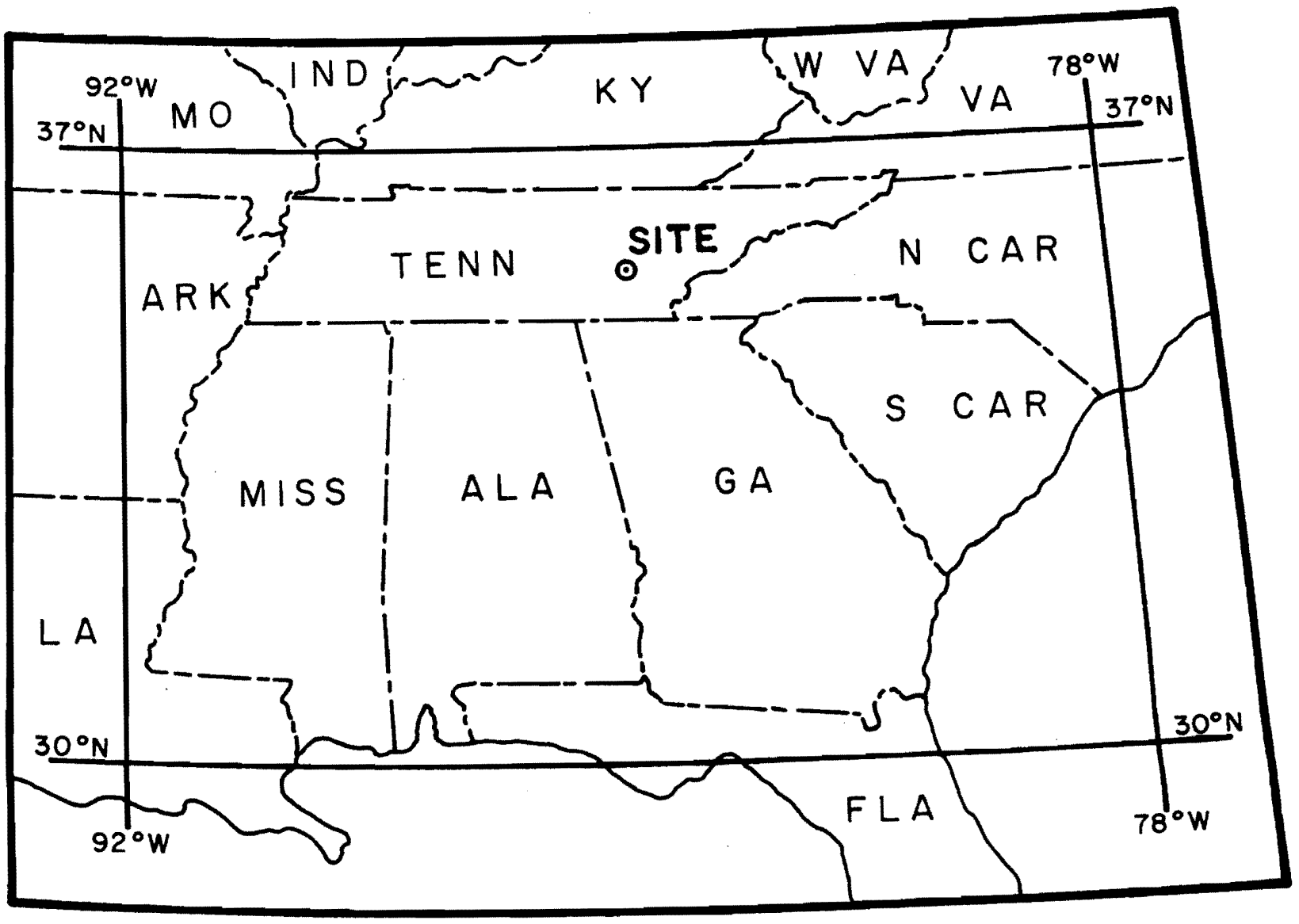

Revised by Amendment 33.

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
INDEX MAP - EARTHQUAKES 6.3 RICHTER OR GREATER LATITUDE 30-37 NORTH LONGITUDE 78-92 WEST Figure 2.5-181

Figure 2.5-181 Index Map -Earthquakes 6.3 Richter or Greater Latitude 30-37 North Longitude 78-92 West

SEISMIC HISTORY OF THE SOUTHEAST REGION OF THE UNITED STATES

THIS IS A CHRONOLOGICAL LISTING OF ALL EARTHQUAKES HAVING EPICENTERS IN THE RECTANGULAR PORTION OF THE SOUTH-EAST REGION BOUNDED BY THE FOLLOWING GEODETIC COORDINATE LINES --

SOUTHERN BOUNDARY - 30.0 -DEGREE NORTH LATITUDE

NORTHERN BOUNDARY - 37.0 -DEGREE NORTH LATITUDE

EASTERN BOUNDARY - 78.0 -DEGREE WEST LONGITUDE

WESTERN BOUNDARY - 92.0 -DEGREE WEST LONGITUDE

AND HAVING A RICHTER SCALE MAGNITUDE EQUAL TO OR GREATER THAN 6.3

YEAR	DATE	TIME-HR-MIN-SEC	LAT - LONG	LOCALITY AND NOTES	FELT-SQ.MI.	MAG/INT	REFERENCES
1811	DEC 16	8 0 0.0	(36.6 89.6)	NEW MADRID,MO-FELT EXTENSIVELY EASTWARD, PERHAPS THE STRONGEST EVER IN U.S.,LIMITED DAMAGE BECAUSE POP. SPARCE,INTENSITY-XII	2000000		ABCD -5,6
1812	JAN 23	15 0 0.0	(36.6 89.6)	NEW MADRID,MO-SECOND MAIN SHOCK OF SERIES, INTENSITY-XII	2000000		ABCD-5,6
1812	FEB 7	9 45 0.0	(36.6 89.6)	NEW MADRID,MO-THIRD MAIN SHOCK OF SERIES, INTENSITY-XII			ABCD-5,6
1886	SEP 1	2 51 0.0	(32.9 80.0)	FIFTEEN MILES NW OF CHARLESTON,SC-ONE OF STRONGEST EVER TO OCCUR IN U.S.,EXTEN-SIVE DAMAGE,INTEN-SITY X	2000000		ABCD-5,6,8
1886	SEP 1	2 59 0.0	(32.9 80.0)	CHARLESTON,SC-2ND MAIN SHOCK,INT-X	2000000		ABCD-5,6,8
1886	SEP 1	5 5 0.0	(32.9 80.0)	CHARLESTON-AFTERSHOCK			-14
1895	OCT 31	11 8 0.0	(37.0 89.4)	NEAR CHARLESTON,MO-4 ACRES OF GROUND SANK FORMING A LAKE, CONSIDERABLE DAMAGE AT CAIRO,ILL,FELT EXTENSIVELY EASTWARD	1000000	VIII-IX	ACD-6,5
1905	JAN 27	0 0 0.0	(34.0 86.0)	NEAR GADSDEN,ALA	250000	VIII	ACD-6,5
1905	JAN 28	0 0 0.0	(34.0 86.0)	GADSDEN-SECOND SHOCK	250000	VIII	ACD-6,5

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EARTHQUAKE LISTING
6.3 RICHTER OR GREATER
LATITUDE 30-37 NORTH
LONGITUDE 78-92 WEST
SHEET 1 OF 1
Figure 2.5-182

Figure 2.5-182 Earthquakes Listing 6.3 Richter Or Greater Latitude 30-37 Longitude 78-92 West

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EARTHQUAKE LISTING
LIST OF REFERENCES

Figure 2.5-183

Figure 2.5-183 Earthquake Listing List of References

THE FOLLOWING NOTES APPLY TO VARIOUS SYMBOLS AND CODE LETTERS USED IN THE EARTHQUAKE LIST

ALL DATES AND TIMES ARE GIVEN IN GREENWICH MEAN TIME.

FOR THE EVENTS PRIOR TO 1928, ZEROS IN THE SEC, MIN, OR HOUR COLUMNS MEANS THAT THE TIME OF THE EVENT IS NOT ACCURATELY KNOWN.

PARENTHESIS AROUND THE COORDINATES OF THE EPICENTER INDICATES THE LOCATION OF AN ISOLATED FELT REPORT OR THE APPROXIMATE CENTER OF THE REPORTED FELT AREA AND THAT THE EVENT WAS NOT INSTRUMENTALLY LOCATED.

IN THE -MAG/INT- COLUMN , THE RICHTER MAGNITUDE OF THE EARTHQUAKE IS GIVEN IN ARABIC NUMBERS WITH A DECIMAL POINT . IF THE MAGNITUDE IS NOT AVAILABLE , THE ESTIMATED INTENSITY, ON THE MODIFIED MERCALLI SCALE , IS GIVEN IN ROMAN NUMERALS. IF NEITHER OF THESE MEASURES OF THE SIZE OF THE EARTHQUAKE ARE AVAILABLE , THIS COLUMN IS LEFT BLANK.

THE FIRST NUMBERED REFERENCE CITED IN THE REFERENCE LIST CONTAINS THE BEST DESCRIPTION AND MOST COMPLETE DISCUSSION OF THE VARIOUS EFFECTS OF THAT EARTHQUAKE. SOME OF THE EFFECTS AND CHARACTERISTICS ARE SUMMARIZED USING THE LETTER CODES BELOW.

A- INDICATES THAT THIS EARTHQUAKE WAS FOLLOWED BY AN AFTERSHOCK SEQUENCE , THE INDIVIDUAL EVENTS OF WHICH ARE NOT INCLUDED IN THE LISTING UNLESS THEY ARE IDENTIFIED AS SUCH.

B- INDICATES THAT VARIOUS RUMBLINGS, GROANS, AND OTHER EARTH NOISES WERE REPORTED ACCOMPANYING THE EARTHQUAKE.

C- INDICATES THAT VISIBLE TOPOGRAPHIC CHANGES OCCURRED AS A RESULT OF THE EARTHQUAKE.

D- INDICATES DAMAGE OR CHANGES TO STRUCTURES SUCH AS CHIMNEYS THROWN DOWN , CONCRETE OR PLASTER CRACKED , MOVEMENT OF FURNITURE OR FIXTURES , ETC.

F- INDICATES A SHARPLY FELT LOCAL SHOCK.

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
EARTHQUAKE LISTING NOTES Figure 2.5-184

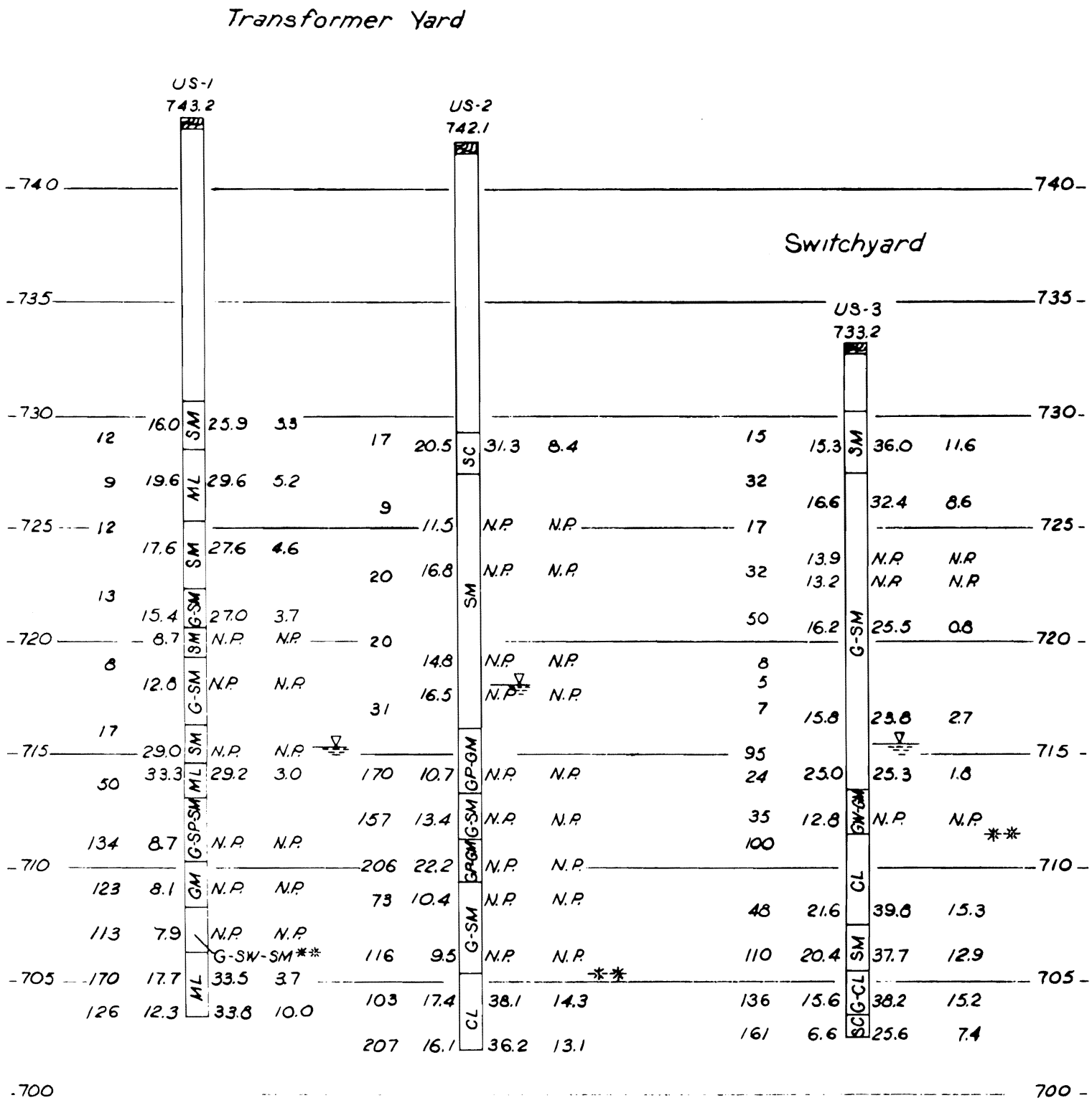
Figure 2.5-184 Earthquake Listing Notes

Security-Related Information - Withheld Under 10CFR2.390

Figure 2.5-185 Yard Soil Borings Location Plan

Security-Related Information - Withheld Under 10CFR2.390

Figure 2.5-185a Yard Soil Borings Location Plan



LEGEND

Hole No.

Elev.

* Blows | Natural Moisture Content | Classification | Liquid Limit | Plasticity Index

* Blows per foot with a 140lb. hammer and a 30 inch drop on a 2 inch OD splitspoon.

** Top of weathered shale

Symbols

Watertable

Topsoil

Scale 1"=5' Before Reduction

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
TRNASFORMER YARD & SWITCHYARD SOIL INVESTIGATION Figure 2.5-186

Figure 2.5-186 Transformer Yard & Switchyard Soil Investigation

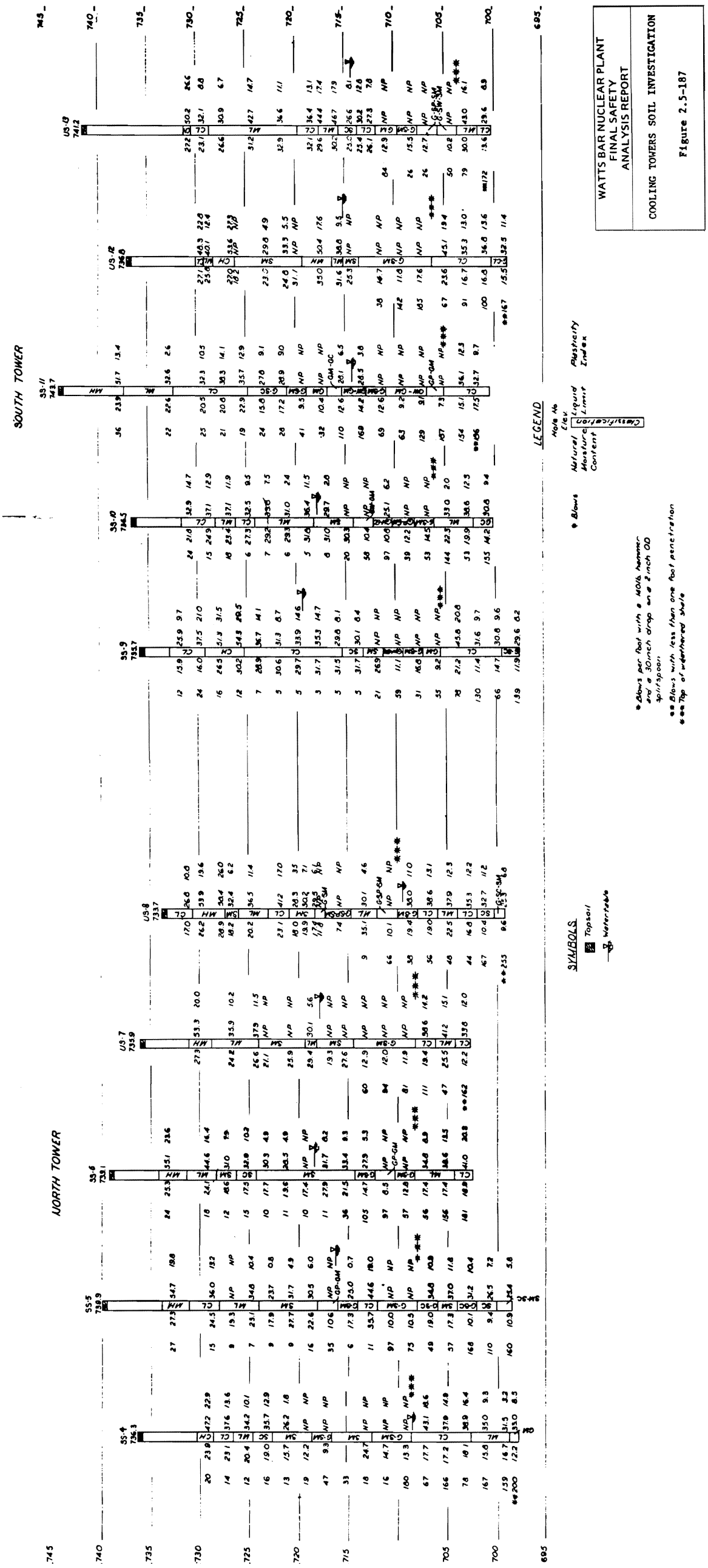


Figure 2.5-187 Cooling Towers Soil Investigation

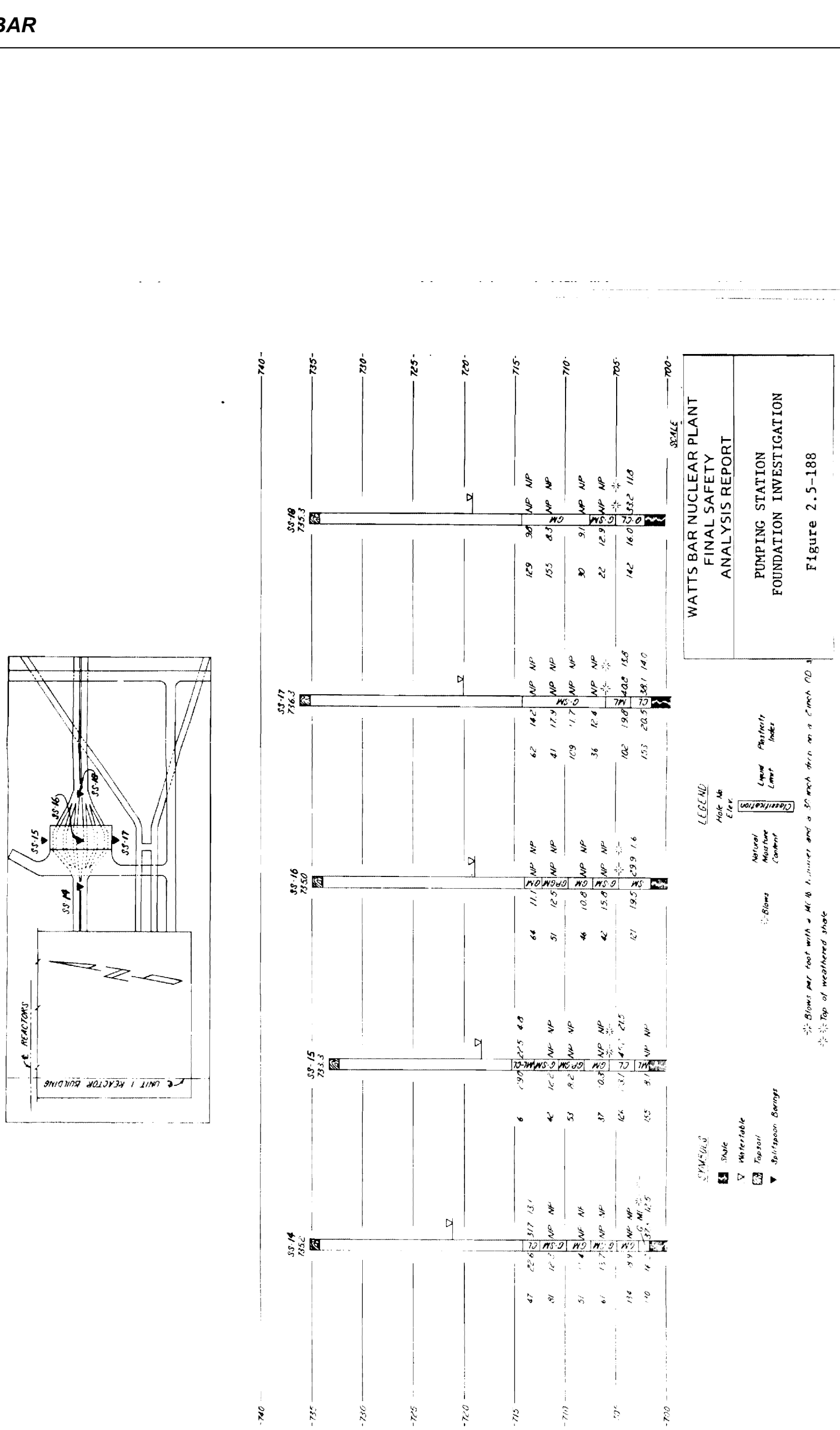


Figure 2.5-188 Pumping Station Foundation Investigation

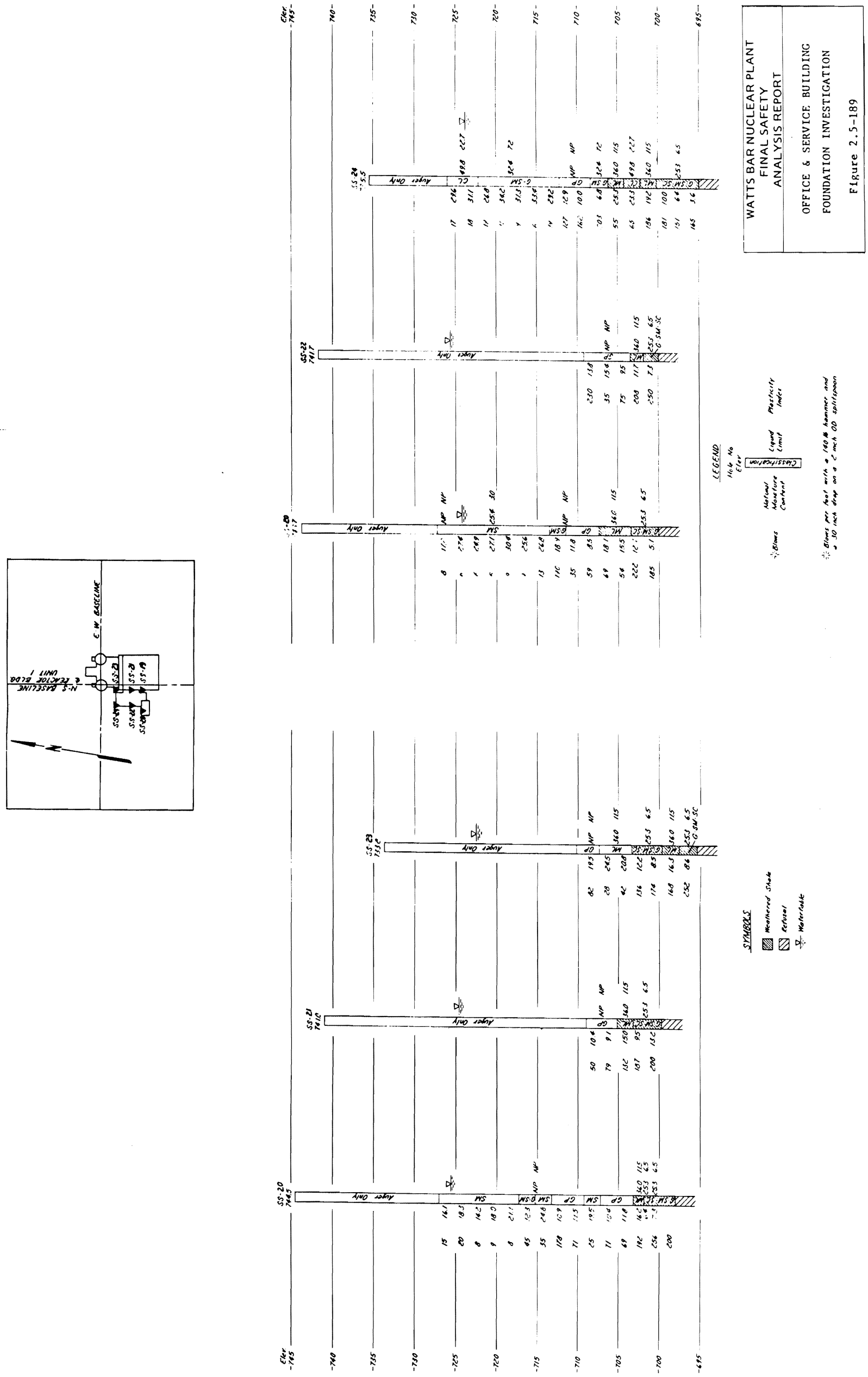


Figure 2.5-189 Office & Service Building Foundation Investigation

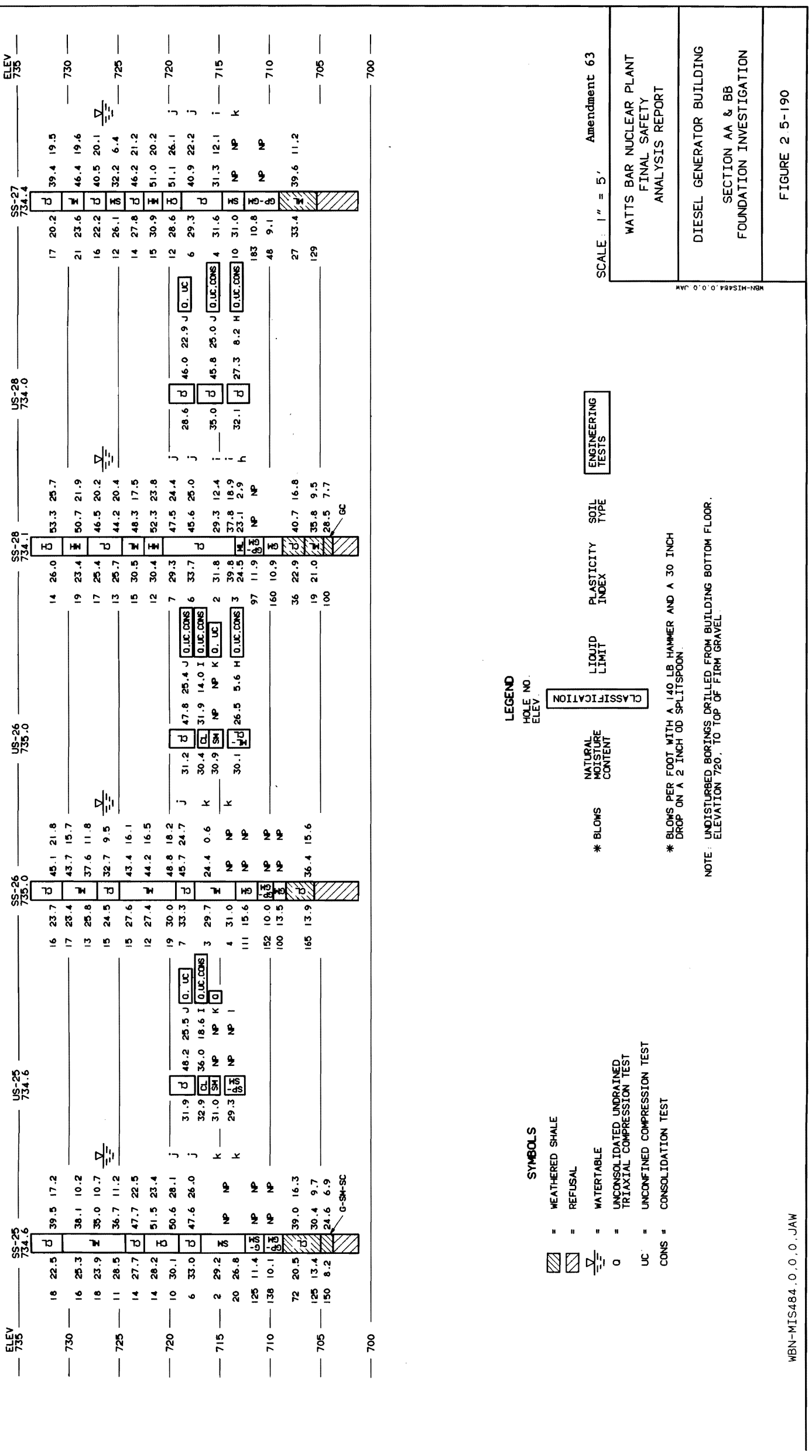


Figure 2.5-190 Diesel Generator Building Sections AA & BB Foundation Investigation

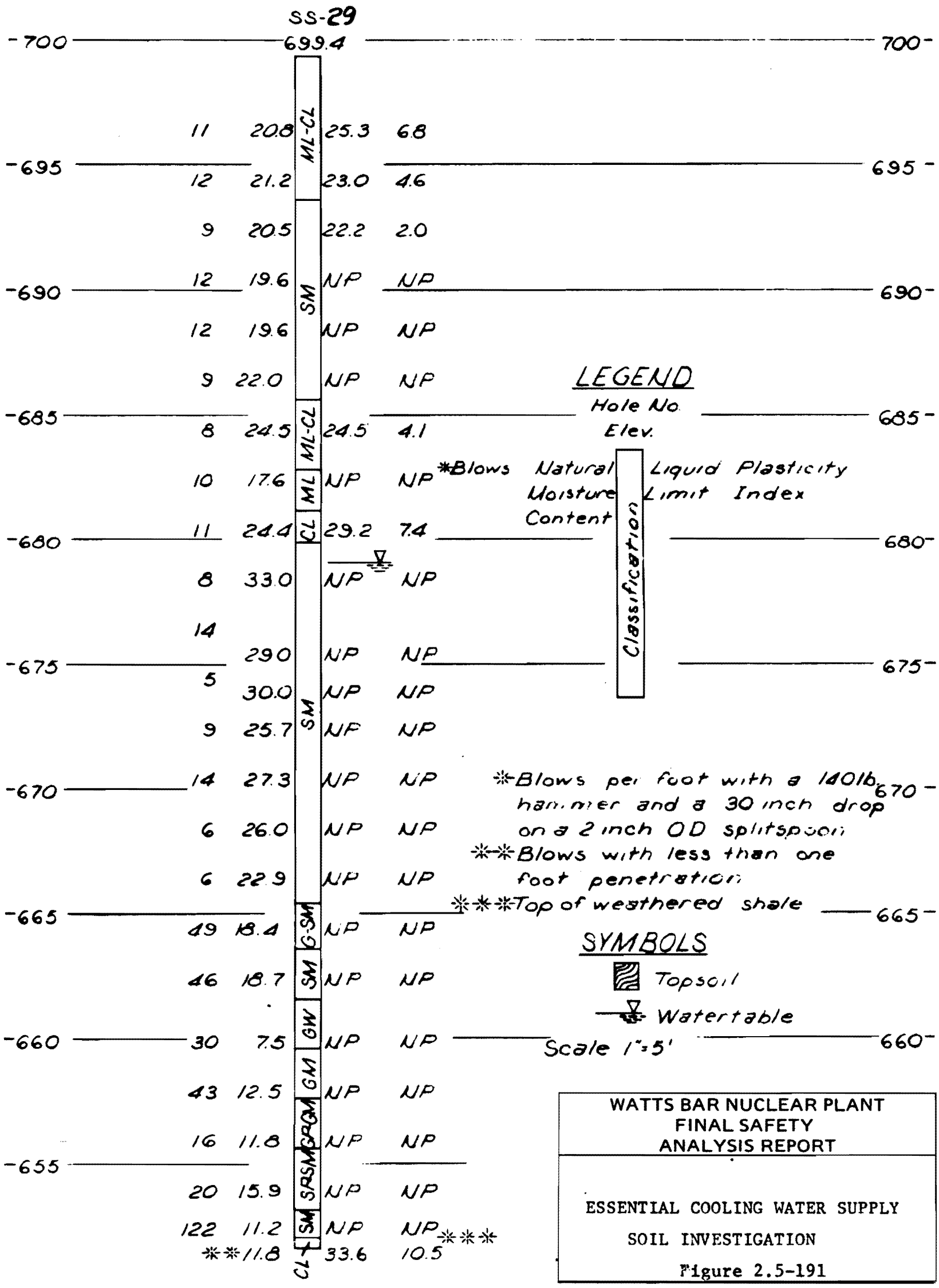
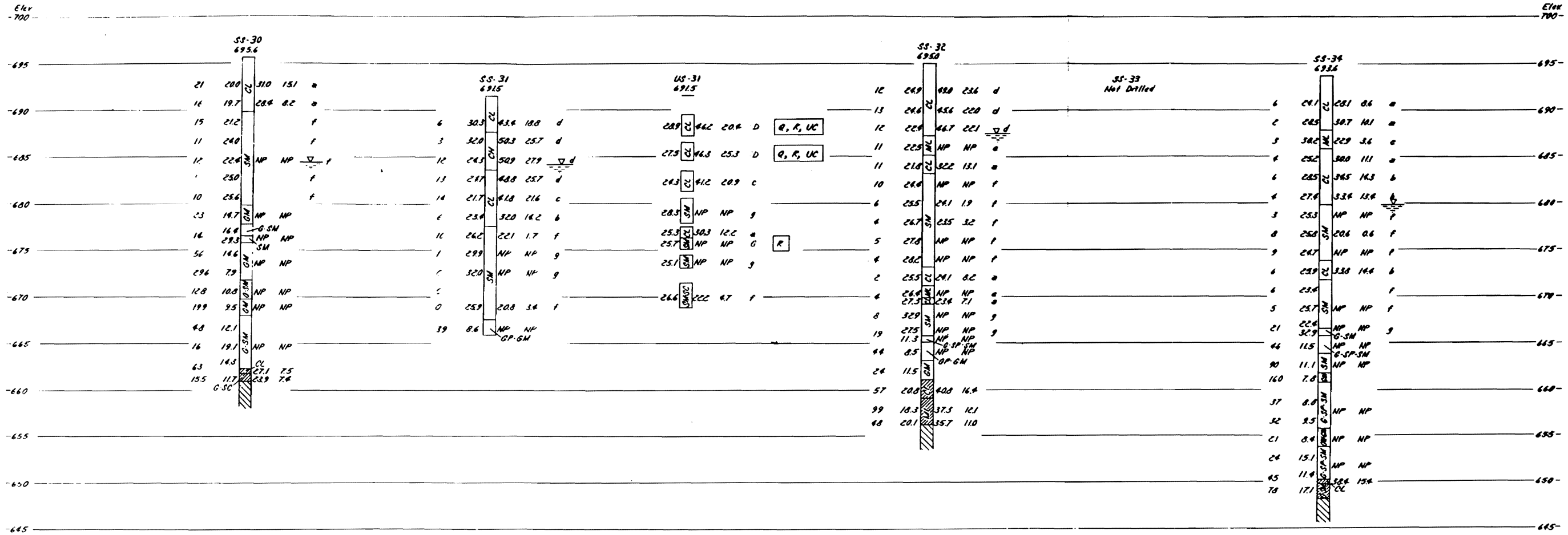


Figure 2.5-191 Essential Cooling Water Supply Soil Investigation



SYMBOLS

- Weathered shale
- Refusal
- Waterlable
- Q Unconsolidated undrained triaxial compression test
- R Consolidated undrained triaxial compression test
- UC Unconfined compression test

LEGEND

Hole No
Elev

Blows | Natural Moisture Content | Classification | Liquid Limit | Plasticity Index | Soil Type | Engineering Tests

Blows per foot with a 140 lb. hammer and a 30 inch drop on a 2 inch OD splitspoon

