SP	SAND, UNIFORM, FINE, TRACE COARSE SAND, 2-4% FINES, DARK YELLOWISH-ORANGE (10 YR 6/6).
		5	◤	42 50/4"	50/4"	7	SP	SAND, UNIFORM, FINE, LESS THAN 2% FINES, DARK YELLOWISH-ORANGE (10 YR 6/6) WITH PALE YELLOWISH-BROWN (10 YR 6/3).
		6	◤	46 50/3"	50/3"	5	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY FINE, 4-6% GRAVEL TO 1.0 IN. MAX., LESS THAN 2% FINES, DARK YELLOWISH-ORANGE (10 YR 6/6) WITH GRAYISH-ORANGE (10 YR 7/4).
		7	◤	41 50/5"	50/5"		SP	SAND, NO RECOVERY.
		8	◤	31 50/5"	50/5"	8	SP	SAND, MOSTLY UNIFORM, FINE, FEW MEDIUM AND COARSE, FEW GRAVEL TO 0.5 IN. MAX., MODERATE YELLOWISH-ORANGE (10 YR 7/6), POCKET DUSKY YELLOWISH-GREEN (10 GY 3/2) FINE SAND.
		9	◤	49 50/5"	50/5"	7	SP	SAND, MOSTLY UNIFORM, FINE, FEW MEDIUM AND COARSE, FEW GRAVEL TO 0.4 IN. MAX., MODERATE YELLOWISH-ORANGE (10 YR 7/6).
		10	◤	41 50/4"	50/4"	7	SP	SAND, MOSTLY UNIFORM, FINE, FEW MEDIUM AND COARSE, DARK YELLOWISH-ORANGE (10 YR 6/6) AND GRAYISH-ORANGE (10 YR 7/4).
		11	◤	18 27 37	64	8	SP	SAND, MOSTLY UNIFORM, FINE, FEW MEDIUM AND COARSE, FEW GRAVEL TO 1.0 IN. MAX., MODERATE YELLOWISH-ORANGE (10 YR 7/6).
		12	◤	12 26 25	51	5	SW	SAND, WELL GRADED COARSE TO FINE, 5-8% GRAVEL TO 0.4 IN. MAX., 2-4% FINES, DARK YELLOWISH-ORANGE (10 YR 5/6).
		13	◤	33 39 26	65	5	SW	SAND, SIMILAR TO SS-12.
		14	◤	17 17 12	29	2	SW	SAND, SIMILAR TO SS-12, WITH SMALL POCKET OF GRAY SANDY CLAY.
		15	◤	19 22 24	46	1	SW	SAND, SIMILAR TO SS-14.
		16	◤	28 43 50/5"	102	4	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY FINE AND MEDIUM, FEW GRAVEL TO 0.4 INCH MAXIMUM, 3-5% FINES, GRAYISH ORANGE (10YR 7/3).
		17	◤	32 48 50/4"	118	3	SP	SAND, SIMILAR TO SS-16.
		18	◤	30 47 50/4"	116	5	SP	SAND, SIMILAR TO SS-16.
		19	◤	28 48 50/5"	102	4	SP	SAND, SIMILAR TO SS-16.
		20	◤	29 27 23	50	4	SP	SAND, SIMILAR TO SS-16.
		21	◤	33 22 24	46	5	SP	SAND, SIMILAR TO SS-16, WITH SMALL POCKETS OF CLAY ASSOCIATED WITH COARSE SAND AND GRAVEL.
		22	◤	50/4"	50/4"	3	SP	GRAVELLY SAND, WIDELY GRADED COARSE TO FINE, MOSTLY FINE AND MEDIUM 10-15% GRAVEL TO 0.6 INCH MAXIMUM, 3-5% FINES, GRAYISH ORANGE (10YR 7/4).
		23	◤	50/3"	50/3"	2	SP	GRAVELLY SAND, SIMILAR TO SS-22.
		24	◤	42 50/3"	50/3"			NO RECOVERY.
		25	◤	24 18 25	43	4	SW	GRAVELLY SAND, GRADED COARSE TO FINE, 20-25% GRAVEL TO 0.5 INCH MAXIMUM, 3-5% FINES, MODERATE YELLOWISH ORANGE (10YR 7/6), MANY POCKETS YELLOWISH GRAY (5Y 7/2) CLAY ASSOCIATED WITH COARSE SAND AND GRAVEL.
		26	◤	30 25 32	57	3	SW	GRAVELLY SAND, SIMILAR TO SS-25.
		27	◤	8 8 15	23	13	CL	SILTY CLAY, MODERATELY PLASTIC, VERY STIFF, PALE OLIVE (10Y 5/2) WITH MODERATE FeOx STAINING AND BLACK FLECKS MnO_2.
		28	◤	9 47 28	75	4	CL	SILTY CLAY, MODERATELY PLASTIC, HARD, PALE OLIVE (10Y 5/2) WITH MODERATE FeOx STAINING.
-52.9	161.5	29	◤	17 18 22	40	18	CL	SILTY CLAY, SIMILAR TO SS-28.
								END OF BORING AT 161.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ● INDICATES LOCATION OF UNDISTURBED SAMPLE. ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 6, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 151 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 152 TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED JANUARY 11-17, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY E.H.W.
COORDINATES, NORTH 16,657.0 EAST 17,379.5 GROUND SURFACE ELEVATION 107.9

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
								NOTE ADVANCED HOLE TO 75.0' WITHOUT SAMPLING.
		1	◤	19 29 30	59	6	SP	SAND, UNIFORM, FINE, FEW GRAVEL TO 0.5 IN. MAX., LESS THAN 2 % FINES, MODERATE YELLOWISH ORANGE (10 YR 7/6).
		2	◤	26 28 34	62	6	SP	SAND, UNIFORM, FINE, FEW COARSE, CLEAN, PALE GRAYISH ORANGE (10 YR 8/4).

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE. ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 10, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 152 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 152 TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED JANUARY 11-17, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY E.H.W.
COORDINATES, NORTH 16,657.0 EAST 17,379.5 GROUND SURFACE ELEVATION 107.9

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		3	◤	32 18 25	43	8	SW	GRAVELLY SAND, WELL GRADED, COARSE TO FINE, 10-15 % GRAVEL TO 0.7 IN. MAX., 3-5 % SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		4	◤	26 51/6	51/6	7	SP	SAND, GRADED FINE, LESS THAN 3 % FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		5	◤	30 53/6	53/6	7	SP	SAND, GRADED MEDIUM TO FINE, MOSTLY FINE, FEW COARSE, LESS THAN 3 % FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		6	◤	26 51/6	51/6	2	GP	GRAVEL, VERY SMALL RECOVERY, FEW GRAVEL TO 1.5 IN. MAX.
		7	◤	50 50/3	50/3	7	SP	SAND, UNIFORM, FINE, FEW COARSE SAND, LESS THAN 3 % FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		8	◤	33 52/6	52/6	10	SP	SAND, MOSTLY GRADED FINE, FEW MEDIUM AND COARSE, FEW GRAVEL TO 0.4 IN. MAX., CLEAN, MODERATE YELLOWISH ORANGE (10 YR 7/5).
		9	◤	52 51/6	51/6		SP	SAND, SIMILAR TO SS 8.
		10	◤	38 51/6	51/6	8	SP	SAND, SIMILAR TO SS 8, WITH POCKET SLIGHTLY PLASTIC CLAYEY SAND.
		11	◤	28 53/6	53/6	8	SP	SAND, MOSTLY GRADED FINE, FEW MEDIUM AND COARSE, LESS THAN 3 % FINES, LIGHT YELLOWISH BROWN (10 YR 6/4), POCKET LIGHT OLIVE GRAY (5 Y 6/1) FINE SAND.
		12	◤	23 57/6	57/6	9	SP	SAND, UNIFORM, FINE, CLEAN, VERY DENSE, GRAYISH ORANGE (10 YR 6/4).
		13	◤	26 28 35	63	9	SP	SAND, UNIFORM, FINE, LESS THAN 2 % FINES, VERY DENSE, DARK YELLOWISH ORANGE (10 YR 6/6).
		14	◤	25 19 18	37	9	SP	SAND, MOSTLY UNIFORM, FINE, FEW MEDIUM AND COARSE, 8-10 % GRAVEL TO 0.6 IN. MAX., DENSE, GRAYISH ORANGE (10 YR 7/4).
		15	◤	13 18 21	39	8	SP	GRAVELLY SAND, WIDELY GRADED COARSE TO FINE, MOSTLY COARSE, 15-20% GRAVEL TO 1.0 IN. MAX., 4-6 % FINES, GRAYISH ORANGE (10 YR 7/4).
		16	◤	15 19 28	47	3	GW	GRAVEL, SUBANGULAR CHERT, TO 1.2 IN. MAX., DARK YELLOWISH ORANGE (10 YR 6/6). NOTE: VERY SMALL RECOVERY THIS SAMPLE.
		17	◤	25 31 36	67	8	SW	SAND, WELL GRADED, COARSE TO FINE, FEW GRAVEL TO 0.6 IN. MAX., LESS THAN 3 % FINES, GRAYISH ORANGE (10 YR 6/4).
		18	◤	21 18 21	39	8	SW	SAND, SIMILAR TO SS 17, WITH SMALL POCKETS LIGHT GRAY CLAY ASSOCIATED WITH GRAVEL AND COARSEST SAND.
		19	◤	10 17 17	34	7	GP	SANDY GRAVEL, SUBROUNDED, TO 0.8 IN. MAX., 30-35% MOSTLY COARSE SAND, 10-15 % MODERATELY PLASTIC FINES, MODERATE YELLOWISH ORANGE (10 YR 7/6). NOTE: SMALL RECOVERY THIS SAMPLE.
		20	◤	11 17 19	36	6	SP	GRAVELLY SAND, WIDELY GRADED, COARSE TO FINE, MOSTLY COARSE, 15-20% GRAVEL TO 0.8 IN. MAX., 10-15 % MODERATELY PLASTIC FINES, MODERATE YELLOWISH ORANGE (10 YR 7/6).
		21	◤	16 19 21	40	8	SP	GRAVELLY SAND, WIDELY GRADED COARSE TO FINE, MOSTLY COARSE AND MEDIUM, 15-20 % GRAVEL TO 0.7 IN. MAX., 3-5 % MODERATELY PLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/5).
		22	◤	100/7	100/7	N.R.		NO RECOVERY
		23	◤	18 18 18	36	7	SP	GRAVELLY SAND, WIDELY GRADED COARSE TO FINE, MOSTLY COARSE AND MEDIUM, 15-20 % GRAVEL TO 0.6 IN. MAX., 15-20 % YELLOWISH GRAY (5 Y 7/2) CLAY BALLS OR POCKETS, ASSOCIATED WITH GRAVEL, DARK YELLOWISH ORANGE (10 YR 6/6).
		24	◤	19 18 19	37	8	GC	CLAYEY GRAVEL, GRADED TO 0.7 IN. MAX., 20-25 % MOSTLY COARSE SAND, 30-35 % MODERATELY PLASTIC CLAY (BINDER), VARIGATED GRAYISH ORANGE (10 YR 7/4) AND YELLOWISH GRAY (5 Y 7/2).
		25	◤	12 15 17	32	18	CL	SILTY CLAY, MODERATELY PLASTIC, HARD GREENISH GRAY (5 GY 6/1), MODERATE TO HEAVY FeOx STAINING, BLACK FLECKS AND ONE LARGE POCKET MnO_2.
		26	◤	12 14 17	31	18	CL	SILTY CLAY, MODERATELY PLASTIC, HARD GREENISH GRAY (5 GY 6/1), SLIGHT TO MODERATE FeOx STAINING, FEW BLACK FLECKS MnO_2.
-48.6	156.5	27	◤	17 18 17	35		CL	SILTY CLAY, SIMILAR TO SS 26.
								END OF BORING AT 156.5.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE. ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 10, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 152 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 153 TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED JANUARY 18-22, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY E.H.W.
COORDINATES, NORTH 16,517.7 EAST 17,132.8 GROUND SURFACE ELEVATION 108.1

NOTE: WASHED TO 75.0

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
BC 30		1	◤	16 23 24	47	9	SP	SAND, UNIFORM, VERY FINE, 3-5 % FINES, DARK YELLOWISH ORANGE (10 YR 5/6).
	80	2	◤	18 35 42	77	8	SP	GRAVELLY SAND, WIDELY GRADED COARSE AND FINE, 30-35 % GRAVEL TO 0.8 IN. MAX., 4-8 % SLIGHTLY PLASTIC FINES, VARIGATED LIGHT BROWN (5 Y 5/4), AND MODERATE RED (5 R 4/6).
20		3	◤	20 21 18	39	5	SW	GRAVELLY SAND, WELL GRADED COARSE TO FINE, 20-25 % SUBROUNDED GRAVEL TO 1.1 IN. MAX., LESS THAN 3 % FINES, DARK YELLOWISH ORANGE (10 YR 5/6).
	90	4	◤	15 16 18	34	7	SP	GRAVELLY SAND, WIDELY GRADED, MOSTLY COARSE AND FINE, 15-20 GRAVEL TO 1.0 IN. MAX., LESS THAN 3 % FINES, GRAYISH ORANGE (10 YR 7/4).
10		5	◤	29 31 36	67	8	SP	SAND, MOSTLY UNIFORM, FINE, FEW COARSE, FEW GRAVEL TO 0.5 IN. MAX., DARK YELLOWISH ORANGE (10 YR 6/6) AND (10 YR 5/6).
	100	6	◤	35 56/6	56/6	7	SP	SAND, WIDELY GRADED, COARSE TO FINE, PREDOMINATELY FINE, 3-5 % FINES, DARK YELLOWISH ORANGE (10 YR 5/6).
		7	◤	19 32 42	74	5	SW	SAND, WELL GRADED COARSE TO FINE, 5-8 % GRAVEL TO 0.6 IN. MAX., LESS THAN 3 % FINE, DARK YELLOWISH ORANGE (10 YR 5/6).
0		8	◤	8 17 18	35	3	GW	SANDY GRAVEL, WELL GRADED TO 1.2 IN. MAX., 35-40 % WELL GRADED COARSE TO FINE SAND, LESS THAN 2 % FINES, MODERATE YELLOWISH BROWN (10 YR 5/5)
	110	9	◤	21 19 19	38	7	SP	GRAVELLY SAND, WIDELY GRADED COARSE TO FINE, MOSTLY COARSE, 20-25 % GRAVEL TO 0.7 IN. MAX., 2-4 % FINES, MODERATE YELLOWISH BROWN (10 YR 5/5).
		10	◤	17 18 19	37	6	SP	GRAVELLY SAND, SIMILAR TO SS 9.
		11	◤	13 17 20	37	7	SP	GRAVELLY SAND, SIMILAR TO SS 9.
-10		12	◤	18 24 22	46	7	SW	GRAVELLY SAND, WELL GRADED COARSE TO FINE, 12-15 % GRAVEL TO 0.7 IN. MAX., LESS THAN 2 % FINES, MODERATE YELLOWISH BROWN (10 YR 5/5)
	120	13	◤	21 31 39	70	4	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY FINE, 4-6 % GRAVEL TO 0.5 IN. MAX., 4-6 % FINES, DARK YELLOWISH ORANGE (10 YR 5/6).
		14	◤	19 30 36	66	6	SW	SAND, WELL GRADED COARSE TO FINE, 5-8 % GRAVEL TO 0.6 IN. MAX., LESS THAN 3 % FINES, DARK YELLOWISH ORANGE (10 YR 5/6).
		15	◤	18 20 21	41	5	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY FINE AND MEDIUM, FEW GRAVEL TO 0.5 IN. MAX., 3-5 % FINES, DARK YELLOWISH ORANGE (10 YR 5/6).
-20		16	◤	17 21 23	44	6	SW	SAND, WELL GRADED COARSE TO FINE, 4-6 % GRAVEL TO 0.4 IN. MAX., LESS THAN 2 % FINES, DARK YELLOWISH ORANGE (10 YR 5/6).
	130	17	◤	21 23 22	45	5	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY COARSE, 3-5 % GRAVEL TO 0.4 IN. MAX., LESS THAN 2 % FINES, MODERATE YELLOWISH BROWN (10 YR 5/5).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 12, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 153 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 153 TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED JANUARY 18-22, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY E.H.W.
COORDINATES, NORTH 16,517.7 EAST 17,132.8 GROUND SURFACE ELEVATION 108.1

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		18	◤	19 22 24	46	6	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY FINE AND MEDIUM, FEW GRAVEL TO 0.4 IN. MAX., 3-5 % FINES, MODERATE YELLOWISH BROWN. (10 YR 5/5).
		19	◤	15 16 18	34	4	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY MEDIUM, FEW GRAVEL TO 0.4 IN. MAX., CLEAN. WHITE (N9) AND DARK YELLOWISH ORANGE (10 YR 6/6).
BC/S -30		20	◤	16 18 19	37	4	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY MEDIUM, ONE PIECE GRAVEL (0.8 IN.) 4-6 % FINES, GRAYISH ORANGE (10 YR 7/4) AND MODERATE PINK (5 R 6/4).
	140	21	◤	8 15 15	30	5	SP	SAND, MOSTLY UNIFORM, VERY FINE, FEW COARSE SAND AND GRAVEL TO 0.8 IN. MAX., LESS THAN 3 % FINES, MODERATE REDDISH ORANGE(10 R 6/6) MANY SMALL POCKETS SOFT, HIGHLY PLASTIC CLAY, LIGHT RED (5 R 6/6).
S/BC		22	◤	13 17 18	35	6	SP	SAND, UNIFORM, VERY FINE, LESS THAN 1 % FINES, MEDIUM DENSE, DUSKY YELLOW (5 Y 6/6).
		23	◤	10 11 18	29	10	CL	GRAVELLY CLAY, MODERATELY PLASTIC, 15-25 % COARSE SAND AND GRAVEL TO 1.0 IN. MAX., LIGHT GREENISH GRAY (5 GY 7/1) TRACE MODERATE RED (5 R 4/6).
-40		24	◤	8 12 16	28	18	CL	SILTY CLAY, MODERATELY PLASTIC, VERY STIFF, GREENISH GRAY (5 GY 6/1), MINOR FeOx STAINING. AND MANY BLACK FLECKS MnO_2.
-43.4	150 151.5	25	◤	8 12 25	25		CL	SILTY CLAY, SIMILAR TO SS 24.

END OF BORING AT 151.5.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 12, 1973.

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 153 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 154 TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED JANUARY 22, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY E.H.W., D.F.P.
COORDINATES, NORTH 17,195.8 EAST 17,273.9 GROUND SURFACE ELEVATION 108.8

ADVANCED HOLE TO 85.0'
NO SAMPLES TAKEN

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
BC		1	◤	14 22 35	57	7	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY FINE, FEW GRAVEL TO 0.3 IN. MAX., VERY PALE ORANGE (10 YR 8/2), WITH LIGHT BROWN (5 YR 5/6), FEW SMALL LENSES CLAYEY SAND.
20	90	2	◤	21 31 42	73	8	SP	SAND, GRADED FINE, FEW GRAVEL TO 0.6 IN. MAX., CLEAN, VERY PALE YELLOWISH BROWN (10 YR 7/2).
		3	◤	21 54/6"	54/6"	8	SP	SAND, GRADED FINE, FEW GRAVEL TO 0.7 IN. MAX., CLEAN, VERY PALE YELLOWISH BROWN (10 YR 7/2), AND MODERATE YELLOWISH BROWN (10 YR 6/4).
10	100	4	◤	12 21 25	46	8	SP	SAND, GRADED FINE, CLEAN, MODERATE YELLOWISH BROWN (10 YR 5/4).
		5	◤	31 63/6"	63/6"	9	SP	SAND, SIMILAR TO SS 4, WITH FEW COARSE SAND AND 1.0 IN. LAYER VERY PALE ORANGE (10 YR 8/2) FINE SAND.
0	110	6	◤	21 54/6"	54/6"		SP	SAND, POORLY GRADED, FINE AND MEDIUM, MOSTLY FINE, CLEAN, 1-3 % FINES, GRAYISH ORANGE (10 YR 7/4).
		7	◤	51 50/3"	50/3"	6	SP	SAND, POORLY GRADED FINE, WITH LESS THAN 1 % MEDIUM AND COARSE SAND, CLEAN, LESS THAN 2 % FINES, GRAYISH ORANGE (10 YR 7/4) CONTAINING ONE PIECE OF GRAVEL 0.5 IN. IN SIZE.
-10	120	8	◤	21 52/6"	52/6"	7	SP	SAND, UNIFORM, FINE, LESS THAN 1 % COARSE SAND, CLEAN, 1-2 % FINES, VERY PALE ORANGE (10 YR 8/2).
		9	◤	18 18 16	34	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, 4-6 % GRAVEL TO 0.7 IN. MAX., CLEAN, 1-3 % FINES, GRAYISH ORANGE (10 YR 7/4).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 13, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 154 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 154 TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED JANUARY 22, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY E.H.W., D.F.P.
COORDINATES, NORTH 17,195.8 EAST 17,273.9 GROUND SURFACE ELEVATION 108.8

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-20		10	◤	12 16 18	34	7	GC	CLAYEY GRAVEL, POORLY GRADED TO 1.8 IN. MAX., 6-10 % FINE TO COARSE SAND, 8-10 % MODERATELY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2).
	130	11	◤	18 21 26	47	8	GC	CLAYEY GRAVEL, POORLY GRADED TO 1.5 IN. MAX., 15-20 % POORLY GRADED, FINE TO COARSE SAND, 10-15 % MODERATELY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2).
		12	◤	21 22 22	44	7	GC	CLAYEY GRAVEL, POORLY GRADED TO 1.7 IN. MAX., 6-8 % FINE TO COARSE SAND, 8-15 % MODERATELY PLASTIC FINES, MOTTLED, MODERATE YELLOWISH BROWN (10 YR 5/4), AND VERY PALE ORANGE (10 YR 8/2).
		13	◤	8 14 17	31	6	GP	SANDY GRAVEL, POORLY GRADED TO 1.5 IN. MAX., 4-6 % FINE TO COARSE SAND, 4-8 % FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
-30		14	◤	12 15 15	30	7	GP	GRAVEL, POORLY GRADED TO 1.1 IN. MAX., 3-5 % FINE AND MEDIUM SAND, 2-4 % FINES, GRAYISH ORANGE (10 YR 7/4), WITH A 1 1/2 " CLAYEY GRAVEL AND SAND POCKET.
	140	15	◤	21 16 14	30	8	GP	GRAVEL, POORLY GRADED TO 1.0 IN.MAX., 5-8% FINE AND MEDIUM SAND, 4-8% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), WITH A 1" SAND CLAY POCKET CONTAINING A FEW PIECES OF GRAVEL, MOST GRAVEL IS CLAY COATED.
		16	◤	21 17 16	33	8	GC	CLAYEY GRAVEL, POORLY GRADED TO 1.4 IN.MAX., 4-6% MEDIUM AND COARSE SAND, VERY PALE ORANGE (10 YR 8/2).
		17	◤	15 12 18	30	10	CL SP	SANDY CLAY, TOP 6 ", MODERATELY TO HIGHLY PLASTIC, 6-12 % FINE TO COARSE SAND, YELLOWISH GRAY (5 Y 8/1). SAND, BOTTOM 4", UNIFORM, FINE, 1-3 % FINES, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6), AND VERY PALE ORANGE (10 YR 8/2), WITH LARGE CLAY BALLS OR POCKETS.
BC/PC -40		18	◤	18 16 17	33	NR		NO RECOVERY.
	150	19	◤	6 8 14	22	18	CL	SILTY CLAY, MODERATELY PLASTIC, 15-20 % VERY FINE SAND, YELLOWISH GRAY (5 Y 8/1).
		20	◤	9 9 10	19	18	CL	SIMILAR TO SS 19.
-50		21	◤	6 7 7	14	18	CL	SILTY CLAY, MODERATELY PLASTIC, 20-25 % VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2), CONTAINING VERY THIN SILT LENSES, THIN, VERY FINE SAND LENSES, OCCASIONALLY MOTTLED WITH SMALL FeOx and MnO_2 NODULES.
	160	22	◤	9 9 12	21	18	CL	SILTY CLAY, MODERATELY PLASTIC, 10-12 % VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2), OCCASIONALLY MOTTLED WITH SMALL MnO_2 NODULES, AND VERY THIN FeOx LENSES.
-60		23	◤	11 13 13	26	18	CL	SILTY CLAY, MODERATELY PLASTIC, 8-10 % VERY FINE SAND, YELLOWISH GRAY (5 Y 8/1), MOTTLED WITH A FEW MEDIUM SIZED FeOx NODULES, AND VERTICAL CLAY LAYERS APPROX. 3/4" - 1" THICK CONTAINING A SPARSE AMOUNT OF VERY FINE SAND.
	170	24	◤	14 18 18	36	18	CL	CLAY, MODERATELY PLASTIC, GRAYISH YELLOW (5 Y 8/4) WITH THIN, SILTY SAND LENSES THROUGHOUT SAMPLE.
		25	◤	14 21 22	43	18	CL	CLAY, SLIGHTLY TO MODERATELY PLASTIC, DARK GREENISH GRAY (5 G 4/1) WITH MEDIUM SIZED DESSICATED CLAY NODULES.
-67.7	176.5	26	◤	9 16 17	33	18	CL	SIMILAR TO SS 24, EXCEPT SAMPLE CONTAINS, VERY LARGE POCKETS AND LAYERS OF DESSICATED CLAY FREQUENTLY THROUGHOUT SAMPLE.

BOTTOM OF BORING

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 13, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 154 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. **154 A** TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED MARCH 11, 1974 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.P.P.
COORDINATES, NORTH 17,208.9 EAST 17,268.8 GROUND SURFACE ELEVATION 109.1'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
								WASHED TO 75.0'
	75	1	◤	10 9 12	21	11	SP	SAND, UNIFORM, FINE, 3-6% SLIGHTLY TO MODERATELY PLASTIC FINES, VARIGATED, GRAYISH ORANGE (10 YR 7/4) AND MODERATE REDDISH ORANGE (10 R 6/6).
30	80	2	◤	17 17 18	35	10	SP	SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM AND COARSE SAND, 4-9% MODERATELY PLASTIC FINES, VARIGATED, GRAYISH ORANGE (10 YR 7/4) AND MODERATE REDDISH ORANGE (10 R 6/6).
		3	◤	20 21 36	57	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 3-5% GRAVEL TO 1.0 IN. MAX., CLEAN 1-2% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
20	90	4	◤	36 48 60	108	10	SP	SAND, POORLY GRADED FINE, LESS THAN 1% COARSE SAND, CLEAN 1-2% FINES, GRAYISH ORANGE (10 YR 7/4).
		5	◤	27 28 40	68	11	SP	SAND, SIMILAR TO SS-4.
10	100	6	◤	17 23 27	50	10	SP	SAND, UNIFORM, FINE, 2-4% MEDIUM SAND, 2-5% FINES, GRAYISH ORANGE (10 YR 7/4).
		7	◤	45 50 4"		12	SP	SAND, UNIFORM, FINE, 2-3% MEDIUM SAND, CLEAN 1-2% FINES, GRAYISH ORANGE (10 YR 7/4).
0	110	8	◤	27 50 6"		10	SP	SAND, SIMILAR TO SS-7.
		9	◤	52 50 3"		9	SP	SAND, UNIFORM, FINE, 1-3% MEDIUM AND COARSE SAND, CLEAN 1-2% FINES, GRAYISH ORANGE (10 YR 7/4).
-10	120	10	◤	53 50 3"		6	SP	SAND, SIMILAR TO SS 9 EXCEPT SAMPLE CONTAINS 1-3% GRAVEL TO 0.5 IN. MAX.
		11	◤	20 19 19	38	6	SP	SAND, POORLY GRADED FINE TO COARSE, MOSTLY FINE AND MEDIUM, 3-5% GRAVEL TO 0.6 IN. MAX., 2-3% FINES, MODERATE YELLOWISH BROWN. (10 YR 5/4).
-20	130	12	◤	24 26 32	58	7	GP-	SANDY GRAVEL, POORLY GRADED TO 1.5 IN. MAX., 20-25% FINE TO COARSE SAND, 6-9% MODERATELY PLASTIC FINES, PALE YELLOWISH BROWN (10 YR 6/2) AND MODERATE YELLOWISH BROWN (10 YR 5/4), SOME GRAVEL IS CLAY COATED.
		13	◤	16 21 25	46	6	GP-	SANDY GRAVEL, POORLY GRADED TO 1.2 IN. MAX., 25-30% FINE TO COARSE SAND, MOSTLY COARSE, 8-12% MODERATELY PLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4) GRAVEL HAS CLAY BINDER.
-30	140	14	◤	18 26 35	61	7	GC	CLAYEY GRAVEL, POORLY GRADED TO 1.6 IN. MAX., 10-15% FINE TO COARSE SAND, 10-15% HIGHLY PLASTIC FINES, MODERATE YELLOWISH BROWN. (10 YR 5/4)
		15	◤	24 24 21	45	8	SP	SAND, UNIFORM, FINE TO VERY FINE, 3-7% SLIGHTLY PLASTIC FINES, VARIGATED, VERY PALE ORANGE (10 YR 8/2) AND GRAYISH ORANGE (10 YR 7/4)

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. R. GREENWOOD
DATE NOVEMBER 24, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 154 A - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. **154 A** TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED MARCH 11, 1974 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.P.P.
COORDINATES, NORTH 17,208.9 EAST 17,268.8 GROUND SURFACE ELEVATION 109.1'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-40	150	16	◤	4 4 7	11	18	SC-SM CL	TOP 9": CLAYEY SAND, UNIFORM, VERY FINE, 8-12% MODERATELY PLASTIC FINES, YELLOWISH GRAY (5 Y 8/1) WITH MINOR FeOx STAINING. BOTTOM 9": SILTY CLAY, MODERATELY PLASTIC, GREENISH GRAY (5 GY 6/1).
		17	◤	4 4 6	10	18	[illegible]	SILTY CLAY, HIGHLY PLASTIC, 10-15% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2) WITH VERY FINE CLAYEY SAND, LAYERS AND POCKETS 1/4" - 1" THICK THROUGHOUT SAMPLE.
-50	160	18	◤	10 7 9	16	18	[illegible]	SILTY CLAY, HIGHLY PLASTIC, 10-12% VERY FINE SAND, DUSKY YELLOW (5 Y 6/4) SEVERELY STAINED WITH SMALL FeOx AND MnO$_2$ NODULES, AND VERY FINE CLAYEY SAND LAYERS 3/4" - 1" THICK THROUGHOUT SAMPLE.
		19	◤	14 15 19	34	18	CL	CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 7/2) SEVERELY STAINED WITH SMALL FeOx NODULES AND THIN LENSES OF FeOx AND SMALL LAYERS OF VERY FINE, CLAYEY SAND 1/4" THICK.
								END OF BORING AT 166.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. R. GREENWOOD
DATE NOVEMBER 24, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 154 A - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. **154 B** TYPE OF BORING SHEET 1 OF 2
DATE DRILLED FEBRUARY 21, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,177.6 EAST 17,298.2 GROUND SURFACE ELEVATION 107.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
								WASHED TO 75.0'.
	75	1	◤	22 23 25	48	12	SP	SAND, UNIFORM, FINE, 2-3% MEDIUM SAND, 2-4% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) WITH A LARGE PIECE OF GRAVEL 1.5 INCH IN SIZE.
30	80	2	◤	12 13 17	30	12	SP	SAND, UNIFORM, FINE, 1-3% FINES, MODERATE ORANGE PINK (5 YR 8/4) AND GRAYISH ORANGE (10 YR 7/4).
		3	◤	18 25 34	59	9	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 2-4% GRAVEL TO 0.5 IN. MAX., 1-3% FINES, PALE YELLOWISH BROWN (10 YR 6/2).
20	90	4	◤	50 50 3"		9	SP	SAND, UNIFORM, FINE, CLEAN 1-2% FINES, GRAYISH ORANGE (10 YR 7/4).
		5	◤	26 45 51	96	10	SP	SAND SIMILAR TO SS 4 EXCEPT SAMPLE HAS LESS THAN 1% GRAVEL TO 0.75 IN. MAX.
10	100	6	◤	18 27 38	65	10	SP	SAND, UNIFORM, FINE, 3-4% MEDIUM TO COARSE SAND, CLEAN, 1-2% FINES, GRAYISH ORANGE (10 YR 7/4).
		7	◤	30 41 53	94	9	SP	SAND, UNIFORM, FINE TO VERY FINE, CLEAN, 1-2% FINES, VERY PALE ORANGE (10 YR 8/2), WITH LESS THAN 1% COARSE SAND.
0	110	8	◤	42 58 6"		9	SP	SAND, POORLY GRADED, VERY FINE TO FINE, 3-5% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4), WITH LESS THAN 1% GRAVEL TO 0.5 IN. MAXIMUM.
		9	◤	28 42 37	79	8	SP	SAND, UNIFORM, FINE, LESS THAN 3% MEDIUM SAND, 2-4% FINES, GRAYISH ORANGE (10 YR 7/4) WITH LESS THAN 2% GRAVEL TO 0.8 IN. MAX., AND SEVERAL SMALL CLAY BALLS.
-10	120	10	◤	31 41 48	89	9	SP	SAND, UNIFORM, FINE, 2-3% FINES, GRAYISH ORANGE (10 YR 7/4) WITH LESS THAN 2% GRAVEL TO 0.7 IN. MAX., SEVERAL SMALL TO MEDIUM SIZED CLAY BALLS AND A THIN LAYER OF VERY FINE SAND.
		11	◤	13 17 17	34	8	CL	GRAVELLY CLAY, HIGHLY PLASTIC, 25-35% GRAVEL TO 1.7 IN. MAX., 10-15% FINE TO COARSE SAND, GRAYISH ORANGE (10 YR 7/4) AND YELLOWISH GRAY (5 Y 8/1).
-20	130	12	◤	29 30 35	65	7	SP	SAND, POORLY GRADED FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 10-20% GRAVEL TO 0.5 IN. MAX., 2-5% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4) WITH A 1 1/2 IN. LAYER OF CLAYEY GRAVEL AT TOP OF SAMPLE.
		13	◤	38 27 27	54		SP	SAND, SIMILAR TO SS 12 EXCEPT SAMPLE HAS TWO SMALL CLAYEY GRAVEL LAYERS 1 IN. AND 3/8 IN. IN SIZE.
-30	140	14		41 62 6"		[illegible]		NO RECOVERY.
		15	◤	4 5 6	11	18	CL	SILTY CLAY, MODERATELY PLASTIC, 4-8% FINE SAND, YELLOWISH GRAY (10 YR 7/2) AND DARK YELLOWISH ORANGE (10 YR 6/6) WITH VERY THIN LENSES AND VEINS OF FeOx AND SOME GRAVEL 0.8 IN. IN SIZE.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. R. GREENWOOD
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 154B - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. **154B** TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED FEBRUARY 21, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,177.6 EAST 17,298.2 GROUND SURFACE ELEVATION 107.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-40	150	16	◤	4 [illegible] 8	14		CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 10-20% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2) WITH A 6" LAYER OF VERY FINE SILTY SAND.
-50		17	◤	4 5 15	20	18	CL	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 30-40% VERY FINE SAND, YELLOWISH GRAY (5 Y 8/1) WITH A 3" LAYER OF NON-SANDY SILTY CLAY.
	160	18	◤	4 8 12	20	18	CL	SILTY CLAY, MODERATELY PLASTIC, LIGHT OLIVE GRAY (5 Y 6/1) WITH SMALL MnO$_2$ NODULES AND THIN FeOx LENSES.
	167.1	19	◤	14 23 28	51	18	CL	SILTY CLAY, SIMILAR TO SS 18 EXCEPT SAMPLE HAS THIN LENSES OF FINE SAND.
								END OF BORING AT 167.1

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. R. GREENWOOD
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 154B - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. **154 C** TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED MARCH 4, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,169.1 EAST 17,270.8 GROUND SURFACE ELEVATION 107.7'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
								WASHED TO 75.0'
30	75	1	◤	12 11 12	23	10	SP	SAND, UNIFORM, FINE, 4-8% MODERATELY PLASTIC FINES, VARIGATED, DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE REDDISH ORANGE (10 YR 6/6).
	80	2	◤	21 14 17	31	8	SP	SAND, UNIFORM, FINE, 2-5% FINES, DARK YELLOWISH ORANGE (10 YR 6/6)
20		3	◤	37 28 22	50	7	SP	SAND, POORLY GRADED FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 6-9% GRAVEL TO 0.6 IN. MAX., 2-4% FINES, PALE YELLOWISH BROWN (10 YR 6/2).
	90	4	◤	31 30 30	60	10	SP	SAND, UNIFORM, FINE, 3-4% GRAVEL TO 0.5 IN. MAX., 2-3% FINES, PALE YELLOWISH BROWN (10 YR 6/2).
10		5	◤	30 36 50 5"		9	SP	SAND, UNIFORM, FINE, CLEAN, 1-2% FINES, VARIGATED VERY PALE ORANGE (10 YR 8/2) AND GRAYISH ORANGE (10 YR 7/4).
	100	6	◤	17 20 30	50	8	SP	SAND, UNIFORM, FINE, 2-3% MEDIUM AND COARSE SAND, 2-5% FINES, GRAYISH ORANGE (10 YR 7/4).
0		7	◤	30 61 ½"		7	SP	SAND, UNIFORM, FINE, CLEAN 1-2% FINES, GRAYISH ORANGE (10 YR 7/4).
	110	8	◤	100 6"		6	SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY MEDIUM, 2-4% FINES, GRAYISH ORANGE (10 YR 7/4) WITH LESS THAN 1% GRAVEL TO 0.5 IN. MAX.
-10		9	◤	43 [illegible] 20 2"		10	SP	SAND, POORLY GRADED FINE TO COARSE, MOSTLY FINE AND MEDIUM, 2-3% GRAVEL TO 0.5 IN. MAX., 2-3% FINES, GRAYISH ORANGE (10 YR 7/4).
	120	10	◤	42 58 4"		9	SP	SAND, UNIFORM, FINE, 1-3% MEDIUM SAND, CLEAN 1-2% FINES, GRAYISH ORANGE (10 YR 7/4) WITH LESS THAN 1% GRAVEL TO 0.5 IN. MAX.
-20		11	◤	26 22 31	53	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 4-6% GRAVEL TO 0.6 IN. MAX., CLEAN, 1-3% FINES, GRAYISH ORANGE (10 YR 7/4).
	130	12	◤	24 24 23	47	8	SP	SAND, POORLY GRADED FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 5-8% GRAVEL TO 0.75 IN. MAX., 4-8% SLIGHTLY PLASTIC FINES GRAYISH ORANGE (10 YR 7/4) WITH A CLAYEY GRAVEL LAYER 1/4 IN. THICK.
-30		13	◤	33 30 26	56	9	SP	GRAVELLY SAND, POORLY GRADED FINE TO COARSE, MOSTLY COARSE AND SOME MEDIUM SAND, 8-15% GRAVEL TO 0.9 IN. MAX., 6-8% MODERATELY PLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4) WITH A 2 IN. CLAYEY GRAVEL LAYER.
	140	14	◤	11 12 8	20	6	CL	GRAVELLY CLAY, HIGHLY PLASTIC, 20-30% GRAVEL TO 1.0 IN. MAX., YELLOWISH GRAY (5 Y 8/1).
		15	◤	17 7 8	15	18	CL	SILTY CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 7/2) WITH LESS THAN 1% COARSE SAND, SEVERELY STAINED WITH VERY THIN LENSES AND VEINS OF FeOx.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DFG
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 154C - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. **154 C** TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED MARCH 4, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,169.1 EAST 17,270.8 GROUND SURFACE ELEVATION 107.7

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
-40	150	16	◤	4 4 7	11	11	CL	SILTY CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 7/2) WITH SMALL VERY FINE CLAYEY SAND LAYERS 1/4 IN. TO 1/2 IN. THICK AND VERY THIN, VERY FINE CLAYEY SAND LENSES.
	156.5	17	◤	5 6 11	17	16	CL	SILTY CLAY, SIMILAR TO SS-16.
								END OF BORING AT 156.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DFG
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 154C - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. **154 D** TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED MARCH 6, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,193.7 EAST 17,247.6 GROUND SURFACE ELEVATION 107.4'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
	70							WASHED TO 75.0'.
30		1	◤	12 10 13	23	11	SP	SAND, UNIFORM, FINE TO VERY FINE, 5-8% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) AND MODERATE REDDISH ORANGE (10 R 6/6).
	80	2	◤	23 25 30	55	12	SP	SAND, UNIFORM, FINE, 3-5% FINES, PALE YELLOWISH BROWN (10 YR 6/2) WITH LESS THAN 1% COARSE SAND AND GRAVEL.
20		3	◤	10 4 8	12	9	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 5-10% GRAVEL TO 1.1 IN. MAX., 4-8% SLIGHTLY TO MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) CONTAINING A 3 IN. LAYER OF CLAY IMBEDDED WITH SAND AND GRAVEL.
	90	4	◤	26 27 28	55	12	SP	SAND, UNIFORM, FINE, LESS THAN 2% COARSE SAND, 2-4% FINES, GRAYISH ORANGE (10 YR 7/4).
10		5	◤	17 17 17	34	11	SP	SAND, UNIFORM, FINE, CLEAN, 1-2% FINES, GRAYISH ORANGE (10 YR 7/4).
	100	6	◤	18 24 36	60	9	SP	SAND, POORLY GRADED FINE, LESS THAN 1% MEDIUM SAND, CLEAN 1-2% FINES, GRAYISH ORANGE (10 YR 7/4) AND VERY PALE ORANGE (10 YR 8/2).
0		7	◤	33 22 26	48	15	SP	SAND, UNIFORM, FINE, 1-2% COARSE SAND, CLEAN, 1-2% FINES, GRAYISH ORANGE (10 YR 7/4).
	110	8	◤	47 50 4"		8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 1-2% GRAVEL TO 0.6 IN. MAX., 2-3% FINES, GRAYISH ORANGE (10 YR 7/4).
-10		9	◤	38 50 5"		7	SP	SAND, POORLY GRADED FINE, 2-3% FINES, GRAYISH ORANGE (10 YR 7/4).
	120	10	◤	37 50 6"		5	SP	SAND, UNIFORM, FINE, 2-3% FINES, GRAYISH ORANGE (10 YR 7/4).
-20		11	◤	37 31 29	60	7	SP	SAND, POORLY GRADED FINE TO COARSE, MOSTLY FINE, 3-5% GRAVEL TO 0.8 IN. MAX., 3-5% FINES, GRAYISH ORANGE (10 YR 7/4).
	130	12	◤	23 23 25	48	9	GC	CLAYEY GRAVEL, POORLY GRADED TO 1.1 IN. MAX., 10-15% FINE TO COARSE SAND, 8-12% MODERATELY TO HIGHLY PLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
-30		13	◤	16 20 27	47	7	GC	CLAYEY GRAVEL, POORLY GRADED TO 1.0 IN. MAX., 6-10% FINE TO COARSE SAND, 10-20% HIGHLY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2).
	140	14	◤	28 20 27	47	11	GC	CLAYEY GRAVEL, POORLY GRADED TO 1.5 IN. MAX., 10-15% FINE TO COARSE SAND, 12-18% HIGHLY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2).
		15	◤	28 44 45	89	12	SP	SAND, UNIFORM, FINE, 3-7% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DFG
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 154D - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. **154 D** TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED MARCH 6, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,193.7 EAST 17,247.6 GROUND SURFACE ELEVATION 107.4'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
-40	150	16	◤	5 7 9	16	18	CL	SILTY CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 8/1) WITH MINOR FeOx DEPOSITS.
-50		17	◤	5 6 11	17	18	CL	SILTY CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 8/1) WITH A 2 IN. LAYER OF SILT.
	160	18	◤	7 11 26	37	16	CL	SILTY CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 8/1) WITH 1-2% FINE SAND AT BOTTOM OF SAMPLE.
								END OF BORING AT 161.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DFG
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 154D - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 155 **TYPE OF BORING** DRIVE **SHEET** 1 **OF** 3
DATE DRILLED JANUARY 26, 1973 **DRILLING COMPANY** - EUSTIS ENGRG. CO. **LOGGED BY** R.B.T.
COORDINATES, NORTH 17,787.7 **EAST** 17,411.4 **GROUND SURFACE ELEVATION** 120.5

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
L	120								
			1	◤	3 4 10	14	12	ML	CLAYEY SILT, SLIGHTLY PLASTIC, SOFT, MODERATE BROWN (5 YR 4/4).
L/PH	110	10	2	◤	6 16 22	38	14	CL	SANDY CLAY, SLIGHTLY PLASTIC, 25-35% VERY FINE SAND, LIGHT BROWN (5 YR 5/6) WITH MODERATE REDDISH BROWN.
			3	◤	11 34 50/5"	92	12	CL	SANDY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 25-35% FINE SAND, LIGHT BROWN (5 YR 5/6).
	100	20	4	◤	6 15 16	31	14	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 15-25% VERY FINE SAND, PALE REDDISH BROWN (10 R 5/4) WITH DARK YELLOWISH ORANGE.
PH/S			5	◤	10 11 12	23	13	CL	SANDY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 25-35% VERY FINE SAND, VERY PALE ORANGE (10 YR 8/2) WITH DARK YELLOWISH ORANGE.
	90	30	6	◤	5 8 13	21	10	SP	SAND, TOP: UNIFORM, FINE, LESS THAN 5% NONPLASTIC FINES, MODERATE REDDISH BROWN (10 R 4/6). BOTTOM: 1 INCH LAYER SANDY CLAY, MODERATELY PLASTIC, VERY PALE ORANGE.
			7	◤	9 12 17	29	11	SM	SILTY SAND, UNIFORM, FINE, 10-25% NONPLASTIC FINES, LIGHT BROWN (5 YR 5/6).
	80	40	8	◤	6 9 12	21	13	SM	SAND, UNIFORM FINE, 5-8% NONPLASTIC FINES, MODERATE REDDISH BROWN (10 R 4/6).
			9	◤	10 15 14	29	10	SP	SAND, TOP: UNIFORM FINE, 3-5% NONPLASTIC FINES, LIGHT BROWN (5 YR 5/6). SAND, BOTTOM: UNIFORM FINE, CLEAN, DARK YELLOWISH ORANGE (10 YR 6/6
	70	50	10	◤	5 9 9	18	11	SP	SAND, UNIFORM FINE, 5-8% NONPLASTIC FINES, MODERATE REDDISH BROWN (10 R 4/6) POCKETS OF DARK YELLOWISH ORANGE, CLEAN SAND.
			11	◤	6 9 11	20	12	SP	SAND, UNIFORM FINE, 5-8% NONPLASTIC FINES, MODERATE REDDISH BROWN (10 R 4/6).
	60	60	12	◤	7 14 16	30	13	SP	SAND, UNIFORM, FINE, CLEAN, DARK YELLOWISH ORANGE (10 YR 6/6).
			13	◤	7 12 18	30	10	SP	SAND, UNIFORM, FINE, CLEAN, LESS THAN 1% GRAVEL TO 0.3 INCH MAXIMUM, PALE REDDISH BROWN (10 R 5/4).
	50	70	14	◤	10 17 26	43	11	SP	SAND, UNIFORM, FINE, CLEAN, DARK YELLOWISH ORANGE (10 YR 6/6).
S/BG			15	◤	1 3 2	5	16	CH	CLAY, HIGHLY PLASTIC, VERY SOFT, PALE REDDISH BROWN (10 R 5/4).
	40	80	16	◤	16 23 25	48	6	SP	SAND, FINE TO COARSE, MOSTLY FINE, CLEAN, LESS THAN 3% GRAVEL TO 0.3 INCH MAXIMUM, PALE REDDISH BROWN (10 R 5/4).

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DATE FEBRUARY 16, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 155 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 155 **TYPE OF BORING** DRIVE **SHEET** 2 **OF** 3
DATE DRILLED JANUARY 26, 1973 **DRILLING COMPANY** - EUSTIS ENGRG. CO. **LOGGED BY** R.B.T.
COORDINATES, NORTH 17,787.7 **EAST** 17,411.4 **GROUND SURFACE ELEVATION** 120.5

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
	40								
			17	◤	3 8 10	18	16	SP	SAND, UNIFORM VERY FINE, 3-8% NONPLASTIC FINES, PALE REDDISH BROWN (10 R 5/4).
	30	90	18	◤	6 6 10	16	15	SP	SAND, UNIFORM VERY FINE, LESS THAN 5 % NONPLASTIC FINES, PALE REDDISH BROWN (10 R 5/4).
			19	◤	8 11 13	24	6	SP	SAND, GRADED FINE, POCKETS OF FINE TO MEDIUM SAND, LESS THAN 3% NONPLASTIC FINES, PALE REDDISH BROWN (10 R 5/4).
	20	100	20	◤	22 46 50	96	10	SP	SAND, GRADED FINE, CLEAN, GRAYISH ORANGE PINK (5 YR 7/2).
			21	◤	13 33 50/5"	91	11	SP	SAND, GRADED FINE TO COARSE, MOSTLY GRADED FINE, CLEAN, GRAYISH ORANGE PINK (5 YR 7/2), FEW REDDISH BALLS OF CLAY, POCKETS OF GRAY SILTY SAND.
	10	110	22	◤	14 25 22	47	10	SP	SAND, FINE TO COARSE, MOSTLY FINE, CLEAN, MODERATE REDDISH ORANGE (10 R 6/6) POCKETS OF PALE REDDISH BROWN CLAYEY SAND.
			23	◤	5 13 17	30	11	SP	SAND, UNIFORM, FINE, CLEAN, MODERATE REDDISH ORANGE (10 R 6/6).
	0	120	24	◤	9 13 21	34	10	SP	SAND, SAME AS ABOVE.
			25	◤	10 19 26	45	10	SP	SAND, SIMILAR TO ABOVE, EXCEPT LIGHT BROWN (5 YR 6/4).
	-10	130	26	◤	14 44 50/4"	113	11	SP	SAND, FINE TO MEDIUM, MOSTLY FINE, CLEAN, GRAYISH ORANGE (10 YR 7/4).
			27	◤	28 42 35	77	12	SP	SAND, FINE, CLEAN, GRAYISH ORANGE (10 YR 7/4).
	-20	140	28	◤	36 50/3"	50/3"	7	SP	SAND, GRADED FINE, CLEAN, MODERATE YELLOWISH BROWN (10 YR 6/4).
			29	◤	180 50/2"	50/2"	12	SP	SAND, FINE TO MEDIUM, MOSTLY GRADED FINE, CLEAN, LESS THAN 1% GRAVEL TO 0.5 INCH MAXIMUM, MODERATE YELLOWISH BROWN (10 YR 5/4).
	-30	150	30	◤	17 34 30	64	9	SW	SAND, WELL GRADED FINE TO COARSE, CLEAN, MODERATE YELLOWISH BROWN (10 YR 5/4), FEW VERY DENSE BALLS OF GRAYISH ORANGE SANDY CLAY.
			31	◤	15 16 9	25	6	SP	SAND, POORLY GRADED, VERY FINE TO COARSE, MOSTLY COARSE, LESS THAN 2% GRAVEL TO 0.5 INCH MAXIMUM, LESS THAN 3% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
BC/PC	-40	160	32	◤	11 14 24	38	16	CH	CLAY, MODERATELY TO HIGHLY PLASTIC, LESS THAN 1% VERY FINE SAND, HARD, VERY DENSE, DARK YELLOWISH ORANGE (10 YR 6/6), POCKETS OF LIGHT BROWN SILTY CLAY.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 16, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 155 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 155 **TYPE OF BORING** DRIVE **SHEET** 3 **OF** 3
DATE DRILLED JANUARY 26, 1973 **DRILLING COMPANY** - EUSTIS ENGRG. CO. **LOGGED BY** R.B.T.
COORDINATES, NORTH 17,787.7 **EAST** 17,411.4 **GROUND SURFACE ELEVATION** 120.5

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-40								
-46.0	166.5	33	◤	9 20 28	48	16	CH	CLAY, SIMILAR TO ABOVE, EXCEPT PALE OLIVE (10 Y 6/2), FeO DEPOSITS.
								BOTTOM OF BORING AT 166.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 16, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 155 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 156
TYPE OF BORING DRIVE
SHEET 1 OF 3
DATE DRILLED JANUARY 31, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 17,492.7
EAST 17,700.1
GROUND SURFACE ELEVATION 123.1

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
L									
	120								
			1	◤	10 16 20	36	10	ML	CLAYEY SILT, SLIGHTLY TO MODERATELY PLASTIC, 1-3% VERY FINE SAND, MOTTLED, MODERATE YELLOWISH BROWN (10 YR 5/4) AND (N-7).
L/PH									
		10	2	◤	13 21 29	50	12	CL	SANDY CLAY, MODERATELY PLASTIC, 40-45% FINE SAND, MODERATE REDDISH BROWN (10 R 4/6).
PH/S	110								
			3	◤	20 28 37	65	12	SM-SC	SILTY SAND, UNIFORM, VERY FINE, 30-35% SLIGHTLY PLASTIC FINES, MOTTLED MODERATE ORANGE PINK (10 R 7/4), AND GRAYISH ORANGE (10 YR 7/4).
		20	4	◤	18 51/6"	51/6"	7	SP	SAND, UNIFORM, VERY FINE, 3-4% FINES, VERY PALE ORANGE (10 YR 8/7)
	100								
			5	◤	7 6 8	14	11	SC	CLAYEY SAND, UNIFORM, VERY FINE, 20-25% MODERATELY TO HIGHLY PLASTIC FINES, YELLOWISH GRAY (5 Y 8/1) AND 1/16 INCH THICK COLOR BAND OF DARK YELLOWISH ORANGE (10 YR 6/6).
		30	6	◤	6 8 9	17	16	CH SM-SC	TOP 12 INCH CLAY, HIGHLY PLASTIC, FATTY, MODERATE RED (5 R 4/6) WITH VERY THIN LENSES OF SILT THROUGHOUT SAMPLE. BOTTOM 4 INCH SILTY SAND, UNIFORM, VERY FINE, 20-25% HIGHLY PLASTIC FINES, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE REDDISH ORANGE (10 R 6/6).
	90								
			7	◤	7 7 9	16	15	CH SM	TOP 4 INCH CLAY, HIGHLY PLASTIC, FATTY, MOTTLED, MODERATE RED (5 R 5/4) AND GRAYISH PINK (5 R 8/2). BOTTOM 11 INCH SILTY SAND, UNIFORM, VERY FINE, 15-20% SLIGHTLY PLASTIC FINES, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6), AND MODERATE REDDISH ORANGE (10 R 6/6) CONTAINING SMALL POCKETS OF CLAY 1/8-1/4 INCH THICK.
		40	8	◤	8 7 9	16	12	SM	SILTY SAND, UNIFORM, VERY FINE, 16-25% MODERATELY PLASTIC FINES, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE REDDISH ORANGE (10 R 6/6).
	80								
			9	◤	13 17 15	32	6	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 1-2% GRAVEL TO 0.5 INCH MAXIMUM, 4-6% SLIGHTLY TO MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) WITH A 3/4 INCH THICK CLAY POCKET CONTAINING SAND AND GRAVEL.
		50	10	◤	14 13 13	26	12	SP	SAND, UNIFORM, FINE, 8-10% HIGHLY PLASTIC FINES, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE REDDISH ORANGE (10 R 6/6)
	70								
			11	◤	12 13 14	27	14	SM-SC	SILTY SAND, UNIFORM, FINE, 15-20% MODERATELY TO HIGHLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6).
		60	12	◤	18 20 24	44	11	SP	SAND, UNIFORM, FINE, 4-6% SLIGHTLY TO MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	60								
			13	◤	30 31 35	66	12	SP	SAND, UNIFORM, FINE, 3-5% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
S/BC		70	14	◤	13 18 19	37	7	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, 2-4% GRAVEL TO 0.7 INCH MAXIMUM, 3-6% FINES, DARK YELLOWISH ORANGE (10 YR 6/6), WITH 1/2-3/4 INCH CLAY POCKETS CONTAINING SANDS THROUGHOUT SAMPLE.
	50								
			15	◤	16 16 18	34	9	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 1-2% GRAVEL TO 0.5 INCH MAXIMUM, 3-5% FINES, DARK YELLOWISH ORANGE (10 YR 6/6), WITH A 1/4 INCH THICK LAYER OF CLAY
		80	16	◤	4 7 11	18	14	SM-SC	SILTY SAND, UNIFORM, VERY FINE, 20-25% MODERATELY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 20, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 156 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 156
TYPE OF BORING DRIVE
SHEET 2 OF 3
DATE DRILLED JANUARY 31, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 17,492.7
EAST 17,700.1
GROUND SURFACE ELEVATION 123.1

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
	40								
			17	◤	6 9 18	27	18	CH SP	TOP 8 INCH CLAY, HIGHLY PLASTIC, FATTY, MOTTLED, PALE REDDISH BROWN (10 R 5/4) AND GRAYISH PINK (5 R 8/2) WITH VERY THIN LENSES OF SILT THROUGHLUT SAMPLE. BOTTOM 4 INCH SAND, UNIFORM, FINE, 3-6% FINES, PALE YELLOWISH ORANGE (10 YR 8/6)
		90	18	◤	13 16 19	35		SP	SAND, UNIFORM, FINE, 2-6% FINES, PALE YELLOWISH ORANGE (10 YR 8/6) AND MODERATE REDDISH ORANGE (10 R 6/6).
	30								
			19	◤	16 20 24	44	11	SP	SAND, UNIFORM, FINE, 4-8% SLIGHTLY TO MODERATELY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6).
		100	20	◤	26 50/6"	50/6"	8	SP	SIMILAR TO SS 19 EXCEPT COLORING IS PALE YELLOWISH ORANGE (10 YR 8/6).
	20								
			21	◤	40 61/6"	61/6"	9	SP	SAND, UNIFORM, FINE, CLEAN, 1-3% FINES, PALE YELLOWISH ORANGE (10 YR 8/6) WITH A 1 INCH THICK CLAY POCKET IMBEDED WITH SAND.
		110	22	◤	14 20 22	42	8	SP	SAND, UNIFORM, FINE, CLEAN, 1-3% FINES, VERY PALE ORANGE (10 YR 8/2), 3 PIECES OF 0.5 INCH MAXIMUM.
	10								
			23	◤	20 23 24	47	10	SP	SAND, UNIFORM, VERY FINE AND FINE, LESS THAN 1% MEDIUM SAND, 2-3% FINES, MOTTLED, VERY PALE ORANGE (10 YR 8/2) AND PALE YELLOWISH ORANGE (10 YR 8/6).
		120	24	◤	1 4 15	19	18	SM	SILTY SAND, UNIFORM, VERY FINE, 20-25% HIGHLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
	0								
			25	◤	19 27 32	59	11	SP	SAND, UNIFORM, FINE, 8-10% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
		130	26	◤	36 51/6"	51/6"	7	SP	SAND, POORLY GRADED, FINE TO COARSE, 1-2% MEDIUM AND COARSE SAND, CLEAN 1-3% FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
	-10								
			27	◤	40 72/6"	72/6"	8	SP	SAND, POORLY GRADED FINE, 3-5% FINES, GRAYISH ORANGE (10 YR 7/4).
		140	28	◤	40 62/6"	62/6"	6	SP	SAND, UNIFORM, FINE, 3-5% FINES, GRAYISH ORANGE (10 YR 7/4).
	-20								
			29	◤	100/6"	100/6"	6	SP	SIMILAR TO SS 28.
		150	30	◤	26 30 36	66	8	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND COARSE, 25-35% GRAVEL TO 0.7 INCH MAXIMUM, 8-10% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
BC/PC	-30								
			31	◤	7 10 14	24	18	CH	CLAY, MODERATELY TO HIGHLY PLASTIC, FATTY, 1-2% VERY FINE SAND, PALE YELLOWISH ORANGE (10 YR 8/6) MODERATELY MOTTLED SMALL FeOx STAINING, SPARSE NUMBER OF MEDIUM SIZED MnO_2 NODULES.
		160	32	◤	12 13 14	27	18	CH	CLAY, HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2), TOP 4 INCH OF SAMPLE IS SEVERLY MOTTLED WITH FeOx STAINING.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 20, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 156 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 156
TYPE OF BORING DRIVE
SHEET 3 OF 3
DATE DRILLED JANUARY 31, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 17,492.7
EAST 17,700.1
GROUND SURFACE ELEVATION 123.1

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-40								
-43.4	166.5	33	◤	10 14 15	29	18	CL	CLAY, MODERATELY PLASTIC, 1-2% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2), BOTTOM 4 INCH OF SAMPLE SEVERLY MOTTLED WITH FeOx STAINING.
								BOTTOM OF BORING AT 166.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 20, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 156 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION – UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 157 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED JANUARY 30, 1973 DRILLING COMPANY – EUSTIS ENGRG. CO. LOGGED BY R.B.T.
COORDINATES, NORTH 17,586.3 EAST 17,555.1 GROUND SURFACE ELEVATION 122.5

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"[1]	SAMPLE "N" VALUE	SAMPLE RECOVERY[3]	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
L									
	120								
			1	◤	3 4 6	10	8	ML	SILT, SLIGHTLY PLASTIC, SOFT, MODERATE YELLOWISH BROWN (10 YR 5/4) LOESS.
L/PH									
		0	2	◤	6 13 18	31	13	CL	TOP SILTY CLAY, MODERATELY PLASTIC, 5-8% VERY FINE SAND, FIRM, DENSE, DARK YELLOWISH ORANGE (10 YR 6/6). BOTTOM SILTY CLAY, SIMILAR TO ABOVE, EXCEPT FOR POCKETS OF MODERATE REDDISH BROWN CLAY.
	110								
PH/S			3	◤	8 16 23	39	14	CL SP	TOP SANDY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 10-15% VERY FINE SAND, DARK YELLOWISH ORANGE (10 YR 6/6) BOTTOM CLAYEY SAND, UNIFORM VERY FINE, DARK YELLOWISH ORANGE (10 YR 6/6)
		20	4	◤	14 20 24	44	10	SP	SAND, UNIFORM, FINE, LESS THAN 1% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	100								
			5	◤	5 6 9	15	18	SP	TOP CLAYEY SAND, UNIFORM, VERY FINE, LESS THAN 1% NONPLASTIC FINES, VERY PALE ORANGE (10 YR 8/2) AND DARK YELLOWISH ORANGE. BOTTOM INCH MODERATE REDDISH BROWN HIGHLY PLASTIC CLAY.
		30	6	◤	4 5 8	13	18	SM	SILTY SAND, UNIFORM, FINE, 10-12% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	90								
			7	◤	3 5 6	11	15	CH SM	TOP SANDY CLAY, HIGHLY PLASTIC, 10-25% UNIFORM FINE SAND, LIGHT BROWN (5 YR 5/6). SILTY SAND, UNIFORM FINE, 12-15% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), BOTTOM.
		40	8	◤	4 5 8	13	14	SM-SC	TOP SILTY SAND, SIMILAR TO ABOVE, EXCEPT MODERATE REDDISH ORANGE (10 R 6/6) AND DARK YELLOWISH ORANGE AT BOTTOM.
	80								
			9	◤	3 6 10	16	18	SM	SILTY SAND, UNIFORM FINE, 15-20% MODERATELY PLASTIC FINES, PALE REDDISH BROWN (10 R 5/4).
		50	10	◤	3 7 8	15	10	SM	SILTY SAND, SIMILAR TO ABOVE, EXCEPT LIGHT BROWN (5 YR 5/6).
	70								
			11	◤	5 7 7	14	10	SM	SILTY SAND, UNIFORM FINE, 10-15% MODERATELY PLASTIC FINES, LIGHT BROWN (5 YR 5/6).
		60	12	◤	9 20 29	49	9	SP	SAND, UNIFORM FINE, LESS THAN 5% NONPLASTIC FINES, LIGHT BROWN (5 YR 5/6).
	60								
S/BC			13	◤	10 14 20	34	7	SP	SAND, POORLY GRADED FINE TO COARSE, MOSTLY FINE, LESS THAN 2% GRAVEL TO 1.0 INCH MAXIMUM, LESS THAN 3% NONPLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4) LAYERS OF DARK REDDISH BROWN FATTY CLAY, POCKETS OF MODERATE BROWN SILT.
		70	14	◤	7 10 18	28	9	SP	SAND, UNIFORM, FINE, LESS THAN 3% NONPLASTIC FINES, PALE REDDISH BROWN (10 R 5/4).
	50								
			15	◤	6 24 50/5"	81	8	SP	SAND, UNIFORM, FINE, 5-8% NONPLASTIC FINES, POCKETS OF MODERATELY PLASTIC SILTY SAND, DARK YELLOWISH ORANGE. (10 YR 6/6).
		80	16	◤	9 8 8	16	13	SP	SAND, UNIFORM VERY FINE, LESS THAN 5% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), WITH PALE REDDISH BROWN.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 23, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 – GSK – 157 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION – UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 157 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED JANUARY 30, 1973 DRILLING COMPANY – EUSTIS ENGRG. CO. LOGGED BY R.B.T.
COORDINATES, NORTH 17,586.3 EAST 17,555.1 GROUND SURFACE ELEVATION 122.5

	ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"[1]	SAMPLE "N" VALUE	SAMPLE RECOVERY[3]	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
	40								
			17	◤	7 13 20	33	10	SP	SAND, UNIFORM VERY FINE, LESS THAN 3% NONPLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6).
		90	18	◤	11 13 15	28	9	SP	SAND, UNIFORM, VERY FINE, CLEAN, PALE REDDISH BROWN (10 R 5/4).
	30								
			19	◤	14 23 29	52	6	SP	SAND, UNIFORM FINE TO MEDIUM, MOSTLY FINE, CLEAN, GRAYISH ORANGE (10 YR 7/4).
		100	20	◤	8 15 12	27	6	SP	SAND, SAME AS ABOVE.
	20								
			21	◤	25 34 34	68	7	SP	SAND, SIMILAR TO ABOVE, EXCEPT LESS THAN 1% GRAVEL TO 0.5 INCH MAXIMUM.
		110	22	◤	15 17 21	38	8	SP	SAND, UNIFORM FINE TO COARSE, MOSTLY UNIFORM FINE, LESS THAN 2% GRAVEL TO 0.7 INCH MAXIMUM, GRAYISH ORANGE (10 YR 7/4).
	10								
			23	◤	13 17 19	36	7	SP	SAND, UNIFORM FINE, CLEAN, GRAYISH ORANGE (10 YR 7/4).
		120	24	◤	13 15 15	30	7	SP	SAND, SAME AS ABOVE.
	0								
			25	◤	15 23 31	54	10	SP	SAND, SAME AS ABOVE.
		130	26	◤	15 40 50/4"	108	8	SP	SAND, SAME AS ABOVE.
	-10								
			27	◤	39 50/3"	50/3"	8	SP	SAND, SIMILAR TO ABOVE, EXCEPT SOME MEDIUM SAND.
		140	28	◤	47 50/1"	50/1"	4	SP	SAND, UNIFORM FINE TO MEDIUM, MOSTLY UNIFORM FINE, CLEAN, SOME BALLS OF SANDY CLAY, MODERATE YELLOWISH BROWN (10 YR 5/4).
	-20								
			29	◤	21 38 54	92			NO RECOVERY.
		150	30	◤	15 22 26	48	5	SP	SAND, FINE TO COARSE, MOSTLY COARSE, LESS THAN 3% GRAVEL TO 0.3 INCH MAXIMUM, LESS THAN 1% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	-30								
			31	◤	42 50/3"	50/3			NO RECOVERY.
BC/PC		160	32	◤	7 10 13	23	14	CH	CLAY, HIGHLY PLASTIC, LESS THAN 5% VERY FINE SAND, DEPOSITS OF FeOx, FIRM, LIGHT OLIVE GRAY (5 Y 6/1).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 23, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 – GSK – 157 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION – UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 157 TYPE OF BORING DRIVE SHEET 3 OF 3
DATE DRILLED JANUARY 30, 1973 DRILLING COMPANY – EUSTIS ENGRG. CO. LOGGED BY R.B.T.
COORDINATES, NORTH 17,586.3 EAST 17,555.1 GROUND SURFACE ELEVATION 122.5

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"[1]	SAMPLE "N" VALUE	SAMPLE RECOVERY[3]	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-40								
		33	◤	9 18 22	40	18	CH	CLAY, SAME AS ABOVE.
-49.0	171.5	34	◤	6 9 15	24	9	CH	CLAY, SAME AS ABOVE.
								END OF BORING AT 171.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE FEBRUARY 23, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 – GSK – 157 C

GULF STATES UTILITIES COMPANY

RIVER BEND POWER STATION - UNITS 1 & 2

WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 158
TYPE OF BORING DRIVE
SHEET 1 OF 3
DATE DRILLED FEBRUARY 1, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY R.B.T.
COORDINATES, NORTH 17,622.3
EAST 17,381.1
GROUND SURFACE ELEVATION 118.1'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		1	◤	2 3 6	9	12	ML	CLAYEY SILT, SLIGHTLY PLASTIC, MODERATE YELLOWISH-BROWN (10 YR 5/4).
		2	◤	5 9 15	24	14	ML	SILT, SLIGHTLY PLASTIC, 3-5% VERY FINE SAND, DARK YELLOWISH-ORANGE (10 YR 6/6).
		3	◤	2 8 10	18	16	CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 3-5% VERY FINE SAND, LIGHT BROWN (5YR 6/2) WITH PALE YELLOWISH-BROWN (10YR 6/2).
		4	◤	8 11 14	25	14	CL	SILTY CLAY, MODERATELY PLASTIC, 3-5% VERY FINE SAND, MODERATE REDDISH-BROWN (10 R 4/6) WITH DARK YELLOWISH-ORANGE.
		5	◤	5 9 12	21	16	CL	SANDY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 10-20% VERY FINE SAND, LIGHT BROWN (5YR 5/6), AND PALE YELLOWISH-BROWN (10YR 7/2).
		6	◤	5 10 11	21	14	SC	CLAYEY SAND, UNIFORM VERY FINE, SLIGHTLY PLASTIC, LIGHT BROWN (5 YR 5/6), WITH MODERATE RED BROWN LAYERS.
		7	◤	5 8 11	19	11	SC	CLAYEY SAND, UNIFORM FINE, 1 INCH LAYERS OF FATTY CLAY, PALE REDDISH-BROWN (10R 5/4).
		8	◤	6 8 14	22	16	SP SM	TOP: SAND, UNIFORM FINE, 5-8% NONPLASTIC FINES, LESS THAN 2% GRAVEL TO 1.0 INCH MAXIMUM, DARK YELLOWISH-ORANGE (10 YR 6/6), 1 INCH LAYER MODERATE REDDISH-BROWN FATTY CLAY. BOTTOM: SILTY SAND, UNIFORM FINE, 10-15% SLIGHTLY PLASTIC FINES, LIGHT BROWN (5 YR 5/6), VERY THIN LAYERS OF MODERATE REDDISH-BROWN CLAY.
		9	◤	6 12 15	27	14	SC	CLAYEY SAND, UNIFORM FINE, SLIGHTLY PLASTIC, MODERATE RED (5R 4/6).
		10	◤	5 10 12	22	15	SC	CLAYEY SAND, SAME AS ABOVE.
		11	◤	5 7 9	16	5	SC	CLAYEY SAND, SAME AS ABOVE.
		12	◤	11 13 13	26	11	SM	SILTY SAND, UNIFORM FINE, 10-12% NONPLASTIC FINES, LIGHT BROWN (5 YR 5/6).
		13	◤	8 12 19	31	8	SP	SAND, UNIFORM FINE, LESS THAN 1% NONPLASTIC FINES, LIGHT BROWN (5 YR 5/6).
		14	◤	6 11 13	24	5	SP	SAND, UNIFORM VERY FINE, CLEAN, LIGHT BROWN (5 YR 5/6).
		15	◤	6 17 26	43	8	SP	SAND, FINE TO COARSE, MOSTLY UNIFORM, FINE, MODERATE YELLOWISH-BROWN (10 YR 5/4).
		16	◤	5 11 14	25	12	SP	SAND, UNIFORM FINE, LESS THAN 3% NONPLASTIC FINES, PALE REDDISH-BROWN (10 R 4/2).

L
L/PH
PH/S
S/BC

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DFG
DATE FEBRUARY 26, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 158 A

GULF STATES UTILITIES COMPANY

RIVER BEND POWER STATION - UNITS 1 & 2

WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 158
TYPE OF BORING DRIVE
SHEET 2 OF 3
DATE DRILLED FEBRUARY 1, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY R.B.T.
COORDINATES, NORTH 17,622.3
EAST 17,381.1
GROUND SURFACE ELEVATION 118.1'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		17	◤	2 10 29	39	16	SM SP	TOP: SILTY SAND, UNIFORM VERY FINE, 10-20% NONPLASTIC FINE, MODERATE REDDISH-ORANGE (10 R 6/6). BOTTOM 6 INCH: SAND, GRADED FINE TO COARSE, CLEAN, LESS THAN 3% GRAVEL TO 0.5 INCH MAXIMUM, DARK YELLOWISH-ORANGE (10YR 6/6).
		18	◤	15 20 21	41	10	SP	SAND, GRADED FINE TO MEDIUM, MOSTLY GRADED FINE, CLEAN, DARK YELLOWISH-ORANGE (10 YR 6/6).
		19	◤	8 15 25	40	10	SP	SAND, UNIFORM FINE, CLEAN, DARK YELLOWISH-ORANGE (10 YR 6/6).
		20	◤	23 45 50/5"	104	9	SP	SAND, SAME AS ABOVE.
		21	◤	3 17 43	60	14	SP	SAND, UNIFORM VERY FINE, CLEAN, DARK YELLOWISH-ORANGE (10YR 6/6).
		22	◤	18 25 29	54	11	SP	SAND, SAME AS ABOVE.
		23	◤	19 36 50	86	12	SP	SAND, SIMILAR TO ABOVE, EXCEPT UNIFORM FINE.
		24	◤	16 25 31	56	12	SP	SAND, GRADED FINE, CLEAN, DARK YELLOWISH-ORANGE (10 YR 6/6).
		25	◤	14 20 20	40	13	SP	SAND, SAME AS ABOVE.
		26	◤	15 30 29	59	11	SP	SAND, SAME AS ABOVE.
		27	◤	41 50/5"	50/5"	12	SP	SAND, SAME AS ABOVE.
		28	◤	31 50/5"	50/5"	10	SP	SAND, FINE TO COARSE, MOSTLY GRADED FINE, LESS THAN 1% GRAVEL TO TO 0.5 INCH MAXIMUM, MODERATE YELLOWISH-BROWN (10 YR 5/4).
		29	◤	14 21 29	50	10	SW	SAND, WELL GRADED FINE TO COARSE, LESS THAN 3% GRAVEL TO 0.5 INCH MAXIMUM, LESS THAN 1% NONPLASTIC FINES, MODERATE YELLOWISH-BROWN (10 YR 5/4).
		30	◤	16 16 31	47	5	GP	SANDY GRAVEL, POORLY GRADED, 5-8% FINE TO COARSE SAND, LAYERS OF DENSE SANDY CLAY.
		31	◤	40 40 18	58	10	SP CH	TOP: SAND, POORLY GRADED, FINE TO COARSE, LESS THAN 5% GRAVEL TO 0.5 INCH MAXIMUM, MODERATE YELLOWISH-BROWN (10 YR 5/4). BOTTOM: CLAY, HIGHLY PLASTIC, LESS THAN 3% VERY FINE SAND, HEAVY DEPOSITS OF FeO, GREENISH-GRAY (5GY 6/1), AND LIGHT BROWN (5 YR 5/6).
		32	◤	12 18 23	41	17	CH	CLAY, HIGHLY PLASTIC LESS THAN 1% VERY FINE SAND, HEAVY DEPOSITS AND PIECES OF FeOx, GREENISH-GRAY (5 GY 6/1), AND LIGHT BROWN (5 YR 5/6), POCKETS OF GRAYISH-BLACK FINE SAND.

BC/PC

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DFG
DATE FEBRUARY 26, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 158 B

GULF STATES UTILITIES COMPANY

RIVER BEND POWER STATION - UNITS 1 & 2

WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO 158
TYPE OF BORING DRIVE
SHEET 3 OF 3
DATE DRILLED FEBRUARY 1, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY R.B.T.
COORDINATES, NORTH 17,622.3
EAST 17,381.1
GROUND SURFACE ELEVATION 118.1'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-48.4	166.5	33	◤	12 18 31	49	18	CH	CLAY, HIGHLY PLASTIC LESS THAN 1% VERY FINE SAND, GREENISH-GRAY (5 GY 6/1), VERY SMALL FeOx DEPOSITS.
								END OF BORING AT 166.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

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◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DFG
DATE FEBRUARY 26, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 158 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 159
TYPE OF BORING DRIVE
SHEET 1 OF 2
DATE DRILLED FEBRUARY 6, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY E.M.W.
COORDINATES, NORTH 17,472.4
EAST 17,658.3
GROUND SURFACE ELEVATION 119.2

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
L L/PH			1	◤	4 9 15	24	18	ML	CLAYEY SILT, SLIGHTLY PLASTIC, LESS THAN 5% VERY FINE SAND, MODERATE YELLOWISH BROWN, GRADING TO SANDY SILT, NON TO SLIGHTLY PLASTIC, 20-25% VERY FINE SAND, DARK YELLOWISH ORANGE (10 YR 6/6).
	110	10	2	◤	100/6"	100/6"	8	ML	SANDY SILT, NONPLASTIC, 10-20% VERY FINE SAND, DRY, PALE YELLOWISH ORANGE (10 YR 8/6).
PH/S			3	◤	52 83/6"	83/6"	10	SP-ML	SANDY SILT, NONPLASTIC, 15-20% VERY FINE SAND, DRY, VERY PALE ORANGE (10 YR 8/2) WITH DARK YELLOWISH ORANGE (10 YR 5/6) AND VERY LIGHT GRAY (N-8).
	100	20	4	◤	22 36 42	78	10	SP	SAND, UNIFORM, FINE, LESS THAN 5% NONPLASTIC FINES, DARK REDDISH ORANGE (10 R 5/6).
			5	◤	4 9 11	20	14	CL	SANDY CLAY, MODERATELY PLASTIC, 30-40% VERY FINE SAND, PALE-MODERATE YELLOWISH ORANGE (10 YR 8-7/6) THINLY INTERBEDDED WITH LAYERS MODERATE REDDISH BROWN HIGHLY PLASTIC CLAY; BOTTOM OF SAMPLE GRADES TO CLAYEY SAND, 15-20% MODERATELY PLASTIC FINES.
	90	30	6	◤	5 9 9	18	11	SP	SAND, UNIFORM, VERY FINE, 5-8% MODERATELY PLASTIC FINES, DARK REDDISH ORANGE (10 R 5/6) WITH MODERATE YELLOWISH ORANGE (10 YR 7/6).
			7	◤	6 9 9	18	15	SP	SAND, UNIFORM, VERY FINE, LESS THAN 5% FINES, DARK REDDISH ORANGE (10 R 5/6) INTERBEDDED WITH MODERATE YELLOWISH ORANGE (10 YR 7/6) TWO 1.0 INCH LAYERS DARK REDDISH ORANGE (10 R 5/6), HIGHLY PLASTIC CLAY.
	80	40	8	◤	12 16 24	40	12	SP SP	TOP 6 INCH: SAND, UNIFORM, VERY FINE, 6-10% NONPLASTIC FINES, BRIGHT ORANGE PINK (5 YR 8/6) BOTTOM 6 INCH: SAND, GRADED, FINE, LESS THAN 3% FINES, MODERATE YELLOWISH ORANGE (10 YR 7/6).
			9	◤	5 7 10	17	[illegible]	SM	SILTY SAND, UNIFORM, VERY FINE, 10-20% NONPLASTIC FINES, MODERATE YELLOWISH ORANGE (10 YR 7/6) MANY THIN BANDS MODERATE REDDISH ORANGE (10 R 6/6) CLAYEY SAND AND CLAY.
	70	50	10	◤	[illegible] 18 20	38	12	SP	SAND, UNIFORM, VERY FINE, 4-7% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH SOME MODERATE REDDISH ORANGE (10 R 6/6).
			11	◤	13 32 40	72	10	SP	SAND, UNIFORM, VERY FINE, 4-7% SLIGHTLY PLASTIC FINES, MODERATE YELLOWISH ORANGE (10 YR 7/6) WITH SMALL AMOUNT MODERATE REDDISH ORANGE (10 R 6/6).
S/BC	60	60	12	◤	12 22 21	43	10	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY FINE, 5-8% GRAVEL TO 0.5 INCH MAXIMUM, 6-9% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), SMALL CLAY POCKETS ASSOCIATED WITH GRAVEL.
			13	◤	13 23 25	48	9	SP	SAND, SIMILAR TO SS 12.
	50	70	14	◤	12 16 19	35	8	SP	SAND, SIMILAR TO SS 12, BUT GRAYISH ORANGE (10 YR 7/4).
			15	◤	9 12 12	24	8	SP	SAND, UNIFORM, FINE, FEW GRAVEL TO 0.6 INCH MAXIMUM, LESS THAN 3% FINES, GRAYISH ORANGE (10 YR 7/5), 1.0 INCH LAYER MODERATE RED (5 R 6/4) SANDY CLAY.
	40	80	16	◤	13 16 17	33	12	SP	SAND, UNIFORM, VERY FINE, LESS THAN 3% FINES, PALE YELLOWISH ORANGE (10 YR 8/6) CHANGING TO PALE REDDISH ORANGE (10 R 7/6) AT BOTTOM.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DFG
DATE MARCH 12, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 159 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 159
TYPE OF BORING DRIVE
SHEET 2 OF 2
DATE DRILLED FEBRUARY 6, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY E.M.W.
COORDINATES, NORTH 17,472.4
EAST 17,658.3
GROUND SURFACE ELEVATION 119.2

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
			17	◤	14 16 16	32	16	SP	SAND, UNIFORM, VERY FINE, 3-8% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6) AND PALE YELLOWISH ORANGE (10 YR 6/6).
	30	90	18	◤	12 16 20	36	12	SP	SAND, UNIFORM, VERY FINE, 2-5% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6).
			19	◤	30 40 48	88	11	SP	SAND, UNIFORM, FINE, 1-3% MEDIUM SAND, 2-4% FINES, GRAYISH ORANGE (10 YR 7/4).
	20	100	20	◤	16 34 46	80	8	SP	SAND, UNIFORM, FINE, 2-5% FINES, PALE YELLOWISH ORANGE (10 YR 8/6) WITH A 1 INCH VERY FINE SAND AND CLAY POCKET, ONE PIECE OF GRAVEL 1.0 INCH IN SIZE.
			21	◤	14 22 22	44	9	SP	SAND, UNIFORM, FINE, LESS THAN 1% GRAVEL TO 0.5 INCH MAXIMUM, 2-4% FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
	10	110	22	◤	20 26 33	59	12	SP	SAND, POORLY GRADED, FINE TO COARSE, 1-3% MEDIUM AND COARSE, 1-2% GRAVEL TO 0.6 INCH MAXIMUM, 2-3% FINES, GRAYISH ORANGE (10 YR 7/4).
			23	◤	16 26 28	54	10	SP	SAND, UNIFORM, VERY FINE, LESS THAN 1% MEDIUM SAND, 2-3% FINES, GRAYISH ORANGE (10 YR 7/4).
			24	◤	17 30 41	71	10	SP	SAND, UNIFORM, VERY FINE, 4-6% FINES, VERY PALE ORANGE (10 YR 8/7) AND GRAYISH ORANGE (10 YR 7/4).
	0	120	25	◤	12 17 23	40	12	SM-SC	SILTY SAND, UNIFORM VERY FINE, 15-18% MODERATELY TO HIGHLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
			26	◤	9 10 12	22	18	SM	SILTY SAND, UNIFORM, VERY FINE, 20-25% HIGHLY PLASTIC, VERY PALE ORANGE (10 YR 8/2).
			27	◤	16 30 42	72	10		SIMILAR TO SS 26.
			28	◤	29 32 39	71	8	SP	SAND, UNIFORM, VERY FINE, 3-5% FINES, GRAYISH ORANGE (10 YR 7/4).
	-10	130	29	◤	51 50/3"	50/3"	9	SP	SAND, UNIFORM, FINE, 1-3% FINES, GRAYISH ORANGE (10 YR 7/4).
			30	◤	52 50/3"	50/3"	8	SP	SIMILAR TO SS 29.
	-20	140	31	◤	143/6"	143/6"	6	SP	SAND, UNIFORM, FINE, 2-4% FINES, GRAYISH ORANGE (10 YR 7/4).
			32	◤	52 50/2"	50/2"	6	SP	SAND, UNIFORM, FINE TO VERY FINE, 2-5% FINES, GRAYISH ORANGE (10 YR 7/4).
	-30	150	33	◤	30 33 41	74	7	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, 6-12% GRAVEL TO 0.7 INCH MAXIMUM, 5-10% MODERATELY PLASTIC FINES, MOTTLED VERY PALE ORANGE (10 YR 8/2), AND DARK YELLOWISH-ORANGE (10 YR 6/6).
BC/PC	-37.3	156.5	34	◤	8 14 16	30		CL	CLAY, MODERATELY PLASTIC, 2-3% VERY FINE SAND, MOTTLED, GREENISH-GRAY (5GY 6/1), AND DUSKY YELLOW (5Y 6/4), SEVERLY MOTTLED WITH FeOx NODULES (SMALL) AND STAINING.
									END OF BORING AT 156.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DFG
DATE MARCH 12, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 159 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 160
TYPE OF BORING DRIVE
SHEET 1 OF 3
DATE DRILLED FEBRUARY 13, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 17,438.0
EAST 17,626.5
GROUND SURFACE ELEVATION 118.5

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
L L/S	110		1	◤	20 27 35	62	7	ML	CLAYEY SILT, SLIGHTLY TO MODERATELY PLASTIC, MODERATE BROWN (5 YR 4/4) OCCASIONALLY STAINED WITH SMALL FeOx AND MnO_2 NODULES.
		10	2	◤	78 100/5"	100/5"	6	SM	SILTY SAND, UNIFORM, VERY FINE, 25-30% SLIGHTLY TO MODERATELY PLASTIC FINES, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6), PALE YELLOWISH ORANGE (10 YR 8/6) AND LIGHT GRAY (N-7).
	100		3	◤	40 61/6"	61/6"	8	SM	SILTY SAND, UNIFORM, VERY FINE, 12-20% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6) AND YELLOWISH GRAY (5 Y 7/2).
		20	4	◤	13 24 32	56	14	SP	SAND, UNIFORM, VERY FINE, 3-6% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6) AND MODERATE ORANGE PINK (5 YR 8/4).
	90		5	◤	4 7 8	15	15	SC	CLAYEY SAND, UNIFORM, VERY FINE, 10-15% SLIGHTLY TO MODERATELY PLASTIC FINES, BANDED COLORING OF VERY LIGHT GRAY (N-8) AND MODERATE YELLOW (5 Y 7/6) WITH A 1 INCH POCKET OF MODERATELY PLASTIC FATTY CLAY.
		30	6	◤	5 7 9	16	12	SC	CLAYEY SAND, UNIFORM, VERY FINE, 12-16% MODERATELY PLASTIC FINES, MODERATE REDDISH ORANGE (10 YR 6/6) AND DARK YELLOWISH ORANGE (10 YR 6/6).
			7	◤	5 7 8	15	15	SC	CLAYEY SAND, UNIFORM, VERY FINE, 8-10% MODERATELY PLASTIC FINES, MODERATE REDDISH ORANGE (10 YR 6/6).
	80	40	8	◤	7 11 10	21	15	SP	SAND, UNIFORM, FINE, 4-6% SLIGHTLY TO MODERATELY PLASTIC, MODERATE REDDISH ORANGE (10 R 6/6) AND DARK YELLOWISH ORANGE (10 YR 6/6) WITH A 1/16 INCH THICK CLAY LAYER.
	70		9	◤	8 10 11	21	8	SP	SAND, POORLY GRADED, FINE AND MEDIUM, MOSTLY FINE, 3-6% FINES, DARK YELLOWISH ORANGE (10 YR 6/6) CONTAINING A 1 INCH CLAY LAYER, FATTY AND MODERATELY PLASTIC, ALSO 4 INCH CLAYEY SAND LAYER AT BOTTOM OF SAMPLE.
		50	10	◤	7 10 10	20	12	SP	SAND, UNIFORM, FINE, 4-8% MODERATELY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6) AND DARK YELLOWISH ORANGE (10 YR 6/6).
	60		11	◤	9 19 23	42	13	SP	SAND, UNIFORM, FINE, 3-6% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6). AND LIGHT BROWN (5 YR 5/6).
		60	12	◤	19 36 42	78	9	SP	SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM SAND, 2-3% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
S/BC			13	◤	17 17 17	34	8	SP	SAND, POORLY GRADED, FINE TO COARSE, 1-3% MEDIUM AND COARSE SAND, LESS THAN 1% GRAVEL TO 0.7 INCH MAXIMUM, 2-5% FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH A 1 INCH THICK CLAYEY SAND POCKET, AT BOTTOM OF SAMPLE.
	50	70	14	◤	16 17 19	36	8	SP	SAND, POORLY GRADED, FINE TO COARSE, 1-2% MEDIUM AND COARSE SAND, 1-2% GRAVEL TO 1.1 INCH MAXIMUM, 2-4% FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
			15	◤	8 12 15	27	18	SM-SC	SILTY SAND, UNIFORM, VERY FINE, 10-15% SLIGHTLY TO MODERATELY PLASTIC FINES, MOTTLED, MODERATE REDDISH ORANGE (10 R 6/6) AND PALE YELLOWISH ORANGE (10 YR 8/6).
	40	80	16	◤	13 16 15	31	13	SP	SAND, UNIFORM, VERY FINE, 5-8% SLIGHTLY TO MODERATELY PLASTIC, PALE YELLOWISH ORANGE (20 YR 8/6) AND MODERATE REDDISH ORANGE (10 R 6/6).

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DFG
DATE MARCH 12, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 160 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 160
TYPE OF BORING DRIVE
SHEET 2 OF 3
DATE DRILLED FEBRUARY 13, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 17,438.0
EAST 17,626.5
GROUND SURFACE ELEVATION 118.5

	ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
			NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
			17	◤	16 17 17	34	15	SP	SAND, UNIFORM, VERY FINE, 3-5% FINES, MODERATE REDDISH ORANGE (10 Y 6/6).
	30	90	18	◤	18 22 27	49	13	SP	SIMILAR TO SS 17, EXCEPT FOR ADDITION OF PALE YELLOWISH ORANGE (10 YR 8/6). TO COLOR.
			19	◤	18 28 38	66	8	SP	SAND, UNIFORM, FINE, 2-3% FINES, PALE YELLOWISH ORANGE (10 YR 8/6)
	20	100	20	◤	20 25 27	52	14	SP	SIMILAR TO SS 19.
			21	◤	20 28 31	59	10	SP	SAND, UNIFORM, FINE, CLEAN, 1-3% FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
	10	110	22	◤	26 35 41	76	9	SP	SAND, UNIFORM, FINE, 1-2% MEDIUM SAND, 2-4% FINES, DARK YELLOWISH ORANGE (10 YR 6/6) AND PALE YELLOWISH ORANGE (10 YR 8/6) WITH A 1 INCH EXTRA SOFT CLAY LAYER.
			23	◤	26 31 39	70	11	SP	SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM SAND, 1-3% FINES, PALE YELLOWISH BROWN (10 YR 6/2) ONE PIECE OF GRAVEL 0.6 INCH IN SIZE.
			24	◤	22 28 28	56	10	SP	SAND, UNIFORM, FINE, CLEAN, 1-2% FINES, GRAYISH ORANGE (10 YR 7/4) OCCASIONALLY MOTTLED WITH SMALL MnO_2 NODULES.
	0		25	◤	22 28 24	52	10	SP	SIMILAR TO SS 24 EXCEPT NO MnO_2 NODULES.
		120	26	◤	16 18 19	37	11	SP	SAND, UNIFORM, FINE, 2-4% FINES, GRAYISH ORANGE (10 YR 7/4) AND VERY PALE ORANGE (10 YR 8/2) WITH SOME VERY SMALL CLAY SPECKS OR FLAKES.
			27	◤	6 16 18	34	10	SP	SAND, UNIFORM, FINE, 3-5% FINES, YELLOWISH GRAY (5 Y 7/2).
			28	◤	16 18 27	45	9	SP	SAND, UNIFORM, FINE, 2-4% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2).
	-10	130	29	◤	22 32 41	73	10	SP	SAND, UNIFORM, FINE, 2-4% FINES, GRAYISH ORANGE (10 YR 7/4).
			30	◤	38 50/3"	50/3"	8	SP	SAND, POORLY GRADED, FINE AND MEDIUM, MOSTLY MEDIUM, CLEAN, 1-3% FINES, MOTTLED VERY PALE ORANGE (10 YR 8/2) AND PALE YELLOWISH BROWN (10 YR 6/2).
	-20	140	31	◤	39 50/4"	50/4"	6	SP	SAND, POORLY GRADED FINE, 2-5% SLIGHTLY TO MODERATELY PLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 6/4) WITH A 1 INCH EXTRA SOFT HIGHLY PLASTIC CLAY POCKET IN SAMPLE.
			32	◤	29 50/6"	50/6"	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, 2-4% SLIGHTLY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2) AND PALE YELLOWISH BROWN (6 YR 6/2).
	-30	150	33	◤	22 33 42	75	6	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 2-5% GRAVEL TO 1.3 INCH MAXIMUM, 4-8% MODERATELY PLASTIC FINES, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6) AND VERY PALE ORANGE (10 YR 8/2).
BC/PC			34	◤	9 12 15	27	18	CL	CLAY, MODERATELY PLASTIC, 1-2% VERY FINE SAND, LIGHT GREENISH GRAY (5 GY 8/1), AND DUSKY YELLOW (5 Y 6/4). SEVERLY STAINED WITH MEDIUM AND LARGE FeOx NODULES.
	-40	160	35	◤	10 13 14	27	18	CH	CLAY, MODERATELY TO HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 8/1) OCCASIONALLY MOTTLED WITH MnO_2 AND FeOx NODULES (0.1 INCH DIAMETER)

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DFG
DATE MARCH 12, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 160 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 160 TYPE OF BORING DRIVE SHEET 3 OF 3
DATE DRILLED FEBRUARY 13, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,438.0 EAST 17,626.5 GROUND SURFACE ELEVATION 118.5

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-48	166.5	36	◤	12 15 15	30	18	CL	CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 8/1) SEVERLY MOTTLED WITH FeOx AND MnO_2 NODUELS.
								BOTTOM OF BORING AT 166.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE MARCH 12, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 160 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 161 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED MAY 29, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY E.M.V.
COORDINATES, NORTH 17,618.6 EAST 17,735.5 GROUND SURFACE ELEVATION 123.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
120								
		1	◤	2 2 4	6	10	ML	CLAYEY SILT, SLIGHTLY TO MODERATELY PLASTIC, LESS THAN 3% VERY FINE SAND, MODERATE YELLOWISH BROWN (10 YR 5/4), LOESS.
	10	2	◤	6 8 13	21	14	CL	SILTY CLAY, MODERATELY PLASTIC, 3-5% VERY FINE SAND, VERY STIFF, MODERATE YELLOWISH BROWN (10 YR 5/5), CHANGING TO A SANDY CLAY, 10-15% FINE SAND.
110								
		3	◤	3 8 13	21	7	SC	CLAYEY SAND, UNIFORM, FINE, 15-25% MODERATELY PLASTIC FINES, COMPACT, DARK YELLOWSIH ORANGE (10 YR 6/6) AND VERY LIGHT GRAY (N-8).
	20	4	◤	14 22 40	62	13	SP	SAND, UNIFORM, VERY FINE, CLEAN, VERY DENSE, VERY PALE ORANGE (10 YR 8/2).
100								
		5	◤	3 6 9	15	14	SP	SAND, UNIFORM, VERY FINE, 4-6% MODERATELY PLASTIC FINES, COMPACT, GRAYISH ORANGE (10 YR 7/4) WITH POCKETS MODERATE REDDISH BROWN (10 R 4/6) AND VERY LIGHT GRAY (N-8).
	30	6	◤	4 5 7	12	16	SP	SAND, UNIFORM, VERY FINE, 2-4% FINES, MODERATE REDDISH BROWN (10 R 4/6) WITH SMALL POCKETS VERY LIGHT GRAY (N-8).
90								
		7	◤	4 7 9	16	13	SP	SAND, UNIFORM, VERY FINE, LESS THAN 3% FINES, MODERATE REDDISH ORANGE (10 R 6/6).
	40	8	◤	4 6 10	16	14	SP	SAND, UNIFORM, VERY FINE, LESS THAN 3% FINES, MODERATE REDDISH ORANGE (10 R 6/6) WITH GRAYISH ORANGE (10 YR 7/4), 1.0 INCH LAYER OR LENSE REDDISH ORANGE HIGHLY PLASTIC CLAY.
80								
		9	◤	4 6 11	17	13	SP	SAND, UNIFORM, VERY FINE, LESS THAN 2% FINES, PALE GRAYISH ORANGE (10 YR 8/4).
	50	10	◤	5 8 11	19	17	SP	SAND, SIMILAR TO SS #9.
70								
		11	◤	10 10 13	23	12	SP	SAND, UNIFORM, VERY FINE, LESS THAN 2% FINES, THINLY BEDDED MODERATE REDDISH BROWN (10 R 5/6) AND GRAYISH ORANGE (10 YR 7/4).
	60	12	◤	31 50/4"		10	SP	SAND, MOSTLY UNIFORM, FINE, 8-10% MEDIUM AND COARSE SAND, LESS THAN 2% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
60								
		13	◤	24 40 40	80	12	SP	SAND, SIMILAR TO SS #12.
-								
	70	14	◤	15 23 27	50	11	SP	SAND, POORLY GRADED MEDIUM TO FINE, TRACE OF COARSE SAND, TRACE OF GRAVEL TO 0.3 INCH MAXIMUM, LESS THAN 2% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
50								
		15	◤	10 12 20	32	10	SP	SAND, GRADED COARSE TO FINE, MOSTLY FINE, 5-7% GRAVEL TO 0.5 INCH MAXIMUM, LESS THAN 3% FINES, GRAYISH ORANGE (10 YR 6/4).
	80	16	◤	3 3 5	8	16	SP	SAND, UNIFORM, VERY FINE, LESS THAN 2% FINES, LOOSE, MODERATE REDDISH ORANGE (10 R 6/6), FEW POCKETS REDDISH ORANGE HIGHLY PLASTIC CLAY.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE MAY 2, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 161-A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO 161 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED MAY 29, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO LOGGED BY E.M.V.
COORDINATES, NORTH 17,618.6 EAST 17,735.5 GROUND SURFACE ELEVATION 123.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
40								
		17	◤	3 6 8	14	16	SP	SAND, UNIFORM, VERY FINE, LESS THAN 4% FINES, MODERATE REDDISH ORANGE (10 R 6/6) WITH PALE GRAYISH ORANGE (10 YR 8/4).
	90	18	◤	3 4 8	12	16	SP	SAND, SIMILAR TO SS #17.
30								
		19	◤	11 19 21	40	16	SP	SAND, GRADED COARSE TO FINE, MOSTLY FINE, CLEAN, PALE GRAYISH ORANGE (10 YR 8/4), POCKET UNIFORM FINE SAND.
	100	20	◤	12 28 38	66	10	SP	SAND, GRADED FINE TO VERY FINE, CLEAN, PALE GRAYISH ORANGE (10 YR 8/4).
20								
		21	◤	28 37 46	83	9	SP	SAND, SIMILAR TO SS #20 WITH FEW COARSE SAND.
	110	22	◤	14 15 19	34	8	SP	SAND, GRADED FINE TO VERY FINE, FEW GRAVEL TO 0.4 INCH MAXIMUM, PALE GRAYISH ORANGE (10 YR 8/4).
10								
		23	◤	22 30 29	59	10	SP	SAND, SIMILAR TO SS #22.
	120	24	◤	16 36 46	82	10	SP	SAND, GRADED FINE TO VERY FINE, FEW MEDIUM AND COARSE, PALE GRAYISH ORANGE (10 YR 8/4), ONE THIN (0.1 INCH) LAYER DESSICATED CLAY.
0								
		25	◤	29 50/5"		9	SP	SAND, UNIFORM, FINE, CLEAN, PALE GRAYISH ORANGE (10 YR 8/4).
	130	26	◤	28 50/5"		8	SP	SAND, GRADED FINE TO VERY FINE, CLEAN, PALE GRAYISH ORANGE (10 YR 8/4).
-10								
		27	◤	50 50/3"		9	SP	SAND, SIMILAR TO SS #26.
	140	28	◤	22 48 50/5"		8	SP	SAND, SIMILAR TO SS #26.
-20								
		29	◤	20 27 31	58	10	SP	SAND, WIDELY GRADED, COARSE TO FINE, MOSTLY MEDIUM, FEW SMALL GRAVEL TO 0.4 INCH MAXIMUM, LESS THAN 2% FINES, GRAYISH ORANGE (10 YR 7/4).
	150	30	◤	22 25 34	59	8	SP	SAND, SIMILAR TO SS #29.
-30								
		31	◤	24 35 37	72	9	SP	SAND, GRADED COARSE TO FINE, MOSTLY FINE, FEW GRAVEL TO 0.4 INCH MAXIMUM, LESS THAN 2% FINES, GRAYISH ORANGE (10 YR 7/4).
	160	32	◤	14 10 16	26	12	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 2% EXTREMELY FINE SAND, YELLOWISH GRAY (5 Y 8/1) AND GREENISH GRAY (5 GY 6/1), MINOR FeOx STAINING.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE MAY 2, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 161-B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 161 TYPE OF BORING DRIVE SHEET 3 OF 3
DATE DRILLED MAY 29, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY E.M.V.
COORDINATES, NORTH 17,618.6 EAST 17,735.5 GROUND SURFACE ELEVATION 123.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-40								
		33	◤	12 11 17	28	14	CL	SILTY CLAY, SIMILAR TO SS #32.
	170	34	◤	10 16 22	38	17	CL	SILTY CLAY, SIMILAR TO SS #32.
								END OF BORING AT 171.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE MAY 2, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 161-C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 162
TYPE OF BORING DRIVE
SHEET 1 OF 1
DATE DRILLED JUNE 12, 1973
DRILLING COMPANY - EUSTIS ENGRG CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 17,541.8
EAST 17,196.7
GROUND SURFACE ELEVATION 112.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
								WASHED TO 95.0'
		1	◤	13 21 31	52	8	SP	SAND, UNIFORM, FINE, 1-3% FINES, DARK YELLOWISH ORANGE (10 YR 6/6) AND VERY PALE ORANGE (10 YR 8/2).
		2	◤	16 25 48	73	9	SP	SAND, SIMILAR TO SS #1.
		3	◤	16 23 34	57	9	SP	SAND, UNIFORM, FINE, CLEAN, 1-3% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
		4	◤	25 34 38	72	11	SP	SAND, SIMILAR TO SS #3.
		5	◤	20 33 42	75	9	SP	SAND, UNIFORM, FINE, CLEAN, 1-3% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
		6	◤	33 45 50/4"		11	SP	SAND, UNIFORM, FINE, CLEAN, 1-3% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
		7	◤	23 38 50/5"		12	SP	SAND, UNIFORM, FINE, CLEAN, 1-3% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4) WITH 2-3% GRAVEL TO 0.6 INCH MAXIMUM.
		8	◤	6 7 10	17	18	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 2-5% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2).
		9	◤	7 8 20	28	18	SM-SC CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 25-35% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2) WITH A 1/4 INCH THICK LAYER AND A 1/2 INCH THICK POCKET OF CLAY AT BOTTOM, AND A 4 INCH THICK LAYER OF VERY FINE CLAYEY SAND/SILTY SAND AT VERY TOP OF SAMPLE, ALSO CONTAINING VERY THIN LAYERS OF FeOx STAINING THROUGHOUT SAMPLE.
		10	◤	12 20 19	39	11	SP	SAND, UNIFORM, FINE, 4-8% FINES, PALE RED (10 R 6/2) AND DARK YELLOWISH ORANGE (10 YR 6/6) WITH A 1 1/4 INCH THICK LAYER OF VERY FINE CLAYEY SAND, CONTAINING A 3/4 INCH THICK LAYER OF SILTY CLAY.
		11	◤	16 19 26	45	12	SP	SAND, UNIFORM, FINE, 3-8% FINES, GRAYISH ORANGE PINK (5 YR 7/2).
		12	◤	5 6 9	15	18	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 8/1) SEVERELY STAINED WITH SMALL FeOx DEPOSITS.
		13	◤	7 10 14	24	18	CH	SILTY CLAY, SIMILAR TO SS #12.
-48.9	161.5	14	◤	8 10 15	25	18	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2).
								END OF BORING AT 161.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD DFG
DATE MAY 2, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 162

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 163
TYPE OF BORING DRIVE
SHEET 1 OF 3
DATE DRILLED JANUARY 29, 1974
DRILLING COMPANY - EUSTIS ENGRG CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 17,082.3
EAST 17,341.3
GROUND SURFACE ELEVATION 103.1

SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
1	◤	2 4 7	11	13	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, MOTTLED.
2	◤	11 14 18	32	14	CH	SILTY CLAY, MODERATELY PLASTIC, MOTTLED, WITH SMALL FeOx AND MnO_2 NODULES AND THIN SILT POCKETS 1/8 - 1/4" THICK.
3	◤	35 18 18	36	16	ML	SILT, MODERATELY PLASTIC, GRAY (N7), WITH A 2" LAYER OF VERY FINE SILTY SAND.
4	◤	46 34 37	71	10	SP	SAND, UNIFORM, FINE, 2-5% NON-PLASTIC TO SLIGHTLY PLASTIC FINES.
5	◤	18 8 8	16	16	SC	CLAYEY SAND, UNIFORM, FINE, 4-7% MODERATELY PLASTIC FINES, WITH VERY SMALL CLAY SLIVERS AND A 1" THICK HIGHLY PLASTIC CLAY POCKET.
6	◤	11 8 7	15	17	SC	CLAYEY SAND, UNIFORM, FINE, 6-8% SLIGHTLY TO MODERATELY PLASTIC FINES, WITH A FEW SMALL CLAY BALLS CONCENTRATED AT BOTTOM OF SAMPLE.
7	◤	8 7 6	13	18	SC	CLAYEY SAND, UNIFORM, FINE, 6-8% MODERATELY PLASTIC FINES, WITH ONE PIECE OF ROUNDED GRAVEL 0.4 IN. IN SIZE.
8	◤	10 10 11	21	16	SP	SAND, UNIFORM, FINE, 5-8% SLIGHTLY PLASTIC FINES, WITH A FEW CLAYEY SAND LAYERS 1/8 - 1/2" THICK.
9	◤	29 35 29	64	16	SP	SAND, POORLY GRADED, FINE, 4-6% FINES DARK YELLOWISH ORANGE (10 YR 6/6).
10	◤	25 22 20	42	18	SP	SAND, UNIFORM, FINE, 2-5% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
11	◤	23 25 45	70	12	SP	SAND, UNIFORM, FINE, 2-5% MEDIUM SAND, 2-5% FINES.
12	◤	20 22 23	45	11	SP	SAND, POORLY GRADED, FINE AND MEDIUM, MOSTLY MEDIUM, 1-2% COARSE, 2-4% FINES.
13	◤	10 11 17	28	13	SP	SAND, UNIFORM, FINE/VERY FINE, 3-6% NON PLASTIC TO SLIGHTLY PLASTIC FINES,
14	◤	15 15 12	27	10	SP	SAND, UNIFORM, VERY FINE, 4-8% SLIGHTLY PLASTIC FINES WITH A 1/8" THICK LAYER OF MEDIUM SAND.
15	◤	24 32 41	73	11	SP	SAND, UNIFORM, VERY FINE/FINE, 2-4% FINES, WITH LESS THAN 1% GRAVEL TO 0.5 IN. MAX.
16	◤	23 22 32	54	10	SW	SAND, WELL GRADED COARSE TO FINE, 2-5% GRAVEL TO 0.5 IN. MAX., 2-4% FINES.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD DFG
DATE DECEMBER 6, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 163-A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 163
TYPE OF BORING DRIVE/PUSH
SHEET 2 OF 3
DATE DRILLED JANUARY 29, 1974
DRILLING COMPANY - EUSTIS ENGRG CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 17,082.3
EAST 17,341.3
GROUND SURFACE ELEVATION 103.1'

SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
17	◤	75 25/2"		8	GP	SANDY GRAVEL, POORLY GRADED TO 1.7 INCH MAXIMUM, 15-20% FINE SAND, 3-6% FINES.
18	◤	24 32 42	74	6	SP	SAND, UNIFORM, FINE, 2-3% FINES, WITH LESS THAN 1% GRAVEL TO 0.8 INCH MAXIMUM.
19	◤	46 38 31	69	7	SP	SAND, SIMILAR TO SS-18.
20	◤	33 36 43	79	3	SP	SAND, UNIFORM, FINE, 3-5% FINES.
21	◤	25 50 51	101	8	SP	SAND, UNIFORM, FINE, 5-8% MEDIUM AND COARSE SAND, 3-5% FINES, 3-6% GRAVEL TO 0.7 INCH MAXIMUM.
22	◤	50 50/2"		9	SP	SAND, POORLY GRADED, FINE TO COARSE, 4-8% MEDIUM AND COARSE SAND, 2-5% GRAVEL TO 0.7 INCH MAXIMUM, 3-6% FINES.
23	◤	36 42 40	82	5	SP	SAND, UNIFORM, FINE, 3-6% FINES, PALE YELLOWISH BROWN (10 YR 6/2)
24	◤	32 25 22	47	10	SP	SAND, UNIFORM, FINE, 2-3% MEDIUM AND COARSE SAND, 3-5% FINES, PALE YELLOWISH BROWN (10 YR 6/2).
25	◤	13 21 38	59	12	SP	SAND, UNIFORM, FINE, 2-5% FINES, VERY PALE ORANGE (10 YR 8/2) AND GRAYISH ORANGE (10 YR 7/4) WITH LESS THAN 1% MEDIUM SAND, AND A 2 INCH THICK, MODERATELY PLASTIC, VERY FINE, CLAYEY SAND LAYER.
26	◤	38 62/7"		12		NO RECOVERY
27	◤	100/6"		9	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 10-15% GRAVEL TO 0.8 INCH MAXIMUM, 5-8% NONPLASTIC TO SLIGHTLY PLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4) AND MODERATE BROWN (5 YR 4/4) SOME GRAVEL CLAY COATED.
28	◤	20 21 17	38	12	GC	CLAYEY GRAVEL, POORLY GRADED TO 1.0 INCH MAXIMUM, MODERATELY TO HIGHLY PLASTIC, 15-20% FINE SAND, GRAYISH ORANGE (10 YR 7/4) AND VERY PLAE ORANGE (10 YR 7/4).
29	◤	3 3 5	8	12	CL	SILTY CLAY, MODERATELY PLASTIC, 10-20% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2) WITH MINOR STAINING OF SMALL FeOx NODULES.
30	■		H-P	24		BEGINNING OF TUBE SAMPLES: LIGHT GRAY BROWN FINE SANDY SILTY CLAY WITH SOME LOCALIZED PURE CLAY POCKETS, AND TWO ½ INCH THICK PURE CLAY LAYERS NEAR BOTTOM. W=35.5%, LL=49.6, PL= 24.9, PI= 24.7
31	■		H-P	24		LIGHT BROWN TO TAN SILTY VERY FINE SANDY CLAY WITH FEW HARD TAN CLAY POCKETS. W= 29.9%, LL=38.5, PL= 18.6, PI=19.9
32	■		H-P	17		SILTY CLAY, POCKETS OF SAND, STIFF, GRAY AND TAN.
33	■		H-P	24		TOP: SILTY CLAY, STIFF, GRAY AND TAN. BOTTOM: SAND, UNIFORM, FINE, DENSE, TAN.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

5 H-P HYDRAULICALLY PUSHED

ISSUED BY D.F. GREENWOOD DFG
DATE DECEMBER 6, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 163-B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 163
TYPE OF BORING PUSH
SHEET 3 OF 3
DATE DRILLED JANUARY 29, 1974
DRILLING COMPANY - EUSTIS ENGRG CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 17,082.3
EAST 17,341.3
GROUND SURFACE ELEVATION 103.1'

SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
34	■		H-P	23		SAND, UNIFORM, FINE, DENSE, TAN.
35	■		H-P	26		SILTY CLAY, VERY STIFF, GRAY AND TAN.
36	■		H-P	25		LIGHT GRAY-BROWN, SLIGHTLY SILT FINE SANDY CLAY. W=26.8%, LL=38.0, PL=15.1, PI=23.8
37	■		H-P	24		GRAY SILTY VERY FINE SANDY CLAY WITH FEW SMALL POCKETS OF FINE SAND. W=26.3%, LL=35.3, PL=14.4, PI= 20.9
38	■		H-P	25		GREENISH GRAY VERY FINE SANDY CLAY, SILTY SANDY CLAY AT BOTTOM. W= 27.5%, LL=36.6, PL= 20.1, PI=16.5
39	■		H-P	25		LIGHT GREEN-GRAY FINE SANDY SILT WITH TRACES CLAY, LAYERS 1/16 TO 1/4 INCH THICK INCLINED 25° FROM HORIZONTAL. W=30.2%, LL= 33.0, PL= 22.5, PI= 10.5
40	■		H-P	12		GREENISH GRAY FINE SANDY CLAY, SILTY AT BOTTOM. W=29.6%, LL=34.8, PL=22.3, PI=12.5
41	■		H-P	22		GRAY SILTY VERY FINE SANDY CLAY. W=26.7%, LL=45.8, PL= 17.9, PI= 27.9
42	■		H-P	22		GREENISH GRAY VERY FINE SANDY SILTY CLAY. W=29.0%, LL=43.2, PL= 18.1, PI= 25.1
43	■		H-P	18		TOP: GREENISH GRAY SLIGHTLY CLAYEY SILT, VERY BRITTLE, TRACES UNIFORM, FINE SAND. MIDDLE: GREENISH GRAY SILT, FINE SANDY CLAY, INCLINED LAYERING UP TO 1½" WITH COLOR VARIATION BETWEEN LAYERS, W=29.5%, LL=35.9, PL=15.9, PI=20.0 BOTTOM: GREENISH GRAY FINE SANDY SILTY WITH CLAY LAYERS 1/4-3/4 INCH THICK.
44	■		H-P	23		DARK GRAY SILTY, FINE SANDY CLAY. W=25.9%, LL=30.6, PL=19.1, PI=11.5
45	■		H-P	26		GREENISH GRAY SILTY FINE SANDY CLAY, VERY FINE SAND AT BOTTOM, AND BECOMING GRAY. W=26.7%, LL=40.3, PL= 20.2, PI= 20.1
46	■		H-P	24		TOP: GRAY SILTY SLIGHT CLAYEY, VERY FINE SAND, BOTTOM 1.25 INCH: GRAY SILTY, VERY FINE SANDY, CLAY. W=28.5%
47	■		H-P	25		GRAY SILTY, VERY FINE SANDY CLAY, BOTTOM 1-2 INCH VERY BRITTLE. W=25.4%, LL=32.9, PL= 21.8, PI= 11.1
48	■		H-P	22		LIGHT GRAY VERY FINE SANDY CLAY WITH TRACES OF SILT AND ORGANIC MATTER AND LAYERS OF VERY FINE SAND AND CLAY UP TO 3/8 INCH THICK THROUGHOUT SAMPLE. W=24.0%, LL=36.5, PL= 17.7, PI= 18.8
49	■		H-P	21		GRAY VERY FINE SANDY, SILTY CLAY WITH INCLINES LAYERS OF UNIFORM FINE SAND UP TO 3/8 INCH THICK THROUGHOUT SAMPLE. W=27.3%, LL= 36.8, PL= 18.0, PI= 18.8
50	■		H-P	21		GRAY FINE SANDY CLAY, HARD WITH LAYERS OF FINE SANDY CLAY AND UNIFORM, FINE SAND UP TO 1/4 INCH THICK THROUGHOUT SAMPLE, SILTY, VERY FINE SANDY CLAY AT BOTTOM. W=28.7%, LL=48.2, PL=16.5, PI=31.7

END OF BORING AT 203.0'

DATA FOR UNDISTURBED SAMPLES TAKEN FROM REPORT BY GEOTECHNICAL ENGINEERS, INC.

DESCRIPTIONS FOR SAMPLES 32-35 TAKEN FROM DRILLER'S LOGS.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

5 H-P INDICATES HYDRAULIC PUSH

ISSUED BY D.F. GREENWOOD DFG
DATE DECEMBER 6, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 163-C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 164 | TYPE OF BORING DRIVE | SHEET 1 OF 3
DATE DRILLED FEBRUARY 4, 1973 | DRILLING COMPANY - EUSTIS ENGRG. CO. | LOGGED BY DFP
COORDINATES, NORTH 17,145.7 | EAST 17,304.6 | GROUND SURFACE ELEVATION 106.2

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
100		1	◤	8 12 11	23	13	CL	SILTY CLAY, MODERATELY PLASTIC, MODERATE YELLOWISH BROWN, (10 YR 5/4), AND VERY PALE ORANGE (10 YR 8/2) WITH LARGE MnO^2 NODULES.
	10	2	◤	6 9 10	19	17	CL	SILTY CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 7/2).
90		3	◤	15 15 16	31	16	CL	SILTY CLAY, MODERATELY PLASTIC, 2-5% FINE SAND, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6) AND LIGHT GRAY (N7).
	20	4	◤	11 11 15	26	16	CL	SILTY CLAY, MODERATELY PLASTIC, LIGHT GRAY (N7) WITH THIN LENSES OF SILT THROUGHOUT SAMPLE.
80		5	◤	16 22 32	54	8	SP	SAND, UNIFORM, VERY FINE, 2-4% FINES, YELLOWISH GRAY (5 Y 7/2) AND GRAYISH ORANGE (10 YR 8/2) WITH A 1" LAYER OF MEDIUM AND FINE SAND CONTAINING A THIN CLAYEY SAND LAYER.
	30	6	◤	7 6 7	13	15	SP-SC	SAND, UNIFORM, VERY FINE, 6-8% MODERATELY TO HIGHLY PLASTIC FINES, VARIGATED, DARK YELLOWISH ORANGE (10 YR 6/6) AND DARK REDDISH BROWN (10 R 3/4) WITH SMALL CLAY POCKETS, SLIVERS, AND THIN CLAY LENSES.
70		7	◤	11 11 12	23	15	SC	CLAYEY SAND, UNIFORM, VERY FINE, 5-8% SLIGHTLY TO MODERATELY PLASTIC FINES, VARIGATED, DARK YELLOWISH ORANGE (10 YR 6/6), MODERATE REDDISH BROWN (10 R 4/6) AND DARK REDDISH BROWN (10 R 3/4); LESS THAN 1% MEDIUM SAND IMBEDDED THROUGHOUT SAMPLE.
	40	8	◤	11 12 12	24	10	SC	CLAYEY SAND, UNIFORM, VERY FINE, 1-2% FINE TO MEDIUM SAND, 6-8% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
60		9	◤	11 10 11	21	4	SP	SAND, UNIFORM, FINE, 3-6% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	50	10	◤	50 55 6"		9	SW	SAND, WELL GRADED MEDIUM TO FINE, LESS THAN 1% GRAVEL TO 0.8 INCH MAXIMUM, 4-7% FINES, LIGHT BROWN (5 YR 5/6).
50		11	◤	20 24 43	67	9	SP	SAND, UNIFORM, FINE, 3-5% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	60	12	◤	20 22 23	45	8	SP	SAND, UNIFORM, FINE, LESS THAN 2% MEDIUM AND COARSE SAND, 3-5% FINES, VARIGATED, DARK YELLOWISH ORANGE (10 YR 6/6) AND LIGHT BROWN (5 YR 5/6), WITH A FEW SMALL MnO$_2$ NODULES AND A 1" LAYER OF VERY FINE CLAYEY SAND.
40		13	◤	7 7 13	20	12	SP	SAND, UNIFORM, VERY FINE, 3-8% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
	70	14	◤	11 19 19	38	10	SP	SAND, UNIFORM, FINE, LESS THAN 1% GRAVEL TO 0.5 INCH MAXIMUM, 2-5% FINES, GRAYISH ORANGE (10 YR 7/4).
30		15	◤	12 15 20	35	12	SP	SAND, UNIFORM, FINE, VERY FINE, 2-5% SLIGHTLY PLASTIC FINES, VARIGATED, GRAYISH ORANGE (10 YR 7/4) AND MODERATE REDDISH ORANGE (10 R 6/6).
	80	16	◤	13 15 24	39	8	SP	SAND, UNIFORM, FINE, 2-7% NONPLASTIC TO SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) WITH A 3/4" LAYER OF SLIGHTLY PLASTIC VERY FINE SAND.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD DFG
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 164 - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 164 | TYPE OF BORING DRIVE | SHEET 2 OF 3
DATE DRILLED FEBRUARY 4, 1973 | DRILLING COMPANY - EUSTIS ENGRG. CO. | LOGGED BY DFP
COORDINATES, NORTH 17,145.7 | EAST 17,304.6 | GROUND SURFACE ELEVATION 106.2

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
20		17	◤	15 11 9	20	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND COARSE, LESS THAN 1% GRAVEL TO 0.7 INCH MAXIMUM, 3-4% FINES, GRAYISH ORANGE (10 YR 7/4) WITH A 1½" LAYER OF HIGHLY PLASTIC, SOFT, SANDY CLAY.
		18	◤	25 32 25	57	10	SP	SAND, POORLY GRADED, VERY FINE TO MEDIUM, MOSTLY FINE, 3-7% SLIGHTLY PLASTIC FINES, VARIGATED GRAYISH ORANGE (10 YR 7/4) AND MODERATE REDDISH ORANGE (10 R 6/6) CONTAINING A CLAY POCKET 1" THICK AND FEW SMALL CLAY BALLS.
	90	19	◤	15 18 16	34	9	SP	SAND, UNIFORM, FINE, LESS THAN 1% GRAVEL TO 0.6 INCH MAXIMUM, 3-4% FINES, GRAYISH ORANGE (10 YR 7/4).
10		20	◤	32 30 30	60	8	SP	SAND, SIMILAR TO SS #19, EXCEPT NO GRAVEL.
	100	21	◤	31 29 30	59	13	SP	SAND, UNIFORM, FINE, 1-2% GRAVEL TO 0.7 INCH MAXIMUM, 2-5% FINES, GRAYISH ORANGE (10 YR 7/4).
0		22	◤	34 39 42	81	9	SP	SAND, UNIFORM, FINE, 2-3% MEDIUM SAND, LESS THAN 2% GRAVEL TO 0.5 INCH MAXIMUM, 3-5% FINES, GRAYISH ORANGE (10 YR 7/4).
	110	23	◤	40 60 5"		8	SP	SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM SAND, 2-3% GRAVEL TO 0.8 INCH MAXIMUM, CLEAN, 1-2% FINES, GRAYISH ORANGE (10 YR 7/4).
-10		24	◤	65 50 4"		10	SP	SAND, UNIFORM, FINE, LESS THAN 1% GRAVEL TO 0.5 INCH MAXIMUM, CLEAN, 1-3% FINES, GRAYISH ORANGE (10 YR 7/4) AND VERY PALE ORANGE (10 YR 8/2).
	120	25	◤	50 50 3"		8	SP	SAND, SIMILAR TO SS #24.
-20		26	◤	42 29 23	52	8	SP	SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM AND COARSE SAND, 1% GRAVEL TO 0.5 INCH MAXIMUM, GRAYISH ORANGE (10 YR 7/4) AND MODERATE YELLOWISH BROWN (10 YR 5/4).
	130	27	◤	27 31 41	72	8	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 15-20% GRAVEL TO 0.8 INCH MAXIMUM, 5-10% MODERATELY PLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4), SOME GRAVEL IS CLAY COATED.
-30		28	◤	31 41 48	89	6	GP	SANDY GRAVEL, POORLY GRADED TO 1.0 INCH MAXIMUM, 10-15% FINE TO COARSE SAND, 5-8% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
	140	29	◤	29 16 29	45	9	GC	CLAYEY GRAVEL, POORLY GRADED TO 1.2 INCH MAXIMUM, HIGHLY PLASTIC, 8-15% FINE AND MEDIUM SAND, VARIGATED, YELLOWISH GRAY (5 Y 7/2) AND DUSKY YELLOW (5 Y 6/4) WITH A 2" MODERATELY TO HIGHLY PLASTIC SILTY CLAY LAYER.
-40		30	◤	5 5 6	11	18	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2).
	150	31	■		H-P	25	CL	SILTY CLAY, LENSES OF SILT, GRAYISH TAN.
		32	■		H-P	25	CL	SILTY CLAY, POCKETS OF SAND, GRAYISH TAN.
-50		33	■		H-P	16	CL	SILTY CLAY, SIMILAR TO SS 32.
	160	34	■		H-P	10	CL	SILTY CLAY, SIMILAR TO SS 32 and 33.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.
5. H-P, HYDRAULICALLY PUSHED
6. SAMPLES 31-34 TAKEN FROM DRILLER'S LOG.

ISSUED BY D. F. GREENWOOD DFG
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 164 - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 164 | TYPE OF BORING DRIVE | SHEET 3 OF 3
DATE DRILLED FEBRUARY 4, 1973 | DRILLING COMPANY - EUSTIS ENGRG. CO. | LOGGED BY D.F.P.
COORDINATES, NORTH 17,145.7 | EAST 17,304.6 | GROUND SURFACE ELEVATION 106.2'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		35	■		H-P	13	CL	SILTY CLAY, MODERATELY PLASTIC, 5-8% VERY FINE SAND, LIGHT OLIVE GRAY (5 Y 6/1) AND OLIVE GRAY (5 Y 4/1) WITH SMALL DESSICATED CLAY CONCRETIONS, TRACE OF MICA, AND SOME MnO$_2$ PRESENT.
-60		36	■		H-P	24	CL	SILTY CLAY, MODERATELY PLASTIC, DUSKY YELLOW (5 Y 6/4) WITH MINOR FeOx DEPOSITS, AND A SMALL LAYER 3/8" THICK OF MEDIUM SAND.
		37	■		H-P	15	CL	SILTY CLAY, SIMILAR TO TW #36.
	170	38	■		H-P	15	CL	SILTY CLAY, MODERATELY PLASTIC, 6-8% VERY FINE SAND, GREENISH GRAY (5 G 6/1).
		39	■		H-P	21	CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, DARK GREENISH GRAY (5 G 4/1) WITH SMALL TO LARGE DESSICATED CLAY CONCRETIONS.
		40	■		H-P	13	CL	SILTY CLAY, SIMILAR TO TW #39.
-70		41	■		H-P	18		SILTY CLAY, MODERATELY PLASTIC, DARK GREENISH GRAY (5 G 4/1).
	180	42	■		H-P	26	CL	SILTY CLAY, SIMILAR TO TUBE #41, EXCEPT SAMPLE HAS THIN, FINE SAND LENSES, DARK GREENISH GRAY (5 G 4/1).
		43	■		H-P	22	CL	SILTY CLAY, SIMILAR TO TUBE #42.
		44	■		H-P	19	CL	SILTY CLAY, SIMILAR TO TUBE #42.
-80		45	■		H-P	24	CL	SILTY CLAY, MODERATELY PLASTIC, DARK GREENISH GRAY (5 G 4/1).
	190	46	■		H-P	25	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, DARK GREENISH GRAY (5 G 4/1) WITH THIN, FINE SAND LENSES.
		47	■		H-P	27	CL	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, DARK GREENISH GRAY (5 G 4/1).
		48	■		H-P	25	CL	SILTY CLAY, MODERATELY PLASTIC, 4-8% VERY FINE SAND, DARK GREENISH GRAY (5 G 4/1) WITH TRACE OF MICA.
-90		49	■		H-P	24	CL	SILTY CLAY, SIMILAR TO TUBE #48.
	200	50	■		H-P	24	SP	SAND, UNIFORM, FINE TO VERY FINE, 1-2% FINES, DARK GREENISH GRAY (5 G 4/1) WITH SOME MICA.
		51	■		H-P	25	CL	SANDY CLAY, MODERATELY PLASTIC, 10-15% FINE SAND, DARK GREENISH GRAY (5 G 4/1) WITH SOME MICA.
		52	■		H-P	25	CL	SANDY CLAY, SIMILAR TO TUBE #51.
								END OF BORING AT 206.0'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.
5. H-P, HYDRAULICALLY PUSHED

ISSUED BY D. F. GREENWOOD DFG
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 164 - C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 165 | TYPE OF BORING PUSH | SHEET 1 OF 1
DATE DRILLED FEBRUARY 27-MARCH 3, 1974 | DRILLING COMPANY - EUSTIS ENGRG. CO. | LOGGED BY L.F.
COORDINATES, NORTH 17,052.6 | EAST 17,346.9 | GROUND SURFACE ELEVATION 105.7'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
100								NOTE: SAMPLES TAKEN WITH 3" DIAMETER FIXED-ROD PISTON SAMPLER (SEE APPENDIX 2Q, PSAR)
	70							WASHED TO A DEPTH OF 75'
		3	■		H-P	16	SP	SAND, POORLY GRADED, TAN AND GRAY.
		4			H-P	N.R.	SP	SAND, POORLY GRADED, TAN AND GRAY.
	80	5			H-P	N.R.		
20		6			H-P	N.R.	SP	SAND, POORLY GRADED, TAN AND GRAY.
		7			H-P	N.R.	SP	SAND, POORLY GRADED, TAN AND GRAY.
		8	■		H-P	10	SP	SAND, POORLY GRADED, TAN AND GRAY.
	90	9	■		H-P		SP	SAND, POORLY GRADED, TAN AND GRAY.
10		10	■		H-P		SP	SAND, POORLY GRADED, TAN AND GRAY.
	100	11	■		H-P		SP	SAND, POORLY GRADED, TAN AND GRAY.
0		12			H-P	N.R.	SP	SAND, POORLY GRADED, DENSE, TAN AND GRAY.
	110	13			H-P	N.R.	GW	GRAVEL, WELL GRADED, DENSE, TAN AND GRAY.
-10		14			H-P	N.R.	SP	SAND, POORLY GRADED, DENSE, TAN AND GRAY.
	120	15			H-P	N.R.	SP	SAND, POORLY GRADED, DENSE, TAN AND GRAY.
-20		16	■		H-P		SP	SAND, POORLY GRADED, DENSE, TAN AND GRAY.
	130	17	■		H-P	8	SP	SAND, POORLY GRADED, DENSE, TAN AND GRAY.
-30		18	■		H-P	7	SP	SAND, POORLY GRADED, DENSE, TAN AND GRAY.
	140	19	■		H-P	17	SP	SAND, POORLY GRADED, DENSE, TAN AND GRAY.
								END OF BORING AT 140.9'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.
5. H-P, HYDRAULICALLY PUSHED
6. DESCRIPTIONS TAKEN FROM DRILLER'S LOG

ISSUED BY D. F. GREENWOOD DFG
DATE JUNE 20, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 165 - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 166 | TYPE OF BORING | SHEET 1 OF 2
DATE DRILLED MARCH 6-8, 1974 | DRILLING COMPANY - EUSTIS ENGRG. CO. | LOGGED BY L.P.
COORDINATES, NORTH 17,022.5 | EAST 17,719.6 | GROUND SURFACE ELEVATION 110.5'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
110								NOTE: SAMPLES TAKEN WITH 3" DIAMETER FIXED-ROD PISTON SAMPLER (SEE APPENDIX 2Q, PSAR)
100								
50	60	1	■		H-P	21	SP	WASHED TO A DEPTH OF 60' SAND, POORLY GRADED, DARK GRAY.
40	70							
30	80	2	■		H-P		SP	SAND, POORLY GRADED, TAN AND GRAY.
		3	■		H-P	6	SP	SAND, POORLY GRADED, TAN AND GRAY.
20	90	4	■		H-P		SP	SAND, POORLY GRADED, TAN AND GRAY.
		5	■		H-P	10	SP	SAND, POORLY GRADED, TAN AND GRAY.
10	100	6			H-P	N.R.	SP	SAND, POORLY GRADED, TAN AND GRAY.
		7			H-P	N.R.	SP	SAND, POORLY GRADED, TAN AND GRAY.
0	110	8			H-P	N.R.	SP	SAND, POORLY GRADED, TAN AND GRAY.
		9			H-P	N.R.	SP	SAND, POORLY GRADED, TAN AND GRAY.
-10	120	10			H-P	N.R.	GW	GRAVEL, WELL GRADED, TAN AND GRAY.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.
5. H-P, HYDRAULICALLY PUSHED.
6. DESCRIPTIONS TAKEN FROM DRILLER'S LOGS

ISSUED BY D.F. GREENWOOD
DATE JUNE 20, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 166-A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 166 | TYPE OF BORING | SHEET 2 OF 2
DATE DRILLED MARCH 6-8, 1974 | DRILLING COMPANY - EUSTIS ENGRG. CO. | LOGGED BY L.P.
COORDINATES, NORTH 17,022.5 | EAST 17,719.6 | GROUND SURFACE ELEVATION 110.5'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		11			H-P	N.R.	SP	SAND, POORLY GRADED, TAN AND GRAY.
-20	130	12			H-P	N.R.	SP	SAND, POORLY GRADED, TAN AND GRAY.
		13			H-P	N.R.	SP	SAND, POORLY GRADED, TAN AND GRAY.
-30	140	14			H-P	N.R.	SP	SAND, POORLY GRADED, TAN AND GRAY.
	145.2	15			H-P	N.R.	SP	SAND, POORLY GRADED, TAN AND GRAY.
								END OF BORING AT 145.2'
-40								

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.
5. H-P, HYDRAULICALLY PUSHED.
6. DESCRIPTIONS TAKEN FROM DRILLER'S LOGS

ISSUED BY D.F. GREENWOOD
DATE JUNE 20, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 166-B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 167 | TYPE OF BORING DRIVE | SHEET 1 OF 2
DATE DRILLED MARCH 14, 1974 | DRILLING COMPANY - EUSTIS ENGRG. CO. | LOGGED BY D.F.P.
COORDINATES, NORTH 17,015.3 | EAST 17,751.2 | GROUND SURFACE ELEVATION 110.5

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
	0							
								WASHED TO A DEPTH OF 70'.
40	70	1	◤	11 14 20	34	13	SP	SAND, UNIFORM, FINE/VERY FINE, 5-6% SLIGHTLY PLASTIC FINES, VARIGATED, VERY PALE ORANGE (10 YR 8/2) AND MODERATE YELLOWISH BROWN (10 YR 5/4).
		2	◤	22 50/4"		8	SP	SAND, UNIFORM, FINE, 2-4% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
30	80	3	◤	22 37 30	67	11	SP	SAND, SIMILAR TO SS-2, EXCEPT COLOR IS DARK YELLOWISH ORANGE (10 YR 6/6).
		4	◤	40 50 4½"		5	SP	SAND, UNIFORM FINE, 1-2% COARSE SAND, 3-6% GRAVEL TO 0.6 IN. MAX., 3-6% FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH 2 SMALL CLAY POCKETS 1/2" AND 3/4" IN SIZE.
20	90	5	◤	32 50/6"		7	SP	SAND, UNIFORM, FINE, LESS THAN 1% GRAVEL TO 1.5 IN. MAX., CLEAN, 1-2% FINES, VERY PALE ORANGE (10 YR 5/2).
		6	◤	20 50/6"		8	SP	SAND, UNIFORM, FINE, 3-5% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
10	100	7	◤	15 31 48	79	12	SP	SAND, UNIFORM, FINE, 1-2% MEDIUM SAND, 2-5% FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH A 1" LAYER OF VERY FINE CLAYEY SAND.
		8	◤	37 50 4½"		8	SP	SAND, UNIFORM, FINE, 3-5% MEDIUM AND COARSE SAND, 4-7% FINES, VARIGATED, PALE YELLOWISH ORANGE (10 YR 8/6), MODERATE YELLOWISH BROWN (10 YR 5/4) AND DARK YELLOWISH ORANGE (10 YR 6/6) WITH 2-3% GRAVEL TO 0.7 IN. MAX.
0	110	9	◤	21 30 36	66	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, LESS THAN 1% GRAVEL TO 0.5 IN. MAX., 4-6% FINES, GRAYISH ORANGE (10 YR 7/4).
		10	◤	18 23 42	65	10	SP	SAND, POORLY GRADED, FINE, LESS THAN 1% GRAVEL TO 0.8 IN. MAX., 4-7% FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH TRACE OF MICA.
-10	120	11	◤	39 50/3"		6	SP	SAND, POORLY GRADED FINE AND MEDIUM, 5-7% FINES, VARIGATED, DARK YELLOWISH ORANGE (10 YR 6/6) AND DARK YELLOWISH BROWN (10 YR 4/2).
		12	◤	19 26 38	64	8	SP	SAND, POORLY GRADED FINE TO COARSE, MOSTLY MEDIUM, 2-5% FINES, PALE YELLOWISH BROWN (10 YR 6/2).
-20	130	13	◤	14 20 31	51	7	SP	SAND, POORLY GRADED FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 3-5% GRAVEL TO 0.7 IN. MAX., 5-7% FINES, PALE YELLOWISH BROWN (10 YR 6/2).

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DATE MAY 30, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 167-A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 167 | TYPE OF BORING DRIVE/PUSH | SHEET 2 OF 2
DATE DRILLED March 14, 1974 | DRILLING COMPANY - EUSTIS ENGRG. CO. | LOGGED BY D.F.P.
COORDINATES, NORTH 17,015.3 | EAST 17,751.2 | GROUND SURFACE ELEVATION 110.5'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		14	◤	21 27 50	77	7	SP	SAND, POORLY GRADED FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 4-7% GRAVEL TO 0.5 INCH MAXIMUM, 4-8% FINES, PALE YELLOWISH BROWN (10 YR 6/2) AND DARK YELLOWISH BROWN (10 YR 4/2).
-30	140	15	◤	22 32 50	82	7	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 6-10% GRAVEL TO 0.9 INCH MAXIMUM, 4-8% FINES, DARK YELLOWISH BROWN (10 YR 4/2) AND DUSKY YELLOWISH BROWN (10 YR 2/2).
		16	◤	32 50 6"		10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 6-8% GRAVEL TO 0.7 INCH MAXIMUM, 5-7% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4), SOME GRAVEL IS CLAY COATED.
-40	150	17	◤	14 9 13	22	11	CL	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, DUSKY YELLOW (5 Y 6/4), SEVERELY STAINED WITH THIN FeOx VEINS AND SMALL MnO_2 AND FeOx NODULES.
		18	■		H-P	6	CL	SILTY CLAY, MODERATELY PLASTIC, 7-12% FINE SAND, VERY STIFF, YELLOWISH BROWN, FEW VEINS OF SLIGHTLY PLASTIC DARK BROWN GRAY.
		19	■		H-P	20	CL	SILTY CLAY, MODERATELY PLASTIC, 3-8% FINE SAND, VERY STIFF, YELLOWISH BROWN, FEW POCKETS LIGHT GRAY CLAY.
	160	20	■		H-P	22	CL	SANDY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 10-22% FINE SAND, HARD TO VERY STIFF, LIGHT BROWN WITH NODULES OF ORANGE BROWN CLAY.
-50		21	■		H-P	9	CH	CLAY, HIGHER PLASTIC, 7-10% FINE SAND, VERY STIFF, LIGHT BROWN, FEW PIECES OF GRAVEL.
		22	■		H-P	22	CL	TOP: SANDY CLAY, MODERATELY TO HIGHLY PLASTIC, 20-30% FINE SAND, BLUISH GRAY, WITH POCKETS BROWN CLAY, BOTTOM: SANDY CLAY, MODERATELY PLASTIC, 40-50% FINE SAND, BLUISH GRAY.
		23	■		H-P	12	CL	SANDY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 15-25% FINE SAND, STIFF, LIGHT GRAY BROWN.
		24	■		H-P	7	CL	SANDY CLAY, MODERATELY PLASTIC, 15-25% FINE SAND, VERY STIFF, LIGHT BROWN, WITH POCKETS YELLOW BROWN CLAY.
-60	170	25	■		H-P	12	CL	TOP: SANDY CLAY, MODERATELY TO HIGHLY PLASTIC, 10-15% FINE SAND, FIRM, BLUISH GRAY AND BROWN. BOTTOM: SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 12-18% FINE SAND, HARD, LIGHT GRAY.
		26	■		H-P	20	CL	SANDY CLAY, MODERATELY PLASTIC, 20-30% FINE SAND, VERY STIFF, LIGHT GREEN AND BROWN WITH POCKETS GRAY CLAY AT TOP.
		27	■		H-P	22	SC	TOP: CLAYEY SAND, UNIFORM, FINE SAND, 25-35% SLIGHTLY TO MODERATELY PLASTIC FINES, DENSE, LIGHT GREEN AND BROWN WITH POCKETS YELLOWISH BROWN CLAY. BOTTOM: SANDY CLAY, MODERATELY TO HIGHLY PLASTIC, 10-20% FINE SAND, VERY STIFF, GREENISH-ORANGISH BROWN.
-70	180	28	■		H-P	23	CL	TOP: SANDY CLAY, MODERATELY TO HIGHLY PLASTIC, 10-15% FINE SAND, VERY STIFF, LIGHT GREEN WITH POCKETS YELLOWISH BROWN CLAY. BOTTOM: CLAYEY SAND, UNIFORM, VERY FINE SAND, 15-25% SLIGHTLY PLASTIC FINES, COMPACT, GREENISH GRAY.
		29	■		H-P	16	CL	SANDY CLAY, MODERATELY PLASTIC, 12-18% FINE SAND, STIFF, LIGHT GREENISH BROWN WITH POCKETS BROWN CLAY AT BOTTOM.
		30	■		H-P	25	CL	TOP: SANDY CLAY, MODERATELY TO HIGHLY PLASTIC, 15-20% FINE SAND VERY STIFF, MOTTLED GRAY AND LIGHT ORANGE BROWN. BOTTOM: SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 15-20% FINE SAND, VERY STIFF, GRAY WITH POCKETS ORANGE BROWN CLAY
		31	■		H-P	25	CL	SANDY CLAY, MODERATELY PLASTIC, 10-20% FINE SAND, VERY STIFF, GREEN GRAY, MICACEOUS.
-80	190	32	■		H-P	26	CL	SANDY CLAY, MODERATELY PLASTIC, 12-18% FINE SAND, STIFF, GREEN GRAY WITH POCKETS SLIGHTLY PLASTIC BROWN SILT AT TOP AND ONE LENSE LIGHT BROWN CLAYEY SAND AT BOTTOM.
		33	■		H-P	24	CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 3-8% FINE SAND, HARD TO STIFF, GRAY WITH ONE INCLINED LENSE SLIGHTLY TO MODERATELY PLASTIC, BROWN CLAYEY SILT AT BOTTOM.
		34	■		H-P	25		SILTY CLAY, MEDIUM STIFF TO STIFF, GREENISH GRAY WITH CLAYEY SILT LAYERS.
		35	■		H-P	25		SILTY CLAY, MEDIUM STIFF, GRAY, WITH SILTY SAND POCKETS.
		36	■		H-P	13		SILTY CLAY, MEDIUM STIFF, GRAY WITH SILTY FINE SAND POCKETS.
-90	200	37	■		H-P	12		SAME AS ABOVE.
		38	■		H-P	23	CL	TOP: SILTY CLAY, MODERATELY PLASTIC, 5-10% VERY FINE SAND, VERY STIFF GRAY. BOTTOM: SANDY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 25% FINE SAND, VERY STIFF, GRAY, SLIGHT ORGANIC ODOR.
		39	■		H-P	20	CL	SANDY CLAY, MODERATELY PLASTIC, 10-20% VERY FINE SAND, HARD, GRAY.
		40	■		H-P	6	CL SP	SAND, UNIFORM, FINE SAND, LESS THAN 3% NONPLASTIC FINES, COMPACT, GRAY WITH ONE POCKET SANDY CLAY, MODERATELY TO HIGHLY PLASTIC, 30-40% FINE SAND, GRAY.
-100	210							END OF BORING AT 210.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.
5. H-P, HYDRAULICALLY PUSHED

DESCRIPTIONS FOR SAMPLES 34-37 TAKEN FROM DRILLER'S LOGS

ISSUED BY D.F. GREENWOOD
DATE MAY 30, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 167B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 168
TYPE OF BORING PUSH
SHEET 1 OF 1
DATE DRILLED MARCH 11-14, 1974
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY L.P.
COORDINATES, NORTH 17,178.1 EAST 17,269.2
GROUND SURFACE ELEVATION 108.5'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
								NOTE: SAMPLES TAKEN WITH 3" DIAMETER FIXED-ROD PISTON SAMPLER (SEE APPENDIX 2Q, PSAR)
30	80							
								WASHED TO A DEPTH OF 85.0'
		1	■		H-P		GW SP SP SP	GRAVEL, WELL GRADED, TAN AND GRAY. SAND, POORLY GRADED, TAN AND GRAY. SAND, POORLY GRADED, TAN AND GRAY. SAND, POORLY GRADED, TAN AND GRAY.
20	90	2	■		H-P		SP	SAND, POORLY GRADED, TAN AND GRAY.
		3			H-P	N.R.	SP	SAND, POORLY GRADED, TAN AND GRAY.
10	100	4			H-P	N.R.	SP	SAND, POORLY GRADED, TAN AND GRAY.
		5			H-P	N.R.	SP	SAND, POORLY GRADED, TAN AND GRAY.
0	110	6			H-P	N.R.	SP	SAND, POORLY GRADED, TAN AND GRAY.
		7			H-P	N.R.	SP	SAND, POORLY GRADED, TAN AND GRAY.
-10	120	8			H-P	N.R.	SP	SAND, POORLY GRADED, TAN AND GRAY.
		9			H-P	N.R.	GW	GRAVEL, WELL GRADED, TAN AND GRAY.
-20		10			H-P	N.R.	GW	GRAVEL, WELL GRADED, TAN AND GRAY.
	130	11			H-P	N.R.	GW	GRAVEL, WELL GRADED, TAN AND GRAY.
		12			H-P	N.R.	GW	GRAVEL, WELL GRADED, TAN AND GRAY.
		13	■		H-P	N.R.	GW	GRAVEL, WELL GRADED, TAN AND GRAY.
-30	140	14	■		H-P		GC	CLAYEY GRAVEL, TAN AND GRAY.
-40		15	■		H-P		SP	SAND, POORLY GRADED, TAN AND GRAY.
	150	16	■		H-P		CL	CLAY, TAN AND GRAY.
	152							END OF BORING AT 152.0'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

5 H-P, HYDRAULICALLY PUSHED.

6 DESCRIPTIONS TAKEN FROM DRILLER'S LOGS

ISSUED BY D.F. GREENWOOD
DFG
DATE JUNE 20, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 168 - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 169
TYPE OF BORING PUSH
SHEET 1 OF 1
DATE DRILLED MARCH 18-20, 1974
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY L.P.
COORDINATES, NORTH 17,186.4 EAST 17,272.9
GROUND SURFACE ELEVATION 112.5'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
110								
								NOTE: SAMPLES TAKEN WITH 3" DIAMETER FIXED-ROD PISTON SAMPLER (SEE APPENDIX 2Q, PSAR)
	10							
100								
	120							WASHED TO A DEPTH OF 122.5'
-10		1	■		H-P	1	SP	SAND, POORLY GRADED, TAN AND GRAY.
		2	■		H-P	24	SP	SAND, POORLY GRADED, TAN AND GRAY.
		3	■		H-P	5	SP	GRAVELLY SAND.
	130	4	■		H-P	[illegible]	SP	GRAVELLY SAND.
-20		5	■		H-P	[illegible]	SP	GRAVELLY SAND.
		6	■		H-P	9	[illegible]	GRAVELLY SAND.
		7	■		H-P	3	SP	GRAVELLY SAND.
	140	8	■		H-P	6	SP	GRAVELLY SAND.
-30		9	■		H-P	24	SP	SAND, POORLY GRADED, TAN AND GRAY.
		10	■		H-P	23	SP	SAND, POORLY GRADED, TAN AND GRAY.
		11	■		H-P	24	SP-CL	SAND, POORLY GRADED, TAN AND GRAY. CLAY, TAN AND GRAY.
	150							END OF BORING AT 149.0'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

5 H-P, HYDRAULICALLY PUSHED.

6 DESCRIPTIONS TAKEN FROM DRILLER'S LOGS

ISSUED BY D.F. GREENWOOD
DFG
DATE JUNE 20, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 169 - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 170
TYPE OF BORING DRIVE
SHEET 1 OF 2
DATE DRILLED MARCH 22, 1974
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 17,105.3 EAST 17,915.1
GROUND SURFACE ELEVATION 112.5'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
	70							
40								
								WASHED TO A DEPTH OF 80'
	80	1	◤	50 50/4"		7	SP	SAND, UNIFORM, FINE, 2-3% MEDIUM SAND, 2-3% FINES, VARIGATED, DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE YELLOWISH BROWN (10 YR 5/4).
30								
		2	◤	18 26 18	44	10	SC	CLAYEY SAND, UNIFORM, VERY FINE, 8-10% HIGHLY PLASTIC FINES, VARIGATED, PALE YELLOWISH ORANGE (10 YR 8/6) AND DARK YELLOWISH ORANGE (10 YR 6/6) WITH A 1 INCH LAYER OF MEDIUM SAND.
	90	3	◤	19 20 22	42	10	SP	SAND, UNIFORM, FINE TO VERY FINE, 2-3% FINES, GRAYISH ORANGE (10 YR 7/4).
20								
		4	◤	26 32 38	70	9	SP	SAND, UNIFORM, FINE, 3-4% FINES, GRAYISH ORANGE (10 YR 7/4).
	100	5	◤	18 33 41	74	9	SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, LESS THAN 1% GRAVEL TO 0.5 INCH MAXIMUM, 3-5% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
10								
		6	◤	18 18 33	51	10	SP	SAND, UNIFORM, FINE, 2-5% FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
	110	7	◤	26 36 46	82	8	SP	SAND, UNIFORM, FINE, 2-4% MEDIUM SAND, 3-7% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
0								
		8	◤	18 26 32	58	12	SP	SAND, UNIFORM, FINE, 2-4% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
	120	9	◤	51 52/6"		11	SP	SAND, UNIFORM, FINE, 3-5% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
-10								
		10	◤	59 65/6"		8	SP	SAND, SIMILAR TO SS #9.
	130	11	◤	50 52/4"		7	SW	SAND, WELL GRADED, FINE TO MEDIUM, 3-5% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
-20								
		12	◤	38 62/4"		6	SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY MEDIUM, 4-6% FINES, MODERATE BROWN (5 YR 4/4).
	140	13	◤	16 25 32	57	9	SP	SAND, UNIFORM, FINE, 3-7% SLIGHTLY PLASTIC FINES, VARIGATED, VERY PALE ORANGE (10 YR 8/2) AND GRAYISH ORANGE (10 YR 7/4).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DFG
DATE JUNE 3, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 170 - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 170
TYPE OF BORING DRIVE
SHEET 2 OF 2
DATE DRILLED MARCH 22, 1974
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 17,105.3 EAST 17,915.1
GROUND SURFACE ELEVATION 112.5'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-30								
		14	◤	16 13 10	23	6	SP	GRAVELLY SAND, POORLY GRADED FINE TO COARSE, MOSTLY FINE, 35-40% GRAVEL TO 0.9 INCH MAXIMUM, 3-8% SLIGHTLY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2), SOME GRAVEL HAS CLAY BINDER.
	150	15	◤	10 15 18	33	18	CL	SILTY CLAY, MODERATELY PLASTIC, PALE OLIVE (10 Y 6/2), SEVERELY STAINED WITH SMALL AND LARGE FeOx NODULES, AND SOME MnO_2 NODULES (SMALL)
-40								
		16	◤	10 10 13	23	15	CL	SILTY CLAY, SIMILAR TO SS #15.
	160	17	◤	15 17 17	34	15	CL	SILTY CLAY, SIMILAR TO SS #15 & 16.
								END OF BORING AT 161.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DFG
DATE JUNE 3, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 170 - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 171 TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED MARCH 28, 1974 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 16,989.8 EAST 17,908.4 GROUND SURFACE ELEVATION 109.9

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
100	10							
								WASHED TO A DEPTH OF 79.9'
30	80	1	◤	52 50/3"		10	SP	SAND, POORLY GRADED FINE TO MEDIUM, LESS THAN 1% GRAVEL TO 1.0 IN. MAX., 3-5% FINES, DARK YELLOWISH ORANGE. (10 YR 6/6)
		2	◤	21 50/6"		10	SP	SAND, POORLY GRADED FINE AND MEDIUM, MOSTLY MEDIUM, LESS THAN 1% GRAVEL TO 1.0 IN. MAX., 3-5% FINES, DARK YELLOWISH ORANGE. (10 YR 6/6)
20	90	3	◤	20 29 46	75	11	SP	SAND, UNIFORM, FINE, 2-3% MEDIUM AND COARSE SAND, 2-[illegible]% FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH SEVERAL SMALL AND LARGE CLAY BALLS, ONE LAYER OF CLAY 1/8" THICK, ONE CLAY POCKET 1" THICK IMBEDDED WITH COARSE SAND, AND 2-4% GRAVEL TO 0.9 IN. MAX.
		4	◤	20 40 50	90	11	SP	SAND, UNIFORM, FINE, 2-4% FINES, DARK YELLOWISH ORANGE. (10 YR 6/6)
10	100	5	◤	15 25 45	70	11	SP	SAND, UNIFORM, FINE, 2-3% GRAVEL TO 0.5 IN. MAX., 2-4% FINES, DARK YELLOWISH ORANGE. (10 YR 6/6)
		6	◤	25 50/6"		9	SP	SAND, UNIFORM, FINE, 2-4% FINES, DARK YELLOWISH ORANGE. (10 YR 6/6)
0	110	7	◤	15 32 50	82	10	SP	SAND, UNIFORM, FINE, 2-3% MEDIUM SAND, 4-7% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE PINK. (5 YR 7/2)
		8	◤	23 83 50/3"		11	[illegible]	SAND, UNIFORM, FINE, 5-10% MEDIUM SAND, 5-8% NON PLASTIC TO SLIGHTLY PLASTIC FINES, VARIGATED PALE YELLOWISH ORANGE (10 YR 8/6) AND DARK YELLOWISH ORANGE (10 YR 6/6) WITH LESS THAN 1% GRAVEL TO 0.7 IN. MAX.
-10	120	9	◤	42 50/4"		7	SP	SAND, POORLY GRADED FINE AND MEDIUM, MOSTLY MEDIUM, 3-5% FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH ONE GRAVEL 0.8 IN. IN SIZE.
		10	◤	24 50/6"		8	SP	SAND, POORLY GRADED FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 4-7% FINES, MODERATE BROWN (5 YR 4/4) WITH 1-2% GRAVEL TO 0.6 IN. MAX.
-20	130	11	◤	41 50/3 1/2"		7	SP	SAND, GRADED MEDIUM 3-4% FINE SAND, 2-3% FINES, GRAYISH ORANGE. (10 YR 7/4)
		12	◤	23 23 48	71	9	SP	SAND, POORLY GRADED FINF TO COARSE, MOSTLY MEDIUM AND COARSE, 3-5% GRAVEL TO 0.7 IN. MAX., 5-6% FINES, MODERATE YELLOWISH BROWN. (10 YR 5/4)
-30	140	13	◤	29 50/3 1/2"		8	SP	SAND, POORLY GRADED FINE TO COARSE, MOSTLY FINE AND MEDIUM, LESS THAN 1% GRAVEL TO 0.7 IN. MAX., 2-4% FINES, PALE YELLOWISH BROWN. (10 YR 6/2)

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 25, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 171-A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 171 TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED MARCH 28, 1974) DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 16,989.8 EAST 17,908.4 GROUND SURFACE ELEVATION 109.9

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		14	◤	19 85 60	145	7	SP	SAND, POORLY GRADED FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 1-2% GRAVEL TO 0.6 IN. MAX., 4-6% FINES, PALE YELLOWISH BROWN. (10 YR 6/2)
-40	150	15	◤	9 14 21	35	18	CL	SILTY CLAY, MODERATELY PLASTIC, PALE OLIVE (10 Y 6/2) SEVERELY STAINED WITH SMALL MnO_2 AND FeOx NODULES.
		16	◤	15 20 35	55	18	CL	SILTY CLAY, MODERATELY PLASTIC, PALE OLIVE (10 Y 6/2) SEVERELY STAINED WITH SMALL FeOx NODULES.
-50	160	17	◤	9 17 26	43	18	CL	SILTY CLAY, MODERATELY PLASTIC, DARK GREENSIH GRAY (5 6 4/1[WITH SMALL DESICCATED CLAY NODULES.
								END OF BORING AT 161.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 25, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 171-B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 172 TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED MARCH 29, 1974 DRILLING COMPANY - EUSTIS ENGRG. CO LOGGED BY D.F.P.
COORDINATES, NORTH 17,140.0 EAST 17,723.4 GROUND SURFACE ELEVATION 114.5

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
110								
	10							
100								
								WASHED TO 85.0'.
30		1	◤	25 75/6"			SP	SAND, POORLY GRADED FINE TO COARSE, MOSTLY FINE, 3-5% FINES, MODERATE YELLOWISH BROWN. (10 YR 5/4)
	90	2	◤	24 28 23	51		SP	SAND, POORLY GRADED FINE TO COARSE, 5-8% MEDIUM AND COARSE SAND, 4-8% GRAVEL TO 1.0 IN. MAX., 3-5% FINES, MODERATE YELLOWISH BROWN. (10 YR 5/4)
20		3	◤	20 23 28	51		SP	SAND, UNIFORM, FINE, 2-5% FINES GRAYISH ORANGE. (10 YR 7/4)
	100	4	◤	13 17 18	35	8	SP	SAND, SIMILAR TO SS 3.
10		5	◤	15 27 43	70	10	SP	SAND, SIMILAR TO SS 3.
	110	6	◤	18 50/6"		7	SP	SAND, SIMILAR TO SS 3.
0		7	◤	16 34 42	76	9	SP	SAND, SIMILAR TO SS 3 EXCEPT COLORING IS PALE YELLOWISH BROWN (10 YR 6/2) AND GRAYISH ORANGE (10 YR 7/4).
	120	8	◤	22 39 46	85	8	SP	SAND, UNIFORM, FINE TO VERY FINE, 3-5% FINES GRAYISH ORANGE. (10 YR 7/4)
-10		9	◤	40 50/3"		8	SP	SAND, UNIFORM, FINE, 4-8% MEDIUM SAND, 3-6% FINES, GRAYISH ORANGE (10 YR 7/4)
	130	10	◤	25 50/6"		8	SW	SAND, WELL GRADED, FINE AND MEDIUM, 2-5% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4) AND PALE YELLOWISH BROWN (10 YR 6/2).
-20		11	◤	17 34 46	80	8	SW	SAND, WELL GRADED MEDIUM, 3-7% COARSE SAND, [illegible]-5% FINES, MODERATE YELLOWISH BROWN. (10 YR 5/4)
	140	12	◤	25 50/6"		7	SP	SAND, POORLY GRADED FINE TO COARSE, 5-10% MEDIUM AND COARSE SAND, LESS THAN 1% GRAVEL TO 0.9 IN. MAX., 3-5% FINES, GRAYISH ORANGE. (10 YR 7/4)
-30		13	◤	28 50/6"		8	SP	SAND, POORLY GRADED FINE TO COARSE, MOSTLY MEDIUM, LESS THAN 1% GRAVEL TO 0.6 IN. MAX., 2-5% FINES, MODERATE YELLOWISH BROWN. (10 YR 5/4)

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 27, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 172-A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 172 TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED MARCH 29, 1974 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,140.0 EAST 17,723.4 GROUND SURFACE ELEVATION 114.5

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
	150	14	◤	100/6"		6	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, [illegible] GRAVELTTO 1.5 IN. MAX., 3-6% SLIGHTLY TO MODERATELY PLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4) WITH A 1/2" THICKNESS OF HIGHLY PLASTIC CLAY.
-40		15	◤	8 8 14	22	18	CL	SILTY CLAY, MODERATELY BLASTIC, YELLOWISH GRAY (5 Y 7/2) SEVERELY STAINED WITH MnO_2 AND FeOx LENSES AND SMALL NODULES.
	160	16	◤	8 15 17	32	18	CL	SILTY CLAY, MODERATELY PLASTIC, MOTTLED YELLOWISH GRAY (5 Y 7/2) AND DUSKY YELLOW (5 Y 6/4), MODERATELY STAINED WITH VERY SMALL FeOx NODULES.
-50		17	◤	11 13 14	27	18	CL	SILTY CLAY, SIMILAR TO SS 16.
								END OF BORING AT 166.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 27, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 172-B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 173 TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED MARCH 27, 1974 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 16,973.6 EAST 17,516.9 GROUND SURFACE ELEVATION 104.7

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
100 90	10							
30								WASHED TO A DEPTH OF 75'.
		1	◤	24 24 33	57	12	SP	SAND, UNIFORM, FINE TO VERY FINE, 4-8% SLIGHTLY PLASTIC FINES, VARIGATED, GRAYISH ORANGE (10 YR 7/4) AND MODERATE YELLOWISH BROWN (10 YR 5/4)
	80	2	◤	55 50/6"		8	SP	SAND, POORLY GRADED FINE TO MEDIUM, MOSTLY FINE, 2-3% GRAVEL TO 0.7 IN. MAX., DARK YELLOWISH ORANGE. (10 YR 6/6)
20		3	◤	2 31 36	67	15	SC SP	CLAYEY SAND, TOP 8", UNIFORM, VERY FINE, 6-10% HIGHLY PLASTIC FINES, DARK YELLOWISH ORANGE. (10 YR 6/6) SAND, BOTTOM 7", POORLY GRADED, FINE TO COARSE, MOSTLY FINE, AND MEDIUM, 3-5% GRAVEL TO 0.6 IN. MAX., 3-7% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE. (10 YR 6/6)
	90	4	◤	31 27 21	48	10	SP	SAND, UNIFORM, FINE, 4-8% SLIGHTLY PLASTIC FINES, DARK YELLOWISH-ORANGE (10 YR 6/6) WITH 3-5% GRAVEL TO 1.3 IN. MAX., NUMEROUS LAYERS OF SANDY CLAY 1/4" - 1" THICK AND A FEW SMALL CLAY BALLS.
10		5	◤	48 50 3 1/2"		7	SP	SAND, UNIFORM, FINE, 2-4% FINES, GRAYISH ORANGE. (10 YR 7/4)
	100	6	◤	27 50/6"		8	SP	SAND, UNIFORM, FINE, 2-4% FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH A 1/8" THICK LAYER OF SANDY CLAY.
0		7	◤	57 50/2"		7	SP	SAND, POORLY GRADED FINE TO MEDIUM, MOSTLY MEDIUM, 2-[illegible] GRAVEL TO 0.6 IN. MAX., 3-5% FINES, DARK YELLOWISH ORANGE. (10 YR 6/6)
	110	8	◤	39 50 2 1/2"		7	SP	SAND, POORLY GRADED FINE TO COARSE, MOSTLY MEDIUM, 3-5% GRAVEL TO 0.6 IN. MAX., 2-4% FINES, MODERATE YELLOWISH BROWN. (10 YR 5/4)
-10		9	◤	32 50 5 1/2"		8	SP	SAND, UNIFORM, FINE, 2-3% FINES, GRAYISH ORANGE. (10 YR 7/4)
	120	10	◤	35 48 47	95	10	SP	SAND, SIMILAR TO SS 9.
-20		11	◤	21 36 50/4"		11	SP	SAND, UNIFORM, FINE TO VERY FINE, 3-6% FINES, VARIGATED, VERY PALE ORANGE (10 YR 8/2) AND PALE YELLOWISH BROWN. (10 YR 6/2)
	130	12	◤	20 19 31	50	9	SP	GRAVELLY SAND, POORLY GRADED FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 10-15% GRAVEL TO 0.8 IN. MAX., 6-8% MODERATELY PLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4) WITH A 3" LAYER OF GRAVELLY CLAY AT TOP OF SAMPLE.
-30		13	◤	49 50/5"		4	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY COARSE, 8-12% GRAVEL TO 0.8 IN. MAX., 5-10% SLIGHTLY TO MODERATELY PLASTIC FINES, MODERATE YELLOWISH BROWN. (10 YR 5/4)

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD DFG
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 173 - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 173 TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED MARCH 27, 1974 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 16,973.6 EAST 17,516.9 GROUND SURFACE ELEVATION 104.7

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
	140	14	◤	28 45 40	85	8	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 10-15% GRAVEL TO 1.0 IN. MAX., 5-8% SLIGHTLY PLASTIC FINES, MODERATE BROWN (5 YR 4/4), SOME GRAVEL IS CLAY COATED.
-40		15	◤	31 50/3"		5	GC	GRAVELLY CLAY, HIGHLY PLASTIC, 35-40% GRAVEL TO 0.8 IN. MAX., 2-3% FINE SAND, YELLOWISH GRAY. (5 Y 7/2)
	150	16	◤	4 7 10	17	18	CH	SILTY CLAY, HIGHLY PLASTIC, YELLOWISH GRAY. (5 Y 7/2)
-50		17	◤	2 6 8	14	18	SM	SILTY SAND, UNIFORM, VERY FINE, 15-18% HIGHLY PLASTIC FINES, YELLOWISH GRAY. (5 Y 7/2)
	160	18	◤	8 12 22	34	18	CL	SILTY CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 7/2) WITH LARGE MnO_2 POCKETS 1/2" - 1" THICK, SMALL MnO_2 NODULES, AND A LAYER OF SANDY CLAY 4" THICK WITH COARSE SAND.
-60		19	◤	17 20 32	52	18	CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, DESICCATED, DUSKY YELLOW (5 Y 6/4) WITH SOME SMALL MnO_2 AND FeOx NODULES.
	170	20	◤	12 16 21	37	18	CL	SILTY CLAY, MODERATELY PLASTIC, DESICCATED, DARK GREENSIH GRAY. (5 G 4/1)
								END OF BORING AT 171.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD DFG
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 173 - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 200 TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED JANUARY 3, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,812.8 EAST 17,211.5 GROUND SURFACE ELEVATION 109.6

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		1	◤	3 5 5	10	12	ML	CLAYEY SILT, HIGHLY PLASTIC, SEVERELY MOTTLED, LIGHT GRAY (N 7) DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE BROWN (5 YR 3/4)
100	10	2	◤	8 18 23	41	13	[illegible]	SANDY CLAY, HIGHLY PLASTIC, 20-25% FINE SAND, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6), PALE YELLOWISH ORANGE (10 YR 8/6), LIGHT GRAY (N 7) AND MODERATE RED (5 R 4/6).
		3	◤	13 21 21	42	10	ML	CLAYEY SILT, MODERATELY PLASTIC, 6-10% VERY FINE SAND, MOTTLED, PALE YELLOWISH ORANGE (10 YR 8/6) AND DARK YELLOWISH ORANGE (10 YR 6/6).
90	20	4	◤	8 11 11	22	13	ML	CLAYEY SILT, SIMILAR TO SS 3 EXCEPT COLORING IS MOTTLED WHITE (N 7) AND PALE YELLOWISH ORANGE (10 YR 8/6).
		5	◤	8 11 14	25	13	SC	CLAYEY SAND, UNIFORM, FINE, 8-12% HIGHLY PLASTIC FINES, WHITE (N 7)
80	30	6	◤	5 9 7	16	11	SP	SAND, UNIFORM, FINE, 6-8% MODERATELY TO HIGHLY PLASTIC FINES, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATELY REDDISH BROWN (10 R 4/6) WITH HIGHLY PLASTIC, VERY DUSKY RED PURPLE (5 RP 2/2) AND VERY PALE ORANGE (10 R 8/2), FATTY CLAY LAYERS 1/4" - 3/4" THICK, THROUGHOUT SAMPLE.
		7	◤	5 7 9	16	9	SP	SAND, UNIFORM, FINE, 3-8% MODERATELY PLASTIC FINES, DUSKY RED (5 R 3/4).
70	40	8	◤	12 8 7	15	12	SC	CLAYEY SAND, UNIFORM, FINE, 10-20% HIGHLY PLASTIC FINES BANDED COLORING OF DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE RED (5 R 4/6).
		9	◤	6 7 9	16	10	SC	CLAYEY SAND, UNIFORM, FINE, 8-12% HIGHLY PLASTIC FINES, MOTTLED, DARK YELLOWISH ORANGE (10 R 6/6) AND MODERATE REDDISH ORANGE (10 R 6/6).
60	50	10	◤	10 10 8	18	9	SP	SAND, UNIFORM, FINE, 8-10% HIGHLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6) AND MODERATE REDDISH ORANGE (10 R 6/6).
		11	◤	3 9 15	24	10	SP	SAND, UNIFORM, FINE, 4-6% SLIGHTLY TO MODERATELY PLASTIC FINES, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE REDDISH ORANGE (10 R 6/6).
50	60	12	◤	2 2 2	4	14	CH	CLAY, HIGHLY PLASTIC, FATTY, SEVERELY MOTTLED DUSKY RED (5 R 3/4), VERY DARK RED (5 R 2/6), GRAYISH RED PURPLE (5 RP 4/2), MODERATE RED (5 R 4/6), PALE YELLOWISH ORANGE (10 YR 8/4), AND GRAYISH ORANGE PINK (10 R 8/2), WITH THIN LAYERS 1/8" - 1/4" THICK OF FINE SAND THROUGHOUT SAMPLE.
		13	◤	3 2 4	6	13	SC-SM	CLAYEY SAND, UNIFORM, FINE, 20-25% HIGHLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6) WITH A 2" HIGHLY PLASTIC, FATTY CLAY LAYER AT TOP OF SAMPLE.
40	70	14	◤	3 5 8	13	9	SP	SAND, UNIFORM, VERY FINE, 8-10% MODERATELY TO HIGHLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6) WITH 1/4" - 1" THICK CLAY POCKETS THROUGHOUT SAMPLE.
		15	◤	7 7 9	16	14	SP	SAND, UNIFORM, FINE, 4-6% MODERATELY PLASTIC FINES, MOTTLED MODERATE REDDISH ORANGE (10 R 6/6) AND PALE YELLOWISH ORANGE (10 YR 8/6)
30	80	16	◤	25 29 20	49	5	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, 3-6% GRAVEL TO 1.0 IN. MAX., 2-4% FINES, GRAYISH ORANGE (10 YR 7/4).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD DFG
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 200-A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 200 TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED JANUARY 3, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,812.8 EAST 17,211.5 GROUND SURFACE ELEVATION 109.6

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		17	◤	23 27 33	60	6	SP	SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM SAND, CLEAN, 1-2% FINES, GRAYISH ORANGE (10 YR 7/4) AND PAKE YELLOWISH ORANGE (10 YR 8/6).
20	90	18	◤	11 13 17	30	7	SP	SAND, UNIFORM, FINE, CLEAN, 1-3% FINES, GRAYISH ORANGE (10 YR 7/4) AND MODERATE ORANGE PINK (10 R 7.4).
		19	◤	10 17 20	37	7	SP	SAND, UNIFORM, FINE, 3-5% FINES, GRAYISH ORANGE (10 YR 7/4) AND MODERATE ORANGE PINK (10 R 7/4).
10	100	20	◤	14 20 37	57	7	SP	SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM SAND, CLEAN, 1-3% FINES, GRAYISH ORANGE (10 YR 7/4) WITH 3 PIECES OF GRAVEL TO 0.8 IN. MAX.
		21	◤	15 29 31	60	8	SP	SAND, UNIFORM, FINE, 3-6% FINES, MOTTLED VERY PALE ORANGE (10 YR 8/2) AND GRAYISH ORANGE (10 YR 7/4).
0	110	22	◤	15 21 23	44	6	SP	SAND, UNIFORM, FINE, CLEAN, 1-2% FINES, VERY PALE ORANGE (10 YR 8/2).
		23	◤	14 22 28	50	7	SP	SAND, SIMILAR TO SS 22.
-10	120	24	◤			6	SP	SAND, UNIFORM, CLEAN, FINE, 1-3% FINES GRAYISH ORANGE (10 YR 7/4) AND VERY PALE ORANGE (10 YR 8/2) LESS THAN 1% GRAVEL TO 0.6 IN. MAX.
		25	◤	14 31 46	77	7	SP	SAND, UNIFORM, FINE, 3-6% FINES, VERY PALE ORANGE (10 YR 8/2) AND GRAYISH ORANGE (10 YR 7/4).
-20	130	26	◤	33 50 11"		4	SP	SAND, UNIFORM, FINE, WITH LESS THAN 1% MEDIUM SAND, CLEAN, 1-2% FINES, GRAYISH ORANGE (10 YR 7/4).
		27	◤	35 50 10"		6	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, CLEAN 1-2% FINES, GRAYISH ORANGE (10 YR 7/4).
-30	140	28	◤	19 24 26	50	7	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, 3-6% GRAVEL TO 0.5 IN. MAX., 3-6% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) AND VERY PALE ORANGE (10 YR 8/2) WITH 2" SILTY CLAY LAYER.
		29	◤	26 32 35	67	7	GP	SAND, GRAVEL, POORLY GRADED TO 0.9 IN. MAX., 8-12% FINE TO COARSE SAND, 5-8% SLIGHTLY PLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4) GRAYISH ORANGE (10 YR 7/4).
-40	150	30	◤	7 10 8	18	18	CH	SILTY CLAY, HIGHLY PLASTIC, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) AND GRAYISH YELLOW (5 Y 8/4) SEVERELY MOTTLED WITH SMALL MnO_2 NODULES.
		31	◤	5 10 17	27	18	CH	SILTY CLAY, MODERATELY PLASTIC, BANDED COLORING OF PALE YELLOWISH ORANGE (10 YR 8/6) GRAYISH YELLOW (5 Y 8/4).
-50	160	32	◤	6 13 14	27	18	CH	CLAY, MODERATELY PLASTIC, DESICCATED, YELLOWISH GRAY (5 Y 8/1).
								END OF BORING AT 161.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD DFG
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 200-B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 201 TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED JANUARY 3, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,618.7 EAST 17,165.5 GROUND SURFACE ELEVATION 106.3

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"¹	"N" VALUE	RECOVERY³	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
100		1	◤	5 7 9	16	16	ML	CLAYEY SILT, MODERATELY TO HIGHLY PLASTIC, LESS THAN 5% VERY FINE SAND, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE YELLOWISH BROWN (10 YR 5/4).
	10	2	◤	9 11 13	24	17	CH	SANDY CLAY, MODERATELY TO HIGHLY PLASTIC, 20-25% FINE SAND, MOTTLED LIGHT GRAY (N 8) AND DARK YELLOWISH ORANGE (10 YR 6/6).
90			◤	10 12 14	26	10	ML	CLAYEY SILT, SLIGHTLY TO MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6) AND VERY LIGHT GRAY (N 8).
	20	4	◤	17 26 36	62	10	SP	SAND, UNIFORM, VERY FINE, 8-10% SLIGHTLY TO MODERATELY PLASTIC FINES, MOTTLED, LIGHT BROWN (5 YR 5/6) DARK YELLOWISH ORANGE (10 YR 6/6) AND LIGHT GRAY (N 7).
80		5	◤	6 11 12	23	10	SM-SC	SILTY SAND, UNIFORM, VERY FINE, 15-20% HIGHLY PLASTIC FINES, MODERATE REDDISH BROWN (10 R 4/6).
	30	6	◤	7 11 12	23	14	SM-SC	SIMILAR TO SS 5 EXCEPT SAMPLE IS SPARSLEY MOTTLED THROUGHOUT WITH MEDIUM SIZED CLAY BALLS.
70		7	◤	4 11 11	22	7	SP	SAND, UNIFORM, VERY FINE, 8-10% HIGHLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH A 2¹/4" LAYER OF VERY DARK RED (5 R 2/6) PALE RED PURPLE (5 R 6/2) CLAYEY SAND LAYER.
	40	8	◤	5 6 7	13	10	SC	CLAYEY SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM AND COARSE SAND, 15-20% MODERATELY TO HIGHLY PLASTIC FINES, MODERATE REDDISH BROWN (10 R 4/6) AND DARK YELLOWISH ORANGE (10 YR 6/6).
60		9	◤	6 6 7	13	11	SC	CLAYEY SAND, UNIFORM, FINE, 20-25% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	50	10	◤	4 7 9	16	12	SP	SAND, UNIFORM, FINE, 6-8% HIGHLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE REDDISH ORANGE (10 R 6/6) WITH 1/2" VERY FATTY HIGHLY PLASTIC CLAY LAYER AT TOP OF SAMPLE.
50		11	◤	11 27 48	75	15	SP	SAND, UNIFORM, FINE, 3-5% FINES DARK YELLOWISH ORANGE (10 YR 6/6).
	60	12	◤	5 7 7	14	9	SC	CLAYEY SAND, UNIFORM, FINE, 3-4% MEDIUM AND COARSE SAND, 25-30% HIGHLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) CONTAINING HIGHLY PLASTIC CLAY POCKETS 1/4" - 2" THICK, WITH 1-2% GRAVEL TO 0.8 IN. MAX.
40		13	◤	3 3 6	9	18	GC	CLAYEY GRAVEL, POORLY GRADED TO 1.0 IN. MAX., 4-8% MEDIUM AND COARSE SAND, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) GRAYISH PINK (5 R 8/2) MODERATE ORANGE PINK (4 YR 8/4) AND MODERATE REDDISH BROWN (10 R 4/6).
	70	14	◤	1 3 6	9	15	SP	SAND, UNIFORM, VERY FINE, 8-10% MODERATELY TO HIGHLY PLASTIC FINES, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE ORANGE PINK (10 R 6/6).
30		15	◤	9 16 26	42	10	SP	SAND, UNIFORM, FINE, 3-6% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	80	16	◤	16 27 36	63	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 1-2% GRAVEL TO 0.9 IN. MAX., 3-5% FINES, DARK YELLOWISH ORANGE (10 YR 6/6) AND GRAYISH ORANGE (10 YR 7/4).

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. E. GREENWOOD
DEG
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 201 - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 201 TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED JANUARY 3, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,618.7 EAST 17,165.5 GROUND SURFACE ELEVATION 106.3

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"¹	"N" VALUE	RECOVERY³	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
20		17	◤	8 16 12	28	10	SP	SAND, UNIFORM, FINE, 4-8% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	90	18	◤	3 3 12	15	16	SM-SC	SILTY SAND, UNIFORM, VERY FINE. 25-30% MODERATELY TO HIGHLY PLASTIC FINES, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE ORANGE (10 R 6/6).
10		19	◤	21 32 27	59	5	SM-SC	SILTY SAND, UNIFORM, VERY FINE, 15-20% MODERATELY TO HIGHLY PLASTIC FINES, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE REDDISH ORANGE (10 R 6/6) AND PALE YELLOWISH ORANGE (10 YR 8/6).
	100	20	◤	16 26 29	55	9	SP	SAND, UNIFORM, FINE, CLEAN, 1-3% FINES, GRAYISH ORANGE (10 YR 7/4).
0		21	◤	12 27 40	67	5	SP	SAND, UNIFORM, FINE, 3-6% SLIGHTLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
	110	22	◤	11 23 29	52	7	SP	SAND, UNIFORM, FINE, CLEAN, 1-3% FINES, GRAYISH ORANGE (10 YR 7/4).
-10		23	◤	15 31 38	69	10	SP	SAND, SIMILAR TO SS 22.
	120	24	◤	17 35 41	76	7	SP	SAND, UNIFORM, FINE, 3-5% FINES, GRAYISH ORANGE (10 YR 7/4) WITH TWO PIECES OF GRAVEL 2.0 AND 1.9 IN. IN SIZE.
-20		25	◤	15 22 21	43	14	SP	SAND, UNIFORM, FINE, 3-5% FINES, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) PALE YELLOWISH ORANGE (10 YR 8/6) AND VERY PALE ORANGE (10 YR 8/2).
	130	26	◤	13 13 12	25	10	CH	CLAY, HIGHLY PLASTIC, 6-8% VERY FINE SAND, MOTTLED PINKISH GRAY (5 YR 8/1) AND GRAYISH PINK (5 R 8/2) WITH VERY THIN, MODERATE RED (5 R 4/6) SILT VEINS, AND A 1 1/2" THICK FINE TO COARSE SAND POCKET AT TOP.
-30		27	◤	4 8 16	24	11	SM	SILTY SAND, UNIFORM, VERY FINE, 25-30% HIGHLY PLASTIC FINES, MODERATE ORANGE PINK (10 R 7/4) AND PALE RED (10 R 6/2) WITH A 2" THICK, SILTY CLAY LAYER, HIGHLY PLASTIC.
	140	28	◤	5 7 18	25	15	SM	SILTY SAND, SIMILAR TO SS 27.
-40		29	◤	8 12 19	31	18	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 3-6% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2) SEVERE MnO_2 AND FeOx STAINING.
	150	30	◤	8 15 17	32	18	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, DESICCATED POCKETS OF CLAY, MOTTLED YELLOWISH GRAY (5 Y 8/1) AND LIGHT OLIVE GRAY (5 Y 6/1), MINOR MnO_2 AND FeOx STAINING.
-50	156.5	31	◤	10 16 18	34	18	CH	SILTY CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 8/1) WITH VERY SMALL DESICCATED CLAY NODULES.
								END OF BORING AT 156.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. E. GREENWOOD
DEG
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 201 - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 202 TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED DEC. 27, 1972 - JAN. 2, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY E.M.W.
COORDINATES, NORTH 17,423.1 EAST 17,138.0 GROUND SURFACE ELEVATION 107.4

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"¹	"N" VALUE	RECOVERY³	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
100		1	◤	9 17 17	34	15	ML	CLAYEY SILT, SLIGHTLY PLASTIC, VERY STIFF, MODERATE YELLOWISH BROWN (10 YR 5/4). LOESS.
	10	2	◤	6 9 12	21	15	CL	SILTY CLAY, MODERATELY PLASTIC, 4-6% VERY FINE SAND, VERY STIFF, YELLOWISH GRAY (5 Y 7/2) MOTTLED WITH WHITE, MINOR FeOx STAINING.
90		3	◤	6 14 12	26	18	CL	SILTY CLAY, MODERATELY PLASTIC, 8-10% VERY FINE SAND, LIGHT OLIVE GRAY (5 Y 5/2) MOTTLED WITH DARK YELLOWISH ORANGE (10 YR 6/6) AT TOP, CHANGING TO DARK YELLOWISH ORANGE AND LIGHT GRAY. (N 7).
	20	4	◤	8 12 18	30	15	SC	CLAYEY SAND, UNIFORM, FINE, 10-15% MODERATELY PLASTIC FINES, DENSE, LIGHT GRAY, (N 7) AND PALE YELLOWISH ORANGE (10 YR 8/4).
80		5	◤	8 8 12	20	18	SC	CLAYEY SAND, UNIFORM, FINE, 10-15% MODERATELY PLASTIC FINES, DENSE, LIGHT GRAY (N 7), HEAVILY STAINED DARK YELLOWISH ORANGE (10 YR 6/6), MANY LARGE LENSES OR POCKETS CLAY, HIGHLY PLASTIC, FIRM, DUSKY RED (5 R 3/4), ALSO YELLOWISH GRAY (5 Y 7/2).
	30	6	◤	8 8 9	17	18	SP	SAND, UNIFORM, FINE, 3-6% PLASTIC FINES, MODERATE REDDISH BROWN (10 R 4/6), VERY MANY LENSES 0.05 TO 0.3 IN. THICK. CLAY, HIGHLY PLASTIC, FIRM, MODERATE RED (5 R 4/6). NOTE: CLAY COMPRISES 40-50% OF SAMPLE.
70		7	◤	6 7 7	14	15	SP	SAND, UNIFORM, FINE, 4-6% PLASTIC FINES, MEDIUM DENSE, MODERATE REDDISH BROWN (10 R 4/6).
	40	8	◤	6 9 8	17	16	SP	SAND, MOSTLY UNIFORM, FINE, [illegible] COARSE, SAND AND GRAVEL TO 0.4 IN. MAX., MODERATE REDDISH BROWN (10 R 4/6) AND DARK YELLOWISH ORANGE (10 YR 6/5), SEVERAL POCKETS OR BALLS CLAY, HIGHLY PLASTIC, MODERATE RED (5 R 4/6). NOTE: COARSE SAND AND GRAVEL APPEARS WITH CLAY BALLS AS LARGE POCKETS IN THE FINE SAND.
60		9	◤	7 9 10	19	18	SP	SAND, UNIFORM, FINE, LESS THAN 4% FINES, MEDIUM DENSE, MODERATE REDDISH BROWN (10 R 4/6), FEW SMALL POCKETS MODERATE RED (5 R 4/6) HIGHLY PLASTIC, CLAY.
	50	10	◤	8 7 8	15	15	SP	SAND, UNIFORM, FINE, FEW COARSE SAND AND GRAVEL TO 0.3 IN. MAX., LESS THAN 4% FINES, MEDIUM DENSE, MODERATE REDDISH BROWN (10 R 5/6).
50		11	◤	7 10 15	25	13	SP	SAND, WIDELY GRADED, COARSE TO FINE, MOSTLY FINE, 6-8% GRAVEL TO 0.5 IN. MAX., DARK YELLOWISH ORANGE (10 YR 7/6), FEW LARGE POCKETS CLAY, HIGHLY PLASTIC, DARK YELLOWISH ORANGE (10 YR 7/6) WITH SLIGHT PINKISH CAST.
	60	12	◤	5 8 12	20	15	SP	SAND, UNIFORM, VERY FINE, MEDIUM DENSE, PALE REDDISH ORANGE (10 R 8/6).
40		13	◤	4 5 7	12	18	SP CH	TOP 8 IN.: SAND, UNIFORM, VERY FINE, LOOSE, MODERATE YELLOWISH ORANGE (10 YR 7/6), FEW SMALL POCKETS SOFT, HIGHLY PLASTIC CLAY, REDDISH ORANGE (10 R 5/6). BOTTOM 10 IN.: CLAY, HIGHLY PLASTIC, FIRM, DUSKY RED (5 R 3/4).
	70	14	◤	6 6 17	23	19	CH SP	CLAY, HIGHLY PLASTIC, SOFT, MODERATE RED (5 R 4/6), THICKLY INTERLAYERED WITH: SAND, UNIFORM, FINE, CLEAN, MODERATE YELLOWISH ORANGE (10 YR 6/6).
30		15	◤	9 22 26	48	13	SP	SAND, UNIFORM, FINE, WITH FEW MEDIUM AND COARSE, FEW GRAVEL TO 0.4 IN. MAX., DARK YELLOWISH ORANGE (10 YR 6/4).
	80	16	◤	13 15 21	36	13	SP CH	TOP 9 IN.: SAND, UNIFORM, FINE, DARK YELLOWISH ORANGE (10 YR 6/6) WITH 0.3 IN. LAYER SOFT, PLASTIC CLAY, GRAYISH ORANGE (10 YR 7/4). BOTTOM 4 IN.: CLAY, MODERATELY TO HIGHLY PLASTIC, FIRM, GRAYISH ORANGE (10 YR 7/4) ONE POCKET FINE TO COARSE SAND AND ONE PIECE GRAVEL 0.4 IN.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. E. GREENWOOD
DEG
DATE NOVEMBER 27, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 202 - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 202 TYPE OF BORING SHEET 2 OF 2
DATE DRILLED DEC. 27, 1972 - JAN. 2, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY E.M.W.
COORDINATES, NORTH 17,423.1 EAST 17,138.0 GROUND SURFACE ELEVATION 107.4

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"¹	"N" VALUE	RECOVERY³	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
20		17	◤	21 20 26	46	14	SP	SAND, UNIFORM, FINE, LESS THAN 1% FINES, DENSE, MODERATE YELLOWISH ORANGE (10 YR 7/6).
	90	18	◤	14 20 27	47	9	SP	SAND, UNIFORM, FINE, CLEAN, DENSE, DARK YELLOWISH ORANGE (10 YR 5/6) WITH POCKET GRAYISH OLIVE GREEN (5 GY 3/2).
10		19	◤	18 50/7"		10	SP	SAND, UNIFORM, FINE, WITH FEW COARSE AND FEW GRAVEL TO 0.4 IN. MAX., CLEAN, VERY DENSE, MODERATE YELLOWISH ORANGE (10 YR 7/6).
	100	20	◤	21 50/8"		13	SP	SAND, UNIFORM, FINE, CLEAN, VERY DENSE, GRAYISH ORANGE PINK (5 YR 8/2).
0		21	◤	16 23 24	47	10	SP	SAND, UNIFORM, FINE, CLEAN, DENSE, GRAYISH ORANGE (10 YR 7/4).
	110	22	◤	25 20 26	46	10	SP	SAND, UNIFORM, FINE, CLEAN, DENSE, MODERATE YELLOWISH BROWN (10 YR 6/4) AND LIGHT GRAYISH ORANGE (10 YR 8/4).
-10		23	◤	55 50/3"		8	SP	SAND, MOSTLY GRADED FINE, FEW MEDIUM AND COARSE, FEW GRAVEL TO 0.4 IN. MAX., VERY DENSE, MODERATE YELLOWISH ORANGE (10 YR 7/6).
	120	24	◤	29 50/8"		11	SP	SAND, UNIFORM, FINE, FEW COARSE, FEW GRAVEL TO 0.6 IN. MAX., MODERATE YELLOWISH ORANGE (10 YR 7/6).
-20		25	◤	23 12 16	28	10	SP GC	TOP 4 IN.: SAND, WIDELY GRADED, COARSE TO FINE, 4-6% GRAVEL TO 0.5 IN. MAX., DARK YELLOWISH ORANGE (10 YR 5/6). BOTTOM 6 IN.: CLAYEY GRAVEL, SUBROUNDED, TO 0.8 IN. MAX., 10-15% COARSE TO FINE SAND, 25-30% MODERATELY PLASTIC CLAY, DARK YELLOWISH ORANGE (10 YR 6/6). NOTE: CLAY OCCURS IN LARGE POCKETS OR BALLS, FRESH CLAY IS VERY LIGHT GRAY (N 8).
	130	26	◤	4 4 6	10	18	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 3% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2) WITH MINOR FeOx STAINING IN THIN BANDS.
-30		27	◤	7 20 30	50	13	CL SP	TOP 4 IN.: SILTY CLAY, MODERATELY PLASTIC, LESS THAN 3% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2) MOTTLED WITH MODERATE REDDISH ORANGE (10 R 6/6), MODERATE FeOx STAINING, ONE SMALL POCKET GRAVEL TO 0.4 IN. MAX. BOTTOM 9 IN.: SAND, UNIFORM, FINE, LESS THAN 2% FINES, DENSE, MODERATE YELLOWISH ORANGE (10 YR 7/6) WITH FEW SMALL POCKETS SAND SHOWING PINKISH CAST, FEW SMALL POCKETS SILTY CLAY AS ABOVE.
	140	28	◤	12 15 21	36	14	SP	SAND, UNIFORM, FINE, LESS THAN 2% FINES, DENSE, LIGHT ORANGE PINK (5 YR 7/4), THIN BANDS FeOx STAINING, POCKET SOFT, YELLOWISH GRAY (5 Y 7/2) CLAY.
-40		29	◤	30 50/5"		10	SP	SAND, UNIFORM, FINE, CLEAN, VERY DENSE, LIGHT YELLOWISH BROWN (10 YR 6/4).
	150	30	◤	7 10 12	22	8	CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, LESS THAN 3% VERY FINE SAND, VERY STIFF, LIGHT OLIVE GRAY (5 Y 6/2), AREA OF HEAVY FeOx STAINING, 2 IN. LAYER OF CLAYEY SILT.
-50		31	◤	8 11 22	33		CL ML	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, LESS THAN 3% VERY FINE SAND, HARD, LIGHT OLIVE GRAY (5 Y 6/2), THICKLY INTERLAYERED WITH: SILT AND CLAYEY SILT, NON PLASTIC TO SLIGHTLY PLASTIC, LIGHT OLIVE GRAY. (5 Y 6/2)
END OF BORING	161.5	32	◤	9 16 17	33	18	CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, LIGHT OLIVE GRAY (5 Y 5/2) WITH POCKETS CLAYEY SILT.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. E. GREENWOOD
DEG
DATE NOVEMBER 27, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 202 - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 203
DATE DRILLED DECEMBER 27, 1972
COORDINATES, NORTH 17,227.0
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 17,090.8
SHEET 1 OF 2
LOGGED BY D.F.P.
GROUND SURFACE ELEVATION 100.8

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"[1]	SAMPLE "N" VALUE	SAMPLE RECOVERY[3]	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
100								
		1	◤	8 11 11	22	14	ML	CLAYEY SILT, MODERATELY TO HIGHLY PLASTIC, SEVERELY MOTTLED, DUSKY YELLOW (5 Y 6/4), PALE YELLOWISH BROWN (10 R 6/2), LIGHT GRAY (N 8).
90	10	2	◤	5 9 13	22	17	ML	CLAYEY SILT, MODERATELY TO HIGHLY PLASTIC, LESS THAN 1% FINE SAND, MOTTLED, WHITE (N 9), MEDIUM LIGHT GRAY (N 6) WITH 1" - 2" THICK CLAY LAYERS THROUGHOUT SAMPLE.
		3	◤	7 18 26	44	15	ML	CLAYEY SILT, MODERATELY PLASTIC, LESS THAN 1% FINE SAND, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), LIGHT GRAY (N 7) AND WHITE (N 9).
80	20	4	◤	12 14 14	28	12	SP	SAND, POORLY GRADED, VERY FINE TOCCOARSE, MOSTLY VERY FINE AND FINE, 1-2% GRAVEL TO 0.4 IN. MAX., CONTAINING FEW PIECES OF WEATHERED FELDSPAR, [illegible]-8% MODERATELY PLASTIC FINES, LIGHT GRAY (N 7), AND WHITE (N 9) WITH THIN LAYERS 1/4" THICK OF SILTY CLAY AT MIDDLE OF SAMPLE.
		5	◤	5 7 8	15	12	SM	SILTY SAND, UNIFORM, FINE, 12-20% MODERATELY TO HIGHLY PLASTIC FINES, MOTTLED, PALE YELLOWISH ORANGE (10 YR 8/6) AND LIGHT GRAY (N 7).
70	30	6	◤	4 6 8	14	12	SM	SIMILAR TO SS 6 WITH ADDITION OF MODERATE REDDISH ORANGE (10 R 6/6) COLORING AT BOTTOM OF SAMPLE.
		7	◤	9 10 9	19	11	SP SC	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 3-4% GRAVEL TO 1.0 IN. MAX., 8-10% HIGHLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) GRAYISH ORANGE PINK (5 YR 7/2) WITH 1/8" - 1/4" THICK CLAYEY SAND LAYERS THROUGHOUT SAMPLE.
60	40	8	◤	6 7 8	15	9	SP	SAND, UNIFORM, FINE, 5-10% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE RED (5 R 4/6) WITH A 1 1/2" CLAY POCKET CONTAINING SANDS AND GRAVEL AT BOTTOM.
		9	◤	6 7 8	15	11	SP	SAND, UNIFORM, FINE, 3-6% SLIGHTLY TO MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
50	50	10	◤	15 16 18	34	11	SP	SAND, UNIFORM, FINE, 2-4% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) AND LIGHT BROWN (5 YR 5/6) WITH A 1" CLAY POCKET AT BOTTOM OF SAMPLE.
		11	◤	3 4 7	11	15	SM	SILTY SAND, UNIFORM, FINE, 15-20% MODERATELY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6), MODERATE REDDISH ORANGE (10 YR 6/6), MODERATELY MOTTLED WITH SMALL TO MEDIUM SIZED MnO_2 NODULES, AND 4" FATTY CLAY LAYER, PALE RED (10 YR 6/2), PALE REDDISH BROWN IN MIDDLE OF SAMPLE (10 R 5/4).
40	60	12	◤	4 9 12	21	12	SP	SAND, UNIFORM, FINE, 8-10% SLIGHTLY TO MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), MODERATE REDDISH ORANGE (10 R 6/6), OCCASIONALLY MOTTLED WITH MEDIUM SIZE MnO_2 NODULES.
		13	◤	7 11 15	26	12	SP	SAND, UNIFORM, FINE, 3-6% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6), SLIGHTLY MOTTLED WITH VERY SMALL CLAY FLAKES.
30	70	14	◤	9 15 21	36	11	SP	SAND, SIMILAR TO SS 13 EXCEPT NO CLAY FLAKES.
		15	◤	14 25 32	57	11	SP	SAND, UNIFORM, FINE, CLEAN 2-3% FINES, GRAYISH ORANGE PINK (5 YR 7/2).
20	80	16	◤	17 20 22	42	6	SP	SAND, UNIFORM, FINE, CLEAN, 1-3% FINES, GRAYISH ORANGE (10 YR 7/4).