Note: Undisturbed borings drilled to top of firm gravel

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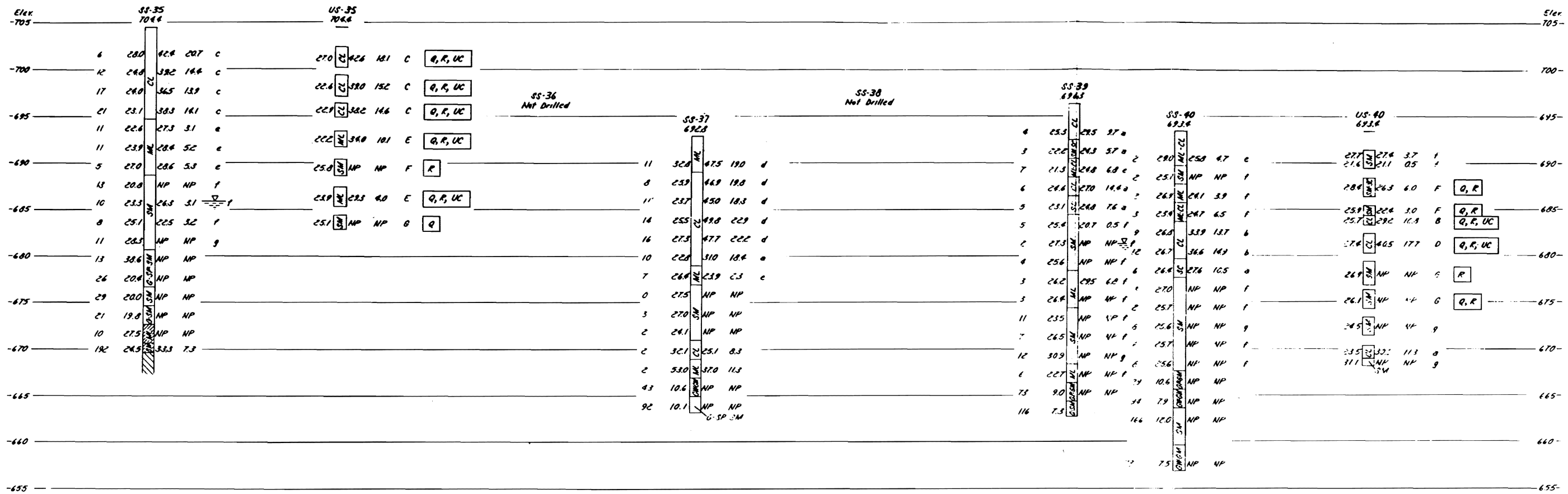
INTAKE CHANNEL, SECTION DD
FOUNDATION INVESTIGATION

Figure 2.5-192

Figure 2.5-192 Intake Channel, Section DD Foundation Investigation



WATTS BAR NUCLEAR PLANT
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ANALYSIS REPORT

INTAKE CHANNEL, SECTION EE
FOUNDATION INVESTIGATION

Figure 2.5-193

Figure 2.5-193 Intake Channel, Section EE Foundation Investigation

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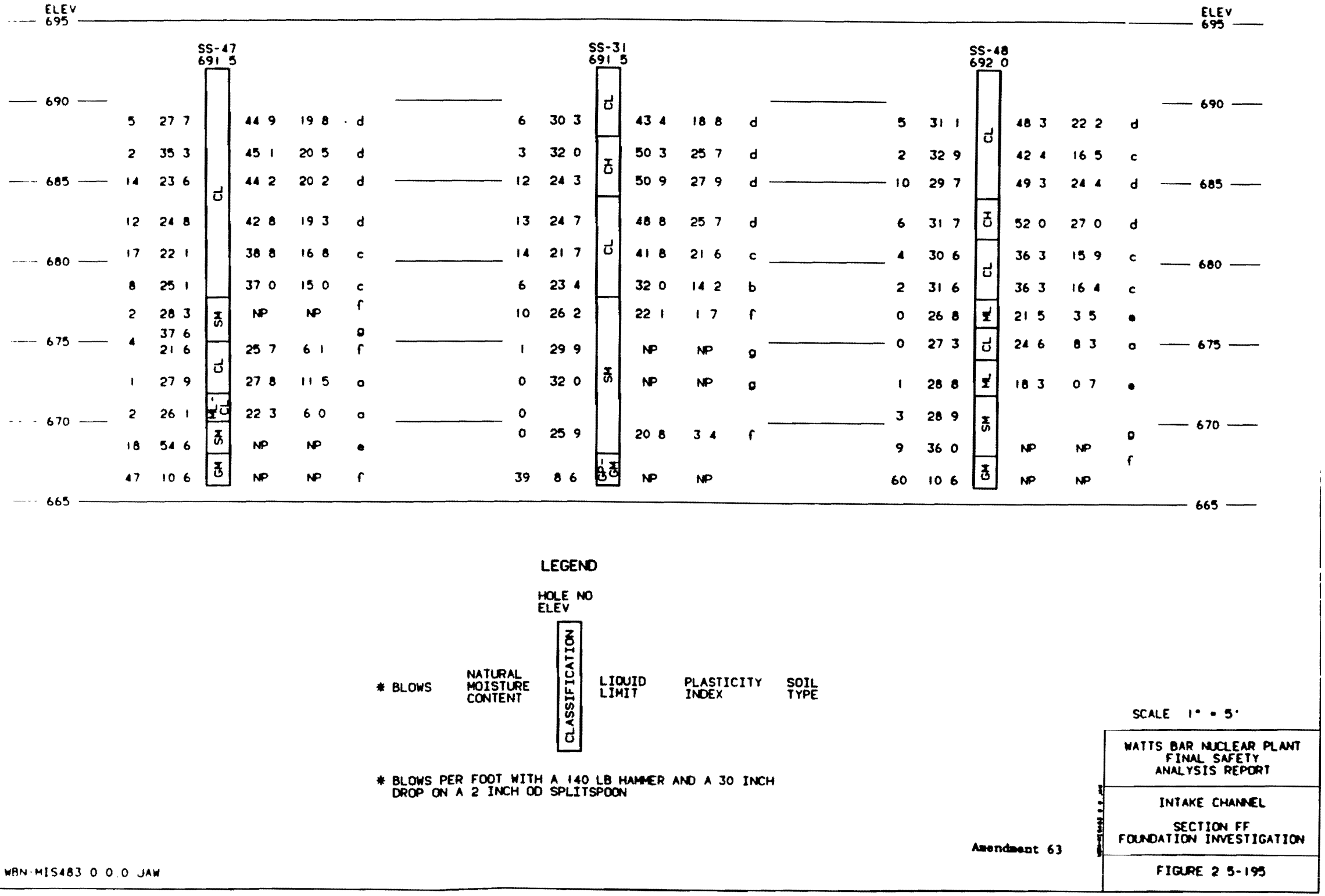
ANALYSIS REPORT

INTAKE CHANNEL, SECTION CC
FOUNDATION INVESTIGATION

Figure 2.5-194

Figure 2.5-194 Intake Channel, Section CC Foundation Investigation



LEGEND

HOLE NO
ELEV

* BLOWS | NATURAL MOISTURE CONTENT | CLASSIFICATION | LIQUID LIMIT | PLASTICITY INDEX | SOIL TYPE

* BLOWS PER FOOT WITH A 140 LB HAMMER AND A 30 INCH DROP ON A 2 INCH OD SPLITSPOON

SCALE 1" = 5'

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
INTAKE CHANNEL SECTION FF FOUNDATION INVESTIGATION
FIGURE 2 5-195

Amendment 63

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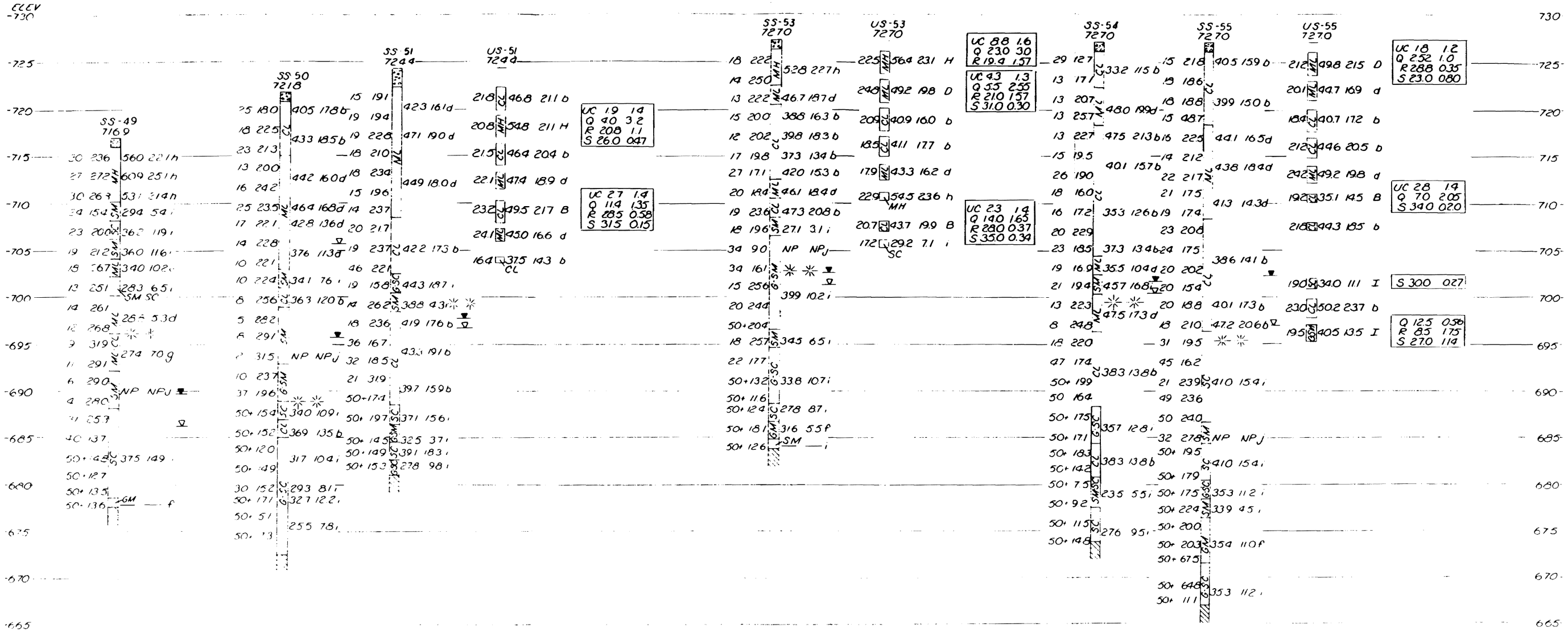
Figure 2.5-195 Intake Channel, Section FF Foundation Investigation



SYMBOLS

- Silty clay
- Limestone gravel
- Refusal
- Q - Unconsolidated undrained triaxial compression test
- R - Consolidated undrained triaxial compression test
- S - Consolidated drained direct shear test
- UC - Unconfined compression test
- ▽ - 1 hour water table reading
- ▼ - 24 hour water table reading

LEGEND

Boring No
Elevation

✳ Blows | Natural Moisture Content | Classification | Liquid Limit | Plasticity Index | Soil Type | Type Test | Friction Angle (degrees) | Unconfined Compressive Strength (tsf) | Cohesion (tsf) or Sensitivity Ratio

✳ Blows per foot with a 140 lb hammer and a 30 inch drop on a 2 inch OD splitspoon sampler

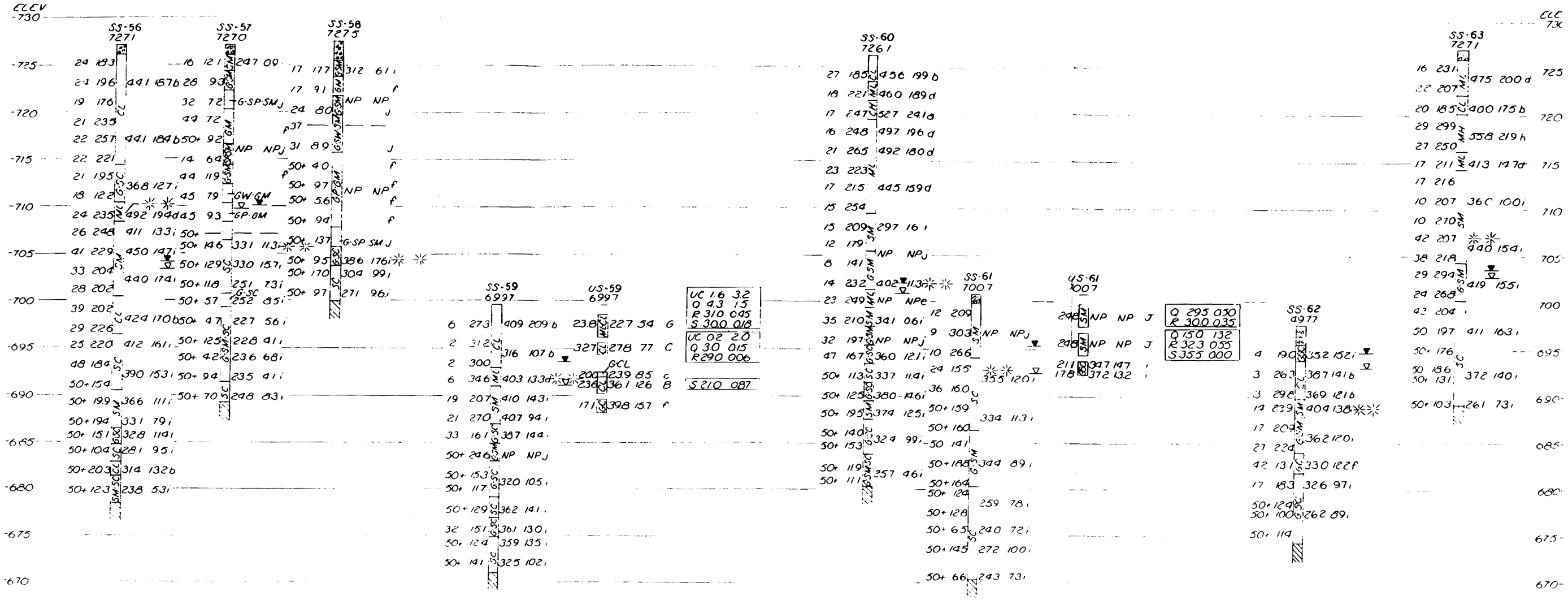
✳✳ Top of weathered shale

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

CLASS IE CONDUITS
SOIL INVESTIGATION

Figure 2.5-196

Figure 2.5-196 Class IE Conduits Soil Investigation



SYMBOLS

- Limestone gravel
- Refusal
- Q - Unconsolidated undrained triaxial compression test
- R - Consolidated undrained triaxial compression test
- S - Consolidated drained direct shear test
- UC - Unconfined compression test
- ▽ - 1 hour water table reading
- ▼ - 24 hour water table reading

LEGEND

Boring No.
Elevation

Blows	Natural Moisture Content	Classification	Liquid Limit	Plasticity Index	Soil Type	Type Test	Friction Angle (degrees) or Unconfined Compressive Strength	Cohesion (tsf) Sensitivity Ratio

✳ Blows per foot with a 140 lb hammer and a 30 inch drop on a 2 inch OD splitspoon sample

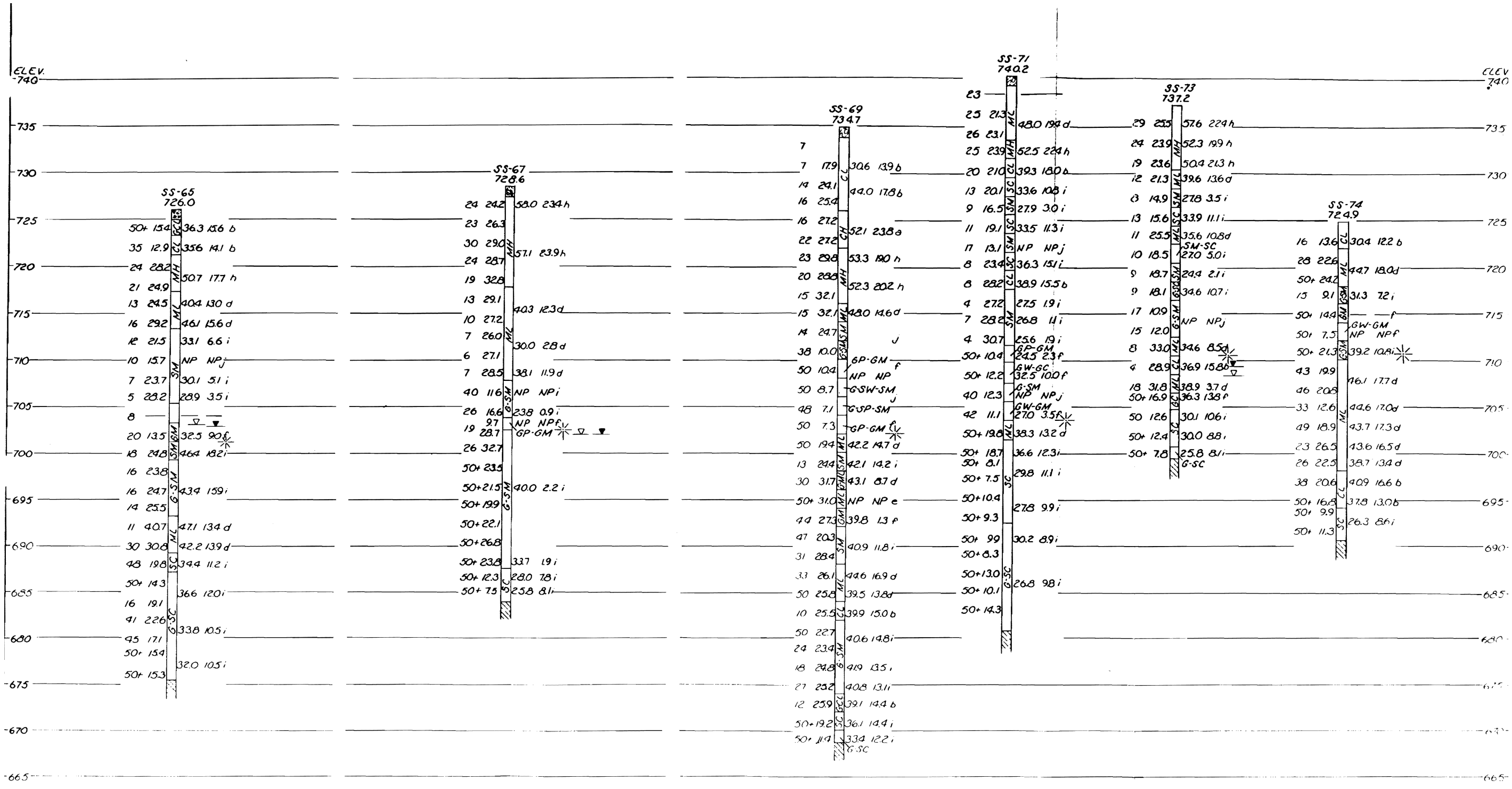
✳ ✳ Top of weathered shale

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

CLASS IE CONDUITS
SOIL INVESTIGATION

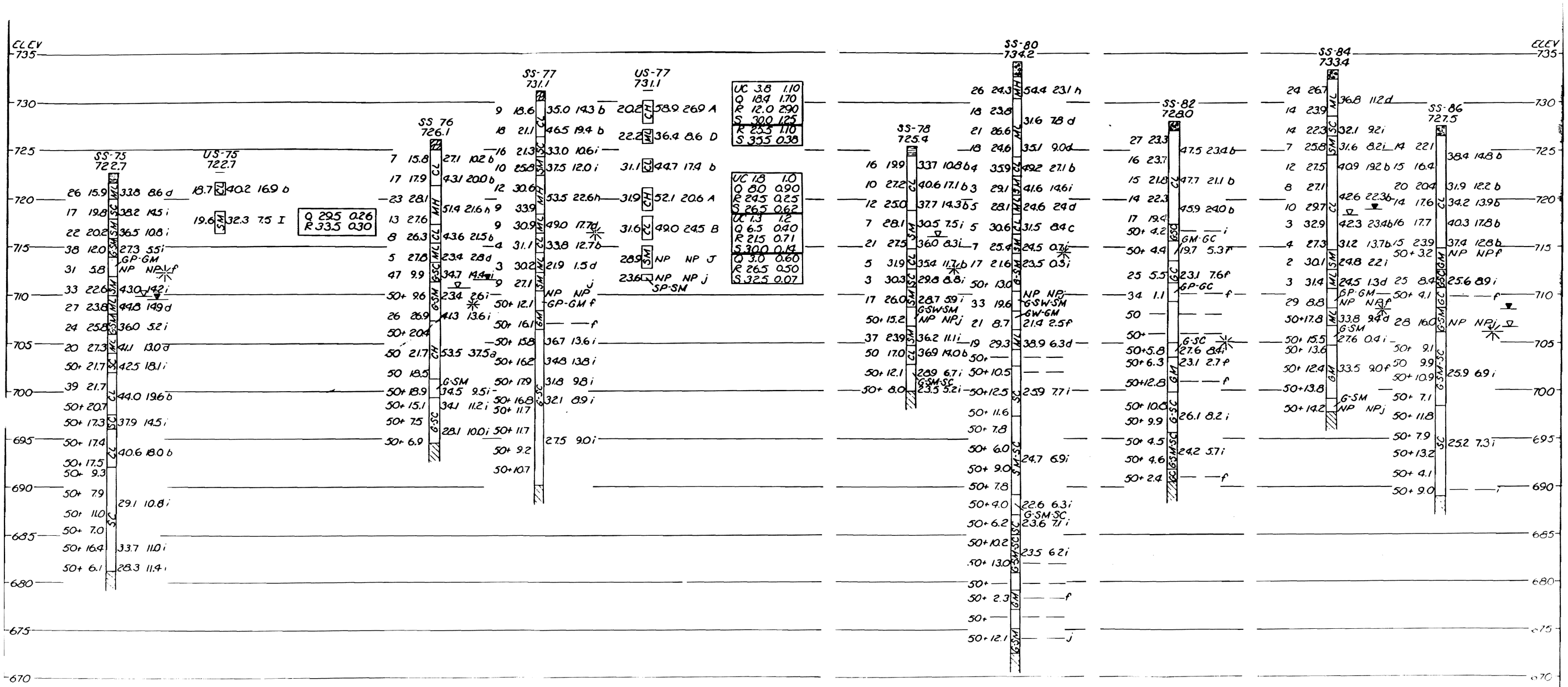
Figure 2.5-197

Figure 2.5-197 Class IE Conduits Soil Investigation



WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
SOIL INVESTIGATION BORINGS FOR ERCW AND HPFP SYSTEMS Figure 2.5-198 Added by Amendment 24

Figure 2.5-198 Soil Investigation Borings For ERCW & HPFP Systems



SYMBOLS

- Topsoil
- Limestone, gravel
- Clayey silt
- Refusal

Q - Unconsolidated undrained triaxial compression test
R - Consolidated undrained triaxial compression test at natural moisture
S - Consolidated drained direct shear test
UC - Unconfined compression test
▽ - One hour water table reading
▼ - Twenty-four hour water table reading

LEGEND

Boring No
Elevation

Blows | Natural Moisture Content | Classification | Liquid Limit | Plasticity Index | Soil Type | Type Test | Friction Angle (degrees) Unconfined Compressive Strength (tsf) | or | Cohesion (tsf) Sensitivity Ratio

Note: Blows per foot with a 140 lb. hammer and a 30 inch drop on a 2 inch OD splitspoon sampler

* Top of weathered shale

WATTS BAR NUCLEAR PLANT
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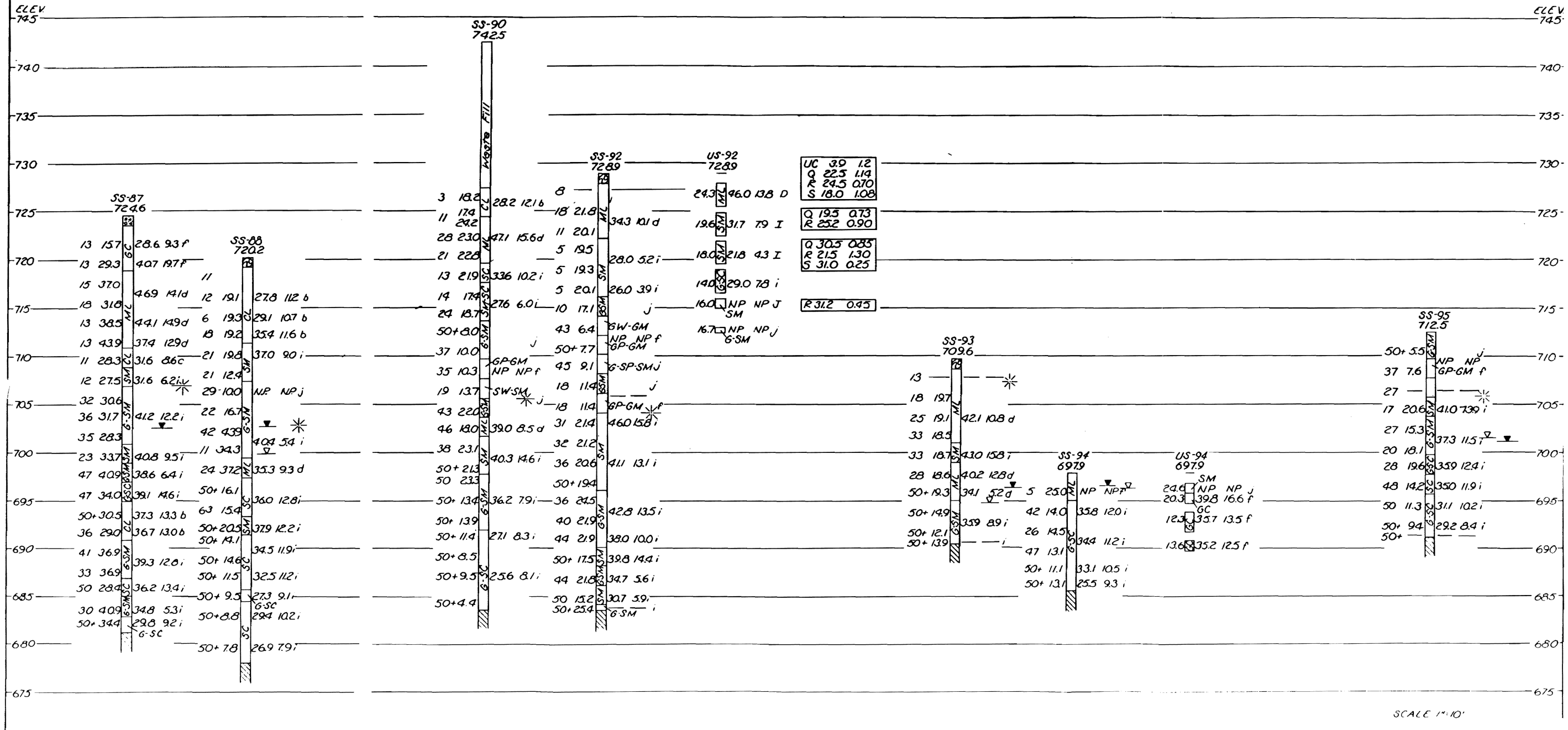
SOIL INVESTIGATION BORINGS
FOR ERCW AND HPFP SYSTEMS
Figure 2.5-199
Added by Amendment 24

KNOXVILLE | 031 75 | 9 | 05 | 3 | 0043A6/17P1

Figure 2.5-199 Soil Investigation Borings For ERCW & HPFP Systems



WATTS BAR NUCLEAR PLANT
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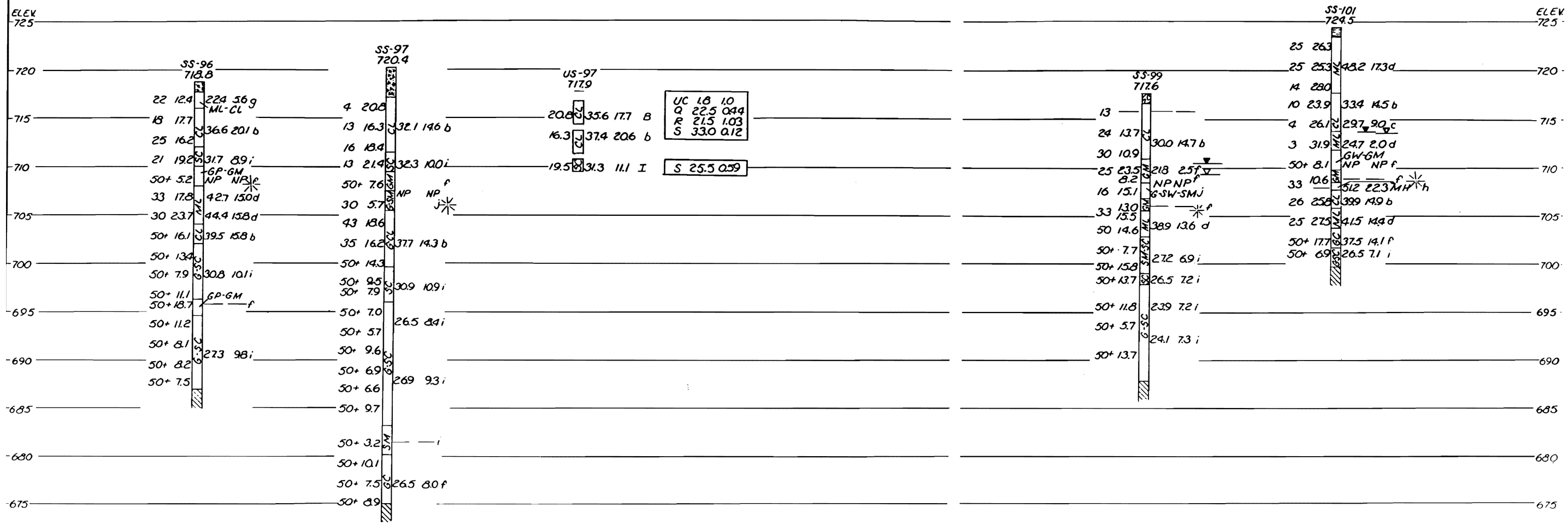
ANALYSIS REPORT

SOIL INVESTIGATION BORINGS
FOR ERCW AND HPFP SYSTEMS
Figure 2.5-200
Added by Amendment 24

Figure 2.5-200 Soil Investigation Borings For ERCW & HPFP Systems



SYMBOLS

- Topsoil
- Limestone gravel
- Clayey silt
- Refusal

Q - Unconsolidated undrained triaxial compression test
R - Consolidated undrained triaxial compression test at natural moisture
S - Consolidated drained direct shear test
UC - Unconfined compression test
▽ - One hour water table reading
▼ - Twentey four hour water table reading

LEGEND

Boring No.
Elevation

Blows | Natural Moisture Content | Classification | Liquid Limit | Plasticity Index | Soil Type | Type Test | Friction Angle (degrees) or Unconfined Compressive Strength (tsf) | Cohesion (tsf) Sensitivity Ratio

Note: Blows per foot with a 140 lb. hammer and a 30 inch drop on a 2 inch OD splitspoon sampler

✳ Top of weathered shale

SCALE: 1" = 10'

WATTS BAR NUCLEAR PLANT
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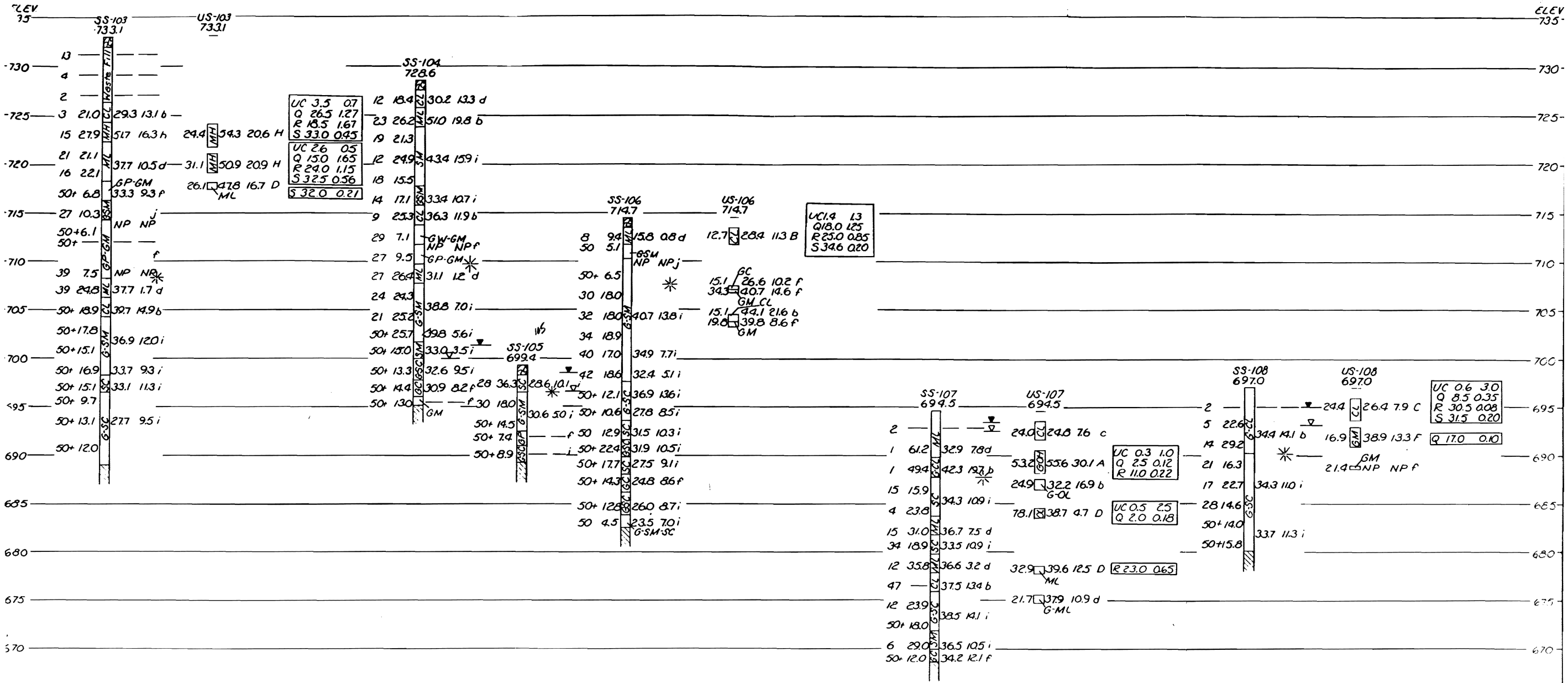
SOIL INVESTIGATION BORINGS
FOR ERCW AND HPFP SYSTEMS
Figure 2.5-201
Added by Amendment 24

EMBREVILLE | 10/3/79 | 9 | CS | 3 | 604K692R

Figure 2.5-201 Soil Investigation Borings For ERCW & HPFP Systems



SYMBOLS

- Topsoil
- Refusal

Q-Unconsolidated undrained triaxial compression test
R-Consolidated undrained triaxial compression test at natural moisture
S-Consolidated drained direct shear test
UC-Unconfined compression test
▽ - One hour water table reading
▼ - Twentey four hour water table reading

LEGEND

Boring No
Elevation

Blows | Natural Moisture Content | Classification | Liquid Limit | Plasticity Index | Soil Type | Type Test | Friction Angle (degrees) or Unconfined Compressive Strength (tsf) | Cohesion (tsf) | Sensitivity Ratio

Note: Blows per foot with a 140 lb hammer and a 30 inch drop on a 2 inch OD splitspoon sampler

✳ Top of weathered shale

SCALE: 1"=10'

WATTS BAR NUCLEAR PLANT
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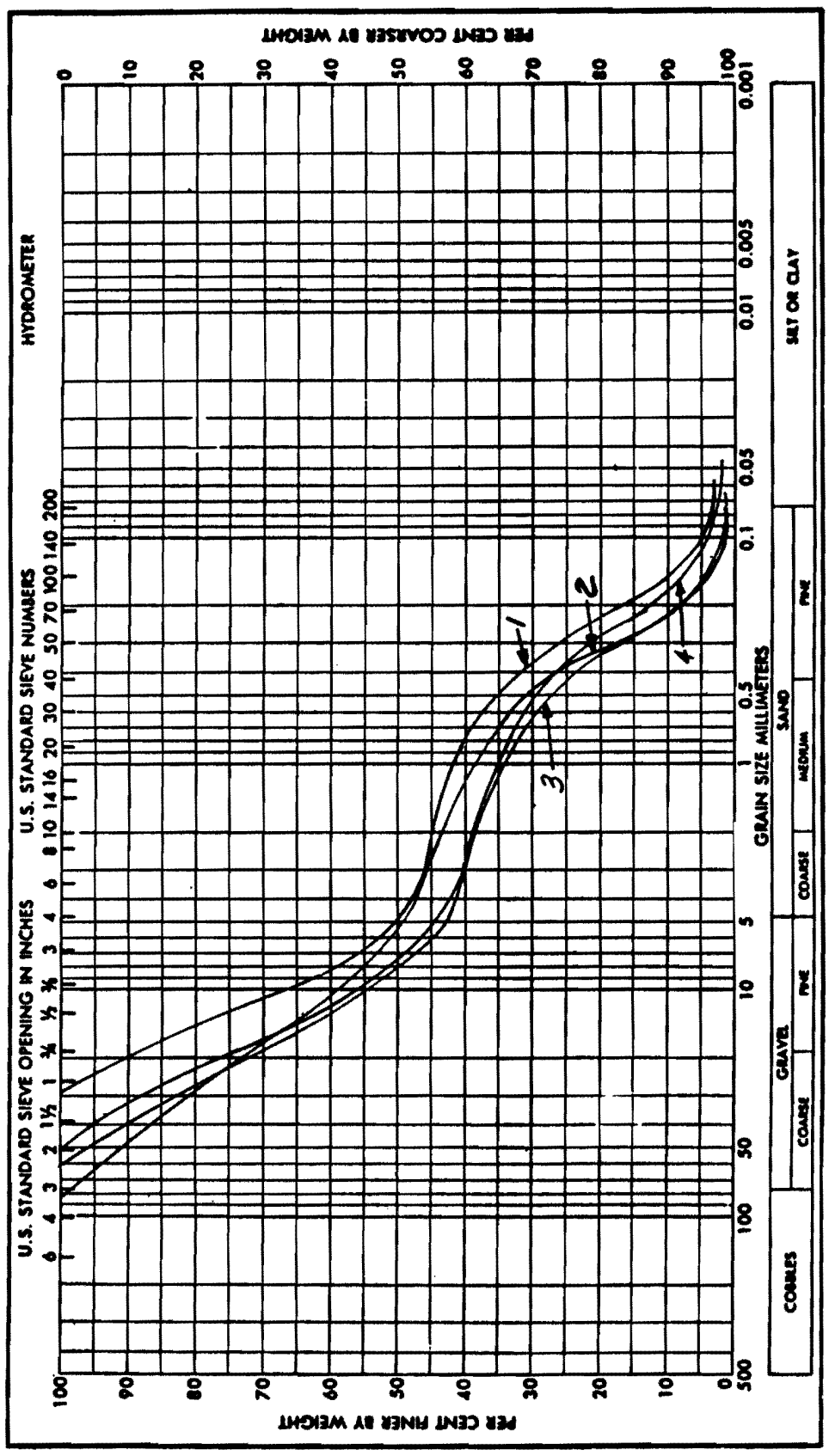
SOIL INVESTIGATION BORINGS
FOR ERCW AND HPFP SYSTEMS
Figure 2.5-202
Added by Amendment 24

KNOXVILLE	10/31/75	9	CS	3	6004K6,7,8,K1

Figure 2.5-202 Soil Investigation Borings For ERCW & HPFP Systems



Soil Symbol	GP	Liquid Limit, %	
Moisture Content, %		Plastic Limit, %	
Specific Gravity		Plasticity Index, %	
		Shrinkage Limit, %	

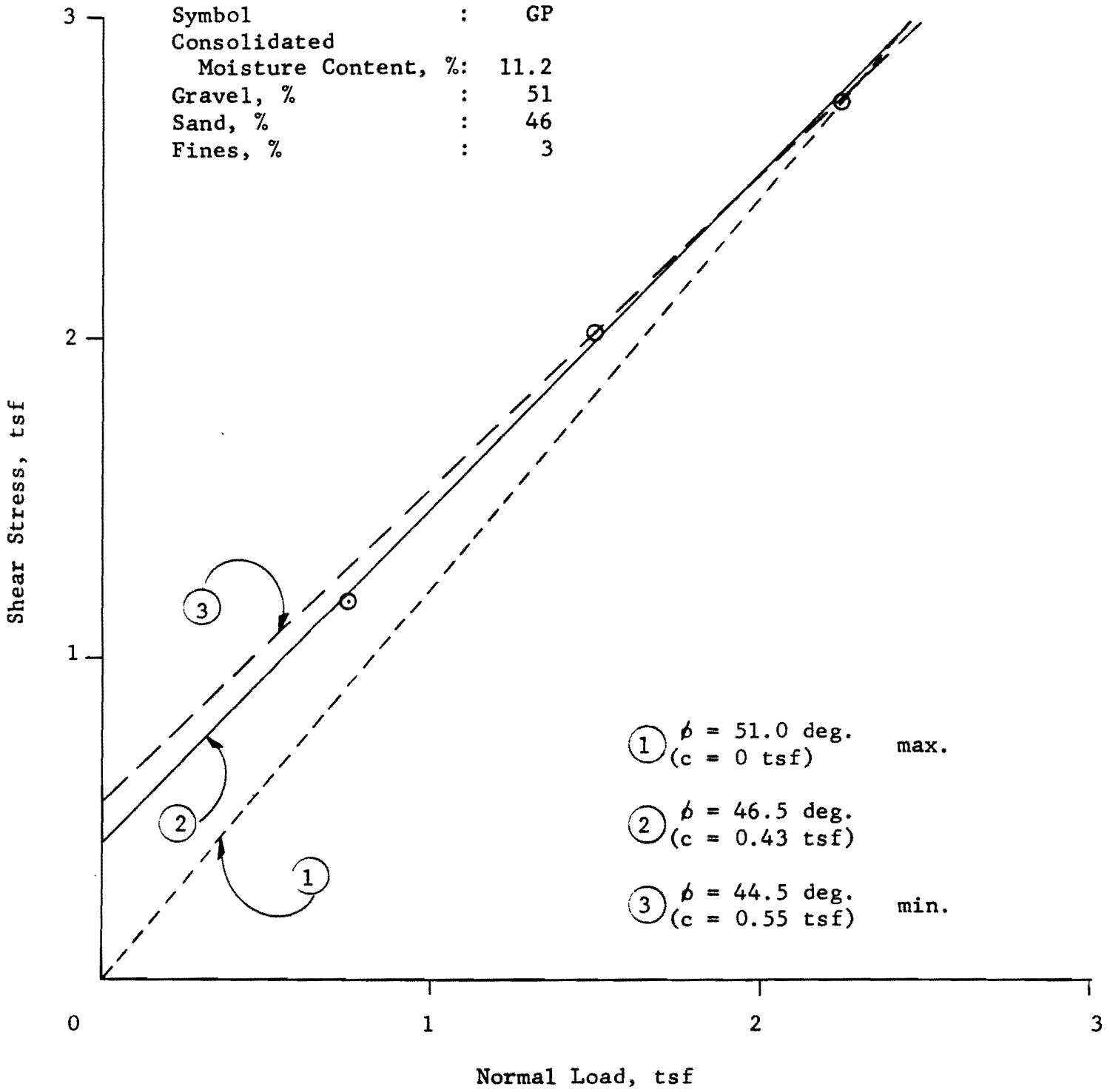
Remarks:

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
INTAKE CHANNEL TRENCH
Figure 2.5-203

Figure 2.5-203 Intake Channel Trench

WATTS BAR NUCLEAR PLANT - INTAKE CHANNEL

TEST 1



Normal Load tsf	Consolidated* Deformation in.	Shear Stress tsf	Consolidated* Dry Density pcf
0.75	0.1833	1.17	118.9
1.50	0.1543	2.02	120.5
2.25	0.2013	2.76	120.3

*Under an overburden pressure of 3000 psf.