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
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4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. E. GREENWOOD
DEG
DATE NOVEMBER 27, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 203-A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 203
DATE DRILLED DECEMBER 27, 1972
COORDINATES, NORTH 17,227.0
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 17,090.8
SHEET 2 OF 2
LOGGED BY D.F.P.
GROUND SURFACE ELEVATION 100.8

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"[1]	SAMPLE "N" VALUE	SAMPLE RECOVERY[3]	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		17	◤	26 35 43	78	10	SP	SAND, UNIFORM, FINE, CLEAN, 1-2% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
10	90	18	◤	12 17 24	41	12	SP	SAND, UNIFORM, FINE, 3-6% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) AND DARK YELLOWISH ORANGE (10 YR 6/6) WITH SMALL MnO_2 NODULES.
		19	◤	17 27 32	59	9	SP	SAND, POORLY GRADED, FINE AND MEDIUM, 3-4% FINES, GRAYISH ORANGE (10 YR 7/4), ONE PIECE OF GRAVEL 0.6 IN. IN SIZE.
0	100	20	◤	20 30 36	66	6	SP	SAND, UNIFORM, FINE, CLEAN, 1-2% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4) OCCASIONALLY MOTTLED WITH SMALL CLAY FLAKES AND MnO_2 NODULES.
		21	◤	21 32 41	73	7	SP	SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM SAND, CLEAN, 1-3% FINES, VERY PALE ORANGE (10 YR 8/2) AND MODERATE YELLOWISH BROWN (10 YR 5/4) WITH ONE PIECE OF GRAVEL TO 1.0 IN. IN SIZE.
-10	110	22	◤	14 17 23	40	7	GP	SANDY GRAVEL, POORLY GRADED, TO 1.2 IN. MAX., 10-20% FINE TO COARSE SAND, 5-8% SLIGHTLY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2) AND GRAYISH ORANGE (10 YR 7/4).
		23	◤	26 50 60	110	7	SP	SAND, UNIFORM, FINE, 1-2% MEDIUM SAND, CLEAN 1-3% FINES, VERY PALE ORANGE (10 YR 8/2) AND GRAYISH ORANGE (10 YR 7/4) WITH LESS THAN 1% GRAVEL TO 0.6 IN. MAX.
-20	120	24	◤	10 14 10	24	8	GP	SANDY GRAVEL, POORLY GRADED TO 0.9 IN. MAX., 20-25% FINE TO COARSE SAND, 4-8% SLIGHTLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6) AND DARK YELLOWISH ORANGE (10 YR 6/6) WITH A 2" THICK HIGHLY PLASTIC CLAY POCKET AT BOTTOM OF SAMPLE.
		25	◤	4 6 7	13	18	CH	SILTY CLAY, HIGHLY PLASTIC, 20-25% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2), OCCASIONALLY MOTTLED WITH SMALL FeOx STAINING.
-30	130	26	◤	17 27 31	58	10	SP	SAND, UNIFORM, FINE, 4-6% SLIGHTLY TO MODERATELY PLASTIC FINES, MOTTLED, MODERATE ORANGE PINK (5 YR 8/4) AND GRAYISH ORANGE PINK (5 YR 7/2) WITH A 1/4" THICK VERY SOFT, HIGHLY PLASTIC CLAY BANDS AT TOP OF SAMPLE.
		27	◤	10 15 20	35	9	SP	SAND, SIMILAR TO SS 26 EXCEPT NO CLAY BANDS.
-40	140	28	◤	30 49 58	107	10	SP	SAND, UNIFORM, FINE, CLEAN, 1-2% FINES, MOTTLED, MODERATE ORANGE PINK (5 YR 8/4), VERY PALE ORANGE (10 YR 8/2), AND GRAYISH ORANGE (10 YR 7/4).
		29	◤	9 14 18	32	11	CL	SILTY CLAY, MODERATELY PLASTIC, 10-15% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2) SEVERELY MOTTLED WITH FeOx STAINING AND SMALL MnO_2 NODULES, 1/4" - 1/2" THICK SILTY SAND LAYERS THROUGHOUT.
-50	150	30	◤	7 10 13	23	12	CL	SILTY CLAY, SIMILAR TO SS 29 EXCEPT SAMPLE HAS 1/2" THICK CLAY LAYERS AT TOP.
		31	◤	7 11 17	28	18	CL	SILTY CLAY, MODERATELY PLASTIC, 15-20% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2).
								END OF BORING AT 155.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. E. GREENWOOD
DEG
DATE NOVEMBER 27, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 203-B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 204
DATE DRILLED DEC. 28-29, 1972
COORDINATES, NORTH 17,028.5
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 17,060.9
SHEET 1 OF 2
LOGGED BY D.F.P.
GROUND SURFACE ELEVATION 97.4

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"[1]	SAMPLE "N" VALUE	SAMPLE RECOVERY[3]	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
90		1	◤	4 7 10	17	12	ML	CLAYEY SILT, MODERATELY PLASTIC, 3-5% VERY FINE SAND, MOTTLED, LIGHT GRAY (N 7) AND PALE YELLOWISH BROWN (10 YR 6/2).
	10	2	◤	5 7 11	18	14	CL	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, LESS THAN 5% VERY FINE SAND, MOTTLED, LIGHT GRAY (N 7) AND BROWNISH BLACK (5 YR 2/1).
80		3	◤	22 36 42	78	10	SP	SAND, UNIFORM, VERY FINE, 5-8% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), LIGHT GRAY (N 7), AND PALE YELLOWISH ORANGE (10 YR 8/6) WITH ONE PIECE OF GRAVEL 0.4 IN. IN SIZE.
	20	4	◤	4 7 10	17	12	SP	SAND, UNIFORM, VERY FINE, 3-6% SLIGHTLY TO MODERATELY PLASTIC FINES, LIGHT GRAY (N 7) AND PALE YELLOWISH ORANGE (10 YR 8/6).
70		5	◤	4 7 10	17	15	SP	SAND, UNIFORM, FINE, 6-10% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 R 6/6).
	30	6	◤	8 10 11	21	15	SP	SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM SAND, 5-8% MODERATELY TO HIGHLY PLASTIC, FINES, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6) AND LIGHT BROWN (5 YR 5/6) CONTAINING VERY THIN, HORIZONTAL CLAY VEINING..
60		7	◤	7 10 10	20	15	SP	SAND, UNIFORM, FINE TO MEDIUM, 5-10% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), SPARSLEY MOTTLED WITH SMALL CLAY SLIVERS, FLAKES AND MnO_2 NODULES.
	40	8	◤	5 6 10	16	13	SP	SAND, UNIFORM, FINE, 6-10% MODERATELY TO HIGHLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6) DARK YELLOWISH ORANGE (10 YR 6/6) WITH VERY THIN LAYERS 1/16" - 1/4" THICK OF VERY SOFT, CLAY THROUGHOUT SAMPLE.
50		9	◤	5 14 18	32	12	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 3-5% GRAVEL TO 1.1 IN. MAX., 4-6% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), SOME GRAVEL IS CLAY COATED.
	50	10	◤	5 10 15	25	13	SP	SAND, UNIFORM, FINE, 3-6% SLIGHTLY TO MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) AND PALE YELLOWISH ORANGE (10 YR 8/6).
40		11	◤	4 6 11	17	13	SP	SAND, UNIFORM, FINE, 4-8% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) WITH VERY SMALL CLAY SLIVERS.
	60	12	◤	10 14 21	35	10	SP	SAND, UNIFORM, FINE, 1-2% MEDIUM SAND, 3-4% FINES, VERY PALE ORANGE (10 YR 8/2) AND PALE YELLOWISH ORANGE (10 YR 8/6), ONE PIECE OF GRAVEL 0.8 IN. IN SIZE.
30		13	◤	12 18 20	38	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, LESS THAN 1% GRAVEL TO 0.5 IN. IN SIZE, 3-5% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	70	14	◤	15 28 28	56	11	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, LESS THAN 1% GRAVEL TO 0.7 IN. MAX., 4-6% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
20		15	◤	8 16 30	46	12	SP	SAND, UNIFORM, FINE, CLEAN, 1-3% FINES, GRAYISH ORANGE (10 YR 7/4).
	80	16	◤	10 35 35	70	10	SP	SAND, SIMILAR TO SS 15.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. E. GREENWOOD
DEG
DATE NOVEMBER 27, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 204-A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 204
DATE DRILLED DEC. 28-29, 1972
COORDINATES, NORTH 17,028.5
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 17,060.9
SHEET 2 OF 2
LOGGED BY D.F.P.
GROUND SURFACE ELEVATION 97.4

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"[1]	SAMPLE "N" VALUE	SAMPLE RECOVERY[3]	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
10		17	◤	12 30 35	65	10	SP	SAND, SIMILAR TO SS 15, SS 16, EXCEPT ADDITIONAL COLOR OF VERY PALE ORANGE (10 YR 8/2).
	90	18	◤	18 40 50	90	11	SP	SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM SAND, CLEAN 1-3% FINES, GRAYISH ORANGE (10 YR 7/4).
0		19	◤	30 60 70	130	10	SP	SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM AND COARSE SAND, CLEAN, 1-3% FINES, GRAYISH ORANGE (10 YR 7/4).
	100	20	◤	55 100 5"		9	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 1-2% GRAVEL TO 0.6 IN. MAX., 2-5% FINES, GRAYISH ORANGE (10 YR 7/4).
-10		21	◤	20 27 31	58	10	SP	SAND, UNIFORM, FINE, CLEAN, 1-3% FINES, MOTTLED GRAYISH ORANGE (10 YR 7/4), DARK YELLOWISH ORANGE (10 YR 6/6), AND VERY PALE ORANGE (10 YR 8/2).
	110	22	◤	12 42 51	93	10	SP	SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM SAND, CLEAN, 1-2% FINES, DARK YELLOWISH ORANGE (10 YR 6/6) AND GRAYISH ORANGE (10 YR 7/4).
-20		23	◤	20 21 27	48	11	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY COARSE AND MEDIUM, 10-15% GRAVEL TO 1.5 IN. MAX., 4-8% MODERATELY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2) AND GRAYISH ORANGE (10 YR 7/4) ALL PIECES OF COARSE SAND AND GRAVEL ARE CLAY COATED.
	120	24	◤	19 20 21	41	10	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 8-12% GRAVEL TO 1.5 IN. MAX., 5-10% MODERATELY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2), ALL GRAVEL AND COARSE SAND IS CLAY COATED.
-30		25	◤	12 11 15	26	13	CL	GRAVELLY CLAY, HIGHLY PLASTIC, 35-40% GRAVEL TO 0.9 IN. MAX., 2-3% FINE AND MEDIUM SAND, YELLOWISH GRAY (5 Y 8/1).
	130	26	◤	12 14 15	29	10	GC	CLAYEY GRAVEL, POORLY GRADED TO 1.9 IN. MAX., 1-3% MEDIUM AND COARSE SAND, YELLOWISH GRAY (5 Y 8/1) AND DARK YELLOWISH ORANGE (10 YR 6/6).
-40		27	◤	36 53/5"		7	GP	GRAVEL, POORLY GRADED, TO 0.6 IN. MAX., 5-6% FINE AND MEDIUM SAND, GRAYISH ORANGE (10 YR 7/4).
	140	28	◤	9 18 22	40	11	SP	SAND, UNIFORM, FINE, CLEAN, 1-2% FINES, VERY PALE ORANGE (10 YR 8/2).
-50		29	◤	5 6 9	15	10	CH	CLAY, HIGHLY PLASTIC, 1-3% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2), OCCASIONALLY MOTTLED WITH SMALL FeOx AND MnO_2 NODULES.
	150	30	◤	11 15 25	40	14	CH	CLAY, MODERATELY PLASTIC, 1-2% VERY FINE SAND, DUSKY YELLOW (5 Y 6/4).
		31	◤	8 8 10	26	14	CH	CLAY, HIGHLY PLASTIC, LIGHT OLIVE GRAY (5 Y 6/1) WITH THIN VEINS OF SILTY SAND THROUGHOUT SAMPLE.
								END OF BORING AT 156.6'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. E. GREENWOOD
DEG
DATE NOVEMBER 27, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 204-B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 205 TYPE OF BORING DRIVE SHEET 1 OF 2
DATE DRILLED JANUARY 2-5, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY DW
COORDINATES, NORTH 16,841.0 EAST 16,990.8 GROUND SURFACE ELEVATION 95.6

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6" [1]	"N" VALUE	RECOVERY [3]	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
90		1	◤	2 4 4	8	17	ML	SILT, NONPLASTIC, LESS THAN 2% VERY FINE SAND, FIRM, MODERATE YELLOWISH BROWN (10 YR 5/4), FEW ROOT HAIRS, LAYER SLIGHTLY PLASTIC CLAYEY SILT.
	10	2	◤	6 7 9	16	18	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, STIFF, MOTTLED DUSKY YELLOW (5 Y 6/3) AND MODERATE YELLOWISH ORANGE (10 YR 7/6); CHANGING TO LIGHT GRAY (N-7) WITH FeOx STAINING.
80		3	◤	7 7 9	16	15	ML CL	TOP 4 INCHES SILT, NONPLASTIC, STIFF, MODERATE YELLOWISH ORANGE (10 YR 7/2), WITH SMALL POCKETS LIGHT GRAY (N7) SILTY CLAY AND MANY LAYERS OR LENSES CLAY, VERY PALE OLIVE (10 Y 7/2) AND MODERATE YELLOWISH ORANGE. BOTTOM 11 INCHES CLAY, MODERATELY TO HIGHLY PLASTIC, VERY STIFF, MODERATE YELLOWISH ORANGE (10 YR 7/2), MANY THIN (LESS THAN 0.05) LAMINAE SILT AND VERY FINE SAND, DARK FeOx STAINED, INCLINED AT 50° TO AXIS OF SAMPLE.
	20	4	◤	5 6 8	14	16	ML CH	SILT, OR VERY FINE SAND, NONPLASTIC, DARK YELLOWISH ORANGE (10 YR 6/6), WITH MANY LARGE POCKETS CLAY, HIGHLY PLASTIC, STIFF, GRAYISH ORANGE (10 YR 7/4) AND MODERATE REDDISH ORANGE (10 R 6/6) CLAY POCKETS COMPRISE MORE THAN 60% OF SAMPLE.
70		5	◤	8 8 9	17	17	SP	SAND, UNIFORM, FINE, LESS THAN 5% FINES, MEDIUM DENSE, MODERATE YELLOWISH ORANGE (10 YR 7/6), SEVERAL SMALL POCKETS CLAY.
	30	6	◤	8 7 9	16	18	SP	SAND, UNIFORM, FINE, LESS THAN 2% FINES, MEDIUM DENSE, BRIGHT YELLOWISH ORANGE (10 YR 6/8)
60		7	◤	6 7 7	14	14	SP CH	SAND, SIMILAR TO SS 6 BUT WITH POCKETS AND ONE 3 INCH LAYER CLAY, HIGHLY PLASTIC, FIRM, GRAYISH ORANGE (10 YR 7/4) AND MODERATE REDDISH ORANGE (10 R 6/6), FEW PIECES GRAVEL TO 0.4 INCH MAXIMUM, ASSOCIATED WITH CLAY.
	40	8	◤	6 6 7	13	15	SP	SAND, UNIFORM, FINE, LESS THAN 5% MODERATELY PLASTIC FINES, MODERATE YELLOWISH ORANGE (10 YR 7/6), FEW POCKETS SOFT PLASTIC CLAY.
50		9	◤	6 50 10"		13	SP	SAND, MOSTLY UNIFORM, FINE; FEW MEDIUM AND COARSE, VERY DENSE, MODERATE YELLOWISH ORANGE (10 YR 7/6) AND MODERATE BROWN (5 YR 4/6).
	50	10	◤	8 11 26	37	15	SP	SAND, WIDELY GRADED, COARSE TO FINE, MOSTLY FINE, 7-10% GRAVEL TO 0.5 INCH MAXIMUM POCKETS CLAY ASSOCIATED WITH GRAVEL, MODERATE YELLOWISH ORANGE (10 YR 7/6).
40		11	◤	6 9 14	23	15	SP	SAND, UNIFORM, VERY FINE, MEDIUM DENSE, PALE ORANGE (10 YR 8/4).
	60	12	◤	21 50 11"		11	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY FINE, FEW GRAVEL TO 0.4 INCH MAXIMUM, VERY DENSE, GRAYISH ORANGE (10 YR 7/4).
30		13	◤	35 50 8"		11	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY FINE, FEW GRAVEL TO 0.3 INCH MAXIMUM, VERY DENSE, LIGHT BROWN (5 YR 5/6).
	70	14	◤	23 50 8"		11	SW	GRAVELLY SAND, WELL GRADED COARSE TO FINE, 20-25% SUBROUNDED GRAVEL TO 1.1 INCH MAXIMUM, PALE ORANGE (10 YR 8/4).
20		15	◤	30 50 8"		10	SW	GRAVELLY SAND, WELL GRADED COARSE TO FINE, 8-12% GRAVEL TO 0.4 INCH MAXIMUM, DARK YELLOWISH ORANGE (10 YR 5/6).
	80	16	◤	30 50 9"		10	SP SW	TOP 4 INCHES: SAND, GRADED FINE, FEW COARSE, MODERATE YELLOWISH ORANGE (10 YR 7/6). BOTTOM 6 INCHES: SAND, WELL GRADED COARSE TO FINE, VERY DENSE, DARK YELLOWISH ORANGE (10 YR 5/6).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 18 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD DFG
DATE JUNE 20, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 205-A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 205 TYPE OF BORING DRIVE SHEET 2 OF 2
DATE DRILLED JANUARY 2-5, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY DW
COORDINATES, NORTH 16,841.0 EAST 16,990.8 GROUND SURFACE ELEVATION 95.6

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6" [1]	"N" VALUE	RECOVERY [3]	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
10		17	◤	22 23 21	44	13	SW	GRAVELLY SAND, WELL GRADED COARSE TO FINE, 20-25% SUBROUNDED GRAVEL TO 0.8 INCH MAXIMUM, DENSE, DARK YELLOWISH ORANGE (10 YR 6/6) FEW LARGE, SOFT PLASTIC CLAY BALLS.
	90	18	◤	54 50 2"		8	SP	SAND, UNIFORM, FINE, FEW PIECES COARSE SAND AND GRAVEL TO 0.4 INCH MAXIMUM, VERY DENSE, MODERATE YELLOWISH ORANGE (10 YR 7/6).
0		19	◤	31 50 6"		11	SP	SAND, GRADED FINE AND MEDIUM, FEW COARSE, FEW GRAVEL TO 0.3 INCH MAXIMUM, VERY DENSE, DARK YELLOWISH ORANGE (10 YR 5/6).
	100	20	◤	34 30 20	50	10	GW	SANDY GRAVEL, SUBROUNDED, 0.6 INCH MAXIMUM, 40-50% SAND, WELL GRADED COARSE TO FINE, DENSE, DARK YELLOWISH ORANGE (10 YR 5/6), BOTTOM 6 INCH CONTAINS 3-5% BLACK NONPLASTIC FINES.
-10		21	◤	36 50 6"		9	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY MEDIUM, VERY DENSE, 5-8% GRAVEL TO 0.5 INCH MAXIMUM, MODERATE YELLOWISH ORANGE (10 YR 7/6).
	110	22	◤	36 50 5"		13	SP	SAND, MOSTLY GRADED FINE, FEW MEDIUM, COARSE SAND, FEW GRAVEL TO 0.5 INCH MAXIMUM, MODERATE YELLOWISH BROWN (10 YR 6/4).
-20		23	◤	22 50 4"		18	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY FINE AND MEDIUM, FEW GRAVEL TO 0.5 INCH MAXIMUM, VERY DENSE, MODERATE YELLOWISH BROWN (10 YR 6/4).
	120	24	◤	36 50 4"		10	SP	SAND, WIDELY GRADED COARSE TO FINE, MOSTLY FINE, FEW GRAVEL TO 0.3 INCH MAXIMUM, VERY DENSE, DARK YELLOWISH ORANGE (10 YR 5/6) WITH MODERATE BROWN (5 YR 3/4).
-30		25	◤	11 17 18	35	10	GC	CLAYEY GRAVEL, SUBROUNDED, TO 0.9 INCH MAXIMUM, 20-25% WIDELY, GRADED SAND, 25-30% VERY LIGHT GRAY (N-8), MODERATELY PLASTIC CLAY, MODERATE YELLOWISH ORANGE (10 YR 7/6).
	130	26	◤	13 21 27	48	16	SP	SAND, UNIFORM, FINE, LESS THAN 3% FINES, DENSE, LIGHT GRAYISH ORANGE (10 YR 8/4), AND MODERATE BROWN (5 YR 4/4) GRADING YELLOWISH GRAY (5 Y 8/2) AT BOTTOM, SEVERAL SMALL LENSES YELLOWISH GRAY (5 Y 7/2) MODERATELY PLASTIC CLAY.
-40		27	◤	20 50 9"		13	SP	SAND, UNIFORM, FINE, CLEAN, VERY DENSE, PALE ORANGE GRAY (10 YR 8/1).
	140	28	◤	11 15 21	36	18	CL	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, VERY STIFF, LIGHT OLIVE GRAY (5 Y 6/2), MOTTLED WITH FeOx STAINING AND SEVERAL BLACK SPECKS MnO_2.
-50		29	◤	13 23 25	48	18	CL	SILTY CLAY, SIMILAR TO SS 28.
	150	30	◤	24 23 32	55	18	CL	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, LESS THAN 2% VERY FINE SAND, HARD, LIGHT DUSKY GREEN (5 G 4/2), SOME SMALL HARD POCKETS DESSICATED CLAY.
								END OF BORING AT 151.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 18 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD DFG
DATE JUNE 20, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 205-B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 206 TYPE OF BORING SHEET 1 OF 2
DATE DRILLED JANUARY 25-30, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 16,644.1 EAST 16,977.5 GROUND SURFACE ELEVATION 93.7

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6" [1]	"N" VALUE	RECOVERY [3]	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
90		1	◤	2 3 6	9	18	ML	CLAYEY SILT, MODERATELY TO HIGHLY PLASTIC, 5-8% FINE SAND, MOTTLED, MODERATE YELLOWISH BROWN (10 YR 5/4), AND LIGHT BROWN (5 YR 6/4).
	10	2	◤	1 4 7	11	18	CH	SANDY CLAY, MODERATELY TO HIGHLY PLASTIC, 35-40% FINE SAND, MOTTLED MODERATE YELLOWISH BROWN (10 YR 5/4), LIGHT BROWN (5 Y/4), AND PALE YELLOWISH BROWN (10 YR 6/2).
80		3	◤	9 12 12	24	9	SP	SAND, UNIFORM FINE, 1-2% GRAVEL TO 0.7 INCH MAXIMUM, 2-3% FINES, VERY PALE ORANGE (10 YR 8/2), AND GRAYISH ORANGE (10 YR 7/4).
	20	4	◤	6 8 9	17	12	SP	SAND, POORLY GRADED FINE, 5-10% MODERATELY PLASTIC FINES, MODERATE YELLOW (5 Y 7/6).
70		5	◤	[illegible] 8 12	20	14	SP	SAND, UNIFORM, VERY FINE. 4-8% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), GRAYISH YELLOW (5 Y 8/4), AND VERY PALE ORANGE (10 YR 8/2).
	30	6	◤	3 4 8	12	14	CH	CLAY, HIGHLY PLASTIC, FATTY, PALE YELLOWISH ORANGE (10 YR 8/6), CONTAINING VERY THIN LAYERS AND LENSES OF VERY FINE SAND THROUGHOUT SAMPLE.
60		7	◤	5 8 10	18	15	SC	CLAYEY SAND, POORLY GRADED FINE AND MEDIUM, MOSTLY FINE, 2-3% GRAVEL TO 0.7 INCH MAXIMUM, 10-15% MODERATELY TO HIGHLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/6), WITH LAYERS OF HIGHLY PLASTIC, FATTY CLAY, APPROXIMATELY 1/4"-3/4" THICK.
	40	8	◤	[illegible] 4 5	9	8	CH	CLAY, HIGHLY PLASTIC. FATTY PALE YELLOWISH ORANGE (10 YR 8/6), WITH A GRAVELLY CLAY CLAY POCKET AT BOTTOM OF SAMPLE, 1" THICK.
50		9	◤	7 8 8	16	13	SM	SILTY SAND, UNIFORM, FINE, 12-20% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), AND PALE YELLOWISH ORANGE (10 YR 8/6) WITH HIGHLY PLASTIC FATTY CLAY LENSES AND POCKETS.
	50	10	◤	4 8 10	18	14	SM	SILTY SAND, UNIFORM, VERY FINE, 12-15% SLIGHTLY TO MODERATELY PLASTIC FINES, WHITE (N9).
40		11	◤	7 8 9	17	15	SP	SAND. UNIFORM, VERY FINE, 5-8% SLIGHTLY TO MODERATELY PLASTIC FINES, BANDED COLORING OF DARK YELLOWISH ORANGE (10 YR 6/6), GRAYISH ORANGE (10 YR 7/4). AND PALE YELLOWISH ORANGE (10 YR 8/6).
	60	12	◤	8 9 10	19	13	SM-SC	SILTY SAND, UNIFORM, VERY FINE, 10-15% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), AND VERY PALE ORANGE (10 YR 8/2)
30		13	◤	12 22 31	53	10	SP	SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM AND COARSE SAND, 3-5% FINES, DARK YELLOWISH ORANGE (10 YR 6/6), AND VERY PALE ORANGE (10 YR 8/2), WITH LESS THAN 1% GRAVEL TO 0.7 INCH MAXIMUM.
	70	14	◤	26 30 23	53	8	SP	GRAVELLY SAND, POORLY GRADED. FINE TO COARSE, MOSTLY FINE AND MEDIUM, 20-25% GRAVEL TO 1.8 INCH MAXIMUM, 4-6% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
20		15	◤	32 39 41	80	7	SP	GRAVELLY SAND, SIMILAR TO SS 14.
	80	16	◤	26 68/6"		6	SP	SAND, UNIFORM, FINE, 4-6% FINES, LIGHT BROWN (5 YR 5/6), WITH TWO PIECES OF GRAVEL 0.8 INCH AND 1.0 INCH IN SIZE.

1 THE NUMBER OF BLO… O LB. HAMMER FALLING FREELY 30 INCHES … TO DRIVE A 2 INCH O.D. STANDARD SPLIT … LER 18 INCHES OR THE DISTANCE INDIC… N INITIAL SEATING OF 6 INCHES IS TH… NETRATION TEST N-VALUE THE NUMBERS … 6 INCH INCREMENTS ARE ALSO REPO…

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY [redacted]OOD
DATE [redacted] 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 206-A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 206 TYPE OF BORING SHEET 2 OF 2
DATE DRILLED JANUARY 25-30, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 16,644.1 EAST 16,977.5 GROUND SURFACE ELEVATION 93.7

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6" [1]	"N" VALUE	RECOVERY [3]	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
10		17	◤	32 33 40	73	10	SP	SAND, POORLY GRADED. FINE TO COARSE, MOSTLY FINE AND MEDIUM, 4-6% GRAVEL TO 0.8 INCH MAXIMUM, 3-6% FINES, DARK YELLOWISH ORANGE (10 YR 6/6), AND DUSKY YELLOWISH BROWN (10 YR 2/2).
	90	18	◤	28 36 41	77	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM AND COARSE. 5-8% GRAVEL TO 0.7 INCH MAXIMUM, 3-6% FINES, DARK YELLOWISH ORANGE (10 YR 6/6), DUSKY YELLOWISH BROWN (10 YR 2/2).
0		19	◤	26 28 23	51	9	SP	SAND, POORLY GRADED, FINE TO COARSE. MOSTLY MEDIUM AND COARSE, 10-15% GRAVEL TO 0.8 INCH MAXIMUM, 3-8% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	100	20	◤	25 26 26	52	7	SP	SAND, SIMILAR TO SS 19.
-10		21	◤	16 26 24	50	7	GP	GRAVEL, POORLY GRADED TO 0.8 INCH MAXIMUM, 8-10% FINE TO COARSE SAND, GRAYISH ORANGE (10 YR 7/4).
	110	22	◤	11 23 28	51	8	SP	GRAVELLY SAND, POORLY GRADED. FINE TO COARSE MOSTLY FINE. AND MEDIUM, 15-20% GRAVEL TO 0.6 INCH MAXIMUM, 3-6% FINES. MODERATE YELLOWISH BROWN (10 YR 5/4).
-20		23	◤	16 18 25	43	7	GP	SANDY GRAVEL, POORLY GRADED TO 0.8 INCH MAXIMUM, 8-12% FINE TO COARSE SAND. 3-6% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
	120	24	◤	15 16 19	35	8	GP	SANDY GRAVEL, POORLY GRADED TO 1.0 INCH MAXIMUM, 10-15% FINE TO COARSE SAND, 4-8% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
-30		25	◤	7 14 12	26	18	CH	CLAY, HIGHLY PLASTIC, FATTY. 3-5% FINE SAND, MOTTLED. PALE REDDISH BROWN (10 R 5/4), MODERATE REDDISH ORANGE (10 R 6/6), MODERATE REDDISH BROWN (10 R 4/6), WITH A 6" UNIFORM FINE SAND LAYER. AND ONE PIECE OF GRAVEL 2.1 INCH IN SIZE.
	130	26	◤	26 51/6"		15	SM-SC	SILTY SAND, UNIFORM, VERY FINE, 1-2% GRAVEL TO 0.5 INCH MAXIMUM, 15-20% MODERATELY PLASTIC FINES, MODERATE ORANGE PINK, (10 R 7/4).
-40		27	◤	12 16 21	37	12	SP	SAND, UNIFORM, VERY FINE, 8-10% SLIGHTLY TO MODERATELY PLASTIC FINES, MODERATE ORANGE PINK (10 R 7/4), GRAYISH ORANGE PINK (5 YR 7/2).
	140	28	◤	15 12 12	24	16	CL	CLAY, MODERATELY TO HIGHLY PLASTIC, 1-2% VERY FINE SAND, YELLOWISH GRAY (5 Y 8/1), MODERATELY MOTTLED WITH SMALL FeOx NODUELS AND LARGE MnO2 LAYERS AND NODULES.
-50		29	◤	15 17 20	37	18	CL	SILTY CLAY, MODERATELY PLASTIC, MOTTLED YELLOWISH GRAY (5 Y 8/1) AND DUSKY YELLOW (5 Y 6/4), MODERATE FeOx AND MnO2 STAINING.
	150	30	◤	20 25 26	51	18	CL	SILTY CLAY, MODERATELY PLASTIC, MOTTLED YELLOWISH GRAY (5 Y 8/1), AND DUSKY YELLOW (5 Y 6/4).
								END OF BORING AT 151.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 18 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD DFG
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 206-B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 207
TYPE OF BORING DRIVE
SHEET 1 OF 3
DATE DRILLED NOVEMBER 14-15, 1972
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 18,046.5
EAST 17,046.7
GROUND SURFACE ELEVATION 121.6

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
120								
		1	◤	8 8 10	18	14	ML	CLAYEY SILT, SLIGHTLY TO MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, LIGHT BROWN (5 YR 5/6), AND VERY PALE ORANGE (10 YR 8/2).
	10	2	◤	5 8 14	22	18	CL	SANDY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 35-40% VERY FINE SILTY SAND, DARK YELLOWISH ORANGE (10 YR 6/6).
110								
		3	◤	9 17 19	36	16	SP-SM	SAND, UNIFORM, FINE, 5-10% SLIGHTLY TO MODERATELY PLASTIC FINES, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), AND PALE YELLOWISH ORANGE, WITH MODERATELY PLASTIC CLAY POCKETS AND LAYERS APPROXIMATELY 1"-2" THICK WITH 4" SANDY CLAY LAYER AT BOTTOM.
	20	4	◤	9 10 10	20	14	SP	SAND, UNIFORM, FINE, 4-8% SLIGHTLY PLASTIC FINES, BANDED COLORING, MODERATE BROWN (5 YR 4/4), DARK YELLOWISH ORANGE (10 YR 6/6), AND PALE YELLOWISH ORANGE (10 YR 8/6), WITH ONE FeOx GRAVEL 0.5 INCH IN SIZE, AND CLAYEY SAND, SANDY CLAY LAYERS 1"-2½" THICK.
100								
		5	◤	5 7 10	[illegible]	13	SP SM	TOP 4 INCHES: SAND, UNIFORM, FINE, 1-3% MEDIUM SAND, 3-6% FINES, DARK YELLOWISH ORANGE (10 YR 6/6). BOTTOM 8 INCHES: SILTY SAND, UNIFORM, VERY FINE, 8-12% MODERATELY PLASTIC FINES, MOTTLED, MODERATE REDDISH BROWN (10 R 4/6), MODERATE REDDISH ORANGE (10 R 6/6), AND PALE YELLOWISH ORANGE (10 YR 8/6), AND VERY THIN MODERATELY PLASTIC CLAY LAYERS.
	30	6	◤	[illegible] [illegible] 8	15	16	SM-SC	SILTY SAND, UNIFORM, VERY FINE, 10-15% MODERATELY PLASTIC FINES, MODERATE REDDISH BROWN (10 YR 4/6), WITH ONE VERY THIN, APPROXIMATELY 1/16" CLAY LAYER.
90								
		7	◤	5 7 10	17	13	SM-SC SP	TOP 8 INCHES: SILTY SAND, UNIFORM, FINE, 8-12% MODERATELY PLASTIC FINES, MOTTLED, MODERATE REDDISH BROWN (10 R 4/6), AND MODERATE REDDISH ORANGE (10 R 6/6). BOTTOM 4 INCHES: SAND, UNIFORM, FINE, 5-10% MODERATELY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6).
	40	8	◤	5 9 13	22	9	SP	SAND, UNIFORM, FINE, 4-8% FINES, MOTTLED, MODERATE REDDISH ORANGE (10 R 6/6), DARK YELLOWISH ORANGE (10 YR 6/6), WITH THREE SANDY CLAY LAYERS 1/16"-1/4" THICK.
80								
		9	◤	11 11 11	22	5	[illegible]	SILTY SAND, UNIFORM, FINE/VERY FINE, 6-12% MODERATELY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6), DARK YELLOWISH ORANGE (10 YR 6/6), CLAY LAYER, SANDY, MODERATELY PLASTIC, 1/8" THICK.
	50	10	◤	13 22 22	44	9	SP	SAND, UNIFORM, FINE, 2-8% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), WITH SMALL CLAY BALLS.
70								
		11	◤	10 11 14	25	14	SP	SAND, UNIFORM, FINE, 3-[illegible]% MODERATELY PLASTIC FINES, MODERATE REDDISH BROWN (10 R 4/6), WITH 1"-2" THICK CLAYEY SAND LAYERS THROUGHOUT SAMPLE.
	60	12	◤	9 9 10	19	9	SC-SM	CLAYEY SAND, UNIFORM, VERY FINE, 10-20% MODERATELY PLASTIC FINES, MODERATE REDDISH BROWN (10 R 4/6).
60								
		13	◤	11 12 13	25	10	SP	SAND, UNIFORM, FINE, 1-2% MEDIUM AND COARSE SAND, 3-8% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6), WITH A 2" CLAYEY SAND/SILTY SAND LAYER.
	70	14	◤	50/4"		4	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 3-6% GRAVEL TO 1.0 INCH MAXIMUM, 3-8% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), WITH 2, 1-2" MODERATELY PLASTIC, SANDY CLAY POCKETS EMBEDDED WITH GRAVEL AND COARSE SAND.
50								
		15	◤	11 12 11	23			NO RECOVERY.
	80	16	◤	6 7 12	19	14	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY TO MODERATELY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6).
40								

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ▆ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 27, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 207-A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 207
TYPE OF BORING DRIVE
SHEET 2 OF 3
DATE DRILLED NOVEMBER 14-15, 1972
DRILLING COMPANY - EUSTIS ENGRG. CO
LOGGED BY D.F.P.
COORDINATES, NORTH 18,046.5
EAST 17,046.7
GROUND SURFACE ELEVATION 121.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		17	◤	6 12 16	28	11	CH SM-SC CH SP	FIRST HALF (9") TOP 5": SILTY CLAY, CLAY, HIGHLY PLASTIC, MOTTLED MODERATE RED (5 R 4/6), GRAYISH PINK (5 R 8/2) WITH VERY THIN SILT LAYERS THROUGHOUT SAMPLE. BOTTOM 4": SILTY SAND, UNIFORM, VERY FINE, 10-15% MODERATELY PLASTIC FINES, MOTTLED, MODERATE REDDISH ORANGE (10 R 6/6), PALE YELLOWISH ORANGE (10 YR 8/6), SMALL CLAY SLIVERS IN SAMPLE. SECOND HALF (9") TOP 5": CLAY, HIGHLY PLASTIC, MOTTLED LIGHT RED (5 R 6/6), GRAYISH ORANGE PINK (10 R 8/2) WITH 1/4" VERY FINE SAND LAYER AT TOP. BOTTOM 4": SAND, UNIFORM, VERY FINE, 4-8% SLIGHTLY TO MODERATELY PLASTIC FINES, MOTTLED, PALE YELLOWISH ORANGE (10 YR 8/6), MODERATE REDDISH ORANGE (10 R 6/6) WITH 1/4" HIGHLY PLASTIC CLAY LAYER, CONTAINING VERY THIN LAYERS OF SILT.
	90							
30								
		18	◤	10 9 8	17	17	SP	SAND, UNIFORM, FINE, 2-6% FINES, MODERATE REDDISH ORANGE (10 R 6/6).
		19	◤	7 6 8	14	13	SP	SIMILAR TO SS 18 EXCEPT COLORING IS MOTTLED MODERATE REDDISH ORANGE (10 R 6/6) AND PALE YELLOWISH ORANGE (10 YR 5/6).
	100	20	◤	21 15 16	31	12	SP	SAND, POORLY GRADED, FINE TO COARSE, LESS THAN 1% MEDIUM AND COARSE, LESS THAN 1% GRAVEL TO 0.5 IN. MAX., 1-5% FINES, MOTTLED, LIGHT RED (5 R 6/6) AND PALE RED (10 R 6/2) WITH A 1 1/2" CLAYEY SAND POCKET AT BOTTOM.
20								
		21	◤	22 21 21	42	9	SP	SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM SAND, 1-5% FINES, MODERATE REDDISH ORANGE (10 R 6/6).
	110	22	◤	22 28 25	53	9	SP	SAND, UNIFORM, LESS THAN 1% GRAVEL TO 1.0 IN. MAX., LESS THAN 1% MEDIUM AND COARSE SAND, CLEAN, 1-4% FINES, GRAYISH ORANGE (10 YR 7/4).
10								
		23	◤	20 28 35	63	10	SP	SAND, UNIFORM, FINE, CLEAN, 1-3% FINES. PALE YELLOWISH ORANGE (10 YR 8/6).
	120	24	◤	15 12 12	24	3	SP	SAND, UNIFORM, FINE, CLEAN, 1-3% FINES, MOTTLED PALE YELLOWISH ORANGE (10 YR 8/6) AND MODERATE REDDISH ORANGE (10 R 6/6) WITH 2" SAND POCKET CONTAINING 5-10% SLIGHTLY TO MODERATELY PLASTIC FINES.
0								
		25	◤	23 25 25	50	7	SP	SAND, UNIFORM, FINE, LESS THAN 1% GRAVEL TO 0.7" MAX., 2-6% FINES, MOTTLED, MODERATE ORANGE PINK (5 YR 8/4) AND MODERATE YELLOWISH BROWN (10 YR 5/4).
	130	26	◤	13 17 16	33	10	SP	SAND, UNIFORM, FINE, 3-6% FINES, MODERATE ORANGE PINK (5 YR 8/4) WITH THREE PIECES OF GRAVEL 0.5" MAX., IMBEDDED IN SAMPLE.
-10								
		27	◤	49 50/4"		8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, LESS THAN 1% GRAVEL TO 0.5" MAX., 1-3% FINES, MOTTLED GRAYISH ORANGE (10 YR 7/4) AND VERY PALE ORANGE (10 YR 8/2).
	140	28	◤	50/5"		5	SP	SAND, UNIFORM, FINE TO MEDIUM, CLEAN, 1-4% FINES, MODERATE ORANGE PINK (5 YR 8/4).
-20								
		29	◤	50/4"		4	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, 1% GRAVEL TO 0.7" MAX., CLEAN, 1-2% FINES GRAYISH ORANGE (10 YR 7/4).
	150	30	◤	50/5"		1	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, 5-10% GRAVEL TO 0.7" MAX., 2-6% MODERATELY PLASTIC FINES, LIGHT BROWN (5 YR 5/6).
-30								
		31	◤	23 21 19	40	9	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 2-5% GRAVEL TO 0.6" MAX., 2-6% FINES DARK YELLOWISH ORANGE (10 YR 6/6). TWO PIECES OF CLAY COATED GRAVEL.
	160	32	◤	22 23 17	40	5	GP	GRAVEL, POORLY GRADED TO 1.5" MAX., 3-8% FINE TO COARSE SAND, 3-6% FINES MODERATE YELLOWISH BROWN (10 YR 5/4), 2" SANDY CLAY POCKET CONTAINING FINE TO COARSE SAND, WITH LARGE PIECES OF CLAY COATED GRAVEL.
-40								

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ▆ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 27, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 207 - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 207
TYPE OF BORING DRIVE
SHEET 3 OF 3
DATE DRILLED NOVEMBER 14-15, 1972
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 18,046.5
EAST 17,046.7
GROUND SURFACE ELEVATION 121.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		33	◤	10 14 17	31	18	CH	SILTY CLAY, HIGHLY PLASTIC, LESS THAN 5% VERY FINE SAND, SEVERELY MOTTLED, PALE YELLOWISH ORANGE (10 YR 8/6), GRAYISH ORANGE (10 Y 8/2) WITH MnO_2 AND FeOx NODULES THROUGHOUT SAMPLE (SMALL).
	170	34	◤	11 12 14	26	18	CH	CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 7/2).
-50								
		35	◤	10 13 22	35	18	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 1-2% VERY FINE SAND, OLIVE GRAY (5 Y 4/1) WITH YELLOWISH GRAY CLAY (5 Y 7/2).
								END OF BORING AT 176.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ▆ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER [illegible], 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 207-C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 208 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED NOVEMBER 6-9, 1974 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,850.0 EAST 16,997.7 GROUND SURFACE ELEVATION 116.1'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
110		1	◤	3 3 4	7	11	ML	CLAYEY SILT, MODERATELY PLASTIC, LESS THAN 5% VERY [illegible] SAND, MOTTLED, LIGHT BROWN (5 YR 6/4), AND VERY LIGHT GRAY (N8).
	10	2	◤	8 13 13	26	15	ML	CLAYEY SILT, SIMILAR TO SS1, EXCEPT COLORING IS MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), VERY PALE ORANGE (10 YR 8/2), PALE YELLOWISH ORANGE (10 YR 8/6), WITH SMALL FeOx NODULES.
100		3	◤	6 11 11	22	[illegible]	CH	SILTY CLAY, MODERATELY PLASTIC, 2-5% FINE SAND, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), LIGHT BROWN (5 YR 5/6), AND VERY LIGHT GRAY (N8).
	20	4	◤	6 10 15	25	[illegible]	CL	SANDY CLAY, MODERATELY TO HIGHLY PLASTIC, 10-15% VERY FINE TO FINE SAND, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), AND LIGHT GRAY (N7), WITH 4" MODERATELY PLASTIC CLAYEY SAND LAYERING, CONTAINING SMALL SANDY CLAY BALLS.
90		5	◤	8 8 10	18	3	CL	SANDY CLAY, HIGHLY PLASTIC, 12-18% FINE SAND, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6), AND YELLOWISH GRAY (5 Y 7/2).
	30	6	◤	19 23 20	43	8	SM-SC	SILTY SAND, UNIFORM VERY FINE/FINE, 8-12% SLIGHTLY TO MODERATELY PLASTIC, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6), AND PALE YELLOWISH ORANGE (10 YR 8/6).
80		7	◤	5 7 6	13	[illegible]	SC	CLAYEY SAND, UNIFORM, FINE, 12-20% MODERATELY TO HIGHLY PLASTIC FINES, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), MODERATE REDDISH ORANGE (10 R 6/6), AND MODERATE REDDISH BROWN (10 R 4/6), WITH HIGHLY PLASTIC CLAY LAYERS 1/16"-1/2" THICK.
	40	8	◤	9 9 13	22	14	SC	CLAYEY SAND, UNIFORM, FINE, 12-20% HIGHLY PLASTIC FINES, MOTTLED PALE YELLOWISH ORANGE (10 YR 8/6). AND MODERATE REDDISH ORANGE (10 R 6/6).
70		9	◤	11 14 14	28	10	SP	SAND, UNIFORM, FINE 5-10% SLIGHTLY PLASTIC FINES, MOTTLED, PALE YELLOWISH ORANGE (10 YR 8/6), AND MODERATE REDDISH ORANGE (10 R 6/6), WITH A 1 1/2" SAND COATED, HIGHLY PLASTIC CLAY POCKET ALSO LARGE CLAY BALLS.
	50	10	◤	9 8 11	19	15	SC	CLAYEY SAND. UNIFORM, FINE, 15-20% MODERATELY PLASTIC FINES, MODERATE REDDISH BROWN (10 R 4/6).
60		11	◤	8 8 10	18	16	SC	CLAYEY SAND, SIMILAR TO SS 10, EXCEPT FOR MOTTLING DARK YELLOWISH ORANGE (10 YR 6/6), AND MODERATE REDDISH ORANGE (10 R 6/6).
	60	12	◤	15 16 22	38	10	SP	SAND, UNIFORM, FINE, 2-3% FINES, MOTTLED PALE YELLOWISH ORANGE (10 YR 8/6), AND MODERATE ORANGE PINK (10 R 7/4), WITH 1/16" THICK MODERATELY PLASTIC CLAY LAYER.
50		13	◤	18 26 30	56	5	SP	SAND, SIMILAR TO SS 12.
	70	14	◤	22 50/6"		8	SP	SAND, UNIFORM, FINE, 1-2% MEDIUM AND COARSE SAND, LESS THAN 1% GRAVEL TO 0.6 INCH MAXIMUM, 3-8% FINES, DARK YELLOWISH ORANGE (10 YR 6/6), AND MODERATE ORANGE PINK (10 R 7/4), WITH LARGE CLAY BALLS, AND 2" MODERATELY PLASTIC SANDY CLAY POCKET.
40		15	◤	5 5 6	11	18	SM-SC	SILTY SAND, UNIFORM, FINE/VERY FINE, 20-25% MODERATELY TO HIGHLY PLASTIC FINES, MOTTLES PALE YELLOWISH ORANGE (10 YR 8/6) AND MODERATE REDDISH ORANGE (10 R 6/6) WITH THIN CLAY LAYERS, AND 5" MODERATELY PLASTIC, MODERATE RED (5 R 4/6) CLAY LAYER WITH VERY THIN SILTY LAYERS THROUGHOUT.
	80	16	◤	7 6 8	14	18	SM-SC	SILTY SAND, UNIFORM, FINE, 20-25% HIGHLY PLASTIC FINES, MOTTLED, PALE YELLOWISH ORANGE (10 YR 8/6) AND MODERATE REDDISH ORANGE (10 R 6/6).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DFG
DATE JUNE 10, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 208 - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 208 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED NOVEMBER 6-9, 1974 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,850.0 EAST 16,997.7 GROUND SURFACE ELEVATION 116.1'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
30		17	◤	50 33 34	67	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND COARSE, 3-8% GRAVEL TO 0.7 INCH MAXIMUM, 1-4% FINES, MOTTLES MODERATE REDDISH ORANGE (10 R 6/6) AND DARK YELLOWISH ORANGE (10 YR 6/6).
	90	18	◤	25 24 21	45	10	SP	SAND, UNIFORM, FINE, LESS THAN 1% MEDIUM SAND, LESS THAN 1% GRAVEL TO 0.6 INCH MAXIMUM, 2-4% FINES, GRAYISH ORANGE (10 YR 7/4).
20		19	◤	21 31 42	73	10	SP	SAND. UNIFORM, FINE, 2-4% FINES, GRAYISH ORANGE (10 YR 7/4).
	100	20	◤	30 31 28	59	12	SP	SAND. POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 1-2% GRAVEL TO 0.8 INCH MAXIMUM, 2-4% FINES GRAYISH ORANGE (10 YR 7/2) AND MODERATE REDDISH ORANGE (10 R 6/6).
10		21	◤	28 34 34	68	[illegible]	SP	SAND. UNIFORM, FINE, LESS THAN 1% MEDIUM SAND. 1-3% FINES. VARIGATED GRAYISH ORANGE (10 YR 7/4) AND MODERATE REDDISH ORANGE (10 R 6/6) WITH ONE PIECE OF GRAVEL 0.9 INCH IN SIZE.
	110	22	◤	35 31 31	62	10	SP	SAND. UNIFORM, FINE, LESS THAN 1% GRAVLE TO 0.6 INCH MAXIMUM, LESS THAN 1% MEDIUM SAND, 2-4% SLIGHTLY PLASTIC FINES, MOTTLED, GRAYISH ORANGE (10 YR 7/4) AND MODERATE REDDISH ORANGE (10 R 6/6).
0		23	◤	34 34 50/4"		10	SP	SAND. UNIFORM, FINE, 1-3% FINES, GRAYISH ORANGE (10 YR 7/4).
	120	24	◤	25 31 31	62	10	SP	SAND. SIMILAR TO SS #23, EXCEPT SAMPLE HAS 1/2 INCH CLAY POCKET.
-10		25	◤	20 26 30	56	10	SP	SAND. SIMILAR TO SS 23 AND 24.
	130	26	◤	33 30 44	74	13	SP	SAND, UNIFORM, FINE, 2-5% SLIGHTLY PLASTIC FINES, MOTTLED, PALE YELLOWISH ORANGE (10 YR 8/6), DARK YELLOWISH ORANGE (10 YR 6/6), AND VERY PALE ORANGE (10 YR 8/2).
-20		27	◤	21 36 45	81	[illegible]	SP	SAND, UNIFORM, FINE AND VERY FINE SAND, 2-6% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
	140	28	◤	46 50/5"		[illegible]	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, LESS THAN 1% GRAVEL TO 0.9 INCH MAXIMUM, 4-8% FINES, GRAYISH ORANGE (10 YR 7/4).
-30		29	◤	50/4"		4	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 3-6% GRAVEL TO 0.7 INCH MAXIMUM, 2-8% FINES, GRAYISH ORANGE (10 YR 7/4).
	150	30	◤	37 41 35	76	9	GP	SANDY GRAVEL, POORLY GRADED TO 1.0 INCH MAXIMUM, 15-25% MEDIUM AND COARSE SAND, 4-8% FINES, GRAYISH ORANGE (10 YR 7/4).
-40		31	◤	30 22 16	38	8	GP	SANDY GRAVEL, POORLY GRADED TO 0.9 INCH MAXIMUM, 7-12% MEDIUM AND COARSE SAND, 1-4% FINES, GRAYISH ORANGE (10 YR 7/4), WITH APPROXIMATELY 2" SILTY CLAY LAYER, MOTTLED, WITH THIN FeOx LAYERS.
	160	32	◤	8 10 14	24	[illegible]	CH	SILTY CLAY, MODERATELY PLASTIC, 3-5% VERY FINE AND FINE SAND, YELLOWISH GRAY (5 Y 7/2), WITH SMALL FeOx NODULES.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DFG
DATE JUNE 10, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 208 - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 208 TYPE OF BORING DRIVE SHEET 3 OF 3
DATE DRILLED NOVEMBER 6-9, 1974 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,850.0 EAST 16,997.7 GROUND SURFACE ELEVATION 116.1

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-50		33	◤		70	18	CH	SILTY CLAY, MODERATELY PLASTIC, 2-5% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2), WITH THIN CLAY LAYERS IN TOP HALF OF SAMPLE.
	170	34	◤	9 9 9	18	18	Ch	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 2-6% VERY FINE SAND, DARK GREENISH GRAY (5 G 4/1).
								END OF BORING AT 171.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DFG
DATE JUNE 10, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 208 - C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 209 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED OCTOBER 19-NOV. 3, 1972 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,654.4 EAST 16,967.8 GROUND SURFACE ELEVATION 111.4

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
110								
		1	◤	6 12 13	25	12	ML	CLAYEY SILT, MODERATELY PLASTIC, 1-2% FINE SAND, DARK YELLOWISH ORANGE (10 YR 6/6).
100	10	2	◤	3 5 8	13	11	ML	CLAYEY SILT, SIMILAR TO SS 1, EXCEPT COLORING IS MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6) AND LIGHT GRAY (N7).
		3	◤	8 11 20	31	15	ML-CL	CLAYEY SILT, MODERATELY PLASTIC 3-8% FINE SAND, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), LIGHT GRAY (N7), SMALL CLAY POCKETS PRESENT.
90	20	4	◤	12 14 18	32	15	ML	CLAYEY SILT, MODERATELY PLASTIC, 5-10% FINE SAND. MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) LIGHT GRAY (N7).
		5	◤	14 16 20	36	12	SM	SILTY SAND, UNIFORM FINE. 10-15% SLIGHTLY TO MODERATELY PLASTIC FINES, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), AND LIGHT GRAY (N7).
80	30	6	◤	10 10 10	20	15	SC	CLAYEY SAND, UNIFORM FINE, 8-15% MODERATELY PLASTIC FINES, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), AND PALE YELLOWISH ORANGE (10 YR 8/6), SMALL CLAY VEINING 0.1 INCH THICK THROUGHOUT SAMPLE.
		7	◤	10 10 15	25	15	SC	CLAYEY SAND, UNIFORM FINE, 2-4% MEDIUM SAND, 8-12% MODERATELY PLASTIC FINE, MOTTLED LIGHT BROWN (5 YR 5/6), MODERATE REDDISH BROWN (10 R 4/6), CLAY BALLS, LARGE AND CLAY FLAKES PRESENTS.
70	40	8	◤	10 10 10	20	10	SC	CLAYEY SAND, UNIFORM FINE. 10-20% MODERATELY TO HIGHLY PLASTIC FINES MODERATE REDDISH ORANGE (10 R 6/6), WITH HIGHLY PLASTIC, VERY THIN, MODERATE RED (5 R 4/6), CLAY VEINING (1/16-1/8" THICK).
		9	◤	6 7 8	15	14	SC	CLAYEY SAND, UNIFORM FINE, 10-15% MODERATELY TO HIGHLY PLASTIC FINES MODERATE REDDISH BROWN (10 YR 4/6), WITH DARK YELLOWISH ORANGE (10 YR 6/6), BANDING.
60	50	10	◤	5 6 8	14	16	SC	CLAYEY SAND, SIMILAR TO SS 9, SAMPLE CONTAINS CLAY FLAKES.
		11	◤	6 12 19	31	16	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE. LESS THAN 1% OF GRAVEL TO 0.6 INCH MAXIMUM, 3-8% MODERATELY PLASTIC FINES, MOTTLED, MODERATE REDDISH ORANGE (10 R 6/6), AND MODERATE REDDISH BROWN (10 R 4/6), WITH HIGHLY PLASTIC CLAY POCKET.
50	60	12	◤	22 25 30	55	10	SP	SAND, POORLY GRADED. FINE AND COARSE MOSTLY FINE. ONE PIECE OF GRAVEL 0.7 INCH IN SIZE, 2-5% FINES, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), AND PALE YELLOWISH ORANGE (10 YR 8/6).
		13	◤	5 8 9	17	8	SM-SP	SILTY SAND, UNIFORM FINE, 10-15% MODERATELY PLASTIC FINE PALE YELLOWISH ORANGE (10 YR 8/6). 5" HIGHLY PLASTIC CLAY POCKETS WITH SILTY SAND LAYERS AND TWO PIECES OF GRAVEL 1.0 INCH IN SIZE AND 1.5 INCH IN SIZE.
40	70	14	◤	2 3 4	7	10	CH SC-SM	TOP 5 INCHES: SILTY CLAY/CLAY, HIGHLY PLASTIC, FATTY, MODERATE RED (5 R 5/4). BOTTOM 10 INCHES: SAND, UNIFORM FINE, 10-12% MODERATELY PLASTIC FINES. MOTTLED PALE YELLOWISH ORANGE (10 YR 8/6), VERY PALE ORANGE (10 YR 8/2), MODERATE ORANGE PINK (10 R 7/4).
		15	◤	4 7 9	16	15	SC-SM	SAND, UNIFORM FINE, 8-12% SLIGHTLY PLASTIC FINES [illegible] ORANGE (10 R 6/6).
30	80	16	◤	12 23 48	71	16	SP	SAND, POORLY GRADED FINE TO COARSE, MOSTLY FINE AND MEDIUM 2-5% GRAVEL TO 1.0 INCH MAXIMUM, 2-6% SLIGHTLY TO MODERATELY PLASTIC FINES, MOTTLED MODERATE PINK (5 R 7/4), AND DARK YELLOWISH ORANGE (10 YR 6/6), 2" SAND AND GRAVEL FILLED MODERATELY TO HIGHLY PLASTIC CLAY POCKET.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 18 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ▪ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD DFG
DATE DECEMBER 2, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 209-A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 209 TYPE OF BORING SHEET 2 OF 3
DATE DRILLED OCTOBER 19-NOV. 3, 1972 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,654.4 EAST 16,967.8 GROUND SURFACE ELEVATION 111.4

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		17	◤	32 50/5"		8	SP	SAND. POORLY GRADED. FINE TO COARSE. MOSTLY MEDIUM, 1-3% FINES, GRAYISH ORANGE (10 YR 7/4) TWO CLAY BALLS 0.4 INCH DIAMETER.
20	90	18	◤	15 21 30	51	9	SP	SAND, UNIFORM FINE, ONE PIECE OF GRAVEL 0.5 INCH IN SIZE, 2-4% FINES GRAYISH ORANGE (10 YR 7/4) ONE SM/SC SAND POCKET 1 1/2"-2" THICK.
		19	◤	16 16 20	36	6	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, LESS THAN 1% GRAVEL TO 0.6 INCH MAXIMUM, 1-3% FINES GRAYISH ORANGE (10 YR 7/4).
10	100	20	◤	23 25 30	55	9	SP	SAND, UNIFORM FINE/VERY FINE, CLEAN, 1-2% FINES, GRAYISH ORANGE (10 YR 7/4), ONE PIECE OF GRAVEL 0.4 INCH IN SIZE.
		21	◤	16 22 26	48	N.R.	SP	NO RECOVERY.
		22	◤	19 20 23	43	9	SP	SAND, UNIFORM FINE, LESS THAN 1% GRAVEL TO 0.5 INCH MAXIMUM, LESS THAN 1-2% FINES, GRAYISH ORANGE (10 YR 7/4).
6	110	23	◤	30 40 48	88	8	SP	SAND, SIMILAR TO SS 22, EXCEPT NO GRAVEL, 1-3% FINES
		24	◤	27 35 35	70	10	SP	SAND, SIMILAR TO SS 22 AND 23, WITH LESS THAN 1% GRAVEL TO 0.6 INCH MAXIMUM.
-10	120	25	◤	42 50/5"		11	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 1-2% GRAVEL TO 0.8 INCH MAXIMUM, 1-2% FINES, GRAYISH ORANGE (10 YR 7/4), ONE MEDIUM SIZE CLAY BALL.
		26	◤	30 50/5"		10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, LESS THAN 1% GRAVEL TO 0.6 INCH MAXIMUM, 1-4% FINES, GRAYISH ORANGE (10 YR 7/4) WITH CLAY LAYER APROXIMATELY 1/2" THICK.
-20	130	27	◤	27 27 28	55	6	SP	SAND, UNIFORM FINE, 2-3% FINES, GRAYISH ORANGE (10 YR 7/4).
		28	◤	23 27 28	55	8	SP	SAND, SIMILAR TO SS 27.
-30	140	29	◤	20 28 29	57	N.R.		NO RECOVERY.
		30	◤	26 33 37	70	6	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 5-10% GRAVEL TO 0.8 INCH MAXIMUM, 3-6% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
-40	150	31	◤	100/ 6"		N.R.		NO RECOVERY.
		32	◤	28 29 30	59	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 3-8% GRAVEL TO 0.8 INCH MAXIMUM, 4-8% SLIGHTLY TO MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), WITH SMALL CLAY COATED GRAVEL AND SAND, CLAY POCKET.
-50	160	33	◤	21 13 11	24	12	CH	SILTY CLAY, MODERATELY PLASTIC, MOTTLED YELLOWISH GRAY (5 Y 8/1), AND DARK YELLOWISH ORANGE (10 YR 6/6), FeOx NODULES IN SAMPLE.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 18 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ▪ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD DFG
DATE DECEMBER 2, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 209-B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 209 TYPE OF BORING SHEET 3 OF 3
DATE DRILLED OCTOBER 19, NOV. 3, 1972 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,654.4 EAST 16,967.8 GROUND SURFACE ELEVATION 111.4

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-50								
		34	◤	14 20 23	43	14	CH	SILTY CLAY, SIMILAR TO SS 34, EXCEPT VERY FINE SILTY SAND LAYERS 2 1/2"-3" THICK WITH VERY THIN FeOx LAYERING THROUGHOUT SAMPLE.
-60	170	35	◤	12 15 19	34	14	CH	SILTY CLAY, MODERATELY PLASTIC, 1-2% VERY FINE SILTY SAND, DUSKY YELLOW (5 Y 6/4), WITH HIGHLY PLASTIC CLAY LAYERS.
		36	◤	10 15 19	34	15	CH	SILTY CLAY, MODERATELY PLASTIC, 1-3% VERY FINE SAND, GREENISH GRAY (5 G 6/1), WITH 4" CLAYEY SILT POCKET, HIGHLY PLASTIC.
								END OF BORING AT 176.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 18 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ▪ INDICATES LOCATION OF UNDISTURBED SAMPLE.
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4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD DFG
DATE DECEMBER 2, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 209-[illegible]

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 210
TYPE OF BORING
SHEET 1 OF 2
DATE DRILLED SEPTEMBER 26-28, 1972
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY T.I.B.
COORDINATES, NORTH 17,461.9 EAST 16,937.0
GROUND SURFACE ELEVATION 107.0

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
100		1	◤	24 20 16	36	8	ML	CLAYEY SILT, NONPLASTIC TO SLIGHTLY PLASTIC, MOTTLED, MODERATE YELLOWISH BROWN (10 YR 5/4), WITH VERY LIGHT GRAY (N8).
	10	2	◤	12 22 27	49	13	ML CL	CLAYEY SILT, NONPLASTIC TO SLIGHTLY PLASTIC, MOTTLED LIGHT GRAY (N7), VERY LIGHT GRAY (5 Y 8/1), WITH SOME LIGHT BROWN SPOTS WITH POCKETS. SILTY CLAY, SLIGHTLY PLASTIC, LIGHT GRAY (N7), WITH LIGHT BROWN (5 YR 5/4).
90		3	◤	12 22 32	54	10	ML	CLAYEY SILT, SLIGHTLY PLASTIC, VERY LIGHT GRAY (N8), WITH LIGHT BROWN (5 YR 5/4).
	20	4	◤	16 19 50	69	12	ML	SANDY SILT, NONPLASTIC, 40-45% UNIFORM FINE SAND, LESS THAN 5% MEDIUM SAND, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), AND LIGHT GRAY (N7) WITH ZONES OF SANDY CLAY.
80		5	◤	15 17 20	37	11	SP	SAND, UNIFORM, FINE, 2-6% FINES, TRACE OF SUBHORIZONTAL COLOR BANDING GRAYISH ORANGE (10 YR 7/4), TO BRIGHT YELLOWISH ORANGE (10 YR 6/6).
	30	6	◤	5 6 7	13	11	SM	SILTY SAND, UNIFORM, FINE, 10-12% SLIGHTLY PLASTIC FINES, PALE YELLOWISH ORANGE (10 YR 8/5), WITH VERTICAL THIN DARK YELLOWISH ORANGE BAND (NOT BEDDING).
70		7	◤	7 27 34	61	14	SP- SC/SM	SAND, UNIFORM, FINE, 8-12% SLIGHTLY PLASTIC FINES, THIN LIGHT BROWN (5 YR 5/5), AND PALE REDDISH BROWN (10 R 5/4), LAYERS DIPPING ABOUT 10°.
	40	8	◤	5 8 10	18	13	SP-SC	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 8-12% SLIGHTLY PLASTIC FINES, LIGHT BROWN (5 YR 5/6), TO DARK YELLOWISH ORANGE (10 YR 6/6).
60		9	◤	5 7 8	15	15	SC	CLAYEY SAND, UNIFORM, FINE, 10-12% SLIGHTLY PLASTIC FINES, THINLY LAYERED (DIPPING 10-15°), MODERATE RED (5 R 5/4), WITH SOME DARK YELLOWISH ORANGE (10 YR 6/6).
	50	10	◤	4 6 7	13	11	SC	CLAYEY SAND, UNIFORM, FINE, 10-12% SLIGHTLY PLASTIC FINES, LIGHT BROWN (5 R 5/6), TO DARK YELLOWISH ORANGE (10 YR 5/6).
50		11	◤	5 5 6	11		[illegible]	SAND, POORLY GRADED, FINE TO MEDIUM MOSTLY FINE, 1-3% GRAVEL TO 0.7 INCH MAXIMUM, 3-4% FINES, DARK TO BRIGHT YELLOWISH ORANGE (10 YR 5/6 TO 6/6), WITH SEVERAL HIGHLY PLASTIC YELLOWISH ORANGE CLAY BALLS.
	60	12	◤	2 4 5	9	10	SP	SAND, UNIFORM, FINE, 4-7% SLIGHTLY PLASTIC FINES, LIGHT RED (5 R 6/6), WITH YELLOWISH ORANGE (10 YR 7/6). RESEMBLES DILATENT SILT.
40		13	◤	2 3 8	11	14	SC	CLAYEY SAND, UNIFORM, FINE, 8-20% SLIGHTLY TO MODERATELY PLASTIC FINES, THINLY LAYERED SUBHORIZONTALLY, MODERATE RED (5 R 6/4), WITH FEW LIGHT YELLOWISH ORANGE (10 YR 7/6) SAND LAYERS, AND FEW VERY THIN HIGHLY PLASTIC CLAY LAYERS.
	70	14	◤	7 7 7	14	14	SP CH	TOP 7 INCHES: SAND, UNIFORM, FINE, 1-2% FINES, MODERATE PINK (10 R 7/5) WITH LIGHT YELLOWISH ORANGE (10 YR 7/6). BOTTOM 7 INCHES: CLAY, HIGHLY PLASTIC, FAT, STEEPLY DIPPING THIN LAYERS, PALE RED (10 R 6/2), TO MODERATE (5 R 5/4), WITH SMALL SILT AND VERY FINE SAND POCKETS
30		15	◤	8 12 14	26	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 1% FINES, LIGHT REDDISH ORANGE (10 R 7/6), WITH ONE SMALL MODERATE RED CLAY POCKET (BALL ?).
	80	16	◤	7 11 11	22	9	SP	SAND, UNIFORM, FINE, 1-3% FINES, LIGHT REDDISH ORANGE (10 R 7/6) WITH GRAYISH ORANGE SAND AT BOTTOM WITH ONE 1.0 INCH PIECE [illegible] GRAVEL AT BOTTOM, WITH MODERATE RED CLAY POCKET (BALL ?) AT TOP (POSSIBLY CUTTINGS).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 210 - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 210
TYPE OF BORING
SHEET 2 OF 2
DATE DRILLED SEPTEMBER 26-28, 1972
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY TIB
COORDINATES, NORTH 17,461.9 EAST 16,937.0
GROUND SURFACE ELEVATION 107.0

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
20		17	◤	15 17 20	37	[illegible]	SP	SAND, UNIFORM, FINE, 5-10% MEDIUM TO COARSE. 5-10% GRAVEL TO 0.5 INCH MAXIMUM, LESS THAN 1% FINES. GRAYISH ORANGE (10 YR 7/3).
	90	18	◤	20 20 26	46	10	SP	SAND, UNIFORM, FINE, 3-6% MEDIUM TO COARSE LESS THAN 1% FINES. LIGHT GRAYISH ORANGE (10 YR 8/4).
10		19	◤	9 10 10	20	10	SP	SAND, POORLY GRADED. FINE TO COARSE. MOSTLY FINE TO MEDIUM AT TOP, MOSTLY FINE AT BOTTOM, 1-2% GRAVEL TO 0.4 INCH MAXIMUM, LESS THAN 1% FINES AT TOP, 2-3% FINES AT BOTTOM. GRAYISH ORANGE (10 YR 8/4), WITH FEW THIN YELLOWISH ORANGE LAYERS.
	100	20	◤	23 30 45	75	10	SP	SAND, POORLY GRADED. FINE TO COARSE, MOSTLY FINE TO MEDIUM, 3-4% GRAVEL TO 0.6 INCH MAXIMUM, LESS THAN 1% FINES, VERY PALE ORANGE (10 YR 8/2), WITH LIGHT GRAYISH ORANGE (10 YR 8/4).
0		21	◤	27 46 51	97	9	SP	SAND, SIMILAR TO SS20, EXCEPT 1% GRAVEL TO 0.5 INCH MAXIMUM. AND 1.0 INCH LAYER GRAVEL TO 0.5 INCH MAXIMUM AT TOP (POSSIBLY CUTTING).
	110	22	◤	16 27 30	57	7	SP	SAND UNIFORM FINE LESS THAN 5% MEDIUM TO COARSE LESS THAN 1% GRAVEL TO 0.4 INCH MAXIMUM, LESS THAN 1% FINES, LIGHT GRAYISH ORANGE (10 YR 8/3).
-10		23	◤	18 20 24	44	8	SP	SAND, UNIFORM, FINE, 5-10% MEDIUM TO COARSE 1% GRAVEL TO 0.5 INCH MAXIMUM, LESS THAN 1% FINES; GRAYISH ORANGE (10 YR 8/3).
	120	24	◤	25 35 60	95	13	SP	SAND, POORLY GRADED. FINE TO COARSE. MOSTLY FINE TO MEDIUM, 2-3% GRAVEL TO 0.5 INCH MAXIMUM, (CONCENTRATED IN BOTTOM 3 TO 4 INCHES). LESS THAN 1% FINES LIGHT GRAYISH ORANGE (10 YR 8/3).
-20		25	◤	29 50/6"		8	SP	SAND, SIMILAR TO SS 24, EXCEPT LESS THAN 1% GRAVEL TO 0.3 INCH MAXIMUM.
	130	26	◤	36 53/6"		8	SP	SAND, SIMILAR TO SS24 AND SS25, EXCEPT 3-5% GRAVEL TO 0.6 INCH MAXIMUM.
-30		27	◤	25 33 50/4"		10	SP	SAND, POORLY GRADED, FINE TO COARSE MOSTLY FINE TO MEDIUM, 2-3% GRAVEL TO 0.5 INCH, LESS THAN 1% FINES LIGHT GRAYISH ORANGE (10 YR 8/3).
	140	28	◤	27 25 26	51	7	GP	SANDY GRAVEL, POORLY GRADED TO 0.7 INCH MAXIMUM, 20-30% MEDIUM TO COARSE SAND 1-3% FINES. MODERATE BROWN (5 YR 4/4), WITH BRIGHT YELLOWISH ORANGE (10 YR 5/6), WITH CLAYEY GRAVEL AT BOTTOM.
-40		29	◤	11 14 18	32	12	SP	SAND, UNIFORM, FINE, 1-3% NONPLASTIC FINES, PALE YELLOWISH GRAY (5 Y 8/2), WITH FEW THIN SUBHORIZONTAL DARK YELLOWISH ORANGE LAYERS.
	150	30	◤	5 8 12	20	12	CH ML	VERY THINLY INTERLAYERED, SUBHORIZONTALLY: SILTY CLAY, HIGHLY PLASTIC. CLAYEY SILT, SLIGHTLY PLASTIC, LESS THAN 5% UNIFORM VERY FINE SAND, PALE OLIVE GRAY (5 Y 6/2), WITH LAYERS OF DARK AND BRIGHT YELLOWISH ORANGE (10 YR 6/6 -5/6). WITH THIN FeOx LAYER.
-50		31	◤	5 8 12	20		ML	CLAYEY SILT, NONPLASTIC TO SLIGHTLY PLASTIC YELLOWISH GRAY (5 Y 7/2). WITH SILTY VERY FINE SAND LAYERS AND FEW THIN SILTY CLAY LAYERS.
	160	32	◤	6 17 11	28	3	SP	SAND, UNIFORM, VERY FINE/FINE, 3-5% NONPLASTIC FINES LIGHT OLIVE GRAY (5 Y 6/2) WITH POCKETS OF SILTY SAND, AND ONE 0.7 INCH PIECE GRAVEL AT BOTTOM. END OF BORING AT [illegible]

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 210 - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 210A
TYPE OF BORING DRIVE
SHEET 1 OF 2
DATE DRILLED SEPTEMBER 11, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 17,449.5 EAST 16,930.6
GROUND SURFACE ELEVATION 106.9'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
								0.0'-85.0' WASH
20	85	1	◤	27 26 28	54	6	SP	SAND, UNIFORM, FINE, 3-5% FINES, GRAYISH ORANGE (10 YR 7/4).
		2	◤	29 37 40	77	6	SP	SAND, UNIFORM, FINE, 2-4% MEDIUM SAND, 3-5% FINES, GRAYISH ORANGE (10 YR 7/4) WITH LESS THAN 1% GRAVEL TO 1.0 INCH MAXIMUM.
	90	3	◤	24 35 50/6"		4	SP	SAND, UNIFORM, FINE, 3-6% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4) AND VERY PALE ORANGE (10 YR 8/2).
		4	◤	50/5"		6	SP	SAND, UNIFORM, FINE, 2-5% FINES, GRAYISH ORANGE (10 YR 7/4).
		5	◤	5 24 31	55	8	SP	SAND, POORLY GRADED FINE AND MEDIUM, MOSTLY FINE, 2-5% FINES, VERY PALE ORANGE (10 YR 8/2).
10		6	◤	17 34 50/5"		8	SP	SAND, UNIFORM FINE, CLEAN, 1-3% FINES, VERY PALE ORANGE (10 YR 8/2).
	100	7	◤	21 89 50/6"		5	SP	SAND, POORLY GRADED FINE, CLEAN, 1-3% FINES, VERY PALE ORANGE (10 YR 8/2).
		8	◤	35 50/5"		8	SP	SAND, UNIFORM, FINE, CLEAN, 1-3% FINES, VERY PALE ORANGE (10 YR 8/2).
		9	◤	42 50/4"		5	SP	SAND, SIMILAR TO SS #8.
0		10	◤	42 50/4"		5	SP	SAND, UNIFORM, FINE, CLEAN, 1-3% FINES, VERY PALE ORANGE (10 YR 8/2) WITH LESS THAN 1% GRAVEL TO 0.7 INCH MAXIMUM.
	110	11	◤	21 50/5"		8	SP	SAND, UNIFORM, FINE, 3-5% FINES, VERY PALE ORANGE (10 YR 8/2), AND DARK YELLOWISH ORANGE (10 YR 6/6).
		12	◤	35 50/3"		10	SP	SAND, POORLY GRADED FINE, 3-5% FINES, VERY PALE ORANGE AND MODERATE YELLOWISH BROWN (10 YR 5/4).
-10		13	◤	38 50/5"		8	SP	SAND, UNIFORM, FINE, 3-5% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
		14	◤	27 32 34	66	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 4-7% GRAVEL TO 0.8 INCH MAXIMUM, 5-6% FINES, DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE YELLOWISH BROWN (10 YR 5/4).
	120	15	◤	48 50/5'		7	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, 2-3% GRAVEL TO 0.7 INCH MAXIMUM, 2-5% FINES, VERY PALE ORANGE (10 YR 8/2).
		16	◤	40 50/4"		5	SP	SAND, POORLY GRADED, FINE TO COARSE, 5-8% MEDIUM AND COARSE SAND, 4-6% FINES, PALE YELLOWISH BROWN (10 YR 6/2).
		17	◤	48 50/5"		8	SP	SAND, UNIFORM, FINE, 6-10% MEDIUM SAND, 4-7% FINES, VERY PALE ORANGE (10 YR 8/2) AND MODERATE YELLOWISH BROWN (10 YR 5/4).
-20		18	◤	42 50/5"		6	SP	SAND, POORLY GRADED FINE, 4-7% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
	130	19	◤	26 50/5"		6	SP	SAND, POORLY GRADED FINE, AND MEDIUM, 5-[illegible]% FINES, VERY PALE ORANGE (10 YR 8/2) AND PALE YELLOWISH BROWN (10 YR 6/2).
		20	◤	34 28 29	57	5	SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY MEDIUM, CLEAN, 1-3% FINES, GRAYISH ORANGE (10 YR 7/4) AND MODERATE YELLOWISH BROWN. (10 YR 5/4).
-30		21	◤	33 45 50	95	5	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 4-6% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
		22	◤	30 50/5"		5	SP	SAND, UNIFORM, FINE, CLEAN, 1-2% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
	140	23	◤	19 17 23	40	6	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 5-8% GRAVEL TO 0.8 INCH MAXIMUM, 5-8% SLIGHTLY TO MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH A 2 INCH LAYER OF GRAVELLY CLAY.
		24	◤	12 11 13	24	5	CH	GRAVELLY CLAY, HIGHLY PLASTIC, 20-25% GRAVEL TO 0.7 INCH MAXIMUM, YELLOWISH GRAY (5 Y 8/1).
		25	◤	7 19 20	39	16	CH	GRAVELLY CLAY, HIGHLY PLASTIC, 20-25% GRAVEL TO 0.6 INCH MAXIMUM, 8-10% FINE SAND, YELLOWISH GRAY (5 Y 8/1).
-40		26	◤	15 32 24	56	10	CL	TOP 4 INCHES: SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 8/1) WITH VERY THIN SILT LENSES. BOTTOM 4 INCHES: SANDY CLAY, HIGHLY PLASTIC, 40-45% FINE TO MEDIUM SAND, YELLOWISH GRAY. (5 Y 8/1).
	150	27	◤	5 6 14	20	16	CL	SILTY CLAY, MODERATELY PLASTIC, 5-10% VERY FINE SAND, YELLOWISH GRAY (5 Y 8/1) WITH VERY THIN SILT LENSES AND VERY FINE SAND LENSES THROUGHOUT SAMPLE.
-50		28	◤	7 7 14	21	16	CL	SILTY CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 7/2) WITH A 2 INCH LAYER OF VERY FINE SILTY SAND AT TOP OF SAMPLE.
	160	29	◤	5 17 30	47	16	CL SM	TOP 4 INCHES: SILTY CLAY, MODERATE PLASTIC, PALE OLIVE (10 Y 6/2). BOTTOM 4 INCHES: SILTY SAND, UNIFORM, VERY FINE, 15-20% SLIGHTLY PLASTIC FINES, DUSKY YELLOW (5 Y 6/4).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

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◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
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ISSUED BY D. F. GREENWOOD
DATE MAY 2, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 210A-A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 210A
TYPE OF BORING DRIVE
SHEET 2 OF 2
DATE DRILLED SEPTEMBER 11, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 17,449.5 EAST 16,930.6
GROUND SURFACE ELEVATION [illegible]

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
	166.5	30	◤	8 10 13	23	16	CL	SILTY CLAY, MODERATELY PLASTIC, 6-10% FINE SAND, PALE OLIVE (10 Y 6/2) WITH A 1 INCH LAYER OF FINE SAND.
								END OF BORING AT 166.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

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ISSUED BY D. F. GREENWOOD
DATE MAY 2, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 210A-B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 211
DATE DRILLED SEPT. 22-25, 1972
COORDINATES, NORTH 17,265.0
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 16,898.2
SHEET 1 OF 2
LOGGED BY T.I.B.
GROUND SURFACE ELEVATION 106.1

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
100		1	◤	7 10 16	26	8	ML	CLAYEY SILT, NON PLASTIC, MOTTLED, MODERATE BROWN (5 YR 4/4) AND LIGHT YELLOWISH BROWN (10 YR 6/4), WITH ROOTS.
	10	2	◤	13 18 18	36	8	ML	CLAYEY SILT, NON PLASTIC, GRAYISH ORANGE (10 YR 7/4) WITH FEW SMALL SOFT YELLOWISH BROWN FeOx NODULES.
90		3	◤	9 14 18	32	14	[illegible]	SILTY CLAY, MODERATELY PLASTIC, OLIVE GRAY (5 Y 5/1 TO 6/1) WITH LIGHT BROWN (5 Y 5/6) AND DARK YELLOWISH (10 YR 6/6) MOTTLES, WITH CLAYEY SILT POCKETS.
	20	4	◤	18 28 45	73	10	ML	SILT, NON PLASTIC, PALE YELLOWISH BROWN (10 YR 7/2) WITH SOME YELLOWISH ORANGE MOTTLES, WITH POCKETS OF SILTY CLAY AND SANDY SILT.
80		5	◤	13 9 7	16	9	SP	SAND, UNIFORM, VERY FINE AT TOP TO FINE AT BOTTOM, 3-9% NONPLASTIC FINES DECREASING DOWN SAMPLE, PALE YELLOWISH BROWN (10 YR 7/2) TO DARK YELLOWISH ORANGE (10 YR 6/6) WITH FEW SMALL CLAY FLAKES.
	30	6	◤	8 7 9	16	11	SP-SM	SILTY SAND, UNIFORM, FINE, 8-12% SLIGHTLY PLASTIC FINES, PINKISH, GRAY (5 YR 8/1) WITH VERY THIN YELLOWISH ORANGE LAYERS DIPPING ABOUT 15°.
70		7	◤	13 28 19	47	12	SP SP	TOP 8.0 IN. SAND, UNIFORM, FINE, LESS THAN 1% FINES, PALE YELLOWISH BROWN (10 YR 7/2) WITH FEW VERY SMALL WHITE CLAY SPOTS - SHARP HORIZONTAL CONTACT - BOTTOM 8.0 IN. SAND, UNIFORM, FINE, 2-3% FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6)
	40	8	◤	9 10 11	21	13	SP	SAND, UNIFORM, FINE, 3-6% SLIGHTLY PLASTIC FINES, THIN MODERATE RED (5R 5/4) AND YELLOWISH ORANGE (10 YR 6/6) LAYERS DIPPING 10-15°, AMOUNT OF FINES, HIGHER IN RED LAYERS THAN YELLOWISH ORANGE LAYERS.
60		9	◤	9 9 8	17	6	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, LESS THAN 1% GRAVEL TO 0.3 IN. MAX., 1-3% FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH THIN CLAYEY SAND LAYER.
	50	10	◤	5 6 7	13	11	SP-SC	SAND, UNIFORM, FINE, LESS THAN 5% MEDIUM, 6-11% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
50		11	◤	11 14 18	32	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, UNIFORM FINE AT BOTTOM, LESS THAN 1% GRAVEL TO 0.3 IN. MAX., 2-3% FINES, YELLOWISH ORANGE (10 YR 6/6) WITH ONE SMALL CLAY POCKET.
	60	12	◤	8 7 7	14	6	SP-SC	CLAYEY SAND, UNIFORM, FINE, 3-4% GRAVEL TO 0.6 IN. MAX., 8-12% SLIGHTLY TO MODERATELY PLASTIC FINES, THINLY LAYERED SUBHORIZONTALLY, MODERATE REDDISH ORANGE (10 R 6/6) WITH YELLOWISH ORANGE, WITH VERY THIN CLAY LAYER.
40		13	◤	6 6 8	14	6	SP	SAND, UNIFORM, FINE, 4-8% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6) WITH YELLOWISH ORANGE (10 YR 6/6).
	70	14	◤	6 17 24	41	15	SP SP	TOP 8 IN.: SAND, UNIFORM, FINE, 2-5% FINES, MODERATE REDDISH ORANGE (10 R 6/6) BOTTOM 7 IN.: GRAVELLY SAND, WIDELY GRADED, 15-20% GRAVELTTO 0.9 IN. MAX., 1% FINES, GRAYISH ORANGE (10 YR 7/4).
30		15	◤	14 19 20	39	9	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 1-3% GRAVEL TO 0.7 IN. MAX., 1-2% FINES, GRAYISH PINK (5 R 8/2) AND YELLOWISH ORANGE (10 YR 7/6).
	80	16	◤	12 15 25	40	9	SP SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE AT TOP, MOSTLY FINE AT BOTTOM, 3-6% GRAVEL TO 0.6 IN. MAX., LESS THAN 1% FINES, LIGHT GRAYISH ORANGE (10 YR 7/4).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD DFG
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 211 - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 211
DATE DRILLED SEPT. 22-25, 1972
COORDINATES, NORTH 17,265.0
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG CO
EAST 16,898.2
SHEET 2 OF 2
LOGGED BY T.I.B.
GROUND SURFACE ELEVATION 106.1

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
20		17	◤	17 23 28	51	[illegible]	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM AT TOP, MOSTLY FINE AT BOTTOM, 1-2% GRAVEL TO 0.4 IN. MAX., LESS THAN 1% FINES, LIGHT YELLOWISH BROWN (10 YR 5/4) AT TOP, POSSIBLY DISCOLORED BY DRILLING MUD, VERY PALE ORANGE (10 YR 8/2) AT BOTTOM.
	90	18	◤	22 34 35	69	11	SP	SAND, UNIFORM, FINE, LESS THAN 5% MEDIUM TO COARSE, LESS THAN 1% GRAVEL TO 0.5 IN. MAX., LESS THAN 1% FINES, PALE YELLOWISH BROWN (10 YR 6/2) AT TOP TO VERY PALE ORANGE (10 YR 8/2)..
10		19	◤	11 21 34	55	12	SP	SAND, UNIFORM, FINE, 4-6% MEDIUM TO COARSE, 1-2% GRAVEL TO 0.8 IN. MAX, LESS THAN 1% FINES, VERY PALE ORANGE (10 YR 8/2).
	100	20	◤	20 24 28	52	10	SP	SAND, UNIFORM, FINE, LESS THAN 1% FINES, LIGHT GRAYISH ORANGE (10 YR 7/[illegible]).
0		21	◤	28 33 42	75	[illegible]	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 2-4% GRAVEL TO 0.5 IN. MAX., LESS THAN 1% FINES, VERY PALE ORANGE (10 YR 8/2) TO PALE YELLOWISH BROWN (10 YR 7/2).
	110	22	◤	30 34 30	64	13	SP	SAND, UNIFORM, FINE, 4-8% MEDIUM TO COARSE, 1-3% GRAVEL TO 0.5 IN. MAX., LESS THAN 1% FINES, PALE YELLOWISH BROWN (10 YR 7/2).
-10		23	◤	14 24 50	74	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 2-4% GRAVEL TO 0.4 IN. MAX., LESS THAN 1% FINES, VERY PALE ORANGE (10 YR 8/2) TO LIGHT YELLOWISH ORANGE (10 YR 7/6).
	120	24	◤	9 6 12	18	12	[illegible]	SILTY CLAY, HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2) SEVERELY OXIDIZED AT TOP TO BRIGHT YELLOWISH ORANGE (10 YR 6/6) FEW PIECES GRAVEL AT TOP, POSSIBLY CUTTINGS.
-20		25	◤	4 5 7	12		[illegible]	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, LESS THAN 5% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2 - 6/2).
	130	26	◤	3 4 6	10		[illegible]	THINLY LAYERED - SILTY CLAY, HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2 - 6/2) WITH FEW SMALL FeOx SPOTS, WITH CLAY, HIGHLY PLASTIC, SANDY CLAY, MODERATELY PLASTIC 10-15% UNIFORM, VERY FINE, SAND.
								END OF BORING AT 131.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD DFG
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 211 - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 212
DATE DRILLED SEPT. 15-20, 1972
COORDINATES, NORTH 17,067.5
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 16,857.9
SHEET 1 OF 2
LOGGED BY T.I.B.
GROUND SURFACE ELEVATION 96.0

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
90		1	◤	13 18 19	37	18	ML	CLAYEY SILT, SLIGHTLY PLASTIC, MOTTLED PALE BROWN (5 Y 5/2) AND PALE YELLOWISH BROWN (10 YR 8/2).
	10	2	◤	8 8 12	20	18	CL	SANDY CLAY, SLIGHTLY PLASTIC, 15-25% FINE SAND, MOTTLED MODERATE BROWN, (5 YR 6/4) AND PALE YELLOWISH BROWN (10 YR 6/2).
80		3	◤	9 11 11	22	15	SP-SC	SAND, UNIFORM, FINE, 8-12% SLIGHTLY PLASTIC FINES, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) AND MODERATE REDDISH BROWN (10 R 4/6) WITH SOME VERY PALE ORANGE (10 YR 8/2) CLEAN SAND AND ONE VERY SMALL CLAY MUDFLAKE.
	20	4	◤	8 7 7	14	17	CH SP	INTERLAYERED: CLAY, HIGHLY PLASTIC, LAYERED MODERATE RED (5 R 4/6) AND LIGHT BROWN (5 YR 6/4) WITH FEW VERY THIN SILT LAYERS. SAND, UNIFORM, FINE, 4-6% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6).
70		5	◤	5 6 7	13	15	CH	CLAY, HIGHLY PLASTIC, MODERATE RED (5 R 4/6) WITH FEW THIN LAYERS BRIGHT YELLOWISH ORANGE (10 YR 6/6) SAND.
	30	6	◤	20 8 18	26	15	SP	SAND, POORLY GRADED, FINE TO COARSE, LESS THAN OR EQUAL TO 5% COARSE, 4-6% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 5/5), 1-2% GRAVEL TO 0.5 IN. MAX., WITH ± 4.0 IN. PALE REDDISH REDDISH BROWN TO DARK YELLOWISH ORANGE CLAYEY FINE SAND AT BOTTOM.
60		7	◤	8 7 6	13	16	SP	SAND, UNIFORM, FINE, 4-8% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10 YR 7/5 - 7/6).
	40	8	◤	8 10 11	21	11	SP	SAND, UNIFORM, FINE, 1-3% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
50		9	◤	9 13 17	30	12	SP	SAND, SIMILAR TO SS 8 BUT WITH FEW VERY SMALL YELLOWISH ORANGE CLAY BALLS.
	50	10	◤	12 14 16	30	12	SP SC	SAND, UNIFORM, FINE, LESS THAN 5% MEDIUM, 2-3% FINES, DARK YELLOWISH ORANGE (6/5) WITH CLAYEY SAND, UNIFORM, FINE, 10-15% SLIGHTLY PLASTIC FINES, YELLOWISH ORANGE (10 YR 6/6) WITH FEW VERY THIN CLAY LAYERS.
40		11	◤	5 8 10	18	15	SP	SAND, UNIFORM, FINE, 4-6% SLIGHTLY PLASTIC FINES (MOSTLY CLAY), MODERATE REDDISH ORANGE (10 R 6/6), WITH MANY VERY THIN SUBHORIZONTAL YELLOWISH ORANGE LAYERS.
	60	12	◤	11 10 13	23	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 3-5% GRAVEL TO 0.5 IN. MAX., 2-5% FINES, MODERATE REDDISH ORANGE (10 R 6/6) WITH FEW THIN LAYERS BRIGHT YELLOWISH ORANGE (10 YR 6/6).
30		13	◤	24 31 27	58	10	SP	GRAVELLY SAND, WIDELY GRADED, 15-20% GRAVEL TO 0.9 IN. MAX., LESS THAN 1% FINES, VERY PALE ORANGE (10 YR 8/2).
	70	14	◤	21 28 25	53	10	SP SP	TOP - SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 1% GRAVEL TO 0.5 IN. MAX., LESS THAN 1% FINES, PALE YELLOWISH BROWN (10 YR 6/2) BOTTOM - GRAVELLY SAND, WIDELY GRADED, 10-20% GRAVEL TO 0.6 IN. MAX., LESS THAN 1% FINES, PALE YELLOWISH BROWN (10 YR 6/2 - 7/2).
20		15	◤	25 27 27	54	7	SP	GRAVELLY SAND, POORLY GRADED, 10-15% GRAVEL TO 0.5 INCH MAXIMUM, 1% FINES, [illegible] BROWN (10 [illegible]
	80	16	◤	28 33 35	68	6	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 15-25% GRAVEL TO 1.0 IN. MAX., LESS THAN OR EQUAL TO 1% FINES, PALE YELLOWISH BROWN (10 YR 7/2).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD DFG
DATE NOVEMBER 27, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 212 - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 212
DATE DRILLED SEPT. 15-20, 1972
COORDINATES, NORTH 17,067.5
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 16,857.9
SHEET 2 OF 2
LOGGED BY T.I.B.
GROUND SURFACE ELEVATION 96.0

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
10		17	◤	41 50/6"			SP	SAND, UNIFORM, FINE, 3-4% MEDIUM TO COARSE, LESS THAN 1% GRAVEL TO 0.3 IN. MAX., 1% FINES, PALE GRAYISH ORANGE (10 YR 8/3).
	90	18	◤	22 29 27	56	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 1% GRAVEL TO 0.4 IN. MAX., LESS THAN OR EQUAL TO 1% FINES, LIGHT YELLOWISH BROWN (10 YR 6/3).
0		19	◤	34 40 43	83	11	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 3-4% GRAVEL TO 0.7 IN. MAX., 1% FINES, PALE YELLOWISH BROWN (10 YR 7/2).
	100	20	◤	45 54/6"		6	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 1-3% GRAVEL TO 0.4 IN. MAX., 1% FINES, PALE YELLOWISH BROWN (10 YR 7/2).
-10		21	◤	34 37 40	77	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 1% GRAVEL TO 0.4 IN. MAX., 1% FINES, LIGHT YELLOWISH BROWN (10 YR 6/4).
	110	22	◤	45 50/6"		8	SP	SAND, SIMILAR TO SS 21.
-20		23	◤	16 17 18	35	8	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY COARSE, 10-20% GRAVEL TO 0.6 IN. MAX., 1% FINES, LIGHT YELLOWISH BROWN (10 YR 6/4) WITH ONE SMALL POCKET OF CLAYEY GRAVEL.
	120	24	◤	4 7 7	14	18		SILTY CLAY, HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2) WITH FEW BRIGHT YELLOWISH ORANGE SPOTS.
-30		25	◤	14 15 15	30	15	SP	SAND, UNIFORM, FINE, 1-3% NON PLASTIC FINES, LIGHT YELLOWISH GRAY (5 Y 8/2) WITH STAINED ZONES OF YELLOWISH ORANGE (10 YR 6/6) WITH FEW THIN LAYERS OF SILTY CLAY.
	130	26	◤	14 21 23	44	13	SP	SAND, UNIFORM, FINE, 1-3% NON PLASTIC FINES, VERY PALE ORANGE (10 YR 6/2).
-40		27	◤	11 11 15	26	13	SP-SM	SAND, UNIFORM, FINE TO VERY FINE, 6-12% NON PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2) WITH FEW YELLOWISH ORANGE MOTTLES.
	140	28	◤	11 16 18	34	18	CH	CLAY, HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2) WITH YELLOWISH ORANGE (FeOx) AND BLACK (MnO_2) SPOTS.
-50		29	◤	15 20 19	39	13	[illegible]	SILTY CLAY, HIGHLY PLASTIC, LIGHT OLIVE GRAY (5 Y 6/2) WITH YELLOWISH ORANGE (10 YR 6/6) AND BLACK MOTTLES.
	150	30	◤	14 20 26	46	18	[illegible]	SILTY CLAY, HIGHLY PLASTIC, HARD, GREENISH GRAY (5GG 6/1) WITH MODERATE YELLOWISH BROWN (10 YR 5/4) MOTTLES.
								END OF BORING AT 151.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD DFG
DATE NOVEMBER 27, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 212 - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 213
DATE DRILLED SEPT. 21, 1972
COORDINATES, NORTH 16,893.6
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 16,829.2
SHEET 1 OF 2
LOGGED BY D.F.P.
GROUND SURFACE ELEVATION 98.1

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
90		1	◤	7 17 12	23	15	SM	SILTY SAND, UNIFORM, VERY FINE, 5-10% SLIGHTLY PLASTIC FINES, MOTTLED LIGHT GRAY (N 7) AND DARK YELLOWISH ORANGE (10 YR 6/6).
	10	2	◤	4 7 8	15	18	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6), VERY PALE ORANGE (10 YR 8/2), MODERATELY PLASTIC CLAY LENSES YELLOWISH GRAY (5 Y 7/2) IN SAMPLE.
80		3	◤	6 7 8	15	15	SM	SILTY SAND, UNIFORM, VERY FINE, 1-2% SLIGHTLY PLASTIC FINES, LIGHT GRAY (N 7).
	20	4	◤	6 7 8	15	15	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO FINE/MEDIUM, 1-3% SLIGHTLY PLASTIC FINES, FEW CLAY BALLS 0.4 IN. IN SIZE, DARK YELLOWISH ORANGE (10 YR 6/6).
70		5	◤	6 8 9	17	15	SP	SAND, SIMILAR TO SS 4.
	30	6	◤	5 4 8	12	18	CH	SANDY CLAY, MODERATELY PLASTIC, FINE TO COARSE SAND, MOSTLY FINE TO MEDIUM, 2-4% GRAVEL TO 0.9 IN. MAX., MOTTLED PALE YELLOWISH ORANGE, (10 YR 8/6) AND DARK YELLOWISH ORANGE SAND (10 YR 6/6).
60		7	◤	6 7 6	13	18	CL	SILTY CLAY, MODERATELY PLASTIC, VERTICAL, SILTY VERY FINE SAND LAYERS, APPROXIMATELY 0.02 IN. THICK, RUNNING THROUGHOUT SAMPLE DARK YELLOWISH ORANGE (10 YR 6/6).
	40	8	◤	6 6 5	11	0		NO RECOVERY.
		9	◤	5 5 8	13	5	SC	CLAYEY SAND, UNIFORM, FINE, 20-25% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
50		10	◤	11 12 14	26	12	[illegible]- SC	CLAYEY SAND, UNIFORM, FINE, 15-20% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	50	11	◤	13 23 26	49	10	SC	CLAYEY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 10-15% MODERATELY TO HIGHLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) CLAY POCKETS AND FEW CLAY BALLS IN SAMPLE.
40		12	◤	24 47 42	89	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO FINE/MEDIUM, 8-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), ONE CLAY BALL 0.3 IN. IN SIZE.
	60	13	◤	16 21 23	44	11	SP	SAND, UNIFORM, MEDIUM, 5-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), TWO CLAY POCKETS 1/4" - 1/2" THICK.
30		14	◤	23 23 26	49	11	SC	CLAYEY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, LESS THAN 1% GRAVEL TO 0.5 IN. MAX., 15-20% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	70	15	◤	28 38 42	80	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 1-3% GRAVEL TO 0.7 IN. MAX., 5-10% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
20		16	◤	21 27 22	49	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 2-4% GRAVEL TO 1.5 IN. MAX., 8-10% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), FEW CLAY BALLS 0.2 IN. IN SIZE, CLAY COATING ON SOME PIECES OF GRAVEL.
	80	17	◤	17 17 16	33	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 2-5% GRAVEL TO 0.6 IN. MAX., 5-10% SLIGHTLY PLASTIC FINES, PALE YELLOWISH BROWN (10 YR 6/2).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

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◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 213-A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 213
DATE DRILLED SEPT. 22, 1972
COORDINATES, NORTH 16,893.6
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 16,829.2
SHEET 2 OF 2
LOGGED BY D.F.P.
GROUND SURFACE ELEVATION 98.1

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		18	◤	13 12 7	19	NR		NO RECOVERY.
10		19	◤	12 8 5	13	NR		NO RECOVERY.
	90	20	◤	39 60/6"		8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 1-3% GRAVEL TO 1.3 IN. MAX., 10% FINE SAND, 6-8% SLIGHTLY TO MODERATELY PLASTIC FINES, MODERATELY BROWN (5 YR 4/4).
0		21	◤	42 110/6"		8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 1-2% GRAVEL TO 0.6 IN. MAX., 2-4% FINES, GRAYISH ORANGE (10 YR 7/4).
	100	22	◤	26 30 22	52	6	GP	SANDY GRAVEL, POORLY GRADED, GRAVEL TO 0.4 IN. MAX., 15-25% MEDIUM/COARSE SAND, 2-4% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
-10		23	◤	34 50/6"		[illegible]	GP	SANDY GRAVEL, POORLY GRADED, GRAVEL TO 1.3 IN. MAX., 25-30% MEDIUM TO COARSE SAND, 3-6% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	110	24	◤	23 30 27	57	3	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 35-40% GRAVEL TO 0.6 IN. MAX., 6-8% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
-20		25	◤	20 18 14	32	6	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 45-50% GRAVEL TO 0.9 IN. MAX., 3-5% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	120	26	◤	14 15 17	32	8	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 25-35% GRAVEL TO 0.7 IN. MAX., 5-8% FINES, DUSKY BROWN (5 Y 2/2).
-30		27	◤	16 20 17	37	9	GP	GRAVEL, POORLY GRADED TO 0.7 IN. MAX., 3-5% FINE TO MEDIUM SAND, 5-8% SLIGHTLY PLASTIC FINES, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) AND VERY PALE ORANGE (10 YR 8/2), TWO CLAY POCKETS IN SAMPLE.
	130	28	◤	18 23 19	42	11	GC	CLAYEY GRAVEL, POORLY GRADED, GRAVEL TO 0.9 IN. MAX., 5-10% FINE SAND, 25-30% MODERATELY PLASTIC FINES, GRAYISH PINK (5 R 8/2).
-40		29	◤	14 17 26	43	16	SP	SAND, UNIFORM, FINE, 5-10% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), HIGHLY PLASTIC GRAYISH PINK (5 R 8/2), CLAY POCKETS, LAYERS AND CLAY BALLS IN SAMPLE.
	140	30	◤	8 13 17	30	18	CH	SILTY CLAY, HIGHLY PLASTIC, 2-3% FINE SAND, LIGHT OLIVE GRAY (5 Y 6/1), MOTTLED WITH FeOx NODULES, AND MnO_2 NODULES.
-50		31	◤	13 16 20	86	[illegible]	CH	SILTY CLAY, MODERATELY PLASTIC, 2-4% FINE SAND MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6), LIGHT OLIVE BROWN (55Y 6/6), FeOx NODULES AND FINE SAND LENSES THROUGHOUT SAMPLE.
	150	32	◤	17 20 25	45	13	CH	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, MEDIUM BLUISH GRAY. (5 B 5/1).
								END OF BORING AT 151.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE NOVEMBER 26, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 213-B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 214
DATE DRILLED OCTOBER 12, 1972
COORDINATES, NORTH 16,695.7
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 16,785.1
SHEET 1 OF 3
LOGGED BY D.I.B.
GROUND SURFACE ELEVATION 108.3

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
100		1	◤	8 10 9	19	15	ML	CLAYEY SILT, NON PLASTIC TO SLIGHTLY PLASTIC, MOTTLED LIGHT GRAY (N 7) AND MODERATE YELLOWISH BROWN (10 YR 5/4) WITH FEW VERY SMALL POCKETS OF SILTY CLAY.
	10	2	◤	9 11 14	25	16	CL	SILTY CLAY, SLIGHTLY PLASTIC, 5-12% UNIFORM FINE SAND, (INCREASING TOWARDS BOTTOM OF SAMPLE), MOTTLED DARK YELLOWISH BROWN (10 YR 5/4), AND DARK YELLOWISH ORANGE (10 YR 6/6), WITH MANY VERY SMALL SOFT BLACK FeOx NODULES.
90		3	◤	14 34 35	69	10	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 1% FINES, DRY, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6) AND GRAYISH ORANGE (10 YR 7/4) WITH SOME DARK BROWNISH ORANGE.
	20	4	◤	8 8 7	15	12	SP- SC	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 3% MEDIUM, ONE 0.4 IN. PIECE OF GRAVEL, 5-12% SLIGHTLY PLASTIC FINES, MOTTLED LIGHT BROWN (5 YR 5/6), GRAYISH ORANGE (10 YR 7/4) AND VERY PALE ORANGE (10 YR 8/2).
80		5	◤	11 10 9	19	12	SP	SAND, POORLY GRADED, FINE TO COARSE, 5-15% MEDIUM TO COARSE, 4-8% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 5/6) WITH 1.0 IN. LAYER SILTY CLAY, MOTTLED DARK YELLOWISH ORANGE WITH VERY LIGHT GRAY.
	30	6	◤	8 8 7	15	12	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 5% MEDIUM, TWO PIECES GRAVEL TO 0.4 IN. MAX., 4-8% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
70		7	◤	8 9 9	18	13	SP	SAND, UNIFORM, FINE, 5-9% MEDIUM, 4-8% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	40	8	◤	15 11 9	20	13	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 5% MEDIUM TO COARSE, 4-8% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
60		9	◤	10 12 9	21	12	SP	SAND, UNIFORM, FINE, 5-9% MEDIUM TO COARSE, 5-9% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH ONE VERY THIN LAYER OF COARSE SAND AND GRAVEL TO 0.4 IN. MAX.
	50	10	◤	8 6 7	13	12	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 3% MEDIUM, 5-9% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4) WITH SOME DARK YELLOWISH ORANGE AT BOTTOM.
50		11	◤	6 6 6	12	13	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 2% MEDIUM, 4-7% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	60	12	◤	4 5 6	11	12	SP	SAND, UNIFORM, FINE, 4-8% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 5/6).
40		13	◤	35 37 40	77	7	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 1-2% GRAVEL TO 0.5 IN. MAX., DARK YELLOWISH ORANGE (10 YR [illegible]/6), 2-4% FINES.
	70	14	◤	20 15 20	35	11	SP	SAND, AT TOP, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, AT BOTTOM UNIFORM, FINE, 1-2% GRAVEL TO 0.6 IN. MAX., 2-4% FINES, DARK YELLOWISH ORANGE (10 YR 5/6) TO LIGHT YELLOWISH ORANGE (10 YR 7/6), WITH FEW SMALL HIGHLY PLASTIC PALE YELLOWISH ORANGE CLAY BALLS AT TOP.
30		15	◤	7 8 9	17	12	SP	SAND, UNIFORM, FINE, 3-6% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10 YR 6/6).
	80	16	◤	7 10 13	23	11	SP	SAND, UNIFORM, FINE, 3-4% FINES, GRAYISH ORANGE (10 YR 7/4) TO DARK YELLOWISH ORANGE (10 YR 6/6).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE JUNE 18, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 214-A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 214
DATE DRILLED OCTOBER 12, 1972
COORDINATES, NORTH 16,695.7
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 16,785.1
SHEET [illegible] OF 3
LOGGED BY T.I.B.
GROUND SURFACE ELEVATION 108.3

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		17	◤	8 11 10	21	11	SP	SAND, AT TOP - POORLY GRADED, FINE TO COARSE, MOSTLY FINE WITH 3-6% GRAVEL TO 0.8 INCH MAXIMUM, AT BOTTOM - UNIFORM, FINE, NO GRAVEL, 2-4% FINES, GRAYISH ORANGE (10 YR 7/4).
20	90	18	◤	22 43 52	95	10	SP	SAND, UNIFORM, FINE, 4-7% MEDIUM TO COARSE, 2-3% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		19	◤	17 14 13	27	6	GP	GRAVEL, POORLY GRADED, TO 1.1 INCH MAXIMUM, 10-15% FINE TO COARSE SAND, 2-4% FINES, GRAYISH ORANGE (10 YR 7/4), (SAMPLE POSSIBLY DISTURBED/CUTTINGS).
10	100	20		55 50/5"		N.R.		NO RECOVERY.
		21		60/5"		N.R.		NO RECOVERY.
		22	◤	20 25 20	45	7	GP	SANDY GRAVEL, POORLY GRADED, TO 0.5 INCH MAXIMUM, 25-35% FINE TO COARSE SAND, MOSTLY COARSE, 3-5% FINES, BRIGHT YELLOWISH ORANGE (10 YR 5/5).
0	110	23	◤	25 45 50	95	6	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 20-25% GRAVEL TO 0.5 INCH MAXIMUM, 4-5% FINES, (ORGANIC) DUSKY YELLOWISH BROWN (10 YR 2/2).
		24	◤	10 14 16	30	3	GP	SANDY GRAVEL, POORLY GRADED, TO 0.7 INCH MAXIMUM, 10-20% MEDIUM TO COARSE SAND, MOSTLY COARSE, 4-6% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), TO DARK YELLOWISH ORANGE (10 YR 6/6).
-10	120	25	◤	12 15 16	31	8	GP	SANDY GRAVEL, POORLY GRADED, TO 0.8 INCH MAXIMUM, 20-30% MEDIUM TO COARSE SAND, 4-6% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), WITH ONE SMALL POCKET OF MODERATE REDDISH ORANGE (10 R 6/6).
		26	◤	5 6 6	12	15	CL	GRAVELLY CLAY, HIGHLY PLASTIC MATRIX, 20-25% GRAVEL TO 0.8 INCH MAXIMUM, VERY DARK RED (5 R 2/6), WITH MODERATE RED (5 R 5/4), CLAYEY SAND LAYER AT TOP, AND MODERATE REDDISH ORANGE (10 R 6/6), CLAYEY SAND LAYER AT BOTTOM.
-20	130	27	◤	5 7 11	18	10	SC CH	TOP 4 IN.: CLAYEY SAND, UNIFORM, FINE, 10-15% MODERATELY PLASTIC FINES, ONE 0.5 INCH PIECE GRAVEL, MODERATE REDDISH ORANGE (10 R 6/6), WITH SEVERAL SMALL CLAY BALLS AND THIN MUDFLAKES. BOTTOM 6 IN.: SILTY CLAY, HIGHLY PLASTIC, DARK RED (5 R 3/6), WITH TRACE GRAYISH ORANGE PINK (5 YR 7/2), WITH THIN VERTICAL FINE SAND FILLED MUD-CRACK.
		28	◤	5[illegible] 6 20	26	8	CH	SILTY CLAY/CLAY, HIGHLY PLASTIC, IRREGULAR BANDS, MODERATE RED (5 R 5/4 TO 5 R 4/6), AND PALE ORANGE (10 YR 8/3).
-30	140	29	◤	14 19 26	45	12	SP	SAND, UNIFORM, FINE, 1-3% FINES, DARK YELLOWISH ORANGE (10 YR 6/6)
		30	◤	17 26 30	56	9	SP	SAND, UNIFORM, FINE, LESS THAN 1% FINES, PALE YELLOWISH BROWN (10 YR 7/3).
-40	150	31	◤	14 18 22	40	9	SP	SAND, UNIFORM, FINE, 1-2% FINES, MOTTLED GRAYISH ORANGE PINK (5 YR 7/2), AND PALE YELLOWISH BROWN (10 YR 7/2).
		32	◤	10 14 18	32	16	CH	SILTY CLAY, HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2), WITH MANY SMALL YELLOWISH ORANGE FeOx MOTTLES AND SOFT NODULES AND WITH FEW SMALL BLACK MnO_2 MOTTLES.
-50	160	33	◤	12 16 20	36	16	CH	SILTY CLAY, SIMILAR TO SS#32.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE JUNE 18, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 214-B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 214
DATE DRILLED OCTOBER 12, 1972
COORDINATES, NORTH 16,695.7
TYPE OF BORING
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 16,785.1
SHEET 3 OF 3
LOGGED BY T.I.B.
GROUND SURFACE ELEVATION 108.3

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
	165	34	◤	11 13 19	32	16	CH	SILTY CLAY, HIGHLY PLASTIC VERY STIFF, DARK GREENISH GRAY (5G 4/1)
								END OF BORING AT 166.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD DFG
DATE JUNE 18, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 214-C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO. 12210

BORING NO. 229
DATE DRILLED NOVEMBER 1-3, 1972
COORDINATES, NORTH 16,954.1
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 16,429.9
SHEET 1 OF 2
LOGGED BY D.F.P.
GROUND SURFACE ELEVATION 114.6

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
110		1	◤	8 11 11	22	6	ML	CLAYEY SILT, MODERATELY TO HIGHLY PLASTIC MOTTLED, LAYERS OF LIGHT GRAY (N7), AND MODERATE YELLOWISH BROWN (10 YR 5/4).
	10	2	◤	15 19 19	38	11	ML	CLAYEY SILT, MODERATELY PLASTIC, LESS THAN 1% VERY FINE SAND, MOTTLED LIGHT GRAY (N7), AND PALE YELLOWISH ORANGE (10 YR 8/6), WITH VERY FINE SILTY SAND VEINS.
100		3	◤	12 12 12	24	18	CL	SILTY CLAY, HIGHLY PLASTIC, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), PALE YELLOWISH BROWN (10 YR 6/2), AND MODERATE YELLOWISH BROWN (10 YR 5/4), WITH FeOx BALLS AND MnO2 NODULES, AND HIGHLY PLASTIC FATTY CLAY POCKETS.
	20	4	◤	5 8 11	19	18	ML	CLAYEY SILT, MODERATELY PLASTIC, 2-8% FINE SAND, MOTTLED VERY LIGHT GRAY (N8), PALE YELLOWISH ORANGE (10 YR 8/6), AND DARK YELLOWISH ORANGE (10 YR 6/6), WITH A 5" HIGHLY PLASTIC CLAY LAYER CONTAINING, 10° VERY FATTY CLAY VEIN WITH 2 PIECES MEDIUM SAND, AND FeOx BALLS THROUGHOUT CLAY LAYER.
90		5	◤	13 15 18	33	15	SM	SILTY SAND, UNIFORM FINE, 12-15% MODERATELY TO HIGHLY PLASTIC FINES, MOTTLED PALE YELLOWISH ORANGE (10 YR 8/6), DARK YELLOWISH ORANGE (10 YR 6/6), AND LIGHT GRAY (N7), CLAY SLIVERS APPROXIMATELY 1/4"-1/2" LONG, 1/16"-1/8" THICK THROUGHOUT SAMPLE.
	30	6	◤	5 8 9	17	18	CH	CLAY, HIGHLY PLASTIC, FATTY, MOTTLED YELLOWISH GRAY (5 Y 8/1), AND MODERATE RED (5 R 4/6), WITH FINE SAND LAYERS.
80		7	◤	5 7 9	16	18	CH	CLAY, SIMILAR TO SS-6, EXCEPT UNIFORM, FINE SAND POCKETS IN SAMPLE.
	40	8	◤	6 12 13	25	11	SM	SILTY SAND, UNIFORM, FINE, 10-15% SLIGHTLY TO MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
70		9	◤	19 35 38	73	8	SP	SAND, UNIFORM, FINE, 4-8% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	50	10	◤	20 25 26	51	9	SP	SAND, UNIFORM, FINE, 3-6% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), WITH LARGE AND SMALL CLAY BALLS.
60		11	◤	8 9 13	22	16	SC	CLAYEY SAND, UNIFORM, FINE, 10-20% MODERATELY PLASTIC FINES, MOTTLED MODERATE ORANGE PINK (5 YR 8/4), PALE YELLOWISH ORANGE (10 YR 8/6), DARK YELLOWISH ORANGE (10 YR 6/6), MODERATE REDDISH ORANGE (10 R 6/6), WITH 4" HIGHLY PLASTIC, SILTY CLAY POCKET WITH CLAYEY SAND LAYERING (THICK) CONTAINING CLAY SLIVERS, LESS THAN 1% GRAVEL TO 1.2 INCH MAXIMUM IN SIZE AND MnO2 MOTTLING THROUGHOUT.
	60	12	◤	12 12 12	24	8	SP	SAND, UNIFORM, FINE, 2-5% SLIGHTLY PLASTIC FINES, MIXED LAYERING OF DARK YELLOWISH ORANGE (10 YR 6/6), PALE YELLOWISH ORANGE (10 YR 8/6), AND MODERATE ORANGE PINK (5 YR 8/4), TWO PIECES OF CLAY COATED GRAVEL 0.9 INCH IN SIZE.
50		13	◤	19 21 23	44		SP	SAND, UNIFORM, FINE, 3-6% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	70	14	◤	4 8 11	19	9	SC SP	CLAYEY SAND, UNIFORM, FINE, 12-20% MODERATELY PLASTIC FINES, GRAYISH PINK (5 R 8/2), LIGHT GRAY (N7), DARK YELLOWISH ORANGE (10 YR 6/6) LAYERING, TWO PIECES OF CLAY COATED GRAVEL 0.9 INCH IN SIZE. (TOP 5"). SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, LESS THAN 1% CLAY COATED GRAVEL TO 0.8 INCH MAXIMUM, 5-10% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), WITH MODERATELY PLASTIC CLAY POCKET. (BOTTOM 4").
40		15	◤	8 16 22	38	7	SP	SAND, UNIFORM, FINE, 4-8% SLIGHTLY TO MODERATELY PLASTIC FINES, LESS THAN 1% GRAVEL TO 0.6 INCH MAXIMUM, 1% OR LESS MEDIUM SAND, DARK YELLOWISH ORANGE (10 YR 6/6).
	80	16	◤	4 4 9	13	6	SM	SILTY SAND, UNIFORM, FINE, 15-20% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD DFG
DATE JUNE 10, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 229-A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 229
DATE DRILLED NOVEMBER 1-3, 1974
COORDINATES, NORTH 16,954.1
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 16,429.1
SHEET 2 OF 2
LOGGED BY D.F.P.
GROUND SURFACE ELEVATION 114.6

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
30		17	◤	7 9 15	24	17	SM	SILTY SAND, SIMILAR TO SS-16.
	90	18	◤	11 15 15	30	15	SP	SAND, UNIFORM, FINE, 5-10% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
20		19	◤	15 15 16	31	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 1% GRAVEL TO 1.0 INCH MAXIMUM, 3-8% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), WITH MODERATELY PLASTIC CLAY POCKET APPROXIMATELY 1"-2" THICK.
	100	20	◤	9 12 11	23	6	GP-GC	CLAYEY GRAVEL, POORLY GRADED TO 2" MAXIMUM, 5-8% FINE TO COARSE SAND, 10-15% HIGHLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), WITH 2" GRAVEL AND SAND MIXTURE HIGHLY PLASTIC CLAY POCKET.
10		21	◤	31 50/6"		6	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, 1-4% FINES, LIGHT BROWN (5 YR 5/6), ONE PIECE OF GRAVEL 0.8 INCH IN SIZE.
	110	22	◤	38 42 44	86	6	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 3-5% GRAVEL TO 0:5 INCH MAXIMUM. 3-6% FINES, LIGHT BROWN (5 YR 5/6).
0		23	◤	41 50/6"		10	SP	SAND. POORLY GRADED, FINE AND MEDIUM, MOSTLY MEDIUM, 1-2% FINES, GRAYISH ORANGE (10 YR 7/4), ONE PIECE OF GRAVEL 0.9 INCH IN SIZE.
	120	24	◤	38 41 46	87	7	SP	SAND, POORLY GRADED, FINE TO COARSE. MOSTLY MEDIUM AND COARSE, 3-8% GRAVEL TO 0.7 INCH MAXIMUM, 5-10% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), SOME PIECES OF GRAVEL ARE CLAY COATED.
-10		25	◤	25 40 42	82		SP	SAND, POORLY GRADED, FINE TO COARSE. MOSTLY MEDIUM AND COARSE, 2-4% GRAVEL TO 0.9 INCH MAXIMUM, 3-6% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	130	26	◤	13 17 19	36	12	SP	SAND. UNIFORM. FINE, 1% GRAVEL TO 0.5 INCH MAXIMUM, 2-4% SLIGHTLY TO MODERATELY PLASTIC FINES. GRAYISH ORANGE (10 YR 7/4).
-20		27	◤	13 15 18	33	10	SP	SAND. UNIFORM. FINE, 3-8% SLIGHTLY TO MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6). WITH SMALL CLAY SLIVERS THROUGHOUT SAMPLE.
	140	28	◤	5 6 8	14	18	CL	SILTY CLAY, HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2), WITH VERY THIN FeOx LAYERS, AND VERY FINE SAND AND CLAYEY SAND LAYERS AND POCKETS LAYERS APPROXIMATELY 1/16"-1/8" THICK, POCKET APPROXIMATELY 1"-2".
-30		29	◤	5 9 16	25	18	CL	SILTY CLAY. 2-8% FINE TO MEDIUM SAND. HIGHLY PLASTIC. YELLOWISH GRAY (5 Y 7/2), WITH FeOx AND MnO2 VERY THIN VEINING. VERY FINE, SILTY SAND/CLAYEY SAND VERTICAL VEINING (APPROXIMATELY 3/16"-1/4" THICK), AND POCKETS 3"-4" MODERATELY TO HIGHLY PLASTIC FINES. CLAYEY SAND LAYER.
	150	30	◤	5 6 11	17	18	CL SC	SILTY CLAY, HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2), WITH THIN LAYERS OF FeOx AND FINE SAND MIXED AND THIN LAYERS OF FINE SAND. (TOP 8"). CLAYEY SAND, UNIFORM FINE. 15-20% MODERATELY TO HIGHLY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2), WITH 1 3/4"-2" SILTY CLAY POCKET. (BOTTOM 6").
								END OF BORING 151.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD DFG
DATE JUNE 10, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 229-B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 238 TYPE OF BORING SHEET 1 OF 2
DATE DRILLED FEBRUARY 6, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY R.B.T.
COORDINATES, NORTH 16,987.9 EAST 16,221.8 GROUND SURFACE ELEVATION 118.1'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		1	◤	2 2 3	5	10	ML	CLAYEY SILT, SLIGHTLY TO MODERATELY PLASTIC, MODERATE YELLOWISH BROWN (10 YR 5/4).
110								
	10	2	◤	4 9 14	23	12	CH	CLAY, HIGHLY PLASTIC, LESS THAN 3% VERY FINE SAND, MODERATE YELLOWISH BROWN (10 YR 5/4) WITH POCKETS OF LIGHT OLIVE GRAY CLAY.
		3	◤	7 14 19	33	14	CL	SANDY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 10-15% VERY FINE TO FINE SAND, DARK YELLOWISH ORANGE (10 YR 6/6) WITH MODERATE REDDISH BROWN DEPOSITS.
100								
	20	4	◤	6 14 25	39	13	SC	CLAYEY SAND, UNIFORM, VERY FINE, SLIGHTLY PLASTIC, DARK YELLOWISH ORANGE (10 YR 6/6) WITH GRAY AND REDDISH BROWN.
		5	◤	70 50/3"		6	SP	SAND, UNIFORM, FINE, CLEAN, PALE YELLOWISH BROWN (10 YR 7/2).
90								
	30	6	◤	8 9 9	18	10	SP	SAND, SAME AS ABOVE.
		7	◤	6 10 7	17	9	SP	SAND, UNIFORM, VERY FINE, LESS THAN 3% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
80								
	40	8	◤	6 9 9	18	10	SP	SAND, UNIFORM, FINE, LESS THAN 1% NONPLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
		9	◤	8 20 15	35	8	CH	SANDY CLAY, HIGHLY PLASTIC, FATTY, PALE YELLOWISH ORANGE (10 YR 7/6), 15-25% SAND FINE TO COARSE, MODERATE REDDISH BROWN.
70								
	50	10	◤	11 12 11	23	10	SP	SAND, UNIFORM FINE TO COARSE, MOSTLY UNIFORM FINE, LESS THAN 3% NONPLASTIC FINES, LESS THAN 1% GRAVEL TO 0.5 INCH MAXIMUM, DARK YELLOWISH BROWN (10 YR 6/6) WITH MODERATE BROWN.
		11	◤	4 7 8	15	12	SP	SAND, UNIFORM, FINE, LESS THAN 5% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
60								
	60	12	◤	6 10 14	24	14	SP	SAND, UNIFORM FINE, LESS THAN 3% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
		13	◤	50 50/4"		7	SP	SAND, SIMILAR TO ABOVE, EXCEPT LIGHT BROWN (5 YR 5/6).
50								
	70	14	◤	30 33 30	63	10	SP	SAND, UNIFORM FINE, CLEAN, DARK YELLOWISH ORANGE (10 YR 6/6).
		15	◤	9 18 19	37	13	SP CL	TOP: SAND, UNIFORM, VERY FINE, LESS THAN 1% NONPLASTIC FINES, GRAYISH ORANGE (10 YR 7/4). BOTTOM: CLAY, HIGHLY PLASTIC, 5-8% FINE TO MEDIUM SAND, LESS THAN 5% GRAVEL TO 0.3 INCH MAXIMUM, GRAYISH ORANGE (10 YR 7/4), FeOx DEPOSITS, DENSE.
40								
	80	16	◤	11 21 23	44	7	SP	SAND, UNIFORM, VERY FINE, CLEAN, GRAYISH ORANGE (10 YR 7/4).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DATE JUNE 20, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 238 - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 238 TYPE OF BORING SHEET 2 OF 2
DATE DRILLED FEBRUARY 6, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY R.B.T.
COORDINATES, NORTH 16,987.9 EAST 16,221.8 GROUND SURFACE ELEVATION 118.1'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		17	◤	8 10 14	24	12	SP	SAND, UNIFORM, FINE, LESS THAN 3% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
30								
	90	18	◤	9 12 17	29	9	SP	SAND, SIMILAR.TO ABOVE EXCEPT, LIGHT BROWN (5 YR 5/6).
		19	◤	5 8 10	18	14	SP	SAND, UNIFORM, VERY FINE,CLEAN, GRAYISH ORANGE (10 YR 7/4).
20								
	100	20	◤	8 9 10	19	16	SP	SAND, SIMILAR TO ABOVE, EXCEPT PALE YELLOWISH ORANGE (10 YR 8/6).
		21	◤	9 18 17	35	16	SP	SAND, SAME AS ABOVE.
10								
	110	22	◤	18 33 50/4"		4	SP	SAND, UNIFORM, FINE TO COARSE, MOSTLY UNIFORM FINE, CLEAN, PALE YELLOWISH ORANGE (10 YR 8/6).
		23	◤	30 33 30	63	12	SP	SAND, UNIFORM, FINE TO COARSE, MOSTLY UNIFORM FINE, LESS THAN 3% GRAVEL TO 0.5 INCH MAXIMUM, GRAYISH ORANGE (10 YR 7/4).
0								
	120	24	◤	35 37 38	75	9	SP	SAND, POORLY GRADED, FINE TO COARSE, 5% GRAVEL TO 1.0 INCH MAXIMUM, DARK YELLOWISH ORANGE (10 YR 6/6), 1 INCH LAYER OF FATTY SANDY CLAY.
		25	◤	44 50/5"		9	SP	SAND, UNIFORM FINE TO MEDIUM, MOSTLY UNIFORM FINE, LESS THAN 1% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
-10								
	130	26	◤	31 23 27	50	7	SW	SAND, WELL GRADED FINE TO COARSE, LESS THAN 1% NONPLASTIC FINES, LESS THAN 5% GRAVEL TO 0.5 INCH MAXIMUM, DARK YELLOWISH ORANGE (10 YR 6/6).
		27	◤	15 20 18	38	7	SP	SAND, POORLY GRADED VERY FINE TO COARSE, LESS THAN 3% SLIGHTLY PLASTIC FINES, LESS THAN 5% GRAVEL TO 0.7 INCH MAXIMUM, DARK YELLOWISH ORANGE (10 YR 6/6).
-20								
	140	28	◤	3 4 10	14	16	CL	CLAY, MODERATELY PLASTIC, 5-8% VERY FINE SAND, LIGHT OLIVE GRAY (5 Y 6/1), WITH HEAVY DEPOSITS OF LIGHT BROWN FeOx.
		29	◤	3 5 7	12	16	CH	CLAY, HIGHLY PLASTIC, LESS THAN 5% VERY FINE SAND, LIGHT OLIVE GRAY (5 Y 6/1), SOME FeOx DEPOSITS.
-30								
	150	30	◤	5 8 14	22	16	CH	CLAY, SIMILAR TO ABOVE, EXCEPT LAYERS OF VERY FINE SANDY CLAY, SAME COLOR.
								END OF BORING AT 151.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DATE JUNE 20, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 238 - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 247 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED FEBRUARY 8, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,031.4 EAST 16,032.2 GROUND SURFACE ELEVATION 122.3'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
120								
		1	◤	3 4 6	10	16	ML	CLAYEY SILT, MODERATELY PLASTIC, 3-4% VERY FINE SAND, MOTTLED, PALE BROWN (5 YR 5/2), LIGHT GRAY (N-7) AND MODERATE YELLOWISH BROWN (10 YR 5/4).
	10	2	◤	8 11 13	24	13	ML	CLAYEY SILT, MODERATELY PLASTIC, 1-2% VERY FINE SAND, MODERATE YELLOWISH BROWN (10 YR 5/4).
110								
		3	◤	13 19 21	40	17	SC	SANDY CLAY, MODERATELY PLASTIC, 30-35% FINE SAND, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) AND LIGHT GRAY (N-7).
	20	4	◤	8 12 20	32	16	SC	SANDY CLAY, MODERATELY PLASTIC, 20-25% FINE SAND, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) AND LIGHT GRAY (N-7).
100								
		5	◤	5 160 6"		7	CL	CLAY, MODERATELY TO HIGHLY PLASTIC, 2-4% VERY FINE SAND, MOTTLED LIGHT GRAY (N-7) AND DARK YELLOWISH ORANGE (10 YR 6/6) WITH THIN SAND LAYERS (1/8") THROUGHOUT SAMPLE, AND 1-2" POCKET OF VERY FINE SILTY SAND AT BOTTOM OF SAMPLE.
	30	6	◤	29 23 22	45	9	SP SP-SM	TOP 4 IN.: SAND, POORLY GRADED FINE, 3-5% FINES, GRAYISH YELLOW (5 Y 8/4) BOTTOM 4 IN.: SAND, UNIFORM, VERY FINE, 5-8% MODERATELY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4).
90								
		7	◤	8 11 12	23	10	SP	SAND, UNIFORM, VERY FINE, 4-8% MODERATELY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2).
	40	8	◤	5 6 10	16	13	SP-SC	CLAYEY SAND, UNIFORM, VERY FINE, 8-10% MODERATELY PLASTIC FINES, COLOR BANDING OF DARK YELLOWISH ORANGE (10 YR 6/6) AND LIGHT GRAY (N-7).
80								
		9	◤	9 12 22	34	9	SP	SAND, UNIFORM, VERY FINE, 2-6% SLIGHTLY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2) AND DARK YELLOWISH ORANGE (10 YR 6/6) WITH 2 THIN CLAY LAYERS 1/8" - 3/16" THICK.
	50	10	◤	8 11 15	26	9	SP	SAND, UNIFORM, VERY FINE, 4-6% MODERATELY PLASTIC FINES MODERATE REDDISH ORANGE (10 R 6/6) AND DARK YELLOWISH ORANGE (10 YR 6/6).
70								
		11	◤	9 9 10	19	8	SP	SAND, UNIFORM, FINE, 2-5% FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH A 1" THICK FATTY CLAY POCKET.
	60	12	◤	8 10 19	29	8	SM	SILTY SAND, UNIFORM, VERY FINE, [illegible]-15% MODERATELY PLASTIC, FINES, PALE YELLOWISH ORANGE (10 YR 8/6).
60								
		13	◤	12 17 24	41	8	SP	SAND, UNIFORM, FINE, 4-8% MODERATELY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4).
	70	14	◤	24 25 60	85	11	SP	SAND, UNIFORM, FINE, 2-3% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
50								
		15	◤	23 41 47	88	11	SP	SAND, SIMILAR TO SS 14.
	80	16	◤	18 26 38	64	11	SP	SAND, UNIFORM, FINE, 3-6% FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH A 1/2" CLAY POCKET.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DATE JULY 16, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 247 - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 247 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED FEBRUARY 8, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 17,031.4 EAST 16,032.2 GROUND SURFACE ELEVATION 122.3'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
40								
		17	◤	7 12 15	27	9	SP	SAND, UNIFORM, VERY FINE, 3-6% FINES, MODERATE REDDISH ORANGE (10 R 6/6) AND DARK YELLOWISH ORANGE (10 YR 6/6) WITH A 1" THICK LAYER OF VERY FINE SILTY SAND (SM-SC) AT BOTTOM.
	90	18	◤	11 12 16	28	11	SP	SAND, UNIFORM, VERY FINE, 2-5% FINES, GRAYISH ORANGE (10 YR 7/4).
30								
		19	◤	8 8 11	19	10	SP	SAND, SIMILAR TO SS 18 EXCEPT COLOR IS DARK YELLOWISH ORANGE (10 YR 6/6).
	100	20	◤	6 6 13	19	12	SP	SAND, UNIFORM, VERY FINE, 2-6% SLIGHTLY TO MODERATELY PLASTIC FINES DARK YELLOWISH ORANGE (10 YR 6/6).
20								
		21	◤	4 5 8	13	18	SP	SAND, UNIFORM, VERY FINE, 4-8% MODERATELY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6), AND GRAYISH ORANGE (10 YR 7/4).
	110	22	◤	2 4 10	14	18	SP-SM	SILTY SAND, UNIFORM, VERY FINE, 8-12% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
10								
		23	◤	4 9 18	27	18	SP	SAND, UNIFORM, VERY FINE, 5-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	120	24	◤	22 21 25	46	8	SP	SAND, POORLY GRADED, FINE TO COARSE MOSTLY FINE, 2-4% GRAVEL TO 0.6 IN. MAX., 2-5% FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH ONE CLAY LENSE 1/8" THICK.
0								
		25	◤	32 50 6"			SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 1-3% GRAVEL TO 0.8 IN. MAX., 3-6% FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH A 1-2" THICK CLAY POCKET ASSOCIATED WITH SANDS AND GRAVEL.
	130	26	◤	27 27 47	74	8	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, 4-6% GRAVEL TO 0.8 IN. MAX., 3-6% FINES DARK YELLOWISH ORANGE (10 YR 6/6) CONTAINING A 2" CLAY POCKET ASSOCIATED WITH THE LARGE PIECES OF GRAVEL.
-10								
		27	◤	18 26 32	58	6	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM AND COARSE, 3-5% TO 0.6 IN. MAX., 5-8% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	140	28	◤	14 15 27	42	10	CL	GRAVELLY CLAY, MODERATELY TO HIGHLY PLASTIC, 30-35% POORLY GRADED GRAVEL TO 1.1 IN. MAX., 5-7% FINE TO COARSE SAND, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) AND YELLOWISH GRAY (5 Y 8/1).
-20								
		29	◤	40 35 31	66	8	CL	SAND, SIMILAR TO SS 28.
	150	30	◤	6 7 18	25	21	CL SP-SM	TOP 8 IN.: SILTY CLAY, MODERATELY PLASTIC, 3-4% VERY FINE SAND, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) AND YELLOWISH GRAY (5 Y 8/1) CONTAINING LARGE FeOx NODULES MODERATELY MOTTLED THROUGHOUT SAMPLE, ALSO CONTAINING VERY THIN, VERY FINE SAND LENSES APPROX. 1/16" THICK. BOTTOM 10 IN.: SILTY SAND, UNIFORM, VERY FINE, 8-12% SLIGHTLY TO MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) AND VERY PALE ORANGE (10 YR 8/2).
-30								
		31	◤	4 5 8	13	23	CL	SILTY CLAY, MODERATELY PLASTIC, 3-6% VERY FINE SAND, YELLOWISH GRAY (5 Y 8/1), SPARSELY MOTTLED WITH SMALL FeOx NODULES.
	160	32	◤	4 5 9	14	16	CL	SILTY CLAY, SIMILAR TO SS 31.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DATE JULY 16, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 247 - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO 247
DATE DRILLED FEBRUARY 8, 1973
COORDINATES, NORTH 17,031.4
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 16,032.2
SHEET 3 OF 3
LOGGED BY D.P.P.
GROUND SURFACE ELEVATION 122.3'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-40								
	165	33	▼	7 11 28	39	18	SM-SC CH	TOP 6 IN.: <u>SILTY SAND</u>, UNIFORM, VERY FINE, 12-15% MODERATELY PLASTIC, FINES, YELLOWISH GRAY (5 Y 8/1). BOTTOM 12 IN.: <u>CLAY</u>, MODERATELY TO HIGHLY PLASTIC, MOTTLED, YELLOWISH GRAY (5 Y 8/1) AND BROWNISH BLACK (5 YR 2/1), SEVERELY MOTTLED WITH FeOx AND MnO2 STAINING.
								END OF BORING AT 166.5'.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.P. GREENWOOD
DATE JULY 16, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 247-C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 409
DATE DRILLED AUGUST 18, 1973
COORDINATES, NORTH 13,155.9
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 6434.0
SHEET 1 OF 2
LOGGED BY D.P.P.
GROUND SURFACE ELEVATION 31.2

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
30		1	■		H-P	4.00'	SM	<u>SILTY SAND</u>, POORLY GRADED, MOSTLY FINE, MOIST.
		2	■		H-P	11.75'	CL	<u>SANDY CLAY</u>, LOW TO MEDIUM PLASTICITY, SOFT, GRAY.
		3	■		H-P	20.00'	SM	<u>SILTY SAND</u>, POORLY GRADED, MOSTLY FINE, MOIST, GRAY.
		4	■		H-P	28.00'	SM	SIMILAR TO ST 3.
	10							
20		5	■		H-P	28.00'	SM	SIMILAR TO ST 3.
		6	■		H-P	23.00'	CH	<u>CLAY</u>, HIGHLY PLASTIC, SOFT, GRAY, NUMEROUS ROOT FIBERS.
		7	■		H-P	15.25'	CH	SIMILAR TO ST 6.
		8	■		H-P	26.00'	CH	SIMILAR TO ST 6.
	20							
10								
		9	■		H-P	26.50"	CH	<u>CLAY</u>, HIGHLY PLASTIC, FIRM, GRAY, NUMEROUS ROOT FIBERS.
		10	■		H-P	26.80"	CH	SIMILAR TO ST 6.
	30							
0								
		11	■		H-P	26.00"	CL	<u>SILTY CLAY</u>, LOW PLASTICITY, STIFF, GRAY.
		12	■		H-P	15.00"	CH	<u>CLAY</u>, HIGH PLASTICITY, STIFF, GRAY.
	40							
-10								
		13	■		H-P	27.25"	ML	<u>CLAYEY SILT</u>, LOW PLASTICITY, HARD, GRAY.
		14	■					
	50	15	▼	10 8 10	18	4	SP	<u>SAND</u>, UNIFORM, FINE, [illegible] FINES, COMPACT LIGHT OLIVE GRAY (5 Y 6/1), WITH A 1/4" LAYER OF SILTY CLAY.
-20								
		16	▼	4 5 6	11	18	CL	<u>SILTY CLAY</u>, MODERATE PLASTICITY, MOTTLED, MEDIUM DARK GRAY (N 4) AND <u>OLIVE</u> GRAY 5 Y 4/1).
		17	■		H-P	28.25'	CH	<u>CLAY</u>, HIGH PLASTICITY, STIFF, DARK GRAY.
	60							
-30								
		18	■		H-P	28.00'	CH	SIMILAR TO ST 17.
		19	■		H-P	28.37'	CH	SIMILAR TO ST 17.
	70							
-40								
		20	■					
		21	▼	4 9 16	25	5"		<u>CLAYEY SILT</u>, MODERATE PLASTICITY 5-8% VERY FINE SAND, COMPACT, <u>LIGHT OLIVE</u> GRAY (5 Y 5/2).
	80							
-50		22	▼	22 50/4"		6"	SP	<u>SAND</u>, UNIFORM, VERY FINE, [illegible]% MODERATELY PLASTIC FINES, OLIVE GRAY (5 Y 4/1).

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

5 H-P, HYDRAULIC PUSH

ISSUED BY D. P. GREENWOOD
DATE DECEMBER 21, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - 409-A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. 409
DATE DRILLED AUGUST 28, 1973
COORDINATES, NORTH 13,155.9
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 6434.0
SHEET 2 OF 2
LOGGED BY D.P.P.
GROUND SURFACE ELEVATION 31.2

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-50								
		23	▼	14 30 41	71	10	SP	<u>SAND</u>, UNIFORM, VERY FINE, 5-10% FINES, OLIVE GRAY (5 Y 4/1).
	90	24	▼	15 33 45	78	10	SP	<u>SAND</u>, SIMILAR TO SS 23.
-60								
		25	▼	30 50/5"		9	SP	<u>SAND</u>, POORLY GRADED, FINE, [illegible]-8% FINES, OLIVE GRAY (5 Y 4/1).
	100	26	▼	14 35 42	77	12	SP	<u>SAND</u>, UNIFORM, FINE, 5-8% FINES, OLIVE GRAY (5 Y 4/1).
-70								
		27	▼	11 15 25	40	10	SP	<u>SAND</u>, SIMILAR TO SS 26.
	110	28	▼	25 30 36	66	8	SP	<u>SAND</u>, SIMILAR TO SS 26.
-80								
		29	▼	14 23 31	54	8	SP	<u>SAND</u>, UNIFORM, FINE, [illegible]-6% FINES, OLIVE GRAY (5 Y 4/1) WITH LESS THAN 1% GRAVEL TO 1.0 INCH MAXIMUM.
	120	30	▼	19 31 41	72	7	SP	<u>SAND</u>, UNIFORM, FINE, 6-8% FINES, OLIVE GRAY (5 Y 4/1).
-90								
		31	▼	18 26 33	59	9	SP	<u>SAND</u>, SIMILAR TO SS 24.
-100	130	32	▼	12 15 19	34	8	SP	<u>SAND</u>, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, 3-5% GRAVEL TO 1.0 INCH MAXIMUM, 4-6% FINES, OLIVE GRAY (5 Y 4/1) AND ~~DARK YELLOWISH BROWN (10 YR 4/2)~~.
								END OF BORING AT 131.5'.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. P. GREENWOOD
DATE DECEMBER 21, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 409-B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 410
TYPE OF BORING DRIVE
SHEET 1 OF 2
DATE DRILLED MARCH 12, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 13,103.9
EAST 6,619.6
GROUND SURFACE ELEVATION 43.0

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"[1]	SAMPLE "N" VALUE	SAMPLE RECOVERY[3]	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		1	■		H-P	18.70	ML	SANDY SILT, POORLY GRADED, MOSTLY FINE, MOIST, NON PLASTIC, GRAY.
40		2	■		H-P	24.00	ML	SIMILAR TO ST 6.
		3	■		H-P	25.00	CL	CLAY, MODERATE PLASTICITY, SOFT, DAMP, BROWN, LAYERS OF FINE SANDY SILT.
	10	4	■		H-P	25.75	CL	SIMILAR TO ST 3
		5	■		H-P	22.00	CL	SIMILAR TO ST 3.
30		6	■		H-P	26.00	CL	SIMILAR TO ST 3, EXCEPT FIRM. .
		7	■		H-P	26.50	SM	SILTY SAND, POORLY GRADED, MOSTLY FINE, MOIST, NON PLASTIC, DENSE, GREENISH GRAY.
	20	8	■		H-P	26.50	SM	SIMILAR TO ST 7, [illegible]
20		9	■		H-P	25.00	ML	CLAYEY SILT, SLIGHT PLASTICITY, COMPACT, MOIST, GRAY.
	30	10	■		H-P	NR	CH	CLAY, HIGH PLASTICITY, SATURATED, FIRM, DARK BLUISH GRAY, CONTAINS NUMEROUS ROOT FIBERS
10		11	■		H-P	25.00	CH	SIMILAR TO ST 10.
	40	12	■		H-P	25.00	CH	SIMILAR TO ST 10.
0		13	■		H-P	27.50	CH	SIMILAR TO ST 10.
	50	14	■		H-P	24.00	SP	SAND, POORLY GRADED, MOSTLY FINE, SATURATED, BROWNISH GRAY, CLAY LAYERS.
-10		15	■		H-P	26.00	SP	SIMILAR TO ST 14.
	60	16	■		H-P	26.00	SP	SIMILAR TO ST 14.
-20		17	■		H-P	25.00	CH	CLAY, HIGH PLASTICITY, SATURATED, VERY STIFF, DARK GRAY, OCCASIONAL COARSE SAND GRAINS.
	70	18	■		H-P	26.00	CH	SIMILAR TO ST 17, EXCEPT VERY STIFF.
-30		19	■		H-P	25.50	CH	SIMILAR TO ST 17.
	80	20	■		H-P	25.75	SM	SILTY SAND, POORLY GRADED, MOSTLY FINE, SATURATED.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.
5. H-P, HYDRAULIC PUSH

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 21, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 410-A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 410
TYPE OF BORING DRIVE
SHEET 2 OF 2
DATE DRILLED MARCH 12, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 13,103.9
EAST 6,619.6
GROUND SURFACE ELEVATION 43.0

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"[1]	SAMPLE "N" VALUE	SAMPLE RECOVERY[3]	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-40		21	■		H-P	25.00	ML	SILT, SLIGHT PLASTICITY, VERY DENSE, SATURATED, GRAY.
	90	22	▼	21 50/6"	R	10	SP	SAND, UNIFORM, VERY FINE, 8-10% SLIGHTLY PLASTIC FINES, MEDIUM DARK GRAY (N 4)
-50		23	▼	16 18 19	37	9	SP	SAND, UNIFORM, VERY FINE, 8-10% FINES, MEDIUM DARK GRAY (N 4).
	100	24	▼	10 18 18	36	12	SP	SILTY SAND, UNIFORM, VERY FINE, 8-12% FINES, OLIVE GRAY (5 Y 4/1) WITH MINOR MnO_2 STAINING.
-60		25	▼	21 15 12	27	12	SP	SAND, POORLY GRADED, FINE, 8-10% FINES, OLIVE GRAY (5 Y 4/1).
	110	26	▼	10 13 17	30	14	SP	SILTY SAND, UNIFORM, VERY FINE, 10-15% FINES, OLIVE BLACK (5 Y 2/1) WITH ALTERNATING LENSES OF MnO_2 (1/16" THICK AND SILTY SAND, ALSO DECAYING WOOD MATERIAL.[2]
-70		27	▼	6 8 12	20	12	SP	SILTY SAND, UNIFORM, VERY FINE, 10-12% FINES, OLIVE GRAY (5 Y 4/1).
	120	28	▼	8 16 17	33	9	SP	SAND, POORLY GRADED FINE, 6-10% FINES, OLIVE GRAY (5 Y 4/1).
-80		29	▼	14 25 25	50	10	SP	SAND, UNIFORM, FINE, 4-8% FINES, OLIVE GRAY (5 Y 4/1).
	130	30	▼	9 15 15	30	10	SP	SAND, POORLY GRADED, FINE, 4-6% FINES, OLIVE GRAY (5 Y 4/1).
-90		31	▼	35 50/6"		3	SP	SAND, UNIFORM, FINE, 5-10% FINES OLIVE GRAY (5 Y 4/1).
	140	32	▼	41 61/6"		6	SP	SAND, SIMILAR TO SS 31.
								END OF BORING AT 141.0'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
   ▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 2, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 410-B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 411
TYPE OF BORING PUSH/DRIVE
SHEET 1 OF 2
DATE DRILLED AUGUST 4-7, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 12,134.1
EAST 7,994.8
GROUND SURFACE ELEVATION 33.7

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"[1]	SAMPLE "N" VALUE	SAMPLE RECOVERY[3]	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		1	■		H-P	26.0	CH	CLAY, HIGHLY PLASTIC, MEDIUM STIFF, BROWN, TRACE OF ROOT FIBERS.
30		2	■		H-P	27.0	CH	CLAY, HIGHLY PLASTIC, MEDIUM STIFF, GRAY, MOTTLED, TRACE OF ROOT FIBERS.
		3	■		H-P	28.0	CH	CLAY, HIGHLY PLASTIC, SOFT, GRAY (WITH SOME ORANGE STAINING) ROOT FIBERS.
		4	■		H-P	6.0	CH	CLAY, SIMILAR TO SS-3.
	10	5	■		H-P	18.0	CH	CLAY, SIMILAR TO SS-3 AND SS-4.
20		6	■		H-P	17.0	CH	CLAY, HIGHLY PLASTIC, SOFT, GRAY, MANY ROOT FIBERS AND WOOD FRAGMENTS UP TO 2.4 INCHES LONG.
		7	■		H-P	28.0	CH	CLAY, HIGHLY PLASTIC, SOFT, GRAY, MANY ROOT FIBERS, ALSO CONTAINS PIECE OF BARK 2.75 INCHES LONG.
	20	8	■		H-P	27.0	CH	CLAY, HIGHLY PLASTIC, MEDIUM STIFF, DARK GRAY, ROOT FIBERS WITH A 2.8 INCH PIECE OF WOOD AT BOTTOM OF SAMPLE.
10		9	■		H-P	23.5	CH	CLAY, HIGHLY PLASTIC, BLUE GRAY, ROOT FIBERS.
	30	10	■		H-P	28.3	CH	CLAY, HIGHLY PLASTIC, MEDIUM STIFF, GRAY, ROOT FIBERS.
0		11	■		H-P	27.0	CL SM ML	TOP 16 IN.: SILTY CLAY, MODERATELY PLASTIC, BLUE GRAY, TRACE ROOT FIBERS AND SOME BLACK STAINING. MIDDLE 5 IN.: SILTY SAND, CONTAINS SOME CLAY, LIGHT TAN, TRACE OF ROOTS. BOTTOM 6 IN.: CLAYEY SILT, SLIGHTLY PLASTIC, LIGHT TAN.
	40					NR		
-10		13	■		H-P	28.3	ML	CLAYEY SILT, SLIGHTLY PLASTIC, GRAY GREEN, CONTAINS POCKETS (LESS THAN 5 MM) OF WHITE CLAY.
	50	14	■		H-P	25.5	ML SM	SILT, SLIGHTLY PLASTIC, LIGHT GRAY, INTERLAYERED WITH BEDS OF LIGHT BROWN MEDIUM TO FINE SAND, TRACE OF CLAY THROUGHOUT SAMPLE, POCKETS OF SILTY SAND AND CLAYEY SILT ALSO PRESENT.
-20		15	■		H-P	27.3	SC	CLAYEY SAND, FINE, SLIGHTLY PLASTIC, DARK GRAY.
	60	16	■		H-P	27.8	CL	SILTY CLAY, SLIGHTLY PLASTIC, FIRM, DARK GRAY.
-30		17	■		H-P	27.8	ML	SANDY SILT, FINE, SLIGHTLY PLASTIC, SOFT TO FIRM, TAN, MIXED WITH SILT AND CONTAINING CLAY LENSES.
	70	18	■		H-P	28.3	OH	ORGANIC SILT, HIGHLY PLASTIC, DARK GRAY TO BLACK, CONTAINS A 1" LAYER OF GRAY SILT AT BOTTOM OF SAMPLE.
-40		19	■		H-P	28.3	OH	ORGANIC SILT, HIGHLY PLASTIC, GRAY BROWN, TRACE SHELL FRAGMENTS.
	80	20	■		H-P	25.8	ML	SILT, SLIGHTLY PLASTIC, LIGHT GRAY BROWN WITH DARKER DEPOSITS ALONG EDGES OF SAMPLE.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.
5. HYDRAULICALLY PUSHED

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 6, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 411 - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 411
TYPE OF BORING DRIVE
SHEET 2 OF 2
DATE DRILLED AUGUST 4-7, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 12,134.1
EAST 7,994.8
GROUND SURFACE ELEVATION 33.7'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"[1]	SAMPLE "N" VALUE	SAMPLE RECOVERY[3]	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-50		21	▼	6 12 16	28	6.0	CL	SILTY CLAY, HIGHLY PLASTIC, 6-8% VERY FINE SAND, OLIVE GRAY (5 Y 4/1) WITH NUMEROUS THIN LAYERS OF VERY FINE SAND THROUGHOUT SAMPLE.
	90	22	▼	22 41 46	87	8.0	SP	SAND, UNIFORM, VERY FINE, 8-10 FINES, OLIVE GRAY (5Y 4/1).
-60		23	▼	29 55/6"		9.0	SP	SAND, SIMILAR TO SS #22.
	100	24	▼	27 55/6"		7.0	SP	SAND, UNIFORM, FINE, 6-8% FINES, OLIVE GRAY (5 Y 4/1).
-70		25	▼	52 50/3"		7.0	SP	SAND, SIMILAR TO SS #24.
	110	26	▼	15 32 36	68	6.0	SP	SAND, SIMILAR TO SS #24.
-80		27	▼	23 50/5"		8.0	SP	SAND, SIMILAR TO SS #24.
	120	28	▼	8 16 20	36	5.0	SP	SAND, UNIFORM, FINE, 4-6% FINES, OLIVE GRAY (5Y 4/1).
-90		29	▼	25 31 37	68	4.0	SM	SILTY SAND, UNIFORM, VERY FINE, 10-15% FINES, OLIVE GRAY (5 Y 4/1).
	130	30	▼	35 50/5"		6.0	SP	SAND, UNIFORM, FINE TO VERY FINE, 4-8% FINES, OLIVE GRAY (5 Y 4/1).
-100		31	▼	10 25 27	52	5.0	SP	SAND, UNIFORM, VERY FINE, [illegible]-8% FINES, DARK YELLOWISH BROWN (10 YR 4/2) WITH VERY SMALL MICA FLAKES THROUGHOUT SAMPLE.
	140	32	▼	9 25 35	60	7.0	SP	SAND, SIMILAR TO SS #31.
								END OF BORING AT 141.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE DECEMBER 6, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 411 - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. **412**
TYPE OF BORING PUSH
SHEET 1 OF 2
DATE DRILLED SEPTEMBER 13-18, 1974
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 13,112.2 EAST 6,631.0
GROUND SURFACE ELEVATION 43.1

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		1	■		H-P	24.5	ML	SANDY SILT, VERY FINE, SLIGHTLY PLASTIC, BROWN, CONTAINING LAYERS OF SILT AND CLAYEY SAND, THIN ROOT FIBERS, LIGHT BROWN AND ORANGE STAINING THROUGHOUT SAMPLE.
40		2	■		H-P	19.3	ML	SANDY SILT, VERY FINE, NONPLASTIC, BROWN, LAYERS OF SILTY CLAY (SLIGHTLY TO MODERATELY PLASTIC) AND FINE SAND IN SAMPLE, TRACE ROOT FIBERS.
		3	■		H-P	27.5	CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, SOFT, BROWN WITH SOME ORANGE STAINING, TRACE ROOT FIBERS. AND HOLES.
		4	■		H-P	28.0	CH	CLAY, MODERATELY TO HIGHLY PLASTIC, SOFT, GRAY BROWN, WITH A 2" LAYER OF FINE SANDY SILT.
	10	5	■		H-P	25.5	CL	SILTY CLAY, SLIGHTLY PLASTIC, SOFT, BROWN, CONTAINS SOME ORANGE STAINING.
30		6	■		H-P	27.5	CH	CLAY, MODERATELY TO HIGHLY PLASTIC, BROWN, CONTAINS ORANGE STAINING AND SOME BLACK STAINS AND DEPOSITS.
		7	■		H-P	28.5	SM	SAND, FINE, GREENISH BROWN, SLIGHTLY CLAYEY WITH A 2" CLAY POCKET NEAR TOP OF SAMPLE.
		8	■		H-P	28.5	SM	SILTY SAND, FINE, GREENISH-GRAY, CONTAINS SOME CEMENTED SAND PARTICLES.
20	20	9	■		H-P	28.0	ML	SILT, SLIGHTLY PLASTIC, GRAY, CONTAINS A ½" THICK CLAY LAYER, ALSO SEVERAL ROOT PORTIONS.
	30	10	■		H-P	25.3	CH	CLAY, HIGHLY PLASTIC, SOFT TO FIRM, GRAY, NUMEROUS ROOT FIBERS BLACKISH DEPOSITS AND STREAKS THROUGHOUT.
10		11	■		H-P	28.6	CH	CLAY, HIGHLY PLASTIC, SOFT, GRAY, CONTAINS ROOT FIBERS AND BLACKISH STAINING.
	40	12	■		H-P	27.5	CH	CLAY, HIGHLY PLASTIC, SOFT, BLUE-GRAY, CONTAINS ROOT FIBERS, ALSO A 1.5 INCH POCKET OF FINE TO MEDIUM CLAYEY SAND.
0		13	■		H-P	28.3	CH	CLAY, HIGHLY PLASTIC, SOFT, GRAY, CONTAINS ROOT FIBERS AND SOME BLACKISH DEPOSITS THROUGHOUT SAMPLE.
	50	14	■		H-P	25.8	ML SC CL	TOP 5 IN.: SANDY SILT, FINE, BLUE GRAY, TRACE MEDIUM TO COARSE SAND MIDDLE 10 IN.: CLAYEY SAND, MEDIUM TO FINE SAND LAYERS IN SAMPLE, LITTLE SILT. BOTTOM 10 IN.: SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, GRAY, CONTAINS A POCKET OF MEDIUM TO COARSE SAND.
-10		15	■		H-P	28.4	CH	TOP 7 IN.: CLAY, HIGHLY PLASTIC, BLUE GRAY, CONTAINS A ZONE OF BLUE GRAY CLAYEY FINE SAND 2.5 IN. LONG, ALSO TWO CONCRETIONS (5 MM DIA.) NEAR TOP OF SECTION. MIDDLE 10 IN.: CLAYEY SAND, MEDIUM TO FINE, GREENISH BROWN, CONTAINS POCKETS OF GREENISH GRAY CLAY NEAR TOP OF SECTION, ALSO A LAYER OF MEDUM TO FINE SAND AT BOTTOM OF SECTION. BOTTOM 11 IN.: SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC. BLUE GRAY, CONTAINS POCKETS OF GRAY SILT, ASLO GREENISH-GRAY CLAY, NEAR BOTTOM OF SAMPLE.
	60	16	■		H-P	26.3	CH SP CL SP	TOP 8 IN.: CLAY, HIGHLY PLASTIC, SOFT, BLUE GRAY, TRACE ROOT FIBERS, ALSO SOME ORANGE STAINING. MIDDLE 11 IN.: SAND, MEDIUM TO FINE, BROWN, CONTAINS TRACE COARSE SAND AND FINE GRAVEL. ALSO TRACE SILT, POCKETS OF CLAY PRESENT IN SAMPLE. BOTTOM 7 IN.: CLAY, MOD. TO HIGHLY PLASTIC, SOFT, GRAY, CONTAINS 1" SAND POCKET: SAND, MED. TO COARSE WITH TRACE FINE GRAVEL.
-20		17	■		H-P	26.0	CH	CLAY, HIGHLY PLASTIC, SOFT, GRAY, CONTAINS PIECES OF WOOD AND ORGANIC MATERIAL THROUGHOUT SAMPLE.
	70	18	■		H-P	28.4	CL	SILTY CLAY, MODERATELY PLASTIC. SOFT. GRAY CONTAINS SOME MEDIUM SAND.
-30		19	■		H-P	27.4	CH	CLAY, HIGHLY PLASTIC, DARK GRAY, CONTAINS SOME MEDIUM-COARSE SAND.
	80	20	■		H-P	22.0	SP	SAND, FINE, GRAY, SLIGHTLY CLAYEY OR SILTY, CONTAINS SOME COARSE SAND, ALSO A POCKET OF GRAY CLAYEY SAND NEAR BOTTOM OF SAMPLE.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.
5. H-P, HYDRAULICALLY PUSHED

ISSUED BY D.F. GREENWOOD
DFG
DATE DECEMBER 9, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 412 - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. **412**
TYPE OF BORING DRIVE
SHEET 2 OF 2
DATE DRILLED SEPTEMBER 13-18, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 13,112.2 EAST 6,631.0
GROUND SURFACE ELEVATION 43.1'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
-40		21	■		H-P	28.0	MH	CLAYEY SILT, HIGHLY PLASTIC, BROWNISH GRAY, 1 INCH LAYER OF ORGANIC MATERIAL IN SAMPLE.
	90	22	◤	13 35 41	76	8.0	SM	SILTY SAND. UNIFORM, VERY FINE. 15-20% SLIGHTLY PLASTIC FINES, OLIVE GRAY (5 Y 4/1).
-50		23	◤	12 26 31	57	8.0	SP	SAND, UNIFORM, VERY FINE. [illegible] FINES, OLIVE GRAY (5 Y 4/1).
	100	24	◤	15 26 31	57	7.0	SP	SAND, UNIFORM, VERY FINE, 6-8% FINES, OLIVE GRAY (5 Y 4/1).
-60		25	◤	13 27 32	59	9.0	SP	SAND, UNIFORM, VERY FINE, [illegible] FINES, OLIVE GRAY (5 Y 4/1), WITH SMALL FLAKES OF MICA AND MnO$_2$.
	110	26	◤	19 19 19	38	10.0	SP	SAND. SIMILAR TO SS-25.
-70		27	◤	18 16 25	41	8.0	SP	SAND, UNIFORM, VERY FINE 6-8% FINES. OLIVE GRAY (5 Y 4/1).
	120	28	◤	11 29 42	71	15.0	SP	SAND, UNIFORM. FINE 6-8% FINES, OLIVE GRAY (5 Y 4/1), WITH A 3/4 INCH HIGHLY PLASTIC CLAY LAYERS AND VERY SMALL SHELL FRAGMENTS
-80		29	◤	18 28 36	64	8.0	SP	SAND. POORLY GRADED, VERY FINE TO FINE. 5-8% FINES, OLIVE GRAY (5 Y 4/1), WITH A 1/2 INCH HIGHLY PLASTIC CLAY POCKET.
	130	30	◤	15 30 37	67	10.0	SP	SAND, UNIFORM, FINE, 5-8% FINES. OLIVE GRAY (5 Y 4/1), CONTAINING A 1 INCH THICK CLAYEY SAND LAYER WITH A 3/4 INCH HIGHLY PLASTIC CLAY POCKET CONTAINING A FEW ROOTS.
-90		31	◤	14 17 28	45	8.0	SP	SAND, UNIFORM. FINE. 5-8% FINES. OLIVE GRAY (5 Y 4/1). WITH A THIN HIGHLY PLASTIC CLAY LENSE 1/8 INCH THICK AT BOTTOM.
	140	32	◤	16 50/7"				SAND, UNIFORM. FINE 4-7% FINES OLIVE GRAY (5 Y 4/1) AND LIGHT OLIVE GRAY (5 Y 6/1). WITH LESS THAN 1% GRAVEL TO 0.5" MAXIMUM.
								END OF BORING AT 141.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DFG
DATE DECEMBER 9, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 412 - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. **414**
TYPE OF BORING DRIVE
SHEET 1 OF 1
DATE DRILLED FEBRUARY 28, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY D.F.P.
COORDINATES, NORTH 17,071.0 EAST 19,024.1
GROUND SURFACE ELEVATION 107.2

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
100		1	◤	1 1 2	3	8	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, VERY SOFT, 1-5% VERY FINE SAND, MODERATE YELLOWISH BROWN (10 YR 5/4).
	10	2	◤	2 5 13	18	12	CH	SANDY CLAY, MODERATELY PLASTIC, 15-20% FINE SAND, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) GRAYISH ORANGE (10 YR 7/4) AND YELLOWISH GRAY (5 Y 7/2).
90		3	◤	4 12 12	24	11	CH	SANDY CLAY, SIMILAR TO SS 2.
	20	4	◤	4 22 31	53	13	SC	CLAYEY SAND, UNIFORM, FINE, 3-6% SLIGHTLY TO MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
80		5	◤	3 6 8	14	10	SC	CLAYEY SAND, UNIFORM, VERY FINE, 4-8% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) AND PALE YELLOWISH ORANGE (10 YR 8/6).
	30	6	◤	3 6 10	16	12	SC	CLAYEY SAND, UNIFORM, FINE, 5-10% MODERATELY PLASTIC FINES, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6), PALE YELLOWISH ORANGE (10 YR 8/6), AND VERY PALE ORANGE (10 YR 8/2).
		7	◤	18 13 18	31	13	SP	SAND, UNIFORM, FINE, 4-8% SLIGHTLY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4).
								END OF BORING AT 36.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DFG
DATE MARCH 19, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 414

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. **415**
TYPE OF BORING DRIVE
SHEET 1 OF 1
DATE DRILLED FEBRUARY 27, 1973
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY R.B.T.
COORDINATES, NORTH 16,075.2 EAST 18,748.9
GROUND SURFACE ELEVATION 101.3

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
100								
		1	◤	2 4 6	10	14	CL	SILTY CLAY, MODERATELY PLASTIC, SOFT, MODERATE BROWN (5 YR 4/4).
90	10	2	◤	1 3 3	6	9	CL	SANDY CLAY, MODERATELY PLASTIC, SOFT, SAND VERY FINE, DARK YELLOWISH BROWN (10 YR 4/2), FeOx DEPOSITS.
		3	◤	8 13 20	33	10	SP	SAND, UNIFORM, VERY FINE SAND, LESS THAN 1% NONPLASTIC FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
80	20	4	◤	10 24 35	59	10	SP	SAND, UNIFORM, VERY FINE (SUGAR), CLEAN, GRAYISH ORANGE (10 YR 7/4) WITH A THIN LAYER OF DARK YELLOWISH ORANGE SILTY SAND.
								END OF BORING AT

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DFG
DATE MARCH 16, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 415

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 434
TYPE OF BORING DRIVE
SHEET 1 OF 2
DATE DRILLED APRIL 16, 1974
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY D.F.P.
COORDINATES, NORTH 12,999.0
EAST 6478.6
GROUND SURFACE ELEVATION 44.4'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
40								
		1	■		H-P	24.3	CL	SANDY CLAY, MODERATELY PLASTIC, FINE TO VERY FINE SAND, VERY SOFT, GRAYISH BROWN, FEW ROOTS AND ORGANIC PARTICLES.
	10							
		2	■		H-P	25.5	CL	SANDY CLAY, 15-20% FINE SAND, MODERATELY PLASTIC, SOFT, PINKISH BROWN, STREAKED WITH ORANGE BROWN, MICACEOUS.
30								
		3	■		H-P	25.3	CL	TOP 12 IN: SILTY CLAY, HIGHLY PLASTIC, SOFT, PINKISH BROWN MOTTLED WITH ORANGE BROWN AND BLACK, MICACEOUS, ONE 8 IN. PEBBLE, LESS THAN 5% FINE SAND. BOTTOM 13 IN: SANDY CLAY, 15-20% UNIFORM FINE SAND, MODERATELY PLASTIC, SOFT, UPPER PORTION CONTAINED MANY SMALL POCKETS, (LESS THAN 0.1 IN.) OF HIGHLY PLASTIC BROWN CLAY.
	20							
		4	■		H-P	26.9	SM	SILTY SAND, POORLY GRADED, MOSTLY FINE, 50% NONPLASTIC FINES, FIRM, GRAY.
20								
		5	■		H-P	26.0	CL CH	TOP 13 IN.: SILTY CLAY, MODERATELY PLASTIC, SOFT TO FIRM, GRAY WITH POCKETS OF BLACK, SEVERAL ROOT FRAGMENTS. BOTTOM 13.: CLAY, HIGHLY PLASTIC, FIRM, GRAY, MANY ROOT AND WOOD FRAGMENTS.
	30							
		6	■		H-P	25.5	CH	CLAY, HIGHLY PLASTIC, FIRM, GRAY WITH LAYERS OF BROWN, MANY ROOTS AND ORGANIC PARTICLES.
10								
		7	■		H-P	19.0	CH	CLAY, HIGHLY PLASTIC, FIRM, GRAY, FEW PIECES OF DECOMPOSED ROOT FRAGMENTS, FEW POCKETS OF LIGHT BROWN SILT NEAR TOP OF SAMPLE AND MANY POCKETS OF SILTY CLAY NEAR BOTTOM.
	40							
		8	■		H-P	21.3	CH	CLAY, HIGHLY PLASTIC, FIRM, GRAY WITH POCKETS OF LIGHT BROWN CLAY.
0								
		9	■		H-P	25.0	CH	CLAY, HIGHLY PLASTIC, FIRM, GRAY WITH POCKETS OF WHITE AND BROWN, FEW PIECES OF WOOD AND ORGANIC MATTER.
	50							
		10	■		H-P	24.3	CL CH	TOP 13 IN.: SILTY CLAY, MODERATELY PLASTIC, SOFT, MEDIUM GRAY WITH ORANGE STAINING, LESS THAN 3% FINE SAND. BOTTOM 12 IN.: CLAY, HIGHLY PLASTIC, FIRM TO STIFF, MEDIUM GRAY, LESS THAN, 3% FINE SAND.
-10								
		11	■		H-P	17.0	CL	SANDY CLAY, 20-25% FINE SAND, MODERATELY PLASTIC, FIRM, GRAY WITH LARGE POCKETS OF LIGHT GRAY SAND, FEW ROOTS.
	60							
		12	■		H-P	15.0	SM	SILTY SAND, POORLY GRADED, 40-45% NONPLASTIC FINES, LIGHT GRAY WITH LAYERS OF GRAY SILT, FEW ORGANIC PARTICLES.
		13	◤	4 5 14	19	8.0	SM	SILTY SAND, UNIFORM, VERY FINE, 12-15% FINES, OLIVE GRAY (5 Y 4/1) WITH SOME SMALL MICA FLAKES AND A 1/2 IN. CLAY LAYER.
-20								
		14	◤	4 4 6	10	18.0	CL CH	SILTY CLAY, HIGHLY PLASTIC, OLIVE GRAY (5 Y 4/1). TOP 12 IN.: CLAY, HIGHLY PLASTIC, FIRM, MEDIUM GRAY, SEVERAL POCKETS OF DECOMPOSED ORGANIC MATERIAL, ALSO MANY THIN LAYERS OF ORANGE BROWN AND/OR GRAY SILT. BOTTOM 13 IN.: SILTY CLAY,
		15	■		H-P	25.0	CL	MODERATELY PLASTIC, STIFF, MEDIUM GRAY, ONE 1 INCH POCKET OF MEDIUM GRAY HIGHLY PLASTIC CLAY.
	70							
		16	■		H-P	25.0	CH	CLAY, MODERATELY PLASTIC, VERY STIFF, GRAY, FEW ROOTS AND ORGANIC PARTICLES.
-30								
		17	■		H-P	20.8	CH	SILTY CLAY, HIGHLY PLASTIC, STIFF, MEDIUM GRAY, 5-10% FINE SAND.
	80							
		18	■		H-P	24.0	CH	SILTY CLAY, HIGHLY PLASTIC, STIFF, DARK BROWN, POCKETS OF LIGHT BROWN, SILT, MANY SMALL ROOTS AND ORGANIC FRAGMENTS.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL
5 H-P HYDRAULICALLY PUSHED

ISSUED BY D. P. GREENWOOD
DATE [illegible] 27, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 434 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 434
TYPE OF BORING DRIVE
SHEET 2 OF 2
DATE DRILLED APRIL 16, 1974
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY D.F.P.
COORDINATES, NORTH 12,999.0
EAST 6478.6
GROUND SURFACE ELEVATION 44.4'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-40								
		19	■		H-P	26.5	MH	SILT, HIGHLY PLASTIC, VERY STIFF, LIGHT GRAYISH BROWN TO DARK BROWN, STREAKED WITH BLACK THROUGHOUT ENTIRE SECTION, CALCAREOUS LAYER NEAR BOTTOM OF SAMPLE WITH MANY SHELL FRAGMENTS, ALSO ORGANIC MATTER THROUGHOUT.
	90							
		20	■		H-P	12.0	ML	SANDY SILT, 30-35% FINE TO VERY FINE SAND, NONPLASTIC, VERY STIFF, GRAY WITH LAYERS OF LIGHT GRAY SILT AND DARK GRAY ORGANIC PARTICLES.
		21	◤	9 17 32	49	18.0	SM	SILTY SAND, UNIFORM, VERY FINE, 15-18% SLIGHTLY PLASTIC FINES, OLIVE GRAY (5 Y 4/1) WITH SOME SMALL MICA FLAKES.
-50								
		22	◤	29 23 27	50	13.5	SP	SAND, UNIFORM, FINE, 8-10% FINES, OLIVE GRAY (5 Y 4/1) WITH SMALL MICA FLAKES.
	100							
		23	◤	17 17 33	50	14.0	SP	SAND, SIMILAR TO SS 22.
-60								
		24	◤	24 29 37	66	12.0	SP	SAND, UNIFORM, VERY FINE, 8-10%, OLIVE GRAY (5 Y 4/1) WITH TRACE OF MICA.
	110							
		25	◤	56 50 6"		10.0	SP	SAND, UNIFORM, FINE, 5-8% FINES, OLIVE GRAY (5 Y 4/1) WITH TRACE OF MICA.
-70								
		26	◤	20 20 46	66	11.0	SP	SAND, SIMILAR TO SS 25.
	120							
		27	◤	13 19 18	37	9.0	SP	SAND, SIMILAR TO SS 25.
-80								
		28	◤	17 20 34	54	10.0	SP	SAND, UNIFORM, FINE, 2-4% VERY FINE SAND, 6-9% FINES, OLIVE GRAY (5 Y 4/1) WITH TRACE OF SMALL MICA FLAKES.
	130							
		29	◤	18 14 20	34	10.0	SP	SAND, UNIFORM, FINE, 3-6% MEDIUM SAND, 5-8% FINES, OLIVE GRAY (5 Y 4/1) WITH TRACE OF MICA, AND SOME VERY SMALL WEATHERED FELDSPAR NODULES.
-90								
		30	◤	14 17 21	38	9.0	SP	SAND, UNIFORM, FINE, 5-7% FINES, VARIGATED, OLIVE GRAY (5 Y 4/1) AND LIGHT OLIVE BROWN (5 Y 5/6).
	140							
		31	◤	17 37 47	84	8.0		SAND, SIMILAR TO SS 30.
								END OF BORING AT 141.5'
	150							

THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. P. GREENWOOD
DATE [illegible] 27, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 434 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 435
TYPE OF BORING PUSH
SHEET 1 OF 2
DATE DRILLED APRIL 17, 1974
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY R.E.S./S.F.L.
COORDINATES, NORTH 13,221.3
EAST 6,519.7
GROUND SURFACE ELEVATION 44.7

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
	0							
40								
		1A 1B	■		H-P	20	ML ML	CLAYEY SILT, MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, DAMP, DARK GRAYISH BROWN. SANDY SILT, SLIGHTLY PLASTIC, 20-25% FINE SAND, MOIST, DARK GRAYISH BROWN, SLIGHTLY MOTTLED, TRACE OF CLAY.
	10							
		2	■		H-P	20	ML	CLAYEY SILT, MODERATELY PLASTIC, 3-8% FINE SAND, MOIST, DARK GRAYISH BROWN, SLIGHTLY MOTTLED.
30								
		3	■		H-P	23	CL	SILTY CLAY, MODERATELY PLASTIC, 3-8% VERY FINE SAND, MOIST, DARK BROWNISH GRAY, WITH POCKETS OF LIGHT BROWN CLAYEY SILT.
	20							
		4	■		H-P	25	SM	SILTY SAND, UNIFORM, FINE TO VERY FINE, 15-20% NON TO SLIGHTLY PLASTIC FINES, MOIST, DARK BROWNISH GRAY, TRACE OF CLAY, ORGANIC DEBRIS (PARTIALLY CARBONIZED).
20								
		5	■		H-P	25		SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 2-5% VERY FINE SAND, MOIST, DARK GRAY, WITH DARK BROWNISH GRAY POCKETS, ORGANIC MATERIAL (PARTIALLY CARBONIZED).
	30							
		6	■		H-P	22	CH	CLAY, HIGHLY PLASTIC, LESS THAN 3% VERY FINE SAND, DAMP, LIGHT GRAYISH BROWN, WITH LIGHT GRAY LAYERS, ORANIC MATERIAL.
10								
		7	■		H-P	22	CH	CLAY, SIMILAR TO ABOVE, EXCEPT LARGE LIGHT GRAY POCKETS OF CLAY.
	40							
		8	■		H-P	22	CH	CLAY, SIMILAR TO ABOVE, EXCEPT NO ORGANIC MATERIAL.
0								
		9	■		H-P	24	CL	SILTY CLAY, MODERATELY PLASTIC, 3-8% SAND, DAMP, LIGHT GRAY WITH POCKETS OF LIGHT BROWNISH GRAY, ORGANIC MATERIAL (PARTIALLY CARBONIZED).
	50							
		10	■		H-P	19	CL	SANDY CLAY, MODERATELY PLASTIC, 10-15% VERY FINE SAND, DAMP, GRAY WITH GRAYISH BROWN OXIDATION RIND, ORGANICS.
-10								
		11A	■		H-P	25	CL	SANDY CLAY, SLIGHTLY PLASTIC, 15-20% FINE SAND, DAMP, GRAY, WITH SILTY CLAY LAYERS (11B).
	60							
		12	■		H-P	16	CL	CLAY, MODERATELY PLASTIC, LESS THAN 10% VERY FINE SAND, MOIST, GRAY, WITH SMALL FINE SAND LAYERS.
-20								
		13	■		H-P	25	CH	CLAY, HIGHLY PLASTIC, LESS THAN 2% VERY FINE SAND, DAMP, GRAY.
	70							
		14	■		H-P	25	CL	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, GRAY, DAMP.
-30								
		15	■		H-P	23	CL	SANDY CLAY, MODERATELY PLASTIC, 20-25% FINE SAND, DAMP, DARK BROWNISH GRAY.
	80							
		16	■		H-P	23	CH	CLAY, MODERATELY TO HIGHLY PLASTIC, DAMP, DARK BROWNISH GRAY, WITH SILTY CLAY POCKETS.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL
5 H-P INDICATES HYDRAULICALLY PUSHED.

ISSUED BY D. P. GREENWOOD
DATE AUGUST 9, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 435 - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 435
TYPE OF BORING DRIVE/PUSH
SHEET 2 OF 2
DATE DRILLED APRIL 17, 1974
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY R.E.S.
COORDINATES, NORTH 13,221.3
EAST 6,519.7
GROUND SURFACE ELEVATION 44.7

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-40								
		17	■		H-P	26	ML	CLAYEY SILT, NON TO SLIGHTLY PLASTIC, LESS THAN 5% FINE SAND, DAMP, DARK BROWN, WITH WOOD AND ORGANIC MATTER.
	90							
		18	■		H-P	12	ML	CLAYEY SILT, SLIGHTLY PLASTIC, MEDIUM BROWN, DAMP, WITH BROWN CLAY LAYERS, AND FINE SAND LAYERS.
		19	◤	9 11	20	11	SP-SM	SILTY SAND, UNIFORM FINE TO VERY FINE, 8-12% NONPLASTIC FINES, MOIST, MEDIUM GRAYISH BROWN, ORGANIC MATERIAL (ROOTS).
-50								
		20	◤	21 30	53	9	SM	SILTY SAND, SIMILAR TO ABOVE, EXCEPT 5% CARBONIZED ORGANIC MATERIAL.
	100							
		21	◤	37 36	73	8	SM	SILTY SAND, SIMILAR TO ABOVE, EXCEPT LESS THAN 1% CARBONIZED ORGANIC MATERIAL.
-60								
		22	◤	6 22 25	47	10	SM	SILTY SAND, SAME AS THE ABOVE.
	110							
		23	◤	36 50	86	13	SP	SAND, POORLY GRADED, COARSE TO FINE, MOSTLY FINE, LESS THAN 5% NONPLASTIC FINES, MOIST, MEDIUM GRAYISH BROWN, ONE POCKET OF GRAY CLAY.
-70								
		24	◤	17 18	35	12	SP	SAND, SAME AS THE ABOVE.
	120							
		25	◤	9 20	29	11	SP	SAND, GRADED MEDIUM TO FINE, MOSTLY FINE, 3-5% NONPLASTIC FINES, MEDIUM GRAYISH BROWN.
-80								
		26	◤	15 24	39	12	SP	SAND, UNIFORM FINE, WITH LESS THAN 3% MEDIUM AND 3-5% NONPLASTIC FINES, MEDIUM GRAYISH BROWN.
	130							
		27	◤	19 34	51	11	SP	SAND, SAME AS THE ABOVE.
-90								
		28	◤	28 33	61	10	SP	SAND, UNIFORM FINE, WITH TRACE OF SILT, MEDIUM GRAYISH BROWN.
	140							
		29	◤	24 41 50	91	9	SP	SAND, SAME AS THE ABOVE.
								END OF BORING AT 141.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL
5 H-P INDICATES HYDRAULICALLY PUSHED.

ISSUED BY D. P. GREENWOOD
DATE AUGUST 9, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 435 - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 436 | TYPE OF BORING PUSH | SHEET 1 OF 2
DATE DRILLED MAY 13, 1974 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY S.F.L./R E S.
COORDINATES, NORTH 12,845.4 | EAST 7,444.1 | GROUND SURFACE ELEVATION 36.7

SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
1	■		H-P	9	CH	CLAY, MODERATELY TO HIGHLY PLASTIC, DAMP, MEDIUM BROWN, MOTTLED, ROOTS.
2	■		H-P	24	LH	CLAY, MODERATELY PLASTIC, DAMP, BROWNISH GRAY WITH BROWN POCKETS, SOME SILT AND ROOTS.
3	■		H-P	25	CH	CLAY, MODERATELY TO HIGHLY PLASTIC, MOIST, BROWNISH GRAY WITH BROWN POCKETS, ROOTS AND OTHER WOOD PRESENT, OLIVE BROWN OXIDATION RIND.
4	■		H-P	18	CH	CLAY, SAME AS ABOVE.
5	■		H-P	22	CH	CLAY, SIMILAR TO ABOVE, EXCEPT HIGHLY PLASTIC.
6	■		H-P	23	CH	CLAY, HIGHLY PLASTIC, MOIST, GRAY WITH A FEW ROOTS.
7	■		H-P	23	CH	CLAY, SIMILAR TO ABOVE, EXCEPT DARK GRAY.
8	■		H-P	24	CL	SANDY CLAY, MODERATELY PLASTIC, 12-17% VERY FINE SAND, MEDIUM BROWNISH GRAY, WITH AAFEW SMALL ROOTS.
9	■		H-P	13	SC	CLAYEY SAND, POORLY GRADED COARSE TO FINE, MOSTLY FINE, 12-15% SLIGHTLY PLASTIC FINES, SATURATED, LIGHT BROWNISH GRAY.
10	■		H-P	23	CH	CLAY, MODERATELY TO HIGHLY PLASTIC, MEDIUM GRAY WITH SOME SILT.
11	■		H-P	25	SM	SILTY SAND, POORLY GRADED MEDIUM TO FINE, MOSTLY FINE, 35-40% SLIGHTLY PLASTIC FINES, LIGHT BROWNISH GRAY, WITH SOME CLAY.
12	■		H-P	24	ML	SANDY SILT, SLIGHTLY PLASTIC FINES, 15-20% FINE SAND, LIGHT BROWNISH GRAY, WITH SOME CLAY, SOME PARTIALLY CARBONIZED ORGANIC MATERIAL.
13	■		H-P	24	ML	CLAYEY SILT, SLIGHTLY PLASTIC, 3-8% VERY FINE SAND, LIGHT BROWNISH GRAY.
14	■		H-P	25	CH	CLAY, MODERATELY TO HIGHLY PLASTIC, LESS THAN 3% VERY FINE SAND, DARK BROWNISH GRAY, TRACE OF ORGANIC MATERIAL.
15	■		H-P	12	CH	CLAY, SIMILAR TO ABOVE, EXCEPT WITH MORE ORGANIC MATTER.
16	■		H-P	24	CL ML	SILTY CLAY, NONPLASTIC, DAMP, DARK BROWN, WITH ORGANIC MATTER. SANDY SILT, 30-35% FINE SAND, NONPLASTIC, SATURATED, MEDIUM BROWNISH GRAY, ORAGANIC MATTER.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 18 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.
5 H-P INDICATES HYDRAULICALLY PUSHED.

ISSUED BY D.F. GREENWOOD
DFG
DATE AUGUST 9, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 436 - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 436 | TYPE OF BORING DRIVE/PUSH | SHEET 2 OF 2
DATE DRILLED MAY 13, 1974 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY S.F.L./R.E.S.
COORDINATES, NORTH 12,845.1 | EAST 7,444.1 | GROUND SURFACE ELEVATION 36.7

SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
17	■			22	ML	CLAYEY SILT, NON TO SLIGHTLY PLASTIC, WITH FEW SANDY LAYERS, MED. BROWNISH GRAY.
18	◤	13 17 32	49	13	SM	SILTY SAND, UNIFORM, FINE SAND, 20-25% NONPLASTIC FINES, MEDIUM GRAYISH BROWN, ORGANIC MATTER (PARTIALLY CARBONIZED).
19	◤	7 14 29	43	10	SM	SILTY SAND, UNIFORM FINE SAND, 15-20% NONPLASTIC FINES, BROWNISH GRAY, ORGANIC MATERIAL, (PARTIALLY CARBONIZED).
20	◤	[illegible] [illegible] 30	46	9	SM	SILTY SAND, UNIFORM FINE SAND, 12-15% NONPLASTIC FINES, LIGHT GRAYISH BROWN, ORGANIC MATTER, (PARTIALLY CARBONIZED).
21	◤	[illegible] [illegible] 27	47	10	SP	SAND, UNIFORM FINE, 3-8% NONPLASTIC FINES, SOME MEDIUM SAND, MED. GRAYISH BROWN, ORGANIC MATERIAL, (PARTIALLY CARBONIZED).
22	◤	11 [illegible] 25	46	8	SP	SAND, SIMILAR TO ABOVE, EXCEPT LESS ORGANIC MATERIAL.
23	◤	11 1 18	31	10	SP	SAND, SAME AS SAMPLE #22.
24	◤	15 [illegible] 24	41	8	SP	SAND, POORLY GRADED, MEDIUM TO FINE, MOSTLY FINE, LESS THAN 3% NONPLASTIC FINES, DARK GRAYISH BROWN.
25	◤	15 [illegible] 35	60	9	SP	SAND, POORLY GRADED, MEDIUM TO FINE, MOSTLY FINE, LESS THAN 3% NONPLASTIC FINES, DARK GRAYISH BROWN, WITH A FEW SMALL CLAY BALLS.
26	◤	[illegible] [illegible] 33	59	8	SP	SAND, POORLY GRADED, COARSE TO FINE, MOSTLY FINE, LESS THAN 3% NONPLASTIC FINES, DARK GRAYISH BROWN.
27	◤	15 [illegible] 32	50	8	SP	SAND, POORLY GRADED, MEDIUM TO FINE, MOSTLY FINE, 3-8% NONPLASTIC FINES, MEDIUM GRAYISH BROWN.

END OF BORING AT 131.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 18 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DFG
DATE AUGUST 9, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 436 - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO 437 | TYPE OF BORING PUSH | SHEET 1 OF 2
DATE DRILLED MAY 9, 1974 | DRILLING COMPANY - EUSTIS ENGRG CO | LOGGED BY R.I.B./R E.S. & S.F.L
COORDINATES, NORTH 12,034.0 | EAST 8,232.8 | GROUND SURFACE ELEVATION 32.4

SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
1	■		H-P	23	CL	CLAY, HIGHLY PLASTIC, DARK BROWN, 75-85% ROOTS AND ORGANIC MATERIAL (BROKEN JAR).
2	■		H-P	9	CH	CLAY, HIGHLY PLASTIC, MOIST, LIGHT GRAY AND YELLOWISH BROWN, SOME SMALL ROOTS AND ORGANIC MATERIAL.
3	■		H-P	22	CH	CLAY, SIMILAR TO ABOVE. EXCEPT YELLOWISH BROWN WITH POCKETS OF LIGHT GRAY.
4	■		H-P	22	CH	CLAY, SAME AS ABOVE.
5	■		H-P	24	CL	SILTY CLAY, SLIGHTLY PLASTIC, 5-10% FINE SAND, DAMP, LIGHT BROWNISH GRAY, FEW SMALL POCKETS LIGHT GRAY CLAY.
6	■		H-P	9	CL	SILTY CLAY, MODERATELY PLASTIC, 1-2% FINE SAND, MOIST, LIGHT BROWNISH GRAY, LARGE POCKET LIGHT GRAY CLAY.
7	■		H-P	23	ML	SILT, NONPLASTIC TO SLIGHTLY PLASTIC, DAMP, LIGHT OLIVE GRAY.
8	■		H-P	23	SP-SM	SAND, POORLY GRADED, MEDIUM TO FINE. 8-12% NONPLASTIC TO SLIGHTLY PLASTIC FINES, DAMP LIGHT YELLOWISH GRAY, WITH SMALL POCKETS OF LIGHT GRAY AND LIGHT YELLOWISH GRAY CLAYEY SAND.
9	■		H-P	22	CL	SANDY CLAY, MODERATELY PLASTIC, 15-20% FINE SAND, SATURATED, LIGHT GRAY AND LIGHT BROWNISH GRAY.
10	■		H-P	20	SM	SILTY SAND, POORLY GRADED, MEDIUM AND FINE, 30-35% NONPLASTIC FINES LIGHT YELLOWISH GRAY WITH A LARGE LAYER CLAYEY SAND. POORLY GRADED, MEDIUM AND FINE, 10-15% SLIGHTLY PLASTIC FINES, LIGHT GRAY.
11	■		H-P	23	CL	SANDY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 10-15% FINE SAND, MED. YELLOWISH GRAY, SOME POCKETS OF LIGHT GRAY SANDY CLAY.
12A 12B	■		H-P	24	CL	ORGANIC CLAY LAYER - SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 3-5% FINE TO MEDIUM SAND, LIGHT BROWNISH GRAY.
13	■		H-P	20	SP-SC	CLAYEY SAND, POORLY GRADED, COARSE TO FINE, MOSTLY FINE, 8-12% SLIGHTLY PLASTIC FINES, LIGHT BROWNISH GRAY, WITH POCKETS OF CLAYEY SAND, SIMILAR TO ABOVE, EXCEPT WITH 12-15% SLIGHTLY PLASTIC FINES, MEDIUM BROWNISH GRAY.
14	■		H-P	24	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 5% FINE SAND, DARK BROWN, WITH ORGANIC MATERIAL.
15	■		H-P	23	ML	SANDY SILT, NON - SLIGHTLY PLASTIC, 15-20% VERY FINE SAND, DARK BROWNISH GRAY.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 18 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.
5 H-P INDICATES HYDRAULICALLY PUSHED.

ISSUED BY D.F. GREENWOOD
DFG
DATE AUGUST 9, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 437 - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO 437 | TYPE OF BORING DRIVE/PUSH | SHEET 2 OF 2
DATE DRILLED MAY 9, 1974 | DRILLING COMPANY - EUSTIS ENGRG. CO. | LOGGED BY R.I.B./S.F.L. & R.E.S.
COORDINATES, NORTH 12,034.0 | EAST 8,232.8 | GROUND SURFACE ELEVATION 32.4

SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
16	■		H-P	29	CL	CLAY, MODERATELY PLASTIC, LIGHT BROWNISH GRAY WITH CLAYEY SILT POCKETS, SLIGHTLY PLASTIC, LIGHT GRAY.
17	■		H-P	12	SM	SILTY SAND, UNIFORM, FINE, TO VERY FINE, 15-20% NONPLASTIC FINES, DARK BROWNISH GRAY, HEAVY MINERALS.
18	◤	[illegible] 26 35	61	15	SM	SILTY SAND, POORLY GRADED, MEDIUM TO FINE, MOSTLY FINE, 12-17% NONPLASTIC FINES, DARK BROWNISH GRAY, MICACEOUS, WITH ONE CLAYEY SAND BALL, HEAVY MINERALS, (5 Y 4/1).
19	◤	[illegible] 18 39	57	11	SP	SAND, POORLY GRADED, MEDIUM TO FINE, MOSTLY FINE, [illegible]-8% NONPLASTIC FINES, DARK BROWNISH GRAY, HEAVY MINERALS, (5 Y 4/1).
20	◤	32 50/4"		6	SP	SAND, UNIFORM, FINE SAND, LESS THAN 5% NONPLASTIC FINES, MEDIUM BROWNISH GRAY, HEAVY MINERAL, (5 Y 4/1).
21	◤	35 50/6"		9	SP	SAND, POORLY GRADED, MEDIUM TO FINE. MOSTLY FINE, 5-8% NONPLASTIC FINES, MEDIUM BROWNISH GRAY, HEAVY MINERALS, PARTIALLY CARBONIZED ORGANIC MATERIAL, (5 Y 4/1).
22	◤	[illegible] [illegible] 27	59	9	SP	SAND, SIMILAR TO ABOVE, EXCEPT LESS THAN 3% NONPLASTIC FINES, (5 Y 4/1).
23	◤	[illegible] 21 32	53	13	SP	SAND, UNIFORM, FINE SAND, LESS THAN 5% NONPLASTIC FINES, MEDIUM BROWNISH GRAY, 5-10% PARTIALLY CARBONIZED ORGANIC MATERIAL, (5 Y - 4/1).
24	◤	[illegible] 31 27	58	8	SP	SAND, POORLY GRADED, COARSE TO FINE, MOSTLY FINE, LESS THAN 5% NONPLASTIC FINES, MEDIUM BROWNISH GRAY, HEAVY MINERALS, (5 Y 4/1).
25	◤	[illegible] [illegible] 50/4.5"		7	SP	SAND, UNIFORM FINE, LESS THAN 5% NONPLASTIC FINES, MEDIUM YELLOWISH GRAY, (5 Y 4/1).
26	◤	[illegible] 15 33	48	7	SP	SAND, SAME AS ABOVE.
27	◤	[illegible] 31 48	79	8	SP	SAND, SAME AS ABOVE.
28	◤	10 14 24	38	7	SP	SAND, SIMILAR TO ABOVE, EXCEPT MICACEOUS.

END OF BORING AT 141.5'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 18 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL.
5 H-P INDICATES HYDRAULICALLY PUSHED.

ISSUED BY D.F. GREENWOOD
DFG
DATE AUGUST 9, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 437 - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. 438 TYPE OF BORING DRIVE SHEET 1 OF 1
DATE DRILLED SEPTEMBER 11, 1974 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 16612.1 EAST 18839.6 GROUND SURFACE ELEVATION 110.3'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
110.3								
	5							
100	10							
	15							
								WASH TO 20.0'
90	20	1	◤	12 13 21	34		SC	CLAYEY SAND, UNIFORM FINE 4-7% SLIGHTLY TO MODERATELY PLASTIC FINES, YELLOWISH GRAY (5 Y 7/2) AND LIGHT OLIVE GRAY (5 Y 7/2).
		2	◤	5 5 11	16		CL	SANDY CLAY, MODERATELY TO HIGHLY PLASTIC, 25-30% VERY FINE SAND, MOTTLED, LIGHT OLIVE GRAY (5 Y 6/1) AND OLIVE GRAY (5 Y 4/1).
	25	3	◤	8 6 6	12		SP-SC	CLAYEY SAND, UNIFORM FINE/VERY FINE, 3-7% SLIGHTLY TO MODERATELY PLASTIC FINES, VERY LIGHT GRAY (N8) AND YELLOWISH GRAY (5 Y 8/1).
		4	◤	9 11 22	33		SP-SC	SAND, UNIFORM FINE, 2-4% MEDIUM SAND LESS THAN 1% GRAVEL TO 0.5 INCH MAXIMUM, 3-6% SLIGHTLY TO MODERATELY PLASTIC FINES, VERY LIGHT GRAY (N8) AND YELLOWISH GRAY (5 Y 8/1).
80	30	5	◤	10 10 8	18		SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY MEDIUM, 2-3% FINES, PALE YELLOWISH BROWN (10 YR 6/2).
		6	◤	15 22 20	42		SP	SAND, UNIFORM, MEDIUM 2-4% FINES, DARK YELLOWISH ORANGE (10 YR-6/6).
								END OF BORING AT 34.0'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DATE NOVEMBER 11, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 438

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO 439 TYPE OF BORING DRIVE SHEET 1 OF 3
DATE DRILLED SEPTEMBER 5, 1974 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY D.F.P.
COORDINATES, NORTH 16520.2 EAST 18479.8 GROUND SURFACE ELEVATION 106.6

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
106.6								
100	5							
	10							
								WASHED TO 15.0'
90	15	1	◤	9 16 21	37		SM	SANDY SILT, MODERATELY PLASTIC, 35-40% VERY FINE SAND, LIGHT OLIVE GRAY (5 Y 6/1) AND DARK YELLOWISH ORANGE (10 YR 6/6).
		2	◤	19 36 40	76		SP	SAND, UNIFORM, VERY FINE, 4-6% SLIGHTLY PLASTIC FINES, VARIEGATED, LIGHT OLIVE GRAY (5 Y 6/1) AND YELLOWISH ORANGE (10 YR 6/6
	20	3	◤	19 9 12	21		SP	SAND, UNIFORM FINE, 4-8% SLIGHTLY TO MODERATELY PLASTIC FINES, LIGHT OLIVE GRAY (5 Y 6/1), WITH A FEW SMALL CLAY BALLS 1/8" TO 1/4" IN DIAMETER.
		4	◤	14 7 5	12		CL	SILTY CLAY, MODERATELY PLASTIC, 3-5% VERY FINE SAND, MOTTLED LIGHT OLIVE GRAY (5 Y 6/1) AND OLIVE GRAY (5 Y 4/1).
80	25	5	◤	2 4 2	6	NR		NO RECOVERY - TWO ATTEMPTS.
		6	◤	30 50/6"			SP	SAND, UNIFORM FINE, CLEAN, LESS THAN 2% FINES, VERY PALE ORANGE (10 YR 8/2).
	30	7	◤	50/6"			SP	SAND, POORLY GRADED FINE TO COARSE, 3-5% MEDIUM AND COARSE SAND, 4-7% GRAVEL TO 0.5 INCH MAXIMUM, 2-3% FINES, GRAYISH ORANGE (10 YR-7/4), VERY PALE ORANGE (10 YR 8/2) AND DARK YELLOWISH ORANGE (10 YR-6/6).
		8	◤	13 9 16	25		SP	SAND, UNIFORM VERY FINE, 2-3% SLIGHTLY PLASTIC FINES, VARIEGATED, VERY PALE ORANGE (10 YR 8/2), AND PALE YELLOWISH BROWN (10 YR 6/2).
	35	9	◤	5 5 4	9		SP-SC	CLAYEY SAND, POORLY GRADED FINE AND MEDIUM, 4-8% MODERATELY PLASTIC FINES, WHITE (N9).
70		10	◤	4 7 9	16		SP-SC	CLAYEY SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINES, 5-8% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6) WITH 2-4% GRAVEL TO 0.5 INCH MAXIMUM.
	40							

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DATE NOVEMBER 11, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 439 - A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO 439 TYPE OF BORING DRIVE SHEET 2 OF 3
DATE DRILLED SEPTEMBER 5, 1974 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY D.F.P
COORDINATES, NORTH 16520.2 EAST 18479.8 GROUND SURFACE ELEVATION 106.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		11	◤	9 6 11	17		SC	CLAYEY SAND, UNIFORM, FINE, 4-7% SLIGHTLY TO MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4), AND PALE YELLOWISH BROWN (10 YR-6/2), WITH A FEW SMALL CLAY POCKETS ½" TO 3/4" IN SIZE.
		12	◤	11 9 10	19		SP	SAND, UNIFORM FINE 4-6% SLIGHTLY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4), WITH A 1" LAYER OF VERY FINE CLAYEY SAND.
	45.0	13	◤	6 9 5	14		SP-SC	SAND, UNIFORM FINE, 5-7% SLIGHTLY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4), WITH A 1" LAYER OF VERY FINE CLAYEY SAND.
60		14	◤	1 2 4	6		CH	CLAY, HIGHLY PLASTIC, FATTY, 2-3% VERY FINE SAND, MOTTLED PALE REDDISH BROWN (10 R 5/4), AND DARK YELLOWISH ORANGE, WITH SOME THIN VERY FINE SAND LENSES (1/8" THICK) AND A 1" LAYER OF VERY FINE SAND NEAR BOTTOM OF SAMPLE.
	50.0	15	◤	2 2 3	5		SP-SC	CLAYEY SAND, UNIFORM, FINE/VERY FINE, 8-12% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6)
		16	◤	9 5 6	11		SP-SC	CLAYEY SAND, UNIFORM, FINE, 8-10% SLIGHTLY TO MODERATELY PLASTIC FINES, VARIGATED DARK YELLOWISH ORANGE (10 YR 6/6), VERY PALE ORANGE (10 YR 8/2) AND MODERATE REDDISH ORANGE (10 R 6/6).
	55.0	17	◤	14 20 18	38		SP	SAND, UNIFORM FINE, 2-5% FINES, VERY PALE ORANGE (10 YR 8/2), AND DARK YELLOWISH ORANGE (10 YR 6/6).
50		18	◤	8 14 9	23		SP	SAND, UNIFORM FINE, 3-6% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
	60.0	19	◤	1 1 2	3		CH	CLAY, HIGHLY PLASTIC, FATTY, 2-4% VERY FINE SAND, MOTTLED, PALE REDDISH BROWN (10 R 6/6), WITH VERY THIN, VERY FINE SAND LENSES, 1/16" THICK.
		20	◤	3 4 5	9		SP-SC	CLAYEY SAND, UNIFORM FINE, 8-10% SLIGHTLY TO MODERATELY PLASTIC FINES, VARIGATED, DARK YELLOWISH ORANGE (10 YR 6/6) AND PALE REDDISH BROWN (10 R 5/4).
	65.0	21	◤	6 6 8	14		SP	SAND, UNIFORM FINE, 4-7% SLIGHTLY PLASTIC FINES, VARIGATED, MOTTLED ORANGE PINK (5 YR 8/4) AND VERY PALE ORANGE (10 YR 8/2).
40		22	◤	6 5 10	15		SP	SAND, UNIFORM FINE, 3-6% SLIGHTLY PLASTIC FINES, VARIGATED, MODERATE REDDISH ORANGE (10 R 6/6).
	70.0	23	◤				SP	SAND, SIMILAR TO SS-22.
		24	◤				SP	SAND, UNIFORM FINE, 4-7% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 YR 6/6), WITH A 1" THICK, HIGHLY PLASTIC, FATTY CLAY LAYER, AND A FEW CLAYEY SAND LAYERS 1/4"-1/2" THICK.
	75.0	25	◤	4 3 3	6	NR		NO RECOVERY.
30		26	◤	8 21 40	61		SP	SAND, UNIFORM FINE, 4-6% SLIGHTLY TO MODERATELY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6).
	80.0							

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DATE NOVEMBER 11, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 439 - B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. 439 TYPE OF BORING DRIVE SHEET 3 OF 3
DATE DRILLED SEPTEMBER 5, 1974 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 16520.2 EAST 18479.8 GROUND SURFACE ELEVATION 106.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		27	◤	11 18 25	43		SP	SAND, POORLY GRADED, FINE TO MEDIUM, 3-5% FINES, VARIGATED MODERATE REDDISH ORANGE (10 R 6/6), AND DARK YELLOWISH ORANGE (10 YR-6/6).
		28	◤	11 17 19	36		SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE AND MEDIUM, 3-5% FINES, VARIGATED MODERATE REDDISH ORANGE (10 R 6/6), WITH A 3/4" THICK HIGHLY PLASTIC, FATTY CLAY LAYER, AND 2-3% GRAVEL TO 0.5 INCH MAXIMUM.
	85.0	29	◤	12 17 11	28		SP	SAND, POORLY GRADED, FINE TO MEDIUM, 2-4% FINES, MODERATE ORANGE PINK (5 YR 8/4).
20		30	◤	11 15 14	29		SP	SAND, UNIFORM FINE, 2-3% FINES, MODERATE ORANGE PINK (5 YR 8/4).
	90.0	31	◤	17 14 36	50		SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 2-3% FINES, VARIGATED, DARK YELLOWISH ORANGE (10 YR 6/6) AND, MODERATE ORANGE PINK, (5 YR 8/4).
								END OF BORING AT 91.5'

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F. GREENWOOD
DATE NOVEMBER 11, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 439 - C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 440 — TYPE OF BORING DRIVE — SHEET 1 OF 1
DATE DRILLED SEPTEMBER 12, 1974 — DRILLING COMPANY - EUSTIS ENGRG. CO — LOGGED BY D.P.P.
COORDINATES, NORTH 17,079.6 — EAST 18,978.9 — GROUND SURFACE ELEVATION 108.5'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
	5.0							
100.0	10.0							
	15.0							WASHED TO 17.5'
90		1	◤	4 6 8	14		CL	SANDY CLAY, MODERATELY TO HIGHLY PLASTIC, 25-35% FINE SAND, MOTTLED LIGHT OLIVE GRAY (5 Y 6/1) AND DARK YELLOWISH ORANGE (10 YR 6/6).
	20.0	2	◤	5 5 5	10		SC	CLAYEY SAND, UNIFORM, FINE/VERY FINE, 12-18% HIGHLY PLASTIC FINES LIGHT OLIVE GRAY (5 Y 6/1), AND DARK YELLOWISH ORANGE (10 YR 6/6).
		3	◤	10 7 7	14		SM	SILTY SAND, UNIFORM, VERY FINE, 15-20% MODERATELY PLASTIC FINES. VARIGATED, VERY LIGHT GRAY (N8), VERY PALE ORANGE (10 YR 8/2), AND DARK YELLOWISH ORANGE (10 YR 6/6).
	25.0	4	◤	7 5 6	11		SM	SAND, SIMILAR TO SS-3.
80		5	◤	5 6 5	11		SC	CLAYEY SAND, UNIFORM, VERY FINE, 10-15% MODERATELY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2), GRAYISH ORANGE (10 YR 7/4), AND DARK YELLOWISH ORANGE (10 YR 6/6).
	30.0	6	◤	6 5 6	11		SC	CLAYEY SAND, UNIFORM, VERY FINE, 15-20% MODERATELY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2), GRAYISH ORANGE (10 YR 7/4), AND DARK YELLOWISH ORANGE (10 YR 6/6).
		7	◤	5 6 4	10		SC	CLAYEY SAND, SIMILAR TO SS-6.
	35.0							END OF BORING AT 34.0'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.P. GREENWOOD
DPG
DATE NOVEMBER 11, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 440

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 441 — TYPE OF BORING DRIVE — SHEET 1 OF 1
DATE DRILLED SEPTEMBER 10, 1974 — DRILLING COMPANY - EUSTIS ENGRG. CO — LOGGED BY D.P.P.
COORDINATES, NORTH 17018.5 — EAST 18614.8 — GROUND SURFACE ELEVATION 113.5'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
112.5								
	5.0							
	10.0							
	15.0							
	20.0							WASHED TO 22.5'
90		1	◤				SC	CLAYEY SAND, UNIFORM, FINE, 6-10% MODERATELY PLASTIC FINES, VARIGATED, DARK YELLOWISH ORANGE (10 YR 6/6), AND DARK RED BROWN (10 R 3/4).
	25.0	2	◤				SC	CLAYEY SAND, SIMILAR TO SS-1, EXCEPT SAMPLE HAS CLAY LAYERS 1/4"-1/2" THICK NEAR BOTTOM OF SAMPLE.
		3	◤	7 7 6	13		SP-SC	CLAYEY SAND, UNIFORM, VERY FINE, 4-8% MODERATELY PLASTIC FINES. VARIGATED DARK YELLOWISH ORANGE (10 YR 6/6), AND DARK REDDISH BROWN (10 R 3/4).
	30.0	4	◤	5 4 5	9		SP-SC	CLAYEY SAND, UNIFORM, VERY FINE 6-10% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), AND MODERATE BROWN (5 YR 4/4), WITH A 1/2" LAYER OF FINE SAND.
		5	◤	4 5 6	11		SP-SC	CLAYEY SAND, POORLY GRADED FINE TO COARSE, 2-3% COARSE SAND, 1-3% GRAVEL TO 0.5 INCH MAXIMUM, 5-8% MODERATELY PLASTIC FINES DARK YELLOWISH ORANGE (10 YR 6/6), GREYISH YELLOW (5 Y 8/4), AND PALE REDDISH BROWN (10 R 5/4), WITH NUMEROUS SMALL CLAY BALLS (1/8"-1/4" IN DIAMETER AND ONE CLAY POCKET 3/4" IN SIZE.
		6	◤	5 6 8	14		SC	CLAYEY SAND, UNIFORM, FINE, 3-7% SLIGHTLY TO MODERATELY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4) AND DARK YELLOWISH ORANGE (10 YR 6/6).
		7	◤	6 6 10	16		SC	SIMILAR TO SS 6.
		8	◤	4 3 4	7		SC	CLAYEY SAND, UNIFORM, FINE, 4-7% SLIGHTLY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4). BOTTOM OF BORING AT 41.5'.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.P. GREENWOOD
DPG
DATE NOVEMBER 11, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 441

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 442 — TYPE OF BORING DRIVE — SHEET 1 OF 1
DATE DRILLED SEPTEMBER 16, 1974 — DRILLING COMPANY - EUSTIS ENGRG. CO — LOGGED BY D.P.P.
COORDINATES, NORTH 17580.2 — EAST 19113.3 — GROUND SURFACE ELEVATION

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
102.4								
100								
	5.0							
	10.0							
90								WASHED TO 12.5'
		1	◤	37 50/6"			SC	CLAYEY SAND, UNIFORM FINE, 8-12% MODERATELY PLASTIC FINES, PALE YELLOWISH BROWN (10 YR 6/2).
	15.0	2	◤	17 25 24	49		SC	CLAYEY SAND, UNIFORM FINE. 6-8% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), GRAYISH ORANGE (10 YR 7/4), AND PALE YELLOW BROWN (10 YR 6/2).
		3	◤	15 11 12	23		SC	CLAYEY SAND, POORLY GRADED, FINE TO MEDIUM, 1-2% GRAVEL TO 0.5 IN. MAXIMUM, 4-8% SLIGHTLY TO MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6), AND PALE YELLOW BROWN (10 YR 6/2), WITH TWO THIN SILT LAYERS 1/2"-3/4" THICK.
	20.0	4	◤	7 10 12	22		SP	SAND, UNIFORM FINE, 3-6% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
80		5	◤	7 10 11	21		SP	SAND, UNIFORM FINE, 2-5% NONPLASTIC TO SLIGHTLY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2).
	25.0	6	◤	4 8 10	18		SP	SAND, SIMILAR TO SS-5.
								END OF BORING AT 26.5'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.P. GREENWOOD
DPG
DATE NOVEMBER 11, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 442

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 443 — TYPE OF BORING DRIVE — SHEET 1 OF 1
DATE DRILLED SEPTEMBER 17, 1974 — DRILLING COMPANY - EUSTIS ENGRG. CO — LOGGED BY D.P.P.
COORDINATES, NORTH 17512.7 — EAST 18748.5 — GROUND SURFACE ELEVATION 115.0'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
	5.0							
100								
	10.0							
	15.0							
90								
	20.0							
	25.0							WASHED TO 25.0'
		1	◤	10 13 19	32		SP-SC	CLAYEY SAND, UNIFORM, FINE, 4-8% MODERATELY PLASTIC FINES, VERY LIGHT GRAY (N8) AND WHITE (N9), WITH A FEW SMALL AND MEDIUM SIZED CLAY BALLS.
80		2	◤	9 9 10	19		SM-SC	SILTY SAND, UNIFORM, FINE. 8-12% SLIGHTLY TO MODERATELY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2) AND DARK YELLOWISH ORANGE (10 YR 6/6).
	30.0	3	◤	8 8 10	18		SP	TOP 5": SAND, UNIFORM, FINE. 3-4% FINES, DARK YELLOWISH ORANGE (10 YR 6/6). BOTTOM 4": CLAYEY SAND, UNIFORM, VERY FINE/FINE, 5-8% MODERATELY PLASTIC FINES, VERY LIGHT GRAY (N8).
		4	◤	11 8 8	16		SP-SC	CLAYEY SAND, UNIFORM, FINE, 6-9% MODERATELY PLASTIC FINES, VERY PALE ORANGE (10 YR 8/2) AND PALE YELLOW BROWN (10 YR 6/2).
	35.0	5	◤	6 7 7	14		SP-SC	CLAYEY SAND, SIMILAR TO SS-4.
70		6	◤	13 14 18	32		SP	SAND, UNIFORM FINE. 3-5% FINES. GRAYISH ORANGE (10 YR 7/4) AND DARK YELLOWISH ORANGE (10 YR 6/6).
								END OF BORING AT 39.0'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.P. GREENWOOD
DPG
DATE NOVEMBER 11, 1974

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 443

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 449 TYPE OF BORING OPEN TRI-CONE SHEET 1 OF 2
DATE DRILLED MARCH 9 & 10, 1978 DRILLING COMPANY RAYMOND INTERNATIONAL LOGGED BY T.J.F. D.F.P.
COORDINATES, NORTH 13187 EAST 6852 GROUND SURFACE ELEVATION 42.5'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"[1]	"N" VALUE	RECOVERY[3]		
		1	◤	2 3 3	6		SM	SILTY SAND, FINE, BROWN.
40	▽ 5	2	◤	2 2 2	4		SM/ML	TOP HALF SILTY SAND, SIMILAR TO SS 1. BOTTOM HALF SANDY SILT, FINE, BROWN.
		3	◤	2 2 1	3		CL	CLAY, FIRM, TRACE BLACK ORGANICS GRAYISH BROWN.
	10	4	◤	1 2 3	5		CL	SILTY CLAY, MODERATELY PLASTIC, FIRM, ORGANIC MATERIAL, LIGHT BROWN.
30		5	◤	2 2 2	4		CL	CLAY, FIRM TO STIFF, TRACE ORGANIC MATERIAL, GRAYISH BROWN.
		6	◤	2 2 2	4		CH	SILTY CLAY, HIGHLY PLASTIC, FIRM, ORGANIC MATERIAL, LIGHT GRAYISH GREEN.
		7	◤	2 2 2	4		CH	SILTY CLAY, VERY SOFT, BLUE GRAY.
	20	8	◤	1 1 1	2		ML	SANDY SILT, NONPLASTIC, 43% VERY FINE SAND, LIGHT GRAY.
20		9	◤	2 2 1	3		ML	SANDY SILT, SIMILAR TO SS 8.
		10	◤	2 2 1	3		ML	SANDY SILT, SIMILAR TO SS 8, SMALL ROOTS.
		11	◤	1 2 1	3		CH	SILTY CLAY, VERY HIGHLY PLASTIC, SOFT, ORGANIC MATERIAL, GRAY.
	30	12	◤	1 1 1	2		CH	SILTY CLAY, SIMILAR TO SS 11.
10		13	◤	1 1	1		CH	CLAY, HIGHLY PLASTIC, SOFT TO VERY SOFT, SMALL ROOTS, BLUE GRAY.
		14	◤	1 1	1		CH	CLAY, HIGHLY PLASTIC, SOFT, SMALL ROOTS, BLUE GRAY.
		15	◤	1 1 2	3		CH	SILTY CLAY, VERY HIGHLY PLASTIC, SOFT, ORGANIC MATERIAL, GRAY.
	40	16	◤	WR 1 2	3		CH	SILTY CLAY, SIMILAR TO SS 15.
0		17	◤	WOH 1 1	2		CH	SILTY CLAY, SIMILAR TO SS 15.
		18	◤	1 2 1	3		CH	SILTY CLAY, SIMILAR TO SS 15.
		19	◤	1 2 1	3		CH	SILTY CLAY, SOFT TO FIRM, ORGANIC MATERIAL, BLUE GREEN.
	50	20	◤	2 2 4	6		CH	SILTY CLAY, HIGHLY PLASTIC, FIRM, 1% VERY FINE SAND IN MEDIUM SAND SIZED CLAY PARTICLES, LIGHT GREEN.
-10		21	◤	1 2 3	5		CL	SILTY CLAY, FIRM TO STIFF, SAND LENSES, BLUE GREEN.
		22	◤	2 2 2	4		CL	SILTY CLAY, FIRM, ORGANIC MATERIAL, BROWN-GREEN.
		23	◤	3 2 2	4		CL	SANDY CLAY, SLIGHTLY PLASTIC, 25-35% FINE AND VERY FINE SAND, SOFT TO FIRM, ORGANIC MATERIAL, LIGHT GREEN.
	60	24	◤	8 10 20	30		SP	SAND, FINE, ROUNDED, CLEAN, GRAY.
-20		25	◤	3 8 6	14		SM	SILTY SAND, UNIFORM, VERY FINE SAND, 45% NONPLASTIC FINES, ORGANIC MATERIAL, GRAY.
		26	◤	2 2 2	4		CL	CLAY, FIRM, ORGANIC MATERIAL, GREEN GRAY.
		27	◤	1 2 3	5		CL	SANDY CLAY, MODERATELY PLASTIC, 20-30% FINE AND VERY FINE SAND, ORGANIC MATERIAL, GRAY.
	70	28	◤	2 2 4	6		CL	SILTY CLAY, STIFF, GREEN HARD CLAY NODULES, GREEN GRAY.
-30		29	◤	2 3 5	8		CL	SILTY CLAY, MODERATELY PLASTIC, FIRM TO STIFF, LIGHT GRAY.
		30	◤	3 5 7	12		CH	SILTY CLAY, HIGHLY PLASTIC, 1% VERY FINE SAND IN MEDIUM SAND SIZED CLAY PARTICLE, STIFF, ORGANIC MATERIAL, BLUE GRAY.
		31	◤	3/8/9	17		CH/SP	TOP 8" SANDY CLAY, FIRM, BLUE GREEN. BOTTOM 2" SAND, UNIFORM, FINE, GRAYISH GREEN.
	80	32	◤	2 4 5	9		CL	TOP 12" SILTY CLAY, FIRM TO STIFF, GREEN-GRAY. BOTTOM 6" CLAYEY SILT, FIRM, ORGANIC MATERIAL, BROWN.
-40		33	◤	5 5 7	12		CL	SILTY CLAY, MODERATELY PLASTIC, STIFF, ORGANIC MATERIAL, BLUISH GRAY.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL
5 "WR" INDICATES WEIGHT OF ROD
6 "WOH" INDICATES WEIGHT OF HAMMER

ISSUED BY G.K. BURKE MRM
DATE 6/13/79

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 449

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 449 TYPE OF BORING OPEN, TRI-CONE SHEET 2 OF 2
DATE DRILLED MARCH 10 & 13, 1978 DRILLING COMPANY RAYMOND INTERNATIONAL LOGGED BY T.J.F./D.F.P.
COORDINATES, NORTH 13187 EAST 6852 GROUND SURFACE ELEVATION 42.5'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"[1]	"N" VALUE	RECOVERY[3]		
-40	85	34	◤	3 3 5	8		CL	SILTY CLAY, MODERATELY PLASTIC, STIFF, ORGANIC MATERIALS WITH SMALL SHELL FRAGMENTS, BLUISH GRAY.
		35	◤	3 8 16	24		CL	SILTY CLAY, MODERATELY PLASTIC, VERY STIFF LESS THAN 5% VERY FINE SAND SIZED SHELL FRAGMENTS, ORGANIC MATERIAL, GRAY.
	90	36	◤	13 17 17	34		SP-SM	SILTY SAND, UNIFORM, FINE SAND, 8% NONPLASTIC FINES, GRAY.
-50		37	◤	17 18 19	37		SP-SM	SAND, UNIFORM, FINE, TRACE TO SOME SILT, GRAY.
		38	◤	13 17 21	38		SP-SM	SAND, SIMILAR TO SS 37.
		39	◤	12 18 27	45		SP-SM	SAND, SIMILAR TO SS 37.
		40	◤	9 10 8	18			SAND, UNIFORM, FINE TO VERY FINE SAND, SOME SILT, GRAY
								END OF BORING AT 100.0'

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY G.K. BURKE MRM
DATE 6/13/79

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 449A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 450 TYPE OF BORING OPEN, TRI-CONE SHEET 1 OF 3
DATE DRILLED MARCH 15 & 17, 1978 DRILLING COMPANY RAYMOND INTERNATIONAL LOGGED BY D.F.P.
COORDINATES, NORTH 13168 EAST 6814 GROUND SURFACE ELEVATION 44.8'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"[1]	"N" VALUE	RECOVERY[3]		
		1	◤	1 2 2	4		SM	SILTY SAND, UNIFORM, VERY FINE, BROWN.
40'	5	2	◤	2 2 2	4		ML	SANDY SILT, BROWN.
		3 ST	■				ML	TOP OF SAMPLE, SANDY SILT, SLIGHTLY PLASTIC, 15-20% FINE SAND, FIRM, SOME ORGANIC MATERIAL. BOTTOM OF SAMPLE, SANDY SILT, NONPLASTIC, 35-45' VERY FINE SAND, SOFT, BROWN.
35'	10	4 ST	■				ML CH	TOP OF SAMPLE, SANDY SILT, NON TO SLIGHTLY PLASTIC, 10-15% VERY FINE SAND, FIRM UNDISTURBED, BECOMES SOFT REMOLDED, BROWN. BOTTOM OF SAMPLE, SILTY CLAY, HIGHLY PLASTIC, FIRM UNDISTURBED, BECOMES SOFT REMOLDED, BROWN.
		5 ST	■				CH CH	TOP OF SAMPLE, SILTY CLAY, HIGHLY PLASTIC, <5% VERY FINE SAND, STIFF UNDISTURBED, BECOMES SOFT REMOLDED, GRAYISH BROWN SPOTTED W/DARK BROWN & ORANGE, MODERATE REACTION TO 10% HCl. BOTTOM OF SAMPLE, SILTY CLAY, HIGH PLASTIC, <2% VERY FINE SAND, FIRM UNDISTURBED, BECOMES SOFT REMOLDED, BROWN, MODERATE REACTION TO 10% HCl.
30'	15	6 ST	■				CH	SILTY CLAY, SIMILAR TO SAMPLE #5.
		7 ST	■	N.R.				
25'	20	8 ST	■	N.R.				
		9 P	■				ML ML	TOP OF SAMPLE, SANDY SILT, NON TO SLIGHTLY PLASTIC, 10-15% VERY FINE SAND, FIRM TO STIFF UNDISTURBED, BECOMES SOFT REMOLDED, LT. GRAY. BOTTOM OF SAMPLE, SANDY SILT, NON TO SLIGHTLY PLASTIC, 35-45% VERY FINE SAND, FIRM UNDISTURBED, BECOMES VERY SOFT REMOLDED, GRAY.
20'	25	10 P	■				ML	CLAYEY SILT, MODERATELY PLASTIC, NUMBEROUS ROOTS, BLUISH GRAY.
15'		11 P	■				CH	CLAY, MODERATELY TO HIGHLY PLASTIC, LARGE WOOD FRAGMENTS & ROOTS, BLUE-GREEN.
	30	12 P	■				CH CH	TOP OF SAMPLE SILTY CLAY, HIGHLY PLASTIC, FIRM UNDISTURBED, BECOMES SOFT REMOLDED, LIGHT GREENISH GRAY, SOME ORGANIC MATERIAL. BOTTOM OF SAMPLE, SILTY CLAY, HIGHLY PLASTIC, FIRM UNDISTURBED & REMOLDED, LIGHT GREENISH GRAY, SOME ORGANIC MATERIAL.
10	35							
		13 P	■				CH CH	TOP OF SAMPLE SILTY CLAY, HIGHLY PLASTIC, SOFT UNDISTRUBED AND REMOLDED, BLUISH GRAY, SOME ORGANIC MATERIAL. BOTTOM OF SAMPLE SILTY CLAY, HIGHLY PLASTIC, STIFF, GREEN.
5	40							

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED
4 DATUM IS MEAN SEA LEVEL

ISSUED BY G.K. BURKE MRM
DATE 6/13/79

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 450

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 450 TYPE OF BORING OPEN, TRI-CONE SHEET 2 OF 3
DATE DRILLED MARCH 15 & 17, 1978 DRILLING COMPANY RAYMOND INTERNATIONAL LOGGED BY D.F.P.
COORDINATES, NORTH 13168 EAST 6814 GROUND SURFACE ELEVATION 44.0'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"[1]	"N" VALUE	RECOVERY		
0		14 P	■				CH	SILTY CLAY, HIGHLY PLASTIC, FIRM, DARK GRAY, SOME ORGANIC MATTER.
	45							
		15 P	■				CH SM CL	TOP OF SAMPLE SILTY CLAY, MODERATE TO HIGHLY PLASTIC, FIRM UNDISTURBED AND REMOLDED, BLUISH GRAY, SOME ORGANIC MATTER. BOTTOM OF SAMPLE SILTY SAND, UNIFORM FINE, <5% MEDIUM SAND, 12-17 NONPLASTIC FINES, LIGHT GRAY, GRADES TO SANDY CLAY, MODERATELY PLASTIC, BLUISH GRAY.
-5	50	16 P	■				CL CH	TOP OF SAMPLE SANDY CLAY, MODERATELY PLASTIC, 15-20% VERY FINE SAND, FIRM, LIGHT BLUISH GRAY. BOTTOM OF SAMPLE SILTY CLAY, HIGHLY PLASTIC, STIFF UNDISTURBED BECOMES FIRM REMOLDED, BLUISH GRAY.
		17 P	■				CL	SANDY CLAY, MODERATELY PLASTIC, BLUISH GREEN.
-10								
	55	18 P	■				CH	CLAY, MODERATE TO HIGHLY PLASTIC, SOME FINE SAND, SOME VERY SMALL ROOTS, BLUISH GREEN.
		19 P	■				CL CL CH	TOP OF SAMPLE SANDY CLAY, MODERATELY PLASTIC, 10-15% VERY FINE SAND, SOFT, GRAY. BOTTOM OF SAMPLE SANDY CLAY, MODERATELY PLASTIC, 20-25% VERY FINE SAND, SOFT LIGHT BROWN, AND SILTY CLAY, HIGHLY PLASTIC, SOFT BLUISH GRAY.
-15								
	60	20	◤	1 2 9	11		CH	SILTY CLAY, MODERATELY PLASTIC, SOME FINE AND MEDIUM SAND & ROOTS, GRAY.
		21	◤	10 8 7	15		SP	SAND, VERY FINE TO MEDIUM, MOSTLY FINE, LIGHT GRAYISH BROWN.
-20		22	◤	4 3 3	6		CH	SILTY CLAY, GRAY, INTERBEDDED WITH SMALL VERY FINE SAND LAYERS AND ROOTS.
	65	23 P	■				CH ML	TOP OF SAMPLE SILTY CLAY, HIGHLY PLASTIC, FIRM, GREENISH GRAY, SOME ORGANIC MATTER. BOTTOM OF SAMPLE CLAYEY SILT, SLIGHTLY PLASTIC, FIRM TO STIFF, SOFT UPON REMOLDING, LIGHT GRAY, SOME ORGANIC MATTER.
-25								
	70							
		24 P	■				CH	TOP OF SAMPLE SILTY CLAY, HIGHLY PLASTIC, SOFT, BLUISH GRAY.
-30							CH	BOTTOM OF SAMPLE SILTY CLAY, HIGHLY PLASTIC, FIRM, BLUISH GRAY.
	75							
-35								
	80							

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY G.K. BURKE MKM
DATE 4/18/79

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 450A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 450 TYPE OF BORING OPEN, TRI-CONE SHEET 3 OF 3
DATE DRILLED MARCH 15 & 17, 1978 DRILLING COMPANY RAYMOND INTERNATIONAL LOGGED BY D.F.P.
COORDINATES, NORTH 13168 EAST 6814 GROUND SURFACE ELEVATION 44.0'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"[1]	"N" VALUE	RECOVERY		
-35								
	80	25	■				CH CL	TOP OF SAMPLE SILTY CLAY, HIGHLY PLASTIC, FIRM GREENISH GRAY, SOME ORGANIC MATTER, BOTTOM SILTY CLAY, MODERATELY PLASTIC, FIRM, DARK BROWN, SOME ORGANIC MATTER
-40		26	◤			N.R.		
	85							
-45		27	◤	15 35 52	87		ML	SILT, INTERBEDDED LAYERS OF BROWN CLAY WITH ROOTS, GRAY.
	90							
-50		28	◤	25 21 30	51		SP	SAND, UNIFORM FINE, CLEAN GRAY.
	95							
	100	29	◤	23 20 17	37		SP	SAND, SIMILAR TO SS 28.
								END OF BORING AT 100.0'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY G.K. BURKE MKM
DATE 4/15/79

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 450B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 451 TYPE OF BORING OPEN, TRI-CONE SHEET 1 OF 1
DATE DRILLED MARCH 21, 1978 DRILLING COMPANY RAYMOND INTERNATIONAL LOGGED BY D.F.P.
COORDINATES, NORTH 13107 EAST 6693 GROUND SURFACE ELEVATION 44.0'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"[1]	"N" VALUE	RECOVERY		
40	▽ 5	1	◤	1 1 2	3		ML	CLAYEY SILT, SLIGHTLY PLASTIC, SOFT TO FIRM, SOME SMALL ROOTS, BROWN.
	10	2	◤	1 1 1	2		ML	CLAYEY SILT, SIMILAR TO SS 1.
30		3	◤	1 1 2	3		CH	SILTY CLAY, HIGHLY PLASTIC, SOFT, ORGANIC DEBRIS, BROWN.
	20	4	◤	2 18"			ML	SILT, SOME FINE SAND, GRAY.
20		5	◤	2 18"			CL	SANDY CLAY, MODERATELY PLASTIC, 11.1% VERY FINE SAND, VERY SOFT, ORGANIC DEBRIS, GRAY.
	30	6	◤	1 2 2	4		CH	SILTY CLAY, HIGHLY PLASTIC, 4.8% VERY FINE SAND, SOFT TO FIRM, ORGANIC DEBRIS, GRAY.
10		7	◤	1 1 2	3		CL	SILTY CLAY, SLIGHTLY PLASTIC, SOFT, VERY THIN INTERBEDDED LAYERS OF ORGANICS, GRAY.
	40	8	◤	1 1 2	3		CL	CLAY, SLIGHTLY TO MODERATELY PLASTIC, SOFT, FEW SMALL ROOTS, GRAY.
								END OF BORING AT 40.0'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY G.K. BURKE MKM
DATE 4/18/79

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 451

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 452 TYPE OF BORING OPEN, TRI-CONE SHEET 1 OF 1
DATE DRILLED MARCH 21, 1978 DRILLING COMPANY RAYMOND INTERNATIONAL LOGGED BY D.F.P.
COORDINATES, NORTH 13045 EAST 6578 GROUND SURFACE ELEVATION 43.0'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"¹	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
40	5	1	◤	2 3 3	6		ML	SILT, FEW SMALL ROOTS, BROWN.
	10	2	◤	1 1 1	2		ML	SILT, SIMILAR TO SS 1.
30		3	◤	2 18"			CH	SILTY CLAY, HIGHLY PLASTIC, VERY SOFT, ORGANIC DEBRIS, BROWN.
	20	4	◤	2 18"			CL	SANDY CLAY, MODERATELY PLASTIC, 7-12% VERY FINE SAND, SOFT, BROWN-GRAY.
20		5	◤	1 1 1	2		CL	SANDY CLAY, SIMILAR TO SS 4.
	30	6	◤				CH	SILTY CLAY, VERY HIGHLY PLASTIC, SOFT, ORGANIC DEBRIS, GRAY.
10		7	◤	2 18"			CL	CLAY, SLIGHTLY TO MODERATELY PLASTIC, SOFT TO FIRM, VERY SMALL ROOTS, GRAY.
	40	8	◤	1 1 2	3		CL	CLAY, MODERATELY PLASTIC, FIRM, GRAY.
0		9	◤	1 1 1	2		CL	CLAY, SIMILAR TO SS 8.
	50	10	◤	2 2 2	4		CH	SILTY CLAY, HIGHLY PLASTIC, SOFT TO FIRM, ORGANIC DEBRIS, LIGHT GREEN.
-10		11	◤	2 2 2	4		CL	CLAY, MODERATELY PLASTIC, FIRM, FEW ROOTS AND VERY THIN GRAYISH WHITE SILT LENSES, GREEN-GRAY.
	60	12	◤	10 8 13	21		SM	SILTY SAND, UNIFORM, VERY FINE SAND, TRACE FINE AND MEDIUM SAND, 37.5% SLIGHTLY PLASTIC FINES, COMPACT, ORGANIC DEBRIS, GRAY.
-20		13	◤	5 2 3	5		CL	SILTY CLAY, SLIGHTLY PLASTIC, FIRM, DARK GRAY.
								END OF BORING AT 65.0'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL

ISSUED BY G.K. BURKE mem
DATE 6/13/79

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 452

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 453 TYPE OF BORING OPEN, TRI-CONE SHEET 1 OF 2
DATE DRILLED MARCH 22 & 23, 1978 DRILLING COMPANY RAYMOND INTERNATIONAL LOGGED BY D.F.P.
COORDINATES, NORTH 12990 EAST 6464 GROUND SURFACE ELEVATION 44.0'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"¹	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
40	5	1	◤	2 3 5	8		ML	CLAYEY SILT, SLIGHTLY PLASTIC, SOFT TO FIRM, BROWN
	10	2	◤	1 1 2	3		CL/ML	SILTY CLAY, MODERATELY PLASTIC, 5-10% VERY FINE SAND, SOFT, BROWN GRADING TO SANDY SILT, SLIGHTLY PLASTIC, 35-45% VERY FINE SAND, SOFT, BROWN
30		3	◤	1 18"			CL/ML	SIMILAR TO SS 2.
	20	4	◤	2 18"			CL	SILTY CLAY, MODERATELY PLASTIC, 5-10% VERY FINE SAND, VERY SOFT, GREENISH BROWN
20		5	◤	2 18"			SM	SILTY SAND, UNIFORM, VERY FINE SAND, 23% NONPLASTIC FINES, GRAY
	30	6	◤	2 18"			CH	SILTY CLAY, HIGHLY PLASTIC, VERY SOFT, ORGANIC MATERIAL, GRAY
10		7	◤	2 18"			CL	CLAY, MODERATELY PLASTIC, FIRM, NUMEROUS SMALL ROOTS AND ORGANICS, GRAY.
	40	8	◤	2 18"			CL	CLAY, MODERATELY PLASTIC, FIRM TO STIFF, FEW SMALL ROOTS, GRAY.
0		9	◤	1 1 1	2		CL	CLAY, SIMILAR TO SS 8.
	50	10	◤	2 2 2	4		CL	CLAY, SLIGHTLY TO MODERATELY PLASTIC, STIFF, BLUISH GRAY.
-10		11	◤	2 2 4	6		CL	CLAY, SIMILAR TO SS 10.
	60	12	◤	8 10 8	18		SP	SAND, UNIFORM, FINE, 2-5% FINES, THIN CLAY AND SANDY CLAY LENSES, GRAY.
-20		13	◤	10 4 3	7		SP CL	TOP 12", SAND, UNIFORM, FINE, CLEAN, ROUNDED, LIGHT GRAY, BOTTOM 6", CLAYEY SILT, SLIGHTLY PLASTIC, FIRM, GRAY.
	70	14	■				CH CL-ML	TOP 2", CLAY, HIGHLY PLASTIC, 10-15% VERY FINE SAND, FIRM, VERY SOFT UPON REMOLDING, ORGANIC MATERIAL, BLUISH GRAY WITH POCKET OF SAND, UNIFORM, FINE, LESS THAN 5% FINES, LIGHT BROWN. BOTTOM 2", SANDY CLAY-SANDY SILT, SLIGHTLY PLASTIC, 10-15% VERY FINE SAND, STIFF, GRAY.
-30		15	■				CL CL	TOP 2", SILTY CLAY, MODERATELY PLASTIC, 4-7% VERY FINE SAND, FIRM, ORGANIC MATERIAL, GRAY. BOTTOM 2", SILTY CLAY, MODERATELY PLASTIC, 4-7% VERY FINE SAND, STIFF, ORGANIC MATERIAL, GRAY
	80	16	■				CH	SANDY CLAY, VERY SOFT, 15-20%, FINE SAND, FEW LARGE WOOD FRAGMENTS, GRAY

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL

ISSUED BY G.K. BURKE mem
DATE 6/13/79

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 453

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 453 TYPE OF BORING OPEN, TRI-CONE SHEET 2 OF 2
DATE DRILLED MARCH 22 & 23, 1978 DRILLING COMPANY RAYMOND INTERNATIONAL LOGGED BY D.F.P.
COORDINATES, NORTH 12990 EAST 6464 GROUND SURFACE ELEVATION 44.0'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"¹	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
-40	85	17	■				MH OH	TOP 2", CLAYEY SILT, HIGHLY PLASTIC, STIFF, CONSIDERABLE ORGANIC MATERIAL, DARK BROWN. BOTTOM 2", ORGANIC SILT, HIGHLY PLASTIC, STIFF, 13.7 ORGANIC MATERIAL, DARK BROWN.
	90	18	◤	10 11 21	32		ML	SILT, NON-PLASTIC, FIRM, INTERBEDDED LAYERS OF VERY FINE SAND & CLAY, GRAY.
-50		19	◤	14 21 21	42		SP	SAND, UNIFORM, FINE, CLEAN, ROUNDED, GRAY
	100	20	◤	7 14 21	35		SP	SAND, UNIFORM, VERY FINE, ROUNDED, 3-6, FINES, GRAY
								END OF BORING AT 100.0'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL

ISSUED BY G.K. BURKE mem
DATE 6/13/79

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 453A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. 454 TYPE OF BORING OPEN, TRI-CONE SHEET 1 OF 1
DATE DRILLED MARCH 22 & 23, 1978 DRILLING COMPANY RAYMOND INTERNATIONAL LOGGED BY D.F.P.
COORDINATES, NORTH 12465 EAST 6550 GROUND SURFACE ELEVATION 44.0'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"¹	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
40	5	1	◤	2 2 2	4		ML	SILT, NON-PLASTIC, TRACE OF VERY FINE SAND, BROWN.
	10	2	◤	2 1 1	2		CL	SANDY CLAY, MODERATELY PLASTIC, 12-15% VERY FINE SAND, VERY SOFT TO SOFT, GRAYISH BROWN
30		3	◤	2 18"			CL	SANDY CLAY, SIMILAR TO SS 2.
	20	4	◤	2 18"			ML	SILT, SLIGHTLY PLASTIC, SOFT TO FIRM, MOTTLED GRAY AND BROWN.
20		5	■				SM CH	TOP OF SAMPLE, SILTY SAND, UNIFORM FINE TO VERY FINE, 35-45% NON-PLASTIC FINES, LOOSE, GRAY. BOTTOM OF SAMPLE, SILTY CLAY, HIGHLY PLASTIC, FIRM, GRAY, SOME ORGANIC MATTER
	30	6	◤	1 1 2	3		CH	CLAY, MODERATELY TO HIGHLY PLASTIC, STIFF, GRAY.
10		7	■				CH CH	TOP OF SAMPLE, SILTY CLAY, HIGHLY PLASTIC, STIFF, GRAY, SOME ORGANIC MATERIAL. BOTTOM OF SAMPLE, SILTY CLAY, SAME AS ABOVE.
	40	8	◤	1 1 1	2		CH	CLAY, MODERATELY TO HIGHLY PLASTIC, FIRM, GRAY
0		9	■				CH SM	TOP OF SAMPLE, SILTY CLAY, VERY HIGHLY PLASTIC, FIRM, UNDISTURBED, SOFT REMOLDED, GRAY, SOME ORGANIC MATERIAL. BOTTOM OF SAMPLE, SILTY SAND, UNIFORM FINE, 15-25% NON TO SLIGHTLY PLASTIC FINES, GRAY.
	50	10	◤	2 3 5	8		CH	CLAY, HIGHLY PLASTIC, FIRM, ORGANIC MATERIAL, GRAYISH GREEN.
-10		11	◤	4 4 4	8		CL	CLAY, SLIGHTLY PLASTIC, STIFF TO VERY STIFF, FEW SMALL ROOTS, BLUE GREEN.
	60	12	◤	11 17 21	38		SM	SILTY SAND, POORLY GRADED, COARSE TO FINE MOSTLY FINE SAND, 22.1% NON-PLASTIC FINES, GRAYISH BROWN.
								END OF BORING AT 60.0'

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE
3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4 DATUM IS MEAN SEA LEVEL

ISSUED BY G.K. BURKE mem
DATE 6/13/79

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - 454

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 122

BORING NO. P1
TYPE OF BORING DRIVE/
SHEET 1 OF 3
DATE DRILLED 9/9/72
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY R.A.J.
COORDINATES, NORTH 18,959.1
EAST 16,919.9
GROUND SURFACE ELEVATION 119.8

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		1	▼	2 3 4	7	14	ML	SILT, SLIGHTLY PLASTIC, MODERATE BROWN (5YR 4/4), WITH LIGHT GRAY (N7) POCKETS OF NONPLASTIC SILT.
110	10	2	▼	3 4 6	10	15	ML	SILT, SLIGHTLY PLASTIC, 5-10% VERY FINE AND MEDIUM SAND, DARK YELLOWISH ORANGE (10YR 6/6).
		3	▼	3 5 7	12	14	CL	SANDY CLAY, SLIGHTLY PLASTIC, 25-35% UNIFORM ~~FINE SAND~~, MODERATE YELLOWISH BROWN (10YR 5/4), WITH POCKETS AND SEAMS OF LIGHT GRAY (N7), SANDY SILT.
100	20	4	▼	8 12 16	28	8	SC	CLAYEY SAND, UNIFORM, FINE, 10-15% HIGHLY PLASTIC FINES, GRAYISH ORANGE (10YR 7/4) AND LIGHT GRAY (N7), WITH SLIGHT MODERATE REDDSIH ORANGE (10YR6/6).
		5	▼	3 6 7	13	14	SC	CLAYEY SAND, FINE, 10-20% SLIGHTLY PLASTIC FINES, MODERATE ORANGE PINK (5YR 8/4), GRAYISH YELLOW (5Y 8/4), AND LIGHT GRAY (N7).
90	30	6	▼	3 6 7	13	14	SC	SIMILAR TO SS-5, BUT BANDED ALTERNATING VERY BREIGHT YELLOWISH ORANGE (10YR 6/6), AND GRAYISH YELLOW (5Y 8/4), WITH SOME LIGHT GRAY (N7), AND MODERATELY PLASTIC FINES.
		7	▼	3 6 6	12	13	SC	SIMILAR TO SS-6, WITH MORE LIGHT GRAY (N7).
80	40	8	▼	8 34 22	56	14	SP	SAND, UNIFORM, FINE, LESS THAN 1% HIGHLY PLASTIC FINES, WHITE, FEW GRAVEL PARTICLES TO 0.5 INCH.
		9	▼	9 11 14	25	15	SP	SAND, UNIFORM, FINE, LESS THAN 3% SLIGHTLY PLASTIC FINES, BRIGHT YELLOWISH ORANGE (10YR 6/6).
70	50	10	▼	4 7 8	15	13	SC	CLAYEY SAND, UNIFORM, FINE, 10-15% SLIGHTLY TO MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10YR 6/6), AND SOME MODERATE RED (5R 4/6).
		11	▼	7 7 11	18	14	SP-SC	SAND, UNIFORM, FINE, 7-12% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10YR 6/6).
60	60	12	▼	5 3 2	5	7	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, DARK YELLOWISH ORANGE (10YR 6/6).
		13	▼	4 6 10	16	15	SP	SIMILAR TO SS-12, BUT DARKER COLOR.
50	70	14	▼	8 14 17	31	14	SP	SAND, UNIFORM, FINE, 3-7% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10YR 6/6), BECOMES GRAVELLY SAND IN TIP, MOSTLY MEDIUM TO COARSE, 3-7% MODERATELY PLASTIC FINES, 10-15% FINE GRAVEL TO 0.5", SAME COLOR.
		15	▼	7 14 22	36	16	SP	SIMILAR TO SS-14, BUT BECOMING MOSTLY MEDIUM SAND WITH 5-10% GRAVEL TO 0.75 INCH IN LAST 6.0 INCH OF SAMPLE.
40	80							

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F.GREENWOOD
DFG
DATE JANUARY 19, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P1 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO P1
TYPE OF BORING DRIVE /
SHEET 2 OF 3
DATE DRILLED 9/10/72
DRILLING COMPANY - EUSTIS ENGRG. CO
LOGGED BY R.A.J.
COORDINATES, NORTH 18,959.1
EAST 16,919.9
GROUND SURFACE ELEVATION 119.8

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		16	▼	3 5 7	12	15	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10R 6/6).
		17	▼	5 5 10	15	16	SP	SIMILAR TO SS-16 WITH SOME FAINT BLACK SEAMS AND FEW 0.25 INCH GRAYISH YELLOW (5Y 8/4) CLAY BALLS.
30	90	18	▼	16 25 27	52	15	SP	SAND, MOSTLY UNIFORM FINE-MEDIUM, 15-25% MEDIUM TO COARSE SAND, CLEAN, LESS THAN 5% FINE GRAVEL TO 0.5 INCH, VERY PALE ORANGE (10YR 8/2).
		19	▼	6 9 15	24	13	SP	SAND, UNIFORM, FINE, 3-8% SLIGHTLY PLASTIC FINES, VERY PALE ORANGE (10YR 8/2), WITH A TRACE OF MODERATE REDDISH ORANGE (10R 6/6), SOME COARSE SAND.
20	100	20	▼	18 50/6"	50/6"	12	SP	SAND, MOSTLY UNIFORM FINE-MEDIUM, CLEAN, 8-12% FINE GRAVEL TO 0.75INCH, WHITE WITH DARK YELLOWISH ORANGE, COARSE SAND AND GRAVEL.
		21	▼	7 12 22	34	12	SP	SAND, MOSTLY UNIFORM FINE AND FINE-MEDIUM, LESS THAN 3% SLIGHTLY PLASTIC FINES TOP AND CLEAN BOTTOM, WHITE WITH TRACE OF MODERATE ORANGE PINK (10R 7/4), NEAR TOP.
10	110	22	▼	13 22 28	50	9	SP	SAND, UNIFORM, FINE, CLEAN, VERY PALE ORANGE (10YR 8/2), ONE LAMINATION OF FINE GRAVEL TO 0.5 INCH.
		23	▼	12 18 19	37	9	SP	SAND, UNIFORM, FINE, CLEAN, VERY PALE ORANGE (10YR 8/2).
0	120	24	▼	16 19 26	45	9	SP	SIMILAR TO SS-23.
		25	▼	7 12 14	26	14	SP	SAND, UNIFORM, FINE, 3-8% SLIGHTLY PLASTIC FINES, GRAYISH ORANGE (10YR 7/4), WITH SOME WHITE MOTTLING.
-10	130	26	▼	9 50/10"	50/10"	10	SP	SIMILAR TO SS-25, WITH A TRACE OF PINK AND FEW 0.75 INCH GRAVEL PARTICLES, BECOMES SAND, UNIFORM FINE AND FINE-MEDIUM, CLEAN, VERY PALE ORANGE (10YR 8/2).
		27	▼	19 12 11	23	18	SP CL	SAND, UNIFORM FINE AND FINE-MEDIUM, CLEAN, MODERATE BROWN (5YR 3/4) 12.0 INCH LAYER SANDY CLAY, MODERATELY PLASTIC, 10-20% VERY FINE SAND, VERY PALE ORANGE (10YR 8/2), WITH SOME DARK YELLOWISH ORANGE (10YR 6/6).
-20	140	28	▼	4 2 6	8	.8	CL SC	CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5Y 8/1), 0.25 INCH, IRON OXIDE LAYER FOLLOWED BY CLAYEY SAND, UNIFORM, FINE 10-20% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5Y 8/1).
		29	▼	2 9 10	19	18	SC CL	SIMILAR TO SS-28, BUT REVERSE ORDER WITH 6.0 INCH CLAYEY SAND FOLLOWED BY 6.0 INCH CLAY, THEN BECOMES SANDY SILTY CLAY, SLIGHTLY PLASTIC, 15-25% VERY FINE SAND, YELLOWISH GRAY (5Y 8/1), MOTTLED-DARK YELLOWISH ORANGE (10YR 6/6).
-30	150	30	▼	3 3 12	15	18	SC	CLAYEY SAND, UNIFORM, FINE, 10-15% SLIGHT PLASTIC FINES, YELLOWISH GRAY (5Y 8/1), FEW SILT CONCRETIONS TO 0.5 INCH.
		31	▼	3 6 9	15	18	CL-CH CL SM	CLAY, MODERATELY PLASTIC, FOR 8.0 INCH THEN BECOMES SILTY WITH 5-10% VERY FINE SAND, LAST 7.0 INCH SILTY SAND, VERY FINE, 10-20% SLIGHTLY PLASTIC FINES, ALL YELLOWISH GRAY (5Y 7/2), MICACEOUS.
-40								

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES. OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F.GREENWOOD
DFG
DATE JANUARY 19, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P1 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. P1
TYPE OF BORING DRIVE
SHEET 3 OF 3
DATE DRILLED 9/11/72
DRILLING COMPANY - EUSTIS ENGRG CO
LOGGED BY R.A.J.
COORDINATES, NORTH 18,959.1
EAST 16,919.9
GROUND SURFACE ELEVATION 119.8

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		32	▼	4 5 7	12	18	CL	ALTERNATING SILTY CLAY, MODERATELY PLASTIC, OLIVE GRAY (5Y 4/1), AND SILTY SANDY CLAY, SLIGHTLY PLASTIC, 8-12% VERY FINE SAND, LIGHT OLIVE GRAY (5Y 6/1).
		33	▼	6 7 10	17	16	SP CL	ALTERNATING 0.25-4.0 INCH LAYERS OF SAND, UNIFORM, FINE 5-10% SLIGHTLY PLASTIC FINES, AND SILTY CLAY, MODERATELY PLASTIC, BOTH YELLOWISH GRAY (5Y 7/2), AND SOME OLIVE GRAY (5Y 4/1), CLAY AND TRACE OF YELLOWISH ORANGE (10YR 7/6).
-50	170	34	▼	5 6 10	16	18	CL	SILTY CLAY, MODERATELY PLASTIC, 5-10% VERY FINE SAND BOTTOM, LIGHT GRAY (N7), AND YELLOWISH GRAY (5Y 7/2), SEVERAL SAND SEAMS AND LAMINATIONS WITH SOME YELLOWISH ORANGE (10YR 7/6), MOTTLING.
		35	▼	5 11 19	30	15	SP	SAND, UNIFORM, VERY FINE 5-10% NON TO SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5Y 8/1), SEVERAL CLAY POCKETS TO 1.0 INCH.
-60	180	36	▼	6 15 25	40	16	SP	SAND, UNIFORM, FINE, 3-8% NON TO SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5Y 8/1), WITH SOME SLIGHT DARK YELLOWISH ORANGE (10YR 6/6), BANDING. BEGAN DRIVING CASING AT 180 FT.
		37	▼	19 15 22	37	12	SP CL-CH	SIMILAR TO SS-36, BUT NO BANDING, OVERDRIVE SECOND ATTEMPT-BECOMES CLAY, MODERATELY PLASTIC, PALE OLIVE (10Y 6/2), WITH DARK YELLOWISH ORANGE (10YR 6/6) SEAMS, 12" OVERDRIVE.
-70	190	38	▼	6 10 14	24	18	SC SP	CLAYEY SAND, UNIFORM, FINE, 15-20% MODERATELY PLASTIC FINES, YELLOWISH GRAY (5 Y 8/1), WITH SOME DARK YELLOWISH ORANGE (10 YR 6/6) SEAMS, AFTER 8.0 IN. BECOMES 8-12 % SLIGHTLY PLASTIC FINES.
		39	▼	8 8 11	19	18	SM	SILTY SAND, UNIFORM, FINE, 10-15% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5Y 7/2), WITH SOME DARK YELLOWISH BROWN SPOTS.
-80	200	40	▼	9 11 13	24	18	SM	SIMILAR TO SS-39.
		41	▼	8 11 18	29	18	SP-SM	SIMILAR TO SS-39, BUT 5-10% SLIGHTLY PLASTIC FINES.
-90	210	42	▼	6 7 14	21	10	SP-SM	SIMILAR TO SS-41.
		43	▼	10 15 22	37	8	SP	SAND, UNIFORM, FINE, 3-6% SLIGHTLY PLASTIC FINES, YELLOWISH GRAY (5Y 7/2).
-100 -101.7	220 221.5	44	▼	11 15 17	32	18	CH	CLAY, HIGHLY PLASTIC, VERY STIFF, DUSKY YELLOW (5Y 6/4), TO 220'0", DARK GREENISH GRAY (5G 4/1), BELOW 220'0, 6" OVERDRIVE.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
▼ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F.GREENWOOD
DFG
DATE JANUARY 19, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P1 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. P3
DATE DRILLED 10/3/72
COORDINATES, NORTH 16,042.3
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG CO
EAST 14,923.6
SHEET 1 OF 4
LOGGED BY T.I.B.
GROUND SURFACE ELEVATION 139.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		1	◤	6 13 19	32		ML	CLAYEY SILT, NONPLASTIC, GRAYISH ORANGE (10 YR 7/4).
130	10	2	◤	7 13 13	26	10	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, LESS THAN OR EQUAL TO 5% FINE SAND, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6), LIGHT BROWN (5 YR 5/6), WITH MODERATE REDDISH BROWN, WITH POCKETS OF CLAYEY SILT.
		3	◤	21 24 23	47	14	SP	SAND, UNIFORM, FINE/VERY FINE, 5-10% NONPLASTIC FINES, (SILT), MOTTLED MODERATE REDDISH ORANGE (10 R 6/6) YELLOWISH ORANGE (10 YR 8/6 TO 6/6), VERY LIGHT GRAY (N8).
120	20	4	◤	8 15 19	32	13	SP-SC	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY FINE, 8-12% SLIGHTLY PLASTIC FINES, MODERATE REDDISH BROWN (10 R 4/6) AND GRAYISH ORANGE (10 YR 7/4).
		5	◤	3 6 9	15	13	CL-CH	SILTY CLAY, MODERATELY PLASTIC, AT TOP MOTTLED YELLOWISH GRAY (5 Y 7/2) AND LIGHT BROWN (5 YR 6/4) WITH FEW DARK YELLOWISH ORANGE SPOTS, WITH VERY LIGHT GRAY (N8) CLAYEY SILT AT BOTTOM.
110	30	6	◤	2 3 6	9	16	CH	CLAY, HIGHLY PLASTIC, STIFF, MOTTLED LIGHT OLIVE GRAY (5 Y 6/1) AND LIGHT GRAY (N7) WITH DARK BROWNISH GRAY (5 YR 4/1).
		7	◤	2 3 9	12	14	CH	SILTY CLAY, HIGHLY PLASTIC, MOTTLED BROWNISH GRAY (5 YR 5/1 TO 4/1) AND LIGHT GRAY (N7), WITH POCKETS OF CLAYEY SAND AND SAND WITH YELLOWISH ORANGE FeOx. SPOTS.
100	40	8	◤	3 5 6	11	15	CL	SANDY CLAY, SLIGHTLY PLASTIC, 30-40% UNIFORM FINE SAND, LIGHT GRAY (N7).
		9	◤	6 10 12	22	14	SP	CLAYEY SAND, UNIFORM, FINE, 10-20% SLIGHTLY TO MODERATELY PLASTIC FINES, VERY THINLY LAYERED SUBHORIZONTALLY VERY PALE ORANGE (10 YR 8/2) TO DARK YELLOWISH ORANGE (10 YR 6/6).
90	50	10	◤	8 9 9	18	12	SP	SAND, UNIFORM, FINE, 1-3% FINES, VERY THIN LAYERS DIPPING 10-15° WHITE (N9), GRAYISH YELLOW (5 Y 8/4) AND DARK YELLOWISH ORANGE (10 YR 6/6).
		11	◤	7 8 8	16	10	SC	CLAYEY SAND, UNIFORM, FINE, 8-12% SLIGHTLY TO MODERATELY PLASTIC FINES, LIGHT REDDISH BROWN (10 R 5/6).
80	60	12	◤	3 6 7	13	15	SC	CLAYEY SAND, UNIFORM, VERY FINE, 15-25% MODERATELY PLASTIC FINES, LIGHT REDDISH BROWN (10 R 5/6).
		13	◤	5 8 11	19	14	SC	CLAYEY SAND, UNIFORM, FINE, 10-20% MODERATELY PLASTIC FINES, LIGHT REDDISH BROWN (10 R 5/6), TRACE OF THIN SUBHORIZONTAL LAYERING.
70	70	14	◤	15 24 27	51	12	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 2% MEDIUM TO COARSE, 1% FINES, VERY PALE ORANGE (10 YR 8/2) TO PALE YELLOWISH ORANGE (10 YR 8/6), WITH VERY THIN SUBHORIZONTAL MODERATE RED CLAY LAYER.
		15	◤	11 17 20	37	13	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, LESS THAN OR EQUAL TO 1% FINES, WHITE (N9) TO YELLOWISH ORANGE (10 YR 7/6), WITH MANY SMALL CLAY BALLS AND ONE VERY THIN MODERATE RED CLAY LAYER.
60	80	16	◤	9 10 11	21	14	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 3% MEDIUM TO COARSE, 1% FINES, VERY LIGHT GRAY (N8) WITH VERY THIN YELLOWISH ORANGE (10 YR 6/6) LAYERS DIPPING 10-15°, WITH VERY THIN CLAYEY SAND LAYERS.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE JANUARY 17, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P3 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO P3
DATE DRILLED 10/3/72
COORDINATES, NORTH 16.042.3
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
EAST 14.923.6
SHEET 2 OF 4
LOGGED BY T.I.B.
GROUND SURFACE ELEVATION 139.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		17	◤	9 11 15	26	14	SC	CLAYEY SAND, UNIFORM, FINE, 10-15% SLIGHTLY PLASTIC FINES, MOTTLED MODERATE REDDISH ORANGE (10 R 6/6), GRAYISH ORANGE (10 YR 7/4) AND DARK YELLOWISH ORANGE (10 YR 6/6).
50	90	18	◤	7 6 8	14	8	SP	SAND, UNIFORM, FINE, 6-9% FINES, MODERATE REDDISH ORANGE (10 R 6/6)
		19	◤	6 8 8	16	16	SP	SAND, UNIFORM, FINE, 6-10% SLIGHTLY PLASTIC FINES, MODERATE REDDISH ORANGE (10 R 6/6), WITH THIN SUBHORIZONTAL YELLOWISH ORANGE LAYERS.
40	100	20	◤	11 12 12	24	16	SP	SAND, UNIFORM, FINE, 4-8% FINES, GRAYISH ORANGE (10 YR 7/4), WITH MODERATE REDDISH ORANGE AND YELLOWISH ORANGE.
		21	◤	11 12 12	24	10	GP-GC	SANDY GRAVEL, POORLY GRADED TO 0.5 IN. MAX., 30-40% MEDIUM TO COARSE SAND, 10-20% SLIGHTLY TO MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4).
30	110	22	◤	16 14 16	30	15	SP	SAND, UNIFORM, FINE, LESS THAN 1% FINES, VERY PALE ORANGE (10 YR 8/2).
		23	◤	36 50/8"	50/8"	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 5-10% GRAVEL TO 0.7 IN. MAX., 1% FINES, BRIGHT YELLOWISH ORANGE (10 YR 7/6).
20	120	24	◤	15 21 24	45	16	SP	SAND, UNIFORM, FINE, 1-2% FINES, DARK YELLOWISH ORANGE (10 YR 5/6)
		25	◤	13 50/10"	50/10"	14	SP	SAND, UNIFORM, FINE, 3-6% GRAVEL TO 0.5 IN. MAX., 1% FINES, YELLOWISH BROWN (10 YR 6/4).
10	130	26	◤	10 15 20	35	14	SP	SAND, UNIFORM, FINE, LESS THAN 1% GRAVEL TO 0.3 IN. MAX., 1% FINES, GRAYISH ORANGE PINK (5 YR 7/2) WITH THIN LAYER MODERATE REDDISH ORANGE (10 R 6/6).
		27	◤	15 18 25	43	15	SP	SAND, UNIFORM, FINE, LESS THAN 1% FINES, GRAYISH ORANGE (10 YR 7/4) WITH MODERATE ORANGE PINK (5 YR 8/4).
0	140	28	◤	20 25 25	50	15	SP	SAND, UNIFORM, FINE, LESS THAN 1% FINES, VERY PALE ORANGE (10 YR 8/2).
		29	◤	17 22 27	49	13	SP	SAND, UNIFORM, FINE, LESS THAN 1% GRAVEL TO 0.3 IN. MAX., LESS THAN OR EQUAL TO 1% FINES, GRAYISH ORANGE (10 YR 7/4).
-10	150	30	◤	24 24 32	56	10	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 35-45% GRAVEL TO 0.7 IN. MAX., 1-3% FINES, LIGHT YELLOWISH BROWN (10 YR 6/4).
		31	◤	100/6"	100/6"	6	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 15-25% GRAVEL TO 0.6 IN. MAX., 1-3% FINES, MODERATE YELLOWISH BROWN (10 YR 5/4).
-20	160	32	◤	69 50/3"	50/3"	10	SP	SAND, UNIFORM, FINE, 4-8% MEDIUM TO COARSE, 1% GRAVEL TO 0.4 IN. MAX., LESS THAN 1% FINES, GRAYISH ORANGE (10 YR 7/4).

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE JANUARY 17, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P3 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. P3
DATE DRILLED 10/3/72
COORDINATES, NORTH 16.042.3
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG CO
EAST 14.923.6
SHEET 3 OF 4
LOGGED BY T.I.B.
GROUND SURFACE ELEVATION 139.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		33	◤	112/6"	112/6"		SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 3-4% GRAVEL TO 0.5 IN. MAX., LESS THAN 1% FINES, GRAYISH ORANGE (10 YR 7/4).
-30	170	34	◤	33 33 41	74	10	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 35-45% GRAVEL TO 0.7 IN. MAX., 1-2% FINES, MODERATE YELLOWISH BROWN.
		35	◤	25 47 38	85	12	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 35-45% GRAVEL TO 0.7 IN. MAX., 3-5% FINES, DARK YELLOWISH BROWN (10 YR 4/2), WITH POCKETS OF CLAYEY SAND.
-40	180	36	◤	11 12 37	49	14	SC	CLAYEY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM, 5-10% GRAVEL TO 0.5 IN. MAX., 10-15% MODERATELY PLASTIC FINES, GRAYISH ORANGE (10 YR 7/4). INTERLAYERED WITH SILTY CLAY, HIGHLY PLASTIC 2-6% GRAVEL TO 0.8 IN. MAX., YELLOWISH GRAY (5 Y 7/2).
		37	◤	25 50/7"	50/7"	15	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 1% FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
-50	190	38	◤	66 19 17	36	12	SP	SAND, POORLY GRADED, FINE TO COARSE MOSTLY FINE TO MEDIUM, 1% GRAVEL TO 0.4 IN. MAX., 4-6% SLIGHTLY PLASTIC FINES, MODERATE BROWN (5 YR 3/4 TO 4/4), WITH 1.0 IN. YELLOWISH GRAY (5 Y 8/1) SILTY CLAY LAYER AT BOTTOM.
		39	◤	6 19 18	37	14	CH SP	TOP 4.0 IN: CLAY, HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2) WITH MEDIUM, LIGHT GRAY (N6) MOTTLES, FEW VERY THIN SUBHORIZONTAL LAYERS OF SILTY SAND. BOTTOM 10 IN.: SAND, UNIFORM, FINE, 2-4% NONPLASTIC FINES, YELLOWISH GRAY (5 Y 8/1
-60	200	40	◤	10 20 28	48	18	CH	SILTY CLAY, HIGHLY PLASTIC, HARD, LIGHT OLIVE GRAY (5 Y 6/1) WITH MANY DARK YELLOWISH ORANGE FeOx. AND BLACK MnO_2 SPOTS.
		41	◤	13 16 20	36	18	CH	SILTY CLAY, HIGHLY PLASTIC, HARD, GREENISH GRAY (5 G 6/1).
-70	210	42	◤	14 22 28	50	18	CH	SILTY CLAY, SIMILAR TO SS41, EXCEPT WITH POCKETS OF CLAYEY VERY FINE SAND.
		43	◤	14 16 23	39	18	ML	CLAYEY SILT, NONPLASTIC TO SLIGHTLY PLASTIC, LESS THAN 10% UNIFORM VERY FINE SAND, DARK GREENISH GRAY (5 G 4/1) WITH MANY VERY SMALL CLAY CONCRETIONS.
-80	220	44	◤	11 15 18	33	18	CH	SILTY CLAY, HIGHLY PLASTIC, HARD, LESS THAN 5% UNIFORM VERY FINE SAND, DARK GREENISH GRAY (5 G 4/1).
		45	◤	10 14 17	31	18	CL-CH	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 5-15% FINE SAND (INCREASING DOWN SAMPLE), TOP 1.0 IN. IS DARK GREENISH GRAY (5 G 4/1), BOTTOM 17.0 IN. LIGHT DUSKY YELLOW (5 Y 7/3).
-90	230	46	◤	28 30 34	64	8	SP	SAND, UNIFORM, FINE AND VERY FINE, 1-4% FINES, VERY THINLY BANDED YELLOWISH GRAY (5 Y 7/2) WITH BRIGHT YELLOWISH ORANGE (10 YR 5/6).
		47	◤	19 28 35	63	15	SP	SAND, UNIFORM, VERY FINE, 2-6% NONPLASTIC FINES, YELLOWISH GRAY (5 Y 7/2).
-100	240	48	◤	14 22 37	59	16	SP CH-CL,S	INTERLAYERED TOP TO BOTTOM: SAND, UNIFORM FINE, 1-2% FINES, YELLOWISH GRAY (5 Y 7/2). SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2) WITH SOME BRIGHT YELLOWISH ORANGE (10 YR 6/6). SILTY SAND, UNIFORM, FINE, 8-12% NONPLASTIC FINES, YELLOWISH GRAY (5 Y 7/2) WITH FEW BRIGHT YELLOWISH ORANGE SPOTS.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE JANUARY 17, 1972

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P3 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO 12210

BORING NO. P3
DATE DRILLED 10/3/72
COORDINATES, NORTH 16.042.3
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG CO
EAST 14.923.6
SHEET 4 OF 4
LOGGED BY T.I.B.
GROUND SURFACE ELEVATION 139.6'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		49	◤	10 26 40	66	13	CH SP CL-CH	9.0 IN. LAYER: SILTY CLAY, HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2) WITH VERY SMALL YELLOWISH ORANGE FeOx. NODULES WHICH MAY BE CRUSHED BETWEEN FINGERNAILS. 3.0 IN LAYER: SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 1% FINES, YELLOWISH GRAY (5 Y 7/2), WITH SEVERE DEPOSIT OF FeOx. DIRECTLY BENEATH SILTY CLAY LAYER ABOVE, 1.0 IN. LAYER IN TIP OF SPOON: SILTY CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 7/2) WITH YELLOWISH ORANGE.
-110	250	50	◤	18 33 30	63	6	SP CH	THINLY INTERLAYERED, SAND, UNIFORM, FINE/VERY FINE, LESS THAN OR EQUAL TO 1% FINES, YELLOWISH GRAY (5 Y 7/2), SILTY CLAY, HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2), WITH SMALL UNIFORM FINE SAND POCKETS, ONE 0.5 IN. PIECE GRAVEL IN SAND POCKET.
		51	◤	39 34 36	70	12	SP CH	THINLY INTERLAYERED: SAND, UNIFORM, FINE, 1% FINES, YELLOWISH GRAY (5 Y 7/2) WITH BRIGHT YELLOWISH ORANGE (10 YR 6/6) FeOx. STAINED ZONES. SILTY CLAY, HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2).
-121.9	261.5	52	◤	8 10 15	25	18	CH	CLAY, HIGHLY PLASTIC, TOP 6 IN. YELLOWISH GRAY (5 Y 6/2), BOTTOM 12 IN. DARK GREENISH GRAY (5 G 4/1).
								BOTTOM OF BORING

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE JANUARY 17 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P3 D

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. P5
TYPE OF BORING DRIVE
SHEET 1 OF 3
DATE DRILLED 11/2/72
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY E.M.W.
COORDINATES, NORTH 15,048.9
EAST 17,354.0
GROUND SURFACE ELEVATION 105.3'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
100		1	◤	4 8 14	22	10	ML	CLAYEY SILT, SLIGHTLY TO MODERATELY PLASTIC, LESS THAN 3% VERY FINE SAND, DENSE, MODERATE YELLOWISH BROWN (10YR 5/5), SOME ROOT FIBERS.
	10	2	◤	3 7 9	16	12	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 3% VERY FINE SAND, STIFF, PALE YELLOWISH BROWN (10YR 6/3).
90		3	◤	6 9 21	30	16	CL	SILTY CLAY, MODERATELY PLASTIC, 3-6% VERY FINE SAND, STIFF, YELLOWISH GRAY (10YR 6/2), CHANGING TO CLAYEY SILT, SLIGHTLY PLASTIC, MODERATELY DENSE, VERY LIGHT GRAY (N-8) (LAST 4").
	20	4	◤	3 3 3	6	18	CL	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 5-7% FINE SAND, FIRM, GRAYISH BLACK (N-2), SOME SMALL POCKETS LIGHT GRAYISH CLAYEY FINE SAND.
80		5	◤	9 16 23	39	14	SP	SAND, WIDELY GRADED FINE TO COARSE, MOSTLY FINE, 5-10% GRAVEL TO 0.6 INCH MAXIMUM, 3-5% MODERATELY PLASTIC FINES, LIGHT GRAY (N-7), WITH DARK YELLOWISH ORANGE (10YR 6/6), FeOx STAINING.
	30	6	◤	10 17 9	26	10	SP	SAND, UNIFORM, FINE, FEW MEDIUM AND COARSE, 5-8% GRAVEL TO 0.4 INCH MAXIMUM, LESS THAN 3% SLIGHTLY PLASTIC FINES, VERY LIGHT GRAY (N-8).
70		7	◤	8 5 12	17	10	SP CL	SAND, (1 FT.), SAME AS SS6 BUT PALE YELLOWISH BROWN (10 YR 7/2). SANDY CLAY, (6 INCH), MODERATELY PLASTIC, 25-30% VERY FINE SAND, LIGHT GRAY (N-7), WITH DARK YELLOWISH ORANGE (10 YR 6/6) STAINS AND LAMINATIONS.
	40	8	◤	7 25 55	80	11	SP	SAND, FINE TO MEDIUM, MOSTLY FINE, LESS THAN 5% GRAVEL TO 0.4 INCH MAXIMUM, LESS THAN 3% SLIGHTLY PLASTIC FINES, PALE YELLOWISH BROWN (10 YR 6/4).
60		9	◤	9 22 19	41	10	SP	SAND, SAME AS SS8, BUT WITHOUT TRACE OF GRAVEL.
	50	10	◤	20 50/8"	50/8"	10	SP	SAND, WIDELY GRADED FINE TO COARSE, MOSTLY FINE, LESS THAN 2% SLIGHTLY PLASTIC FINES, PALE YELLOWISH BROWN (10 YR 7/2).
50		11	◤	6 10 15	25	12	SP	SAND, UNIFORM, FINE, LESS THAN 2% FINES, MODERATE YELLOWISH BROWN (10 YR 6/4), WITH 1 INCH LAYER MODERATELY PLASTIC CLAY, DARK YELLOWISH ORANGE (10 YR 6/6).
	60	12	◤	2 6 11	17	16	CL CL GC	(4") CLAY, MODERATELY TO HIGHLY PLASTIC, LESS THAN 3% FINE SAND, VERY STIFF, DUSKY YELLOW (5Y 6/5), (8") CLAY, MODERATELY PLASTIC, FIRM, YELLOWISH-GRAY (5Y 7/2), WITH PIECE SUBROUNDED GRAVEL 0.6", AND 0.5" LAYER FINE TO COARSE SAND, (6"), CLAYEY GRAVEL, SUBROUNDED AND SUBANGULAR TO 0.6" MAXIMUM, 20-25% WIDELY GRADED, MOSTLY COARSE SAND, 30-35% MODERATELY PLASTIC CLAY, DARK YELLOWISH-ORANGE. (10 YR 6/6).
40		13	◤	9 7 7	14	16	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, STIFF, DUSKY YELLOW (5 Y 6/5), WITH POCKETS AND SMALL LENSES FeOx.
	70	14	◤	4 6 9	15	18	CL SC	(14") SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, FIRM, DUSKY YELLOW (5Y 6/4). (4") CLAYEY SAND, UNIFORM, VERY FINE 10-12% MODERATELY PLASTIC FINES, DUSKY YELLOW (5Y 6/3).
30		15	◤	3 4 5	9	18	CL	SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, FIRM, DUSKY YELLOW (5Y 6/3), FEW FeOx NODULES.
	80							

1. THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F.GREENWOOD
DATE FEBRUARY 12, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P5 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. P5
TYPE OF BORING DRIVE
SHEET 2 OF 3
DATE DRILLED 11/2/72
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY E.M.W.
COORDINATES, NORTH 15,048.9
EAST 17,354.0
GROUND SURFACE ELEVATION 105.3'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		16	◤	4 10 14	24	18	SC	CLAYEY SAND, UNIFORM, VERY FINE, 10-12% MODERATELY PLASTIC FINES, DUSKY YELLOW (5Y 6/3).
20		17	◤	2 3 6	9	18	CL	SILTY CLAY, MODERATELY PLASTIC, 10-15% VERY FINE SAND, FIRM, PALE OLIVE (10Y 6/2), THIN SEAMS (0.1") AND OCCASIONAL SMALL POCKETS OF VERY FINE CLAYEY SAND.
	90	18	◤	7 11 17	28	18	CL SC	(6") SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 10-15% VERY FINE SAND, STIFF, YELLOWISH-GRAY (5Y7/2). (12") CLAYEY SAND, UNIFORM, VERY FINE, 10-15% MODERATELY PLASTIC FINES, DENSE, PALE OLIVE (10Y 6/2).
10		19	◤	5 6 7	13	18	CL	SILTY CLAY, MODERATELY PLASTIC, 10-15% VERY FINE SAND, FIRM, PALE OLIVE (10Y 6/2).
	100	20	◤	3 5 5	10	18	CL	SILTY CLAY, SAME AS SS19, WITH SOME BRIGHT YELLOWISH-ORANGE FeOx STAINING.
0		21	◤	4 4 5	9	18	CL SP	(15") SILTY CLAY, SAME AS SS19. (3") SAND, UNIFORM, VERY FINE, 5-8% MODERATELY PLASTIC FINES, PALE OLIVE (10Y 6/2).
	110	22	◤	2 5 6	11	18	CL CL	(5") SANDY CLAY, MODERATELY PLASTIC, 20-25% VERY FINE SAND, STIFF, YELLOWISH-GRAY (5Y 7/3). (10") SILTY CLAY, SLIGHTLY TO MODERATELY PLASTIC, 10-15% VERY FINE SAND, FIRM, DUSKY YELLOW (5Y 7/4).
-10		23	◤	6 7 10	17	18	CL	SILTY CLAY, MODERATELY PLASTIC, 5-10% VERY FINE SAND, VERY STIFF, YELLOWISH-GRAY (5Y 7/2), FEW BLACK VEINS AND SMALL POCKETS MnO_2.
	120	24	◤	6 12 12	24	18	CL	SILTY CLAY, MODERATLEY TO HIGHLY PLASTIC, 5-10% VERY FINE SAND, VERY STIFF, YELLOWISH-GRAY (5Y 6/2), MANY BLACK VEINS AND SMALL POCKETS MnO_2.
-20		25	◤	7 9 13	22	18	CL	SILTY CLAY, MODERATELY PLASTIC, 5-10% VERY FINE SAND, VERY STIFF, YELLOWISH-GRAY (5Y 6/2).
	130	26	◤	3 10 21	31	14	CL	SILTY CLAY, MODERATELY PLASTIC, 4-8% VERY FINE SAND, HARD, YELLOWISH GRAY, (5Y 6/2), MANY CHALKY WHITE DESSICATED CLAY BALLS ON POCKETS TO 0.6 INCH.
-30		27	◤	7 12 15	27	18	CL	SILTY CLAY, SIMILAR TO SS25, BUT WITH LOWER MOISTURE CONTENT.
	140	28	◤	7 8 9	17	12	SP	SAND, UNIFORM, VERY FINE, 8-10% MODERATELY PLASTIC FINES, MODERATELY DENSE, YELLOWISH-GRAY (5Y 7/2), WITH 1.5 INCH LAYER. SILTY CLAY, MODERATELY PLASTIC, SOFT, YELLOWISH-GRAY (5Y 7/2).
-40		29	◤	8 11 19	30	11	SP SC	TOP 7": SAND, SIMILAR TO SS28, BUT WITH 0.75 INCH LAYER SILTY CLAY BOTTOM 4": CLAYEY SAND, UNIFORM, FINE, 15-20% MODERATELY PLASTIC FINES, YELLOWISH-GRAY (5Y 7/2).
	150	30	◤	6 12 15	27	16	SC	CLAYEY SAND, UNIFORM, FINE, 15-20% MODERATELY PLASTIC FINES, YELLOWISH-GRAY (5Y 7/2).
-50		31	◤	11 17 18	35	18	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, HARD, YELLOWISH-GRAY (5Y 6/2), MINOR FeOx STAINING.
	160							

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F.GREENWOOD
DATE FEBRUARY 12, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P5 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. P5
TYPE OF BORING DRIVE
SHEET 3 OF 3
DATE DRILLED 11/2/72
DRILLING COMPANY - EUSTIS ENGRG. CO.
LOGGED BY E.M.W.
COORDINATES, NORTH 15,048.9
EAST 17,354.0
GROUND SURFACE ELEVATION 1-5.3'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		32	◤	11 13 19	32	18	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, HARD, YELLOWISH-GRAY (5Y 6/2), WITH LIGHT BROWN (5YR 5/4), MOTTLED IN TOP 6 INCH.
-60		33	◤	5 11 12	23	18	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 2% VERY FINE SAND, VERY STIFF, DARK GREENISH-GRAY (5G 4/1), WITH FEW SMALL VEINS AND POCKETS MODERATE YELLOWISH-BROWN (10YR 5/4).
	170	34	◤	7 12 15	29	18	CL CL	TOP 12 INCH: SILTY CLAY, MODERATELY PLASTIC, 5-8% VERY FINE SAND, VERY STIFF, YELLOWISH-GRAY (5Y 7/4). BOTTOM 6 INCH: SILTY CLAY, MODERATELY PLASTIC, LESS THAN 2% VERY FINE SAND, VERY STIFF, DARK GREENISH-GRAY (5G 4/1).
-70		35	◤	9 17 17	34	N.R.		NO RECOVERY.
		36	◤	9 17 15	32 24	18	CL	SANDY CLAY, MODERATELY PLASTIC, 15-20% VERY FINE SAND, HARD, YELLOWISH-GRAY (5Y 6/2), MINOR FeOx STAINING AND FEW BLACK FLECKS MnO_2.
	180	37	◤	6 10 14	24	12	SP	SAND, UNIFORM, VERY FINE, LESS THAN 3% FINES, MODERATELY DENSE, YELLOWISH-GRAY (5Y 7/2).
-80		38	◤	6 15 28	43	12	SP	SAND, UNIFORM, FINE, LESS THAN 1% FINES, DENSE, YELLOWISH-GRAY (5Y 7/3).
	190	39	◤	6 17 23	40	18	SP	SAND, UNIFORM, FINE, LESS THAN 2% FINES, DENSE, YELLOWISH-GRAY (5Y 7/3).
-90		40	◤	20 13 21	34	16	SP	SAND, UNIFORM, FINE, 4-8% SLIGHTLY PLASTIC FINES, DENSE, YELLOWISH-GRAY (5Y 7/2).
-96.2	201.5	41	◤	1 6 7	13	18	CL	SANDY CLAY, MODERATELY PLASTIC, 15-20% FINE SAND, STIFF, YELLOWISH-GRAY (5Y 7/2), WITH THIN LAYER OF CLAYEY SAND.

1. THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.
2. ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
   ◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.
3. THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.
4. DATUM IS MEAN SEA LEVEL.

ISSUED BY D.F.GREENWOOD
DATE FEBRUARY 12, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P5 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. P7 TYPE OF BORING DRIVE/CORE SHEET 1 OF 3
DATE DRILLED NOVEMBER 7, 1972 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 13,017.3 EAST 18,990.4 GROUND SURFACE ELEVATION 123.5'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
120								
		1	◤	5 8 11	19	15	ML	CLAYEY SILT, MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, MOTTLED, DARK YELLOWISH ORANGE (10 YR 6/6) AND GRAYISH ORANGE (10 YR 7/4).
	10	2	◤	16 18 24	42	16	ML	CLAYEY SILT, HIGHLY PLASTIC, 5-8% FINE SAND, MOTTLED, LIGHT BROWN (5 Y 5/6), PALE YELLOWISH ORANGE (10 YR 8/6), AND YELLOWISH GRAY (5 Y 7/2).
110								
		3	◤	28 21 12	33	12	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, LESS THAN 1% WEATHERED FELDSPAR GRAVEL TO 0.5" MAX., 3-6% MODERATELY PLASTIC FINES, MOTTLED LIGHT BROWN (5 YR 5/6), AND MODERATE REDDISH ORANGE (10 R 6/6) WITH WEATHERED FELDSPAR FLAKES, AND 5" HIGHLY PLASTIC MOTTLED, SILTY CLAY LAYER, WITH 3-6% FINE SAND.
	20	4	◤	5 10 18	28	18	CH	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 5% FINE SAND, MOTTLED PALE YELLOWISH ORANGE (10 YR 8/6), LIGHT BROWN (5 YR 5/6), PALE YELLOWISH BROWN (10 YR 6/2), YELLOWISH GRAY (5 Y 7/2) WITH ERRATIC VERTICAL, VERY THIN, MODERATE RED (5 R 4/6) SILT VEIN.
100								
		5	◤	10 11 15	26	18	SC	CLAYEY SAND, UNIFORM, FINE, 10-20% HIGHLY PLASTIC FINES, MOTTLED VERY LIGHT GRAY (N 8), MODERATE REDDISH ORANGE (10 R 6/6), PALE YELLOWISH ORANGE (10 YR 8/6).
	30	6	◤	8 10 18	28	15	SM/SC	SILTY SAND, UNIFORM, FINE/VERY FINE, 10-17% SLIGHTLY PLASTIC FINES, MOTTLED PALE YELLOWISH ORANGE (10 YR 8/6), VERY LIGHT GRAY (N 8).
90								
		7	◤	6 9 9	18	11	SM/SC	SILTY SAND, SIMILAR TO SS-6.
	40	8	◤	10 17 22	39	10	SP	SAND, POORLY GRADED, FINE TO MEDIUM, MOSTLY MEDIUM, 3-6% SLIGHTLY PLASTIC FINES, MOTTLED PALE YELLOWISH ORANGE (10 YR 8/6), DARK YELLOWISH ORANGE (10 YR 6/6) AND VERY LIGHT GRAY (N 8).
80								
		9	◤	4 5 5	10	18	CH	SILTY CLAY, HIGHLY PLASTIC, 2-4% FINE AND VERY FINE SAND, YELLOWISH GRAY (5 Y 8/1) WITH 1/16"-1/4" THICK BANDING OF MODERATE REDDISH ORANGE (10 R 6/6) AND PALE YELLOWISH ORANGE (10 YR 8/6).
	50	10	◤	2 3 5	8	18	SM	SILTY SAND, UNIFORM, VERY FINE, 20-25% MODERATELY TO HIGHLY PLASTIC FINES, MOTTLED PINKISH GRAY (5 YR 8/1), GRAYISH YELLOW (5 Y 8/4), AND PALE YELLOWISH ORANGE (10 YR 8/6).
70								
		11	◤	8 10 10	20	12	SP-SM	SAND, UNIFORM, FINE, 5-10% MODERATELY PLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 6/6).
	60	12	◤	8 10 12	22	15	SP-SM	SAND, UNIFORM, FINE TO VERY FINE, 5-10% MODERATELY PLASTIC FINES, MOTTLED PALE YELLOWISH ORANGE (10 YR 8/6) AND YELLOWISH GRAY (5 Y 7/2) WITH 1" SANDY CLAY POCKET, MOTTLED YELLOWISH GRAY (5 Y 7/2) AND MODERATE RED (5 R 4/6).
60								
		13	◤	4 7 11	18	16	CL	SANDY CLAY, MODERATELY TO HIGHLY PLASTIC, 12-20% MEDIUM AND FINE SAND, 2-5% CLAY COATED GRAVEL TO 0.9" MAX., MOTTLED PALE YELLOWISH ORANGE (10 YR 8/6), LIGHT GRAY (N 7) AND MODERATE RED (5 R 4/6), WITH THIN FINE SAND LAYERS AND FINE SAND POCKETS.
	70	14	◤	2 3 5	8	18	SM	SILTY CLAY/CLAY, HIGHLY PLASTIC, 1-2% VERY FINE SAND, MOTTLED MODERATE RED (5 R 4/6), MODERATE REDDISH BROWN (10 R 4/6), PALE RED PURPLE (5 RP 6/8), YELLOWISH GRAY (5 Y 8/1), AND PALE YELLOWISH ORANGE (10 YR 8/6) WITH THIN VERY FINE SAND LAYERS CONTAINING FeOx. NODULES AND MnO_2 NODULES, TWO PIECES OF GRAVEL 0.9" AND 1.0" IN SIZE EMBEDDED IN CLAY.
50								
		15	◤	8 3 5	8	18	SM	SILTY SAND, UNIFORM, VERY FINE TO FINE, 3-6% GRAVEL TO 1.0" MAX., 10-20% MODERATELY PLASTIC FINES, GRAYISH YELLOW (5 Y 8/4) AND DARK YELLOWISH ORANGE (10 YR 6/6) WITH 1"-2" SANDY CLAY POCKET, MODERATELY PLASTIC, AT TOP OF SAMPLE.
	80	16	◤	1 2 5	7	NR		NO RECOVERY.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE JANUARY 23, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P7 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. P7 TYPE OF BORING DRIVE/CORE SHEET 2 OF 3
DATE DRILLED NOVEMBER 7, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 13,017.3 EAST 18,990.4 GROUND SURFACE ELEVATION 123.5'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
40								
		17	◤	4 4 6	10	18	SC	SILTY CLAY, HIGHLY PLASTIC, 1-3% VERY FINE SAND, MOTTLED GRAYISH YELLOW (5 Y 8/4) AND PALE YELLOWISH ORANGE (10 YR 8/6) WITH SMALL FeOx. NODULES THROUGHOUT SAMPLE.
	90	18	◤	3 4 5	9	18	CH	SIMILAR TO SS-17.
30								
		19	◤	4 8 8	16	18	CH	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 5% FINE SAND, YELLOWISH GRAY (5 Y 7/2).
	100	20	◤	3 5 6	11	18	CH	SILTY CLAY, MODERATELY PLASTIC, 2-5% FINE SAND, YELLOWISH GRAY (5 Y 7/2) WITH GRAYISH YELLOW (5 Y 8/4), THIN, FINE SILTY SAND LAYERS.
20								
		21	◤	7 7 7	14	18	SM	SILTY CLAY, MODERATELY PLASTIC, 5-10% VERY FINE SAND, BANDED COLORING, YELLOWISH GRAY (5 Y 7/2), DARK YELLOWISH ORANGE (10 YR 6/6), YELLOWISH GRAY (5 Y 8/1).
	110	22	◤	5 7 15	22	18	SM-SC	SILTY SAND, UNIFORM, VERY FINE, 20-25% MODERATELY TO HIGHLY PLASTIC FINES, MOTTLED YELLOWISH GRAY (5 Y 7/2) WITH THIN BANDING OF DARK YELLOWISH ORANGE (10 YR 6/6).
10								
		23	◤	5 7 12	19	18	SC-SM	CLAYEY SAND, UNIFORM, VERY FINE, 10-20% MODERATELY TO HIGHLY PLASTIC FINES, MOTTLED MODERATE REDDISH ORANGE (10 R 6/6), PALE YELLOWISH ORANGE (10 YR 8/6), AND VERY PALE ORANGE (10 YR 8/2).
	120	24	◤	6 7 10	17	18	CH	CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 7/2), MOTTLED WITH SMALL FeOx. AND MnO_2 NODULES.
0								
		25	◤	8 12 14	26	18	CH	SILTY CLAY, MODERATELY PLASTIC, YELLOWISH GRAY (5 Y 7/2), MOTTLED WITH SMALL FeOx. AND MnO_2 NODULES.
	130	26	◤	10 12 15	27	18	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, 1-3% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2), MOTTLED WITH SMALL FeOx. AND MnO_2 NODULES.
-10								
		27	◤	10 13 15	28	18	CH	SILTY CLAY, MODERATELY PLASTIC, 1-2% VERY FINE SAND, MOTTLED PALE YELLOWISH BROWN (10 YR 6/2) AND YELLOWISH GRAY (5 Y 7/2) WITH SMALL AND MEDIUM FeOx. NODULES.
	140	28	◤	6 11 13	24	18	CH	CLAY/SILTY CLAY, MODERATELY PLASTIC, 1-2% VERY FINE SAND, MOTTLED, PALE YELLOWISH BROWN (10 YR 7/2) AND GRAYISH YELLOW GREEN (5 GY 7/2), CONTAINING SMALL FeOx. NODULES, 30°, 1/2" THICK WEATHERED FELDSPAR VEIN WITH LARGE WEATHERED FELDSPAR NODULES, THIN SILT VEINS.
-20								
		29	◤	7 10 12	22	18	CH	CLAY/SILTY CLAY, SIMILAR TO SS-28.
	150	30	◤	6 8 10	18	18	CH	CLAY, MODERATELY PLASTIC, FATTY, MOTTLED, MODERATE YELLOWISH BROWN (10 YR 5/4), AND GRAYISH YELLOW GREEN (5 GY 7/2), CONTAINING LARGE MnO_2 AND WEATHERED FELDSPAR NODULES WITH SMALL FeOx. NODULES.
-30								
		31	◤	6 7 11	18	18	CH	SILTY CLAY/CLAY, MODERATELY TO HIGHLY PLASTIC, 1-4% VERY FINE TO FINE SAND, MOTTLED, DUSKY YELLOW (5 Y 6/4), YELLOWISH GRAY (5 Y 7/2) AND PALE GREENISH YELLOW (10 Y 8/2), CONTAINING MEDIUM FeOx. NODULES AND THIN SILT LAYERES (APPROX. 1/16"-3/16" THICK).
	160	32	◤	13 18 22	40	18	CH	CLAY, MODERATELY TO HIGHLY PLASTIC, FATTY, MOTTLED MODERATE YELLOWISH BROWN (10 YR 5/4) AND GRAYISH YELLOW GREEN (5 GY 7/2) CONTAINING SMALL FeOx. AND MnO_2 NODULES.

THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE JANUARY 23, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P7 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. P7 TYPE OF BORING DRIVE/CORE SHEET 3 OF 3
DATE DRILLED NOVEMBER 7, 1972 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY D.F.P.
COORDINATES, NORTH 13,017.3 EAST 18,990.4 GROUND SURFACE ELEVATION 123.5'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
-40								
		33	◤	11 14 17	31	18	CH	SILTY CLAY, MODERATELY PLASTIC, 2-6% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2) WITH SMALL MnO_2 NODULES.
	170	34	◤	11 15 17	32	18	ML	CLAYEY SILT/SILT, SLIGHTLY TO MODERATELY PLASTIC, 5-12% VERY FINE SILTY SAND, YELLOWISH GRAY (5 Y 7/2).
-50								
		35	◤	6 9 14	23		ML	SAME AS SS-34.
	180	36	◤	8 10 20	30	18	CH	SILTY CLAY, HIGHLY PLASTIC, LESS THAN 5% VERY FINE SAND, YELLOWISH GRAY (5 Y 7/2), FeOx. AND MnO_2 NODULES THROUGHOUT SAMPLE (SMALL).
-60								
		37	◤	40 56/6"	56/6"	9	SP	SAND, UNIFORM, FINE, 2-6% FINES, MOTTLED VERY PALE ORANGE (10 YR 8/2) AND GRAYISH ORANGE (10 YR 7/4).
-67	190 190.5	38	◤	78/6"	78/6"		SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 3-6% GRAVEL TO 0.7" MAX., 3-8% FINES, GRAYISH ORANGE (10 YR 7/4).

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE JANUARY 23, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P7 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. P9
DATE DRILLED OCTOBER 31-NOVEMBER 16, 1972
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG CO
SHEET 1 OF 6
LOGGED BY T.I.B.
COORDINATES, NORTH 18,697.2 EAST 18,101.3
GROUND SURFACE ELEVATION 126.9'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
120		1	◤	2 2 3	5	11	ML-CL	CLAYEY SILT, SLIGHTLY PLASTIC, MODERATE YELLOWISH BROWN (10 YR 5/4)
	10	2	◤	4 7 8	15	17	CL	SILTY CLAY, SLIGHTLY PLASTIC, YELLOWISH ORANGE (10 YR 6/5) WITH LIGHT BROWN MOTTLES (5 YR 5/6).
110		3	◤	10 18 13	31	16	CL-SC	SANDY CLAY, SLIGHTLY PLASTIC, 40-45% UNIFORM FINE/VERY FINE SAND, MOTTLED GRAYISH ORANGE PINK (5 YR 7/2), WITH DARK YELLOWISH ORANGE (10 YR 6/6), LIGHT BROWN (5 YR 6/4) AND REDDISH BROWN.
	20	4	◤	5 8 11	19	15	CL	SANDY CLAY, SLIGHTLY PLASTIC, 35-45% UNIFORM FINE SAND, WHITE (N 9) WITH YELLOWISH ORANGE (10 YR 7/6 TO 6/8) AND LIGHT REDDISH BROWN (10 R 4/4), WITH CLAYEY SAND POCKETS.
100		5	◤	13 15 18	33	16	SC	CLAYEY SAND, UNIFORM, FINE, 30-40% SLIGHTLY TO MODERATELY PLASTIC FINES, THINLY LAYERED SUBHORIZONTALLY, MODERATE REDDISH BROWN (10 R 4/6) AND BRIGHT YELLOWISH ORANGE (10 YR 6/6) WITH SEVERAL HIGHLY PLASTIC DARK RED (5 R 2/6) CLAY LAYERS UP TO 1.0" THICK.
	30	6	◤	5 8 9	17	12	SP	SAND, UNIFORM, FINE, LESS THAN 5% MEDIUM TO COARSE, 6-9% SLIGHTLY PLASTIC FINES, PALE REDDISH BROWN (10 YR 5/4) WITH DARK YELLOWISH ORANGE (10 YR 5/6) TRACE SUBHORIZONTAL COLOR BANDING, WITH FEW SMALL RED CLAY FLAKES/BALLS.
90		7	◤	5 7 9	16	13	SP	SAND, UNIFORM, FINE, 4-8% MEDIUM, 1% GRAVEL TO 0.6" MAX., 3-6% SLIGHTLY PLASTIC FINES, MODERATE REDDISH (5 R 5/4).
	40	8	◤	6 12 13	25	13	SP	SAND, UNIFORM, FINE, LESS THAN 5% MEDIUM, 4-7% SLIGHTLY PLASTIC FINES, MODERATE RED (5 R 5/4) WITH SOME YELLOWISH ORANGE.
80		9	◤	19 35 38	73	11	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 1-2% GRAVEL TO 0.6" MAX., 3-5% FINES, MODERATE RED (5 R 5/4) WITH MODERATE REDDISH BROWN (10 R 4/6) AND DARK YELLOWISH ORANGE (10 YR 5/6).
	50	10	◤	7 7 9	16	12	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 5% MEDIUM, 4-8% SLIGHTLY PLASTIC FINES, MODERATE YELLOWISH BROWN (10 R 4/6) WITH TRACE OF YELLOWISH ORANGE.
70		11	◤	6 7 9	16	13	SP-SC	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 5% MEDIUM, 5-10% SLIGHTLY PLASTIC FINES, ONE PIECE GRAVEL AT 0.6", LIGHT RED (5 R 5/6) WITH TRACE DARK YELLOWISH ORANGE (10 YR 5/6).
	60	12	◤	8 23 28	51	15	SP-SC	SAND, UNIFORM, FINE, 5-10% MEDIUM TO COARSE, 5-10% SLIGHTLY PLASTIC FINES, REDDISH ORANGE (10 R 5/6) WITH BRIGHT YELLOWISH ORANGE (10 YR 6/6) WITH VERY THIN SUBHORIZONTAL CLAY LAYER.
60		13	◤	11 15 9	24	10	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE, 10-20% GRAVEL TO 0.7" MAX., 3-5% FINES, LIGHT BROWN (5 YR 5/6) WITH FEW SMALL MODERATE RED CLAY BALLS.
	70	14	◤	4 6 11	17	18	SP	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, MODERATE REDDISH BROWN (10 R 5/6) WITH SOME BRIGHT YELLOWISH ORANGE (10 YR 6/6), RESEMBLES DILATENT SILT.
50		15	◤	3 3 5	8	17	SP	SAND, UNIFORM, FINE, 3-7% FINES, GRAYISH ORANGE (10 YR 7/4) WITH PALE REDDISH BROWN (10 R 5/4), RESEMBLES DILATENT SILT, WITH FEW SMALL FeOx. NODULES.
	80	16	◤	3 4 5	9	21	SP-SC	SAND, UNIFORM, FINE, 5-10% SLIGHTLY PLASTIC FINES, LIGHT REDDISH BROWN (10 R 5/6), WITH FEW THIN LAYERS HIGHLY PLASTIC MODERATE RED (5 R 4/4) CLAY.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE.
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE JANUARY 17, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P9 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. P9
DATE DRILLED OCTOBER 31-NOVEMBER 16, 1972
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG CO
SHEET 2 OF 6
LOGGED BY T.I.B.
COORDINATES, NORTH 18,697.2 EAST 18,101.3
GROUND SURFACE ELEVATION 126.9'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
40		17	◤	2 4 9	13	19	SP-SC	SAND, WITH CLAY LAYERS, SIMILAR TO SS-16.
	90	18	◤	8 11 10	21	14	SP	SAND, UNIFORM, FINE, 2-4% FINES, MODERATE REDDISH ORANGE (10 R 6/6) RESEMBLES DILATENT SILT, WITH 3.0-4.0" HIGHLY PLASTIC MODERATE RED (5 R 4/6) CLAY LAYER AT BOTTOM.
30		19	◤	15 19 11	30	6	SP	SAND, UNIFORM, FINE, 5-10% MEDIUM TO COARSE, LESS THAN 1% GRAVEL TO 0.3" MAX., LESS THAN 1% FINES, LIGHT BROWN (5 YR 6/4).
	100	20	◤	20 26 22	48	6	SP	SAND, UNIFORM, FINE, 5-15% MEDIUM TO COARSE, 2-4% GRAVEL TO 0.4" MAX., LESS THAN 1% FINES, LIGHT BROWN (5 YR 6/4) WITH OLIVE GRAY (5 Y 5/2).
20		21	◤	15 18 21	39	6	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 1% GRAVEL TO 0.7" MAX., 1-2% FINES, GRAYISH ORANGE (10 YR 7/4).
	110	22	◤	9 14 19	33	12	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 2% MEDIUM TO COARSE, 1-3% FINES, MODERATE ORANGE PINK (5 YR 8/4).
10		23	◤	8 12 17	29	10	SP	SAND, UNIFORM, FINE, 3-5% GRAVEL TO 0.7" MAX., 1-3% FINES, LIGHT BROWN (5 YR 6/4) AND GRAYISH ORANGE (10 YR 7/4).
	120	24	◤	14 17 18	35	7	SP	SAND, UNIFORM, FINE, 1-2% GRAVEL TO 0.6" MAX., LESS THAN OR EQUAL TO 1% FINES, GRAYISH ORANGE (10 YR 7/4).
0		25	◤	18 23 32	55	6	SP	SAND, UNIFORM, FINE, 5-10% MEDIUM TO COARSE, 2-3% GRAVEL TO 0.5" MAX., LESS THAN OR EQUAL TO 1% FINES, GRAYISH ORANGE (10 YR 7/4).
	130	26	◤	50 64/6"	64/6"	18	SP	SAND, POORLY GRADED, FINE TO COARSE, MOSTLY FINE TO MEDIUM, 10-15% GRAVEL TO 0.6" MAX., LESS THAN OR EQUAL TO 1% FINES, PALE YELLOWISH BROWN (10 YR 6/2).
-10		27	◤	14 24 28	52	14	SP	SAND, UNIFORM, FINE, LESS THAN 1% FINES, LIGHT YELLOWISH BROWN (10 YR 6/4).
	140	28	◤	22 44 48	92	12	SP	SAND, UNIFORM, FINE, LESS THAN 1% FINES, LIGHT BROWN (5 YR 6/4) TO VERY PALE ORANGE (10 YR 8/2).
-20		29	◤	24 25 26	51	12	SP	SAND, UNIFORM, FINE, LESS THAN 2% MEDIUM TO COARSE, 2-4% GRAVEL TO 0.7" MAX., LESS THAN 1% FINES, LIGHT BROWN (5 YR 6/4) TO VERY PALE ORANGE (10 YR 8/2).
	150	30	◤	19 27 48	75	14	SP	SAND, UNIFORM, FINE, LESS THAN OR EQUAL TO 1% FINES, GRAYISH ORANGE (10 YR 7/4).
-30		31	◤	37 64/6"	64/6"	14	SP	SAND, UNIFORM, FINE, 3-7% MEDIUM TO COARSE, 4-8% GRAVEL TO 0.6" MAX., LESS THAN OR EQUAL TO 1% FINES, GRAYISH ORANGE PINK (5 YR 7/2) WITH SOME VERY PALE ORANGE (10 YR 8/2).
	160	32	◤	17 19 16	35	8	SP	GRAVELLY SAND, POORLY GRADED, FINE TO COARSE, MOSTLY MEDIUM TO COARSE, 20-30% GRAVEL TO 1.0" MAX., 1-4% FINES, MODERATE YELLOWISH BROWN (10 YR 6/4) WITH COMPRESSED YELLOWISH GRAY CLAY BALLS.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

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◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE JANUARY 17, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P9 B

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. P9
DATE DRILLED OCTOBER 31-NOVEMBER 16, 1972
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG CO
SHEET 3 OF 6
LOGGED BY T.I.B.
COORDINATES, NORTH 18,697.2 EAST 18,101.3
GROUND SURFACE ELEVATION 126.9'

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS/6"	SAMPLE "N" VALUE	SAMPLE RECOVERY	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
- 40		33	◤	5 7 9	16	25	CH	SILTY CLAY, HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2) WITH MANY SMALL BRIGHT YELLOWISH ORANGE FeOx. AND BLACK MnO_2 NODULES.
	170	34	◤	13 17 25	42	24	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, YELLOWISH GRAY (5 Y 7/2) SOME LIGHT OLIVE GRAY (5 Y 5/2) MOTTLING, WITH YELLOWISH ORANGE (10 YR 6/6) FeOx. AND BLACK MOTTLING DECREASING TOP TO BOTTOM, PARTIALLY DESSICATED AT TOP.
- 50		35	◤	6 9 13	22	19	CL W/ SC	SANDY CLAY, SLIGHTLY PLASTIC, 10-20% UNIFORM, VERY FINE SAND, GREENISH GRAY (5 GY 5/1) WITH MANY CLAY PELLETS TO 0.1" MAX., WITH POCKETS OF CLAYEY SAND.
	180	36	◤	9 17 21	38	12	SC-SM	CLAYEY/SILTY SAND, UNIFORM, VERY FINE, 10-15% SLIGHTLY PLASTIC FINES, GREENISH GRAY (5 GY 5/1), WITH POCKETS AND LAYERS OF SAND AND SANDY CLAY.
- 60		37	◤	8 15 17	32	20	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, LESS THAN OR EQUAL TO 5% UNIFORM, VERY FINE SAND, GREENISH GRAY (5 G 5/1 TO 6/1).
	190	38	◤	8 14 19	33	27	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, GREENISH GRAY (5 G 5/1) WITH CLAY PELLETS TO 0.1" MAX.
- 70		39	◤	9 22 32	54	27	SP CH	TOP 12" SAND, POORLY GRADED, FINE TO MEDIUM, LESS THAN OR EQUAL 1% COARSE, 2-3% FINES, LIGHT OLIVE GRAY (5 Y 6/1), WITH MANY GREENISH GRAY CLAY PELLETS TO 0.2" MAX. BOTTOM 15" SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, LESS THAN 5% VERY FINE TO FINE SAND, GREENISH GRAY (5 G 6/1) WITH FEW SMALL WHITE DESSICATED CLAY PELLETS.
	200	40	◤	11 14 18	32	18	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, LESS THAN 2% VERY FINE SAND, HARD GREENISH GRAY (5 G 6/1) MOTTLED WITH GRAYISH OLIVE (10 Y 5/2), FEW SMALL WHITE PELLETS AND POCKETS OF DESSICATED CLAY.
- 80		41	◤	8 15 25	40	27	CH CH	TOP 5" SAND, FINE TO MEDIUM, MOSTLY FINE, CLEAN, MODERATE YELLOWISH BROWN (10 YR 6/4), MANY LARGE BALLS OR POCKETS SANDY CLAY, MODERATELY PLASTIC, 10-15% FINE SAND, GREENISH GRAY (5 G 6/1), MANY SMALL (FINE SAND SIZE) GREENISH GRAY CLAY BALLS. BOTTOM 22" SILTY CLAY, MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, HARD, GREENISH GRAY (5 G 5/1).
	210	42	◤	9 16 22	38	17	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, LESS THAN 2% VERY FINE SAND, HARD, GREENISH GRAY (5 G 5/1).
- 90		43	◤	8 12 17	29	25	CH	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, LESS THAN 5% VERY FINE SAND, VERY STIFF, GREENISH GRAY (5 G 5/1), LAYERS OR LENSES OF YELLOWISH BROWN FINE TO MEDIUM SAND IN TOP, FINE TO MEDIUM SAND IN TOP 3 IN. OF SAMPLE, SEVERAL FeOx STAINS AND SMALL POCKETS TO 0.5 IN.
	220	44	◤	8 10 18	28	25	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 2% VERY FINE SAND, STIFF, GREENISH GRAY (5 G 5/1), SEVERAL FeOx. STAINS AND SMALL POCKETS.
-100		45	◤	6 9 17	26	18	CL SC	TOP 12" SILTY CLAY, MODERATELY PLASTIC, 5-10% VERY FINE SAND, VERY STIFF, DARK GREENISH GRAY (5 G 4/1). BOTTOM 6" CLAYEY SAND, UNIFORM, FINE, 20-25% MODERATELY PLASTIC FINES, DENSE, DARK GREENISH GRAY (5 G 4/1).
	230	46	◤	8 13 22	35	18	CL SC SP	TOP 6" SILTY CLAY, MODERATELY PLASTIC, 5-10% VERY FINE SAND, STIFF GREENISH GRAY (5 G 6/1). BOTTOM 12" CLAYEY SAND, UNIFORM, FINE, 10-15% MODERATELY PLASTIC FINES, DARK GREENISH GRAY (5 G 4/1), GRADING TO SAND, UNIFORM, FINE, LESS THAN 5% FINES, DARK GREENISH GRAY (5 G 4/1).
-110		47	◤	5 7 9	16	24	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 2% VERY FINE SAND, VERY STIFF, GREENISH GRAY, (5 G 5/1).
	240	48	◤	5 6 9	15	24	CL	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, LESS THAN 2% VERY FINE SAND, STIFF, OLIVE GRAY, (5 Y 3/2), FEW VERY THIN DARK BROWN, BRITTLE, LENSES OR FLAKES.

1 THE NUMBER OF BLOWS OF A 140 LB. HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE. THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

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◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE.

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED.

4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE JANUARY 17, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P9 C

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. P9
DATE DRILLED OCTOBER 31-NOVEMBER 16,1972
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
SHEET 4 OF 6
LOGGED BY T.I.B.
COORDINATES, NORTH 18,697.2 EAST 18,101.3
GROUND SURFACE ELEVATION 126.9'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-120		49	◤	5 8 10	18	26	CL	TOP 16" CLAY, MODERATELY TO HIGHLY PLASTIC, VERY STIFF, OLIVE BLACK (5 Y 2/1), MANY FRAGMENTS DECAYED WOOD TO 1.0" X 0.25" BOTTOM 10" SILTY CLAY, MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, VERY STIFF, DARK GREENISH GRAY (5 GY 4/1).
	250	50	◤	10 13 19	32	21	CL	SILTY CLAY, MODERATELY PLASTIC, HARD, DARK GREENISH GRAY (5 G 4/1).
-130		51	◤	7 12 17	29	26	CL	SILTY CLAY, SIMILAR TO SS-50, WITH FEW SMALL CHALKY CONCRETIONS OF DESSICATED CLAY.
	260	52	◤	11 19 22	41	24	CL	SILTY CLAY, MODERATELY PLASTIC, HARD, DARK GREENISH GRAY (5 G 4/1), FEW SMALL POCKETS CHALKY WHITE DESSICATED CLAY.
-140		53	◤	11 15 16	31	18	CL	SILTY CLAY, MODERATELY PLASTIC, HARD, DARK GREENISH GRAY (5 G 4/1).
	270	54	◤	7 12 22	34	16	CL	SILTY CLAY, SIMILAR TO SS-53, WITH POCKETS OR LAYERS TO 1.0" OF CLAYEY SAND, UNIFORM, VERY FINE, 10-15% FINES, DARK GREENISH GRAY (5 G 4/1).
-150		55	◤	7 16 28	44	17	SC	CLAYEY SAND, UNIFORM, VERY FINE, 10-15% MODERATELY PLASTIC FINES, DARK GREENISH GRAY (5 G 4/1).
	280	56	◤	8 16 23	39	17	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, HARD, DARK GREENISH GRAY (5 G 4/1).
-160		57	◤	10 11 14	25	16	CL	SILTY CLAY, SIMILAR TO SS-56.
	290	58	◤	8 12 21	33	15	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, HARD, DARK GREENISH GRAY (5 G 4/1).
-170		59	◤	5 6 16	22	14	CL	SILTY CLAY, SIMILAR TO SS-58.
	300	60	◤	10 21 27	48	24	CL	SILTY CLAY, SIMILAR TO SS-59, WITH MINOR FeOx. STAINING AND FEW SMALL CHALKY WHITE DESSICATED CLAY CONCRETIONS.
-180		61	◤	8 12 18	30	16	CL	SILTY CLAY, MODERATELY PLASTIC, HARD, DARK GREENISH GRAY (5 G 4/1), MOTTLED WITH DARK YELLOWISH BROWN (10 YR 4/3), SEVERAL HARD CHALKY WHITE DESSICATED CLAY CONCRETIONS, ONE LAYER (1.0") VERY FINE CLAYEY SAND.
	310	62	◤	12 20 22	42	17	CL	SILTY CLAY, MODERATELY PLASTIC, HARD, DARK GREENISH GRAY (5 G 4/1) MOTTLED WITH DARK YELLOWISH BROWN (10 YR 4/3).
-190		63	◤	5 13 18	31	17	CL	SILTY CLAY, MODERATELY PLASTIC, HARD, DARK GREENISH GRAY (5 G 4/1) OCCASIONALLY MOTTLED WITH DARK YELLOWISH BROWN (10 YR 4/3).
	320	64	◤	13 21 33	54	14	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND, HARD, GREENISH GRAY (5 GY 6/1) MOTTLED MODERATE YELLOWISH BROWN (10 YR 5/3)

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

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4 DATUM IS MEAN SEA LEVEL.

ISSUED BY D. F. GREENWOOD
DATE JANUARY 17, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P9 D

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. P9
DATE DRILLED OCTOBER 31-NOVEMBER 16, 1972
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
SHEET 5 OF 6
LOGGED BY T.I.B.
COORDINATES, NORTH 18,697.2 EAST 18,101.3
GROUND SURFACE ELEVATION 126.9'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
-200		65	◤	9 14 22	36	22	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 3% VERY FINE SAND, HARD, GREENISH GRAY (5 G 6/1) MOTTLED WITH MODERATE OLIVE BROWN (5 Y 5/4)
	330	66	◤	10 17 24	41	24	CL	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, HARD, GREENISH GRAY (5 G 6/1) WITH MODERATE YELLOWISH BROWN (10 YR 4/4).
-210		67	◤	9 13 21	34	27	CL	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, HARD, MODERATE YELLOWISH BROWN (10 YR 4/4) MOTTLED AND BANDED WITH GREENISH GRAY (5 G 6/1).
	340	68	◤	2 8 13	21	14	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 3% VERY FINE SAND, VERY STIFF, DARK GREENISH GRAY (5 G 4/1).
								NOTE: BEYOND 340', BEGAN ADVANCING HOLE BY WASHING WITH A RODS AND FISHTALE BIT, SAMPLING EVERY 15" OR AT STRATA CHANGES.
-220								
	350							
-230		69	◤	32 37 40	77	24	CL SC	TOP INCH: SILTY CLAY, MODERATELY PLASTIC, LESS THAN 3% VERY FINE SAND, HARD, MEDIUM GREENISH GRAY (5 G 5/1). BOTTOM 8": CLAYEY SAND, UNIFORM, VERY FINE, 15-20% MODERATELY PLASTIC FINES, DARK GREENISH GRAY (5 G 4/1), POCKETS OR LAYERS OF SANDY CLAY TO 1.5" THICK, CHANGING BACK TO SILTY CLAY AT BOTTOM.
	360							
-240		70	◤	14 22 24	46	22	CL	SILTY CLAY, MODERATELY PLASTIC, LESS THAN 3% VERY FINE SAND, HARD, DARK GREENISH GRAY (5 G 4/1).
	370							
-250								
	380	71	◤	23 30 31	61	24	CL	SILTY CLAY, SIMILAR TO SS-70.
-260								
	390							
-270		72	◤	21 28 34	62	24	CL	SILTY CLAY, SIMILAR TO SS-70.
	400							

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

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ISSUED BY D. F. GREENWOOD
DATE JANUARY 17, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P9 E

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. P9
DATE DRILLED OCTOBER 31-NOVEMBER 16, 1972
TYPE OF BORING DRIVE
DRILLING COMPANY - EUSTIS ENGRG. CO.
SHEET 6 OF 6
LOGGED BY T.I.B.
COORDINATES, NORTH 18,697.2 EAST 18,101.3
GROUND SURFACE ELEVATION 126.9'

ELEVATION FEET	DEPTH FEET	SAMPLE					UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION
		NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY		
		73	◤	49 100/ 3"	100/ 3"	24	CL SP	TOP 8" SILTY CLAY, MODERATELY PLASTIC, 4-8% FINE SAND, HARD, DARK GREENISH GRAY (5 G 4/1). BOTTOM 5" SAND, UNIFORM, FINE, LESS THAN 2% FINES, VERY DENSE, GRAYISH OLIVE (10 Y 4/2), WITH MANY BLACK GRAINS.
-280		74	◤	67 50/4"	50/4"	10	SP	SAND, SIMILAR TO ABOVE.
	410							
-284.6	411.5	75	◤	10 30 50/5"	90	10	SP	SAND, UNIFORM, FINE, 5-8% MODERATELY PLASTIC FINES, VERY DENSE, GRAYISH OLIVE (10 Y 4/2), TWO LAYERS OR POCKETS (1.5") SILTY CLAY, MODERATELY PLASTIC, DARK GREENISH GRAY (5 G 4/1).

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O.D. STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED.

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STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P9 F

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO P-11 TYPE OF BORING DRIVE SHEET 1 OF 1
DATE DRILLED FEBRUARY 21, 1973 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY RBT & DAW
COORDINATES, NORTH 16,902.1 EAST 18229.4 GROUND SURFACE ELEVATION 103.9

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
								WASH DOWN TO 165' CLAY REACHED AT 160'
		1	◤	9 16 20	36	11	CL CL	TOP SILTY CLAY, MODERATE PLASTIC, 3-5% VERY FINE SAND, SOFT, FeOx DEPOSITS, YELLOWISH GRAY (5 Y 7/2). BOTTOM: SILTY CLAY, MODERATE PLASTIC, 3-5% VERY FINE SAND, WITH SMALL LAYERS OF SANDY CLAY, FeOx DEPOSITS IN SAND, FEW BLACK SPECKS, YELLOWISH GRAY (5 Y 7/2).
	170	2	◤	8 13 26	39	15	CL	TOP: SILTY CLAY, MODERATE PLASTIC,3-5% VERY FINE SAND, 12-15% FINES, YELLOWISH GRAY (5 Y 7/2). BOTTOM: SILTY CLAY, MODERATE PLASTIC, 3-5% VERY FINE SAND, DARK GREENISH GRAY (5 G 5/1).
-70		3	◤	4 11 15	26	15	CL	SILTY CLAY, MODERATE PLASTIC, 3-5% VERY FINE SAND, DARK GREENISH GRAY (5 G 5/1).
	180	4	◤	6 13 22	35	14	CL	SILTY CLAY, SAME AS SS 3.
-80		5	◤	7 17 19	36	16	CL	SILTY CLAY, SIMILAR TO SS 3.
	190	6	◤	8 9 14	23	17	CL	SANDY CLAY, MODERATELY PLASTIC, 15-20% VERY FINE SAND, VERY STIFF, DARK GREENISH GRAY (5 G 4/1).
-90		7	◤	9 16 39	55	17	CL SP	TOP 11 INCH: SANDY CLAY, MODERATELY PLASTIC, 20-30% VERY FINE SAND, VERY DENSE, YELLOWISH GRAY (5 Y 7/2), SOME POCKETS OR LAYERS VERY FINE SAND AND CLAYEY SAND, MODERATE FeOx STAINING IN PLACES. BOTTOM 6 INCH: SAND, UNIFORM, VERY FINE, 2-4% FINES, VERY DENSE, YELLOWISH GRAY (5 Y 7/2) TO DUSKY YELLOW (5 Y 6/4).
	200	8	◤	26 50/5"	50/5"	8	SP	SAND, UNIFORM, VERY FINE, CLEAN, VERY DENSE, DUSKY YELLOW (5 Y 7/4), LAYER (0.5 INCH) YELLOWISH GRAY (5 Y 7/2) CLAY WITH HEAVY FeOx STAINING.
-100 -102.6	206.5	9	◤	27 20 21	41	18	SP CL	TOP 6 INCH: SAND, UNIFORM, VERY FINE, CLEAN, VERY DENSE, DUSKY YELLOW (5 Y 7/4), 1.0 INCH LAYER CLAY. BOTTOM 12 INCH: SILTY CLAY, MODERATELY PLASTIC, LESS THAN 3% VERY FINE SAND, HARD, YELLOWISH GRAY (5 Y 7/2). NOTE: TOP AND BOTTOM OF SAND LAYER ARE VERY CLEAN IN SAMPLES, (9.5' STRATA)
								DROVE CASING TO 208.5 AND CLEANED OUT, BACK FILLED WITH SAND TO 205.5. SET PIEZOMETER TIP AT 205.5, PACKED WITH SAND TO 195.0, GROUTED FROM 195' TO SURFACE.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE MARCH 13, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P11 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J O NO 12210

BORING NO P-12 TYPE OF BORING DRIVE SHEET 1 OF 1
DATE DRILLED FEBRUARY 20, 1973 DRILLING COMPANY - EUSTIS ENGRG CO LOGGED BY R.B.T.
COORDINATES, NORTH 16,893.7 EAST 18,249.4 GROUND SURFACE ELEVATION 104.0

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
								WASHED TO 90'
10								
	100							DROVE CASING FROM 90.0 TO 103.5
0 -2.0	106.0	1	◤	13 25 35	60	13	SP	SAND, UNIFORM, VERY FINE, LESS THAN 1% NONPLASTIC FINES, DARK YELLOWISH ORANGE (10 YR 7/6).
								DROVE CASING FROM 103.5 TO 106.0. SET PIEZOMETER AT 106.0. BOTTOM OF GROUT SEAL AT 80.0.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
◤ INDICATES LOCATION OF SPLIT SPOON SAMPLE

3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE MARCH 13, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P-12 A

GULF STATES UTILITIES COMPANY
RIVER BEND POWER STATION - UNITS 1 & 2
WEST FELICIANA PARISH, LOUISIANA
J.O. NO. 12210

BORING NO. P-13 TYPE OF BORING DRIVE SHEET 1 OF 1
DATE DRILLED FEBRUARY 20-22, 1973 DRILLING COMPANY - EUSTIS ENGRG. CO. LOGGED BY E.M.W.
COORDINATES, NORTH 11300.0 EAST 12249.8 GROUND SURFACE ELEVATION 107.7

ELEVATION FEET	DEPTH FEET	SAMPLE NUMBER	TYPE	BLOWS/6"	"N" VALUE	RECOVERY	UNIFIED SOIL CLASSIFI-CATION	SOIL DESCRIPTION
								ADVANCED HOLE TO 150 FT. USING NX CASING AND LO LOSS DRILLING MUD.
		1	◤	9 14 20	34	20	CL	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, HARD, YELLOWISH GRAY (5 Y 7/2), MINOR FeOx STAINING, MANY SMALL BLACK SPECKS MnO_2.
-50		2	◤	14 20 24	44	20	CL	SILTY CLAY, MODERATELY PLASTIC, HARD, LESS THAN 5% VERY FINE SAND, YELLOWISH GRAY (5 Y 8/1) MANY BLACK SPECKS MnO_2, LAYERS (TO 2.0 INCH) YELLOWISH GRAY VERY FINE SAND AND CLAYEY SAND.
	160	3	◤	15 18 23	41	22	CL	SILTY CLAY, SIMILAR TO SS 1, WITH SOME SMALL WHITE POCKETS DESSICATED CLAY.
-60		4	◤	11 15 23	38	24	CL	SILTY CLAY, MODERATELY TO HIGHLY PLASTIC, HARD, PALE OLIVE (10 Y 7/2), MINOR FeOx STAINING, MANY LARGE SPECKS MnO_2, SEVERAL POCKETS AND LENSES HARD WHITE DESSICATED CLAY.
	170	5	◤	8 9 14	23	19	CL-SC	SANDY CLAY - CLAYEY SAND, MODERATELY PLASTIC, 40-60% VERY FINE SAND, VERY STIFF, PALE OLIVE (10 Y 7/2), MINOR FeOx STAINING, FEW SMALL BLACK SPECKS MnO_2, 3 INCH LAYER CLAYEY SAND, 15-20% FINES, AT BOTTOM OF SAMPLE.
		6	◤	4 7 17	24	20	SC	CLAYEY SAND, UNIFORM, VERY FINE, 15-25% SLIGHTLY TO MODERATELY PLASTIC FINES, MEDIUM DENSE, LIGHT REDDISH BROWN (10 R 5/6).
-70	180	7	◤	3 6 19	25	20	SC SP	TOP 10 INCH: CLAYEY SAND, SIMILAR TO SS 6, WITH POCKETS MODERATE YELLOWISH ORANGE (10 YR 7/6). BOTTOM 10 INCH: SAND, UNIFORM, FINE, 7-10% MODERATELY PLASTIC FINES, DENSE, MODERATE REDDISH BROWN (10 R 4/6).
		8	◤	14 17 24	41	16	SP	SAND, UNIFORM, VERY FINE, 3-5% FINES, DENSE, LIGHT REDDISH BROWN (10 R 5/6).
-80	190	9	◤	11 23 33	56	13	SP	SAND, UNIFORM, VERY FINE, LESS THAN 3% FINES, VERY DENSE, LIGHT REDDISH BROWN (10 R 5/6).
		10	◤	15 35 50/3½"	107	13	SP	SAND, SIMILAR TO SS 9, WITH VERY FEW GRAINS FINE AND MEDIUM SAND.
-90 -92.3	200	11	◤	37 50/4"	50/4"	6	SP	SAND, UNIFORM, VERY FINE, FEW MEDIUM AND COARSE, LESS THAN 2% FINES, VERY DENSE, LIGHT REDDISH BROWN (10 R 5/6).
								SET PIEZOMETER TIP AT 200.0' BACK FILLED WITH CLEAN SAND TO 180.0' GROUTED HOLE FROM 180.0' TO SURFACE.

1 THE NUMBER OF BLOWS OF A 140 LB HAMMER FALLING FREELY 30 INCHES REQUIRED TO DRIVE A 2 INCH O D STANDARD SPLIT SPOON SAMPLER 12 INCHES OR THE DISTANCE INDICATED AFTER AN INITIAL SEATING OF 6 INCHES IS THE STANDARD PENETRATION TEST N-VALUE THE NUMBERS FOR EACH OF THE 6 INCH INCREMENTS ARE ALSO REPORTED

2 ■ INDICATES LOCATION OF UNDISTURBED SAMPLE
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3 THE AMOUNT OF SAMPLE RECOVERED IN INCHES IS INDICATED

4 DATUM IS MEAN SEA LEVEL

ISSUED BY D. F. GREENWOOD
DATE MARCH 13, 1973

STONE & WEBSTER ENGINEERING CORPORATION
12210 - GSK - P-13 A

APPENDIX 2I

CORRESPONDENCE

LETTER FROM DR. C.O. DURHAM, JR.
CONSULTING GEOLOGIST
ON ST. TAMMANY PARISH FAULT

LETTERS TO MR. EDWARD N. LEVINE
WESTON GEOPHYSICAL RESEARCH, INC.

January 31, 1973

To: Stone and Webster Engineering Corporation
P. O. Box 2325
Boston, Massachusetts 02107
Attn.: R. J. Conlon, 100/25

From: C. O. Durham, Jr. Ph.D., Consulting Geologist
10822 Effringham Avenue
Baton Rouge, Louisiana 70815

Re: Riverbend Project, Louisiana
St. Tammany Parish Fault

Reference is made to the northwest-southeast trending fault which is depicted as paralleling the Pearl River along the northeastern margin of St. Tammany Parish, Louisiana on the "Tectonic Map of Gulf Coast Region, U.S.A." jointly issued in 1972 by the Gulf Coast Association of Geological Societies and the American Association of Petroleum Geologists. This "fault" is shown to extend northwesterly from the eastern extension of the Baton Rouge fault system through an area marked by southwesterly dip on the flank of the "Hancock County High" so that the "fault" trends along strike.

In 1962, Herbert J. Howe published a thorough and well-documented subsurface study of the area in question and did not recognize the "fault". ("Subsurface Geology of St. Helena, Tangipahoa, Washington and St. Tammany Parishes, Louisiana" Transactions, Gulf Coast Association of Geological Societies, Volume 12, pp. 121-155). Howe's study includes five structural maps on the top of the Heterostegina (Tatum limestone), top of the Wilcox, top of the Eutaw shale (Upper Cretaceous), and top of the lower Tuscaloosa, the latter at depths of approximately 10,000 feet. All of these horizons dip southwesterly without interruption by faulting. Howe also includes an isolith map of total Wilcox sands and an isopach map of the Sparta-Cane River stratigraphic interval, both of which thin southeastward perpendicular to the "fault". The accompanying figure, taken from Plate 6 of Howe's article, depicts the Wilcox structure map and the Wilcox isolith map.

Along the trend of the "fault" two petroleum test holes were available to Howe, and no more have been drilled in this area subsequently:

ST-7 Sun Oil Co. #1 Poitevent Favre, Sec. 10, Tp. 8S, Rg. 15E, St. Tammany Ph., total depth 11,001 ft. in Lower Cretaceous.

ST-16 Rimrock Tidelands & Robert Oil Co. #1 Iwanta Realty Co., Sec. 25, Tp. 9S, Rg. 15E, St. Tammany Ph., total depth 8017 ft. in Midway shale.
(9 miles SSE of ST-7).

These two test holes have been compared to the nearest test holes to the east and to the west as follows:

ST-8	W.R. Fairchild & Associates #1 Poitevent Lumber Co. Sec. 26, Tp. 8S, Rg. 14E, St. Tammany Ph., total depth 8010 ft. in Midway shale. (5 mi. WSW of ST-7).
H-2	Sun Oil Co. #1 Weston Lumber Co., Sec. 28, Tp. 8S, Rg. 16W, Hancock Co., Mississippi, total depth 10,378 ft. in Lower Cretaceous. (6 mi. ESE of ST-7).

Comparison of electric logs from these four holes does not reveal any evidence of faulting in any of them. This is significant because ST-7 is located approximately on the "fault" drawn on the 1972 Tectonic Map and consequently should have been cut by the "fault" if it were real.

In an effort to determine the basis for the "fault" I telephoned various geologists that had been involved in the preparation of this part of the Tectonic Map. These included Lee H. Meltzer, 1970 Chairman of the Special Projects Committee, and Robert W. Sabate, Co-Chairman of the Tectonic Map Committee, both of New Orleans. They referred me to Dale M. Holyoak as the geologist who supplied the original information on the area in question. However, they also informed me that the map may havebeen revised after Mr. Holyoak's input because the lengthy time in preparation of the map resulted in successive committee changes.

Mr. Holyoak was formerly a geologist with Mobil Oil Co. in New Orleans. I contacted him in Calgary, Alberta where he is geologist for Great Northern Oil Ltd. He had not yet seen the published Tectonic Map but was familiar with the questionable "fault". He stated that he had drawn this "fault" on office work maps but did not recall submitting it for placement on the Tectonic Map. He opined that his Mobil associate, J. G. Meinert, may have copied it from the office work maps for use after Mr. Holyoak left New Orleans. However, Mr. Meinert, who is still with Mobil in New Orleans believes that it was submitted on Mr. Holyoak's original manuscript map. At any rate, Mr. Holyoak is the geologist who postulated the fault.

The evidence that Mr. Holyoak recalled as his basis for the fault follows:

1) The northwest-southeast trend of the Pearl River appears to be fault-controlled.
2) The present surface is topographically higher to the east of the Pearl River than to the west.
3) The changed character of the Wilcox across the "fault" in the subsurface.
4) The "fault" is published in G. E. Murray's 1961 book.

A search of Murray's book shows one such: fig 3-9, page 88. However, this is a reproduction of Fisk's 1944 map showing the northwest and northeast trending regional fracture patterns of the southern United States. These have been discussed and discounted as faulting in Section 2.5 of the PSAR. Furthermore, Fisk's fracture is somewhat southwest of the Pearl River and diverges northwesterly from it; consequently, the alignment of the Pearl River is not connected to this mapped fracture, even if it were to exist. Insofar as higher topography east of the Pearl than west of it, this is readily explained by the fact that the Pearl is flowing along the east side of its floodplain. Consequently, the higher ground to the east is the terrace upland whereas the lower terrain to the west is the floodplain. Regarding the Wilcox changes purported to occur across the "fault", the Howe total sand isolith depicts changes at right angle to the "fault", not across it.

In the face of this evidence, the only definitive proof of the existence of the "fault" would be its appearence on seismic profiles. Since Mr. Holyoak and Mr. Meinert conceivably could have had access to such data, this was a possible reason for postulating the "fault". However, they have informed me that such data was not available except at the southeastern extent of the "fault" where it joins the documented Baton Rouge fault zone. In view of the above analysis it is concluded that Howe's interpretation of no fault in the area is correct.

Respectfully submitted,

C.O. Durham, Jr.

C. O. Durham, Jr.
Consulting Geologist

Enclosure: Plate 6 of Howe (1962)

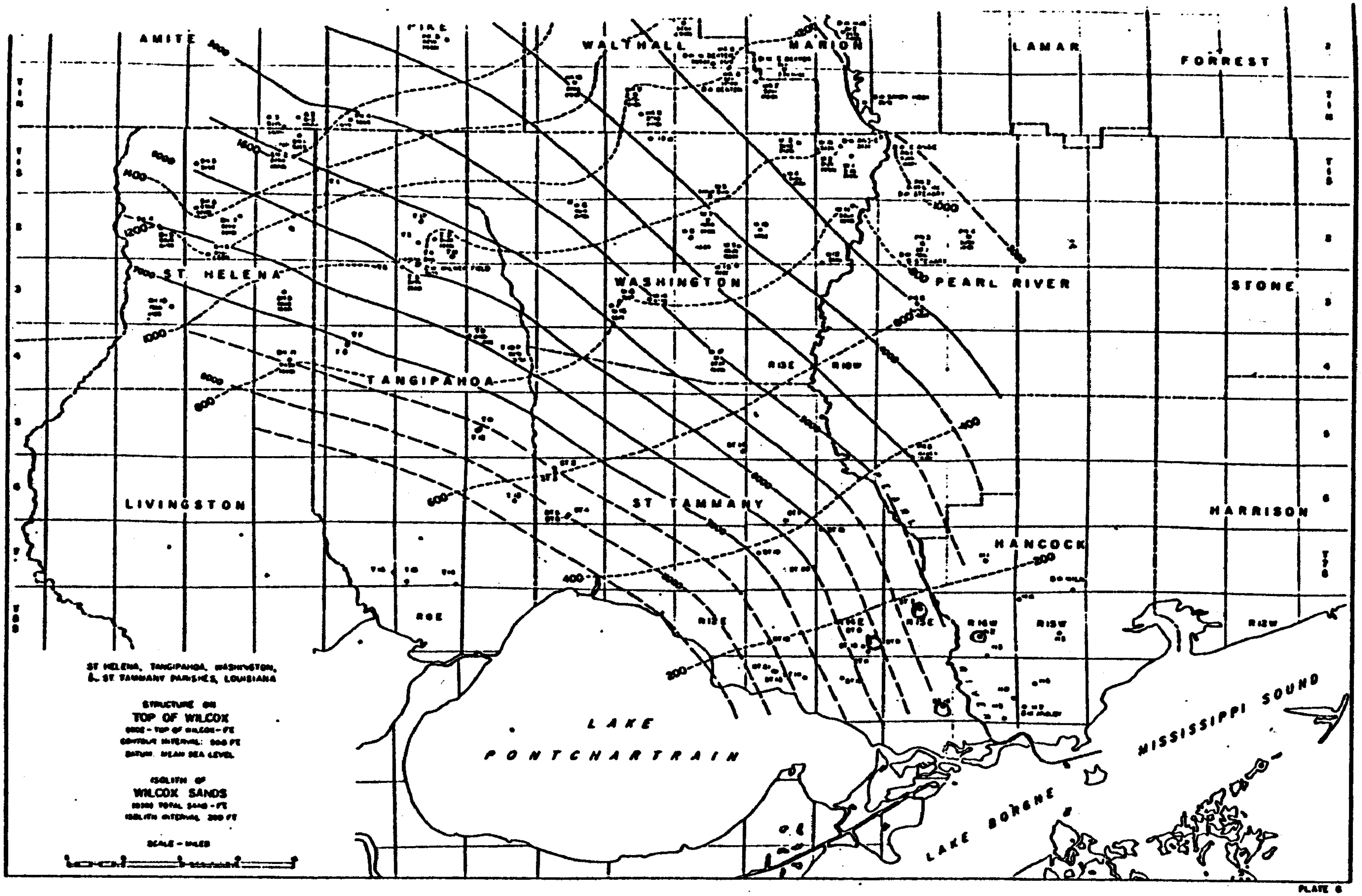

AMITE
PIKE
WALTHALL
MARION
LAMAR
FORREST
ST HELENA
WASHINGTON
PEARL RIVER
STONE
TANGIPAHOA
LIVINGSTON
ST TAMMANY
HARRISON
HANCOCK
LAKE PONTCHARTRAIN
LAKE BORGNE
MISSISSIPPI SOUND
R1E
R2E
R13E
R14W
R15W
R12W
1000
1200
1400
1600
2000
4000
6000
8000
800
600
400
200
ST HELENA, TANGIPAHOA, WASHINGTON,
& ST TAMMANY PARISHES, LOUISIANA
STRUCTURE ON
TOP OF WILCOX
CONTOUR INTERVAL: 500 FT
DATUM: MEAN SEA LEVEL
ISOLITH OF
WILCOX SANDS
ISOLITH INTERVAL 200 FT
SCALE - MILES

PLATE 6

LOYOLA UNIVERSITY
NEW ORLEANS, LA. 70118

ARTMENT OF PHYSICS

June 15, 1972

Mr. Edward N. Levine
c/o Weston Geophysical Research, Inc.
Post Office Box 364
Weston, Massachusetts 02193

Dear Mr. Levine:

Tectonic Earthquakes are indeed rare occurrences in Southeastern U.S.A., particularly in Louisiana. As far as I can remember, only two shocks, of mederate intensity not exceeding VI on the Modified Mercalli Scale, have had their foci in Louisiana in this present century:

1) October 19, 1930. The epicenter was located between Donaldsonville and Houma. Maximum intensity not over VI M.M.S. although it was felt over a great area.

2) March 19, 1957. Very localized around Baton Rouge, certainly not exceeding V in intensity.

Our seismometers have a period of 18 seconds for the two horizontal components and 2 seconds for the vertical component. We pick up all kinds and very large recordings of weather microseisms, especially the vertical component.

However besides these weather seisms, we record a great many relatively high frequency disturbances. I surmise that some of these at least owe their origin to minor dislocations occurring in our deep alluvial. I cannot be certain of that, because we have no instruments of high enough frequency and recorders fast enough to allow certain interpretation of these seismograms. Perhaps some oil company or prospecting company could give you better information concerning these events than I can.

I hear the oil companies complaining about certain dislocations that have occurred in some of their drill-holes. To make a definite study of these occurrances would require instruments and recorders of higher frequency and speed than are available to me.

With best regards and the hope you may visit with us again in the near future, I am,

Yours very sincerely,

K. A. Maring S.J.

K. A. Maring, S.J.
Director

KAM/ba

THE UNIVERSITY OF MISSISSIPPI
SCHOOL OF ENGINEERING
UNIVERSITY, MISSISSIPPI

**Department of Geology and
Geological Engineering**

20 May 1972

Mr. Edward N. Levine
Weston Geophysical Research, Inc.
P.O. Box 364
Weston, Massachusetts 02193

Dear Mr. Levine:

Enclosed is a short report on the 'Historical Seismicity of the Mississippi Embayment Area, Central Mississippi Valley, North America' which you requested in your letter of 14 February 1972.

I wish to thank you for the opportunity to participate, Weston Geophysical enjoys a well earned reputation for excellence.

Best regards,

Fred E. Followill
Associate Professor &
Director of the Seismological
Observatory (WWSSN-OXF)

Report: Historical Seismicity of the Mississippi Embayment Area,
Central Mississippi Valley, North America.
By: Fred E. Followill, Seismological Observatory, University of Mississippi
Date: May 1972

INTRODUCTION.

The seismic risks defined in the Seismic Risk Map released by the U.S. Department of Commerce in 1970 for a triangular area bounded by the apex-cities of Cleveland, Ohio, St. Louis, Missouri and Greenville, Mississippi, suggests that moderate or major damage (i.e. vibrations exceeding ER = 6 or 10% gravity) has been historically documentated and that it is expected that history will be repeated. This doesnot specify statistical return rates for the respective levels of damaging vibrations. The Seismic Risk Map does point out the fact that the greatest damage is expected along the valleys of the major drainage systems (i.e. Ohio and Mississippi Rivers). In fact, within this triangular area are the confluences of the Ohio - Mississippi, the Tennessee-Ohio, the Wabash-Ohio, and other minor rivers. It is an observational fact that the alluvial fill along river valleys experience an amplification of the vibrations due to earthquakes and we should expect higher risks to follow the trends of the alluvial valleys. The seismological point-in-question is: Why have the epicenters of the historical events been concentrated along the valleys of the Wabash, Ohio and Mississippi Rivers? Geologically, the juxtapositioning of these confluences may be explained by the joint-control of the drainage due to subsurface structural control in addition to the glacial epochs. If this hypothesis is valid, then regional and local geological structures and provinces may be used as a posteriori information in the statistical interpretation of the seismic risks of the Central Mississippi Valley.

In view of the incompleteness of the historical record of the seismic activity prior to 1850, due to the sparcity of the population, the additional evidences gleaned from the working hypothesis proposed above have been utilized in evaluating the seismic risks.

GEOLOGICAL SETTING.

The Mississippi Embayment opens toward the South from the confluence of the Ohio and Mississippi Rivers and is approximately bisected by the Mississippi River. It is supposed that an arch-complex extends from the Ozark Dome along the Pascola Arch to the Nashville Dome, then continuing North along the Cincinnati Arch. The Pascola Arch underlies the Northern portion of the Mississippi Embayment and the Ozark and Nashville Domes are to the West and East of the Embayment, respectively. The Embayment appears to be discordantly superimposed on the Pascola Arch. Paralleling this arch-complex, the Ouachita Folded Metamorphic Front transverses the Embayment from Hot Springs, Arkansas to Meridian, Mississippi. The Appalachian Metamorphic Front extends toward the NNE from Meridian, Mississippi. The area of interest in this report is the portion of the northern Embayment which lies North of the Ouachita Front as mapped in the subsurface.

SEISMICITY: 1811-1966.

The historical record of the seismicity prior to 1850 is not well established due to an insufficient density of population. The instrumental record of the seismicity is not well established prior to 1950. The WWSSN-OXF, a permanent seismic station, was established in 1963 and was the first seismic station to be established in the Northern Embayment area.

The great earthquakes of the Winter of 1811-1812 were the first documentated events which caused major damage, but there is very little information regarding the occurences of foreshocks or aftershocks. There were some reports of aftershocks felt at Louisville, Kentucky; one report implied that 1800 aftershocks were felt within three months, another report implied that the "ground shook for two years". Statistical recurrence relations have not included these aftershocks since they are not recorded in catalogues of earthquakes. Another major shock was not reported until 1895 (at Charleston, Missouri). This might imply that there is a clustering in time (episodic) of the strain energy release, possibly similar to the Yunnen Province, China, with relatively quite periods containing only a few moderate events and many minor events. This is consistant with the concept of Statistical Return Periods.

As the population density has increased, the number of felt-events has increased. But with few exceptions, the epicenters of the major and minor earthquakes have been concentrated in the western half of the Embayment, North of latitude 35°, which corresponds to the meizoseismal region, mapped by Fuller in 1912, for the major earthquakes of 1811-1812.

SEISMICITY: 1967-1972.

In June 1967, two minor earthquakes occurred just northeast of Greenville, Mississippi. These earthquakes prompted a study of the December 1931 earthquake which was felt throughout Northern Mississippi. St. Louis University seismic records and the JSA Seismological Bulletins of the 1931 earthquake were used to relocate this event using the SLM-Crustal Model. The epicenter was migrated toward the SSW approximately 75 kilometers, yielding a much closer proximity to the 1967 epicenters. Although these three epicenters and reported 'felts' of 1941 and 1955 are along the Mississippi River, there is a marked-absence of historical epicenters and a total absence of modern (since 1963) epicenters between Greenville, Mississippi, and Memphis, Tennessee, along the Mississippi River.

In Northeast Arkansas and Western Tennessee, the modern seismicity has exhibited a fairly consistent pattern: foreshocks-mainshock-aftershocks (where the mainshock has been of magnitude 3.5-4.5 on the Richter Scale) which have defined a NNE-SSW trend, apparently defining several deep-crustal fractures. These fractures correlate with the Paleozoic Escarpment on the Western boundary of the Embayment, the physiographic feature -Crowleys Ridge, the St. Francis River, and the Loess Bluffs of the Mississippi River.

ISOSEISMALS.

Although the assigning of intensities is, at best, qualitative, the isoseismals in the Embayment tend to be ellipsoidal with major axis NNE, and often the ellipse is shifted to the NNE of the instrumental epicenter. Some of the elliptic may be due to alluvial valleys and terraces, but North of latitude 35^o, the Paleozoic-subsurface appears to significantly modify the isoseismals. Hydrogeologic conditions of the Loess Bluffs on the East Bank of the Mississippi River appear to be prone to slumps triggered by minor earthquakes (slumps have been triggered 50 kilometers from a magnitude 4.0 event.).

The isoseismals are spaced farther-apart (as if from an intermediate focus earthquake) in the Central Mississippi Valley compared to Southern California.

STATISTICAL RETURN PERIODS.

The estimation of the statistical return period of an event assumes that the entire population is available for sampling and also assumes that the queing exists for a sufficient length of time to obtain stable samples. Interpreting this for the estimate of the statistical return period of earthquakes, this implies that the population density is high, that the population density is stable through time, that the quality of construction is known in order that the damage may be properly defined, and that the sampling interval is several times the longest statistical-return-period of interest. These criteria are seldom met in seismic risk studies, and cannot be met in the Central Mississippi Valley. This deficiency is easily recognized when successive sampling intervals are investigated: if the sampling interval remains constant, the smaller events are often proportional to the population density, hence the number of small events counted for a given time-interval (sampling window) increases chronologically; if the time-interval (sampling window) of successive samples is increased, the probability of sampling the larger event increases.

Applying Gumbel-type Extremum Statistics suffers the same restrictions, but if a 'population estimate' can be reasonably constructed using the various sampling windows, then a minimum-maximum confidence limit may be estimated and the median may be a reasonable representation of the statistical return period. Using moving-sample-windows of 25 years, 50 years and 100 years, respectively, the estimate of the median statistical return periods are not in excess of

$$\text{Log}_{10}\, T(\text{yrs.}) = 0.6\, I_{MM} - 2.8 \quad , \text{(Modified Mercalli Intensity)}.$$

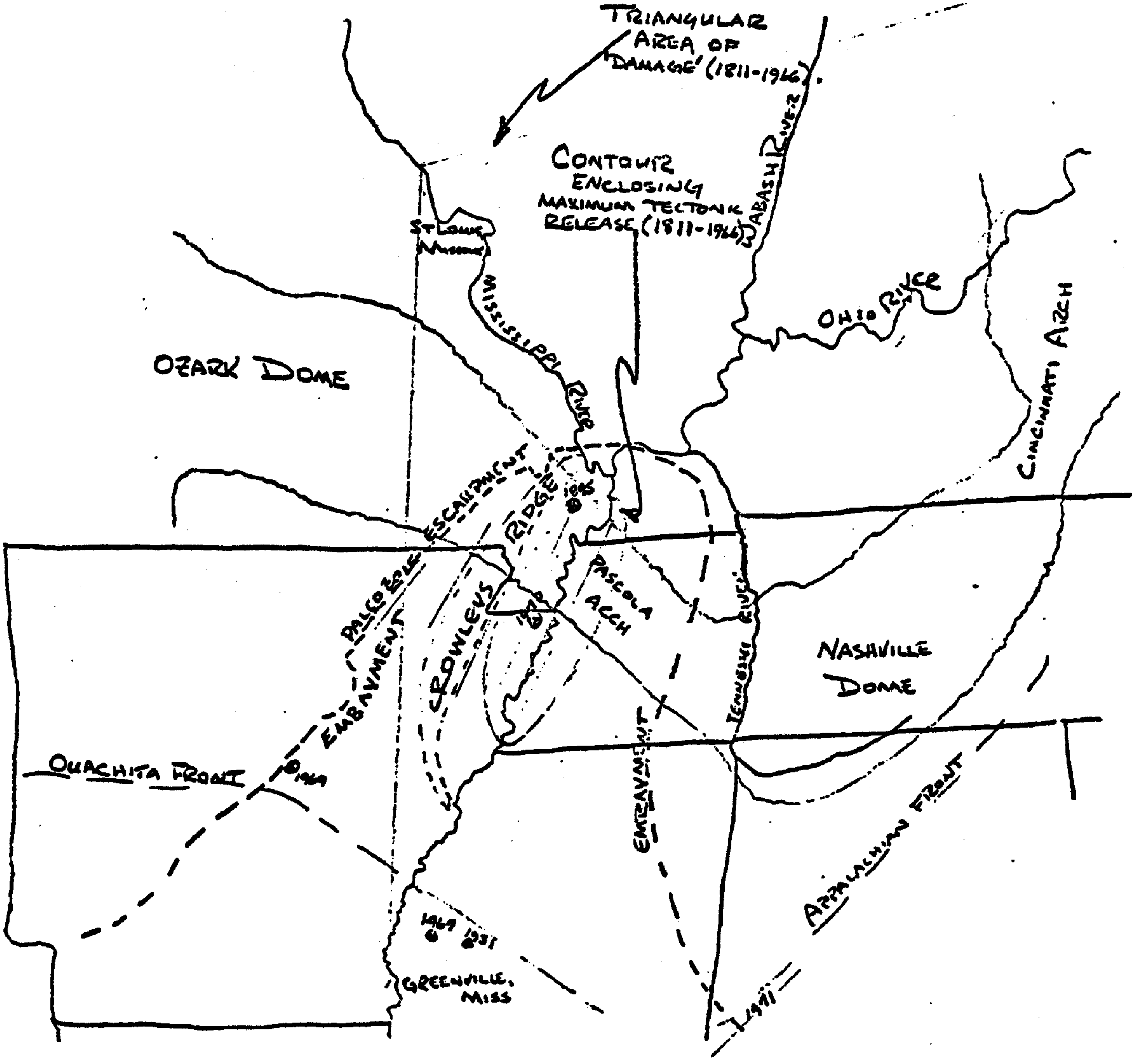
CONCLUSIONS.

Although the statistical return periods cannot be determined with confidence, the estimates of these periods indicate that the probabilistic risks of earthquake-occurrence for a particular size event in the Central Mississippi Valley is considerably less than for the same size event in Southern California (both defined as High Risk, Zone 3 Areas on U.S. Risk Map). For a given size event, the 'felt-area' is considerably larger (attenuation constant is order of magnitude less) for Central Mississippi Valley compared to Southern California.

Although a minor seismic lineation along the Ouachita Front from Hot Springs, Arkansas, to Meridian,Mississippi, has exhibited recent seismic activity, no major events have ever been reported, and the return periods are significantly longer (Much lower risk) than the region along the Mississippi Valley between latitudes 35° and 37° North.

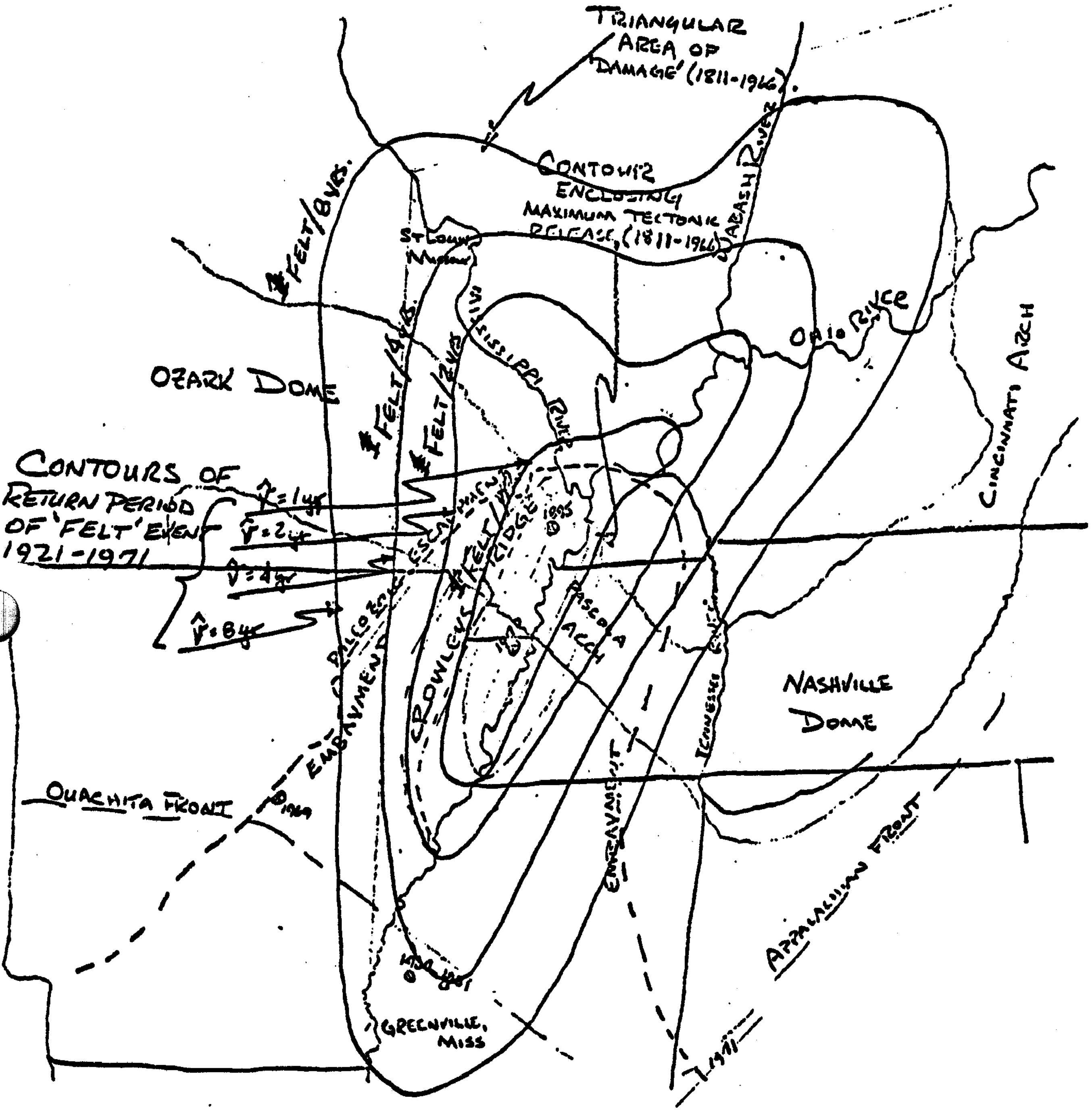
If the seismic activity of the Northern Mississippi Embayment Area is episodic, with only moderate activity during the long interval of strain accumulation, then relatively short periods of major strain release (as suggested by the historical record of the last 200 years), the seismic probabilistic-risk estimated from recent data or incomplete historical data must be considered as underestimated.

The meizoseismal region of the 1811-1812 earthquakes as described by Fuller's Report in 1912 must be classified as an extremely hazardous seismic region.



Northern Mississippi Embayment Seismicity

Geologic Structures & Provinces Adapted & Inferred by Followill (1972).



NORTHERN MISSISSIPPI EMBAYMENT SEISMICITY
GEOLOGIC STRUCTURES & PROVINCES ADAPTED & INFERRED
BY FOLLOWILL (1972).

REPORT

on

GRAIN SIZE AND ATTERBERG LIMIT TESTS

JAR SAMPLES

RIVER BEND POWER STATION

GULF STATES UTILITIES

Submitted to

STONE & WEBSTER ENGINEERING CORP.
Boston, Massachusetts

Project 7263

GEOTECHNICAL ENGINEERS, INC.
934 Main Street
Winchester, Massachusetts 01890

January 1973

TABLE OF CONTENTS

LIST OF FIGURES

GRAIN SIZE CURVES

1. **INTRODUCTION**

1.1 PURPOSE

The purpose of the laboratory testing program reported herein was to determine the grain size distribution and Atterberg Limits of jar samples of soil from the site of the River Bend Power Station.

1.2 SCOPE

A total of 387 jar samples were received, corresponding to 165 split-spoon samples from 26 borings. Each jar sample corresponds to a section of a split-spoon sample and is numbered A, B, etc., starting at the top. The Table lists all samples received, their depths and elevations, and the number of sections received from each split-spoon sample.

Ninety-eight of the 165 split-spoon samples correspond to three borings and range in elevation from -65 to +100. The remaining 67 samples correspond to 23 borings and range in elevation between +19 and +36.

The total number of tests that were performed is:

160	Sieve Analyses
25	Combined Hydrometer and Sieve Analyses
22	Atterberg Limit Tests.

1.3 AUTHORIZATION

This work was authorized by Mr. David Greenwood under Purchase order No. E-11563.

3. **ATTERBERG LIMITS**

A total of 22 Atterberg Limits tests were performed. A jar sample was selected from each split-spoon sample that appeared to have some plasticity. At least 24 hours prior to the test, the samples were mixed wtth distilled water to obtain a water content slightly above the Liquid Limit.

The test results are listed in the Table and are summarized in the Plasticity Chart in Fig. 62.

SUMMARY OF TEST RESULTS

Boring No.	Sample No.	Depth ft	Elevation of Top of Sample	No. of Sample Sections	Sample Section Tested	Grain Size Tests			Atterberg Limits		
						Type (1)	Figure No.	Passing #200 mesh %	Liquid Limit	Plastic Limit	Plasticity Index
102	15	70.0 to 71.5	35.5	3	A	S	1	12			
	16	75.0 to 76.5	30.5	1	A	S	1	9			
	17	80.0 to 81.5	25.5	2	B	S	1	6			
103	16	80.0 to 81.5	35.7	2	A	S	2	7			
	17	85.0 to 86.5	30.7	2	B	S	2	6			
	18	90.0 to 91.5	25.7	2	B	S	2	8			
104	17	85.0 to 86.5	34.0	2	A	S	3	11			
	18	90.0 to 91.5	29.0	2	B	S	3	13			
	19	95.0 to 96.5	24.0	2	A	S	3	9			
105	16	80.0 to 81.5	33.7	3	A	S	4	12			
	17	85.0 to 86.5	28.7	2	A	S	4	6			
					B	S	4	7			
	18	90.0 to 91.5	23.7	1	A	S	4	9			
106	16	80.0 to 81.5	32.1	2	B	S	5	6			
	17	85.0 to 86.5	27.1	2	A	S	5	7			
	18	90.0 to 91.5	22.1	2	B	S	5	8			
107	14	70.0 to 71.5	33.5	3	A	S	6	14			
	15	75.0 to 76.5	28.5	2	B	S	6	6			
	16	80.0 to 81.5	23.5	1	A	S	6	4			
108	16	80.0 to 81.5	32.5	2	B	S	7	7			
	17	85.0 to 86.5	27.5	2	A	S	7	4			
	18	90.0 to 91.5	22.5	2	B	S	7	8			

SUMMARY OF TEST RESULTS

Boring No.	Sample No.	Depth ft	Elevation of Top of Sample	No. of Sample Sections	Sample Section Tested	Grain Size Tests			Atterberg Limits		
						Type (1)	Figure No.	Passing #200 mesh %	Liquid Limit	Plastic Limit	Plasticity Index
109	18	85.0 to 86.5	27.8	2	B	S	8	7			
110	15	75.0 to 76.5	30.9	2	A	S	9	14			
	16	80.0 to 81.5	25.9	2	B	S	9	5			
	17	85.0 to 86.5	20.9	2	A	S	9	6			
111	15	75.0 to 76.5	33.6	3	C	S	10	10			
	16	80.0 to 81.5	28.6	2	B	S	10	8			
	17	85.0 to 86.5	23.6	2	A	S	10	6			
					B	S	10	7			
112	1	5.0 to 6.5	97.1	4	A	H	11	97			
					B				29	17	12
	2	10.0 to 11.5	92.1	3	A	H	11	90	36	15	21
	3	15.0 to 16.5	87.1	3	A	H	11	62			
					B				19	11	8
					C	S	11	39			
	4	20.0 to 21.5	82.1	3	A	S	12	32			
					B	H	12	31			
					C				24	11	13
	5	25.0 to 26.5	77.1	2	A	S	12	16			
	6	30.0 to 31.5	72.1	2	A	S	13	14			
	7	35.0 to 36.5	67.1	2	A	S	13	14			
	8	40.0 to 41.5	62.1	2	A	S	13	15			
	9	45.0 to 46.5	57.1	2	A	S	14	4			
	10	50.0 to 51.5	52.1	3	A	S	14	5			
					C	S	14	7			
	11	55.0 to 56.5	47.1	2	B	S	15	4			
	12	60.0 to 61.5	42.1	3	A	S	15	13			
	13	65.0 to 66.5	37.1	3	A	S	15	10			

SUMMARY OF TEST RESULTS

Boring No.	Sample No.	Depth ft	Elevation of Top of Sample	No. of Sample Sections	Sample Section Tested	Grain Size Tests			Atterberg Limits		
						Type (1)	Figure No.	Passing #200 mesh %	Liquid Limit	Plastic Limit	Plasticity Index
112 (cont.)	15	72.0 to 73.5	30.1	2	A	S	16	5			
	16	75.0 to 76.0	27.1	1	A	S	16	3			
	17	80.0 to 81.5	22.1	2	A	S	16	8			
	18	85.0 to 86.5	17.1	3	B	S	17	10			
	19	90.0 to 91.5	12.1	3	A	S	17	7			
	20	95.0 to 96.5	7.1	2	B	S	17	7			
	21	100.0 to 101.5	2.1	1	A	S	18	5			
	22	105.0 to 106.5	-2.9	2	A	S	18	7			
	23	110.0 to 110.8	-7.9	2	A	S	18	6			
	24	115.0 to 116.5	-12.9	2	A	S	19	4			
	25	120.0 to 121.3	-17.9	2	A	S	19	4			
	26	125.0 to 126.5	-22.9	2	A	S	19	3			
	27	130.0 to 131.5	-27.9	2	A	S	20	6			
	28	135.0 to 136.5	-32.9	1	A	S	20	5			
	29	140.0 to 141.5	-37.9	1	A	S	21	9			
	30	145.0 to 146.5	-42.9	2	A	S	21	12			
	31	150.0 to 151.5	-47.9	4	A	H	22	84	50	18	32
	32	155.0 to 156.5	-52.9	3	A	H	22	88	40	18	22
	33	160.0 to 161.5	-57.9	4	A	H	22	75	42	16	26
113	15	75.0 to 76.5	33.1	3	A	S	23	11			
	16	80.0 to 81.5	28.1	3	C	S	23	8			
	17	85.0 to 86.5	23.1	3	C	S	23	7			
114	1	5.0 to 6.5	100.2	4	A	H	24	99			
					B				35	19	16
	2	10.0 to 11.5	95.2	4	B	H	24	96			
					C				46	17	29
	3	15.0 to 16.5	90.2	4	B	H	24	91	37	13	24

SUMMARY OF TEST RESULTS

Boring No.	Sample No.	Depth ft	Elevation of Top of Sample	No. of Sample Sections	Sample Section Tested	Grain Size Tests			Atterberg Limits		
						Type (1)	Figure No.	Passing #200 mesh %	Liquid Limit	Plastic Limit	Plasticity Index
114 (cont.)	4	20.0 to 21.5	85.2	4	A	S	25	31			
					B	H	25	31			
					C				Non	Plastic	
	5	25.0 to 26.5	80.2	4	A	S	25	66			
					B	H	25	74			
					C				80	17	63
	6	30.0 to 31.5	75.2	3	A	S	26	25			
					B	H	26	17			
					C				Non	Plastic	
	7	35.0 to 36.5	70.2	4	A	S	26	17			
	8	40.0 to 41.5	65.2	3	A	S	27	16			
	9	45.0 to 46.5	60.2	2	A	S	27	13			
	10	50.0 to 51.5	55.2	2	A	S	27	10			
	11	55.0 to 56.5	50.2	2	A	S	28	9			
	12	60.0 to 61.5	45.2	3	A	S	28	15			
	13	65.0 to 66.5	40.2	3	C	S	28	13			
	14	70.0 to 71.5	35.2	2	B	S	29	10			
	15	75.0 to 76.1	30.2	2	A	S	29	5			
	16	80.0 to 81.3	25.2	2	A	S	29	5			
	17	85.0 to 86.5	20.2	3	C	S	30	8			
	18	90.0 to 91.3	15.2	2	B	S	30	7			
	19	94.7 to 96.0	10.5	2	A	S	30	6			
	20	100.0 to 101.2	5.2	2	A	S	31	7			
	21	105.0 to 106.0	0.2	2	A	S	31	4			
	22	110.0 to 110.9	-4.8	2	B	S	31	6			
	23	115.0 to 116.3	-9.8	2	B	S	32	7			
	24	120.0 to 121.5	-14.8	2	A	S	32	6			
	25	125.0 to 126.5	-19.8	2	A	S	32	5			

SUMMARY OF TEST RESULTS

Boring No.	Sample No.	Depth ft	Elevation of Top of Sample	No. of Sample Sections	Sample Section Tested	Grain Size Tests			Atterberg Limits		
						Type (1)	Figure No.	Passing #200 mesh %	Liquid Limit	Plastic Limit	Plasticity Index
114	26	130.0 to 131.5	-24.8	2	A	S	33	5			
(cont.)	28	136.5 to 138.0	-31.3	2	A	S	33	6			
					B	S	33	9			
	29	140.0 to 141.5	-34.8	2	A	S	34	8			
					B	S	34	8			
	30	145.0 to 146.5	-39.8	2	A	S	34	7			
	31	150.0 to 151.5	-44.8	4	A	S	35	8			
	32	155.0 to 156.5	-49.8	4	A	H	35	71			
					B				41	19	22
	33	160.0 to 161.5	-54.8	4	B	H	35	85	45	18	27
	34	165.0 to 166.5	-59.8	4	A	H	36	75	43	17	26
	35	170.0 to 171.5	-64.8	4	B	H	36	45	33	19	14
115	1	5.0 to 6.5	98.1	2	A	H	37	97	43	21	22
	2	10.0 to 11.5	93.1	3	A	H	37	94	38	14	24
	3	15.0 to 16.5	88.1	4	A	H	37	77	25	10	15
					D	S	37	55			
	4	20.0 to 21.5	83.1	3	A	S	38	14			
					C	S	38	34			
	5	25.0 to 26.5	78.1	2	B	S	38	7			
	6	30.0 to 31.5	73.1	3	A	S	39	18			
					B	H	39	19			
					C				Non	Plastic	
	7	35.0 to 36.5	68.1	1	A	S	39	13			
	8	40.0 to 41.5	63.1	3	A	S	40	13			
	9	45.0 to 46.5	58.1	2	A	S	40	12			
	10	50.0 to 51.5	53.1	2	A	S	40	7			
	11	55.0 to 56.5	48.1	2	A	S	41	5			
					B	S	41	14			
	12	60.0 to 61.5	43.1	3	A	S	41	13			

SUMMARY OF TEST RESULTS

Boring No.	Sample No.	Depth ft	Elevation of Top of Sample	No. of Sample Sections	Sample Section Tested	Grain Size Tests			Atterberg Limits		
						Type (1)	Figure No.	Passing #200 mesh %	Liquid Limit	Plastic Limit	Plasticity Index
115 (cont.)	13	65.0 to 66.5	38.1	2	A	S	42	11			
	14	70.0 to 71.5	33.1	2	A	S	42	13			
	15	75.0 to 76.5	28.1	2	A	S	42	7			
	16	80.0 to 81.5	23.1	1	A	S	43	7			
	17	85.0 to 86.5	18.1	1	A	S	43	10			
	18	90.0 to 91.5	13.1	2	A	S	43	6			
	19	95.0 to 96.5	8.1	1	A	S	44	7			
	20	100.0 to 101.5	3.1	2	B	S	44	10			
	21	105.0 to 106.5	-1.9	2	A	S	44	5			
	22	110.0 to 111.5	-6.9	1	A	S	45	7			
	23	115.0 to 116.5	-11.9	1	A	S	45	7			
	24	120.0 to 121.5	-16.9	2	A	S	45	4			
	25	125.0 to 126.5	-21.9	3	A	S	46	5			
	26	130.0 to 131.5	-26.9	1	A	S	46	6			
	27	135.0 to 136.5	-31.9	1	A	S	46	8			
	28	140.0 to 141.5	-36.9	2	A	S	47	3			
					B	S	47	9			
	29	145.0 to 146.5	-41.9	2	A	S	47	17			
					B	H	47	71	47	19	28
	30	150.0 to 151.5	-46.9	3	A	H	48	75	46	18	28
	31	155.0 to 156.5	-51.9	4	A	H	48	85	42	15	27
	32	160.0 to 161.5	-56.9	5	A	H	48	68			
					B				38	13	25
116	14	70.0 to 71.5	30.2	2	B	S	49	5			
	15	75.0 to 76.5	25.2	2	B	S	49	9			
	16	80.0 to 81.5	20.2	2	B	S	49	7			

SUMMARY OF TEST RESULTS

Boring No.	Sample No.	Depth ft	Elevation of Top of Sample	No. of Sample Sections	Sample Section Tested	Grain Size Tests			Atterberg Limits		
						Type (1)	Figure No.	Passing #200 mesh %	Liquid Limit	Plastic Limit	Plasticity Index
117	15	65.0 to 66.5	34.9	2	A	S	50	4			
	16	70.3 to 71.7	29.6	1	A	S	50	8			
	17	75.0 to 76.5	24.9	2	A	S	50	6			
118	16	72.5 to 74.0	33.6	2	A	S	51	4			
					B	S	51	7			
	17	75.0 to 76.5	31.1	2	B	S	51	7			
	18	80.0 to 81.5	26.1	2	A	S	51	7			
					B	S	51	8			
121	15	75.0 to 76.5	33.2	3	A	S	52	7			
	16	80.0 to 81.5	28.2	3	A	S	52	12			
	17	85.0 to 86.5	23.2	2	A	S	52	10			
122	15	75.0 to 76.5	31.1	2	A	S	53	6			
					B	S	53	7			
	16	80.0 to 81.5	26.1	2	B	S	53	11			
	17	82.5 to 83.6	23.6	2	A	S	54	6			
					B	S	54	6			
123	13	65.0 to 66.5	32.7	2	A	S	55	8			
	14	70.0 to 71.5	27.7	2	B	S	55	10			
	15	75.0 to 76.5	22.7	2	A	S	55	8			
124	14	70.0 to 71.5	33.7	2	B	S	56	10			
	15	75.0 to 76.5	28.7	2	B	S	56	7			
	16	80.0 to 81.5	23.7	2	B	S	56	10			

SUMMARY OF TEST RESULTS

Boring No.	Sample No.	Depth ft	Elevation of Top of Sample	No. of Sample Sections	Sample Section Tested	Grain Size Tests			Atterberg Limits		
						Type (1)	Figure No.	Passing #200 mesh %	Liquid Limit	Plastic Limit	Plasticity Index
125	15	75.0 to 76.5	33.1	3	A	S	57	13			
	16	80.5 to 82.0	27.6	2	A	S	57	10			
	17	85.0 to 86.0	23.1	2	A	S	57	7			
126	15	75.0 to 76.5	33.5	2	B	S	58	15			
	16	80.0 to 81.5	28.5	3	A	S	58	12			
	17	85.0 to 86.5	23.5	2	B	S	58	12			
127	15	75.0 to 76.5	32.9	2	B	S	59	5			
	16	80.0 to 81.5	27.9	2	B	S	59	9			
	17	85.0 to 86.5	22.5	2	B	S	59	8			
128	15	75.0 to 76.0	32.4	2	B	S	60	7			
	16	80.0 to 81.5	27.4	2	B	S	60	7			
	17	85.0 to 86.5	22.4	2	B	S	60	7			
129	15	75.0 to 76.6	32.6	2	A	S	61	7			
	16	80.0 to 81.5	27.6	1	A	S	61	5			
	17	85.0 to 86.5	22.6	3	A	S	61	9			

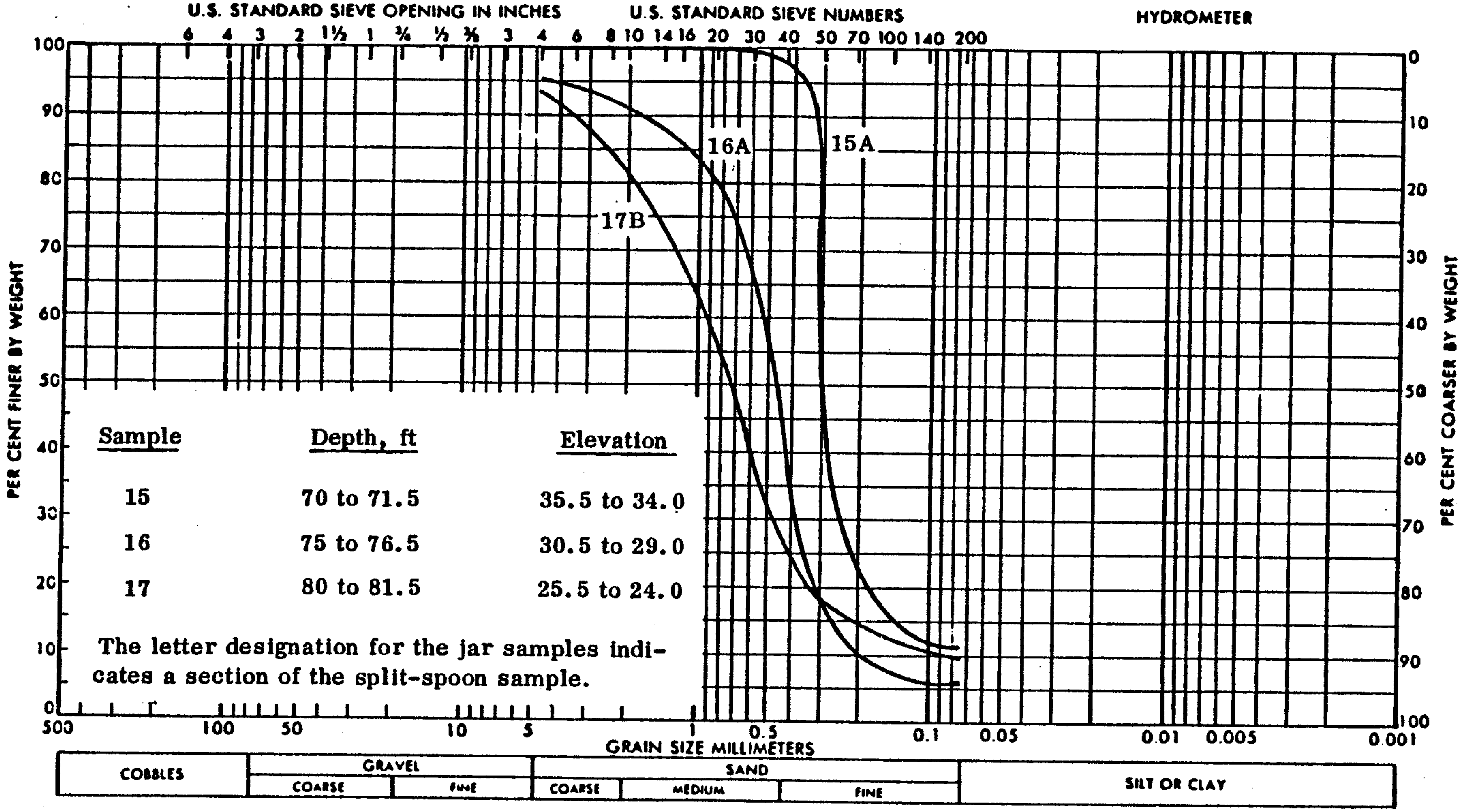
(1) S = Sieve analysis
H = Combined hydrometer and sieve analysis

SYMBOLS FOR STRATIGRAPHIC ZONES

The symbols listed below are used to designate stratigraphic zones on the following grain size curves.

Symbol	Stratigraphic Zone
L	Loess
PH	Port Hickey Top-Stratum Silts and Clays
S	Sands and Clayey Sands
BC	Citronelle Buried Channel Deposits, Sands, and Gravels
PC	Pascagoula Clays

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
15	70 to 71.5	35.5 to 34.0
16	75 to 76.5	30.5 to 29.0
17	80 to 81.5	25.5 to 24.0

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
15	BC
16	BC
17	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

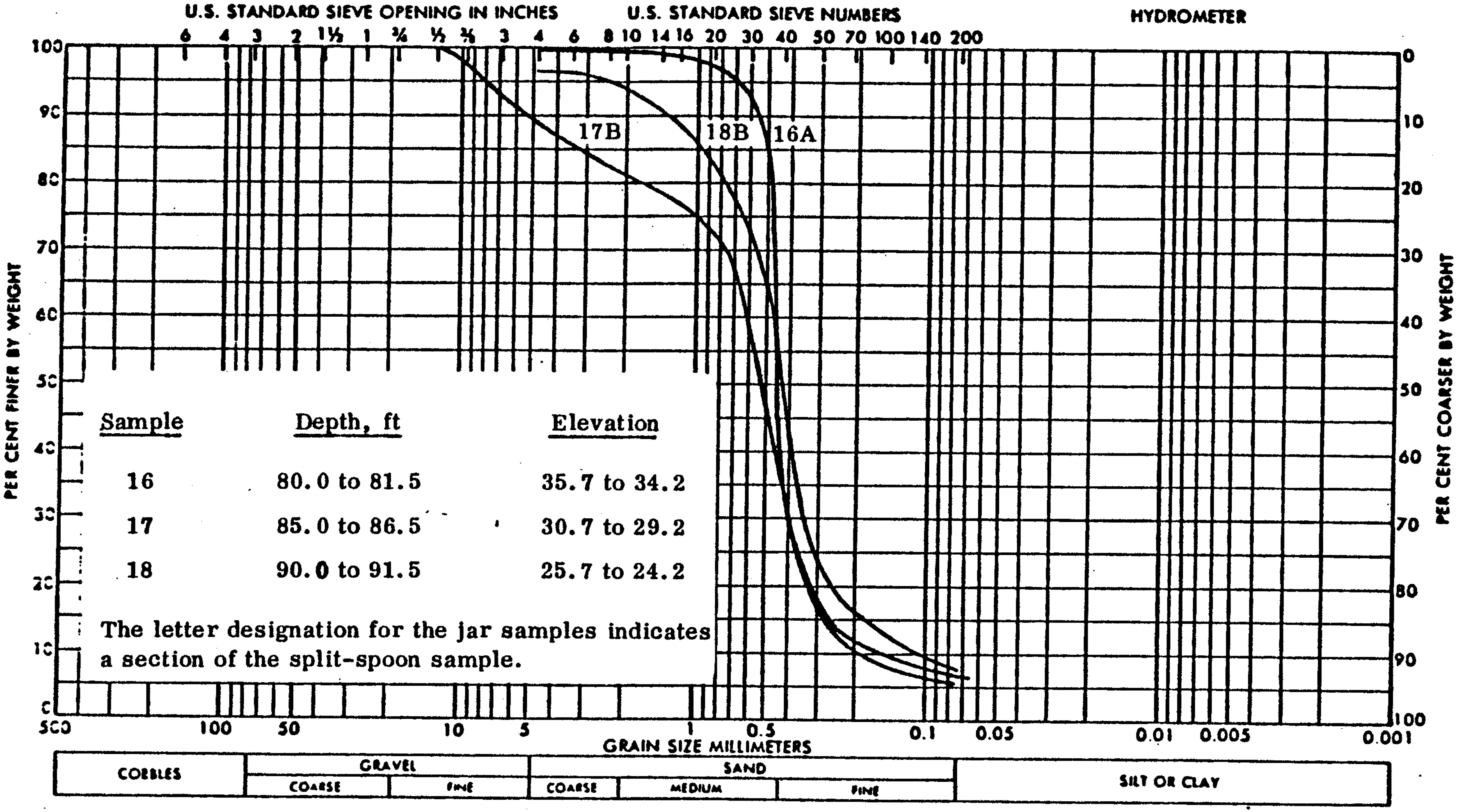
Project 7263

GRAIN SIZE CURVES
Boring 102
Samples 15A, 16A, 17B

Jan 1973

FIG. 1

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
16	80.0 to 81.5	35.7 to 34.2
17	85.0 to 86.5	30.7 to 29.2
18	90.0 to 91.5	25.7 to 24.2

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
16	BC
17	BC
18	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

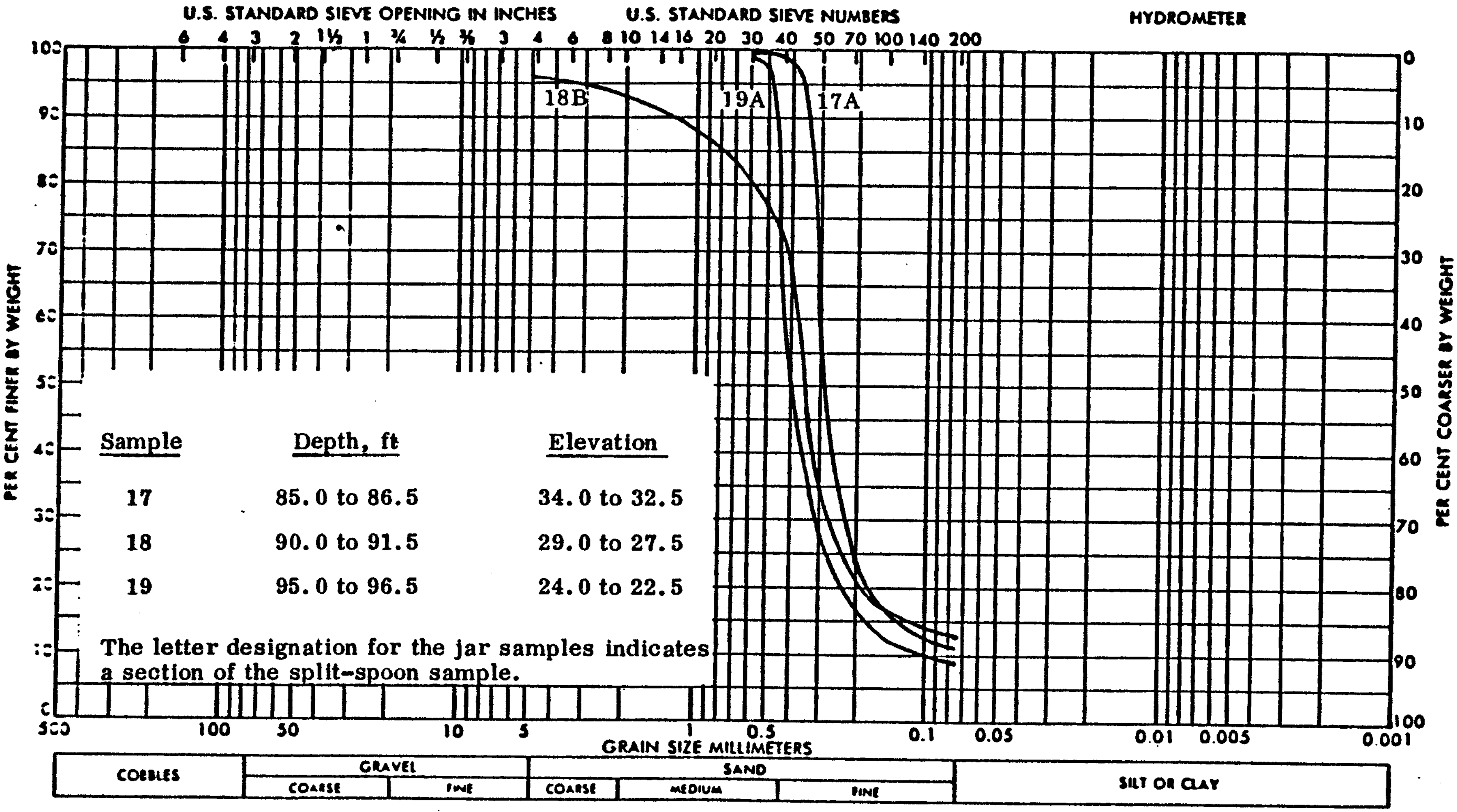
Project 7263

GRAIN SIZE CURVES
Boring 103
Sample 16A, 17B, 18B

Jan 1973

FIG. 2

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
17	85.0 to 86.5	34.0 to 32.5
18	90.0 to 91.5	29.0 to 27.5
19	95.0 to 96.5	24.0 to 22.5

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
17	BC
18	BC
19	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

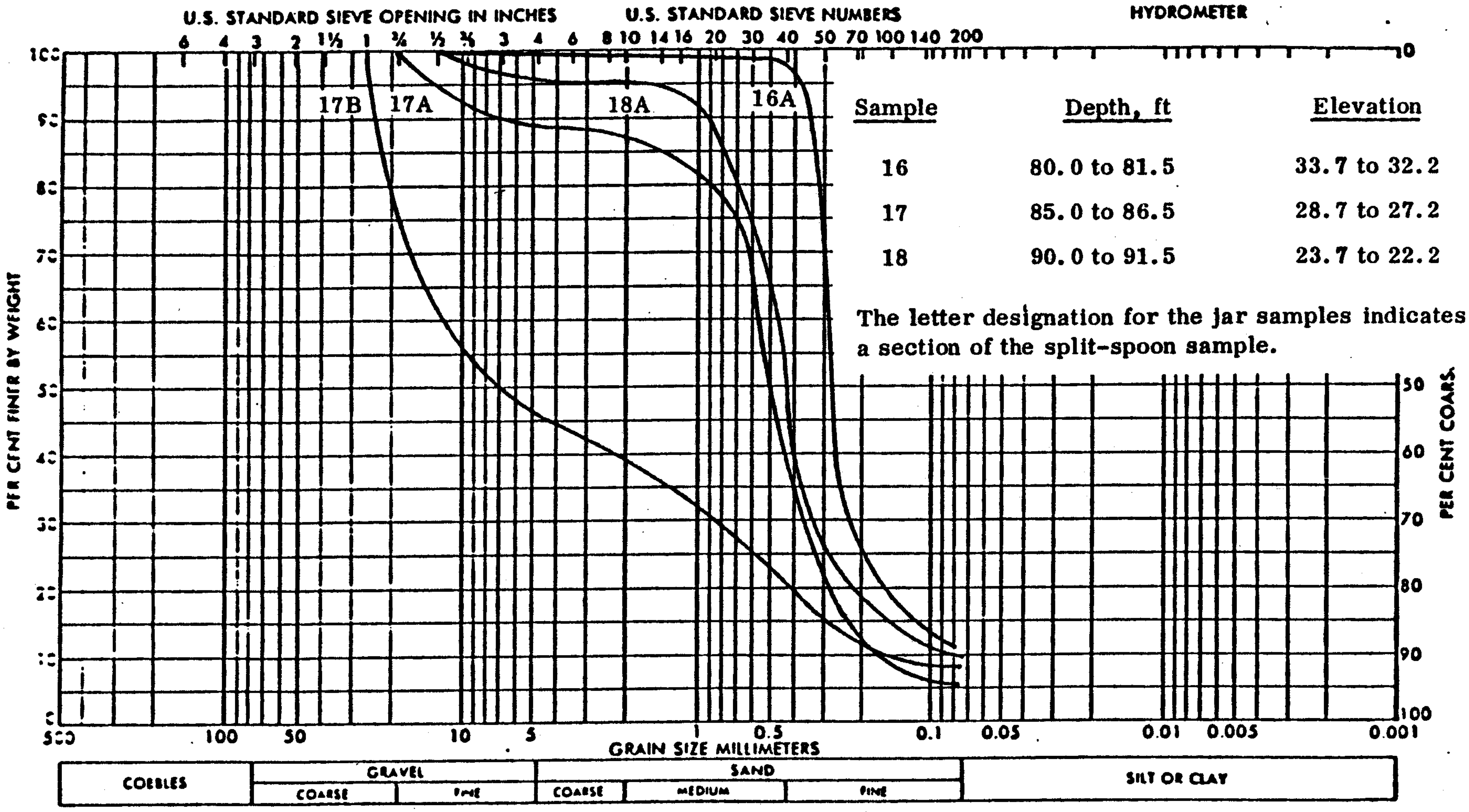
Project 7263

GRAIN SIZE CURVES
Boring 104
Sample 17A, 18B, 19A

Jan 1973

FIG. 3

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
16	80.0 to 81.5	33.7 to 32.2
17	85.0 to 86.5	28.7 to 27.2
18	90.0 to 91.5	23.7 to 22.2

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
16	BC
17	BC
18	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

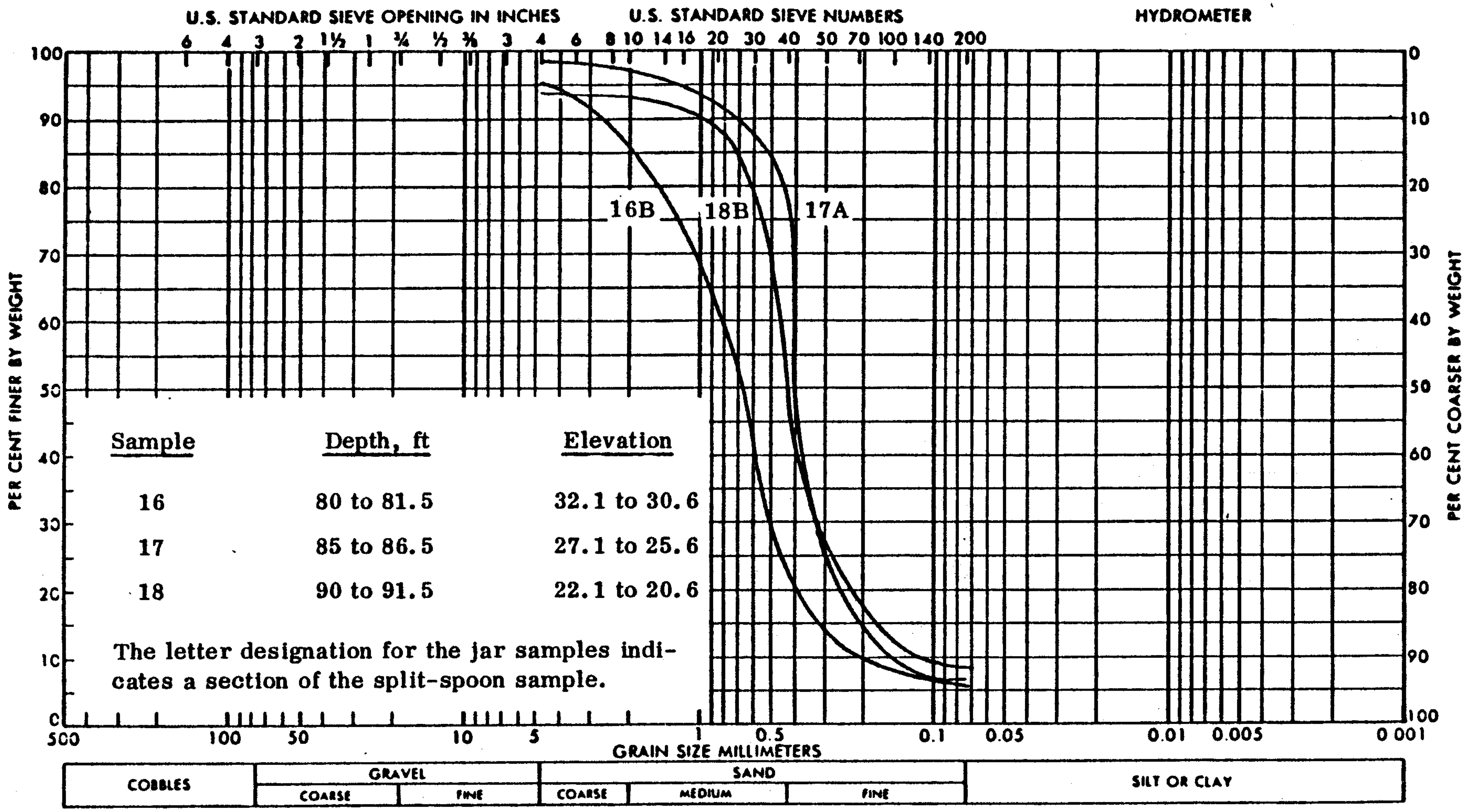
River Bend Power Station
Gulf States Utilities

Project 7263

GRAIN SIZE CURVES
Boring 105
Sample 16A, 17A&B, 18A

Jan 1973

FIG. 4



Sample	Depth, ft	Elevation
16	80 to 81.5	32.1 to 30.6
17	85 to 86.5	27.1 to 25.6
18	90 to 91.5	22.1 to 20.6

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
16	BC
17	BC
18	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

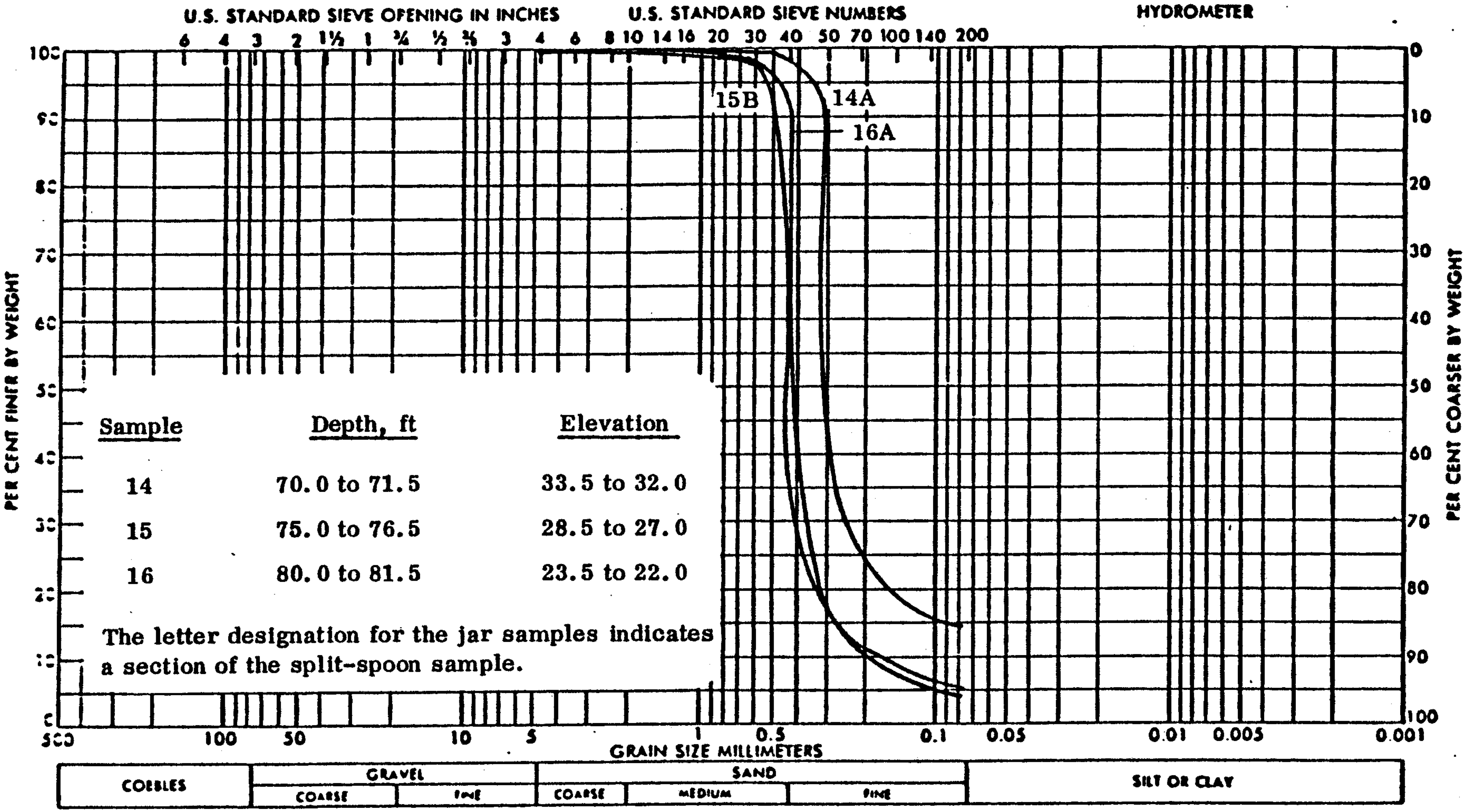
River Bend Power Station
Gulf States Utilities

Project 7263

GRAIN SIZE CURVES
Boring 106
Samples 16B, 17A, 18B

Jan 1973

FIG. 5



Sample	Depth, ft	Elevation
14	70.0 to 71.5	33.5 to 32.0
15	75.0 to 76.5	28.5 to 27.0
16	80.0 to 81.5	23.5 to 22.0

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
14	BC
15	BC
16	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

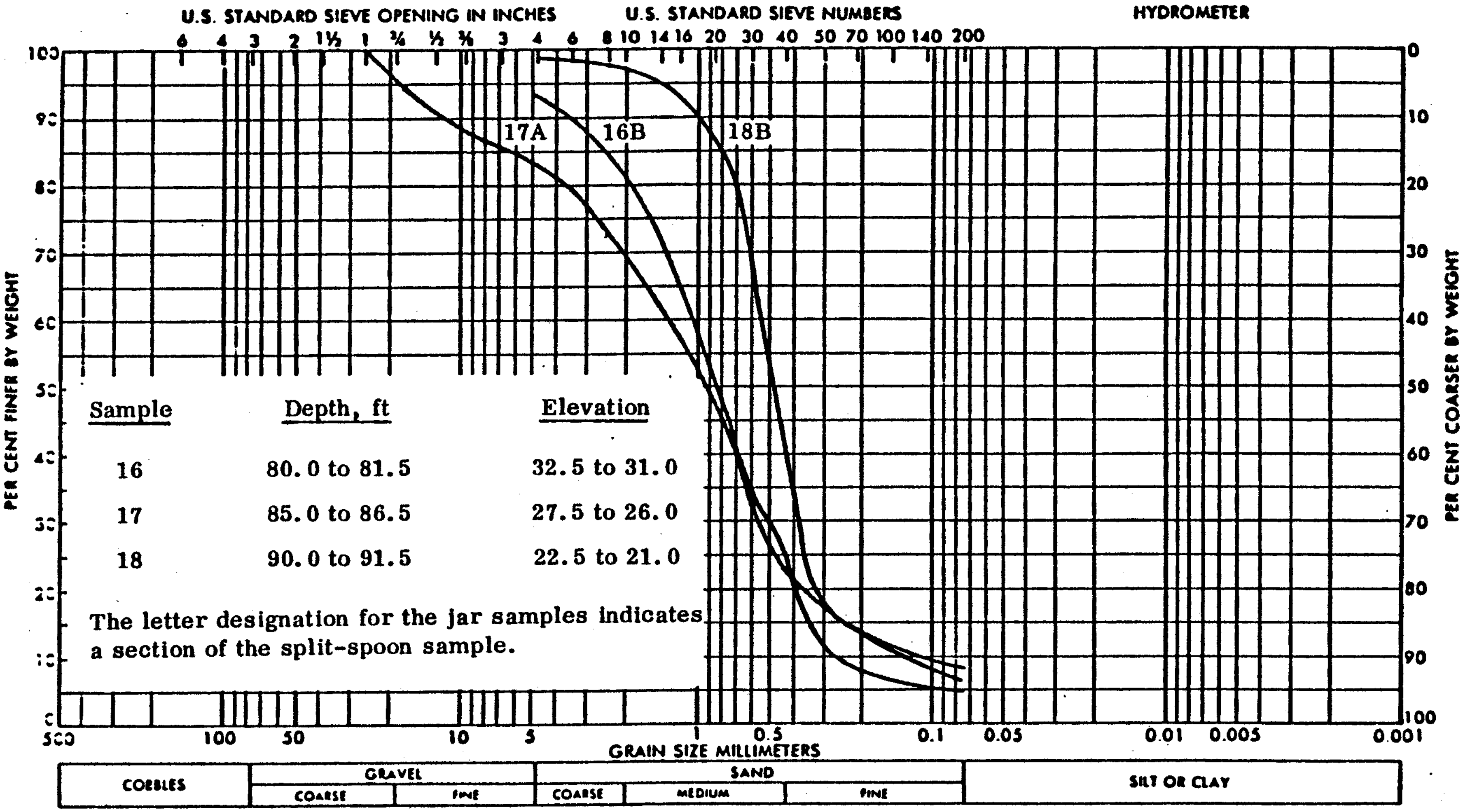
Project 7263

GRAIN SIZE CURVES
Boring 107
Sample 14A, 15B, 16A

Jan 1973

FIG. 6

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
16	80.0 to 81.5	32.5 to 31.0
17	85.0 to 86.5	27.5 to 26.0
18	90.0 to 91.5	22.5 to 21.0

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
16	BC
17	BC
18	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

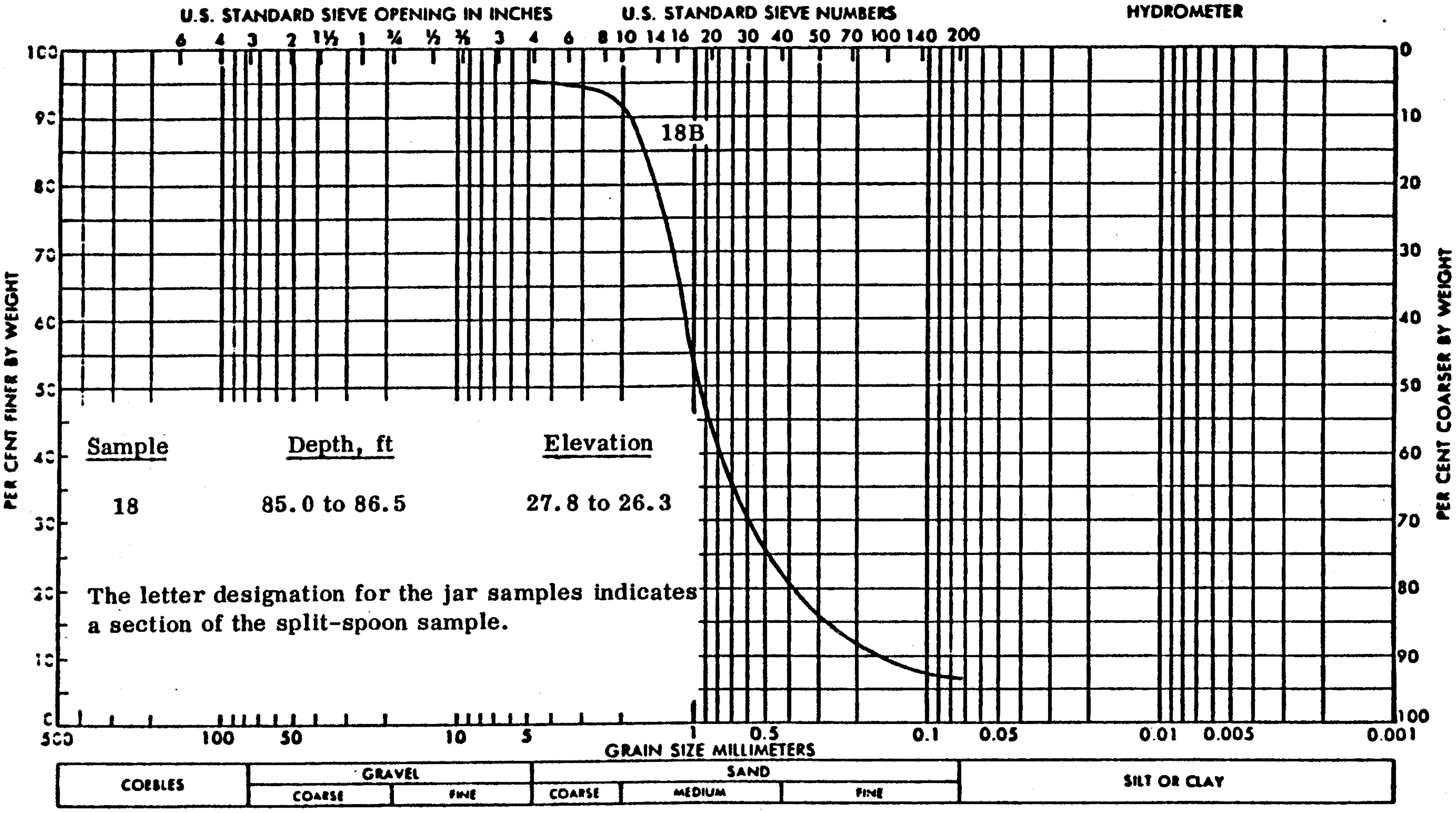
River Bend Power Station
Gulf States Utilities

Project 7263

GRAIN SIZE CURVES
Boring 108
Sample 16B, 17A, 18B

Jan 1973

FIG. 7



Sample	Depth, ft	Elevation
18	85.0 to 86.5	27.8 to 26.3

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
18	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

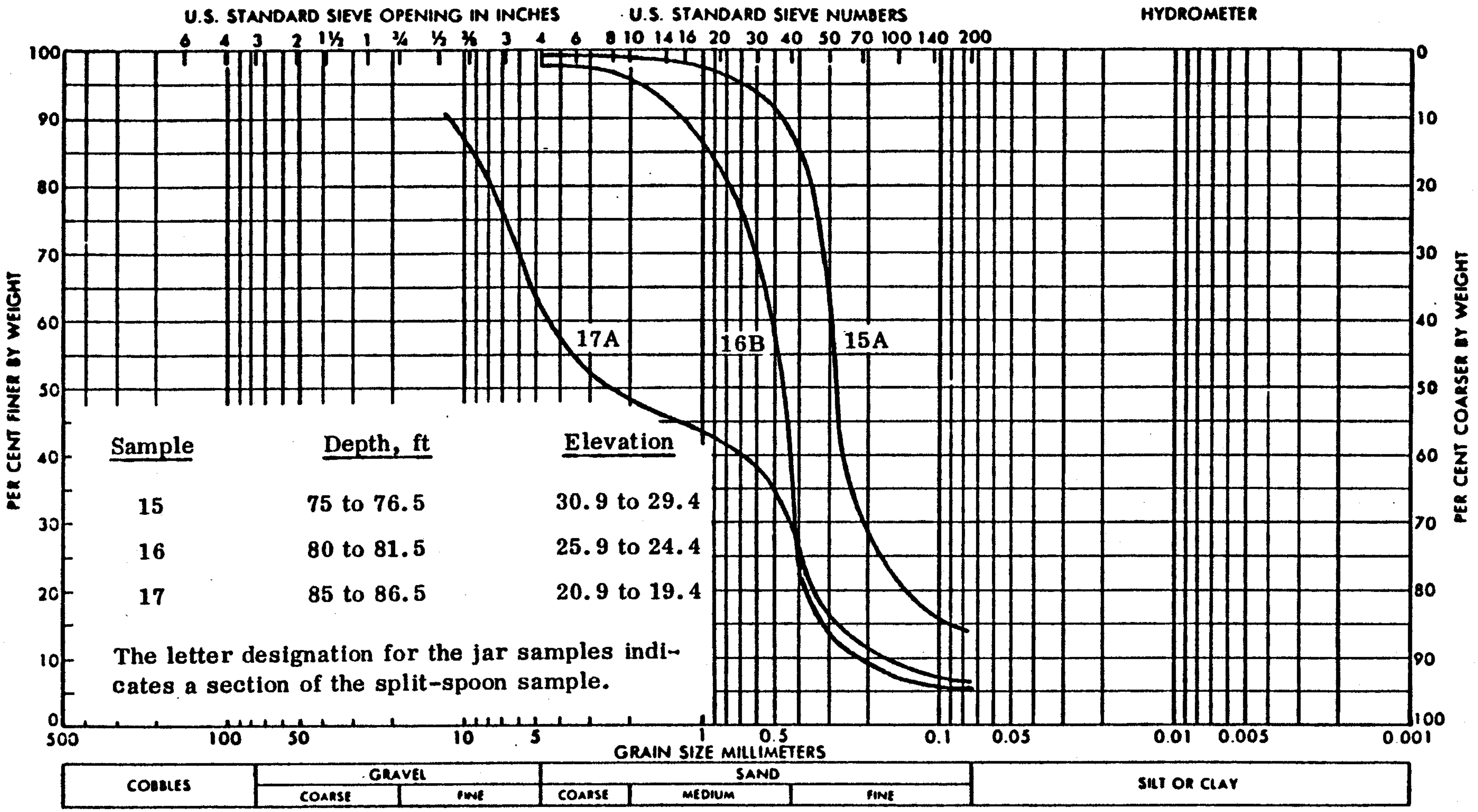
Project 7263

GRAIN SIZE CURVES
Boring 109
Sample 18B

Jan 1973

FIG. 8

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
15	75 to 76.5	30.9 to 29.4
16	80 to 81.5	25.9 to 24.4
17	85 to 86.5	20.9 to 19.4

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
15	BC
16	BC
17	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