Figure 2.5-204

Figure 2.5-204 Intake Channel Test 1

Normal Load (tsf)	Consolidated* Deformation (in)	Shear Stress (tsf)	Consolidated* Dry Density (psf)
0.75	0.0987	1.25	126.3
1.50	0.0987	1.89	126.3
2.25	0.0842	2.65	125.5

*Under an overburden pressure of 3000 psf.

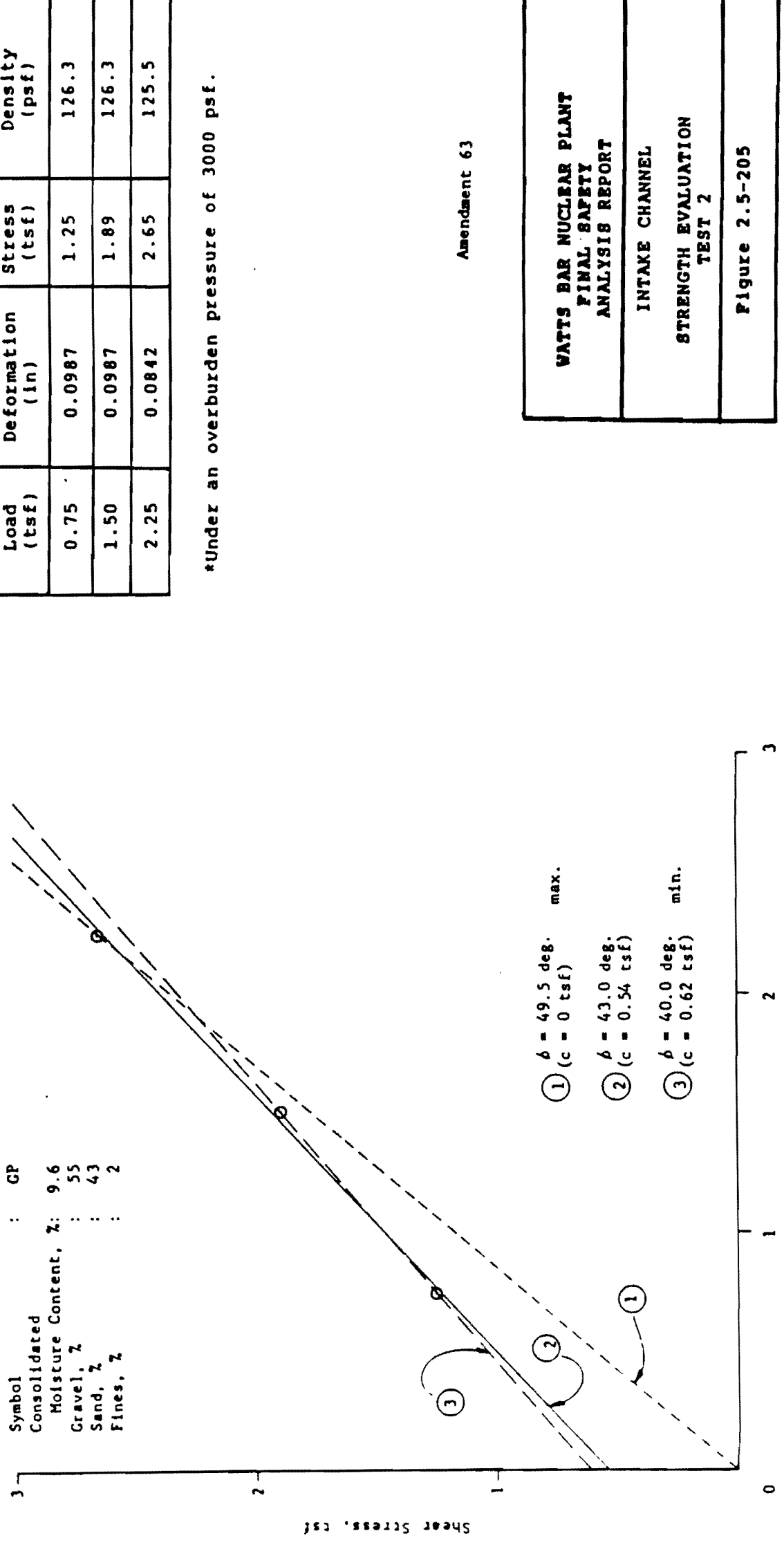


Figure 2.5-205 Intake Channel Strength Evaluation Test 2

Amendment 63

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
INTAKE CHANNEL STRENGTH EVALUATION TEST 2
Figure 2.5-205

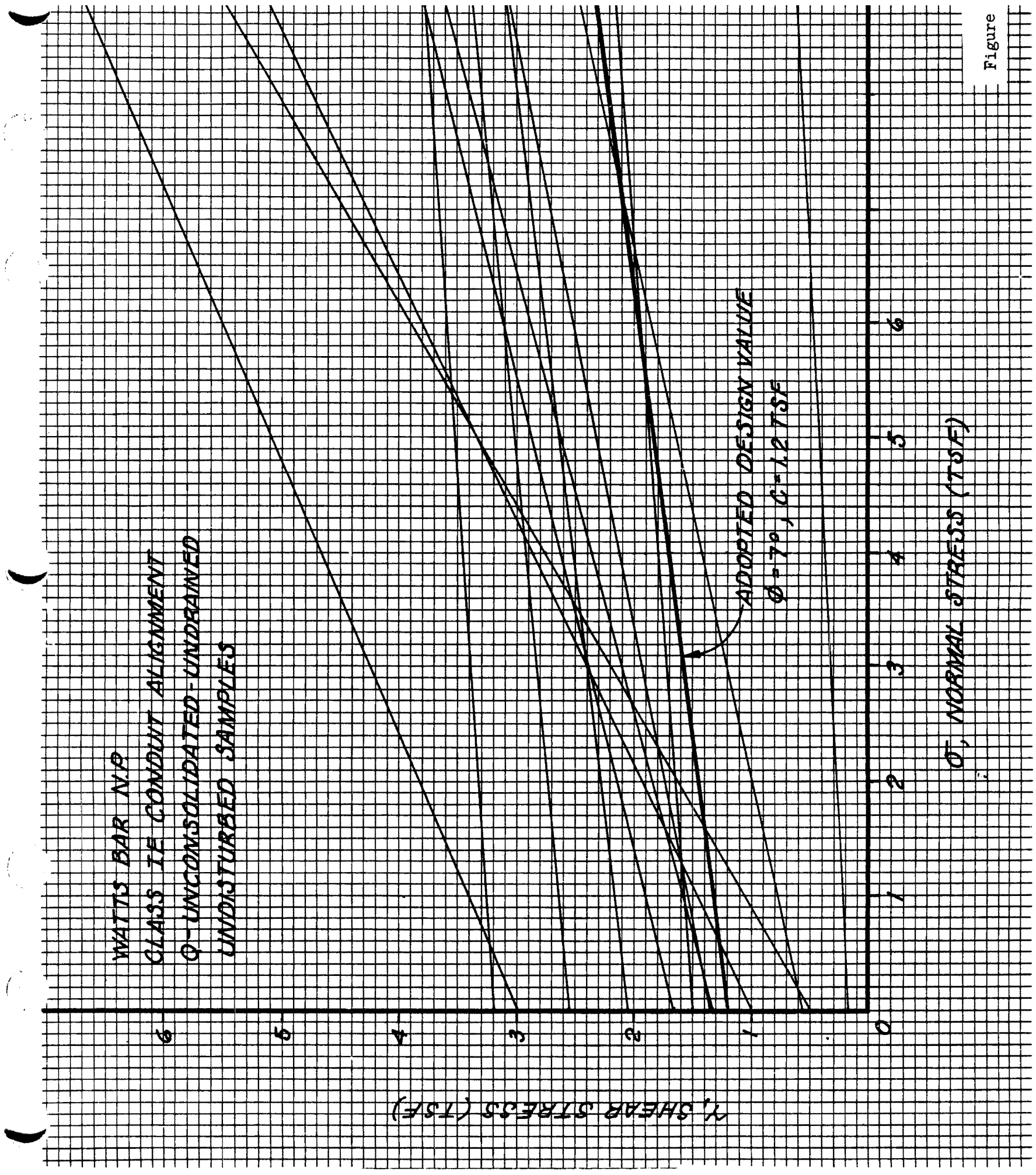


Figure 2.5-206 Class IE Conduit Alignment Q (Unconsolidated, Undrained, Undisturbed) Samples.

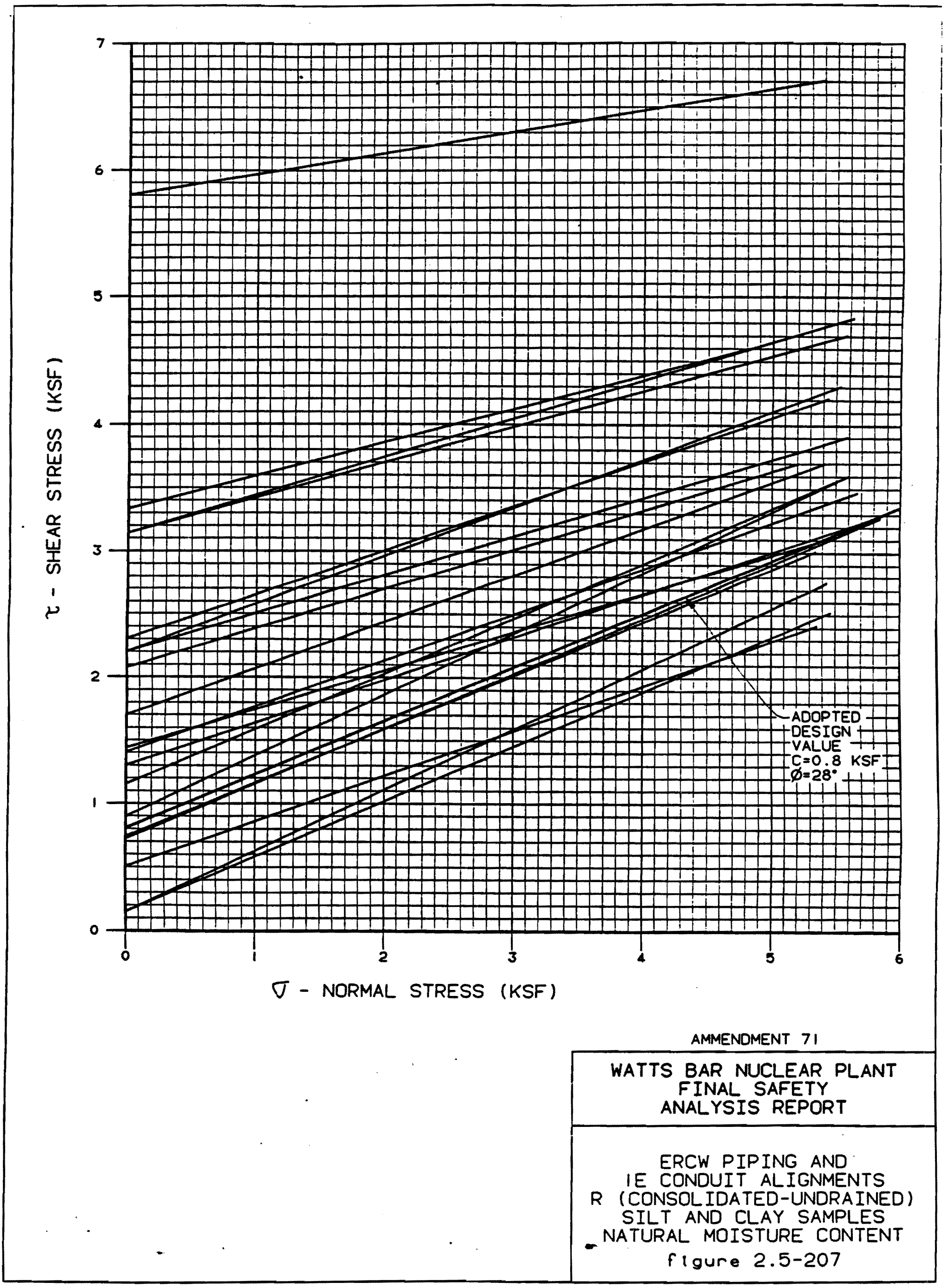


Figure 2.5-207 ERCW Piping and IE Conduit Alignments R (Consolidated - Undrained) Silt and Clay Samples Natural Moisture Content

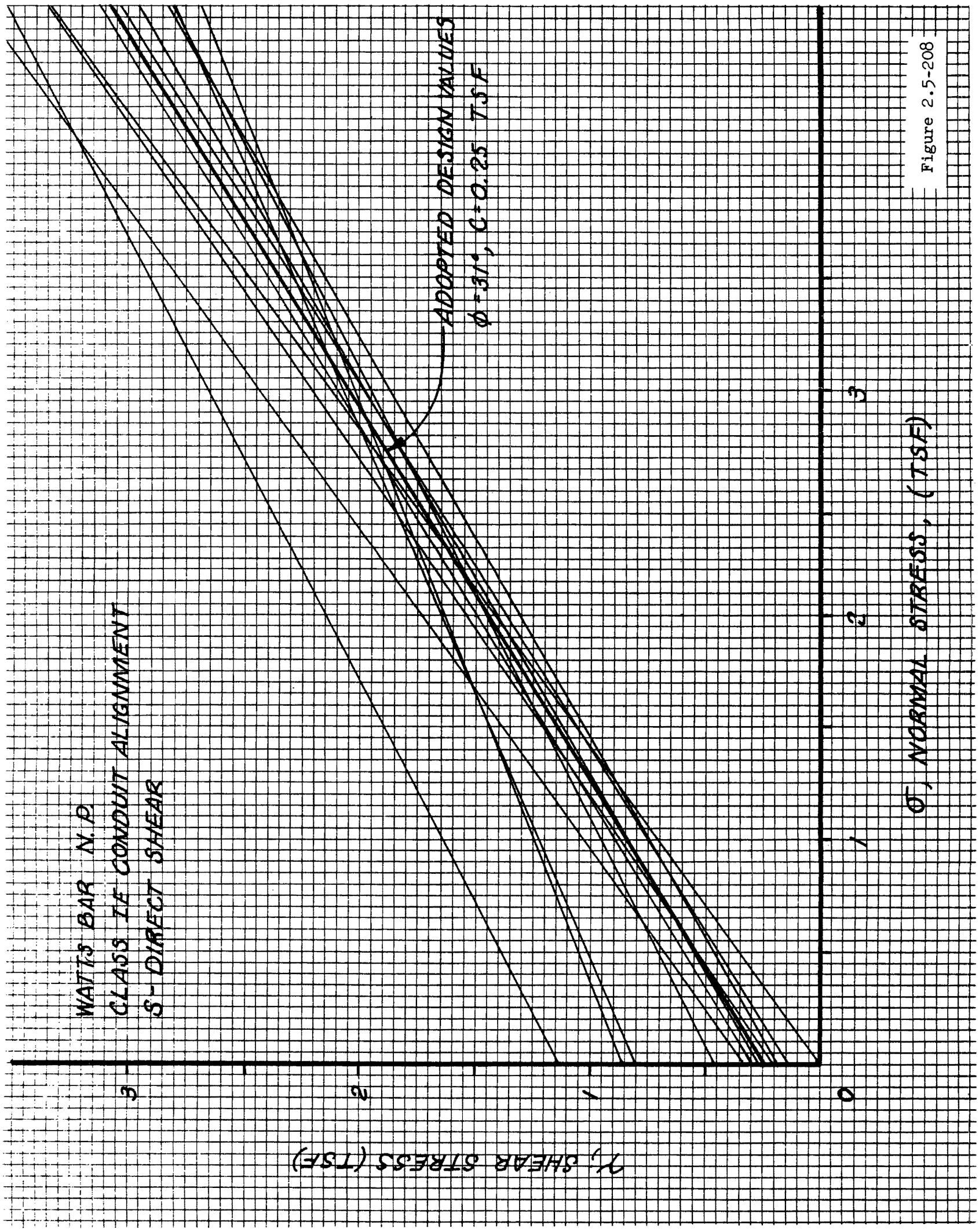
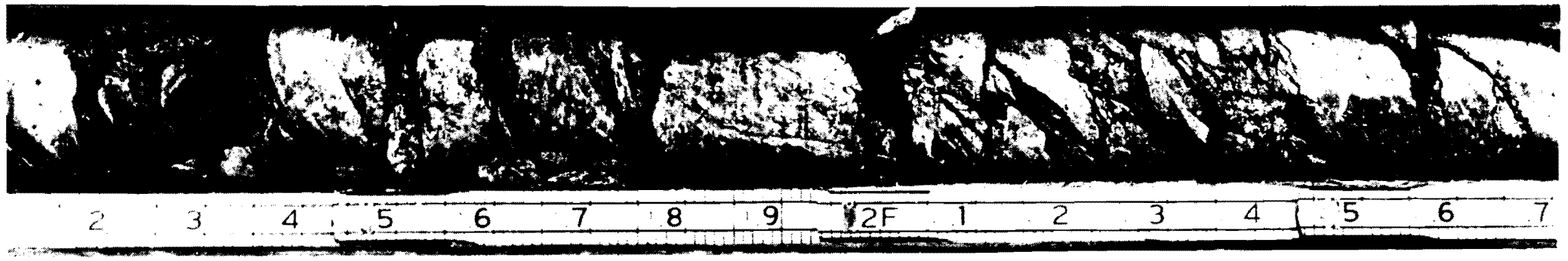
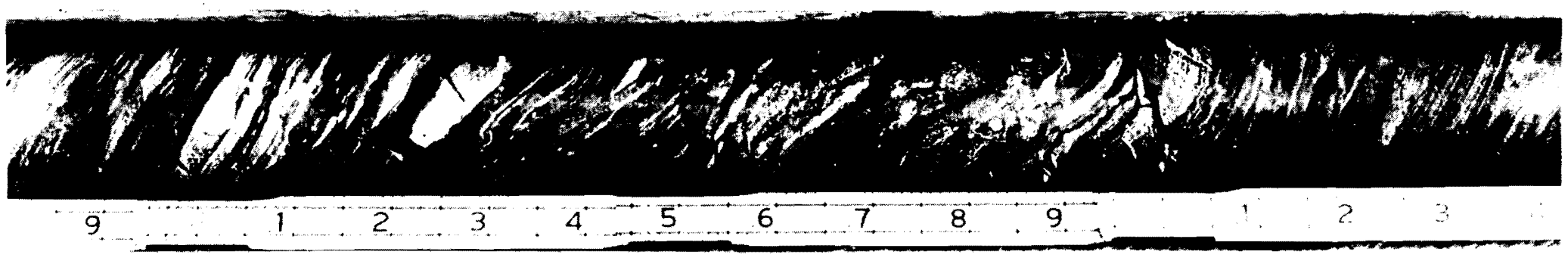


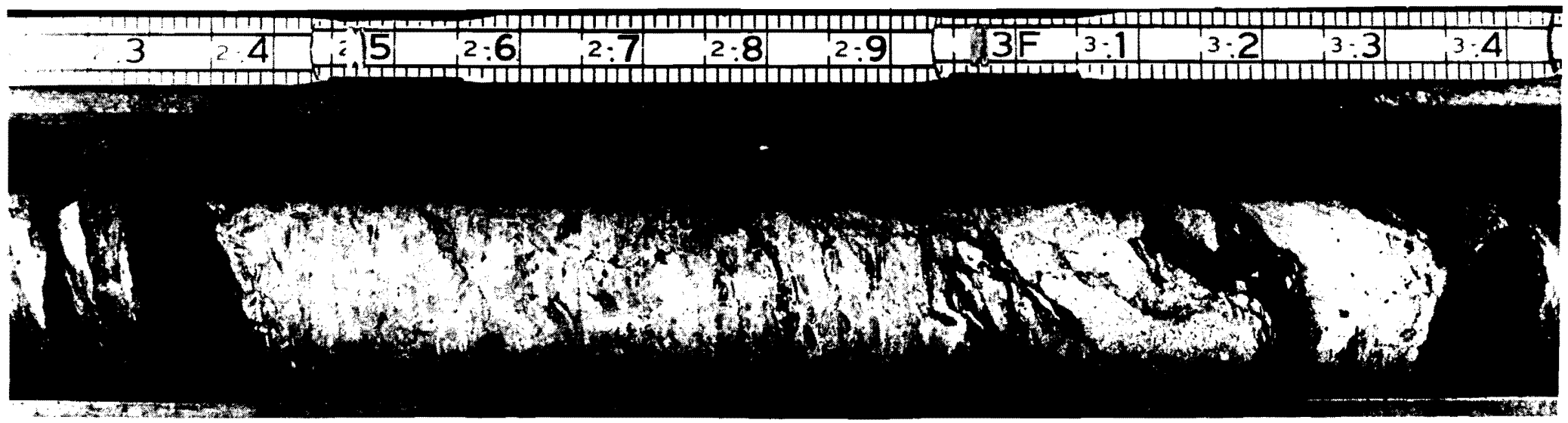
Figure 2.5-208 Class IE Conduit Alignment S-Direct Shear

TYPE 1 – SOFT SHALE



TYPE 2 – HARD SHALE

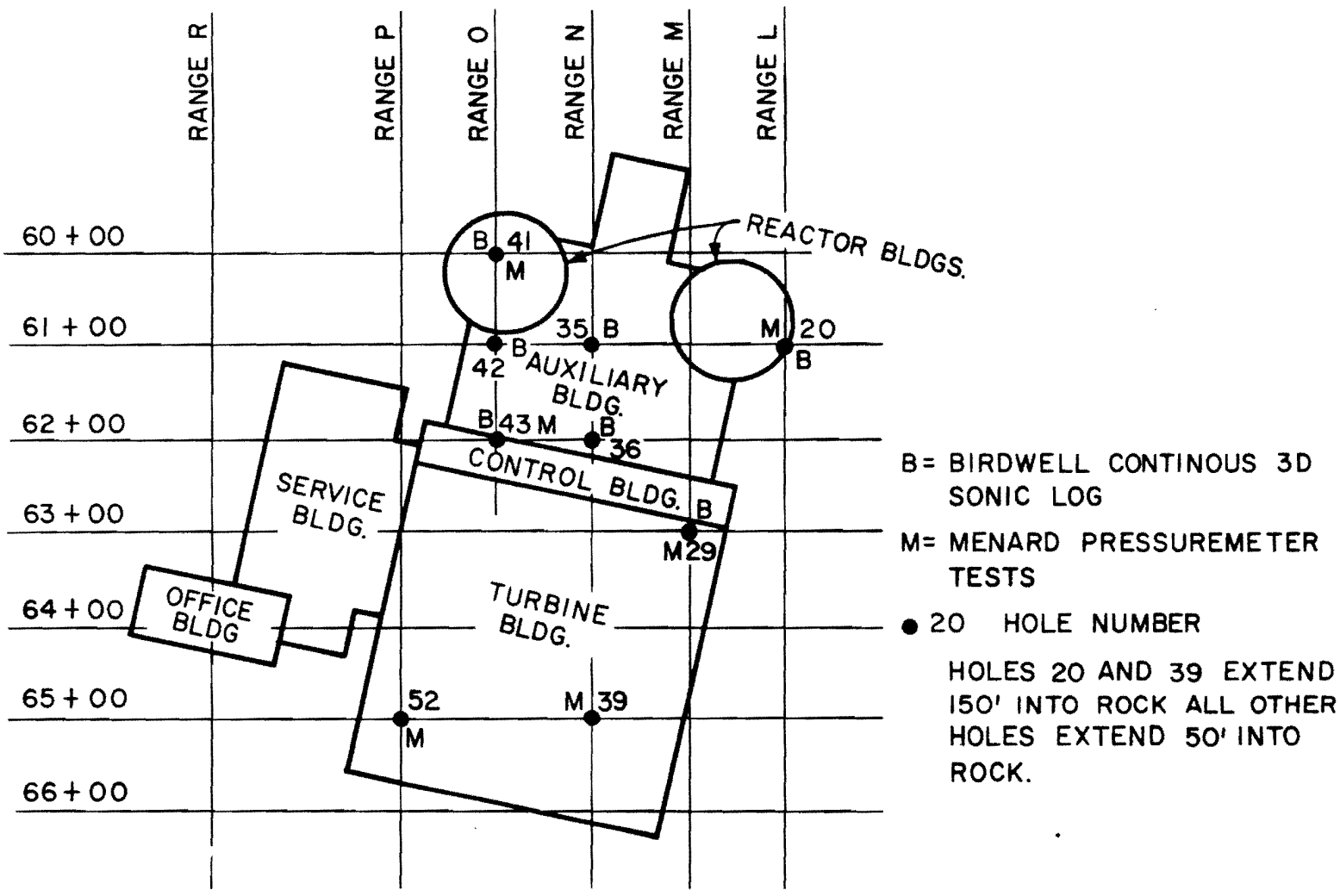




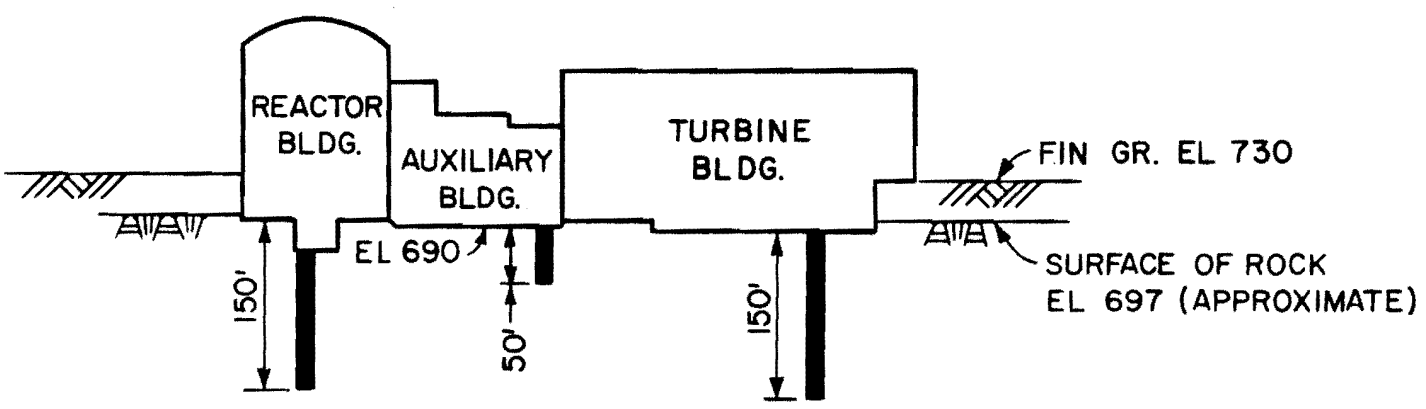
TYPE 3 – LIMESTONE

Figure 2.5-209

Figure 2.5-209 Type 1-Soft Shale Type 2-Hard Shale -Type 3 Limestone



PLAN
Scale 1" = 200'



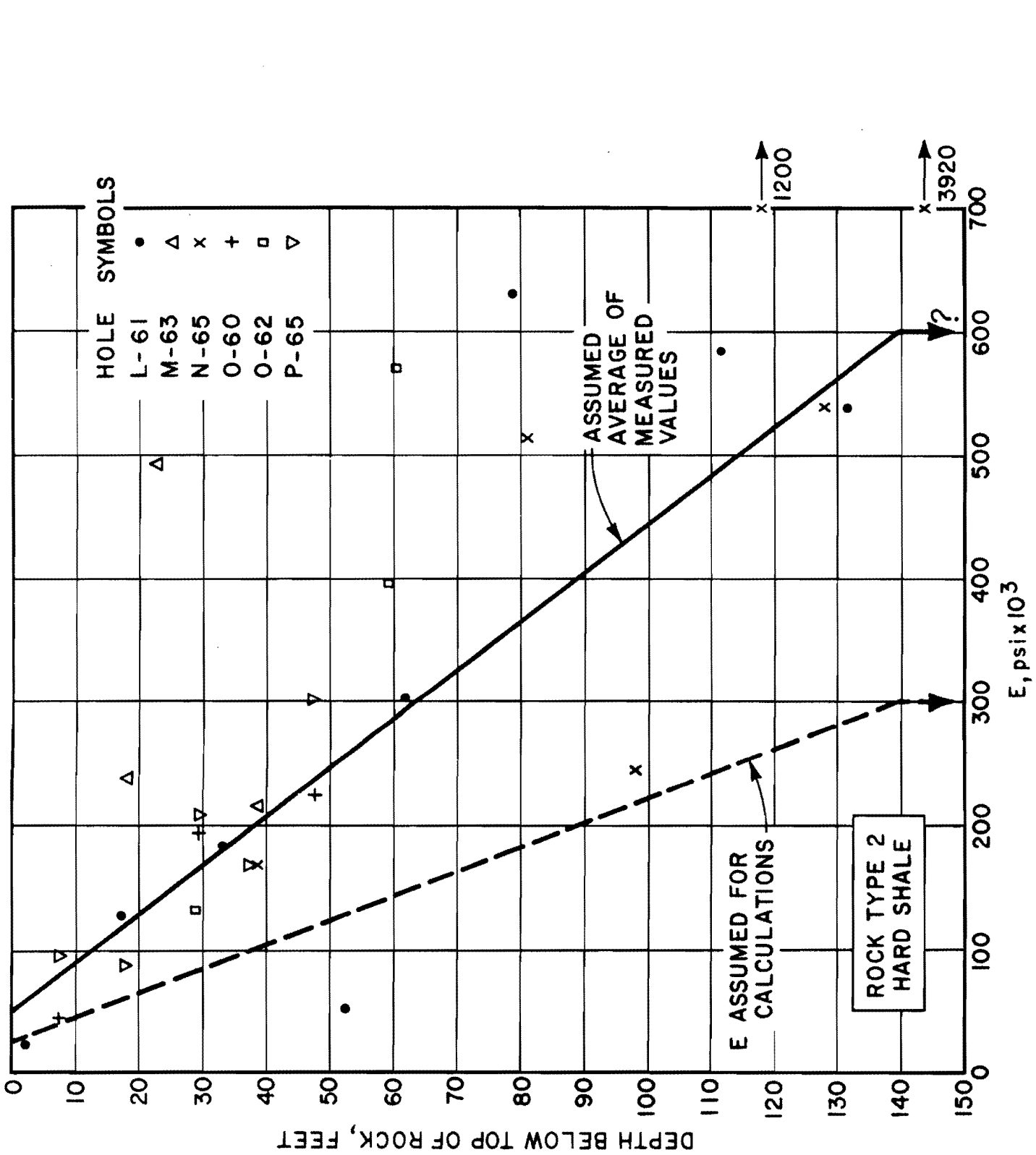
PROFILE
Scale 1" = 200'