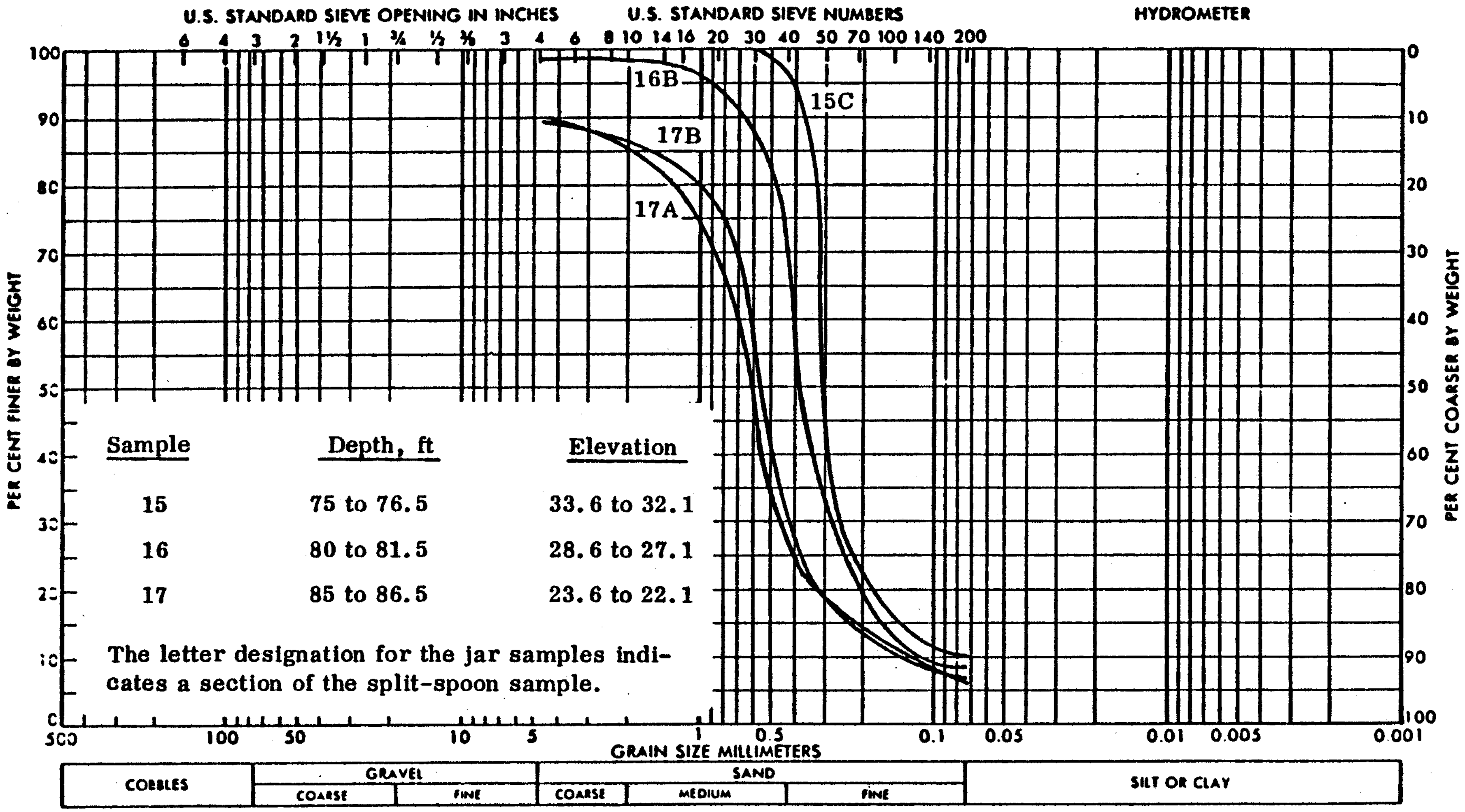
River Bend Power Station
Gulf States Utilities

Project 7263

GRAIN SIZE CURVES
Boring 110
Samples 15A, 16B, 17A

Jan 1973

FIG. 9



Sample	Depth, ft	Elevation
15	75 to 76.5	33.6 to 32.1
16	80 to 81.5	28.6 to 27.1
17	85 to 86.5	23.6 to 22.1

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
15	BC
16	BC
17	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

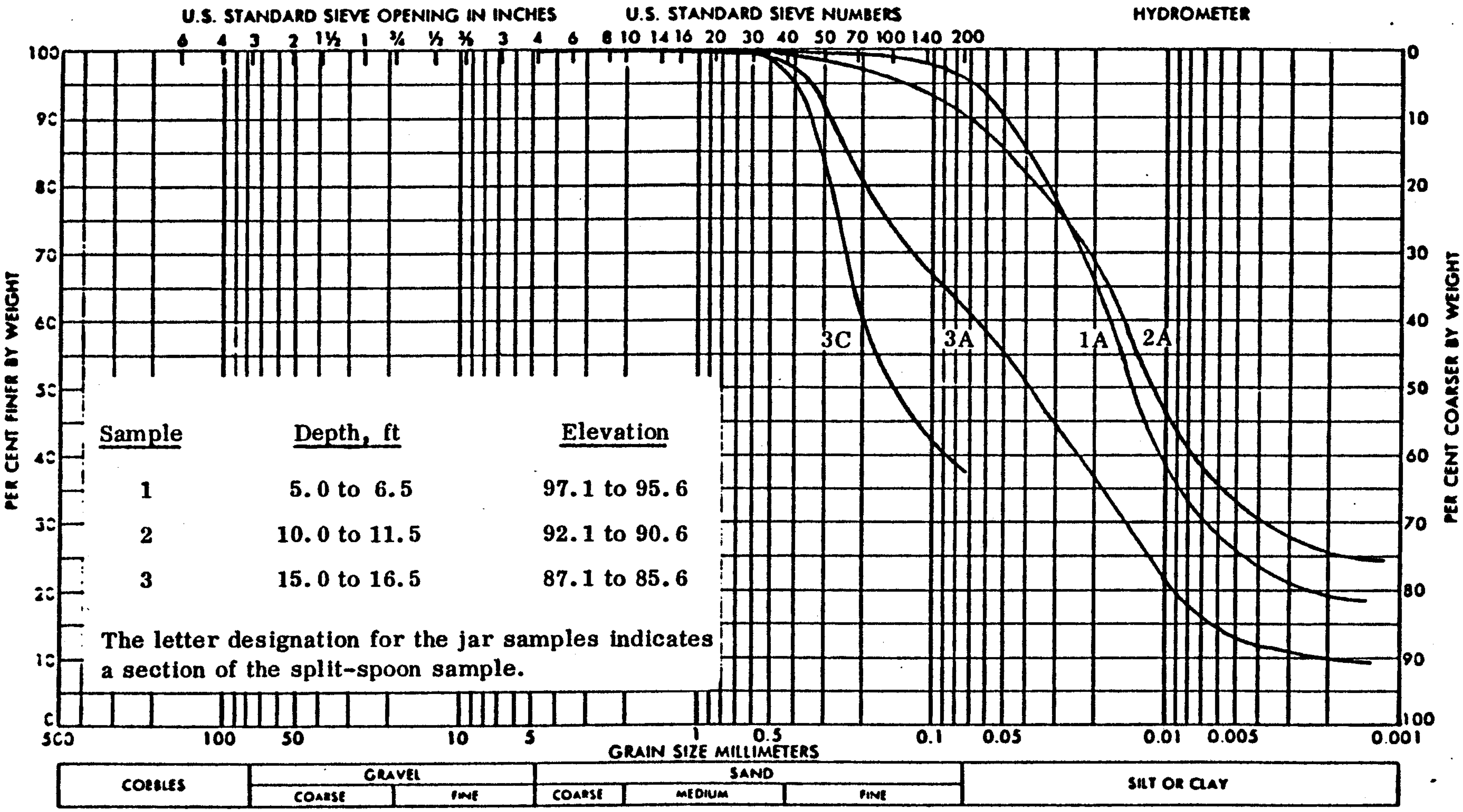
Project 7263

GRAIN SIZE CURVES
Boring 111
Samples 15C, 16B, 17A&

Jan 1973

FIG. 10

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
1	5.0 to 6.5	97.1 to 95.6
2	10.0 to 11.5	92.1 to 90.6
3	15.0 to 16.5	87.1 to 85.6

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
1	L
2	PH
3	S

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

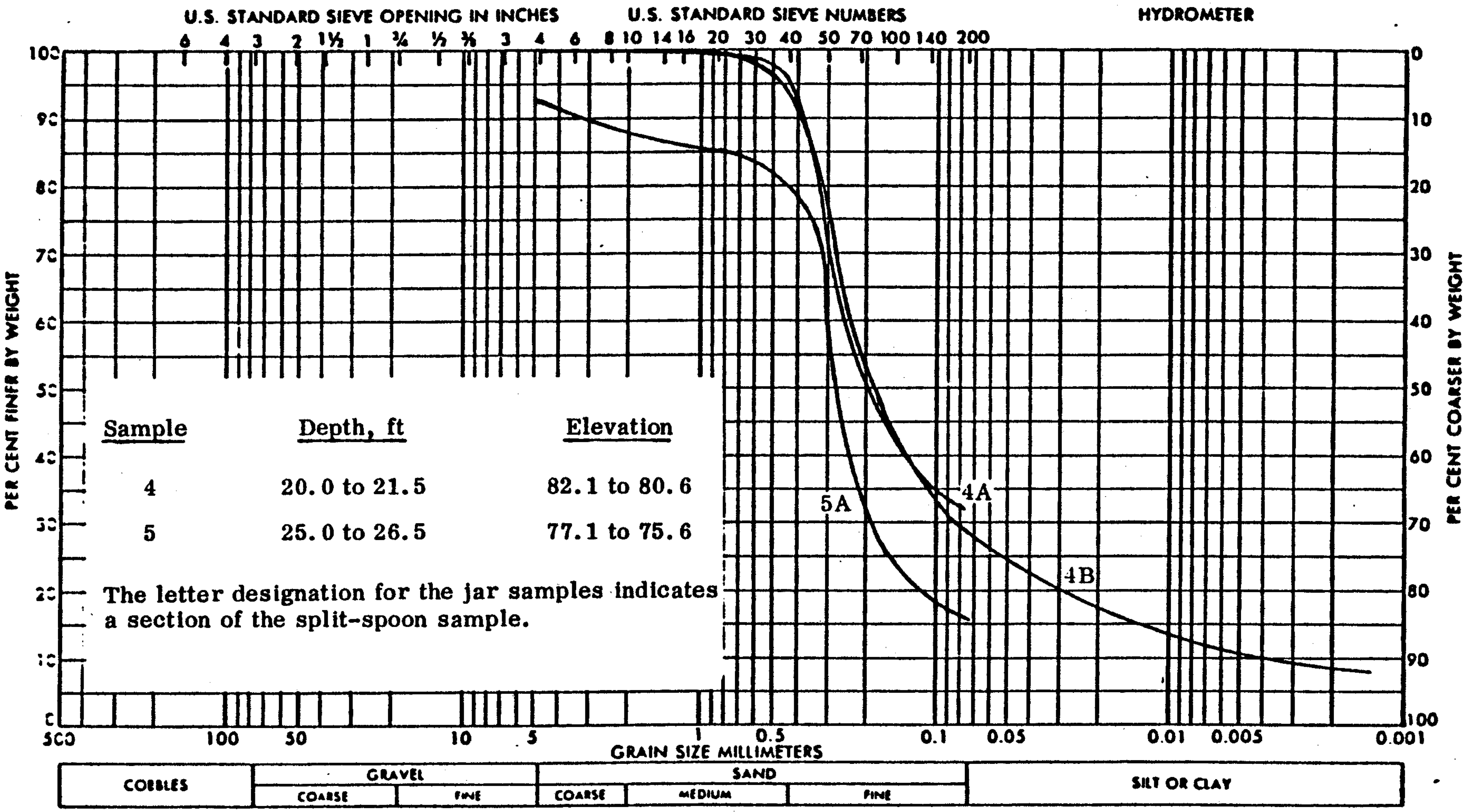
Project 7263

GRAIN SIZE CURVES
Boring 112
Sample 1A, 2A, 3A, 3C

Jan 1973

FIG. 11

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
4	20.0 to 21.5	82.1 to 80.6
5	25.0 to 26.5	77.1 to 75.6

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
4	S
5	S

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

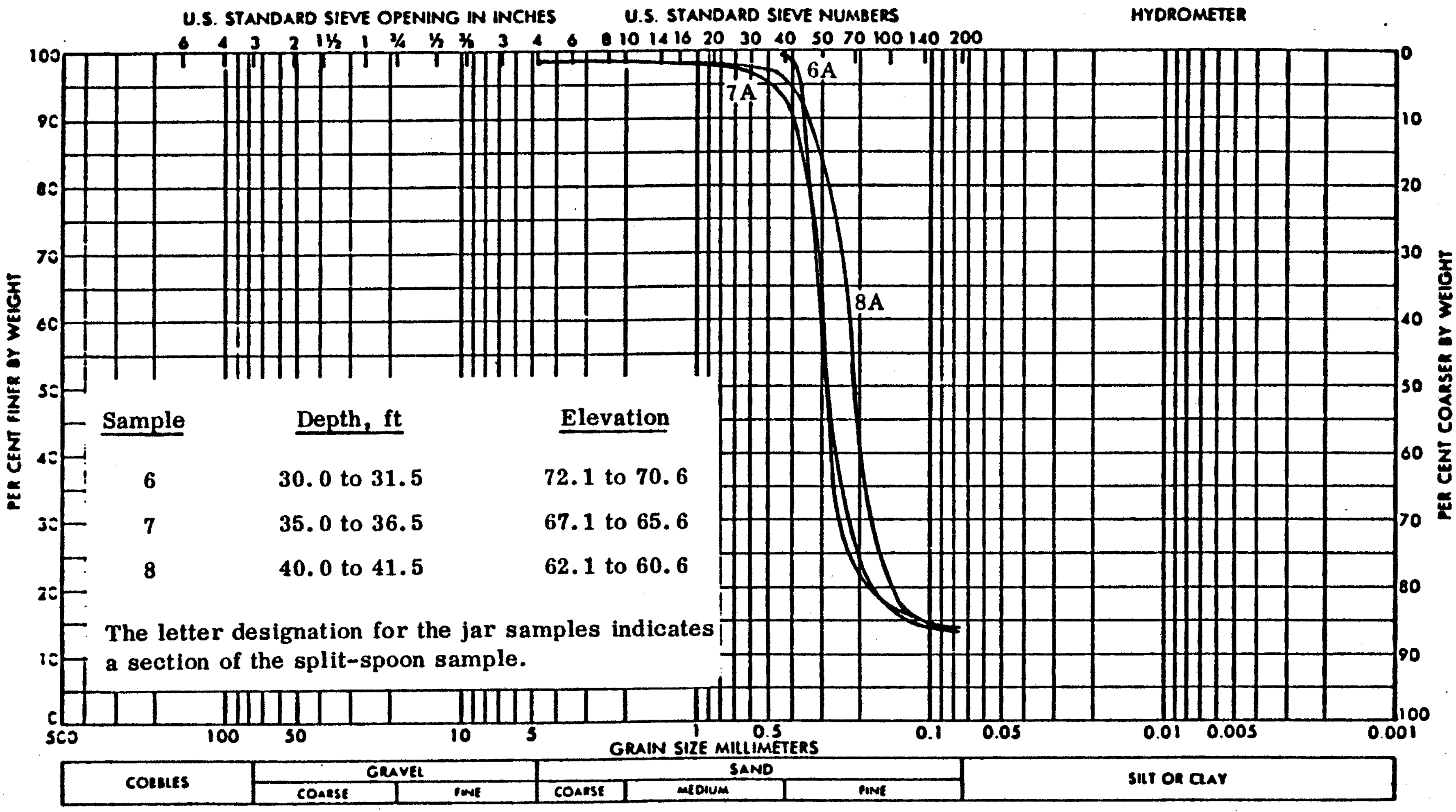
Project 7263

GRAIN SIZE CURVES
Boring 112
Sample 4A, 4B, 5A

Jan 1973

FIG. 12

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
6	30.0 to 31.5	72.1 to 70.6
7	35.0 to 36.5	67.1 to 65.6
8	40.0 to 41.5	62.1 to 60.6

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
6	S
7	S
8	S

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

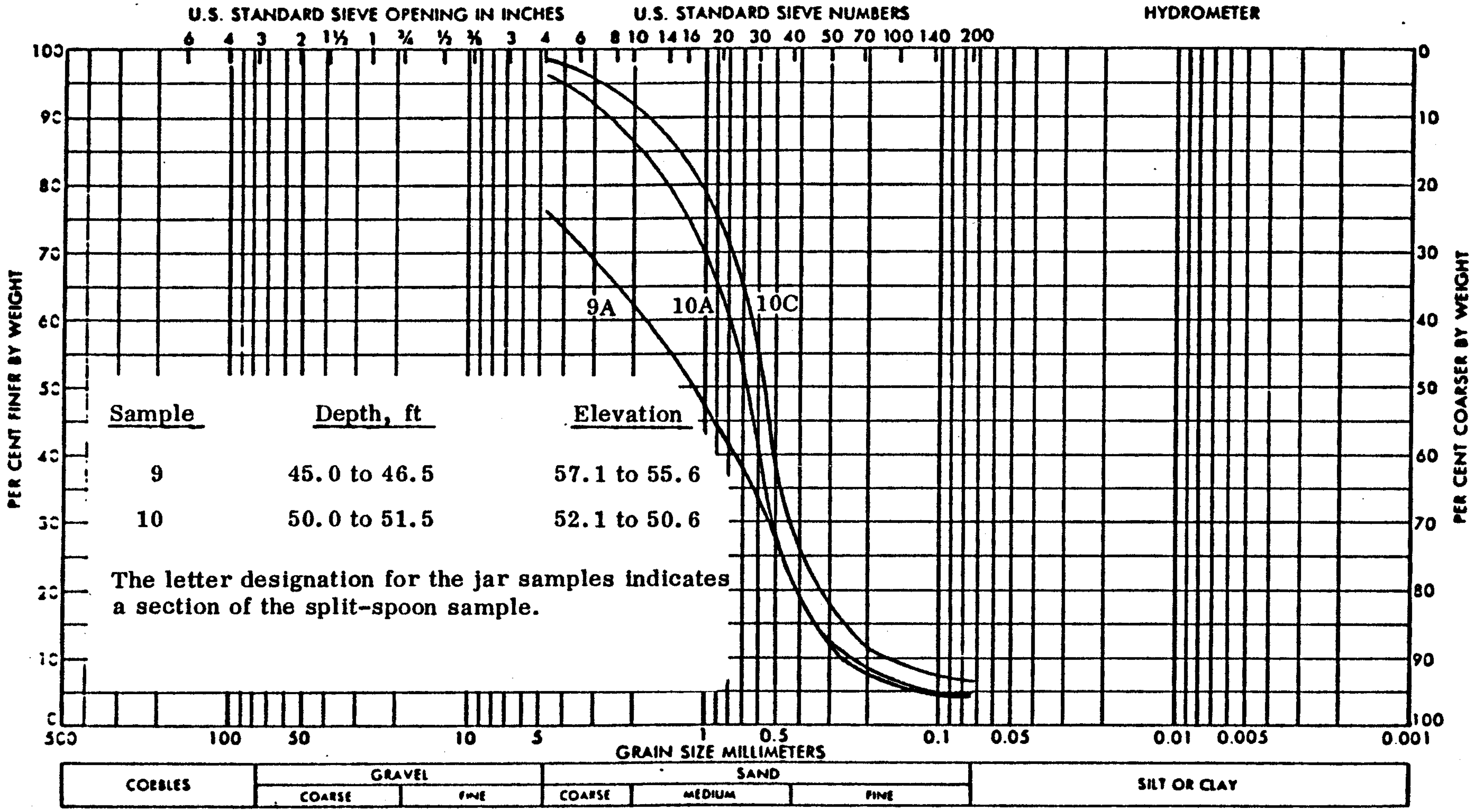
Project 7263

GRAIN SIZE CURVES
Boring 112
Sample 6A, 7A, 8A

Jan 1973

FIG. 13

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
9	45.0 to 46.5	57.1 to 55.6
10	50.0 to 51.5	52.1 to 50.6

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
9	BC
10	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

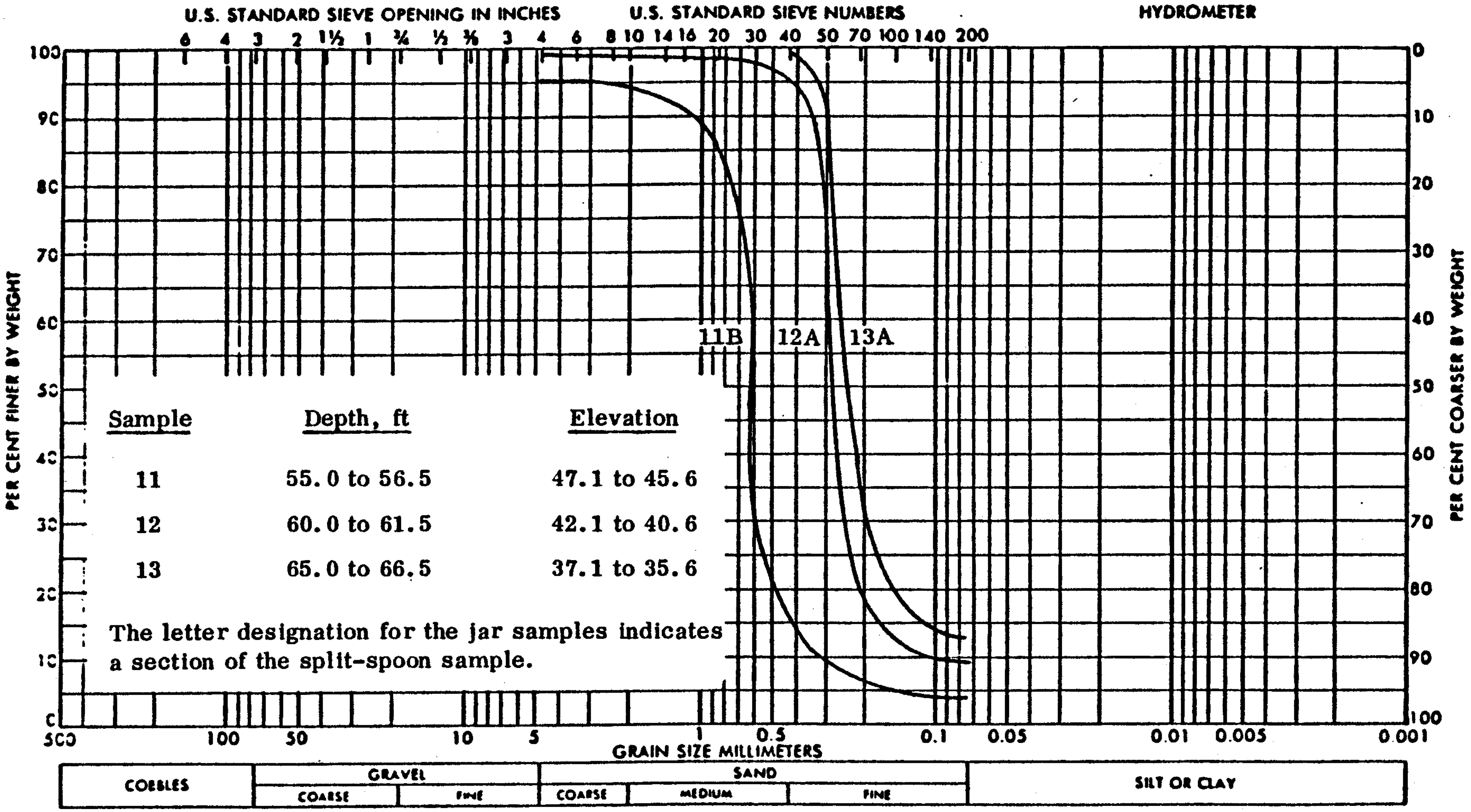
River Bend Power Station
Gulf States Utilities

Project 7263

GRAIN SIZE CURVES
Boring 112
Sample 9A, 10A, 10C

Jan 1973 FIG. 14

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
11	55.0 to 56.5	47.1 to 45.6
12	60.0 to 61.5	42.1 to 40.6
13	65.0 to 66.5	37.1 to 35.6

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
11	BC
12	BC
13	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

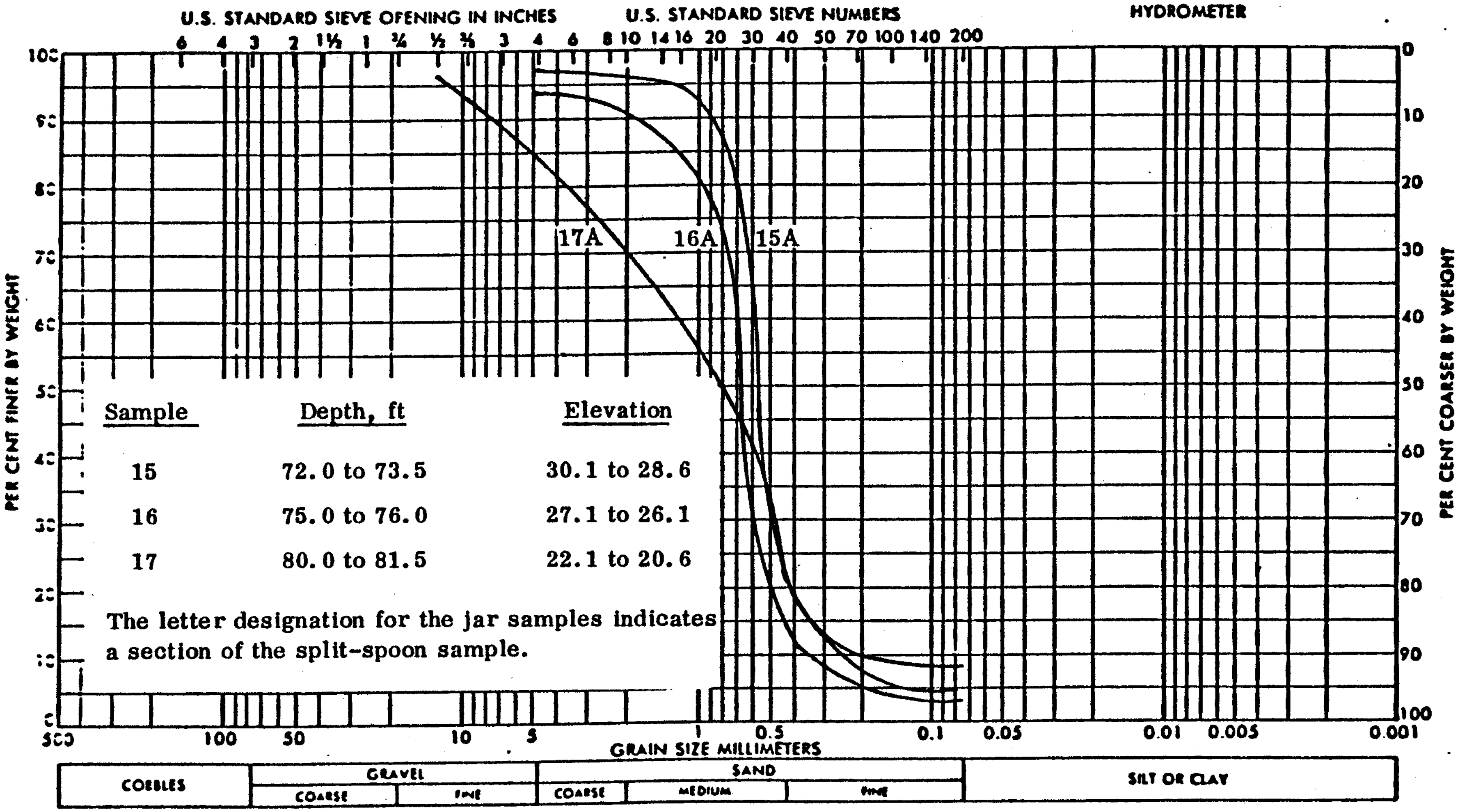
River Bend Power Station
Gulf States Utilities

Project 7263

GRAIN SIZE CURVES
Boring 112
Sample 11B, 12A, 13A

Jan 1973

FIG. 15



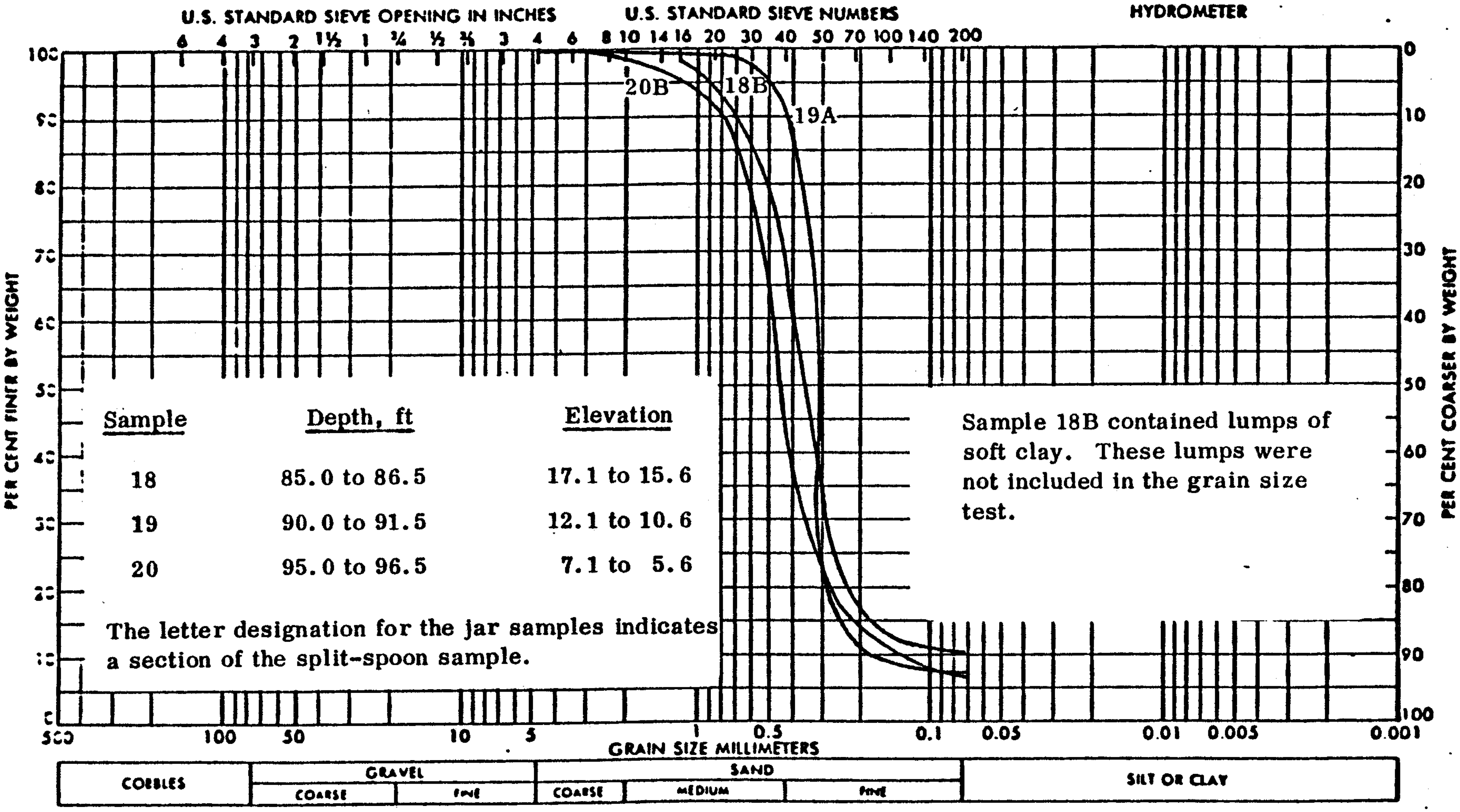
Sample	Depth, ft	Elevation
15	72.0 to 73.5	30.1 to 28.6
16	75.0 to 76.0	27.1 to 26.1
17	80.0 to 81.5	22.1 to 20.6

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
15	BC
16	BC
17	BC

Stone & Webster Eng. Corp. Boston, Mass.	River Bend Power Station Gulf States Utilities	GRAIN SIZE CURVES Boring 112 Sample 15A, 16A, 17A
Geotechnical Engineers, Inc. Winchester, Mass.	Project 7263	Jan 1973 FIG. 16

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
18	85.0 to 86.5	17.1 to 15.6
19	90.0 to 91.5	12.1 to 10.6
20	95.0 to 96.5	7.1 to 5.6

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample 18B contained lumps of soft clay. These lumps were not included in the grain size test.

Sample	Zone
18	BC
19	BC
20	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

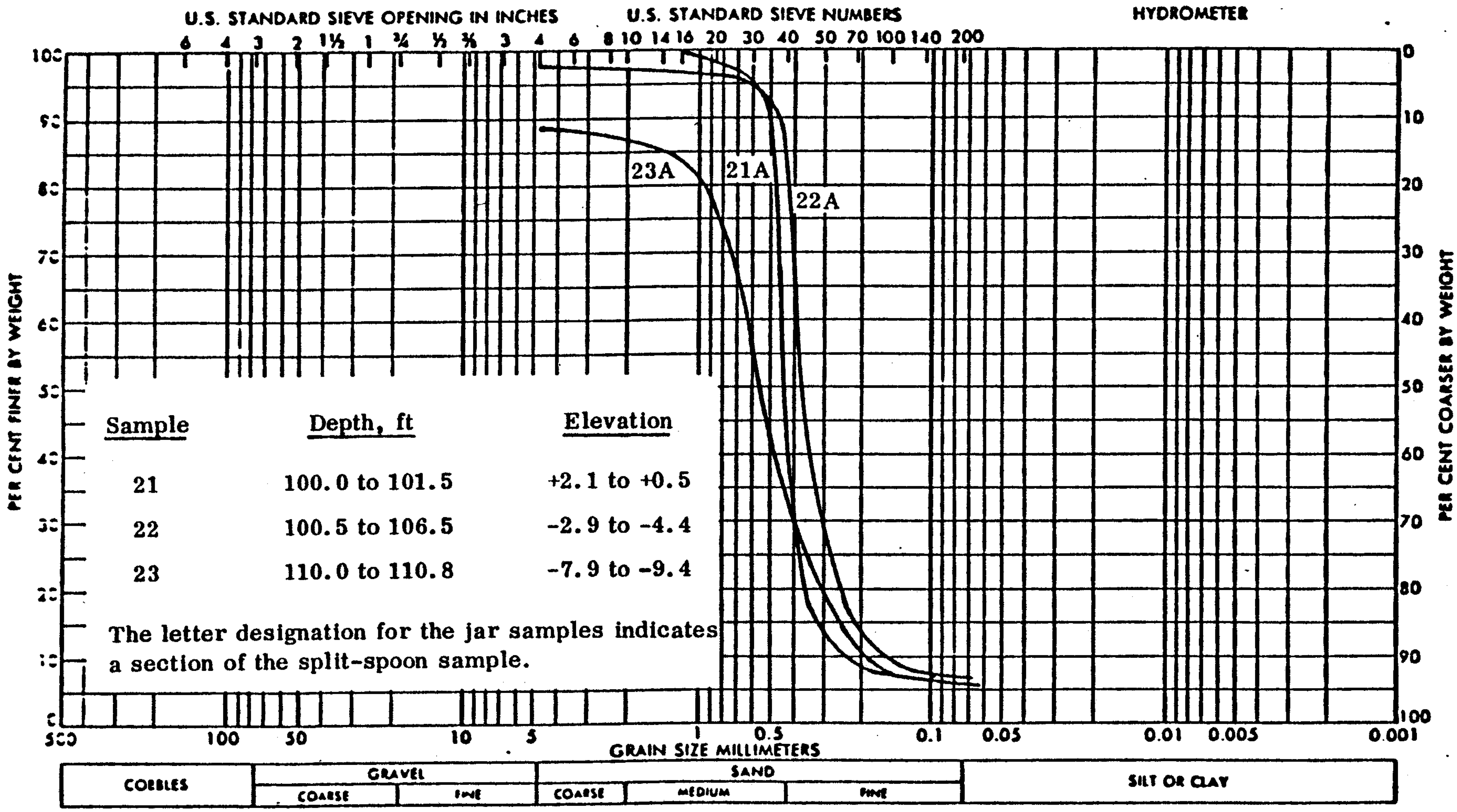
River Bend Power Station
Gulf States Utilities

Project 7263

GRAIN SIZE CURVES
Boring 112
Sample 18B, 19A, 20B

Jan 1973

FIG. 17



Sample	Depth, ft	Elevation
21	100.0 to 101.5	+2.1 to +0.5
22	100.5 to 106.5	-2.9 to -4.4
23	110.0 to 110.8	-7.9 to -9.4

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
21	BC
22	BC
23	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

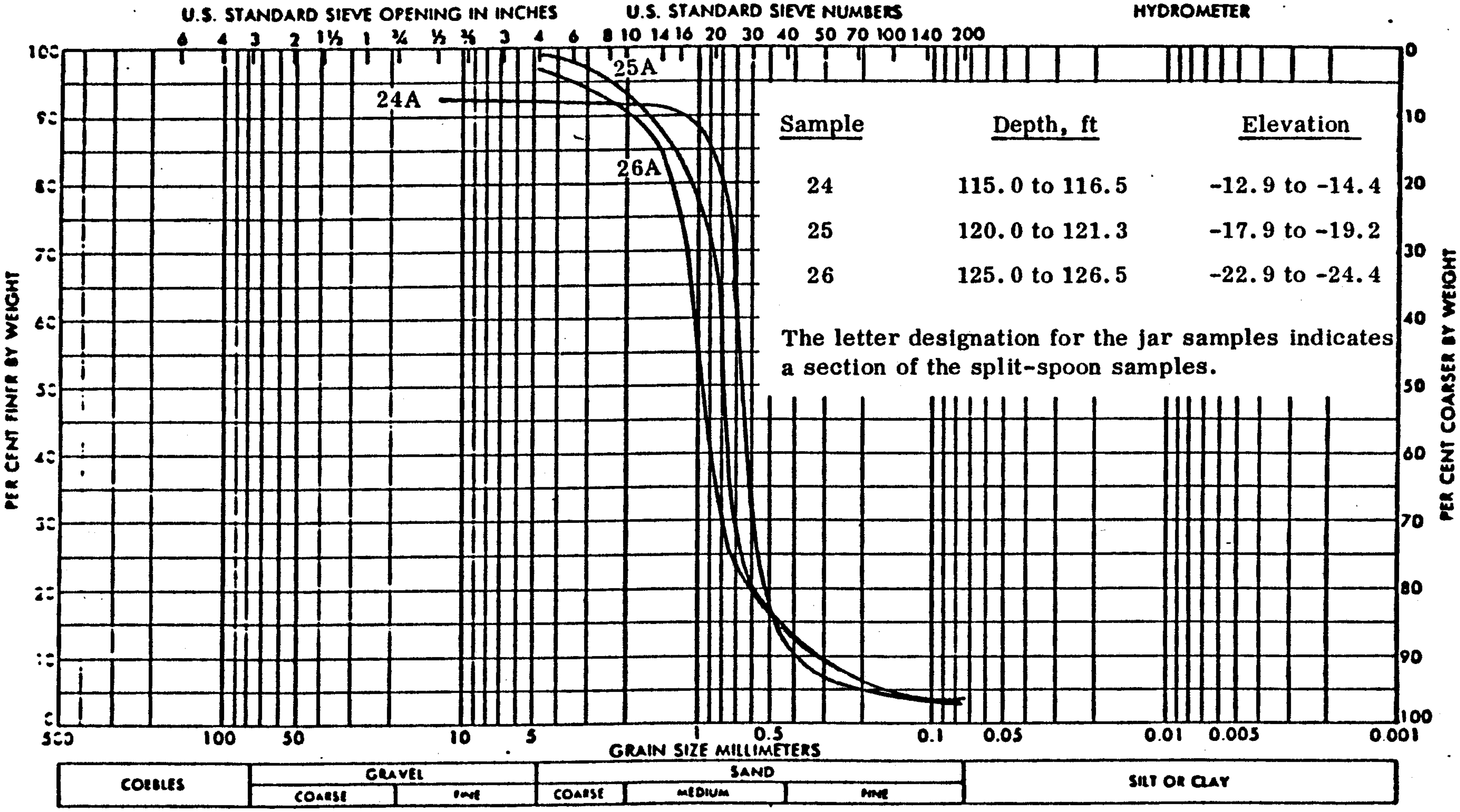
Project 7263

GRAIN SIZE CURVES
Boring 112
Sample 21A, 22A, 23A

Jan 1973

FIG. 18

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
24	115.0 to 116.5	-12.9 to -14.4
25	120.0 to 121.3	-17.9 to -19.2
26	125.0 to 126.5	-22.9 to -24.4

The letter designation for the jar samples indicates a section of the split-spoon samples.

Sample	Zone
24	BC
25	BC
26	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

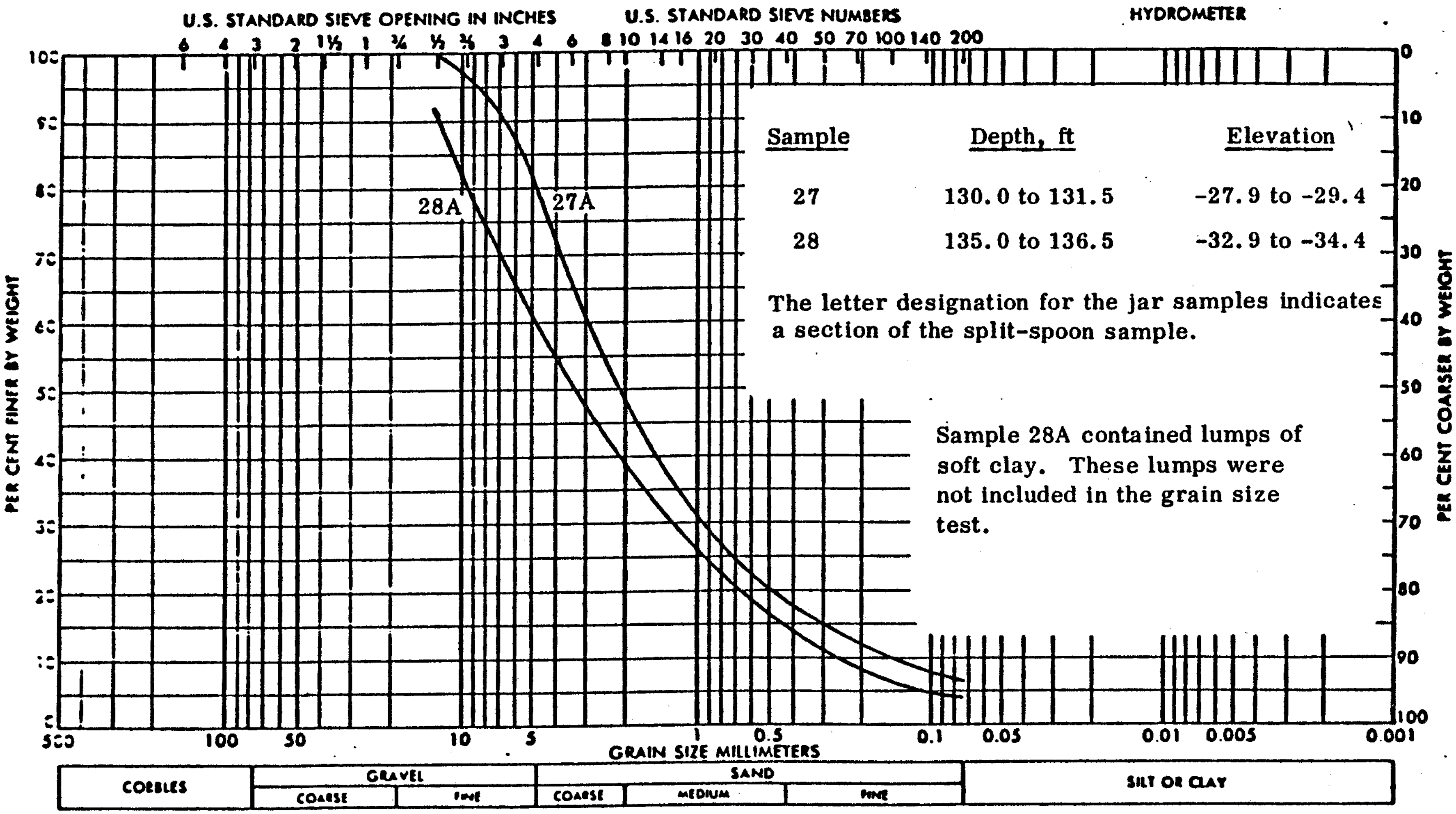
Project 7263

GRAIN SIZE CURVES
Boring 112
Sample 24A, 25A, 26A

Jan 1973

FIG. 19

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
27	130.0 to 131.5	-27.9 to -29.4
28	135.0 to 136.5	-32.9 to -34.4

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample 28A contained lumps of soft clay. These lumps were not included in the grain size test.

Sample	Zone
27	BC
28	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

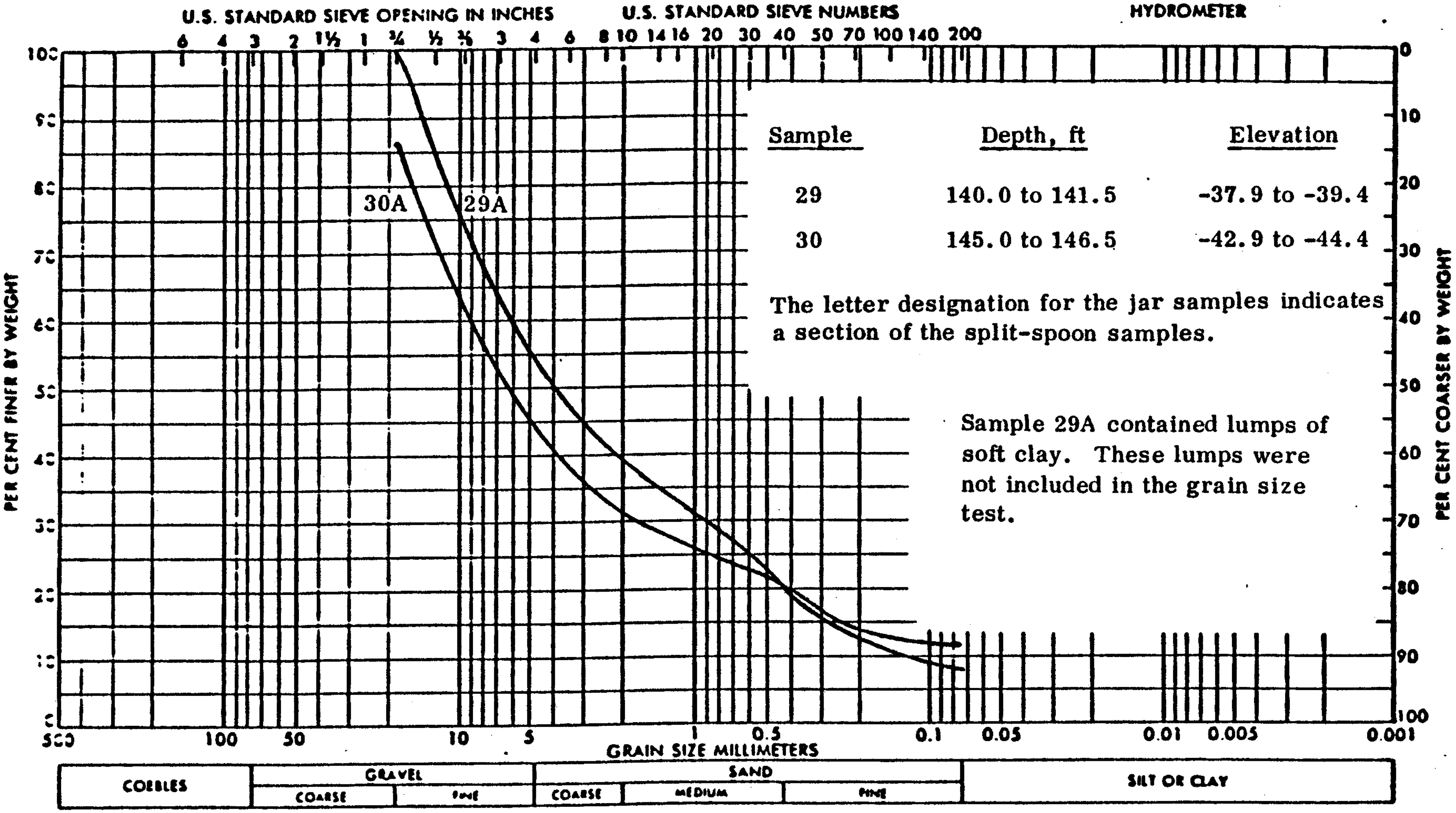
Project 7263

GRAIN SIZE CURVES
Boring 112
Sample 27A, 28A

Jan 1973

FIG. 20

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
29	140.0 to 141.5	-37.9 to -39.4
30	145.0 to 146.5	-42.9 to -44.4

The letter designation for the jar samples indicates a section of the split-spoon samples.

Sample 29A contained lumps of soft clay. These lumps were not included in the grain size test.

Sample	Zone
29	BC
30	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

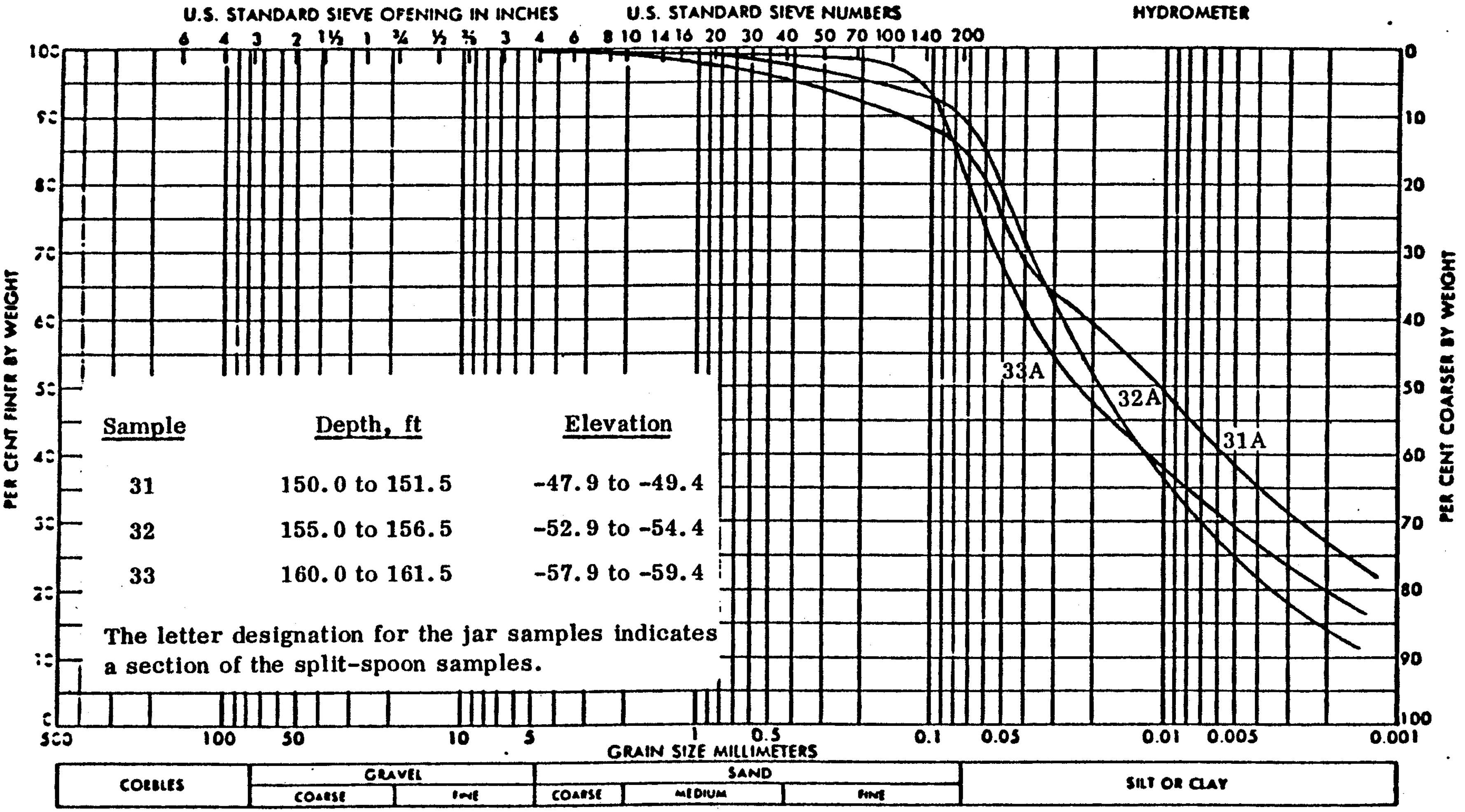
Project 7263

GRAIN SIZE CURVES
Boring 112
Sample 29A, 30A

Jan 1973

FIG. 21

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
31	150.0 to 151.5	-47.9 to -49.4
32	155.0 to 156.5	-52.9 to -54.4
33	160.0 to 161.5	-57.9 to -59.4

The letter designation for the jar samples indicates a section of the split-spoon samples.

Samples	Zone
31	PC
32	PC
33	PC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

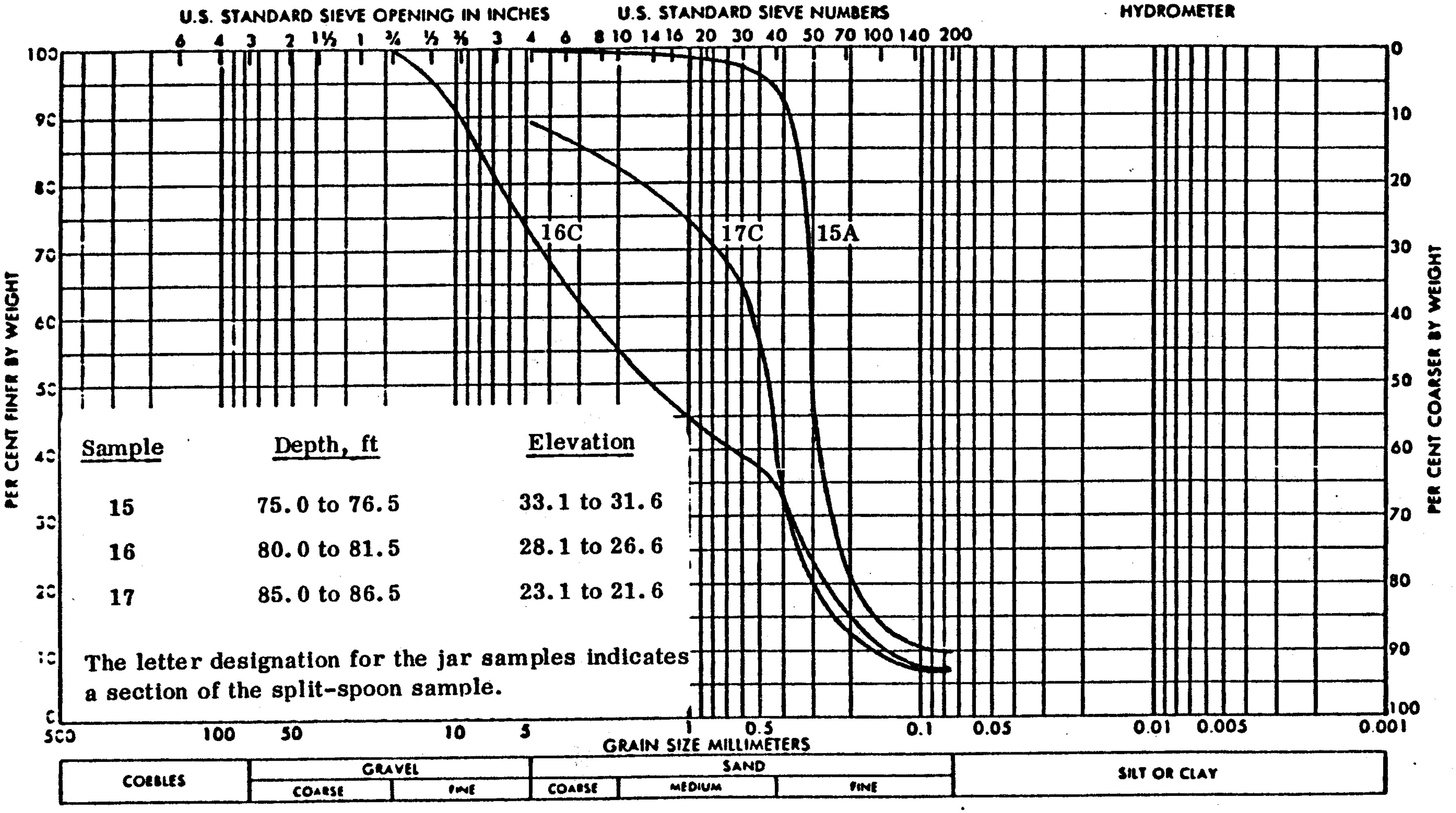
Project 7263

GRAIN SIZE CURVES
Boring 112
Sample 31A, 32A, 33A

Jan 1973

FIG. 22

GEOTECHNICAL ENGINEERS INC



Sample	Depth, ft	Elevation
15	75.0 to 76.5	33.1 to 31.6
16	80.0 to 81.5	28.1 to 26.6
17	85.0 to 86.5	23.1 to 21.6

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
15	BC
16	BC
17	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

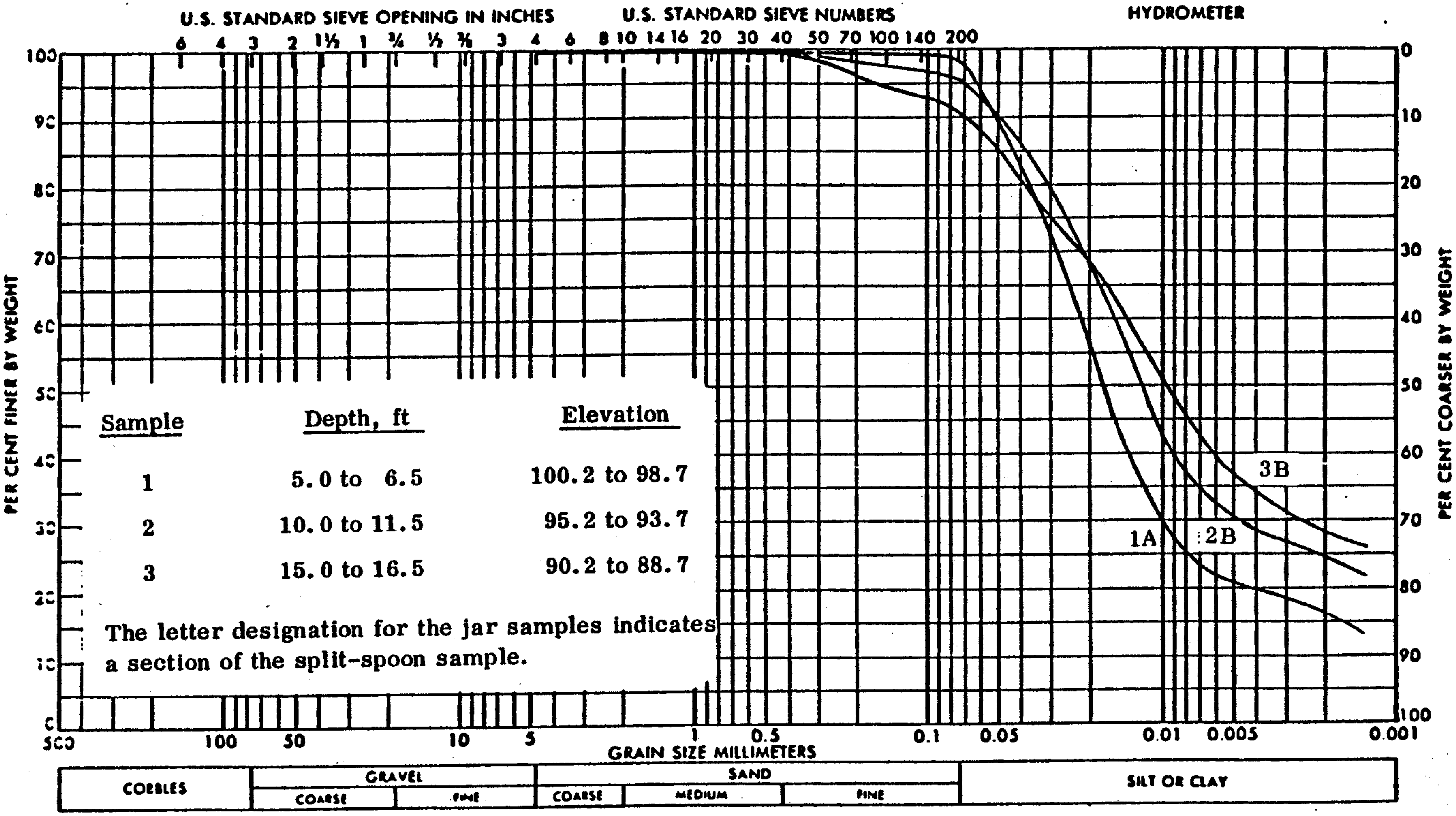
Project 7263

GRAIN SIZE CURVES
Boring 113
Sample 15A, 16C, 17C

Jan 1973

FIG. 23

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
1	5.0 to 6.5	100.2 to 98.7
2	10.0 to 11.5	95.2 to 93.7
3	15.0 to 16.5	90.2 to 88.7

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
1	L
2	PH
3	PH

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

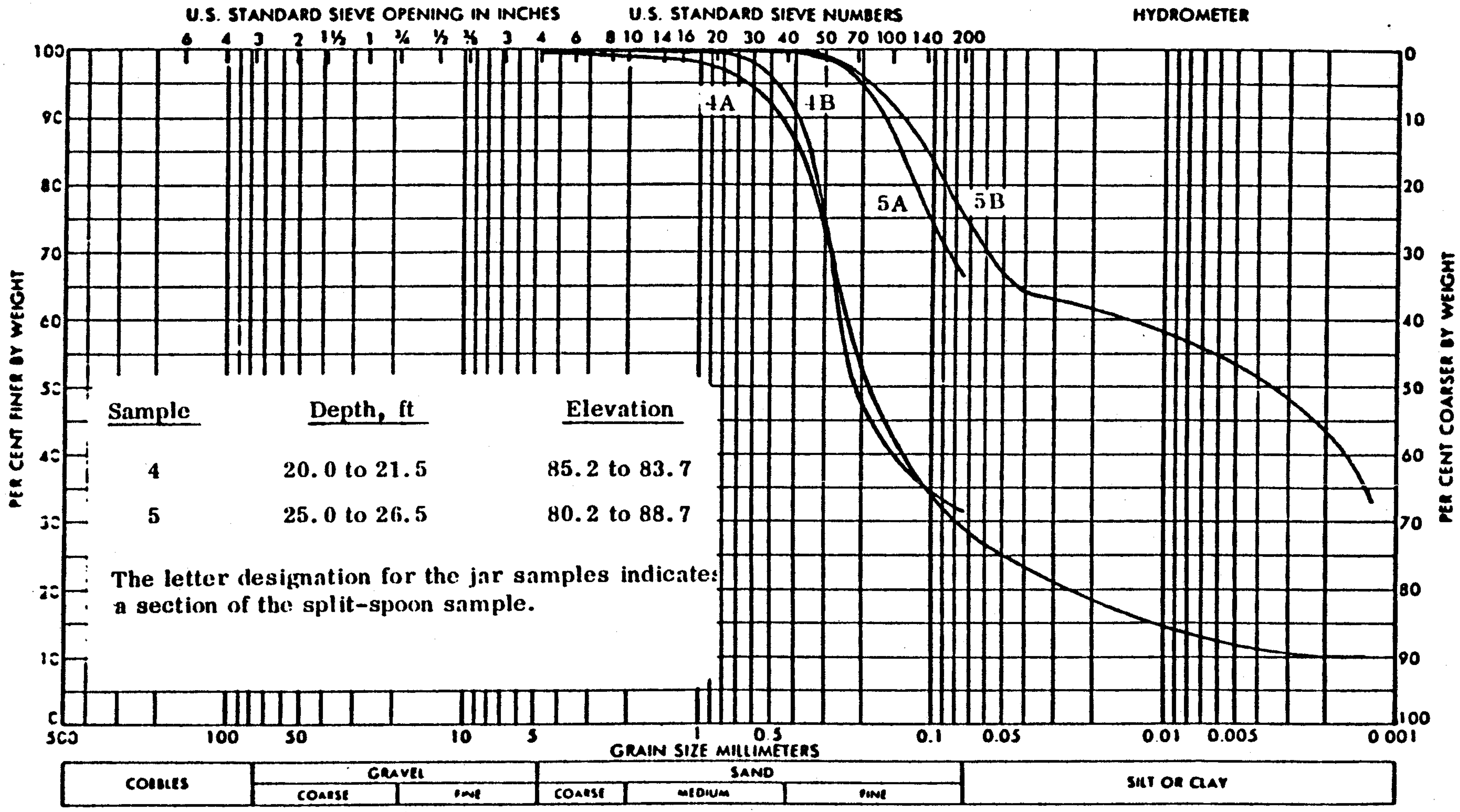
Project 7263

GRAIN SIZE CURVES
Boring 114
Sample 1A, 2B, 3B

Jan 1973

FIG. 24

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
4	20.0 to 21.5	85.2 to 83.7
5	25.0 to 26.5	80.2 to 88.7

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
4	S
5	S

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

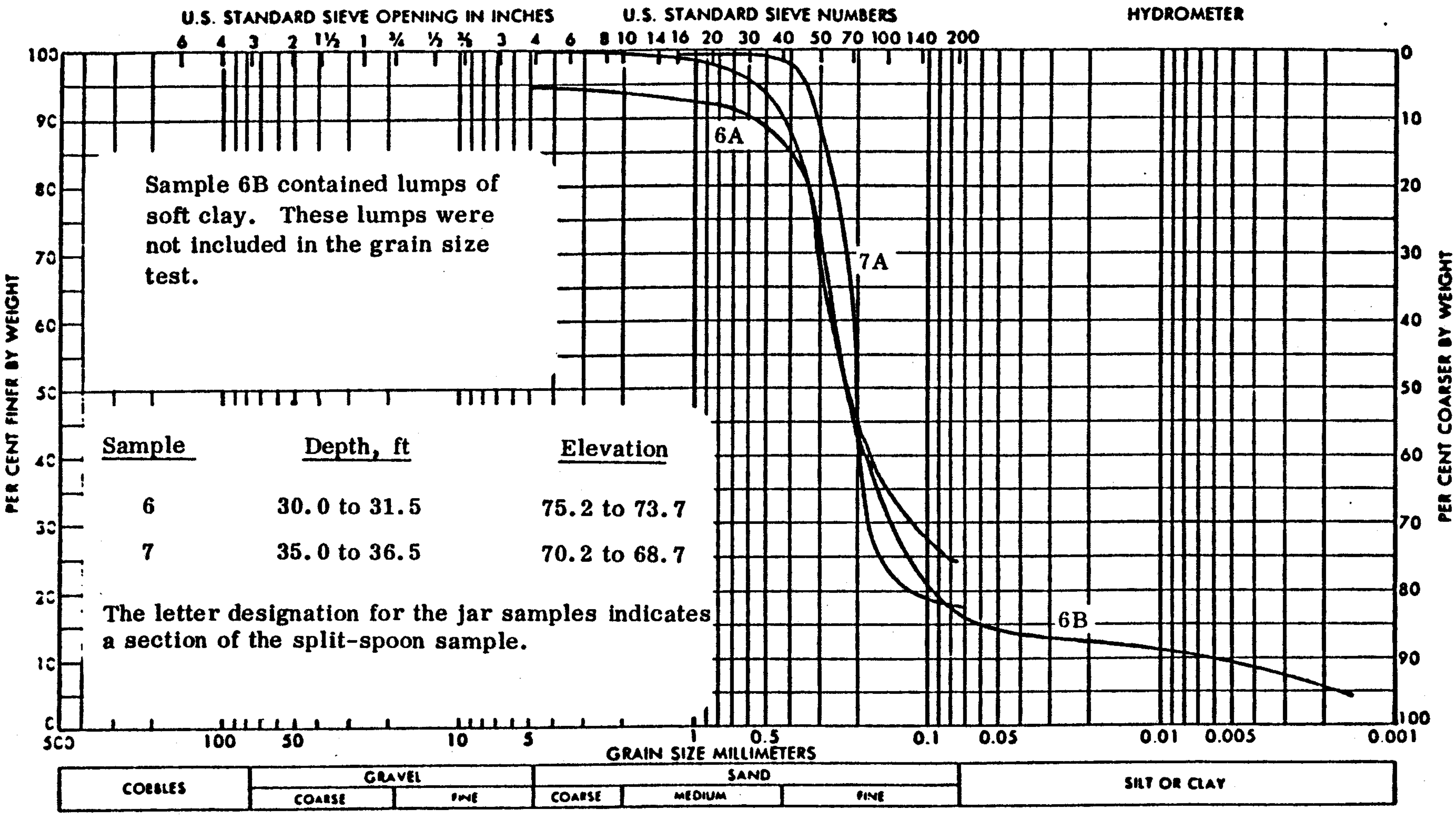
River Bend Power Station
Gulf States Utilities

Project 7263

GRAIN SIZE CURVES
Boring 114
Sample 4A, 4B, 5A, 5B

Jan 1973 FIG. 25

GEOTECHNICAL ENGINEERS INC.



Sample 6B contained lumps of soft clay. These lumps were not included in the grain size test.

Sample	Depth, ft	Elevation
6	30.0 to 31.5	75.2 to 73.7
7	35.0 to 36.5	70.2 to 68.7

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
6	S
7	S

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

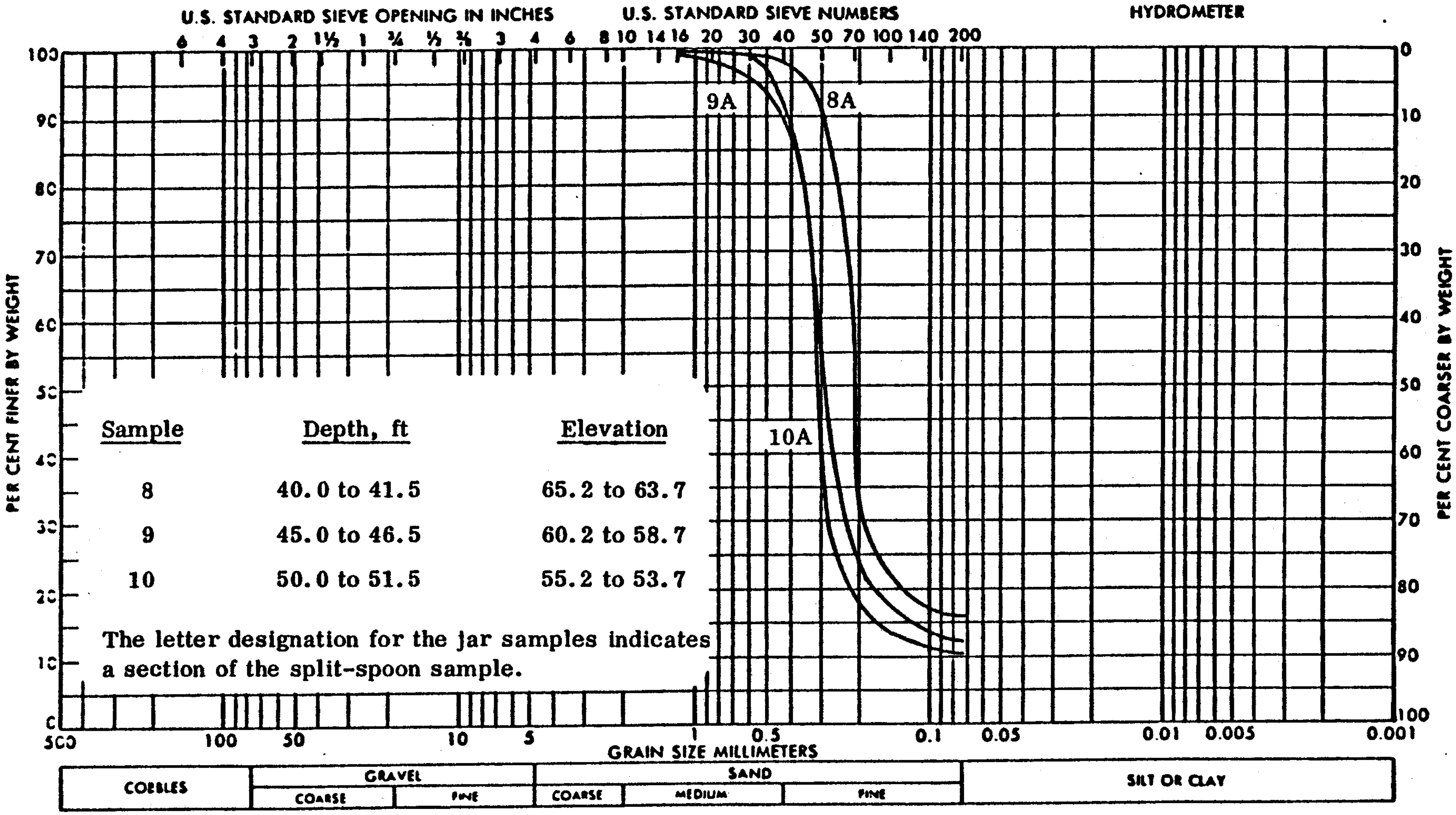
River Bend Power Station
Gulf States Utilities

Project 7263

GRAIN SIZE CURVES
Boring 114
Sample 6A, 6B, 7A

Jan 1973

FIG. 26



Sample	Depth, ft	Elevation
8	40.0 to 41.5	65.2 to 63.7
9	45.0 to 46.5	60.2 to 58.7
10	50.0 to 51.5	55.2 to 53.7

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
8	S
9	S
10	S

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

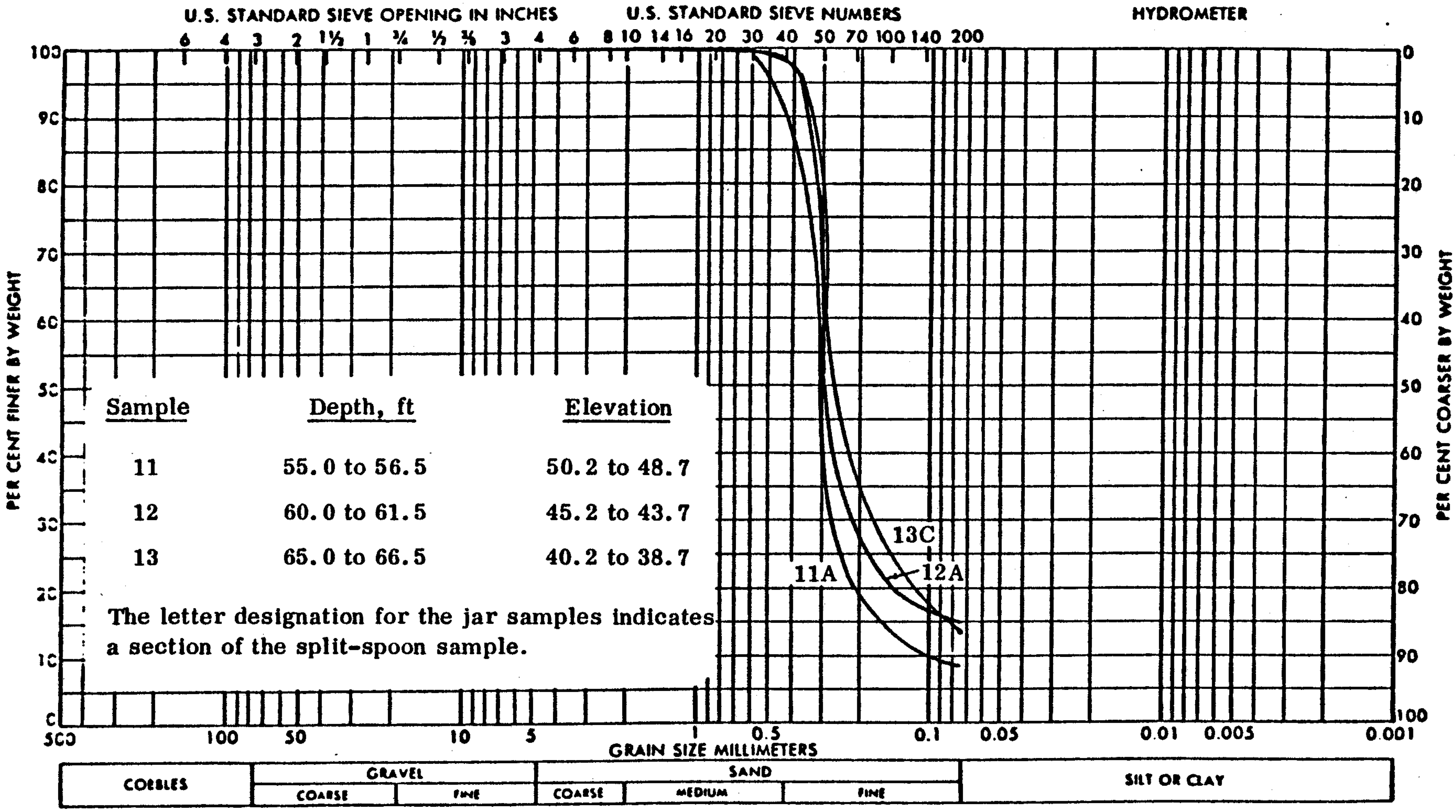
Project 7263

GRAIN SIZE CURVES
Boring 114
Sample 8A, 9A, 10A

Jan 1973

FIG. 27

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
11	55.0 to 56.5	50.2 to 48.7
12	60.0 to 61.5	45.2 to 43.7
13	65.0 to 66.5	40.2 to 38.7

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
11	S
12	S
13	S

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

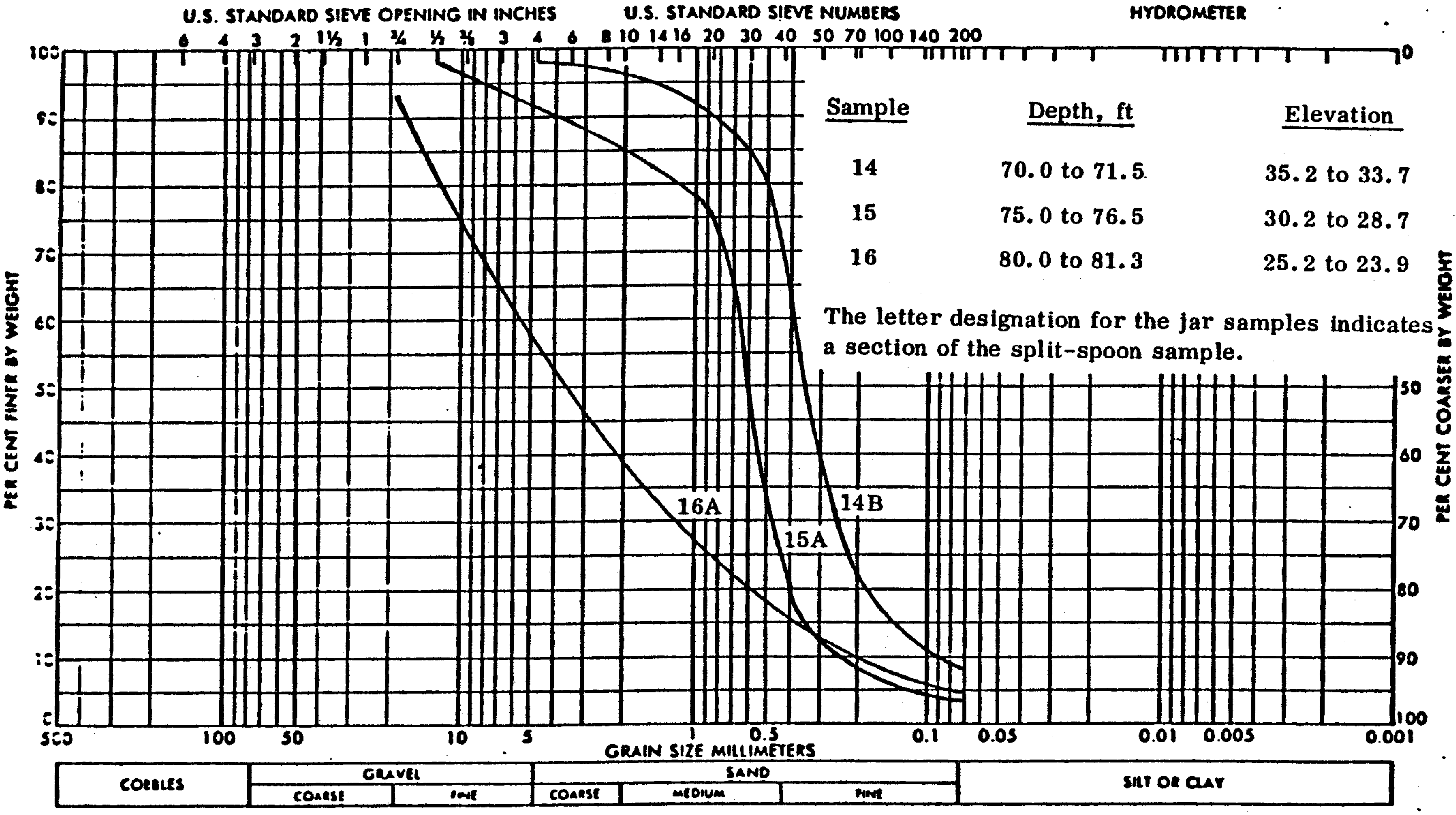
Project 7263

GRAIN SIZE CURVES
Boring 114
Sample 11A, 12A, 13C

Jan 1973

FIG. 28

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
14	70.0 to 71.5	35.2 to 33.7
15	75.0 to 76.5	30.2 to 28.7
16	80.0 to 81.3	25.2 to 23.9

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
14	S
15	BC
16	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

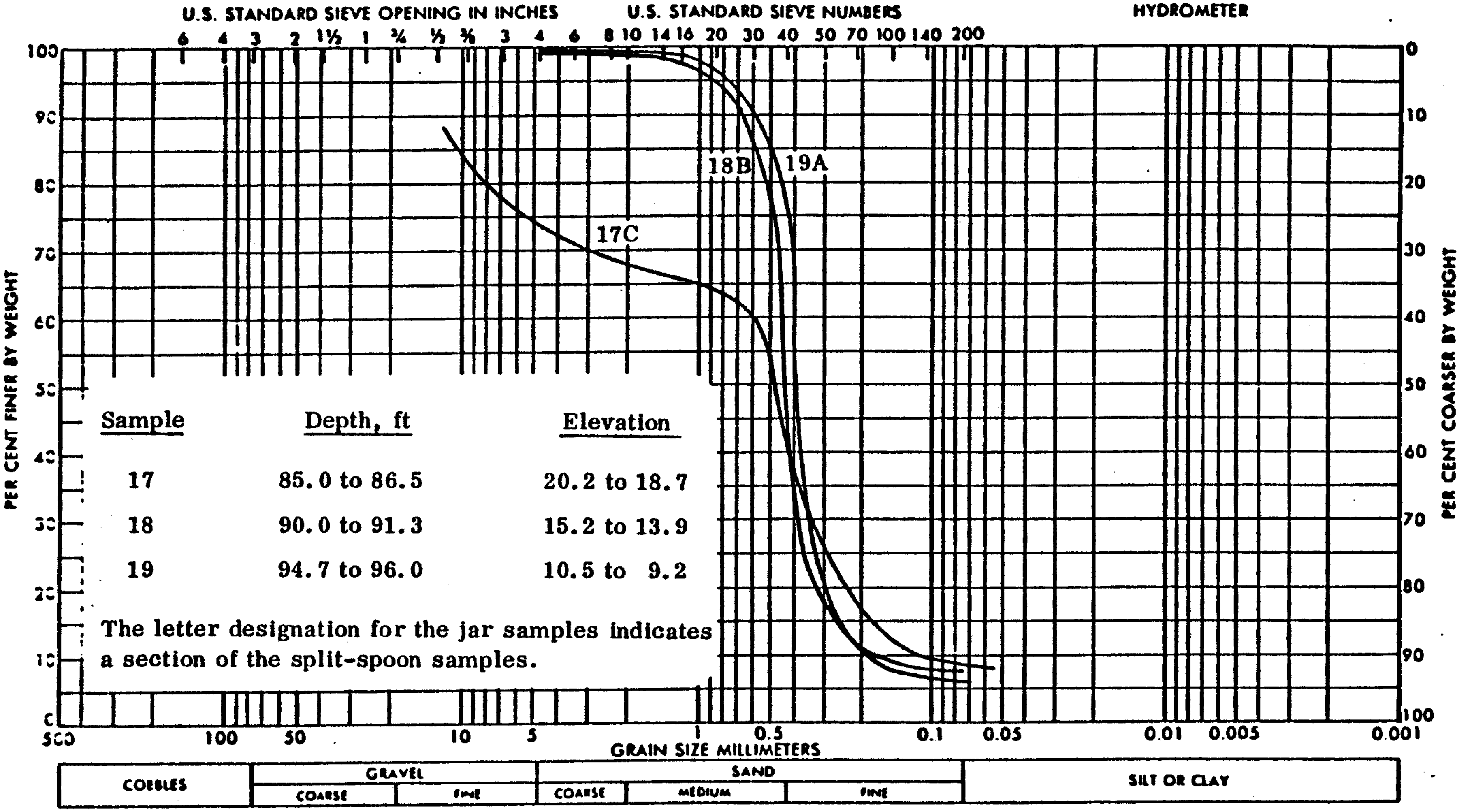
Project 7263

GRAIN SIZE CURVES
Boring 114
Sample 14B, 15A, 16A

Jan 1973

FIG. 29

GEOTECHNICAL ENGINEERS INC.



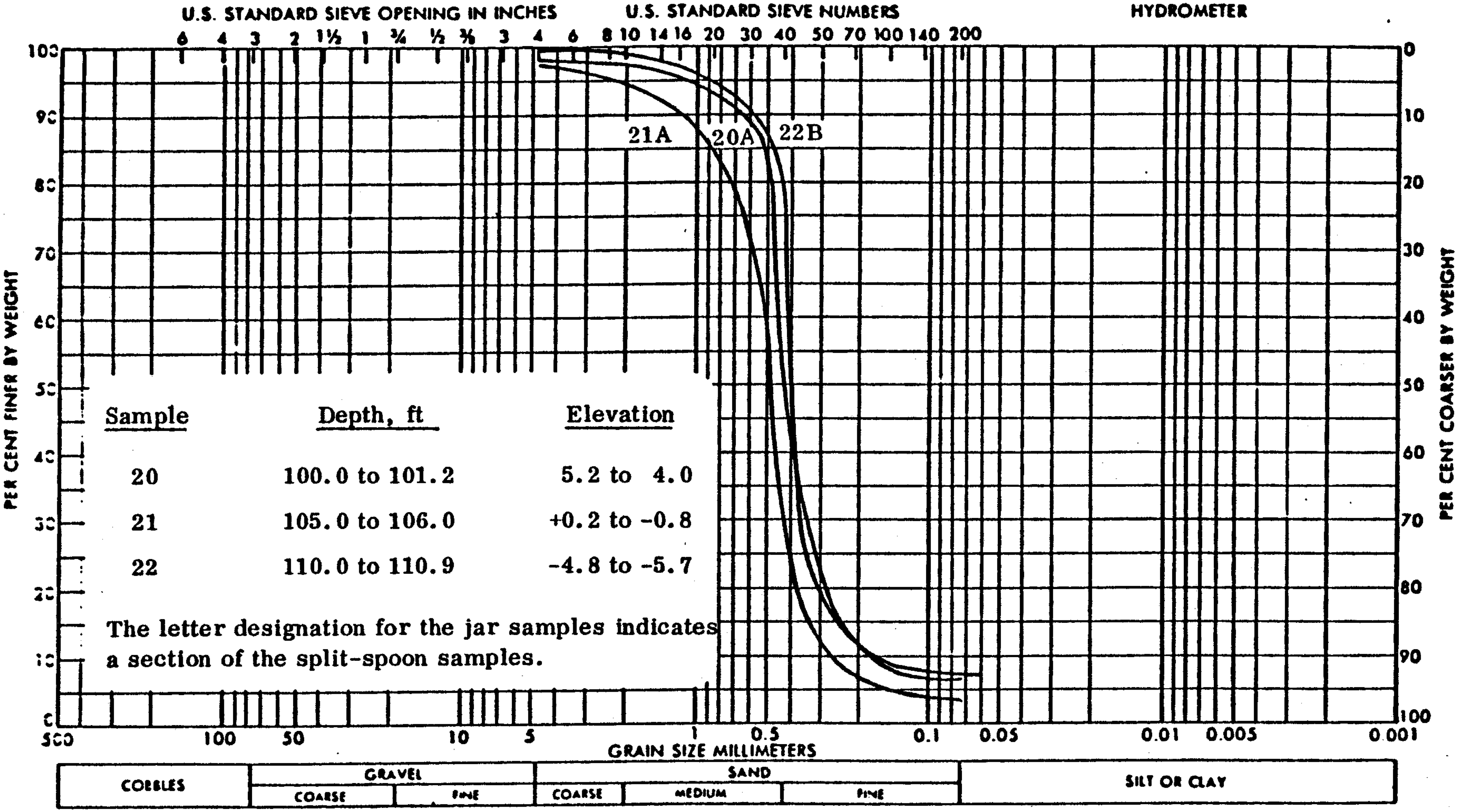
Sample	Depth, ft	Elevation
17	85.0 to 86.5	20.2 to 18.7
18	90.0 to 91.3	15.2 to 13.9
19	94.7 to 96.0	10.5 to 9.2

The letter designation for the jar samples indicates a section of the split-spoon samples.

Sample	Zone
17	BC
18	BC
19	BC

Stone & Webster Eng. Corp. Boston, Mass.	River Bend Power Station Gulf States Utilities	GRAIN SIZE CURVES Boring 114 Sample 17C, 18B, 19A
Geotechnical Engineers, Inc. Winchester, Mass.	Project 7263	Jan 1973 FIG. 30

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
20	100.0 to 101.2	5.2 to 4.0
21	105.0 to 106.0	+0.2 to -0.8
22	110.0 to 110.9	-4.8 to -5.7

The letter designation for the jar samples indicates a section of the split-spoon samples.

Sample	Zone
20	BC
21	BC
22	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

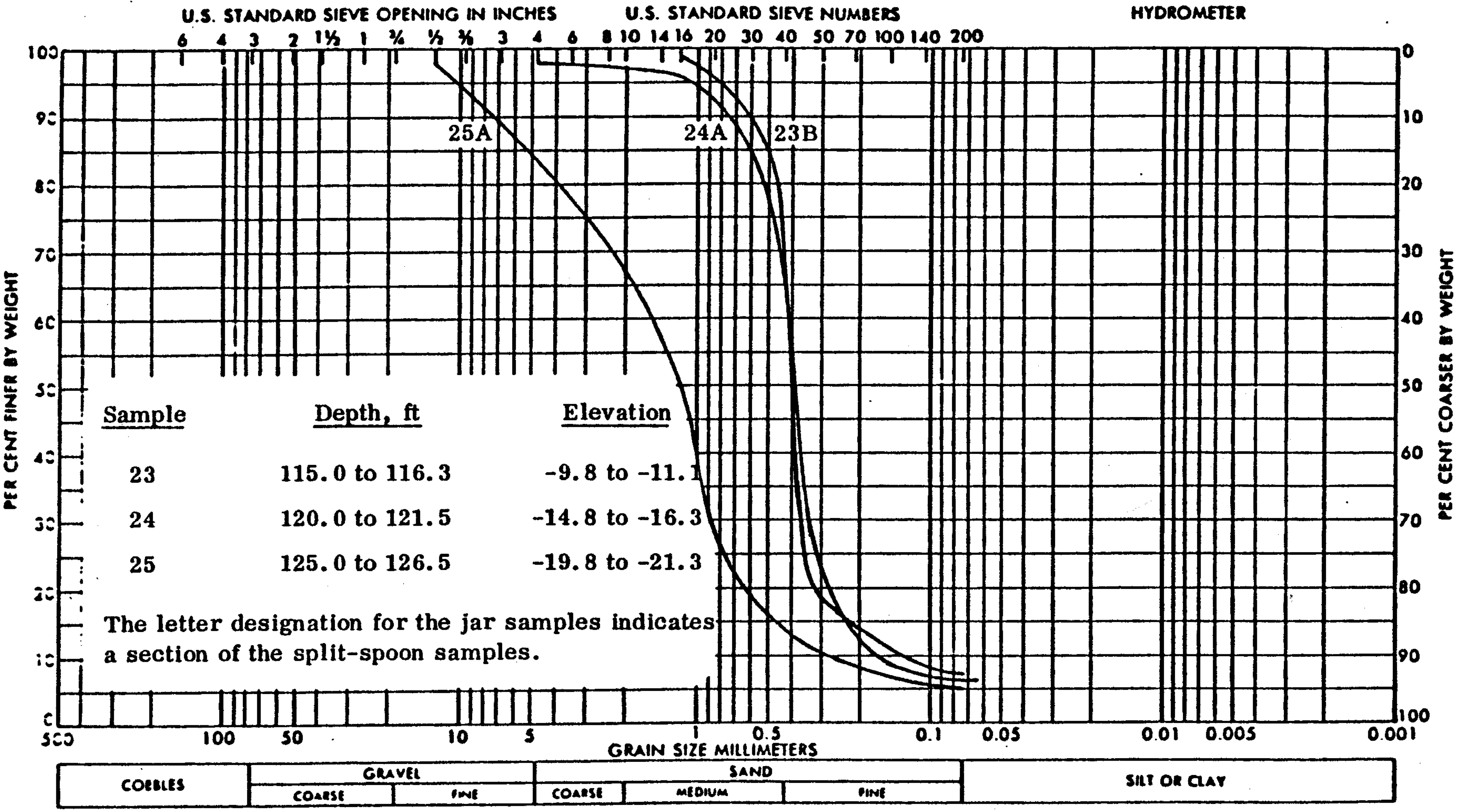
River Bend Power Station
Gulf States Utilities

Project 7263

GRAIN SIZE CURVES
Boring 114
Sample 20A, 21A, 22B

Jan 1973

FIG. 31



Sample	Depth, ft	Elevation
23	115.0 to 116.3	-9.8 to -11.1
24	120.0 to 121.5	-14.8 to -16.3
25	125.0 to 126.5	-19.8 to -21.3

The letter designation for the jar samples indicates a section of the split-spoon samples.

Sample	Zone
23	BC
24	BC
25	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

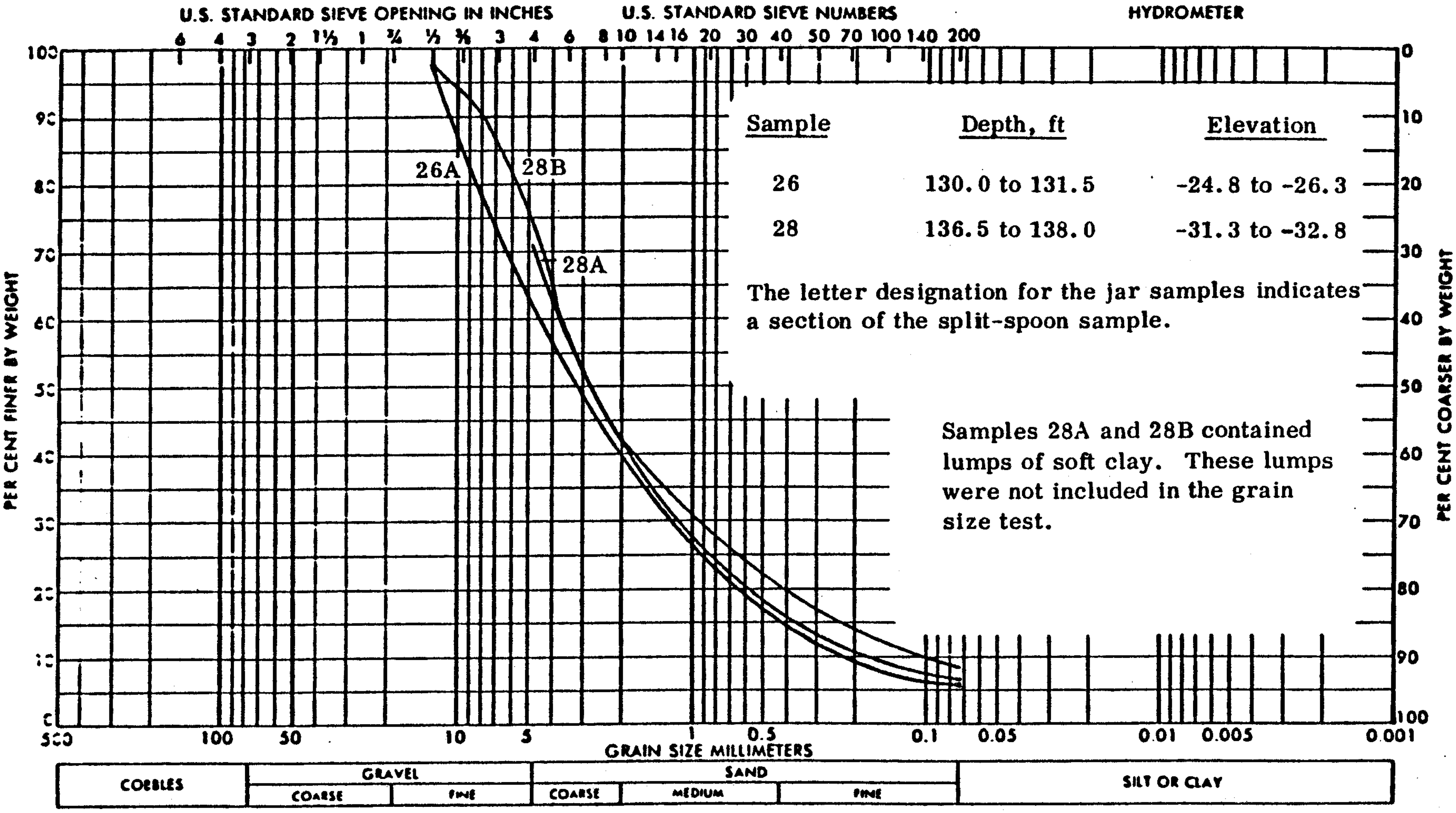
Project 7263

GRAIN SIZE CURVES
Boring 114
Sample 23B, 24A, 25A

Jan 1973

FIG. 32

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
26	130.0 to 131.5	-24.8 to -26.3
28	136.5 to 138.0	-31.3 to -32.8

The letter designation for the jar samples indicates a section of the split-spoon sample.

Samples 28A and 28B contained lumps of soft clay. These lumps were not included in the grain size test.

Sample	Zone
26	BC
28	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

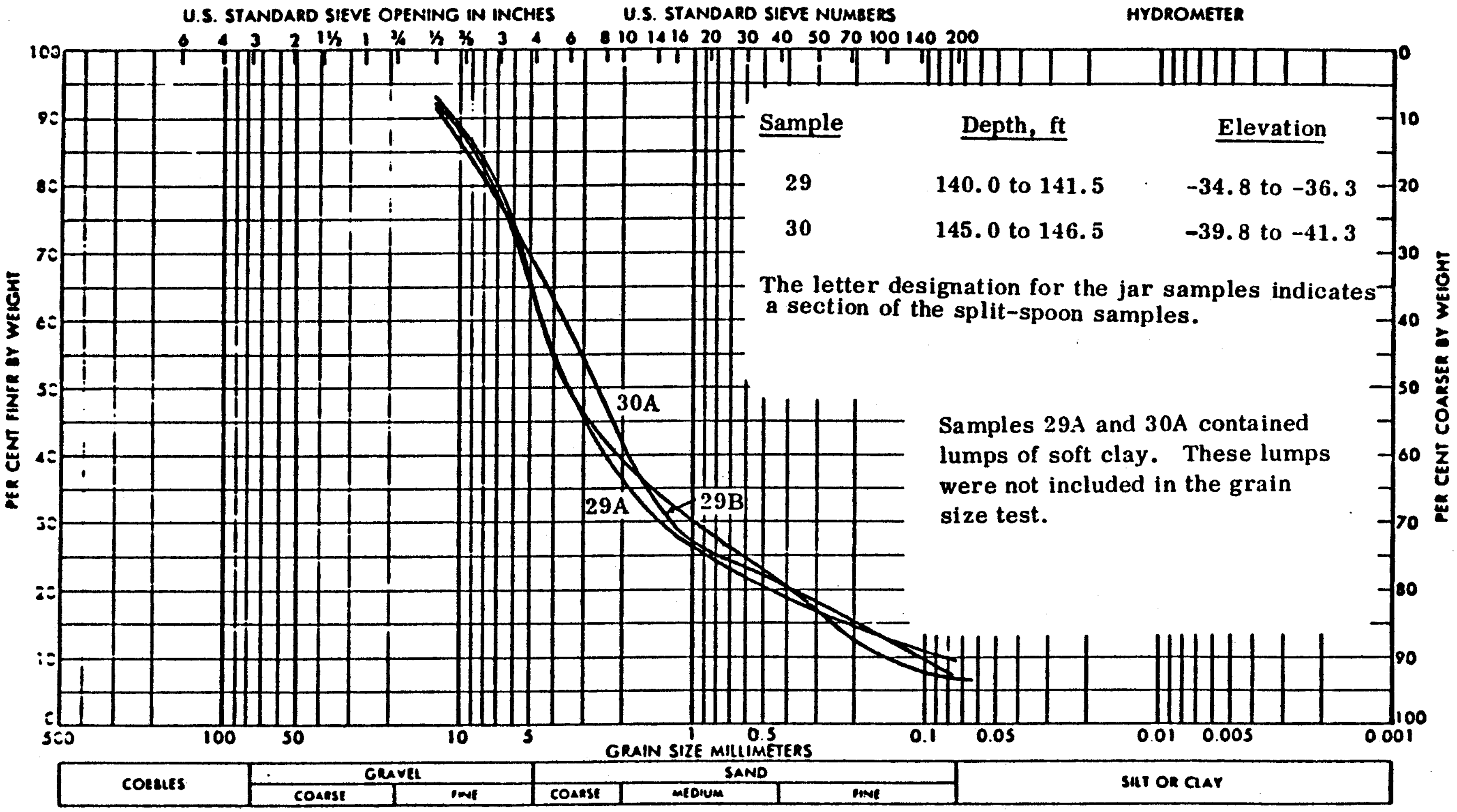
Project 7263

GRAIN SIZE CURVES
Boring 114
Sample 26A, 28A, 28B

Jan 1973

FIG. 33

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
29	140.0 to 141.5	-34.8 to -36.3
30	145.0 to 146.5	-39.8 to -41.3

The letter designation for the jar samples indicates a section of the split-spoon samples.

Samples 29A and 30A contained lumps of soft clay. These lumps were not included in the grain size test.

Sample	Zone
29	BC
30	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

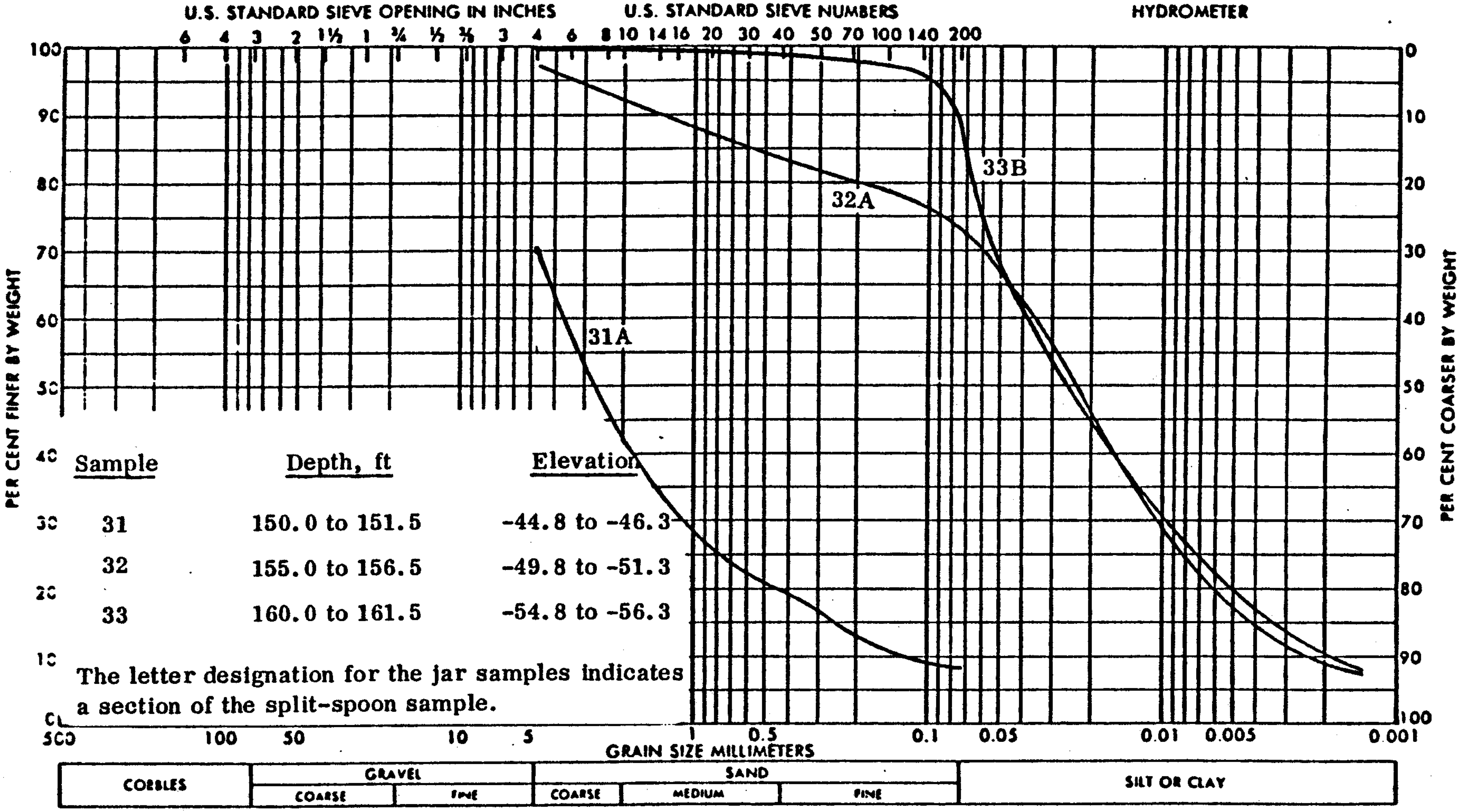
Project 7263

GRAIN SIZE CURVES
Boring 114
Sample 29A, 29B, 30A

Jan 1973

FIG. 34

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
31	150.0 to 151.5	-44.8 to -46.3
32	155.0 to 156.5	-49.8 to -51.3
33	160.0 to 161.5	-54.8 to -56.3

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
31	BC-PC
32	PC
33	PC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

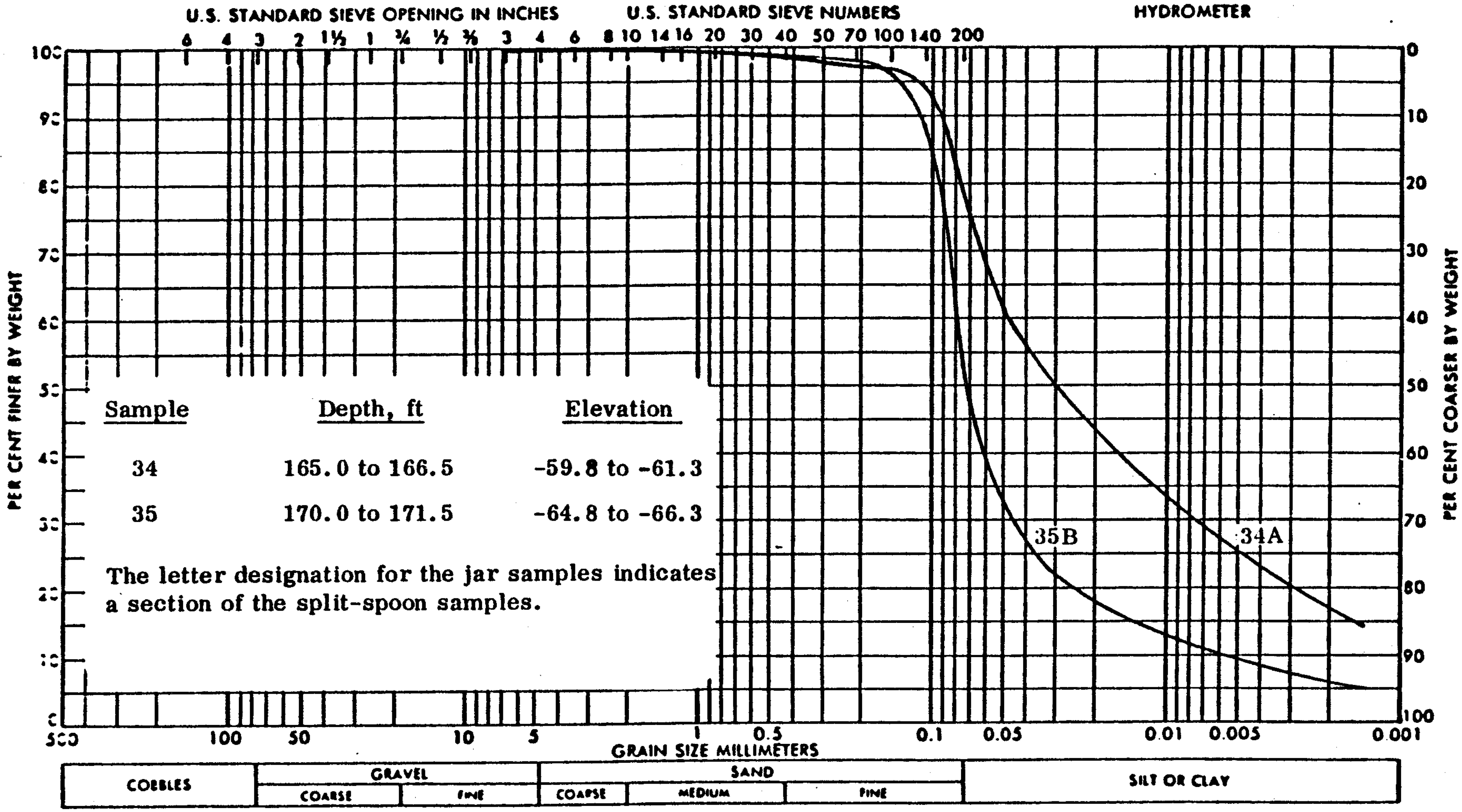
Project 7263

GRAIN SIZE CURVES
Boring 114
Sample 31A, 32A, 33 B

Jan 1973

FIG. 35

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
34	165.0 to 166.5	-59.8 to -61.3
35	170.0 to 171.5	-64.8 to -66.3

The letter designation for the jar samples indicates a section of the split-spoon samples.

Sample	Zone
34	PC
35	PC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

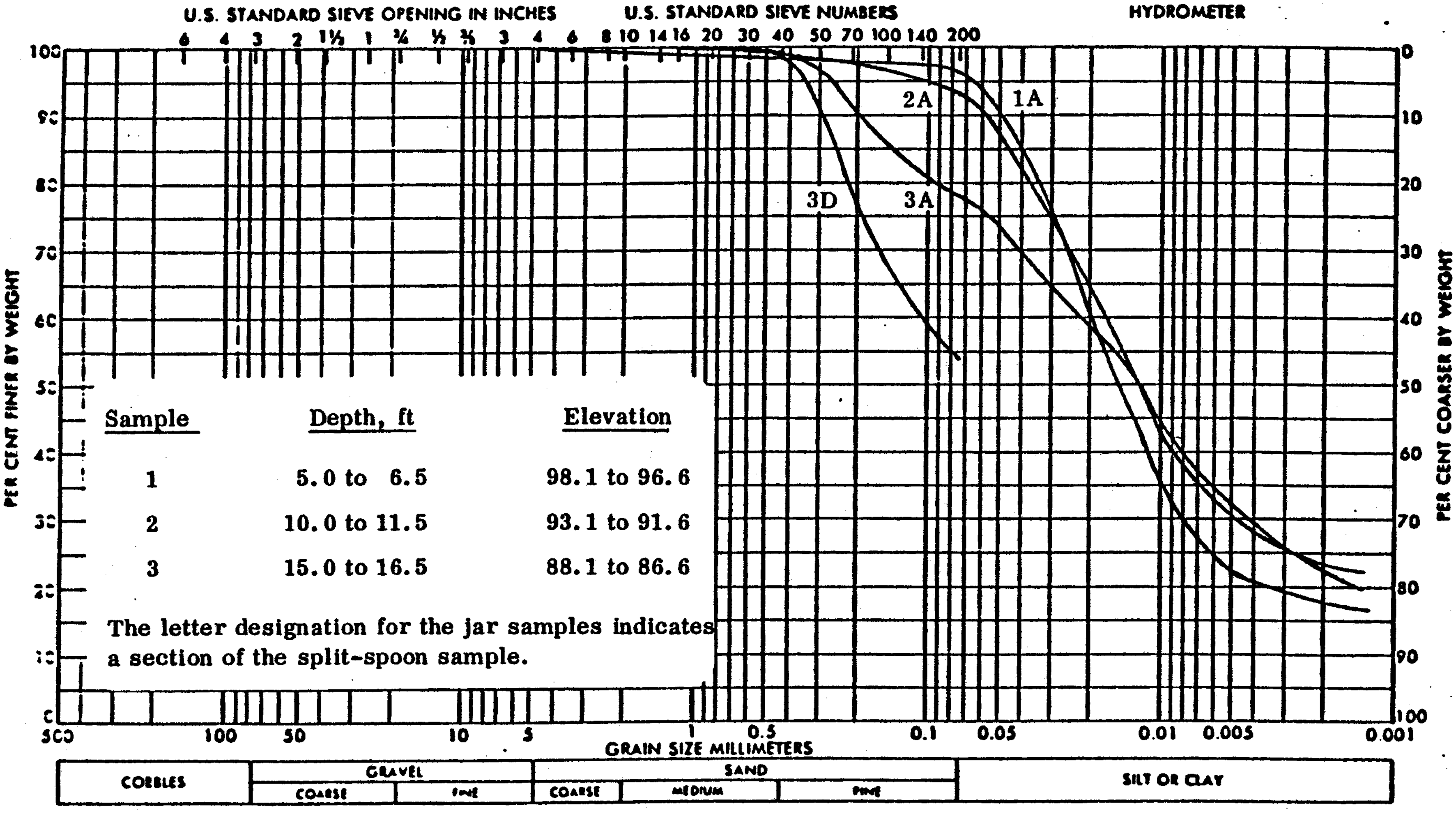
Project 7263

GRAIN SIZE CURVES
Boring 114
Sample 34A, 35B

Jan 1973

FIG. 36

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
1	5.0 to 6.5	98.1 to 96.6
2	10.0 to 11.5	93.1 to 91.6
3	15.0 to 16.5	88.1 to 86.6

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
1	L
2	PH
3	PH

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

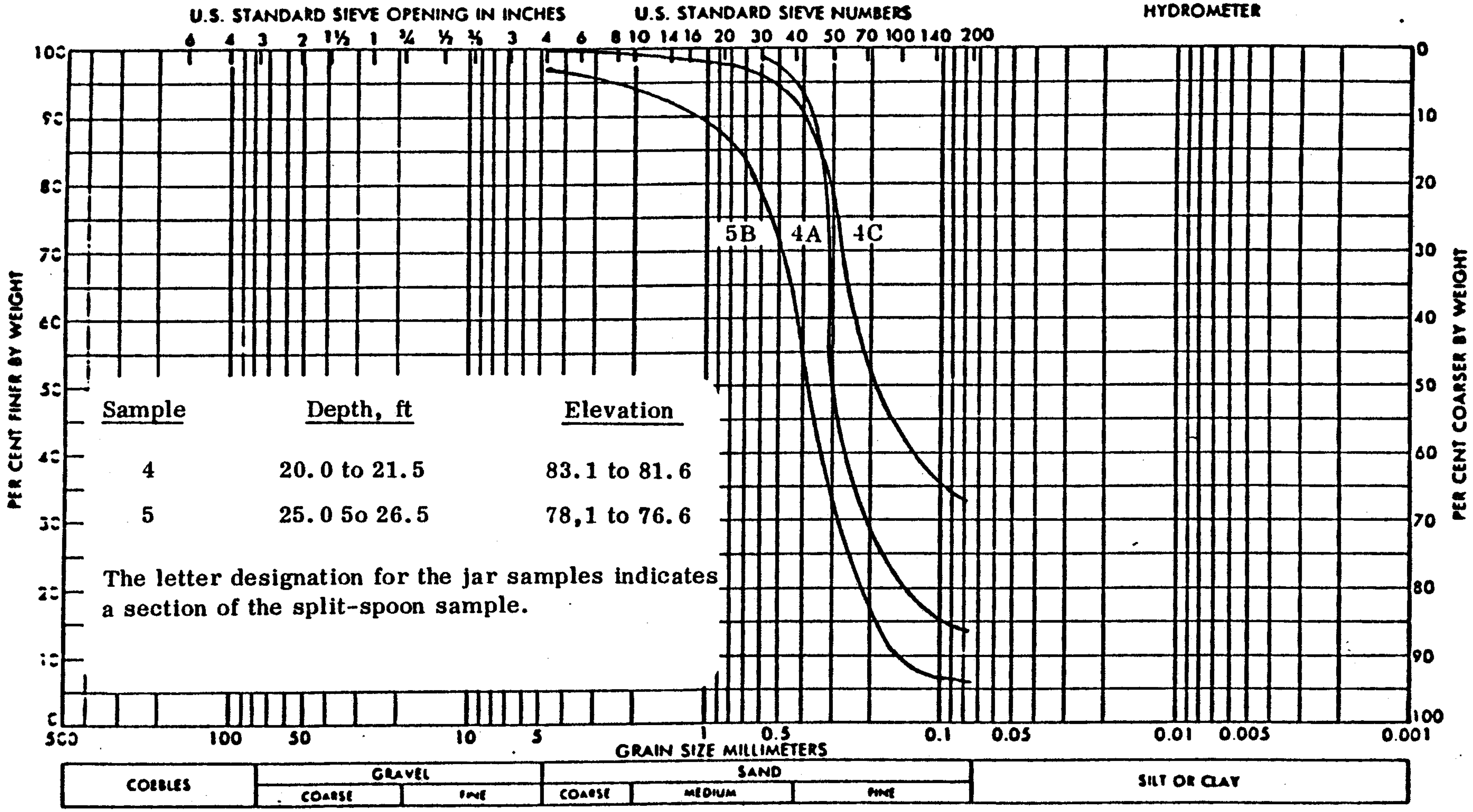
Project 7263

GRAIN SIZE CURVES
Boring 115
Sample 1A, 2A, 3A, 3D

Jan 1973

FIG. 37

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
4	20.0 to 21.5	83.1 to 81.6
5	25.0 5o 26.5	78,1 to 76.6

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
4	S
5	S

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

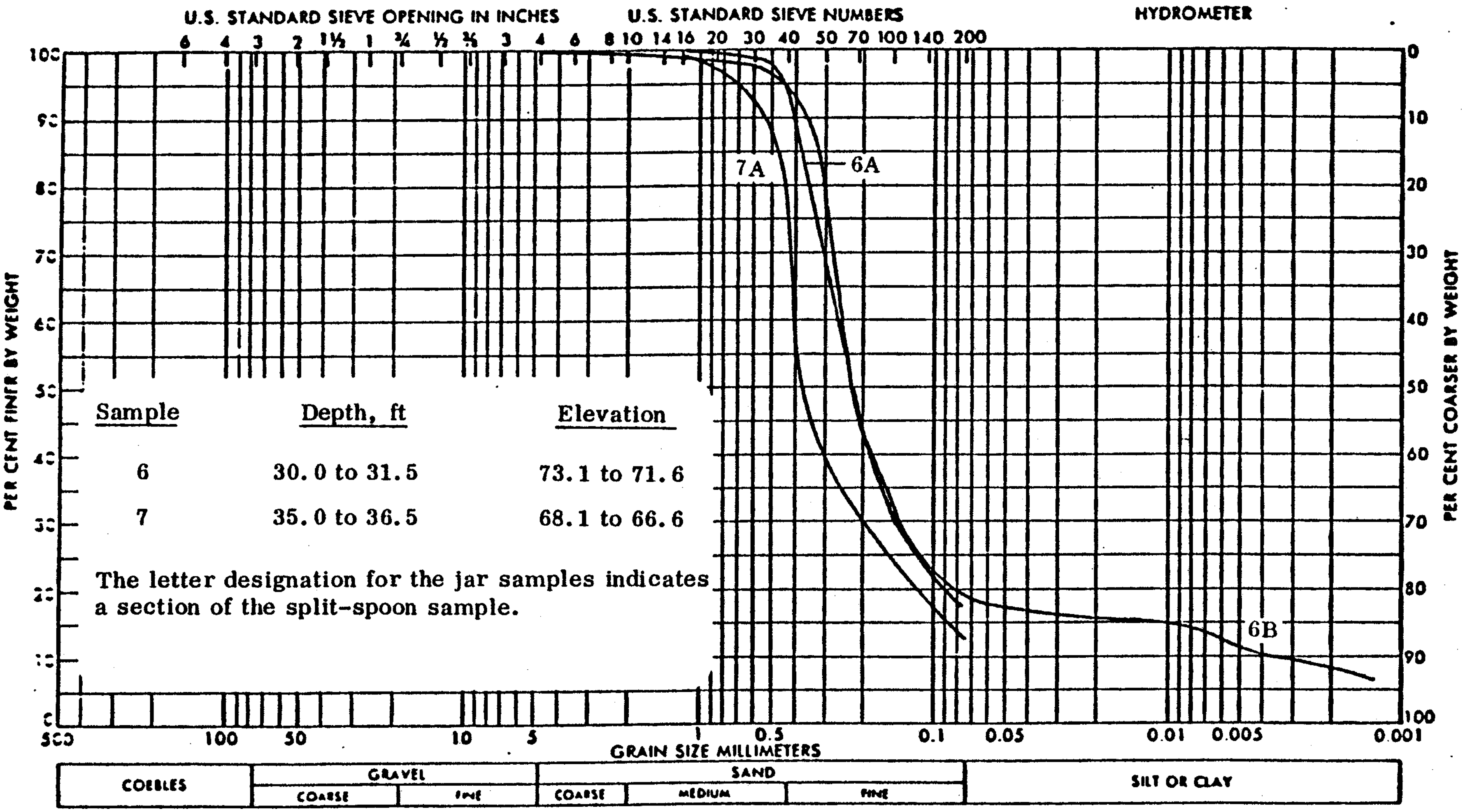
Project 7263

GRAIN SIZE CURVES
Boring 115
Sample 4A, 4C, 5B

Jan 1973

FIG. 38

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
6	30.0 to 31.5	73.1 to 71.6
7	35.0 to 36.5	68.1 to 66.6

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
6	S
7	S

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

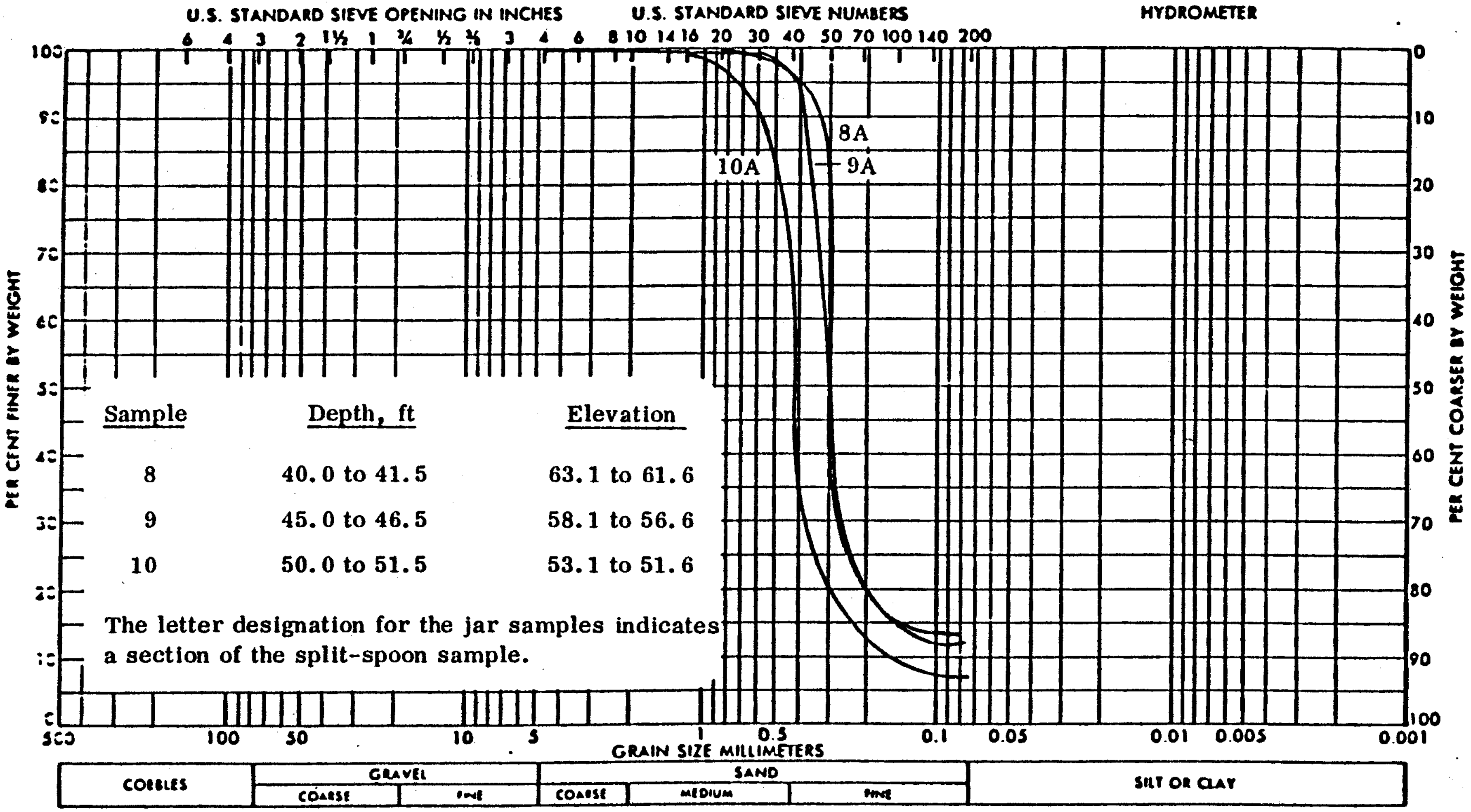
River Bend Power Station
Gulf States Utilities

Project 7263

GRAIN SIZE CURVES
Boring 115
Sample 6A, 6B, 7A

Jan 1973

FIG. 39



Sample	Depth, ft	Elevation
8	40.0 to 41.5	63.1 to 61.6
9	45.0 to 46.5	58.1 to 56.6
10	50.0 to 51.5	53.1 to 51.6

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
8	S
9	S
10	S

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

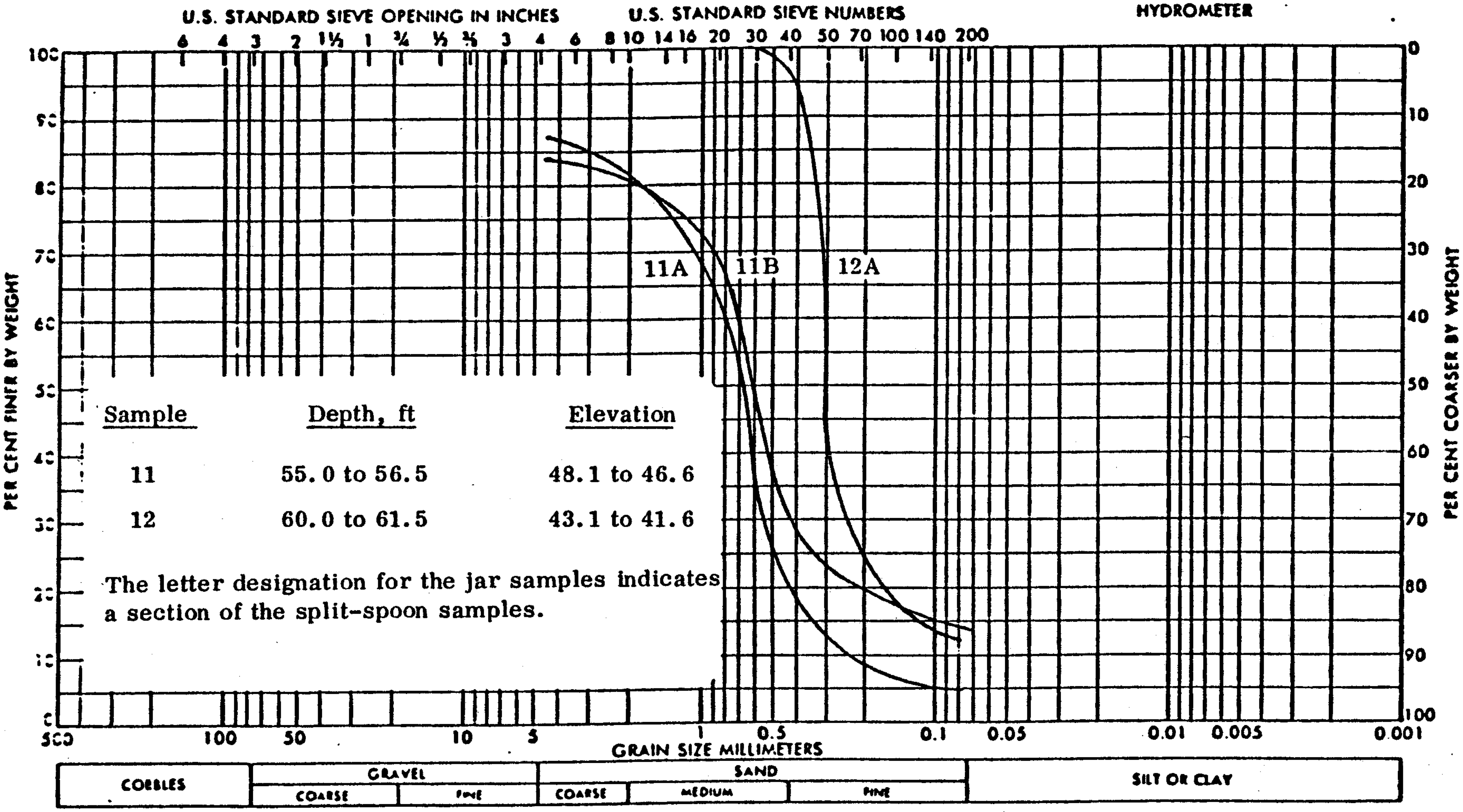
Project 7263

GRAIN SIZE CURVES
Boring 115
Sample 8A, 9A, 10A

Jan 1973

FIG. 40

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
11	55.0 to 56.5	48.1 to 46.6
12	60.0 to 61.5	43.1 to 41.6

The letter designation for the jar samples indicates a section of the split-spoon samples.

Sample	Zone
11	BC
12	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

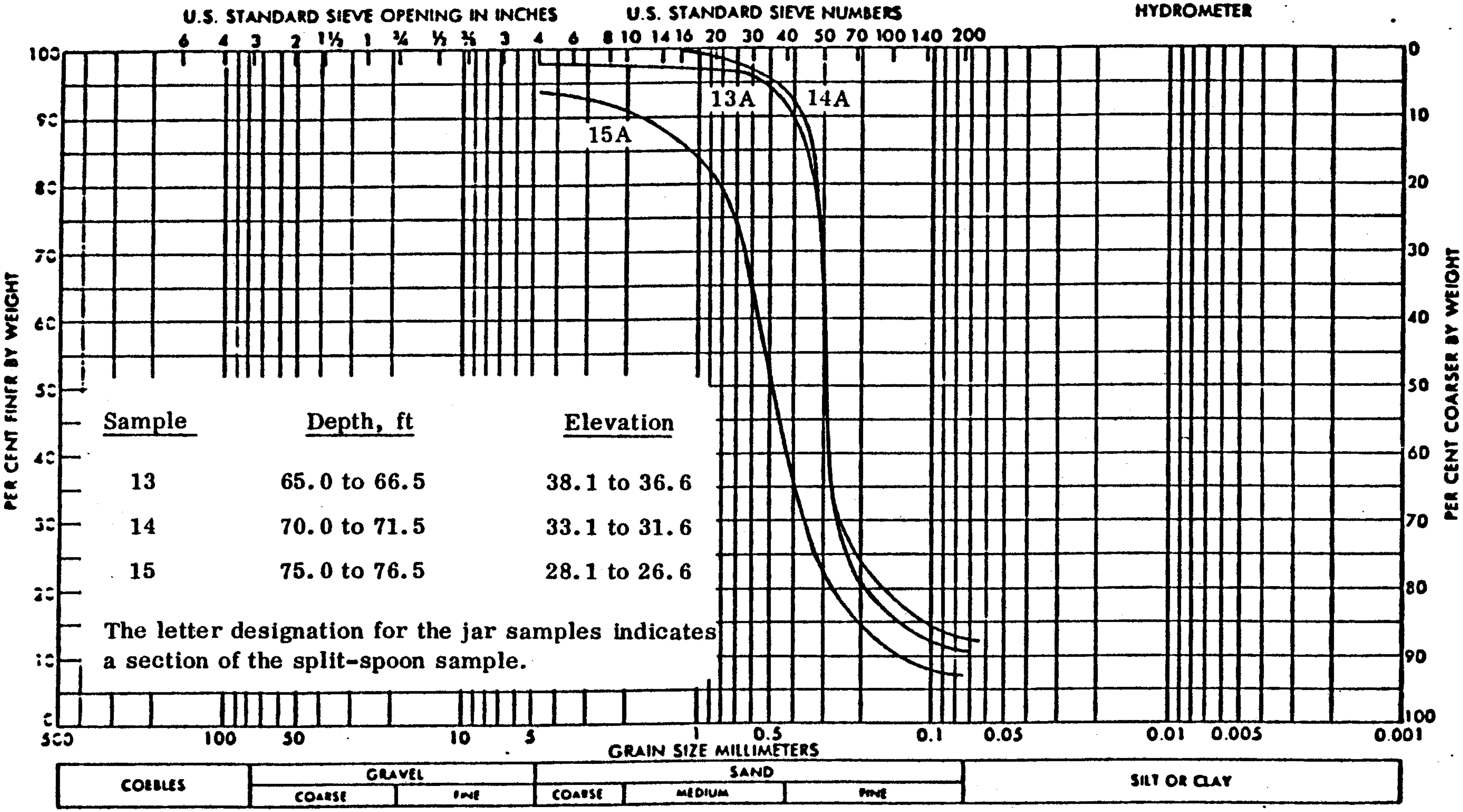
Project 7263

GRAIN SIZE CURVES
Boring 115
Sample 11A, 11B, 12A

Jan 1973

FIG. 41

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
13	65.0 to 66.5	38.1 to 36.6
14	70.0 to 71.5	33.1 to 31.6
15	75.0 to 76.5	28.1 to 26.6

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
13	BC
14	BC
15	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

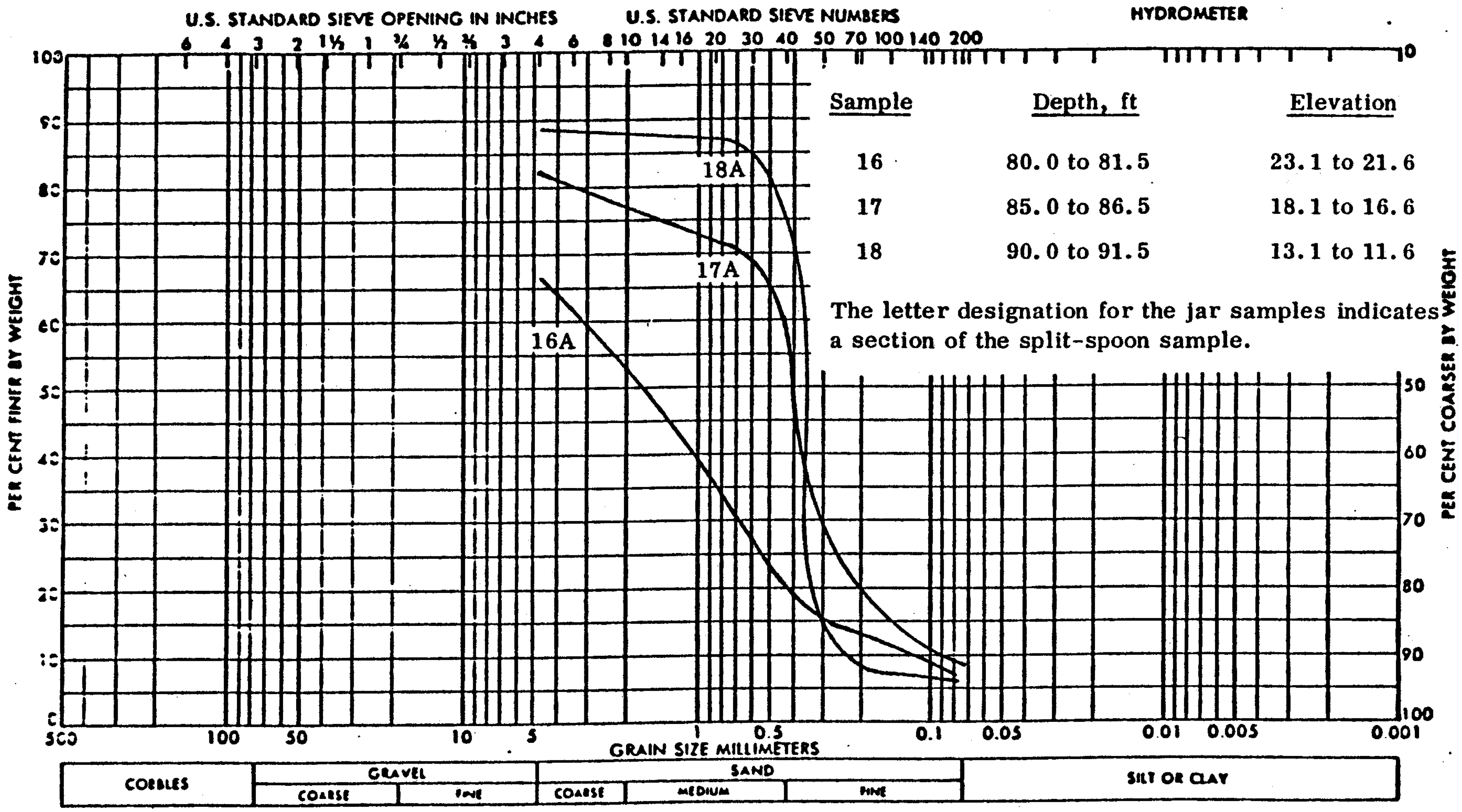
Project 7263

GRAIN SIZE CURVES
Boring 114
Sample 13A, 14A, 15A

Jan 1973

FIG. 42

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
16	80.0 to 81.5	23.1 to 21.6
17	85.0 to 86.5	18.1 to 16.6
18	90.0 to 91.5	13.1 to 11.6

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
16	BC
17	BC
18	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

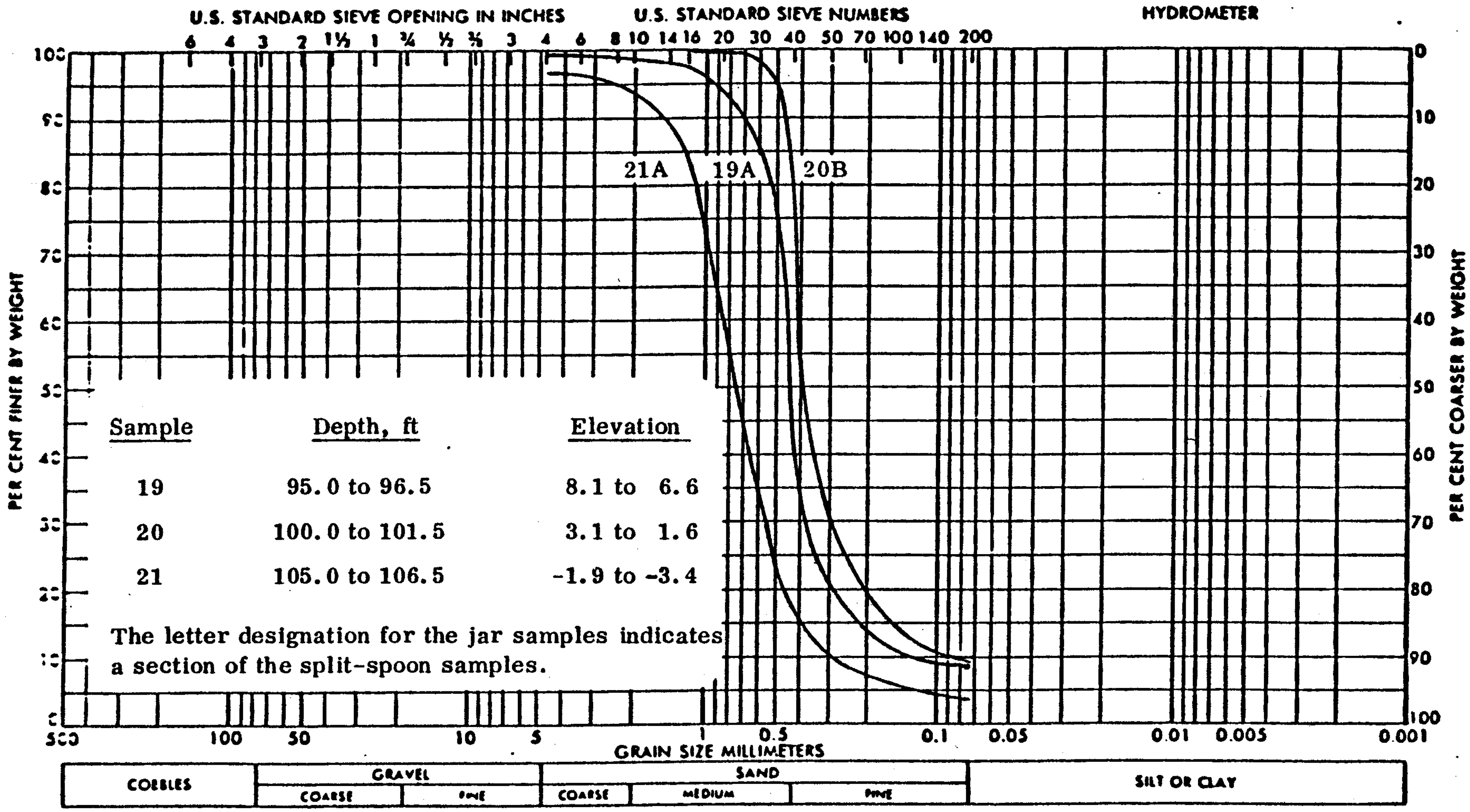
River Bend Power Station
Gulf States Utilities

Project 7263

GRAIN SIZE CURVES
Boring 115
Sample 16A, 17A, 18A

Jan 1973 FIG. 43

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
19	95.0 to 96.5	8.1 to 6.6
20	100.0 to 101.5	3.1 to 1.6
21	105.0 to 106.5	-1.9 to -3.4

The letter designation for the jar samples indicates a section of the split-spoon samples.

Sample	Zone
19	BC
20	BC
21	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

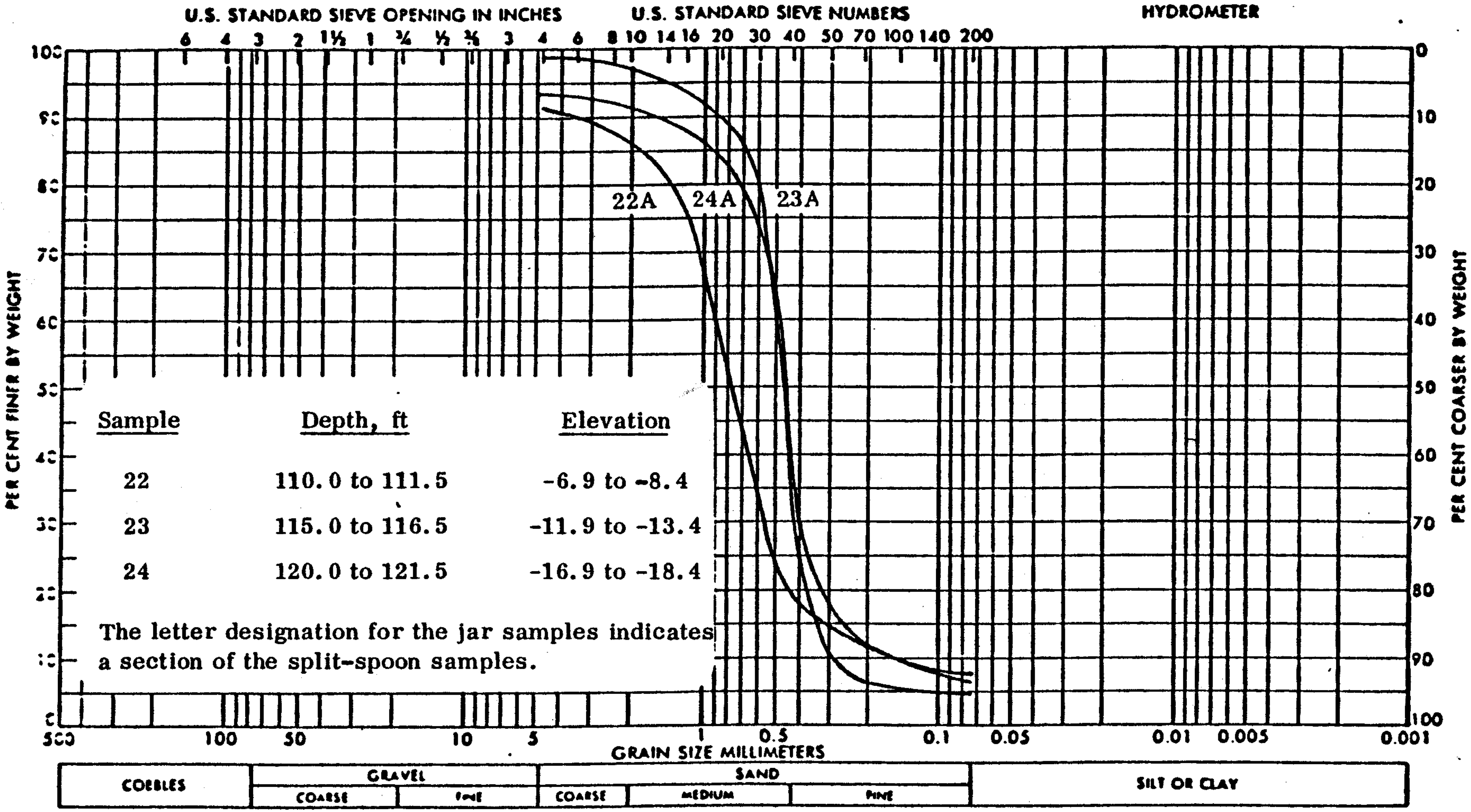
Project 7263

GRAIN SIZE CURVES
Boring 115
Sample 19A, 20B, 21A

Jan 1973

FIG. 44

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
22	110.0 to 111.5	-6.9 to -8.4
23	115.0 to 116.5	-11.9 to -13.4
24	120.0 to 121.5	-16.9 to -18.4

The letter designation for the jar samples indicates a section of the split-spoon samples.

Sample	Zone
22	BC
23	BC
24	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

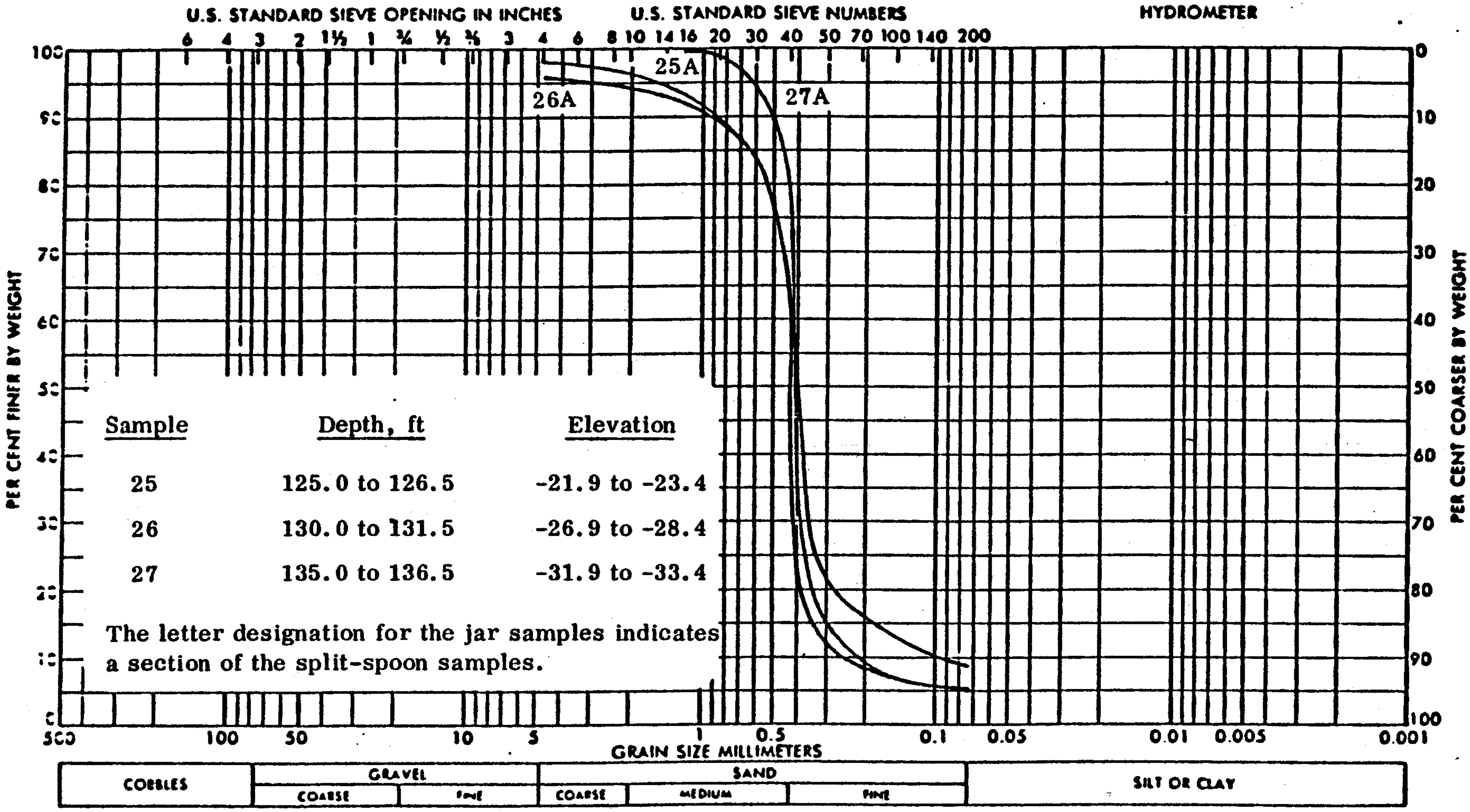
Project 7263

GRAIN SIZE CURVES
Boring 115
Sample 22A, 23A, 24A

Jan 1973

FIG. 45

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
25	125.0 to 126.5	-21.9 to -23.4
26	130.0 to 131.5	-26.9 to -28.4
27	135.0 to 136.5	-31.9 to -33.4

The letter designation for the jar samples indicates a section of the split-spoon samples.

Sample	Zone
25	BC
26	BC
27	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

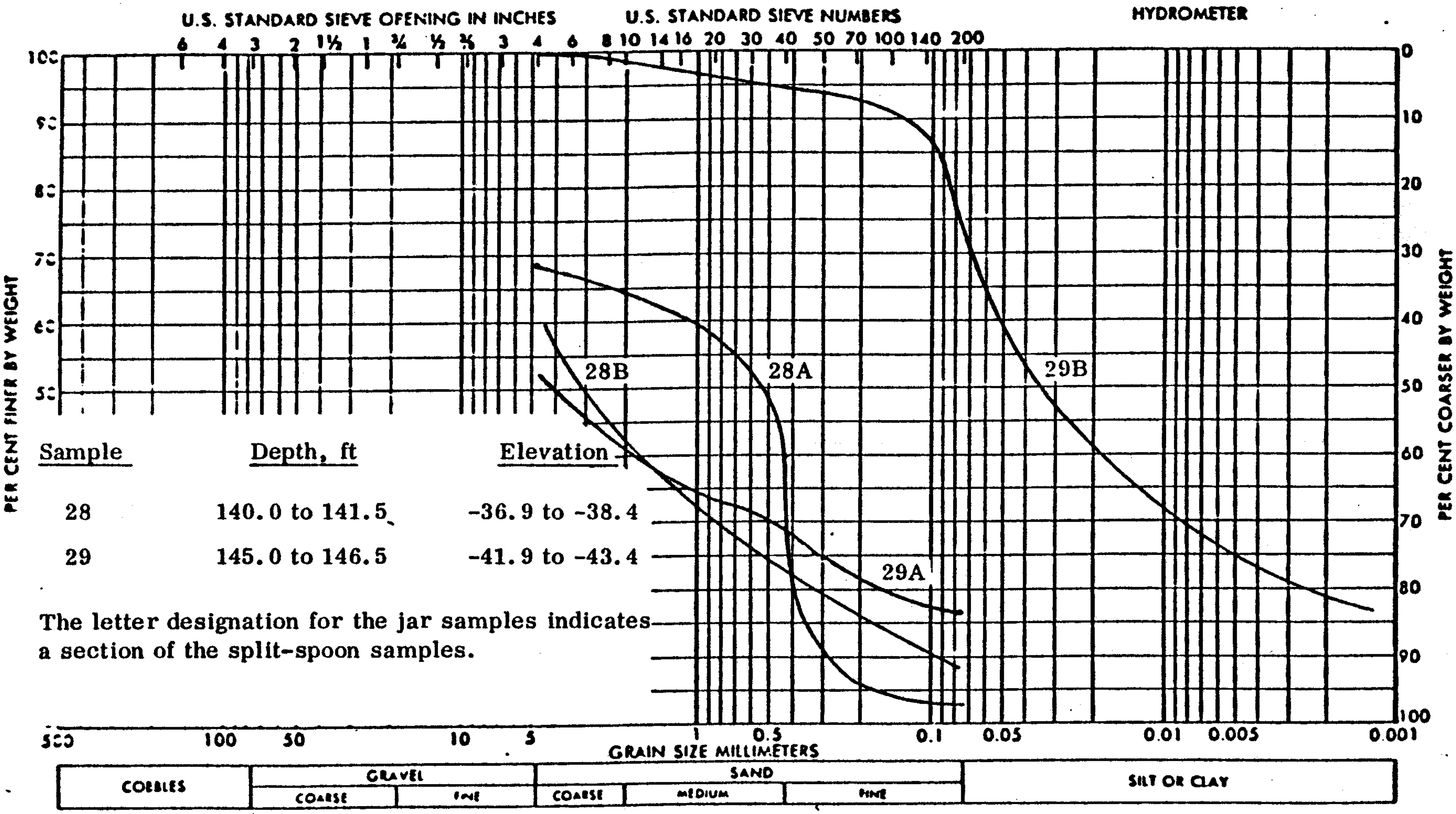
Project 7263

GRAIN SIZE CURVES
Boring 115
Sample 25A, 26A, 27A

Jan 1973

FIG. 46

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
28	140.0 to 141.5	-36.9 to -38.4
29	145.0 to 146.5	-41.9 to -43.4

The letter designation for the jar samples indicates a section of the split-spoon samples.

Sample	Zone
28	BC
29	BC-PC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

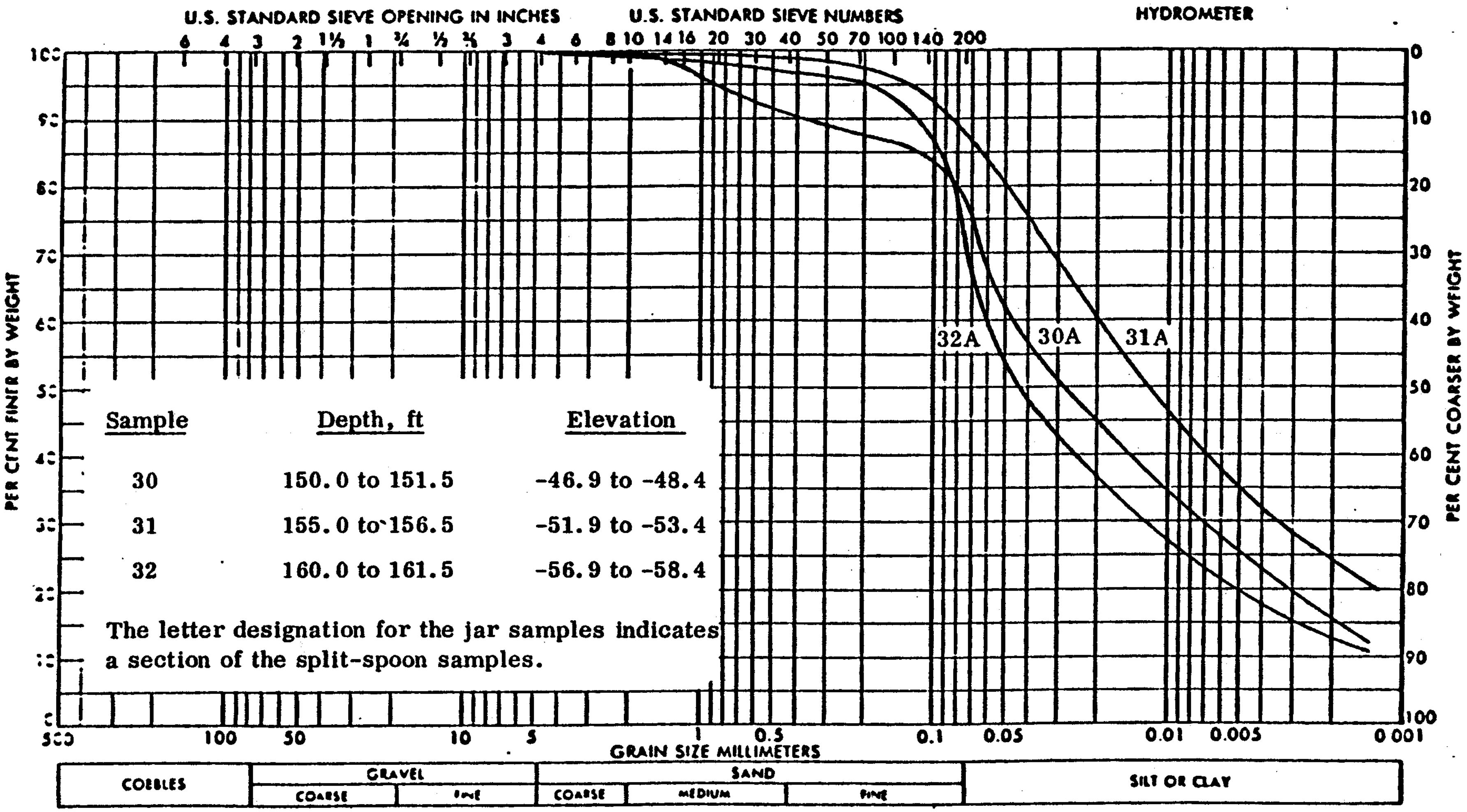
Project 7263

GRAIN SIZE CURVES
Boring 115
Sample 28A, 28B, 29A, 29B

Jan 1973

FIG. 47

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
30	150.0 to 151.5	-46.9 to -48.4
31	155.0 to 156.5	-51.9 to -53.4
32	160.0 to 161.5	-56.9 to -58.4

The letter designation for the jar samples indicates a section of the split-spoon samples.

Sample	Zone
30	PC
31	PC
32	PC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

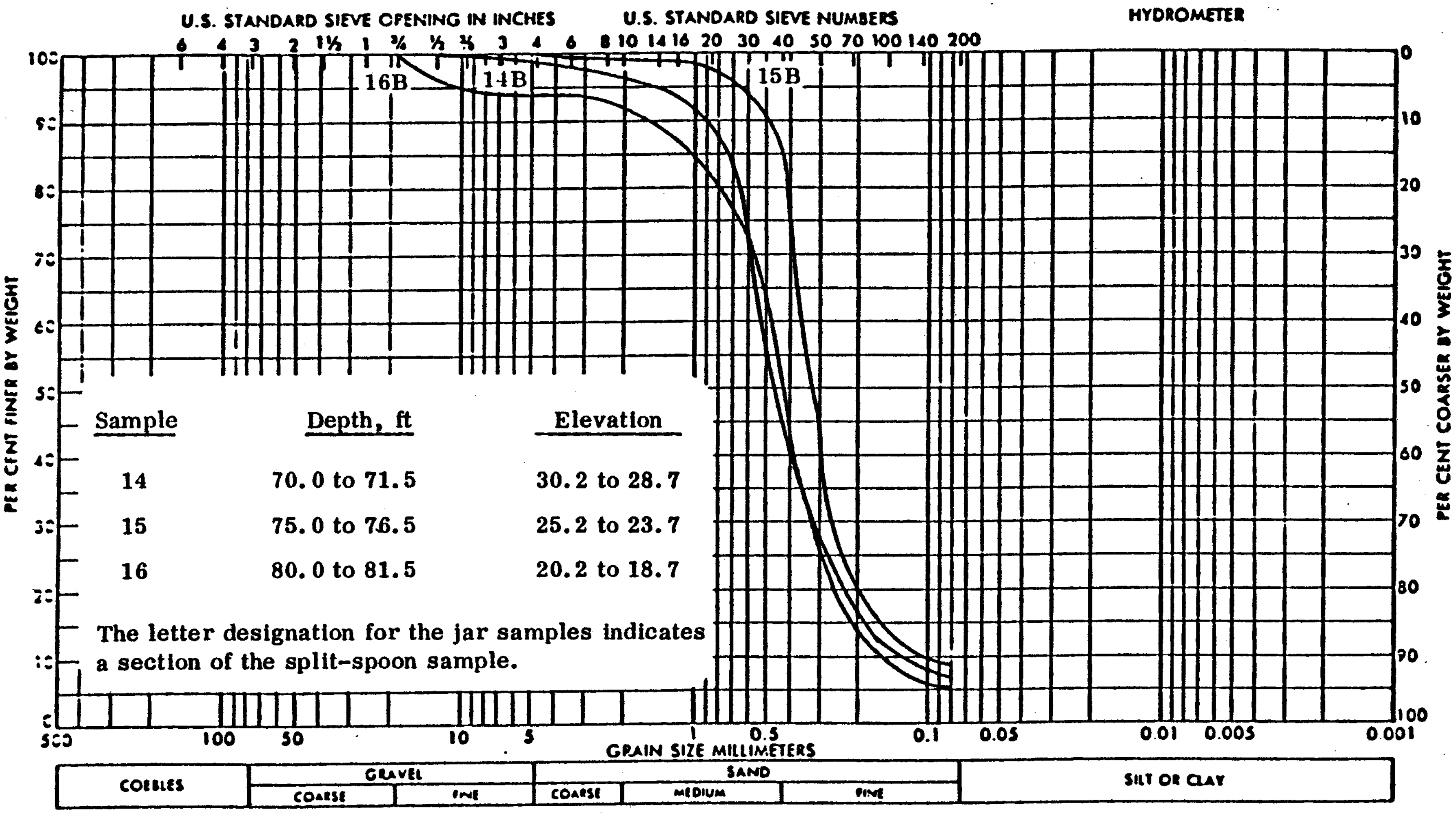
Project 7263

GRAIN SIZE CURVES
Boring 115
Sample 30A, 31A, 32A

Jan 1973

FIG. 48

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
14	70.0 to 71.5	30.2 to 28.7
15	75.0 to 76.5	25.2 to 23.7
16	80.0 to 81.5	20.2 to 18.7

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
14	BC
15	BC
16	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

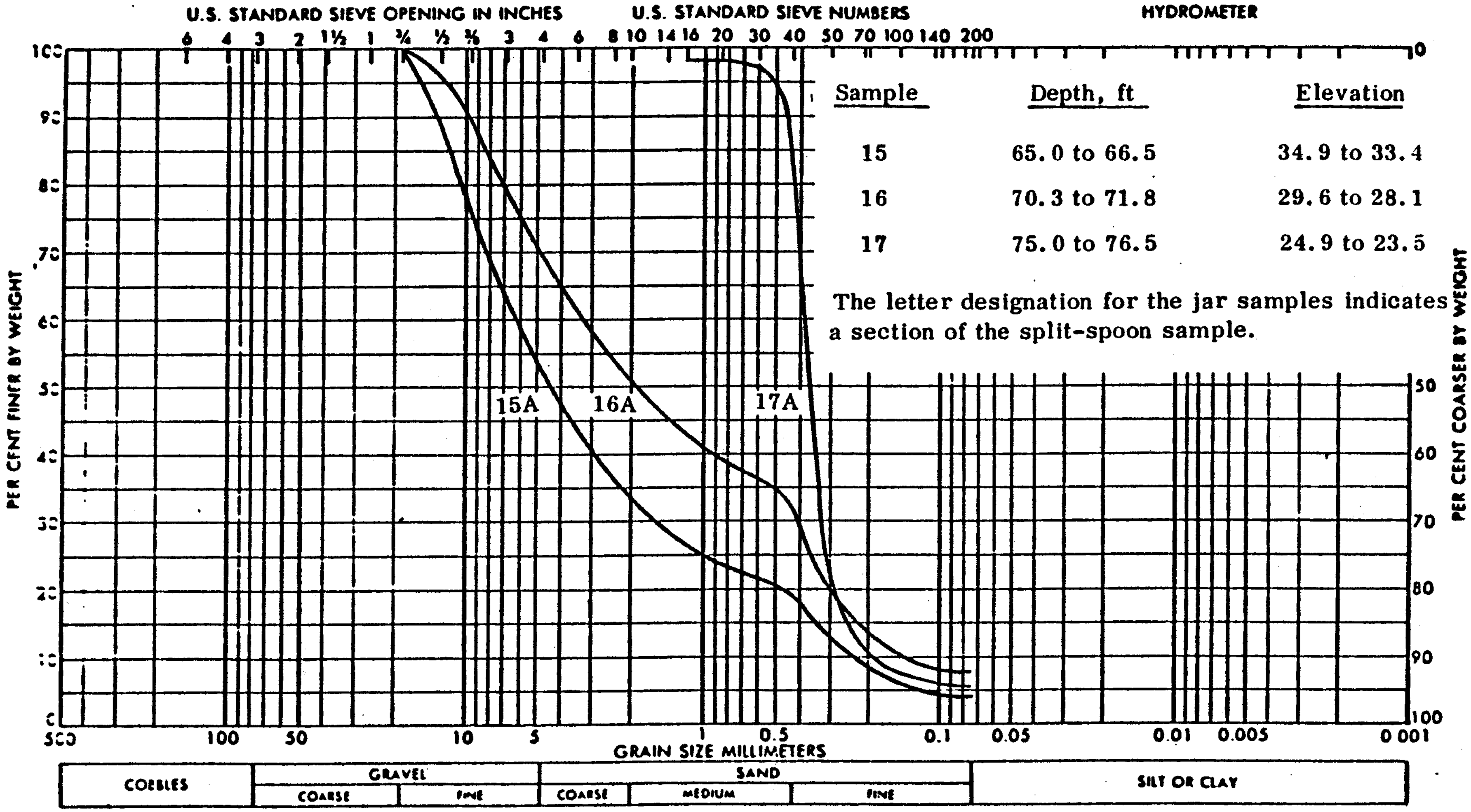
Project 7263

GRAIN SIZE CURVES
Boring 116
Sample 14B, 15B, 16B

Jan 1973

FIG. 49

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
15	65.0 to 66.5	34.9 to 33.4
16	70.3 to 71.8	29.6 to 28.1
17	75.0 to 76.5	24.9 to 23.5

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
15	BC
16	BC
17	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

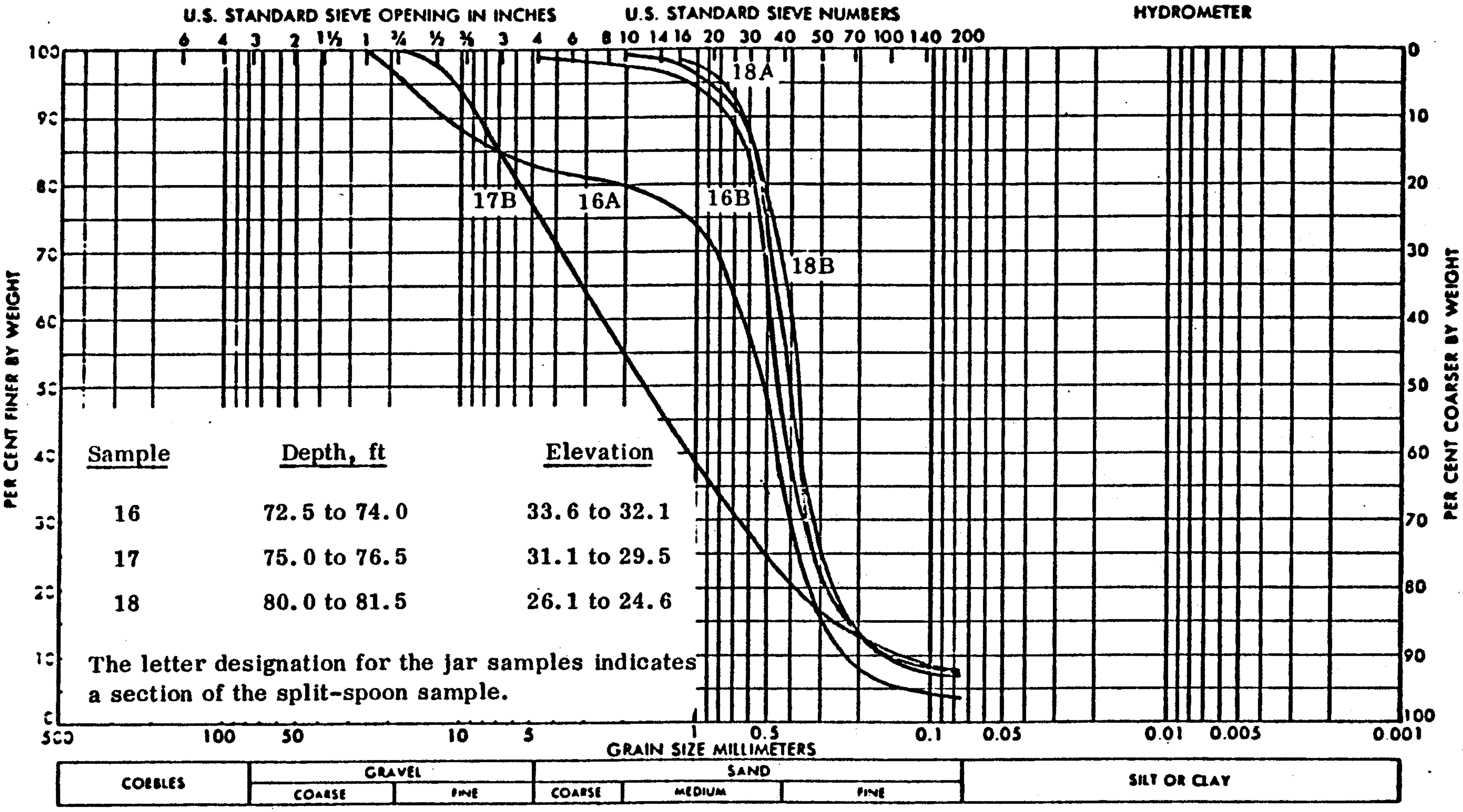
Project 7263

GRAIN SIZE CURVES
Boring 117
Sample 15A, 16A, 17A

Jan 1973

FIG. 50

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
16	72.5 to 74.0	33.6 to 32.1
17	75.0 to 76.5	31.1 to 29.5
18	80.0 to 81.5	26.1 to 24.6

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
16	BC
17	BC
18	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

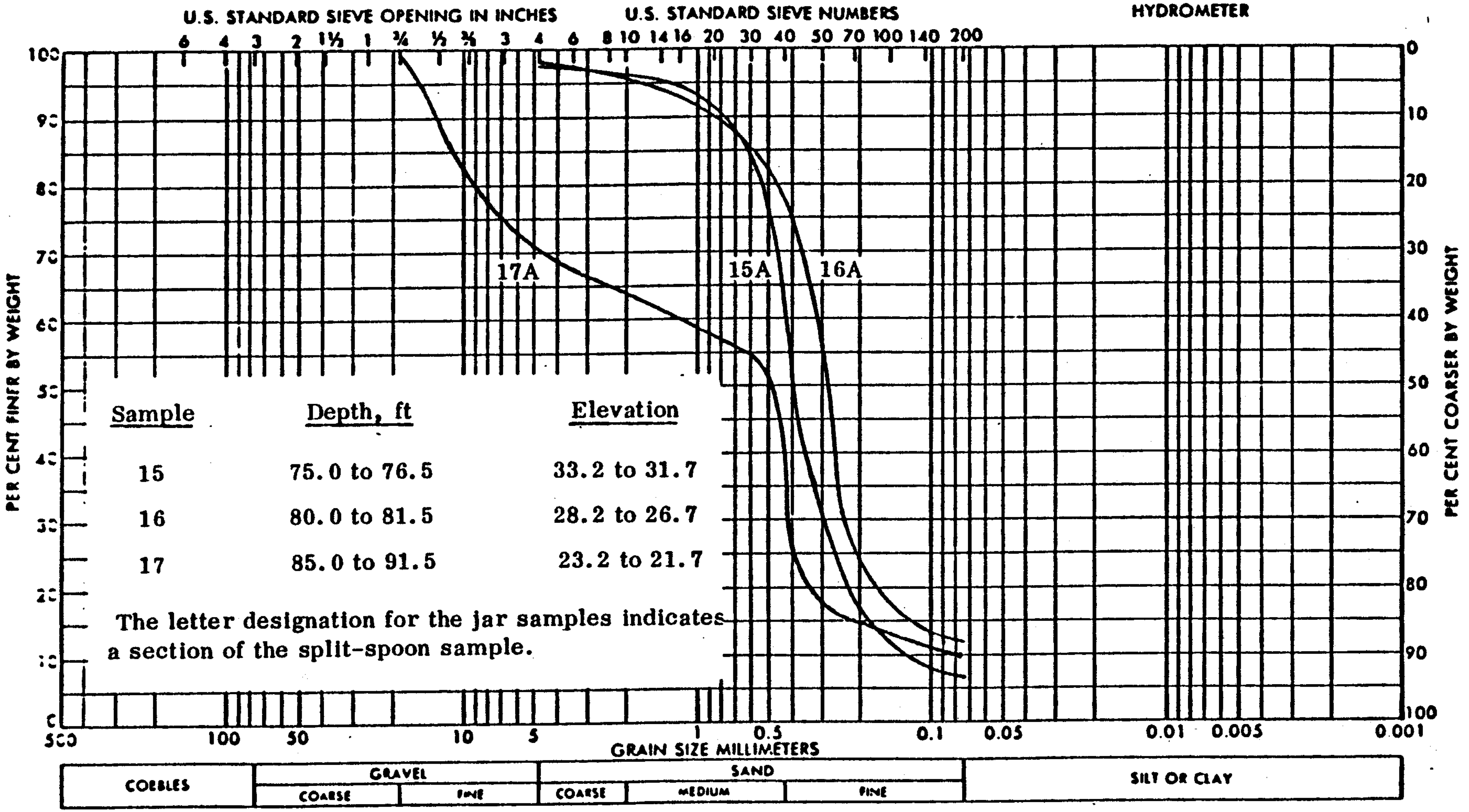
Project 7263

GRAIN SIZE CURVES
Boring 118
Sample 16A&B, 17B, 18A&B

Jan 1973

FIG. 51

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
15	75.0 to 76.5	33.2 to 31.7
16	80.0 to 81.5	28.2 to 26.7
17	85.0 to 91.5	23.2 to 21.7

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
15	BC
16	BC
17	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

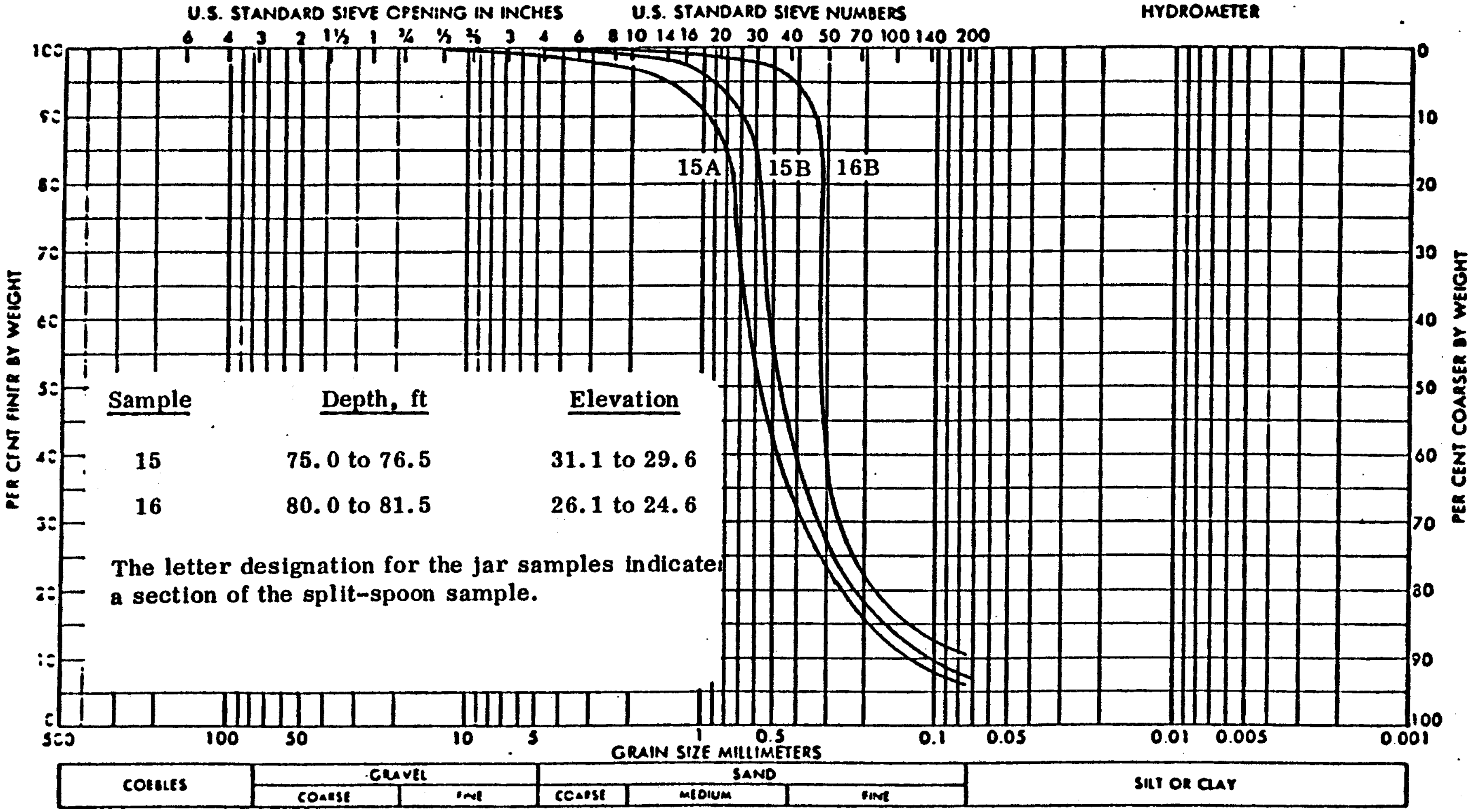
Project 7263

GRAIN SIZE CURVES
Boring 121
Sample 15A, 16A, 17A

Jan 1973

FIG. 52

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
15	75.0 to 76.5	31.1 to 29.6
16	80.0 to 81.5	26.1 to 24.6

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
15	BC
16	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

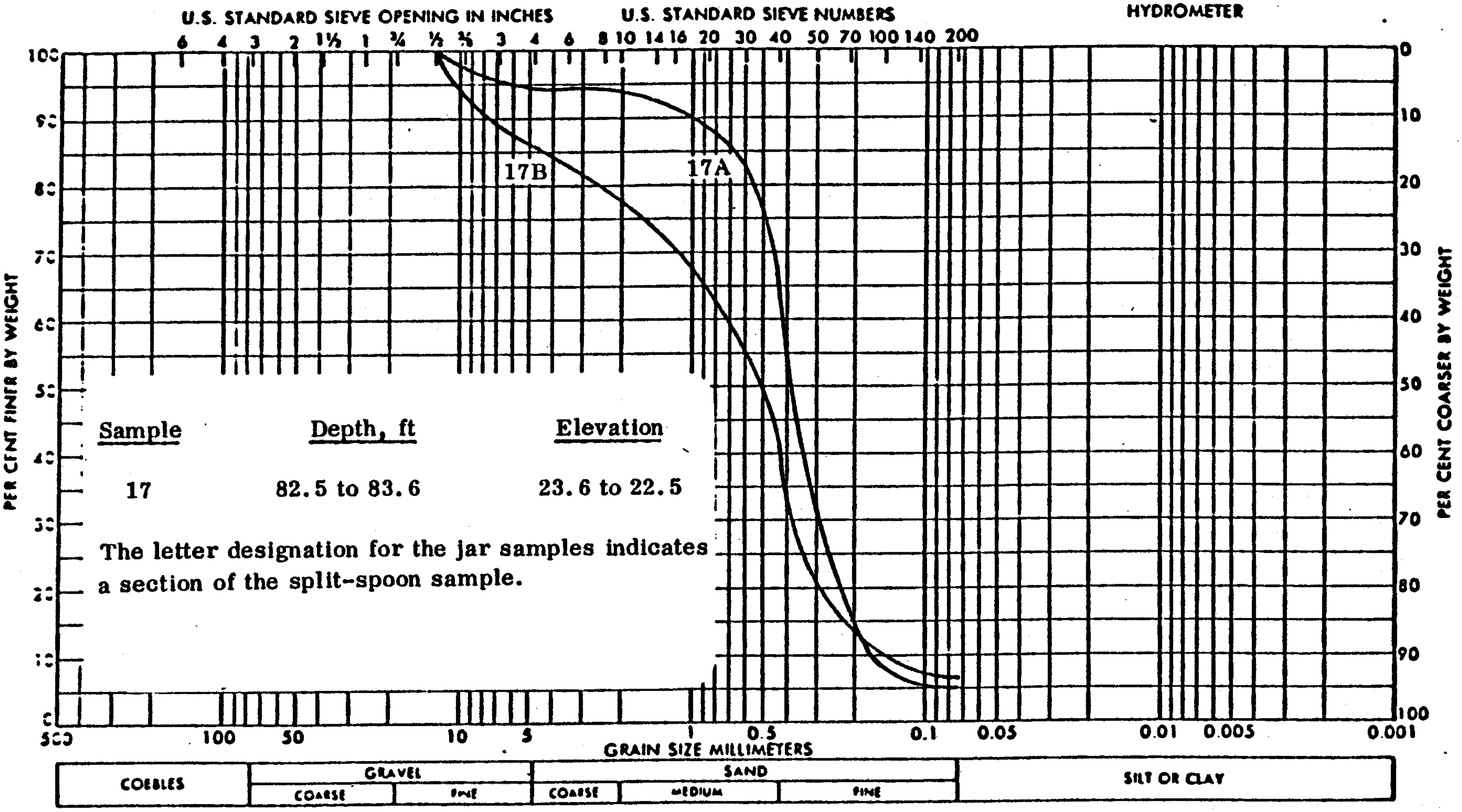
Project 7263

GRAIN SIZE CURVES
Boring 122
Sample 15A, 15B, 16B

Jan 1973

FIG. 53

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
17	82.5 to 83.6	23.6 to 22.5

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
17	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

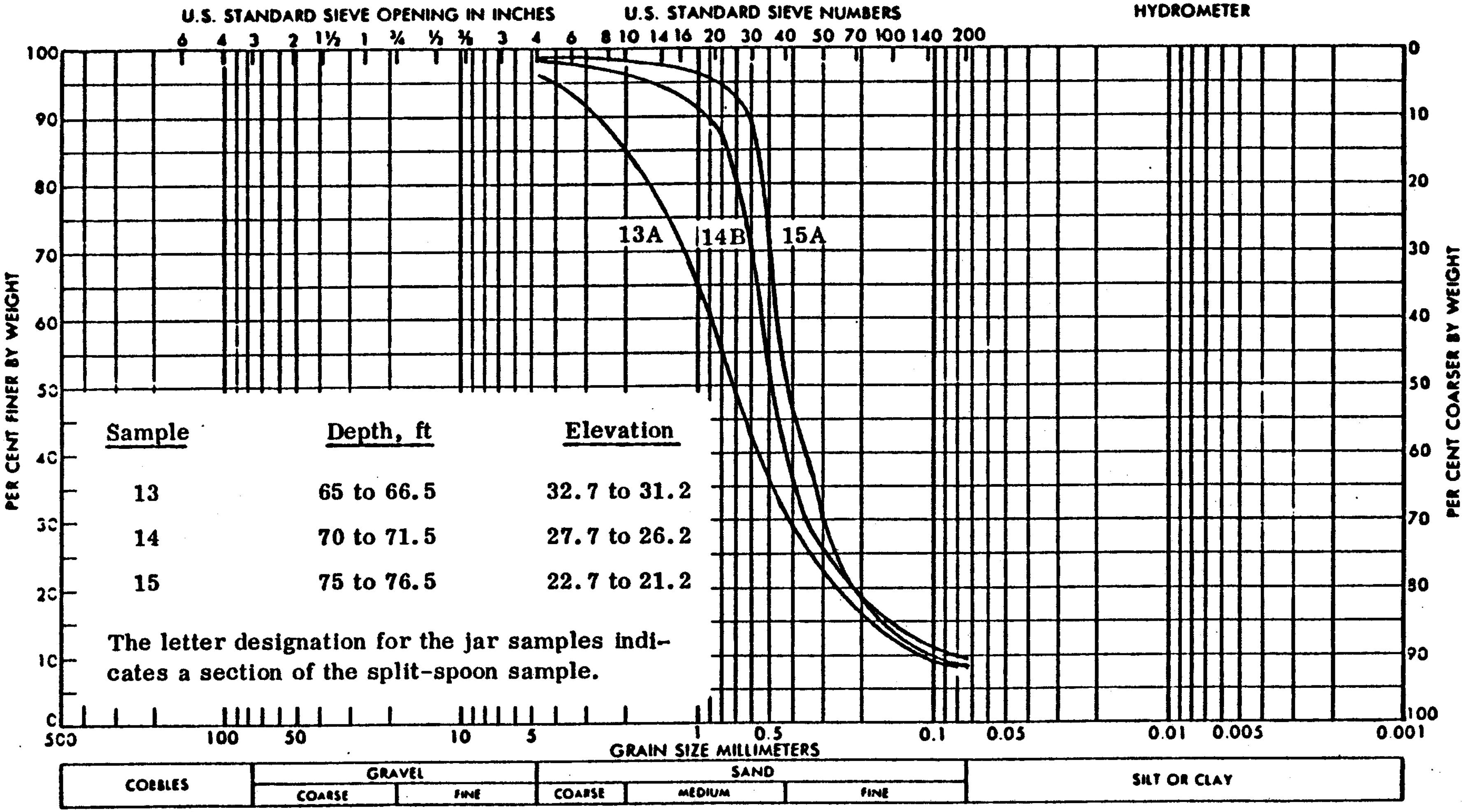
Project 7263

GRAIN SIZE CURVES
Boring 122
Sample 17A, 17B

Jan 1973

FIG. 54

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
13	65 to 66.5	32.7 to 31.2
14	70 to 71.5	27.7 to 26.2
15	75 to 76.5	22.7 to 21.2

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
13	BC
14	BC
15	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

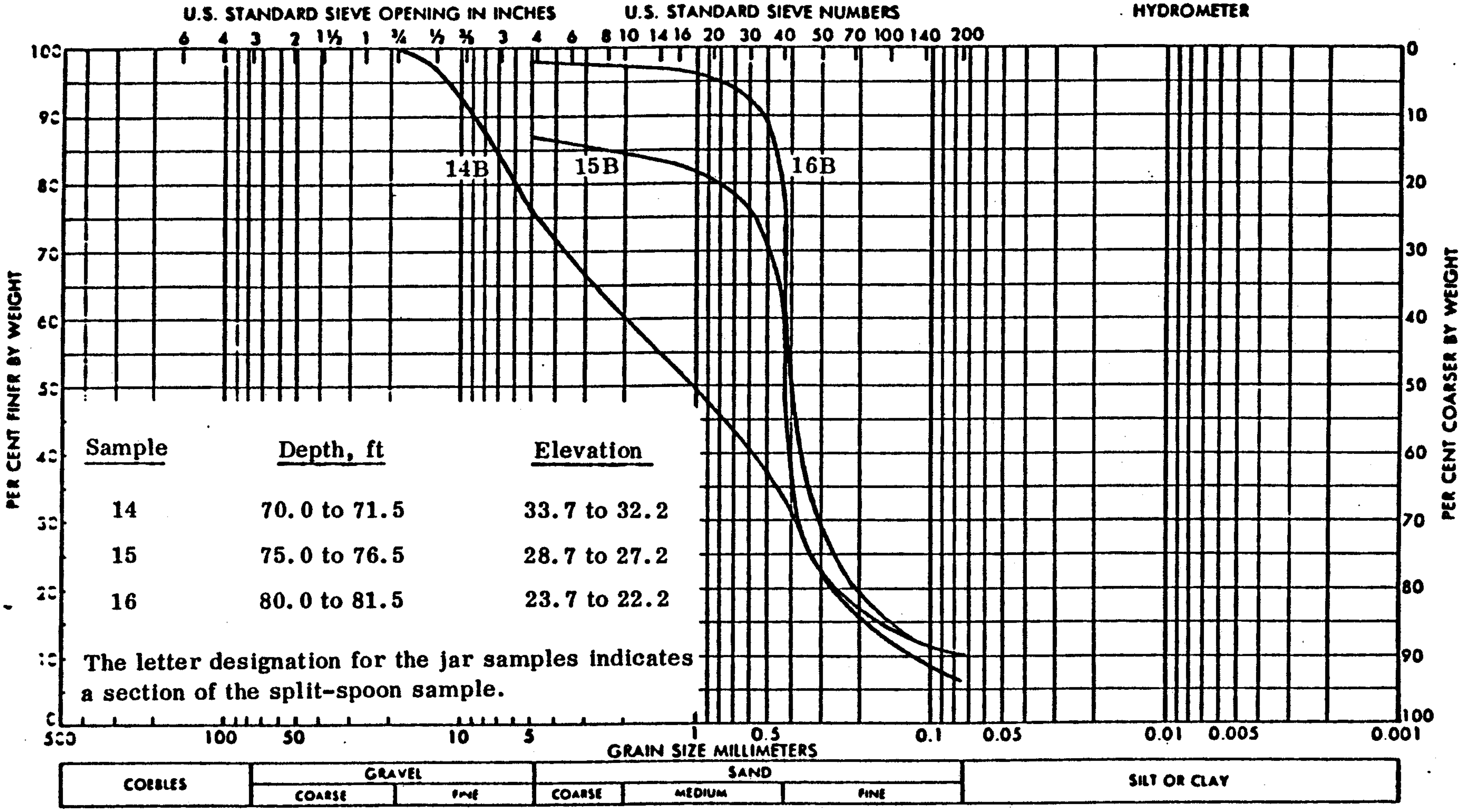
Project 7263

GRAIN SIZE CURVES
Boring 123
Samples 13A, 14B, 15A

Jan 1973

FIG. 55

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
14	70.0 to 71.5	33.7 to 32.2
15	75.0 to 76.5	28.7 to 27.2
16	80.0 to 81.5	23.7 to 22.2

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
14	BC
15	BC
16	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

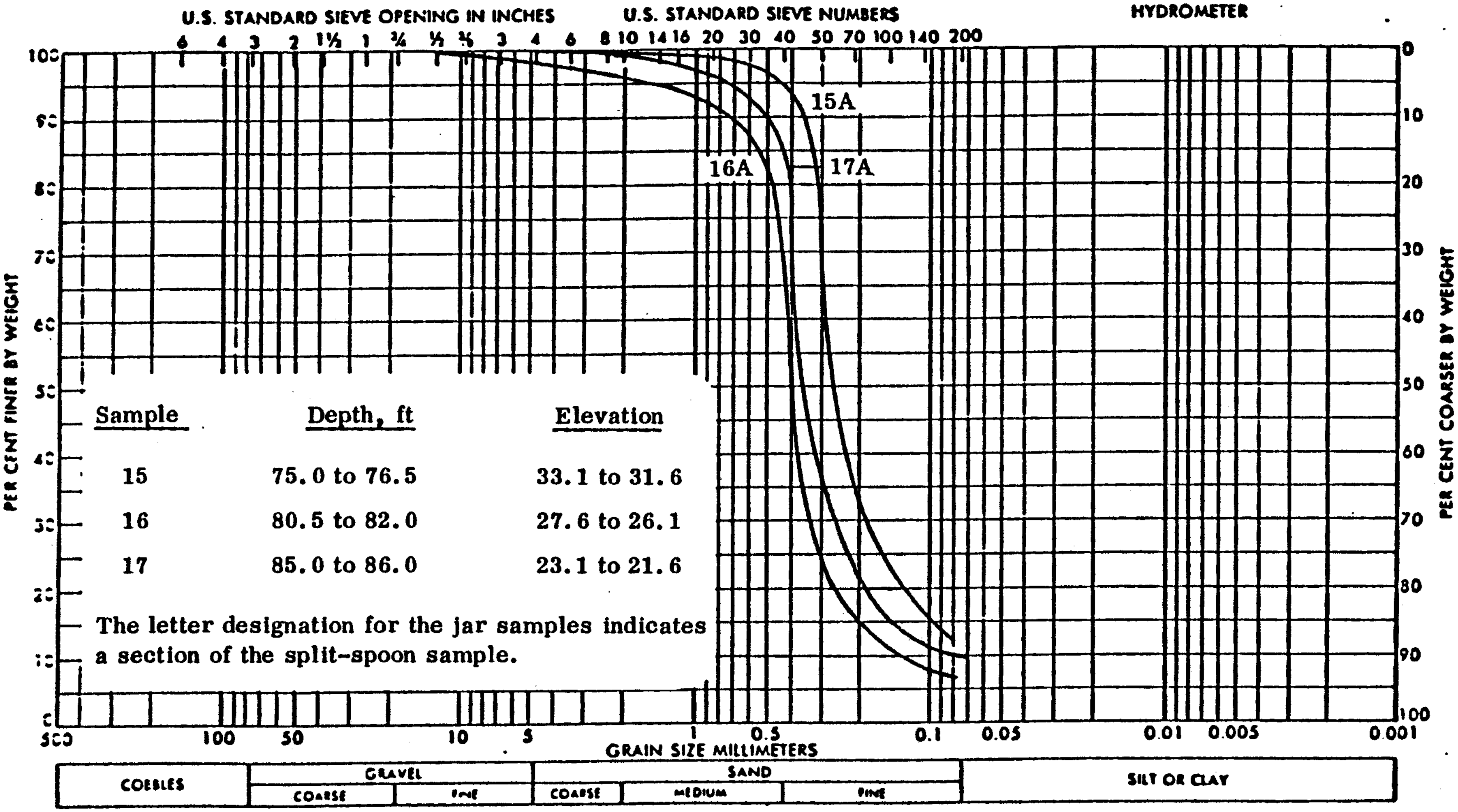
River Bend Power Station
Gulf States Utilities

Project 7263

GRAIN SIZE CURVES
Boring 124
Sample 14B, 15B, 16B

Jan 1973 FIG. 56

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
15	75.0 to 76.5	33.1 to 31.6
16	80.5 to 82.0	27.6 to 26.1
17	85.0 to 86.0	23.1 to 21.6

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
15	BC
16	BC
17	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

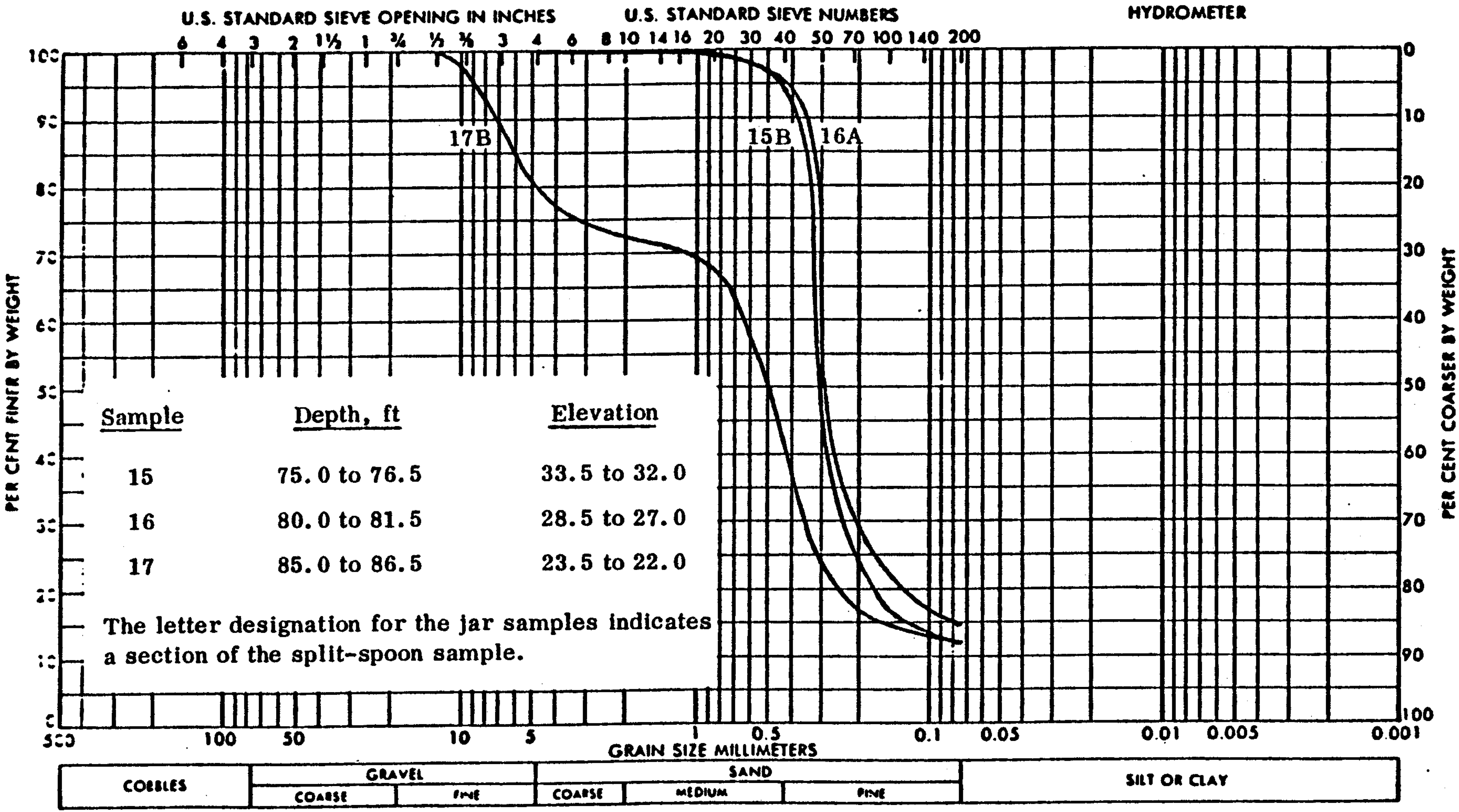
Project 7263

GRAIN SIZE CURVES
Boring 125
Sample 15A, 16A, 17A

Jan 1973

FIG. 57

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
15	75.0 to 76.5	33.5 to 32.0
16	80.0 to 81.5	28.5 to 27.0
17	85.0 to 86.5	23.5 to 22.0

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
15	S
16	BC
17	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

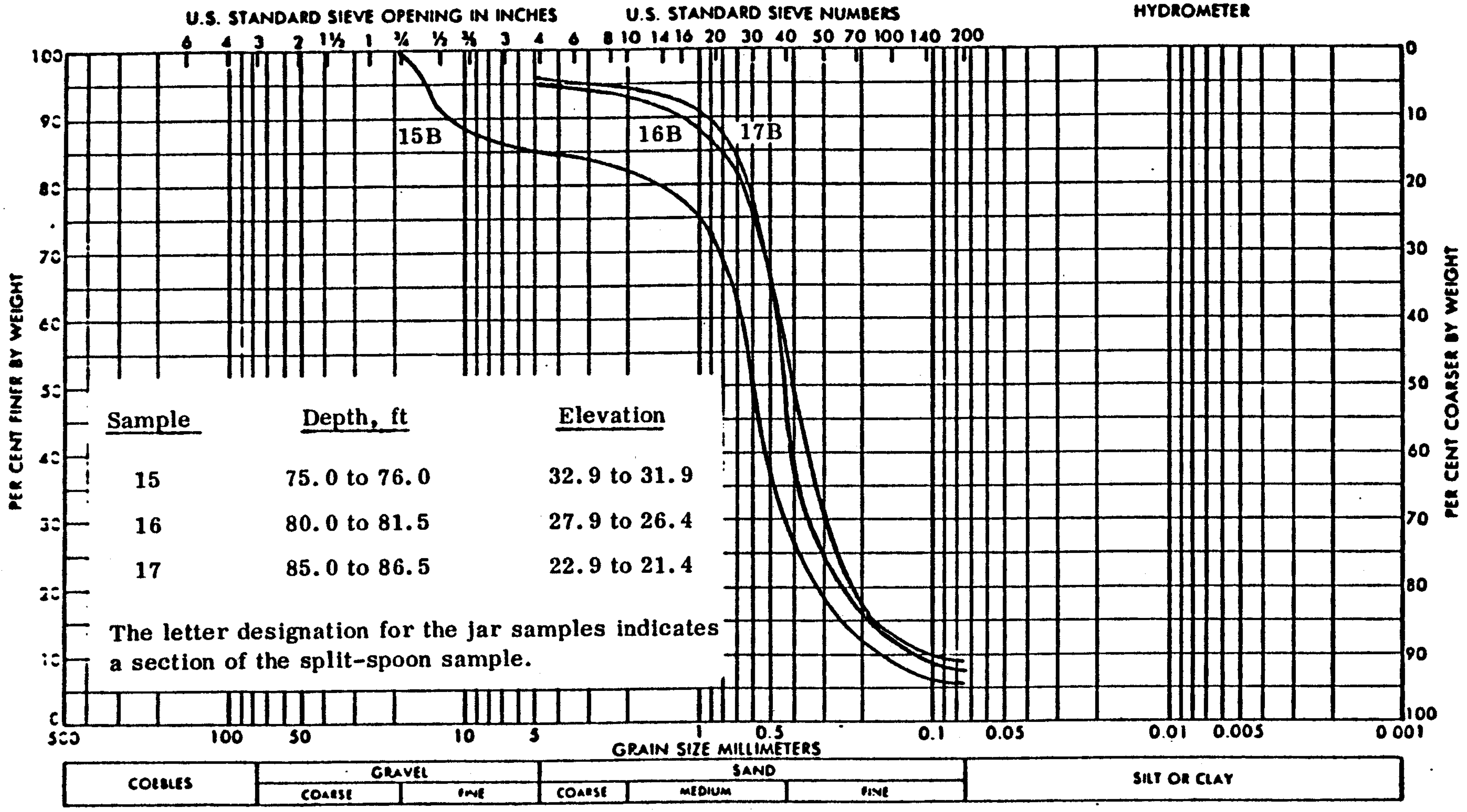
Project 7263

GRAIN SIZE CURVES
Boring 126
Sample 15B, 16A, 17B

Jan 1973

FIG. 58

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
15	75.0 to 76.0	32.9 to 31.9
16	80.0 to 81.5	27.9 to 26.4
17	85.0 to 86.5	22.9 to 21.4

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
15	BC
16	BC
17	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

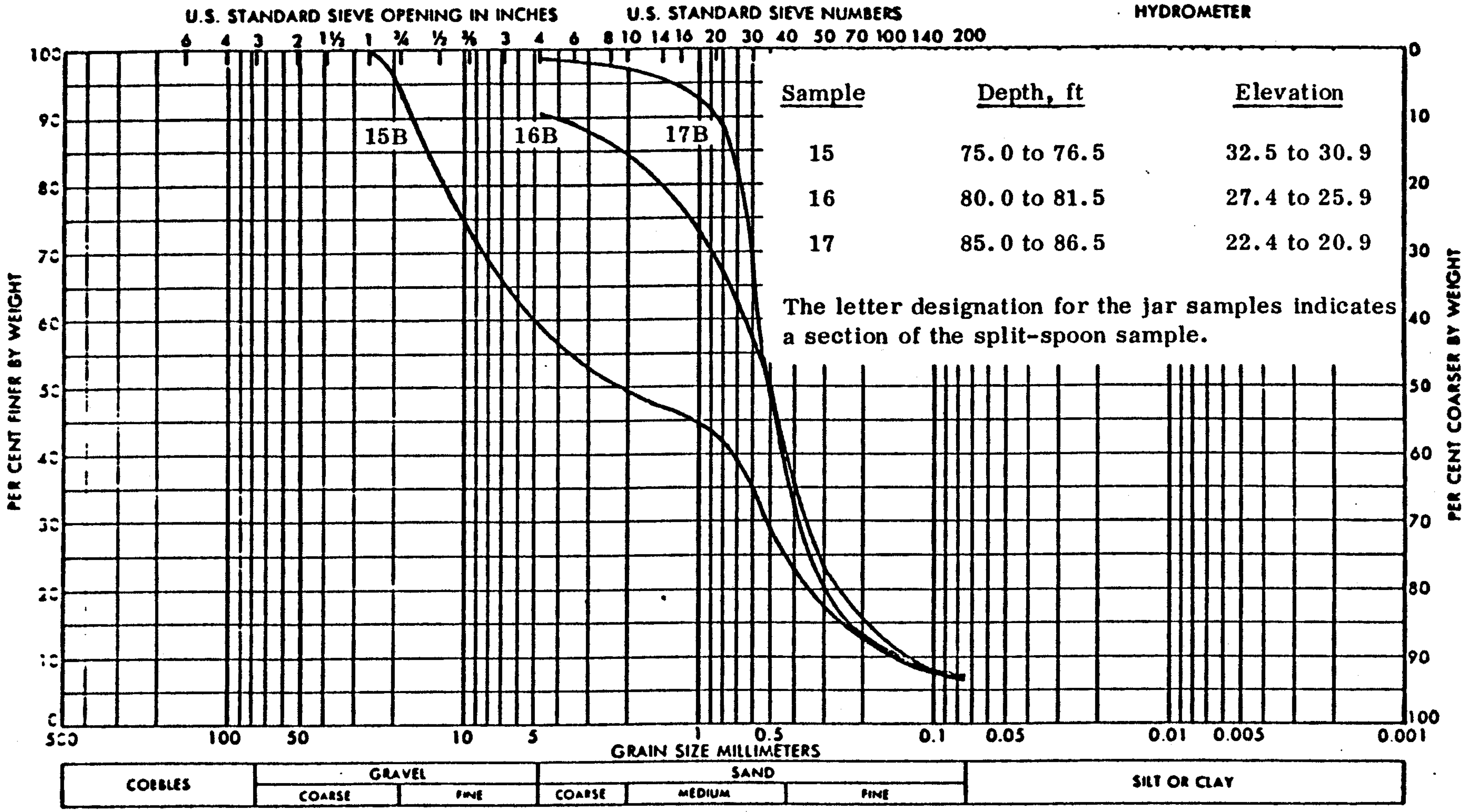
Project 7263

GRAIN SIZE CURVES
Boring 127
Sample 15B, 16B, 17B

Jan 1973

FIG. 59

GEOTECHNICAL ENGINEERS INC.



Sample	Depth, ft	Elevation
15	75.0 to 76.5	32.5 to 30.9
16	80.0 to 81.5	27.4 to 25.9
17	85.0 to 86.5	22.4 to 20.9

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
15	BC
16	BC
17	BC

Stone & Webster Eng. Corp.
Boston, Mass.

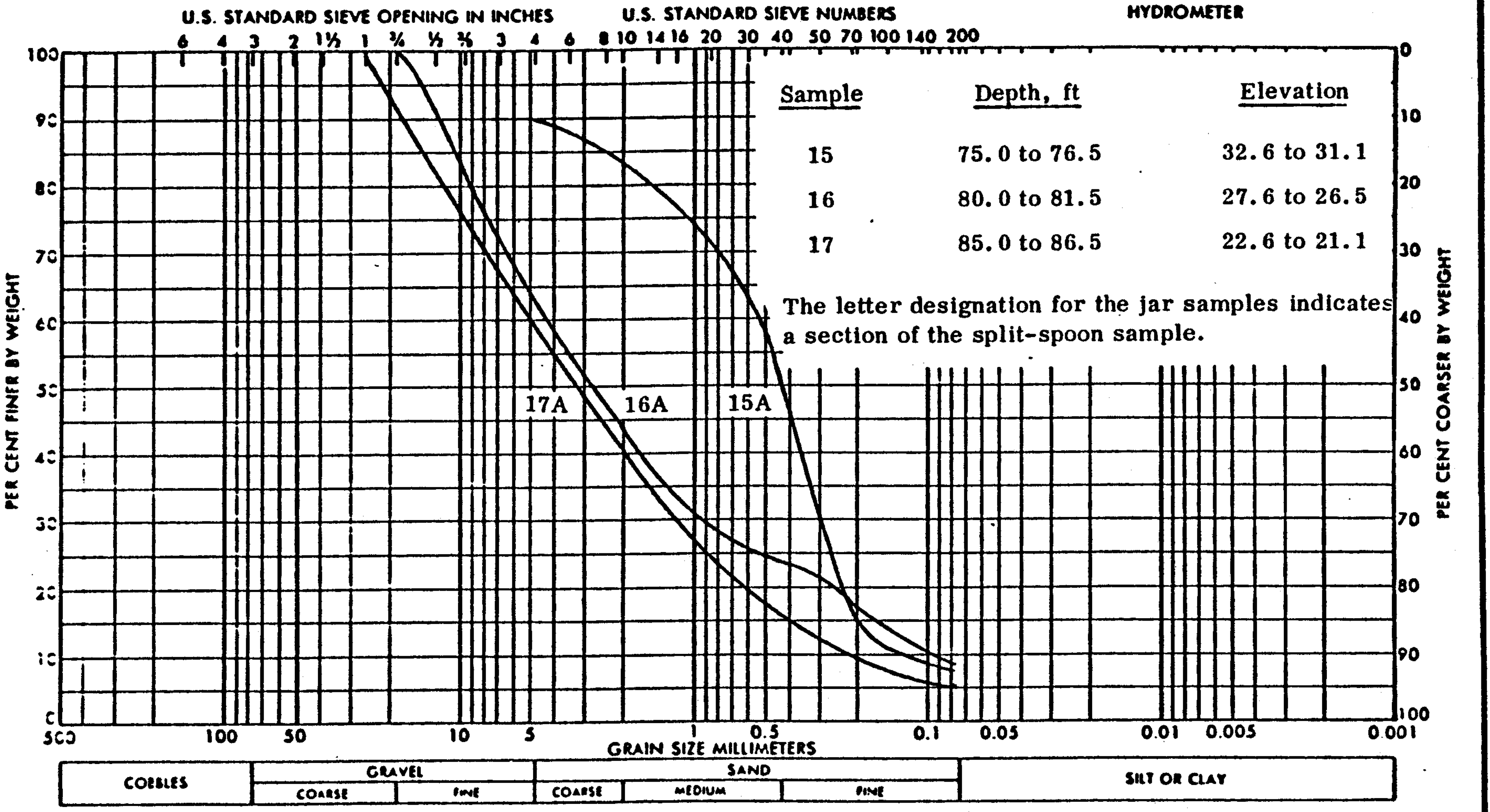
Geotechnical Engineers, Inc.
Winchester, Mass.

River Bend Power Station
Gulf States Utilities

Project 7263

GRAIN SIZE CURVES
Boring 128
Sample 15B, 16B, 17B

Jan 1973 FIG. 60



Sample	Depth, ft	Elevation
15	75.0 to 76.5	32.6 to 31.1
16	80.0 to 81.5	27.6 to 26.5
17	85.0 to 86.5	22.6 to 21.1

The letter designation for the jar samples indicates a section of the split-spoon sample.

Sample	Zone
15	BC
16	BC
17	BC

Stone & Webster Eng. Corp.
Boston, Mass.

Geotechnical Engineers, Inc.
Winchester, Mass.

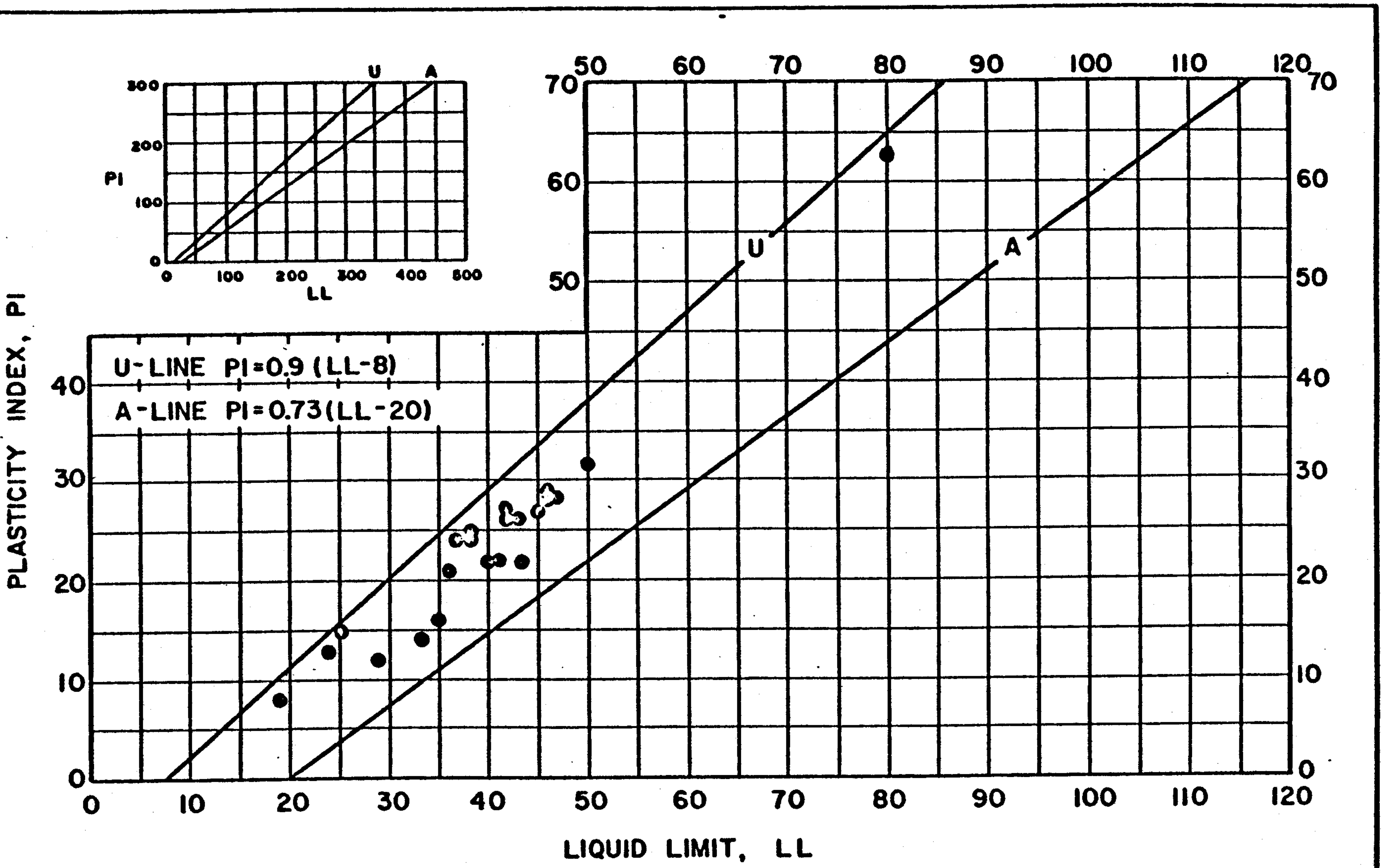
River Bend Power Station
Gulf States Utilities

Project 7263

GRAIN SIZE CURVES
Boring 129
Sample 15A, 16A, 17A

Jan 1973
FIG. 61

GEOTECHNICAL ENGINEERS INC.



Stone & Webster Eng. Corp. Boston, Mass.	River Bend Power Station Gulf States Utilities	PLASTICITY CHART JAR SAMPLES
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	PROJECT 7263	Jan. 1973 FIG. 62

REPORT

ON

GRAIN SIZE DETERMINATIONS
FOR
SELECTED SAMPLES

Prepared by

STONE & WEBSTER ENGINEERING CORPORATION

APPENDIX 2J

LABORATORY CLASSIFICATION TESTING ON SAMPLES OF IN SITU SOILS FROM THE PLANT AREA

TABLE OF CONTENTS

2J.1 PURPOSE OF TESTS

The purpose of the laboratory testing reported herein was to determine the grain size distribution of selected samples of soil from River Bend Station. These samples were selected from the various soil types encountered at the site to aid in the visual description of the texture of these and similar samples and also to provide a profile of the texture of a portion of boring No. 120.

2J.2 TEST PROCEDURES

A grain size determination was made on one jar sample per split-spoon sample, except where visual inspection indicated that the jar samples corresponded to different soil types. Each jar sample represents only a portion of the total split-spoon sample, and the jars are therefore numbered with the letters A, B, C, etc, denoting the portion of the sample starting from the top, as well as the number indicating the split-spoon sample.

A combined sieve and hydrometer analysis test was performed in all cases except in boring No. 120. Most of the combined analyses were performed on predominantly coarse-grained soils by, first, oven-drying a sample having a dry weight between 50 and 150 g (depending on the amount of material available and its gradation), chemically and mechanically dispersing the entire sample into 1,000 ml of distilled water, and then performing the hydrometer analysis on the resulting suspension. (All particles coarser than the No. 200 sieve had fallen below the bulb of the hydrometer before the first reading was taken; any particles coarser than the No. 10 sieve were removed from the sample before dispersing and replaced after completing the hydrometer analysis.) The suspension was then washed upon a No. 200 sieve to remove all fines, and the material retained by the No. 200 was again oven-dried and, finally, sieved. Samples of predominantly fine-grained soils were given combined sieve and hydrometer analyses in a similar manner, except they were not first oven-dried; a portion of the wet soil was weighed before being dispersed, while a second portion was used to determine the water content of the wet material.

Comparisons of the two methods for the same samples of predominantly coarse-grained soils showed no measurable differences in the results.

All samples from boring No. 120 were oven-dried (the dry weights varied from 150 to 450 g) and then, with one exception, washed clean of particles passing the No. 200 sieve before being oven-dried again and sieved.

2J.3 LIST OF GRAIN SIZE CURVES

Sheet	1	Boring	11	Samples	13,14,15,16
	2		12		1,2,3, and 4
	3		12		10
	4		23		17 and 20
	5		24		20
	6		25		18 and 22
	7		26		22
	8		27		21
	9		28		25 and 31
	10		29		19 and 24
	11		30		20 and 23
	12		31		25
	13		32		1,2,3, and 4
	14		32		7,8,9, and 10
	15		32		11,12, and 13
	16		32		14,15,16, and 17
	17		32		18,19,20, and 21
	18		32		22,23,24,25, and 26
	19		32		27,28,29,30, and 31
	20		34		24
	21		35		1,2,3,4, and 7
	22		35		8,9,10,11, and 12
	23		35		16
	24		53		17
	25		54		12
	26		61		7,12,14, and 17
	27		69		10,11, and 17
	28		74		11 and 21
	29		120		15,16, and 17
	30		120		18
	31		120		19,20,21, and 22
	32		120		23,24, and 25
	33		120		26,27, and 28
	34		120		29 and 30

SYMBOLS FOR STATIGRAPHIC ZONES

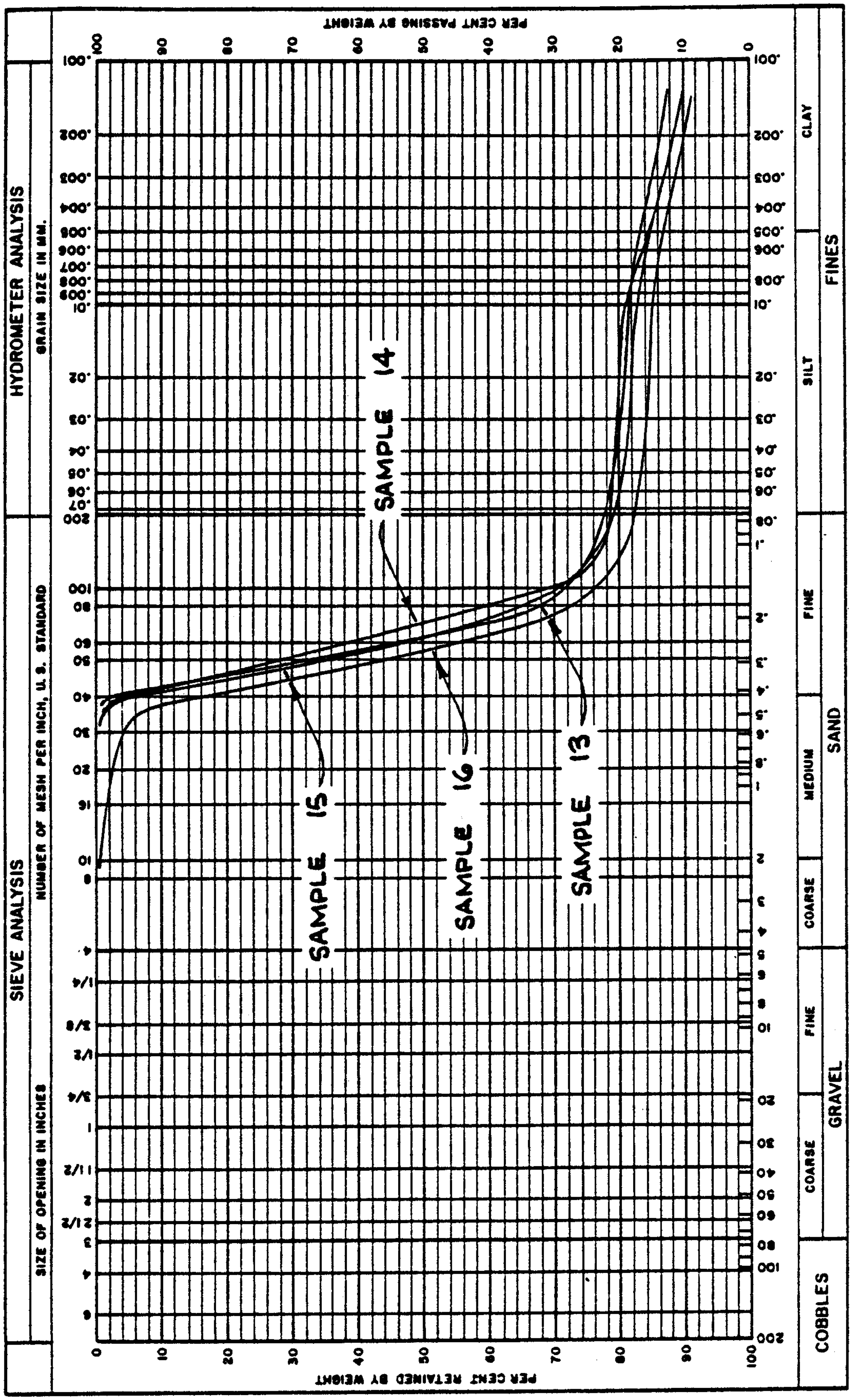
The symbols listed below are used to designate stratigraphic zones on the following grain size curves.

Symbol	Stratigraphic Zone
L	Loess
PH	Port Hickey top-stratum silts and clays
S	Sands and clayey sands
BC	Citronelle buried channel deposits, sands, and gravels
PC	Pascagoula clays

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 11
SITE RIVER BEND POWER STATION	DATE 13 MAR 72	SAMPLE NUMBERS 13, 14, 15, AND 16

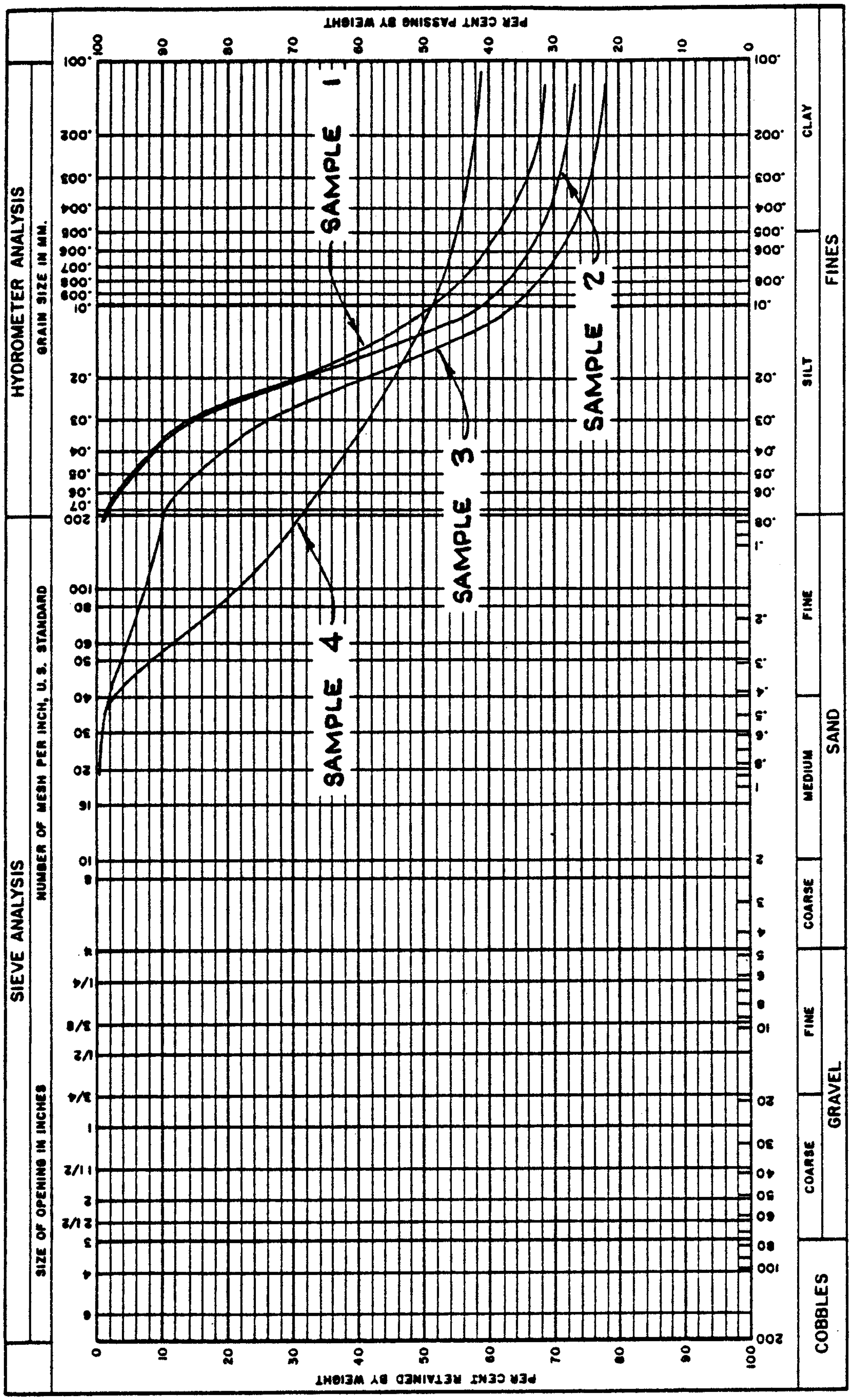


SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
13	58.5-60.0	97	28	22	14	MODERATE REDDISH BROWN (10 R 4/6)
14	63.5-65.0	96	30	22	12	MODERATE REDDISH BROWN (10 R 4/6)
15	68.5-70.0	95	30	21	12	MODERATE REDDISH BROWN (10 R 4/6)
16	73.5-75.0	84	24	18	10	PALE REDDISH BROWN (10 R 5/5)

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT: GULF STATES UTILITIES COMPANY
J.O. NUMBER: 12210
EXPLORATION TYPE AND NUMBER: BORING 12
SITE: RIVER BEND POWER STATION
DATE: 19 MAY 72
SAMPLE NUMBERS: 1, 2, 3, AND 4

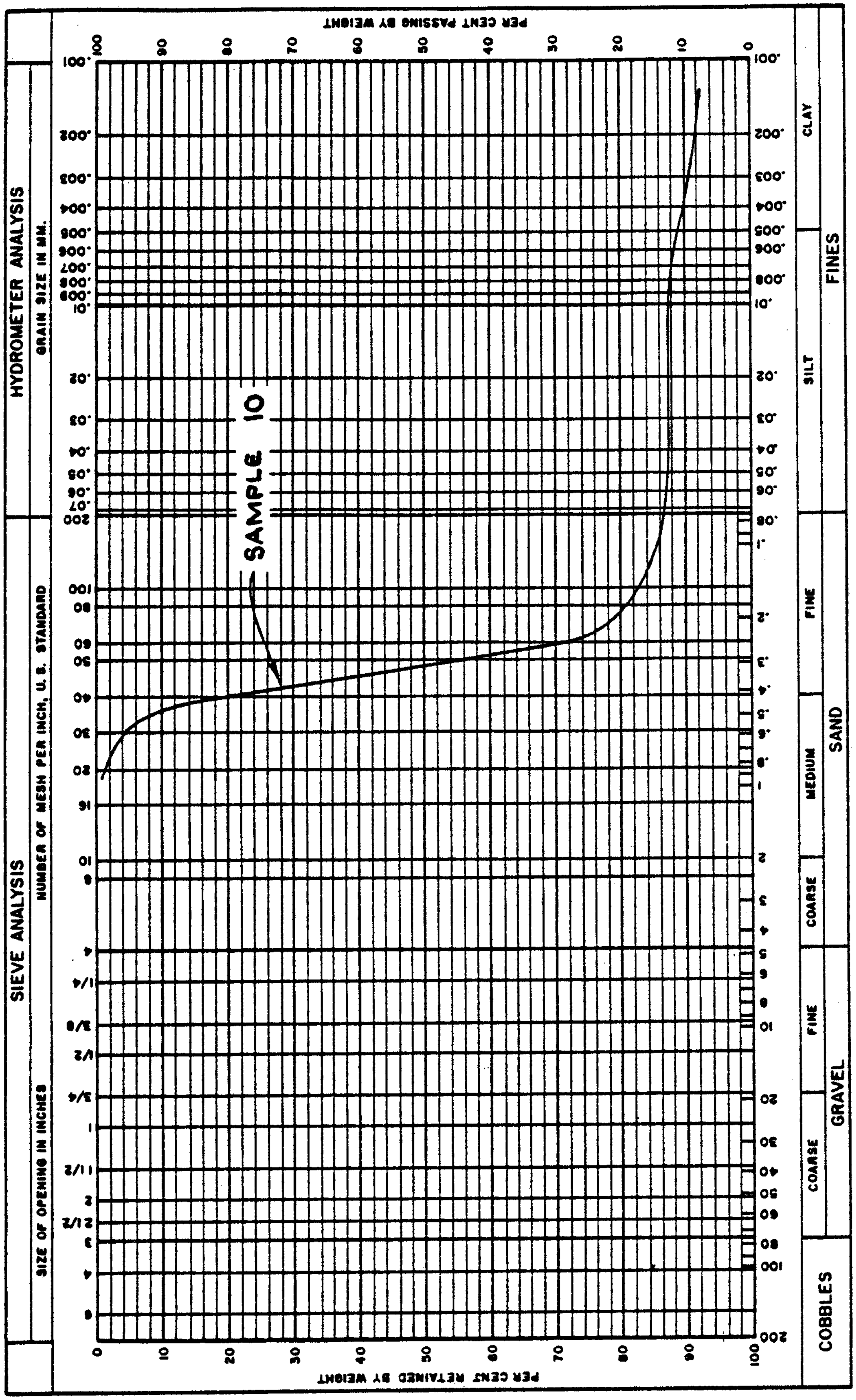


SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
1	0.5-2.0	100	100	99	32	DARK YELLOWISH BROWN (10 YR 4/3)
2	3.5-5.0	100	100	99	28	MODERATE YELLOWISH BROWN (10 YR 4/4)
3	8.5-10.0	98	93	90	23	LIGHT YELLOWISH BROWN (10 YR 6/4)
4	13.5-15.0	98	78	69	42	MEDIUM YELLOWISH ORANGE (10 YR 7/6)

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 12
SITE RIVER BEND POWER STATION	DATE 3 MAY 72	SAMPLE NUMBERS 10



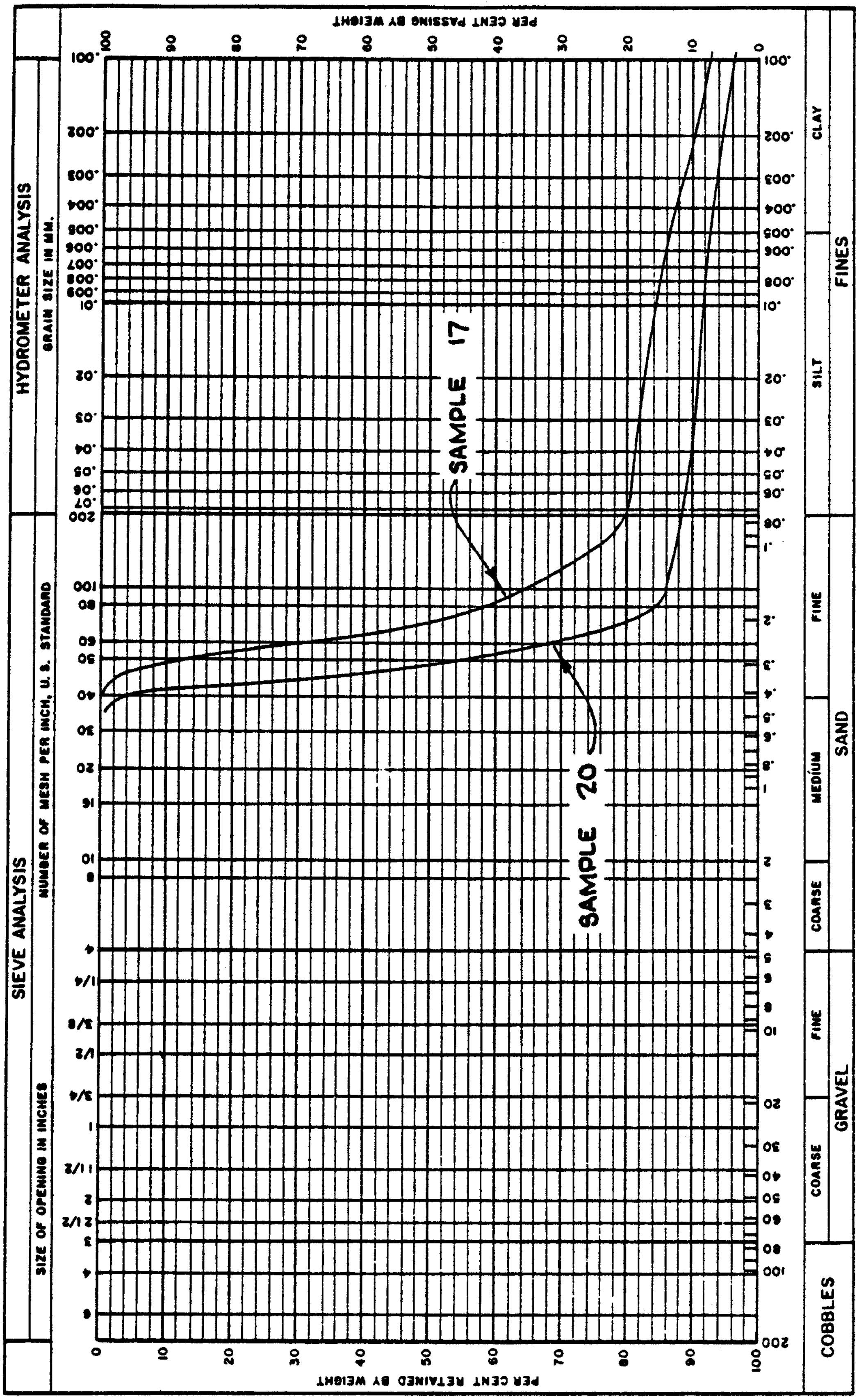
SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
10	43.5-45.0	80	17	13	8	MEDIUM REDDISH ORANGE (10 R 5/5)

SHEET 3

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 23
SITE RIVER BEND POWER STATION	DATE 28 APR 72	SAMPLE NUMBERS 17 AND 20

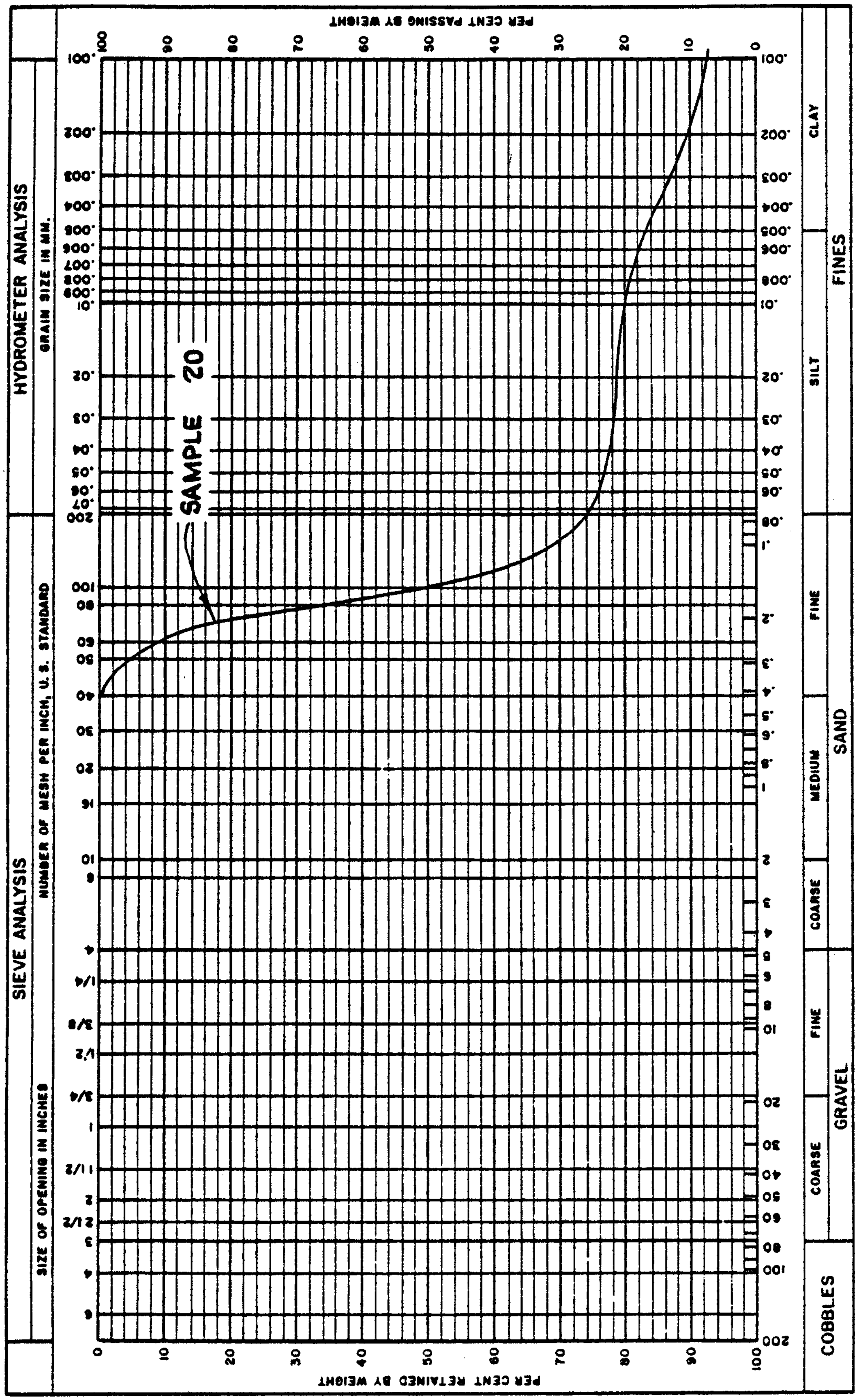


SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
17	78.5-80.0	100	38	20	10	PALE REDDISH BROWN (10 R 5/4)
20	93.5-95.0	96	14	12	5	LIGHT PINKISH BROWN (5 YR 6/4)

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 24
SITE RIVER BEND POWER STATION	DATE 28 APR 72	SAMPLE NUMBERS 20



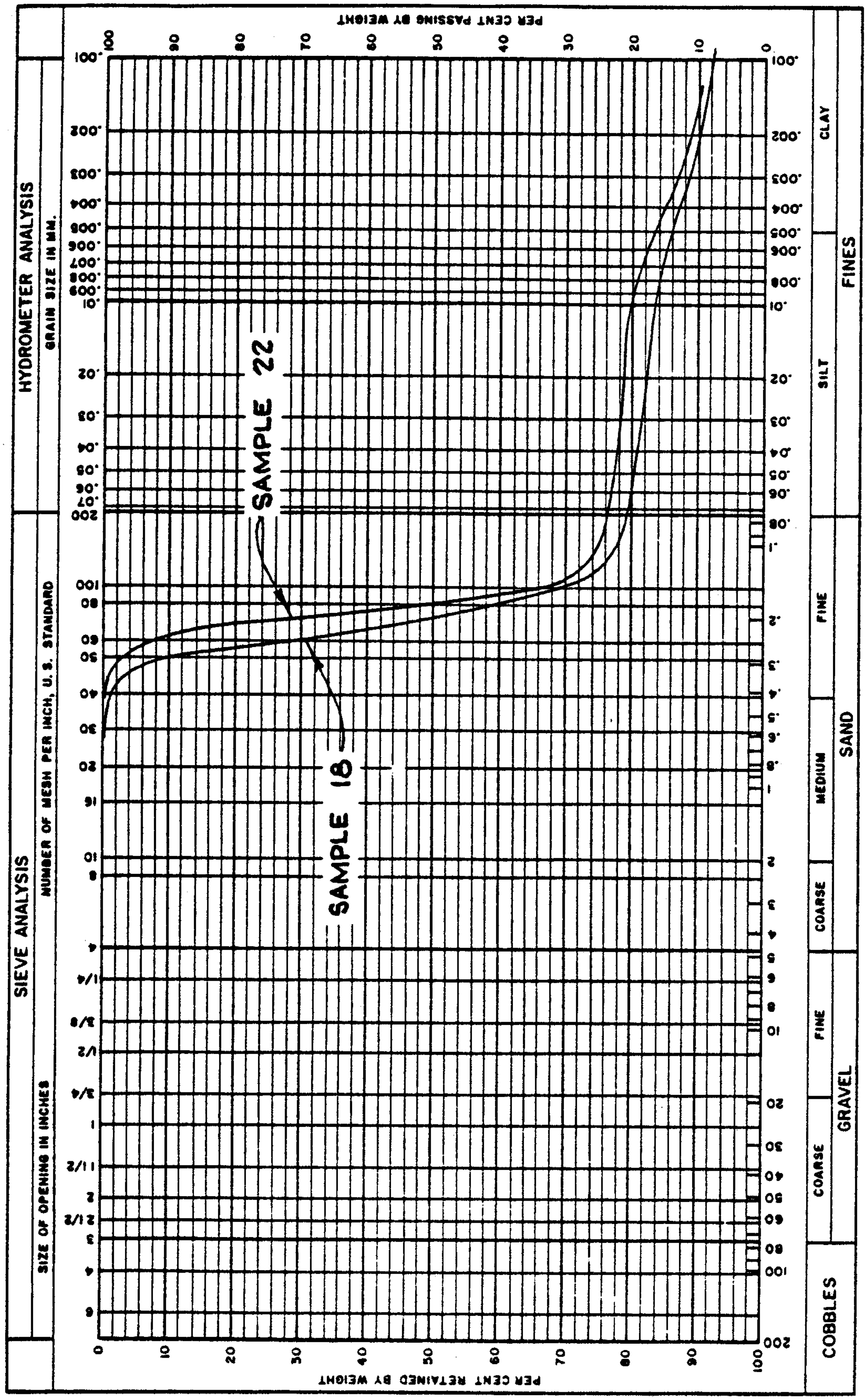
SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
20	93.5-95.0	100	50	26	10	PALE REDDISH BROWN (10 R 5/4)

SHEET 5

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 25
SITE RIVER BEND POWER STATION	DATE 27 APR 72	SAMPLE NUMBERS 18 AND 22



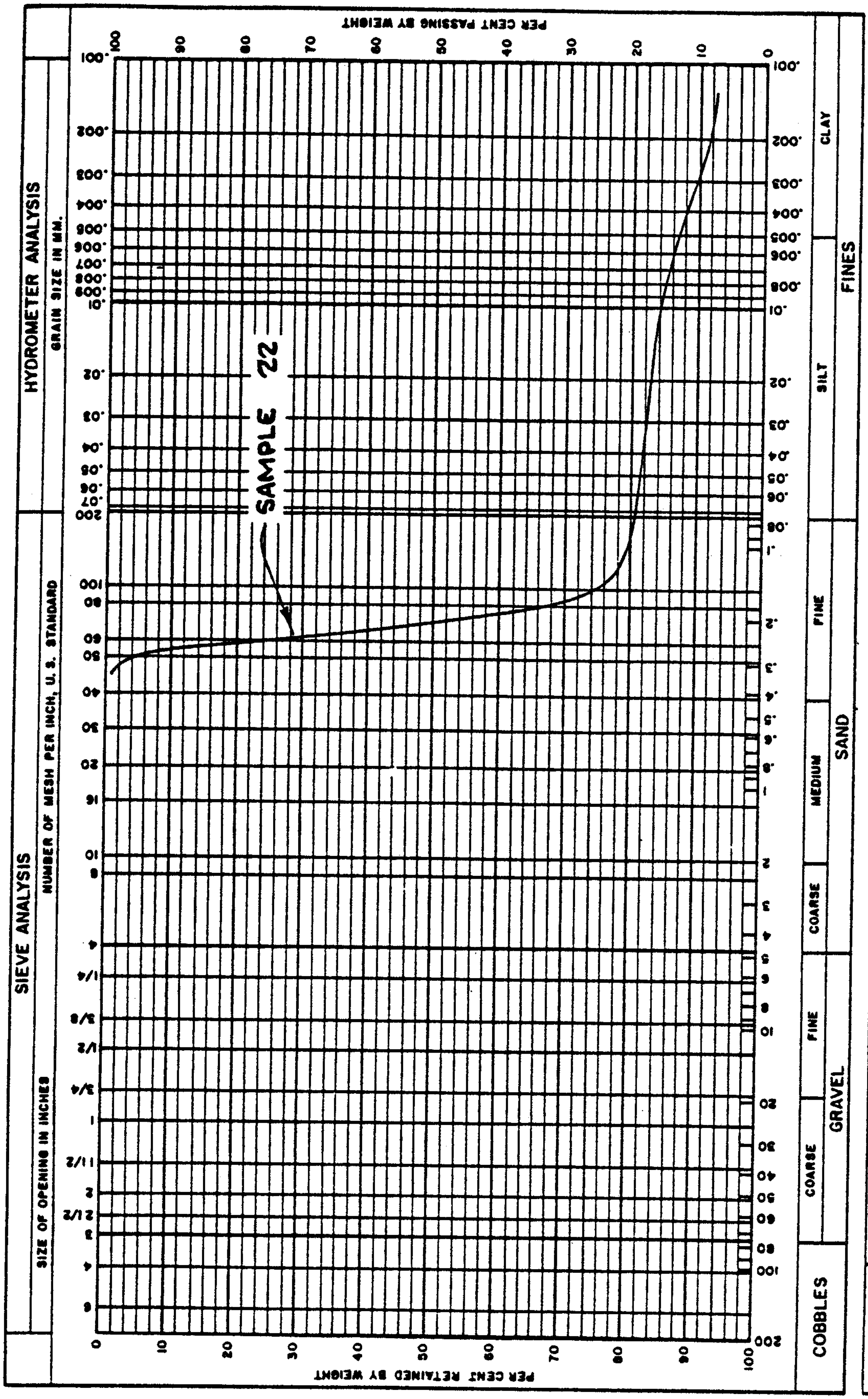
SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
18	83.5-85.0	99	31	21	10	MEDIUM REDDISH ORANGE (10 R 5/5)
22	103.5-105.0	100	34	24	11	MEDIUM REDDISH BROWN (10 R 5/6)

SHEET 6

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 26
SITE RIVER BEND POWER STATION	DATE 1 MAY 72	SAMPLE NUMBERS 22

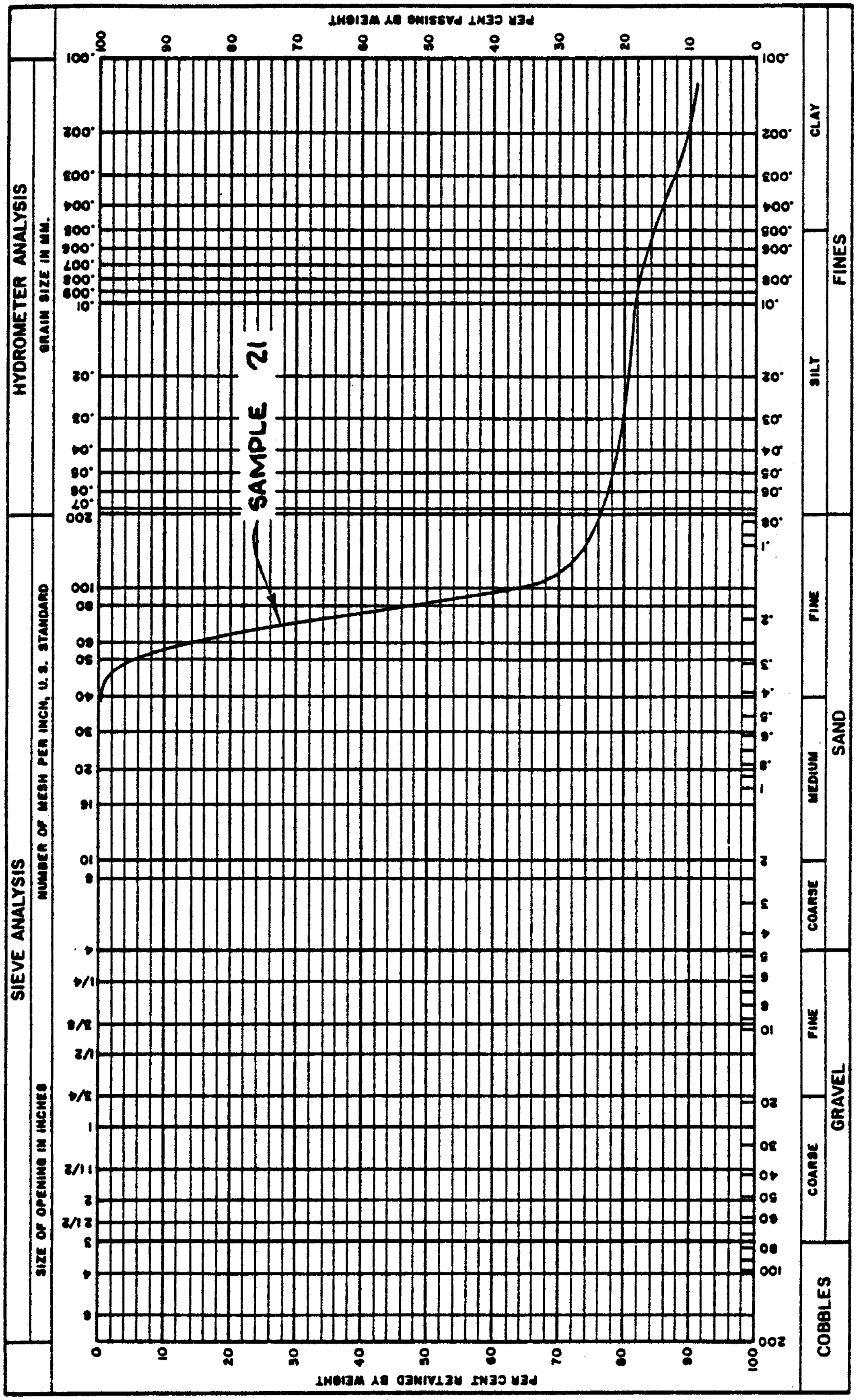


SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
22	103.5-105.0	100	26	19	8	MEDIUM REDDISH BROWN (10 R 5/6)

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 27
SITE RIVER BEND POWER STATION	DATE 1 MAY 72	SAMPLE NUMBERS 21



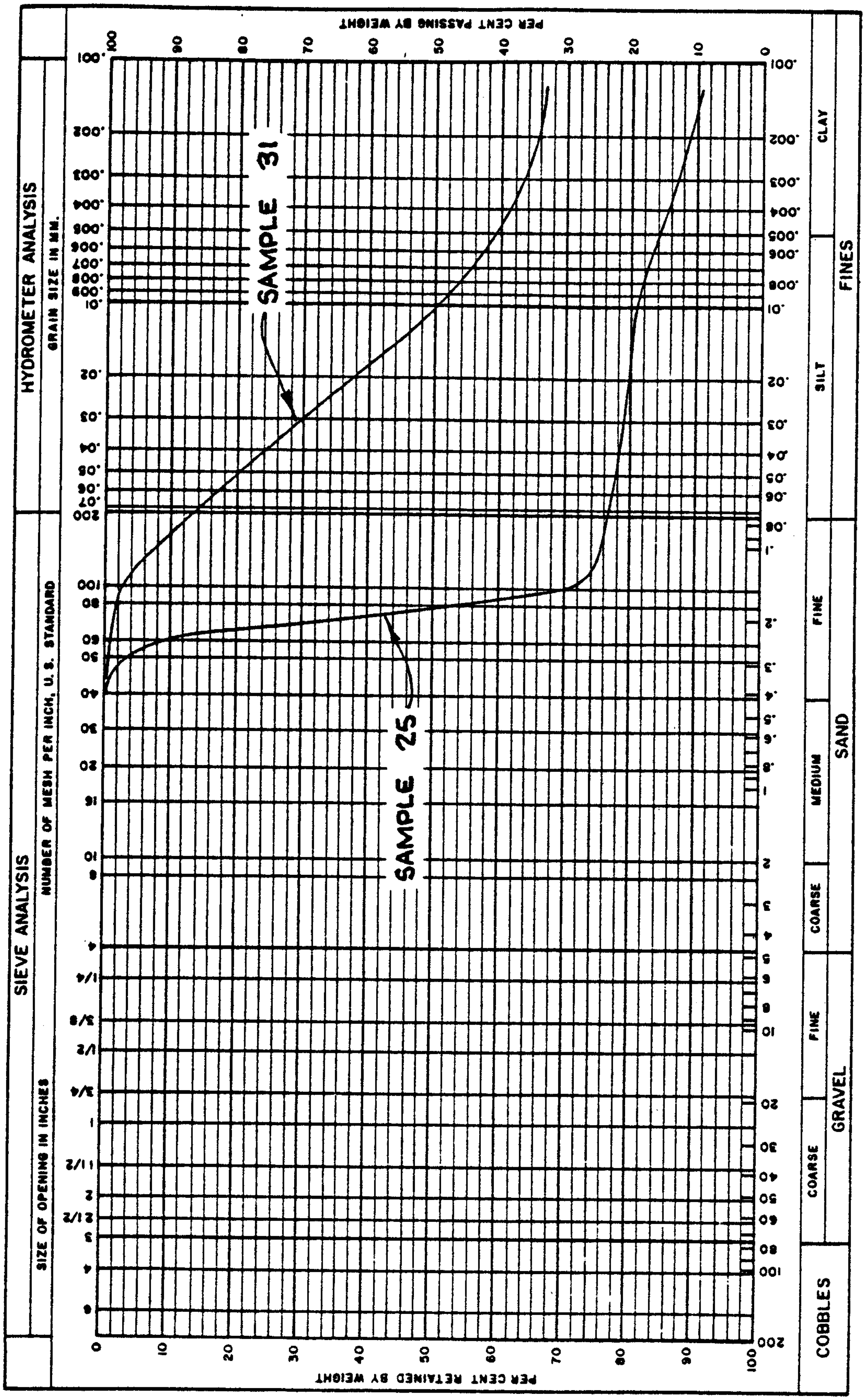
SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
21	98.5-100.0	100	36	24	10	MEDIUM REDDISH BROWN (10 R 5/6)

SHEET 8

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 28
SITE RIVER BEND POWER STATION	DATE 27 APR 72	SAMPLE NUMBERS 25 AND 31

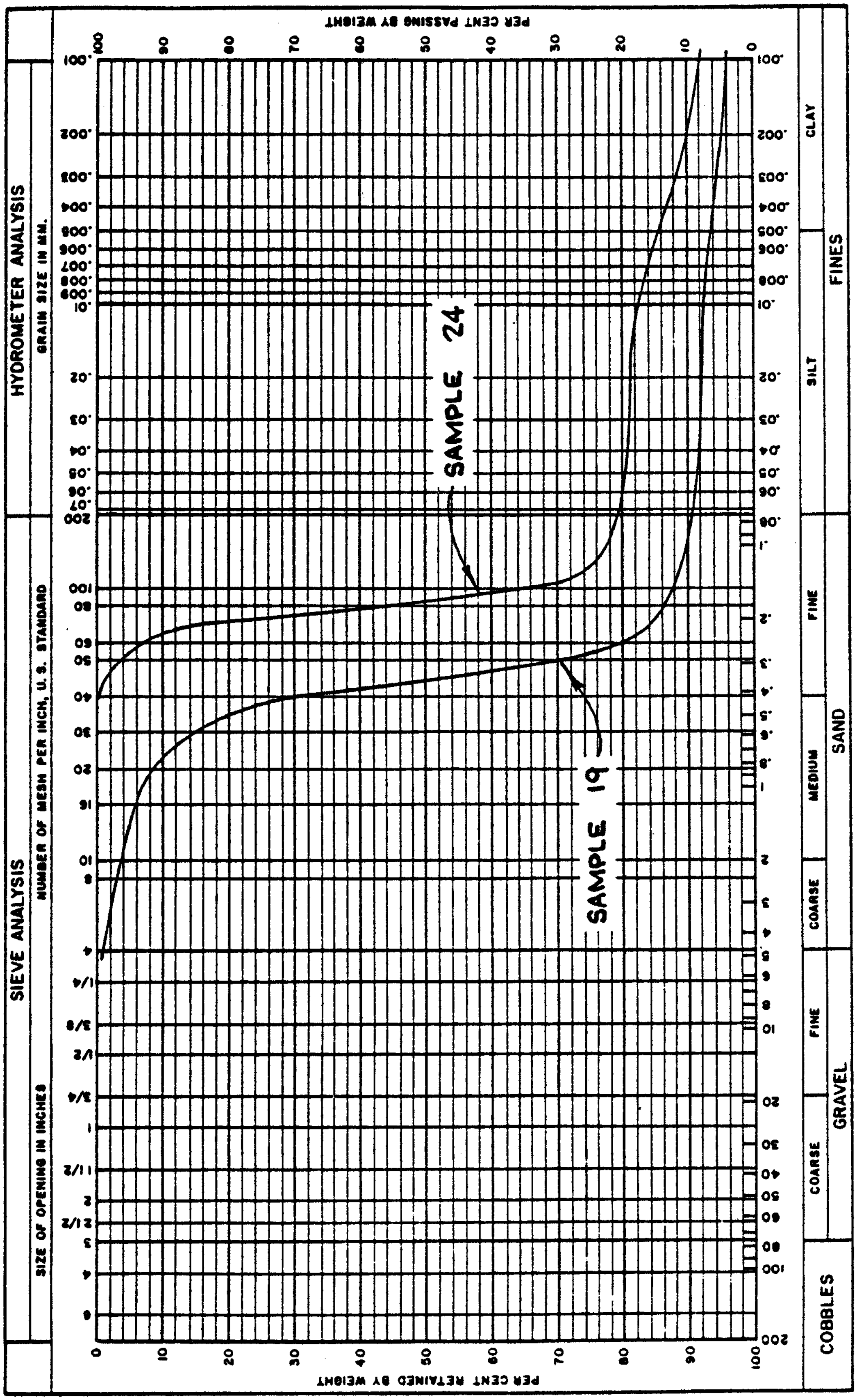


SAMPLE	DEPTH, FT	% < #40	% < #100	% < #200	% < 2μ	COLOR (MUNSELL SYSTEM)
25	113.5-115.0	100	30	23	11	MEDIUM REDDISH BROWN (10 R 5/6)
31	143.5-145.0	100	97	87	34	DARK YELLOWISH GRAY (5 Y 6/2)

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 29
SITE RIVER BEND POWER STATION	DATE 1 MAY 72	SAMPLE NUMBERS 19 AND 24



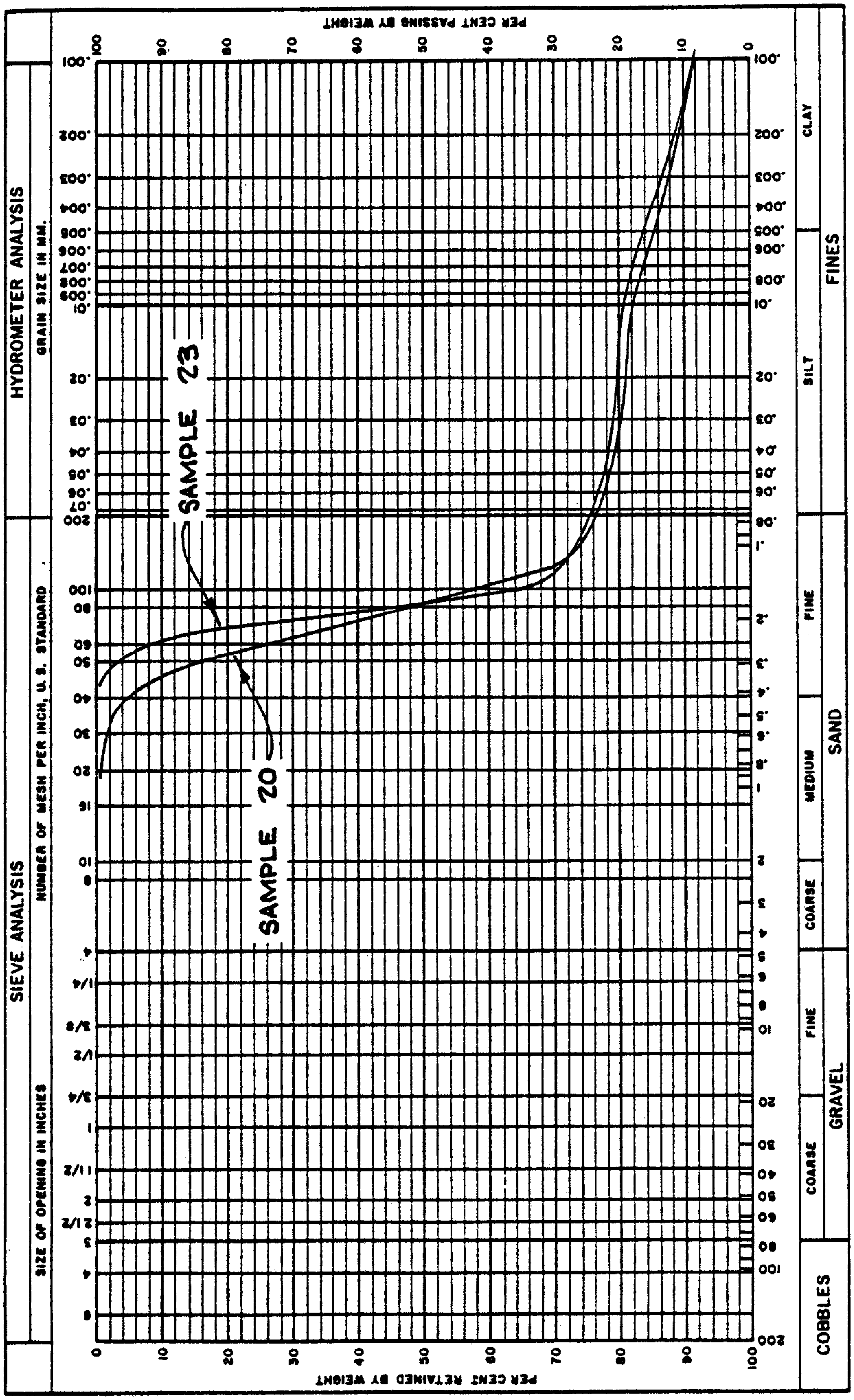
SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
19	88.5-90.0	70	12	10	4	LIGHT GRAYISH RED (10 R 5/2)
24	113.5-115.0	100	35	21	10	LIGHT REDDISH ORANGE (10 R 7/6)

SHEET 10

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 30
SITE RIVER BEND POWER STATION	DATE 28 APR 72	SAMPLE NUMBERS 20 AND 23



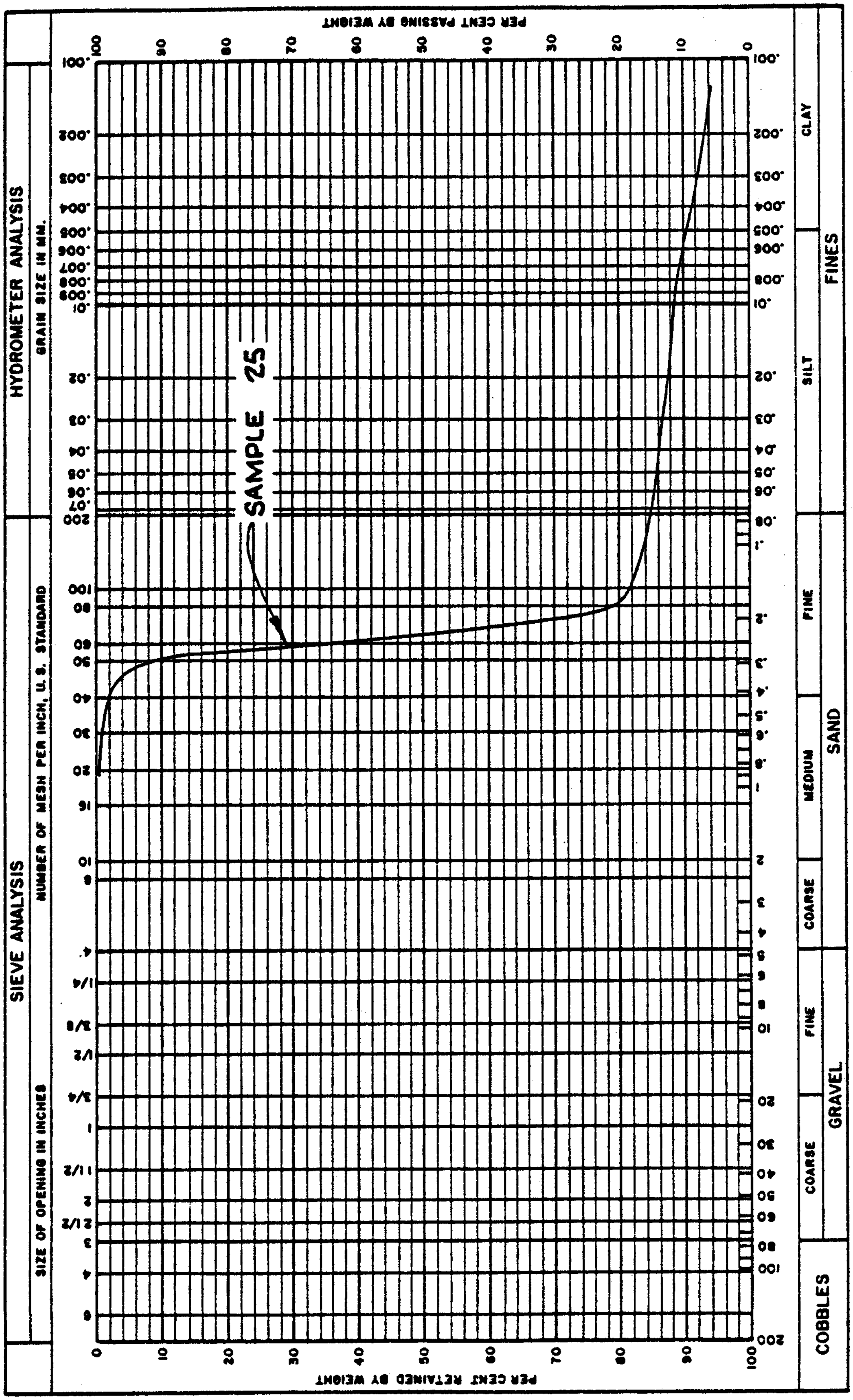
SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
20	93.5-95.0	95	42	24	10	PALE REDDISH BROWN (10 R 5/4)
23	108.5-110.0	100	34	25	11	PALE REDDISH BROWN (10 R 5/4)

SHEET 11

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 31
SITE RIVER BEND POWER STATION	DATE 1 MAY 72	SAMPLE NUMBERS 25



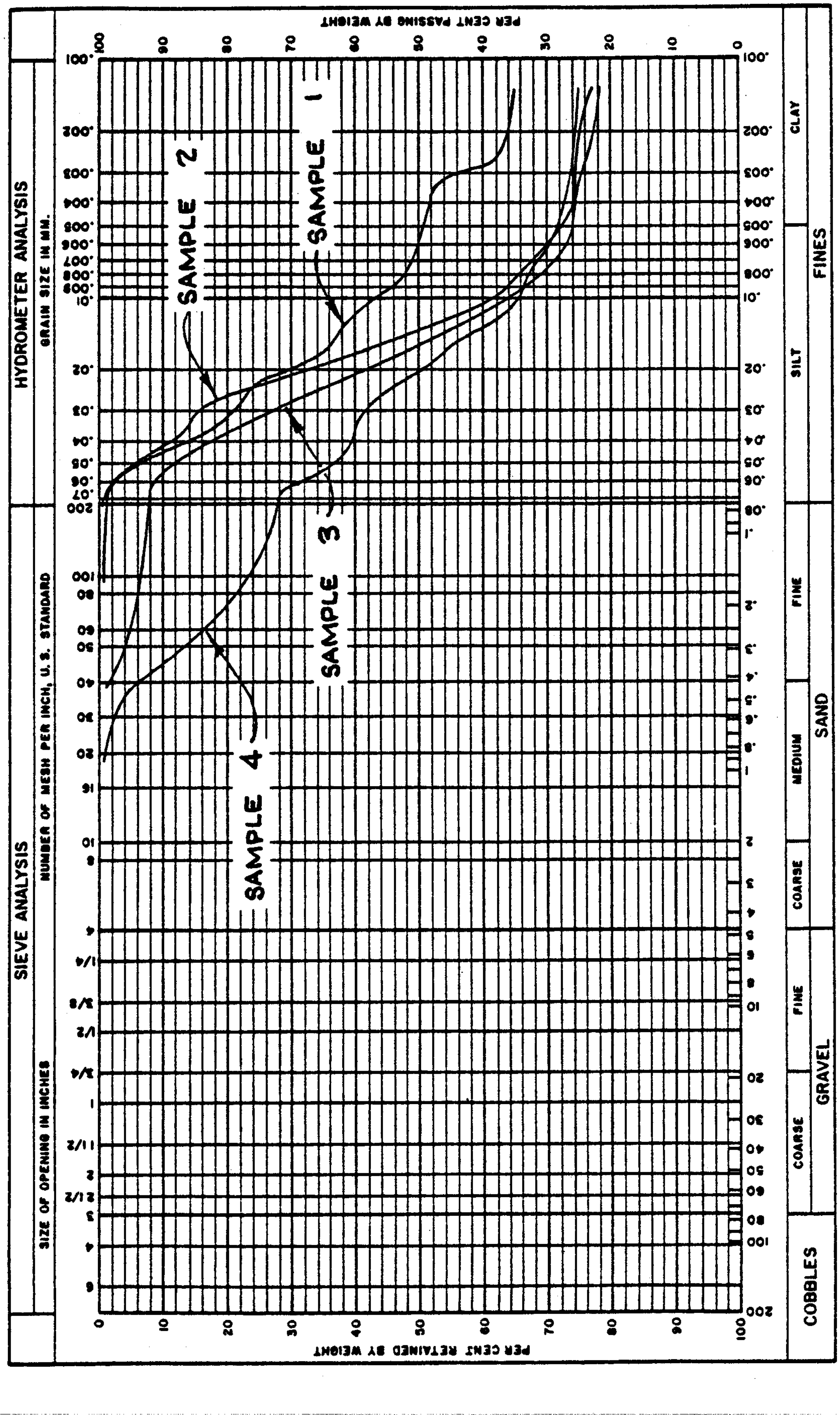
SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
25	118.5-120.0	98	18	15	7	MEDIUM REDDISH BROWN (10 R 5/6)

SHEET 12

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT: GULF STATES UTILITIES COMPANY
J.O. NUMBER: 12210
EXPLORATION TYPE AND NUMBER: BORING 32
SITE: RIVER BEND POWER STATION
DATE: 23 MAY 72
SAMPLE NUMBERS: 1, 2, 3, AND 4



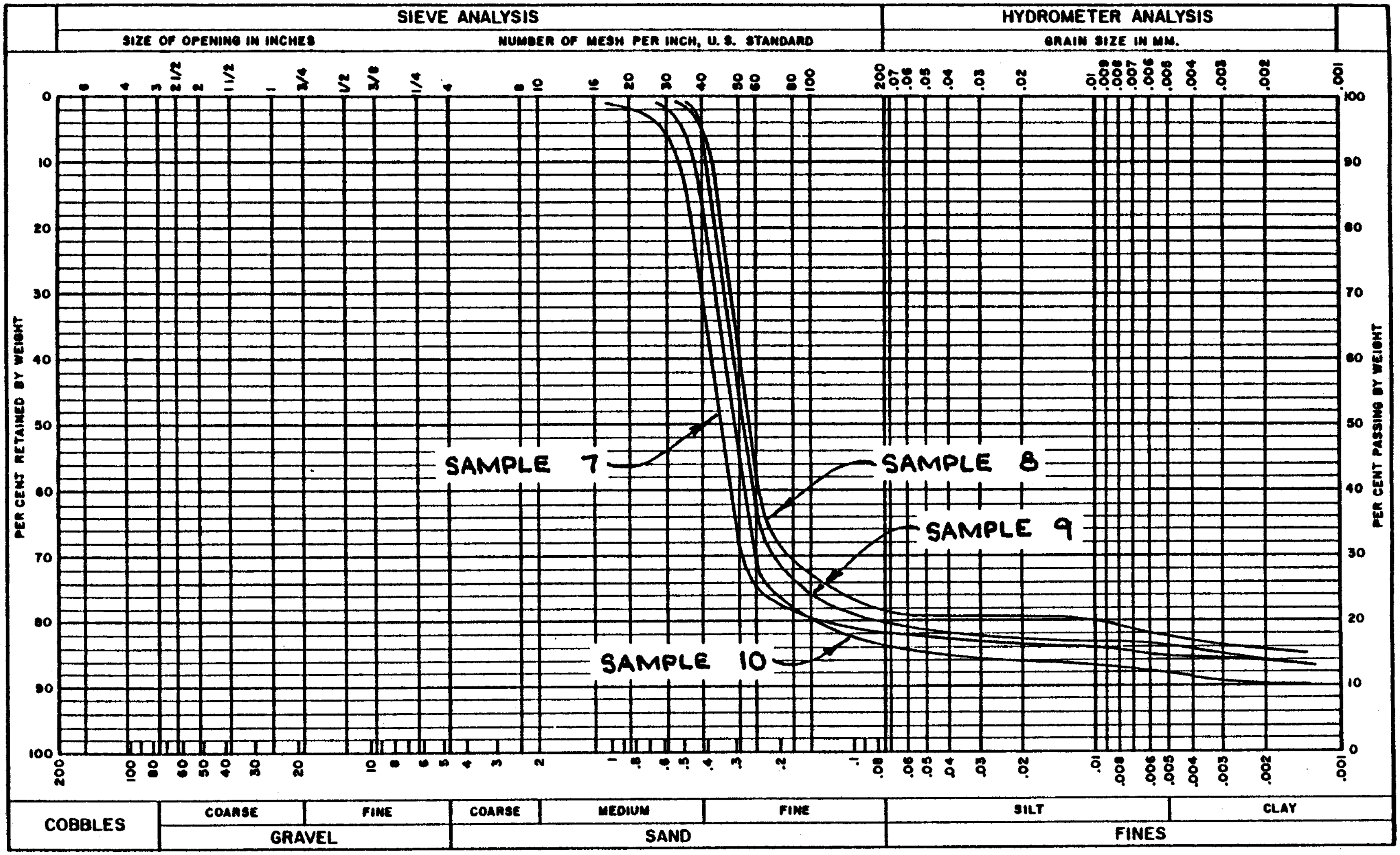
SAMPLE	DEPTH, FT	%< #40	%< #100	%< #200	%< 2μ	COLOR (MUNSELL SYSTEM)
1	0-1.5	100	99	99	36	MEDIUM BROWN (5 YR 4/6)
2	3.5-5.0	100	100	100	25	MODERATE BROWN (5 YR 4/4)
3	8.5-10.0	98	94	92	23	MODERATE YELLOWISH BROWN (10 YR 5/4)
4	13.5-15.0	94	77	72	26	MODERATE BROWNISH ORANGE (10 YR 5/6)

SHEET 13

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 32
SITE RIVER BEND POWER STATION	DATE 28 MAR 72	SAMPLE NUMBERS 7, 8, 9, AND 10



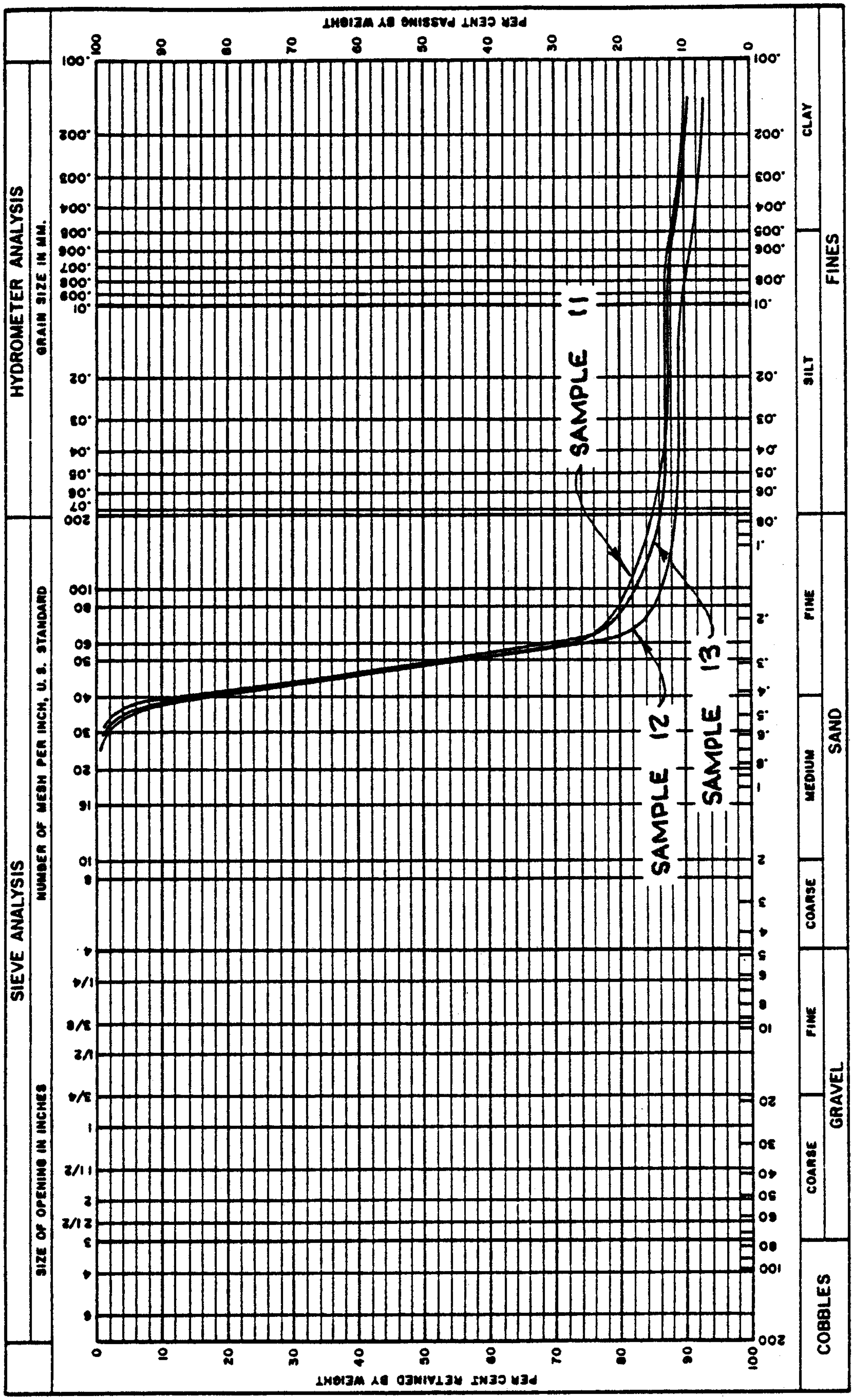
SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
7	28.5-30.0	70	21	18	14	MEDIUM REDDISH BROWN (10 R 5/6)
8	33.5-35.0	95	27	22	16	MODERATE BROWNISH ORANGE (10 YR 5/6)
9	38.5-40.0	95	24	20	14	LIGHT BROWN (5 YR 5/6)
10	43.5-45.0	84	20	16	10	MEDIUM REDDISH BROWN (10 R 5/6)

SHEET 14

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT	J.O. NUMBER	EXPLORATION TYPE AND NUMBER
GULF STATES UTILITIES COMPANY	12210	BORING 32
SITE	**DATE**	**SAMPLE NUMBERS**
RIVER BEND POWER STATION	29 MAR 72	11, 12, AND 13

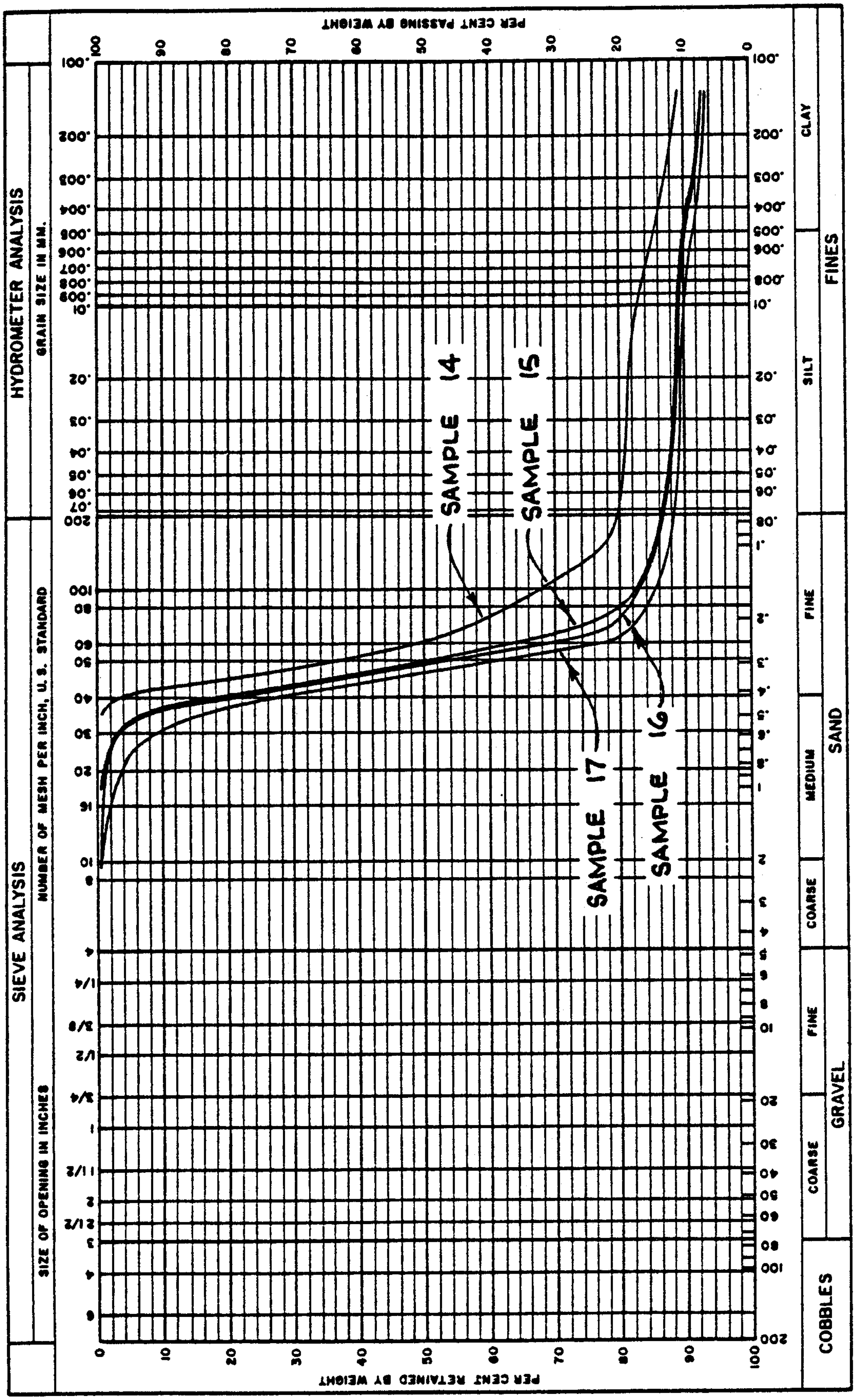


SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
11	48.5-50.0	82	19	15	10	MODERATE REDDISH BROWN (10 R 4/6)
12	53.5-55.0	86	14	11	7	MODERATE REDDISH BROWN (10 R 4/6)
13	58.5-60.0	86	18	14	10	MODERATE REDDISH BROWN (10 R 4/6)

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 32
SITE RIVER BEND POWER STATION	DATE 29 MAR 72	SAMPLE NUMBERS 14, 15, 16, AND 17



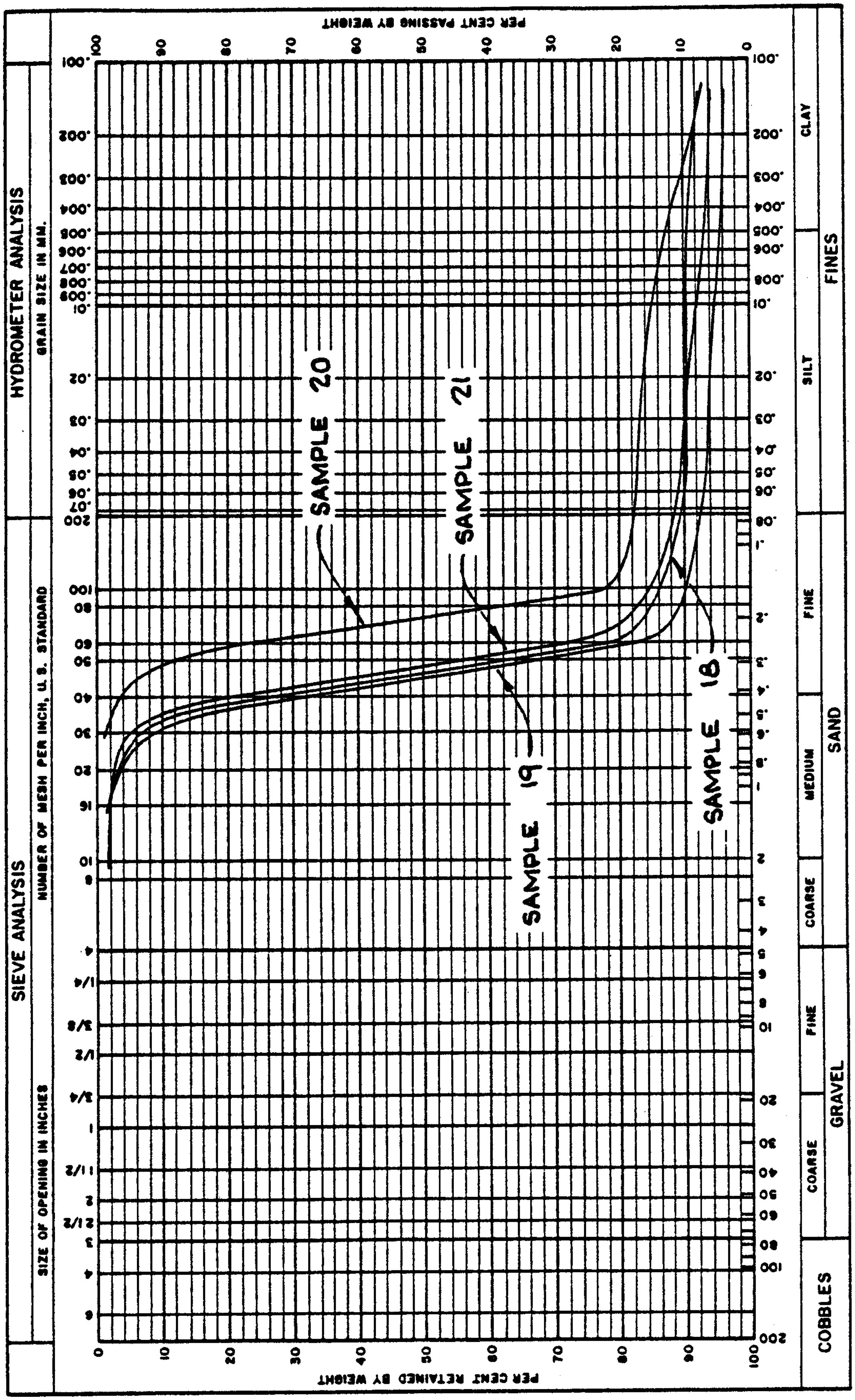
SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
14	63.5-65.0	97	32	20	12	MODERATE REDDISH BROWN (10 R 4/6)
15	68.5-70.0	83	18	14	8	MODERATE REDDISH ORANGE (10 YR 5/6)
16	73.5-75.0	82	17	13	8	MODERATE REDDISH ORANGE (10 YR 5/6)
17	78.5-80.0	72	15	12	7	MODERATE REDDISH ORANGE (10 YR 5/6)

SHEET 16

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT	J.O. NUMBER	EXPLORATION TYPE AND NUMBER
GULF STATES UTILITIES COMPANY	12210	BORING 32
SITE	**DATE**	**SAMPLE NUMBERS**
RIVER BEND POWER STATION	30 MAR 72	18, 19, 20, AND 21



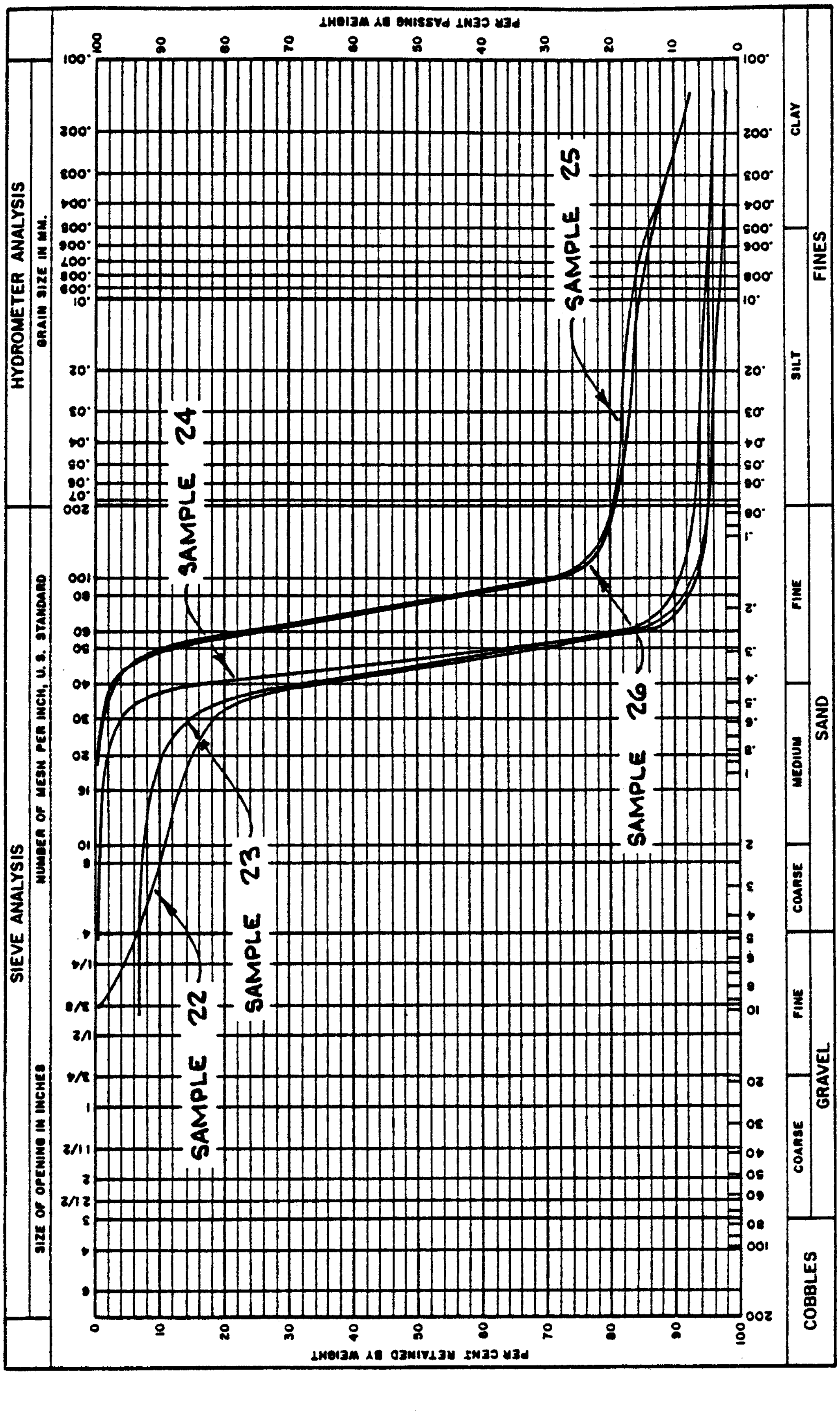
SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
18	83.5-85.0	73	14	11	8	MODERATE BROWNISH ORANGE (10 YR 5/6)
19	88.5-90.0	67	10	8	4	MODERATE BROWNISH ORANGE (10 YR 5/6)
20	93.5-95.0	96	22	18	9	PALE REDDISH BROWN (10 R 5/4)
21	98.5-100.0	80	16	12	6	LIGHT BROWN (5 YR 5/6)

SHEET 17

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 32
SITE RIVER BEND POWER STATION	DATE 31 MAR 72	SAMPLE NUMBERS 22, 23, 24, 25, AND 26



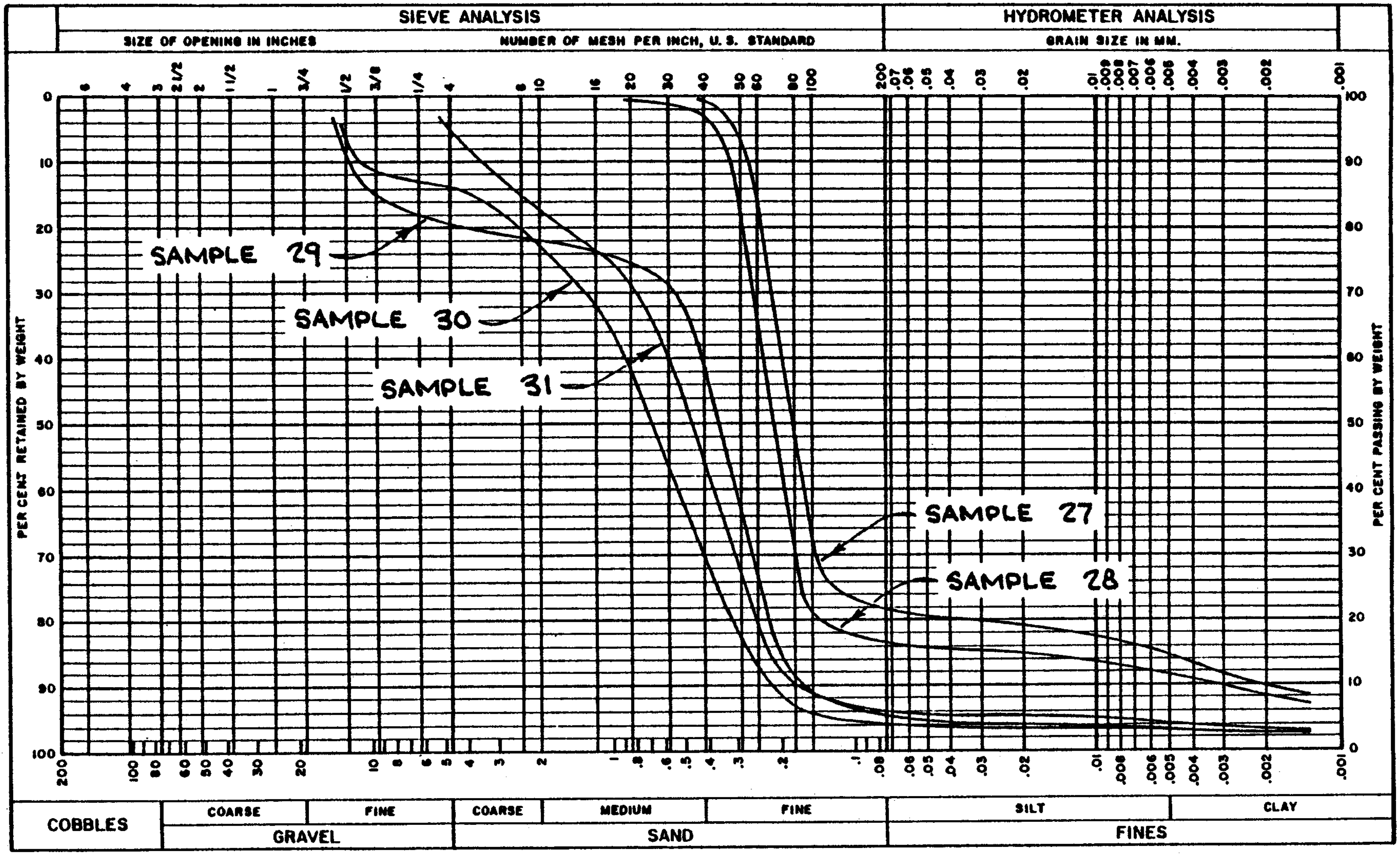
SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
22	103.5-105.0	64	7	5	2	MODERATE YELLOWISH BROWN (10 YR 5/4)
23	108.5-110.0	67	9	7	4	LIGHT BROWN (5 YR 5/6)
24	113.5-115.0	84	7	5	4	MODERATE YELLOWISH BROWN (10 YR 5/4)
25	118.5-120.0	97	29	20	9	PALE REDDISH BROWN (10 R 5/4)
26	123.5-125.0	98	29	20	9	MEDIUM REDDISH BROWN (10 R 5/6)

SHEET 18

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 32
SITE RIVER BEND POWER STATION	DATE 3 APR 72	SAMPLE NUMBERS 27, 28, 29, 30, AND 31



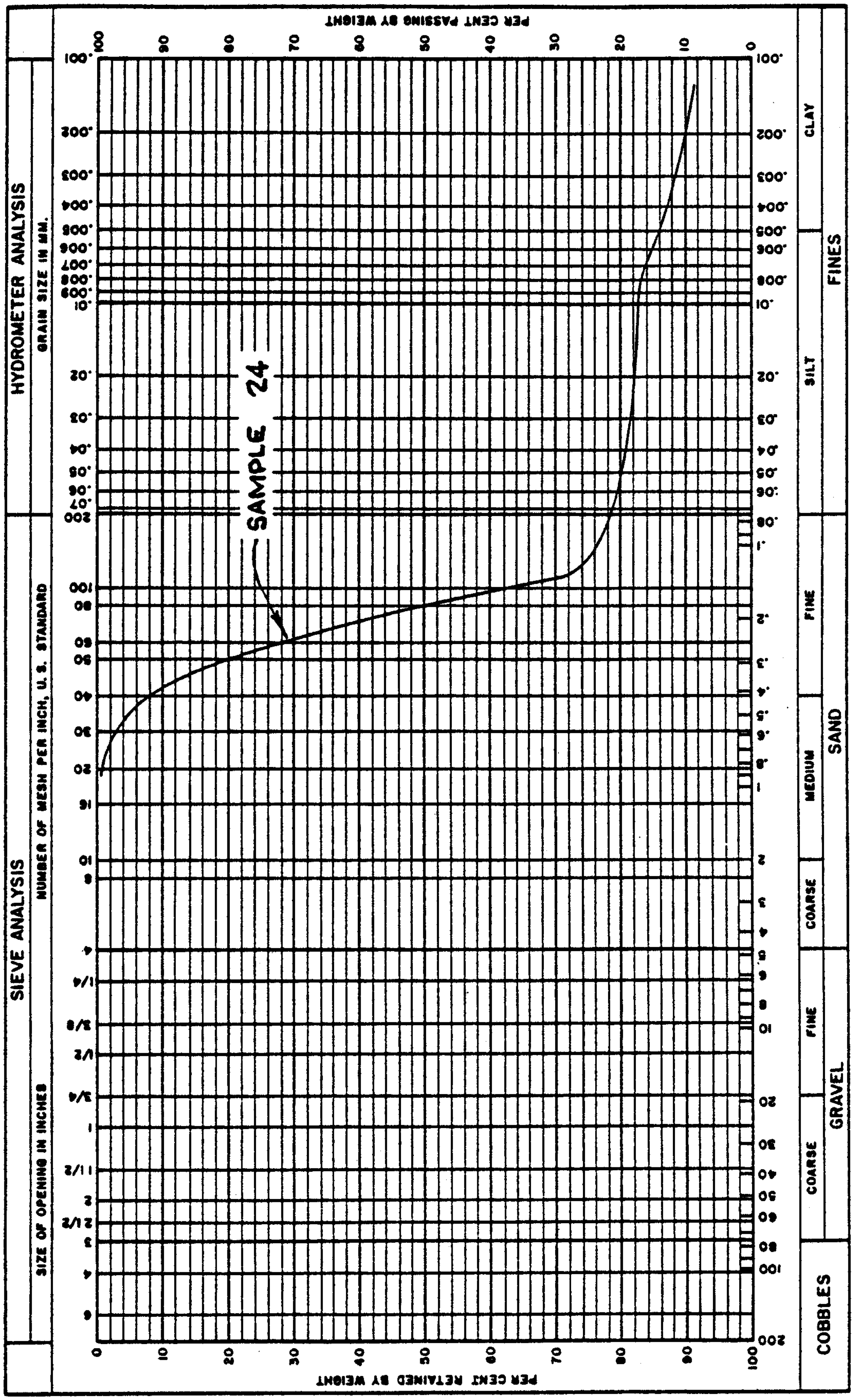
SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
27	128.5-130.0	99	32	22	10	PALE REDDISH BROWN (10 R 5/4)
28	133.5-135.0	97	21	17	8	PALE REDDISH BROWN (10 R 5/4)
29	138.5-140.0	58	9	5	3	MODERATE YELLOWISH BROWN (10 YR 5/4)
30	143.5-145.0	30	6	4	3	LIGHT BROWN (5 YR 5/6)
31	148.5-150.0	44	9	6	3	DARK YELLOWISH BROWN (10 YR 4/4)

[illegible]

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 34
SITE RIVER BEND POWER STATION	DATE 1 MAY 72	SAMPLE NUMBERS 24



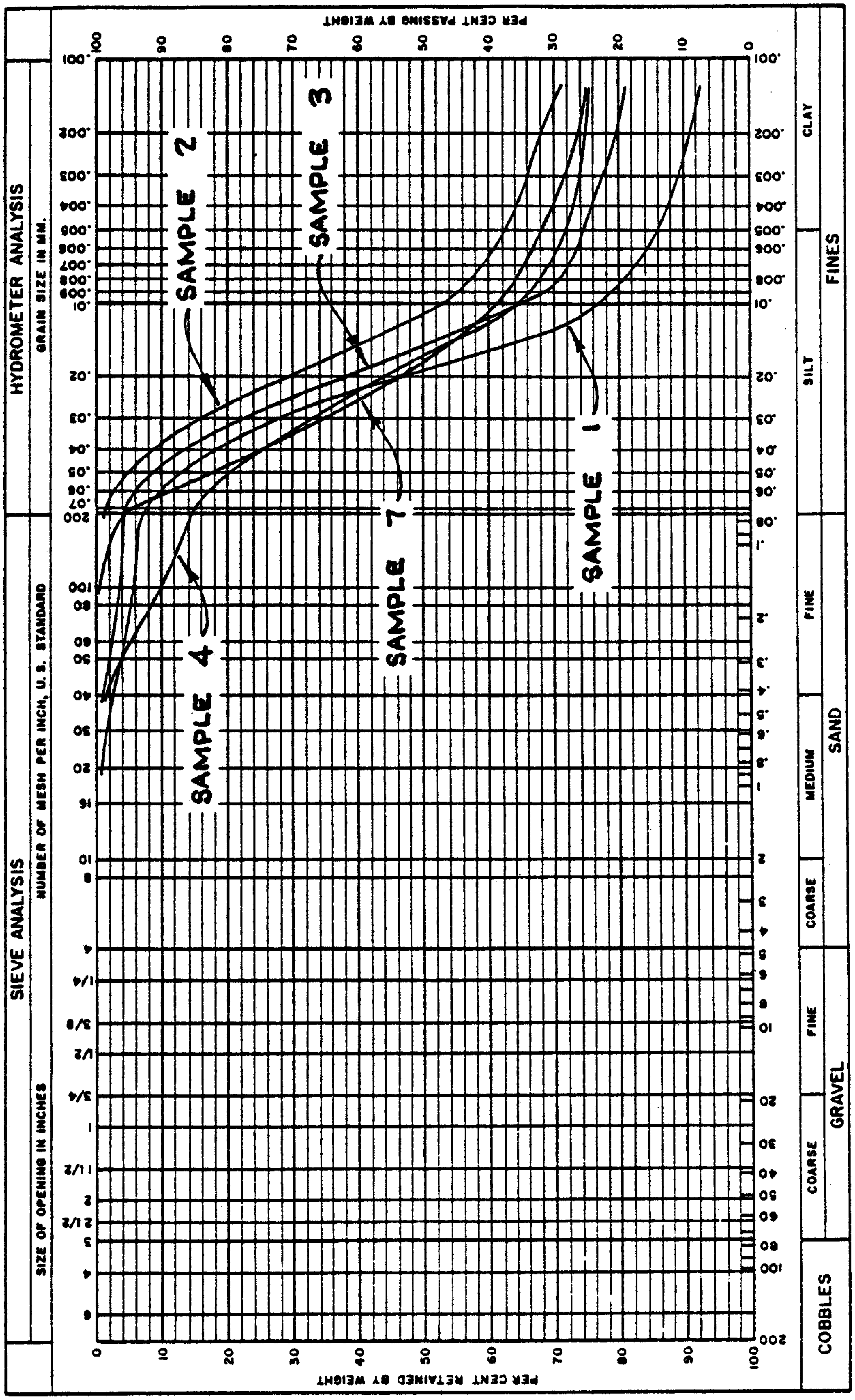
SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
24	113.5-115.0	92	38	22	10	MEDIUM YELLOWISH BROWN (10 YR 6/4)

SHEET 20

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 35
SITE RIVER BEND POWER STATION	DATE 24 MAY 72	SAMPLE NUMBERS 1, 2, 3, 4, AND 7



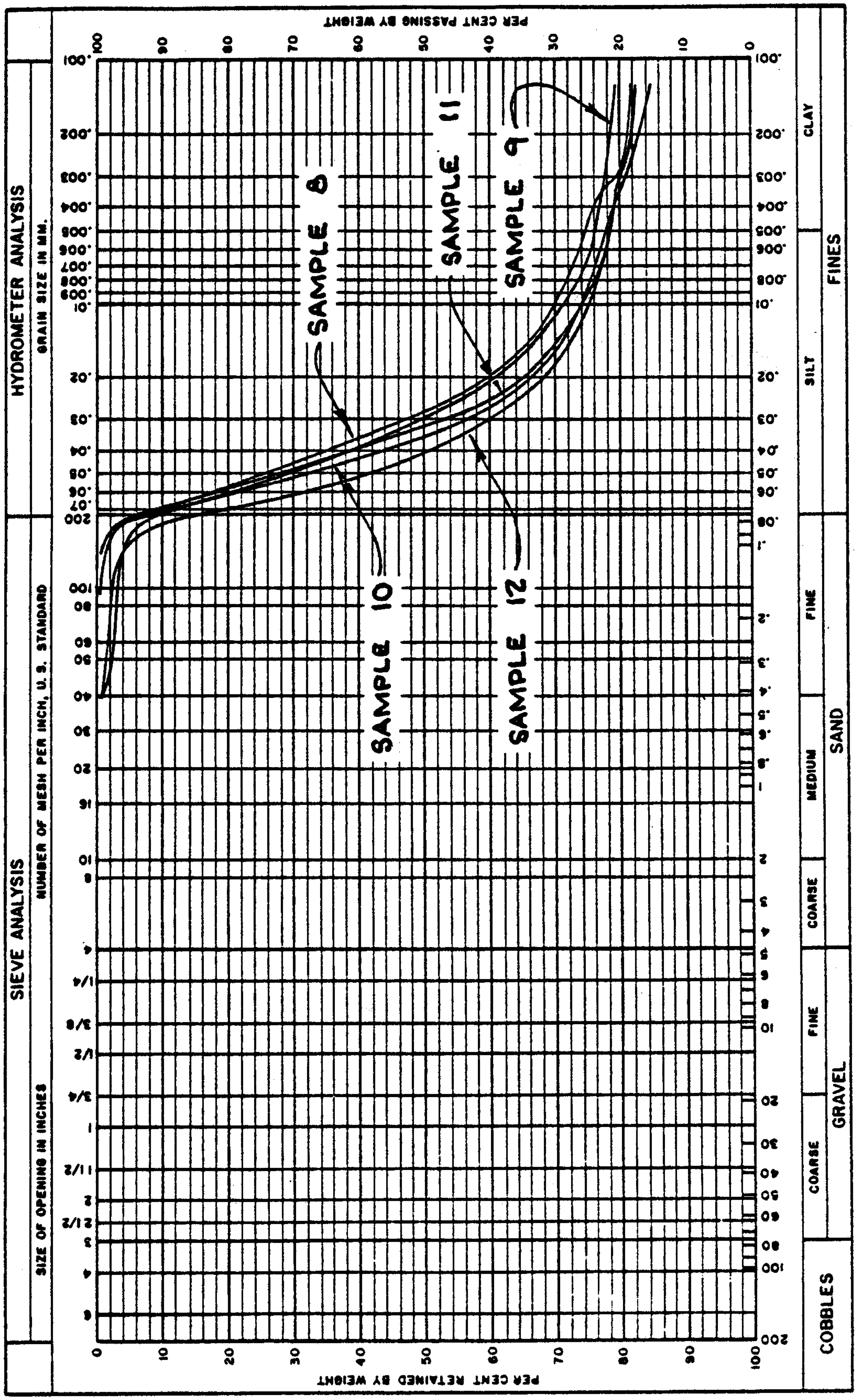
SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
1	0-1.5	98	94	93	9	YELLOWISH BROWN (10 YR 5/2)
2	3.5-5.0	100	99	99	32	MODERATE BROWN (5 YR 3/4)
3	8.5-10.0	99	97	96	20	MODERATE YELLOWISH BROWN (10 YR 5/4)
4	13.5-15.0	99	90	86	25	MEDIUM YELLOWISH BROWN (10 YR 6/4)
7	28.5-30.0	100	100	96	26	LIGHT OLIVE GRAY (5 Y 6/1)

SHEET 21

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT	J.O. NUMBER	EXPLORATION TYPE AND NUMBER
GULF STATES UTILITIES COMPANY	12210	BORING 35
SITE	**DATE**	**SAMPLE NUMBERS**
RIVER BEND POWER STATION	26 MAY 72	8, 9, 10, 11, AND 12

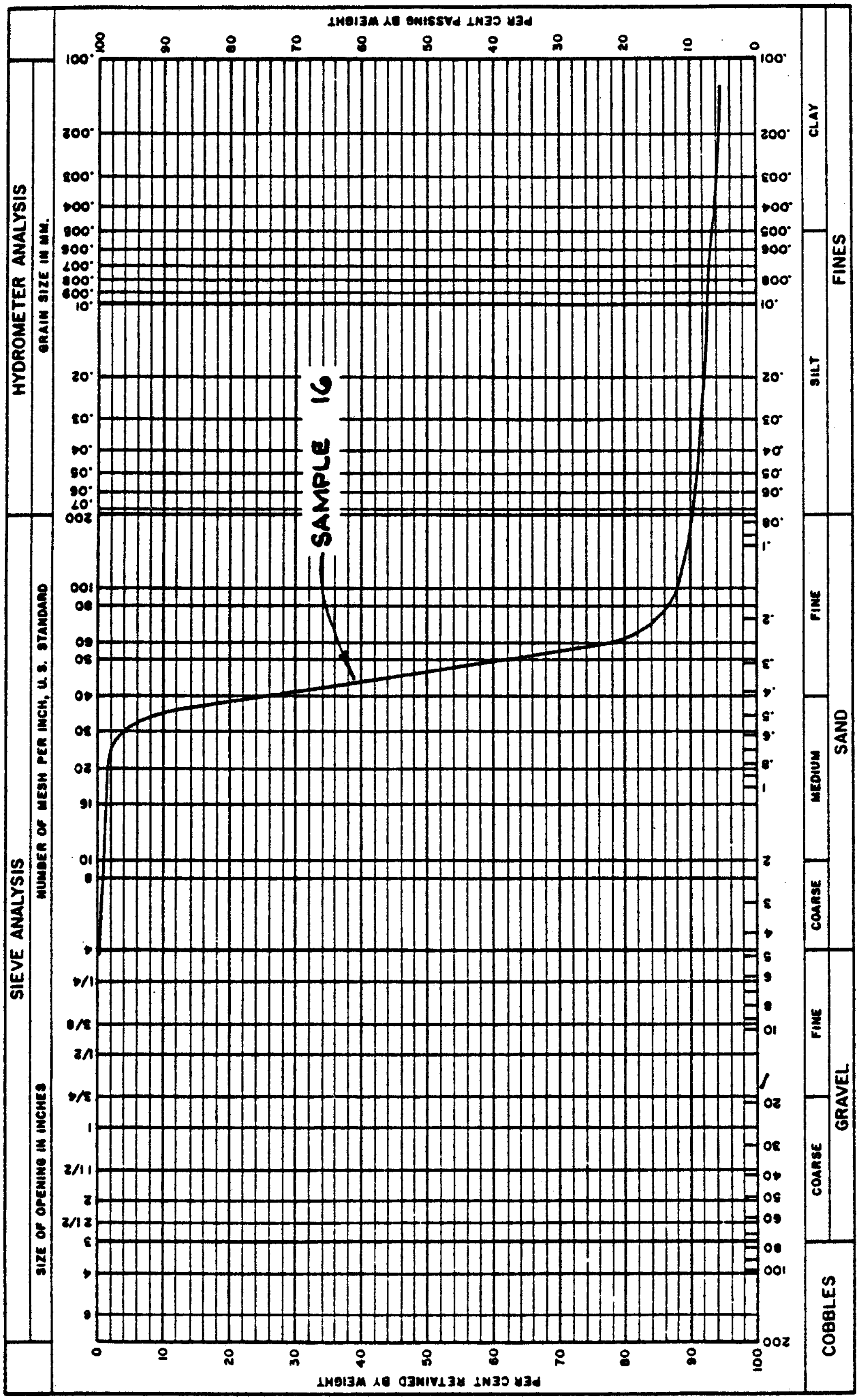


SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
8	33.5-35.0	100	100	93	19	LIGHT OLIVE GRAY (5 Y 6/2)
9	38.5-40.0	100	97	91	22	LIGHT OLIVE GRAY (5 Y 6/2)
10	43.5-45.0	100	100	90	17	LIGHT OLIVE GRAY (5 Y 6/2)
11	48.5-50.0	100	100	94	18	MODERATE YELLOWISH BROWN (10 YR 5/4)
12	53.5-55.0	99	98	85	18	MEDIUM OLIVE GRAY (5 Y 5/4)

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT	J.O. NUMBER	EXPLORATION TYPE AND NUMBER
GULF STATES UTILITIES COMPANY	12210	BORING 35
SITE	**DATE**	**SAMPLE NUMBERS**
RIVER BEND POWER STATION	1 MAY 72	16



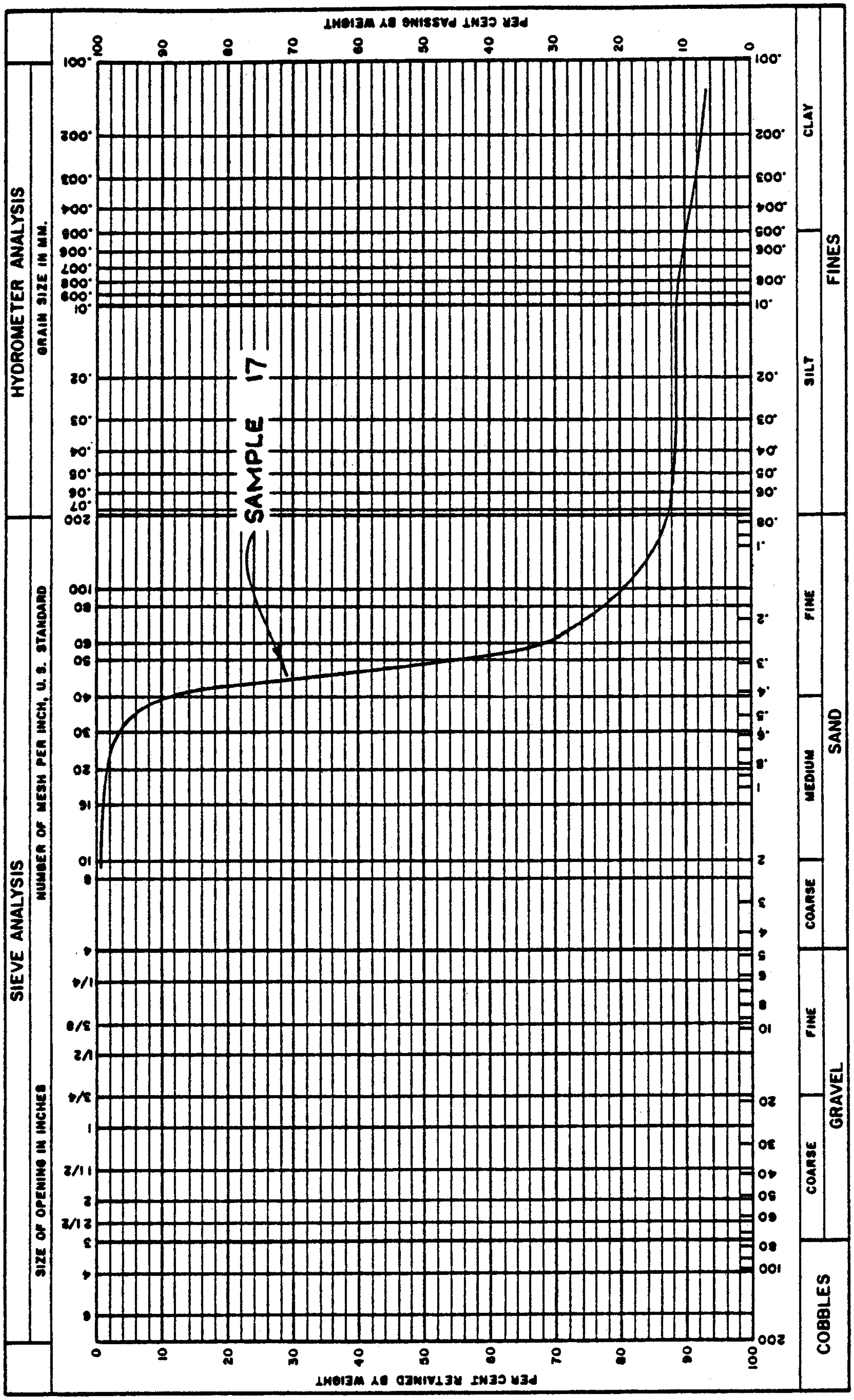
SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
16	73.5-75.0	75	12	10	6	MEDIUM REDDISH BROWN (10 R 5/6)

SHEET 23

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 53
SITE RIVER BEND POWER STATION	DATE 3 MAY 72	SAMPLE NUMBERS 17



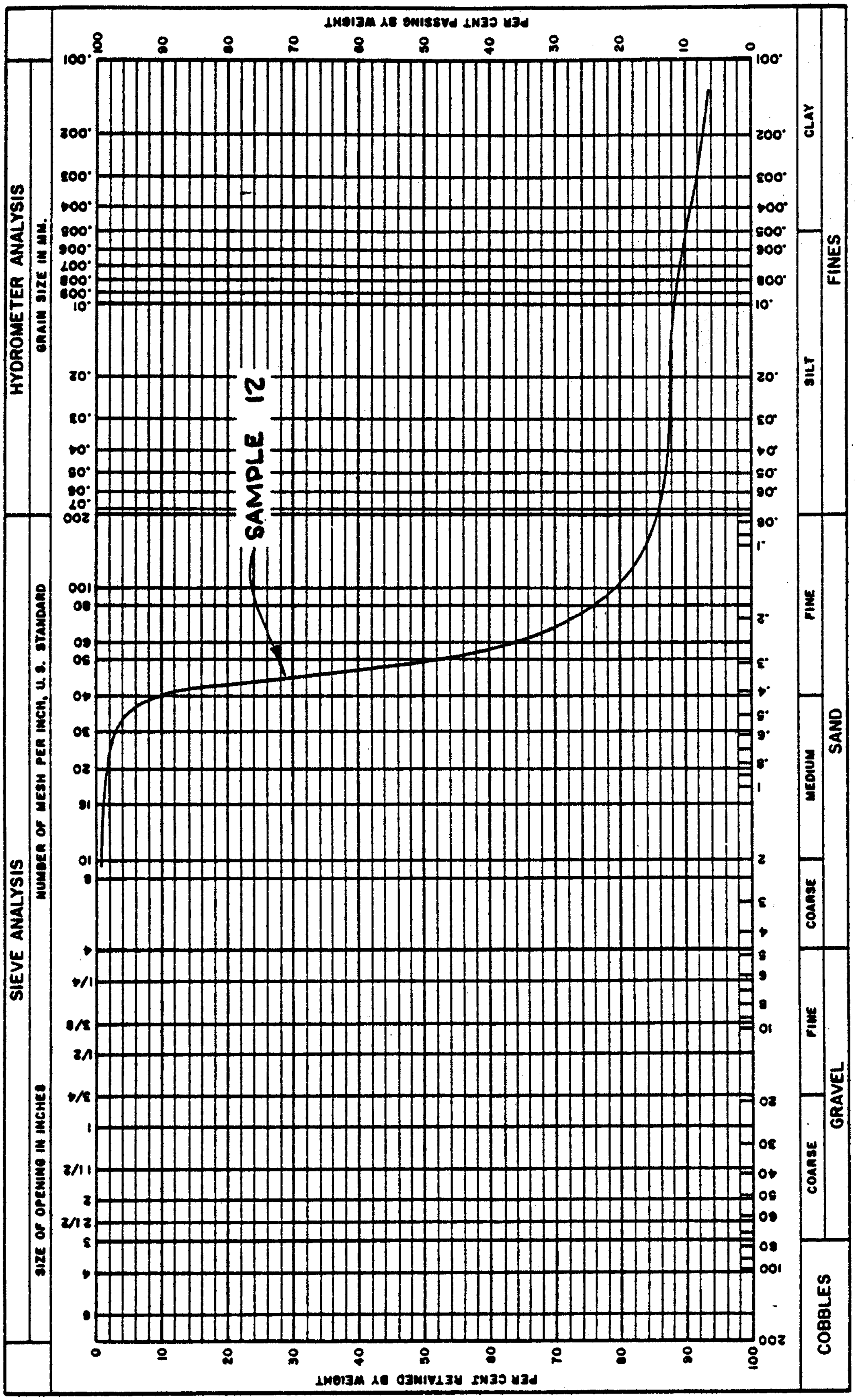
SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
17	78.5-80.0	89	20	13	7	MEDIUM REDDISH BROWN (10 R 5/6)

SHEET 21

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 54
SITE RIVER BEND POWER STATION	DATE 3 MAY 72	SAMPLE NUMBERS 12



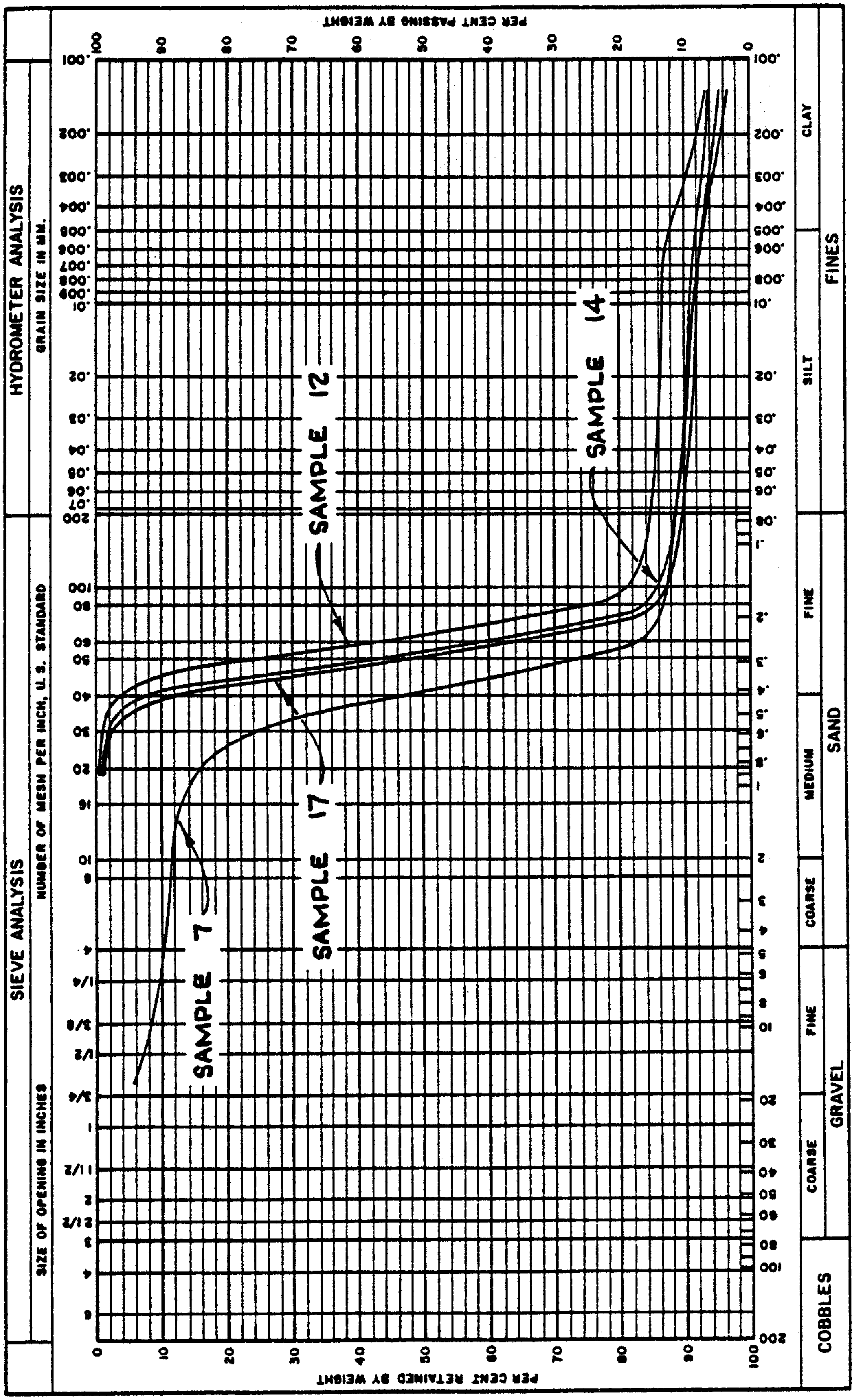
SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
12	53.5-55.0	90	21	14	7	MEDIUM REDDISH ORANGE (10 R 5/6)

SHEET 25

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 61
SITE RIVER BEND POWER STATION	DATE 3 MAY 72	SAMPLE NUMBERS 7, 12, 14, AND 17

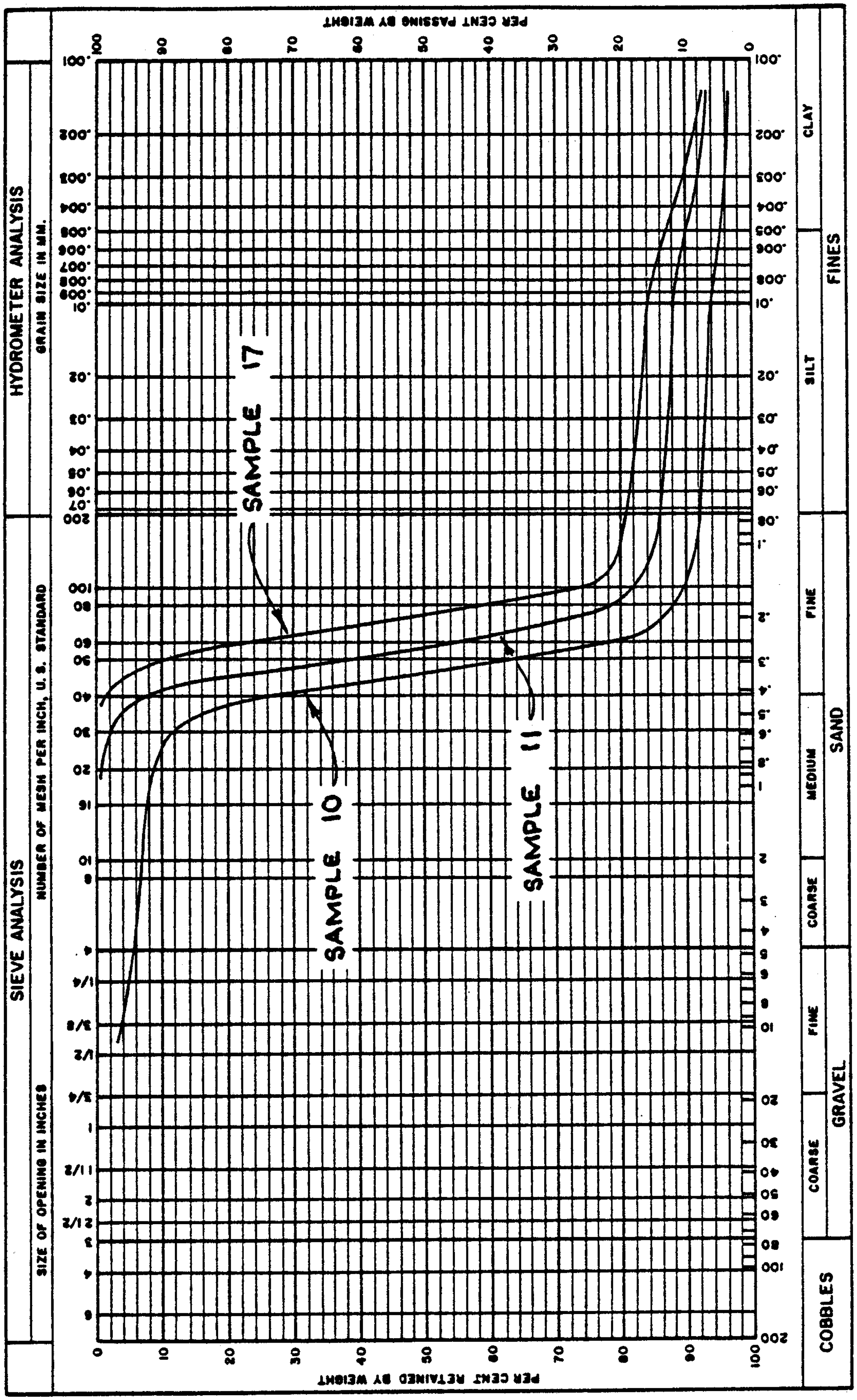


SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
7	28.5-30.0	53	13	11	7	MEDIUM BROWN (5 YR 4/6)
12	53.5-55.0	96	19	15	8	REDDISH ORANGE (10 R 5/6)
14	63.5-65.0	93	14	12	5	DARK REDDISH ORANGE (10 R 5/6)
17	78.5-80.0	88	13	10	4	LIGHT BROWN (5 YR 5/6)

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 69
SITE RIVER BEND POWER STATION	DATE 4 MAY 72	SAMPLE NUMBERS 10, 11, AND 17



SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
10	43.5-45.0	74	10	8	4	LIGHT BROWN (5 YR 5/6)
11	48.5-50.0	92	18	14	7	MEDIUM REDDISH BROWN (10 R 5/6)
17	78.5-80.0	98	27	19	9	PALE REDDISH BROWN (10 R 5/4)

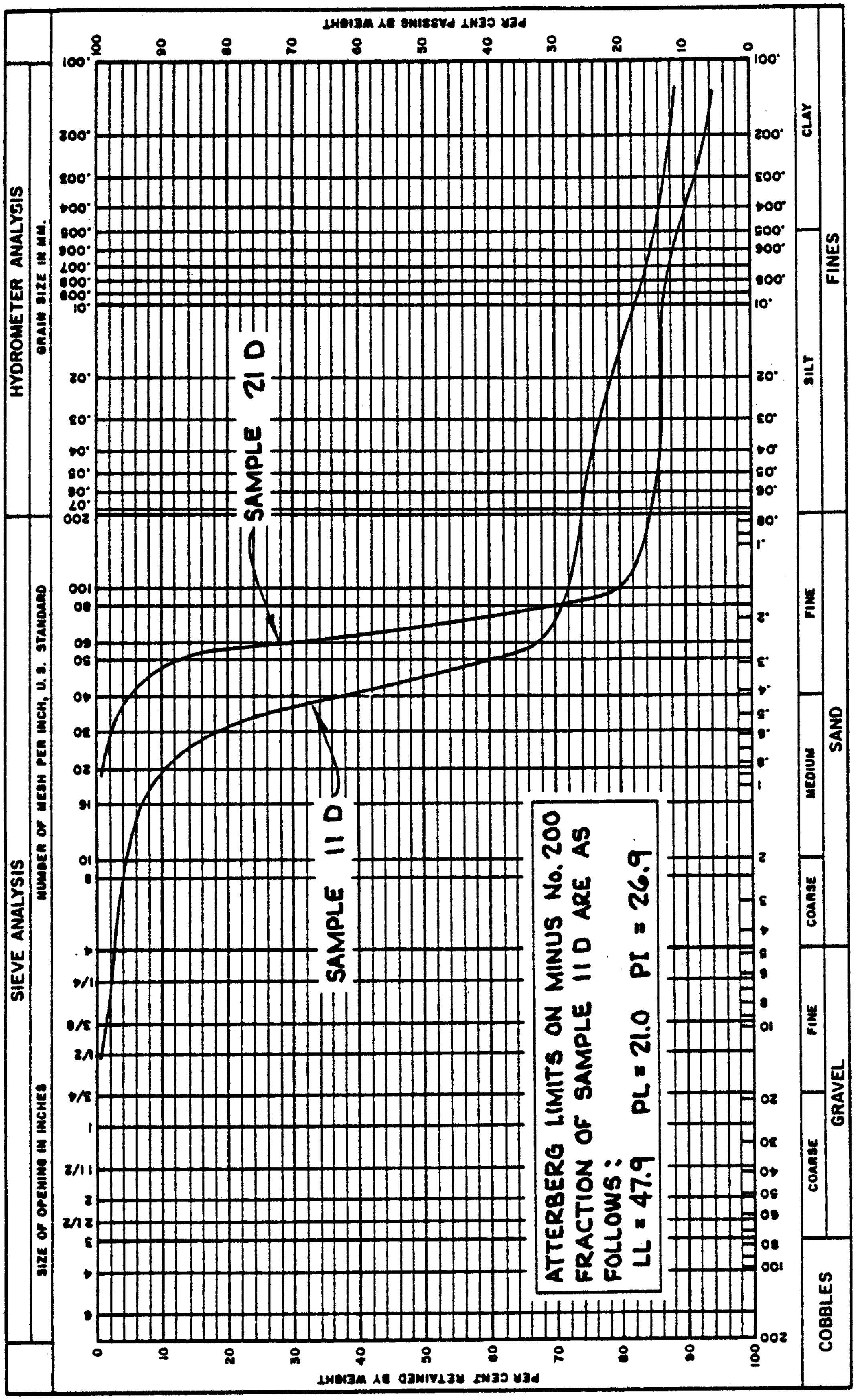
SHEET 1 2.1

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 74
SITE RIVER BEND POWER STATION	DATE 31 MAY 72	SAMPLE NUMBERS 11 AND 21

SHEET 28

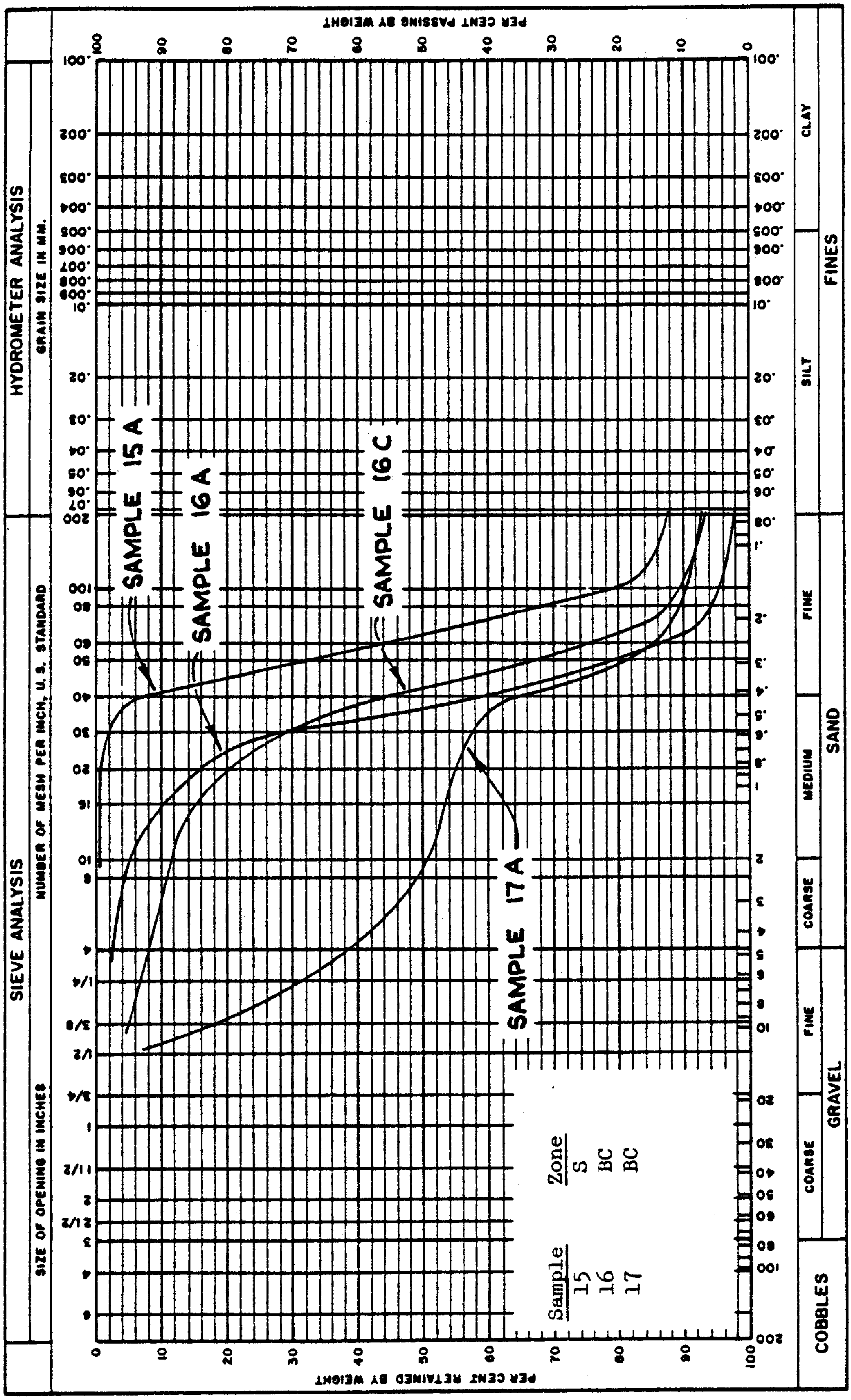


ATTERBERG LIMITS ON MINUS No. 200 FRACTION OF SAMPLE 11 D ARE AS FOLLOWS:
LL = 47.9 PL = 21.0 PI = 26.9

SAMPLE	DEPTH, FT	%<#40	%<#100	%<#200	%<2μ	COLOR (MUNSELL SYSTEM)
11 D	49.0-51.5	63	28	26	12	MODERATE REDDISH BROWN (10 R 4/6)
21 D	116.0-118.5	95	20	16	7	MODERATE REDDISH ORANGE (10 R 6/6)

GRADATION CURVES

CLIENT	J.O. NUMBER	EXPLORATION TYPE AND NUMBER
GULF STATES UTILITIES COMPANY	12210	BORING 120
SITE	**DATE**	**SAMPLE NUMBERS**
RIVER BEND POWER STATION	27 JUL 72	15, 16, AND 17



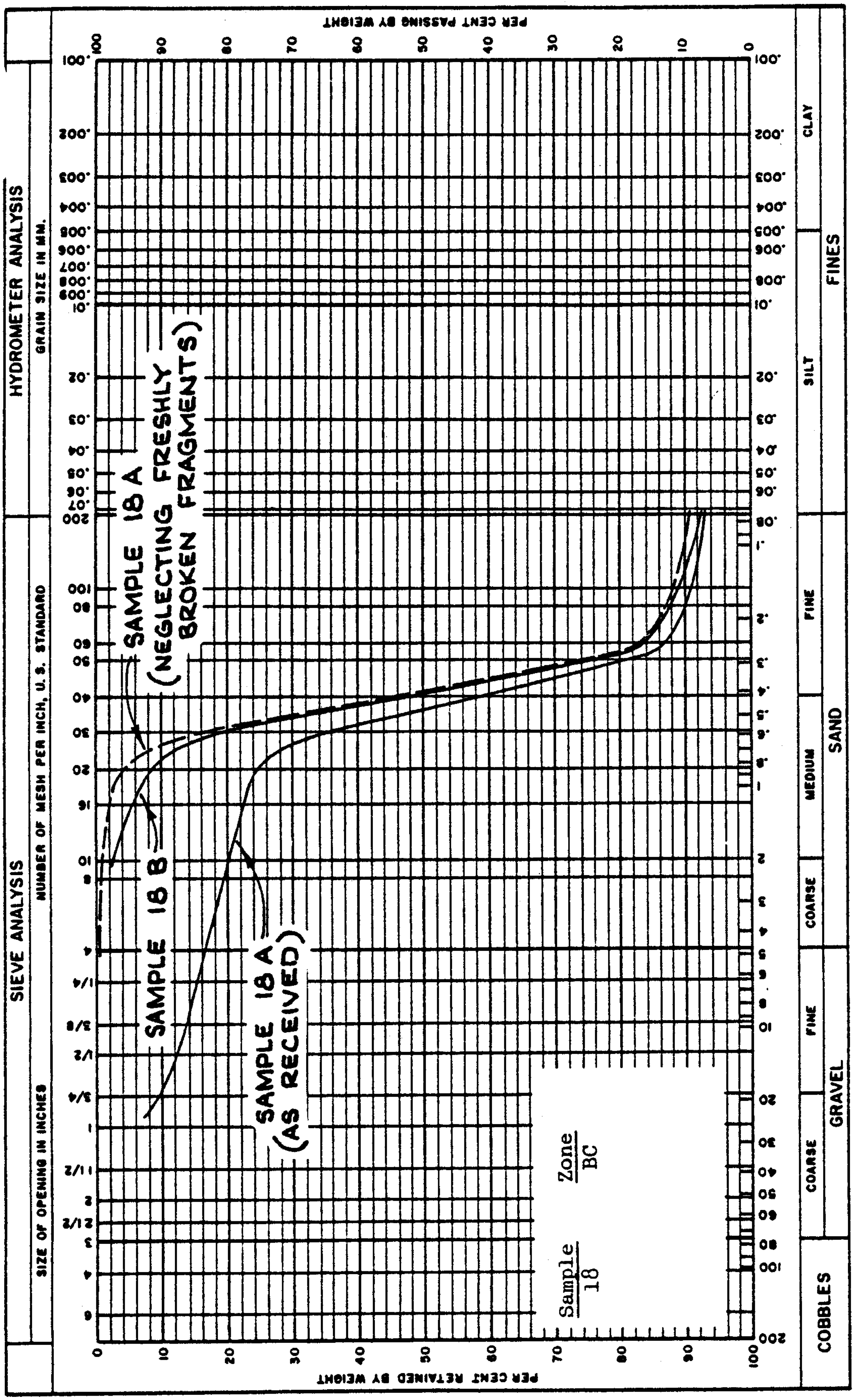
Sample	Zone
15	S
16	BC
17	BC

SAMPLE	DEPTH, FT	%<#10	%<#40	%<#200	Cu	COLOR (MUNSELL SYSTEM)
15A	75.0-76.5	100	93	12	-	DARK YELLOWISH ORANGE (10 YR 6/6)
16A	80.0-81.5	95	40	2	2.3	DARK ORANGE BROWN (10 YR 4/4)
16C	80.0-81.5	89	55	7	3.0	DARK YELLOWISH ORANGE (10 YR 6/6)
17A	85.0-86.5	49	35	7	26	DARK YELLOWISH ORANGE (10 YR 6/6)

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 120
SITE RIVER BEND POWER STATION	DATE 22 JUL 72	SAMPLE NUMBERS 18

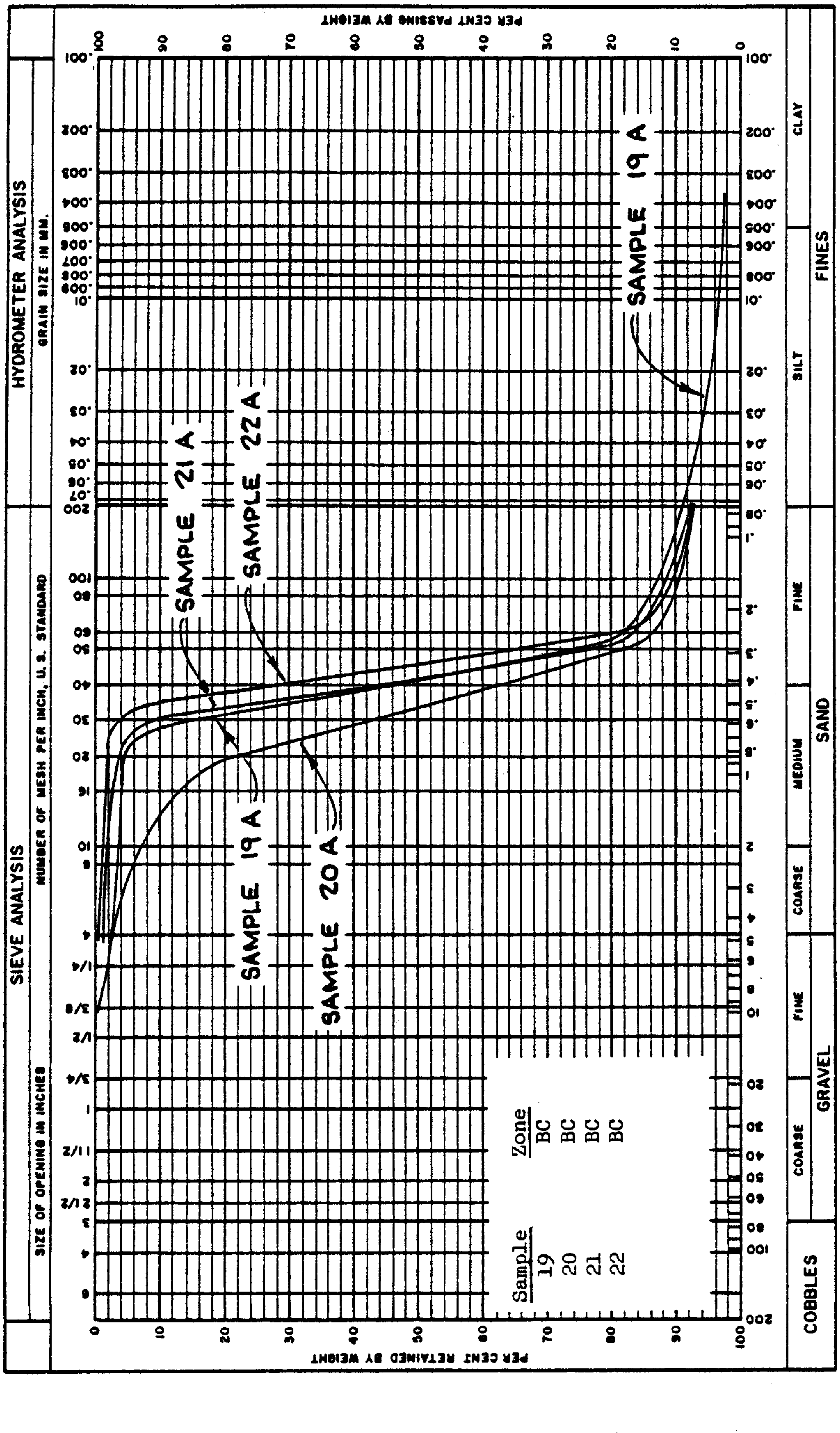


SAMPLE	DEPTH, FT	%< #10	%< #40	%< #200	Cu	COLOR (MUNSELL SYSTEM)
18 A	90.0-91.5	80	41	7	3.1	MODERATE YELLOWISH ORANGE (10 YR 5/6)
18 B	90.0-91.5	98	53	8	3.5	MODERATE YELLOWISH ORANGE (10 YR 5/6)

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT	J.O. NUMBER	EXPLORATION TYPE AND NUMBER
GULF STATES UTILITIES COMPANY	12210	BORING 120
SITE	**DATE**	**SAMPLE NUMBERS**
RIVER BEND POWER STATION	22 JUL 72	19, 20, 21, AND 22



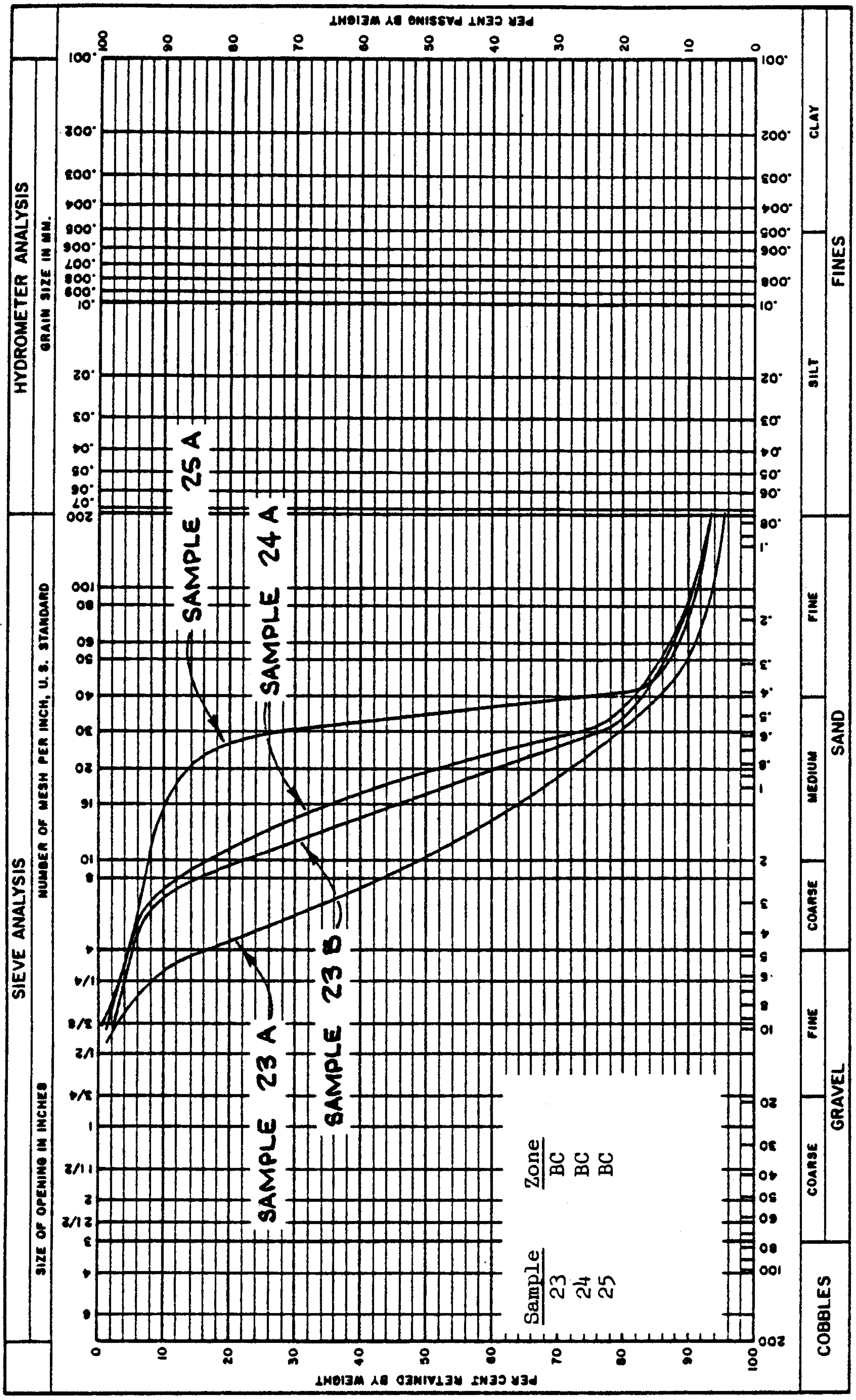
Sample	Zone
19	BC
20	BC
21	BC
22	BC

SAMPLE	DEPTH, FT	%<#10	%<#40	%<#200	Cu	COLOR (MUNSELL SYSTEM)
19 A	95.0-96.5	97	54	9	4.9	MODERATE YELLOWISH ORANGE (10 YR 5/6)
20 A	100.0-101.5	93	38	7	3.6	MODERATE ORANGE BROWN (10 YR 6/4)
21 A	105.0-106.5	98	55	8	3.4	MODERATE ORANGE BROWN (10 YR 6/4)
22 A	110.0-111.5	99	71	8	2.5	DARK YELLOWISH ORANGE (10 YR 6/5)

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT	J.O. NUMBER	EXPLORATION TYPE AND NUMBER
GULF STATES UTILITIES COMPANY	12210	BORING 120
SITE	**DATE**	**SAMPLE NUMBERS**
RIVER BEND POWER STATION	25 JUL 72	23, 24, AND 25



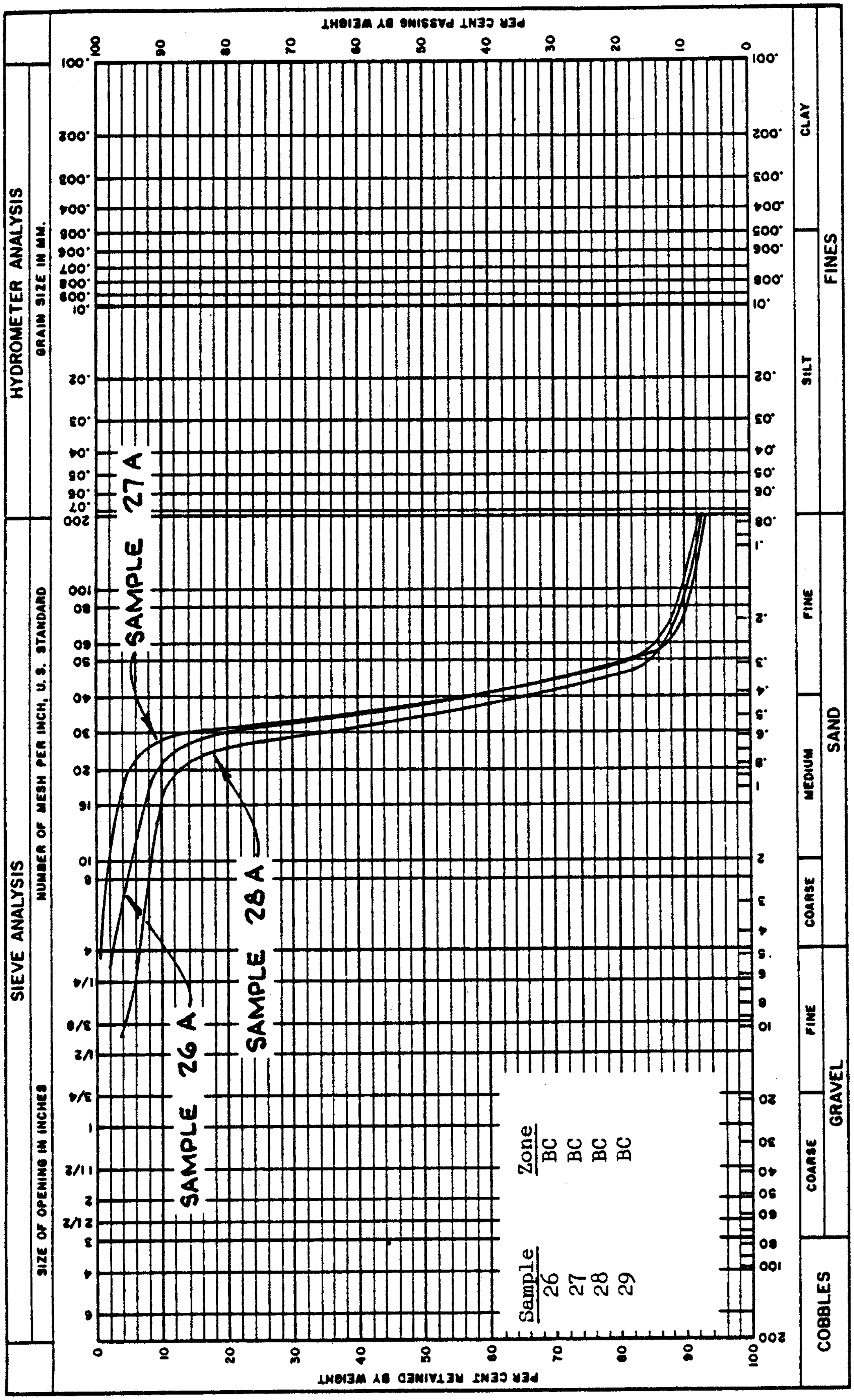
Sample	Zone
23	BC
24	BC
25	BC

SAMPLE	DEPTH, FT	%< #10	%< #40	%< #200	Cu	COLOR (MUNSELL SYSTEM)
23 A	115.0-116.5	51	15	5	9.8	MODERATE YELLOWISH BROWN (10 YR 5/5)
23 B	115.0-116.5	78	17	7	8.2	MODERATE YELLOWISH BROWN (10 YR 5/5)
24 A	120.0-121.5	83	18	7	6.5	MODERATE YELLOWISH BROWN (10 YR 5/3)
25 A	125.0-126.5	92	25	7	2.5	MODERATE YELLOWISH BROWN (10 YR 5/4)

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT	J.O. NUMBER	EXPLORATION TYPE AND NUMBER
GULF STATES UTILITIES COMPANY	12210	BORING 120
SITE	**DATE**	**SAMPLE NUMBERS**
RIVER BEND POWER STATION	26 JUL 72	26, 27, AND 28



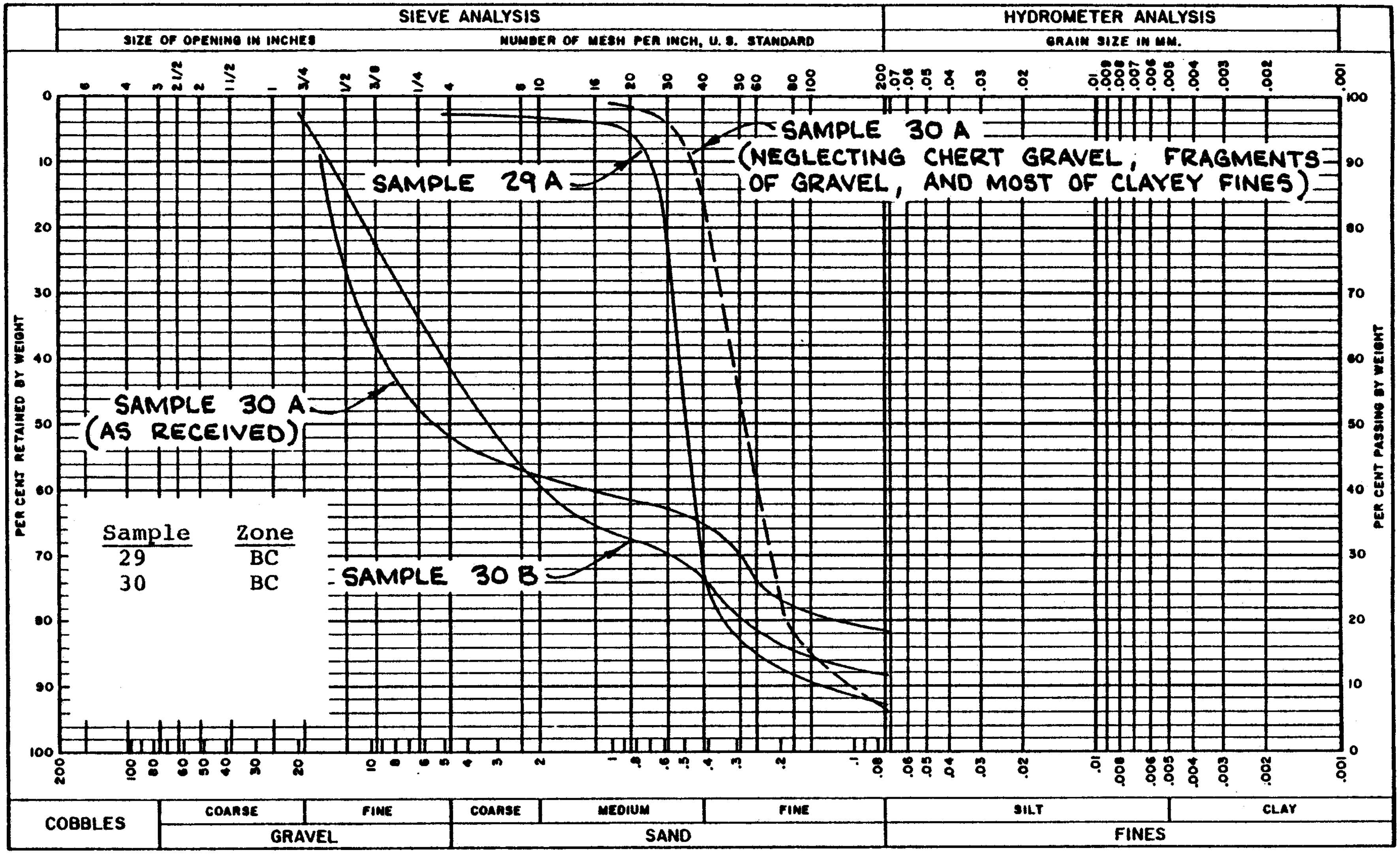
Sample	Zone
26	BC
27	BC
28	BC
29	BC

SAMPLE	DEPTH, FT	%<#10	%<#40	%<#200	Cu	COLOR (MUNSELL SYSTEM)
26A	130.0-131.5	95	42	7	2.6	MODERATE GRAYISH ORANGE (10 YR 6/5)
27A	135.0-136.5	98	42	8	3.5	GRAYISH BROWN (10 YR 6/4)
28A	140.0-141.5	92	24	7	3.2	GRAYISH BROWN (10 YR 6/4)

STONE & WEBSTER ENGINEERING CORPORATION

GRADATION CURVES

CLIENT GULF STATES UTILITIES COMPANY	J.O. NUMBER 12210	EXPLORATION TYPE AND NUMBER BORING 120
SITE RIVER BEND POWER STATION	DATE 26 JUL 72	SAMPLE NUMBERS 29 AND 30



SAMPLE	DEPTH, FT	%< #10	%< #40	%< #200	Cu	COLOR (MUNSELL SYSTEM)
29 A	145.0-146.5	97	27	7	3.5	GRAYISH BROWN (10 YR 6/4)
30 A	150.0-151.5	42	35	18	-	GRAYISH ORANGE (10 YR 7/4)
30 B	150.0-151.5	41	27	12	-	DARK GRAYISH ORANGE (10 YR 6/5)

APPENDIX 2K

SOIL TESTING
ON
UNDISTURBED SAMPLES
TERTIARY (PASCAGOULA) CLAYS
RIVER BEND STATION

Appendix 2K contains:

1. Report on Soil Testing, Undisturbed Samples, Tertiary Clays, River Bend Power Station, prepared by Geotechnical Engineers, Inc., January 1973.

2. Report on Soil Testing, Undisturbed Samples, Tertiary Clays, Borings 163 & 164, River Bend Power Station, prepared by Geotechnical Engineers, Inc., April 1974.

3. Resonant Column Testing, Undisturbed Samples, Tertiary Clays, Borings 163(Z-5), 164(Z-6), & 165(Z-7), River Bend Station, performed by Stone & Webster Engineering Corporation, January to March 1977.

Report

on

SOIL TESTING
UNDISTURBED SAMPLES, TERTIARY CLAYS
RIVER BEND POWER STATION
GULF STATES UTILITIES

Submitted to

STONE & WEBSTER ENGINEERING CORP.
Boston, Massachusetts

Project 7263

GEOTECHNICAL ENGINEERS, INC.
934 Main Street
Winchester, Massachusetts 01890

January 1973

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF FIGURES (continued)

CONSOLIDATION TESTS

SOIL PROFILES

1. **INTRODUCTION**

1.1 PURPOSE

The purpose of the laboratory testing program reported herein was to determine the engineering properties of undisturbed samples of the Tertiary clays from the site of the River Bend Power Station.

1.2 SCOPE

Forty-two three-inch-diameter thin-wall-tube samples were received, corresponding to Borings 136 and 138 at depths of 152 feet to 210 feet, ranging in elevation between -42 and -100.

The schedule of tests is shown in Table I. The total number of tests that were performed is:

102	Natural Water Content Determinations
81	Atterberg Limits Tests
59	Photographs of Longitudinal Slices
6	Specific Gravity Tests
38	Unconsolidated-Undrained (Q) Triaxial Tests
12	Consolidation Tests.

1.3 AUTHORIZATION

This work was authorized by Mr. David Greenwood under Purchase Order No. E-11563.

2. **SAMPLE DESCRIPTIONS**

The tube samples were divided into sections designated A, B, etc., starting at the top. A description of each section and the water content and Atterberg Limits for most sections are presented in Tables II and III. Photographs of partially dried longitudinal slices are shown in the Appendix. The slices were left to dry until the contrast between layers or zones of different gradation became maximum. The photographs were taken with Type 51 High Contrast Polaroid film that enhances color or tone differences. In pictures taken with Type 51 film, the samples appear to have a somewhat coarser texture than they actually have.

The Plasticity Chart in Fig. 1 includes all determinations of Liquid and Plastic Limits. The Soil Profiles shown in Figs. 52 and 53 include plots of Water Content and Liquid and Plastic Limits with depth.

The great majority of the samples are a gray or greenish-gray sandy clay or clay. With few exceptions, there is no horizontal or inclined stratification shown in the samples. They have a very irregular pattern of zones of clay and sandy clay, the zones being from 1/8 in. to 1/2 in. in size. In some samples this irregular pattern assumes the appearance of marble with thin layers of clay or sandy clay which are contorted and displaced by what appear to he numerous shear failure surfaces.

In the samples that show horizontal or inclined stratification, there is no evidence of distortion of the layers at the edge of the samples. In the photograph of Sample 49A, Boring 136, one can observe a horizontal nonconformity separating a lower zone of contorted layers and an upper zone which is horizontally stratified. It is therefore believed that the contorted layers are representative of in-situ conditions and were not caused by sampling.

Continuous layers of sand across the samples were found only in Sample 51 of Boring 136 and Samples 52 and 53 of Boring 138, ranging in thickness from 1 in. to 5 in. and amounting to a total thickness of 2 in. in Boring 136 and 16 in. in Boring 138. In addition, occasional lenses of fine sand with a thickness of 1 to 3 mm were found in other samples. The total thickness of these sand lenses in each boring amounts to a few inches in a total length of samples of about 40 feet.

The clay and sandy clay is hard and brittle, breaking easily along irregularly shaped surfaces that are oriented predominantly, but not exclusively, horizontal. When the soil is remolded at its natural water content, it breaks into blocks and becomes crumbly and has the feeling of a soil of low plasticity. However, after thorough remolding, the soil has a feeling of medium plasticity, and it is tough at water contents near the Plastic Limit. The Atterberg Limits were determined at least 24 hours after the soil had been thoroughly remolded with the addition of distilled water to increase the water content to slightly above the Liquid Limit. In the Plasticity Chart, the results plot above the A-Line, with only two exceptions, and the Liquid Limits are mostly in the range of 30 to 50.

Six determinations were made of specific gravity. The results are listed in Table IV, and they range between 2.72 and 2.76, with an average of 2.735.

Triaxial Unconsolidated-Undrained (Q) Tests were performed on all tube samples, except for those for which the cutting edge of the tube was substantially damaged and/or the cross section of the tube was oval, indicating large resistance to advancing the tube at the time of sampling and probable major disturbance of the soil samples recovered.

Consolidation Tests were performed on samples selected in consultation with Stone & Webster.

3. UNCONSOLIDATED-UNDRAINED (Q) TESTS

Thirty-eight Q Tests were performed on 1.4-inch-diameter by 3.5-inch-high undisturbed specimens.

The test specimens were trimmed from the 2.8-in, -diameter tube samples to obtain a specimen from the less-disturbed core of the tube samples. A rubber membrane with a wall thickness of 0.03 cm was used to enclose the specimen. The end cap and base of the triaxial cell were covered with polyethylene, and the drainage valves remained closed during the complete test to avoid changes in water content of the specimen. The chamber pressure was then applied, and it was equal to 2 kg/cm^2 for thirty-four tests and 7 kg/cm^2 for the other four tests. The axial load was applied by means of deformation-controlled equipment at a rate of about 1% strain per minute. The axial load was measured with a calibrated proving ring. At the end of the test, all triaxial specimens showed one or more failure planes, except for Samples 44C and 51B of Boring 138, for which the specimens had bulged, with no evidence of shear planes.

The stress-strain curves for the Q Tests are shown in Figs. 2 through 39, indicating with an arrow the point corresponding to maximum (σ_1 - σ_3). The test results are tabulated in Tables V and VI, indicating for each test the compressive strength $(\sigma_{l\ -}\ \sigma_3)_{max}$ and the corresponding failure strain. Also listed in Tables V and VI are the Water Content of the specimens and the Atterberg Limits determined on the trimmings. The Soil Profiles in Figs. 52 and 53 include plots of compressive strength $(\sigma_1 - \sigma_3)_{max}$ versus depth, indicating also the failure strain.

4. CONSOLIDATION TESTS

Twelve Consolidation Tests were performed on undisturbed specimens selected in consultation with Stone & Webster. The samples were selected to provide test results along the complete profile and to test the least-disturbed samples. An indication concerning the degree of disturbance of the samples was obtained from the shape of the stress-strain curves and the magnitude of the failure strain in the triaxial Q tests.

The Consolidation Test specimens had a diameter of 6.34 cm (2.5 in.) and a height of 1.25 cm (0.5 in.). The tests were performed in a floating ring with drainage allowed through porous stones at both ends of the specimen. The consolidation stress was applied in increments starting with 0.10 kg/cm^2, and then the stress was approximately doubled each time up to a load of 32 kg/cm^2. Up to a stress of 8 kg/cm^2 the specimen and porous stones were kept from drying by surrounding them with wet paper towels. At the end of the 8 kg/cm^2 stress application, the specimen was flooded. No measurable change in rate of deformation took place as a result of flooding.

The time of loading for each stress increment was such that one could accurately define the deformation at 1000 min. At 1000 min the deformation was well into the secondary phase in all cases. For the smaller stresses, up to 1 kg/cm^2, a time of loading of about 2 hours was sufficient, while for stresses of 8 kg/cm^2 or larger each load was generally left for at least 24 hours before applying the next load.

The compression curves, Figs. 40 to 51, are plotted for the deformations corresponding to 1000 mins after application of each load increment. They were either read directly from the time curves or estimated by extrapolation.

For each test, a probable range for the preconsolidation pressure was estimated by applying the Casagrande Construction to a range of smooth curves that fit the experimental points of the compression curve, with an arrow indicating the preconsolidation pressure corresponding to the curve plotted in Figs. 40 to 51.

The estimated range of preconsolidation pressures and the computed in-situ effective vertical stress are shown on each compression curve in Figs. 40 to 51, and are plotted versus depth in the Soil Profiles in Figs. 52 and 53.

Table VII lists all Consolidation Tests performed, including the initial water content of the specimen and the Atterberg Limits determined on the trimmings.

TABLE I
SCHEDULE OF TESTS

Boring	Sample	Water Content and Limits	Specific Gravity	Triaxial Q Test	Consolidation Test
136	31	X(2)			
	32	X(2)		X	
	33	X(2)			
	34	X(3)		X	X
	35	X(2)		X	
	36	X(2)			
	37	X(2)	X	X	X
	38	X(2)	X	X	X
	39	X(2)			
	40	X(2)		X	
	41	X(2)		X	
	42	X(3)		X	X
	43	X(3)		X(3)	
	44	X		X	
	45	X(2)		X	
	46	X(3)		X(2)	
	47	X(2)	X	X	X
	48	X		X	
	49	X(2)		X	
	50	X(2)		X	X
	51	X(2)		X	
	52	X		X	
138	31	X			
	32	X(2)			
	33	X			
	34	X(2)		X	X
	35	X			
	36	X(3)	X	X	X
	37	X (3)		X	
	38	X(3)	X	X	X
	40	X(2)		X	
	42	X(2)		X	X
	43	X(2)		X	
	44	X(2)		X	
	45	X(2)		X	X
	46	X (2)		X	
	48	X(2)		X	
	49	X(2)	X	X	X
	50	X(2)		X	
	51	X(2)		X	
	52	X(2)		X	
	53	X		X	

Note: Number in parentheses indicates number of tests when more than one was performed

TABLE II

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 136

Project - River Bend Power Station | Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
31 152.5-154.5	A	6.0	Top 4 in. is a clayey gravel with subrounded shape up to 1 in. in size. Appears to be washed material. Bottom 2 in. is a mottled yellowish-brown and light brown fine-sandy clay. No stratification. Becomes sandier towards bottom of section. w = 28.7%
	B	6.5	Mottled yellowish and grayish-brown clay and sandy clay. No stratification. Complex structure of pockets, bent and discontinuous layers of clay with different sand content and color. Clay is very stiff and crumbly. w = 31.5% LL = 46 PL = 17 PI = 29
	C	8.0	Mottled gray and yellowish-gray hard clay with numerous streaks and pockets of orange-brown clay. Several pockets of black fine to medium sand about 1 mm in diameter. w = 29.5% LL = 43 PL = 20 PI = 23 Cutting edge of tube dented inwards by 1/4 in. Lower part of tube is oval, 6.8 cm by 8.0 cm.

TABLE II

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 136

Project - River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
32 155.0-157.0	A	6.0	Mottled light gray and yellowish- and orangish-gray clay. No stratification. Occasional streaks of black fine to medium sand about 1/16 in. in thickness. Clay is hard and crumbly. w = 25.1% LL = 43 PL = 19 PI = 24
	B	7.0	Light gray hard clay with numerous layers and pockets of reddish-brown silty clay. Scattered grains of fine to medium sand. Medium sand grains are black and angular. Q Test w = 23.2% LL = 47 PL = 24 PI = 23

TABLE II

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 136

Project - River Bend Power Station Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
33 157.5-159.5	A	8.5	Mottled light gray and yellowish-brown slightly sandy clay. No stratification. Very irregular pattern of pockets and streaks of different color and/or somewhat sandier or siltier clay. Clay is hard and crumbly. w = 23.0% LL = 42 PL = 15 PI = 27
	B	7.5	Yellowish-gray clay. Hard. Several 1-mm-thick orange streaks throughout section containing clayey fine sand or sandy clay. w = 23.7% LL = 44 PL = 21 PI = 23 Lower part of tube is oval in shape, 6.6 cm by 7.6 cm.

TABLE II

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 136

Project - River Bend Power Station Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
34 160.0-162.0	A	6.0	Mottled light gray and yellowish-gray clay and sandy clay. No stratification except for one horizontal seam of orange sandy clay about 1 mm in thickness. Very irregular structure of clay and sandy clay throughout section, including black specks of sandy clay. The clay and sandy clay are hard and crumbly. w = 20.8% LL = 33 PL = 15 PI = 18
	B	4.0	Yellowish-brown fine-sandy clay. Scattered small black specks of sandy clay. No stratification. Consolidation Tests w = 21.7% LL = 32 PL = 17 PI = 15
	C	6.0	Yellowish-brown fine-sandy clay. Several 1/4-in.-thick layers of less sandy soil. Many scattered small black medium sand grains, occasional thin reddish streaks at random orientation. Q Test w = 20.9%

TABLE II
DESCRIPTION OF UNDISTURBED SAMPLES
BORING NO. 136

Project- River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
35 162.5-164.5	A	1.5	Yellowish-brown fine-sandy clay. w = 25.3% LL = 34 PL = 15 PI = 19
	B	5.0	Fine-sandy silty clay. Yellowish-brown in upper 4 inches and gray in lower one inch. No stratification in either zone. Q Test w = 22.8% LL = 29 PL = 18 PI = 11

TABLE II

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 136

Project - River Bend Power Station — Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
36 165.0-167.0	A	9.0	Clayey gravel, probably washed material.
	B	8.5	Top 5 in. - Same as above. Bottom 3.5 in. - Greenish-gray clay and sandy clay. No stratification. Irregular structure of clay and sandy clay pockets in the range of 1/8 in. to 1/2 in. in size. Clay and sandy clay are hard and crumbly. w = 20.5% LL = 37 PL = 14 PI = 23
	C	7.0	Greenish-gray fine-sandy clay. Hard and brittle with softer zones of sandier clay. No stratification. w = 31.1% LL = 43 PL = 20 PI = 23 Lower end of tube is dented by about 1/2 of the tube diameter.

TABLE II

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 136

Project - River Bend Power Station | Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
37 167.5-169.5	A	1.5	Gray fine-sandy clay with some orange stains.
	B	4.0	Greenish-gray fine-sandy clay. Pockets of yellowish-orange sandy clay. No stratification. Consolidation Test w = 20.4% LL = 38 PL = 17 PI = 21
	C	6.0	Greenish-gray fine-sandy clay. No stratification. Q Test w = 20.2% LL = 42 PL = 24 PI = 18

TABLE II

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 136

Project - River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
38 170.0-172.0	A	7.5	Greenish-gray fine-sandy clay. A zone of yellowish-gray sandy clay runs vertically through the center of the specimen. No stratification. Irregular pattern of pockets and streaks of orange-brown and yellowish-brown sandy clay. Clay is hard and brittle. w = 25.6%
	B	2.0	Greenish-gray fine-sandy clay. No stratification. Consolidation Test w = 23.2% LL = 40 PL = 17 PI = 23
	C	5.0	Gray fine-sandy clay. No stratification except for an inclined seam of yellowish-brown sandy clay layered with a seam of orange clayey silt. Q Test w = 25.4% LL = 41 PL = 16 PI = 25

TABLE II

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 136

Project - River Bend Power Station | Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
39 172.5-174.5	A	10.5	Fine-sandy clay, light brown in upper 3.5 in., greenish-gray in the bottom 7 in. Both zones have an irregular pattern of pockets of clay and sandy clay with different contents of sand. Soil is hard and brittle, breaking into chunks. w = 27.9% LL = 41 PL = 19 PI = 22
	B	13.0	Greenish-gray fine-sandy clay. Hard and brittle. w = 27.4% LL = 38 PL = 17 PI = 21 Cutting end of tube was completely pinched shut.

TABLE II

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 136

Project - River Bend Power Station Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
40 175.0-177.0	A	10.2	Greenish-gray slightly sandy clay. No stratification. Mottled structure of sandier clay and clay zones. Hard and crumbly. w = 26.9% LL = 37 PL = 14 PI = 23
	B	6.0	Greenish-gray fine-sandy clay. Blocky structure. No stratification. Q Test w = 24.9% LL = 34 PL = 16 PI = 18

TABLE II
DESCRIPTION OF UNDISTURBED SAMPLES
BORING NO. 136

Project - River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
41 177.5-179.5	A	11.5	Greenish-gray fine-sandy clay. Two layers of clayey sand or very sandy clay about 1/4 in. thick about 4 in. from the bottom of the section. Irregular pattern of pockets of clay and sandy clay. Soil is hard and brittle, breaking into chunks. w = 27.3% LL = 42 PL = 19 PI = 23
	B	6.0	Gray fine-sandy clay. Contains several pieces of coarse sand and fine gravel which are softer in the outside and become hard towards the center. No stratification. Q Test w = 26.7% LL = 38 PL = 18 PI = 20
	C	6.0	Gray fine-sandy clay. Contains occasional medium sand grains, also pockets of orange fine sand up to 5 mm in diameter. No stratification.

TABLE II

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 136

Project - River Bend Power Station Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
42 180.0-182.0	A	16.5	Greenish-gray fine-sandy clay. A 5-in.-thick sandier zone at the center of the section. In this zone there is a hint of stratification. Remainder of the section has no stratification, with an irregular pattern of clay and sandy clay pockets. Very stiff and brittle, breaks into chunks. w = 29.3% LL = 36 PL = 16 PI = 20
	B	1.5	Greenish-gray fine-sandy clay. A few small pockets of fine sand of about 1 to 3 mm in diameter. No stratification. Consolidation Test w = 26.1% LL = 36 PL = 15 PI = 21
	C	5.0	Greenish-gray fine-sandy clay. Some fine sand grains appear to be mica. No stratification. Q Test w = 26.9% LL = 42 PL = 23 PI = 19

TABLE II

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 136

Project - River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
43 182.5-184.5	A	13.0	Greenish-gray sandy to very sandy clay. Top 7 in. are more sandy than lower part. No stratification except for occasional streaks of very sandy clay about 1/8 in. in thickness. Q Test on upper part of section. w = 27.8% LL = 30 PL = 23 PI = 7 Lower part of section: w = 26.6%
	B	6.0	Gray fine-sandy clay. Hard. A vertical sliver of brownish clay at edge of section. No stratification. Q Test w = 25.8% LL = 39 PL = 20 PI = 19
	C	6.0	Gray fine-sandy clay. One irregularly-shaped zone, light gray in color, about 1/2 in. in thickness, appears harder when trimming. No stratification. w = 28.4% LL = 44 PL = 18 PI = 26

TABLE II

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 136

Project - River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
44 185.0-187.0	A	7.2	Greenish-gray slightly sandy clay. A one-inch-thick zone near center of section is more sandy clay. Hard and crumbly, breaks into chunks. w = 26.8%
	B	7.8	Greenish-gray slightly sandy clay. Upper half is very hard and brittle. Lower half is more sandy clay stratified with a few thin layers of fine sand. Total thickness of sand about 3/4 in. w = 27.4%
	C	6.0	Gray fine-sandy clay containing vertical hairline cracks. A two-inch layer of gray silty fine sand at bottom of section. Q Test w = 27.9% LL = 32 PL = 20 PI = 12

TABLE II
DESCRIPTION OF UNDISTURBED SAMPLES
BORING NO. 136

Project - River Bend Power Station **Project No.** 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
45 187.5-189.5	A	8.0	Greenish-gray fine-sandy clay. Mostly irregular pattern of clays with somewhat different sand content, with a faint indication of some inclined layering. Top 2 in. are much sandier, being either a clayey sand or a very sandy clay. Sandy clay is very stiff and brittle. w = 27.3% LL = 35 PL = 17 PI = 18
	B	9.0	Greenish-gray fine-sandy clay. Occasional partings of fine sand about 2 mm in thickness. Total thickness of sand about 1/2 in.
	C	5.0	Gray fine-sandy clay. Contains a seam of reddish-brown sand about 1/8 in. thick. Occasional pieces of angular coarse sand. Q Test w = 25.6% LL = 37 PL = 16 PI = 21

TABLE II

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 136

Project - River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
46 190.0-192.0	A	13.5	Greenish-gray clay ranging from slightly sandy to sandy in different zones of the sample. The bottom inch and a zone 3 in. thick at the center are less sandy. Within each zone there is an irregular pattern of small pockets of sandy and less sandy clay. w = 28.9% LL = 41 PL = 17 PI = 24
	B	6.0	Gray fine-sandy clay. Very fragile when trimming. No stratification. Q Test w = 23.6% LL = 37 PL = 20 PI = 17
	C	5.0	Gray clayey sand. At top two inches there are layers of sandy clay and fine sand. Q Test w = 25.0% LL = 26 PL = 23 PI = 3

TABLE II

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 136

Project - River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
47 192.5-194.5	A	14.0	Top 1 in. is clay and gravel, probably washed material. Gray slightly sandy clay. At top it has a 1/4-in.-thick layer of clayey sand. Numerous small pockets of sandy or very sandy clay, up to about 1/4 in. in diameter. The clay is hard and brittle. w = 29.5%
	B	3.0	Gray sandy clay. No apparent stratification. Consolidation Test w = 29.8% LL = 41 PL = 23 PI = 18
	C	6.0	Slightly greenish-gray fine-sandy clay. Some zones of more plastic soil look like dried shards of clay intermixed with the sandy clay. Q Test w = 24.5% LL = 38 PL = 20 PI = 18

TABLE II

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 136

Project - River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
48 195.0-197.0	A	9.0	Greenish-gray sandy clay. Several lenses and streaks of silty fine sand ranging between 1 and 3 mm in thickness. Total thickness amounts to about 1/2 in. Sandy clay is very stiff and brittle. w = 26.7%
	B	9.0	Greenish-gray sandy clay. Several lenses of silty fine sand ranging between 2 to 7 mm in thickness. Total thickness of silty fine sand is about 1/2 in. Sandy clay has mottled appearance with clayier and sandier spots. It is hard and brittle. w = 28.7%
	C	5.0	Gray fine-sandy clay. A few medium sand size grains of a black mineral. Occasional small fine sand pockets, slightly lighter in color. Q Test w = 25.6% LL = 37 PL = 15 PI = 22

TABLE II

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 136

Project - River Bend Power Station Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
49 197.5-199.5	A	8.0	Gray fine-sandy clay. Upper 6 in. are slightly stratified with varying sand content in the clay. Also a few lenses of silty fine sand about 2 to 4 mm in thickness. Bottom 2 in. are clearly differentiated from the top 6 in., and consist of a marble-like pattern of clay, sandy clay, and silty fine sand pockets and lenses. Sandy clay is very stiff and brittle.
	B	9.0	Gray sandy clay with similar structure as bottom 2 in. of Section A. Contains two concretions about 1/8 in. in size. w = 25.5% LL = 37 PL = 16 PI = 21
	C	5.0	Gray fine-sandy clay. Bottom half of section is somewhat more clayey. A few small pockets of silty fine sand, some of which have orangish-brown staining. Occasional medium and coarse sand grains throughout section. Q Test LL = 34 PL = 17 PI = 17

TABLE II
DESCRIPTION OF UNDISTURBED SAMPLES
BORING NO. 136

Project - River Bend Power Station | Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
50 200.0-202.0	A	17.0	Gray fine-sandy clay. The upper 11 in. and bottom 1/2 in. have a marble-like appearance with veins of clay, sandy clay, and clayey sand. The remainder of the section appears homogeneous with a slight stratification. w = 28.6%
	B	3.0	Brownish-gray clay with partings and 1 to 2 mm pockets of fine sand. Consolidation Test w = 25.9% LL = 43 PL = 19 PI = 24
	C	5.0	Gray sandy clay with 1 to 10 mm layers of silty fine sand inclined up to 30° to horizontal. A few angular pieces of fine gravel in thickest sand layer. Q Test w = 28.9% LL = 45 PL = 14 PI = 31

TABLE II

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 136

Project - River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
51 202.5-204.5	A	12.0	Gray slightly fine-sandy clay. Irregular pattern of pockets of clay with different sand content. At top, center, and bottom of section, there are layers of silty fine sand stratified with sandy clay. Thickest sand layer is at center and about 1 in. thick. Total thickness of sand is about 2.5 in. Sandy clay is very stiff and brittle, breaks into blocks. A 2-in.-long, 1/4-in.-diameter concretion near center of section was in horizontal position. w = 25.6%
	B	5.5	Gray fine-sandy clay. Layers of less sandy clay and occasional 1 to 2 mm layers of fine sand. Q Test w = 28.1% LL = 41 PL = 16 PI = 25
	C	5.0	Gray fine-sandy clay. Occasional thin fine sand layers and one 1/2-in.-thick layer at center of section. Q Test w = 26.5% LL = 30 PL = 19 PI = 11

TABLE II

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 136

Project - River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
52 205.0-207.0	A	7.5	Gray fine-sandy clay. Some horizontal stratification in top 1-1/2 in. Remainder has an irregular structure with a 3/4-in.-thick irregular pocket of sandier material at center. w = 28.3%
	B	7.5	Gray fine-sandy clay. Irregular pattern with veins of clay with different sand content. Veins are about 1 to 3 mm thick. w = 28.7%
	C	5.0	Top 1/2 inch is a gray fine-sandy silty clay. Lower 4-1/2 inches is a yellowish-brown fine-sandy silty clay. A few scattered medium and coarse sand grains near interface. Q Test w = 28.8% LL = 33 PL = 23 PI = 10

TABLE III

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 138

Project - River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
31 152.5-154.5	A	7.0	Mottled yellowish-brown, gray and brown clay. Some fine-sandy clay pockets. Several black specks. Hard and crumbly. w = 33.5%
	B	6.0	Mottled yellowish-gray and yellow hard clay with spots and streaks of black, orange, and brown color. It is brittle and crumbles after breaking it. w = 30.5% LL = 50 PL = 18 PI = 32 Cutting edge of tube dented in by about 1/4 in.

TABLE III

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 138

Project - River Bend Power Station Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
32 155.0-157.0	A	7.5	Light gray clay mottled with dark gray and yellowish clay. Yellowish spots are surrounded by dark gray. Clay is hard and crumbly. w = 34.1% LL = 54 PL = 18 PI = 36
	B	9.5	Upper 4 in. similar to above. Bottom 5.5 in. is stratified with about 2-mm-thick orange-brown clay layers and thicker light gray clay layers. Two 1-in. pockets of light gray clay interrupt the stratification at both sides of the sample about 1 in. from the bottom of the section. Clay is hard and crumbly. w = 35.7%
	C	6.0	Mottled yellowish-gray and yellow clay. Hard and brittle. Streaks, spots, and horizontal seams of brown and orange clay, silty fine sand It is brittle and crumbles. w = 32.6% LL = 58 PL = 16 PI = 42 Lower end of tube is oval is shape, max dia 7.6 cm, min dia 6.8 cm.

TABLE III

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 138

Project - River Bend Power Station | Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
33 157.5-159.5	A	9.0	Layered light gray and yellowish-brown clay. Layers are about 1 in. thick and are separated by 1 to 2 mm layers of orange-brown clay. Color is mottled. Very stiff and brittle. It breaks into chunks. w = 30.3%
	B	9.0	Similar to A, except that fewer layers.
	C	6.0	Yellow clay with streaks and seams of orange, black, and brown colors. Hard and brittle. w = 33.1% LL = 53 PL = 17 PI = 36 Cutting edge of tube is oval in shape. Max dia 7.5 cm; min dia 6.8 cm.

TABLE III
DESCRIPTION OF UNDISTURBED SAMPLES
BORING NO. 138

Project - River Bend Power Station Project No. 7236

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
34 160.0-162.0	A	14.0	The top 10 in. is a gray clay and silty clay stratified with 1/2 in. to 1 in. thick layers inclined about 45° to the horizontal. Layers are deformed and displaced by several shear surfaces. Some zones have the appearance of marble because of the distortion of the layers. At the bottom there is a shear plane with a shiny surface. The bottom 4 in., under the shear plane, is a gray clay and silty clay with an irregular mottled appearance. The clay and silty clay are very stiff and brittle. w = 41.5%
	B	3.0	Gray clay. Occasional black streaks. Hard and brittle. Consolidation Test w = 29.7% LL = 48 PL = 19 PI = 29
	C	6.0	Gray clay with dark streaks. A vertical streak of green clay separates a slice of lighter gray and harder clay at one side of section. Q Test w = 29.4% LL = 46 PL = 17 PI = 29

TABLE III

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 138

Project - River Bend Power Station Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
35 162.5-164.5	A	7.0	Gray slightly fine-sandy clay. Very irregular pattern of pockets of sandier clay and silty clay. Contains two pockets of dark brown organic material, 1/2 in. and 1/4 in. in diameter. Clay is hard and brittle.
	B	8.5	Gray slightly fine-sandy clay. Very irregular pattern of pockets of sandier clay and silty clay. A few concretions up to 1/4 in. in diameter. Scattered dark brown organic pockets up to 1/8 in. in size. Clay is hard and brittle. w = 29.7%
	C	6.0	Gray clay with a yellowish streak running vertically through the section. Clay is hard and brittle. w = 28.8% LL = 45 PL = 18 PI = 27 Lower end of tube is oval. Max dia 7.4 cm; min dia 6.8 cm.

TABLE III
DESCRIPTION OF UNDISTURBED SAMPLES
BORING NO. 138

Project - River Bend Power Station | Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
36 165.0-167.0	A	14.5	Gray fine-sandy clay. Irregular pattern of lenses and pockets of sandier clay, clay, and silty fine sand. The sand pockets are smaller than 1/4 in. Near the center there is an intrusion-like inclined zone about 1/2 in. thick outlined by a 1-mm-thick clay layer. Clay is hard and brittle. w = 27.0% LL = 43 PL = 18 PI = 25
	B	3.0	Gray fine-sandy clay. Hard and very fragile. Consolidation Test w = 29.0% LL = 41 PL = 19 PI = 22
	C	5.0	Gray fine-sandy clay. Several small lenses of fine sand. A few 1/2-in. pockets of orange-brown silty clay. Q Test w = 27.5% LL = 42 PL = 18 PI = 24

TABLE III

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 138

Project - River Bend Power Station **Project No.** 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
37 167.5-169.5	A	5.5	Top 3.5 in. is a gray clay with an irregular pattern of veins of slightly sandy clay. Bottom 2 in. is a greenish-gray fine-sandy clay. A 1/4-in.-thick lense of silty fine sand is at the boundary of the two zones. The clay and sandy clay are very stiff to hard and brittle. The top zone has: w = 28.4% LL = 43 PL = 14 PI = 29
	B	6.0	Greenish-gray fine-sandy clay. Irregular pattern of pockets and veins of clay and sandier clay. Very hard and brittle, Breaks into chunks. w = 23.2% LL = 43 PL = 23 PI = 20
	C	6.0	Green fine-sandy clay with veins of yellowish color. Hard and brittle. Q Test w = 20.4% LL = 42 PL = 16 PI = 26

TABLE III
DESCRIPTION OF UNDISTURBED SAMPLES
BORING NO. 138

Project - River Bend Power Station | Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
38 170.0-172.0	A	2.0	Greenish-gray fine-sandy clay. Irregular pattern of pockets and lenses of clay and silty fine sand. Sand lenses are about 1/8 in. thick. Sandy clay is hard and brittle. w = 26.9% LL = 43 PL = 16 PI = 27
	B	4.0	Greenish-gray sandy clay. A pocket of more plastic clay about 2 in. in size. Consolidation Test w = 22.2% LL = 43 PL = 17 PI = 26
	C	6.0	Gray fine-sandy clay. Top 3 in. of section contains occasional medium sand grains. Q Test w = 24.7% LL = 40 PL = 15 PI = 25

TABLE III

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 138

Project - River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
40 175.0-177.0	A	10.0	Greenish-gray fine-sandy clay. Mottled appearance with irregularly shaped zones of clay and sandier clay. Very stiff and brittle. w = 29.6% LL = 39 PL = 17 PI = 22
	B	6.0	Greenish-gray fine-sandy clay. Several 1/2-in. to 1-in. pockets of orange-brown silty clay. Q Test w = 29.1% LL = 41 PL = 18 PI = 23

TABLE III

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 138

Project - River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
42 180.0-182.0	A	1.0	Greenish-gray fine-sandy clay. Light gray silty clay veins.
	B	3.0	Greenish-gray fine-sandy clay. Streaks of less sandy clay. Consolidation Test w = 27.7% LL = 41 PL = 19 PI = 22
	C	6.0	Greenish-gray fine-sandy clay. Some fine sand grains appear to be mica. Q Test w = 28.2% LL = 46 PL = 16 PI = 30

TABLE III

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 138

Project - River Bend Power Station Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
43 182.5-184.5	A	6.0	Greenish-gray fine-sandy clay and clay. A few very sandy clay lenses about 1/8 in. thick. Irregularly shaped zones of clay and fine-sandy clay. Very stiff and brittle. Some very hard zones.
	B	7.5	Greenish-gray fine-sandy clay. Irregular pattern of sandier and less sandy clay zones. Slight horizontal stratification in center 3 in. of section. Very stiff and brittle. w = 29.1%
	C	6.0	Greenish-gray fine-sandy clay. Hard and brittle. Q Test w = 28.8% LL = 41 PL = 15 PI = 26

TABLE III

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 138

Project - River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
44 185.0-187.0	A	7.5	Greenish-gray slightly fine-sandy clay. Irregular pattern of zones with slightly different content of sand. Hard and brittle, breaks into chunks.
	B	9.0	Similar to A with a more sandy clay zone near center. w = 23.9%
	C	6.0	Greenish-gray fine-sandy clay. Less sandy in top half of section. Hard, brittle, and crumbly. Q Test w = 24.2% LL = 37 PL = 14 PI = 23

TABLE III

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 138

Project - River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
45 187.5-189.5	A	13.0	Greenish-gray fine-sandy clay. It contains 1/8-in. to 1/2-in. pockets of sandier and less sandy clay that are distributed throughout the section in an irregular pattern. Very stiff and brittle. w = 25.7%
	B	3.0	Greenish-gray fine-sandy clay. A parting of fine sand along an irregular surface. Consolidation Test w = 27.5% LL = 39 PL = 16 PI = 23
	C	6.0	Greenish-gray very sandy clay. Q Test w = 26.8% LL = 38 PL = 17 PI = 21

TABLE III
DESCRIPTION OF UNDISTURBED SAMPLES
BORING NO. 138

Project - River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
46 190.0-192.0	A	6.5	Greenish-gray fine-sandy clay. Contains an irregular pattern of clay and sandier clay pockets. Top 1-1/2 in. is somewhat less sandy. A 1/2 in. by 3/4 in. pocket of silty fine sand at the bottom. Very stiff and brittle. w = 29.4% LL = 42 PL = 15 PI = 27
	B	6.0	Greenish-gray very sandy clay, becoming less sandy towards bottom. A 1/2-in. layer of hard brittle clay. A roughly horizontal bluish streak at bottom of section. Q Test w = 28.1% LL = 34 PL = 18 PI = 16

TABLE III
DESCRIPTION OF UNDISTURBED SAMPLES
BORING NO. 138

Project - River Bend Power Station　　Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
48 195.0-197.0	A	8.0	Gray fine-sandy clay. A few lenses of silty fine sand at top 1-1/2 in. about 1/8 in. in thickness. Throughout the rest of the section there is an irregular pattern of zones of sandy clay with slightly different sand content. A few 1/8-in. specks of orange-brown clay. Sandy clay is stiff and brittle. w = 28.4%　LL = 42 PL = 16 PI = 26
	B	6.0	Gray fine-sandy clay. Several very thin (~ 1 mm) partings of fine sand in bottom 2 in. of section. A 1/2-in. piece of gravel at bottom of section. Q Test w = 28.9%　LL = 42 PL = 15 PI = 27

TABLE III
DESCRIPTION OF UNDISTURBED SAMPLES
BORING NO. 138

Project - River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
49 197.5-199.5	A	2.0	Gray fine-sandy clay. Pockets of silty fine sand about 1/8 in. in diameter.
	B	3.0	Gray sandy clay. Contains greenish-gray zones which are clayier. Small lenses (~ 1 mm thick) of fine sand. A soft root of about 1 mm in dia. Consolidation Test w = 27.4% LL = 42 PL = 17 PI = 25
	C	6.0	Gray sandy clay. A 2-mm-thick seam of fine sand and a few small fine sand pockets. Q Test w = 26.4% LL = 40 PL = 16 PI = 24

TABLE III

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 138

Project - River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
50 200.0-202.0	A	5.5	Gray fine-sandy clay. Occasional streaks of yellowish-gray fine-sandy clay. Numerous pockets, 1/8 in. to 1/2 in. in diameter, of sandier clay and of clay irregularly distributed throughout section. w = 20.1% LL = 36 PL = 17 PI = 19
	B	6.0	Gray fine-sandy clay. No apparent stratification Q Test w = 25.1% LL = 37 PL = 15 PI = 22

TABLE III
DESCRIPTION OF UNDISTURBED SAMPLES
BORING NO. 138

Project - River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
51 202.5-204.5	A	9.5	Gray fine-sandy clay. Marble-like pattern of veins of sandy clay and clay. A 1-in. layer at the bottom of homogeneous very sandy clay. A 1/4-in.-thick lense of silty fine sand near top of section. Clay and sandy clay are very stiff and brittle. w = 29.2% LL = 46 PL = 17 PI = 29
	B	6.0	Gray fine-sandy clay. Some stratification with layers of different sand content. A 2-mm-thick silty sand parting. Several scattered coarse sand grains. Q Test w = 23.0% LL = 34 PL = 16 PI = 18

TABLE III

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 138

Project - River Bend Power Station　　Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
52 205.0-207.0	A	6.0	Top 2 in. - light brownish-gray silty fine sand. Bottom 4 in. - gray hard clay with irregular layers of sand up to 1/4 in. thick in lower part. Q Test performed on bottom 4 in. of section. w = 32.4%　LL = 44 PL = 15 PI = 29
	B	4.5	Section can be divided into three zones approximately as follows: Top 1 in. - gray silty fine sand. Middle 3 in. - gray clay with several 1- to 3-mm-thick lenses of fine sand. w = 31.3%　LL = 41 PL = 14 PI = 27 Bottom 1/2 in. - silty fine sand.
	C	4.0	Gray silty fine sand. Contains a few 1/2-in.-diameter clay lumps.