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

LOCATION OF TEST HOLES

Figure 2.5-210

Figure 2.5-210 Location of Test Holes

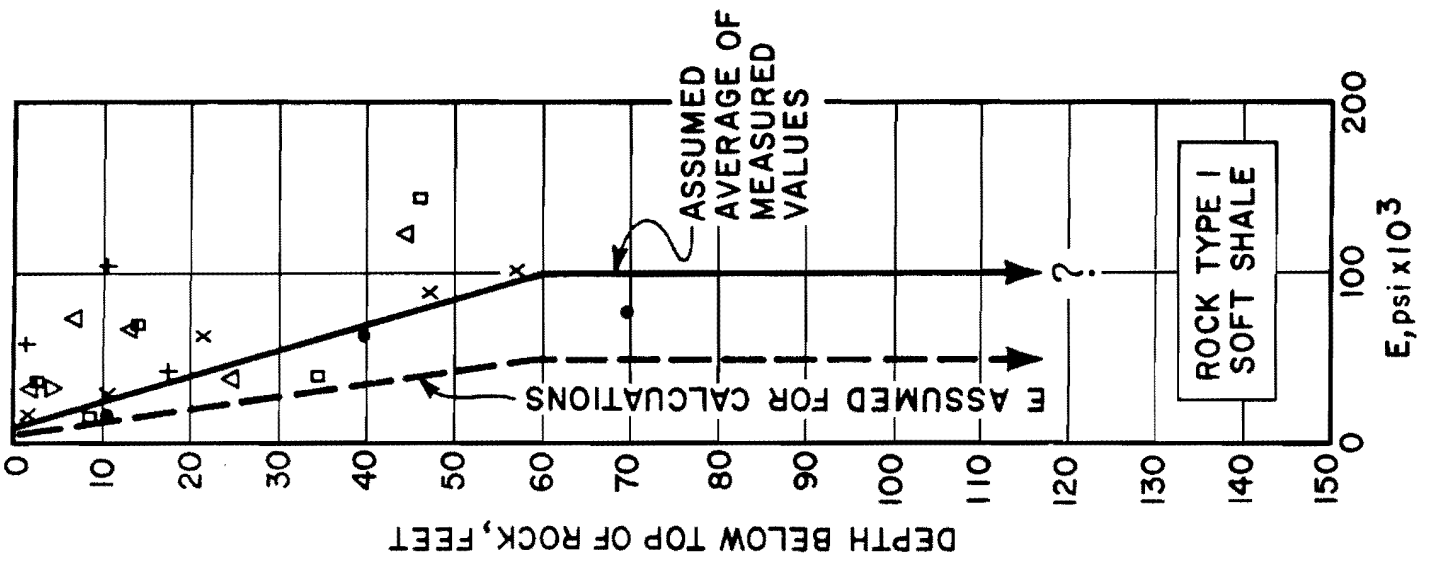


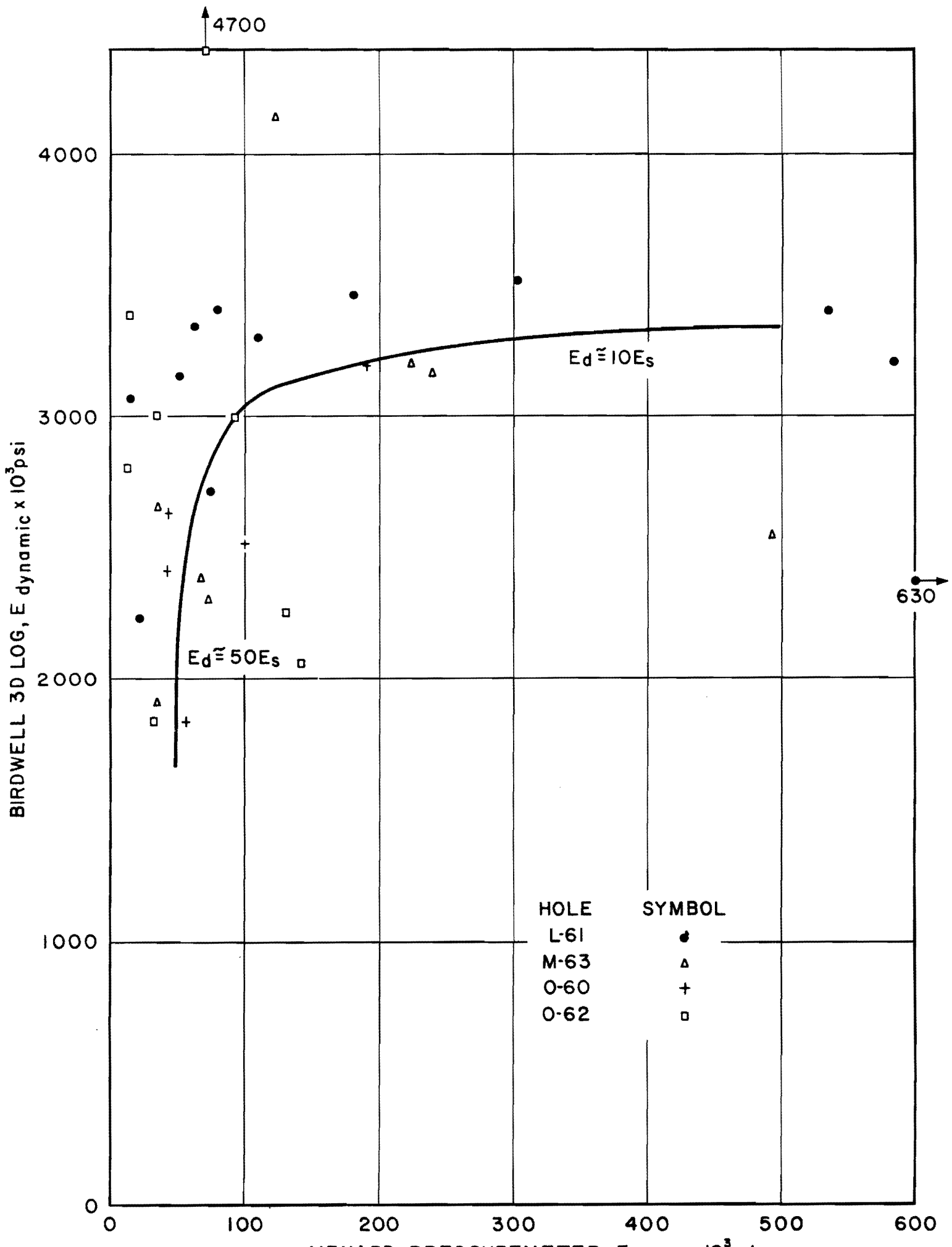
WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

DEFORMATION MODULI FROM MENARD
PRESSUREMETER TESTS

Figure 2.5-211

Figure 2.5-211 Deformation Moduli From Menard Pressuremeter Tests





WATTS BAR NUCLEAR PLANT
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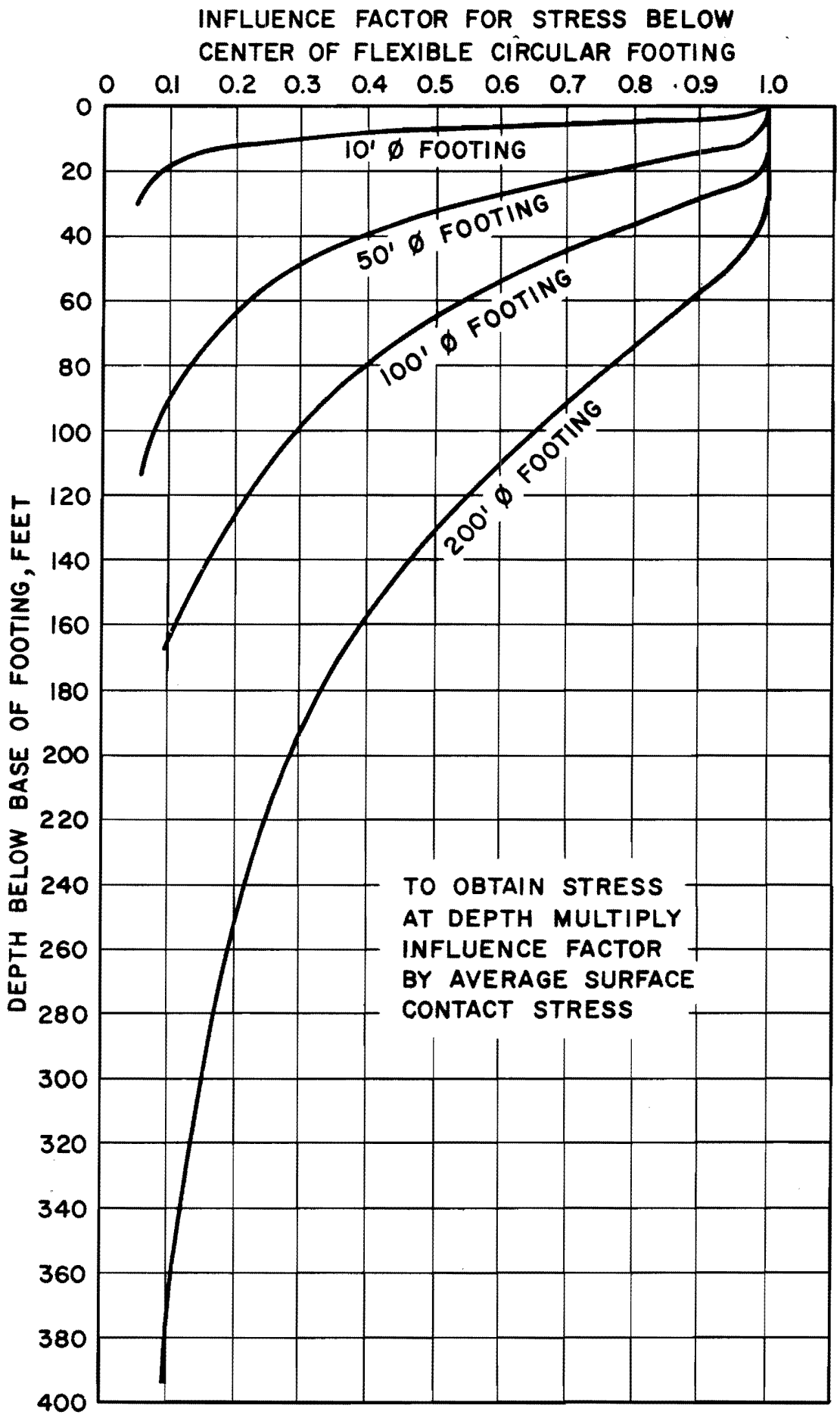
ANALYSIS REPORT

COMPARISON OF MODULI OBTAINED WITH MENARD PRESSUREMETER AND BIRDWELL 3D SONIC LOGGER

Figure 2.5-212

Figure 2.5-212 Comparison of Moduli Obtained With Menard Pressuremeter and Birdwell 3D Sonic Logger



WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
INFLUENCE FACTORS FOR DETERMINING STRESSES BELOW THE CENTER OF FLEXIBLE CIRCULAR FOOTING 10, 50, 100, AND 200 FT. IN DIAMETER Figure 2.5-213

Figure 2.5-213 Influence Factors For Determining Stresses Below The Center of Flexible Circular Footing 10, 50, 100, and 200 Ft. in Diameter

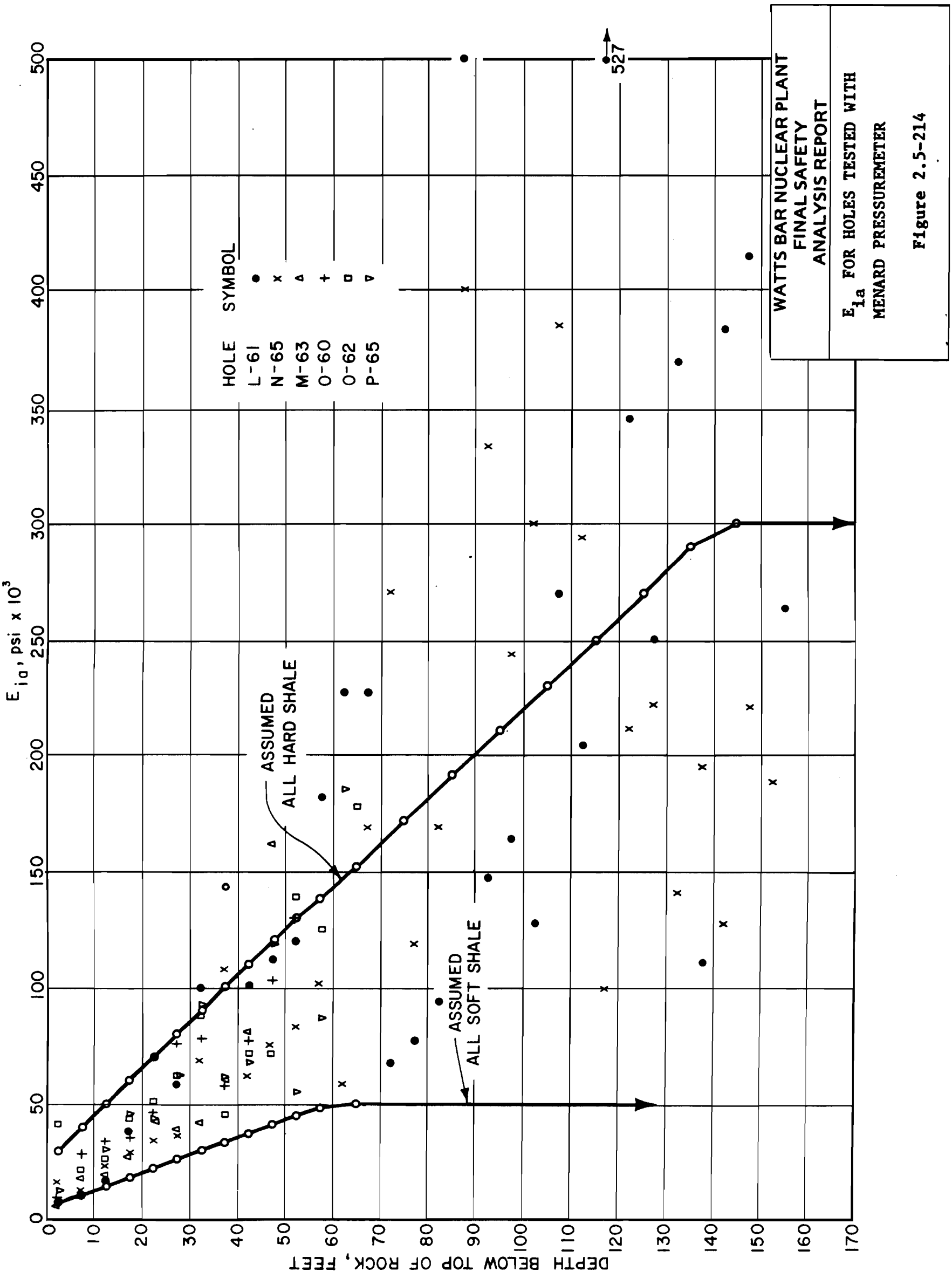


Figure 2.5-214 E_{ia} For Holes Tested With Menard Pressuremeter

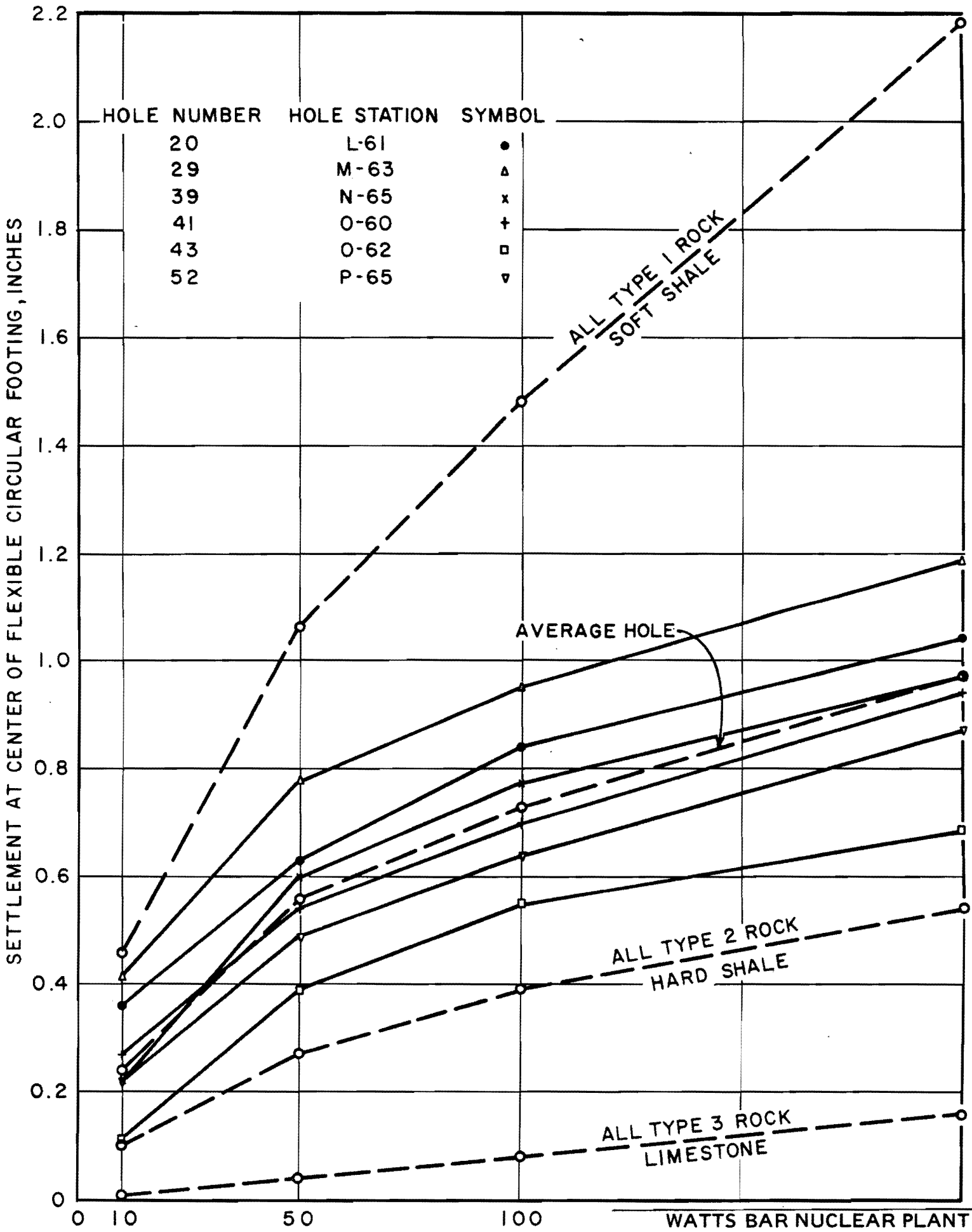
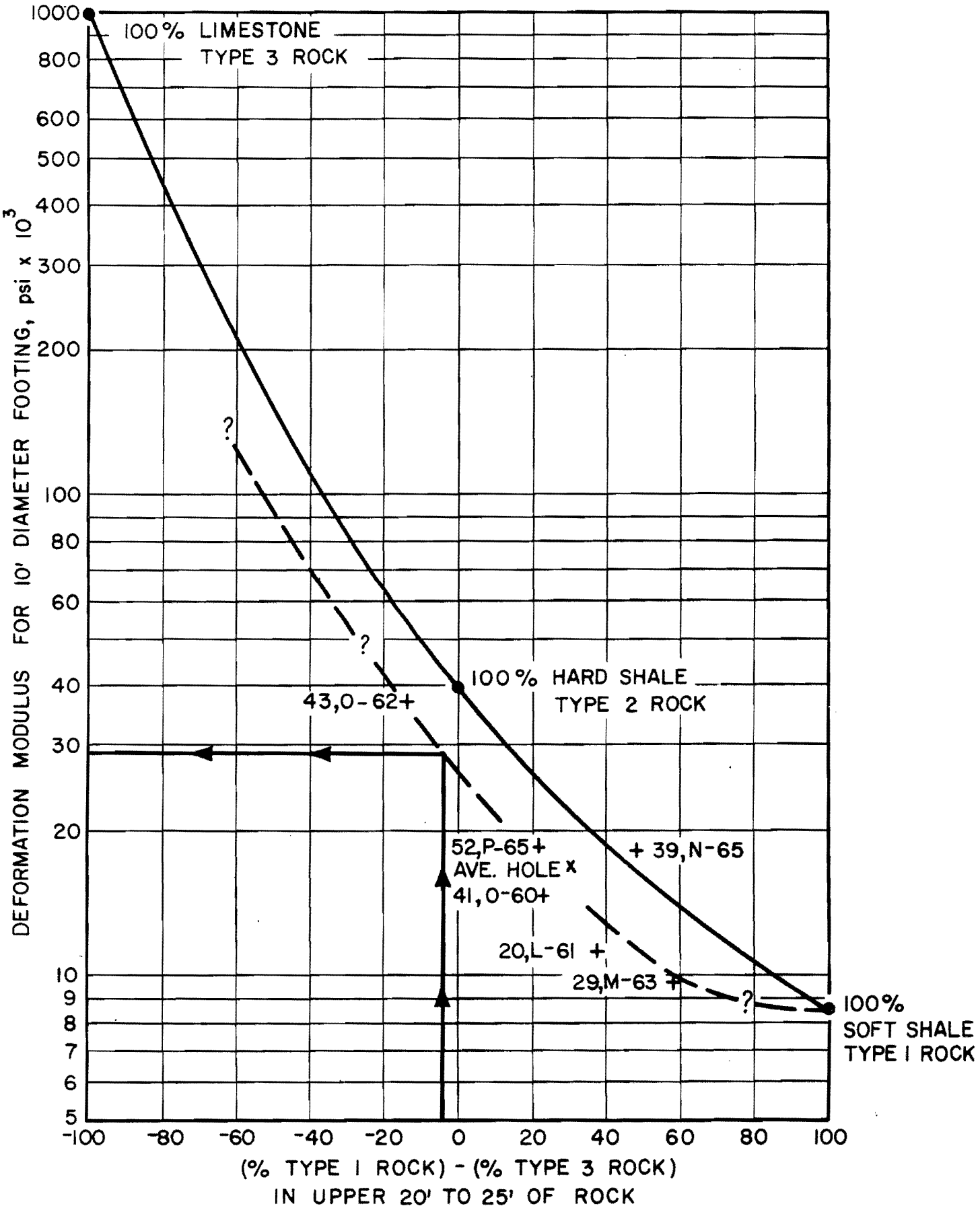
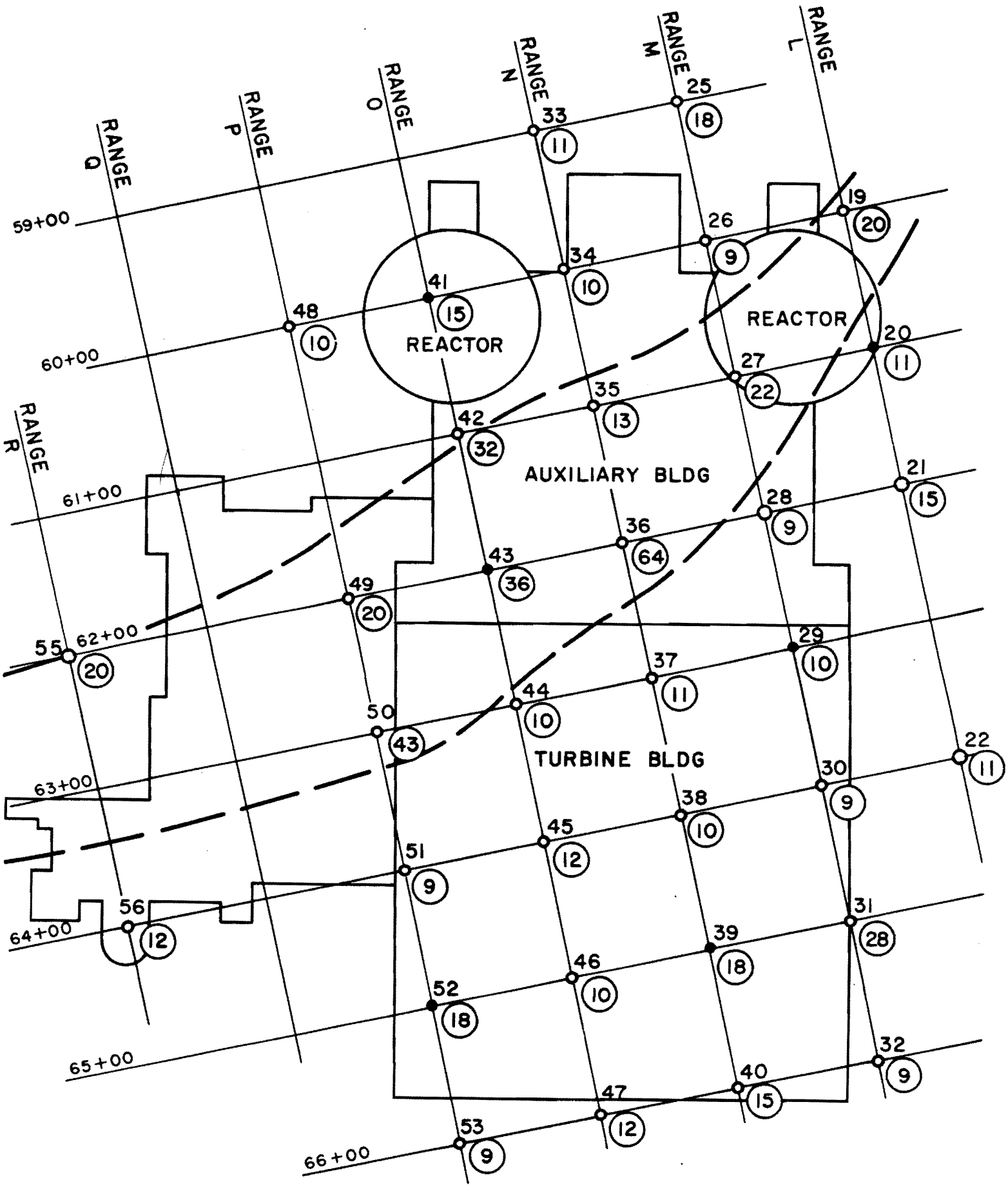


Figure 2.5-215 Settlement at Center of Flexible Circular Footing Loaded With SKSF



WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
CORRELATION USED TO ESTIMATE AVERAGE MODULI FOR HOLES WHERE DETAILED CALCULATIONS WERE NOT MADE Figure 2.5-216

Figure 2.5-216 Correlation Used To Estimate Average Moduli For Holes Where Detailed Calculations Were Not Made.

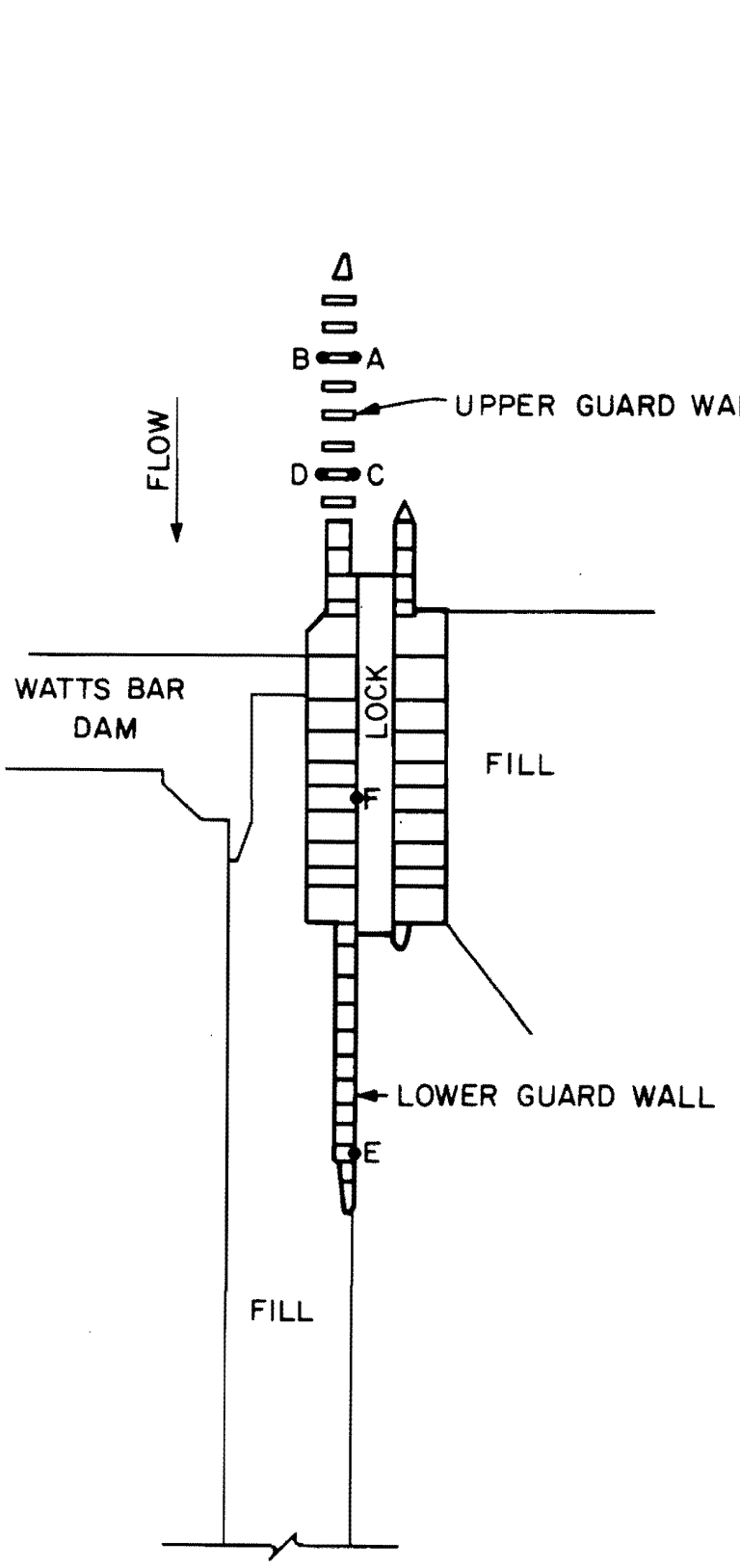


WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

DISTRIBUTION OF DEFORMATION MODULI FOR 10 FOOT DIAMETER FOOTINGS

Figure 2.5-217

Figure 2.5-217 Distribution of Deformation Moduli For 10 Foot Diameter Footings



CALCULATED DEFORMATION MODULI

POINT	Deformation modulus calculated from settlement data assuming flexible foundation
A	25,000 psi
B	89,000 psi
C	23,500 psi
D	43,000 psi
E	99,000 psi

POINT	Deformation modulus calculated from settlement data assuming rigid foundation
A-B	43,000 psi
C-D	49,000 psi

WATTS BAR NUCLEAR PLANT
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SIMPLIFIED PLAN OF LOCK FOUNDATION SHOWING LOCATION OF MODULUS CALCULATIONS

Figure 2.5-218

Figure 2.5-218 Simplified Plan of Lock foundation Showing Location of Modulus Calculations

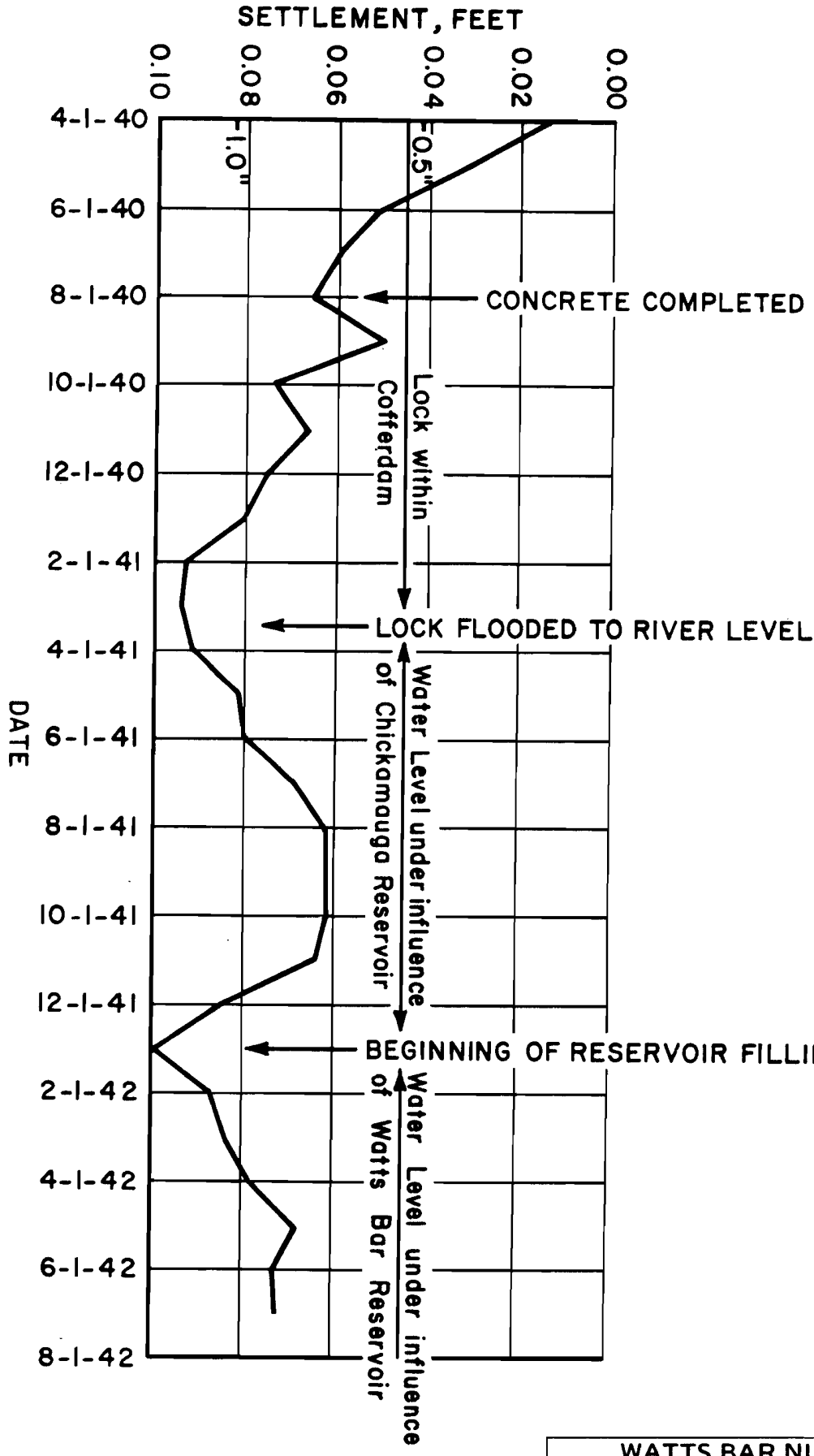


Figure 2.5-219 Settlement of Face of Block R-10 (Point F, fig. 16)

Figure 2.5-220 Yard Soil Investigations Borrow Soils

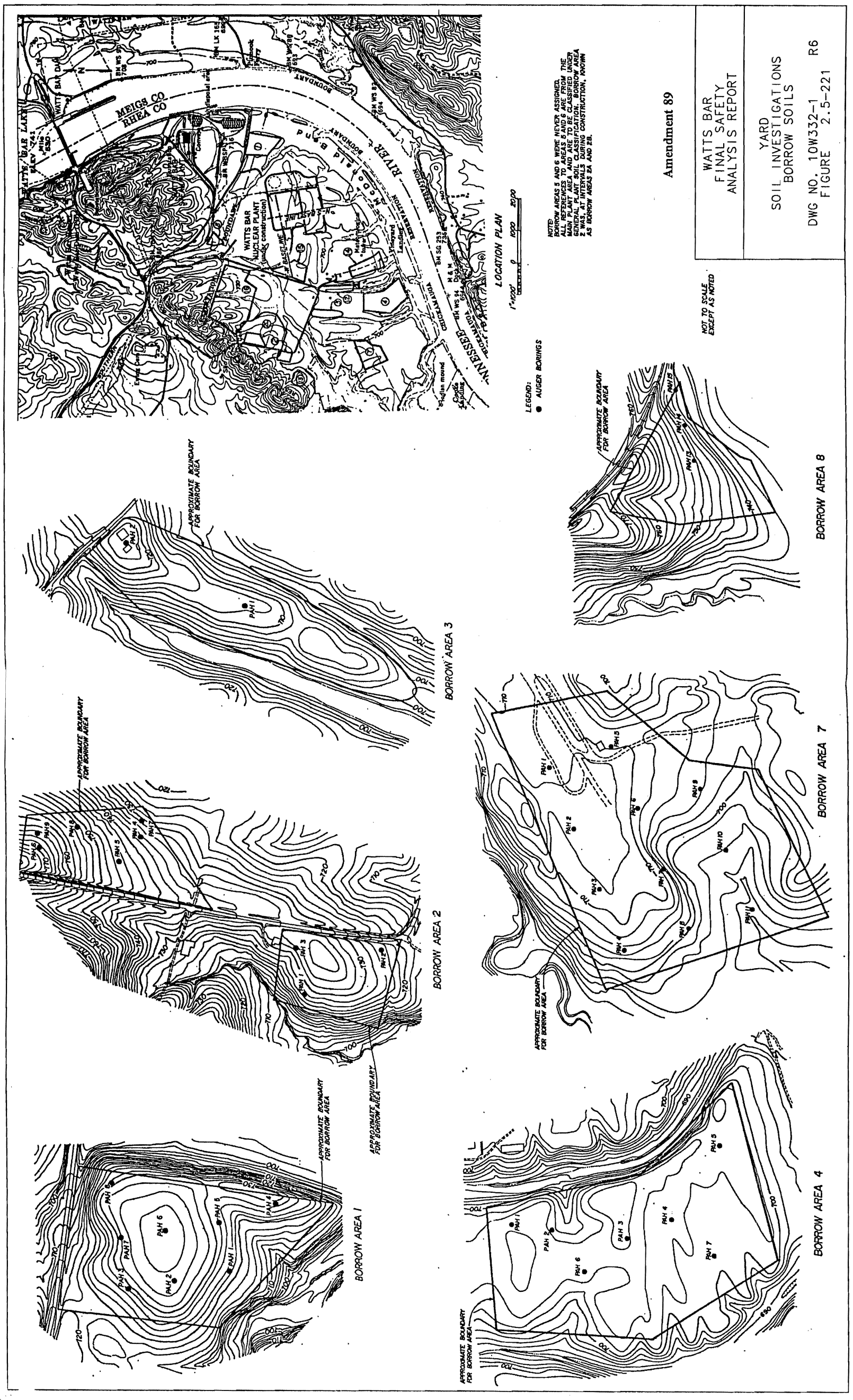


Figure 2.5-221 Yard Soil Investigations Borrow Soils

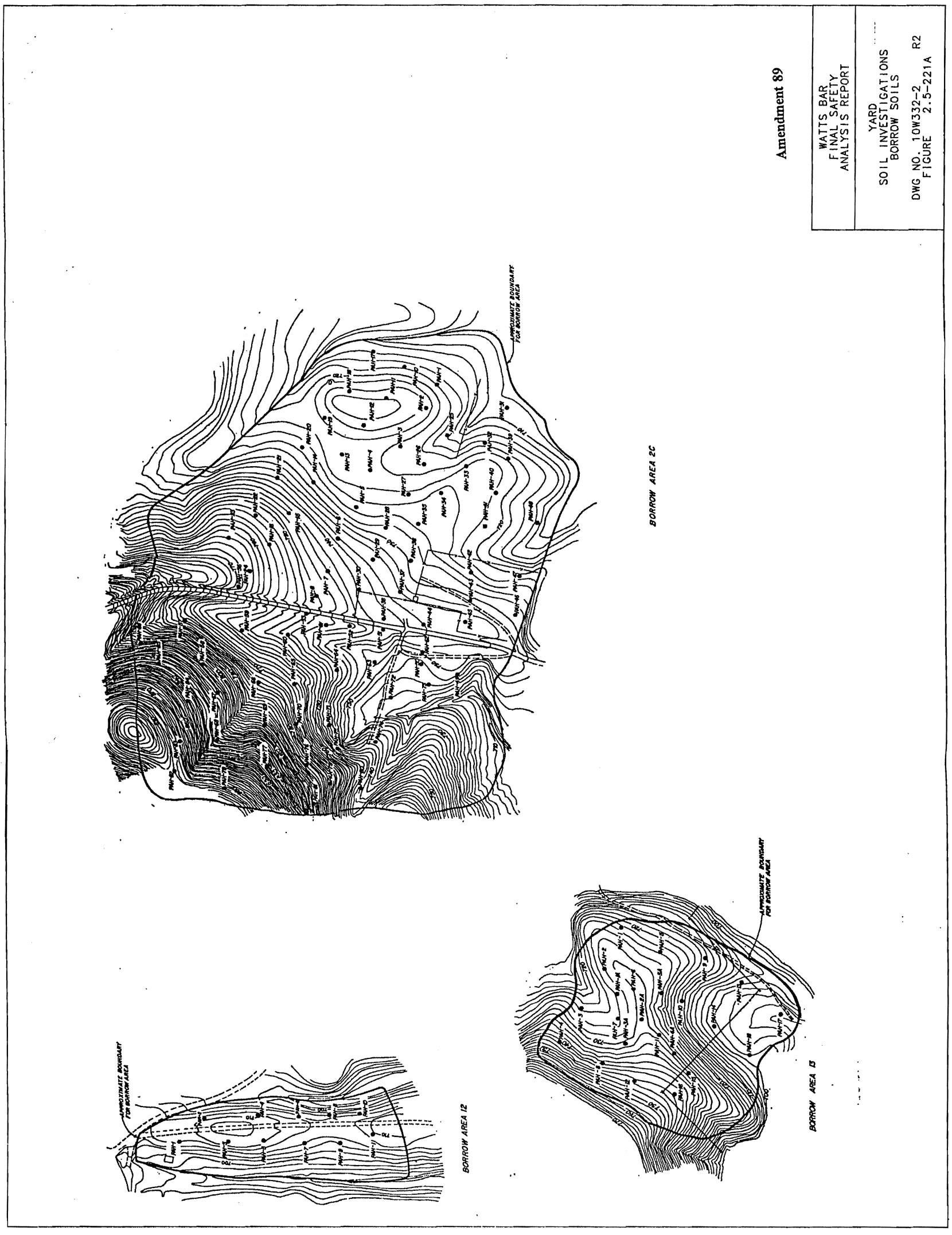


Figure 2.5-221a Yard Soil Investigations Borrow Soils

Figure 2.5-222 Borrow Investigation (Actual Figure Located in Oversized Figures File)