TABLE III

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 138

Project - River Bend Power Station

Project No. 7263

Sample No. and Depth ft.	Section No.	Length of Section in.	Description
53 208.0-210.0	A	6.0	Top 1 in. - Gray hard silty clay with thin fine sandy seams. Middle 4 in. - Gray silty fine to medium sand. Lower 1 in. - Yellowish-brown fine-sandy clay.
	B	5.0	Top 3-1/2 in. - Yellowish-brown stiff clay with a trace of fine sand. Small pockets and streaks of orange-brown fine to medium sand. Bottom 1-1/2 in. - Orange-brown silty fine to medium sand. At the interface with the clay there was a cemented 1/8-in. layer of iron oxide Q Test on upper 3-1/2 in. of section. w = 27.8% LL = 40 PL = 16 PI = 24
	C	3.5	Orange-brown silty fine sand. w = 22.6%

TABLE IV
SPECIFIC GRAVITIES

Boring No.	Sample No.	Section No.	Specific Gravity
136	37	B	2.73
136	38	B	2.73
136	47	B	2.73
138	36	B	2.76
138	38	B	2.74
138	49	B	2.72

TABLE V

UNCONSOLIDATED-UNDRAINED (Q) TRIAXIAL TESTS - BORING 136

Sample and Section No.	Water Content %	Liquid Limit LL	Plastic Limit PL	Plasticity Index PI	Chamber Pressure σ_c kg/cm^2	Maximum $(\sigma_1-\sigma_3)$ kg/cm^2	Axial Strain at $(\sigma_1-\sigma_3)_{max}$ %
32B	23.2	47	24	23	2	5.90	7.2
34C	20.9				2	5.60	2.8
35B	22.8	29	18	11	2	4.70	3.0
37C	20.2	42	24	18	2	6.75	3.4
38C	25.4	41	16	25	2	6.00	3.5
40B	24.9	34	16	18	2	4.50	8.0
41C	26.7	38	18	20	2	5.50	3.7
42C	26.9	42	23	19	2	6.80	3.8
43A	27.6	30	23	7	7	4.30	15.0
43B	25.8	39	20	19	7	10.40	2.8
43C	28.4	44	18	26	2	6.30	3.2
44C	27.9	32	20	12	2	4.40	5.0
45C	25.6	37	16	21	2	5.55	4.2
46B	23.6	37	20	17	7	10.30	4.0
46C	25.0	26	23	3	2	4.25	3.6
47C	24.5	38	20	18	2	6.45	2.3
48C	25.6	37	15	22	2	5.45	3.6
49C		34	17	17	2	5.20	3.0
50C	28.9	45	14	31	2	4.60	4.2
51B	28.1	41	16	25	7	5.50	4.0
51C	26.5	30	19	11	2	3.85	5.5
52C	28.8	33	23	10	2	4.70	6.5

TABLE VI
UNCONSOLIDATED UNDRAINED (Q) TRIAXIAL TESTS - BORING 138

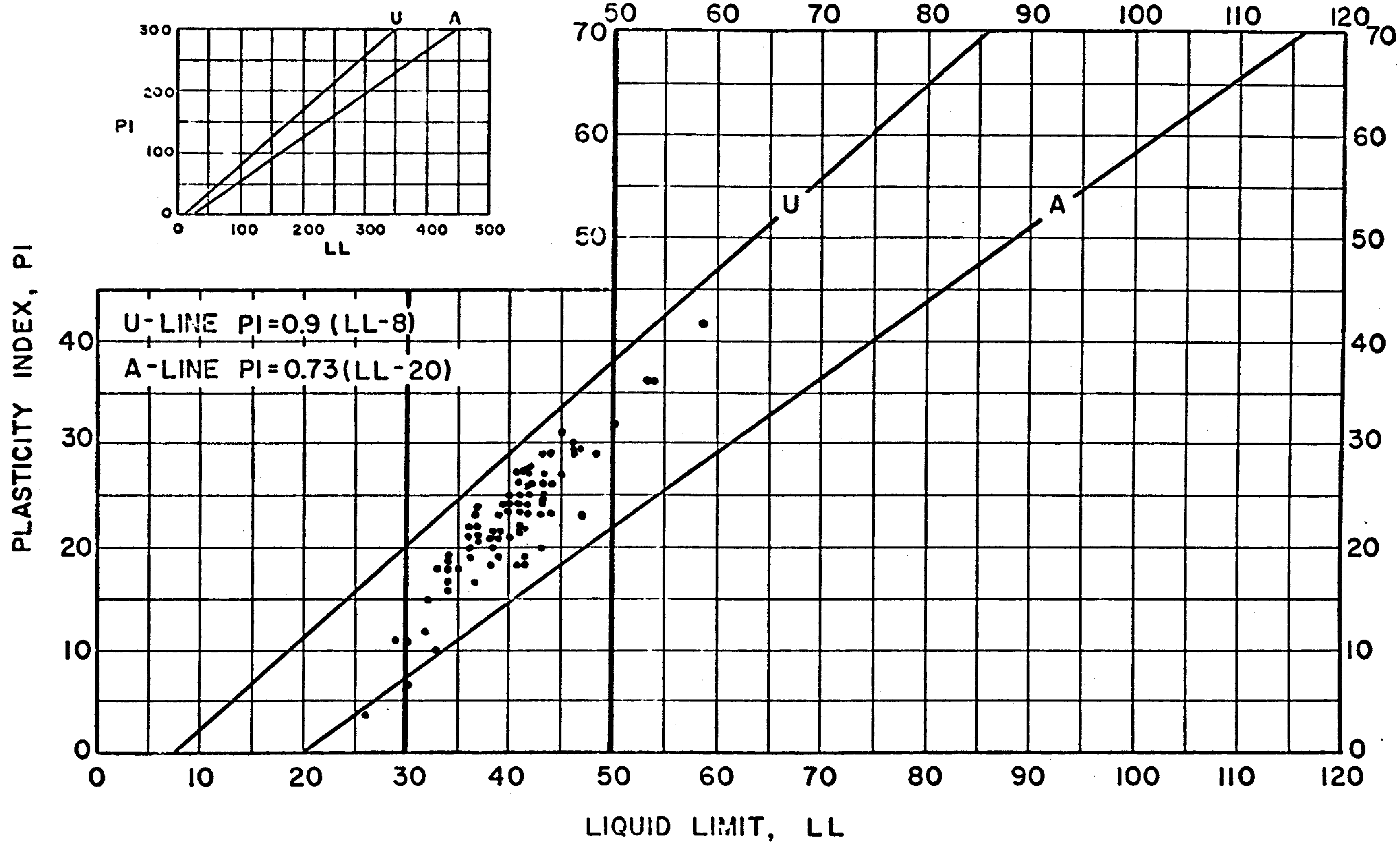
Sample and Section No.	Water Content %	Liquid Limit LL	Plastic Limit PL	Plasticity Index PI	Chamber Pressure σ_c kg/cm^2	Maximum $(\sigma_1 - \sigma_3)$ kg/cm^2	Axial Strain at $(\sigma_1 - \sigma_3)_{max}$ %
34C	29.4	46	17	29	2	4.90	1.6
36C	27.5	42	18	24	2	5.85	2.3
37C	20.4	42	16	26	2	6.05	4.0
38C	24.7	40	15	25	2	6.10	4.0
40B	29.1	41	18	23	2	4.30	13.0
42C	28.2	46	16	30	2	6.55	3.5
43C	28.8	41	15	26	2	4.70	4.2
44C	24.2	37	14	23	2	4.60	20.0
45C	26.8	38	17	21	2	4.60	3.5
46B	28.1	34	18	16	2	3.40	5.0
48B	28.9	42	15	27	2	6.15	4.0
49C	26.4	40	16	24	2	5.75	3.0
50B	25.1	37	15	22	2	5.40	5.5
51B	23.0	34	16	18	2	4.40	19.0
52C	32.4	44	15	29	2	3.05	5.5
53C	27.8	40	16	24	2	2.50	16.0

TABLE VII
CONSOLIDATION TESTS

Boring No.	Sample and Section No.	Water Content %	Liquid Limit	Plastic Limit	Plasticity Index	In-Situ Effective Vertical Stress(1) kg/cm^2	Estimated Range of Preconsolidation Pressure kg/cm^2
136	34B	21.7	32	17	15	6.4	11 - 18
	37B	20.4	38	17	21	6.7	11.5 - 16
	38B	23.2	40	17	23	6.8	11.5 - 17
	42B	26.1	36	15	21	7.0	12 - 15
	47B	29.8	41	23	18	7.3	10.5 - 13
	50B	25.9	43	19	24	7.6	12.5 - 17
138	34B	29.7	48	19	29	6.6	9.2 - 10.7
	36B	29.0	41	19	22	6.8	12 - 15.5
	38B	22.2	43	17	26	7.0	12 - 16
	42B	27.7	41	19	22	7.2	11.5 - 16.5
	45B	27.5	39	16	23	7.4	13 - 18.5
	49B	27.4	42	17	25	7.9	12 - 15

(1) Computed on the basis of the following:

Ground Surface Elevation	Boring 136	+108.1 ft
Ground Surface Elevation	Boring 138	+110.2 ft
Groundwater Table Elevation		+ 57.0 ft



Stone & Webster Eng. Corp.
Boston, Mass.

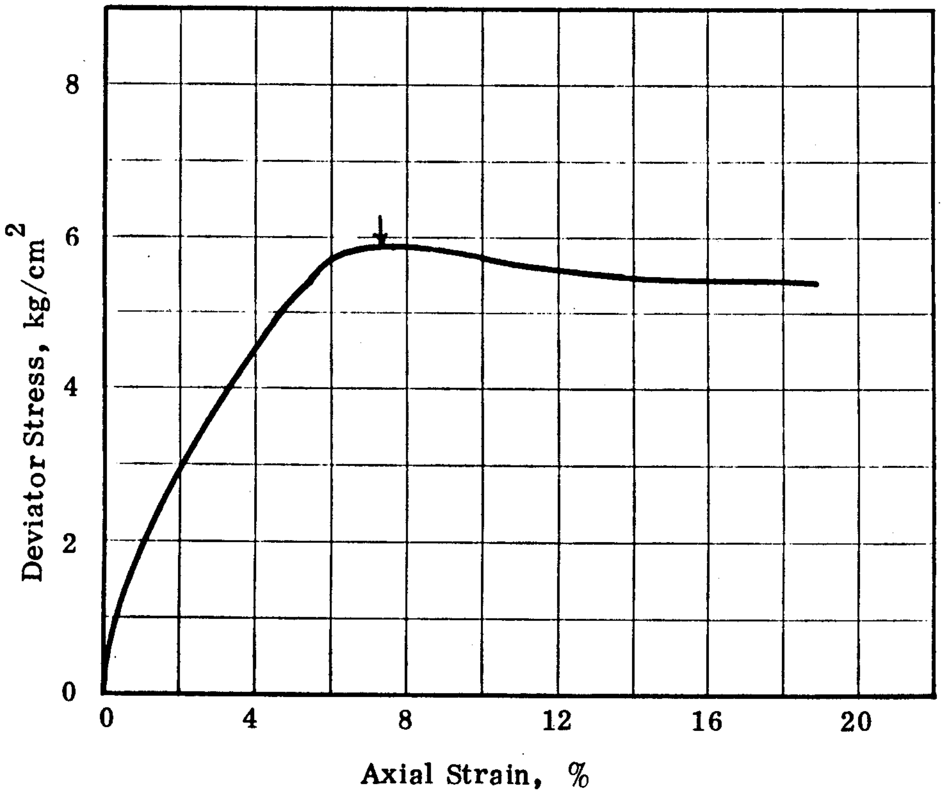
GEOTECHNICAL ENGINEERS INC.
WINCHESTER, MASS.

River Bend Power Station
Gulf States Utilities

PROJECT 7263

PLASTICITY CHART
Borings 136 & 138
Depths 152 ft to 210 ft

Dec. 1972 FIG. 1



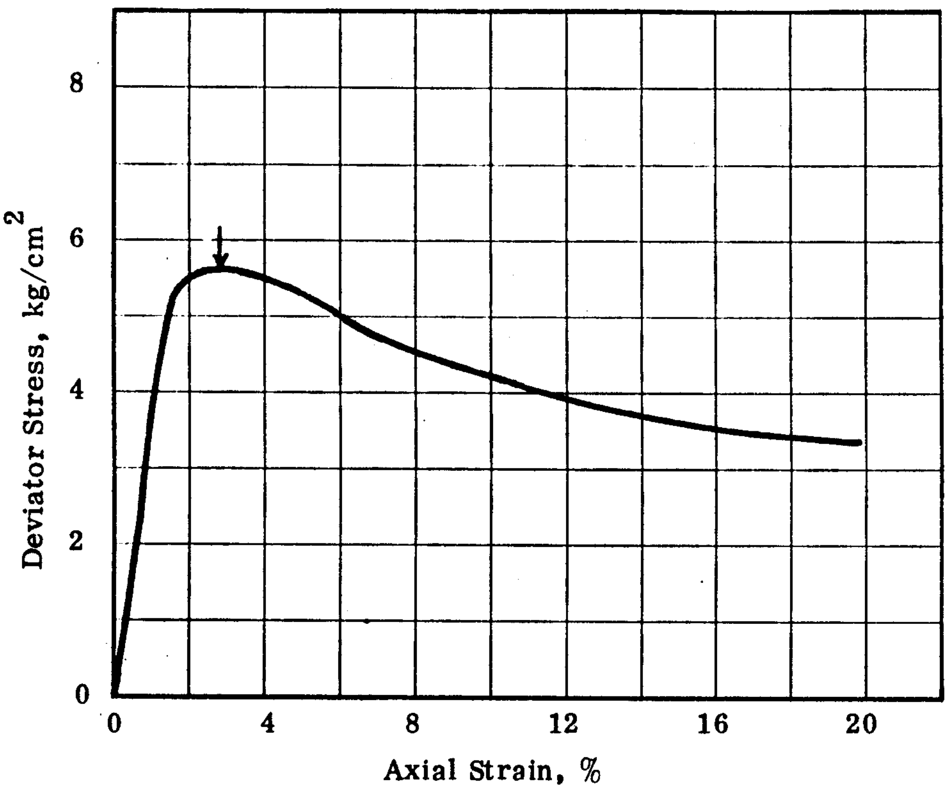
Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 23.2%
LL = 47
PL = 24
PI = 23

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 136 Sample 32B
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Nov. 1972 **FIG.** 2

Φ GEOTECHNICAL ENGINEERS INC.

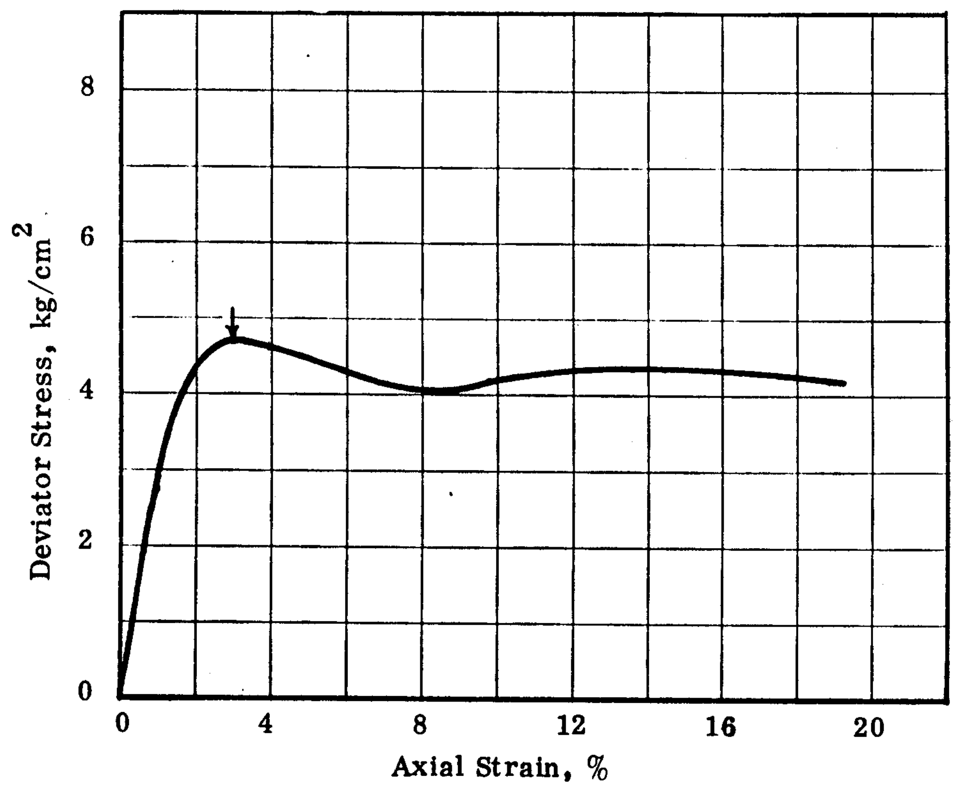


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 20.9%
LL = 32
PL = 17
PI = 15

$\sigma_c = 2\ kg/cm^2$

Stone & Webster Eng. Corp. Boston, Massachusetts **GEOTECHNICAL ENGINEERS INC.** **WINCHESTER, MASS.**	River Bend Power Station Project 7263	Q Test Boring 136 Sample 34C Nov. 1972 **FIG.** 3

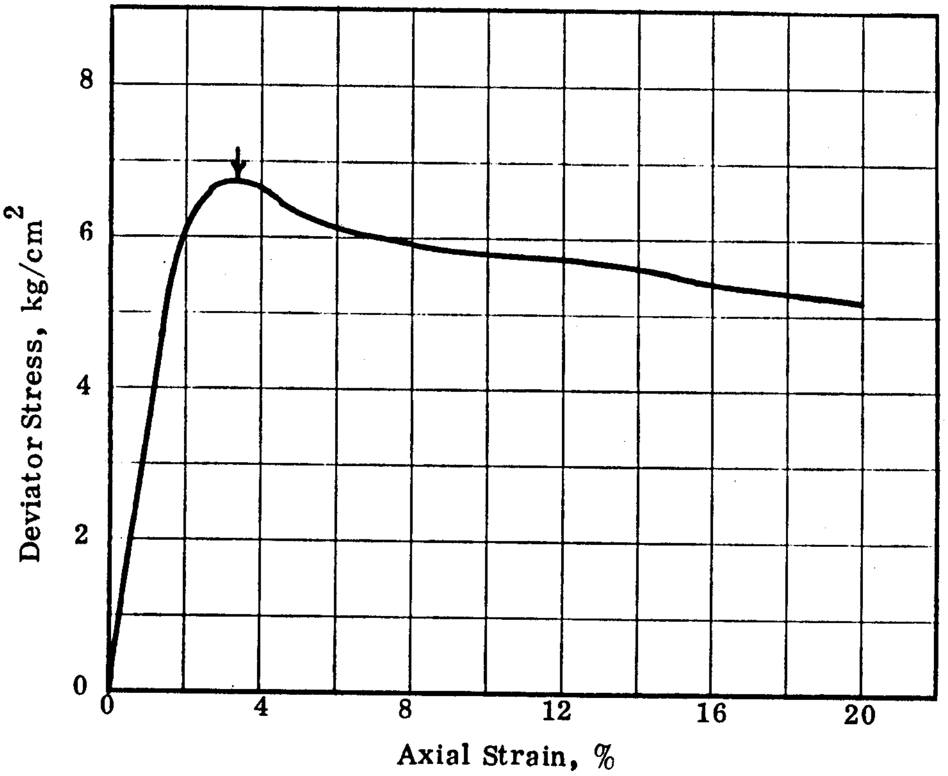


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 20.4%
LL = 29
PL = 18
PI = 11

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 136 Sample 35B
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Nov. 1972 **FIG.** 4

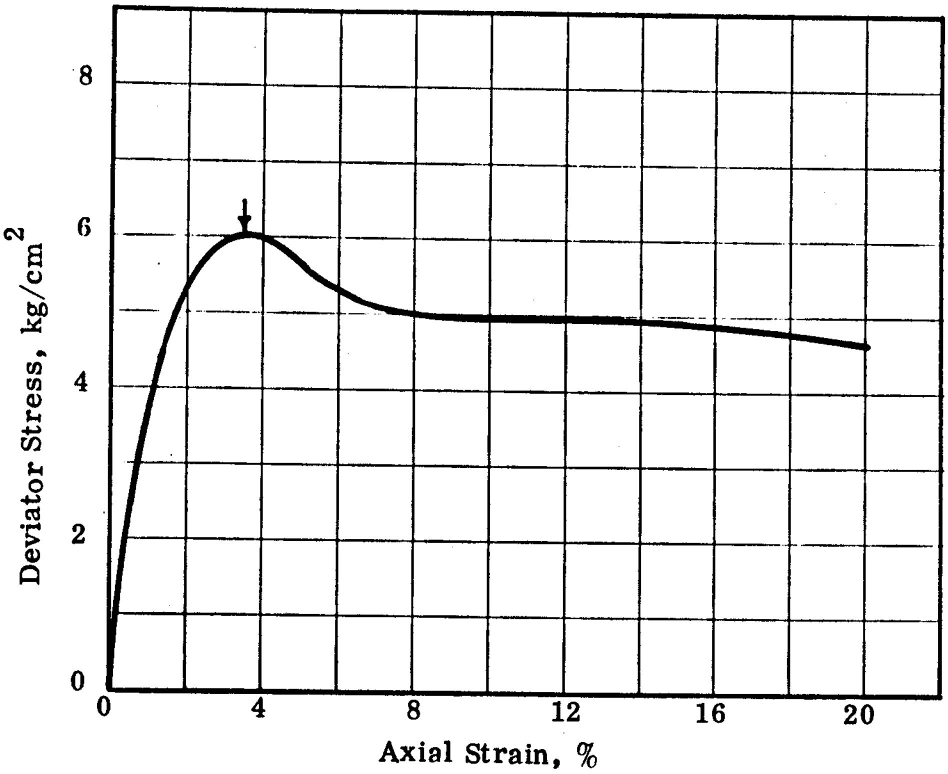


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 20.3%
LL = 42
PL = 24
PI = 18

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 136 Sample 37 C
GEOTECHNICAL ENGINEERS INC. **WINCHESTER, MASS.**	Project 7263	Nov. 1972 **FIG.** 5

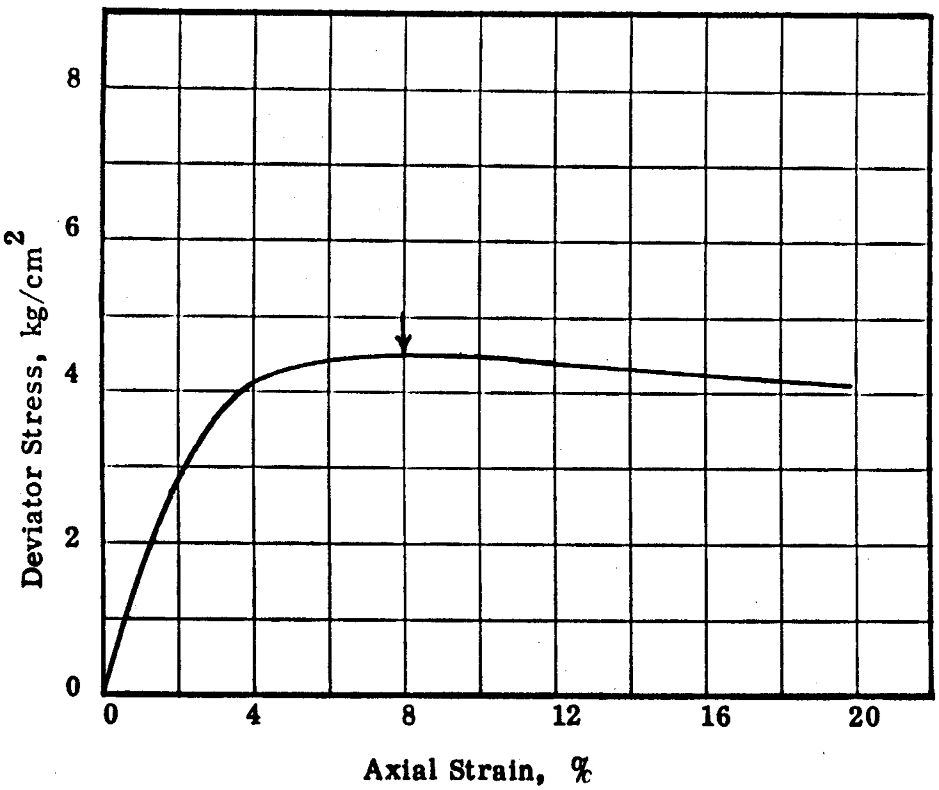


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

$w_i = 25.4\%$
LL = 41
PL = 16
PI = 25

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 136 Sample 38C
GEOTECHNICAL ENGINEERS INC. **WINCHESTER, MASS.**	Project 7263	Nov. 1972 **FIG.** 6

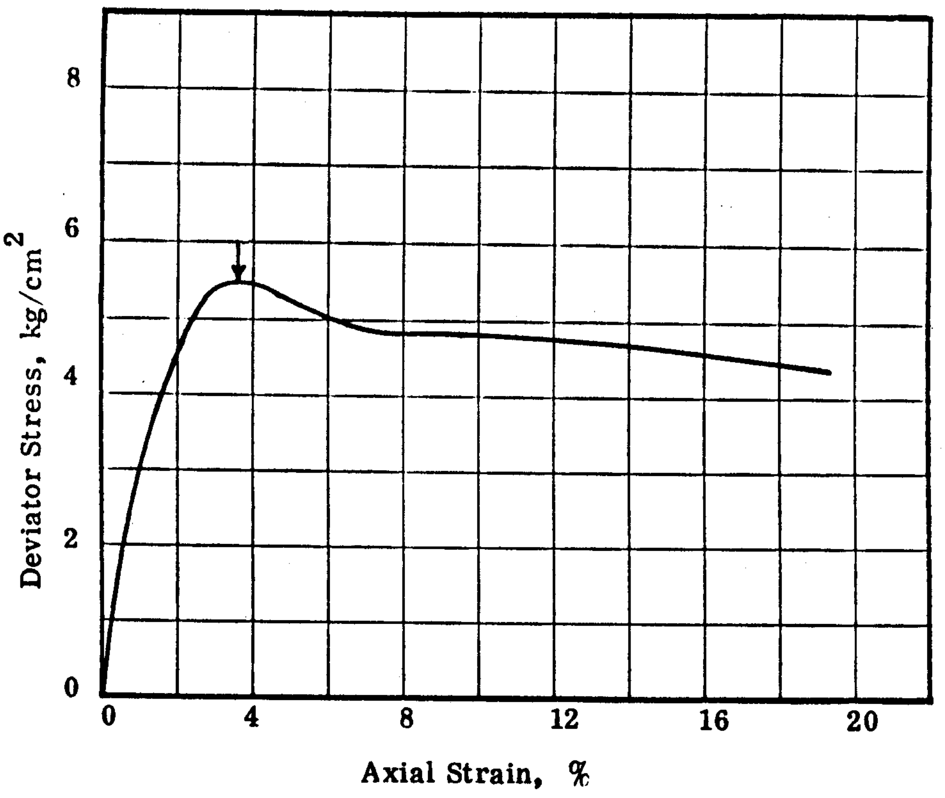


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 24.9%
LL = 34
PL = 16
PI = 18

$\sigma_c = 2\ kg/cm^2$

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 136 Sample 40B
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 7

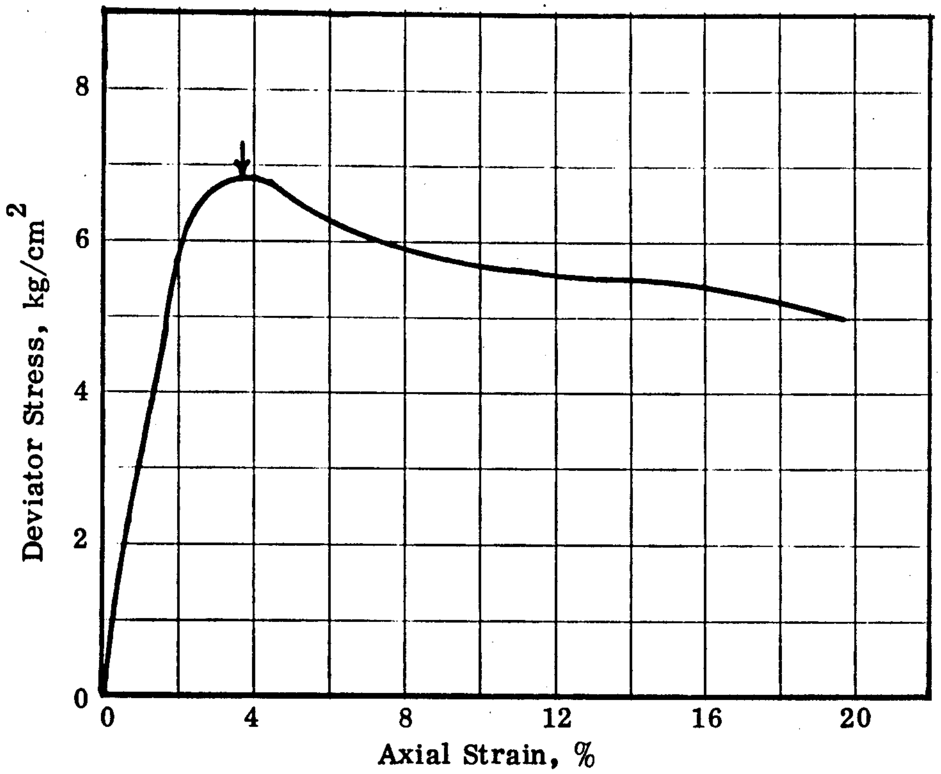


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

wi = 26.7%
LL = 38
PL = 18
PI = 20

$\sigma_c = 2\ kg/cm^2$

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 136 Sample 41C
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 8

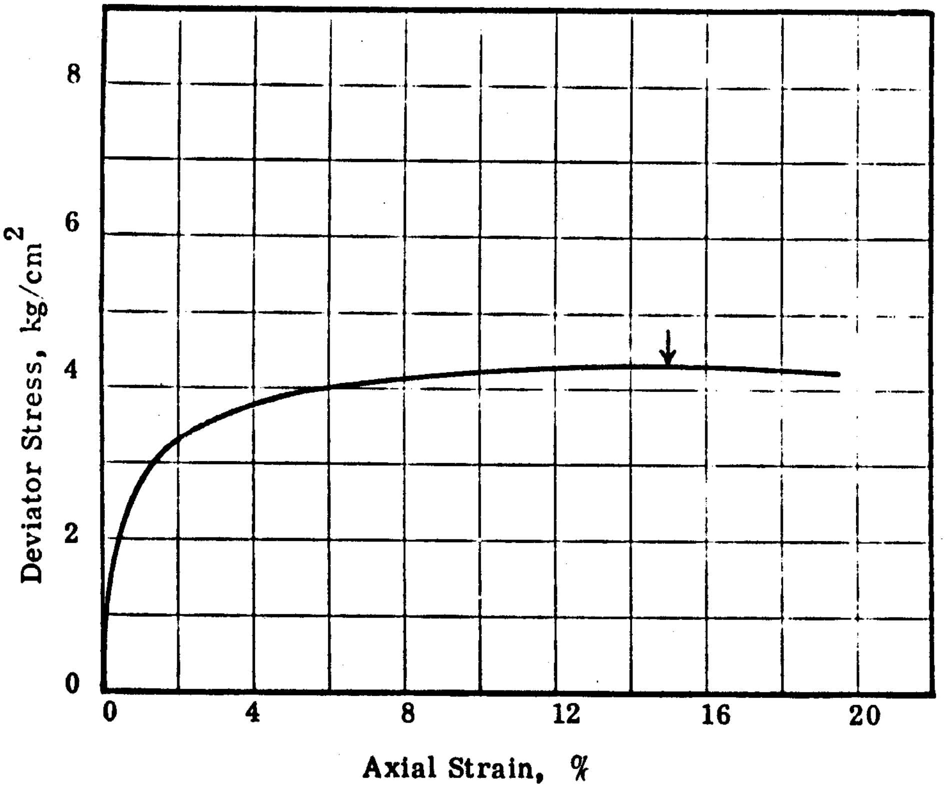


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 26.9%
LL = 42
PL = 23
PI = 19

$\sigma_c = 2\ kg/cm^2$

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring136 Sample 42 C
GEOTECHNICAL ENGINEERS INC. **WINCHESTER, MASS.**	Project 7263	Nov. 1972 **FIG.** 9

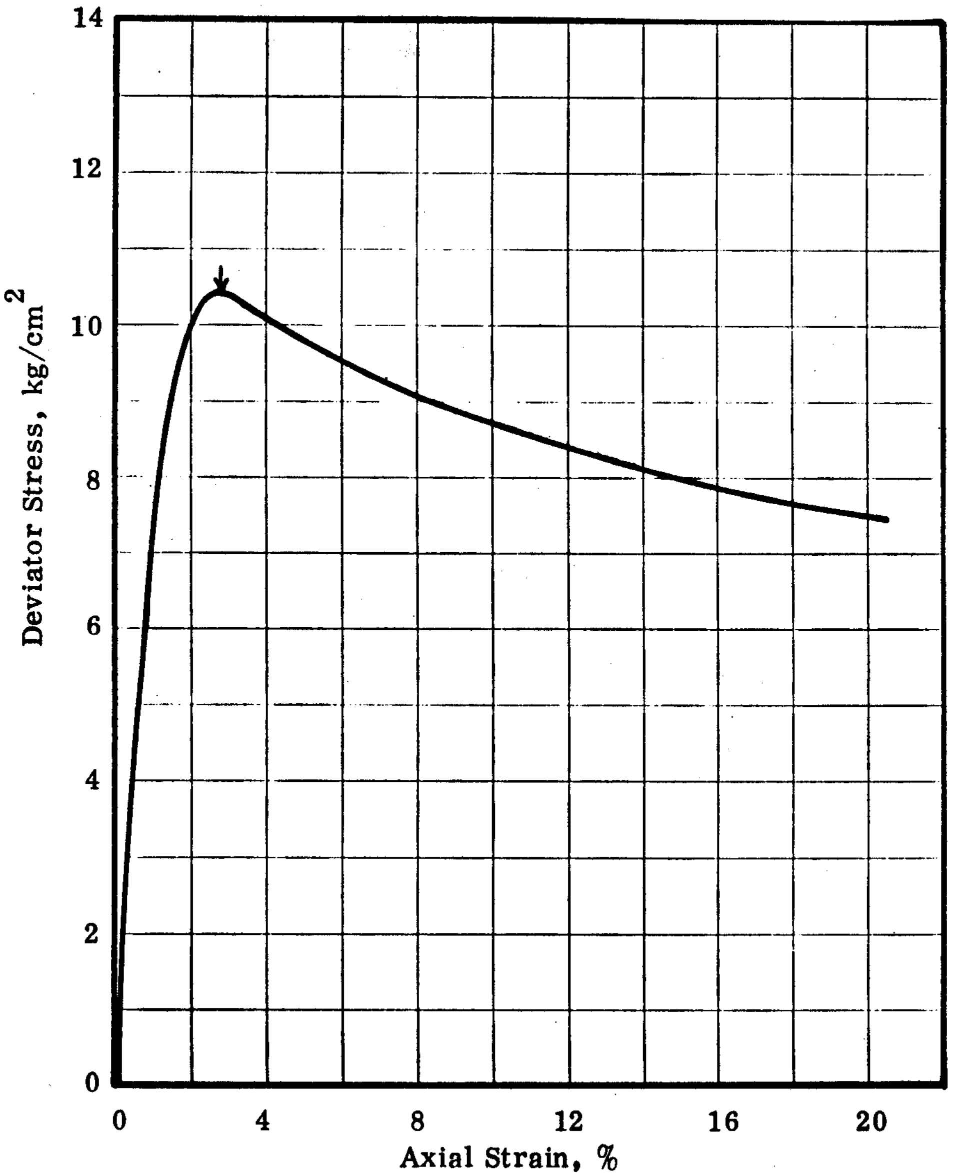


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 27.6%
LL = 30
PL = 23
PI = 7

$\sigma_c = 7 \text{ kg/cm}^2$

Stone & Webster Eng. Corp.	River Bend Power Station	Q Test Boring 136 Sample 43A
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 **FIG.** 10

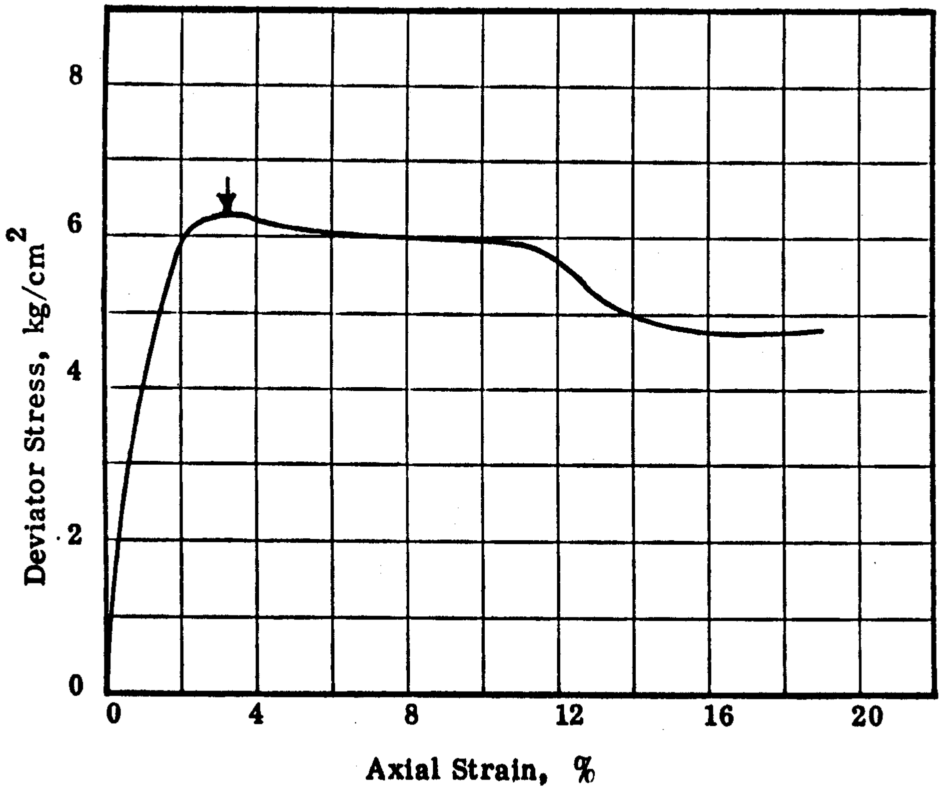


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

$\sigma_c = 7 \text{ kg/cm}^2$

w_i = 25.8%
LL = 39
PL = 20
PI = 19

Stone & Webster Eng. Corp.	River Bend Power Station	Q Test Boring 136 Sample 43B
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 11

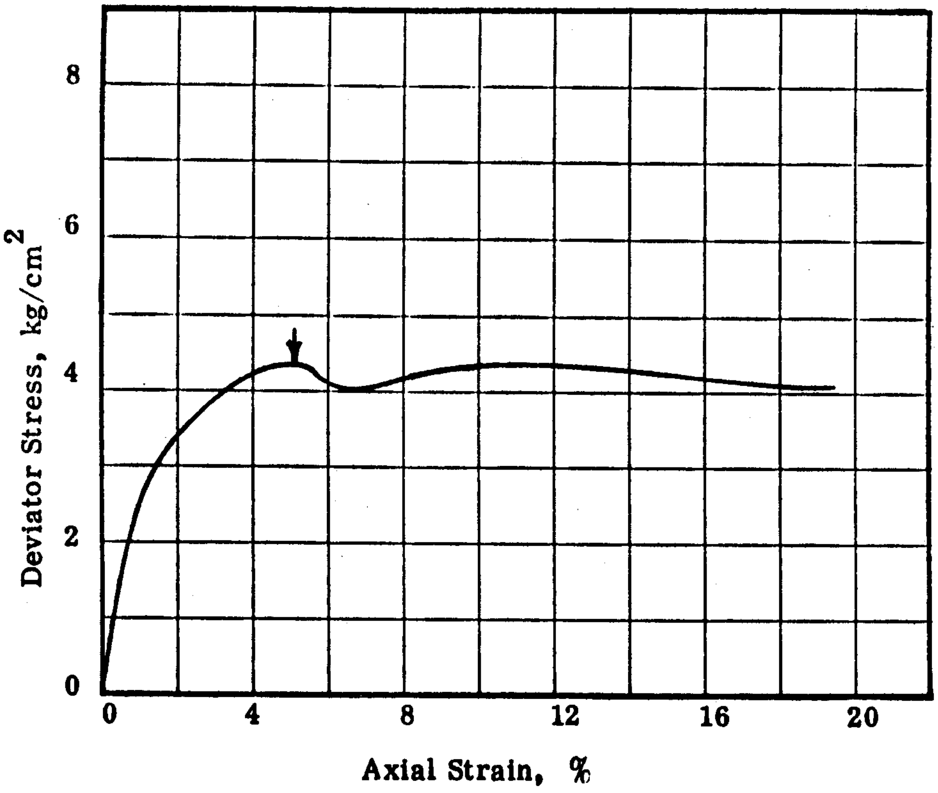


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 28.4%
LL = 44
PL = 18
PI = 26

$\sigma_c = 2\ kg/cm^2$

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 136 Sample 43 C
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 12

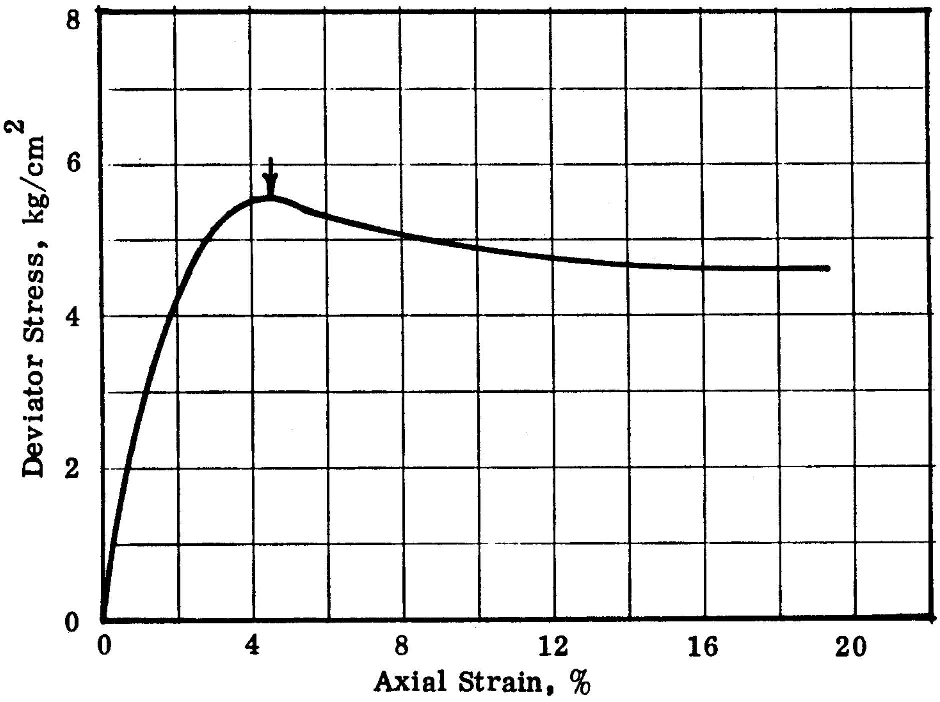


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 27.9%
LL = 32
PL = 20
PI = 12

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 136 Sample 44C
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 13

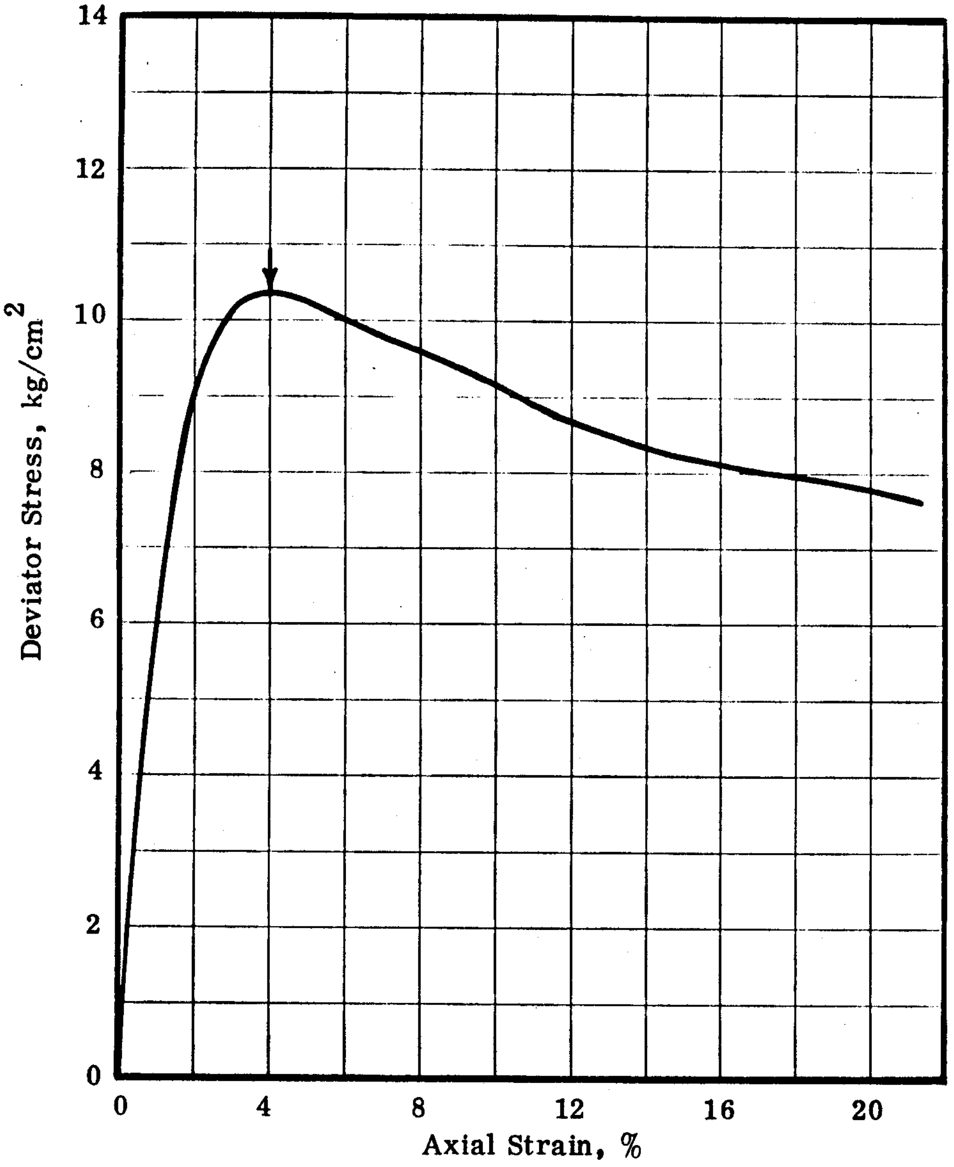


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

$w_i = 25.6\%$
LL = 37
PL = 16
PI = 21

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 136 Sample 45 C
GEOTECHNICAL ENGINEERS INC. **WINCHESTER, MASS.**	Project 7263	Nov. 1972 **FIG.** 14

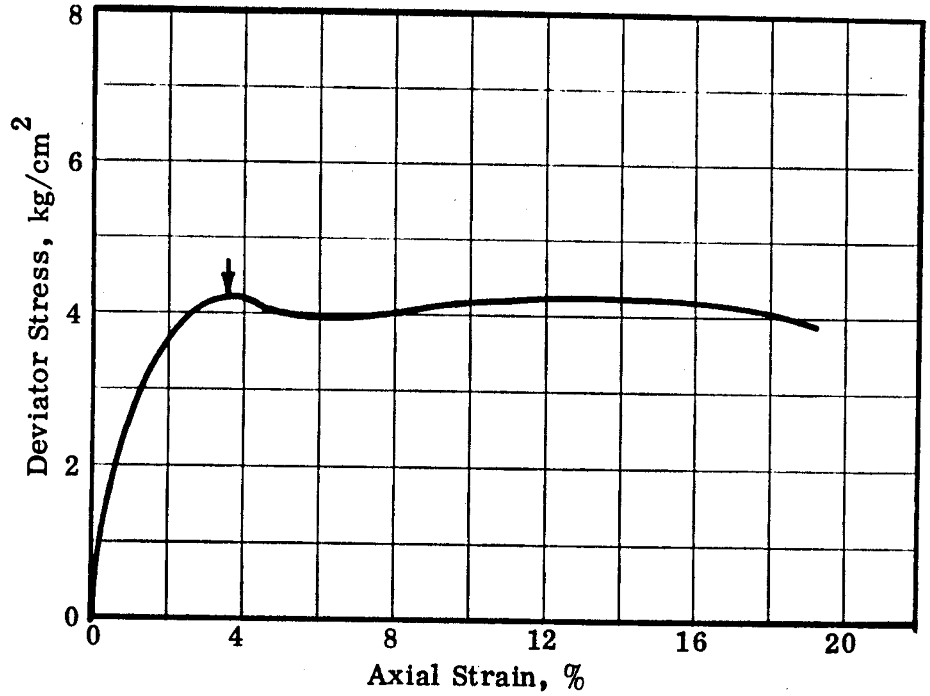


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

$\sigma_c = 7$ kg/cm^2

w_i = 23.6%
LL = 37
PL = 20
PI = 17

Stone & Webster Eng. Corp.	River Bend Power Station	Q Test Boring 136 Sample 46B
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 15

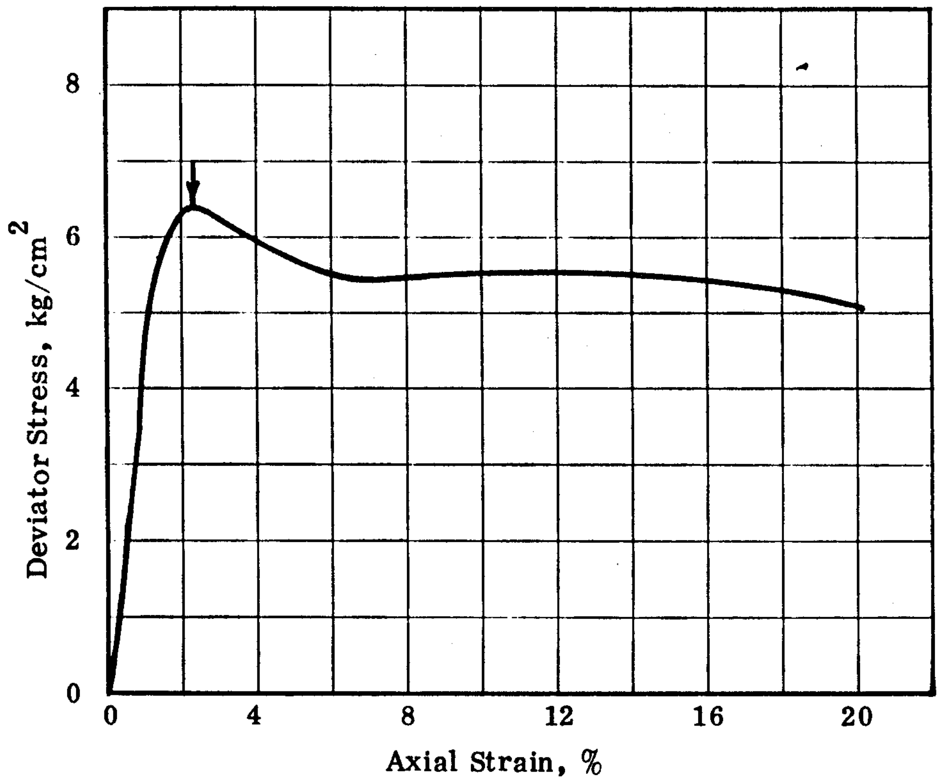


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

$w_i = 25.0\%$
LL = 26
PL = 23
PI = 3

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 136 Sample 46 C
GEOTECHNICAL ENGINEERS INC. **WINCHESTER, MASS.**	Project 7263	Nov. 1972 **FIG.** 16

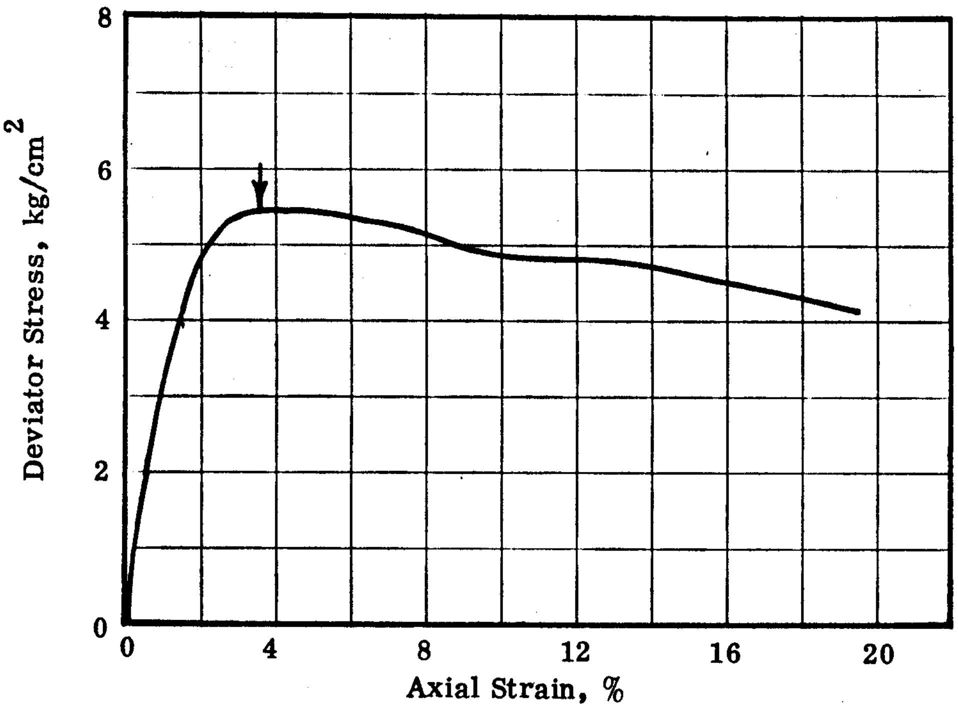


Arrow indicates axial strain at
maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 24.5%
LL = 38
PL = 20
PI = 18

$\sigma_c = 2\ kg/cm^2$

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 136 Sample 47 C
GEOTECHNICAL ENGINEERS INC. **WINCHESTER, MASS.**	Project 7263	Nov. 1972 **FIG. 17**

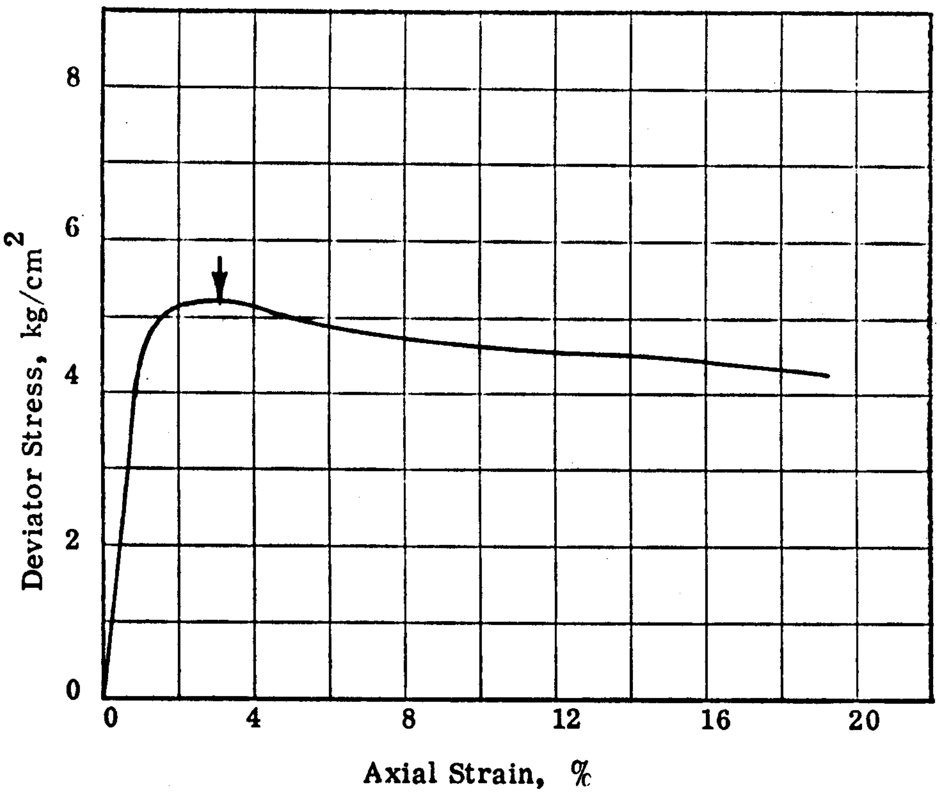


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

$w_i = 25.6\%$
LL = 37
PL = 15
PI = 22

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 136 Sample 48 C
GEOTECHNICAL ENGINEERS INC. **WINCHESTER, MASS.**	Project 7263	Nov. 1972 **FIG.** 18

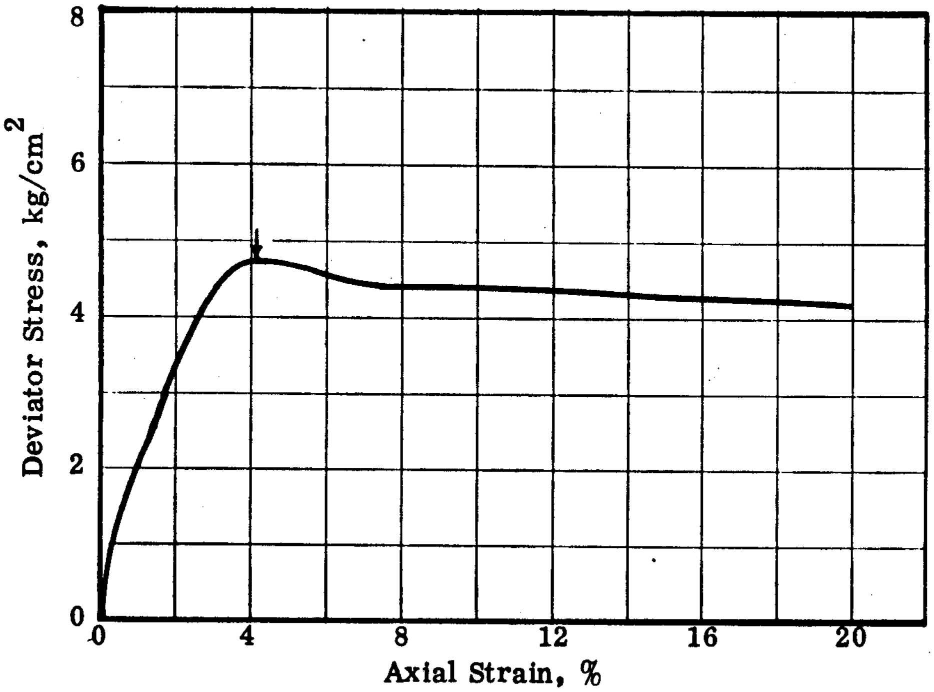


Arrow indicates axial strain at
maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

LL = 34
PL = 17
PI = 17

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp.	River Bend Power Station	Q Test Boring 136 Sample 49 C
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 19

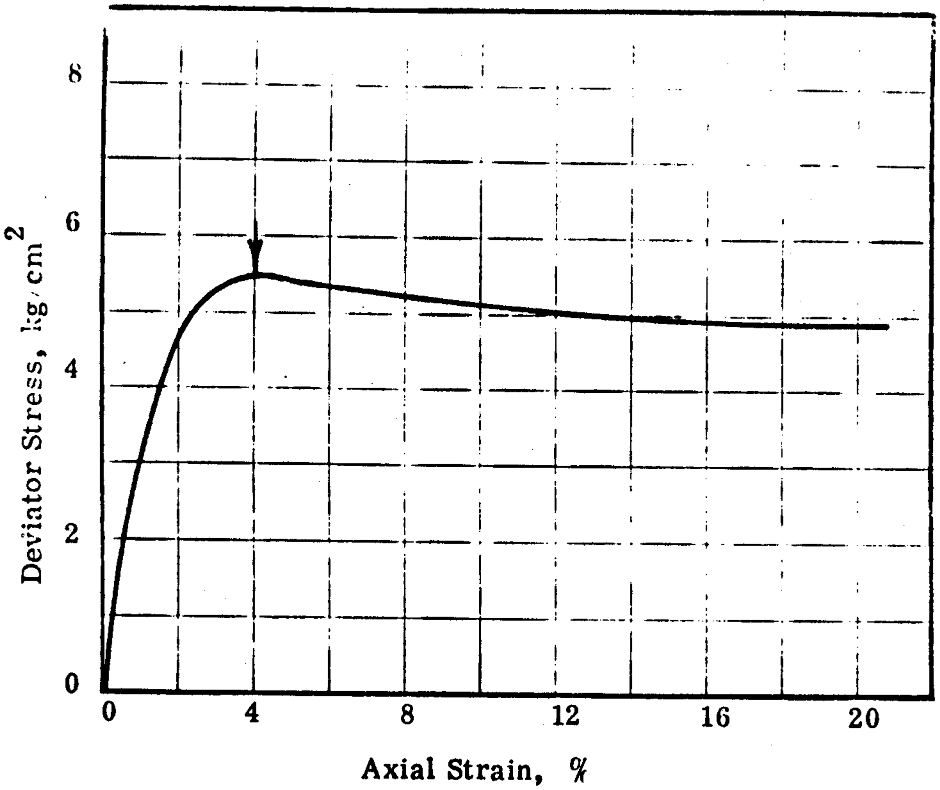


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

$w_i = 28.9\%$
LL = 45
PL = 14
PI = 31

$\sigma_c = 2\ kg/cm^2$

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 136 Sample 50C
GEOTECHNICAL ENGINEERS INC. **WINCHESTER, MASS.**	Project 7263	Nov. 1972 **FIG.** 20

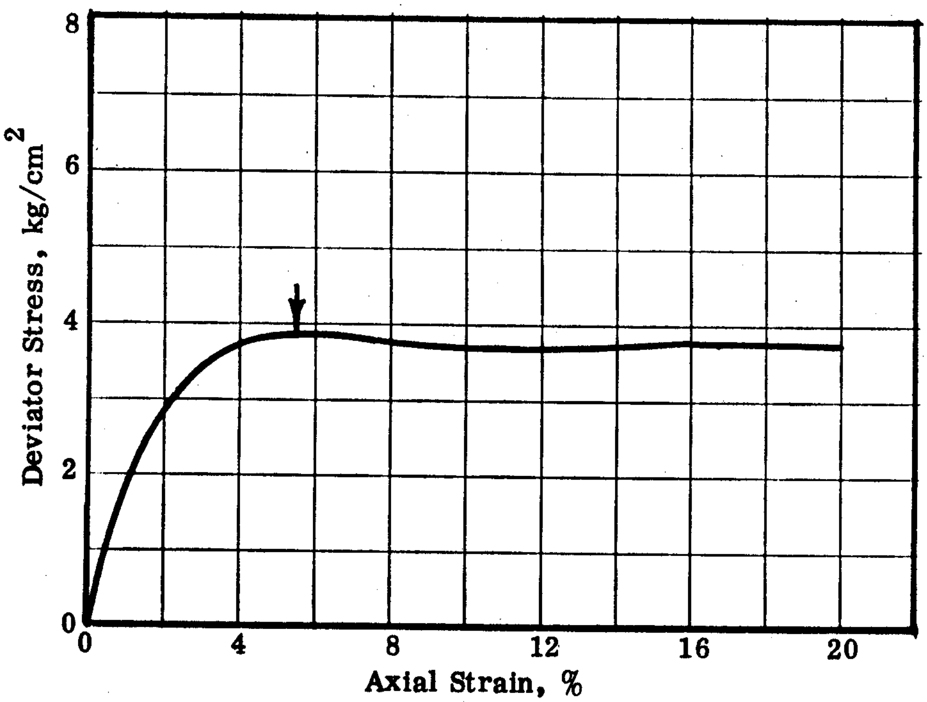


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

$\sigma_c = 7\ kg/cm^2$

w_i = 28.1%
LL = 41
PL = 16
PI = 25

Stone & Webster Eng. Corp.	River Bend Power Station	Q Test Boring 136 Sample 51B
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 21

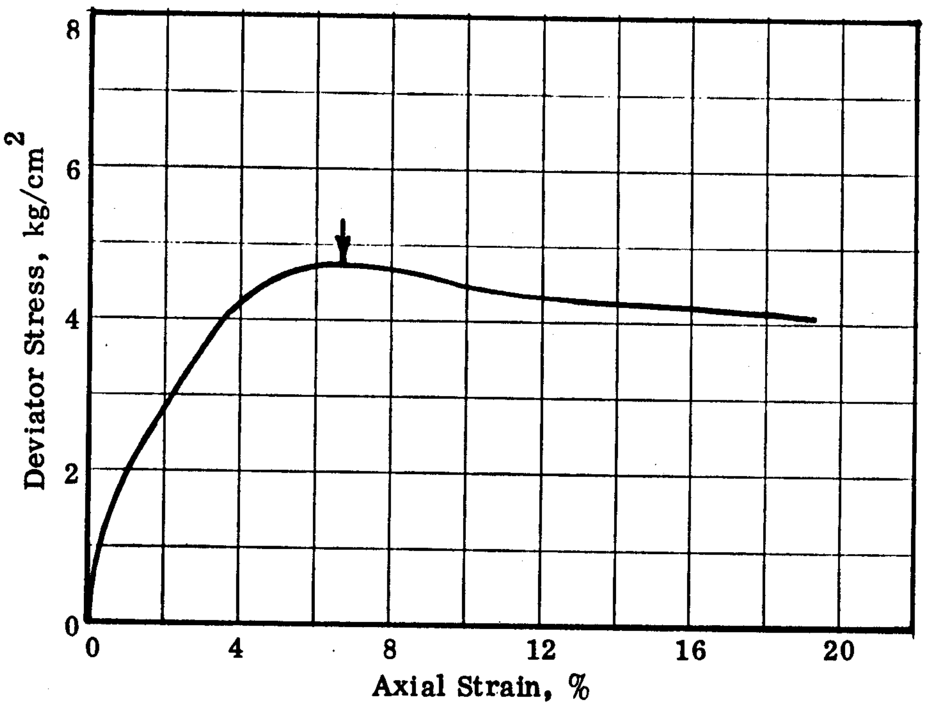


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

$w_i = 26.5\%$
LL = 30
PL = 19
PI = 11

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 136 Sample 51 C
GEOTECHNICAL ENGINEERS INC. **WINCHESTER, MASS.**	Project 7263	Nov. 1972 **FIG.** 22

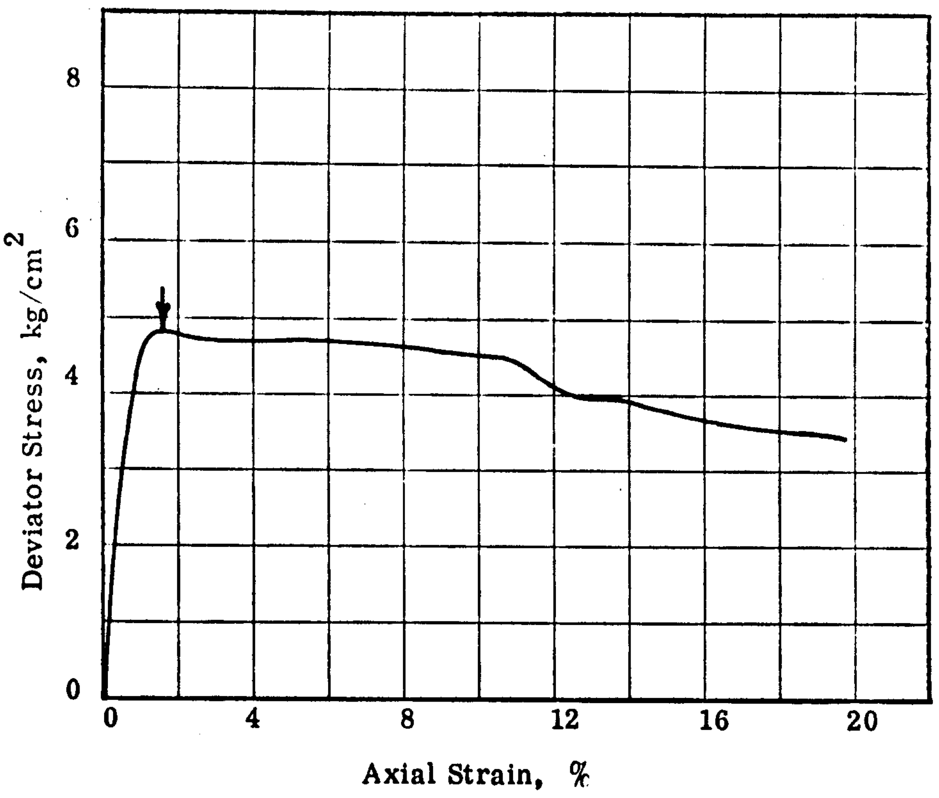


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

$w_i = 28.8\%$
LL = 33
PL = 23
PI = 10

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 136 Sample 52 C
GEOTECHNICAL ENGINEERS INC. **WINCHESTER, MASS.**	Project 7263	Nov. 1972 **FIG.** 23

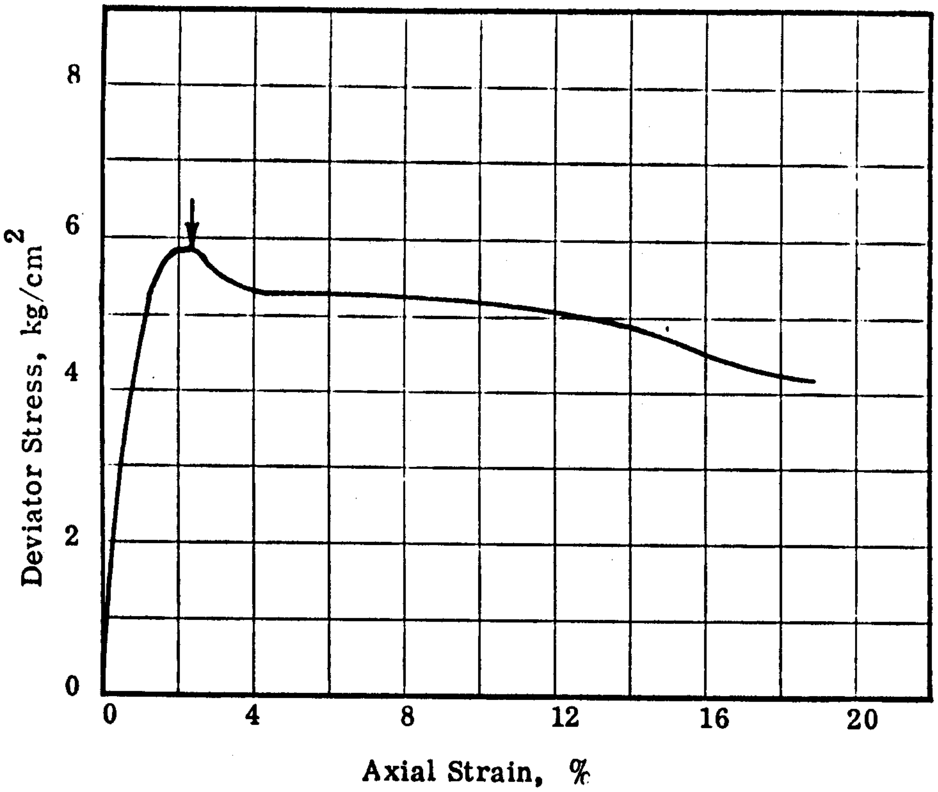


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

W_i = 29.4%
LL = 46
PL = 17
PI = 29

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp.	River Bend Power Station	Q Test Boring 138 Sample 34 C
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 24

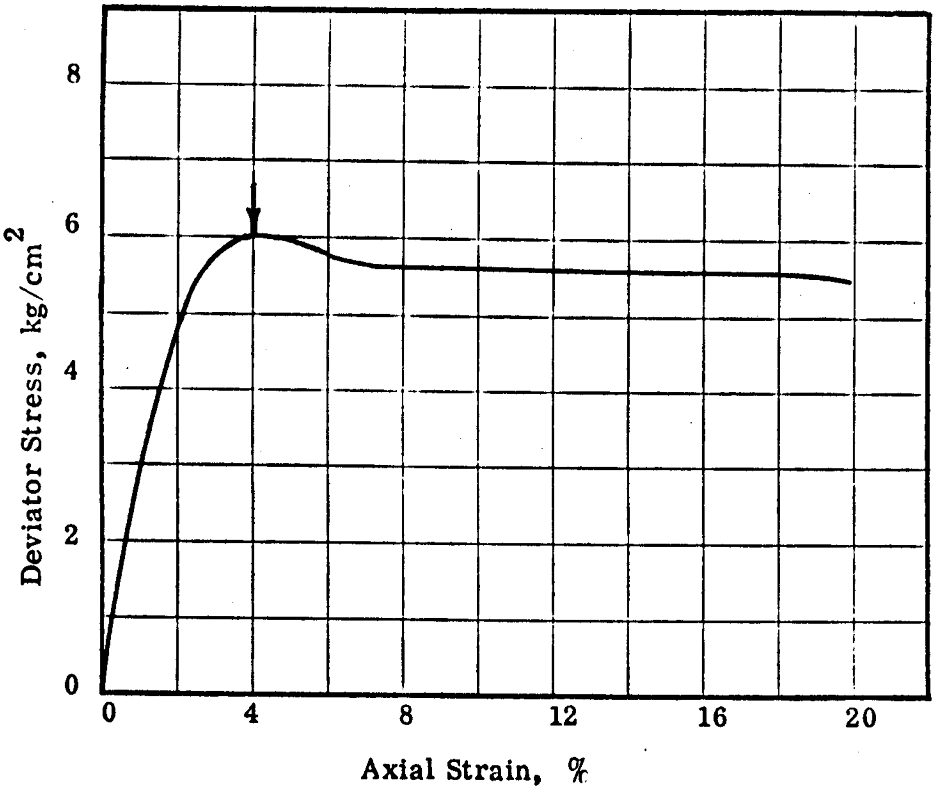


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

wi = 27.5%
LL = 42
PL = 18
PI = 24

$\sigma_c = 2\ \mathrm{kg/cm^2}$

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 138 Sample 36 C
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 25

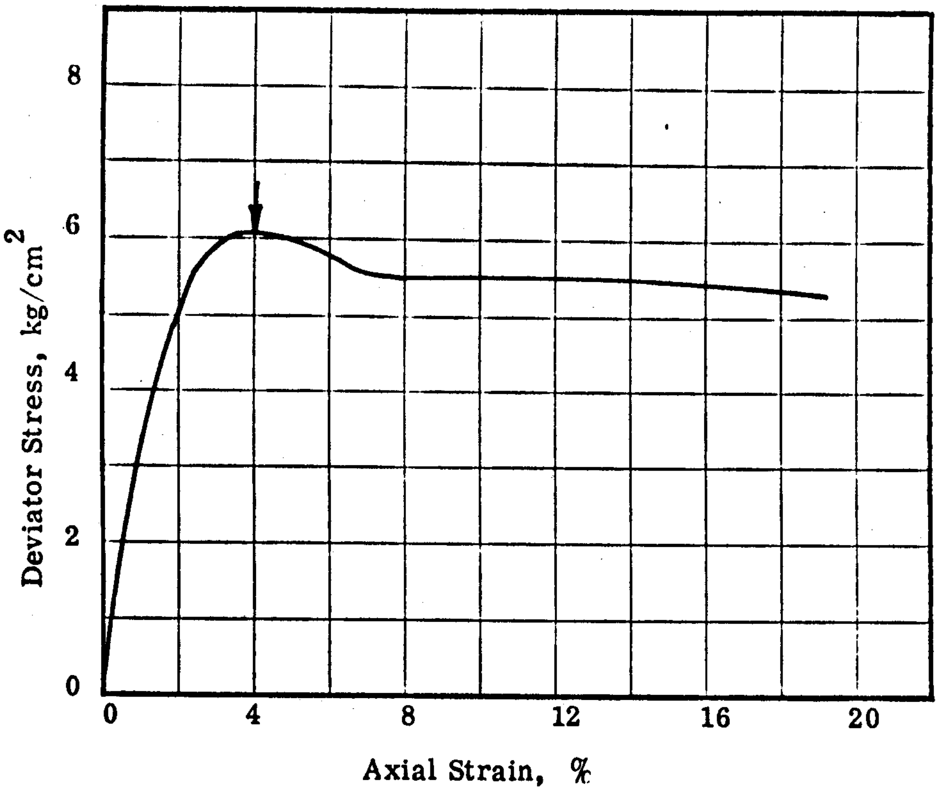


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 20.4%
LL = 42
PL = 16
PI = 26

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 138 Sample 37 C
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 26

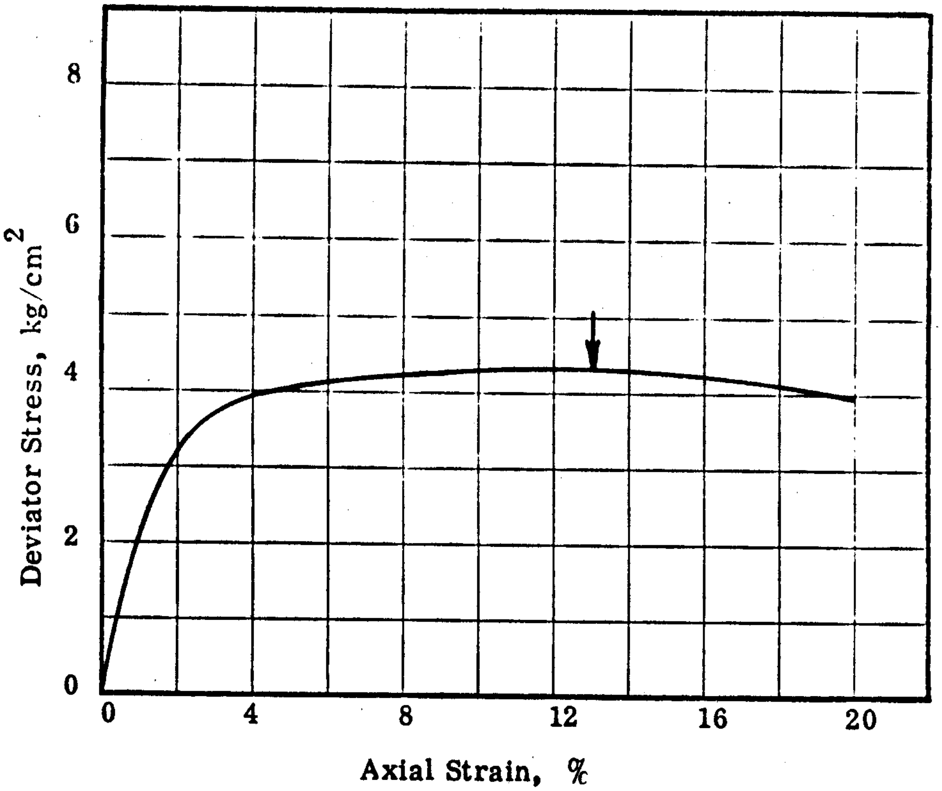


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

wi = 24.7%
LL = 40
PL = 15
PI = 25

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 138 Sample 38 C
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 27

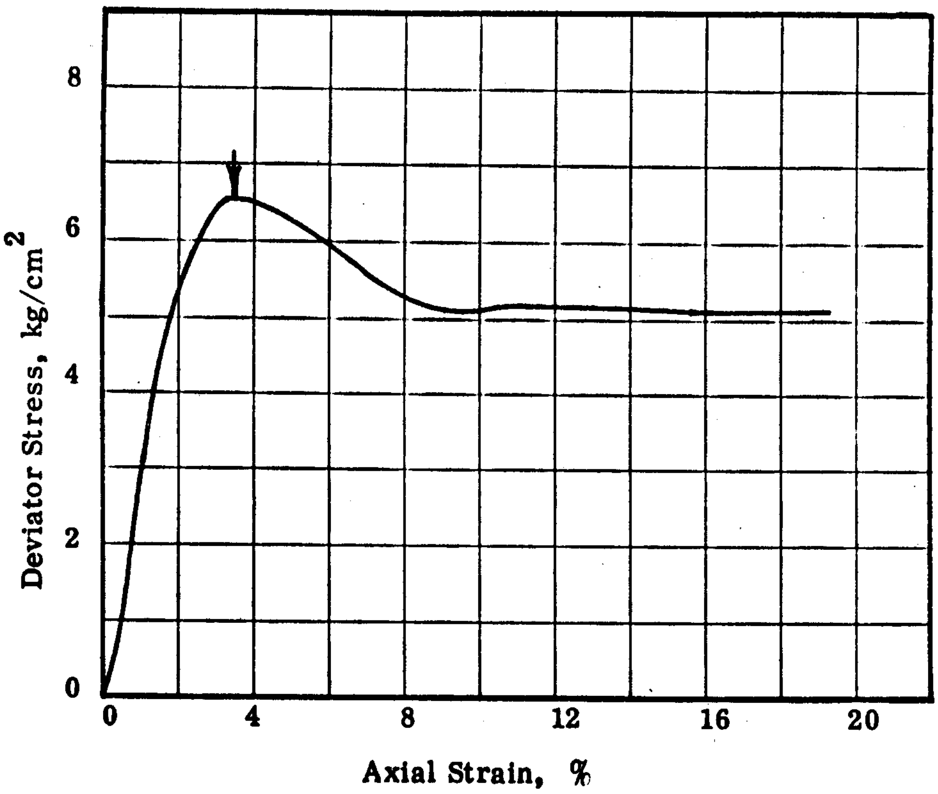


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 29.1%
LL = 41
PL = 18
PI = 23

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 138 Sample 40B
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 28

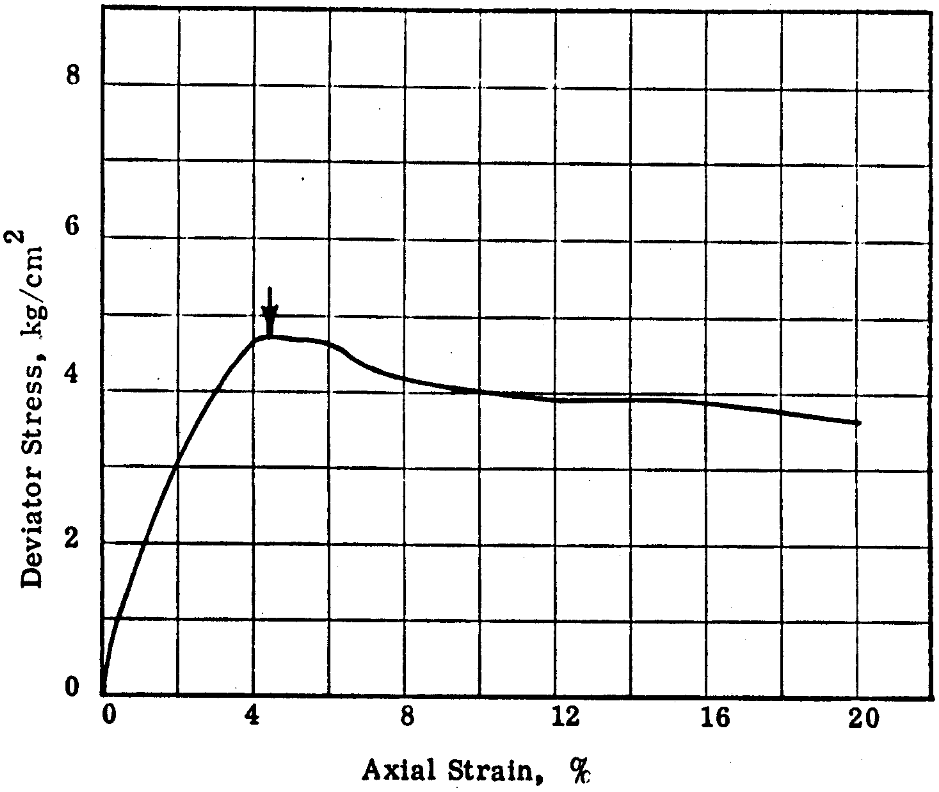


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 28.2%
LL = 46
PL = 16
PI = 30

$\sigma_c = 2\ kg/cm^2$

Stone & Webster Eng. Corp.	River Bend Power Station	Q Test Boring 138 Sample 42C
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 29

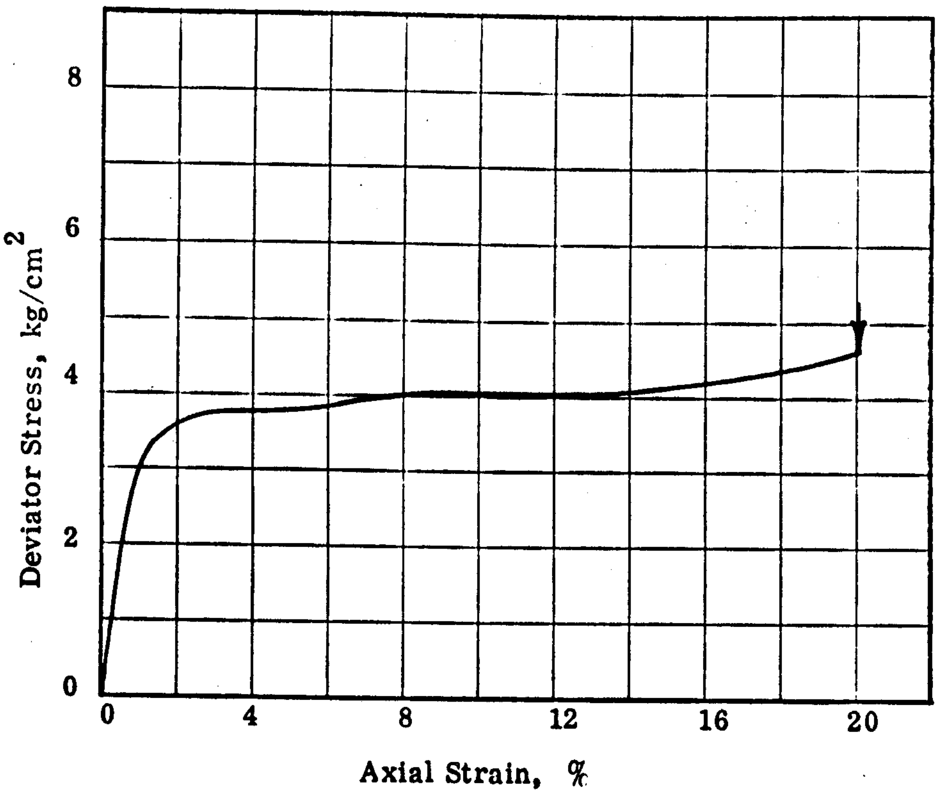


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

W_i = 28.8%
LL = 41
PL = 15
PI = 26

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp.	River Bend Power Station	Q Test Boring 138 Sample 43 C
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 30

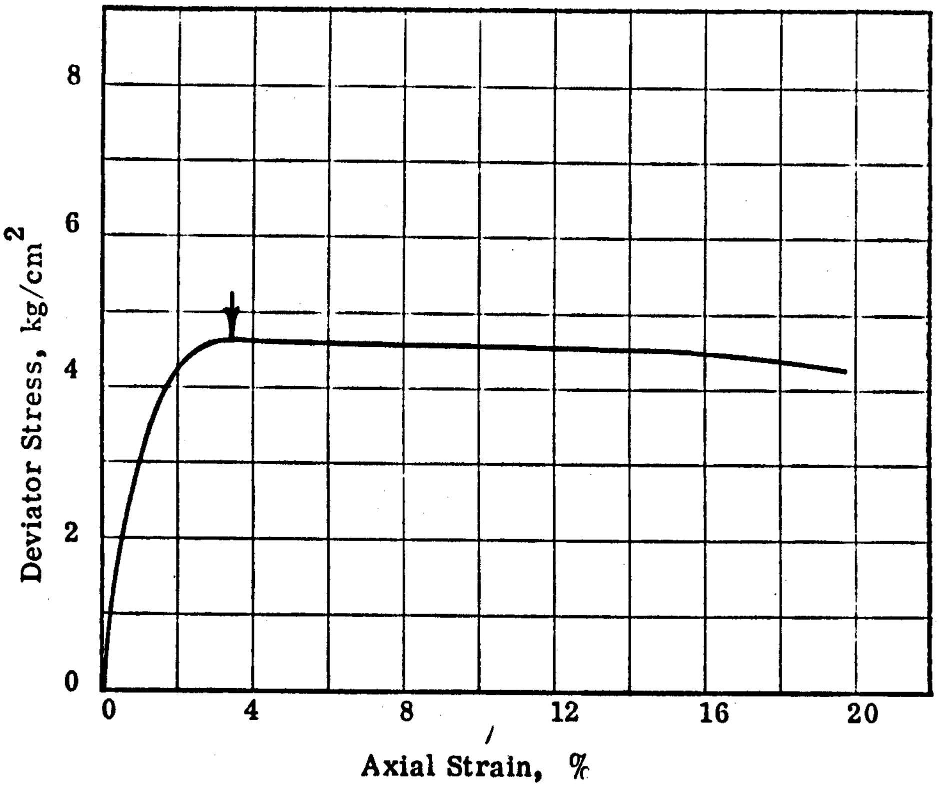


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

W_i = 24.2%
LL = 37
PL = 14
PI = 23

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp.	River Bend Power Station	Q Test Boring 138 Sample 44 C
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 31

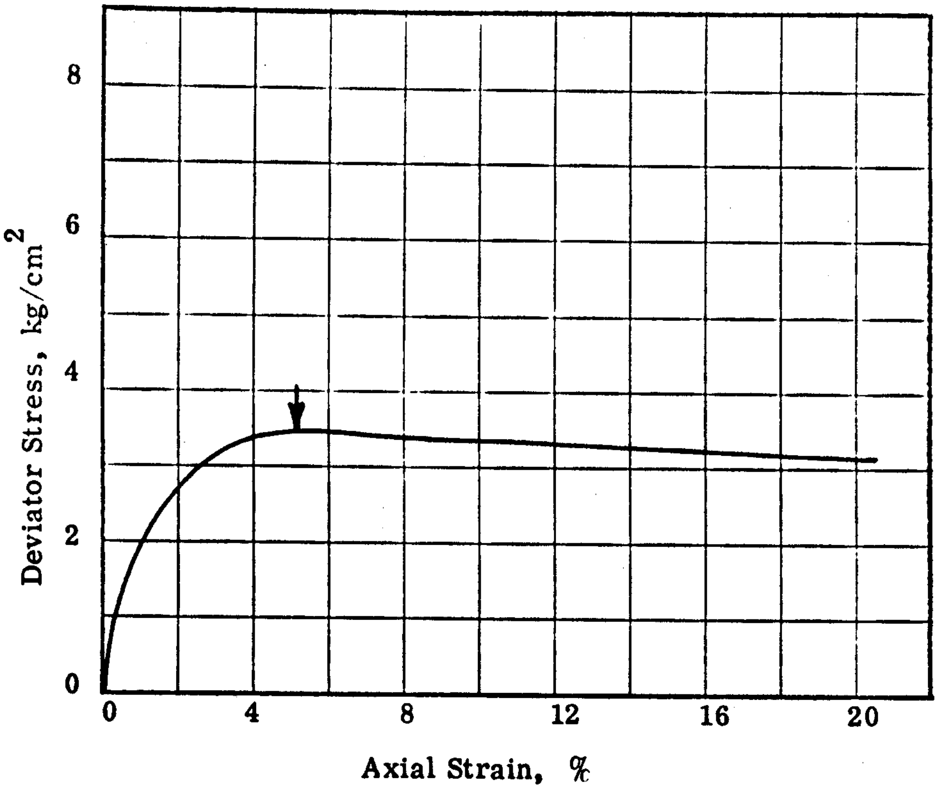


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

W_i = 26.8%
LL = 38
PL = 17
PI = 21

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp.	River Bend Power Station	Q Test Boring 138 Sample 45 C
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 32

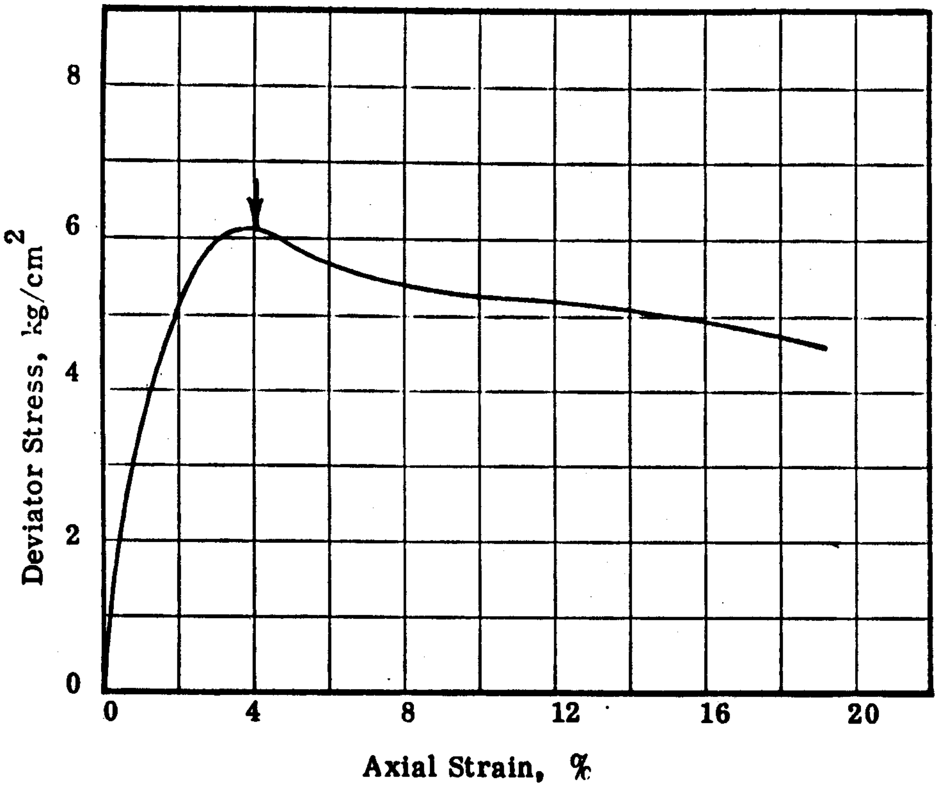


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

W_i = 28.1%
LL = 34
PL = 18
PI = 16

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp.	River Bend Power Station	Q Test Boring 138 Sample 46B
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 33

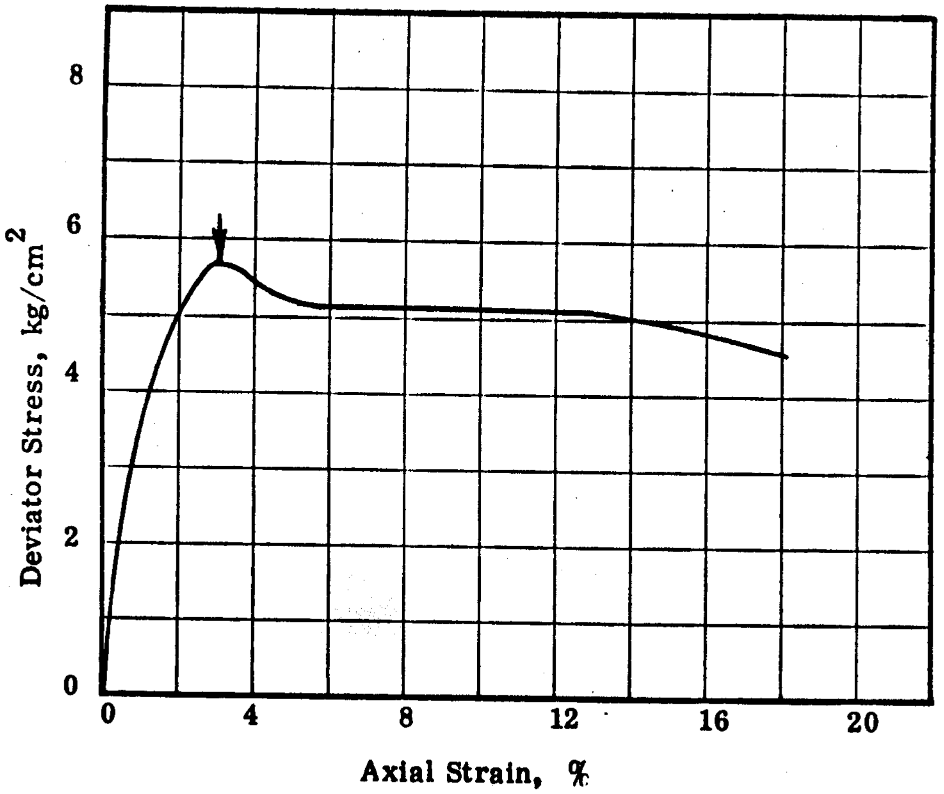


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 28.9%
LL = 42
PL = 15
PI = 27

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 138 Sample 48B
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 34

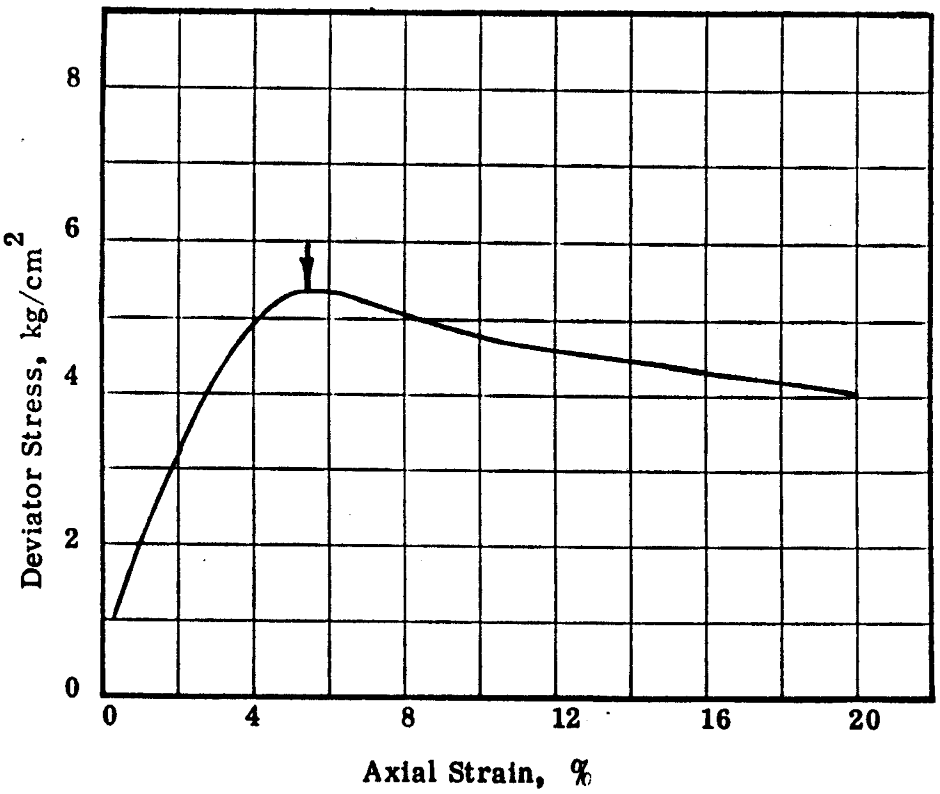


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 26.4%
LL = 40
PL = 16
PI = 24

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 138 Sample 49 C
GEOTECHNICAL ENGINEERS INC. **WINCHESTER, MASS.**	Project 7263	Dec. 1972 **FIG.** 35

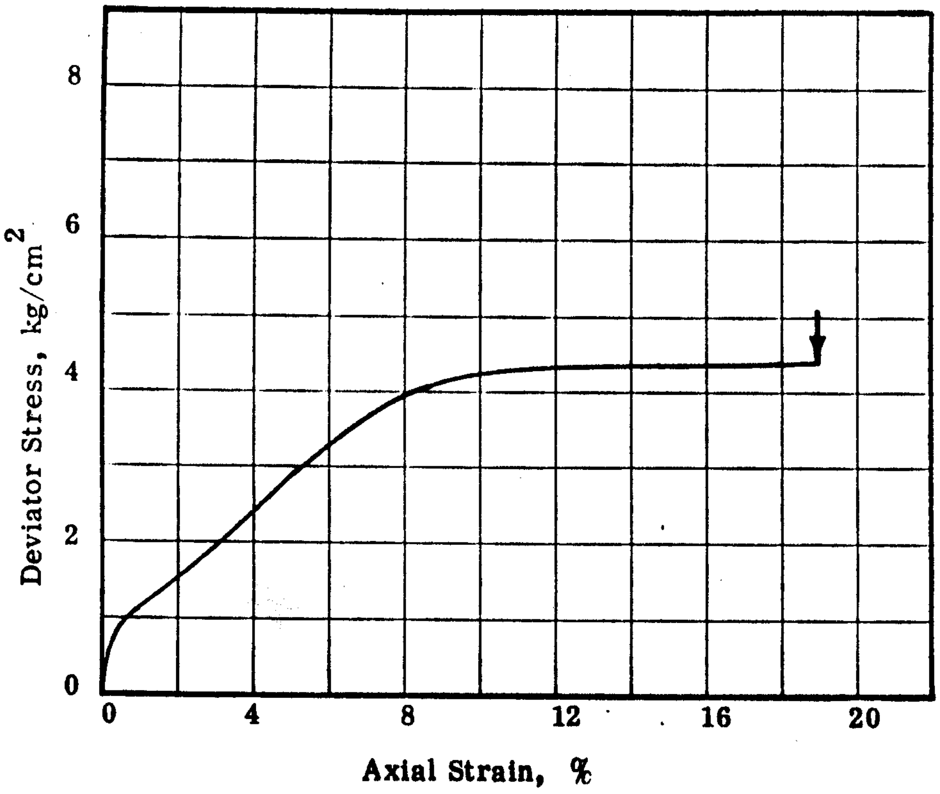


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

$w_i = 25.1\%$
LL = 37
PL = 15
PI = 22

$\sigma_c = 2\ kg/cm^2$

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 138 Sample 50B
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 36

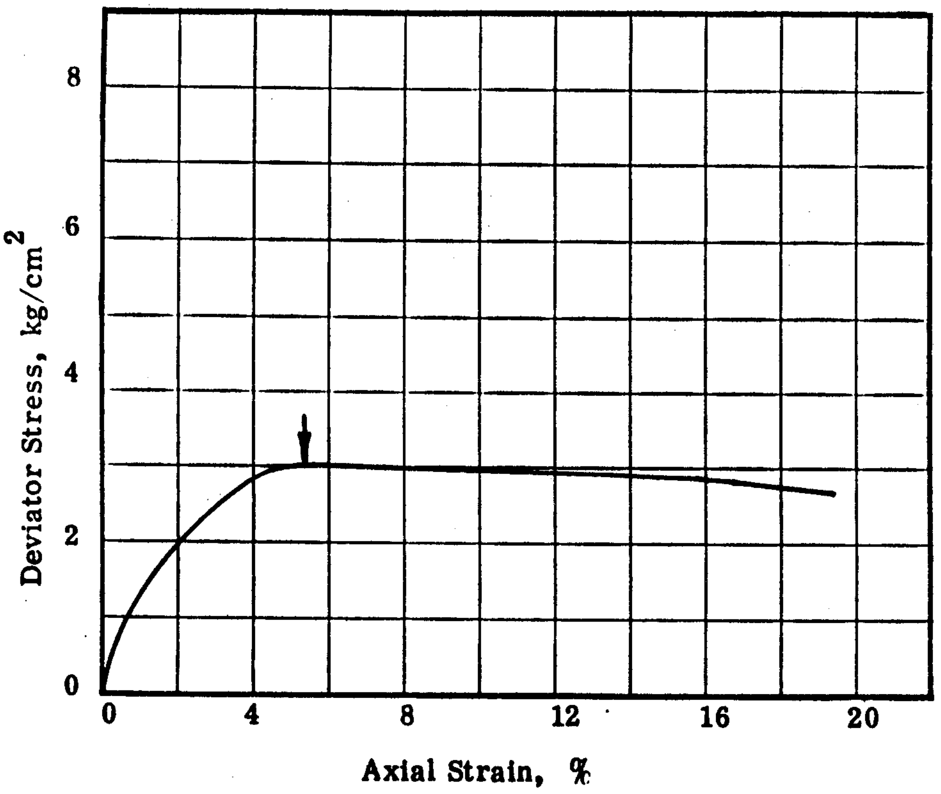


Arrow indicates axial strain at
maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 23.0%
LL = 34
PL = 16
PI = 18

$\sigma_c = 2\ kg/cm^2$

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 138 Sample 51B
GEOTECHNICAL ENGINEERS INC. **WINCHESTER, MASS.**	Project 7263	Dec. 1972 **FIG. 37**

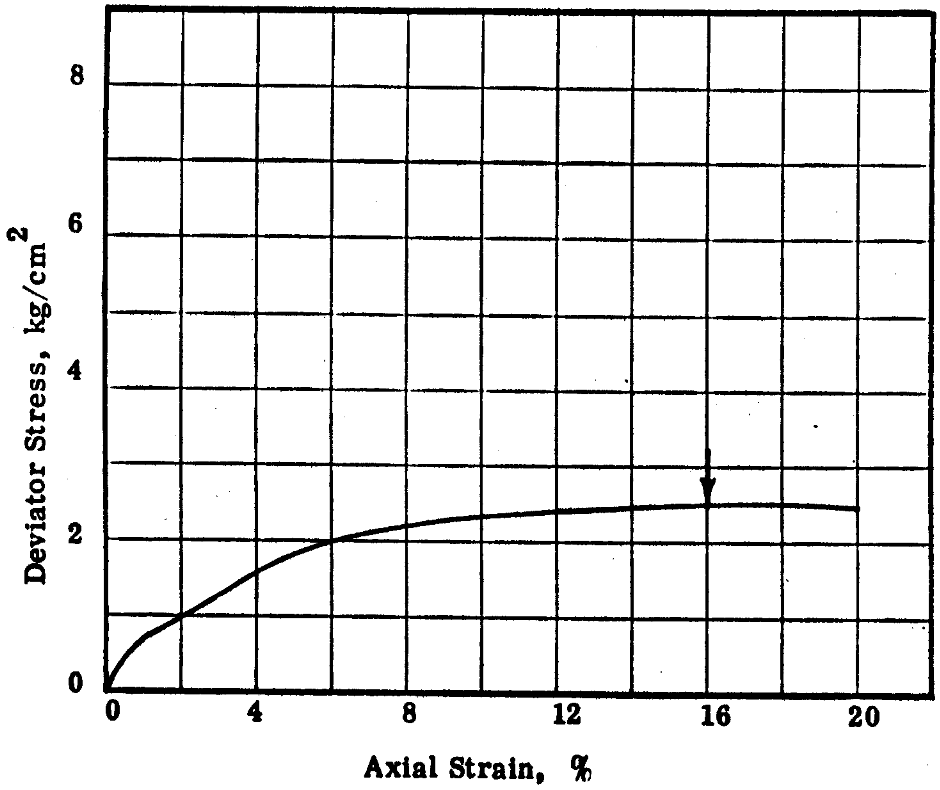


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 32.4%
LL = 44
PL = 15
PI = 29

$\sigma_c = 2\ kg/cm^2$

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station	Q Test Boring 138 Sample 52 C
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 38

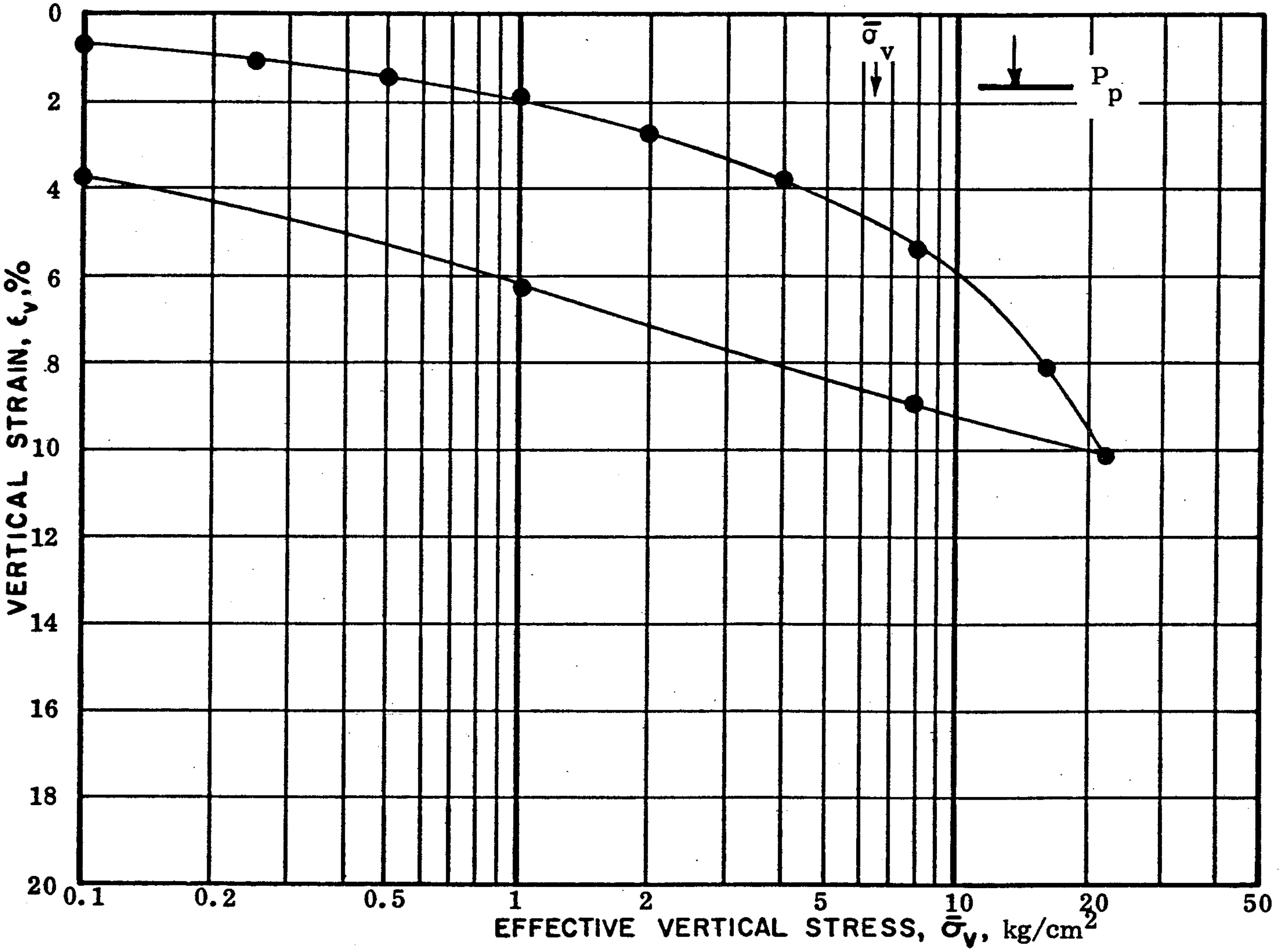


Arrow indicates axial strain at maximum deviator stress, $(\sigma_1-\sigma_3)_{max}$

w_i = 27.8%
LL = 40
PL = 16
PI = 24

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp.	River Bend Power Station	Q Test Boring 138 Sample 53 C
GEOTECHNICAL ENGINEERS INC. WINCHESTER, MASS.	Project 7263	Dec. 1972 FIG. 39



Location River Bend

Boring 136

Sample 34B

Depth 161.0 ft

Elevation -52.9 ft

Specimen size

1.25 cm x 6.34 cm dia

e_o = 0.616

w_o = 21.7%

S_o = 96 %

G = 2.73

LL = 32

PI = 15

Soil description

Yellowish-brown
fine-sandy clay

Stone & Webster Eng. Corp.
Boston, Mass.

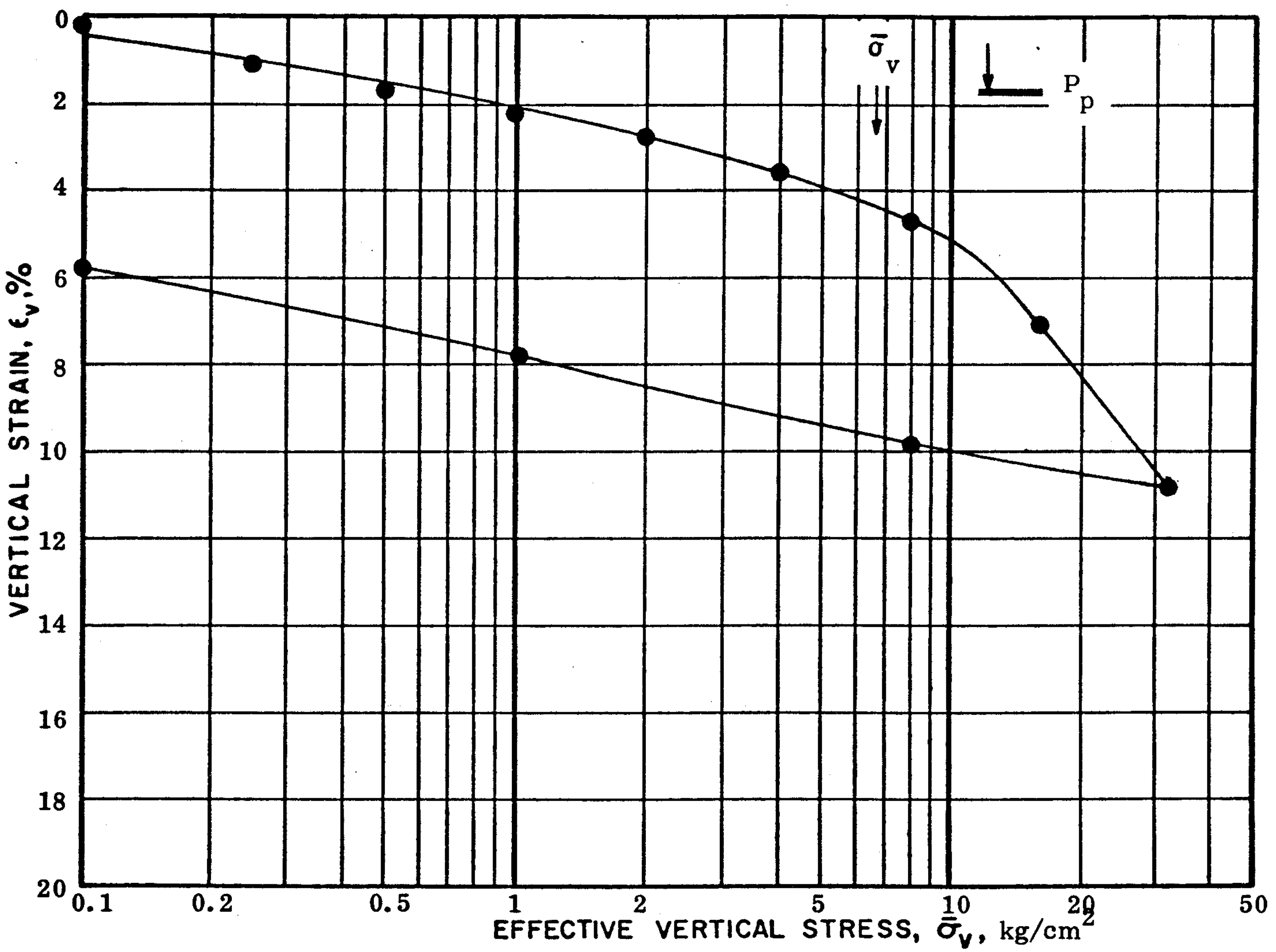
GEOTECHNICAL ENGINEERS INC
WINCHESTER, MASS.

River Bend Power Station
Gulf States Utilities

PROJECT 7263

COMPRESSION CURVE
CONSOLIDATION TEST C1

Dec. 1972 FIG. 40



Location River Bend

Boring 136

Sample 37B

Depth 169.0 ft

Elevation -60.9 ft

Specimen size

1.25 cm x 6.34 cm dia

e_o = 0.628

w_o = 20.4%

S_o = 89 %

G = 2.73

LL = 38

PI = 21

Soil description

Greenish-gray
fine-sandy clay

Stone & Webster Eng. Corp.
Boston, Mass.

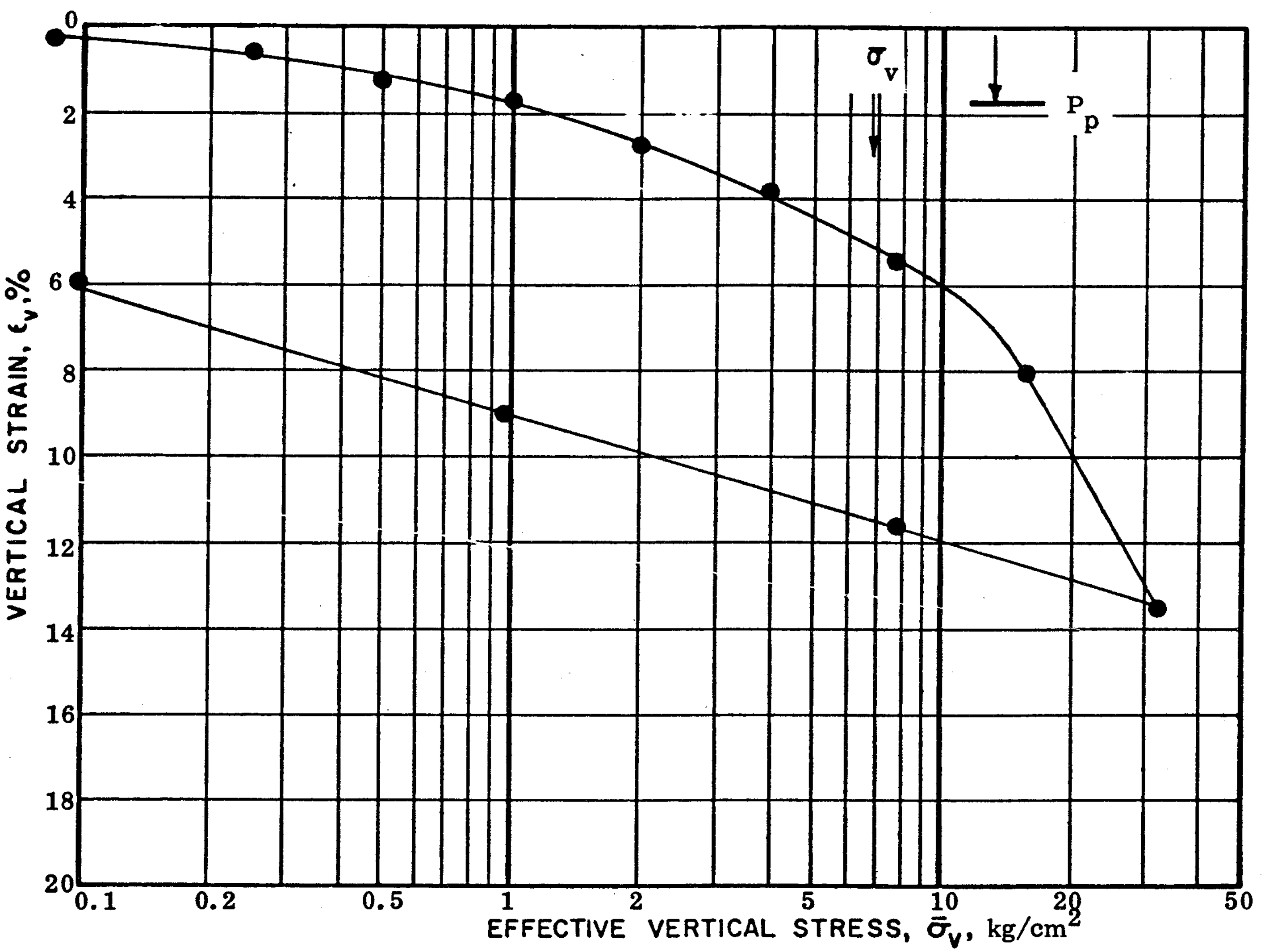
GEOTECHNICAL ENGINEERS INC
WINCHESTER, MASS.

River Bend Power Station
Gulf States Utilities

PROJECT 7263

COMPRESSION CURVE
CONSOLIDATION TEST C3

Dec. 1972 FIG. 41



Location River Bend

Boring 136

Sample 38B

Depth 171.0 ft

Elevation -62.9 ft

Specimen size

1.25 cm x 6.34 cm dia

e_o = 0.735

w_o = 23.2%

S_o = 86 %

G = 2.73

LL = 40

PI = 23

Soil description

Greenish-gray
fine-sandy clay

Stone & Webster Eng. Corp.
Boston, Mass.

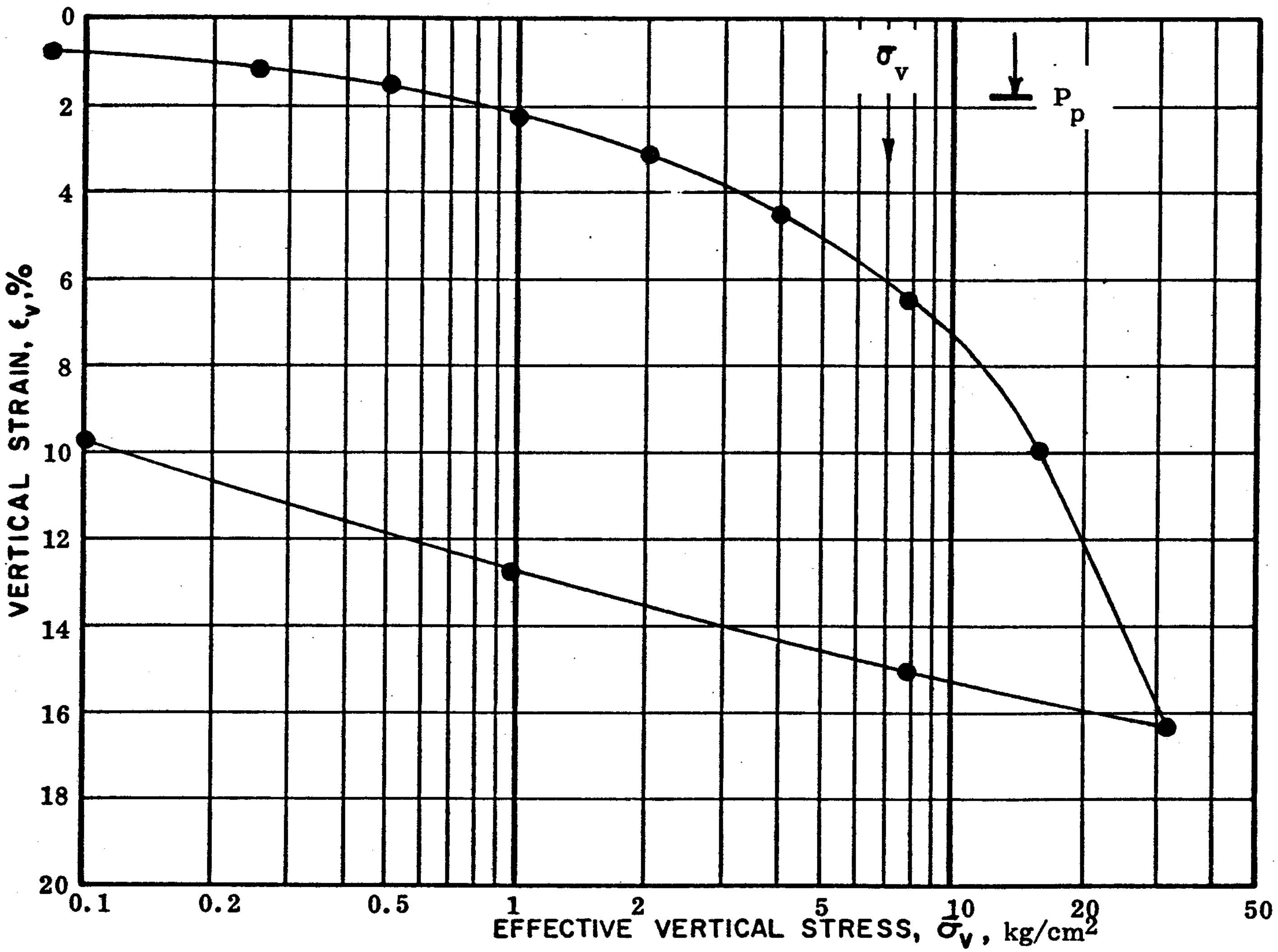
GEOTECHNICAL ENGINEERS INC
WINCHESTER, MASS.

River Bend Power Station
Gulf States Utilities

PROJECT 7263

COMPRESSION CURVE
CONSOLIDATION TEST C4

Dec. 1972 FIG. 42



Location River Bend

Boring 136

Sample 42B

Depth 181.0 ft

Elevation -72.9 ft

Specimen size
1.25 cm x 6.34 cm dia

e_o = 0.712

w_o = 26.1%

S_o = 91 %

G = 2.73

LL = 36

PI = 21

Soil description

Greenish-gray
fine-sandy clay

Stone & Webster Eng. Corp.
Boston, Mass.

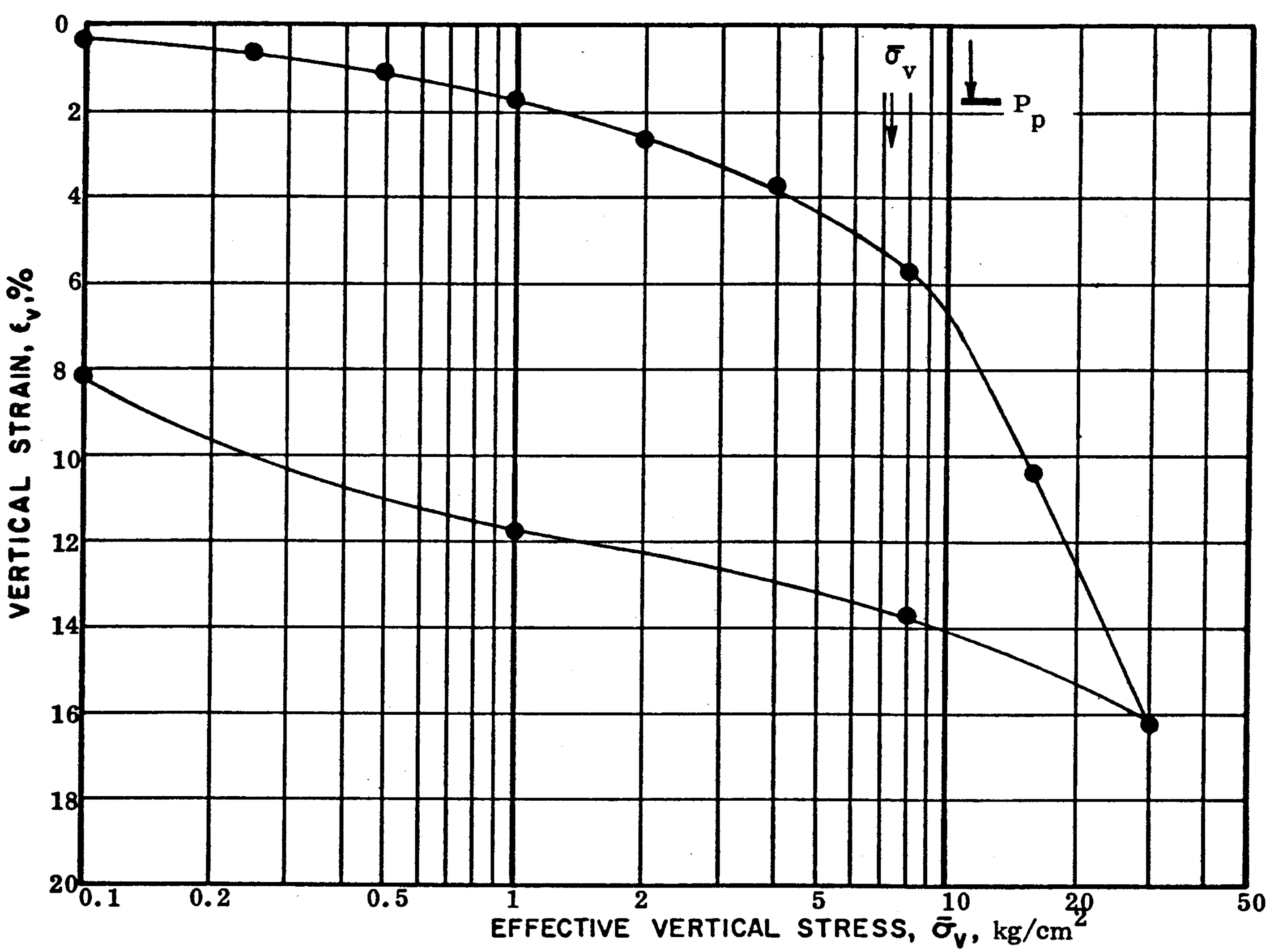
GEOTECHNICAL ENGINEERS INC
WINCHESTER, MASS.

River Bend Power Station
Gulf States Utilities

PROJECT 7263

COMPRESSION CURVE
CONSOLIDATION TEST C5

Dec. 1972 FIG. 43



Location River Bend

Boring 136

Sample 47B

Depth 193.0 ft

Elevation -84.9 ft

Specimen size

1.25 cm x 6.34 cm

e_o = 0.811

w_o = 29.8%

S_o =100 %

G = 2.73

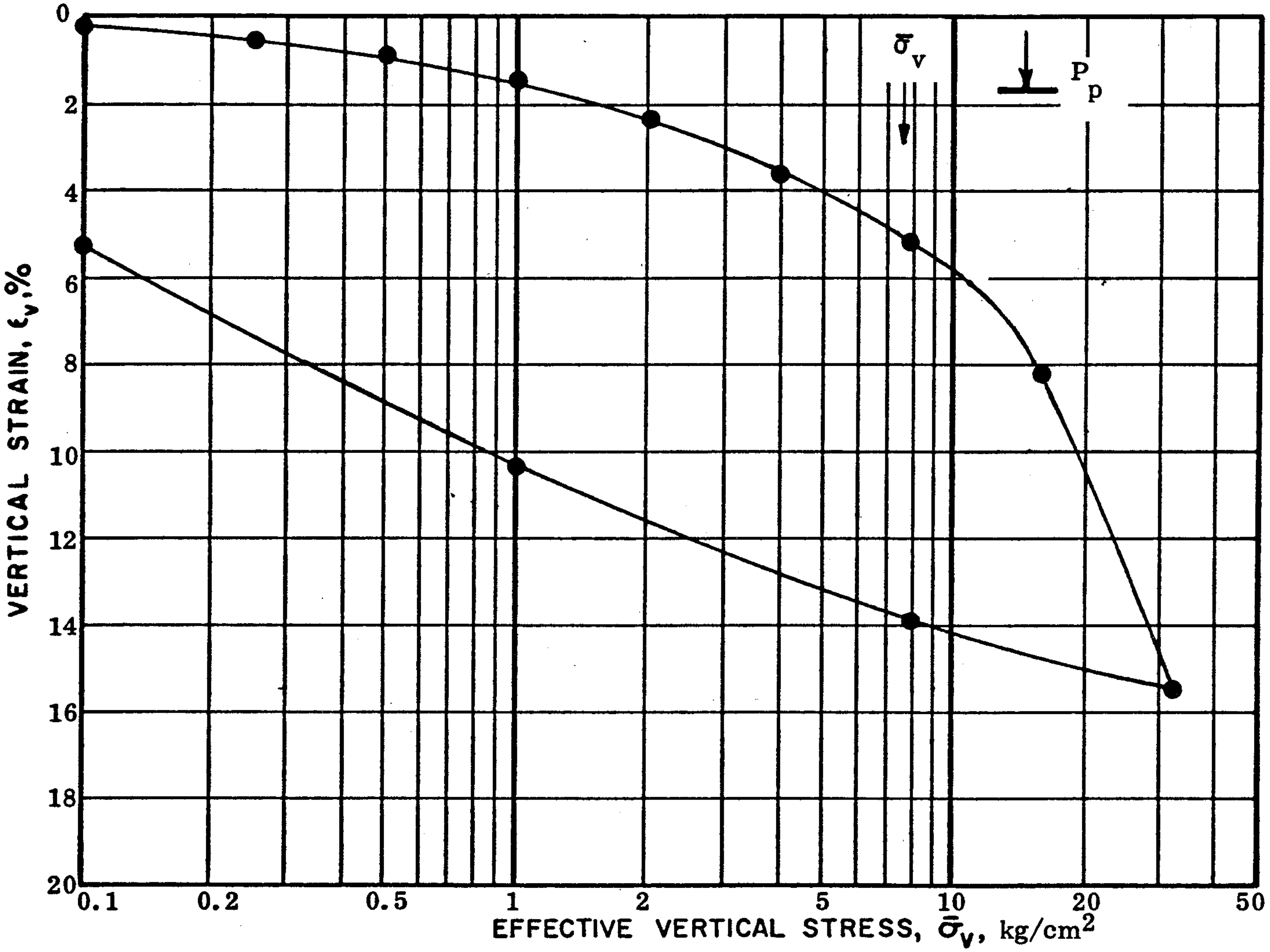
LL = 41

PI = 18

Soil description

Gray sandy clay

Stone & Webster Eng. Corp. Boston, Mass.	River Bend Power Station Gulf States Utilities	COMPRESSION CURVE CONSOLIDATION TEST C2
GEOTECHNICAL ENGINEERS INC WINCHESTER, MASS.	PROJECT 7263	Dec. 1972 FIG. 44



Location River Bend

Boring 136

Sample 50B

Depth 201.0 ft

Elevation -92.9 ft

Specimen size

1.25 cm x 6.34 cm dia

e_o = 0.781

w_o = 25.9%

S_o = 91 %

G = 2.73 (est)

LL = 43

PI = 24

Soil description

Brown clay

Stone & Webster Eng. Corp.
Boston, Mass.

GEOTECHNICAL ENGINEERS INC
WINCHESTER, MASS.

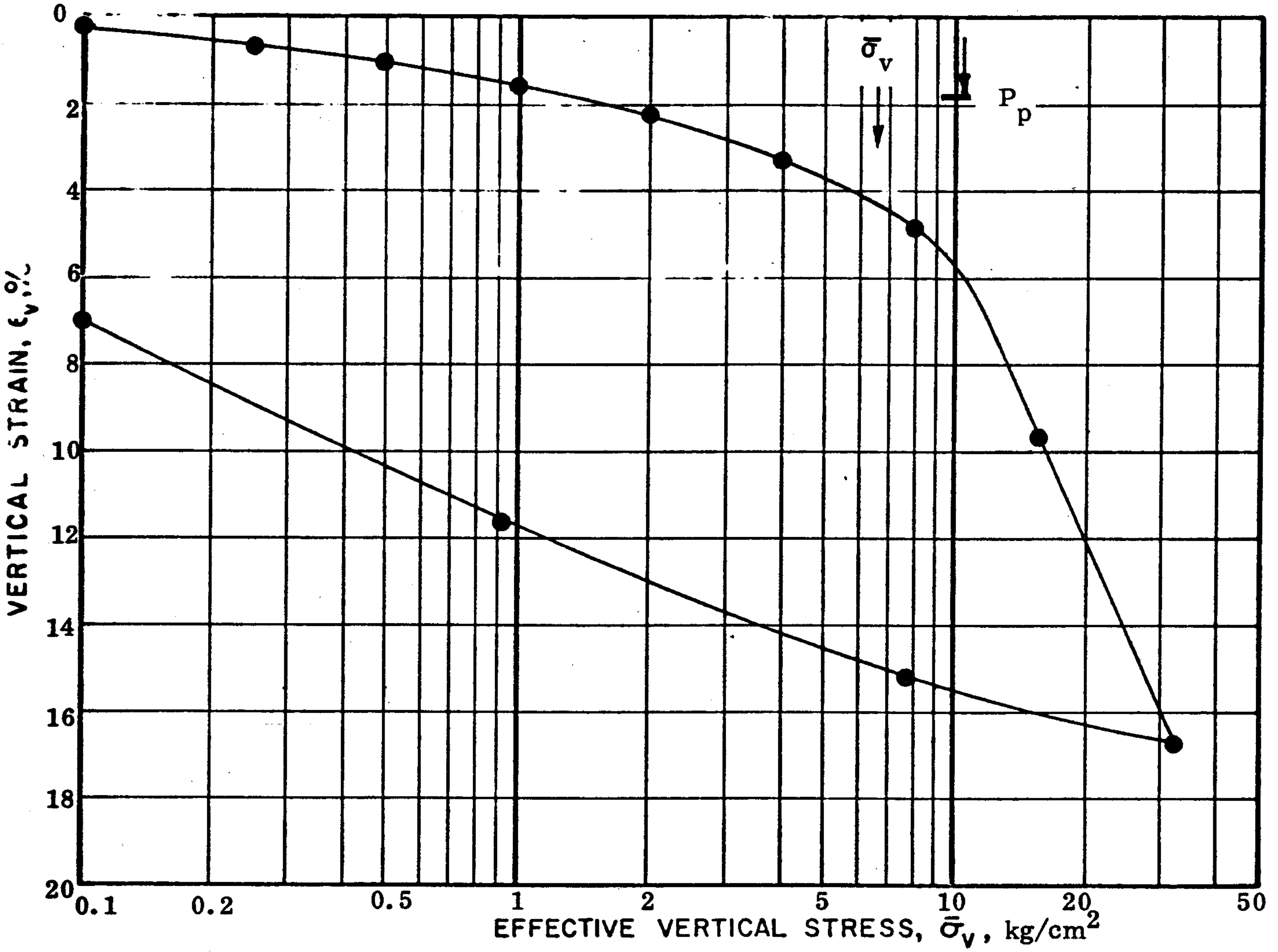
River Bend Power Station
Gulf States Utilities

PROJECT 7263

COMPRESSION CURVE
CONSOLIDATION TEST C6

Dec. 1972

FIG. 45



Location River Bend

Boring 138

Sample 34B

Depth 161.0 ft

Elevation -50.8 ft

Specimen size
1.25 cm x 6.34 cm dia

e_o = 0.811

w_o = 29.7%

S_o =100 %

G = 2.73 (est)

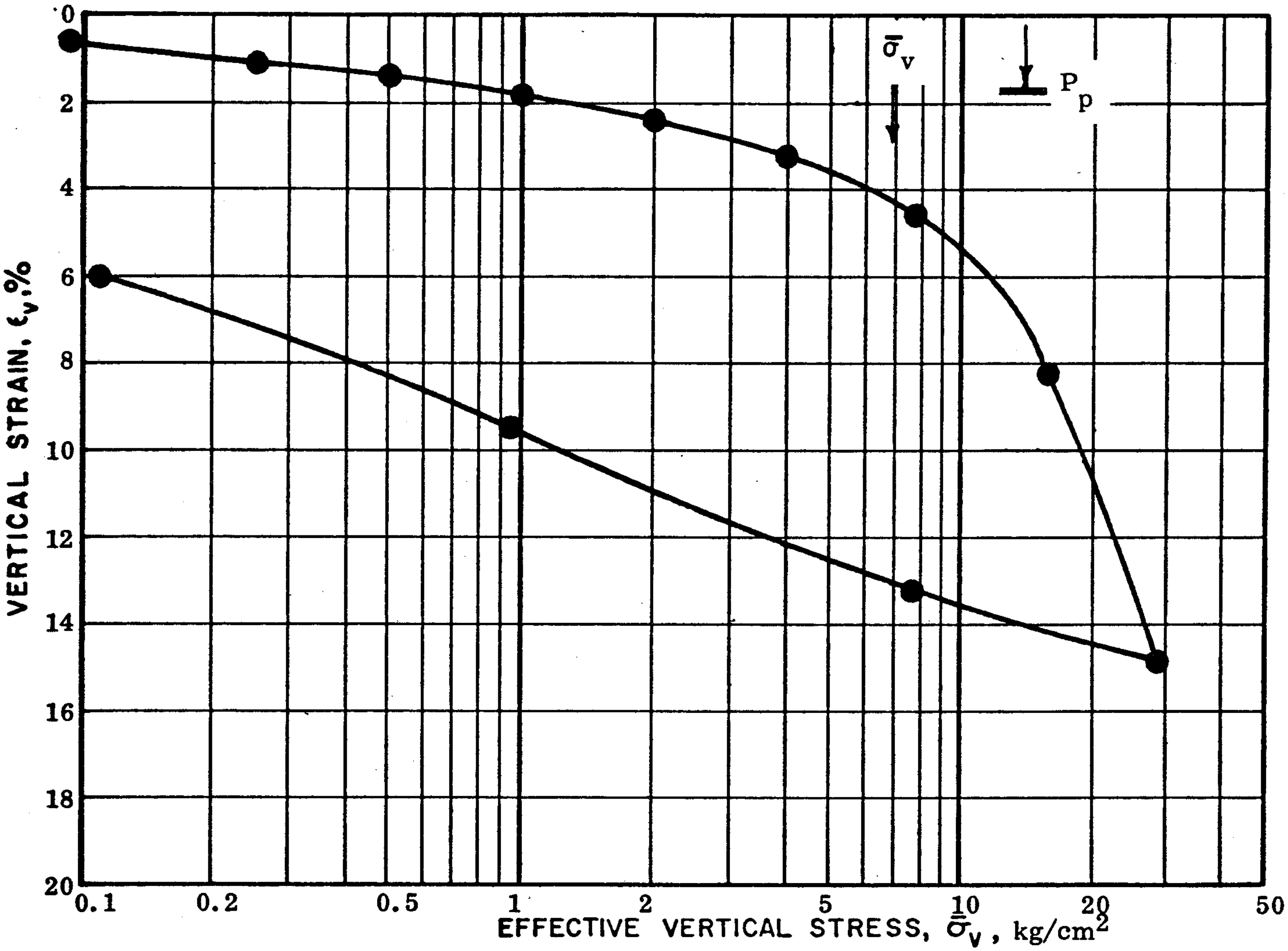
LL = 48

PI = 29

Soil description

Gray clay

Stone & Webster Eng. Corp. Boston, Mass.	River Bend Power Station Gulf States Utilities	COMPRESSION CURVE CONSOLIDATION TEST C10
GEOTECHNICAL ENGINEERS INC WINCHESTER, MASS.	PROJECT 7263	Dec. 1972 FIG. 46



Location River Bend

Boring 138

Sample 36B

Depth 164.0 ft

Elevation -53.8 ft

Specimen size

1.25 cm x 6.34 cm dia

e_o = 0.780

w_o = 29.0%

S_o = 100%

G = 2.76

LL = 41

PI = 22

Soil description

Gray sandy clay.

Stone & Webster Eng. Corp.
Boston, Mass.

GEOTECHNICAL ENGINEERS INC
WINCHESTER, MASS.

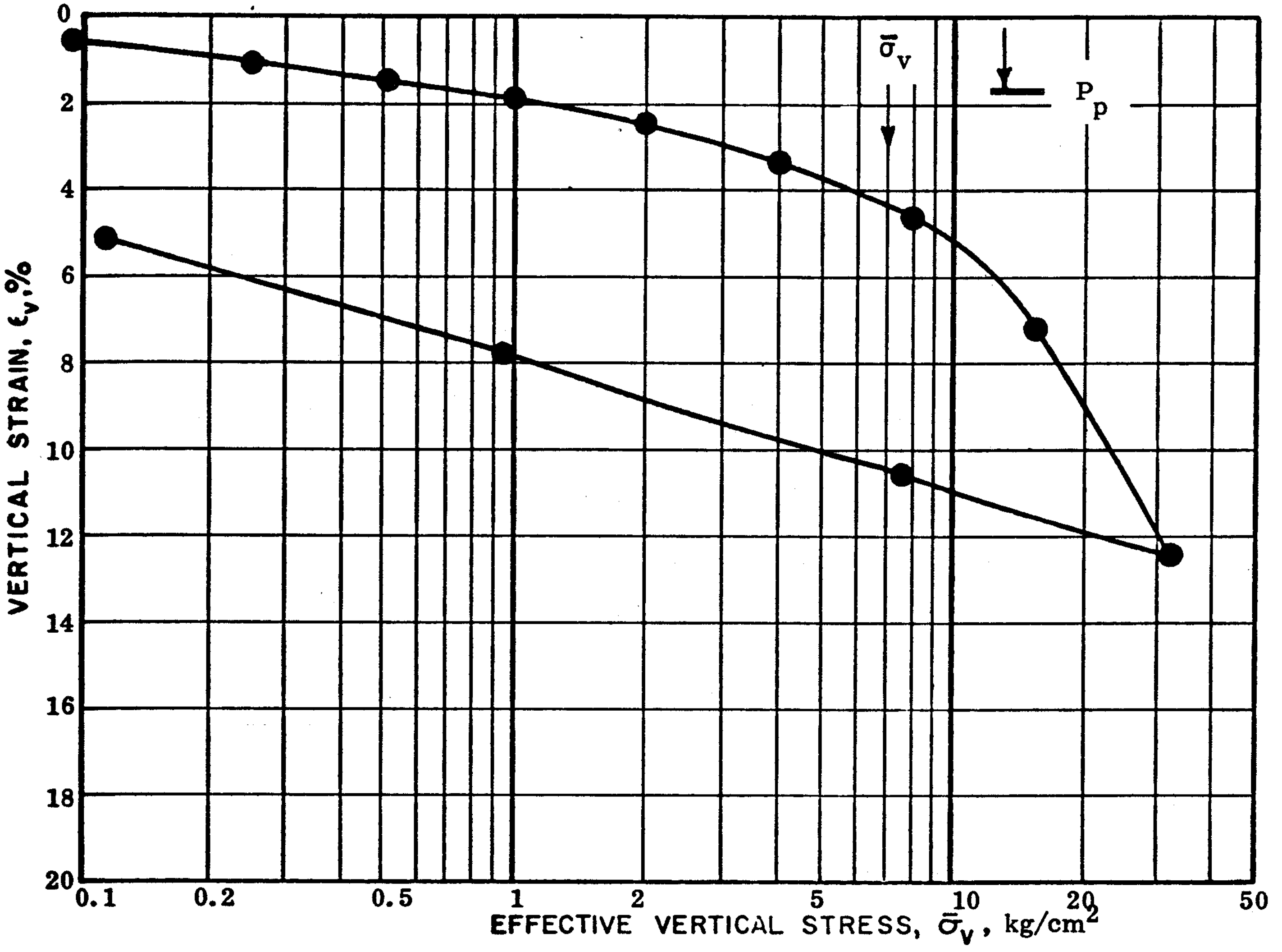
River Bend Power Station
Gulf States Utilities

PROJECT 7263

COMPRESSION CURVE
CONSOLIDATION TEST C7

Dec. 1972

FIG.47



Location River Bend

Boring 138

Sample 38 B

Depth 171.0 ft

Elevation -60.8 ft

Specimen size
1.25 cm x 6.34 cm dia

e_o = 0.672

w_o = 22.2%

S_o = 90 %

G = 2.74

LL = 43

PI = 26

Soil description

Greenish gray sandy clay.

Stone & Webster Eng. Corp.
Boston, Mass.

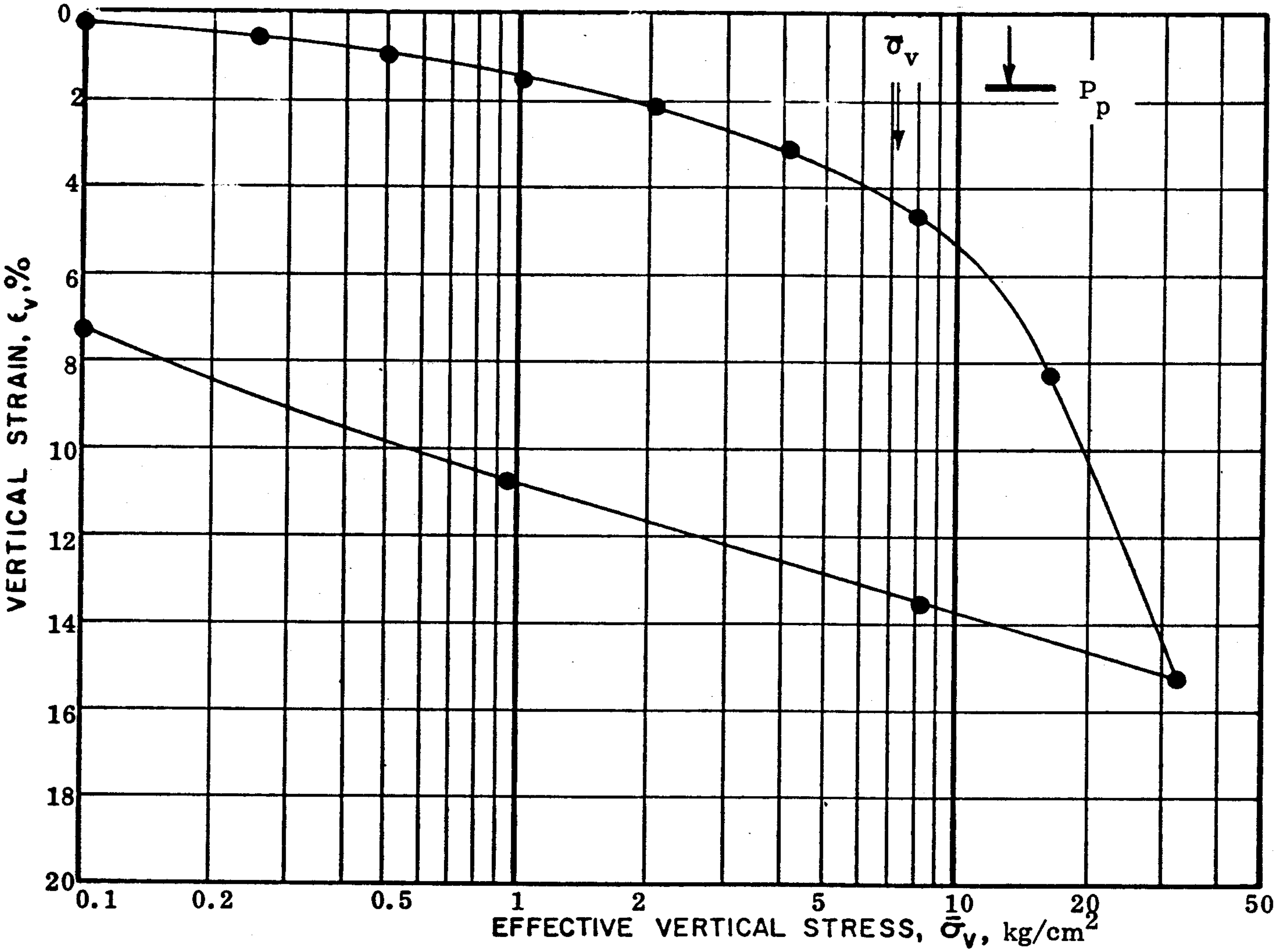
GEOTECHNICAL ENGINEERS INC
WINCHESTER, MASS.

River Bend Power Station
Gulf States Utilities

PROJECT 7263

COMPRESSION CURVE
CONSOLIDATION TEST C8

Dec. 1972 FIG. 48



Location River Bend

Boring 138

Sample 42B

Depth 181.0 ft

Elevation -70.8 ft

Specimen size
1.25 cm x 6.34 cm dia

e_o = 0.812
w_o = 27.7%
S_o = 93 %
G = 2.73 (est)
LL = 41
PI = 22

Soil description

Greenish-gray
fine-sandy clay

Stone & Webster Eng. Corp.
Boston, Mass.

GEOTECHNICAL ENGINEERS INC
WINCHESTER, MASS.

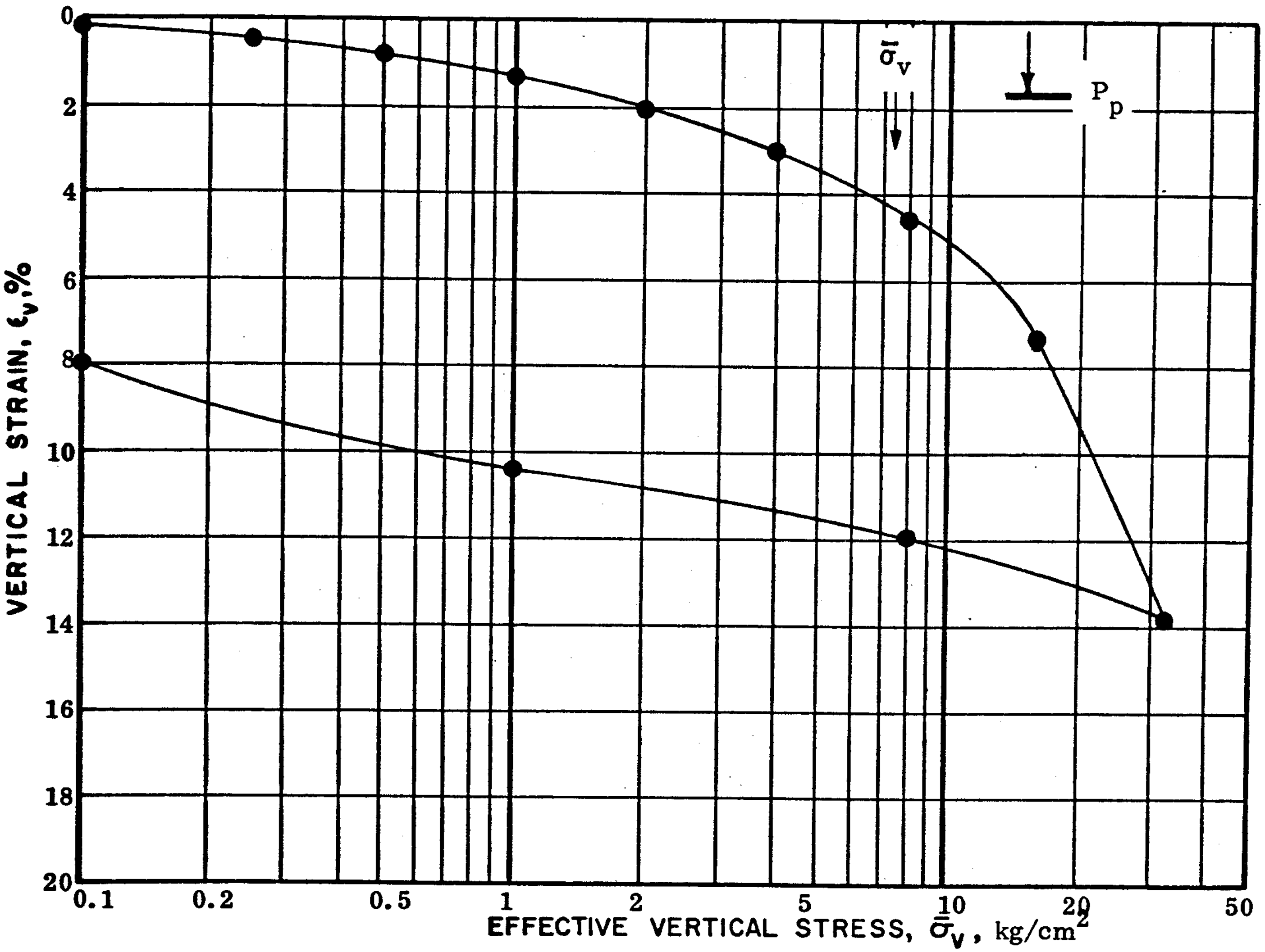
River Bend Power Station
Gulf States Utilities

PROJECT 7263

COMPRESSION CURVE
CONSOLIDATION TEST C11

Dec. 1972

FIG. 49.



Location River Bend

Boring 138

Sample 45B

Depth 189.0 ft

Elevation -78.8 ft

Specimen size

1.25 cm x 6.34 cm dia

e_o = 0.761

w_o = 27.5%

S_o = 99 %

G = 2.73 (est)

LL = 39

PI = 23

Soil description

Greenish-gray
fine-sandy clay

Stone & Webster Eng. Corp.
Boston, Mass.

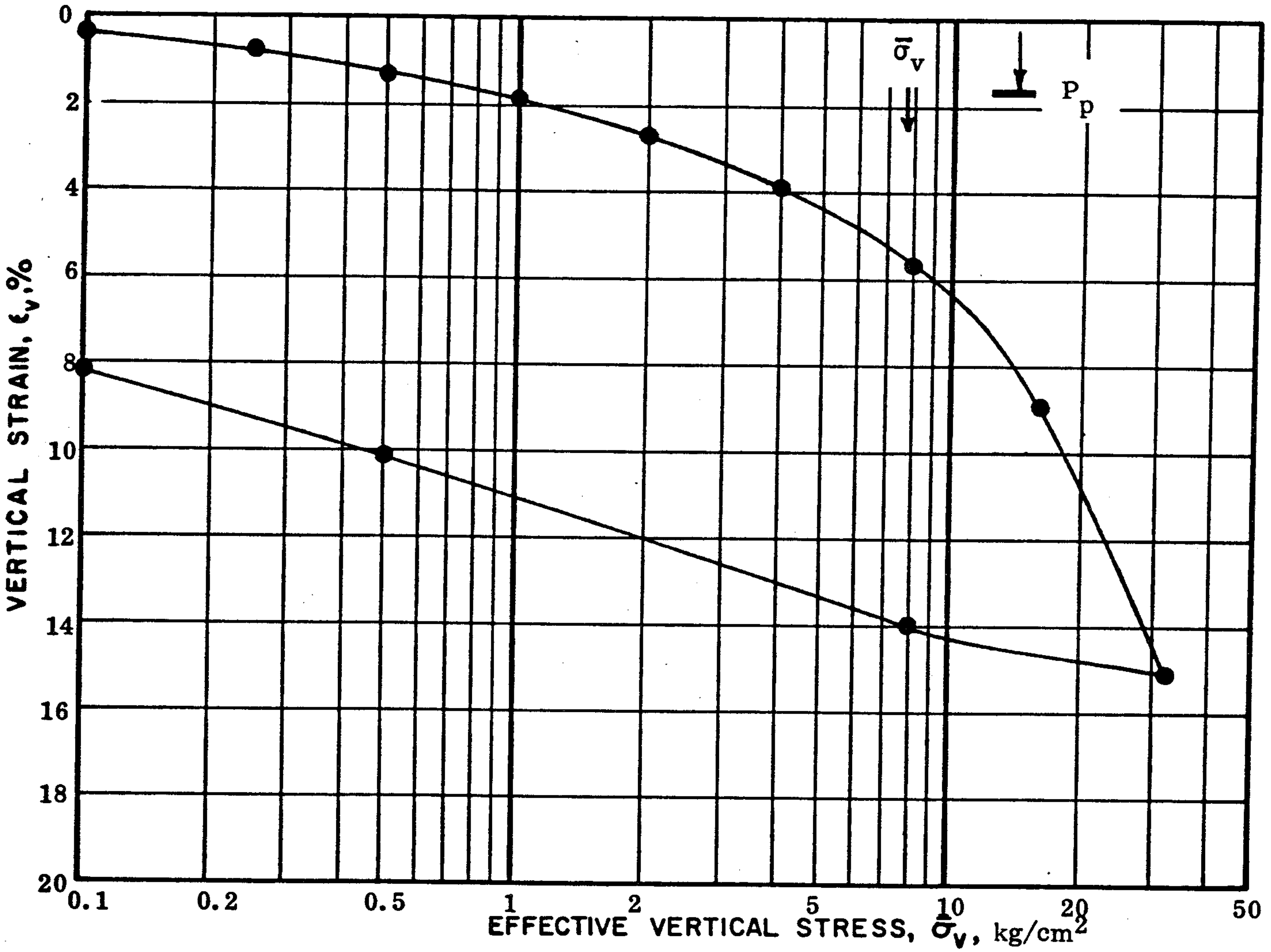
GEOTECHNICAL ENGINEERS INC
WINCHESTER, MASS.

River Bend Power Station
Gulf States Utilities

PROJECT 7263

COMPRESSION CURVE
CONSOLIDATION TEST C12

Dec. 1972 FIG. 50



Location River Bend

Boring 138

Sample 49B

Depth 199.0 ft

Elevation -88.8 ft

Specimen size
1.25 cm x 6.34 cm dia

e_o = 0.745

w_o = 27.4%

S_o =100 %

G = 2.72

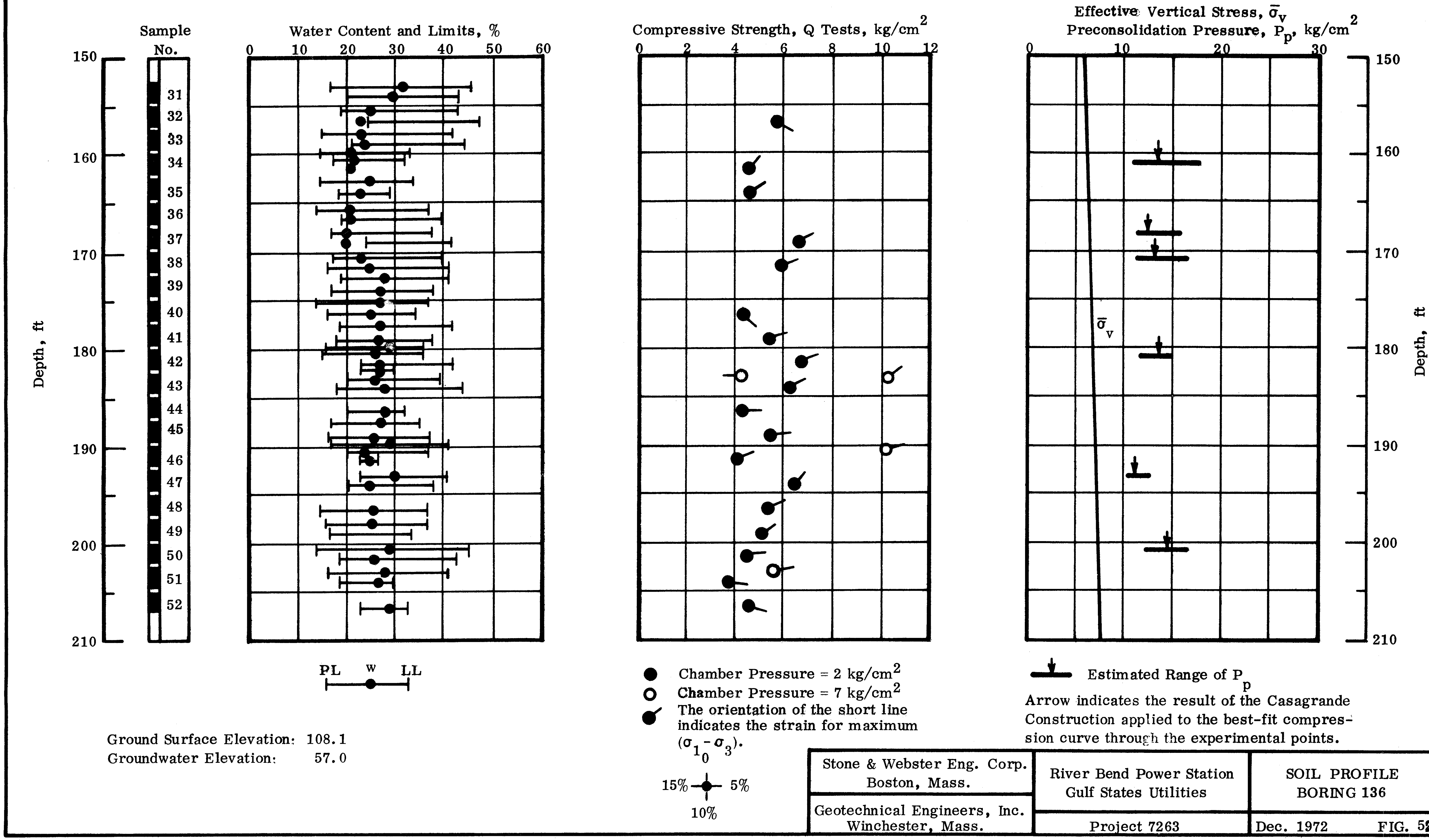
LL = 42

PI = 25

Soil description

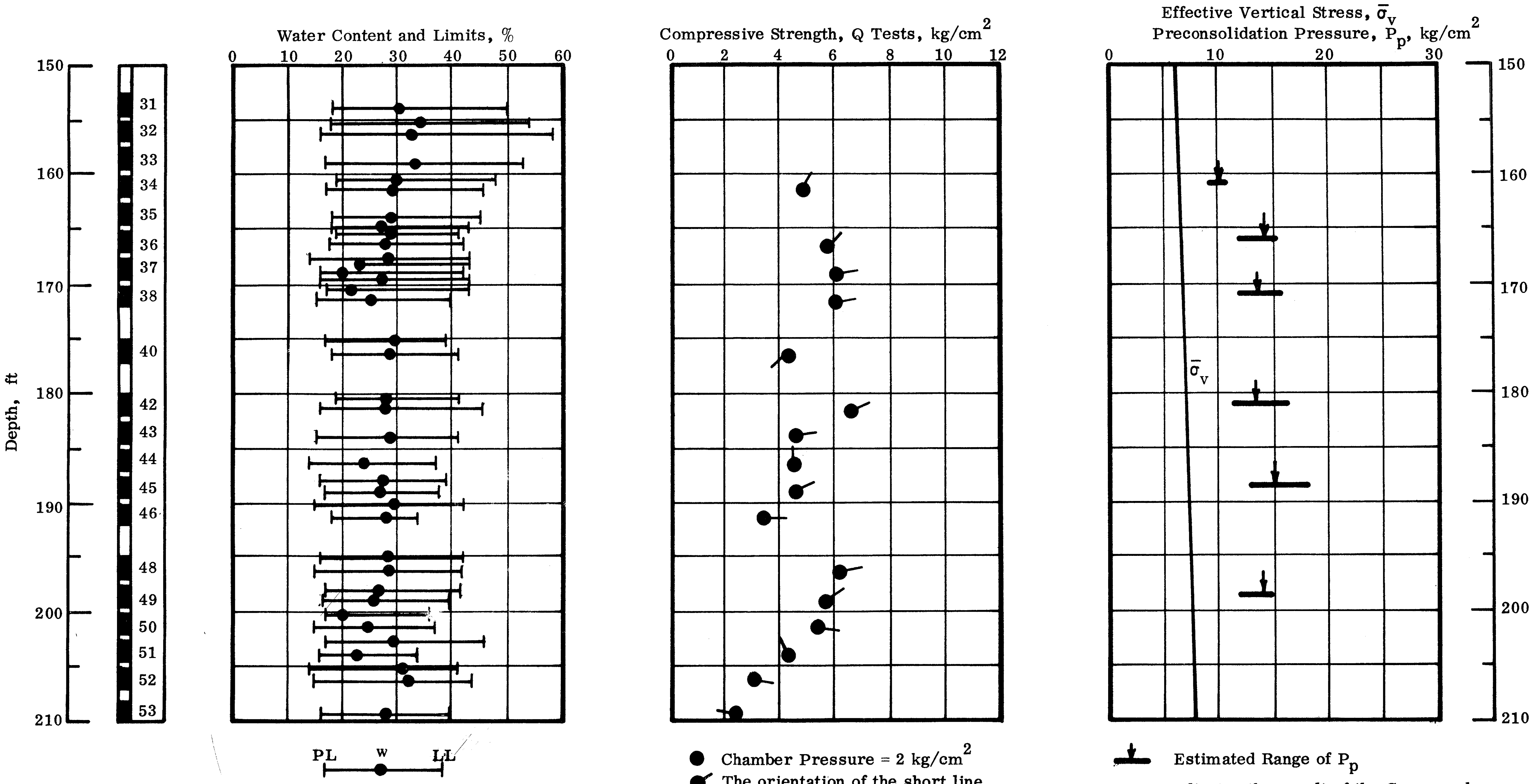
Gray sandy clay.

Stone & Webster Eng. Corp. Boston, Mass.	River Bend Power Station Gulf States Utilities	COMPRESSION CURVE CONSOLIDATION TEST C9
GEOTECHNICAL ENGINEERS INC WINCHESTER, MASS.	PROJECT 7263	Dec. 1972 FIG. 51



Ground Surface Elevation: 108.1
Groundwater Elevation: 57.0

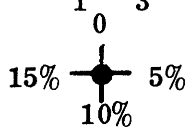
Stone & Webster Eng. Corp. Boston, Mass.	River Bend Power Station Gulf States Utilities	SOIL PROFILE BORING 136
Geotechnical Engineers, Inc. Winchester, Mass.	Project 7263	Dec. 1972 FIG. 52



Ground Surface Elevation: 110.2
Groundwater Elevation: 57.0

● Chamber Pressure = 2 kg/cm^2

● The orientation of the short line indicates the strain for maximum $(\sigma_1 - \sigma_3)$.



Estimated Range of P_p

Arrow indicates the result of the Casagrande Construction applied to the best-fit compression curve through the experimental points.

Stone & Webster Eng. Corp. Boston, Mass.	River Bend Power Station Gulf States Utilities	SOIL PROFILE BORING 138
Geotechnical Engineers, Inc. Winchester, Mass.	Project 7263	Dec. 1972 FIG. 53

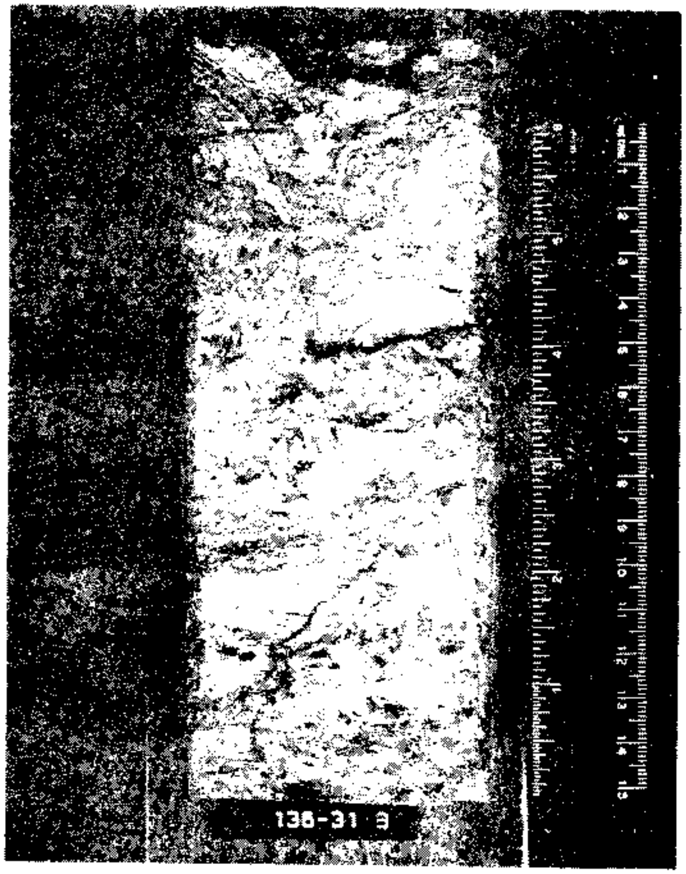
APPENDIX

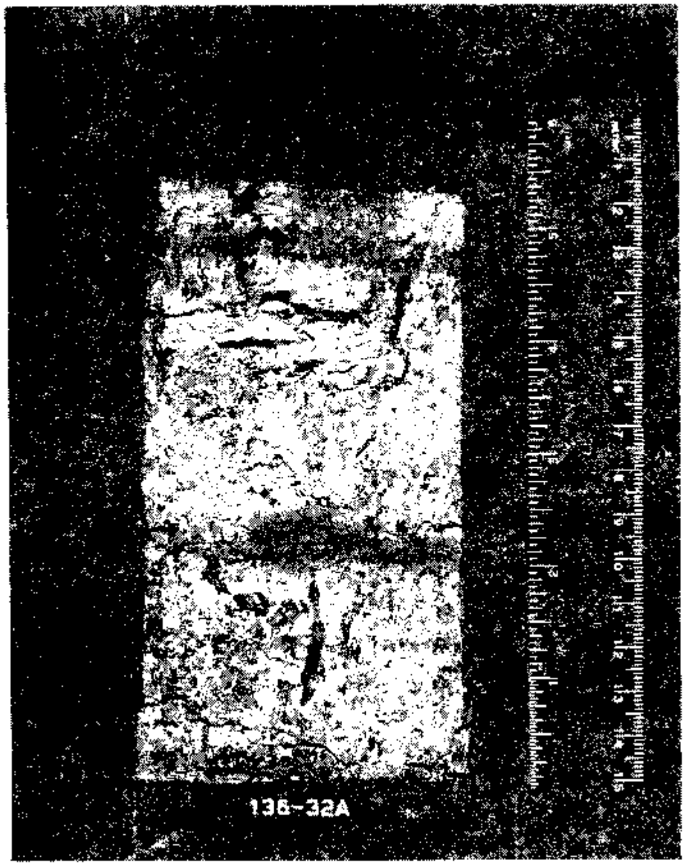
PHOTOGRAPHS

The photographs are identified by Boring Number - Sample Number

and Section written at the bottom.


136-31 A


136-31 B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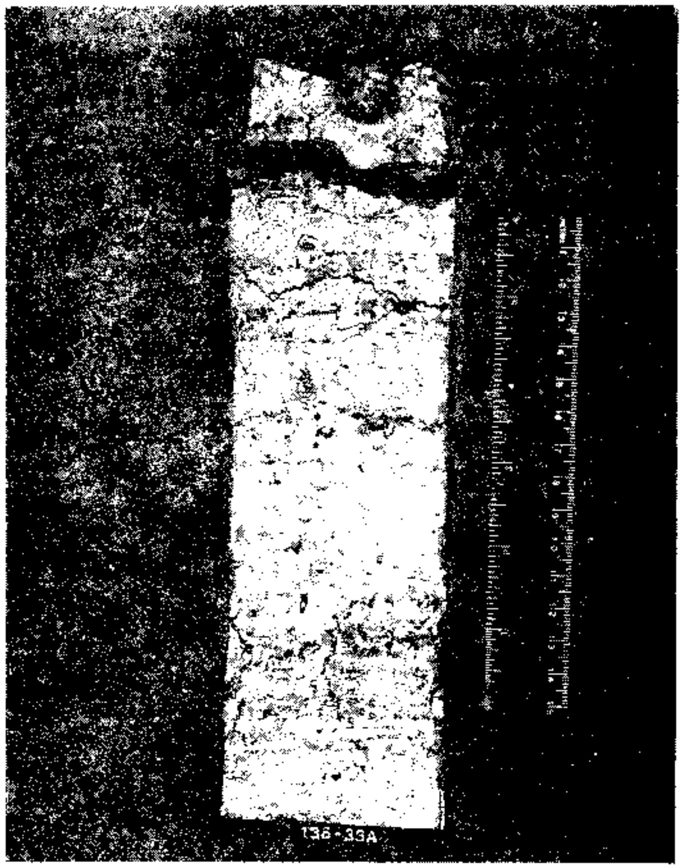
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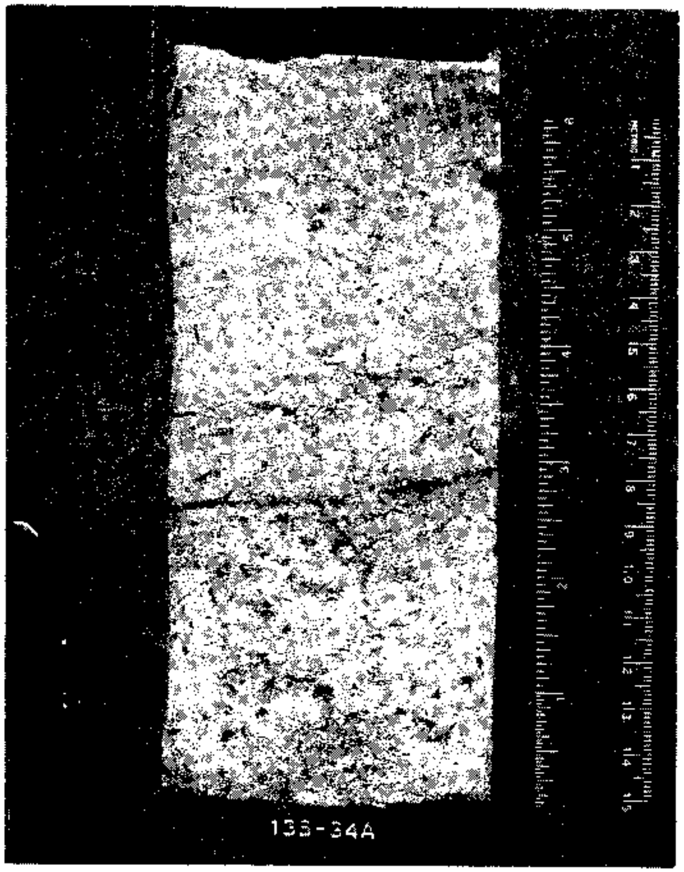
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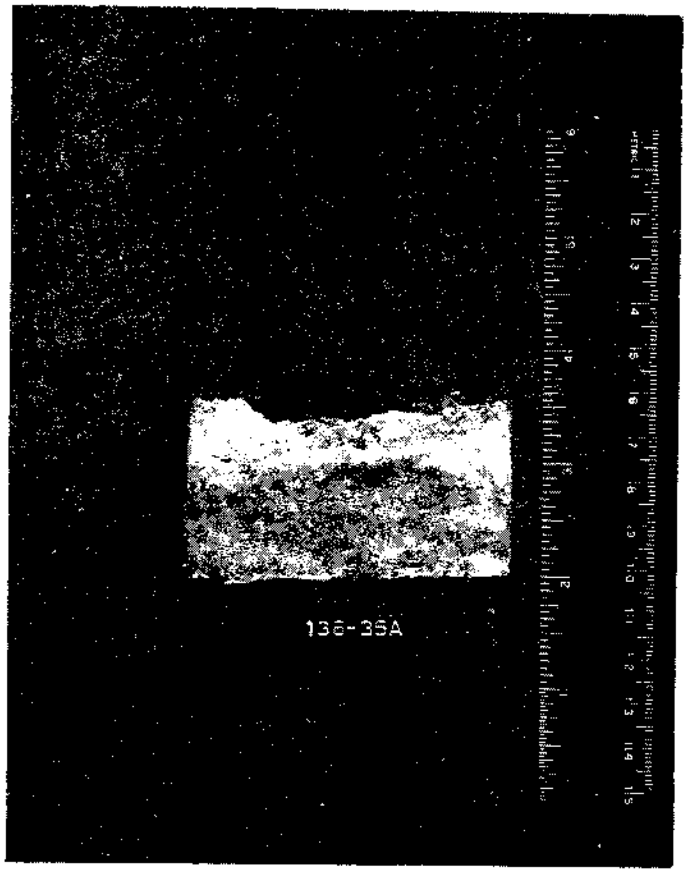
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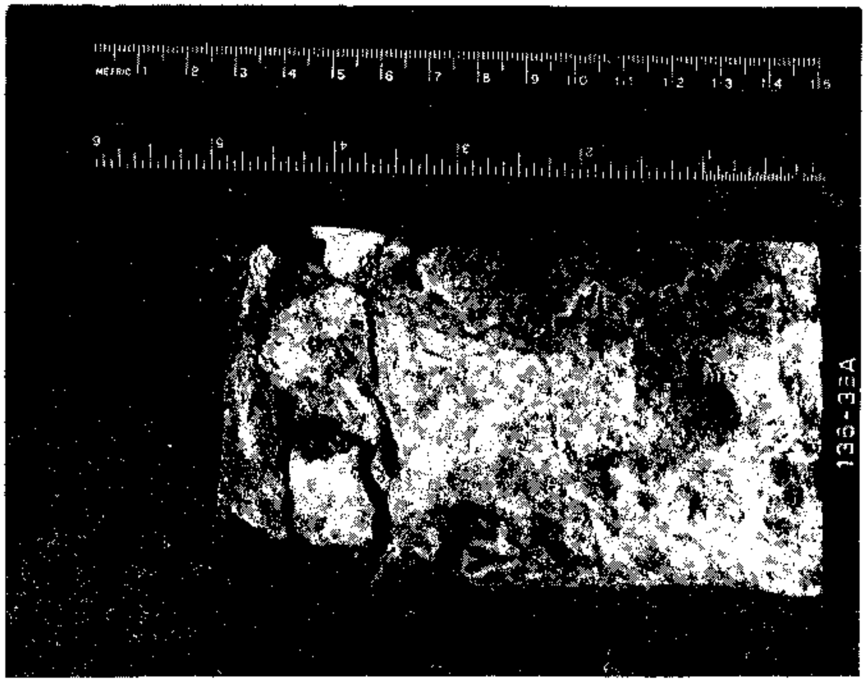
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6 5 4 3 2 1
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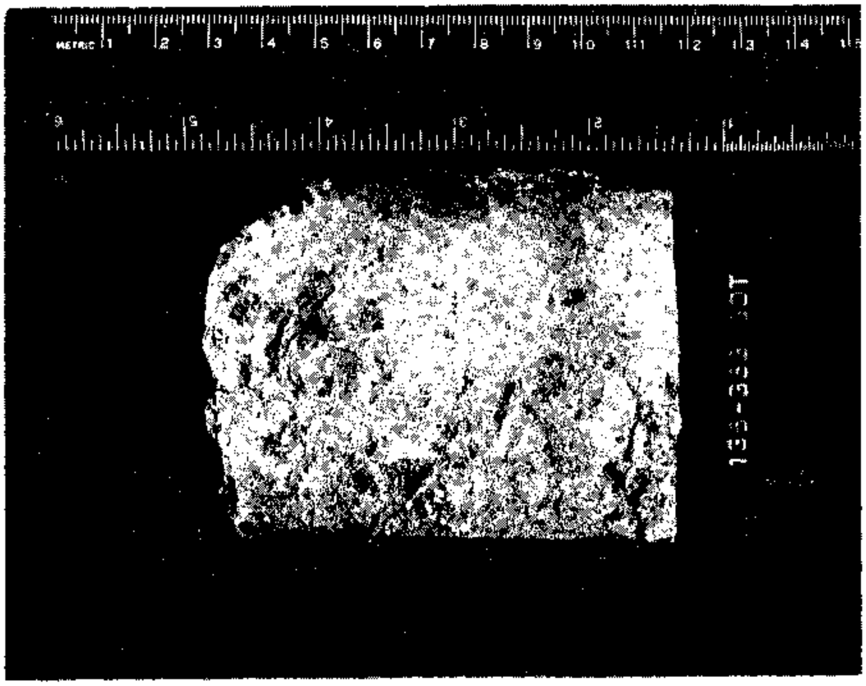
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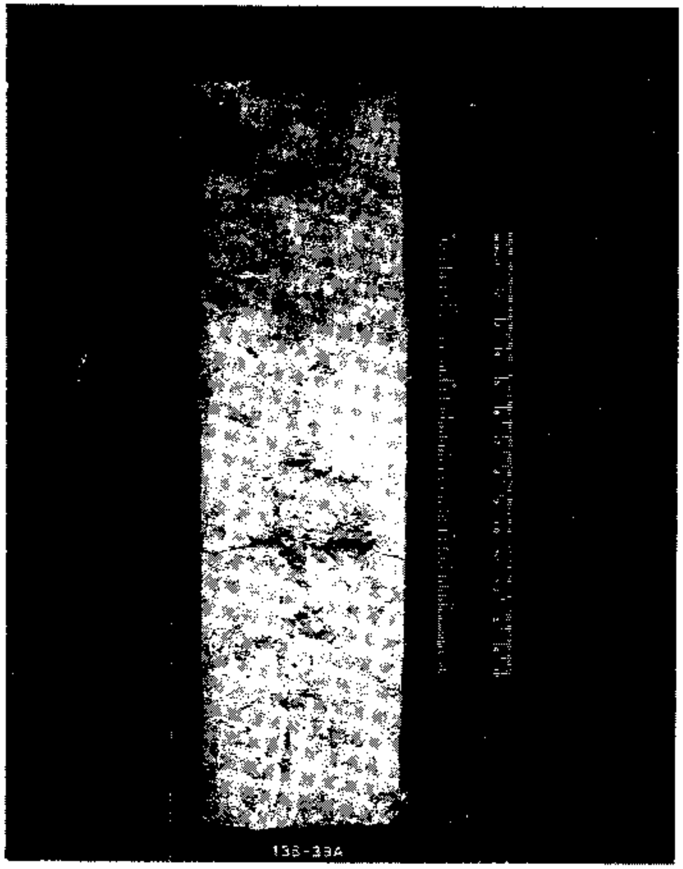
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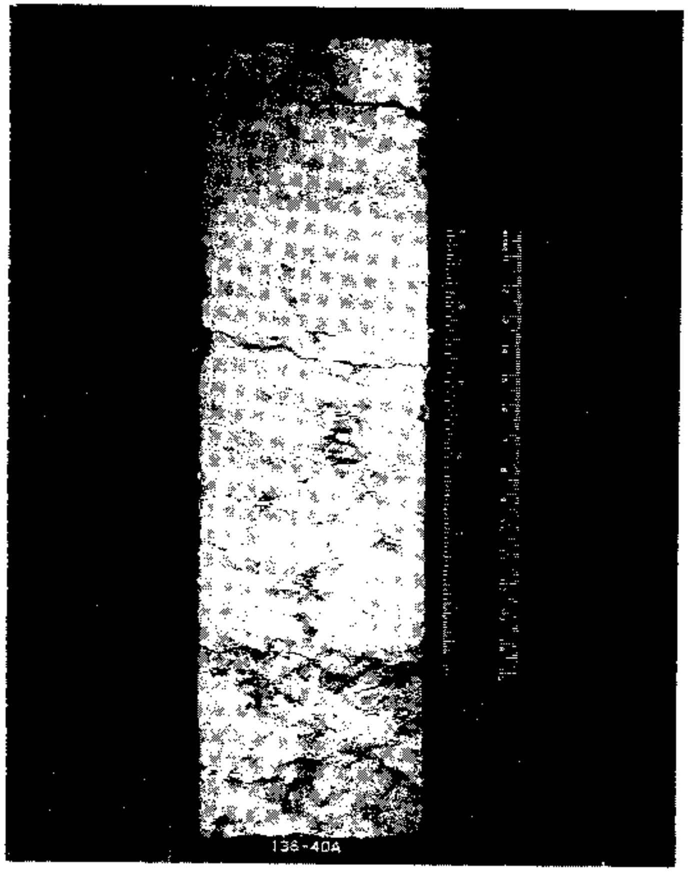
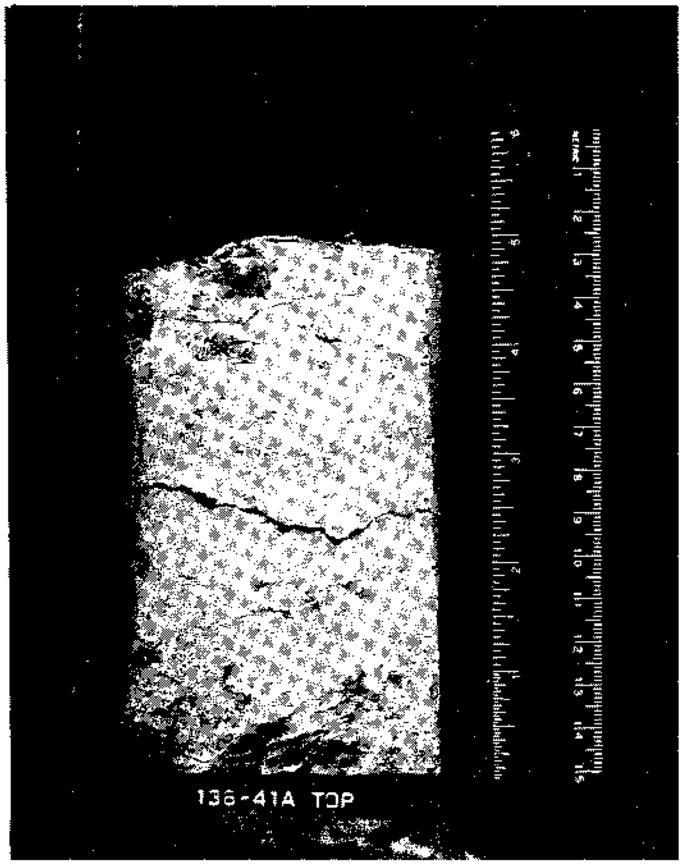
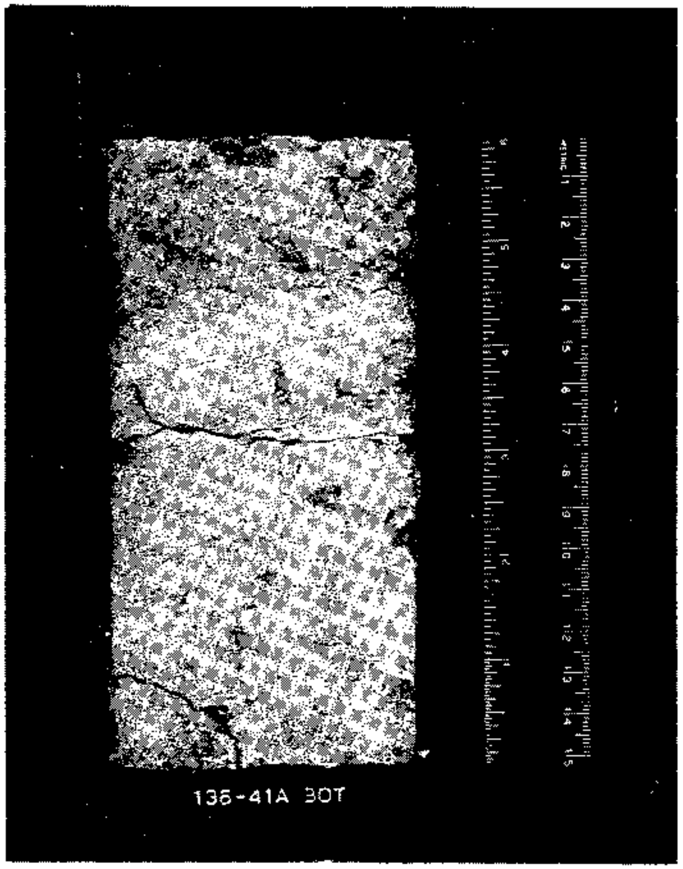
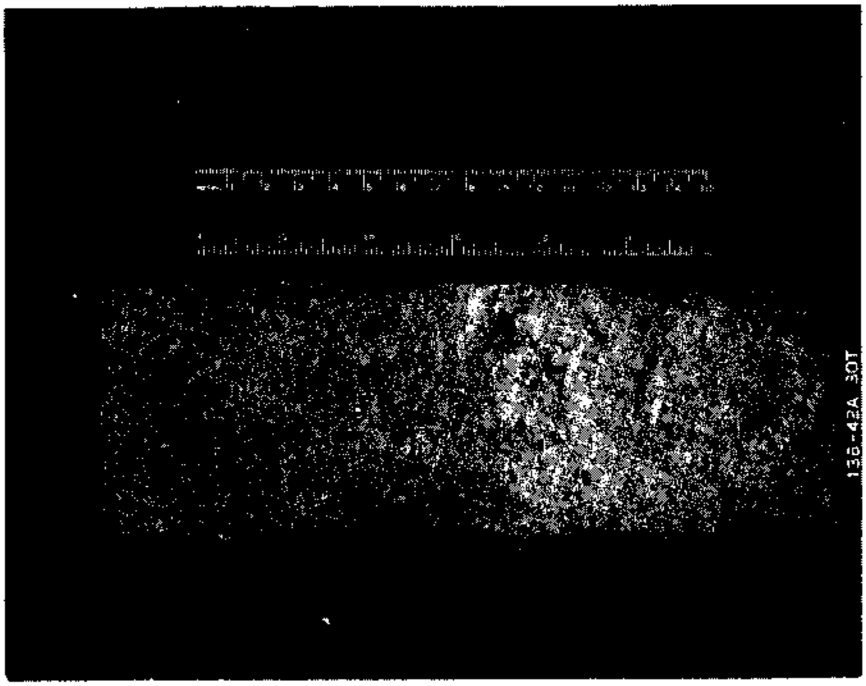

136-40A


136-41A TOP


136-41A BOT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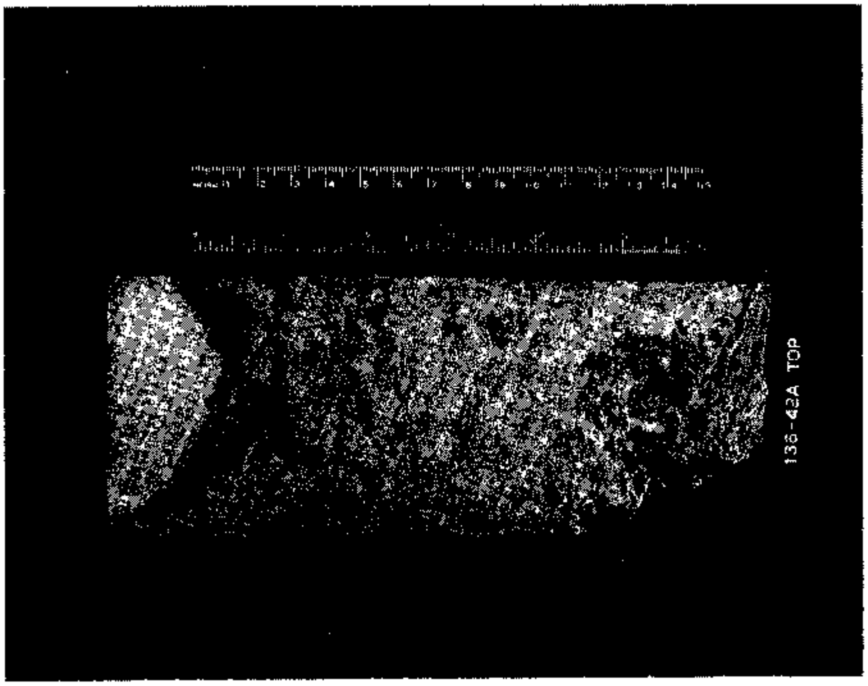
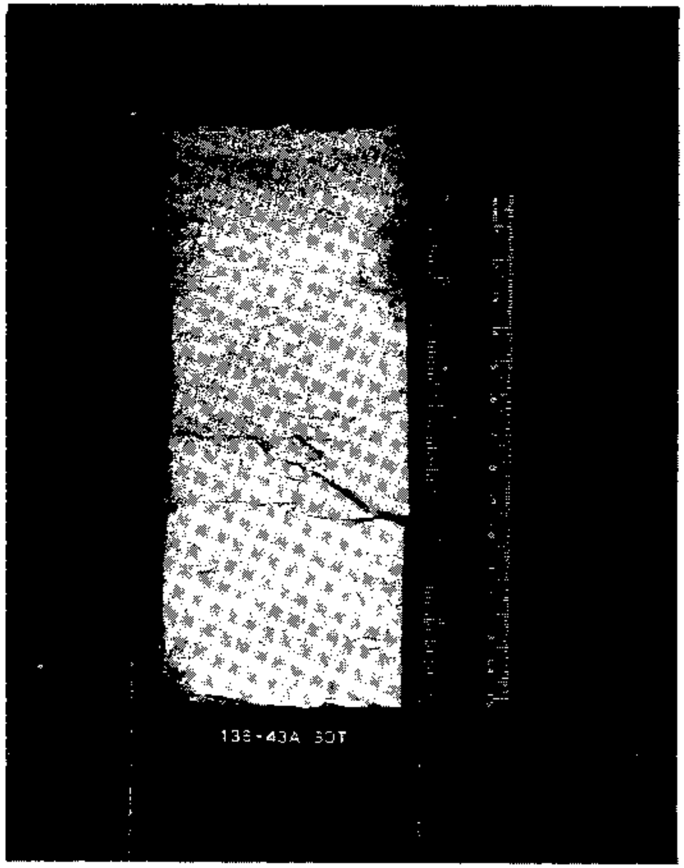
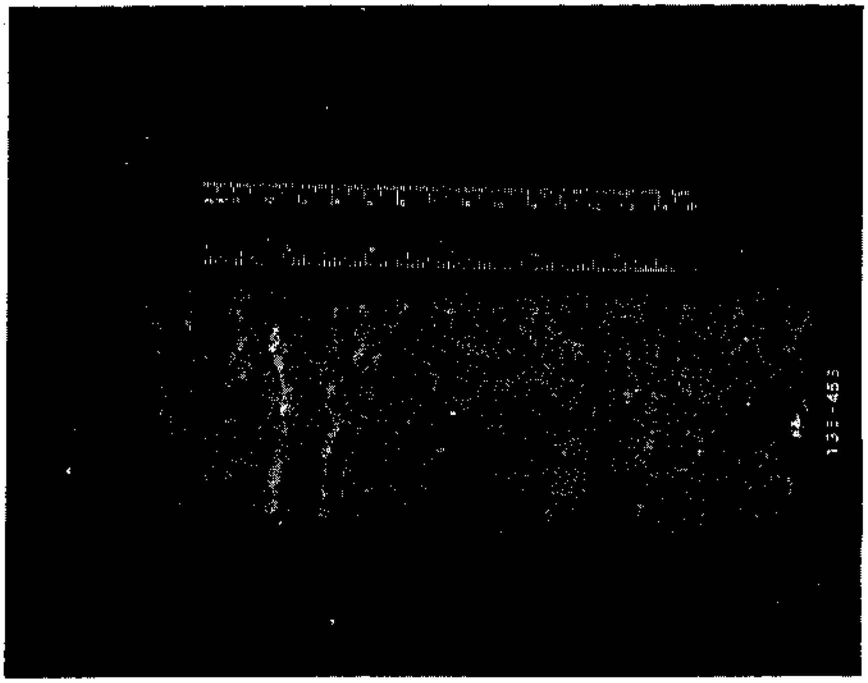
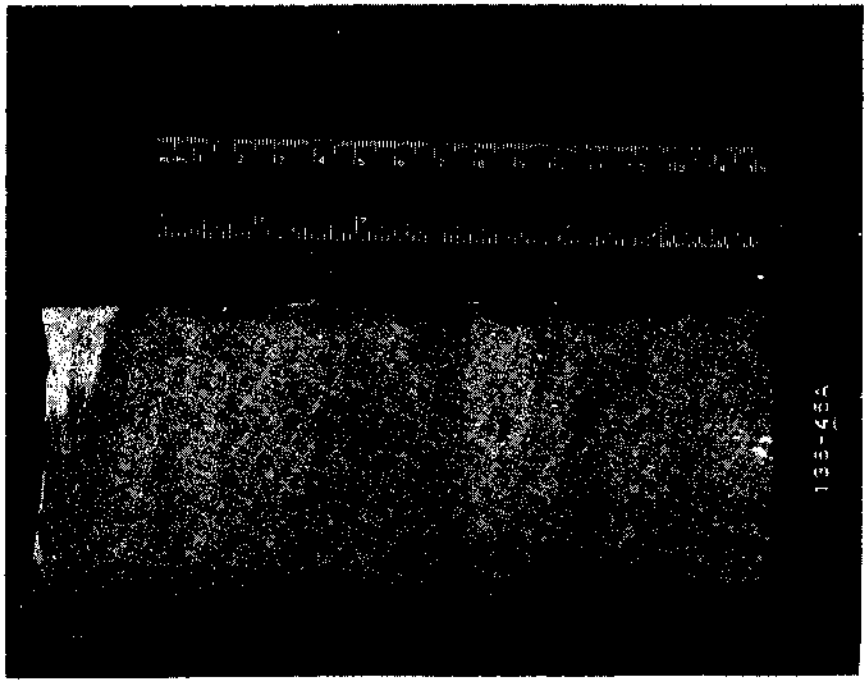

136-42A TOP


136-43A BOT


136-44A


138-45B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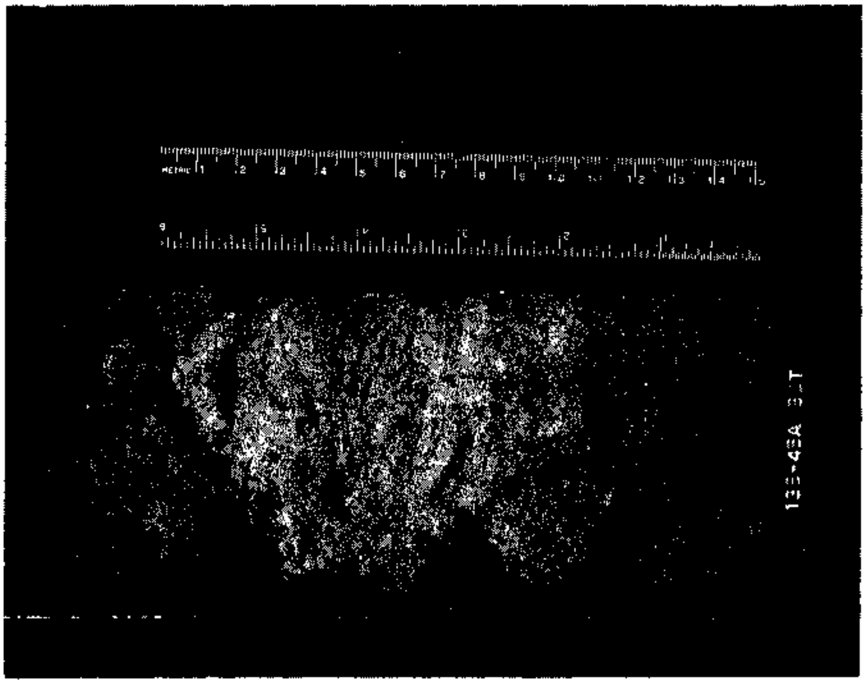
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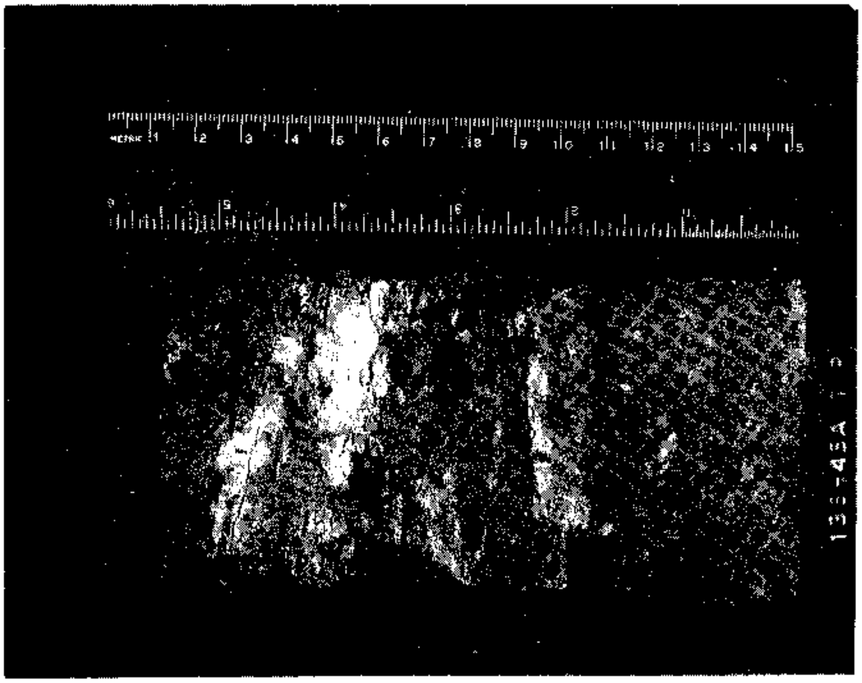
133-43A 3-T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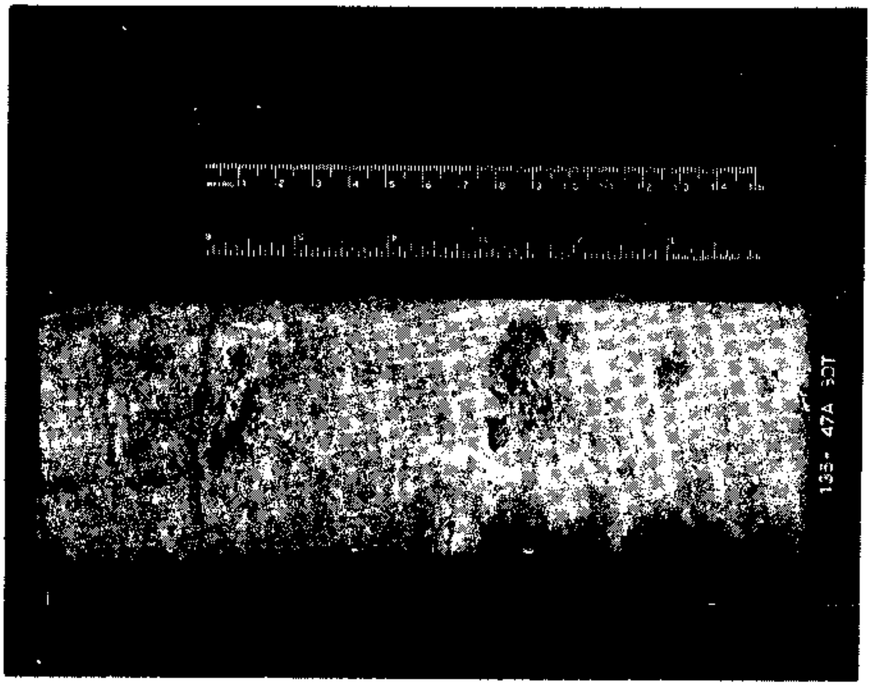
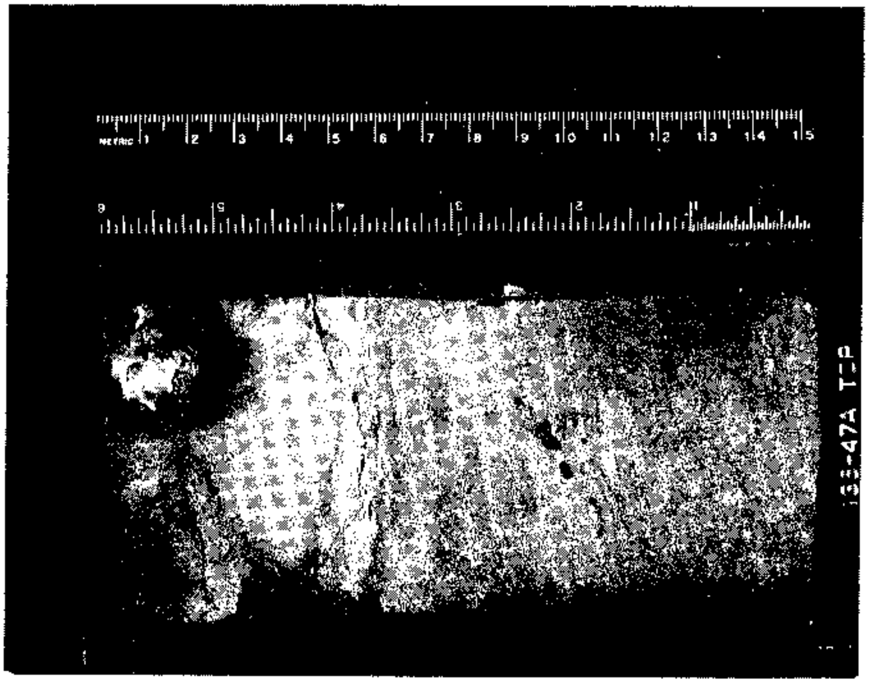
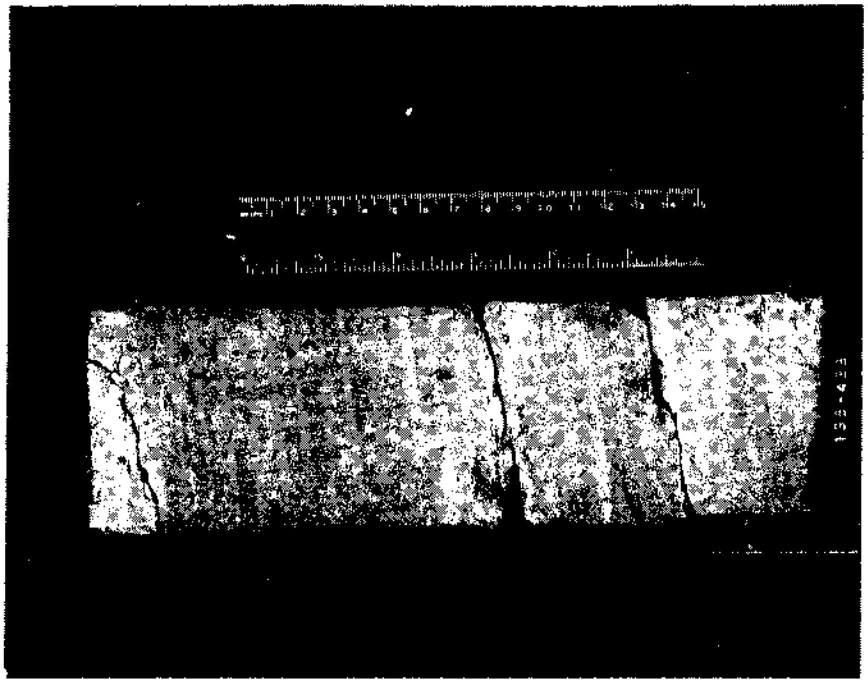
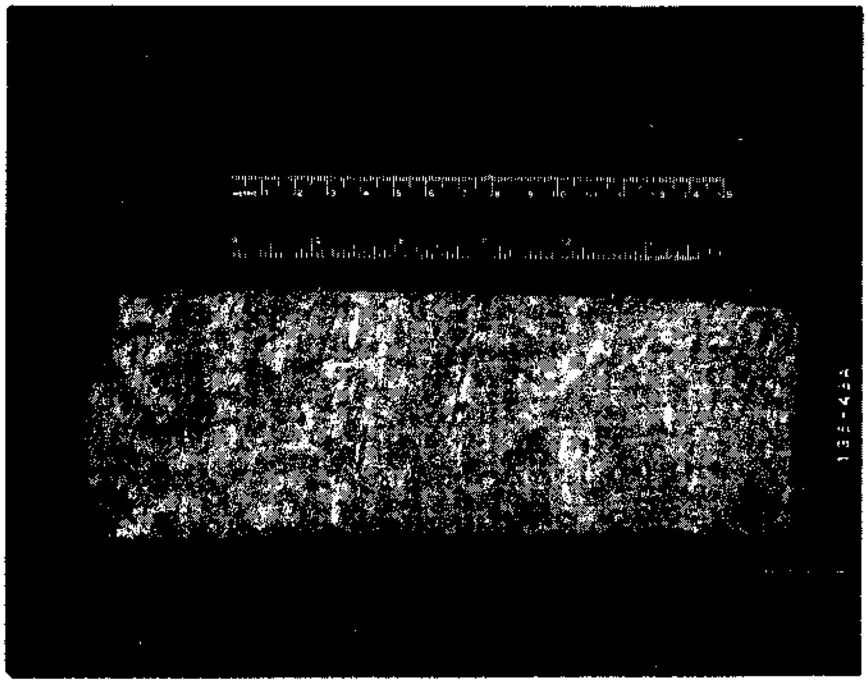

133- 47A BOT


METRIC
133-47A TOP


134-43B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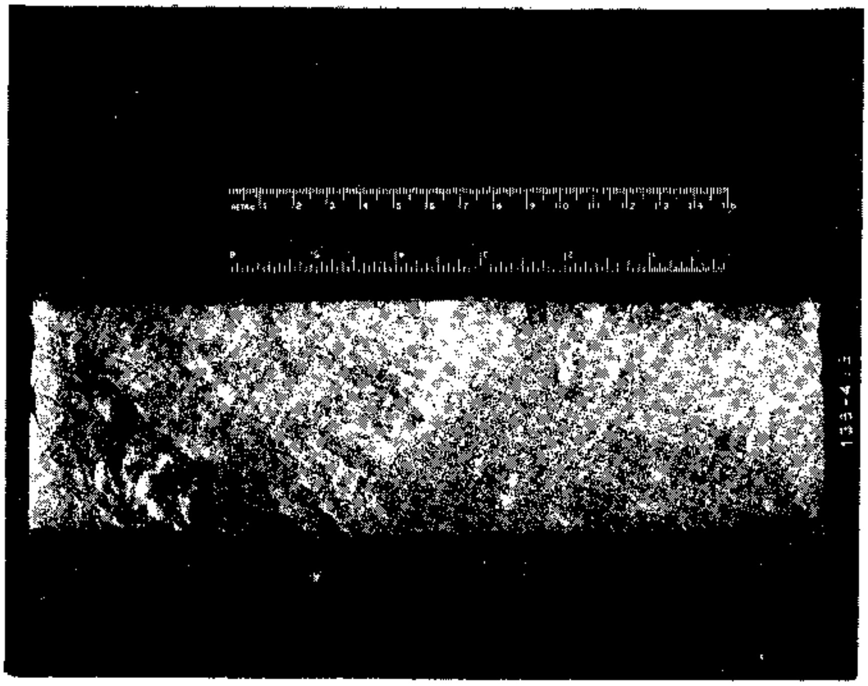
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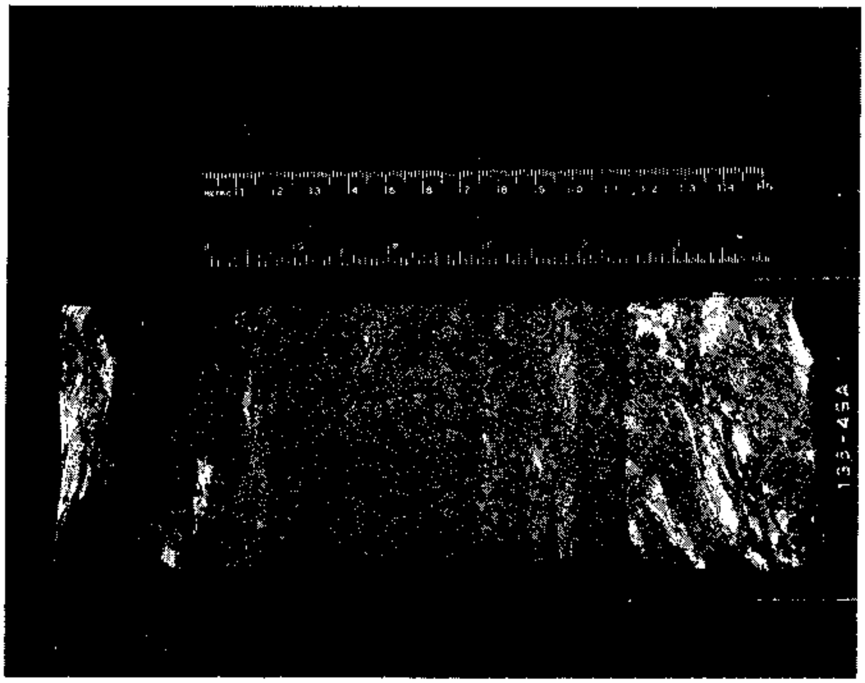
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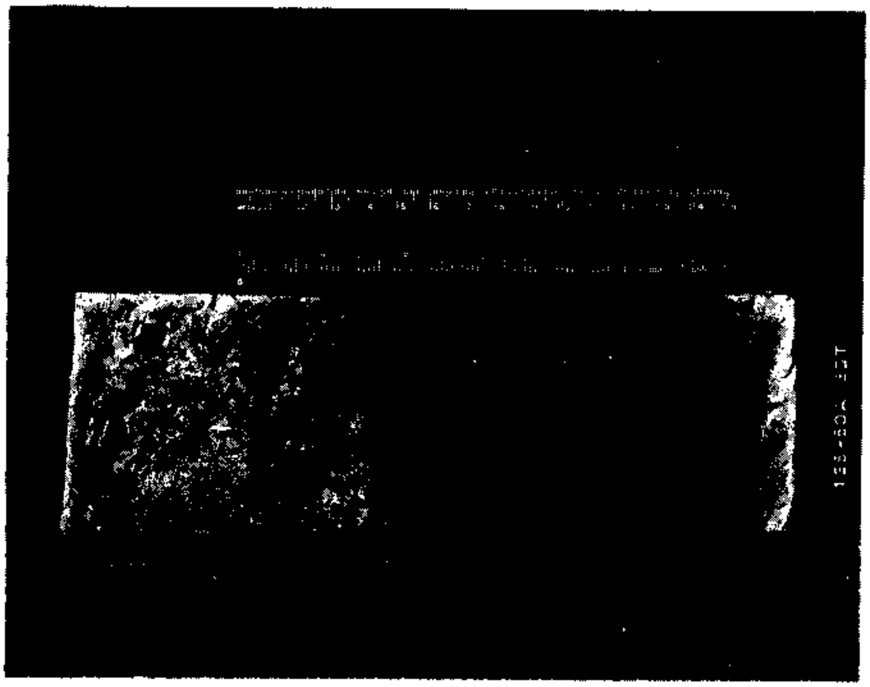
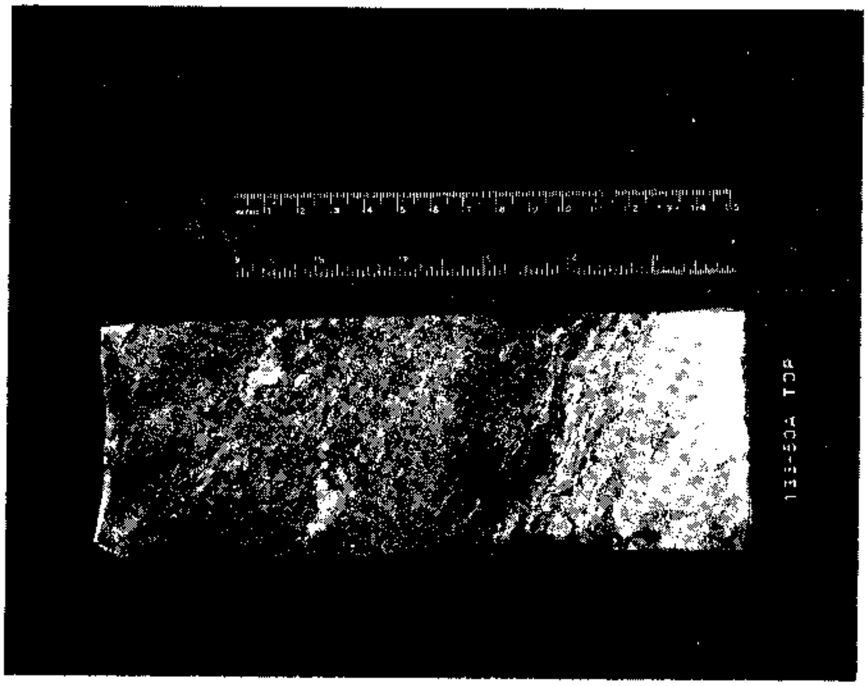

133-50A LFT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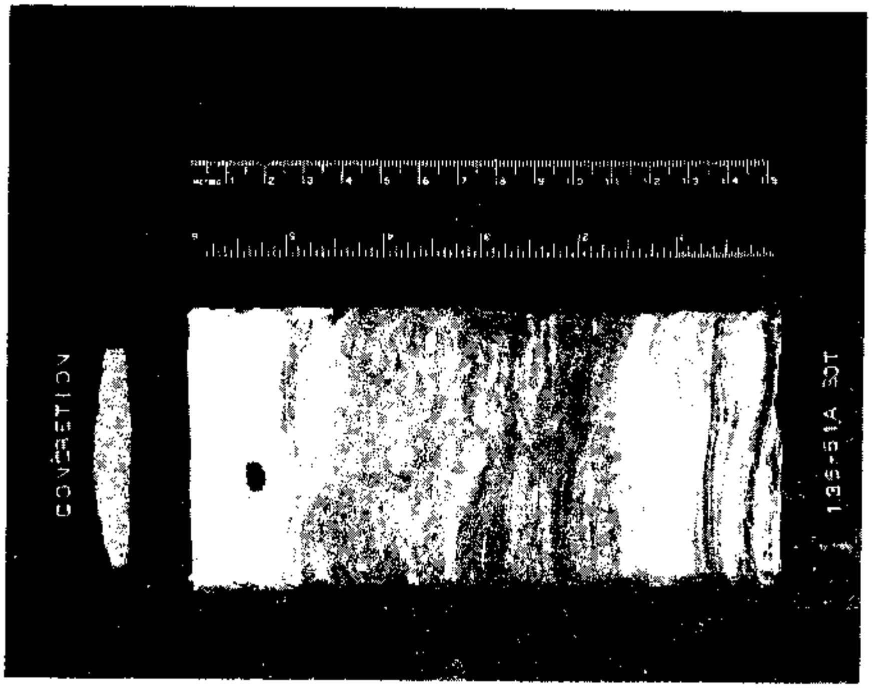
CONCRETION
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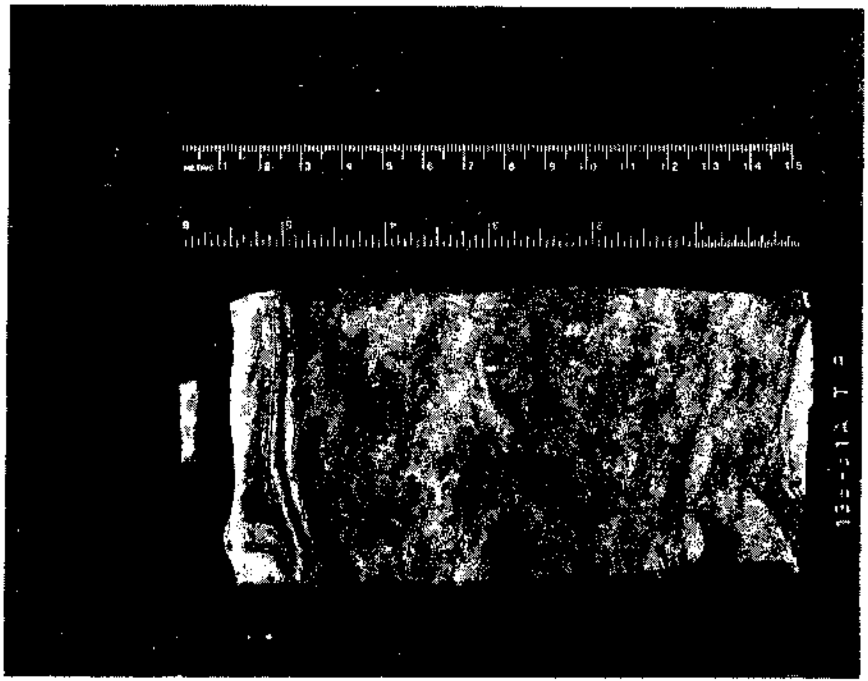
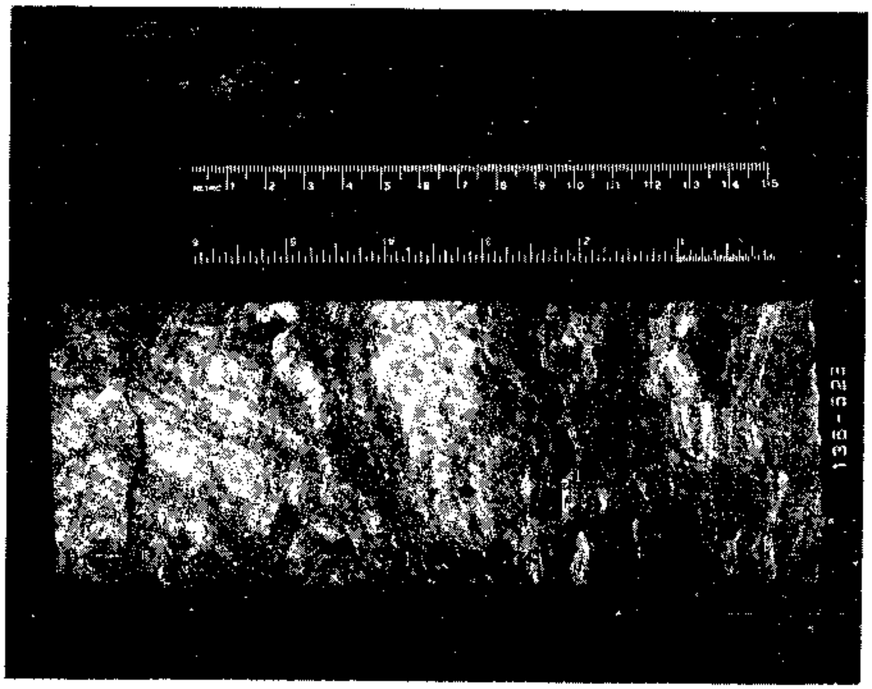
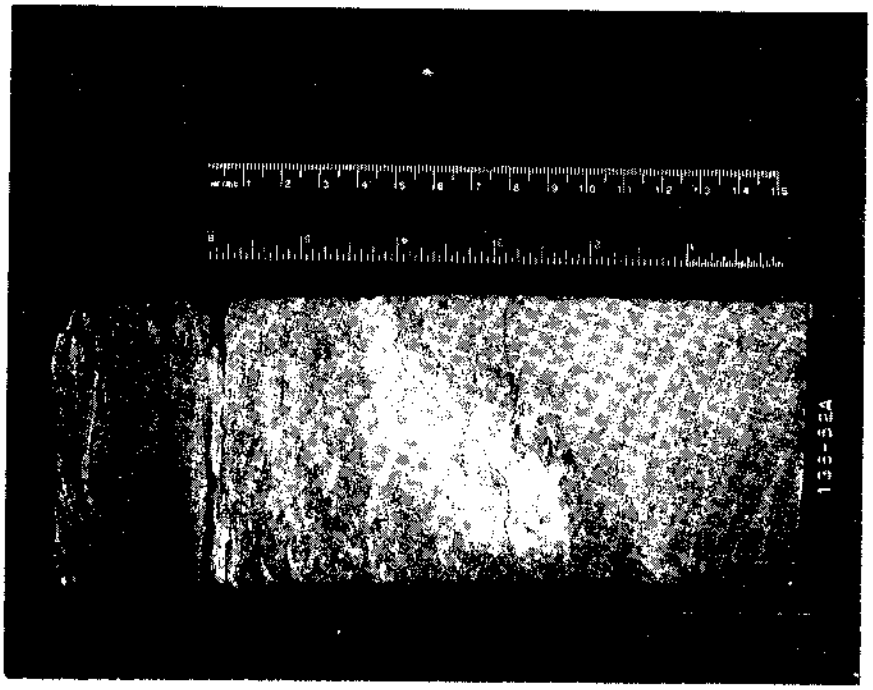

135-51A T 3


136-52B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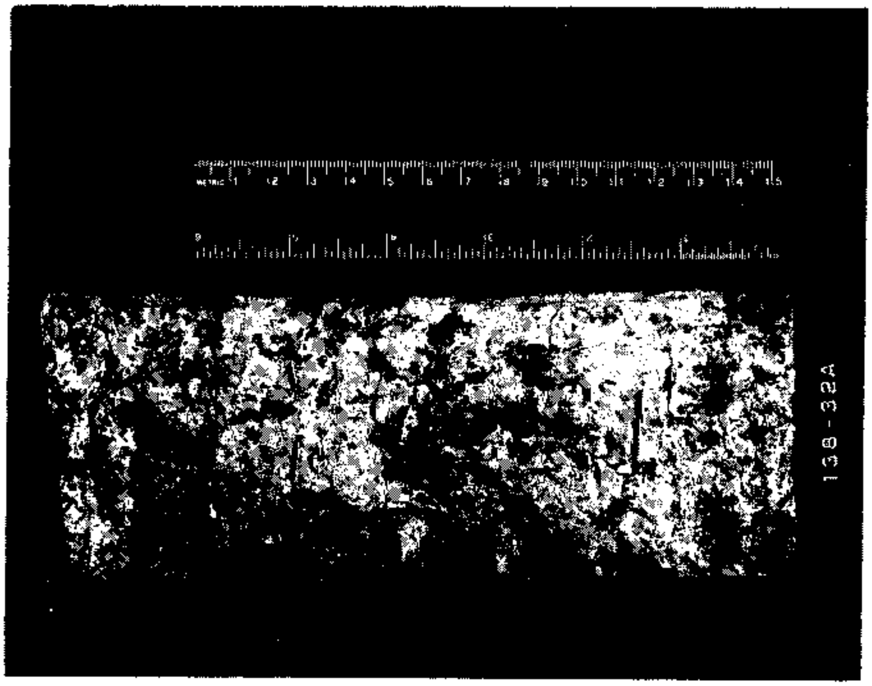
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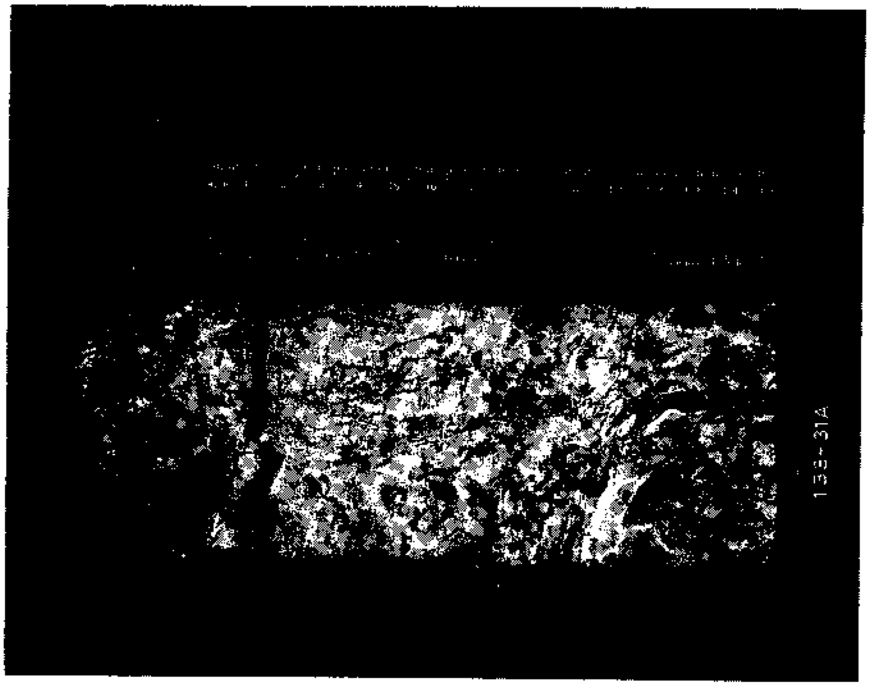
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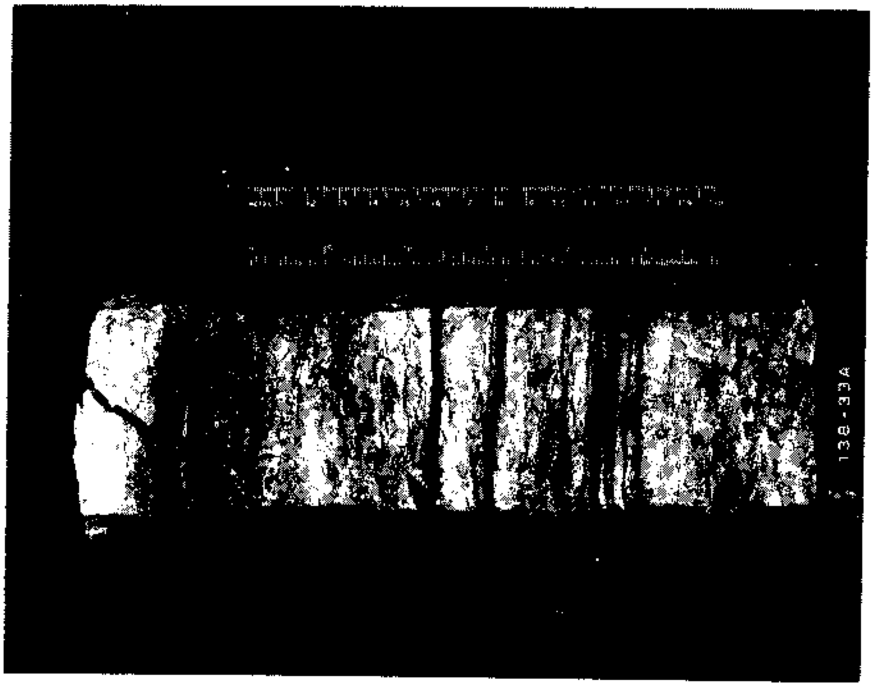
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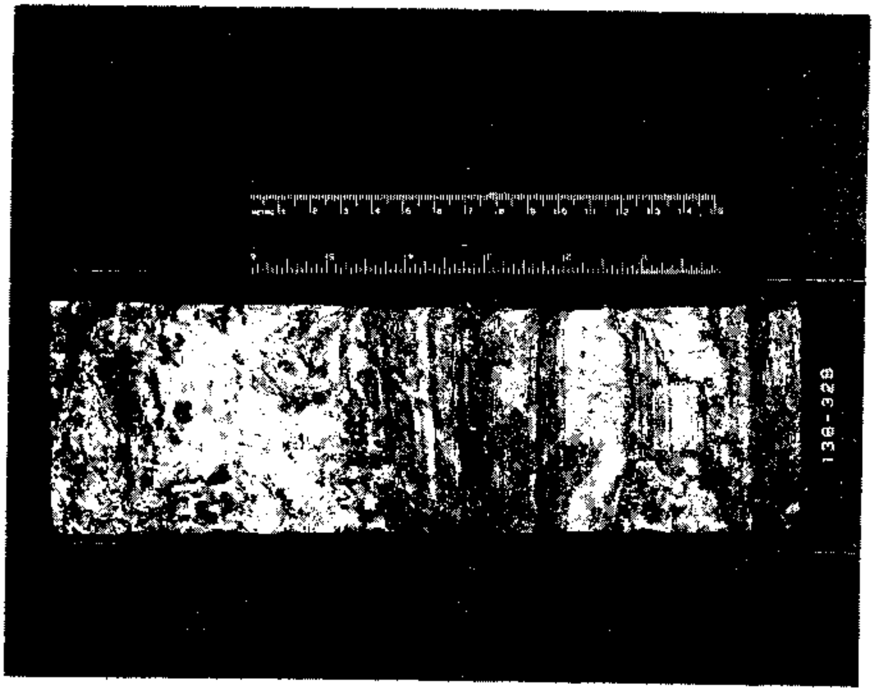
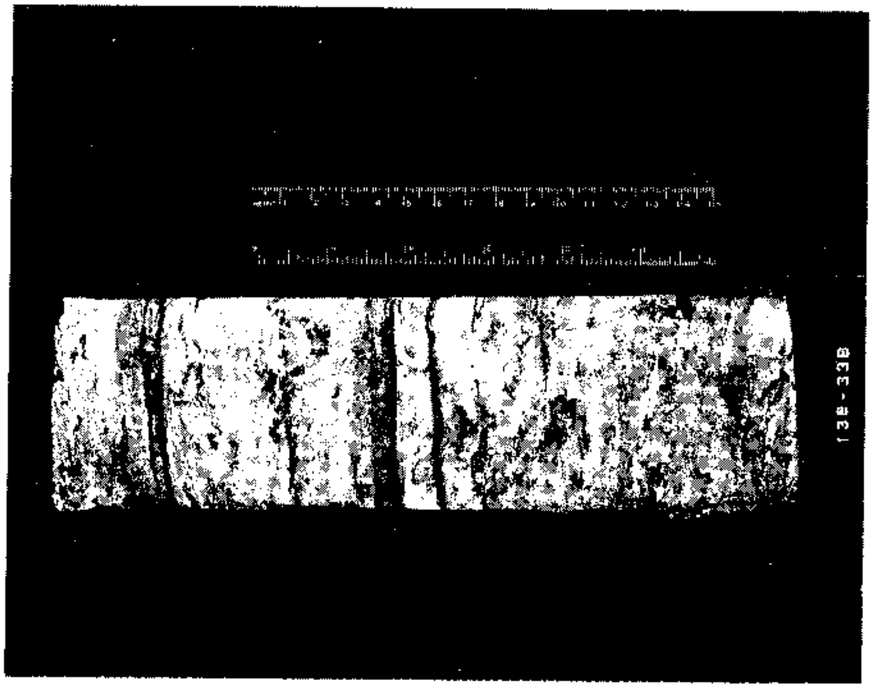

138-328



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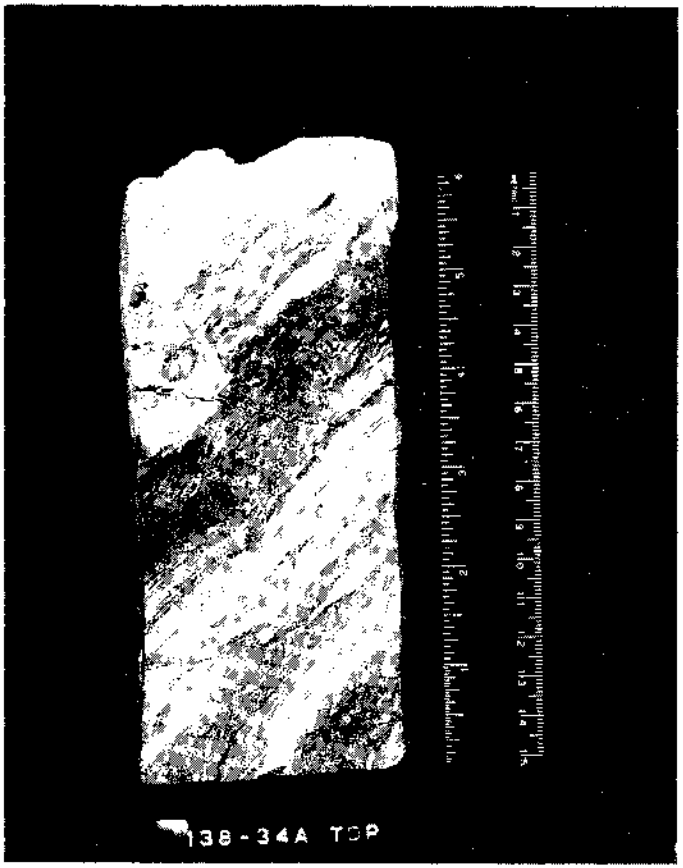
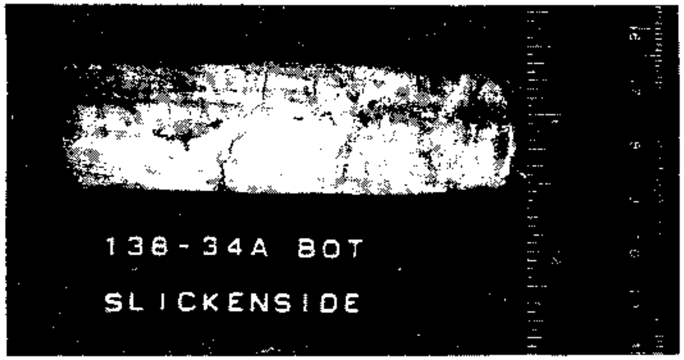
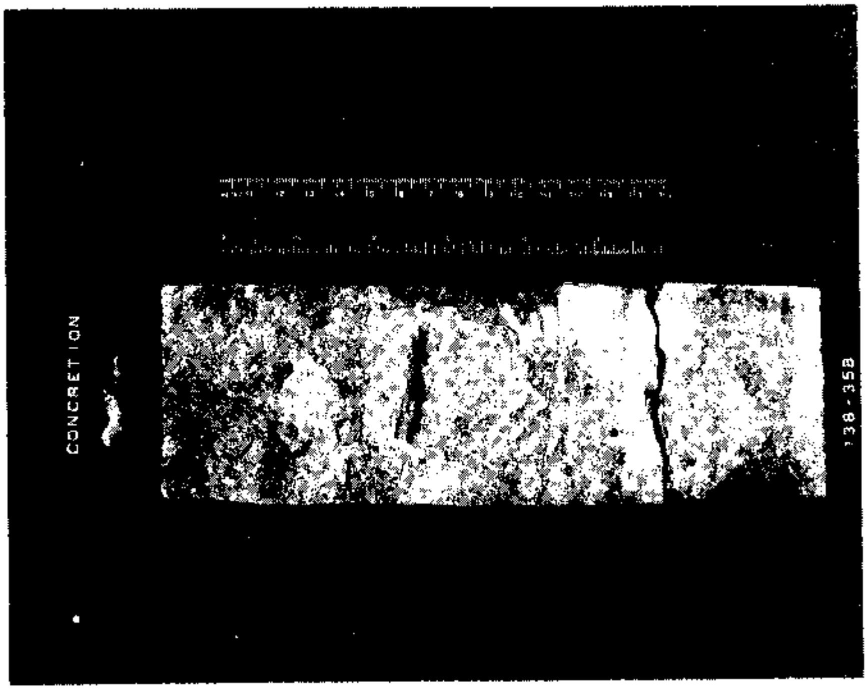

138-34A TOP


138-34A BOT


138-34A BOT
SLICKENSIDE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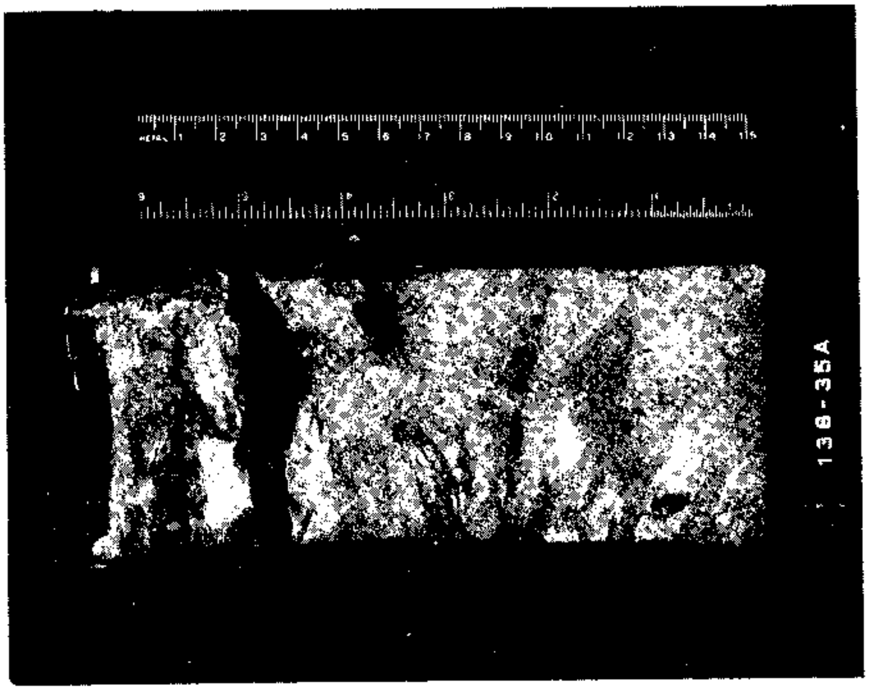
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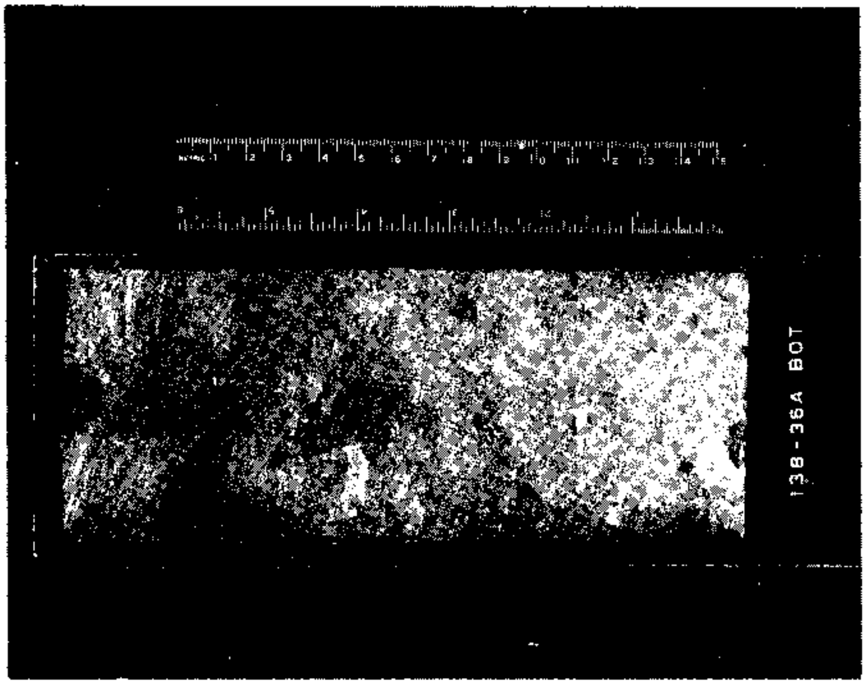
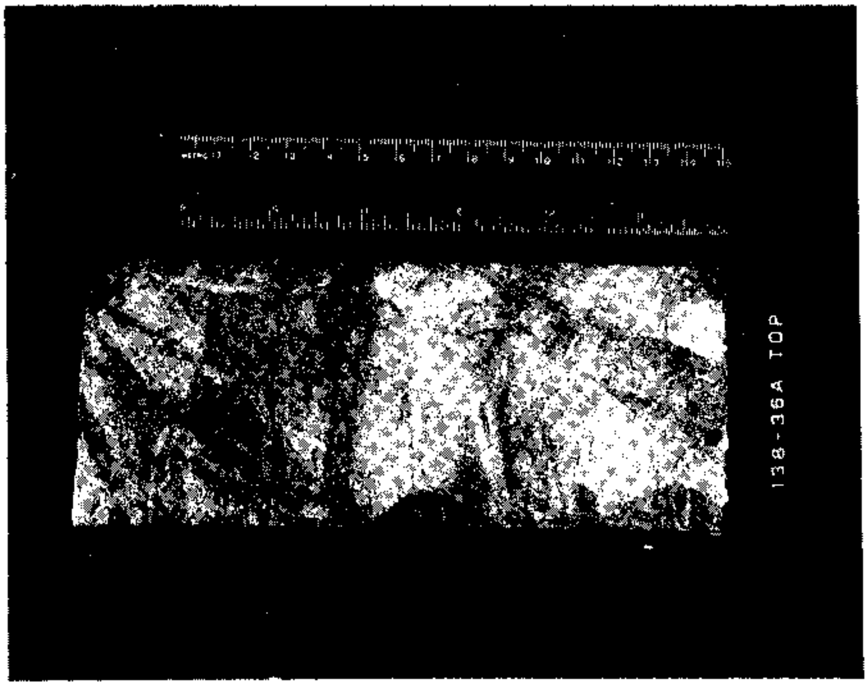
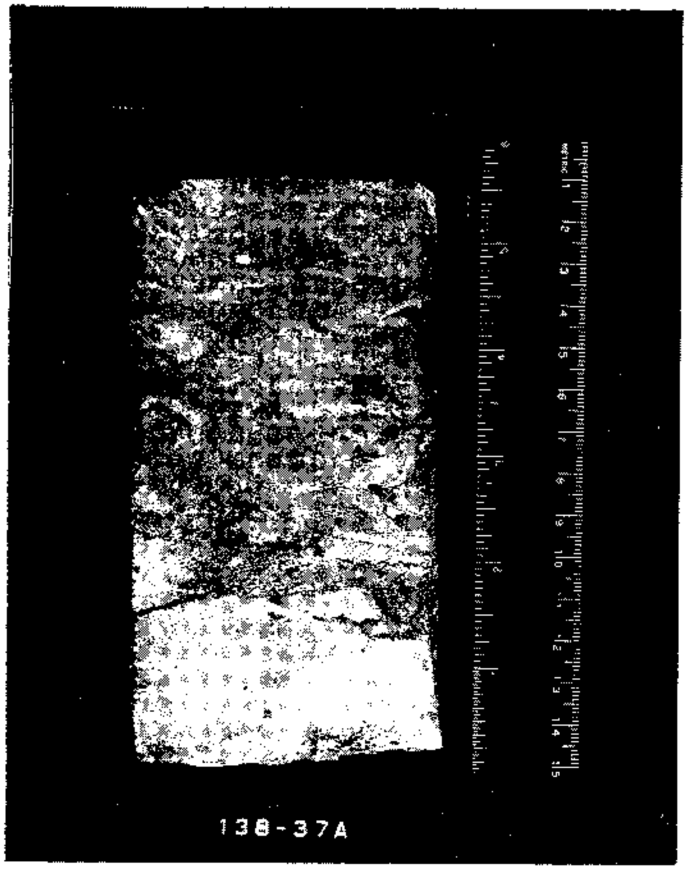
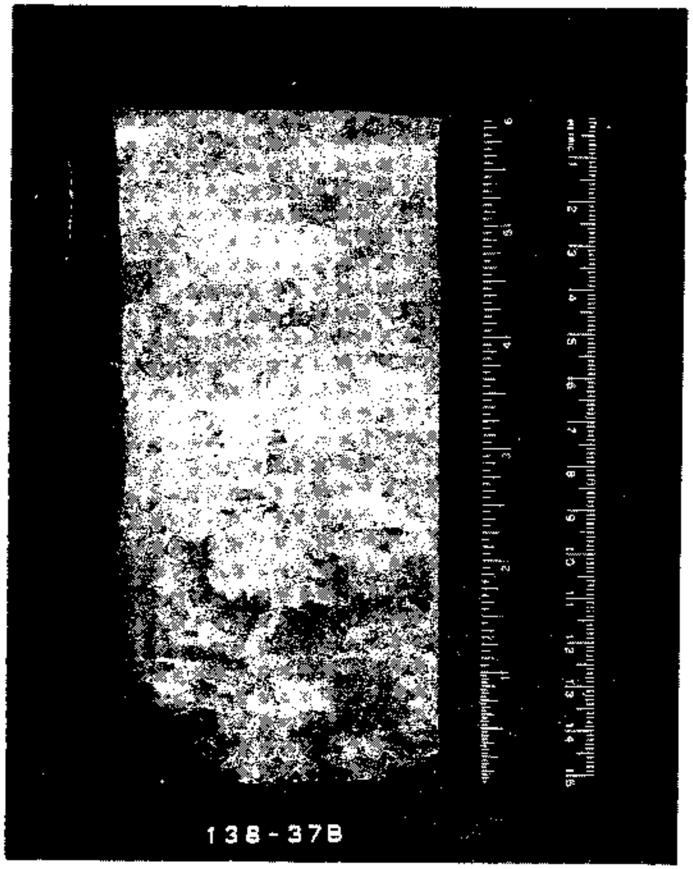
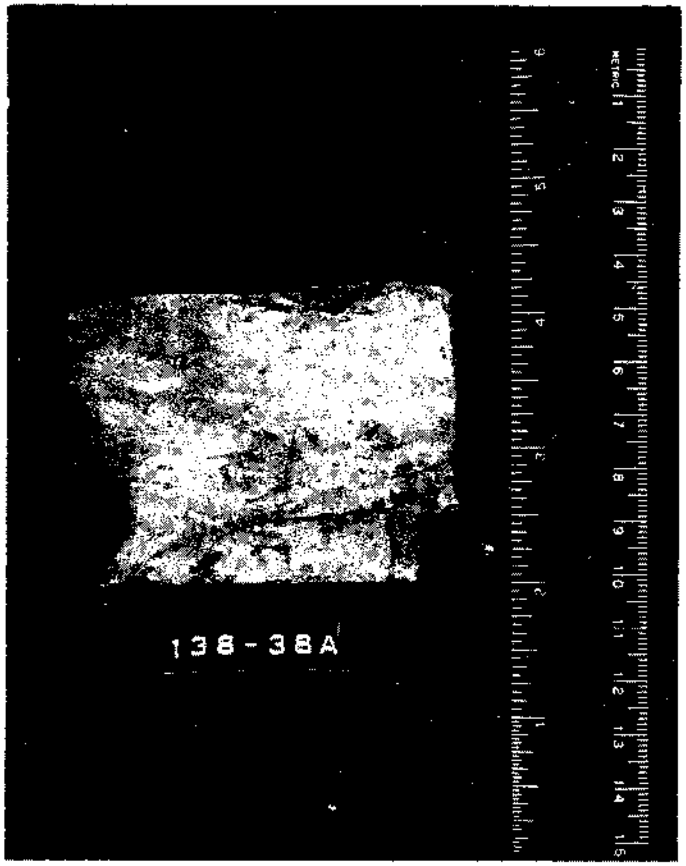
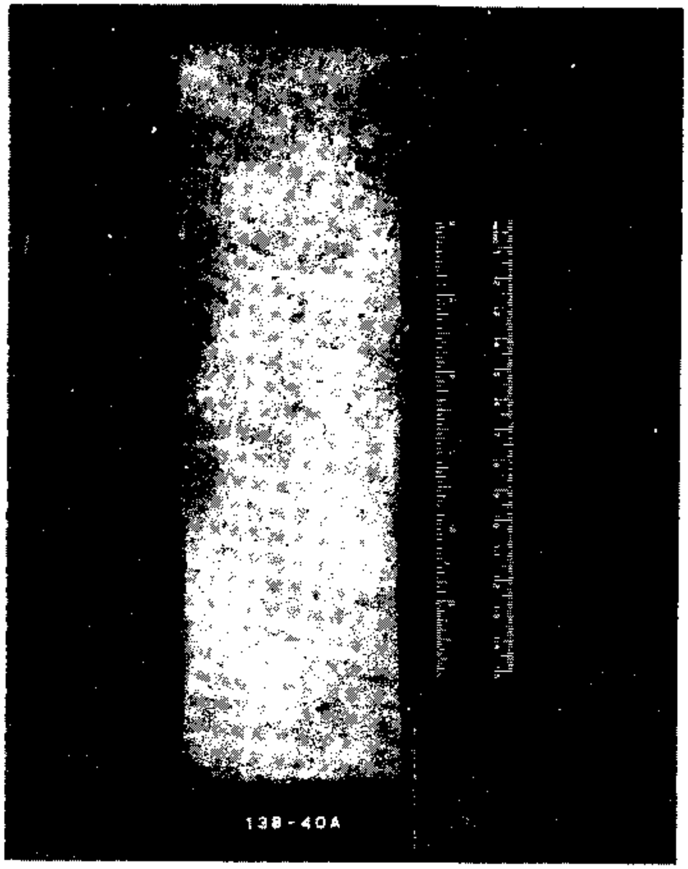

138-36A BOT

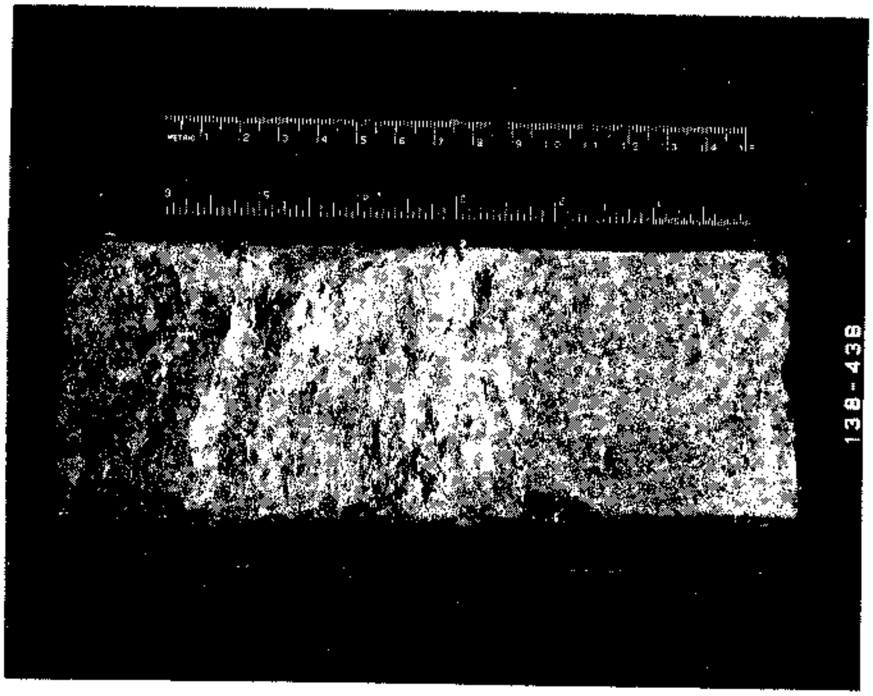

138-36A TOP


138-37A

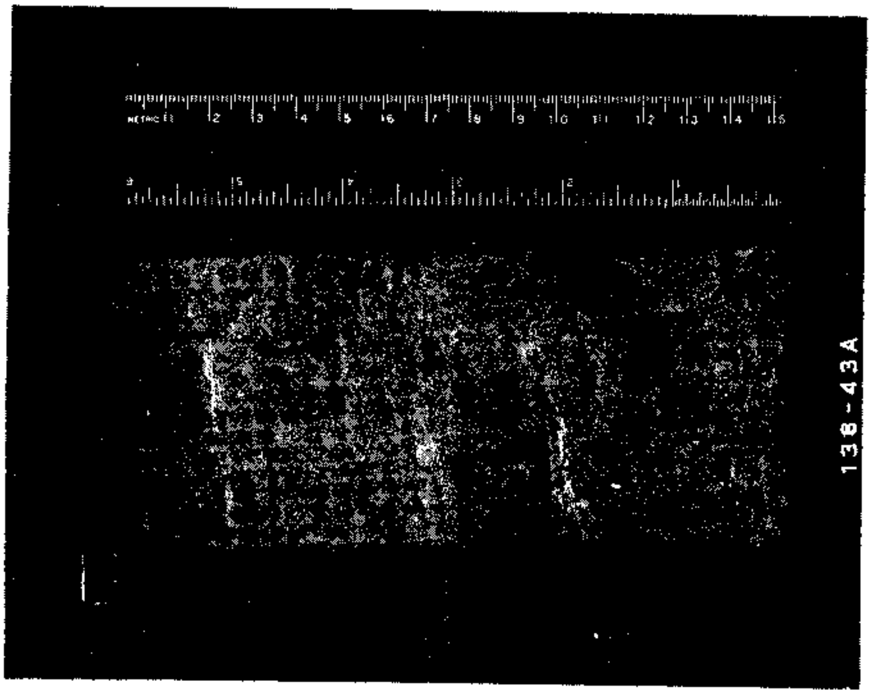

138-37B


METRIC
138-38A

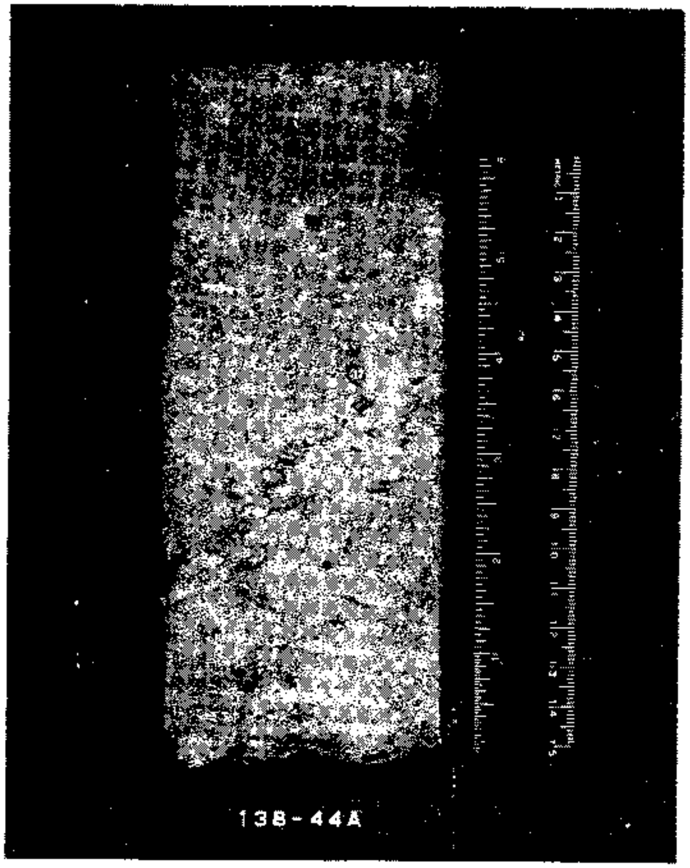

138-40A

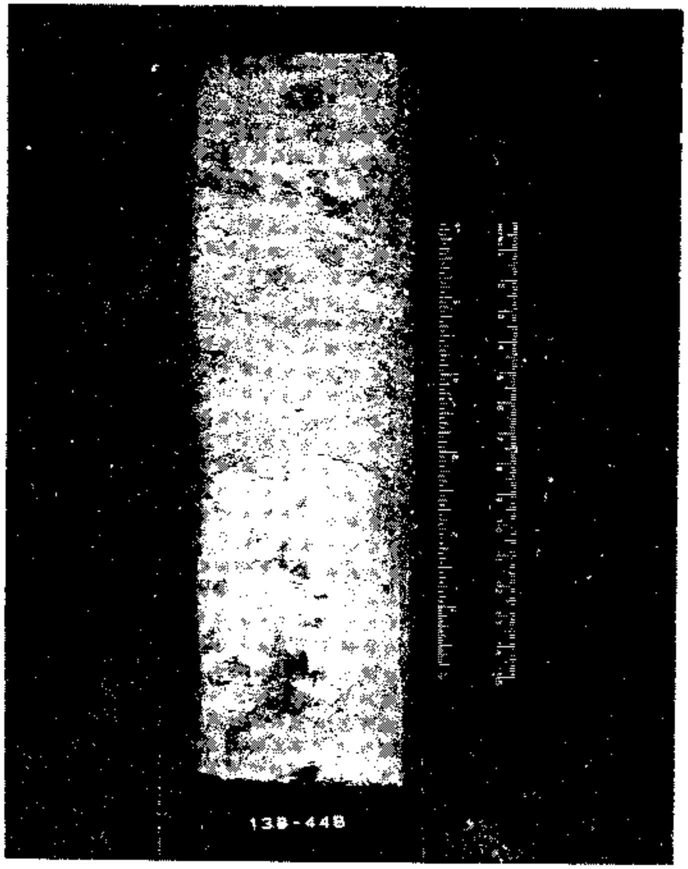


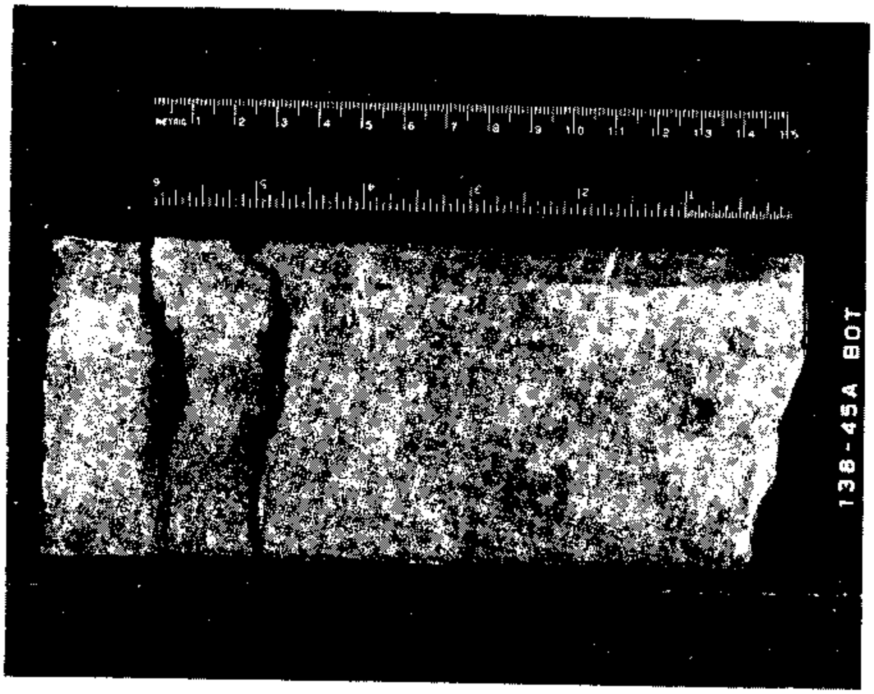
138-43B

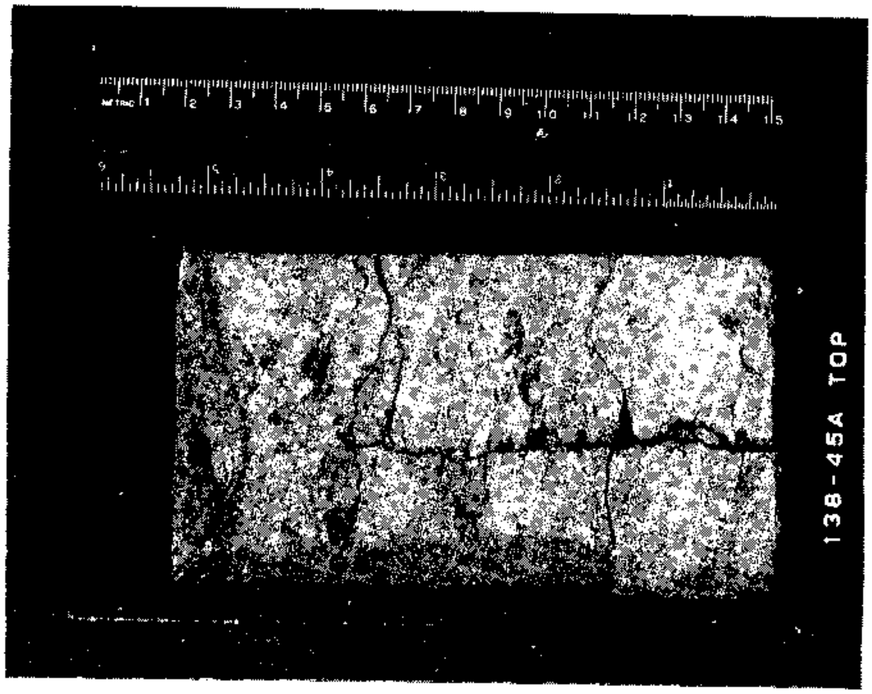


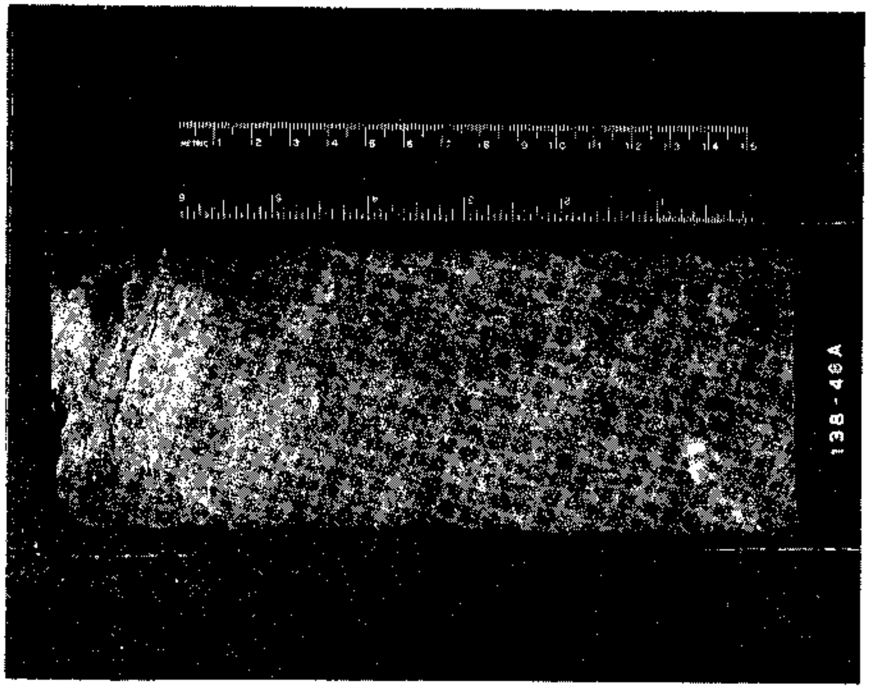
138-43A

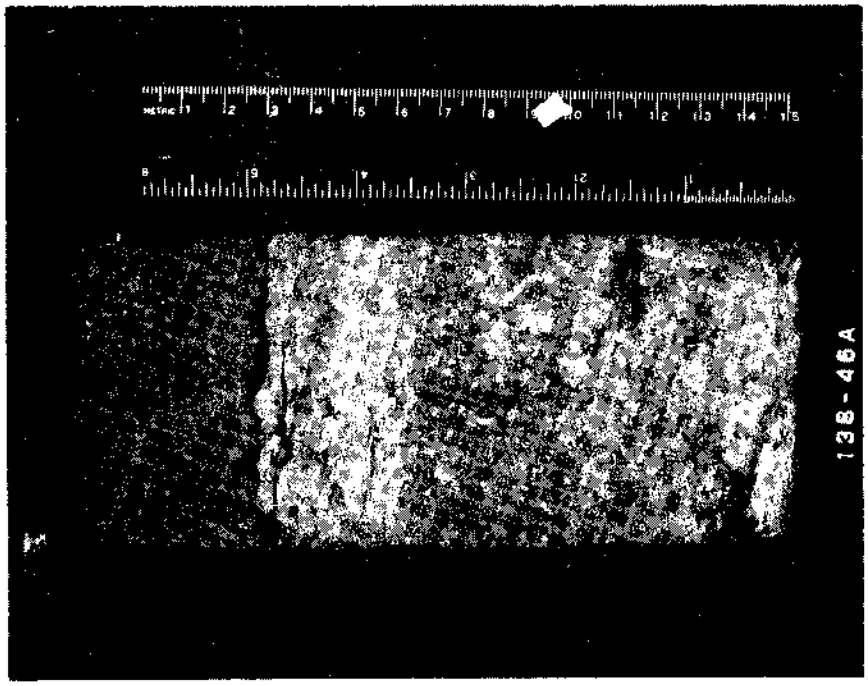

138-44A

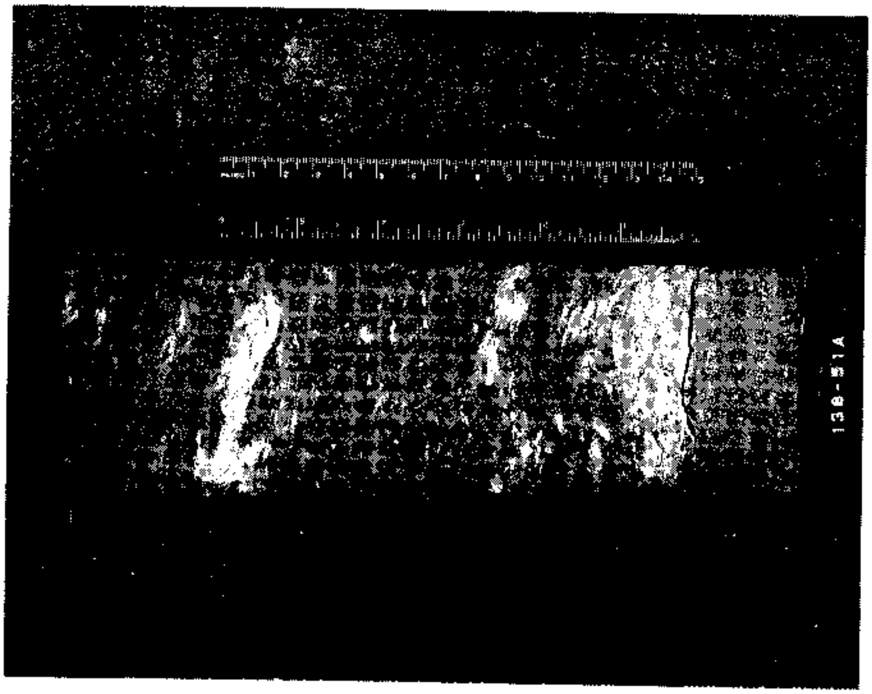

138-44B

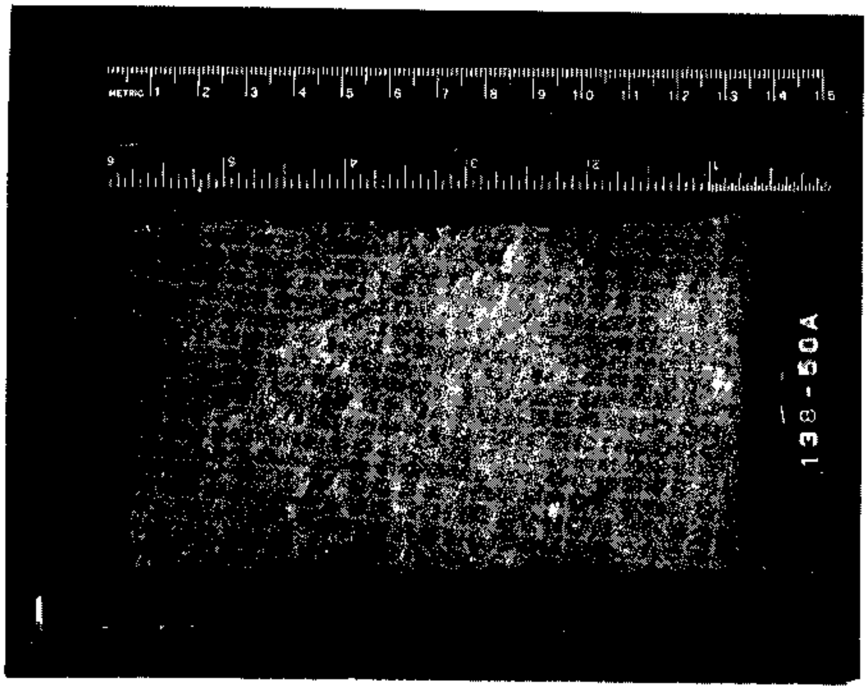

138-45A BOT

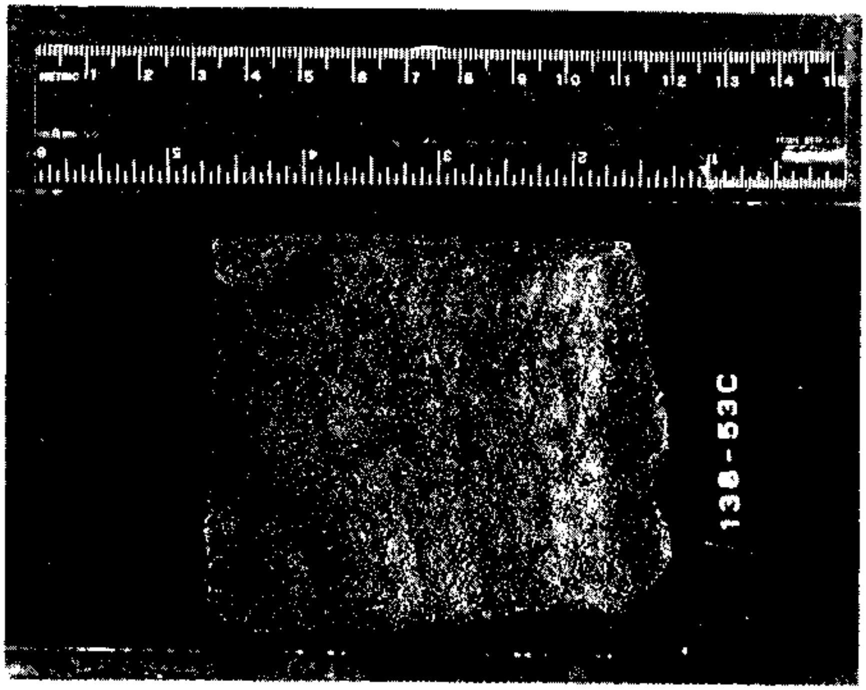

138-45A TOP

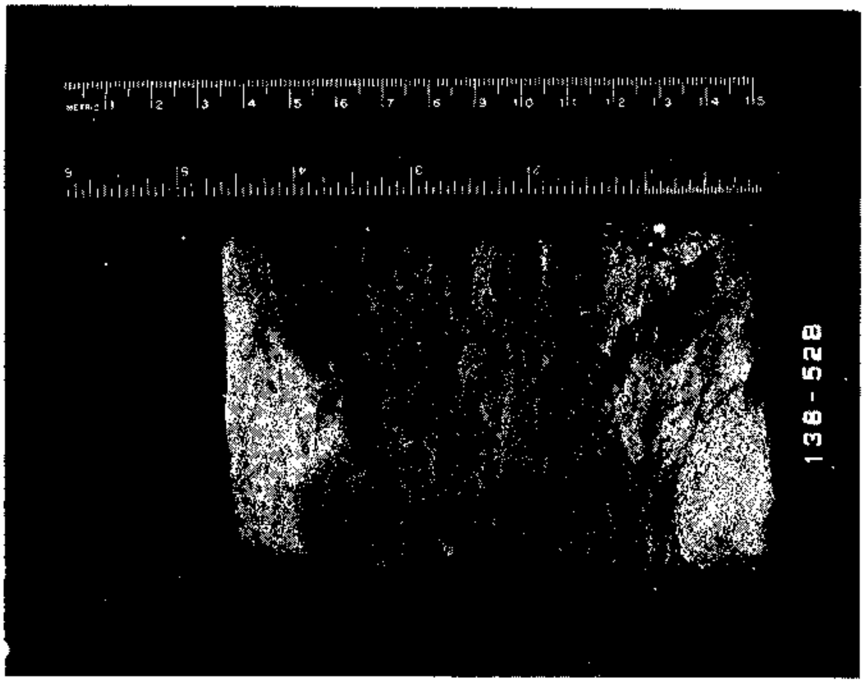

138-46A


138-46A


138-51A


METRIC
138-50A


METRIC
138-53C


METRIC
138-52B

Report

on

SOIL TESTING
UNDISTURBED SAMPLES, TERTIARY CLAYS
BORINGS 163 & 164
RIVER BEND POWER STATION
GULF STATE UTILITIES

Submitted to

STONE & WEBSTER ENGINEERING CORP.
Boston, Massachusetts

by

GEOTECHNICAL ENGINEERS, INC.
1017 Main Street
Winchester, Massachusetts 01890

Project 73113

April 1974

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1. **INTRODUCTION**

1.1 **PURPOSE**

The purpose of the laboratory testing program reported herein was to determine the engineering properties of undisturbed samples obtained from Borings 163 and 164 of the Tertiary clays from the site of the River Bend Power Station.

1.2 **SCOPE**

Forty-three 3-in. -diameter thin-wall tube samples were received corresponding to Boring 163 and 164 at depths of 148 ft to 206 ft, ranging in elevation between -44 and -110.

The schedule of tests is shown in Table I. The total number of tests that were performed is:

27 Natural Water Content Determinations
25 Atterberg Limits Tests
21 Unconsolidated-Undrained (Q) Triaxial Tests
6 Consolidation Tests

l.3 **AUTHORIZATION**

This work was authorized by Mr. David Greenwood under Purchase Order No. E-11563-3.

2. **SAMPLE DESCRIPTIONS**

The tube samples were divided into sections designated A, B, etc. starting at the top. A description of each section tested and the water content and Atterberg Limits for most sections are presented in the appendix. Specimens for Q Tests were taken from the bottom section of the tubes. Specimens for consolidation tests were taken from sections directly above each Q Test section.

The plasticity chart in Fig. 1 includes all determinations of liquid and plastic limits. The soil profiles shown in Figs. 29 and 30 include plots of water content and liquid and plastic limits with depth.

The great majority of the samples are a hard gray or greenish-gray fine sandy, silty clay. In almost all the samples, no horizontal or inclined stratification was evident. Some samples contained a very irregular pattern of zones of clay or sandy clay, the zones being not more than 1 cm thick. In some samples this irregular pattern assumes the appearance of marble with thin layers of clay or sandy clay which are contorted and displaced by what appears to be numerous shear failure surfaces. In the samples that do show horizontal or inclined stratification, there is no evidence of distortion of the layers at the edge of the sample.

The clay and sandy clay is hard and brittle, breaking easily along irregular surfaces that are oriented predominantly but not exclusively horizontal. When the soil is remolded at its natural water content, it breaks into blocks and becomes crumbly and has the feeling of a soil of low plasticity. However, after thorough remolding, the soil has a feeling of medium plasticity and toughness at water contents near the plastic limit. The Atterberg Limits were determined at least 24 hours after the soil had been thoroughly remolded with the addition of distilled water to increase the water content to slightly above the liquid limit. In the plasticity chart all the results plot above the A line with liquid limits mostly in the range of 30 to 50.

Triaxial Unconsolidated-Undrained (Q) Tests were performed on specimens taken from all tube samples from Boring 163, except for those for which the sample was a sand, the cutting edge of the tube was substantially damaged and/or the cross section of the tube was oval indicating probably major disturbance of the soil samples recovered. Four samples from Boring 164 were also tested.

Six Consolidation Tests were performed on clay samples from Boring 163.

3. UNCONSOLIDATED-UNDRAINED(Q)TESTS

Twenty-one Q Tests were performed on 1.4-in. diameter by 3.5-in. high undisturbed specimens.

The test specimens were trimmed from the 3-in. diameter tube samples to obtain a specimen from the less-disturbed core of the tube samples. A rubber membrane with a wall thickness of 0.05 cm was used to enclose the specimen. The end cap and base of the triaxial cell were covered with polyethylene and the drainage valves remained closed during the complete test to avoid changes in water content of the specimen. A chamber pressure equal to 2 kg/cm^2 was applied. The axial load was applied by means of deformation--controlled equipment at a rate of about 1% strain per minute. The axial load was measured with a calibrated proving ring. At the end of the test, all triaxial specimens showed one or more failure planes except for Samples 31 and 39 of Boring 163 for which the specimen had bulged with no evidence of shear planes.

The stress-strain curves for the Q Test are shown in Figs. 2 through 22 indicating with an arrow the point corresponding to $(\sigma_l - \sigma_3)_{max}$ at failure.

The deviator stress at failure was defined as either the maximum $(\sigma_1 - \sigma_3)$,

or the first peak reached in the deviator stress versus strain curve when it was followed by a decrease in resistance, even though for larger strains, the value of $(\sigma_l - \sigma_3)$ may have become larger than the first peak. The test re-

sults are tabulated in Tables II and III indicating for each test the compressive strength, i.e., $(\sigma_1 - \sigma_3)_{max}$ at failure, and the corresponding failure strain.

Also listed in Tables II and III are the water contents of the specimens and the Atterberg Limits determined on the trimmings. The soil profiles in Figs. 29 and 30 include plots of compressive strength versus depth, indicating also the failure strain.

4. CONSOLIDATION TESTS

Six consolidation tests were performed on undisturbed specimens selected to provide test results along the complete profile and to test the least-disturbed samples. An indication concerning the degree of disturbance of the samples was obtained from the shape of the stress-strain curves and the magnitude of the failure strain in the triaxial Q tests.

The consolidation test specimens had diameters ranging between 6.39 cm (2.52 in.) to 7.10 cm (2.80 in.), and a height of 1.25 cm (0.5 in.). The tests were performed in a floating ring with drainage allowed through porous stones at both ends of the specimen. The consolidation stress was applied in increments starting with approximately .10 kg/cm^2 and then the stress was approximately doubled each time up to a load of approximately 6 kg/cm^2. Up to this stress, the specimens and porous stones were kept from drying by surrounding them with wet paper towels. At the end of the 6 kg/cm^2 stress application and before the first unloading, the specimens were flooded. No measurable change in rate of deformation took place as a result of flooding. The specimens then were unloaded to a stress of approximately 2 kg/cm^2, and then reloaded to a stress of approximately 20 kg/cm$^{2.}$

The time of loading for each stress increment was such that one could accurately define the deformation at 1000 min. At 1000 min. the deformation was well into the secondary phase in all cases. For the smaller stresses up to approximately 1.5 kg/cm^2 a time of loading of about 4 hours was sufficient while for stresses of approximately 3 kg/cm^2 or larger, each load was generally left for about 24 hours before applying the next load.

The compression curves, Figs. 23 to 28 are plotted for the deformation corresponding to 1000 mins. after application of each load increment. They were either read directly from the time curves or estimated by extrapolation.

A probable range for the preconsolidation pressure was estimated by applying the Casagrande Construction to a range of smooth curves that fit the experimental points of the compression curves, with an arrow indicating the preconsolidation pressure corresponding to the curves plotted in Figs. 24 to 28. The estimated range of preconsolidation pressure and the computed in-situ effective vertical stress are shown in Figs. 23 to 28 and are plotted versus depth in the soil profiles in Fig. 29. No estimate of preconsolidation was made for the test on Sample 30, Boring 163 because the compression curve indicates some disturbance of the sample.

Table IV lists all consolidation tests performed including the initial water content of the specimens and the Atterberg Limits determined on the trimmings.

TABLE I

SCHEDULE OF TESTS

Boring No.	Sample No.	Water Contents and Limits	Triaxial Q Test	Consolidation Test
163	30	X (2)	X	X
	31	X	X	
	36	X (2)	X	X
	37	X	X	
	38	X (2)	X	X
	39	X	X	
	40	X (2)	X	X
	41	X	X	
	42	X	X	
	43	X	X	
	44	X	X	
	45	X (2)	X	X
	46	X (*)	X	
	47	X	X	
	48	X	X	
	49	X	X	
	50	X (2)	X	X
164	31	X	X	
	35	X	X	
	36	X	X	
	43	X (*)	X	

Note: Number in parentheses indicates number of tests when more than one was performed.

(*) No Atterberg Limits run

TABLE II

UNCONSOLIDATED-UNDRAINED (Q) TRIAXIAL TESTS - BORING 163

Sample and Section No.	Water Content %	Liquid Limit LL	Plastic Limit PL	Plasticity Index PI	Chamber Pressure σ_c kg/cm^2	$(\sigma_1 - \sigma_3)$ at Failure kg/cm^2	Axial Strain at Failure %
30C	26.7	27.6	15.6	12.0	2.0	1.89	3.0
31D	29.9	38.5	18.6	19.9	2.0	2.26	8.1
36D	27.6	36.3	20.6	15.7	2.0	3.99	3.4
37D	26.3	35.3	14.4	20.9	2.0	9.34	2.0
38D	27.5	36.6	20.1	16.5	2.0	4.16	3.2
39D	30.2	33.0	22.5	10.5	2.0	2.87	11.3
40C	26.9	38.4	18.0	20.4	2.0	7.02	4.3
41C	26.7	45.8	17.9	27.9	2.0	5.00	2.0
42D	29.0	43.2	18.1	25.1	2.0	5.93	3.4
43C	29.5	35.9	15.9	20.0	2.0	4.20	18.4
44D	25.9	30.6	19.1	11.5	2.0	4.83	3.4
45D	27.9	39.7	15.7	24.0	2.0	5.18	2.4
46D	28.5				2.0	3.52	14.8
47D	25.4	32.9	21.8	11.1	2.0	4.37	8.5
48C	24.0	36.5	17.7	18.8	2.0	6.08	7.2
49D	27.3	36.8	18.0	18.8	2.0	4.88	8.5
50D	26.7	42.3	20.0	22.3	2.0	5.67	5.7

TABLE III

UNCONSOLIDATED-UNDRAINED (Q) TRIAXIAL TESTS - BORING 164

Sample and Section No.	Water Content %	Liquid Limit LL	Plastic Limit PL	Plasticity Index PI	Chamber Pressure σ_c kg/cm^2	$(\sigma_1 - \sigma_3)$ at Failure kg/cm^2	Axial Strain at Failure %
31D	28.1	42.0	20.9	21.1	2.0	3.12	3.2
35C	29.1	34.3	17.6	16.7	2.0	2.91	11.5
36C	31.2	47.3	19.7	27.6	2.0	1.70	6.8
43B	27.5				2.0	3.17	6.4

TABLE IV

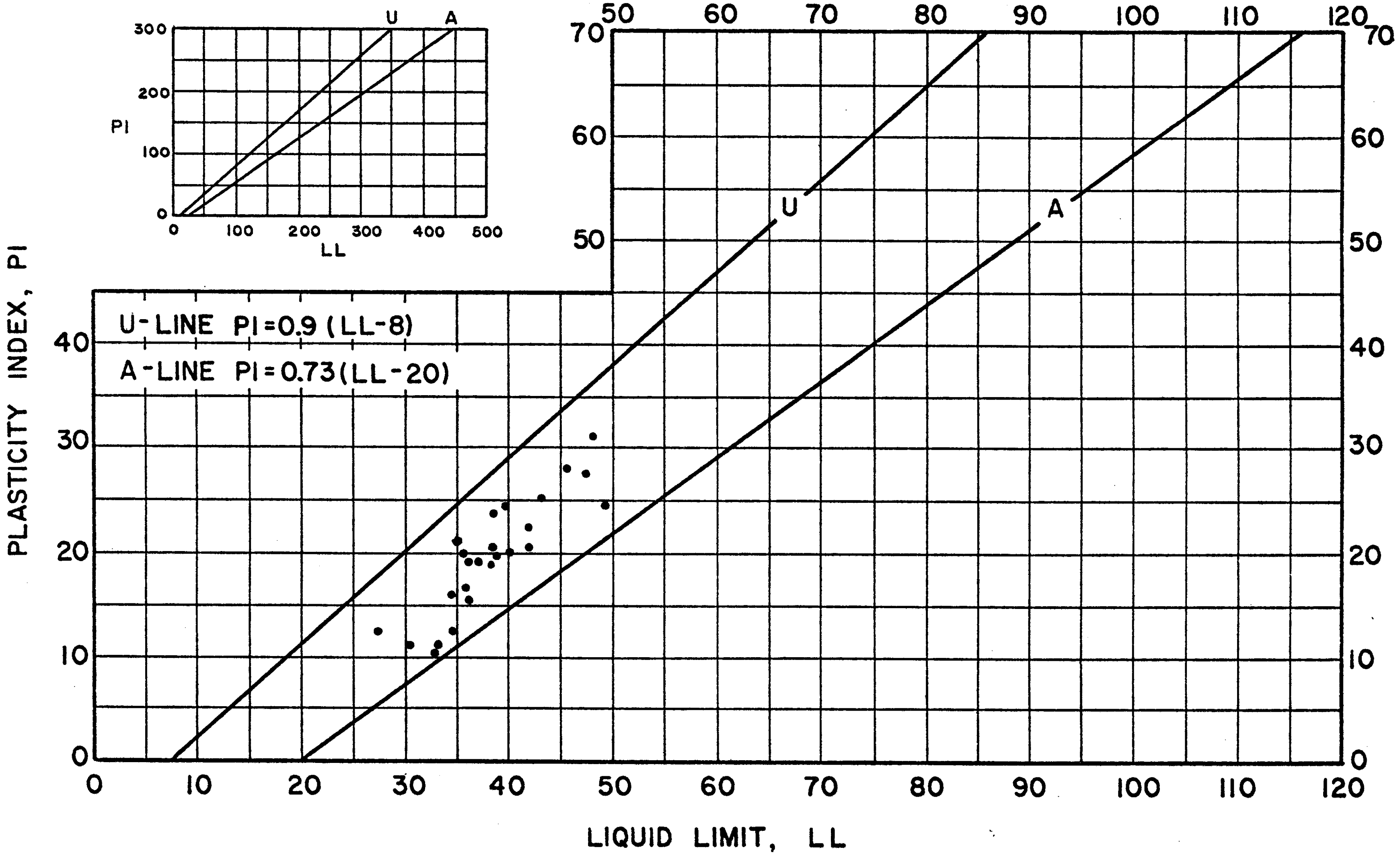
CONSOLIDATION TESTS

Boring No. 163

Sample and Section No.	Water Content %	Liquid Limit LL	Plastic Limit PL	Plasticity Index PI	In-Situ Effective Vertical Stress (1) kg/cm^2	Estimated Range of Preconsolidation Pressure kg/cm^2
30A	35.5	49.6	24.9	24.7	6.07	—
36C	26.8	38.0	15.1	23.9	6.58	8.4 - 13.2
38C	28.8	37.9	19.3	18.6	6.72	8.1 - 12.4
40A	29.6	34.8	22.3	12.5	6.87	7.3 - 11.0
45C	26.7	40.3	20.2	20.1	7.51	7.5 - 12.0
50C	28.7	48.2	16.5	31.7	7.60	7.5 - 12.0

(1) Computed on the basis of the following:

Ground Surface Elevation	+103.3 ft
Ground Table Elevation	+57.0 ft



Stone & Webster Eng. Corp.
Boston, Massachusetts

Geotechnical Engineers, Inc.
Winchester, Massachusetts

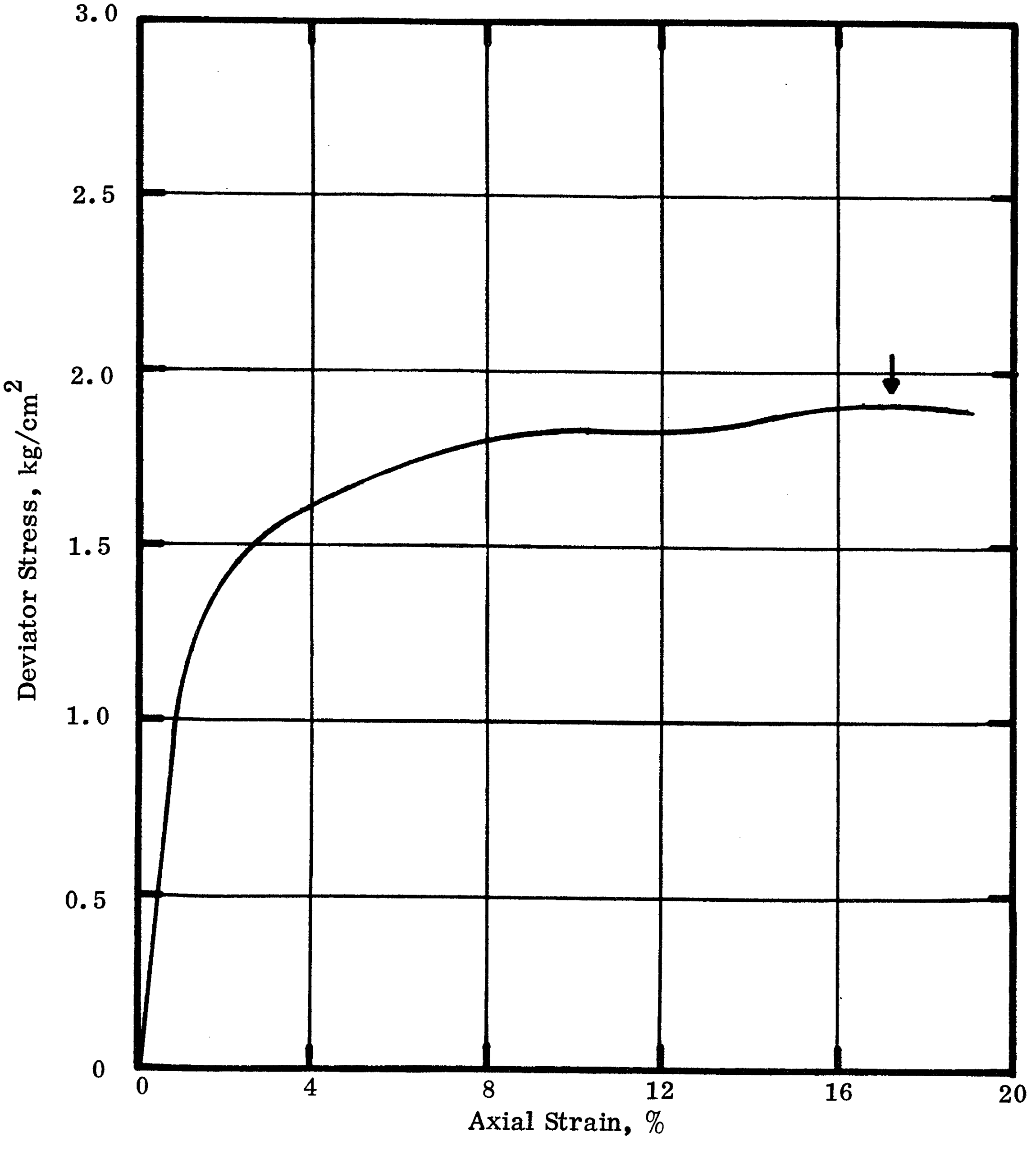
River Bend Power Station
Gulf States Utilities

Project 73113

PLASTICITY CHART
Borings 163 and 164
Depths 148 ft to 206 ft

April , 1974

Fig. 1

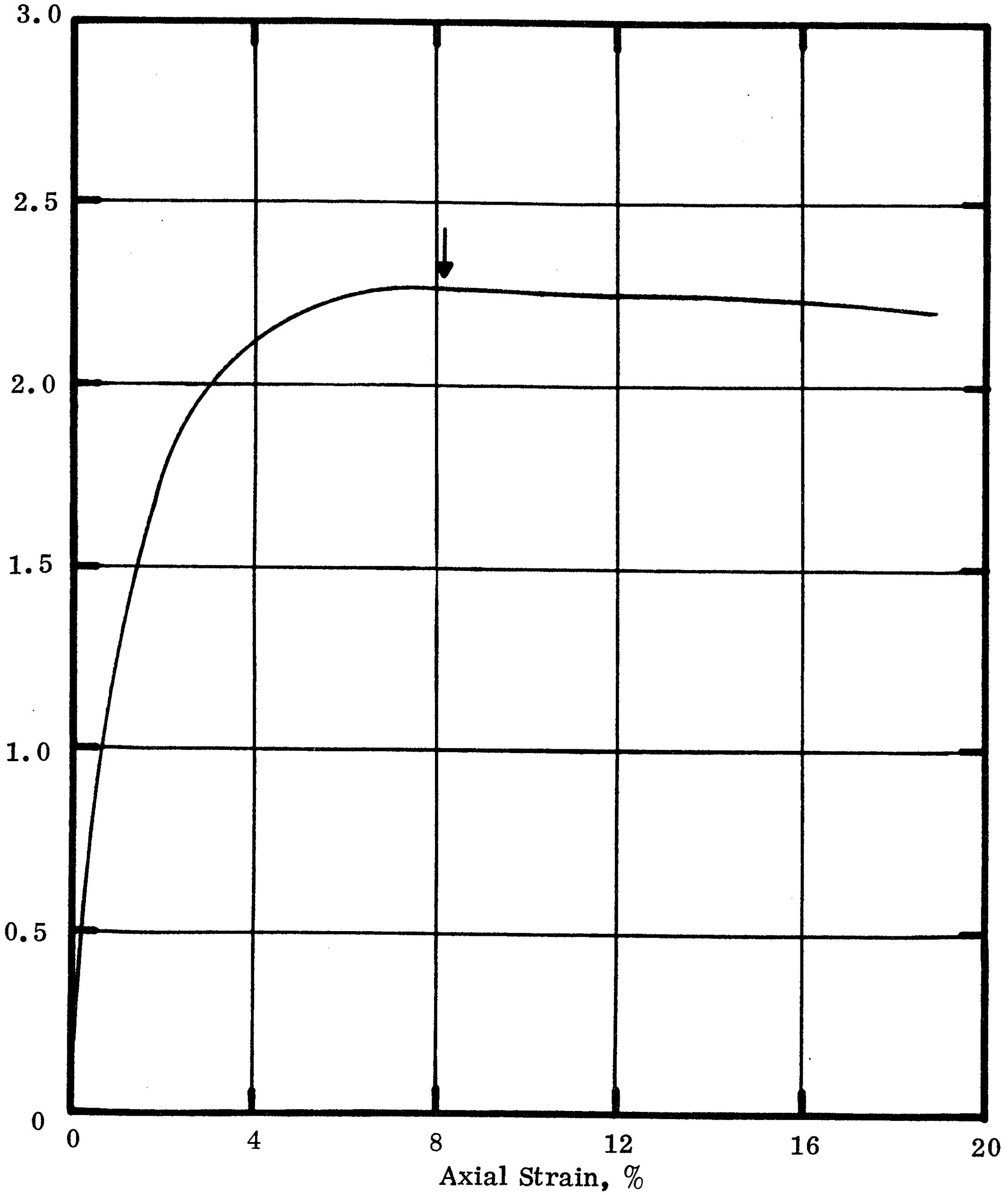


Arrow indicates axial strain at failure deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 26.7%
LL = 27.6
PL = 15.6
PI = 12.0

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	Q TEST Boring 163 Sample 30C
Geotechnical Engineers, Inc. Winchester, Massachusetts	Project 73113	April , 1974 Fig. 2



Arrow indicates axial strain at
failure deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 29.9%
LL = 38.5
PL = 18.6
PI = 19.9

$\sigma_c = 2\ kg/cm^2$

Stone & Webster Eng. Corp.
Boston, Massachusetts

Geotechnical Engineers, Inc.
Winchester, Massachusetts

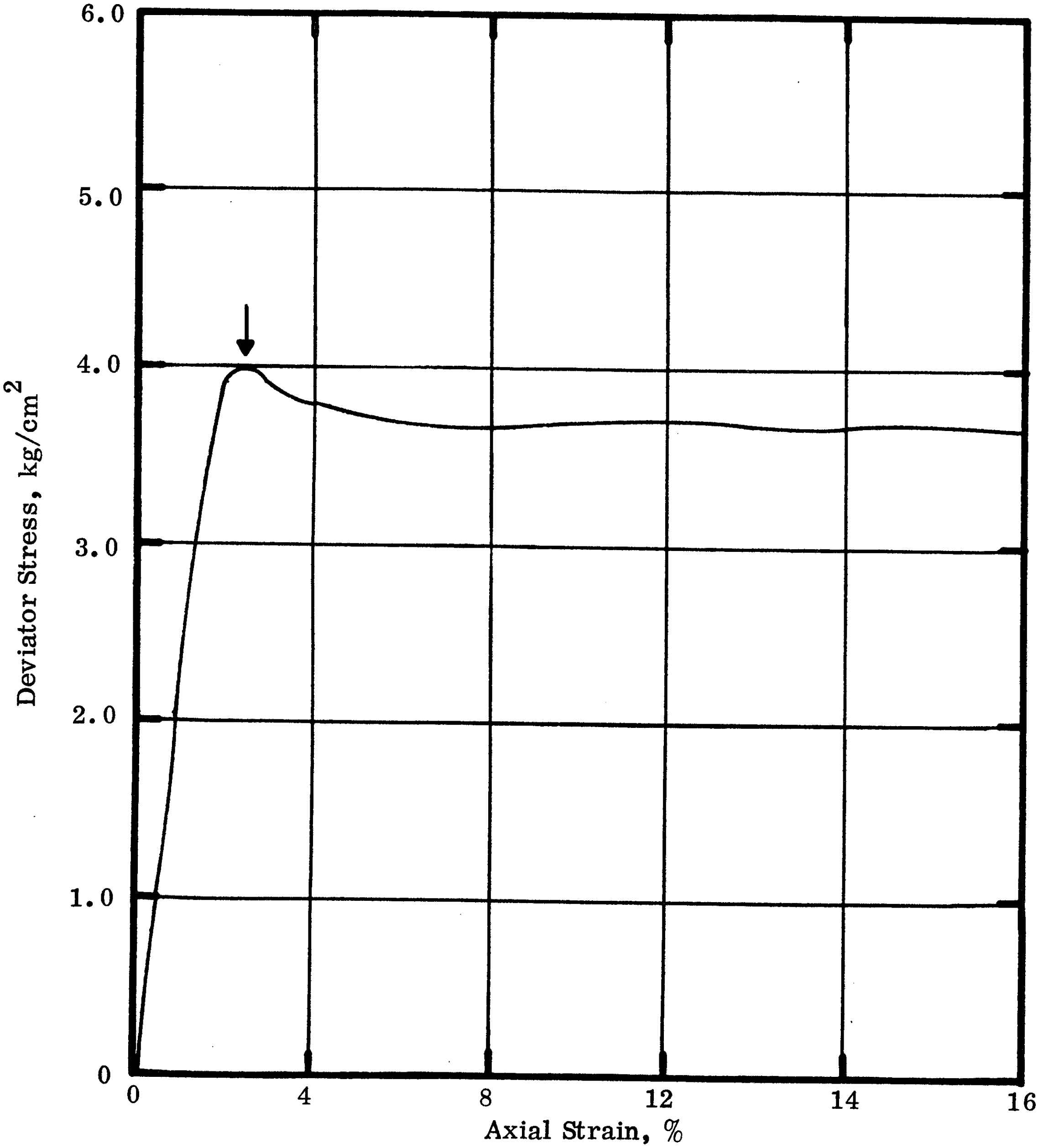
River Bend Power Station
Gulf States Utilities

Project 73113

Q TEST
Boring 163
Sample 31D

April, 1974

Fig. 3

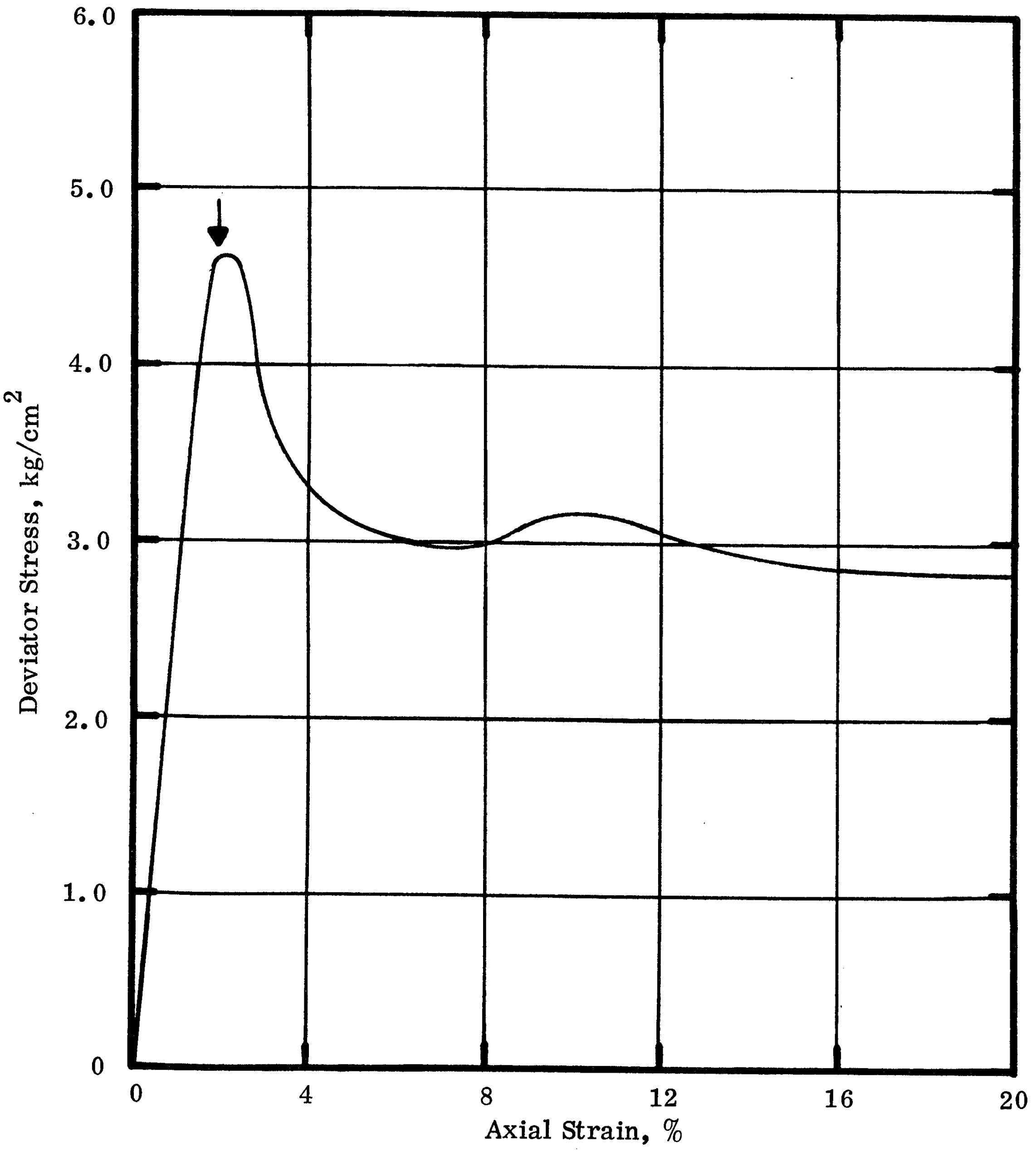


Arrow indicates axial strain at failure deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 27.6%
LL = 36.3
PL = 20.6
PI = 15.7

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	Q TEST Boring 163 Sample 36D
Geotechnical Engineers, Inc. Winchester, Massachusetts	Project 73113	April, 1974 Fig. 4

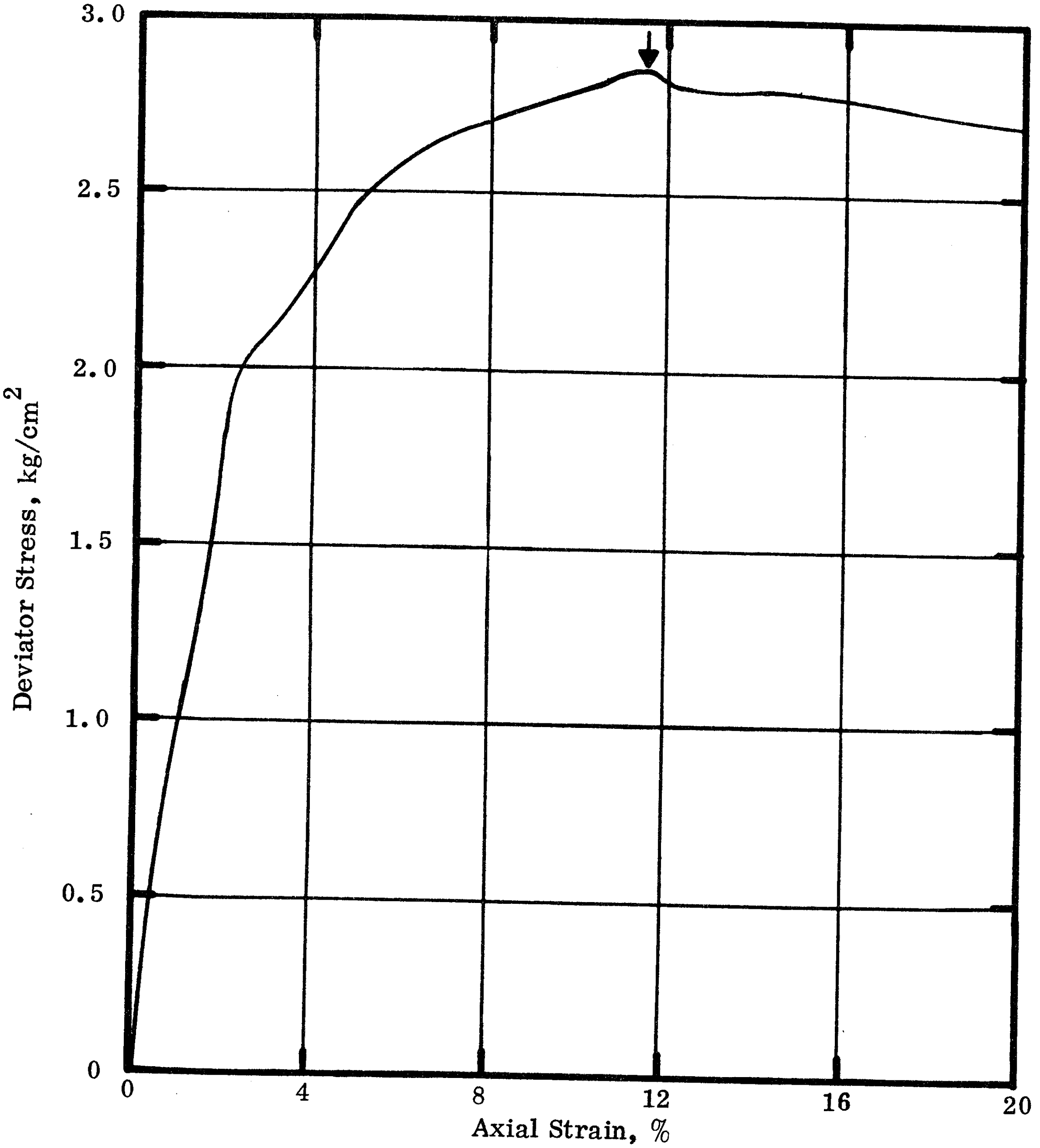


Arrow indicates axial strain at failure deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 26.3%
LL = 35.3
PL = 14.4
PI = 20.9

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	Q TEST Boring 163 Sample 37D
Geotechnical Engineers, Inc. Winchester, Massachusetts	Project 73113	April, 1974 Fig. 5

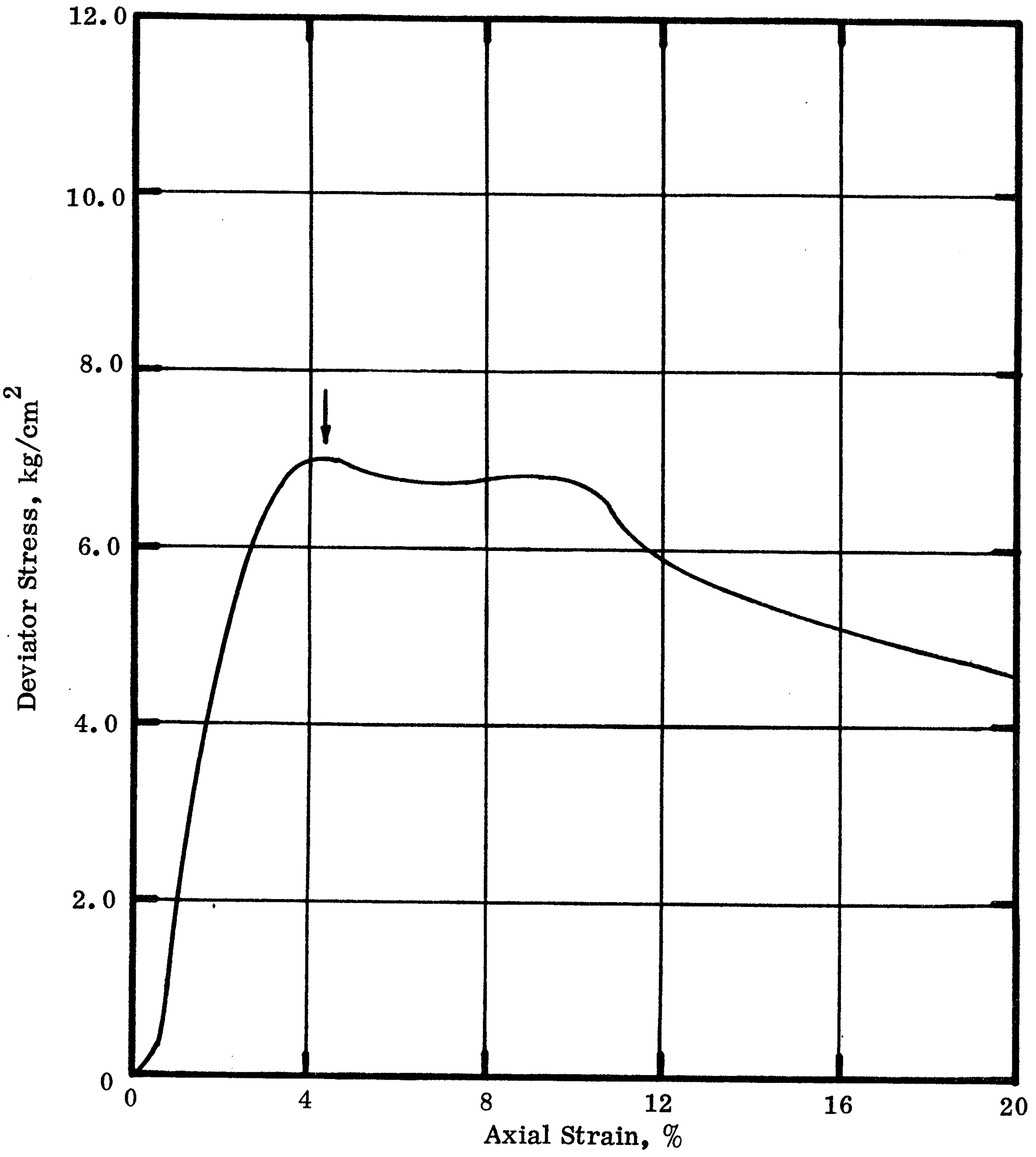


Arrow indicates axial strain at failure deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 30.2%
LL = 33.0
PL = 22.5
PI = 10.5

$\sigma_c = 2$ kg/cm^2

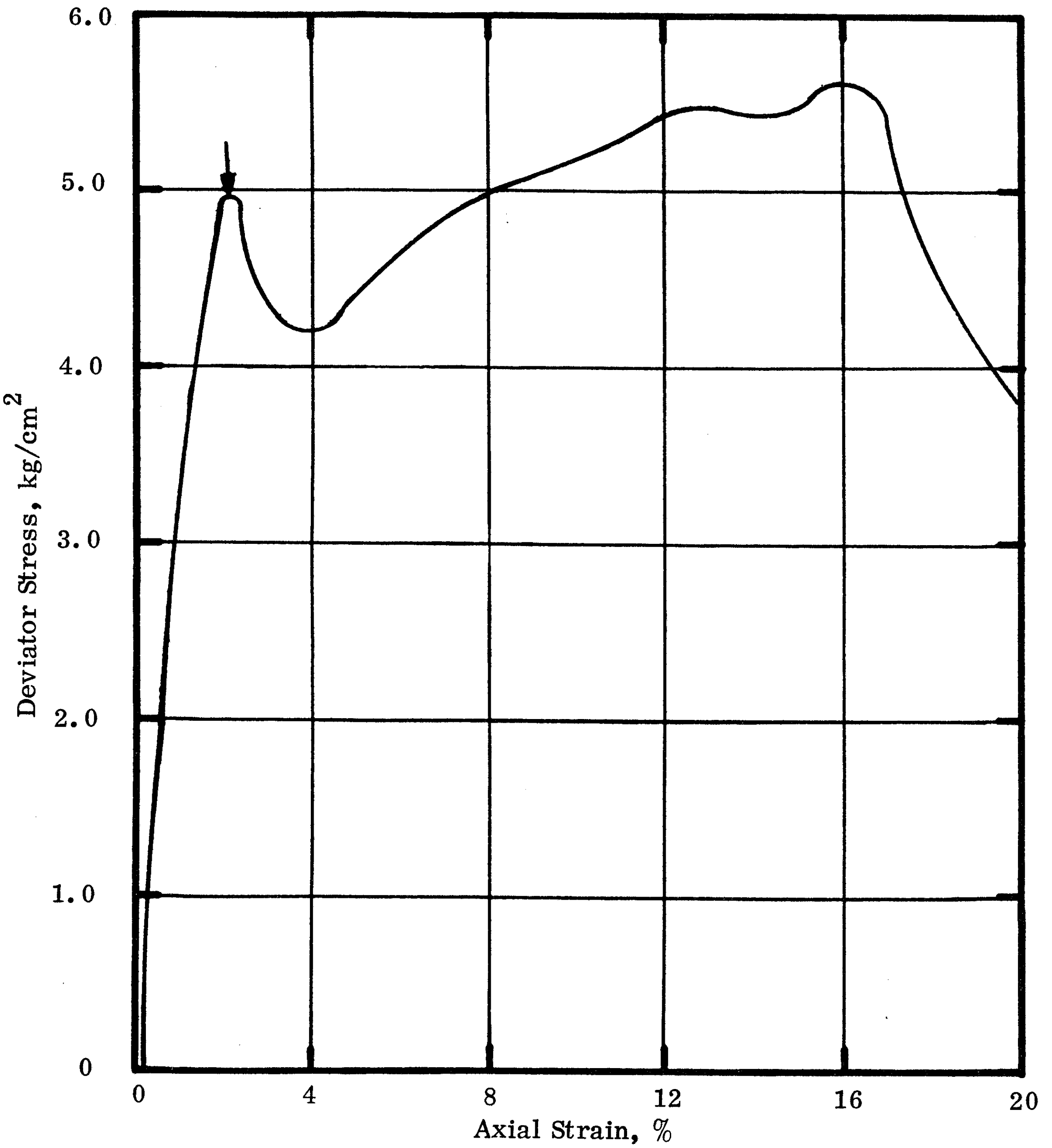
Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	Q TEST Boring 163 Sample 39D
Geotechnical Engineers, Inc. Winchester, Massachusetts	Project 73113	April, 1974 Fig. 7



Arrow indicates axial strain at failure deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 26.9%
LL = 38.4
PL = 18.0
PI = 20.4

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	Q TEST Boring 163 Sample 40C
Geotechnical Engineers, Inc. Winchester, Massachusetts	Project 73113	April, 1974 Fig. 8

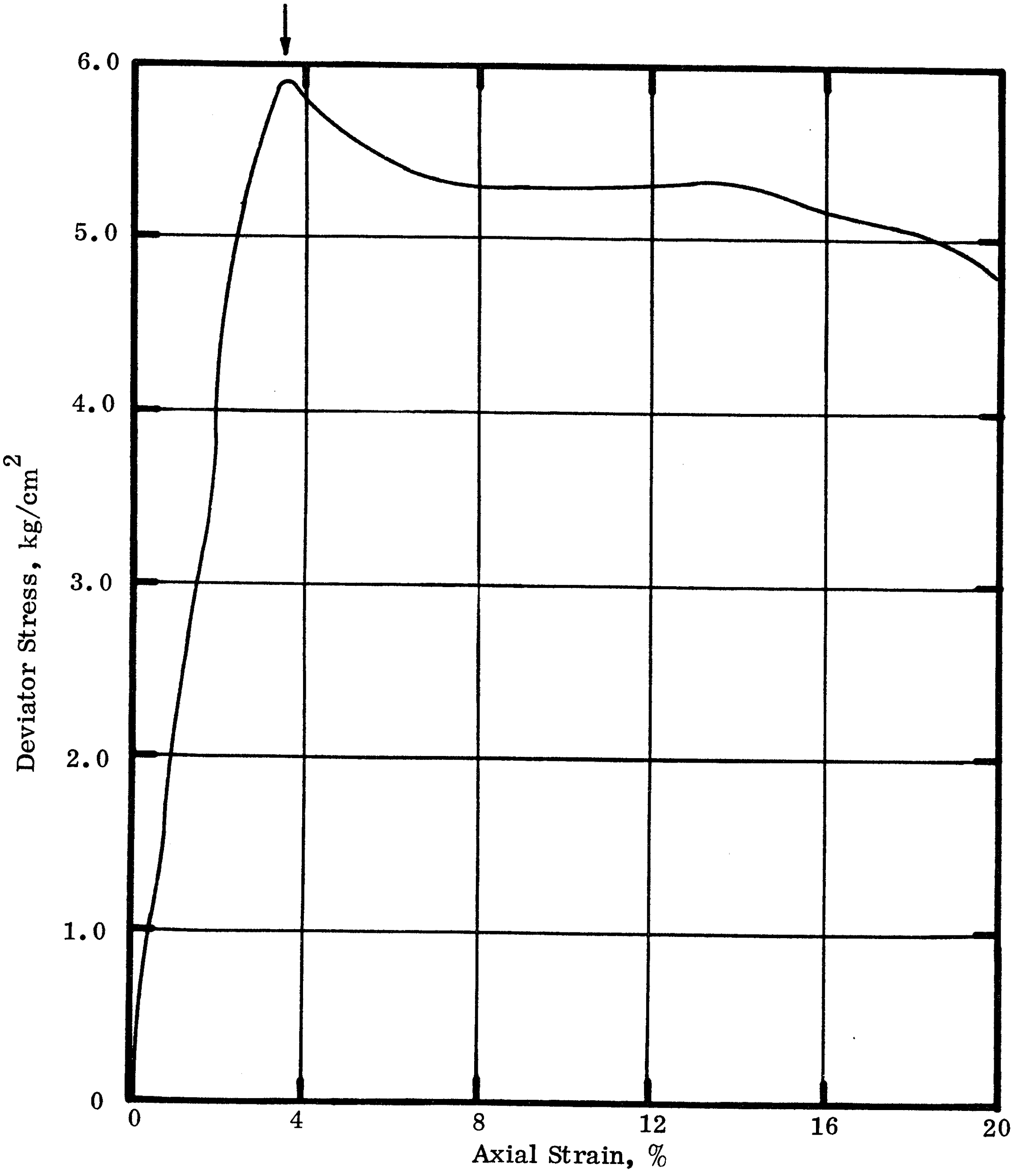


Arrow indicates axial strain at failure deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 26.7%
LL = 45.8
PL = 17.9
PI = 27.9

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	Q TEST Boring 163 Sample 41C
Geotechnical Engineers, Inc. Winchester, Massachusetts	Project 73113	April, 1974 Fig. 9

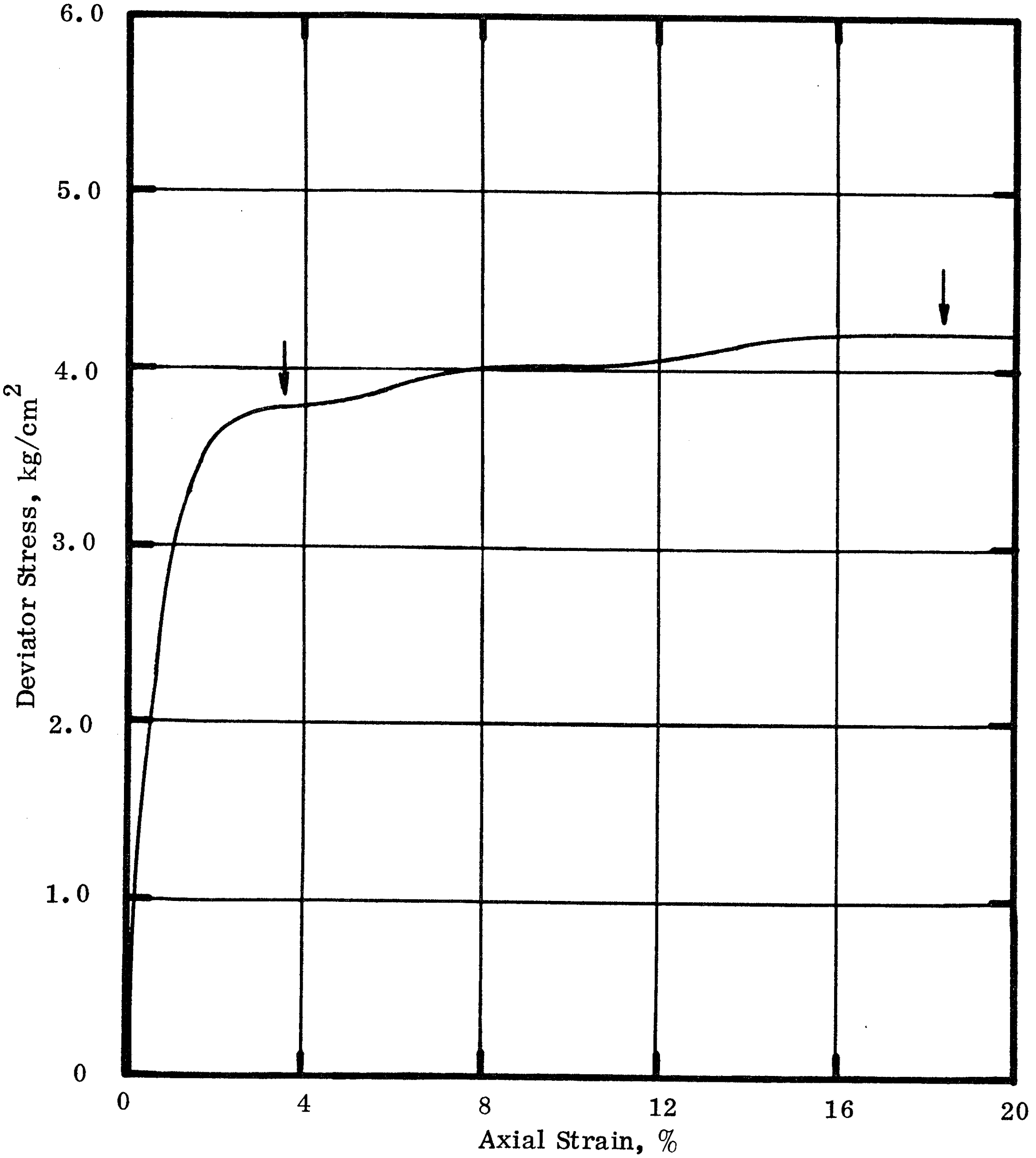


Arrow indicates axial strain at failure deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 29.0%
LL = 43.2
PL = 18.1
PI = 25.1

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	Q TEST Boring 163 Sample 42D
Geotechnical Engineers, Inc. Winchester, Massachusetts	Project 73113	April, 1974 Fig. 10

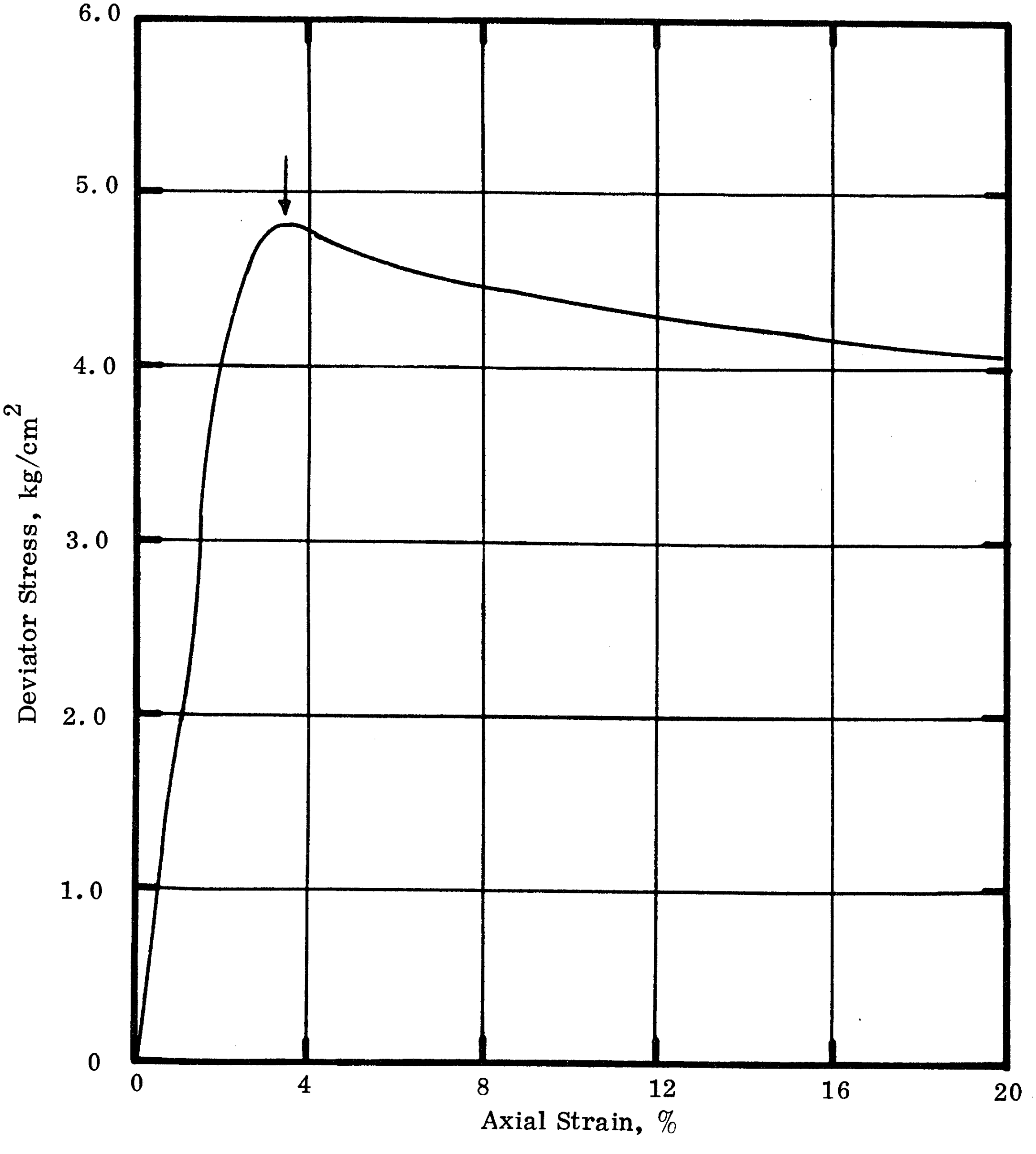


Arrow indicates axial strain at failure deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 29.5%
LL = 35.9
PL = 15.9
PI = 20.0

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	Q TEST Boring 163 Sample 30C
Geotechnical Engineers, Inc. Winchester, Massachusetts	Project 73113	April, 1974 Fig. 11

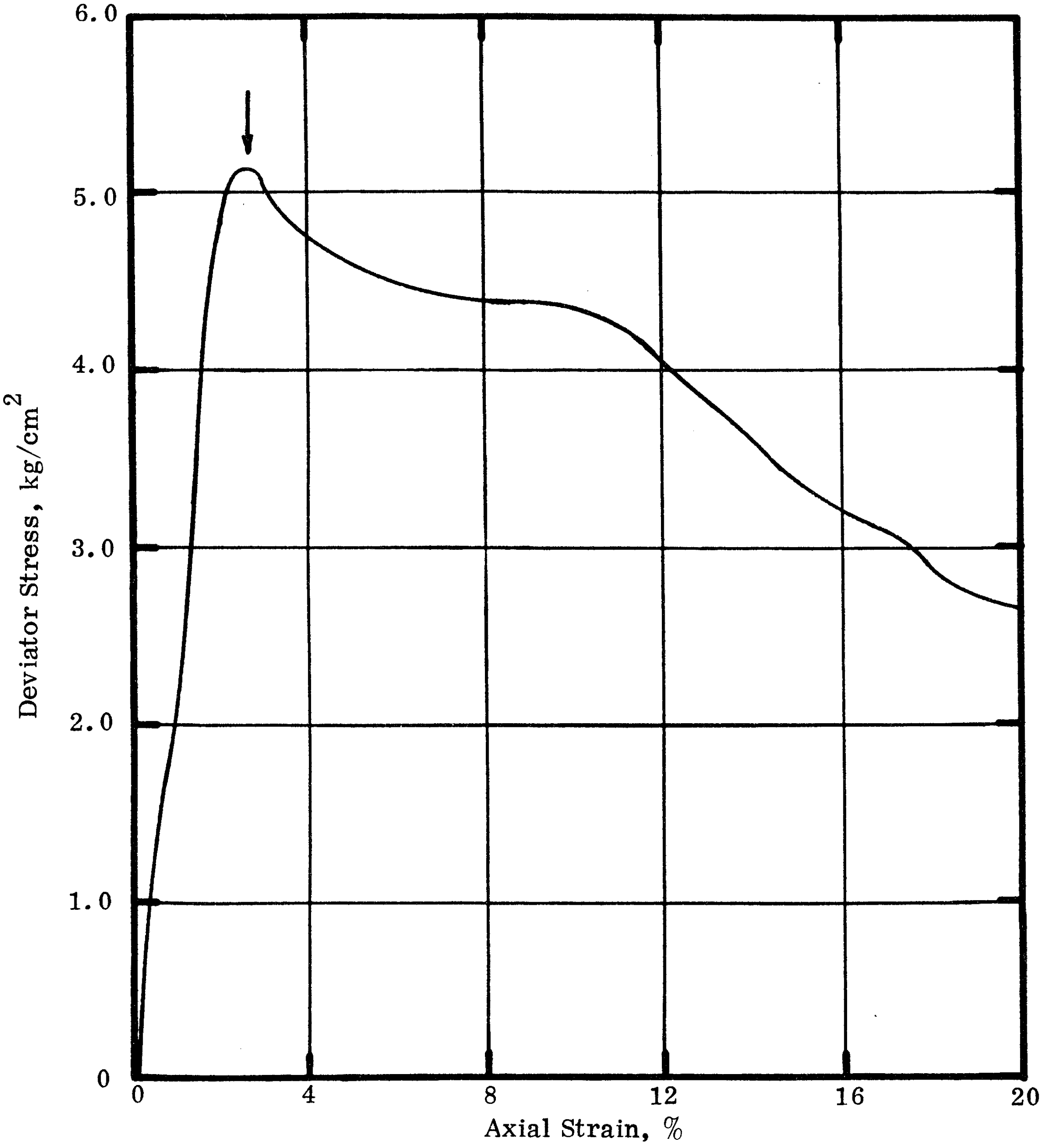


Arrow indicates axial strain at failure deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 25.9%
LL = 30.6
PL = 19.1
PI = 11.5

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	Q TEST Boring 163 Sample 44D
Geotechnical Engineers, Inc. Winchester, Massachusetts	Project 73113	April, 1974 Fig. 12

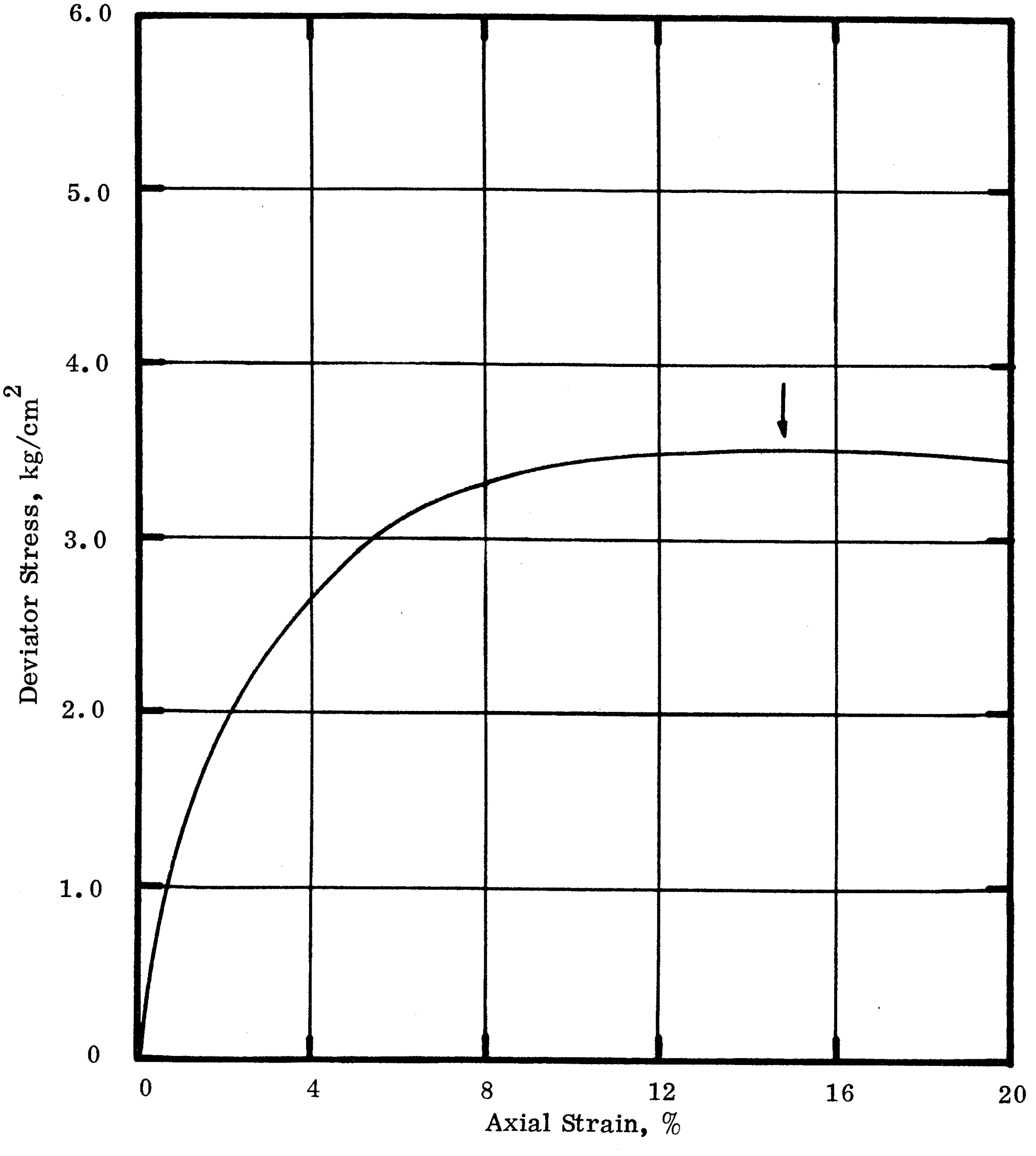


Arrow indicates axial strain at failure deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 27.9%
LL = 39.7
PL = 15.7
PI = 24.0

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	Q TEST Boring 163 Sample 45D
Geotechnical Engineers, Inc. Winchester, Massachusetts	Project 73113	April, 1974 Fig. 13

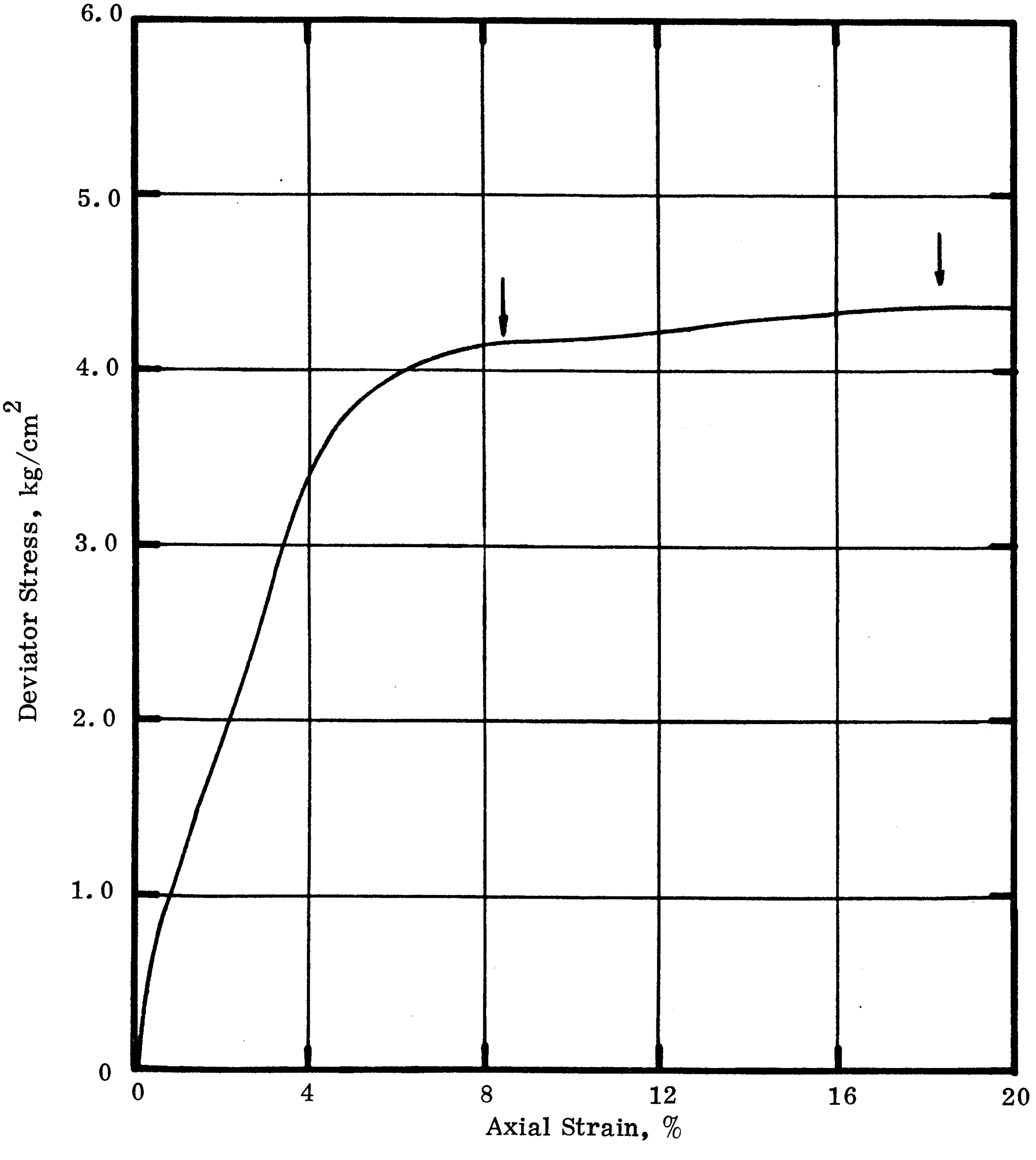


Arrow indicates axial strain at failure deviator stress, $(\sigma_1 - \sigma_3)_{max}$

$w_i = 28.5$

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	Q TEST Boring 163 Sample 46D
Geotechnical Engineers, Inc. Winchester, Massachusetts	Project 73113	April, 1974 Fig. 14

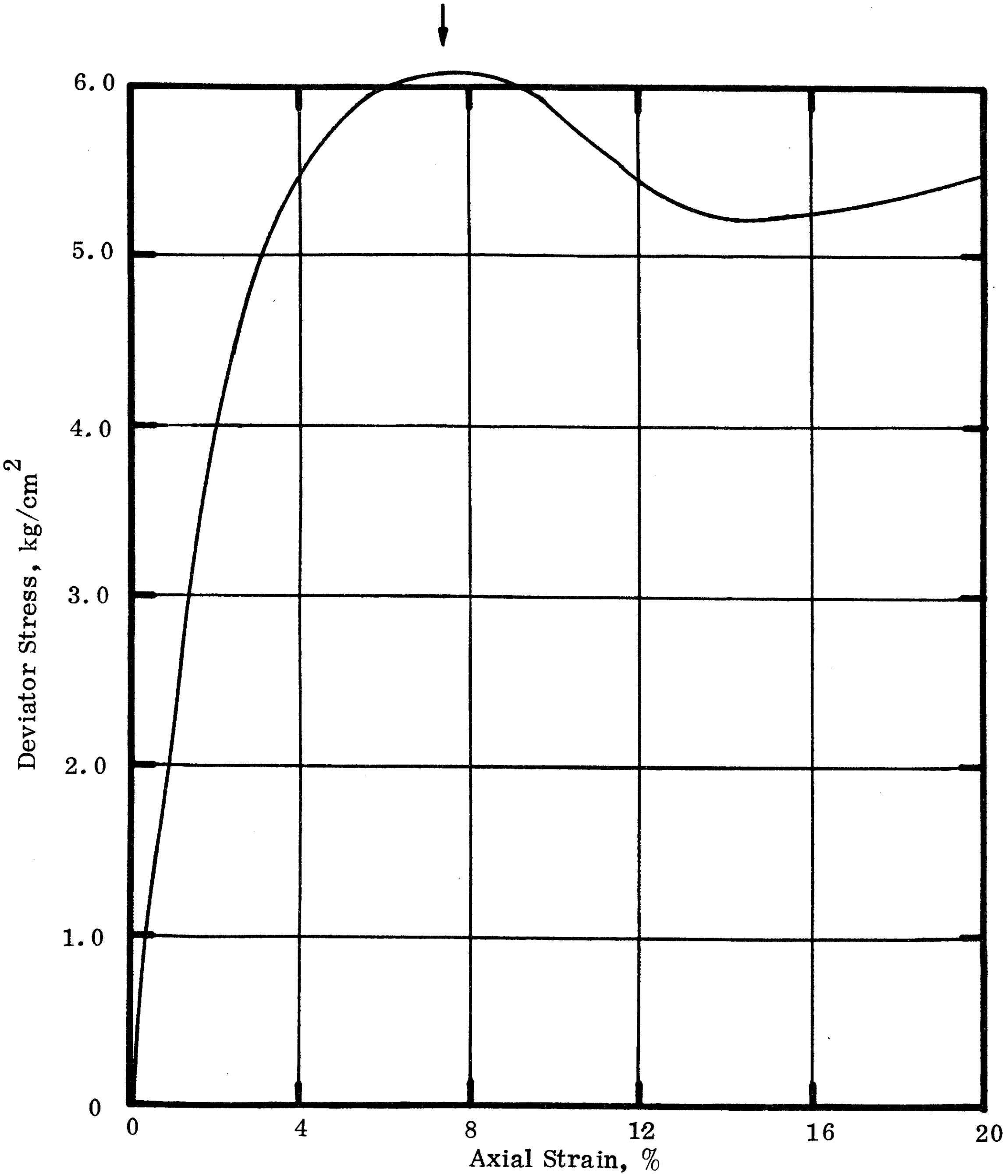


Arrow indicates axial strain at failure deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 25.4%
LL = 32.9
PL = 21.8
PI = 11.1

$\sigma_c = 2$ kg/cm^2

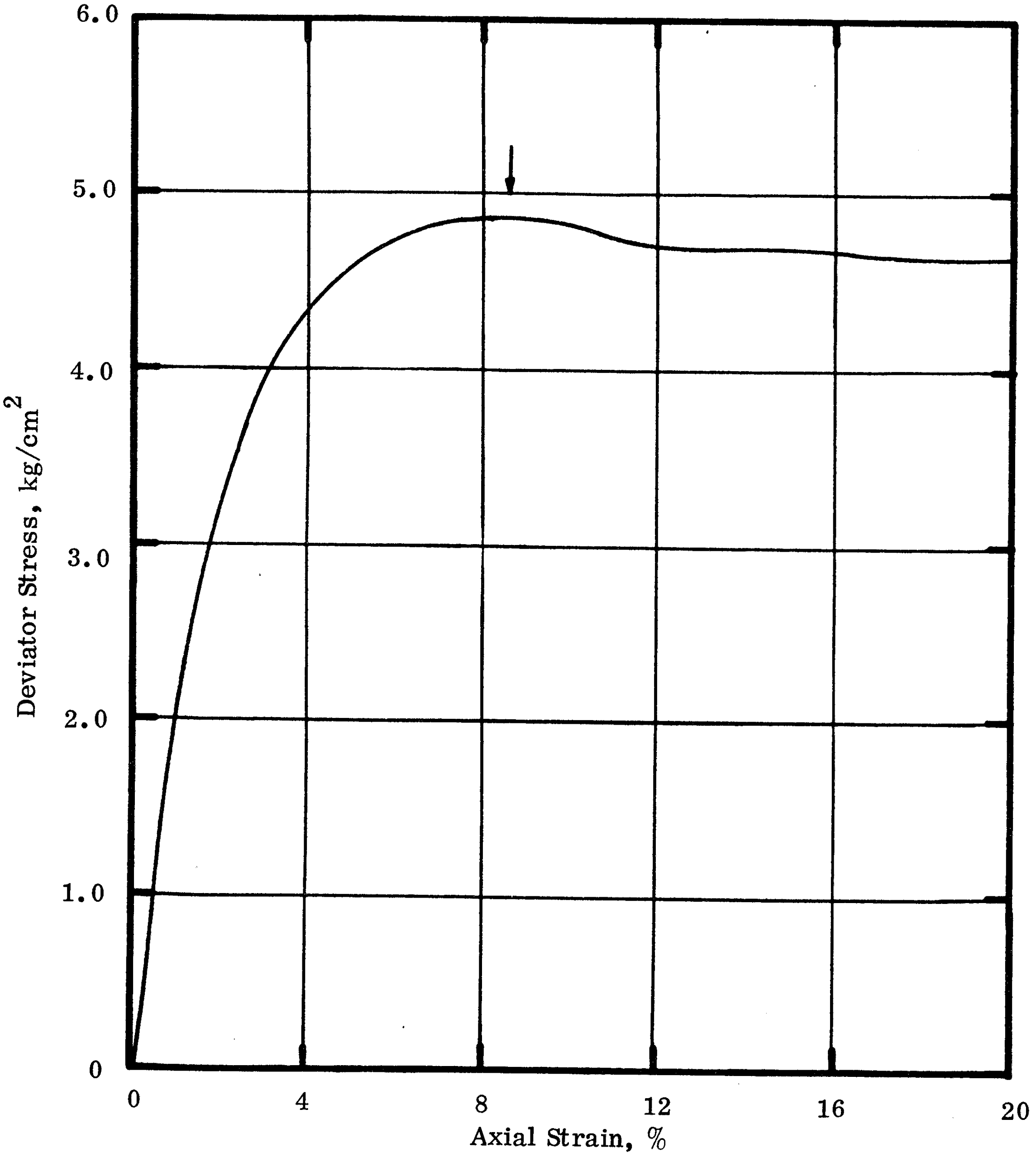
Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	Q TEST Boring 163 Sample 47D
Geotechnical Engineers, Inc. Winchester, Massachusetts	Project 73113	April, 1974 Fig. 15



Arrow indicates axial strain at failure deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 24.0%
LL = 36.5
PL = 17.7
PI = 18.8

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	Q TEST Boring 163 Sample 48C
Geotechnical Engineers, Inc. Winchester, Massachusetts	Project 73113	April, 1974 Fig. 16

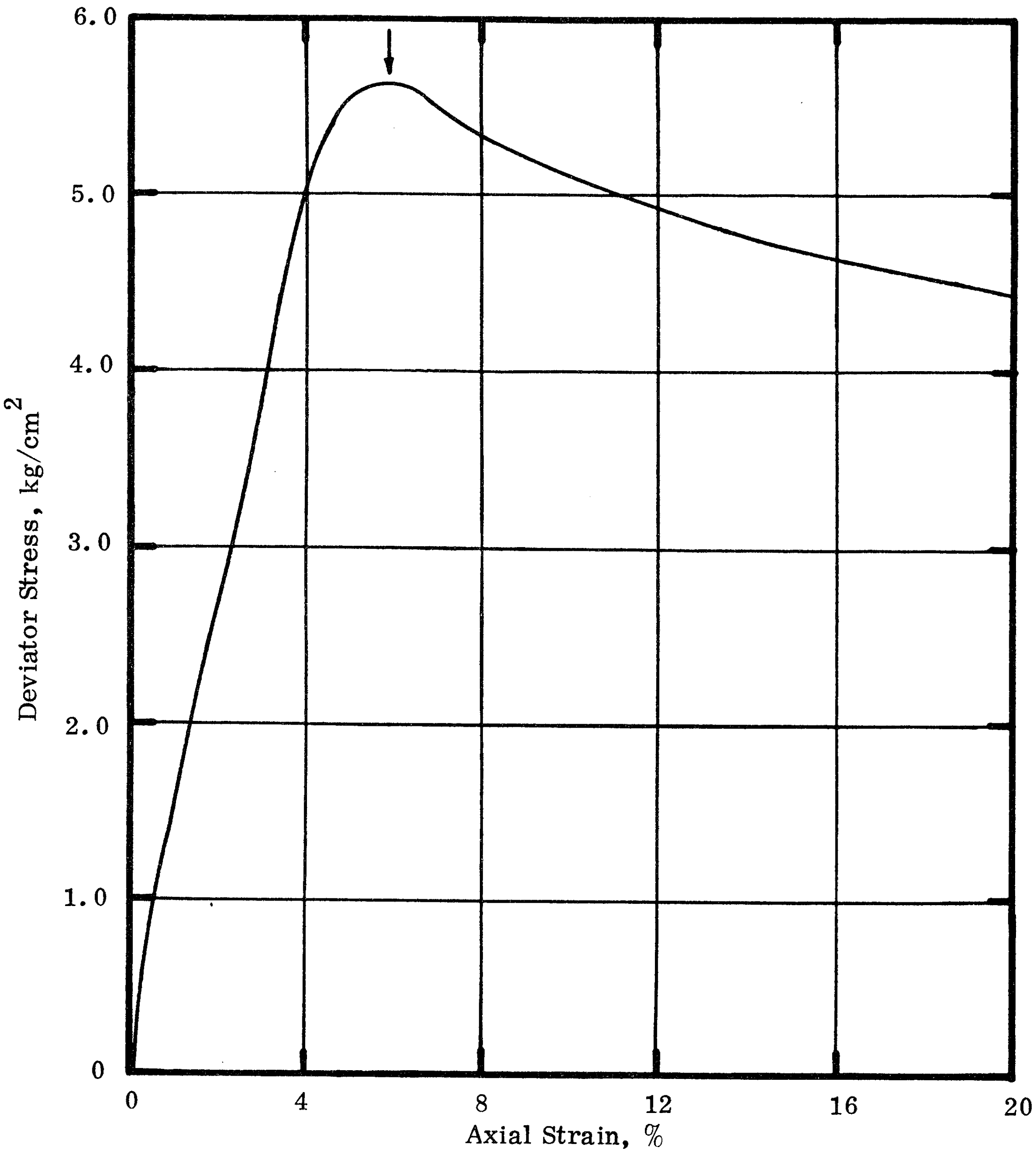


Arrow indicates axial strain at failure deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 27.3%
LL = 36.8
PL = 18.0
PI = 18.8

$\sigma_c = 2\ kg/cm^2$

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	Q TEST Boring 163 Sample 49D
Geotechnical Engineers, Inc. Winchester, Massachusetts	Project 73113	April, 1974 Fig. 17

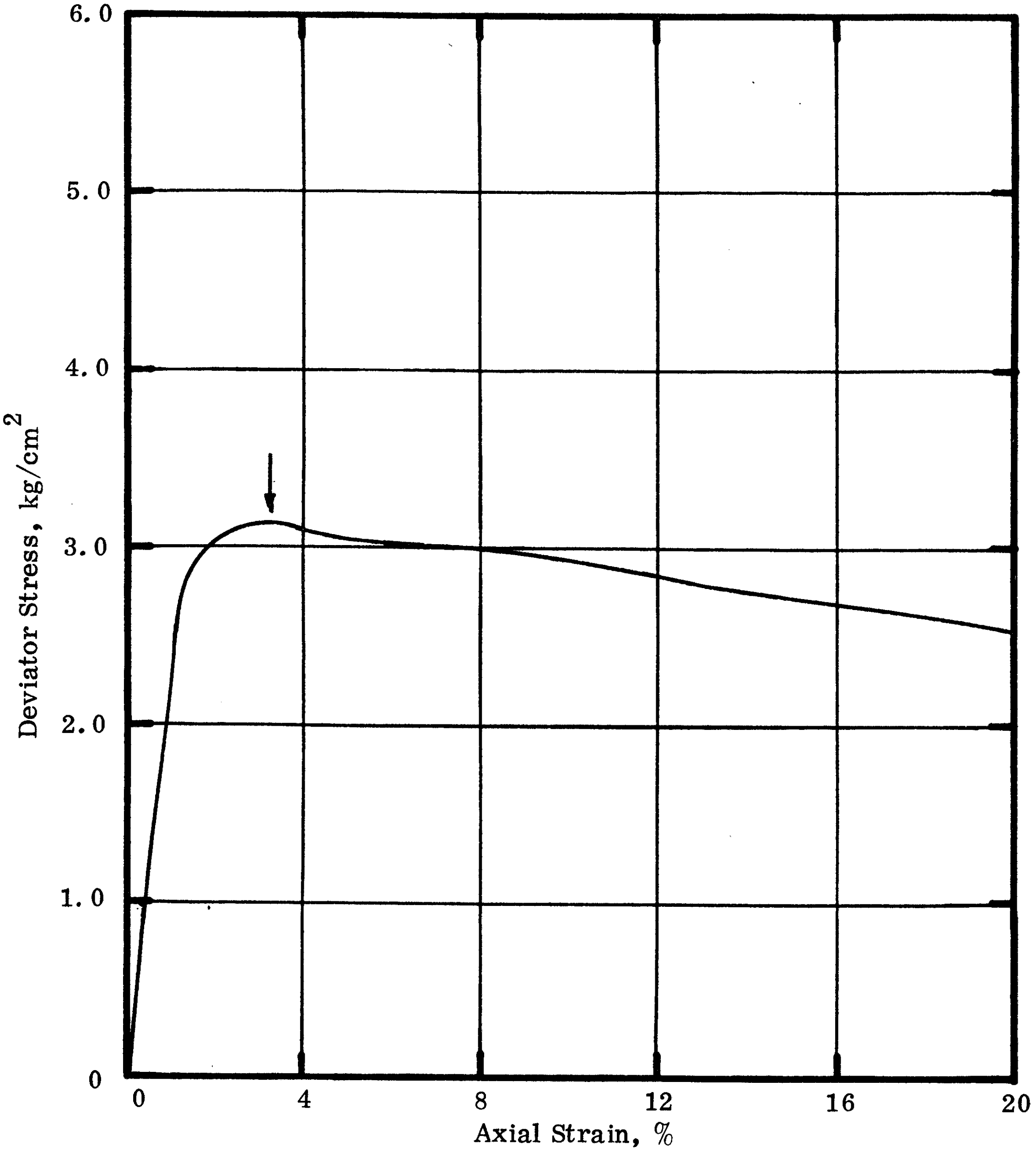


Arrow indicates axial strain at failure deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 26.7%
LL = 42.3
PL = 20.0
PI = 22.3

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	Q TEST Boring 163 Sample 50D
Geotechnical Engineers, Inc. Winchester, Massachusetts	Project 73113	April, 1974 Fig. 18



Arrow indicates axial strain at failure deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 28.1%
LL = 42.0
PL = 20.9
PI = 21.1

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp.
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Winchester, Massachusetts

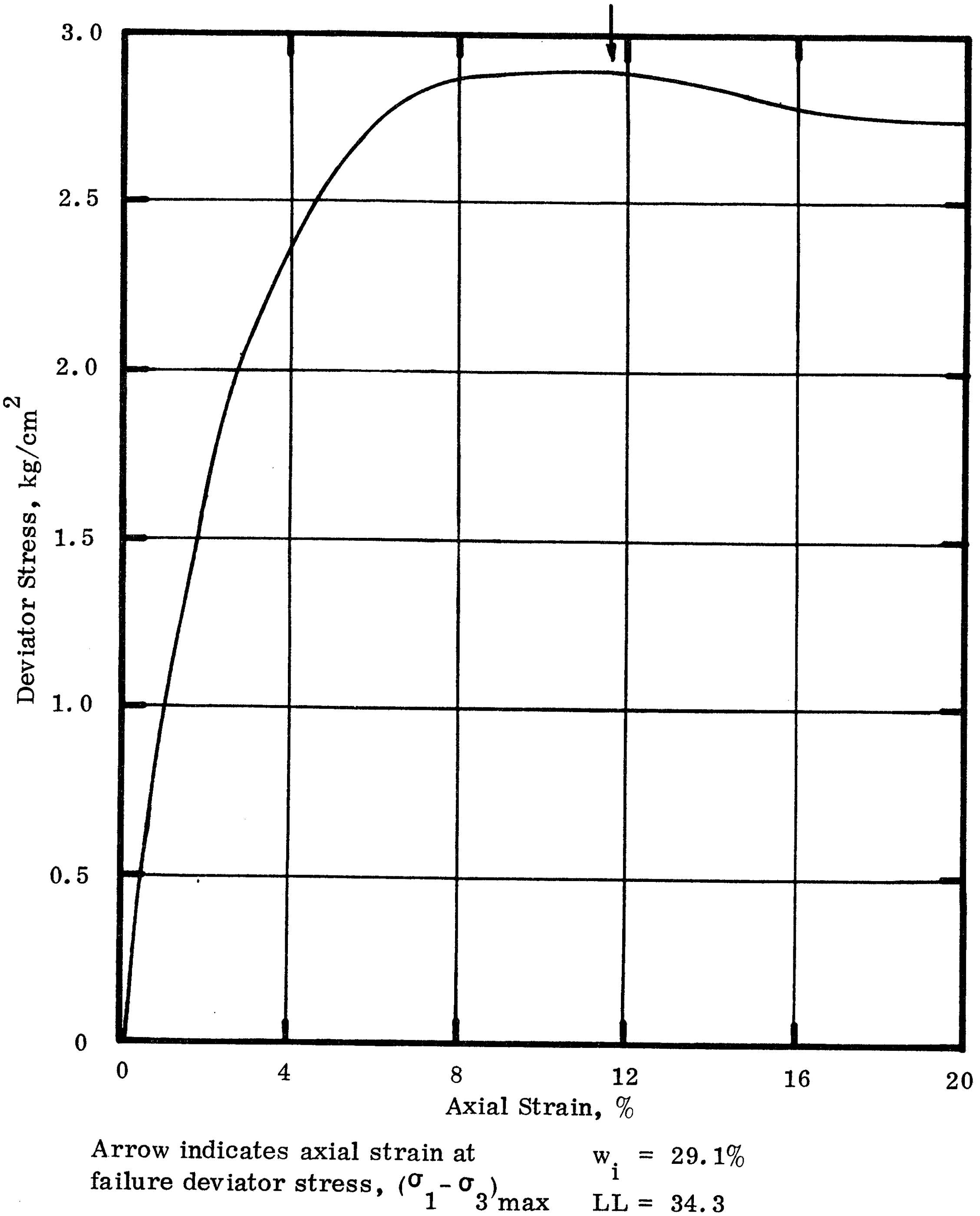
River Bend Power Station
Gulf States Utilities

Project 73113

Q TEST
Boring 164
Sample 31D

April, 1974

Fig. 19

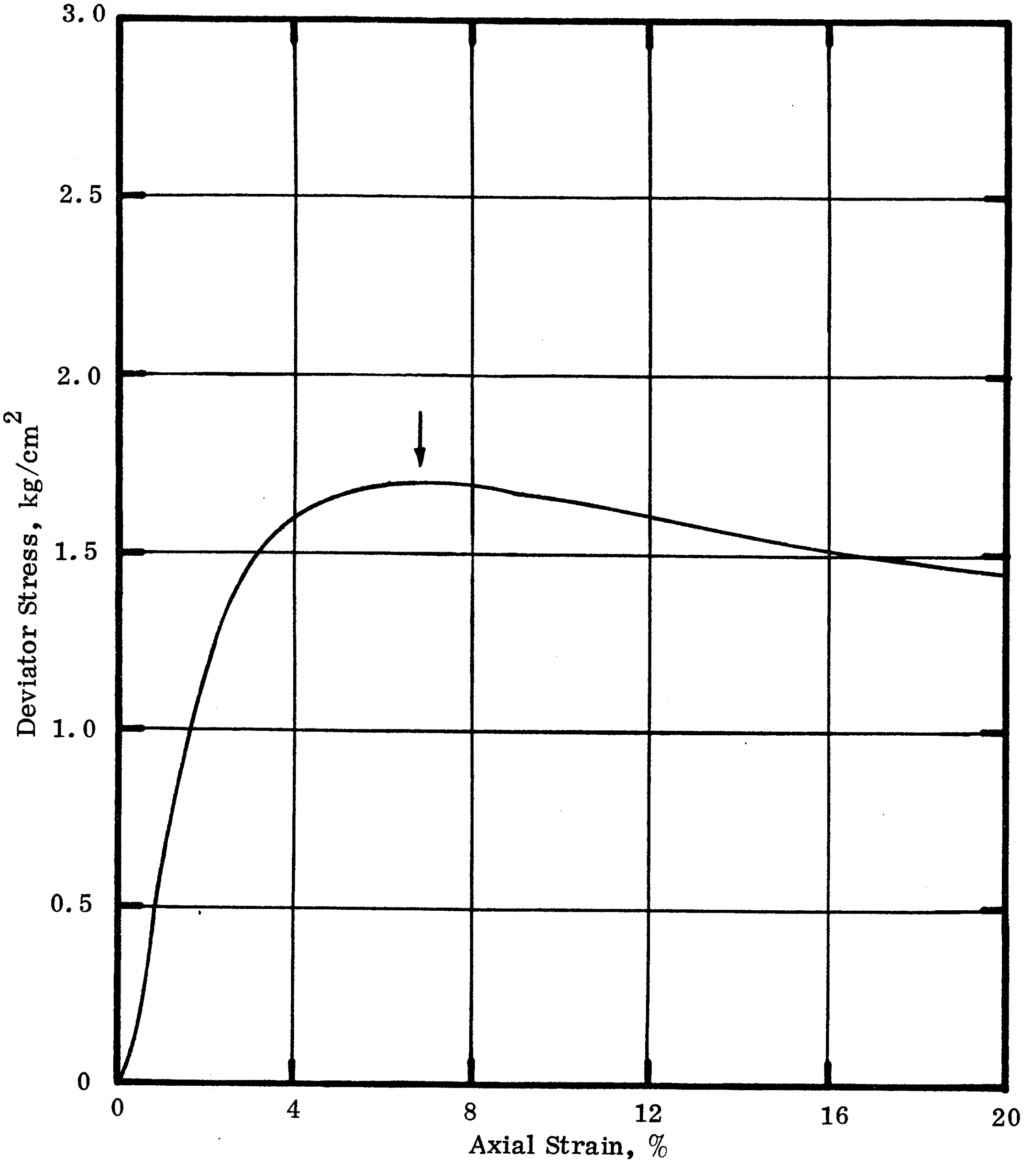


Arrow indicates axial strain at failure deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 29.1%
LL = 34.3
PL = 17.6
PI - 16.7

$\sigma_c = 2$ kg/cm^2

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	Q TEST Boring 164 Sample 35C
Geotechnical Engineers, Inc. Winchester, Massachusetts	Project 73113	April, 1974 Fig. 20

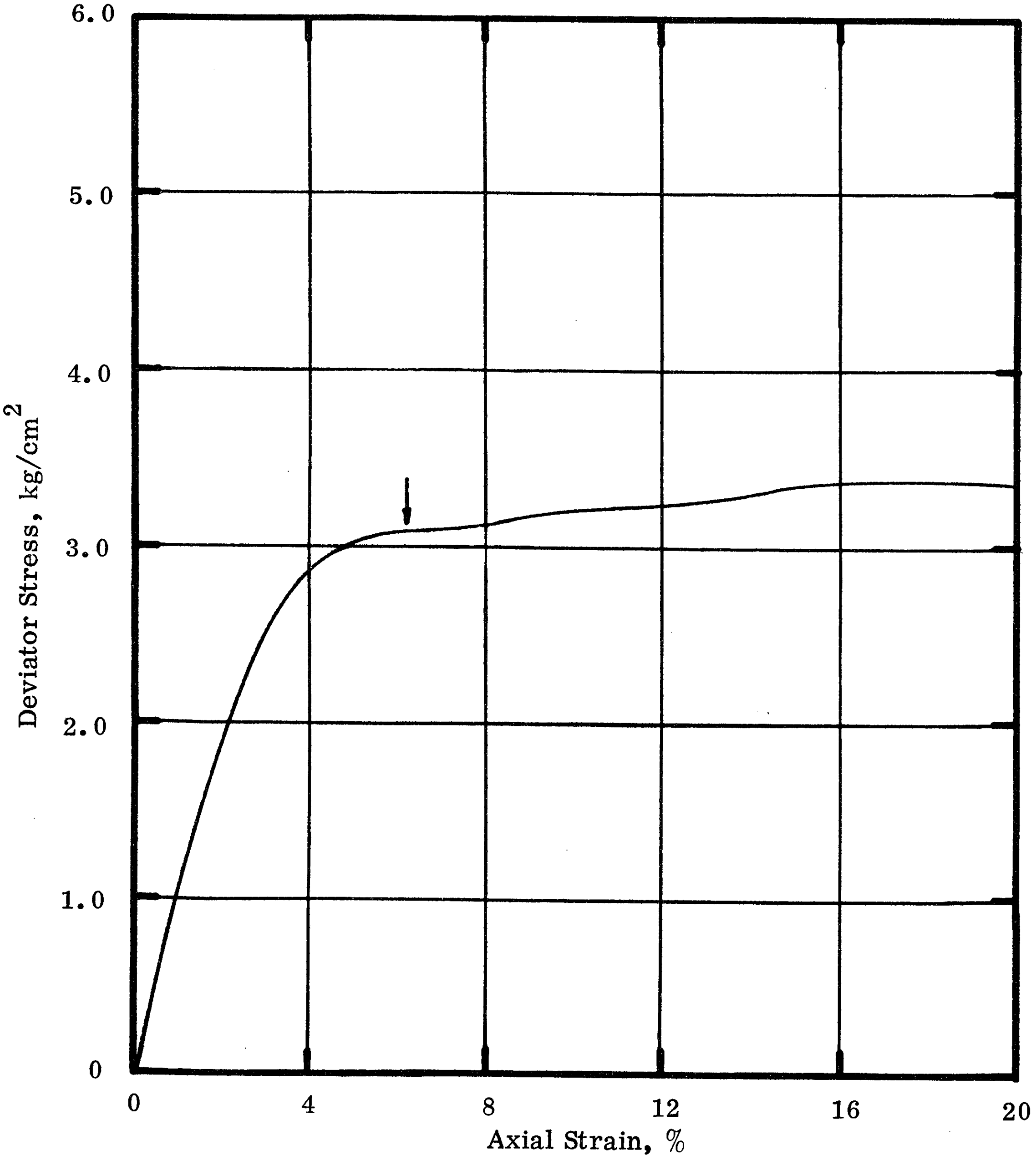


Arrow indicates axial strain at failure deviator stress, $(\sigma_1 - \sigma_3)_{max}$

w_i = 31.2%
LL = 47.3
PL = 19.7
PI = 27.6

$\sigma_c = 2$ kg/cm^2

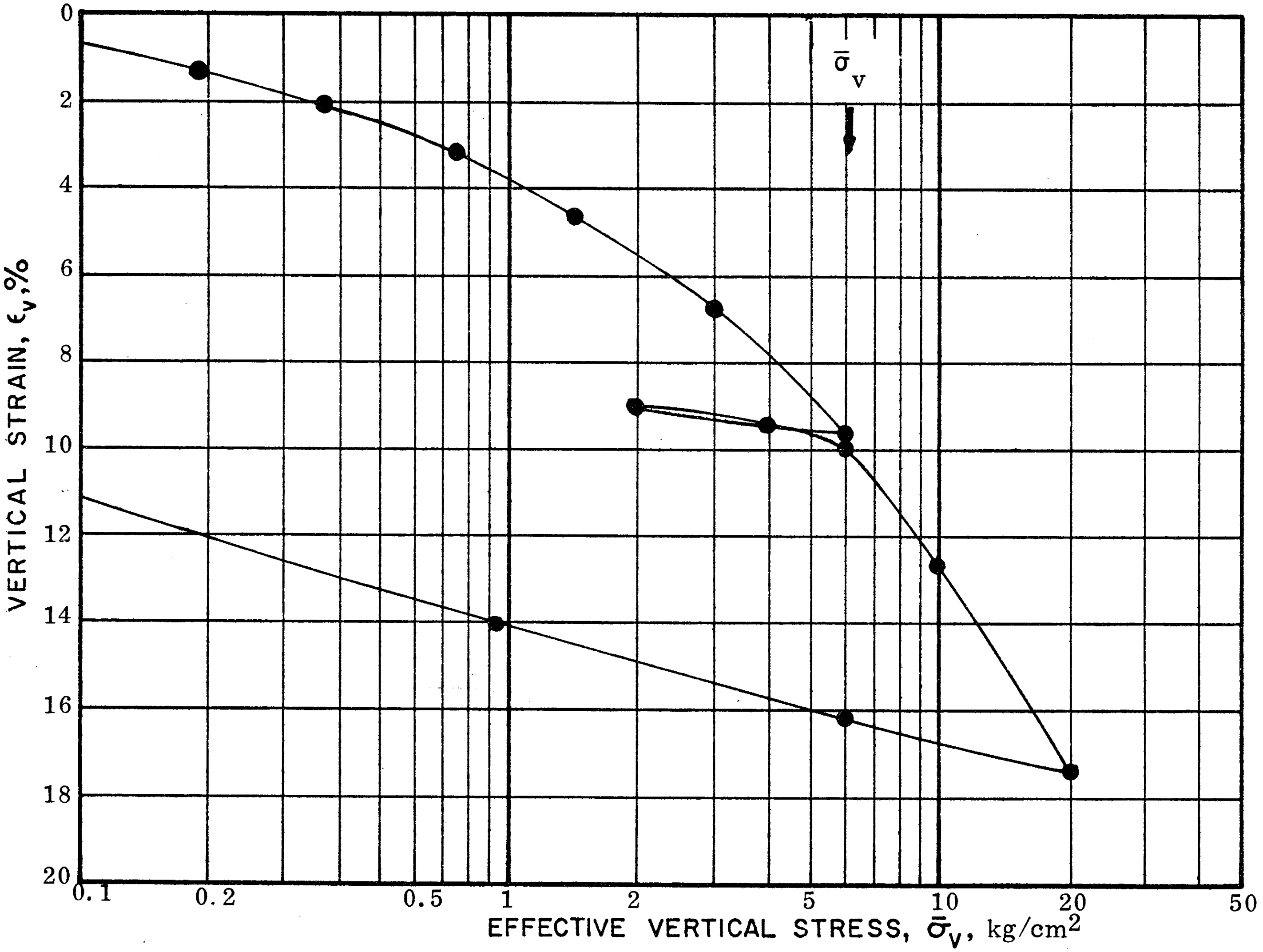
Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	Q TEST Boring 164 Sample 36C
Geotechnical Engineers, Inc. Winchester, Massachusetts	Project 73113	April, 1974 Fig. 21



Arrow indicates axial strain at failure deviator stress, $(\sigma_1 - \sigma_3)_{max}$

$w_i = 27.5\%$

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	Q TEST Boring 164 Sample 43B
Geotechnical Engineers, Inc. Winchester, Massachusetts	Project 73113	April, 1974 Fig. 22



Location River Bend

Boring 163

Sample 30A

Depth 148.0 ft

Elevation -44.7 ft

Specimen size
1.26 cm x 6.39 cm dia.

e_o = 0.9657
w_o = 35.5%
S_o = 92.1%
G = 2.73
LL = 49.6
PI = 24.7

Soil description
Light gray-brown, fine sandy silty clay.

Stone & Webster Eng. Corp.
Boston, Massachusetts

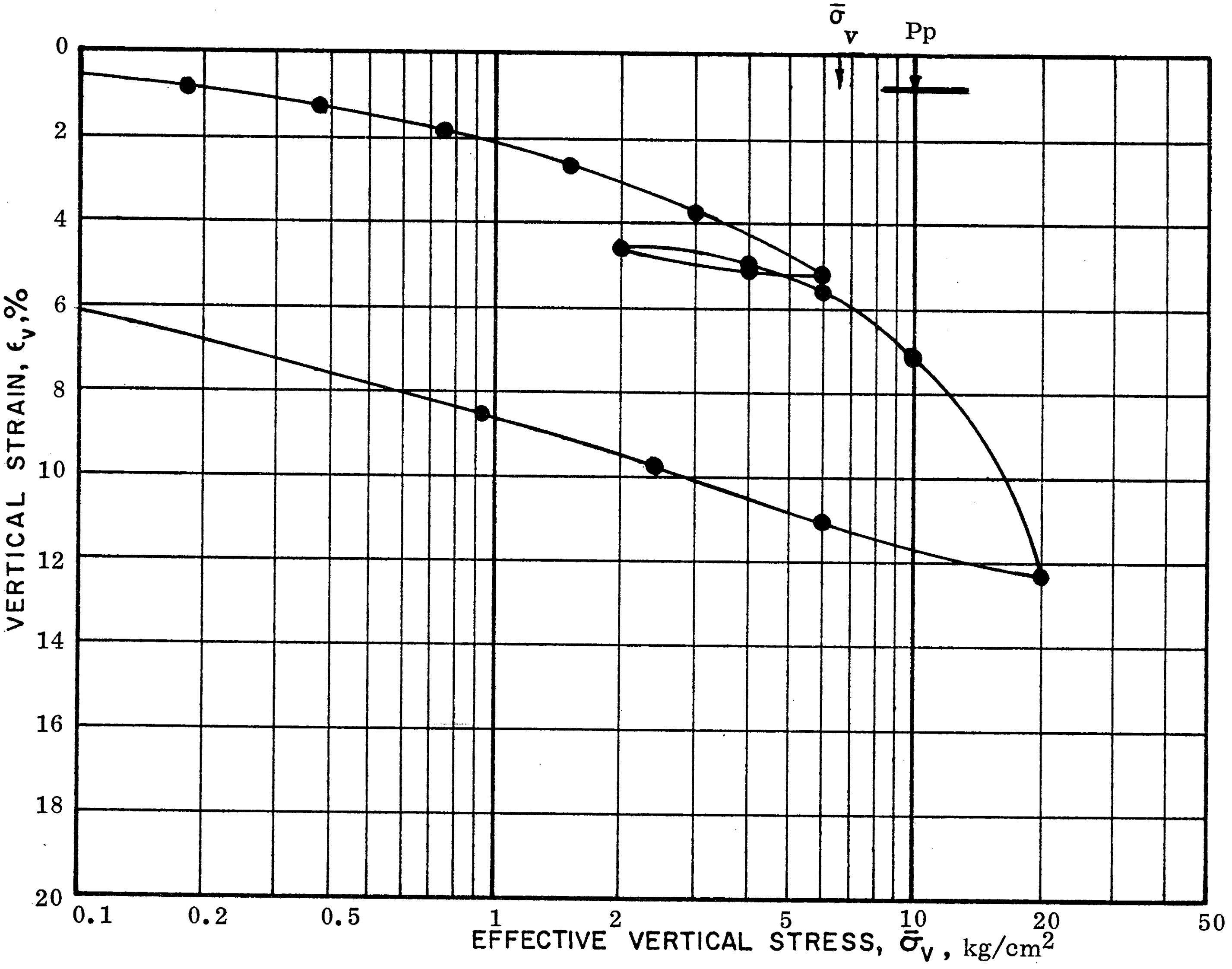
GEOTECHNICAL ENGINEERS INC
WINCHESTER, MASS.

River Bend Power Station
Gulf States Utilities

PROJECT 73113

COMPRESSION CURVE
CONSOLIDATION TEST

April, 1974 FIG. 23



Location River Bend

Boring 163

Sample 36C

Depth 165.5 ft

Elevation -62.2

Specimen size

1.27 cm x 6.37 cm dia.

e_o = .8638

w_o = 26.8%

S_o = 92.9%

G = 2.73

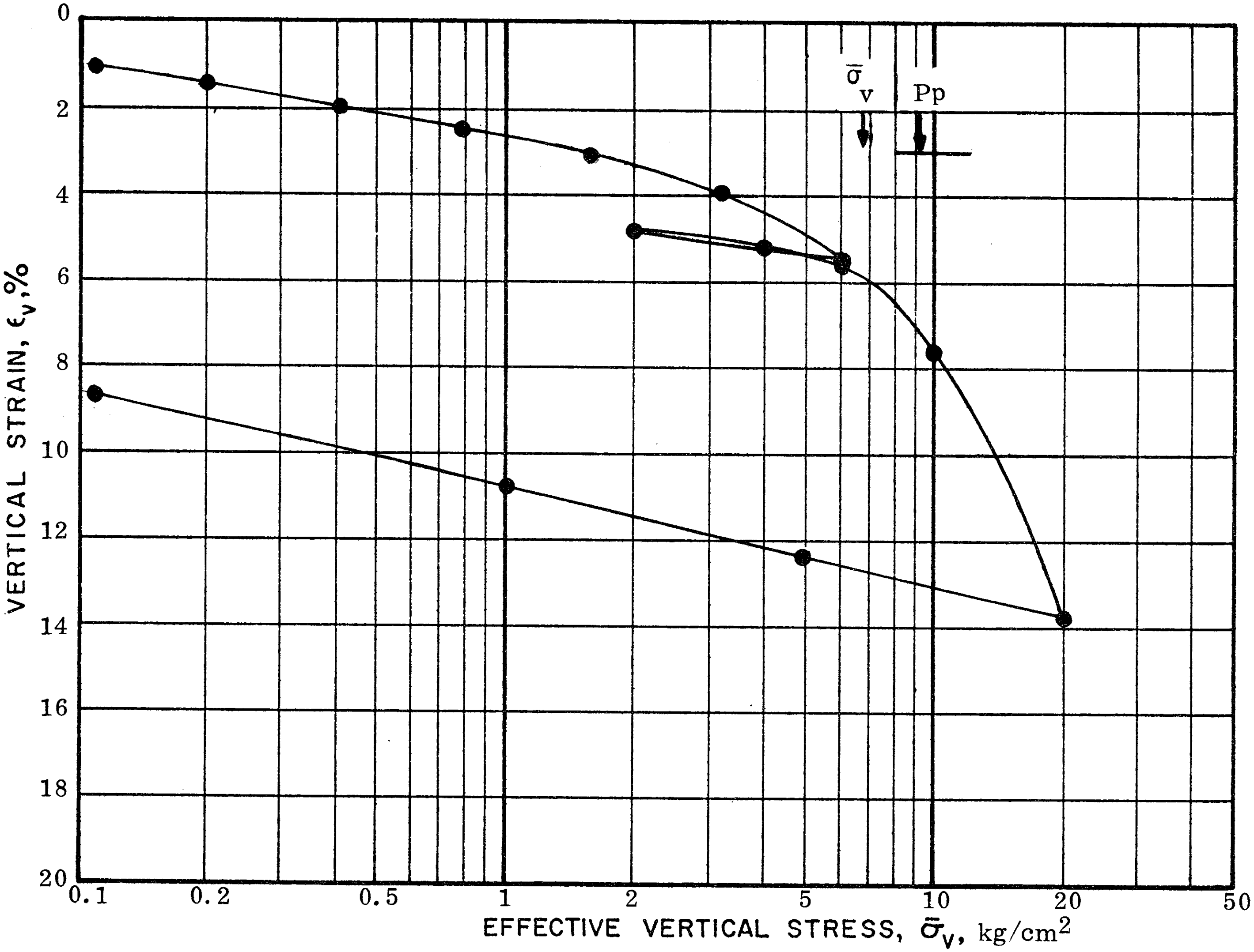
LL = 38.0

PI = 23.9

Soil description

Light gray-brown
slightly fine sandy
silty clay.

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	COMPRESSION CURVE CONSOLIDATION TEST
GEOTECHNICAL ENGINEERS INC WINCHESTER, MASS.	PROJECT 73113	April, 1974 FIG. 24



Location	River Bend
Boring	163
Sample	38C
Depth	171.5 ft
Elevation	-68.2 ft

Specimen size

1.25 cm x 7.10 cm dia.

e_o = .8329

w_o = 28.8%

S_o = 94.1%

G = 2.73

LL = 37.9

PI = 18.6

Soil description

Greenish-gray very fine sandy clay.

Stone & Webster Eng. Corp.
Boston, Massachusetts

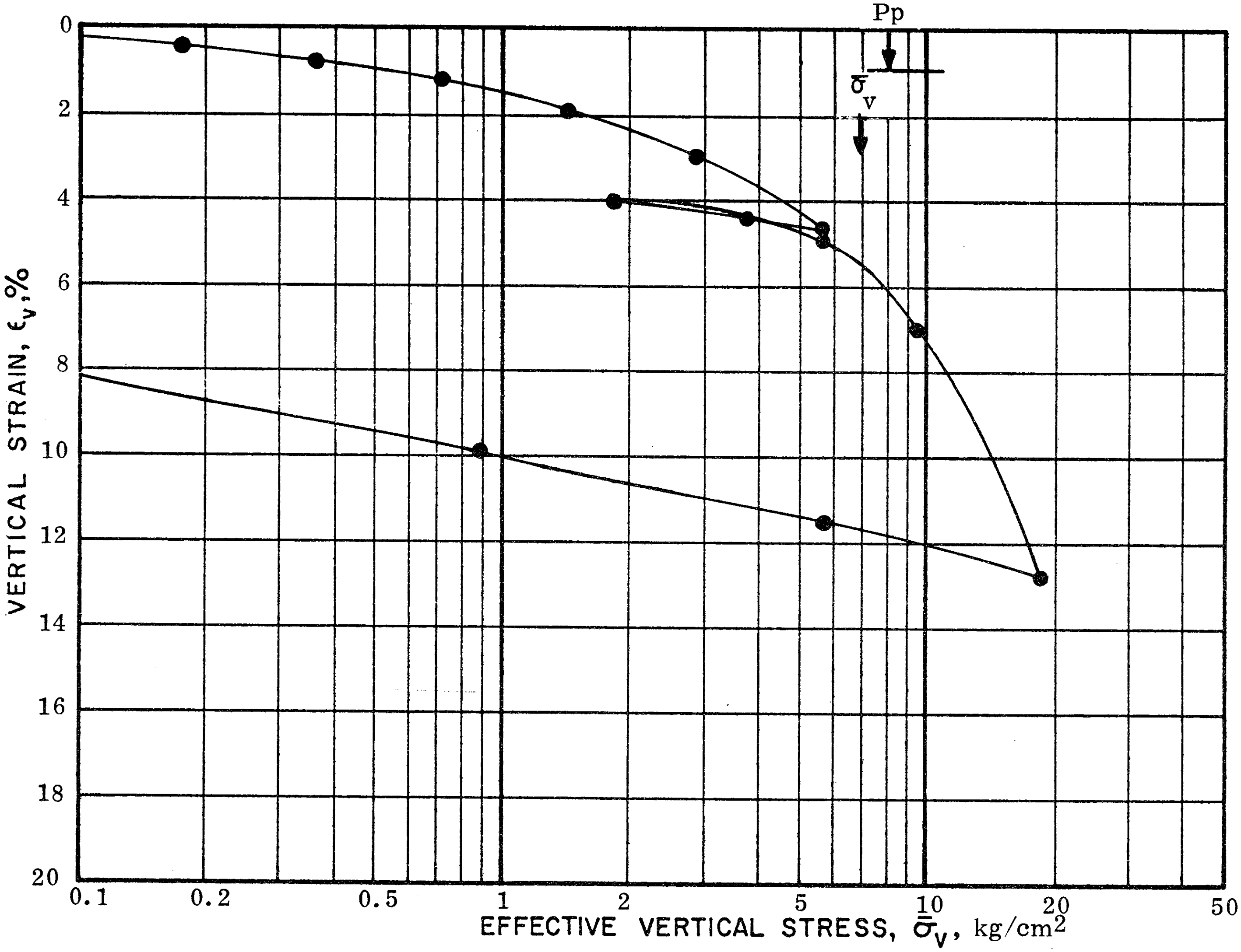
GEOTECHNICAL ENGINEERS INC
WINCHESTER, MASS.

River Bend Power Station
Gulf States Utilities

PROJECT 73113

COMPRESSION CURVE
CONSOLIDATION TEST

April, 1974 FIG. 25



Location	River Bend
Boring	163
Sample	40A
Depth	175.5 ft
Elevation	-72.2

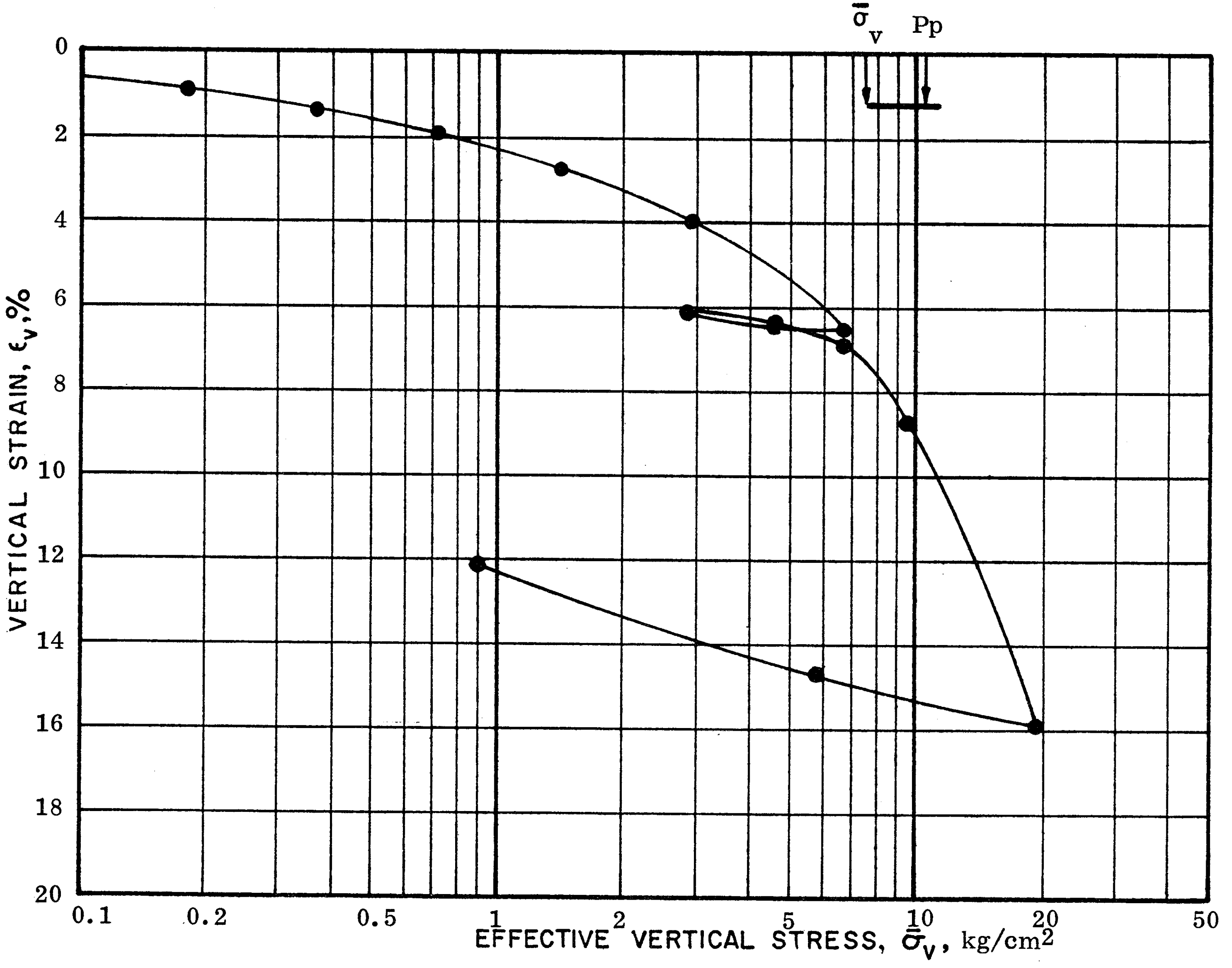
Specimen size
126 cm x 6.54 cm dia.

e_o = .8078
w_o = 29.6%
S_o = 100.4%
G = 2.73
LL = 34.8
PI = 12.5

Soil description

Greenish-gray fine sandy clay.

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	COMPRESSION CURVE CONSOLIDATION TEST
GEOTECHNICAL ENGINEERS INC WINCHESTER, MASS.	PROJECT 73113	April, 1974 FIG. 26



Location River Bend

Boring 163

Sample 45

Depth 188.0 ft

Elevation -84.7

Specimen size

1.30 cm x 6.57 cm dia.

e_o = 0.7956

w_o = 26.7%

S_o = 101.2%

G = 2.73

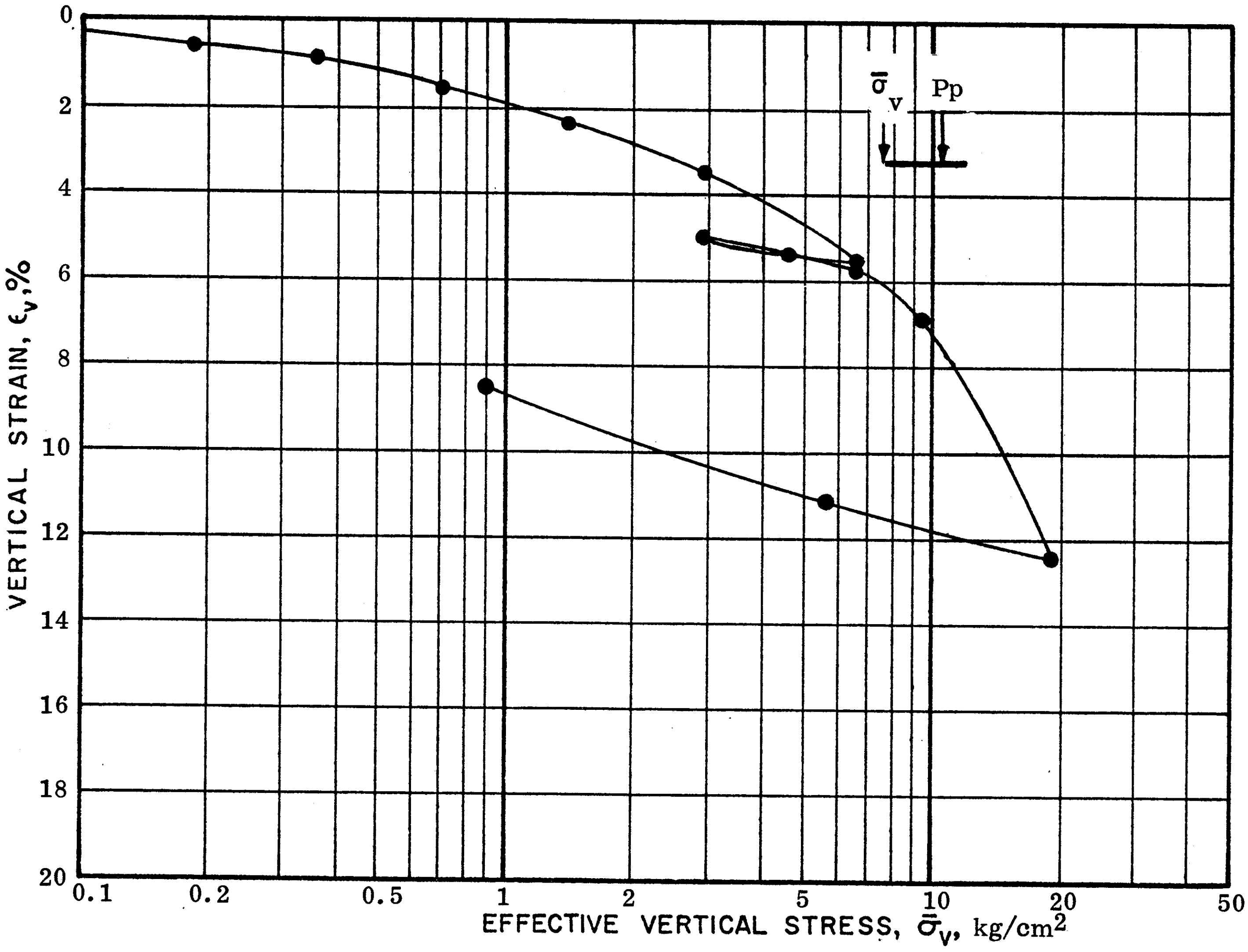
LL = 40.3

PI = 20.1

Soil description

Greenish gray silty fine sandy clay.

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	COMPRESSION CURVE CONSOLIDATION TEST
GEOTECHNICAL ENGINEERS INC WINCHESTER, MASS.	PROJECT 73113	April, 1974 FIG. 27



Location River Bend

Boring 163

Sample 50

Depth 201.0 ft

Elevation -97.7 ft

Specimen size

1.26 cm x 6.54 cm dia.

e_o = 0.9005

w_o = 28.7%

S_o = 93.3%

G = 2.73

LL = 48.2

PI = 31.7

Soil description

Hard gray clay with lenses of fine sandy clay and fine sand.

Stone & Webster Eng. Corp.
Boston, Massachusetts

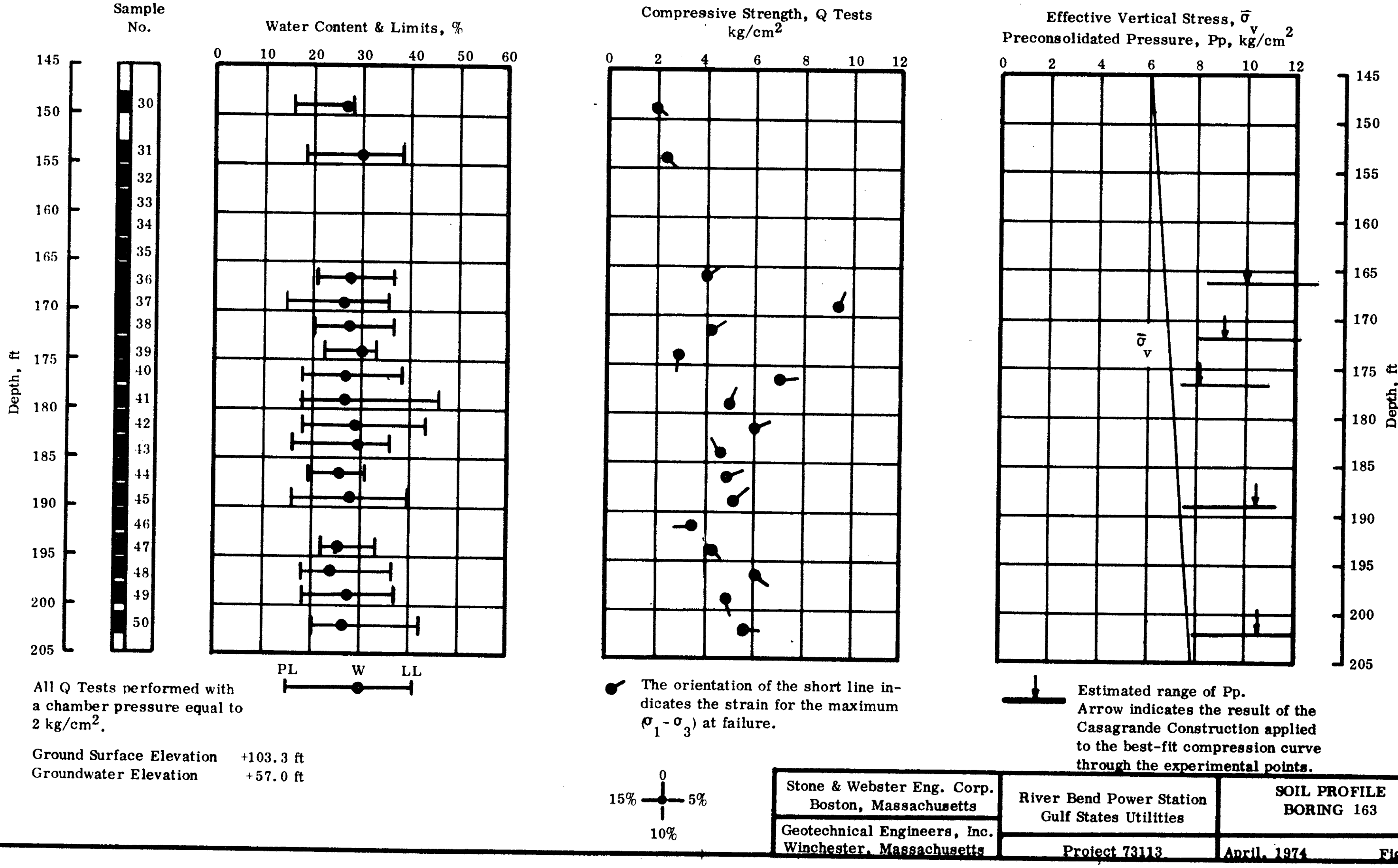
GEOTECHNICAL ENGINEERS INC
WINCHESTER, MASS.