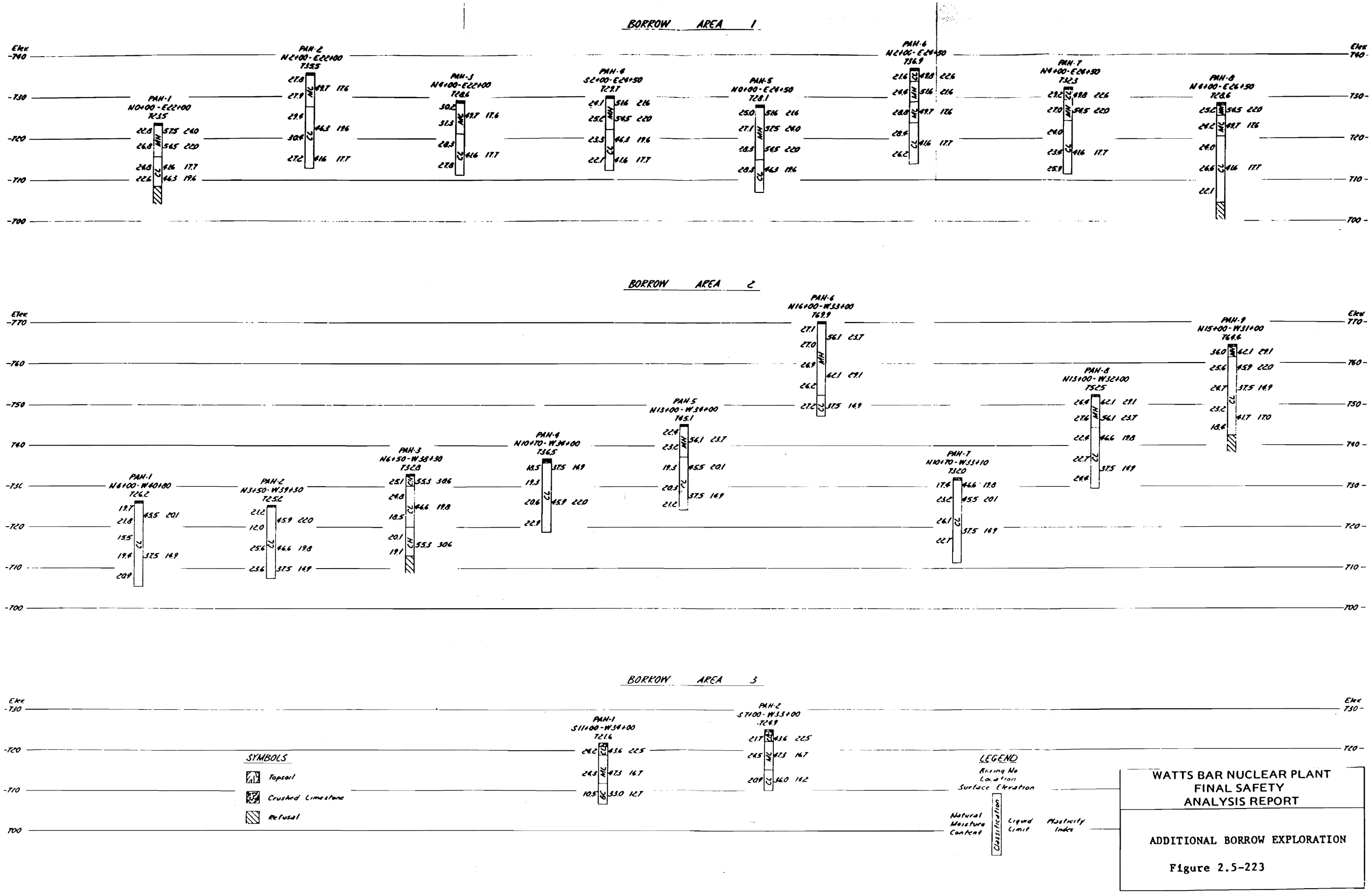
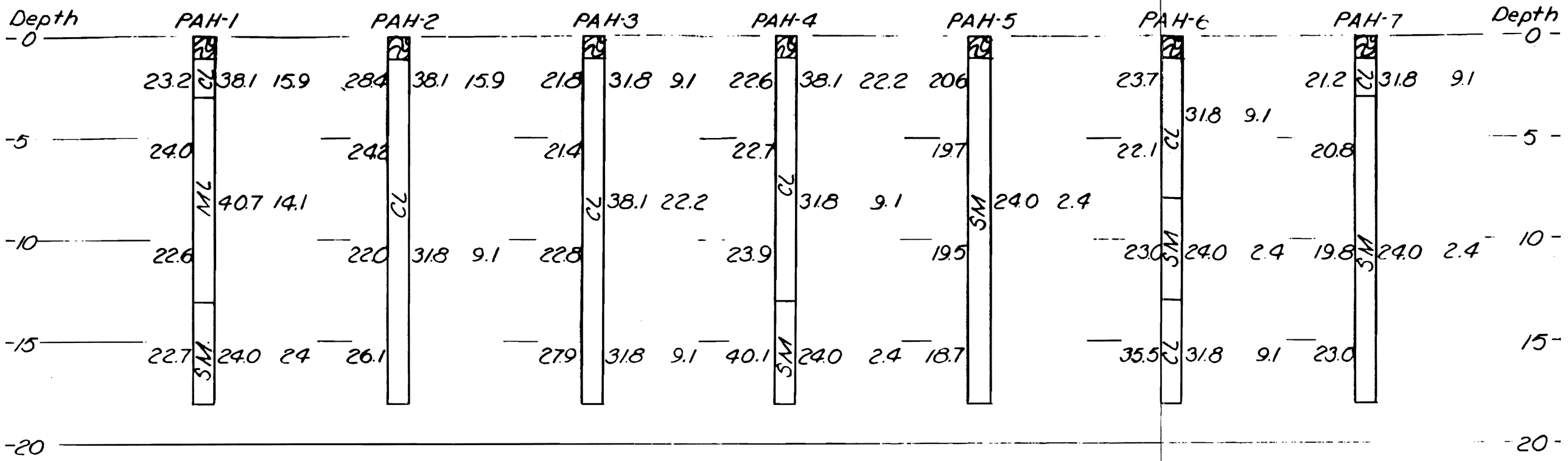


Figure 2.5-223 Additional Borrow Exploration



SYMBOLS

Topsoil

LEGEND

Boring No.

Natural Moisture Content | Classification | Liquid Limit | Plasticity Index

Figure 2.5-224 Additional Borrow Area 4

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
ADDITIONAL BORROW AREA 4 Figure 2.5-224

Security-Related Information - Withheld Under 10CFR2.390

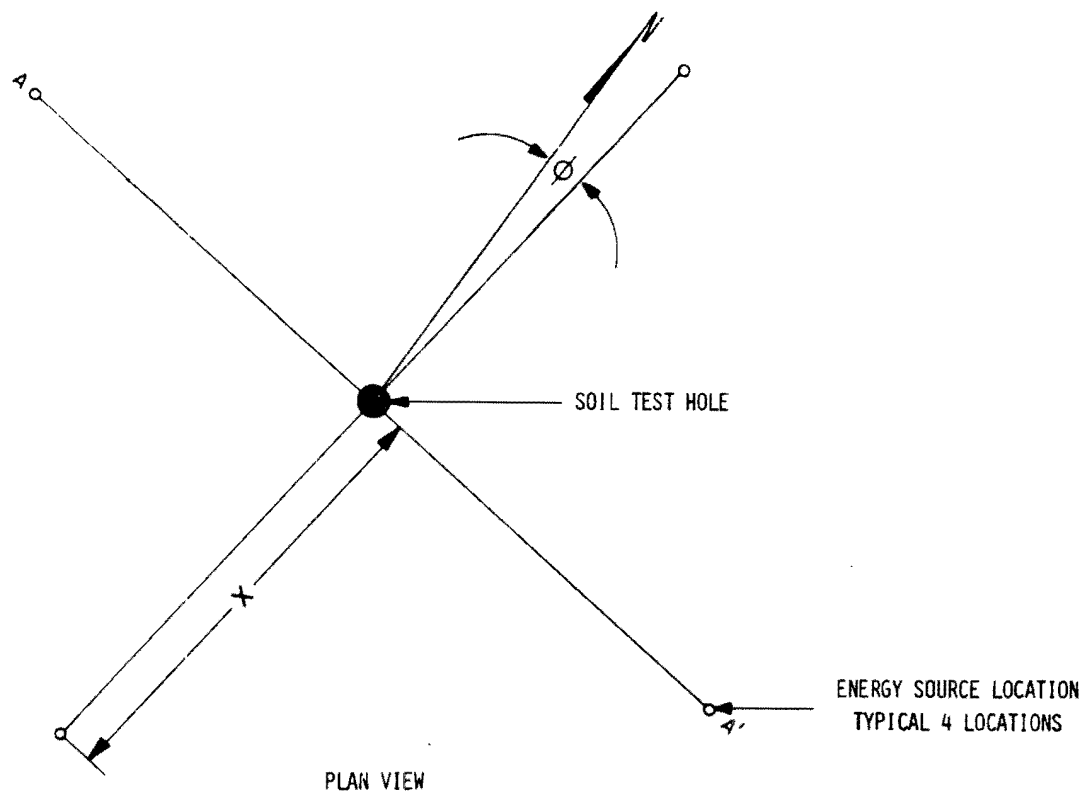
Figure 2.5-225 Main Plant Excavation & Backfill Category I Structures

Security-Related Information - Withheld Under 10CFR2.390

Figure 2.5-226 Main Plant Excavation & Backfill Category I Structures

Security-Related Information - Withheld Under 10CFR2.390

Figure 2.5-226a Excavation and Backfill Category I Structures



NOTES:

1. THIS DRAWING SHOWS A TYPICAL PLAN VIEW AND VERTICAL SECTION VIEW FOR ALL IN-SITU SOIL DYNAMIC MEASUREMENTS.
2. FOR DRILL HOLE LOCATIONS SEE FIGURE 2.5-185
3. COMPRESSIONAL AND SHEAR WAVES WERE EITHER OBTAINED BY STRIKING A STEEL PLATE WITH A SLEDGEHAMMER OR BY EXPLODING TWO FEET OF PRIMACORD ONE FOOT BELOW GROUND.
4. FOR EACH BOREHOLE EITHER EXPLOSIVES OR SLEDGEHAMMER WAS USED AS THE ENERGY SOURCE. A SINGLE TYPE OF SOURCE WAS USED FOR EACH HOLE, AS CONDITIONS REQUIRED.
5. WHERE POSSIBLE, ENERGY SOURCE LOCATIONS ARE PLACED IN A 90° ARRAY AT HORIZONTAL DISTANCE X FROM BOREHOLE AND ORIENTED NORTH, SOUTH, EAST, AND WEST. OTHERWISE, THE WHOLE ARRAY MAY BE ROTATED ABOUT THE BOREHOLE AXIS BY THE ANGLE Ø ABOVE.

WATTS BAR NUCLEAR PLANT
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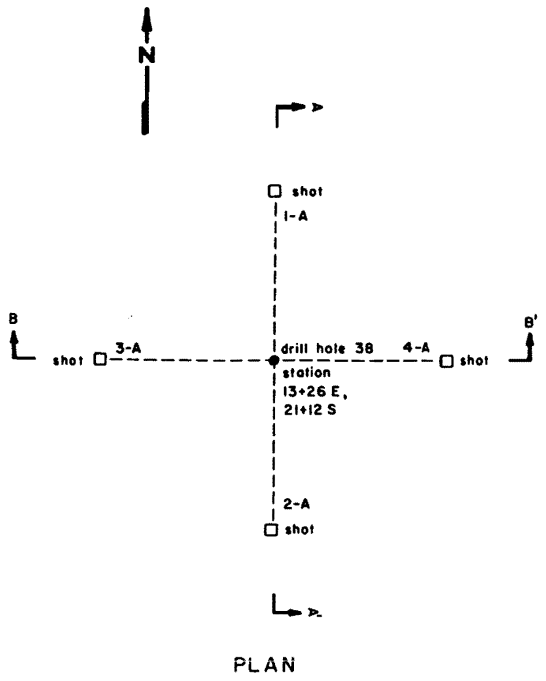
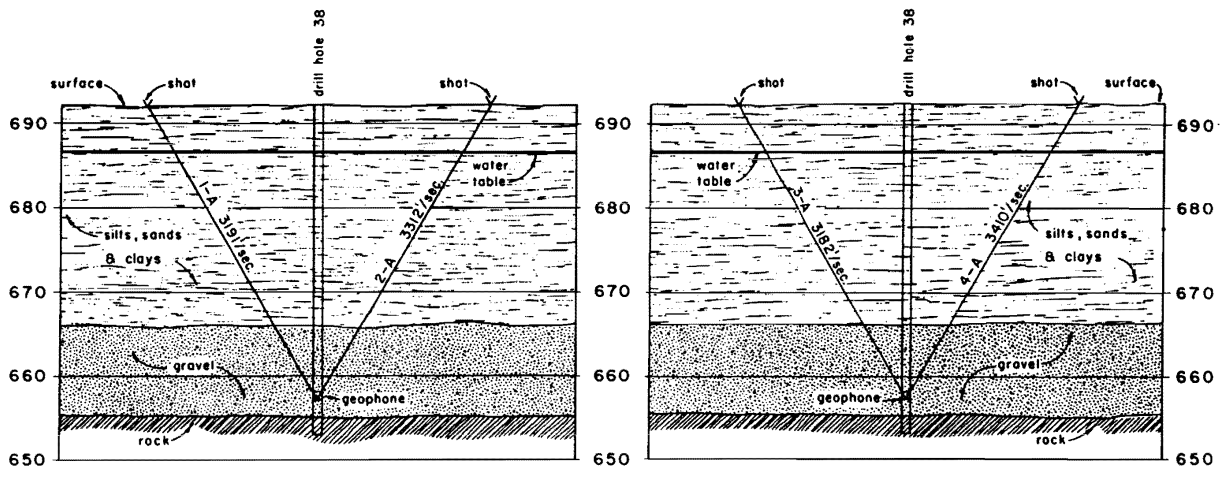
TYPICAL IN-SITU SOIL DYNAMICS MEASUREMENT LAYOUT & SECTION
Figure 2.5-227

Figure 2.5-227 Typical In-Situ Soil Dynamics Measurements Layout & Section

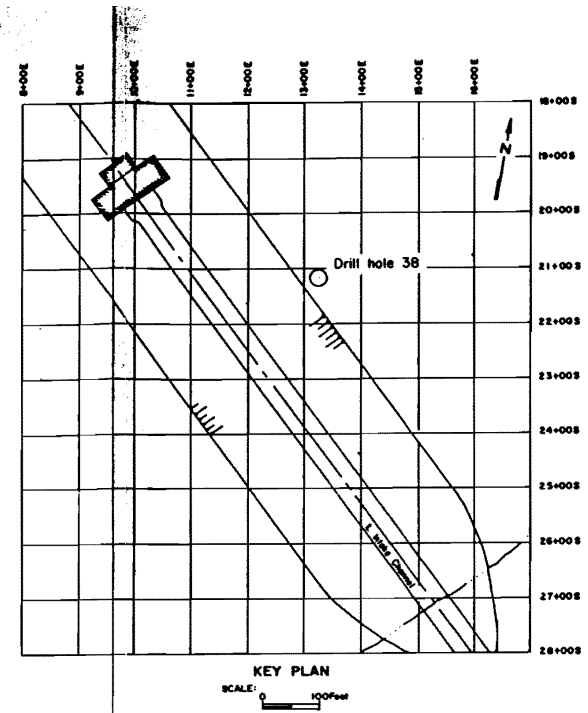


PLAN



SECTION A-A'

SECTION B-B'



Seismic Line Number	Seismic Path Distance (Feet)	Compressional Velocity Ft./Sec. Measured	Shear Velocity Ft./Sec. Calculated	Density Lbs/Cu.Ft. Assumed	Poisson's Ratio Assumed	Dynamic Shear Modulus PSI x 10^3 Calculated	Dynamic Young's Modulus PSI x 10^3 Calculated
1 - A	40.31	3191	962	90	0.45	17.97	52.11
2 - A	40.31	3312	999	90	0.45	19.36	56.13
3 - A	40.31	3182	959	90	0.45	17.87	51.81
4 - A	40.31	3410	1028	90	0.45	20.52	59.50
Average	40.31	3274	987	90	0.45	18.28	54.85

NOTES:

1. The lines on the sections between shot points and geophone locations indicate only the travel direction of compressional waves.

2. The types of soils are based on general soil data obtained from the Construction Services Branch.

4. The equipment used in making the time measurements consisted of a Bison seismograph 1570B and recorder 1540, and a Hall Sears geophone MP-8.

5. Using all 4 seismic lines the shear modulus with a 67% confidence interval is 17,670 psi to 20,180 psi and with a 90% confidence interval it is 16,410 psi to 21,440 psi.

SCALE: 100 0 100 100 Feet

WATTS BAR NUCLEAR PLANT
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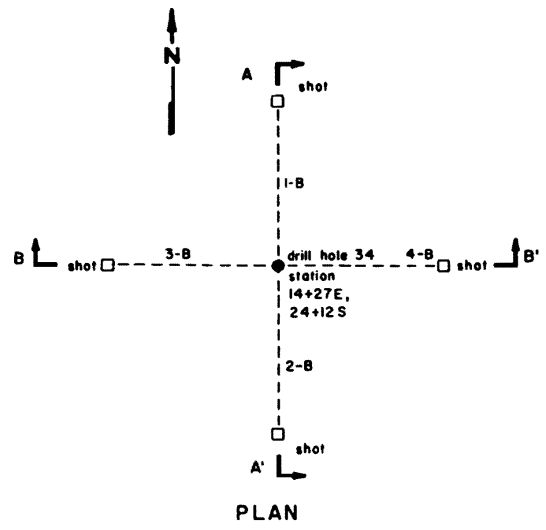
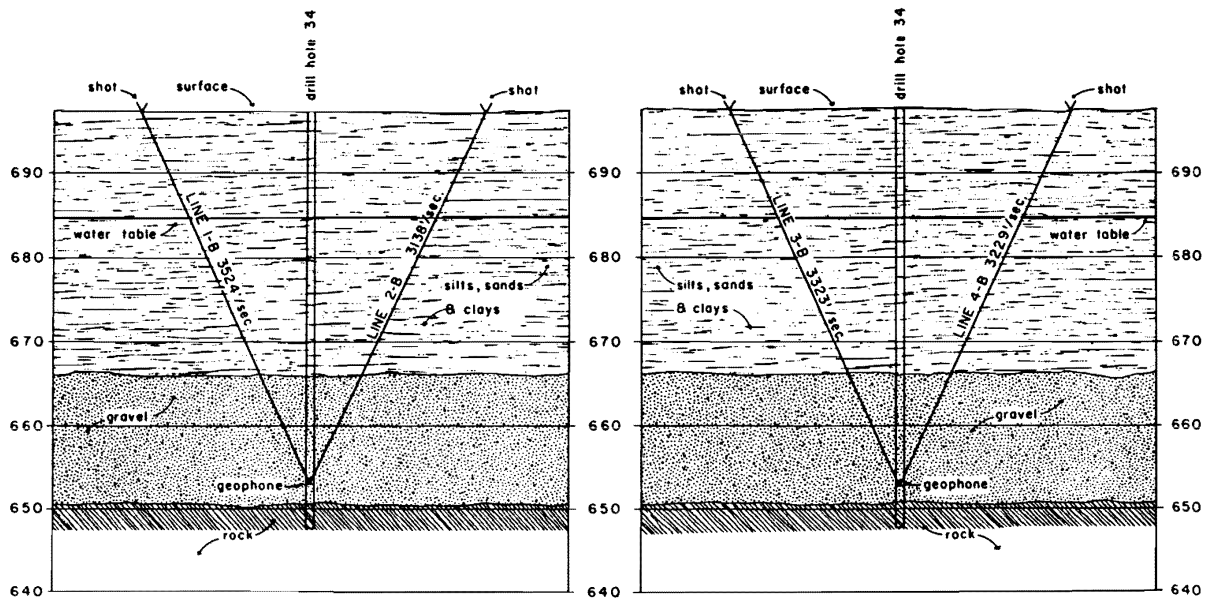
SOIL DYNAMICS INTAKE CHANNEL
STATION 13+ 26E, 21 + 12S

Figure 2.5-228

Figure 2.5-228 Soil Dynamics Intake Channel Station 13 + 26E, 21 + I2S

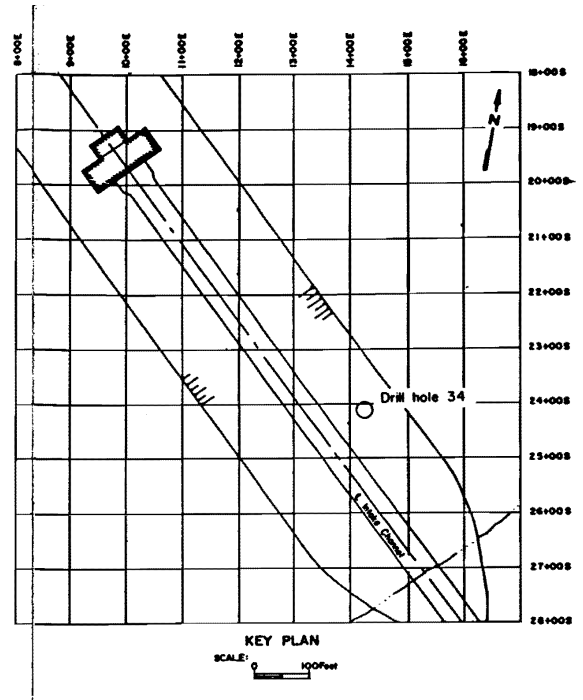


PLAN



SECTION A-A'

SECTION B-B'



Seismic Line Number	Seismic Path Distance (Feet)	Compressional Velocity Ft./Sec. Measured	Shear Velocity Ft./Sec. Calculated	Density Lbs/Cu.Ft. Assumed	Poisson's Ratio Assumed	Dynamic Shear Modulus G PSI x 10^3 Calculated	Dynamic Young's Modulus E PSI x 10^3 Calculated
1 - B	49.24	3524	1062	90	0.45	21.91	63.55
2 - B	49.24	3138	946	90	0.45	17.38	50.39
3 - B	49.24	3323	1002	90	0.45	19.48	56.51
4 - B	49.24	3229	973	90	0.45	18.39	53.35
Average	49.24	3303	996	90	0.45	19.25	55.83

NOTES:

1. The lines on the sections between shot points and geophone locations indicate only the travel direction of compressional waves.

2. The types of soils are based on general soil data obtained from the Construction Services Branch.

4. The equipment used in making the time measurements consisted of a Bison seismograph 1570B and recorder 1540, and a Hall Sears geophone MP-8.

5. Using all 4 seismic lines the shear modulus with a 67% confidence interval is 17,340 psi to 21,230 psi and with a 90% confidence interval it is 15,390 psi to 23,180 psi.

SCALE: 10 0 10 20 Feet

WATTS BAR NUCLEAR PLANT
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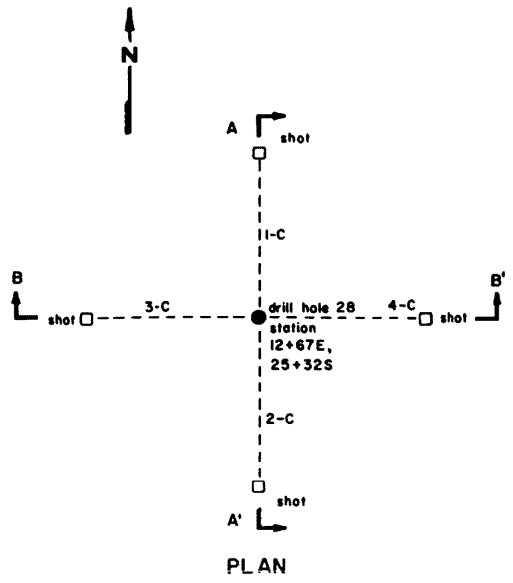
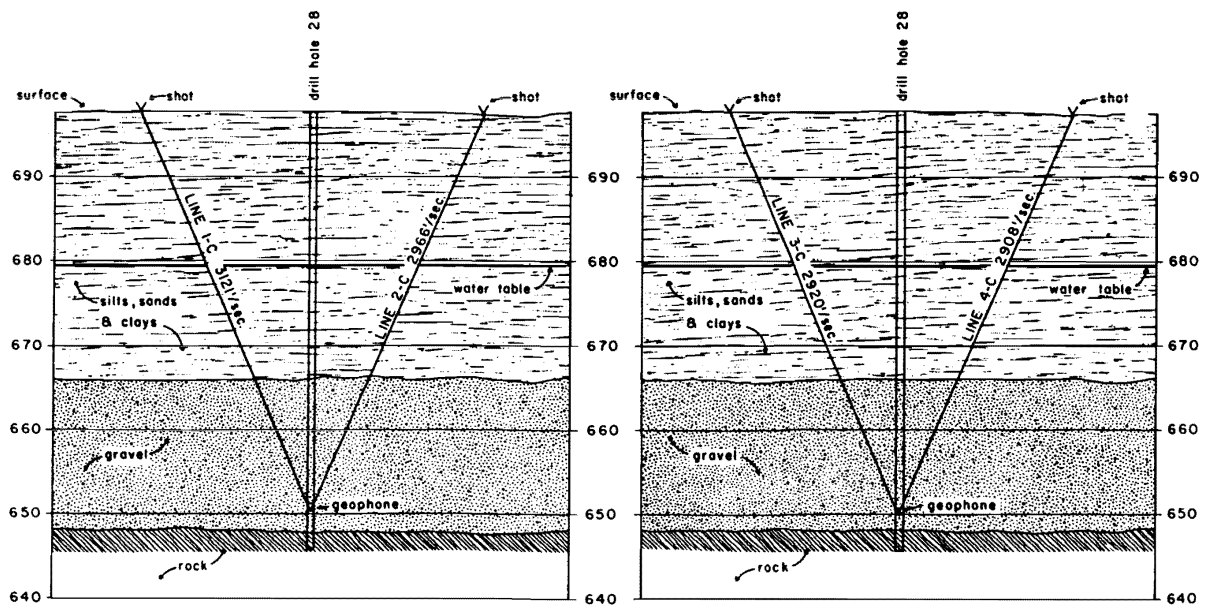
SOIL DYNAMICS INTAKE CHANNEL
STATION 14 + 27E, 24 + 12S

Figure 2.5-229

Figure 2.5-229 Soil Dynamics Intake Channel Station 14 + 27E, 24 + I2S

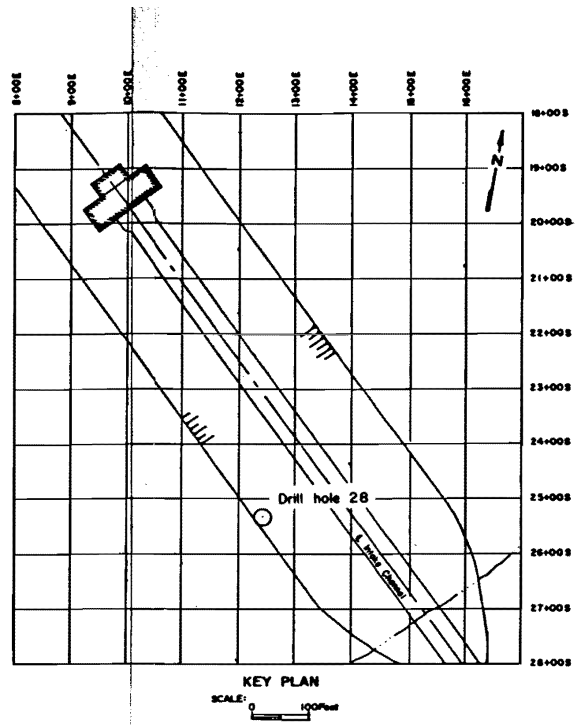


PLAN



SECTION A-A'

SECTION B-B'



SEISMIC LINE NUMBER	SEISMIC PATH DISTANCE (FEET)	COMPRESSIONAL VELOCITY FT./SEC. MEASURED	SHEAR VELOCITY FT./SEC. CALCULATED	DENSITY LBS/CU.FT. ASSUMED	POISSON'S RATIO ASSUMED	DYNAMIC SHEAR MODULUS PSI x 10³ CALCULATED	DYNAMIC YOUNG'S MODULUS PSI x 10³ CALCULATED
1 - C	52.0	3121	941	90	0.45	17.19	49.84
2 - C	52.0	2966	894	90	0.45	15.52	45.02
3 - C	52.0	2920	880	90	0.45	15.05	43.63
4 - C	52.0	2908	877	90	0.45	14.92	43.27
AVERAGE	52.0	2979	898	90	0.45	15.66	45.41

NOTES:

1. THE LINES ON THE SECTIONS BETWEEN SHOT POINTS AND GEOPHONE LOCATIONS INDICATE ONLY THE TRAVEL DIRECTION OF COMPRESSIONAL WAVES.

2. THE TYPES OF SOILS ARE BASED ON GENERAL SOIL DATA OBTAINED FROM THE CONSTRUCTION SERVICES BRANCH.

4. THE EQUIPMENT USED IN MAKING THE TIME MEASUREMENTS CONSISTED OF A BISON SEISMOGRAPH 1570B AND RECORDER 1540, AND A HALL SEARS GEOPHONE HP-8.

5. USING ALL 4 SEISMIC LINES THE SHEAR MODULUS WITH A 67% CONFIDENCE INTERVAL IS 14,620 PSI TO 16,710 PSI AND WITH A 90% CONFIDENCE INTERVAL IT IS 13,570 PSI TO 17,760 PSI.

SCALE: 10 0 10 20 Feet

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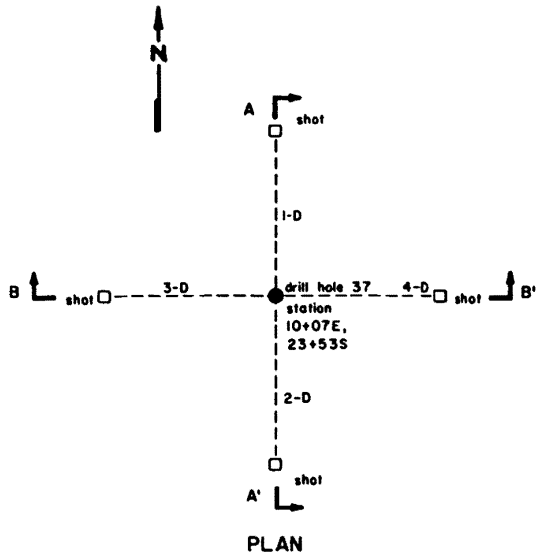
SOIL DYNAMICS INTAKE CHANNEL

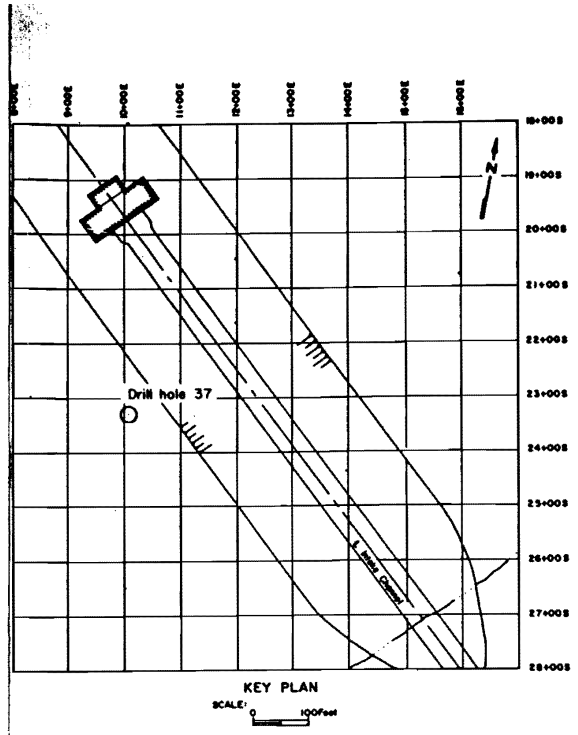
STATION 12 + 67E, 25 + 32S

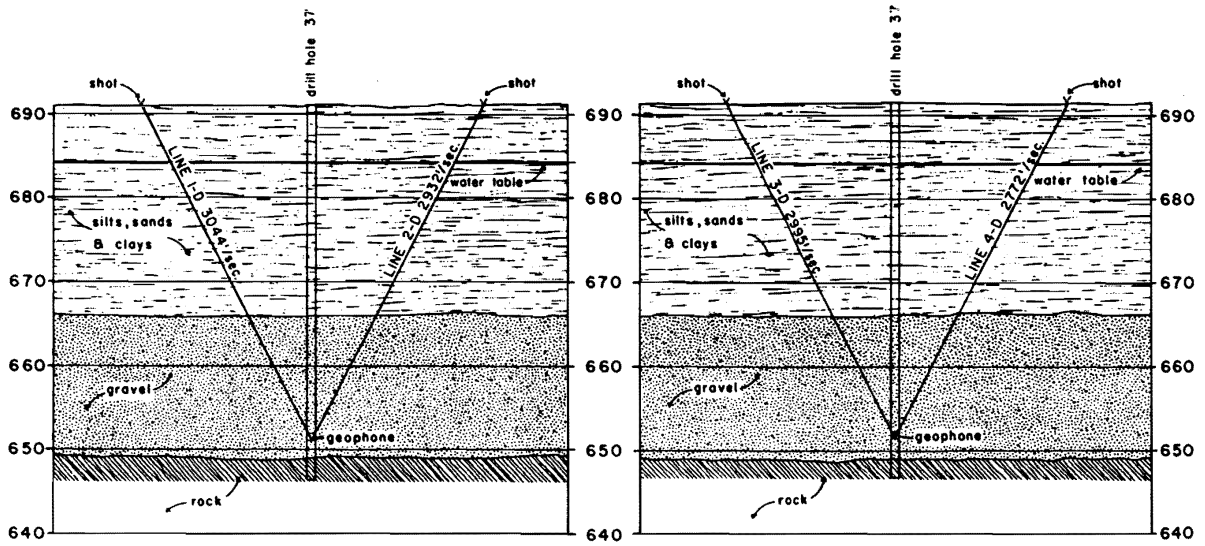
Figure 2.5-230

Figure 2.5-230 Soil Dynamics Intake Channel Station 12 + 67E, 25 + 32S



PLAN





SECTION A-A'

SECTION B-B'

Seismic Line Number	Seismic Path Distance (Feet)	Compressional Velocity Ft./Sec. Measured	Shear Velocity Ft./Sec. Calculated
1 - D	44.72	3044	918
2 - D	44.72	2932	884
3 - D	44.72	2995	903
4 - D	44.72	2772	836
Average	44.72	2936	885

Density Lbs/Cu.Ft. Assumed	Poisson's Ratio Assumed	Dynamic Shear Modulus PSI x 10^3 Calculated	Dynamic Young's Modulus PSI x 10^3 Calculated
90	0.45	16.35	47.42
90	0.45	15.17	43.99
90	0.45	15.83	45.90
90	0.45	13.56	39.32
90	0.45	15.21	44.11

NOTES:

1. The lines on the sections between shot points and geophone locations indicate only the travel direction of compressional waves.