River Bend Power Station
Gulf States Utilities

PROJECT 73113

COMPRESSION CURVE
CONSOLIDATION TEST

April, 1974 FIG. 28



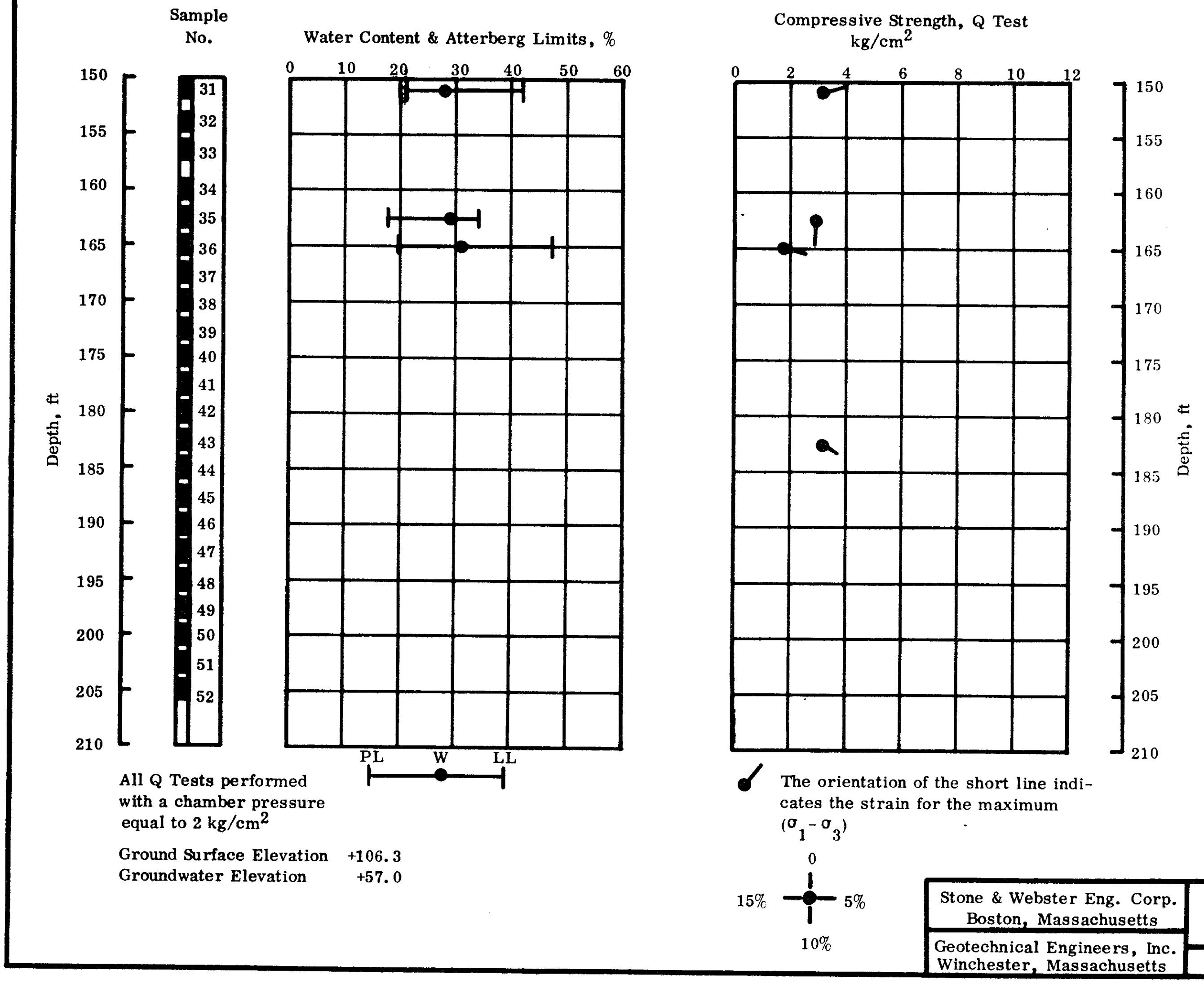
All Q Tests performed with a chamber pressure equal to 2 kg/cm^2.

Ground Surface Elevation +103.3 ft
Groundwater Elevation +57.0 ft

The orientation of the short line indicates the strain for the maximum $(\sigma_1 - \sigma_3)$ at failure.

Estimated range of Pp.
Arrow indicates the result of the Casagrande Construction applied to the best-fit compression curve through the experimental points.

Stone & Webster Eng. Corp. Boston, Massachusetts	River Bend Power Station Gulf States Utilities	SOIL PROFILE BORING 163
Geotechnical Engineers, Inc. Winchester, Massachusetts	Project 73113	April, 1974 Fig. 29



All Q Tests performed with a chamber pressure equal to 2 kg/cm²

Ground Surface Elevation +106.3
Groundwater Elevation +57.0

The orientation of the short line indicates the strain for the maximum $(\sigma_1 - \sigma_3)$

Stone & Webster Eng. Corp.
Boston, Massachusetts

Geotechnical Engineers, Inc.
Winchester, Massachusetts

River Bend Power Station
Gulf States Utilities

Project 73113

SOIL PROFILE
BORING 164

April, 1974

Fig. 30

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 163

Project No. 73113

Project River Bend Power Station **Page** 1 **of** 8

Sample No. and Depth ft	Section No.	Length of Section in.	Description
30 148.0- 150.0	A	5.0	Light gray brown fine sandy silty clay. Some localized pockets of pure clay. Consolidation Test w_i = 35.5% LL = 49.6 PL = 24.9 PI = 24.7
	B	6.0	Light gray brown very fine sandy clay. Drilling mud in sample. No tests performed on section.
	C	5.0	Light gray brown silty fine sandy clay. Two clay layers ~ 5 mm thick between top and middle of section; very uniform. Q Test w_i= 26.7% LL = 27.6 PL = 15.6 PI = 12.0
31 153.0- 155.0	D	5.75	Light brown to tan silty very fine sandy clay. Occasional tan hard clay lumps. Q Test w_i= 29.9% LL = 38.5 PL = 18.6 PI = 19.9
36 165.5- 167.5	C	6.0	Light gray brown slighty silty fine sandy clay. Consolidation Test w_i= 26.8% LL = 38.0 PL = 15.1 PI = 23.8
	D	5.75	Light green gray slightly fine sandy silty clay. Q Test w_i= 27.6% LL = 36.3 PL = 20.6 PI = 15.7

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 163

Project No. 73113
Project River Bend Power Station
Page 2 **of** 8

Sample No. and Depth ft	Section No.	Length of Section in.	Description
37 168.0- 170.0	D	5.0	Gray silty very fine sandy clay. Occasional small fine sand pockets. Q Test $w_i = 26.3\%$ LL = 35.3 PL = 14.4 PI = 20.9
38 170.5- 172.5	C	6.0	Greenish gray very fine sandy clay. Consolidation Test $w_i = 28.8\%$ LL = 37.9 PL = 19.3 PI = 18.6
	D	6.0	Greenish gray silty very fine sandy clay. Q Test $w_i = 27.5\%$ LL = 36.6 PL = 20.1 PI = 16.5
39 173.0- 175.0	D	6.5	Light green gray fine sandy silt with a trace of clay. Layers inclined at ~ 25° from horizontal and on the order of 2 to 5 mm thick are visible. Q Test $w_i = 30.2\%$ LL = 33.0 PL = 22.5 PI = 10.5

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 163

Project No. 73113

Project River Bend Power Station

Page 3 of 8

Sample No. and Depth ft	Section No.	Length of Section in.	Description
40 175.5- 177.5	A	3.0	Greenish gray fine sandy clay. Consolidation Test $w_i = 29.6\%$ LL = 34.8 PL = 22.3 PI = 12.5
	B	6.0	Greenish gray fine sandy clay. No test on this section.
	C	6.0	Dark greenish gray silty very fine sandy clay. Q Test $w_i = 26.9\%$ LL = 38.4 PL = 18.0 PI = 20.4
41 178.0- 180.0	C	5.0	Gray silty very fine sandy clay. Very chunky material. Q Test $w_i = 26.7\%$ LL = 45.8 PL = 17.9 PI = 27.9
	D	6.75	Same as Section C. No Q Test.
42 180.5- 182.5	D	7.5	Greenish gray very fine sandy silty clay. Q Test $w_i = 29.0\%$ LL = 43.2 PL = 18.1 PI = 25.1

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 163

Project No. 73113
Page 4 **of** 8

Project River Bend Power Station

Sample No. and Depth ft	Section No.	Length of Section in.	Description
43 183.0- 185.0	C	5.75	Top 4 cm: Greenish gray slightly clayey silt with a trace of fine sand. Very brittle material. Bottom 10.6 cm: Greenish gray silty fine sandy clay. Lumpy and brittle material. Inclined layering on the order of 1-4 cm thick with a variation of color between layers. Q Test $w_i = 29.5\%$ LL = 35.9 PL = 15.9 PI = 20.0
	D	6.0	Greenish gray fine sandy silt. Clay layers are visible on the order of .2 to 2 cm thick.
44	D	5.75	Dark gray silty very fine sandy clay. Q Test $w_i = 25.9\%$ LL = 30.6 PL = 19.1 PI = 11.5

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 163

Project No. 73113

Project River Bend Power Station

Page 5 of 8

Sample No. and Depth ft	Section No.	Length of Section in.	Description
45 188.0- 190.0	C	6.0	Greenish gray silty fine sandy clay. Consolidation Test $w_i = 26.7\%$ LL = 40.3 PL = 20.2 PI = 20.1
	D	7.0	Top 4.5 cm: Gray silty slightly fine sandy clay. Bottom 2.5 cm: Gray silty very fine sandy clay. This portion not tested. $w_i = 27.9\%$ LL = 39.7 PL = 15.7 PI = 24.0
46 190.5- 192.5	D	5.9	Top 2.75 cm: Gray silty slightly clayey very fine sand. Bottom 3.15 cm: Gray silty very fine sandy clay. Q Test $w_i = 28.5\%$
47 193.0- 195.0	D	5.75	Gray silty very fine sandy clay. Top 1 to 2 in. is more sandy than the rest of the material. Bottom 1 to 2 in. is a very chunky and brittle material and was not used for Q Test. Q Test $w_i = 25.4\%$ LL = 32.9 PL = 21.8 PI = 11.1

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 163

Project No. 73113
Page 6 of 8

Project River Bend Power Station

Sample No. and Depth ft	Section No.	Length of Section in.	Description
48 195.5- 197.5	C	10.5	Light gray very fine sandy clay with a trace of silt and organic matter. Layers less than 1 cm thick of very fine sand and clay appear throughout sample. Q Test $w_i = 24.0\%$ LL = 36.5 PL = 17.7 PI = 18.8
49 198.0- 200.0	D	7.0	Gray very fine sandy silty clay. Layers of fine sand less than 1 cm thick occur in the section running diagonally. Q Test $w_i = 27.3\%$ LL = 36.8 PL = 18.0 PI = 18.8

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 163

Project No. 73113
Page 7 of 8

Project River Bend Power Station

Sample No. and Depth ft	Section No.	Length of Section in.	Description
50 201.0- 203.0	C	5.75	Hard gray fine sandy clay. Layers less than .5 cm thick of fine sandy clay and fine sand appear throughout sample. Consolidation Test $w_i = 28.7\%$ LL = 48.2 PL = 16.5 PI = 31.7
	D	5.75	Gray silty very fine sandy clay. Q Test $w_i = 26.7\%$ LL = 42.3 PL = 20.0 PI = 22.3

DESCRIPTION OF UNDISTURBED SAMPLES

BORING NO. 164

Project No. 73113

Project River Bend Power Station

Page 8 of 8

Sample No. and Depth ft	Section No.	Length of Section in.	Description
31 150.0- 152.0	D	5.75	Light tan silty clay. Traces of fine sand. Q Test w_i = 28.1% LL = 42.0 PL = 20.9 PI = 21.1
35 161.5- 163.5	C	5.0	Gray brown silty fine to medium sandy clay. Bottom 2 to 2.5 in. contain black conglomerates constructed in zones orientated diagonally. Q Test w_i = 29.1% LL = 34.3 PL = 17.6 PI = 16.7
36 164.0- 166.0	C	6.0	Light brown silty fine to medium sandy clay. Occasional fine gravel and black conglomerates occur in the section. Q Test w_i = 31.2% LL = 47.3 PL = 19.7 PI = 27.6
43 181.5- 183.5	B	5.75	Greenish brown slightly silty fine to medium sandy clay. Layer 1 to 2 mm thick of fine sand characterized by a lighter color than the rest of the sample. Q Test w_i = 27.5%
	C	5.6	Same as Section B.

RESONANT COLUMN TESTING
UNDISTURBED SAMPLES
TERTIARY CLAYS
BORINGS 163(Z-5), 164(Z-6), & 165(Z-7)
RIVER BEND STATION

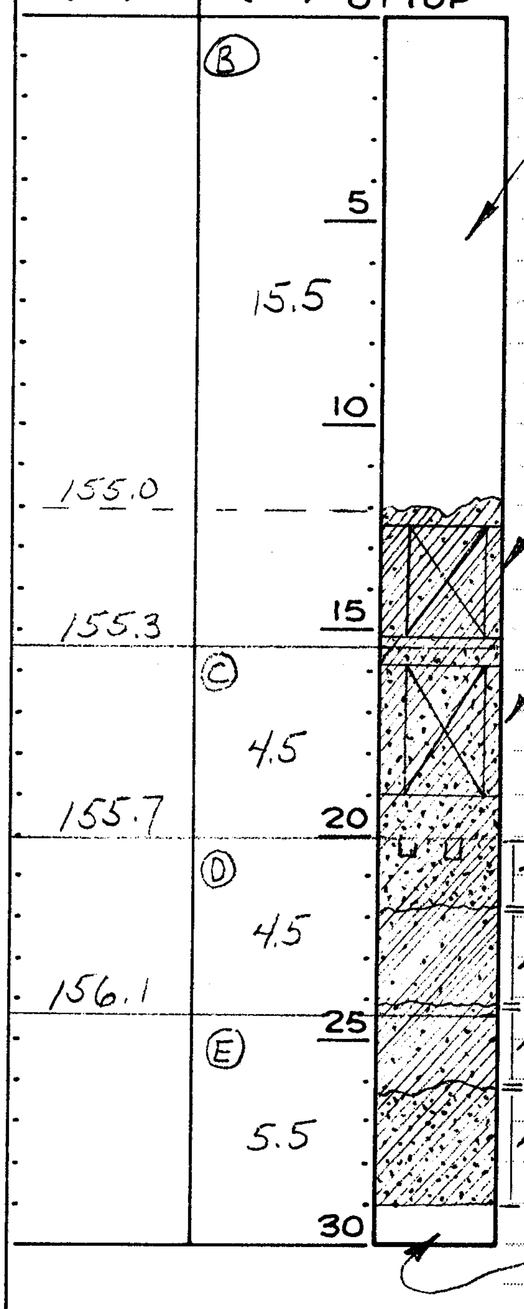
Testing performed by
Stone & Webster Engineering Corporation

UNDISTURBED SAMPLE LOG

STONE & WEBSTER
ENGINEERING CORPORATION

			BORING NUMBER Z 5
CLIENT GULF STATES UTILITIES	J.O. NUMBER 12210	LOGGED BY RKW	SAMPLE NUMBER 32
SITE RIVER BEND		CHECKED BY WJO	DEPTH 155 - 156.5 FT.
SAMPLE SIZE AND TYPE 3.0 IN.	CONDITION OF CUTTING EDGE SLIGHTLY NICKED - TUBE BADLY OUT OF ROUND		DATE 15 FEB 77

DEPTH (FT) | SECTION (IN.) | DESCRIPTION OF SAMPLE



EMPTY

Resonant Column Specimen Z-5/32B

Resonant Column Specimen Z-5/32C

Sandy Clay, moderately plastic, about 25% medium to fine mostly fine sand, light brown dotted throughout with tiny black specks, brittle.

Sandy Clay, same as section "E" top except stained deep rusty orange brown, very brittle

Sandy Clay, moderately plastic, 16.1% medium to fine mostly fine sand, similar to section "E" bottom but appears much more clayey.

Sandy Clay, moderately plastic, 30.6% medium to fine, mostly fine sand, light brown mottled with orange brown, no reaction to 10% HCl, looks more sandy than clayey.

EMPTY

SEE INDICATED TEST DATA SHEET FOR DETAILS OF SPECIFIC SECTION OF SAMPLE

SAMPLE NUMBER		WASH 32 E SANDY	WASH 32 E CLAY	32 D TOP	32 D BOTTOM	32 B TRIMMINGS	
CONTAINER NUMBER		C79	C107	D9	C70	A22	
WT. WET SOIL + TARE		140.39	107.80	137.08	107.28	40.95	
WT. DRY SOIL + TARE		123.82	96.68	121.34	96.70	36.19	
WT. WATER		16.57	11.12	15.74	10.58	4.76	
TARE WT.		58.92	58.31	63.42	58.52	18.09	
WT. DRY SOIL		64.90	38.37	57.92	38.18	18.10	
WATER CONTENT (%)		25.5	29.0	27.2	27.7	26.3	
Ø q_u*	UNDISTURBED	WASHED DRY 78.80	64.50	2.7, 3.0	3 to 4		
	REMOLDED	LOST IN WASHING 45.02	32.18	0.6, 0.5, 0.6	—		
⊠ s_u**	UNDISTURBED	% FINES 69.4	83.9	0.39	0.6		
	REMOLDED			0.27	—		

*DETERMINED BY POCKET PENETROMETER IN KG/SQ CM OR TSF **DETERMINED BY TORVANE

RESONANT COLUMN TEST
GENERAL DATA

STONE & WEBSTER
ENGINEERING CORPORATION

CLIENT GOLF STATES UTILITIES	JO NUMBER 12210	TESTED BY RKW	BORING Z-5
			SAMPLE 32 B
SITE RIVER BEND		CHECKED BY WSO	DEPTH 155.0 FT.
SPECIMEN PROPERTIES			DATE 8 MAR 77

TYPE OF TEST:

BALANCE NO. P2200

TYPE OF SPECIMEN: UNDISTURBED ☒ REMOLDED ☐ COMPACTED ☐ (Method)______

WEIGHTS:

Weight of specimen + tare 150.29 gm.

Weight of tare 2.21 gm.

Weight of specimen 148.08 gm.

SPECIMEN PROPERTIES: INITIAL

Water content 27.4 %

γ_d 95.0 lb/cu. ft.

γ_m 121.1 lb/cu. ft.

DIMENSIONS:

Height of specimen + caps ______ in.

Height of caps ______ in.

Height of specimen 2.92 in. 7.42 cm

Area of specimen 10.29 sq. cm.

Volume of specimen 76.35 cu. cm.

CIRCUMFERENCE of specimen ~~+ membrane~~

1 11.38 2 11.38 3 11.38

Ave. 11.38 cm.

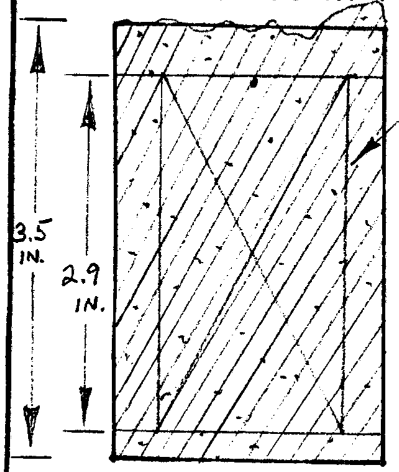
DIAMETER of specimen ~~+ membrane~~ 3.62 cm

2 thickness membrane 0.125 cm

Diameter of specimen 3.62 cm

HEIGHT/DIAMETER: 2.05 RULE NO. 0822 TAPE NO. 0147 CALIPER NO. 0151

SOIL DESCRIPTION:



Sandy Clay, moderately to highly plastic, 11.7 % uniform fine sand, light brown speckled with black, some clay in small pockets is sandless.

FILTER PAPER: ☒

DIMENSIONS: AFTER TEST 11.29, 11.29, 11.3

Circumference of specimen 11.29 cm

thickness membrane ______ cm

Diameter of specimen 3.59 cm

Height of specimen 2.90 in. 7.37 cm

Area of specimen 10.12 sq. cm.

Volume of specimen 74.58 cu. cm.

SAMPLE SECTIONS	TRIMMINGS	CENTER	SPECIMEN AFTER TEST
CONTAINER NUMBER	A22		D19
WT. WET SOIL + TARE	40.95		208.88
WT. DRY SOIL + TARE	36.19		179.46
WT. WATER	4.76		29.42
TARE WT.	18.09		63.25
WT. DRY SOIL	18.10		116.21
WATER CONTENT (%)	26.3		25.3
SIEVE NO.			
WT. WASHED DRY SOIL + TARE	20.21		
WT. LOST IN WASHING	15.98		
% FINES	88.3		

WEIGHTS: AFTER TEST

Wet weight after test 145.63 gm

Dry weight after test 116.21 gm

Weight of water 29.42 gm

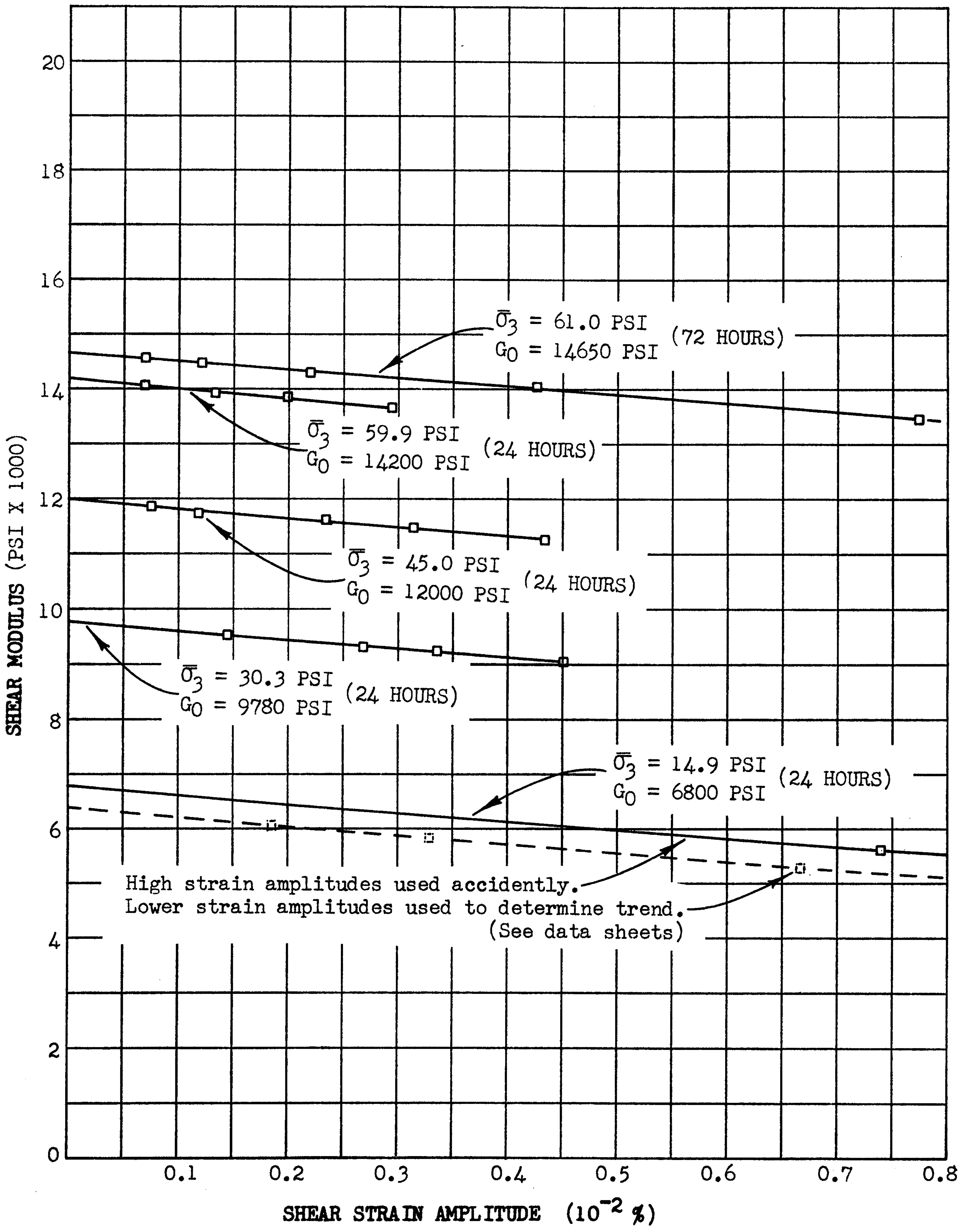
Water content 25.3 %

γ_d = 97.3 PCF

STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

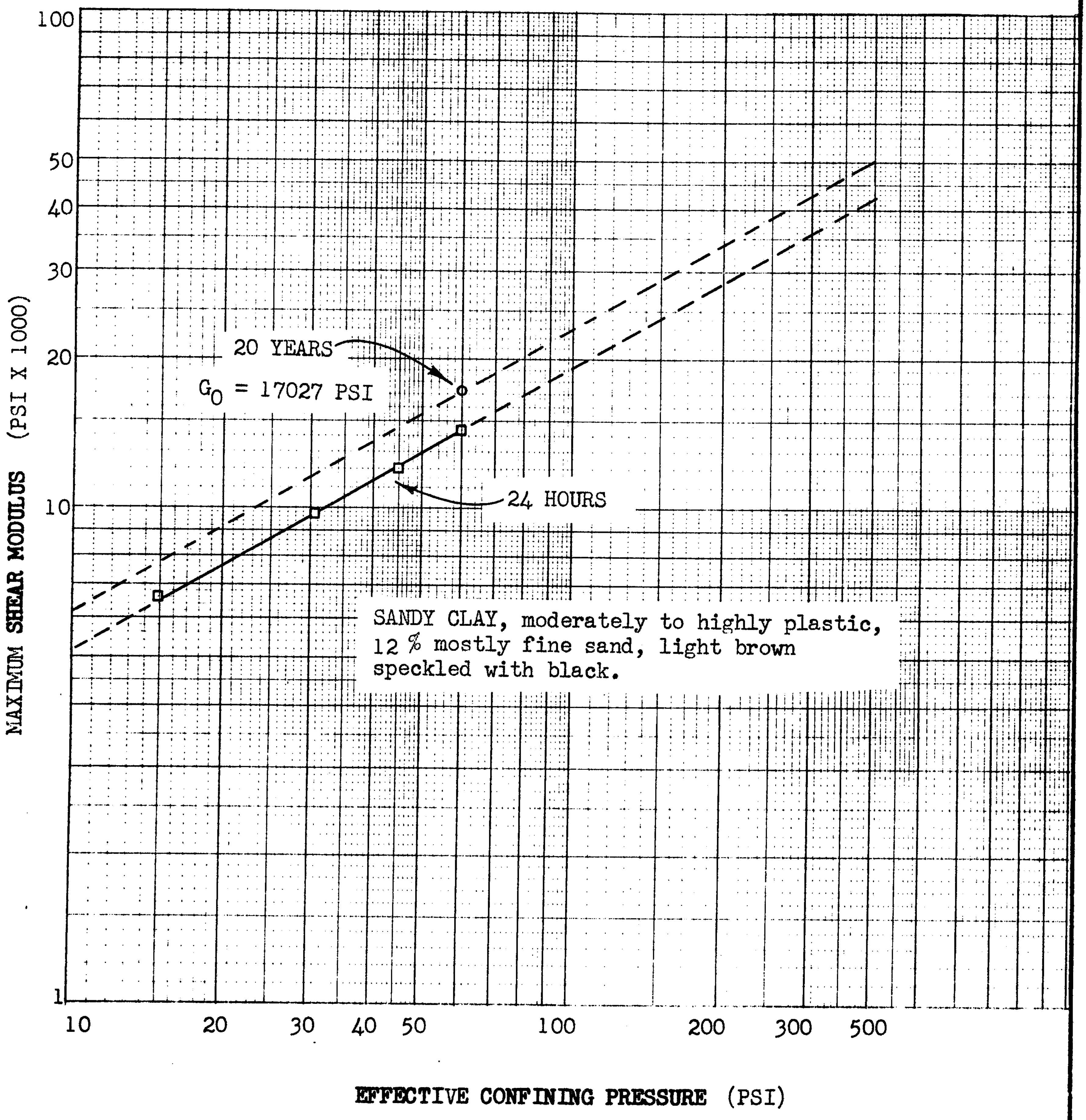
CLIENT GULF STATES UTILITIES	J.O. NUMBER 12210	BORING NUMBER Z-5
SITE RIVER BEND	DATE 15 MAR 77	SAMPLE NUMBER 32B
DETERMINATION OF G_0 FROM VARIATION OF SHEAR MODULUS WITH STRAIN		DEPTH 155.0 FT.



STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

CLIENT GULF STATES UTILITIES	J.O. NUMBER 12210	BORING NUMBER Z-5
SITE RIVER BEND	DATE 15 MAR 77	SAMPLE NUMBER 32B
EFFECT OF CONFINING PRESSURE ON SHEAR MODULUS SUMMARY		DEPTH 155.0 FT.

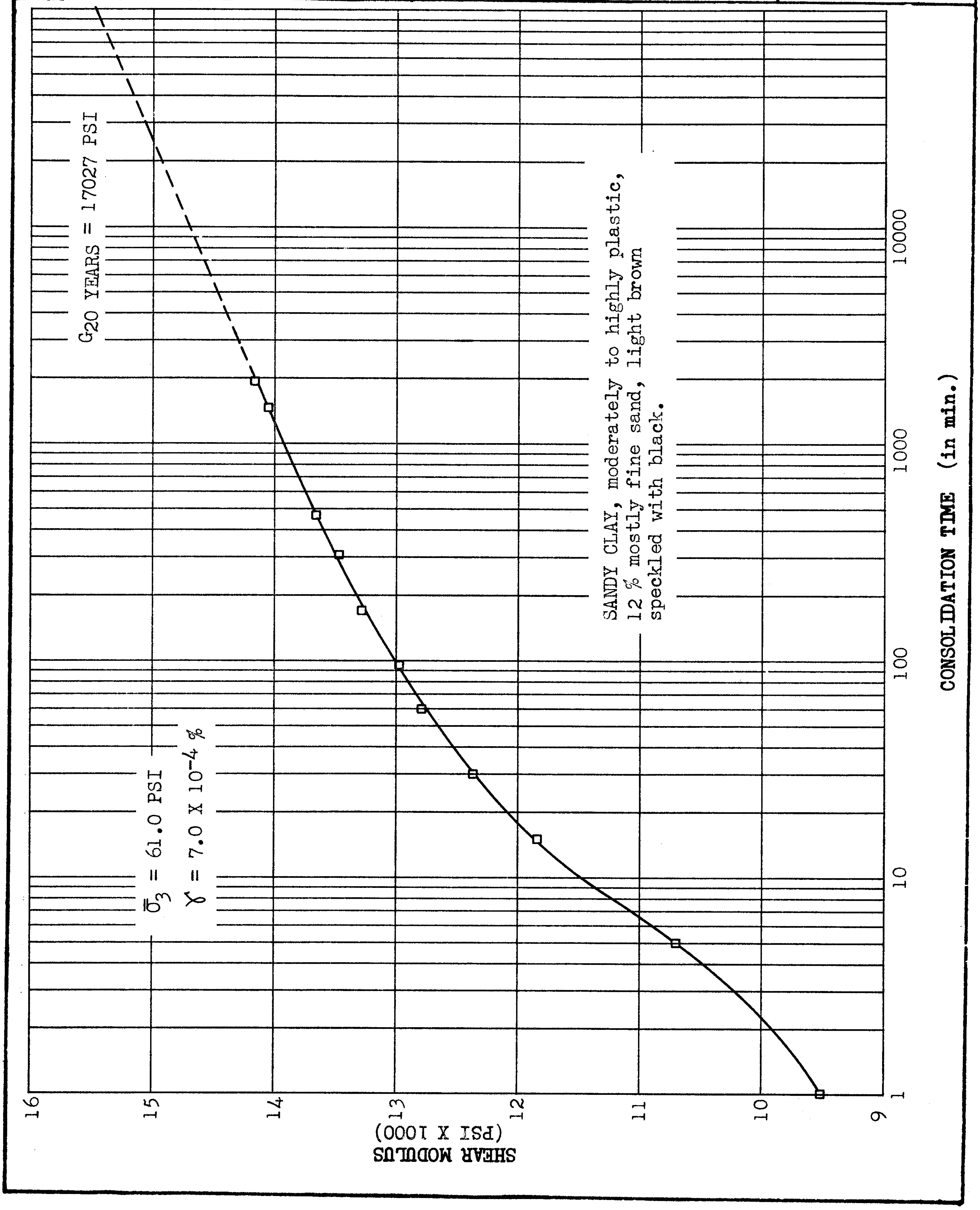


SANDY CLAY, moderately to highly plastic, 12 % mostly fine sand, light brown speckled with black.

STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

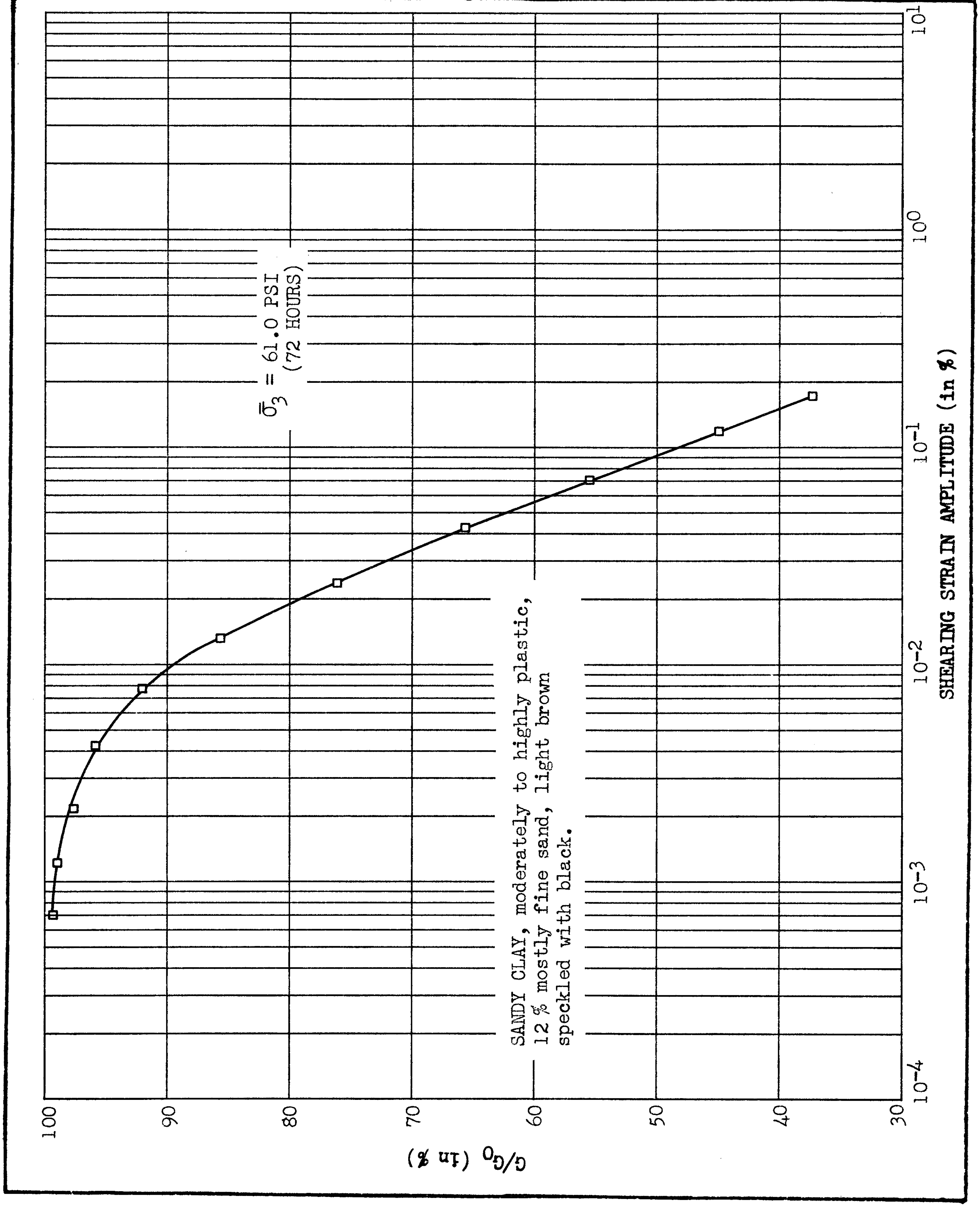
CLIENT GULF STATES UTILITIES	**J.O. NUMBER** 12210	**BORING NUMBER** Z-5
SITE RIVER BEND	**DATE** 16 MAR 77	**SAMPLE NUMBER** 32B
EFFECT OF CONSOLIDATION TIME ON SHEAR MODULUS SUMMARY		**DEPTH** 155.0 FT.



STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

CLIENT GULF STATES UTILITIES	**J.O. NUMBER** 12210	**BORING NUMBER** Z-5
SITE RIVER BEND	**DATE** 17 MAR 77	**SAMPLE NUMBER** 32B
EFFECT OF SHEARING STRAIN AMPLITUDE ON SHEAR MODULUS SUMMARY		**DEPTH** 155.0 FT.



STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

CLIENT
GULF STATES UTILITIES

J.O. NUMBER
12210

BORING NUMBER
Z-5

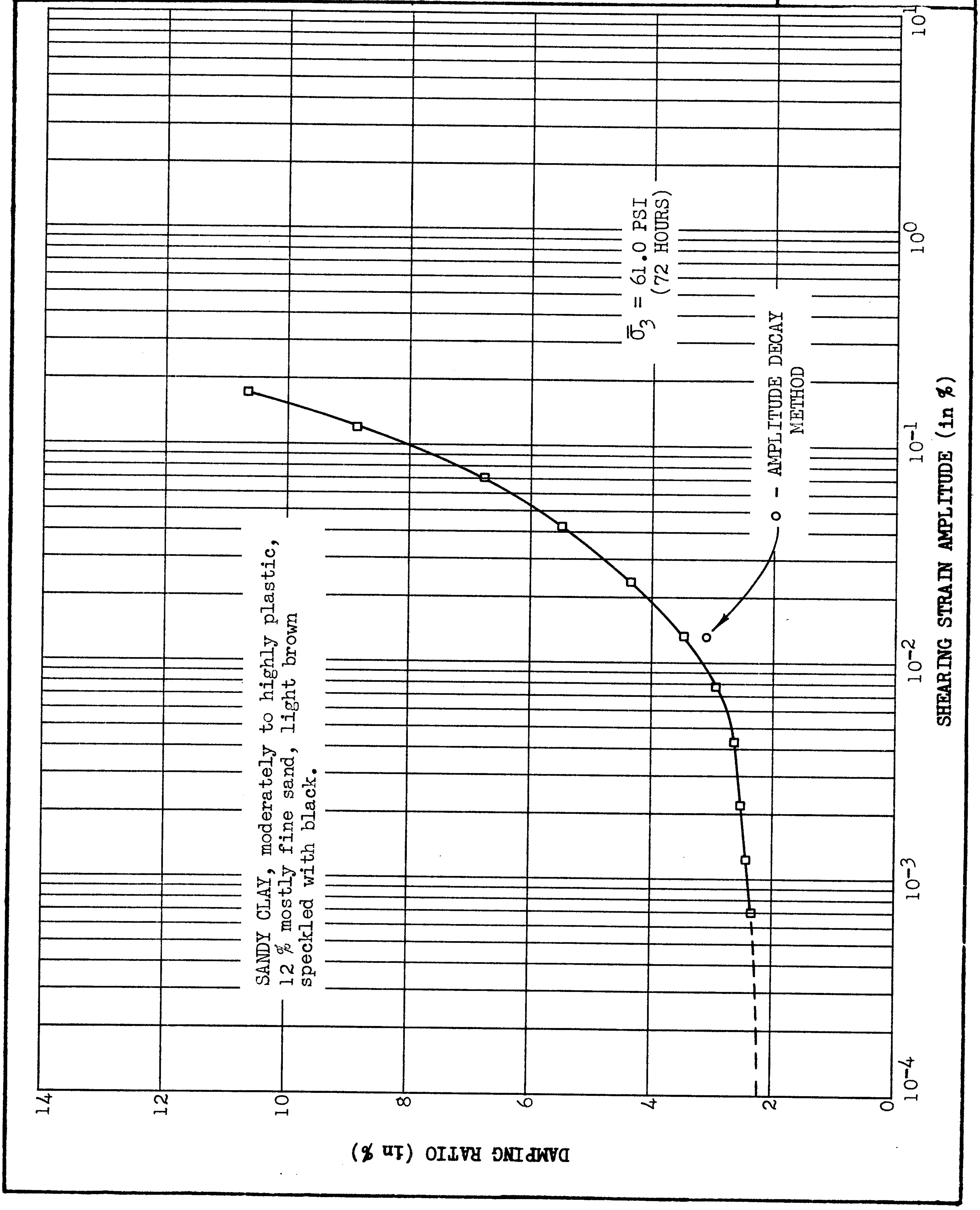
SITE
RIVER BEND

DATE
18 MAR 77

SAMPLE NUMBER
32B

EFFECT OF SHEARING STRAIN AMPLITUDE ON DAMPING RATIO SUMMARY

DEPTH
155.0 FT.



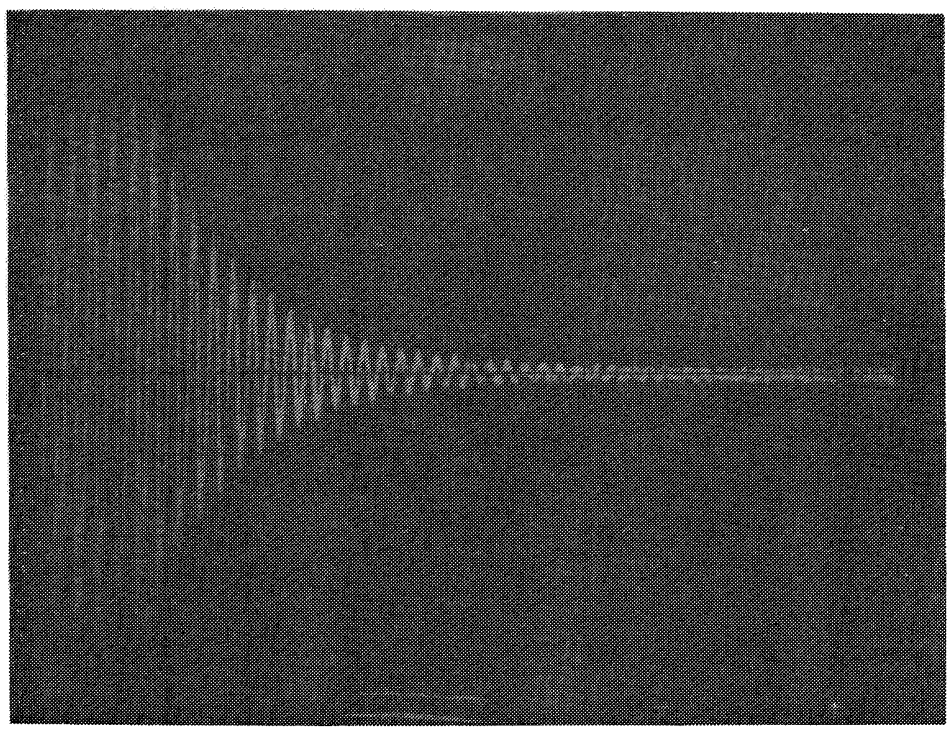
$\bar{\sigma}_3$ = 61.0 PSI (72 HOURS)

SANDY CLAY, moderately to highly plastic, 12 % mostly fine sand, light brown speckled with black.

STONE & WEBSTER ENGINEERING CORPORATION

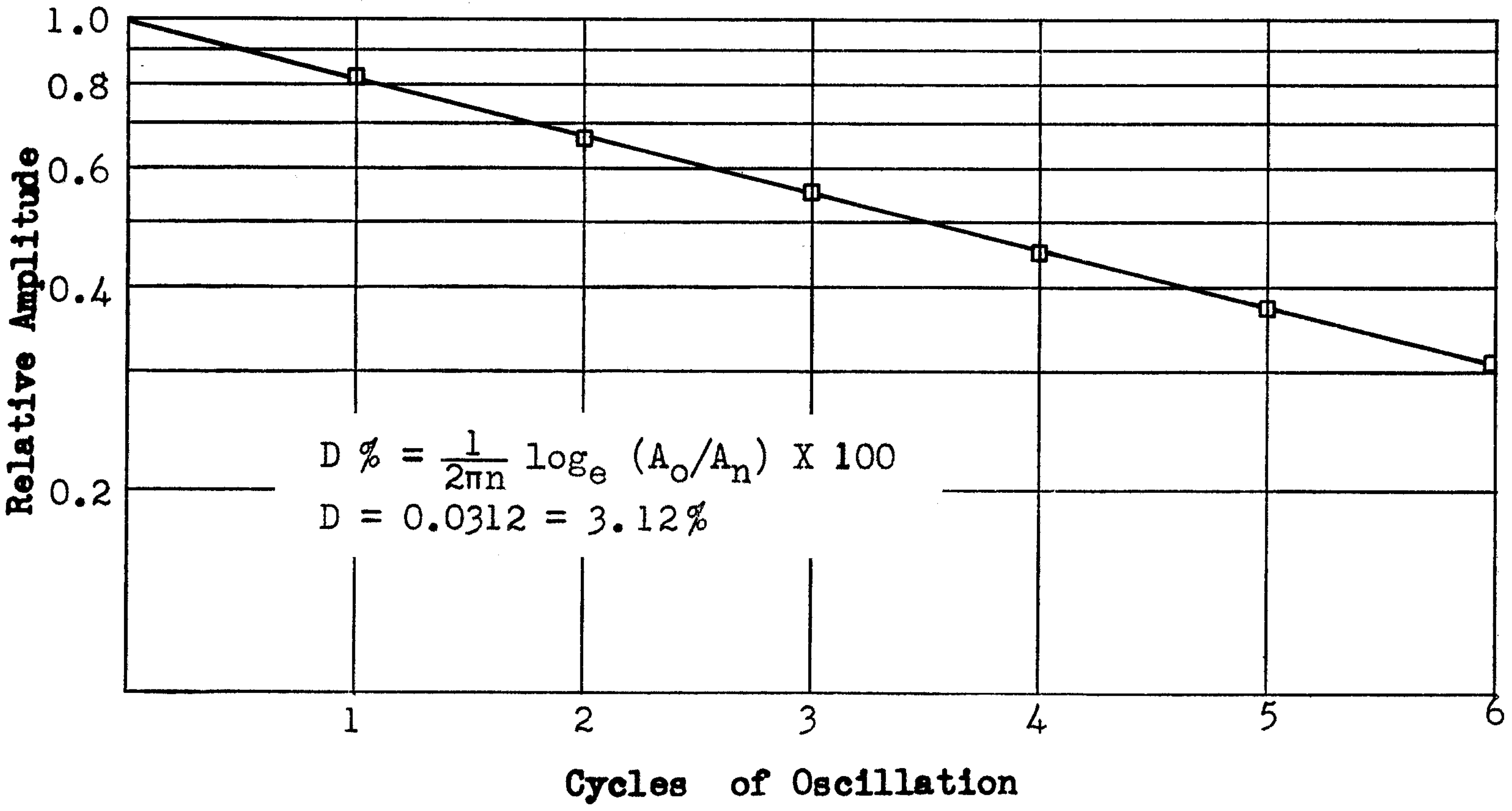
RESONANT COLUMN TEST

CLIENT GULF STATES UTILITIES	J.O. NUMBER 12210	BORING NUMBER Z-5
SITE RIVER BEND	DATE 18 MAR 77	SAMPLE NUMBER 32B
DETERMINATION OF DAMPING RATIO BY AMPLITUDE DECAY METHOD		DEPTH 155.0 FT.



$\bar{\sigma}_3$ = 61.0 PSI
(72 HOURS)
γ = 0.013 %

(a) **Amplitude-Time Decay Curve**



$D\ \% = \frac{1}{2\pi n} \log_e (A_o/A_n)\ X\ 100$

D = 0.0312 = 3.12%

(b) **Amplitude v.s. Cycle Number Plot**

RESONANT COLUMN TEST
GENERAL DATA

STONE & WEBSTER
ENGINEERING CORPORATION

CLIENT GULF STATES UTILITIES	JO NUMBER 12210	TESTED BY RKW	BORING Z-5
			SAMPLE 32C
SITE RIVER BEND		CHECKED BY WJO	DEPTH 155.3 FT.
SPECIMEN PROPERTIES			DATE 15 FEB 77

TYPE OF TEST:

BALANCE NO. P2200

TYPE OF SPECIMEN: UNDISTURBED ☑ REMOLDED ☐ COMPACTED ☐ (Method)____

WEIGHTS:

Weight of specimen ~~+ tare~~ 158.40 gm.

Weight of tare —— gm.

Weight of specimen 158.40 gm.

SPECIMEN PROPERTIES: INITIAL

Water content 28.9 %

γ_d 90.3 lb/cu. ft.

γ_m 116.5 lb/cu. ft.

DIMENSIONS:

Height of specimen + caps —— in.

Height of caps —— in.

Height of specimen 3.14 in. 7.98 cm

Area of specimen 10.64 sq. cm.

Volume of specimen 84.91 cu. cm.

CIRCUMFERENCE of specimen + ~~membrane~~:

1 11.60 2 11.55 3 11.50

Ave. 11.55 cm.

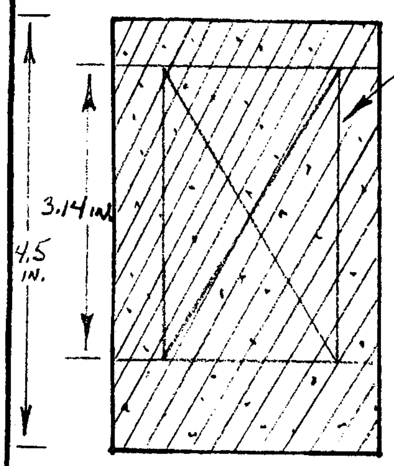
DIAMETER of specimen + ~~membrane~~ 3.68 cm

thickness membrane —— cm

Diameter of specimen 3.68 cm

HEIGHT/DIAMETER: 2.17 RULE NO. 0822 TAPE NO. 0147 CALIPER NO. C151

SOIL DESCRIPTION:



Sandy Clay, mod to highly plas, 25.4 % medium to fine, mostly fine sand, light brown dotted with tiny black specks (manganese dioxide?)

FILTER PAPER: ☒

DIMENSIONS: AFTER TEST

CIRCUMFERENCE ~~DIAMETER~~ of specimen + membrane 11.63 cm

- thickness membrane 0.08 cm

11.55

Diameter of specimen 3.68 cm

Height of specimen 3.07 in. 7.80 cm

Area of specimen 10.64 sq. cm.

Volume of specimen 82.99 cu. cm.

SAMPLE SECTIONS	TRIMMINGS WASH	CENTER	SPECIMEN AFTER TEST
CONTAINER NUMBER	C106		D36
WT. WET SOIL + TARE	110.45		215.85
WT. DRY SOIL + TARE	99.24		186.20
WT. WATER	11.21		29.65
TARE WT.	58.66		63.35
WT. DRY SOIL	40.58		122.85
WATER CONTENT (%)	27.6		24.1
SIEVE NO.			
WT. WASHED DRY SOIL + TARE	68.97		
WT. LOST IN WASHING	30.27		
% FINES	74.6		

WEIGHTS: AFTER TEST

Wet weight after test 152.50 gm

Dry weight after test 122.85 gm

Weight of water 29.65 gm

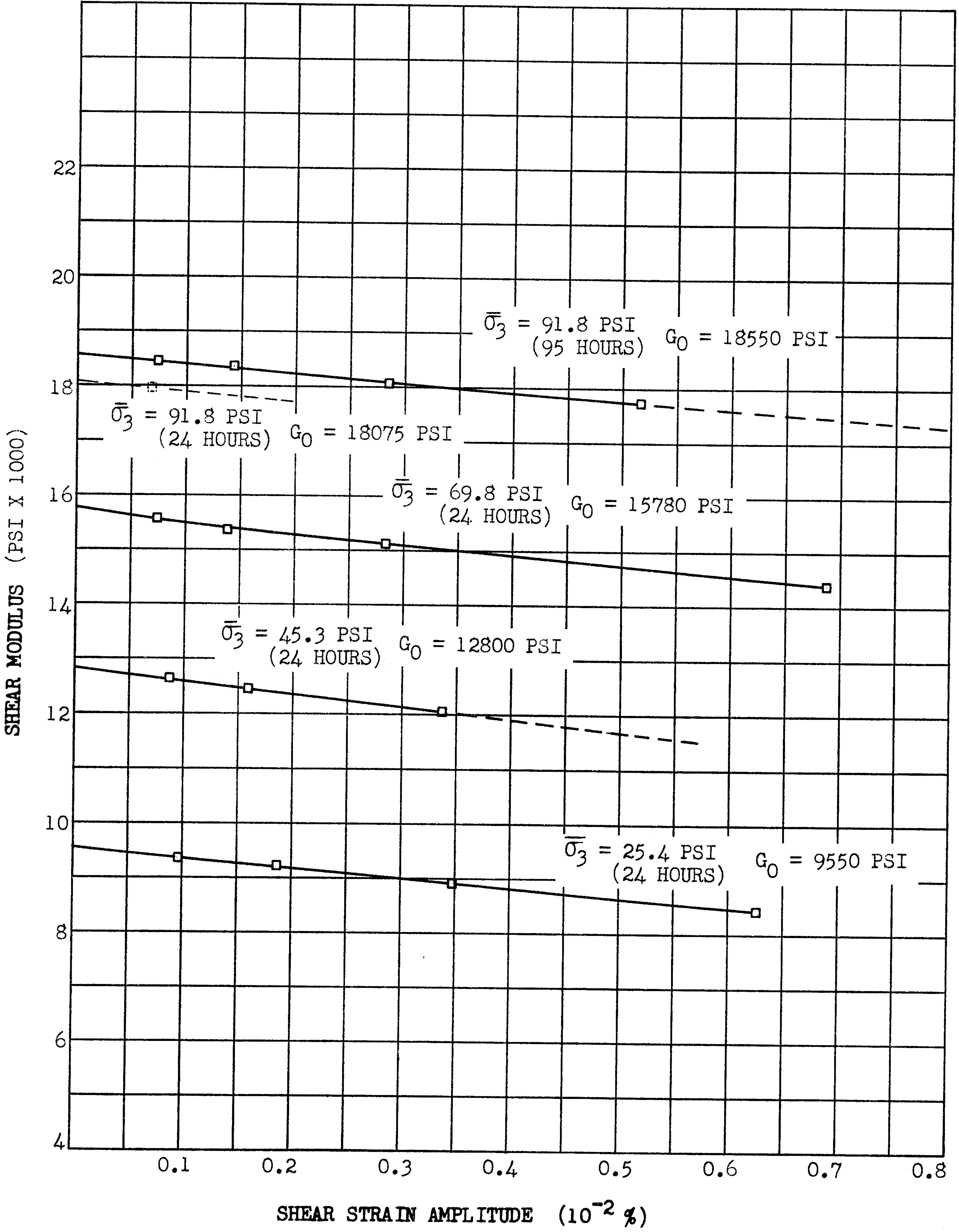
Water content 24.1 %

γ_d = 92.4 PCF

STONE & WEBSTER ENGINEERING CORPORATION

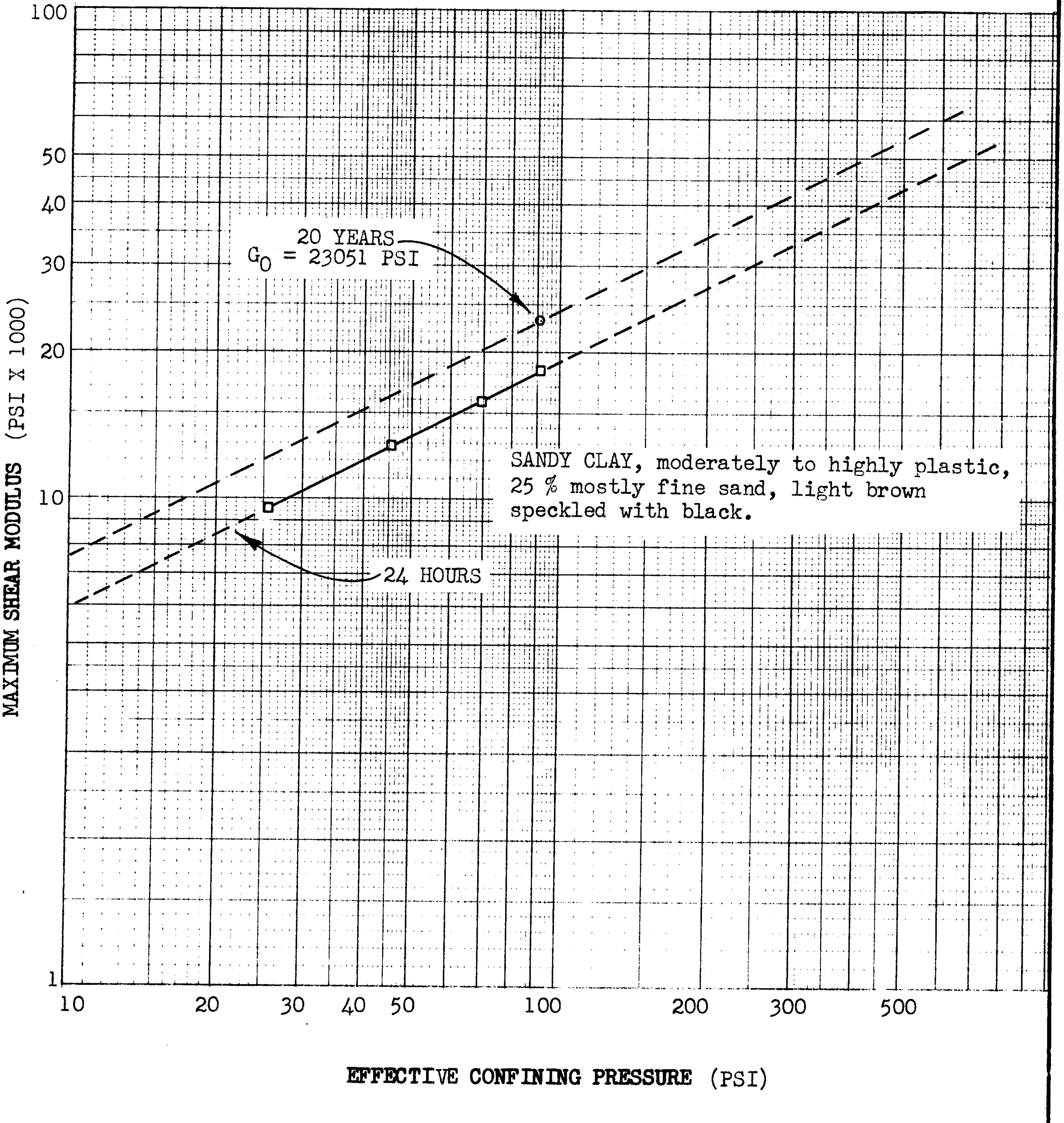
RESONANT COLUMN TEST

CLIENT GULF STATES UTILITIES	J.O. NUMBER 12210	BORING NUMBER Z-5
SITE RIVER BEND	DATE 22 FEB 77	SAMPLE NUMBER 32C
DETERMINATION OF G_0 FROM VARIATION OF SHEAR MODULUS WITH STRAIN		DEPTH 155.3 FT.



RESONANT COLUMN TEST

CLIENT GULF STATES UTILITIES	**J.O. NUMBER** 12210	**BORING NUMBER** Z-5
SITE RIVER BEND	**DATE** 22 FEB 77	**SAMPLE NUMBER** 32C
EFFECT OF CONFINING PRESSURE ON SHEAR MODULUS SUMMARY		**DEPTH** 155.3 FT.

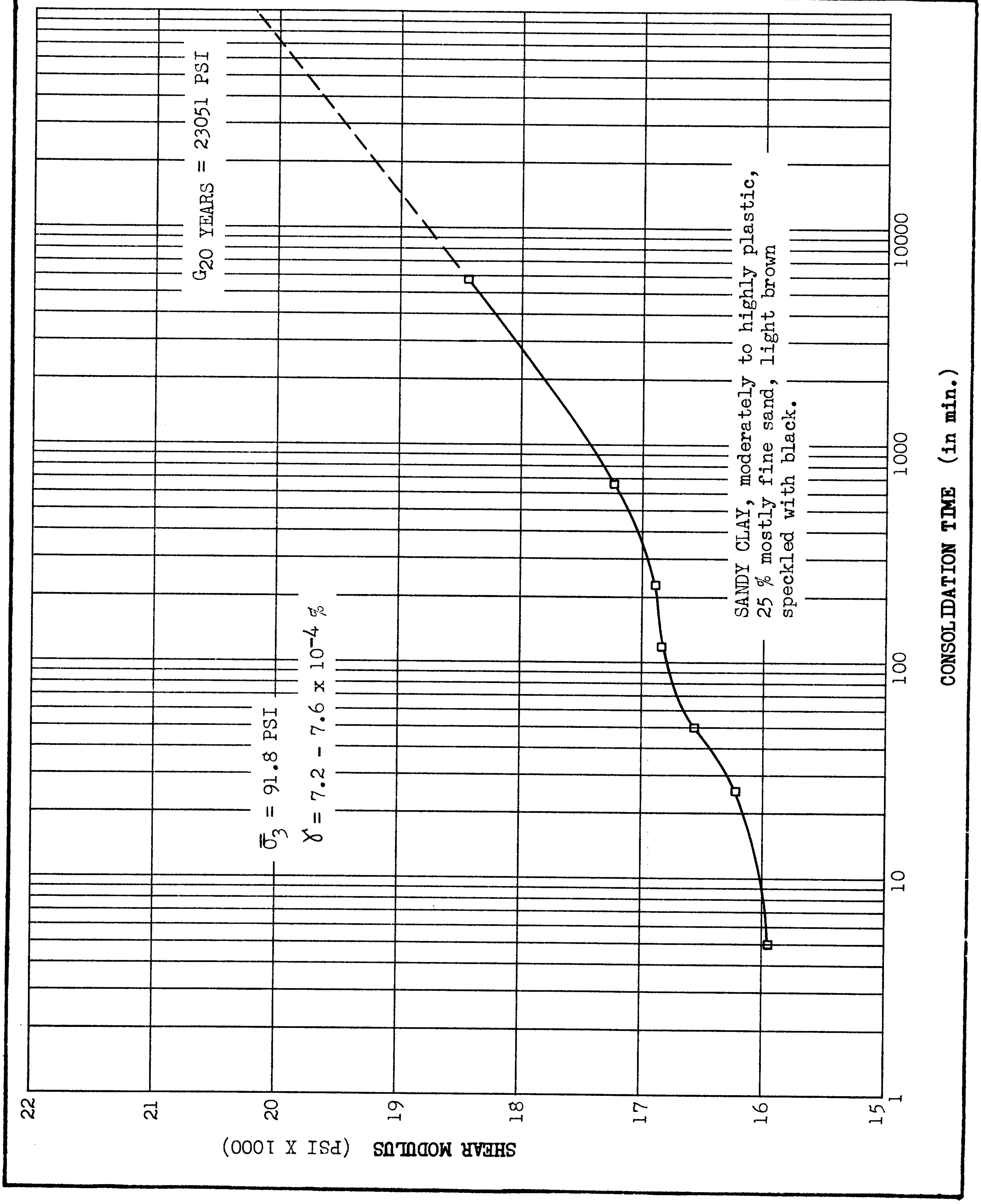


SANDY CLAY, moderately to highly plastic, 25 % mostly fine sand, light brown speckled with black.

STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

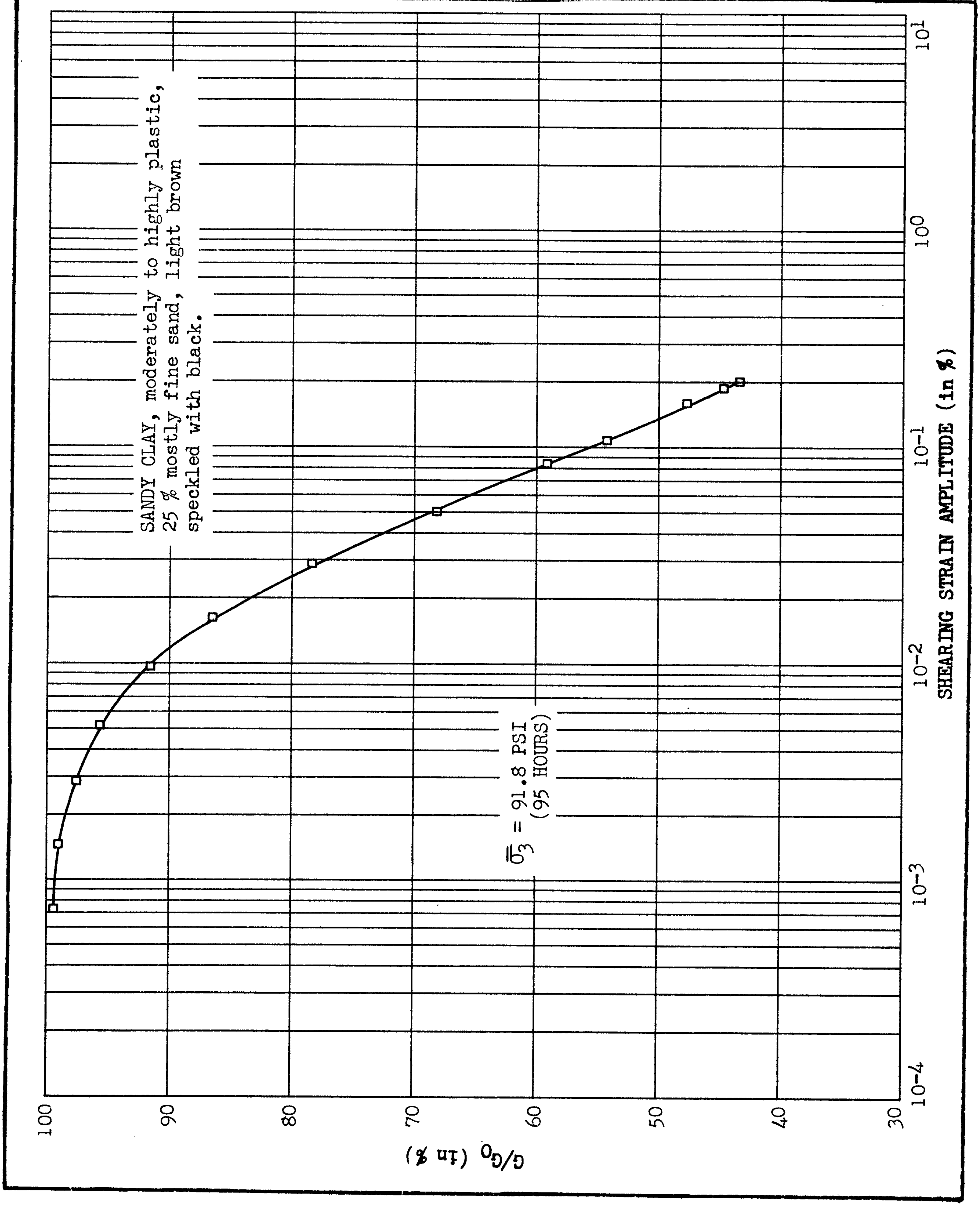
CLIENT GULF STATES UTILITIES	J.O. NUMBER 12210	BORING NUMBER Z-5
SITE RIVER BEND	DATE 22 FEB 77	SAMPLE NUMBER 32C
EFFECT OF CONSOLIDATION TIME ON SHEAR MODULUS SUMMARY		DEPTH 155.3 FT.



STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

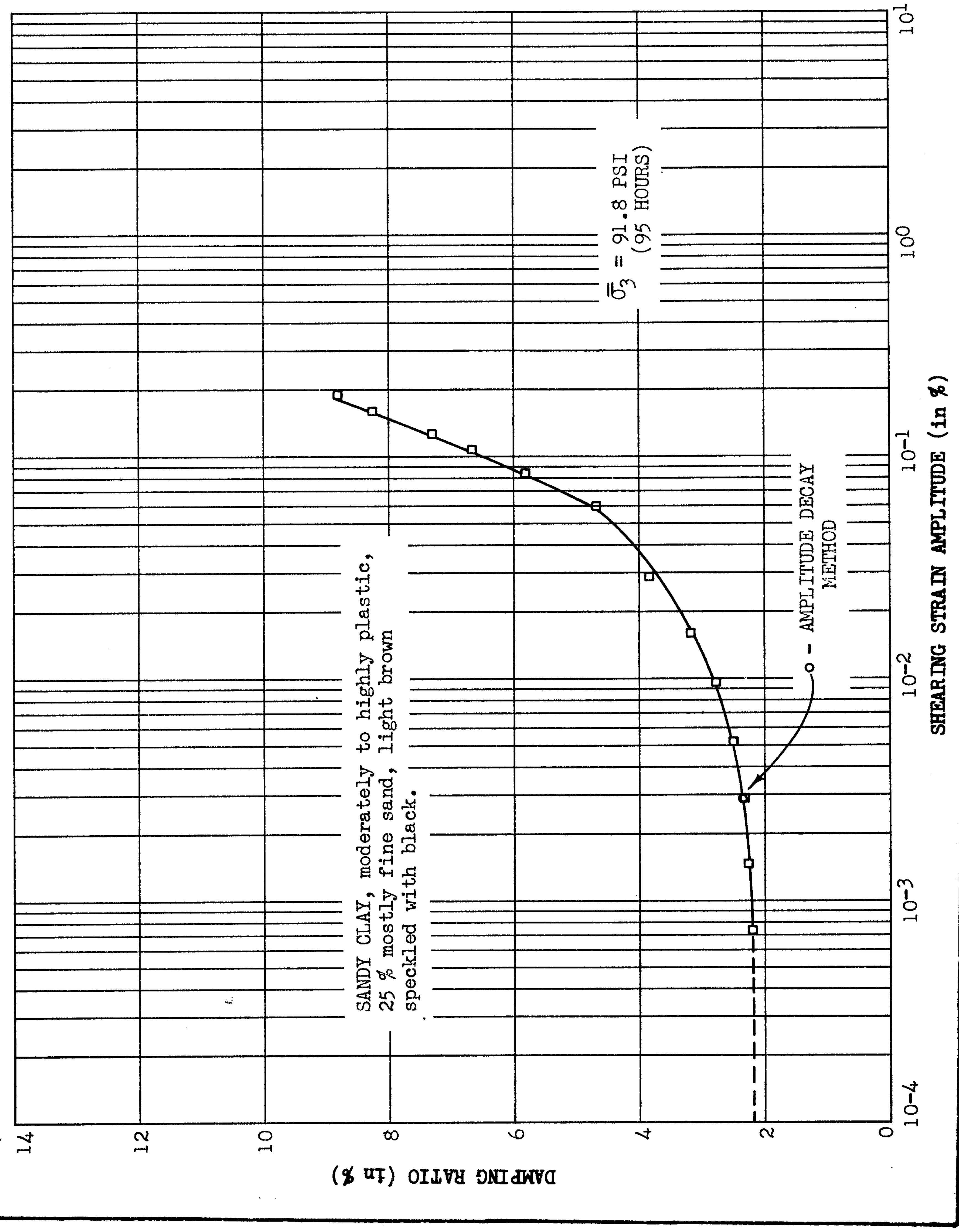
CLIENT GULF STATES UTILITIES	**J.O. NUMBER** 12210	**BORING NUMBER** Z-5
SITE RIVER BEND	**DATE** 23 FEB 77	**SAMPLE NUMBER** 32C
EFFECT OF SHEARING STRAIN AMPLITUDE ON SHEAR MODULUS SUMMARY		**DEPTH** 155.3 FT.



STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

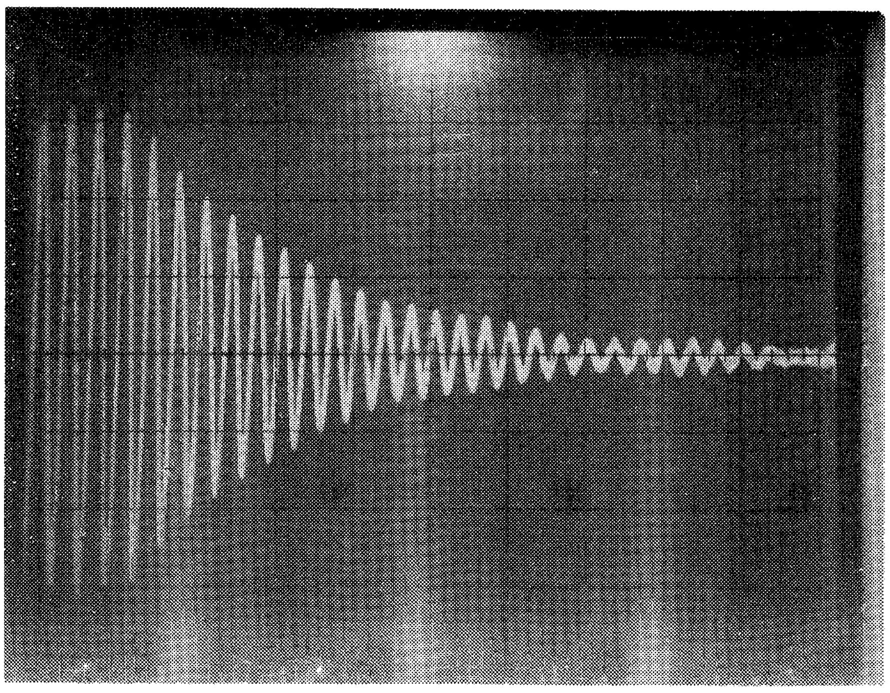
CLIENT GULF STATES UTILITIES	**J.O. NUMBER** 12210	**BORING NUMBER** Z-5
SITE RIVER BEND	**DATE** 24 FEB 77	**SAMPLE NUMBER** 32C
EFFECT OF SHEARING STRAIN AMPLITUDE ON DAMPING RATIO SUMMARY		**DEPTH** 155.3 FT.



STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

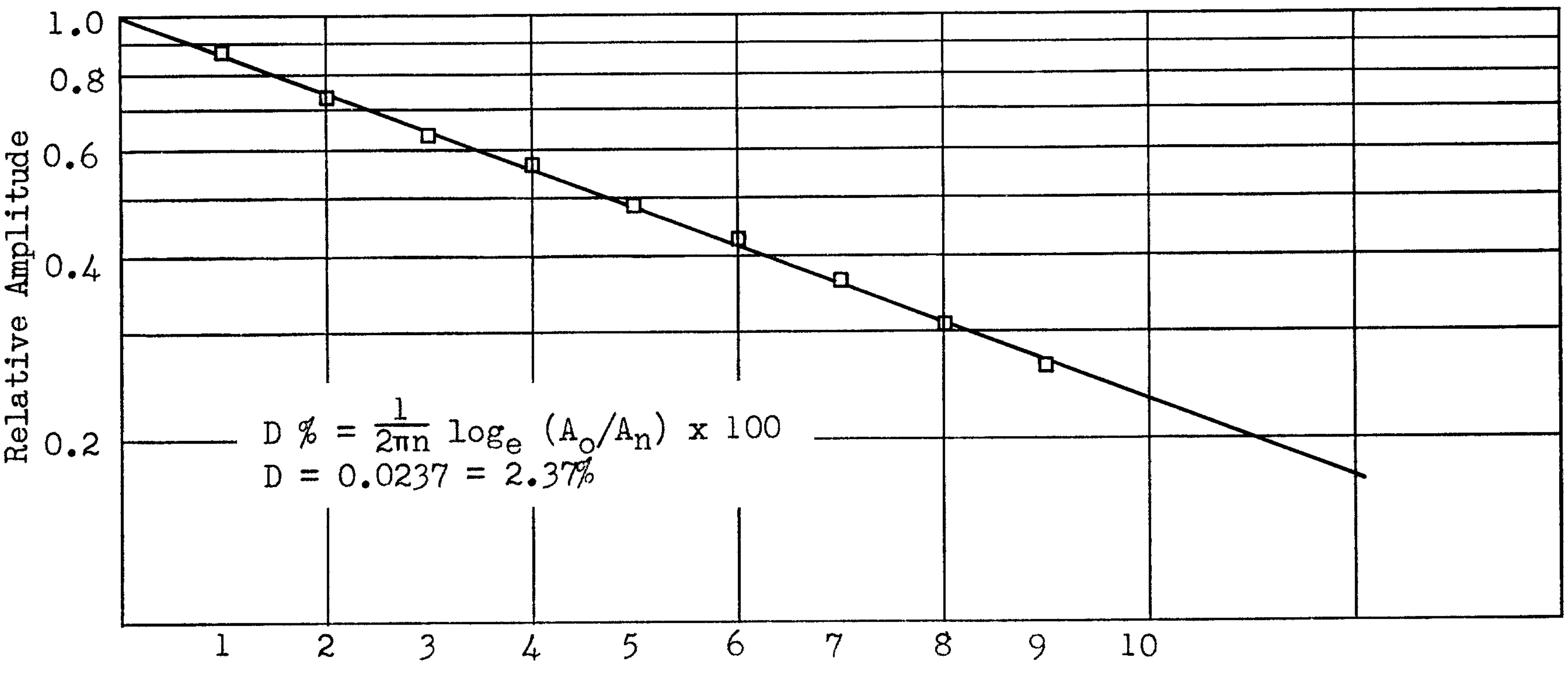
CLIENT GULF STATES UTILITIES	J.O. NUMBER 12210	BORING NUMBER Z-5
SITE RIVER BEND	DATE 25 FEB 77	SAMPLE NUMBER 32C
DETERMINATION OF DAMPING RATIO BY AMPLITUDE DECAY METHOD		DEPTH 155.3 FT.



$\bar{\sigma}_3$ = 91.8 PSI
(95 HOURS)

γ = 0.0029 %

(a) **Amplitude-Time Decay Curve**



$D\,\% = \frac{1}{2\pi n} \log_e (A_o/A_n) \times 100$

D = 0.0237 = 2.37%

(b) **Amplitude v.s. Cycle Number Plot**

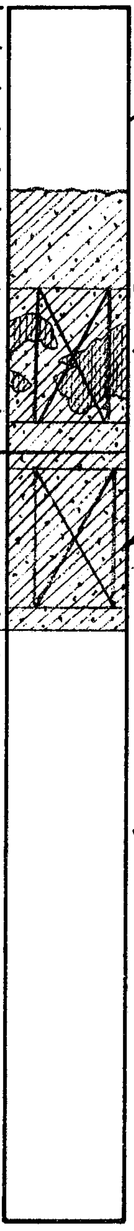
UNDISTURBED SAMPLE LOG

STONE & WEBSTER
ENGINEERING CORPORATION

BORING NUMBER: Z-6

CLIENT: GULF STATES UTILITIES
J.O. NUMBER: 12210
LOGGED BY: RKW
SAMPLE NUMBER: 43
SITE: RIVER BEND
CHECKED BY: wJO
DEPTH: 181.0 - 181.8 FT.
SAMPLE SIZE AND TYPE: 3.0 IN.
CONDITION OF CUTTING EDGE: UNKNOWN
DATE: 23 FEB 77

DEPTH (FT)	SECTION (IN.)	DESCRIPTION OF SAMPLE
	Ⓐ 0	TOP
		EMPTY
181.0	5	
181.2	11.0	Resonant Column Specimen Z-6/43A
	10	
181.5		
	Ⓑ 4.3	Sandy Clay, moderately plastic, 25-30% uniform fine sand, greenish brown mottled with orange - RESONANT COLUMN SPECIMEN Z6/43B
181.8	15	
	Ⓒ	
	20	LOGGED BY GEOTECHNICAL ENGINEERS OF WINCHESTER.
	147	
	25	
	30	



SEE INDICATED TEST DATA SHEET FOR DETAILS OF SPECIFIC SECTION OF SAMPLE

SAMPLE NUMBER		43B					
CONTAINER NUMBER		D23					
WT. WET SOIL + TARE		151.49					
WT. DRY SOIL + TARE		135.78					
WT. WATER		15.71					
TARE WT.		63.43					
WT. DRY SOIL		72.35					
WATER CONTENT (%)		21.7					
~~☐ qu~~ *	~~UNDISTURBED~~	83.02	WASHED DRY + TARE				
	~~REMOLDED~~	52.76	WT LOST WASHING				
~~☒ Su~~ **	~~UNDISTURBED~~	72.9	% FINES				
	~~REMOLDED~~						

*DETERMINED BY POCKET PENETROMETER IN KG/SQ CM OR TSF **DETERMINED BY TORVANE

RESONANT COLUMN TEST
GENERAL DATA

STONE & WEBSTER
ENGINEERING CORPORATION

BORING Z-6

CLIENT GULF STATES UTILITIES

JO NUMBER 12210

TESTED BY RKW

SAMPLE 43 A

SITE RIVER BEND

CHECKED BY WSD

DEPTH 181.2 FT.

DATE 21 MAR 77

SPECIMEN PROPERTIES

TYPE OF TEST:

BALANCE NO. P2200

TYPE OF SPECIMEN: UNDISTURBED ☒ REMOLDED ☐ COMPACTED ☐ (Method)______

WEIGHTS:

Weight of specimen + tare 147.44 gm.

Weight of tare 1.29 gm.

Weight of specimen 146.15 gm.

SPECIMEN PROPERTIES: INITIAL

Water content 25.1 %

γ_d 90.3 lb/cu. ft.

γ_m 113.0 lb/cu. ft.

DIMENSIONS:

Height of specimen + caps — in.

Height of caps — in.

Height of specimen 3.07 in. 7.80 cm

Area of specimen 10.35 sq. cm.

Volume of specimen 80.73 cu. cm.

CIRCUMFERENCE of specimen + ~~membrane~~:

1 11.35 2 11.40 3 11.42

Ave. 11.39 cm.

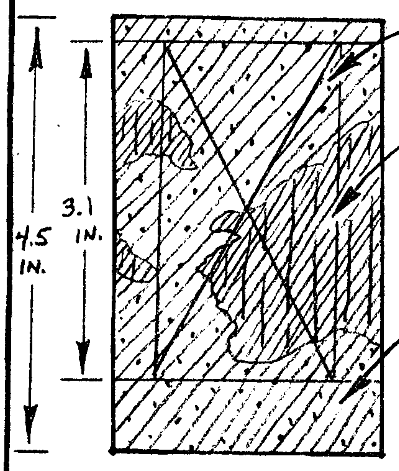
DIAMETER of specimen~~+membrane~~ 3.63 cm

2 thickness membrane 0.12 cm

Diameter of specimen 3.63 cm

HEIGHT/DIAMETER: 2.15 RULE NO. 0822 TAPE NO. 0147 CALIPER NO. 0151

SOIL DESCRIPTION:



Sandy Clay, same as bottom except orange-brown.

Silty Clay, moderately to highly plastic, 6.5 % uniform fine sand, gray, no ℞ to 10% HCl.

Sandy Clay, slightly to moderately plastic, 21.0 % fine sand, greenish gray, no ℞ to HCl.

FILTER PAPER: ☒

DIMENSIONS: AFTER TEST

11.27 11.35 11.4

CIRCUMFERENCE of specimen 11.35 cm

thickness membrane — cm

Diameter of specimen 3.61 cm

Height of specimen 3.05 in. 7.75 cm

Area of specimen 10.24 sq. cm.

Volume of specimen 79.36 cu. cm.

SAMPLE SECTIONS	TRIMMINGS SANDY CLAY	~~CENTER~~ GRAY CLAY	SPECIMEN AFTER TEST
CONTAINER NUMBER	C 80	A 56	D 25
WT. WET SOIL + TARE	103.30	24.90	209.50
WT. DRY SOIL + TARE	95.93	23.21	180.65
WT. WATER	7.37	1.69	28.85
TARE WT.	59.22	18.16	63.85
WT. DRY SOIL	36.71	5.05	116.80
WATER CONTENT (%)	20.1	33.5	24.7
SIEVE NO.			
WT. WASHED DRY SOIL + TARE	66.92	18.49	
WT. LOST IN WASHING	29.01	4.72	
% FINES	79.0	93.5	

WEIGHTS: AFTER TEST

Wet weight after test 145.65 gm

Dry weight after test 116.80 gm

Weight of water 28.85 gm

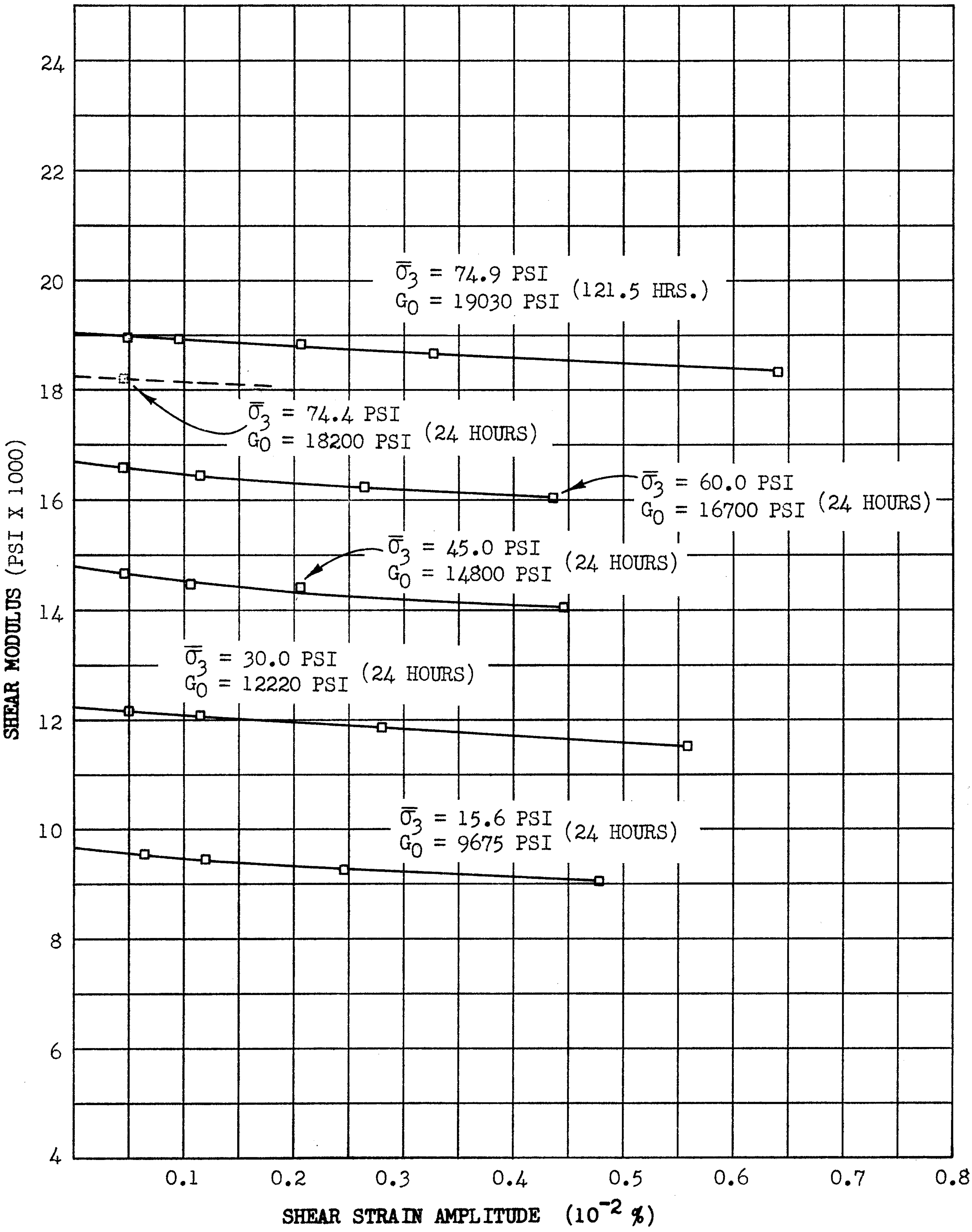
Water content 24.7 %

$\gamma_d = 91.9$ PCF

STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

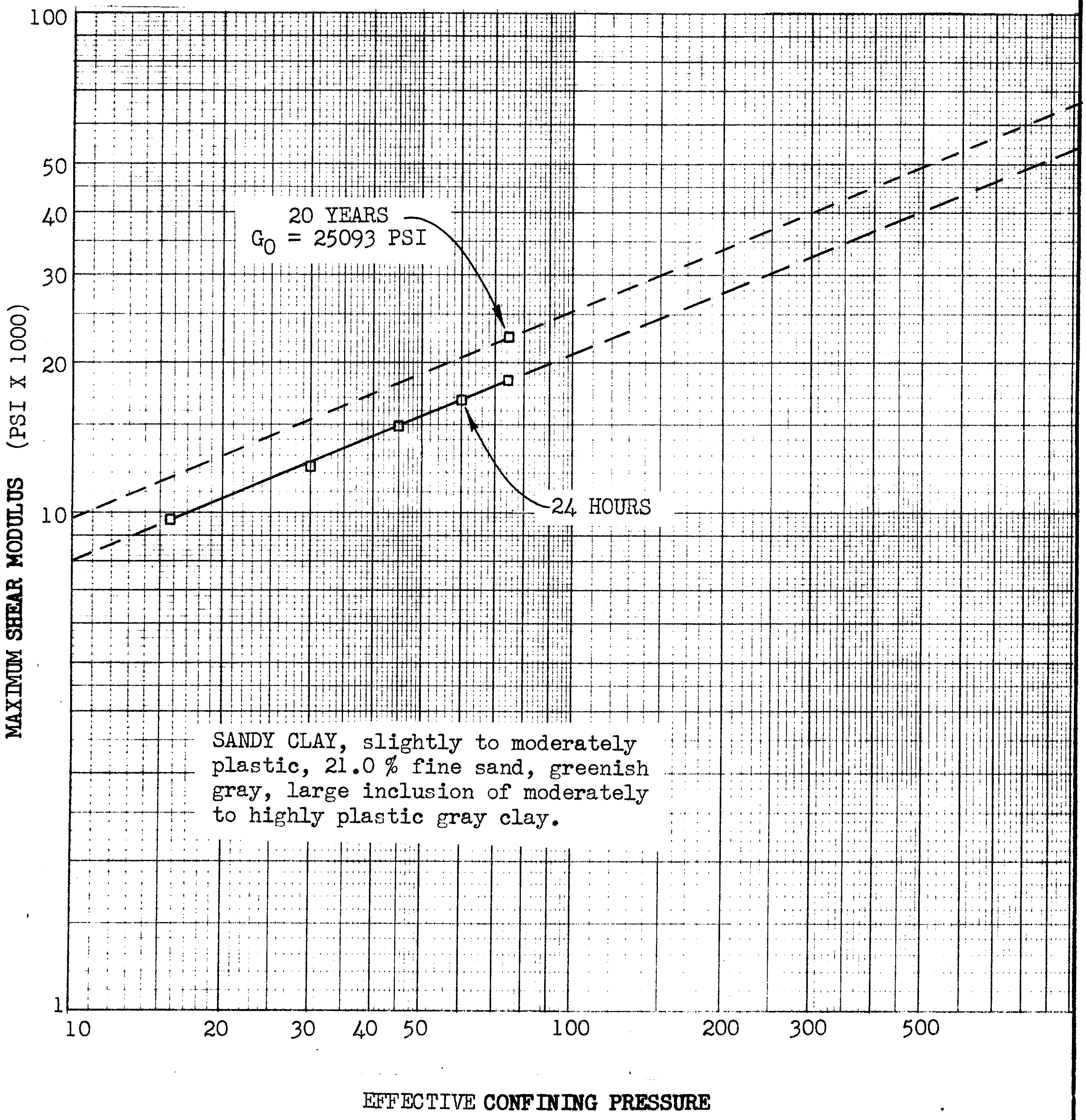
CLIENT GULF STATES UTILITIES	**J.O. NUMBER** 12210	**BORING NUMBER** Z-6
SITE RIVER BEND	**DATE** 22 MAR 77	**SAMPLE NUMBER** 43A
DETERMINATION OF G_0 FROM VARIATION OF SHEAR MODULUS WITH STRAIN		**DEPTH** 181.2 FT.



STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

CLIENT GULF STATES UTILITIES	J.O. NUMBER 12210	BORING NUMBER Z-6
SITE RIVER BEND	DATE 30 MAR 77	SAMPLE NUMBER 43A
EFFECT OF CONFINING PRESSURE ON SHEAR MODULUS SUMMARY		DEPTH 181.2 FT.

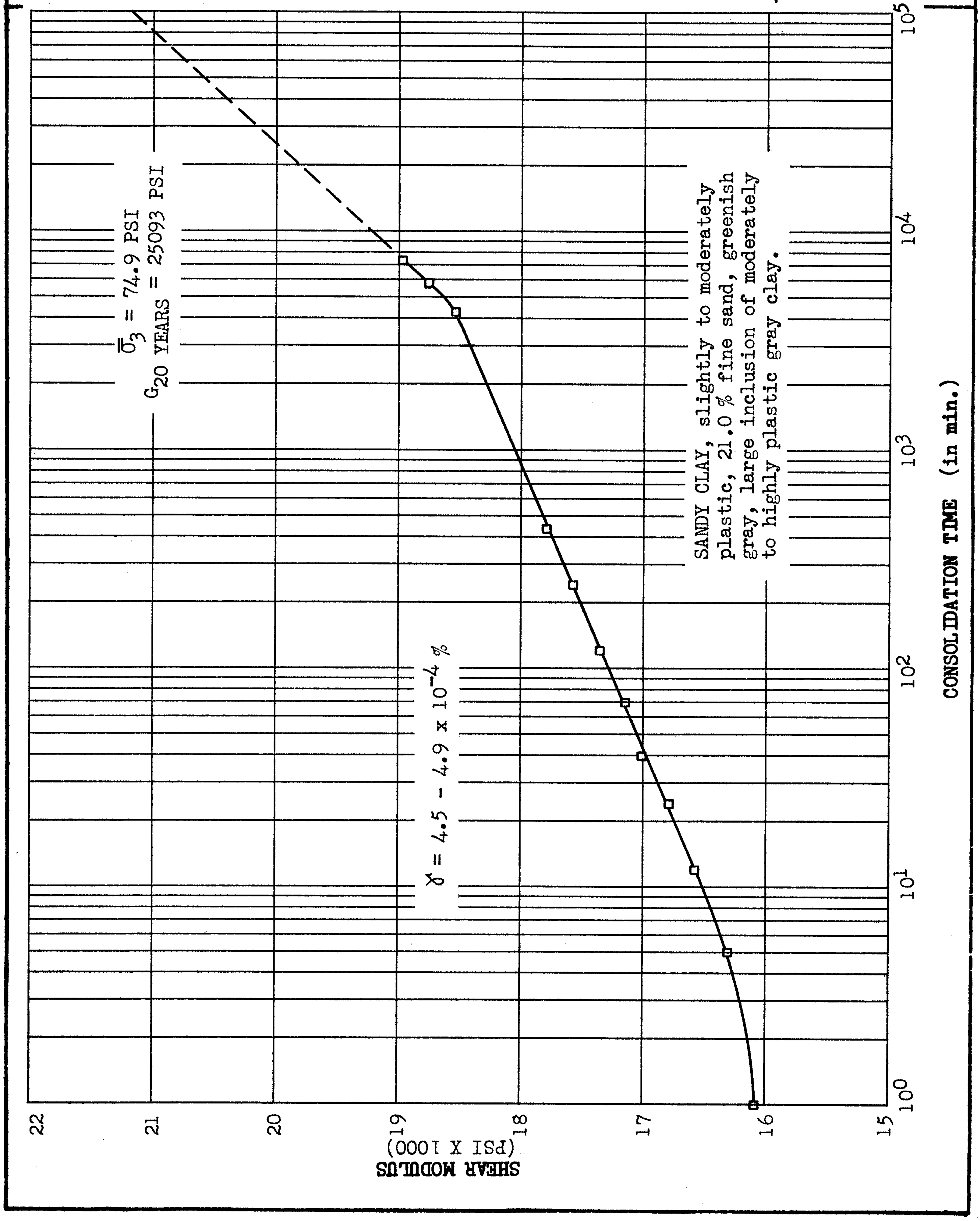


SANDY CLAY, slightly to moderately plastic, 21.0 % fine sand, greenish gray, large inclusion of moderately to highly plastic gray clay.

STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

CLIENT GULF STATES UTILITIES	J.O. NUMBER 12210	BORING NUMBER Z-6
SITE RIVER BEND	DATE 25 MAR 77	SAMPLE NUMBER 43A
EFFECT OF CONSOLIDATION TIME ON SHEAR MODULUS SUMMARY		DEPTH 181.2 FT.



$\overline{\sigma}_3 = 74.9$ PSI

$G_{20 \text{ YEARS}} = 25093$ PSI

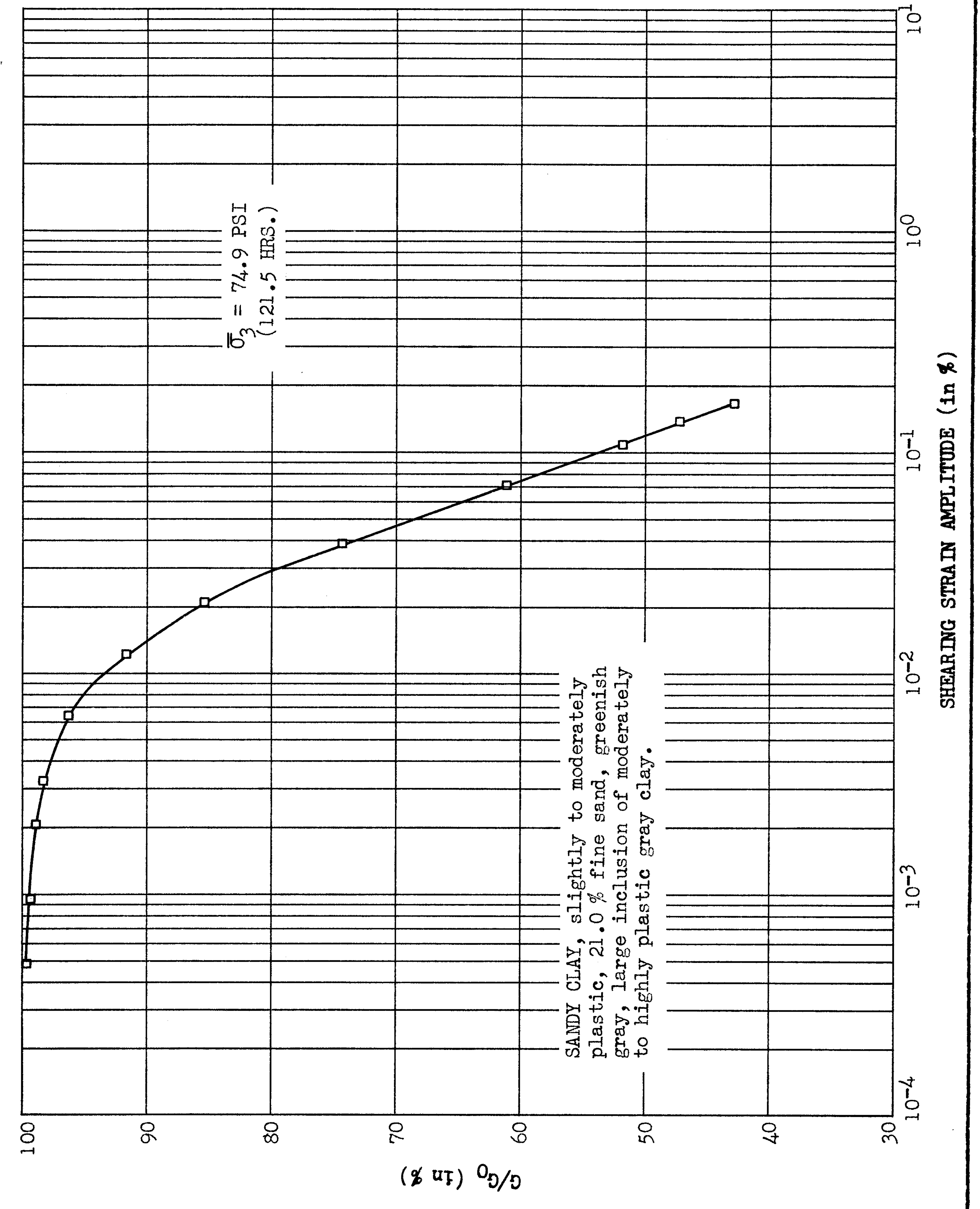
$\gamma = 4.5 - 4.9 \times 10^{-4}$ %

SANDY CLAY, slightly to moderately plastic, 21.0 % fine sand, greenish gray, large inclusion of moderately to highly plastic gray clay.

STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

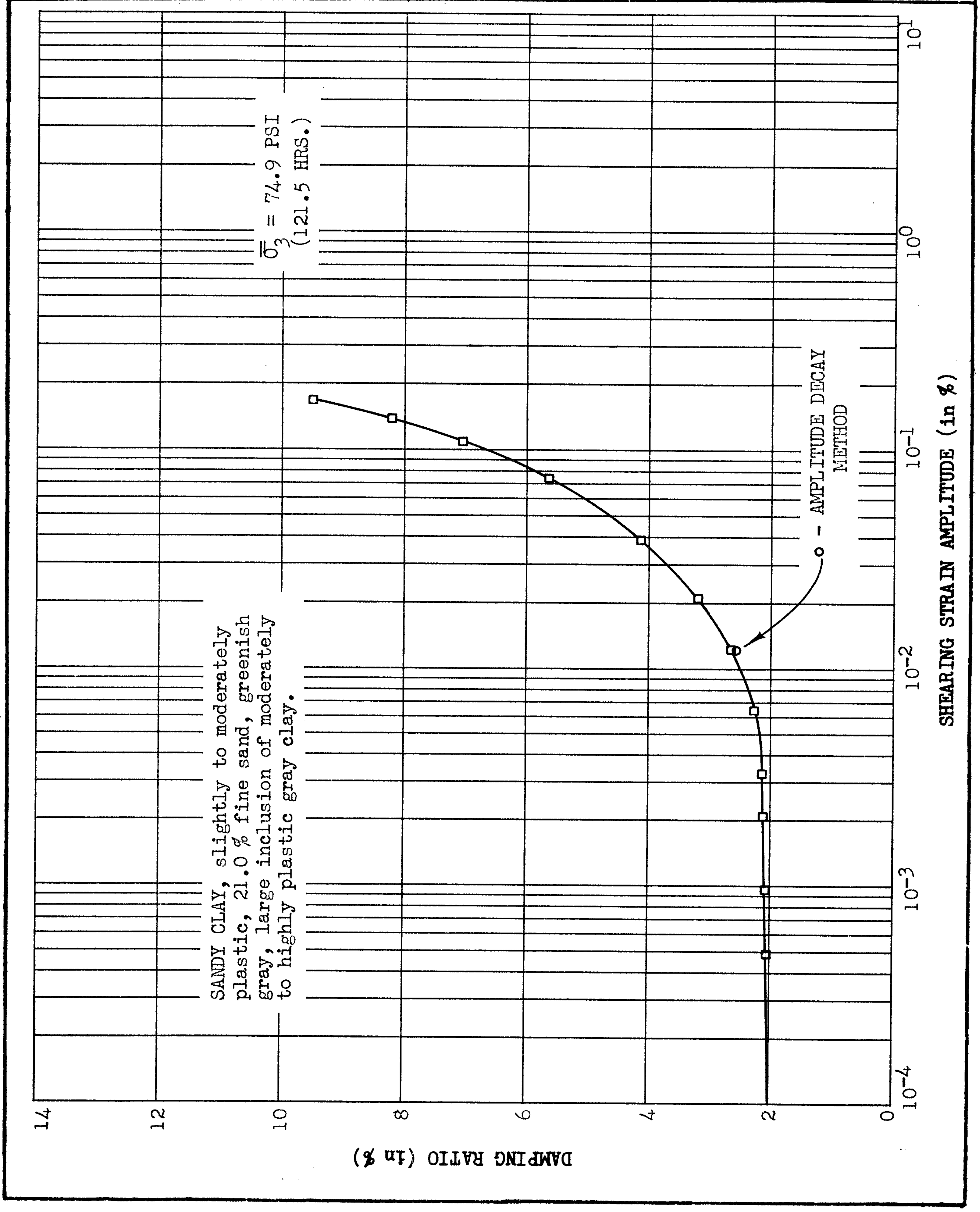
CLIENT GULF STATES UTILITIES	J.O. NUMBER 12210	BORING NUMBER Z-6
SITE RIVER BEND	DATE 30 MAR 77	SAMPLE NUMBER 43A
EFFECT OF SHEARING STRAIN AMPLITUDE ON SHEAR MODULUS SUMMARY		DEPTH 181.2 FT.



STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

CLIENT GULF STATES UTILITIES	**J.O. NUMBER** 12210	**BORING NUMBER** Z-6
SITE RIVER BEND	**DATE** 31 MAR 77	**SAMPLE NUMBER** 43A
EFFECT OF SHEARING STRAIN AMPLITUDE ON DAMPING RATIO SUMMARY		**DEPTH** 181.2 FT.



STONE & WEBSTER ENGINEERING CORPORATION **RESONANT COLUMN TEST**

CLIENT
GULF STATES UTILITIES

J.O. NUMBER
12210

BORING NUMBER
Z-6

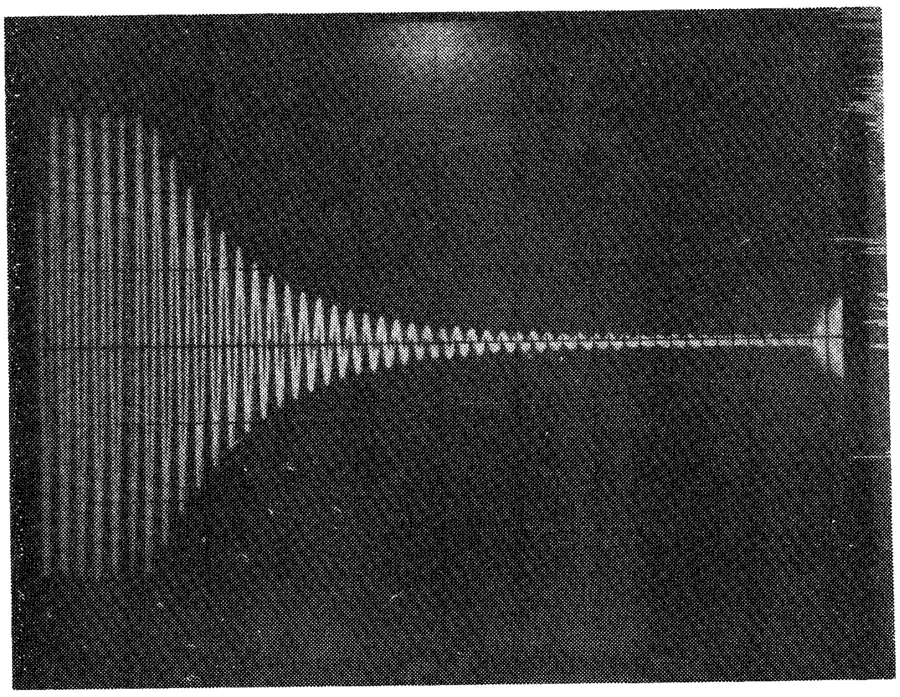
SITE
RIVER BEND

DATE
30 MAR 77

SAMPLE NUMBER
43A

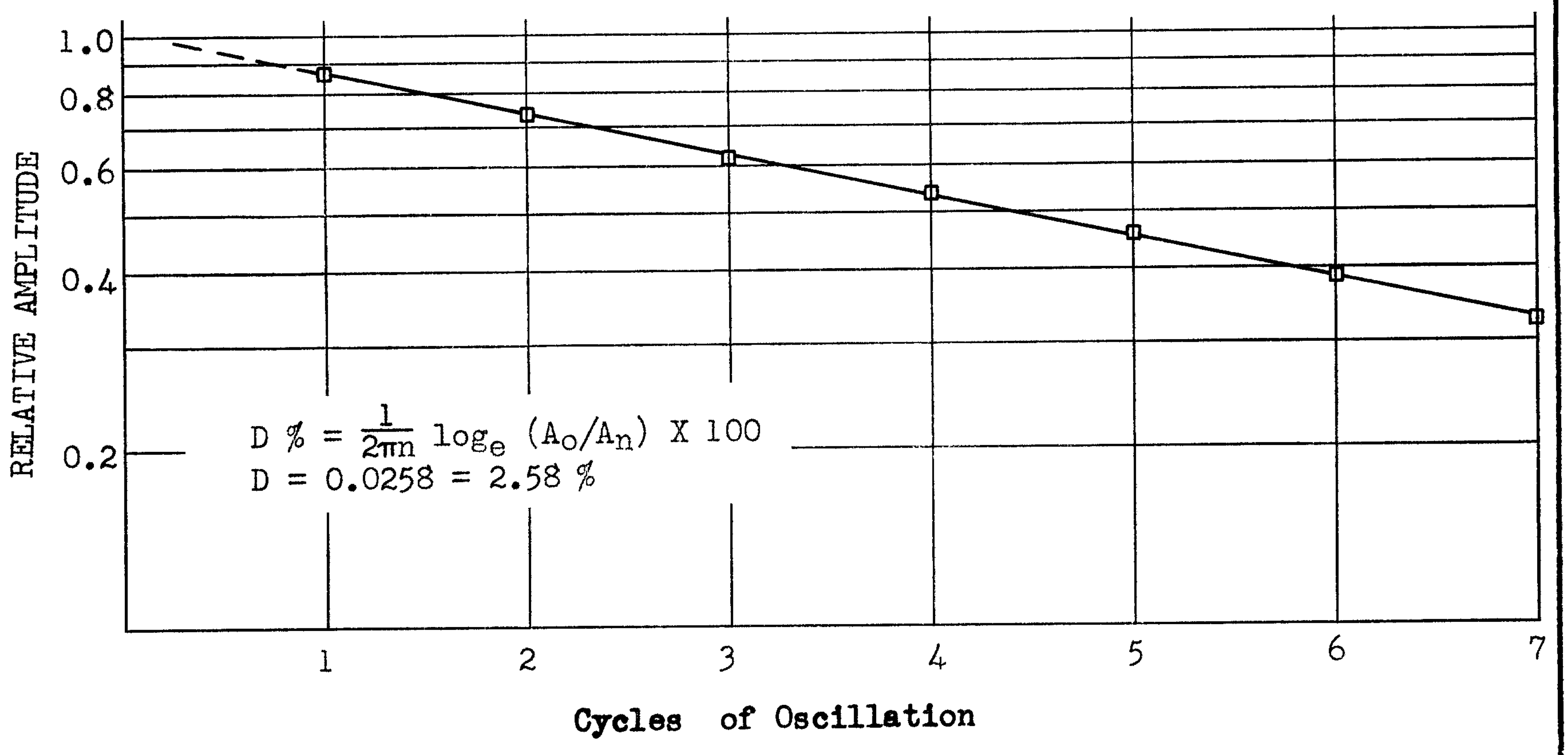
DETERMINATION OF DAMPING RATIO BY AMPLITUDE DECAY METHOD

DEPTH
181.2 FT.



$\overline{\sigma}_3$ = 74.9 PSI
(121.5 HRS)
γ = 0.012 %

(a) **Amplitude-Time Decay Curve**



D % = $\frac{1}{2\pi n}$ $\log_e$ (A_o/A_n) X 100
D = 0.0258 = 2.58 %

(b) **Amplitude v.s. Cycle Number Plot**

RESONANT COLUMN TEST
GENERAL DATA

STONE & WEBSTER
ENGINEERING CORPORATION

BORING Z-6

CLIENT GULF STATES UTILITIES

JO NUMBER 12210

TESTED BY RKW

SAMPLE 43 B

SITE RIVER BEND

CHECKED BY WJO

DEPTH 181.5 FT.

SPECIMEN PROPERTIES

DATE 23 FEB 77

TYPE OF TEST:

BALANCE NO. P2200

TYPE OF SPECIMEN: UNDISTURBED ☒ REMOLDED ☐ COMPACTED ☐ (Method)______

WEIGHTS:

Weight of specimen + tare 157.97 gm.

Weight of tare 1.30 gm.

Weight of specimen 156.67 gm.

SPECIMEN PROPERTIES:

Water content 20.5 %

γ_d 91.8 lb/cu. ft.

γ_m 110.7 lb/cu.ft.

DIMENSIONS:

Height of specimen + caps — in.

Height of caps — in.

Height of specimen 3.20 in. 8.13 cm

Area of specimen 10.87 sq. cm.

Volume of specimen 88.37 cu. cm.

CIRCUMFERENCE of specimen + ~~membrane.~~

1 11.60 2 11.70 3 11.75

Ave. 11.68 cm.

DIAMETER of specimen ~~+ membrane~~ 3.72 cm

thickness membrane — cm

Diameter of specimen 3.72 cm

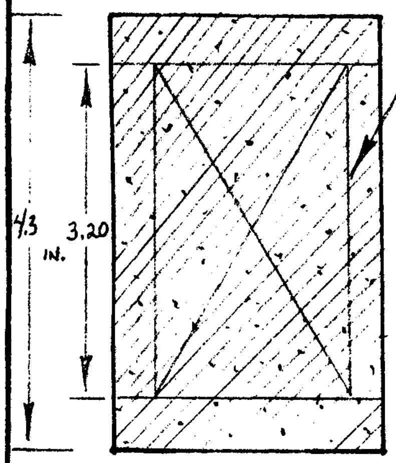
HEIGHT/DIAMETER: 2.19

RULE NO. 0822

TAPE NO. 0147

CALIPER NO. 0151

SOIL DESCRIPTION:



Sandy Clay, moderately plastic, 27.1 % uniform fine sand, greenish brown mottled with orange.

FILTER PAPER: ☒

DIMENSIONS: AFTER TEST 11.62, 11.60, 11.40

BARE SPEC.

CIRCUMFERENCE of specimen 11.54 cm

thickness membrane — cm

Diameter of specimen 3.67 cm

Height of specimen 3.18 in. 8.08 cm

Area of specimen 10.58 sq. cm.

Volume of specimen 85.49 cu. cm.

SAMPLE SECTIONS	TRIMMINGS	CENTER	EXCESS SOLIDS
CONTAINER NUMBER			C54
WT. WET SOIL + TARE			214.10
WT. DRY SOIL + TARE			189.26
WT. WATER			24.84
TARE WT.			59.26
WT. DRY SOIL			130.00
WATER CONTENT (%)			19.1
SIEVE NO.			
WT. WASHED DRY SOIL + TARE			
WT. LOST IN WASHING			
% FINES			

WEIGHTS: AFTER TEST

Wet weight after test 154.84 gm

Dry weight after test 130.00 gm

Weight of water 24.84 gm

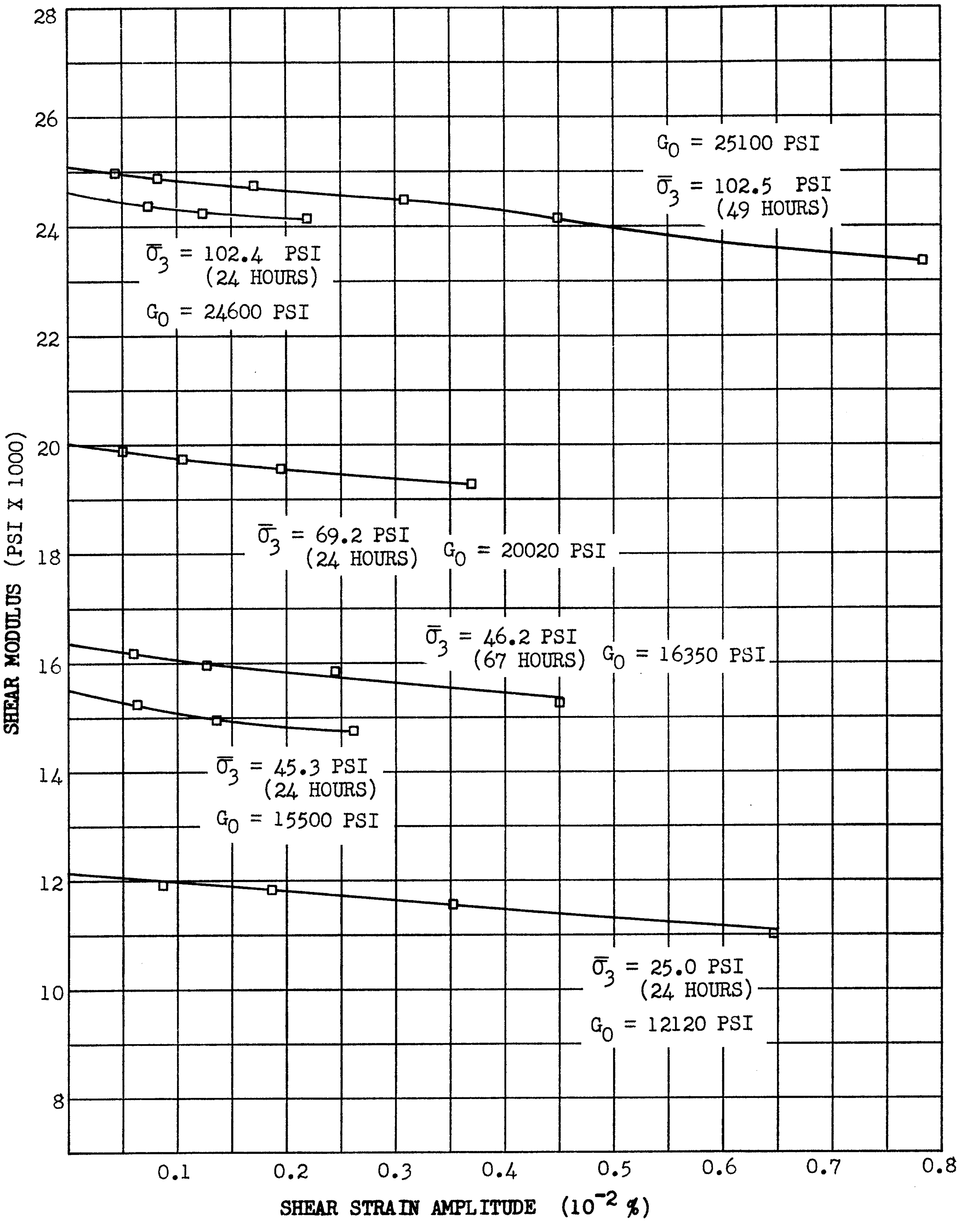
Water content 19.1 %

γ_m = 113.1 γ_d = 94.9 PCF

STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

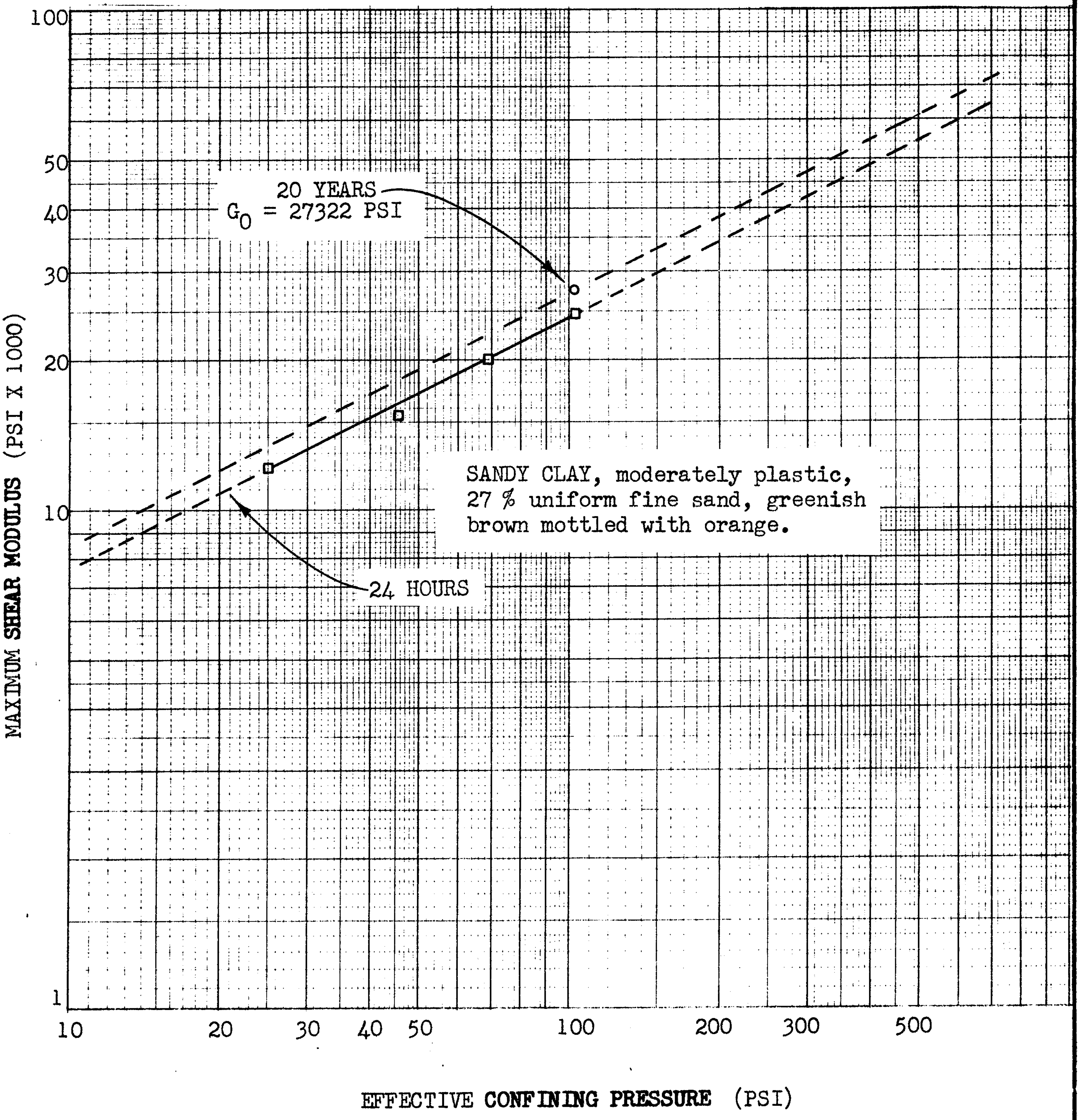
CLIENT GULF STATES UTILITIES	**J.O. NUMBER** 12210	**BORING NUMBER** Z-6
SITE RIVER BEND	**DATE** 3 MAR 77	**SAMPLE NUMBER** 43B
DETERMINATION OF G_0 FROM VARIATION OF SHEAR MODULUS WITH STRAIN		**DEPTH** 181.5 FT.



STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

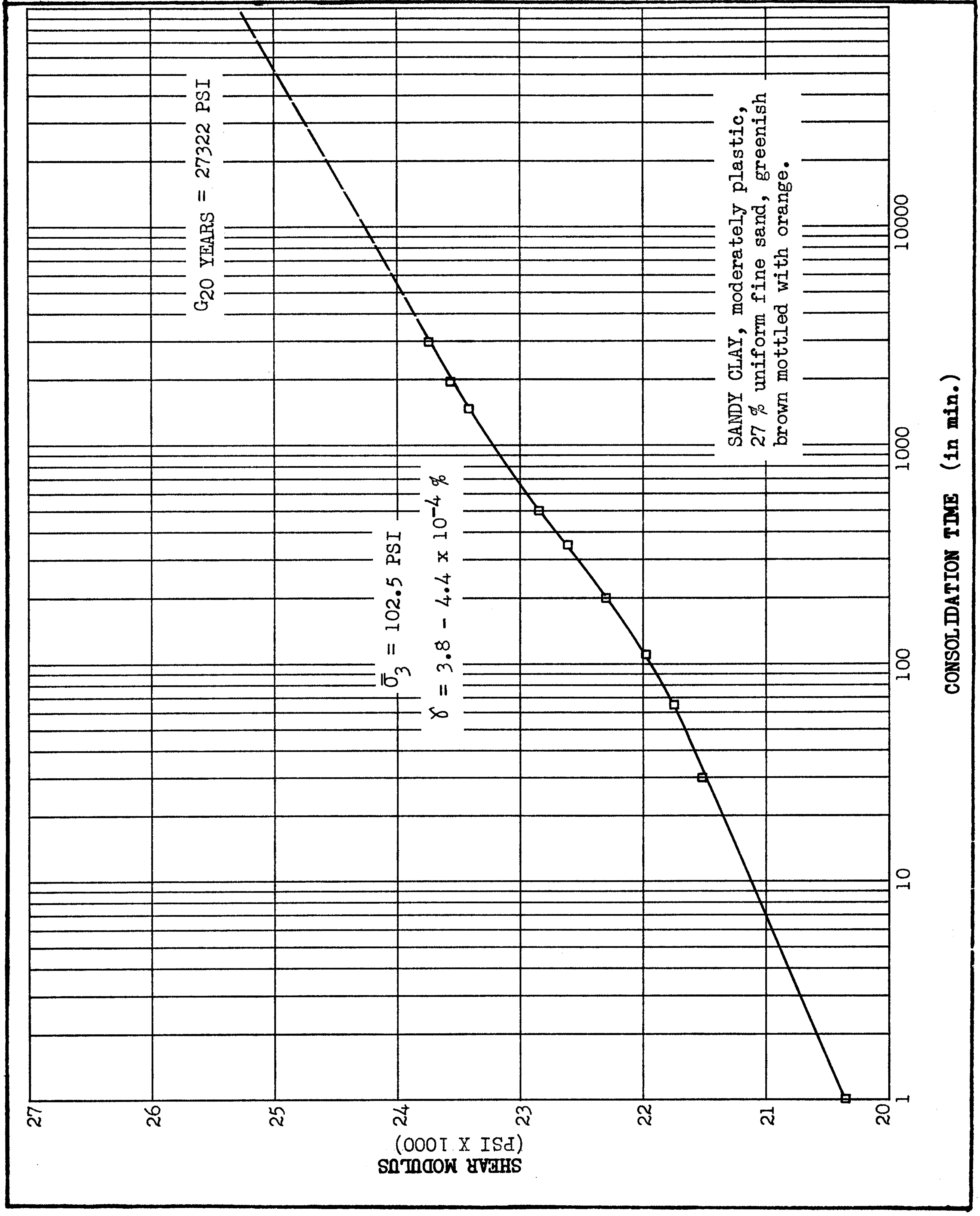
CLIENT GULF STATES UTILITIES	J.O. NUMBER 12210	BORING NUMBER Z-6
SITE RIVER BEND	DATE 4 MAR 77	SAMPLE NUMBER 43B
EFFECT OF CONFINING PRESSURE ON SHEAR MODULUS SUMMARY		DEPTH 181.5 FT.



STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

CLIENT GULF STATES UTILITIES	**J.O. NUMBER** 12210	**BORING NUMBER** Z-6
SITE RIVER BEND	**DATE** 4 MAR 77	**SAMPLE NUMBER** 43B
EFFECT OF CONSOLIDATION TIME ON SHEAR MODULUS SUMMARY		**DEPTH** 181.5 FT.



STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

CLIENT
GULF STATES UTILITIES

J.O. NUMBER
12210

BORING NUMBER
Z-6

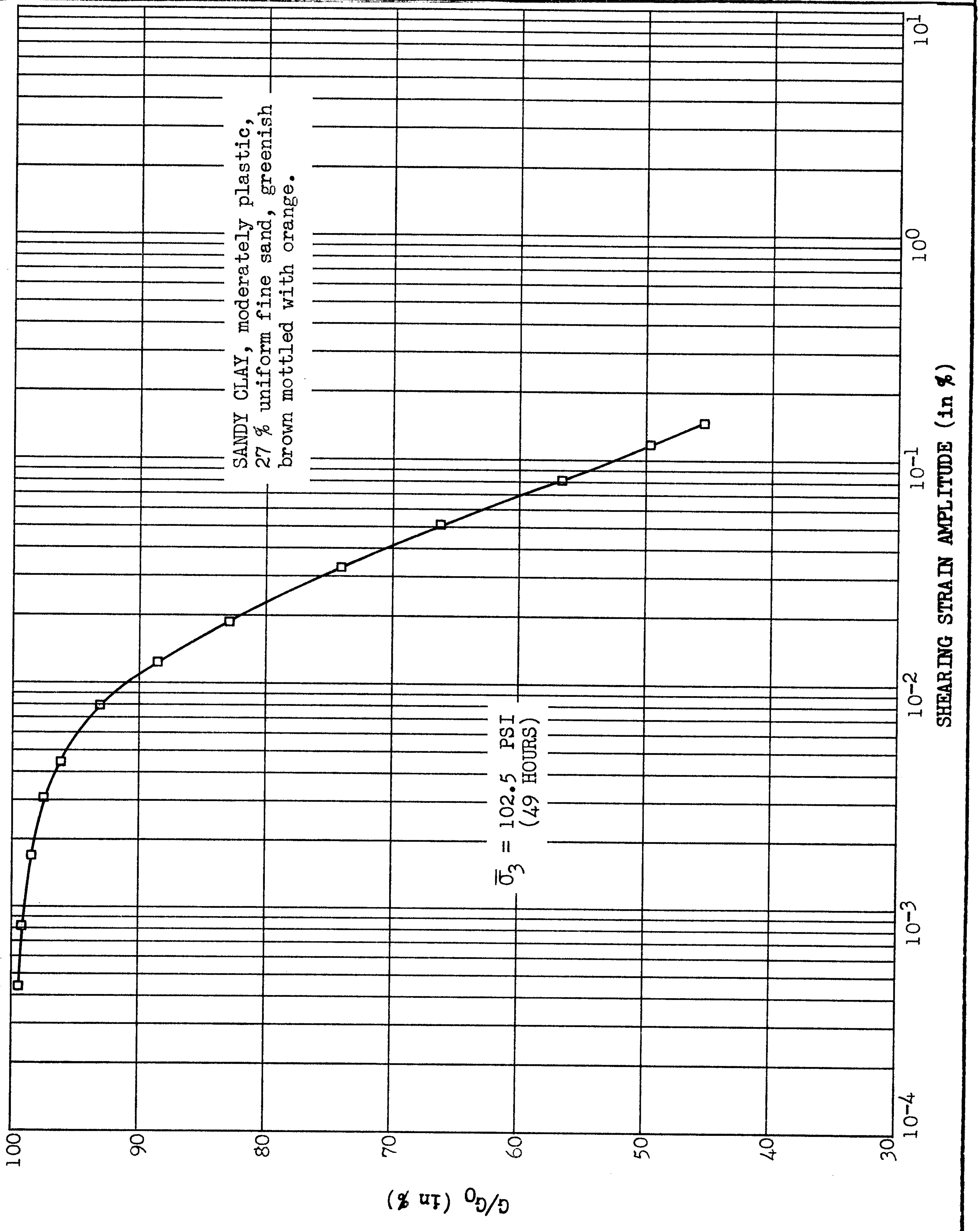
SITE
RIVER BEND

DATE
8 MAR 77

SAMPLE NUMBER
43B

EFFECT OF SHEARING STRAIN AMPLITUDE ON SHEAR MODULUS SUMMARY

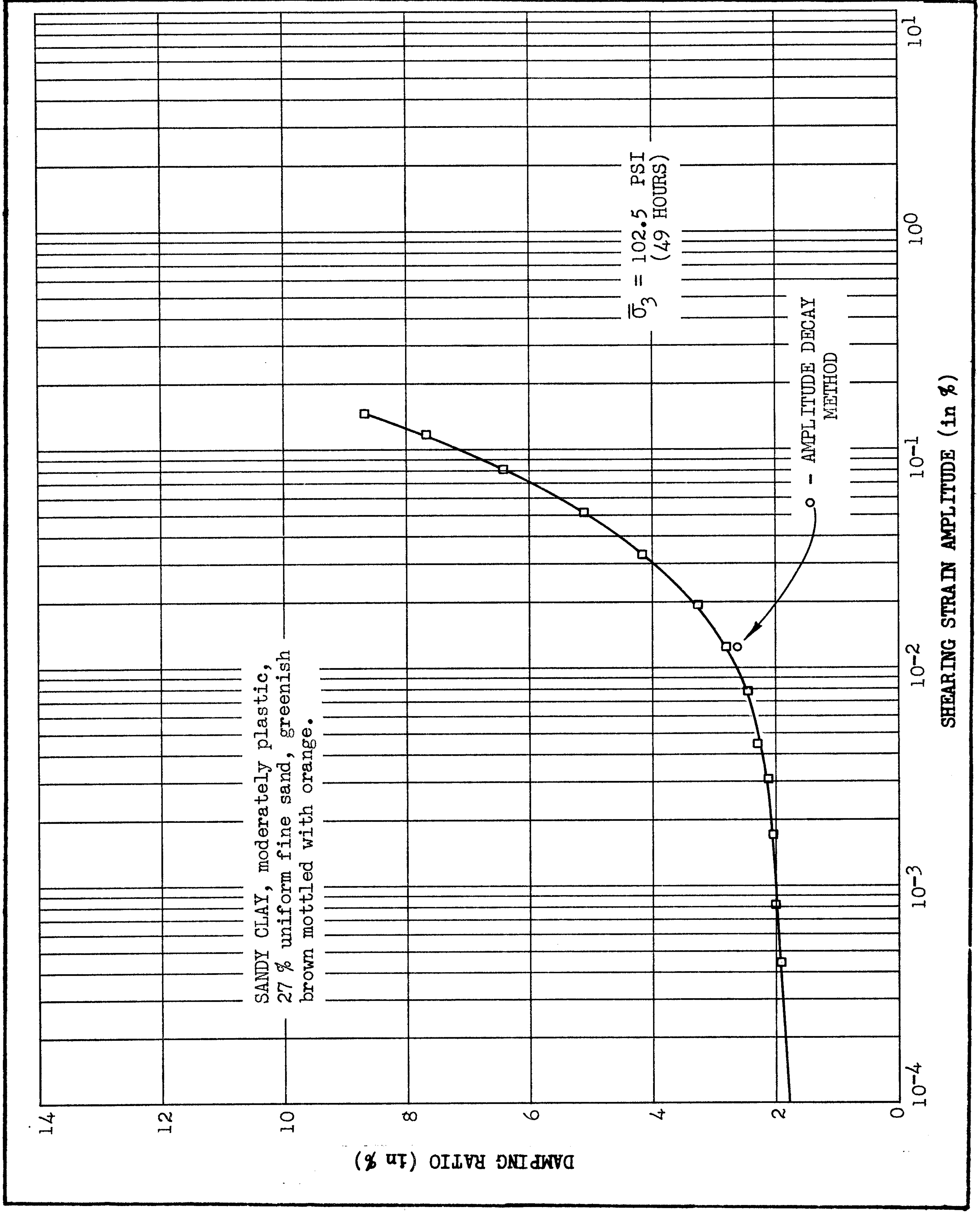
DEPTH
181.5 FT.



STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

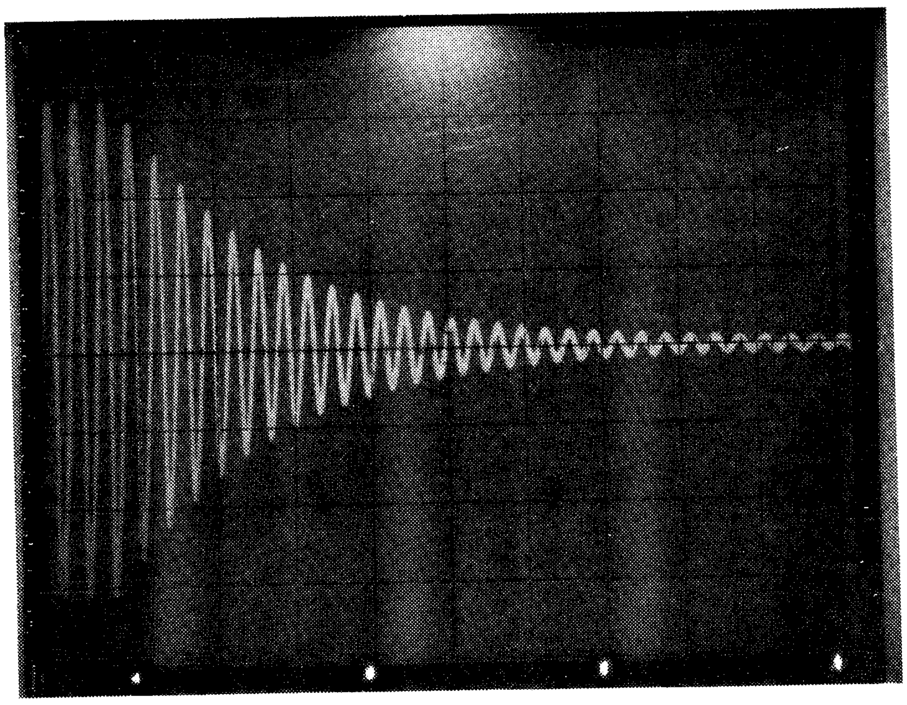
CLIENT GULF STATES UTILITIES	J.O. NUMBER 12210	BORING NUMBER Z-6
SITE RIVER BEND	DATE 7 MAR 77	SAMPLE NUMBER 43B
EFFECT OF SHEARING STRAIN AMPLITUDE ON DAMPING RATIO SUMMARY		DEPTH 181.5 FT.



SANDY CLAY, moderately plastic, 27 % uniform fine sand, greenish brown mottled with orange.

STONE & WEBSTER ENGINEERING CORPORATION **RESONANT COLUMN TEST**

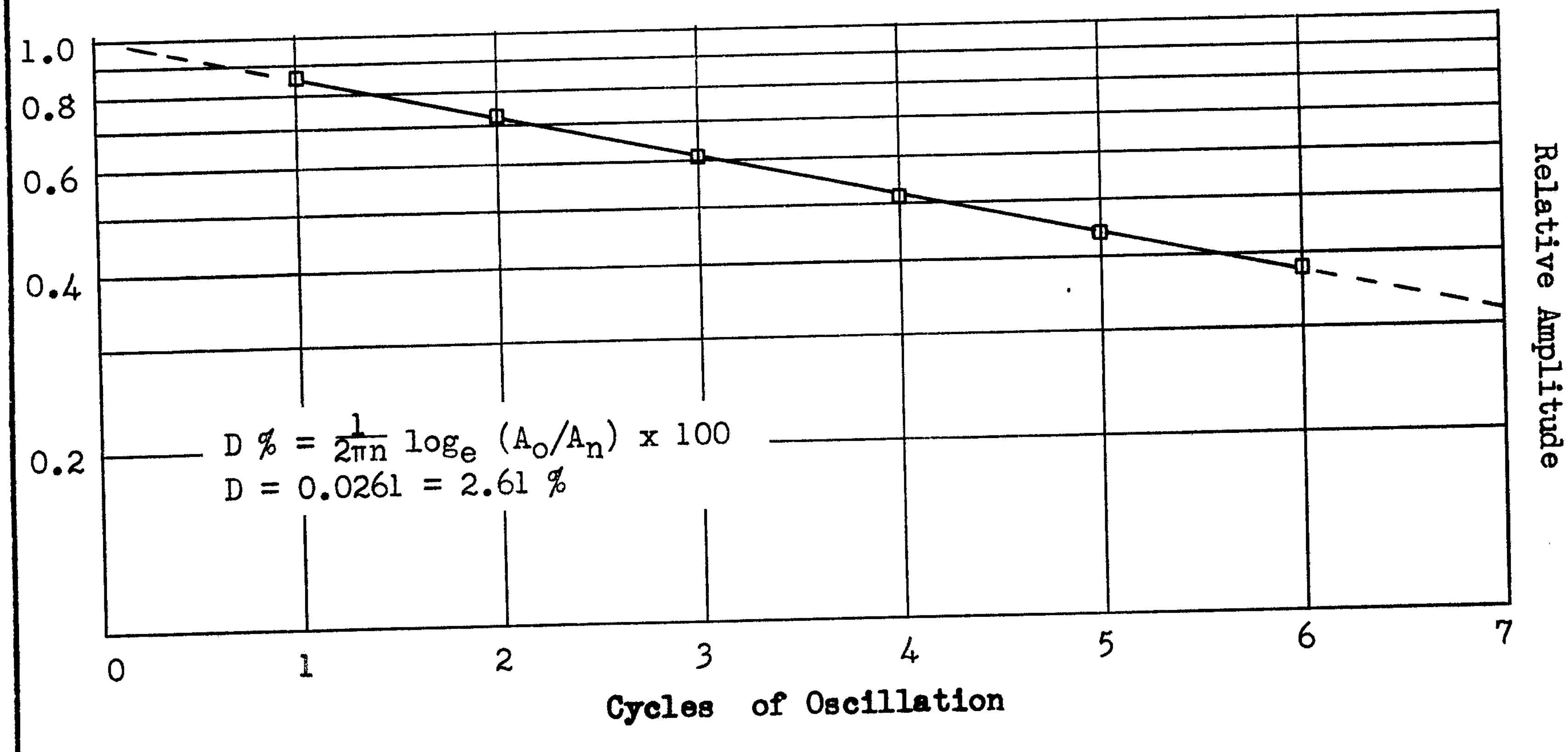
CLIENT GULF STATES UTILITIES	J.O. NUMBER 12210	BORING NUMBER Z-6
SITE RIVER BEND	DATE 8 MAR 77	SAMPLE NUMBER 43B
DETERMINATION OF DAMPING RATIO BY AMPLITUDE DECAY METHOD		DEPTH 181.5 FT.



$\bar{\sigma}_3$ = 102.5 PSI
(49 HOURS)

γ = 0.0122 %

(a) Amplitude-Time Decay Curve



$D \% = \frac{1}{2\pi n} \log_e (A_o/A_n) \times 100$

D = 0.0261 = 2.61 %

(b) Amplitude v.s. Cycle Number Plot

UNDISTURBED SAMPLE LOG

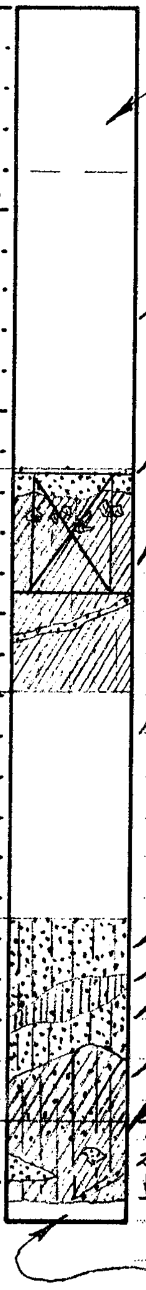
STONE & WEBSTER
ENGINEERING CORPORATION

			BORING NUMBER 164 (Z6)
CLIENT GULF STATE UTILITIES	J.O. NUMBER 12210	LOGGED BY WJO / RKW	SAMPLE NUMBER 52
SITE RIVER BEND		CHECKED BY WJO	DEPTH 204.0 - 206.0 FT
SAMPLE SIZE AND TYPE 3.0-in	CONDITION OF CUTTING EDGE DULL BUT NOT NICKED		DATE 26 JAN 77

DEPTH (FT)	SECTION (IN.)	
		0
204.0		5
		10
204.6	Ⓓ 5.6	15
205.1	Ⓔ 5.6	20
205.6	Ⓕ 4.5	25
206.0	Ⓖ 2.5	30

DESCRIPTION OF SAMPLE

TOP



EMPTY

PRESERVED IN TUBE

Silty Sand, similar to part of section "F" except 12 % nonplastic fines.

Silty Clay, similar to section "G". Resonant Column specimen Z6/52 D.

PRESERVED IN WAXED FOIL

Silty Sand, uniform fine, 30-40 % nonplastic fines, gray, shows steep angle bedding.

Sandy Silt, slightly to moderately plastic, 10-25 % uniform fine sand, gray.

Sandy Clay, moderately to highly plastic, 15-20 % uniform fine sand, gray.

Silty Clay, moderately to highly plastic, 8-12 % uniform fine sand, very stiff undisturbed becoming firm remolded, gray, lenses, pockets and seams of uniform fine gray silty sand.

EMPTY

SEE INDICATED TEST DATA SHEET FOR DETAILS OF SPECIFIC SECTION OF SAMPLE

SAMPLE NUMBER		52 G					
CONTAINER NUMBER		142					
WT. WET SOIL + TARE		37.07					
WT. DRY SOIL + TARE		31.51					
WT. WATER		5.56					
TARE WT.		12.57					
WT. DRY SOIL		18.94					
WATER CONTENT (%)		29.4					
☐ q_u^*	UNDISTURBED	3.6, 3.2, 3.2					
	REMOLDED	0.8, 0.8, 0.8					
☒ s_u^{**}	UNDISTURBED	0.85 —					
	REMOLDED	0.48 0.42					

*DETERMINED BY POCKET PENETROMETER IN KG/SQ CM OR TSF **DETERMINED BY TORVANE

RESONANT COLUMN TEST
GENERAL DATA

STONE & WEBSTER
ENGINEERING CORPORATION

CLIENT GULF STATES UTILITIES	JO NUMBER 12210	TESTED BY RKW	BORING Z-6
			SAMPLE 52 D
SITE RIVER BEND		CHECKED BY WJO	DEPTH 204.6 FT.
SPECIMEN PROPERTIES			DATE 26 JAN 77

TYPE OF TEST:

BALANCE NO. P1200

TYPE OF SPECIMEN: UNDISTURBED ☑ REMOLDED ☐ COMPACTED ☐ (Method)______

WEIGHTS: WET

Weight of specimen + tare 270.15 gm.

Weight of tare 129.96 gm.

Weight of specimen 140.19 gm.

SPECIMEN PROPERTIES: INITIAL

Water content 29.2 %

γ_d 91.4 lb/cu. ft.

γ_m 118.1 lb/cu.ft.

DIMENSIONS: 7.33/7.25/7.25 cm

Height of specimen + caps — in.

Height of caps — in.

Height of specimen — in. 7.28 cm

Area of specimen 10.18 sq. cm.

Volume of specimen 74.11 cu. cm.

HEIGHT/DIAMETER: 2.02 RULE NO. 0822

CIRCUMFERENCE of specimen + membrane:

1 11.45 2 11.45 3 11.50

Ave. 11.47 cm.

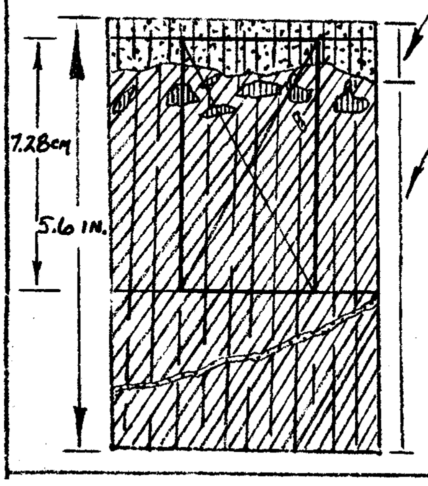
DIAMETER of specimen+membrane 3.65 cm

2 thickness membrane 0.05 cm

Diameter of specimen 3.60 cm

TAPE NO. 0147 CALIPER NO. 0151

SOIL DESCRIPTION:



Silty Sand, uniform fine, 12% nonplastic fines, light gray.

Silty Clay, moderately to highly plastic, 5-10 % uniform fine sand, gray. Just below interface with sand are many irregular pockets of nonplastic silt and near bottom a seam of uniform fine silty sand with nonplastic fines.

FILTER PAPER: ☐

DIMENSIONS: AFTER TEST 11.42/11.42/11.48

7.20 7.20
7.28 7.22

DIAMETER of specimen+membrane 11.44 3.64 cm

4 thickness membrane .07 cm

Diameter of specimen 11.42 3.57 cm

Height of specimen ____ in. 7.23 cm

Area of specimen 10.01 sq. cm. γ_d = 93.6 PCF

Volume of specimen 72.37 cu. cm. γ_m = 113.4 PCF

IN TUBE DENSITY:

SAMPLE DIAM. 7.297 CM. AREA 41.82 SQ. CM.

WT. WET SOIL + TARE 1660.25 Gm.

TARE WT. (tube plates) 513.05 Gm.

WT. WET SOIL 1147.20 ~~cu. cm.~~

LENGTH OF SAMPLE 14.22 CM. 5.60 IN.

VOL. OF WET SOIL 594.68 Gm/CU.CM 120.4 PCF.

DRY UNIT WEIGHT 93.2 PCF.

EXCESS SOLIDS SPEC AFTER TEST
C86
188.35
165.38
22.97
56.86
108.52
21.2

WEIGHTS: AFTER TEST

Wet weight after test 131.49 gm

Dry weight after test 108.52 gm

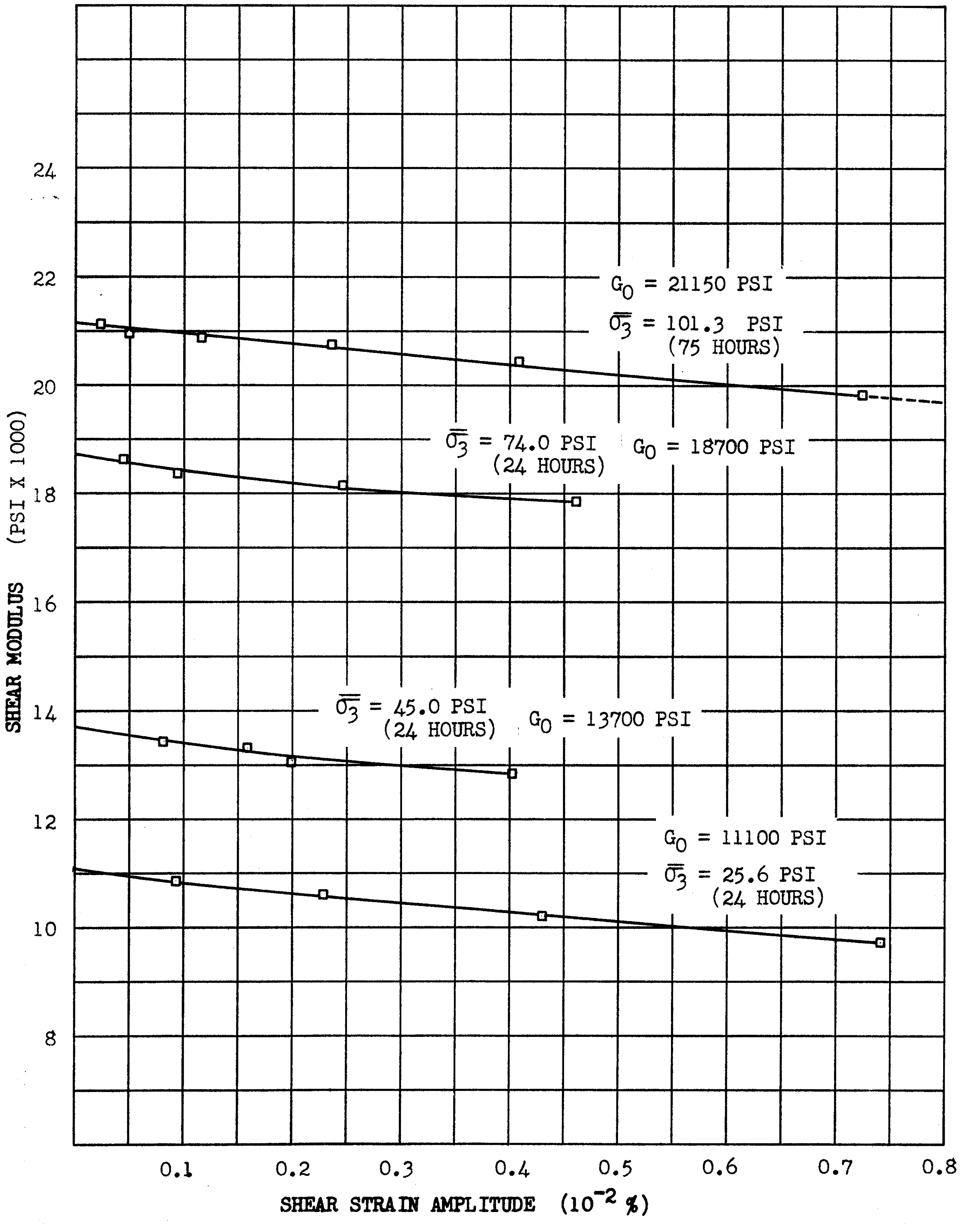
Weight of water 22.97 gm

Water content 21.2 %

STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

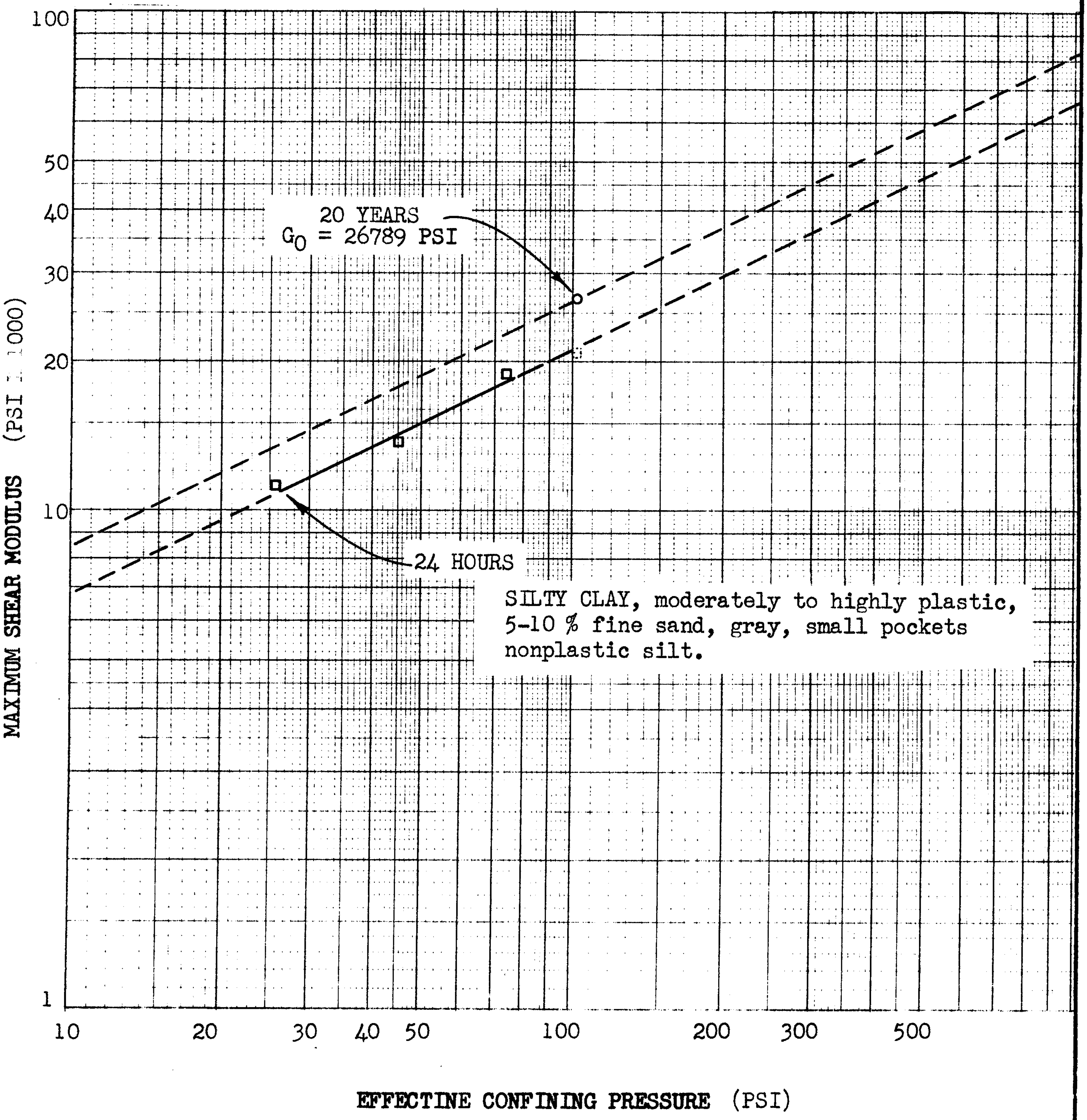
CLIENT GULF STATES UTILITIES	J.O. NUMBER 12210	BORING NUMBER Z-6
SITE RIVER BEND	DATE 28 JAN 77	SAMPLE NUMBER 52D
DETERMINATION OF G_0 FROM VARIATION OF SHEAR MODULUS WITH STRAIN		DEPTH 204.6 FT.



STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

CLIENT GULF STATES UTILITIES	J.O. NUMBER 12210	BORING NUMBER Z-6
SITE RIVER BEND	DATE 3 FEB 77	SAMPLE NUMBER 52D
EFFECT OF CONFINING PRESSURE ON SHEAR MODULUS SUMMARY		DEPTH 204.6 FT.

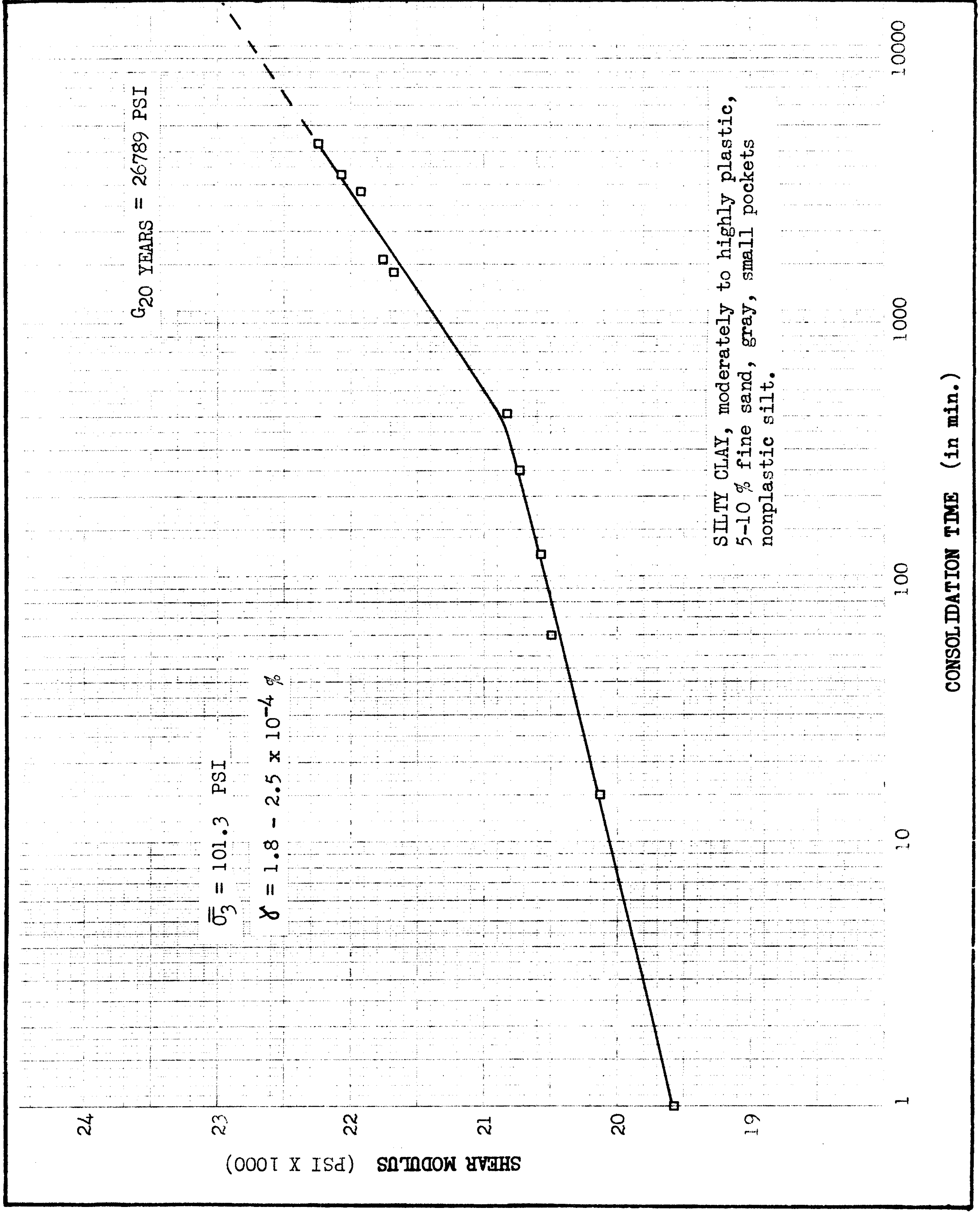


SILTY CLAY, moderately to highly plastic, 5-10 % fine sand, gray, small pockets nonplastic silt.

STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

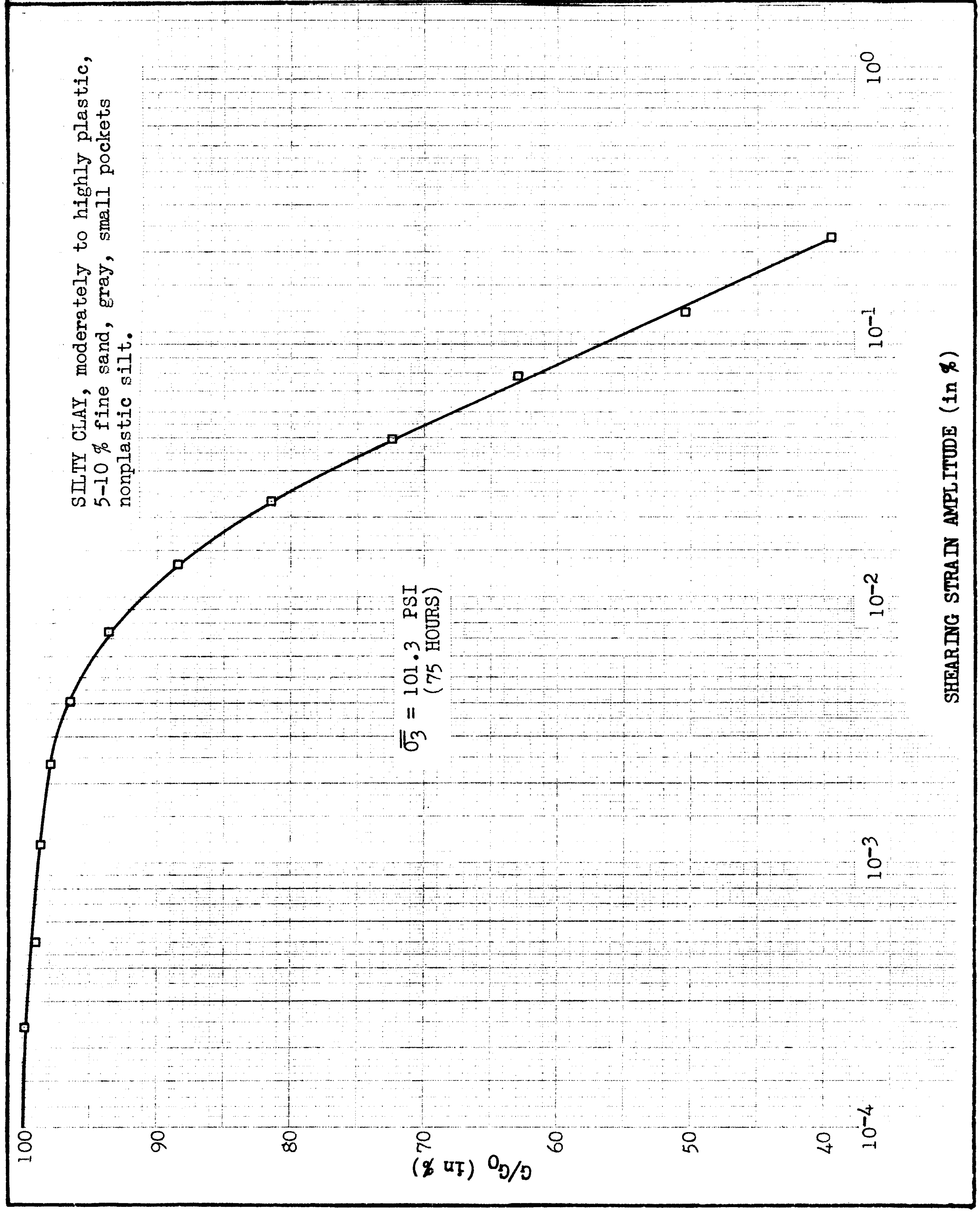
CLIENT GULF STATES UTILITIES	J.O. NUMBER 12210	BORING NUMBER Z-6
SITE RIVER BEND	DATE 6 FEB 77	SAMPLE NUMBER 52D
EFFECT OF CONSOLIDATION TIME ON SHEAR MODULUS SUMMARY		DEPTH 204.6 FT.



STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

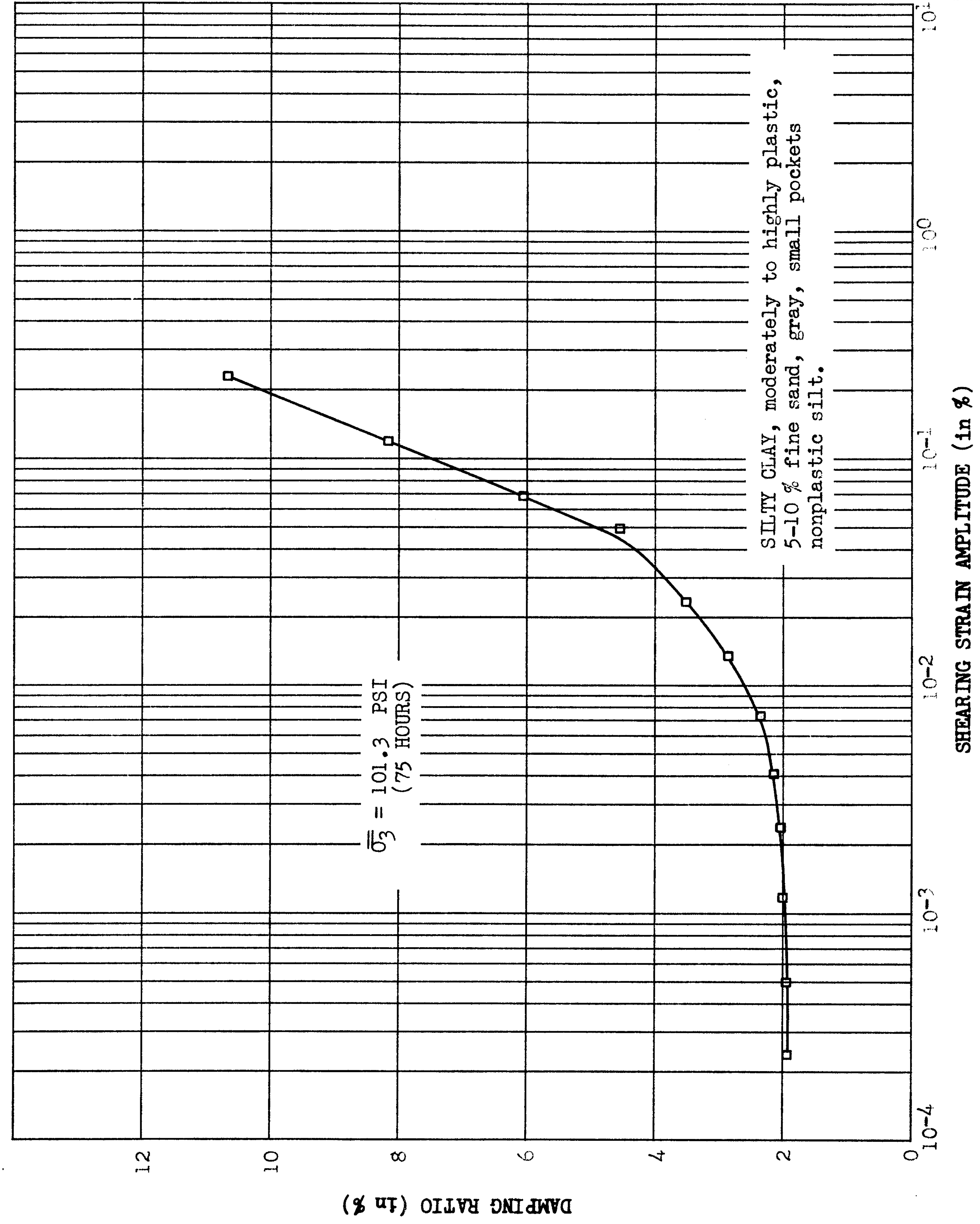
CLIENT GULF STATES UTILITIES	J.O. NUMBER 12210	BORING NUMBER Z-6
SITE RIVER BEND	DATE 5 FEB 77	SAMPLE NUMBER 52D
EFFECT OF SHEARING STRAIN AMPLITUDE ON SHEAR MODULUS SUMMARY		DEPTH 204.6 FT.



STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

CLIENT	**J.O. NUMBER**	**BORING NUMBER**
GULF STATES UTILITIES	12210	Z-6
SITE	**DATE**	**SAMPLE NUMBER**
RIVER BEND	7 FEB 77	52D
EFFECT OF SHEARING STRAIN AMPLITUDE ON DAMPING RATIO SUMMARY		**DEPTH** 204.6 FT.



SILTY CLAY, moderately to highly plastic, 5-10 % fine sand, gray, small pockets nonplastic silt.

$\overline{\sigma}_3 = 101.3$ PSI (75 HOURS)

RESONANT COLUMN TEST
GENERAL DATA

STONE & WEBSTER
ENGINEERING CORPORATION

BORING Z6

CLIENT

JO NUMBER 12210

TESTED BY

SAMPLE 52 F

SITE

CHECKED BY

DEPTH 26 JAN 77

DATE

SPECIMEN PROPERTIES NO TEST PERFORMED

TYPE OF TEST:

BALANCE NO. P2200

TYPE OF SPECIMEN: UNDISTURBED ☐ REMOLDED ☐ COMPACTED ☐ (Method)______

WEIGHTS:

Weight of specimen + tare ______ gm.

Weight of tare ______ gm.

Weight of specimen ______ gm.

SPECIMEN PROPERTIES:

Water content ______ %

γ_d ______ lb/cu. ft.

γ_m ______ lb/cu. ft.

IN TUBE DENSITY:

SAMPLE DIAM. 7.296 CM. AREA 41.81 SQ. CM.

WT. WET SOIL + TARE 1351.20 Gm.

TARE WT. (tube plates) 452.59 Gm.

WT. WET SOIL 898.61 CU. CM.

LENGTH OF SAMPLE 11.53 CM.

VOL. OF WET SOIL 482.07 Gm/CU.CM 116.4 PCF.

DRY UNIT WEIGHT ______ PCF.

CIRCUMFERENCE of specimen + membrane:

1 ______ 2 ______ 3 ______

Ave. ______ cm.

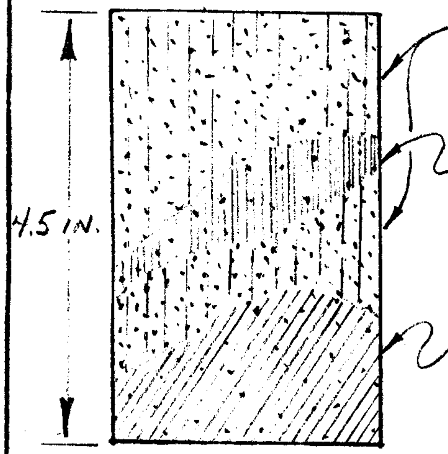
DIAMETER of specimen+membrane ______ cm

thickness membrane ______ cm

Diameter of specimen ______ cm

TAPE NO. ______ CALIPER NO. ______

SOIL DESCRIPTION:



Silty Sand, uniform fine, 30-40% nonplastic fines, gray, shows steep angle bedding.

Sandy Silt, slightly to moderately plastic, 10-25 % uniform fine sand, gray.

Sandy Clay, moderately to highly plastic, 15-20% uniform fine sand, gray.

FILTER PAPER: ☐

DIMENSIONS: AFTER TEST

DIAMETER of specimen+membrane ______ cm

thickness membrane ______ cm

Diameter of specimen ______ cm

Height of specimen ______ in. ______ cm

Area of specimen ______ sq. cm.

Volume of specimen ______ cu. cm.

SAMPLE SECTIONS	TRIMMINGS CLAY	CENTER SAND	EXCESS SOLIDS
CONTAINER NUMBER	B 36	B 37	
WT. WET SOIL + TARE	34.83	44.57	
WT. DRY SOIL + TARE	30.80	40.42	
WT. WATER	4.03	4.15	
TARE WT.	17.63	17.96	
WT. DRY SOIL	13.17	22.46	
WATER CONTENT (%)	30.6	18.5	
SIEVE NO.			
WT. WASHED DRY SOIL + TARE			
WT. LOST IN WASHING			
% FINES			

WEIGHTS: AFTER TEST

Wet weight after test ______ gm

Dry weight after test ______ gm

Weight of water ______ gm

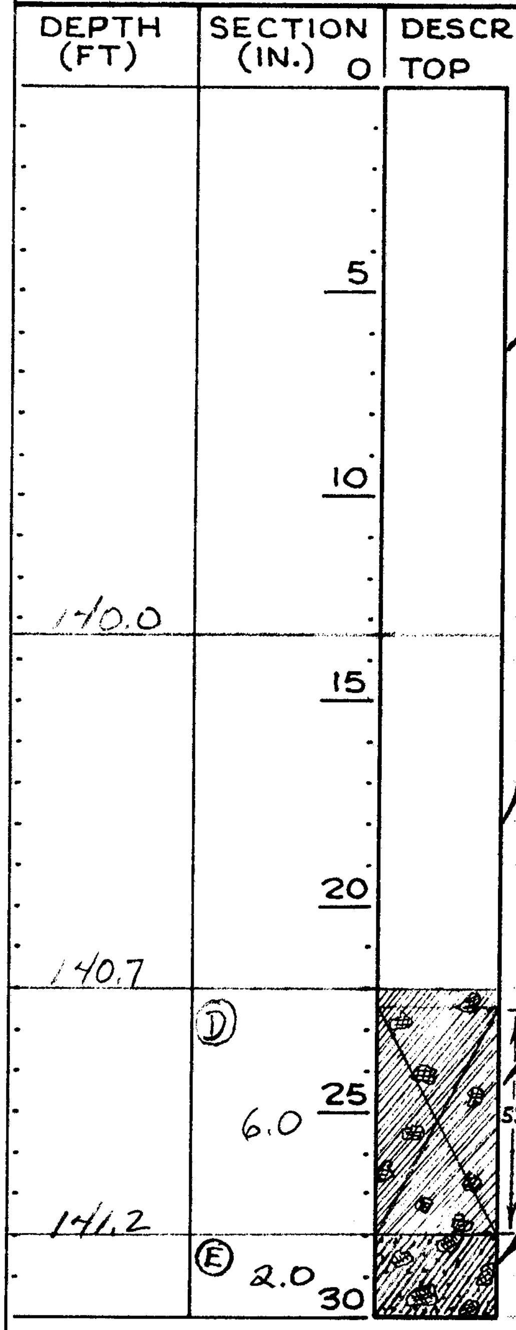
Water content ______ %

UNDISTURBED SAMPLE LOG

STONE & WEBSTER
ENGINEERING CORPORATION

CLIENT GULF STATES UTILITIES	J.O. NUMBER 12210	LOGGED BY RKW	BORING NUMBER Z-7
SITE RIVER BEND		CHECKED BY WJO	SAMPLE NUMBER 19
SAMPLE SIZE AND TYPE 3.0 IN.	CONDITION OF CUTTING EDGE ENTIRE EDGE DULLED AND DENTED.		DEPTH 140.0-141.5 FT.
			DATE 2 FEB 77

DEPTH (FT)	SECTION (IN.)	DESCRIPTION OF SAMPLE



EMPTY

PRESERVED IN TUBE

Resonant Column Specimen Z-7/19 D

Clayey Gravel, widely graded, gravel to 0.6 IN. max., 18.4 % coarse to fine sand, 37.2 % highly plastic fines, light brown, gravel is chert.
Note: Soil out of tube appears to be dried to the point of being brittle though the clay portion is easily sectile.

SEE INDICATED TEST DATA SHEET FOR DETAILS OF SPECIFIC SECTION OF SAMPLE

SAMPLE NUMBER	19E	19E	% SUB #200	19E		
CONTAINER NUMBER	A54	D15		D15		
WT. WET SOIL + TARE	65.11	312.77	DRY SOIL + TARE	324.63		
WT. DRY SOIL + TARE	60.23	282.52	TARE WT.	63.41		
WT. WATER	4.88	30.25	WT DRY SOIL	261.22		
TARE WT.	18.12	63.41	WASHED DRY + TARE	227.47		
WT. DRY SOIL	42.11	219.11	WT LOST WASHING	97.16		
WATER CONTENT (%)	11.6	13.8	% FINES	37.2		
Ø q_u* UNDISTURBED			WT RET #4 SIEVE	115.86		
Ø q_u* REMOLDED			% GRAVEL	44.4		
☒ s_u** UNDISTURBED						
☒ s_u** REMOLDED			SAND %	18.4		

*DETERMINED BY POCKET PENETROMETER IN KG/SQ CM OR TSF **DETERMINED BY TORVANE

RESONANT COLUMN TEST
GENERAL DATA

STONE & WEBSTER
ENGINEERING CORPORATION

BORING Z7

CLIENT GULF STATES UTILITIES
JO NUMBER 12210
TESTED BY RKW
SAMPLE 19D

SITE RIVER BEND
CHECKED BY WJO
DEPTH 140.7 FT

SPECIMEN PROPERTIES
DATE 3 FEB 77

TYPE OF TEST:
BALANCE NO. P2200

TYPE OF SPECIMEN: UNDISTURBED ☑ REMOLDED ☐ COMPACTED ☐ (Method)______

WEIGHTS:

NO PATCHING

Weight of specimen + tare 1373.00 gm.

Weight of tare 291.90 gm.

Weight of specimen 1081.10 gm.

SPECIMEN PROPERTIES:

Water content ? %

γ_d ______ lb/cu. ft.

γ_m 117.3 lb/cu. ft. ← INITIAL

DIMENSIONS: NO PATCHING

SPECIMEN DISCARDED AFTER TEST. WEIGHTS AND DIMENSIONS WITH PATCHING NOT AVAILABLE.

Height of specimen + caps — in.

Height of caps — in.

Height of specimen 5.44 in. 13.82 cm

Area of specimen 41.62 sq. cm.

Volume of specimen 575.19 cu. cm.

CIRCUMFERENCE of specimen + ~~membrane~~:

1 22.88 2 22.88 3 22.83

Ave. 22.86 cm.

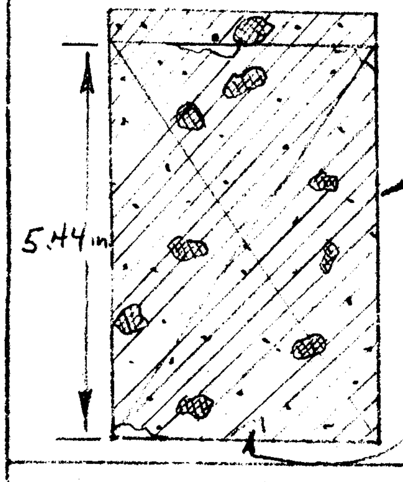
DIAMETER of specimen + ~~membrane~~ 7.28 cm

thickness membrane — cm

Diameter of specimen 7.28 cm

HEIGHT/DIAMETER: 1.90 RULE NO 0822 TAPE NO. 0147 CALIPER NO. 0151

SOIL DESCRIPTION:



Clayey Gravel, widely graded, gravel to 0.6 in max, 15-20% coarse to fine sand, 35-40% highly plastic fines, light brown, sample appears to be somewhat dessicated.

Void spaces due to brittle clay pockets - filled with sand clay mixture.

FILTER PAPER: ☐

DIMENSIONS: AFTER TEST

DIAMETER of specimen + membrane ______ cm

NO MEMBR.
22.25 22.50
22.63

thickness membrane ______ cm

Diameter of specimen 7.15 cm

Height of specimen 5.38 in. 13.67 cm
NO PATCHING

Area of specimen 40.15 sq. cm.

Volume of specimen 548.85 cu. cm.

SAMPLE SECTIONS	TRIMMINGS	CENTER	EXCESS ~~SOLIDS~~ AFTER TEST
CONTAINER NUMBER			PAN 82
WT WET SOIL + TARE			1244.88
WT DRY SOIL + TARE			1108.89
WT WATER			135.99
			82.35
			1026.64
WATER CONTENT (%)			13.2
SIEVE NO.			
WT WASHED DRY SOIL + TARE			
WT LOST IN WASHING			
% FINES			

WEIGHTS: AFTER TEST

1118.25 SCRAPED WET

WITH PATCHING

Wet weight after test ~1080 gm

Dry weight after test ? gm

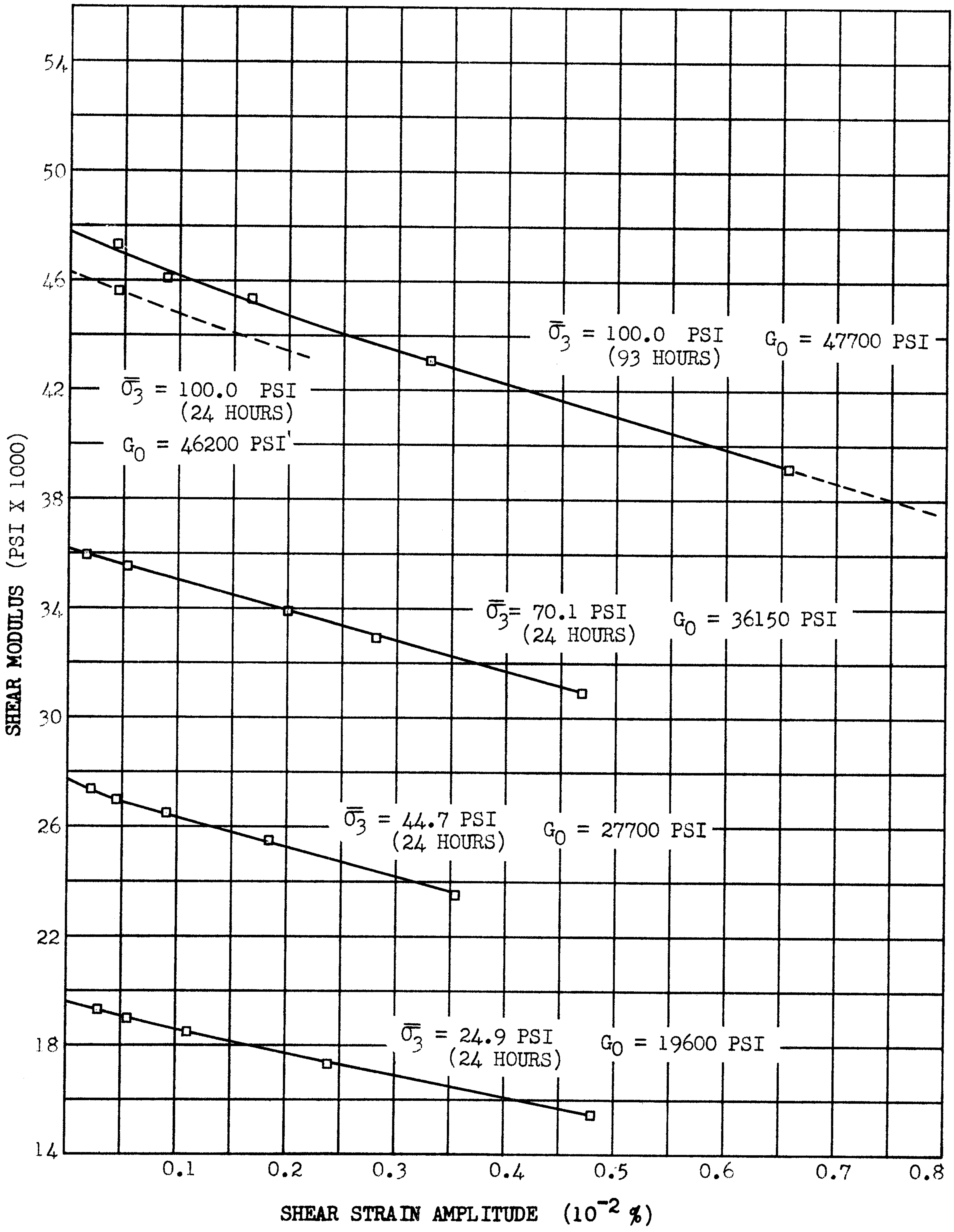
Weight of water ______ gm

Water content ______ %

STONE & WEBSTER ENGINEERING CORPORATION

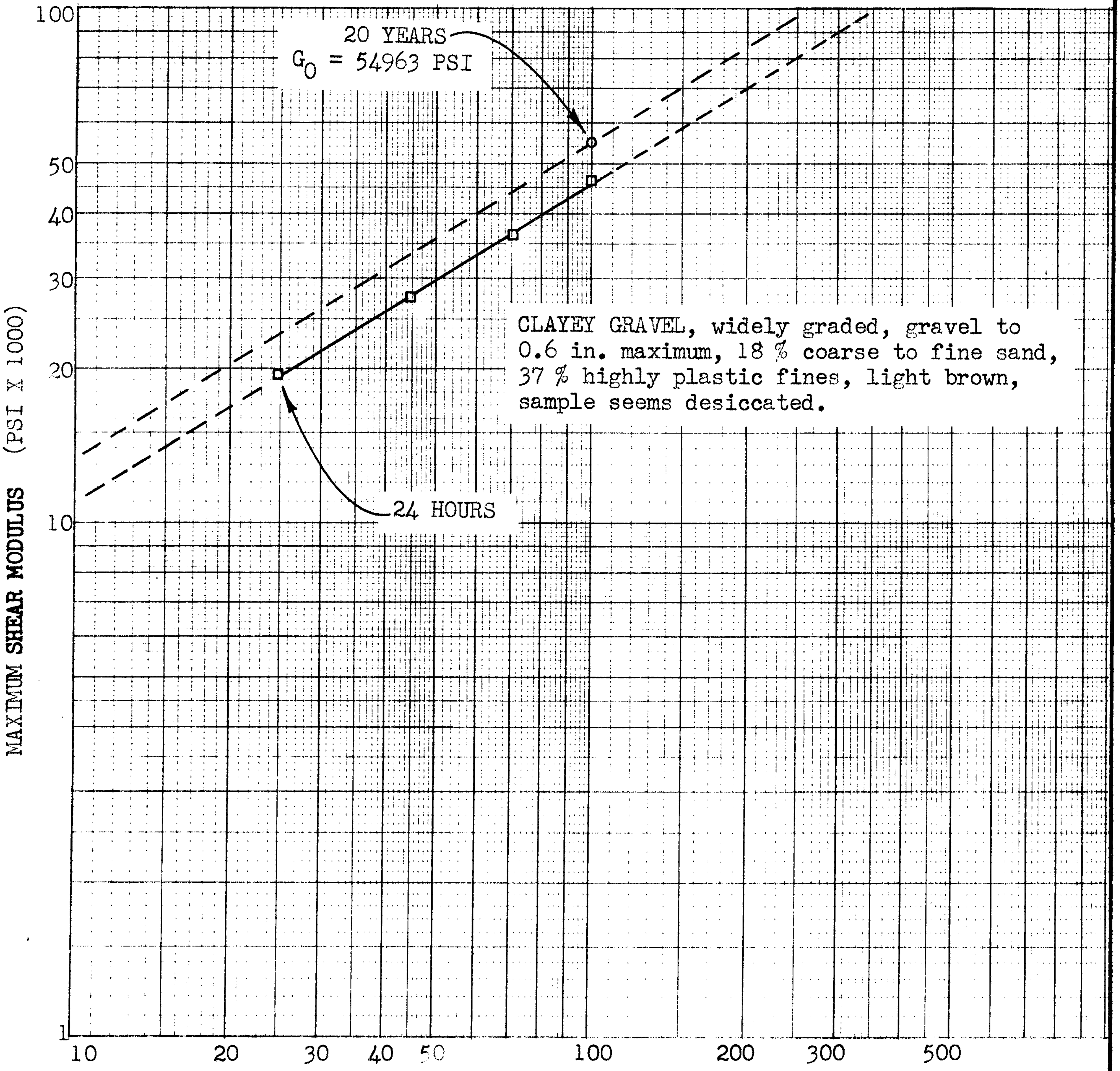
RESONANT COLUMN TEST

CLIENT GULF STATES UTILITIES	J.O. NUMBER 12210	BORING NUMBER Z-7
SITE RIVER BEND	DATE 8 FEB 77	SAMPLE NUMBER 19D
DETERMINATION OF G_0 FROM VARIATION OF SHEAR MODULUS WITH STRAIN		DEPTH 140.7 FT.



RESONANT COLUMN TEST

CLIENT GULF STATES UTILITIES	**J.O. NUMBER** 12210	**BORING NUMBER** Z-7
SITE RIVER BEND	**DATE** 10 FEB 77	**SAMPLE NUMBER** 19D
EFFECT OF CONFINING PRESSURE ON SHEAR MODULUS SUMMARY		**DEPTH** 140.7 FT.

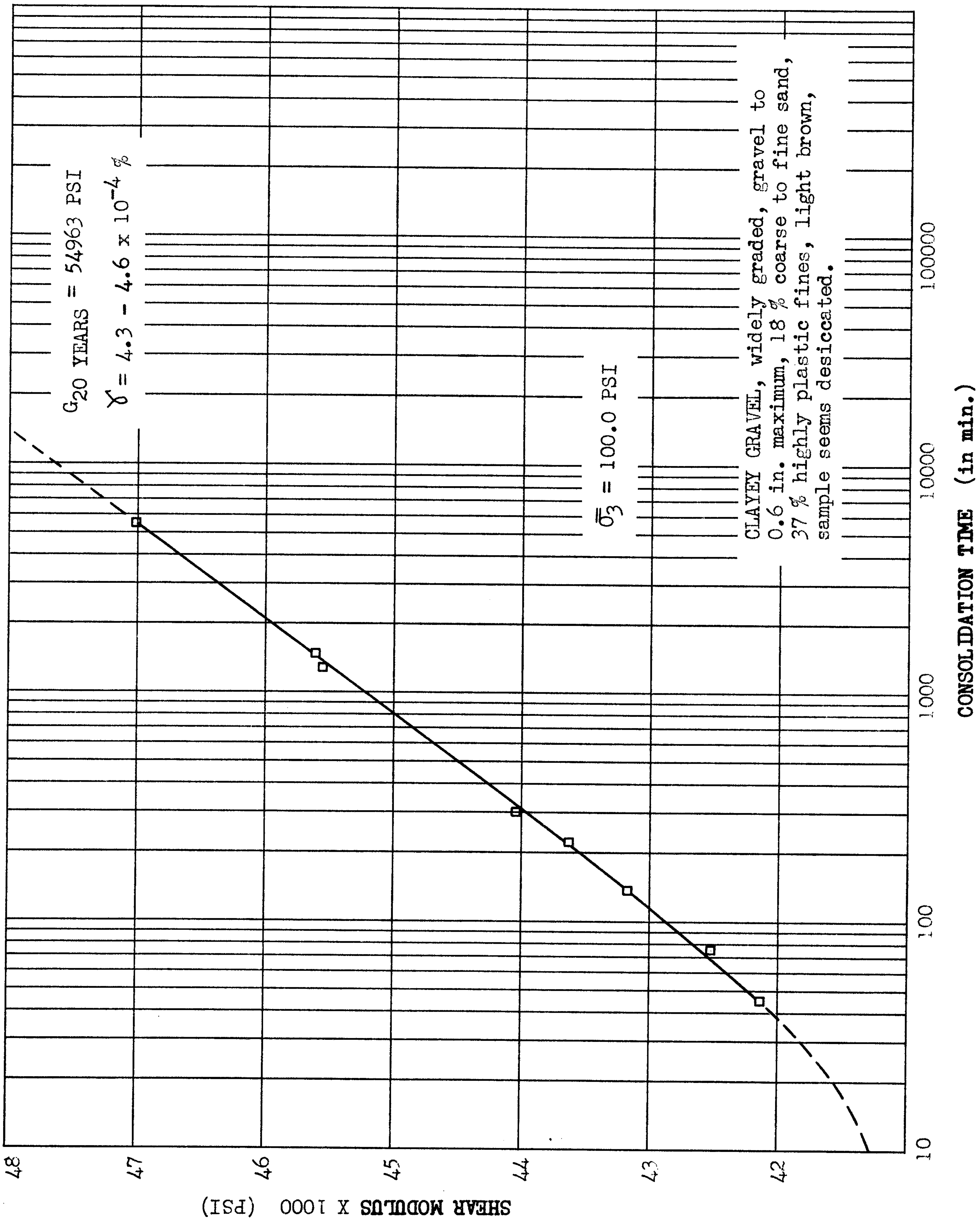


CLAYEY GRAVEL, widely graded, gravel to 0.6 in. maximum, 18 % coarse to fine sand, 37 % highly plastic fines, light brown, sample seems desiccated.

STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

CLIENT GULF STATES UTILITIES	**J.O. NUMBER** 12210	**BORING NUMBER** Z-7
SITE RIVER BEND	**DATE** 10 FEB 77	**SAMPLE NUMBER** 19D
EFFECT OF CONSOLIDATION TIME ON SHEAR MODULUS SUMMARY		**DEPTH** 140.7 FT.


G_{20} YEARS = 54963 PSI

$\gamma = 4.3 - 4.6 \times 10^{-4}$ %

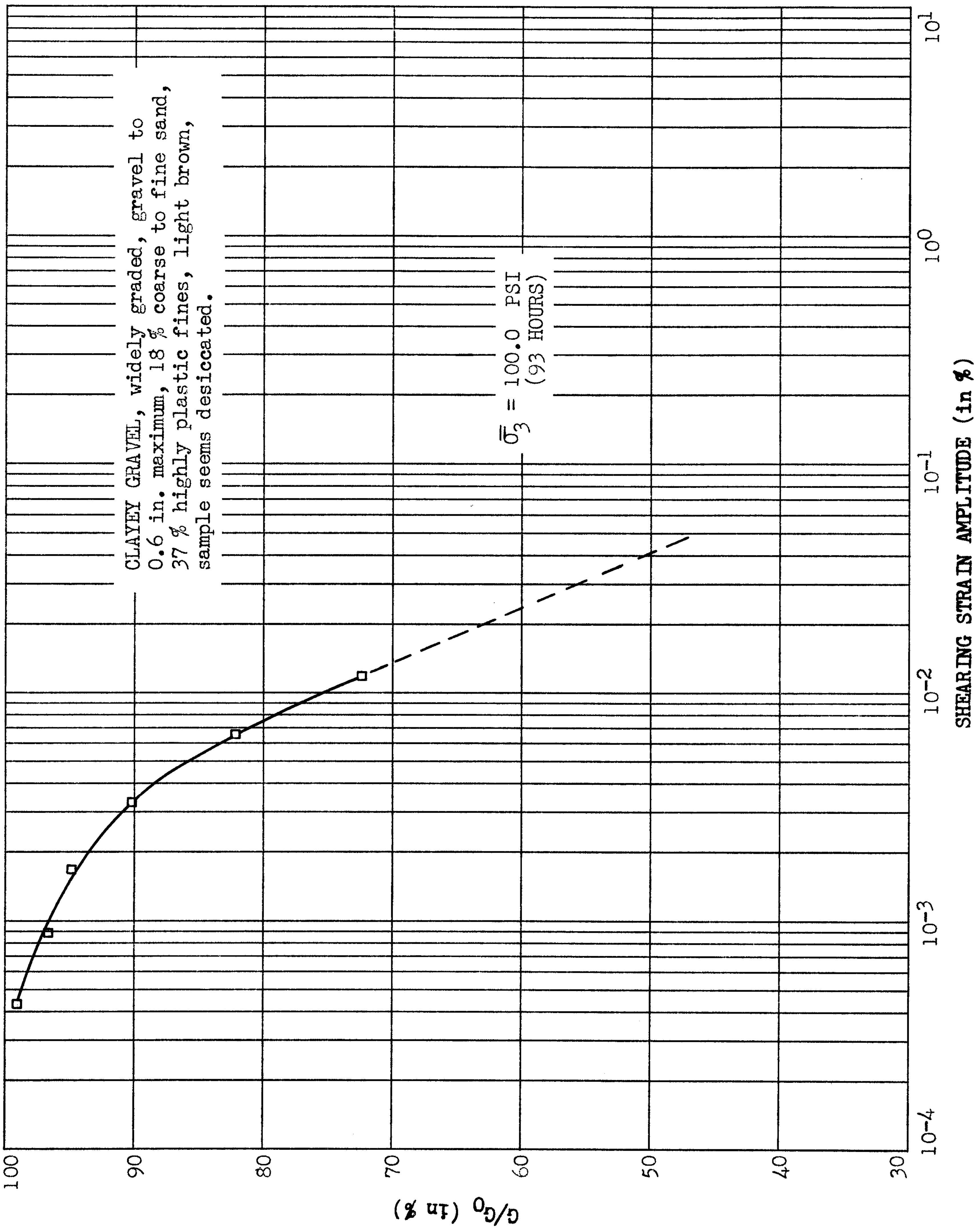
$\bar{\sigma}_3 = 100.0$ PSI

CLAYEY GRAVEL, widely graded, gravel to 0.6 in. maximum, 18 % coarse to fine sand, 37 % highly plastic fines, light brown, sample seems desiccated.

STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

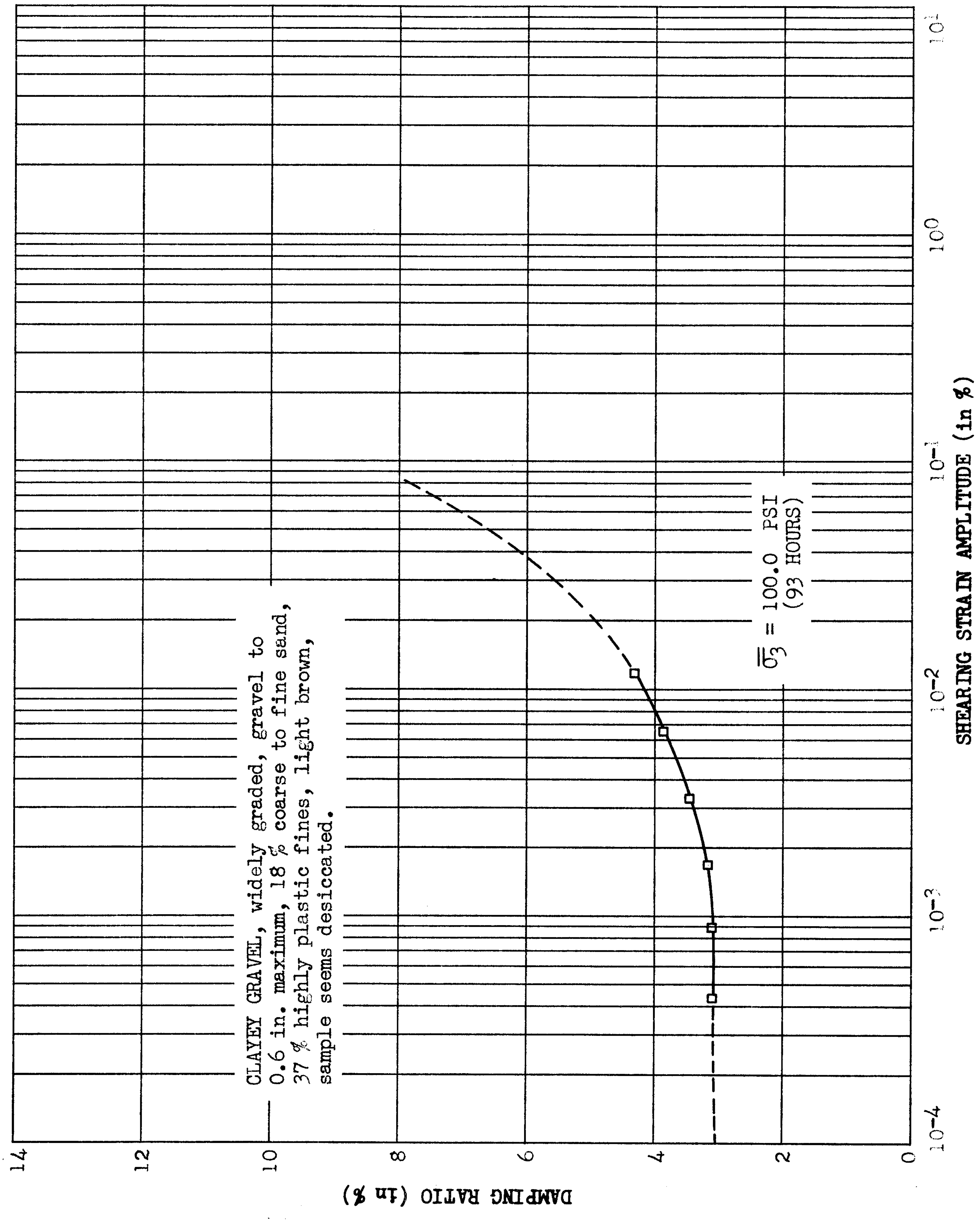
CLIENT GULF STATES UTILITIES	J.O. NUMBER 12210	BORING NUMBER Z-7
SITE RIVER BEND	DATE 11 FEB 77	SAMPLE NUMBER 19D
EFFECT OF SHEARING STRAIN AMPLITUDE ON SHEAR MODULUS SUMMARY		DEPTH 140.7 FT.



STONE & WEBSTER ENGINEERING CORPORATION

RESONANT COLUMN TEST

CLIENT GULF STATES UTILITIES	**J.O. NUMBER** 12210	**BORING NUMBER** Z-7
SITE RIVER BEND	**DATE** 16 FEB 77	**SAMPLE NUMBER** 19D
EFFECT OF SHEARING STRAIN AMPLITUDE ON DAMPING RATIO SUMMARY		**DEPTH** 140.7 FT.



$\bar{\sigma}_3$ = 100.0 PSI (93 HOURS)

CLAYEY GRAVEL, widely graded, gravel to 0.6 in. maximum, 18 % coarse to fine sand, 37 % highly plastic fines, light brown, sample seems desiccated.