2. The types of soils are based on general soil data obtained from the Construction Services Branch.

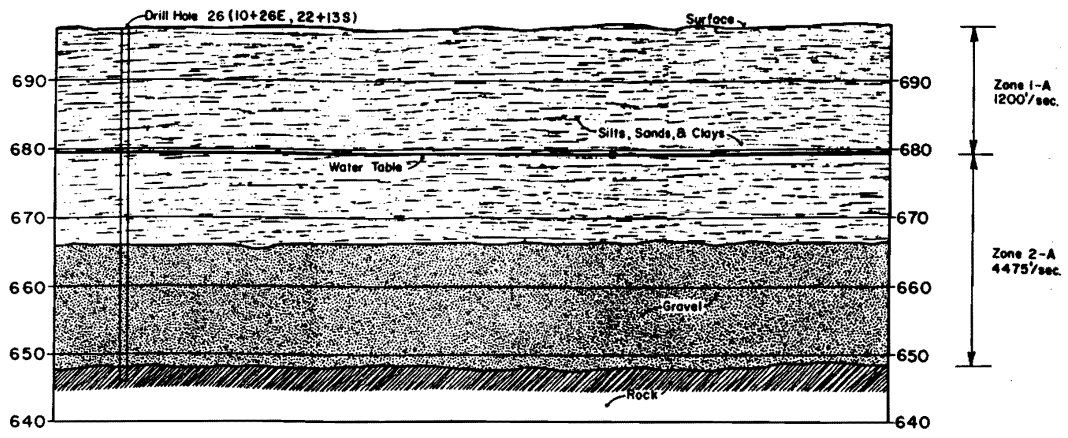
4. The equipment used in making the time measurements consisted of a Bison seismograph 1570B and recorder 1540, and a Hall Sears geophone MP-8.

5. Using all 4 seismic lines the shear modulus with a 67% confidence interval is 14,010 psi to 16,430 psi and with a 90% confidence interval it is 12,800 psi to 17,650 psi.

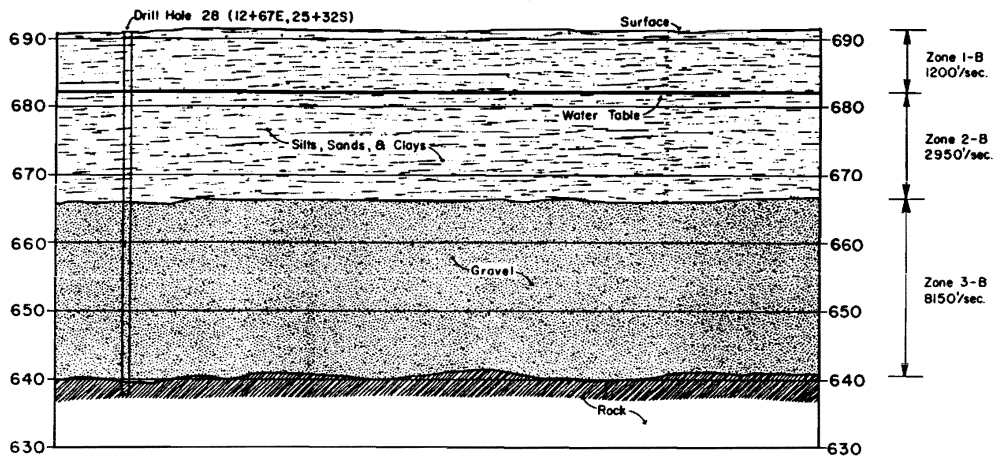
SCALE: 10 0 10 20 Feet

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
SOIL DYNAMICS INTAKE CHANNEL STATION 10 + 07E, 23 + 53S
Figure 2.5-231

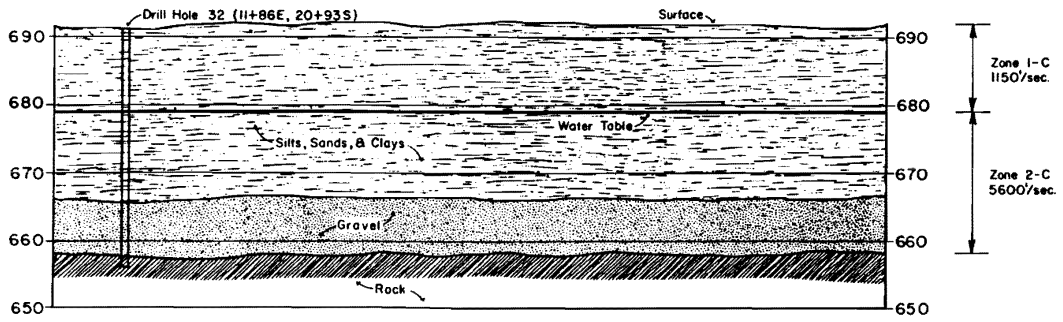
Figure 2.5-231 Soil Dynamics Intake Channel Station 10 + 07E, 23 + 53S



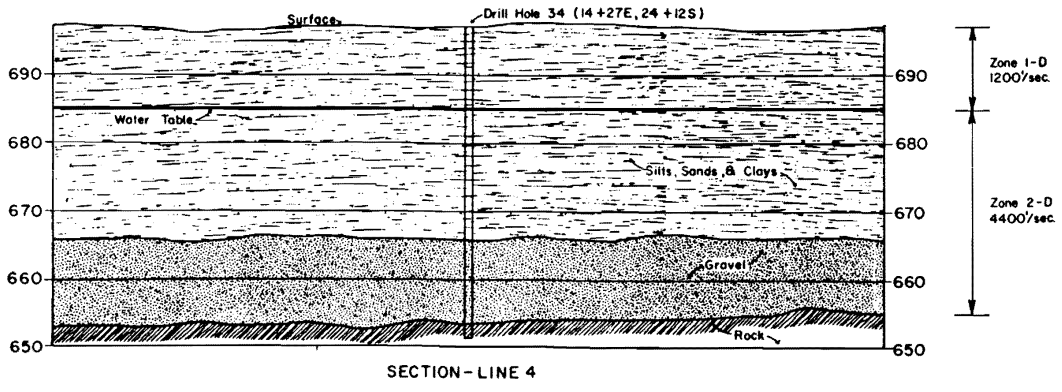
SECTION - LINE 1



SECTION - LINE 2



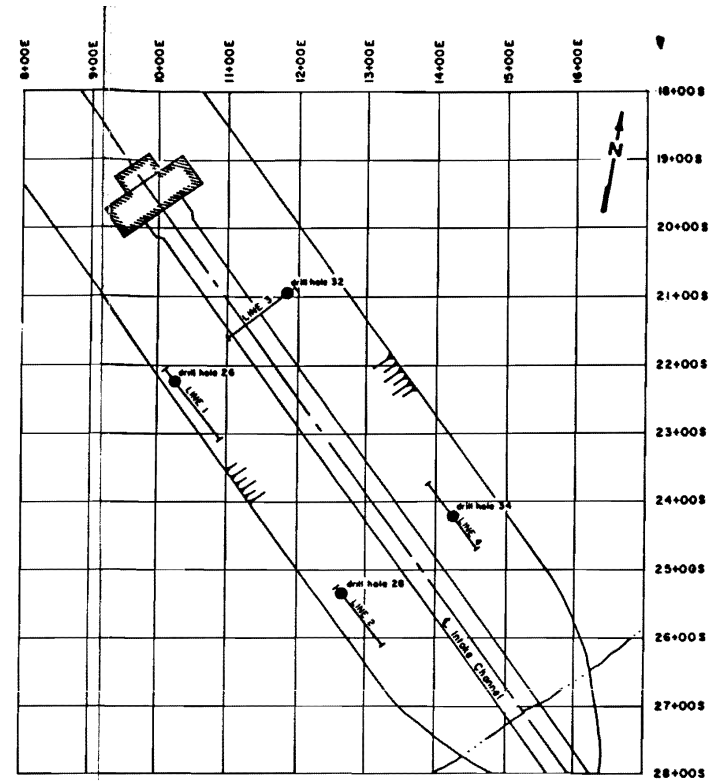
SECTION - LINE 3



SECTION - LINE 4

NOTES:

1. THE TYPES OF SOILS ARE BASED ON GENERAL SOIL DATA OBTAINED FROM THE CONSTRUCTION SERVICES BRANCH.
2. THE EQUIPMENT USED IN MAKING THE REFRACTION SURVEY CONSISTED OF A BISOM SEISMOGRAPH 15708 AND RECORDER 1540.
3. THE REFRACTED COMPRESSIONAL VELOCITY OF 8150'/SEC. FOR LINE 2 IS ABNORMALLY HIGH FOR SATURATED GRAVELS. THIS VELOCITY IS NOT COMPATABLE WITH THE UP-HOLE SEISMIC VELOCITY MEASUREMENTS AND DOES NOT COMPARE FAVORABLE WITH LINES 1, 3 AND 4.
4. THE SOIL VELOCITIES BELOW THE WATER TABLE DO NOT DIFFERENTIATE BETWEEN SILTS AND GRAVELS. THIS MAY BE THE RESULT OF THE GRADATIONAL NATURE OF THE SOIL.
5. REFRACTED SHEAR VELOCITIES FOR ZONES 1 AND 2 ALONG LINES 1, 3 AND 4 WERE OBTAINED.
6. THE REFRACTION SEISMIC LINES WERE SURVEYED IN TWO DIRECTIONS WITH APPARENT VELOCITIES BEING AVERAGED FOR EACH LINE.



KEY PLAN

SCALE: 0 100 Feet

SEISMIC REFRACTION LINES
SOIL DYNAMIC PROPERTIES

SEISMIC REFRACTION LINE	VELOCITY ZONES ELEVATIONS	COMPRESSIONAL VELOCITY FT./SEC. MEASURED	SHEAR VELOCITY FT./SEC.	DENSITY LBS./CU. FT. ASSUMED	POISSON'S RATIO CALCULATED	DYNAMIC SHEAR MODULUS PSI x 10^3 CALCULATED	DYNAMIC YOUNG'S MODULUS PSI x 10^3 CALCULATED
LINE 1	697 - 679	1200	545 MEASURED	90	0.37	5.77	15.80
	679 - 648	4750	1130 MEASURED	90	0.46	32.44	94.72
LINE 2	691 - 682	1200	545 CALCULATED	90	0.37	5.77	15.80
	682 - 666	2950	803 CALCULATED	90	0.46	12.51	36.54
	666 - 640	8150	2218 CALCULATED	90	0.46	95.50	278.86
LINE 3	691 - 679	1150	522 MEASURED	90	0.37	5.29	14.51
	679 - 658	5600	1524 MEASURED	90	0.46	45.09	131.66
LINE 4	697 - 685	1200	545 MEASURED	90	0.37	5.77	15.80
	685 - 654	4400	1150 MEASURED	90	0.46	25.67	75.13

DYNAMIC SHEAR MODULUS
SEISMIC LINES 1, 3 AND 4
STANDARD DEVIATION

ZONE	67% CONFIDENCE INTERVAL PSI x 10^3	90% CONFIDENCE INTERVAL PSI x 10^3	AVERAGE PSI x 10^3
1	5.33 TO 5.88	5.05 TO 6.16	5.61
2	9.85 TO 24.54	14.68 TO 54.11	34.40

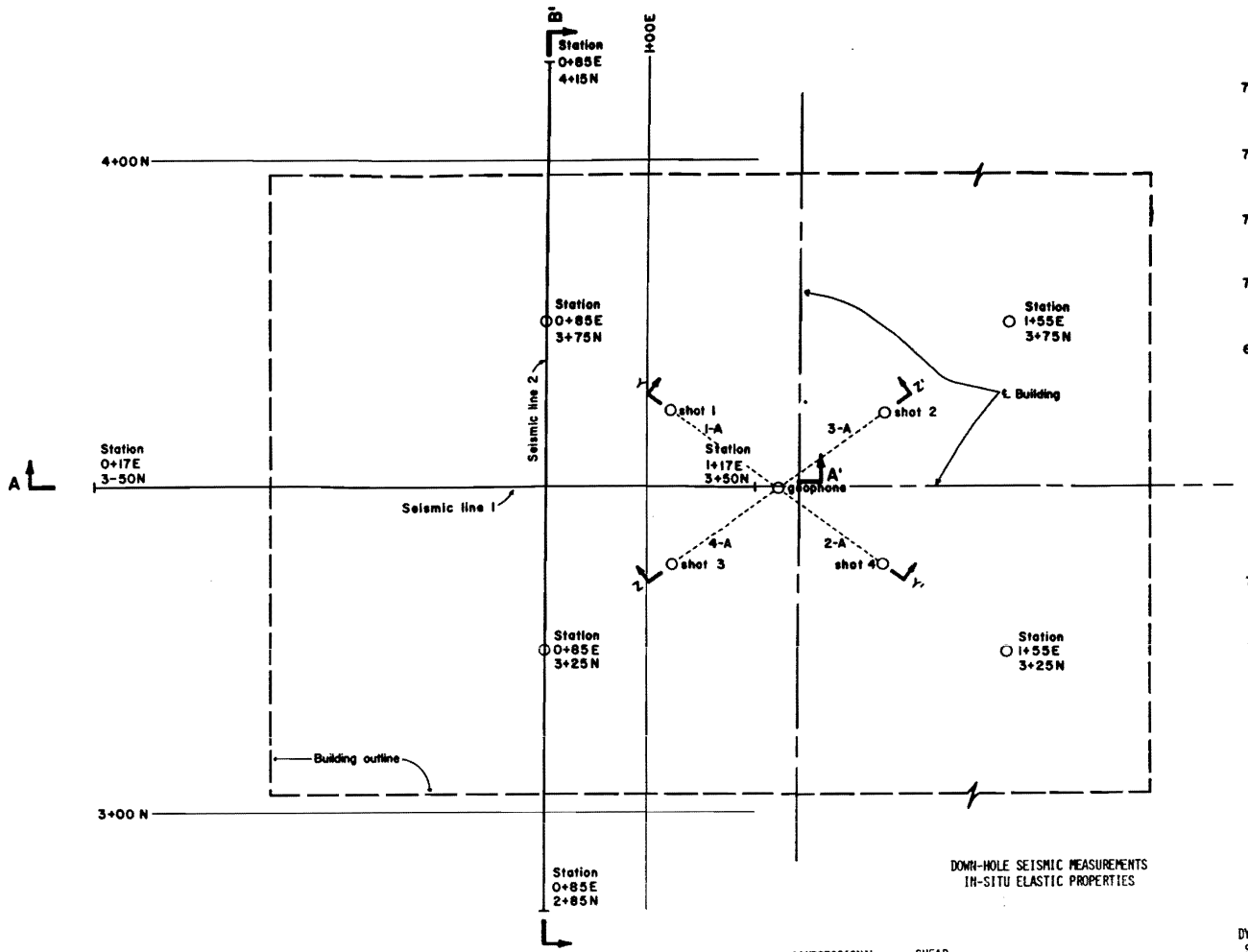
SCALE: 10 0 10 20 Feet

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SEISMIC REFRACTION DYNAMIC PROPERTIES INTAKE CHANNEL

Figure 2.5-232

Figure 2.5-232 Seismic Refraction Dynamic Properties Intake Channel

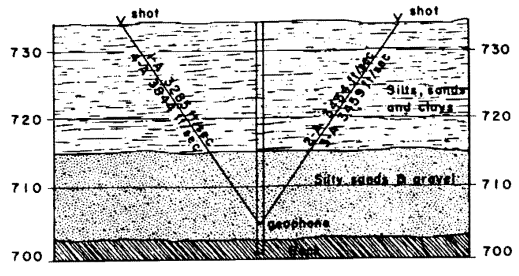


DOWN-HOLE SEISMIC MEASUREMENTS
IN-SITU ELASTIC PROPERTIES

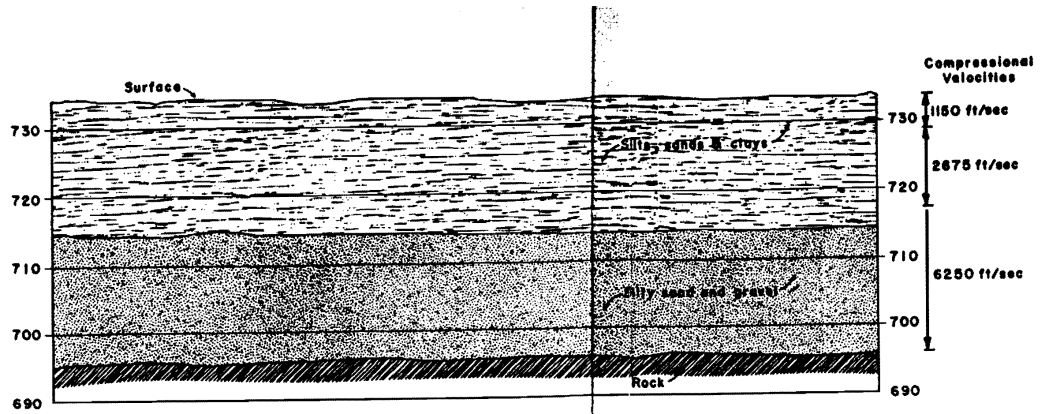
SEISMIC LINE NUMBER	SEISMIC PATH DISTANCE (FEET)	COMPRESSIONAL VELOCITY FT./SEC. MEASURED	SHEAR VELOCITY FT./SEC. CALCULATED	DENSITY LBS./CU. FT. ASSUMED	POISSON'S RATIO ASSUMED	DYNAMIC SHEAR MODULUS PSI x 10^3 CALCULATED	DYNAMIC YOUNG'S MODULUS PSI x 10^3 CALCULATED
1 - A	36.06	3205	966	90	0.45	18.13	52.56
2 - A	36.06	3434	1035	90	0.45	20.81	60.34
3 - A	36.06	3354	1011	90	0.45	19.85	57.56
4 - A	36.06	3844	1159	90	0.45	26.07	75.61
AVERAGE	36.06	3459	1042	90	0.45	21.11	61.23

STANDARD DEVIATION
DOWN-HOLE SEISMIC MEASUREMENTS
DYNAMIC SHEAR MODULUS PSI x 10^3

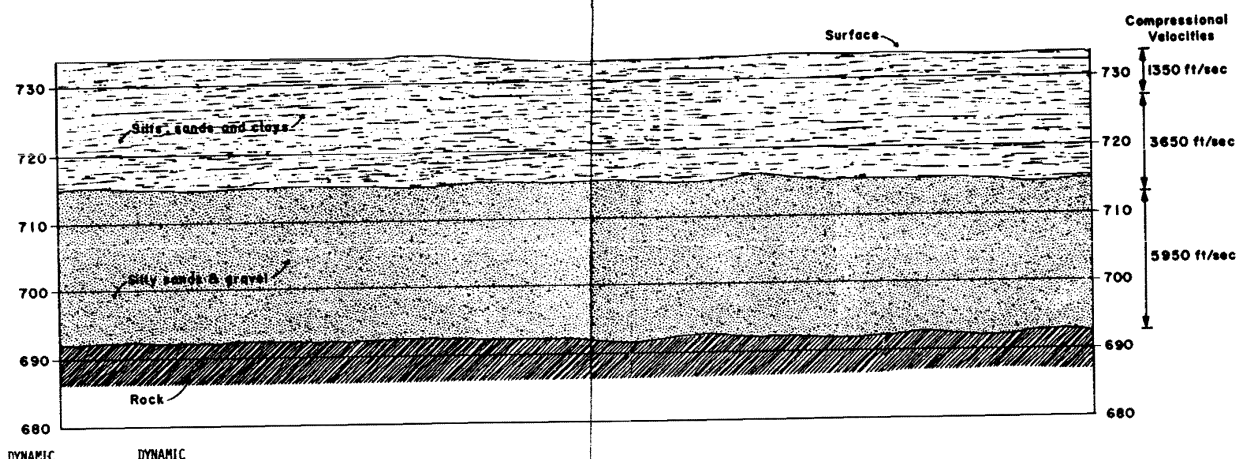
67% CONFIDENCE INTERVAL	90% CONFIDENCE INTERVAL
17.79 TO 24.63	14.37 TO 28.05



SECTIONS Y-Y' & Z-Z'



SECTION A-A'



SECTION B-B'

SEISMIC REFRACTION LINES
IN-SITU DYNAMIC PROPERTIES

SEISMIC REFRACTION LINE	VELOCITY ZONES ELEVATIONS	COMPRESSIONAL VELOCITY FT./SEC. MEASURED	SHEAR VELOCITY FT./SEC.	DENSITY LBS./CU. FT. ASSUMED	POISSON'S RATIO CALCULATED	DYNAMIC SHEAR MODULUS PSI x 10^3 CALCULATED	DYNAMIC YOUNG'S MODULUS PSI x 10^3 CALCULATED
1	734 TO 729	1150	552 CALCULATED	90	0.35	5.92	15.99
	729 TO 717	2675	1176 CALCULATED	90	0.38	26.88	74.19
	717 TO 697	6250	1701 CALCULATED	90	0.46	56.16	163.99
2	734 TO 727	1350	645 MEASURED	90	0.35	8.08	21.84
	727 TO 713	3650	1587 MEASURED	90	0.38	48.89	135.26
	713 TO 692	5950	1619 CALCULATED	90	0.46	50.90	148.63

NOTES:

1. THE TYPES OF SOILS ARE BASED ON GENERAL SOIL DATA OBTAINED FROM CONSTRUCTION SERVICES BRANCH.
2. THE EQUIPMENT USED IN MAKING THE REFRACTION SURVEY CONSISTED OF A BISON SEISMOGRAPH 1570B AND RECORDER 1540.
3. THE WATER TABLE FOR THE SEISMIC LINES WAS NOT RECORDED.
4. THE REFRACTION SEISMIC LINES WERE SURVEYED IN TWO DIRECTIONS WITH APPARENT VELOCITIES BEING AVERAGED FOR EACH LINE.

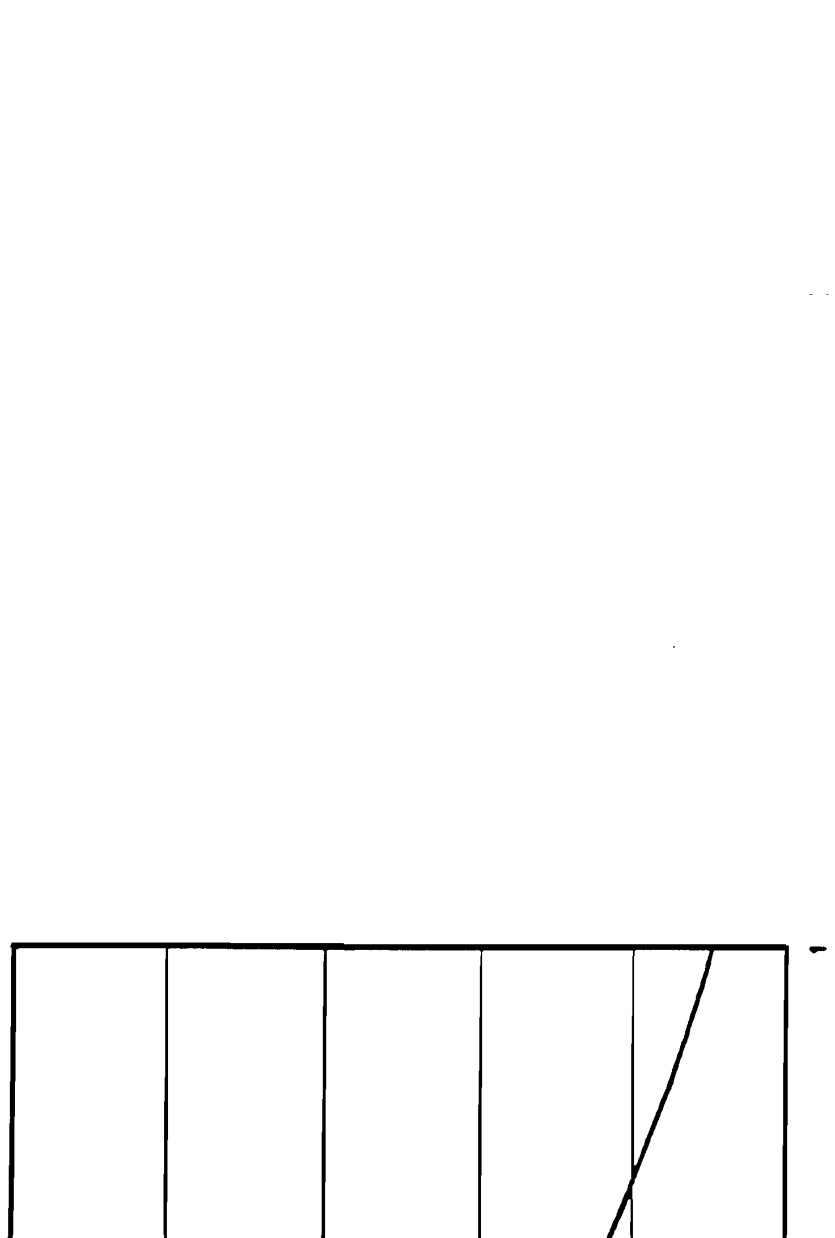
SCALE:

10 0 10 20 Feet

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL DYNAMICS DEISEL GENERATOR
BUILDING DOWN HOLE SEISMIC 8
REFRACTION MEASUREMENT
Figure 2.5-233

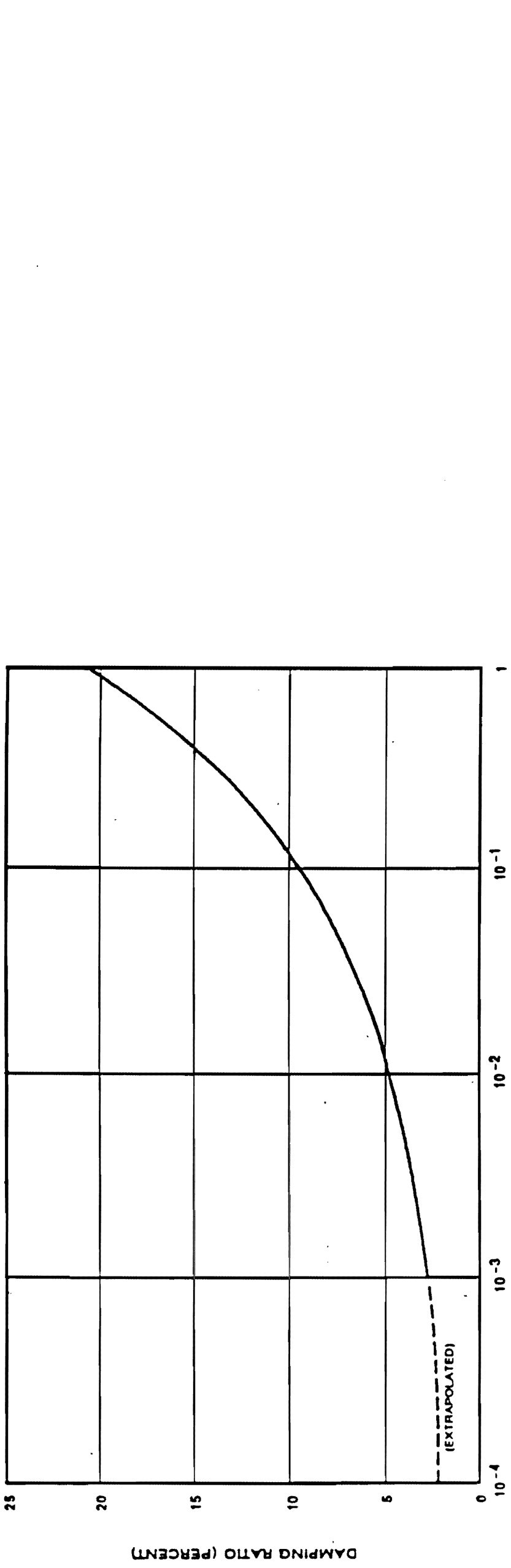
Figure 2.5-233 Soil Dynamics Diesel Generator Building Down Hole Seismic 8 Refraction Measurement



WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
CLASS A BACKFILL
SHEAR MODULUS REDUCTION WITH SHEAR STRAIN
Figure 2.5-233A

Amendment 63

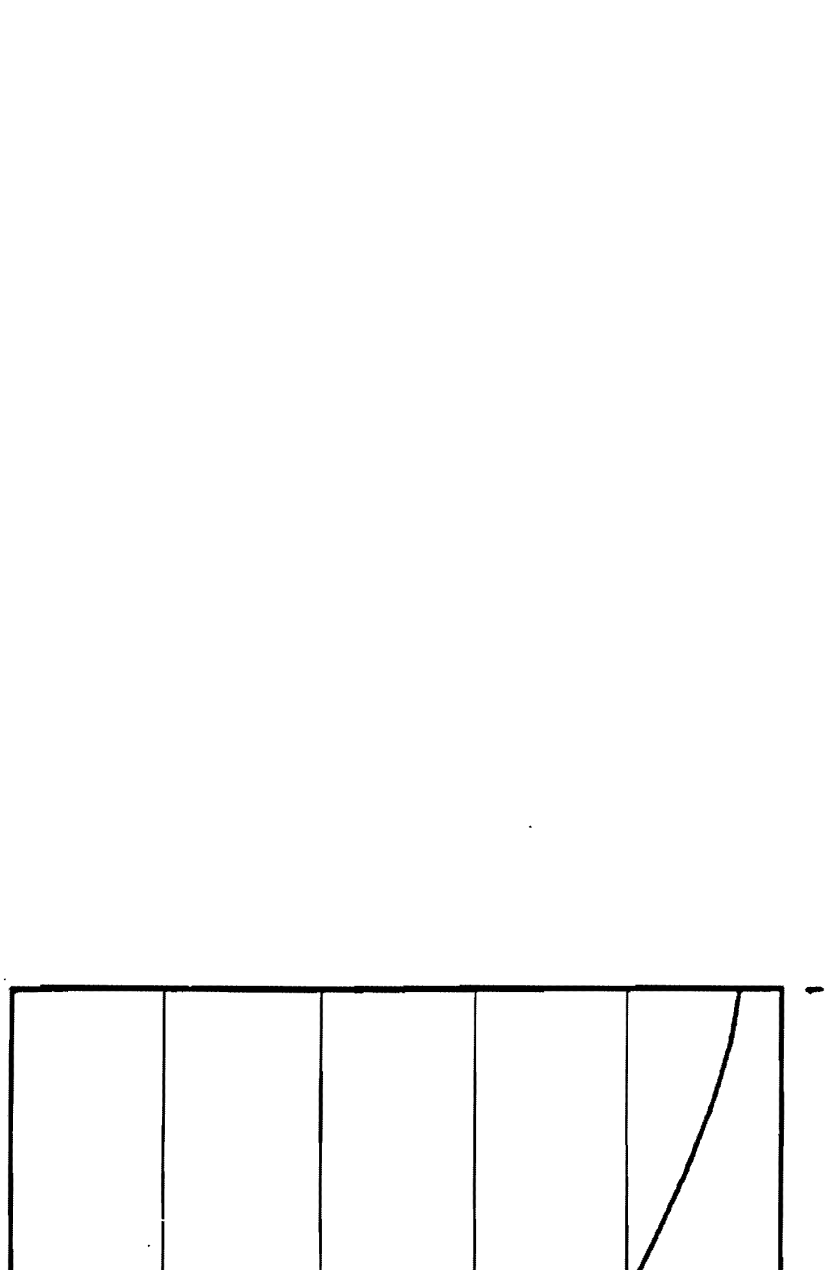
Figure 2.5-233a Class A Backfill -Shear Modulus Reduction with Shear Strain



WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
CLASS A BACKFILL
DAMPING RATIO VARIATION WITH SHEAR STRAIN
Figure 2.5-233B

Amendment 63

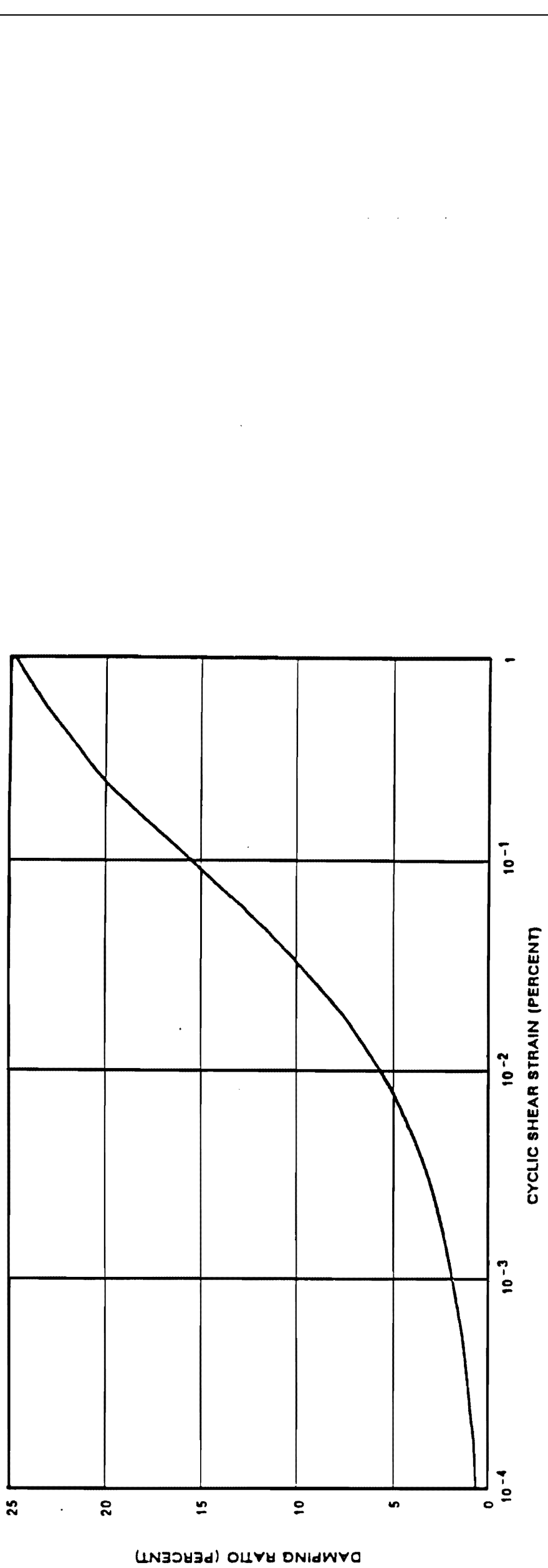
Figure 2.5-233b Class A Backfill -Damping Ratio Variation with Shear Strain



WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
CRUSHED STONE BACKFILL
SHEAR MODULUS REDUCTION WITH SHEAR STRAIN
Figure 2.5-233C

Amendment 63

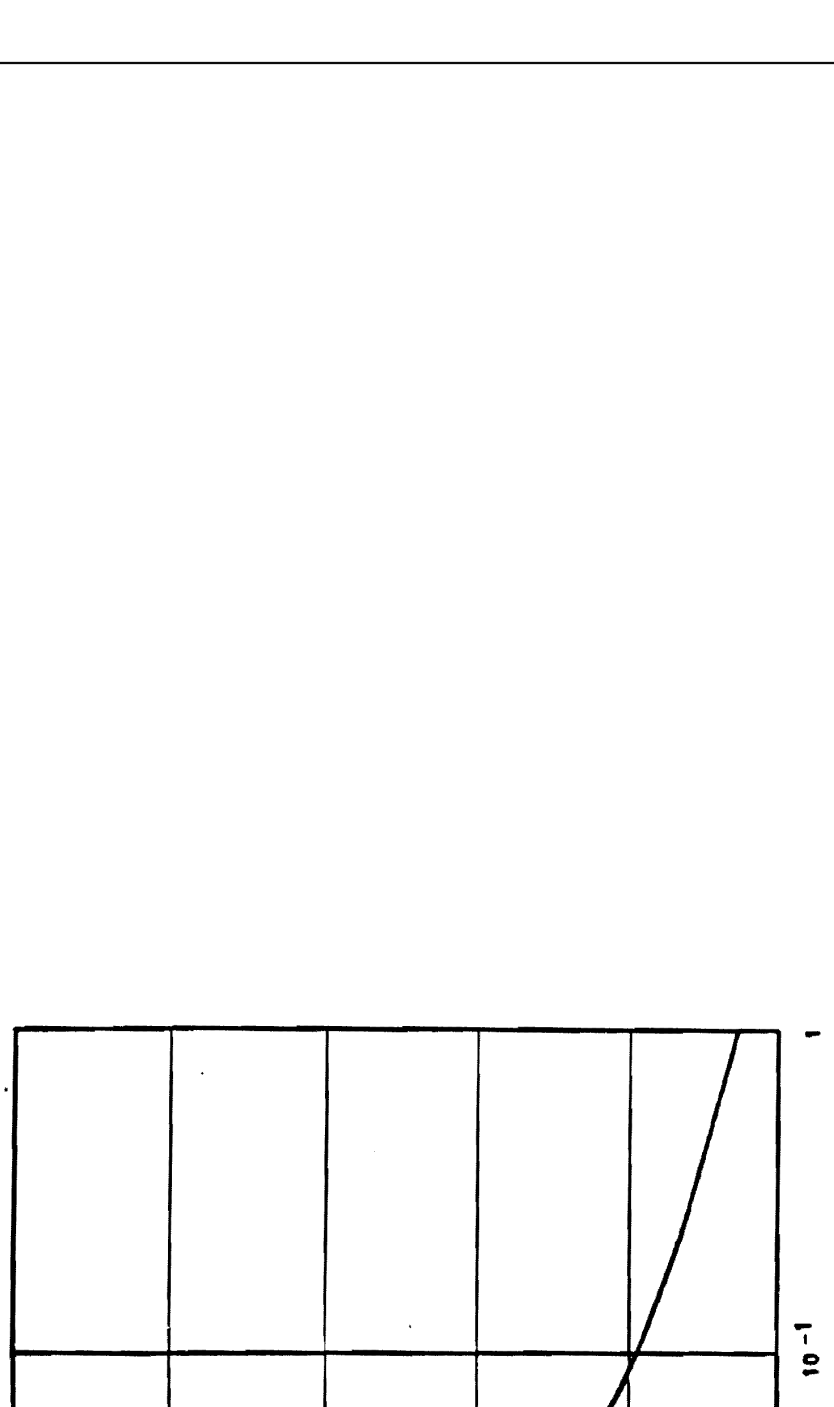
Figure 2.5-233c Crushed Stone Backfill - Shear Modulus Reduction with Shear Strain



WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
CRUSHED STONE BACKFILL
DAMPING RATIO VARIATION WITH SHEAR STRAIN
Figure 2.5-233D

Amendment 63

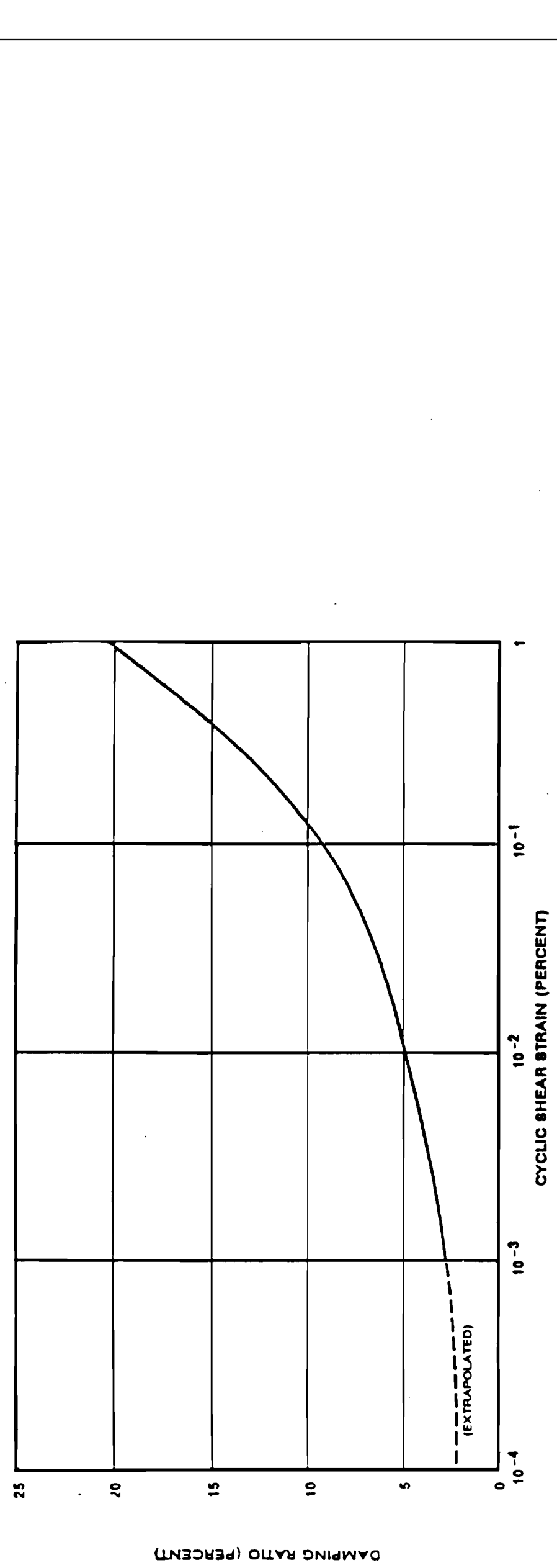
Figure 2.5-233d Crushed Stone Backfill - Damping Ratio Variation with Shear Strain



WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
IN SITU COHESIVE SOILS
SHEAR MODULUS REDUCTION WITH SHEAR STRAIN
Figure 2.5-233E

Amendment 63

Figure 2.5-233e In Situ Cohesive Soils - Shear Modulus Reduction with Shear Strain



WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

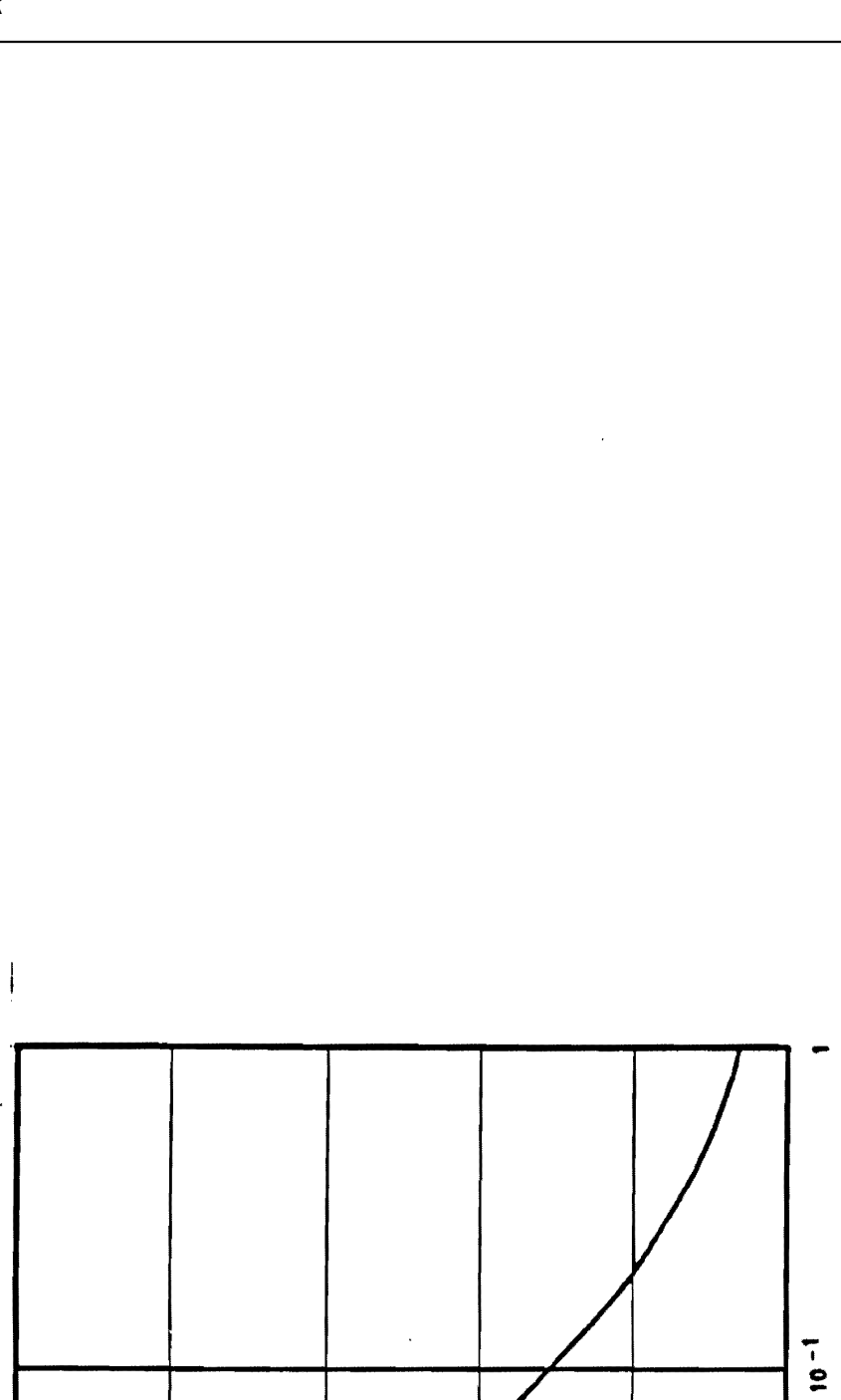
IN SITU COHESIVE SOILS

DAMPING RATIO VARIATION
WITH SHEAR STRAIN

Figure 2.5-233f

Amendment 63

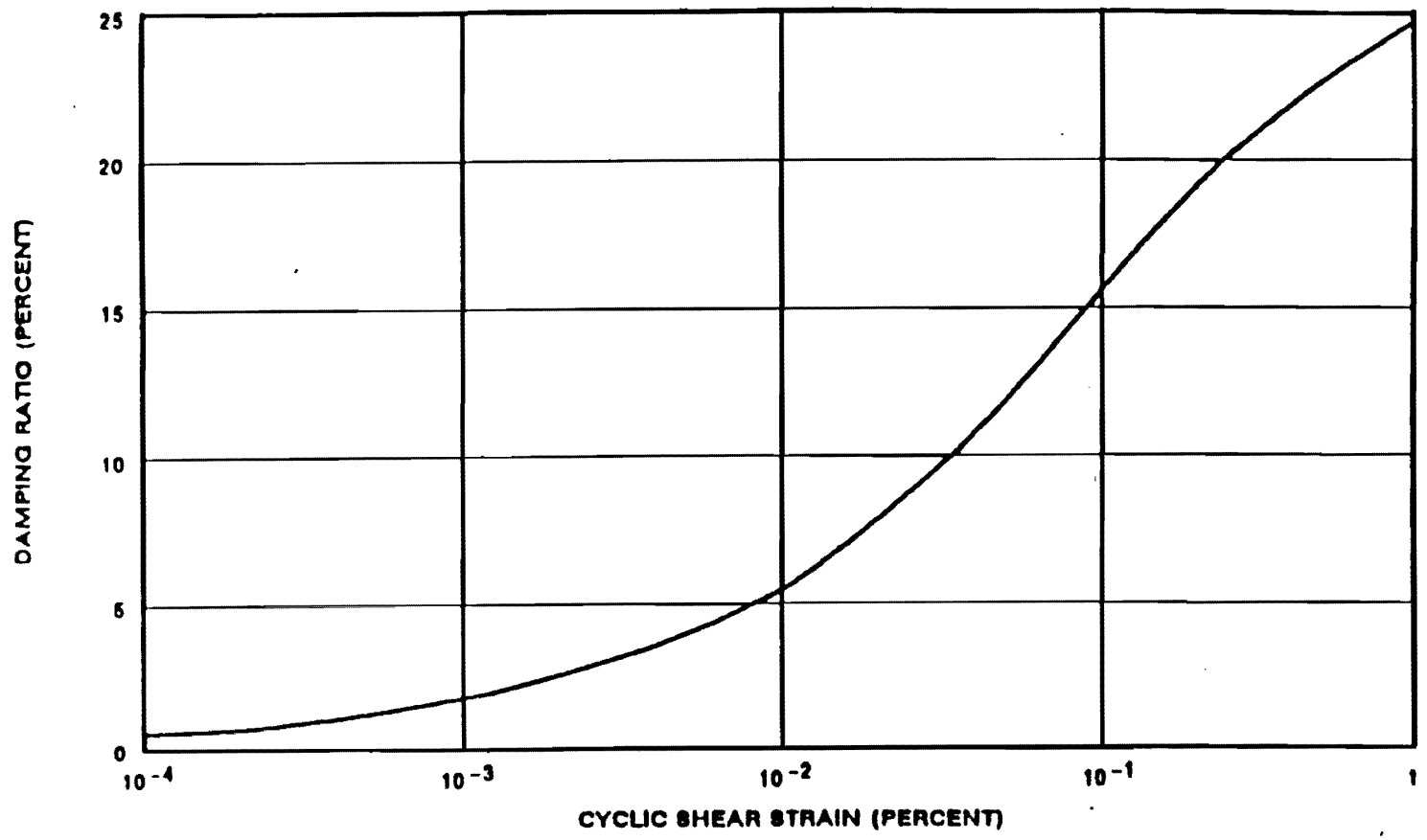
Figure 2.5-233f In Situ Cohesive Soils - Damping Ratio Variation with Shear Strain



WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT			
NON-PLASTIC IN SITU SOIL			
SHEAR MODULUS REDUCTION WITH SHEAR STRAIN			
Figure 2.5-233G			

Amendment 63

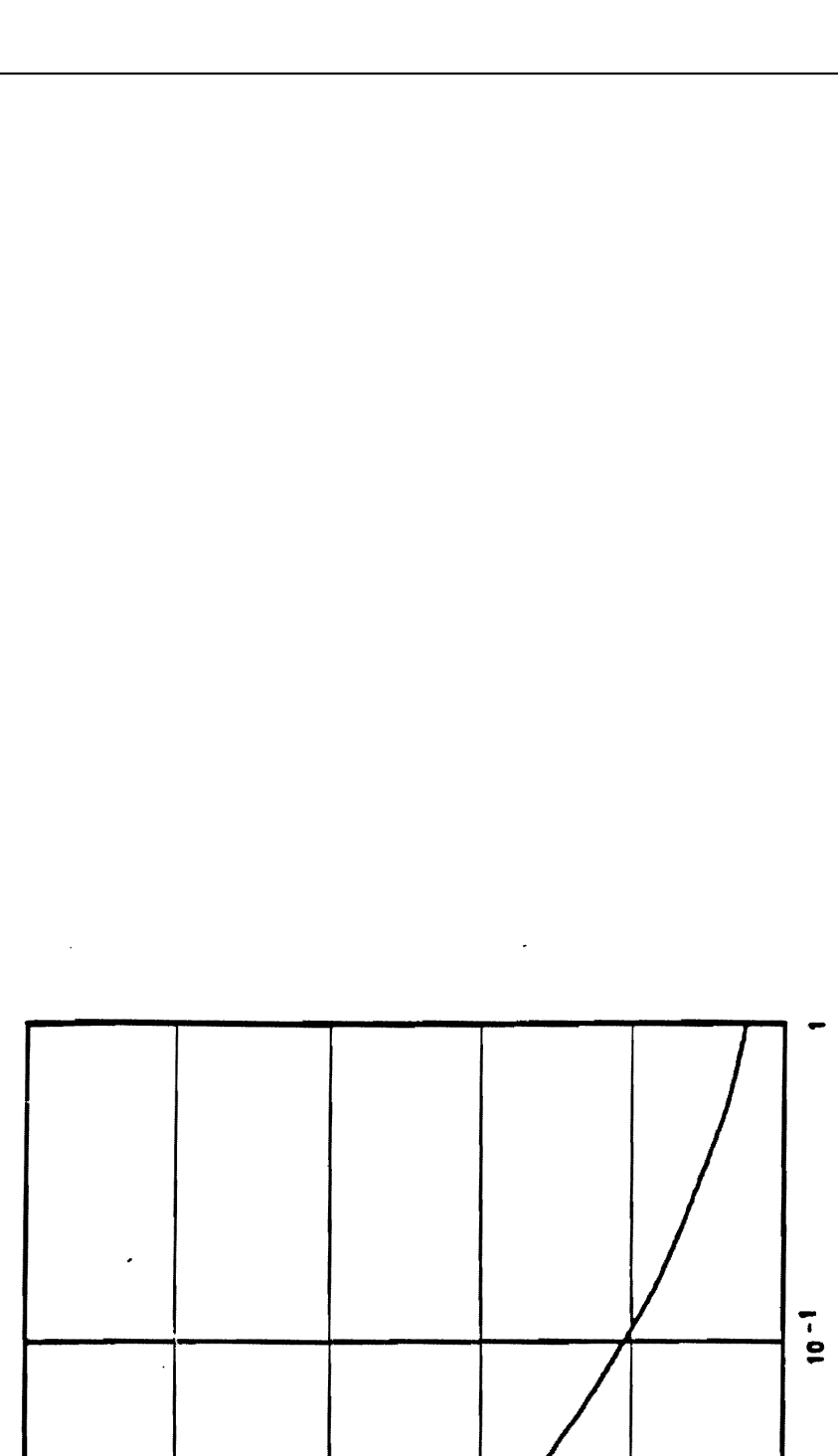
Figure 2.5-233g Non-Plastic In Situ Soil - Shear Modulus Reduction with Shear Strain



WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
NON-PLASTIC IN SITU SOILS DAMPING RATIO VARIATION WITH SHEAR STRAIN
Figure 2.5-233H

Amendment 63

Figure 2.5-233h Non-Plastic In Situ Soils - Damping Ratio Variation with Shear Strain



WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

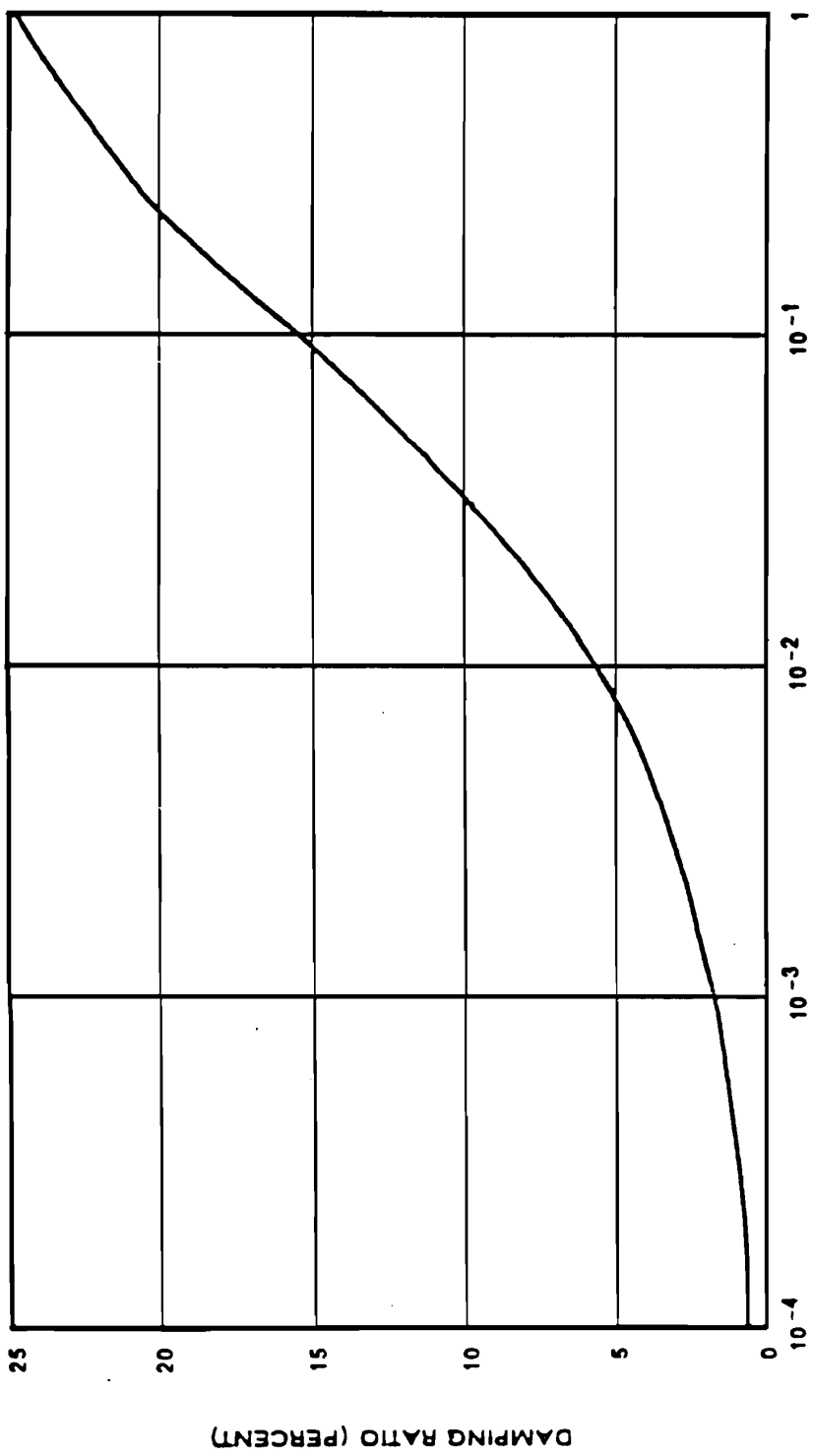
BASAL GRAVEL

SHEAR MODULUS REDUCTION
WITH SHEAR STRAIN

Figure 2.5-233i

Amendment 63

Figure 2.5-233i Basal Gravel - Shear Modulus Reduction with Shear Strain



WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

BASAL GRAVEL

DAMPING RATIO VARIATION
WITH SHEAR STRAIN

Figure 2.5-233J

Amendment 63

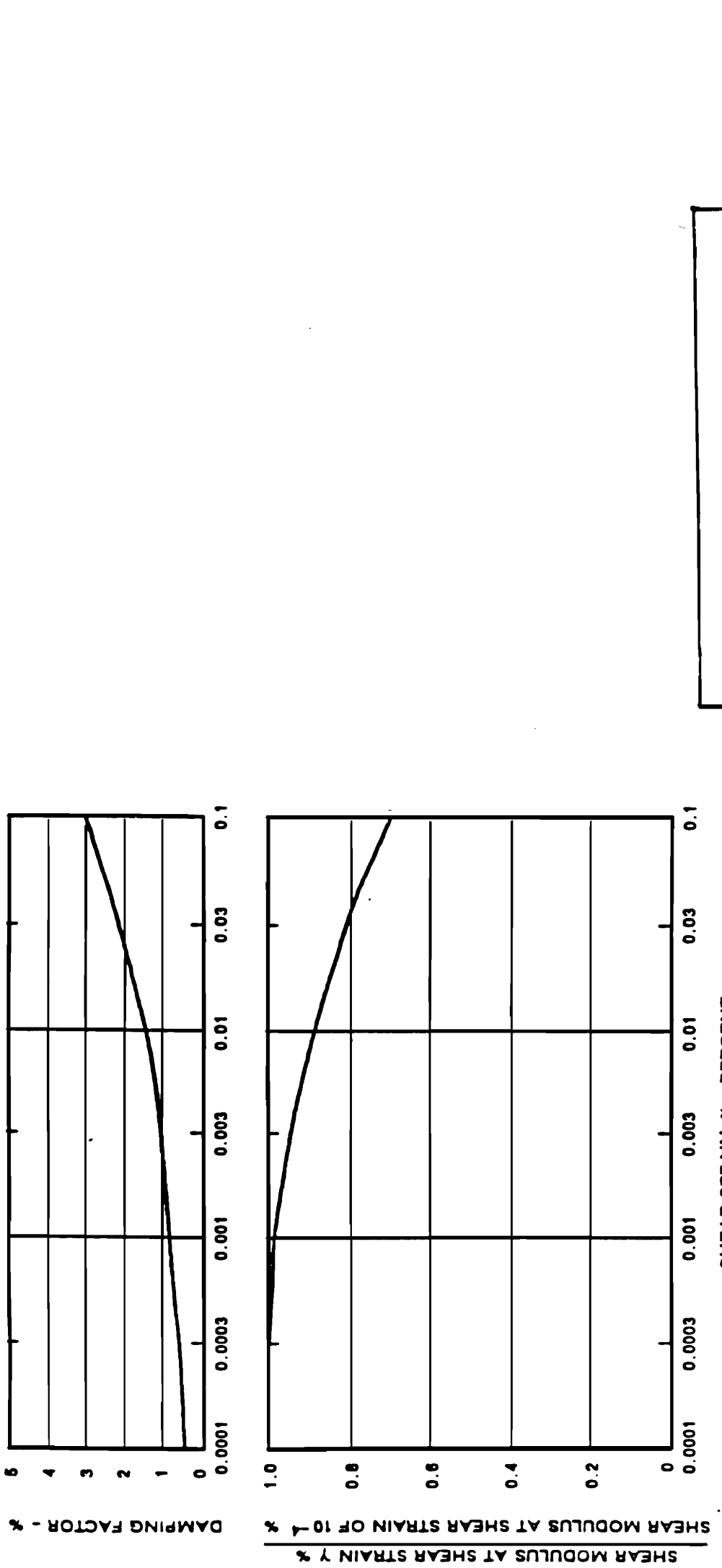
Figure 2.5-233j Basal Gravel - Damping Ratio Variation with Shear Strain

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

WEATHERED SHALE

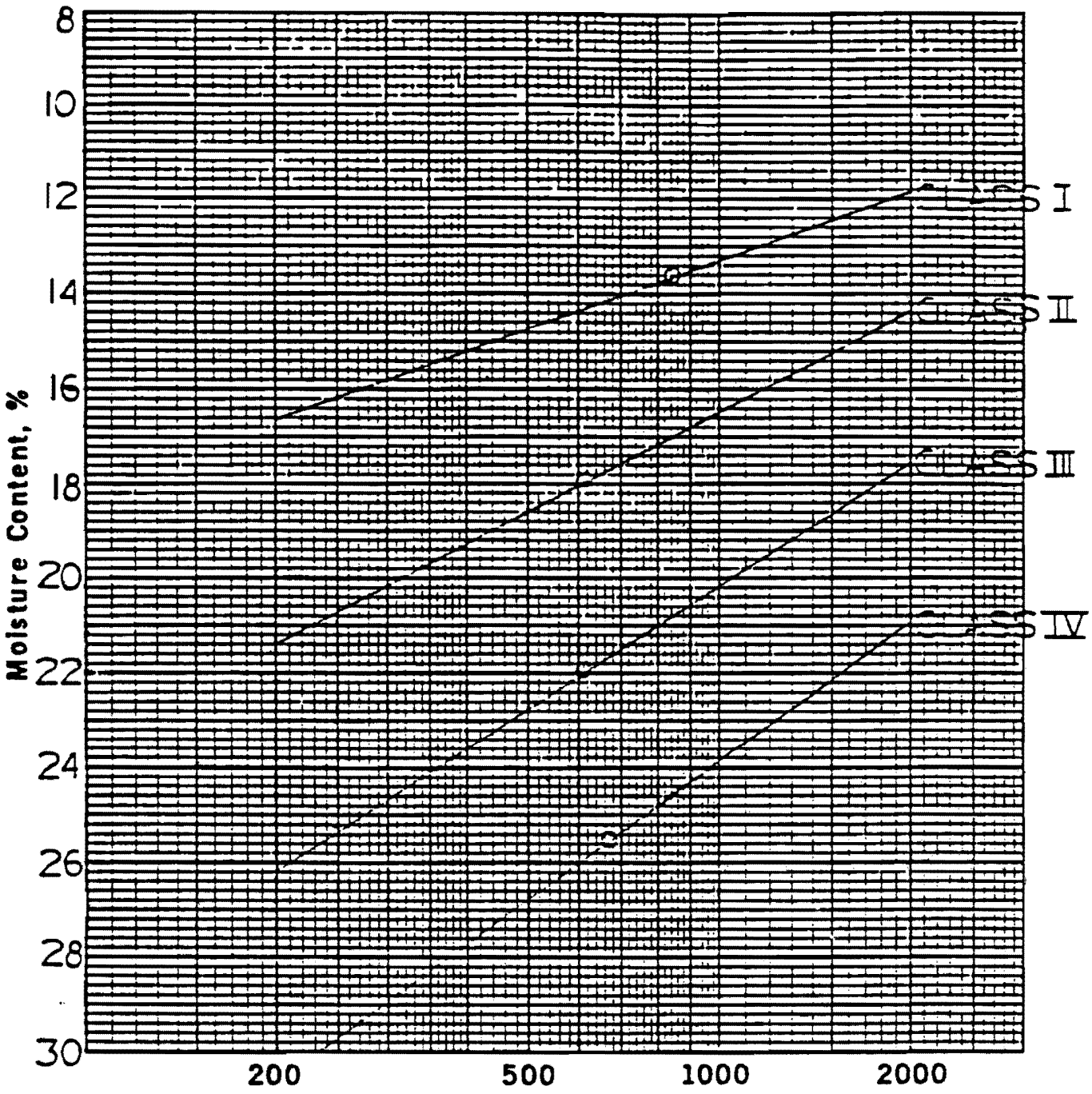
SHEAR MODULUS AND DAMPING
VARIATION WITH SHEAR STRAIN

Figure 2.5-233K



Amendment 63

Figure 2.5-233k Weathered Shale - Shear Modulus and Damping Variation with Shear Strain



Soil Class	Optimum Moisture, %	Maximum Density, pcf	Penetration Resistance, psi
I-SC	13.6	116.3	850
II-CL	17.9	108.0	615
III-MH	21.8	101.1	615
IV-MH	25.5	94.2	680

Remarks:
REVISED 12-8-82

O Denotes Optimum Moisture

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

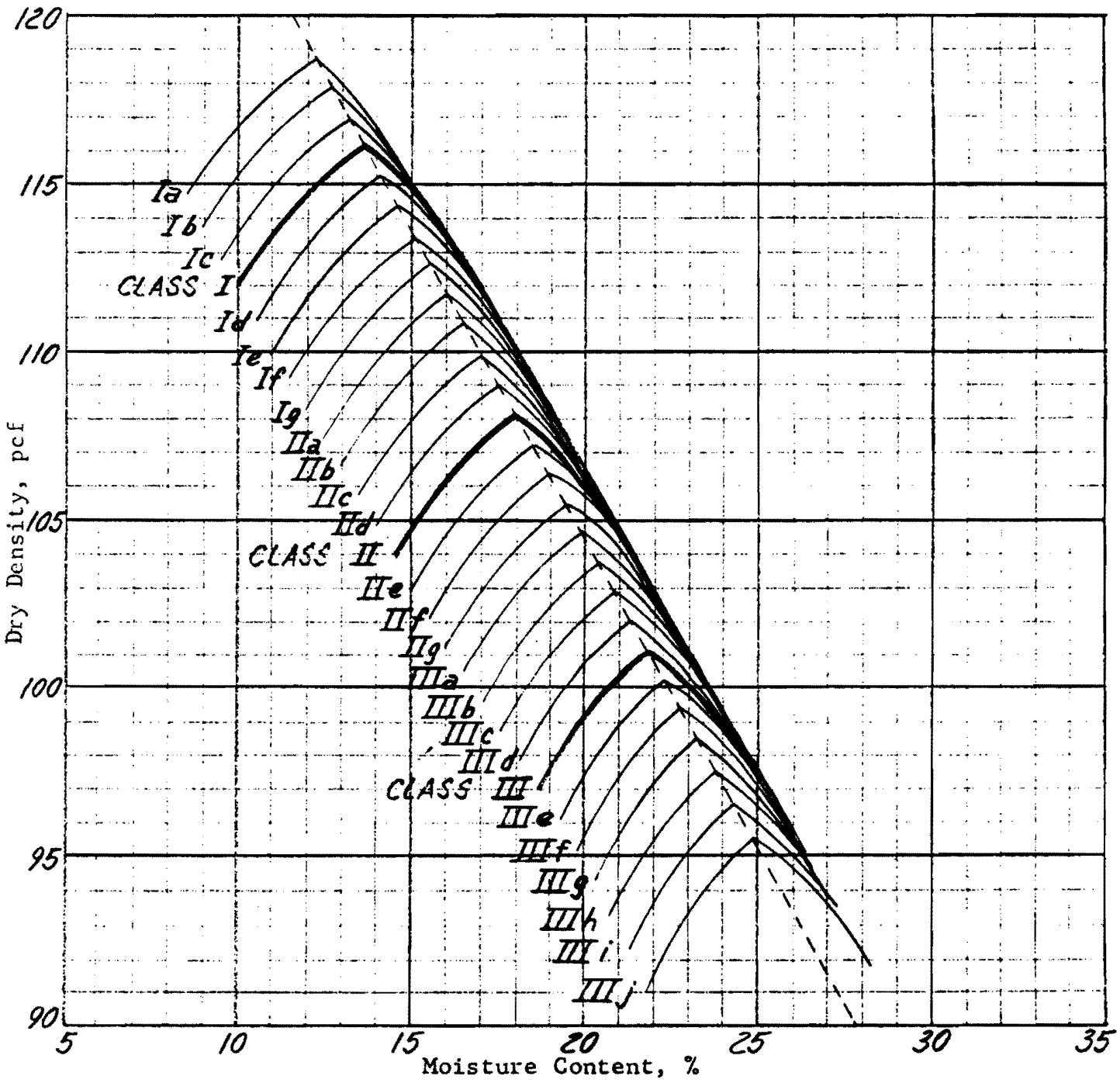
MAIN PLANT BORROW AREAS

MOISTURE-PENETRATION TEST

Figure 2.5-234

Amendment 63

Figure 2.5-234 Main Plant Borrow Areas, Moisture - Penetration Test



Soil Class	Gravel %	Sand %	Silt %	Clay %	Specific Gravity	LL %	PI %	Optimum Moisture, %	Maximum Density, pcf
I-SC	0	54	25	21	2.71	25.4	7.8	13.6	116.3
II-CL	0	35	29	36	2.73	41.9	18.6	17.9	108.0
III-MH	0	24	30	46	2.76	50.6	22.1	21.8	101.1

Plus No. 4 Specific Gravity, SSD	
Plus No. 4 Absorption, %	

Remarks:

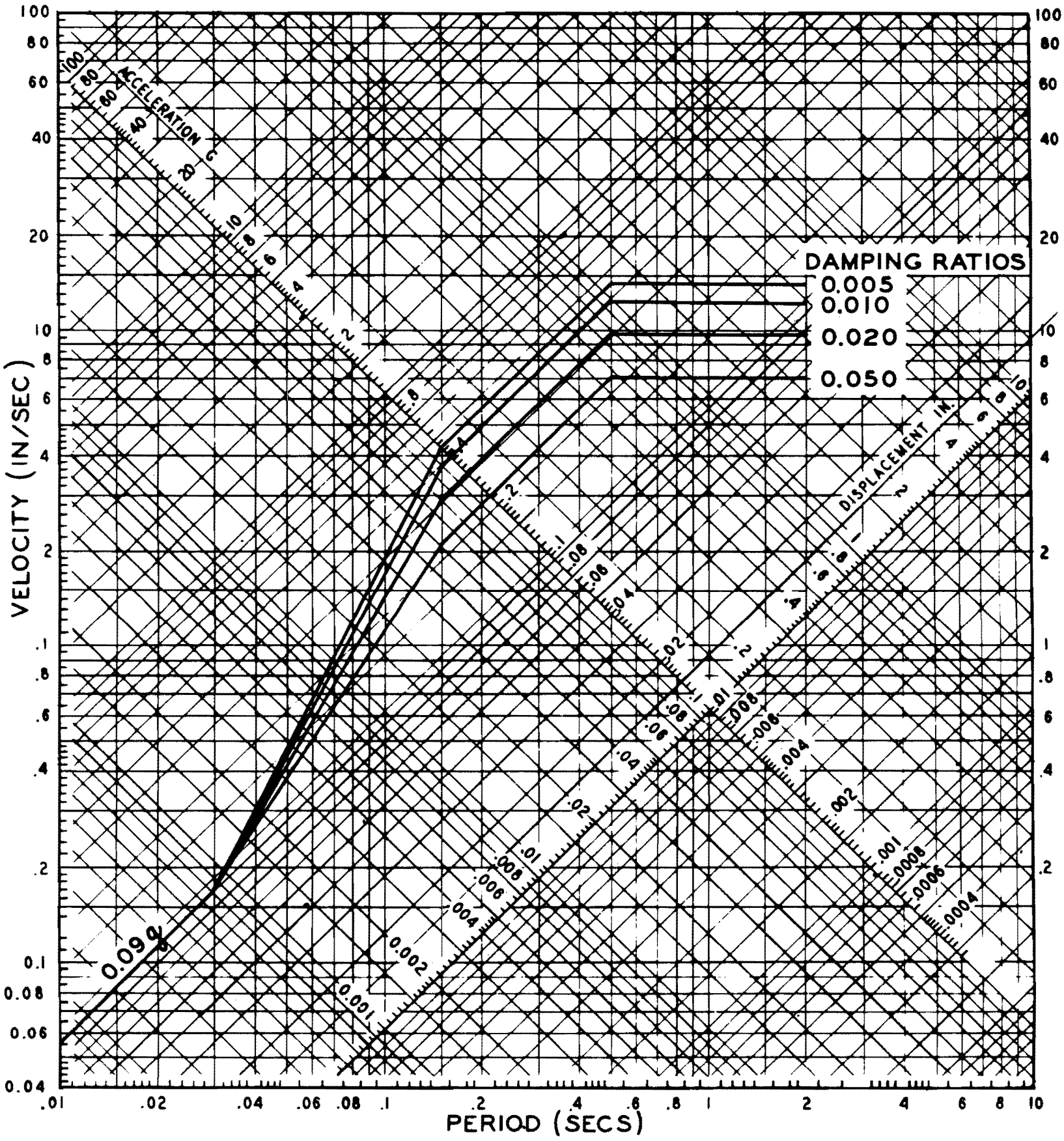
WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

COMPACTION TEST
BORROW AREAS (family of curves)
date tested 1-5-73

Figure 2.5-235

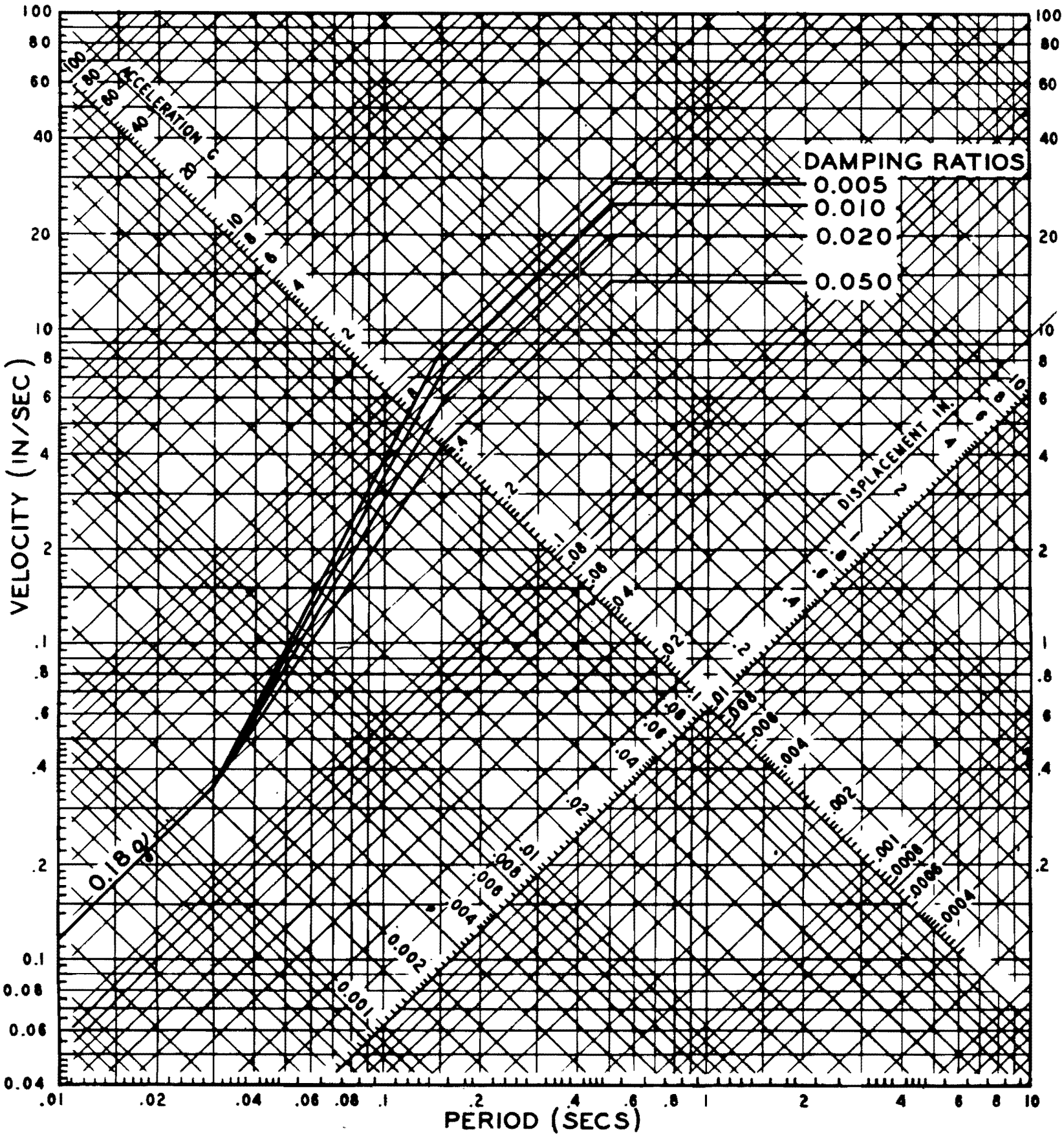
Soil Form 14

Figure 2.5-235 Compaction Test Borrow Areas (Family Of Curves)



WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
OPERATING BASIS EARTHQUAKE RESPONSE SPECTRA FOR ROCK SUPPORT STRUCTURES Figure 2.5-236a

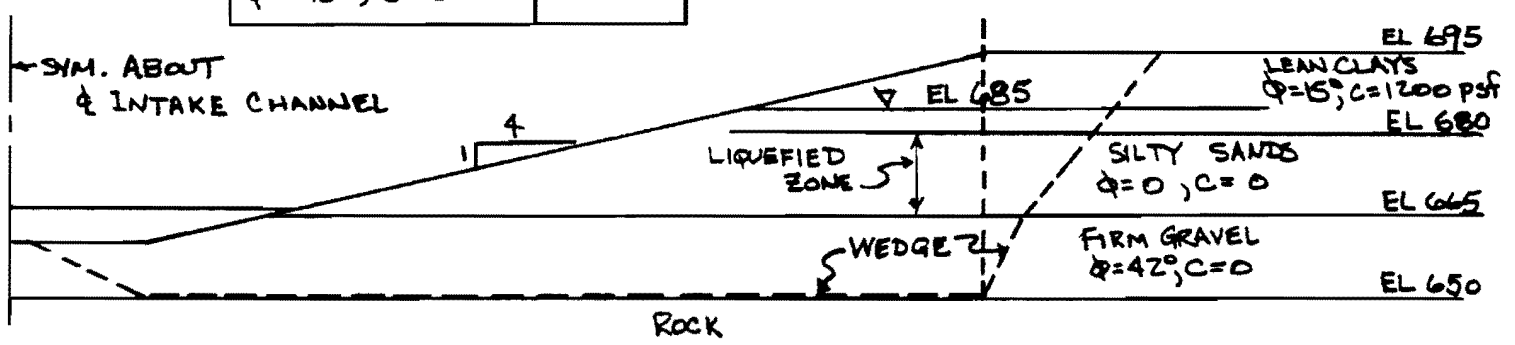
Figure 2.5-236A Operating Basis Earthquake Response Spectra For Rock Support Structures



WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
SAFE SHUTDOWN EARTHQUAKE RESPONSE SPECTRA FOR ROCK SUPPORT STURCTURES Figure 2.5-236b

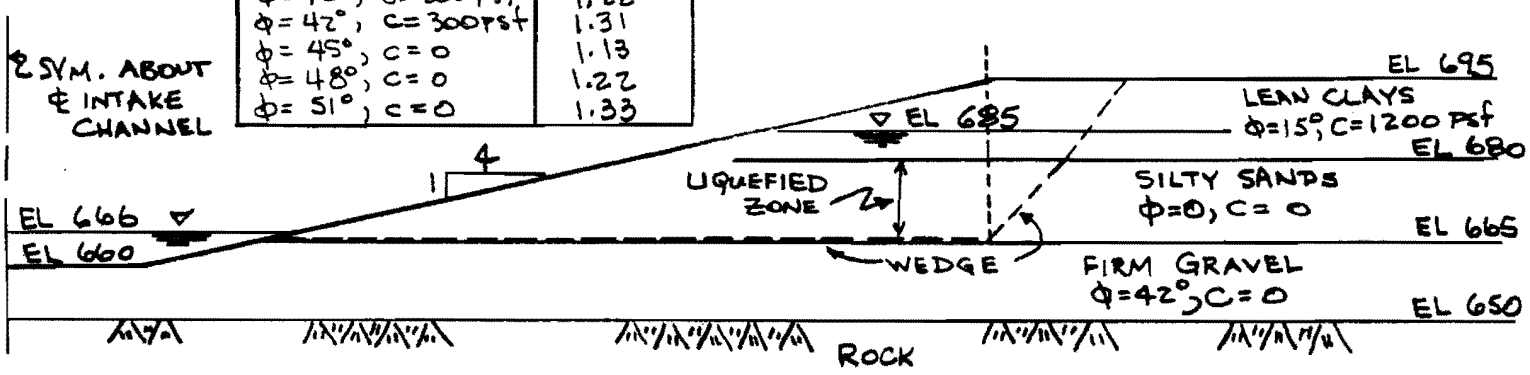
Figure 2.5-236b Safe Shutdown Earthquake Response Spectra For Rock Support Structures

EARTHQUAKE DESIGN CASE 2 WEDGE @ EL. 650	
Soil Properties Used for Resistance on Sliding Wedge	Factor of Safety
$\phi = 42°, C = 0$	1.12
$\phi = 45°, C = 0$	1.20



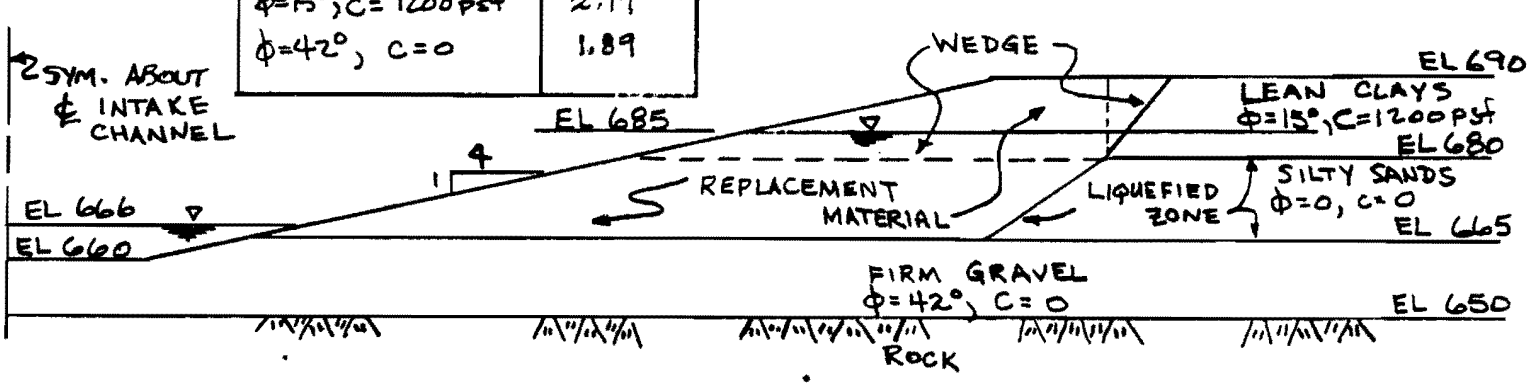
SECTION A-A

EARTHQUAKE DESIGN CASE 2 WEDGE @ EL. 665	
Soil Properties Used for Resistance on Sliding Wedge	Factor of Safety
$\phi = 15°, C = 1200$ psf	1.57
$\phi = 42°, C = 0$	1.04
$\phi = 42°, C = 100$ psf	1.13
$\phi = 42°, C = 200$ psf	1.22
$\phi = 42°, C = 300$ psf	1.31
$\phi = 45°, C = 0$	1.13
$\phi = 48°, C = 0$	1.22
$\phi = 51°, C = 0$	1.33



SECTION B-B

EARTHQUAKE DESIGN CASE 2 WEDGE @ EL 680	
Soil Properties Used for Resistance on Sliding Wedge	Factor of Safety
$\phi = 15°, C = 1200$ psf	2.77
$\phi = 42°, C = 0$	1.89



SECTION C-C

FIGURE 2.5-237
INTAKE CHANNEL
SEISMIC STABILITY ANALYSIS

NOTE:
Soils above firm gravel will be removed and replaced as compacted fill with controlled compaction density and moisture content at least as far back as the critical wedges shown.
See Figure 2.5-239

Figure 2.5-237 Intake Channel Seismic Stability Analysis

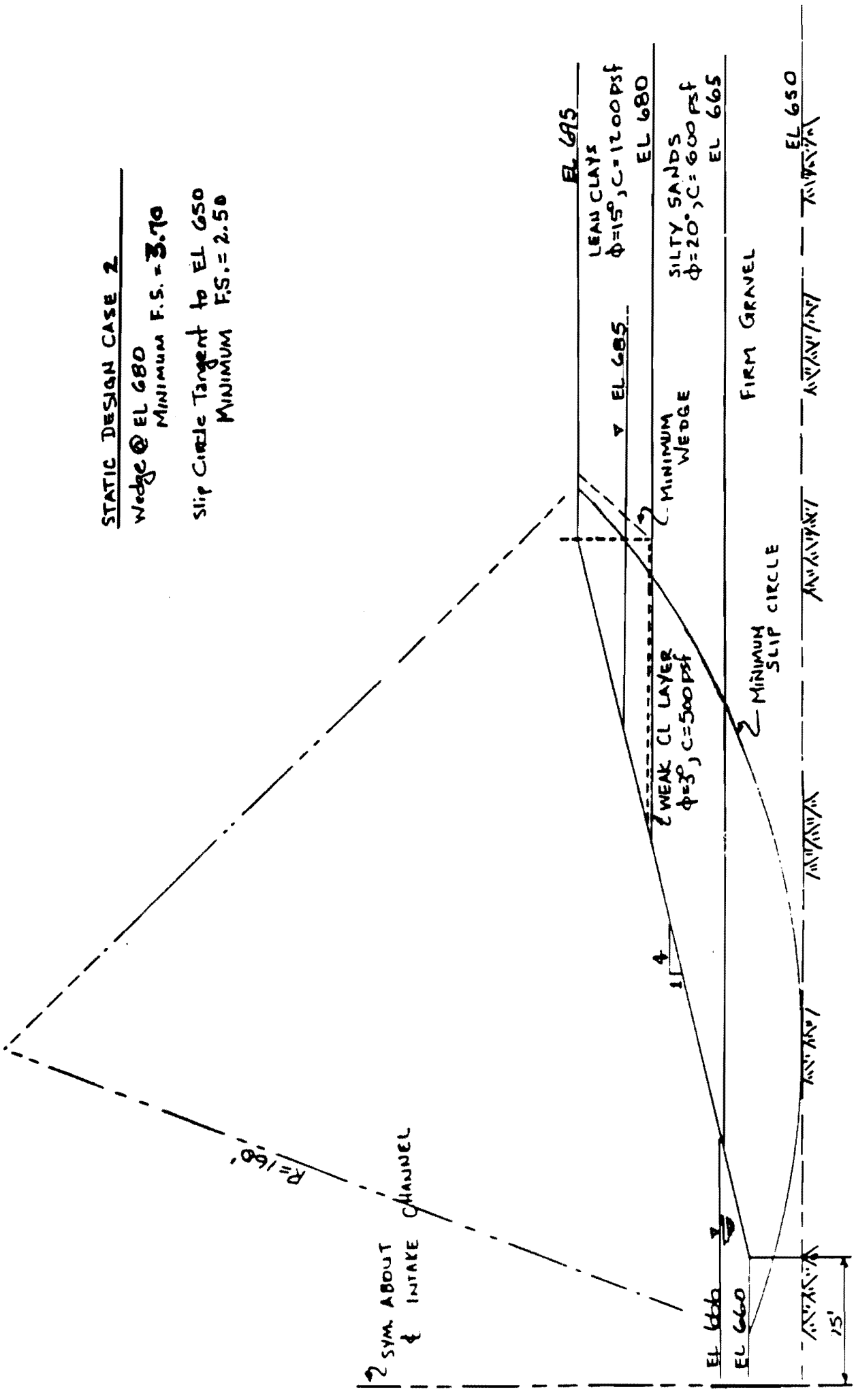


FIGURE 2.5-238

Amendment 63

Figure 2.5-238 Static Design Case 2

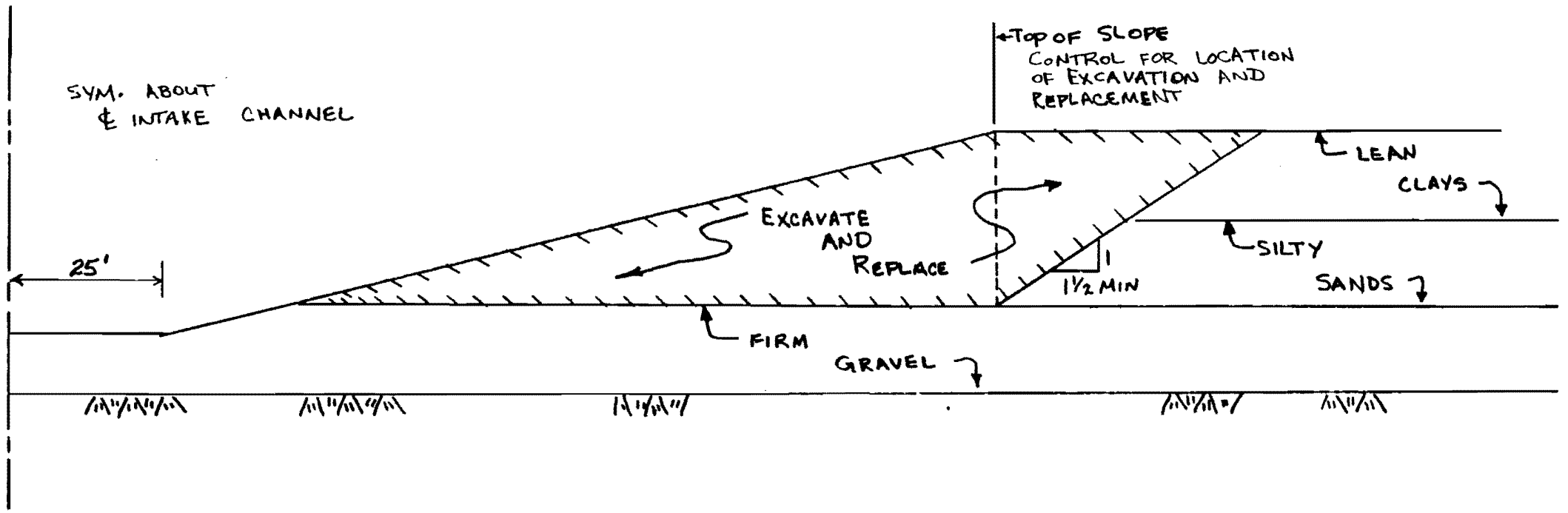
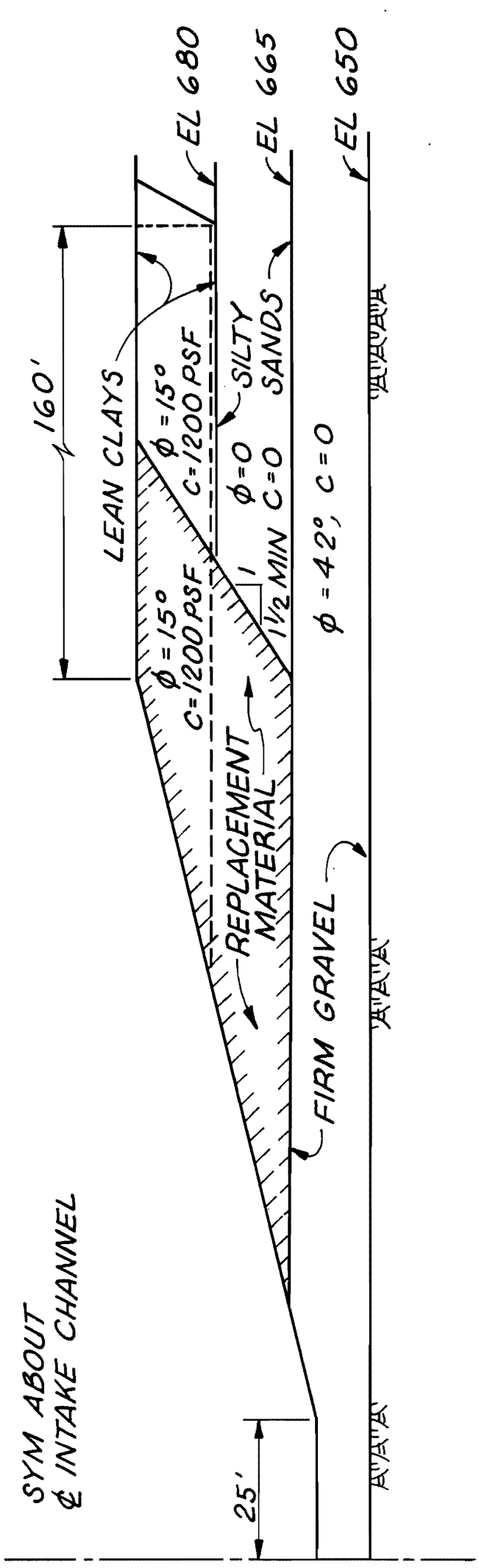


FIGURE 2.5-239
INTAKE CHANNEL - LATERAL
EXCAVATION & REPLACEMENT
ADDED BY AMENDMENT 28

Figure 2.5-239 Intake Channel-Lateral Excavation & Replacement



WEDGE USED TO DETERMINE HORIZONTAL DISPLACEMENT OF THE INTAKE CHANNEL BY NEWMARK'S METHOD

FIGURE 2.5-240
ADDED BY AMENDMENT 28

Figure 2.5-240 Wedge Used To Determine Horizontal Displacement of The Intake Channel By Newmark's Method

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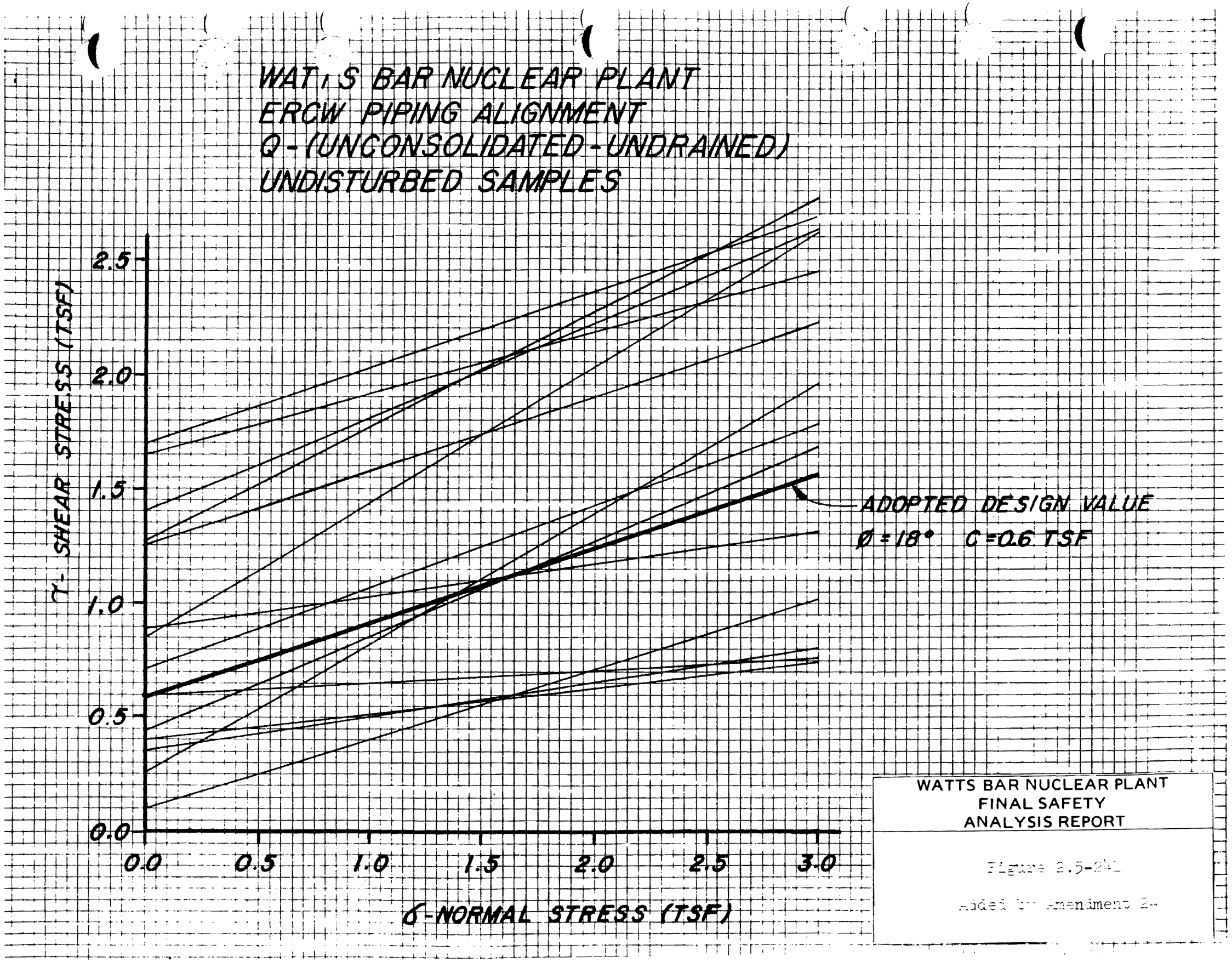
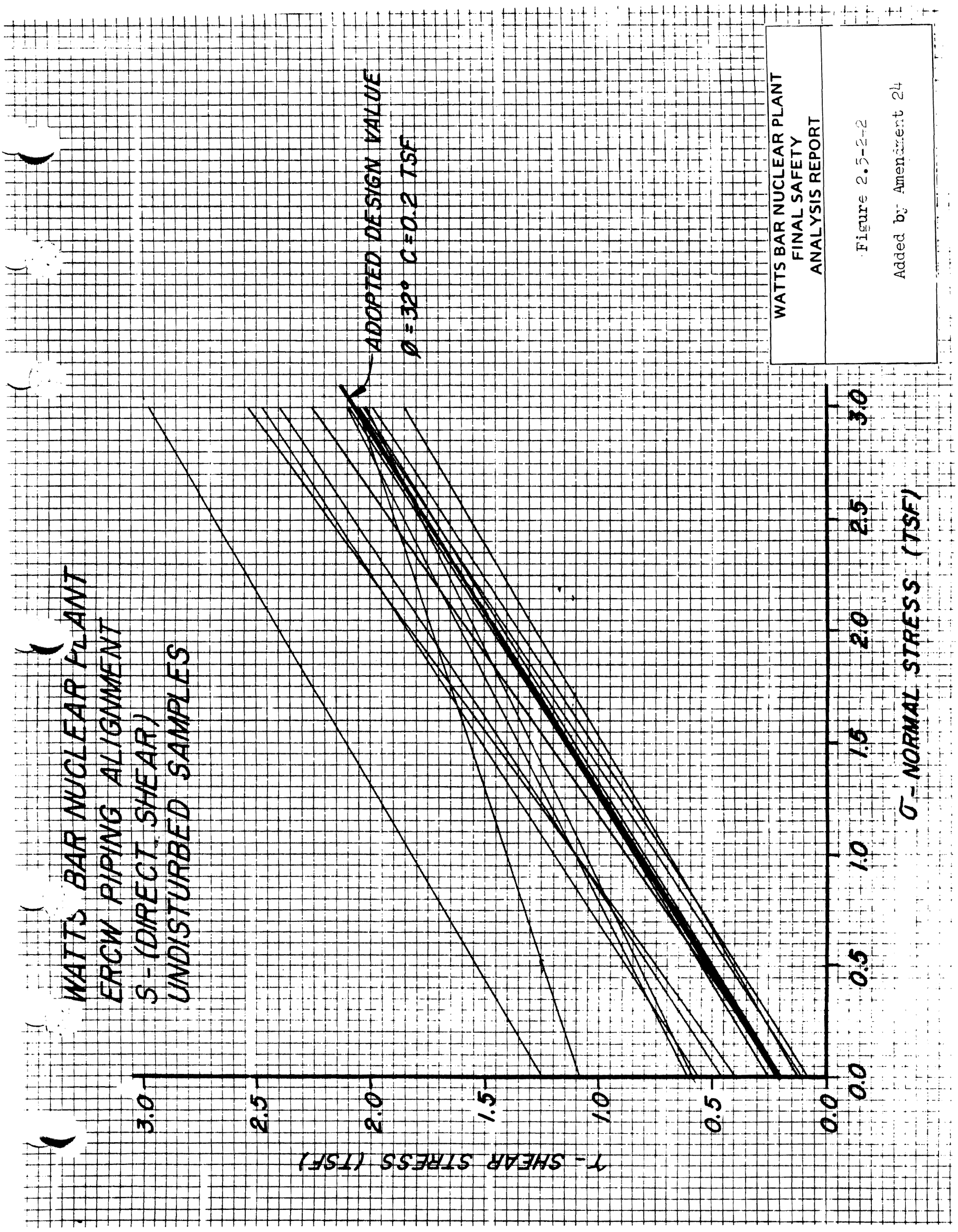


Figure 2.5-241 ERCW Piping Alignment Q (Unconsolidated Undrained - Undisturbed Samples)



WATTS BAR NUCLEAR PLANT
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Figure 2.5-2-2

Added by Amendment 24

Figure 2.5-242 ERCW Piping Alignment S (Direct Shear) Undisturbed Samples

Figure 2.5-243 Deleted by Amendment 71

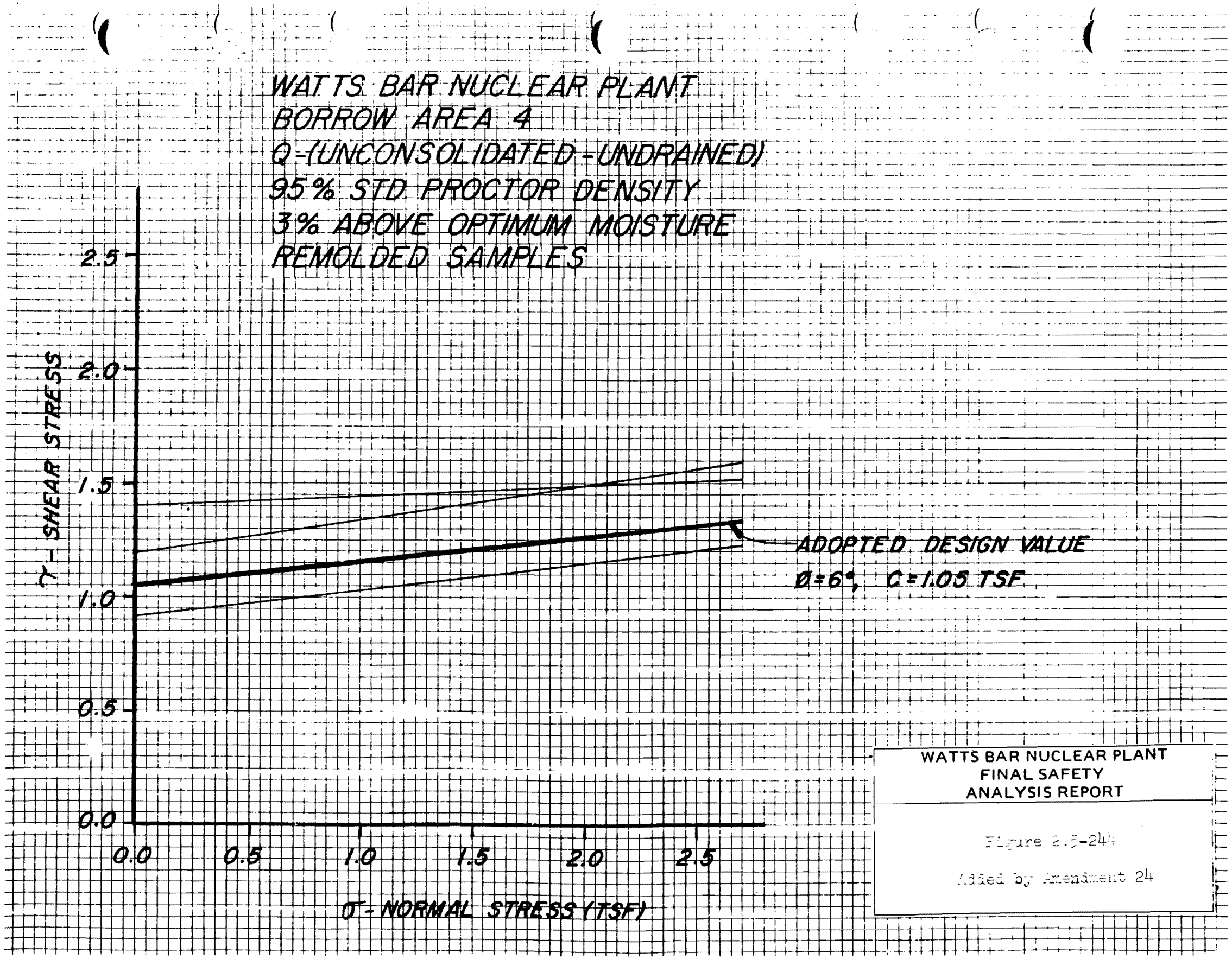


Figure 2.5-244 Borrow Area 4 Q - (Unconsolidated - Undrained) 95% STD Proctor Density 3% Above Optimum Moisture Remolded Samples

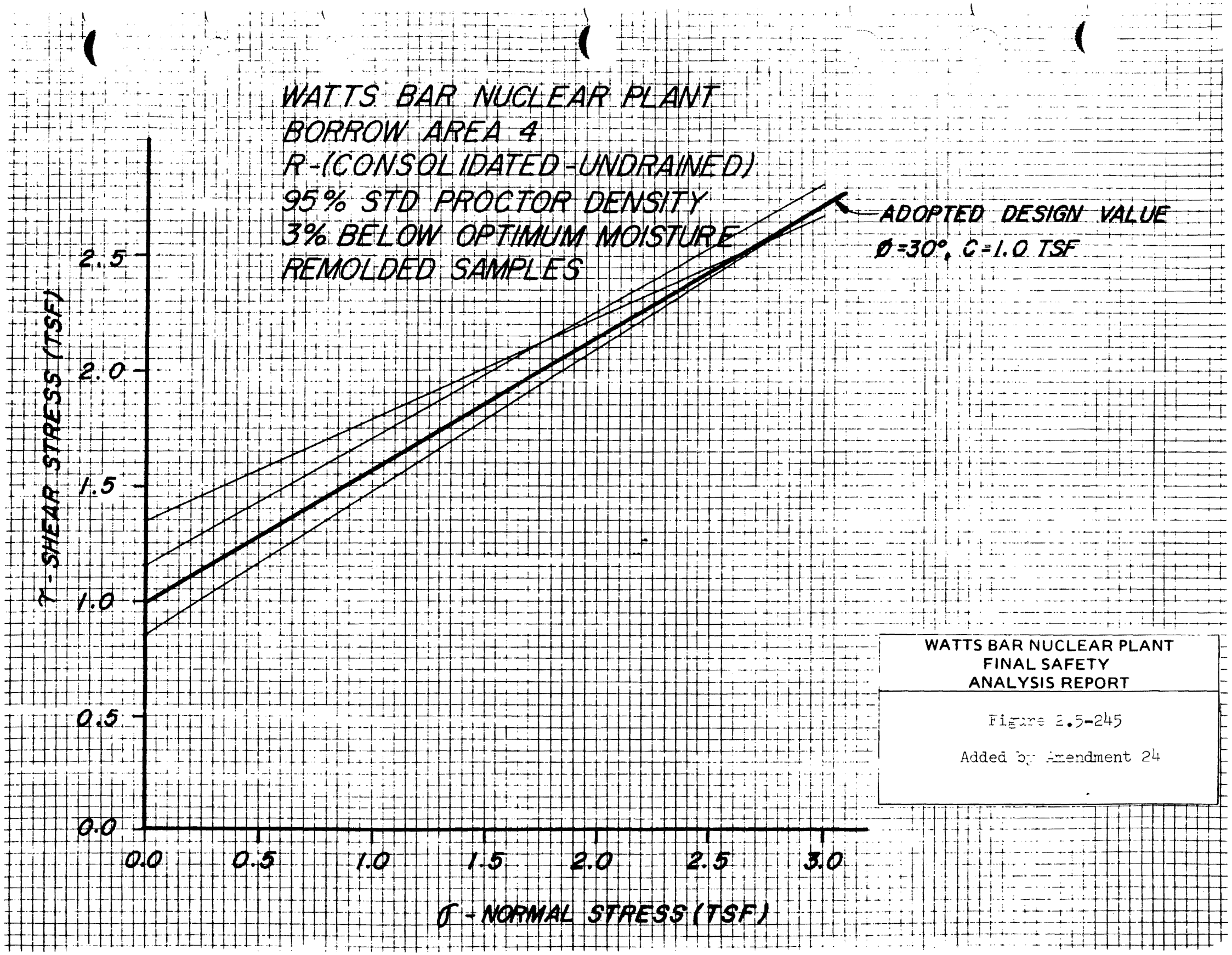


Figure 2.5-245 Watts Bar Nuclear Plant Borrow Area 4R - (Consolidate Undrained) 95% STD Proctor Density 3% Below Optimum Moisture Remolded Samples

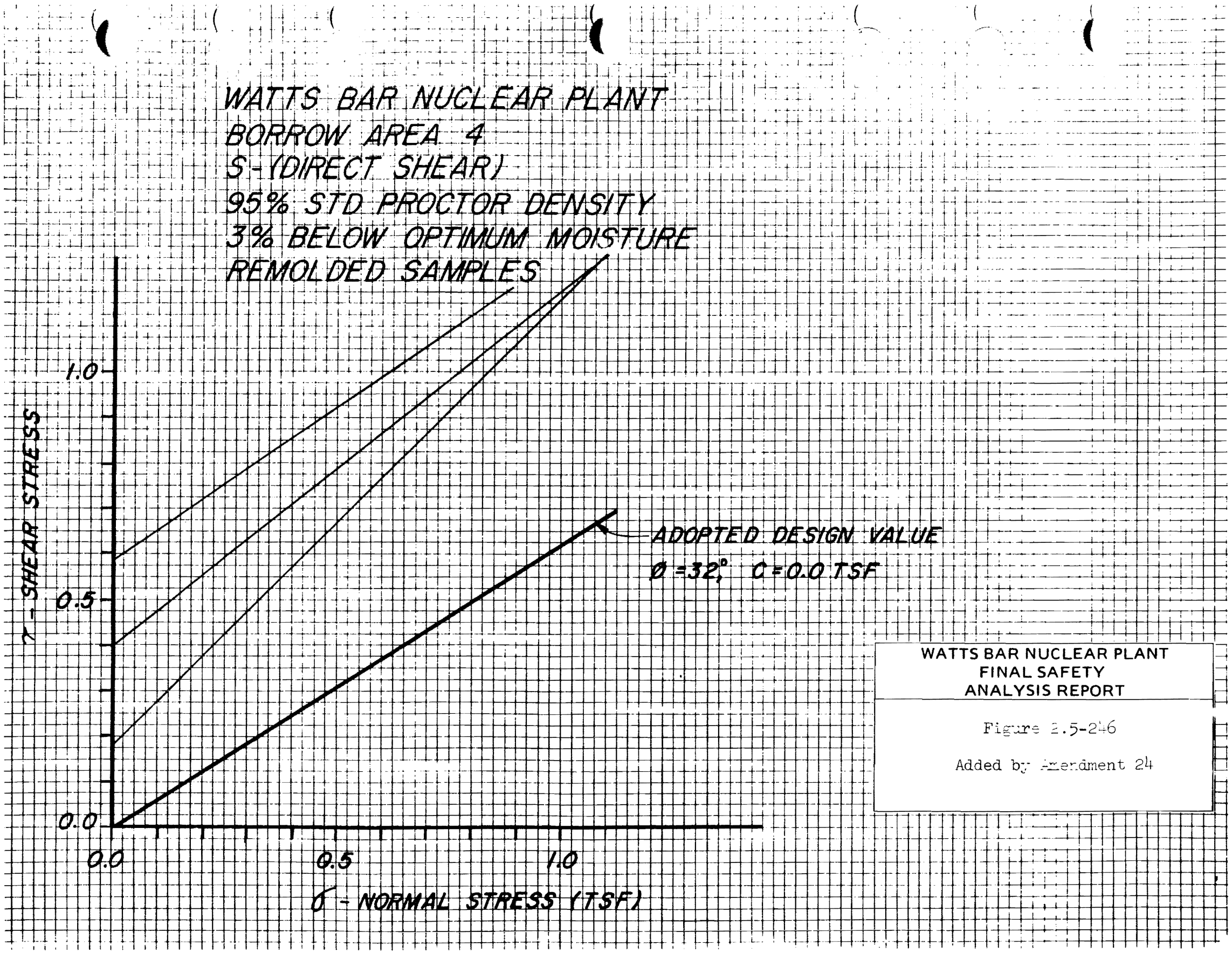


Figure 2.5-246 Borrow Area 4 S -(Direct Shear) 95% STD Proctor Density 3% Below Optimum Moisture Remolded Samples

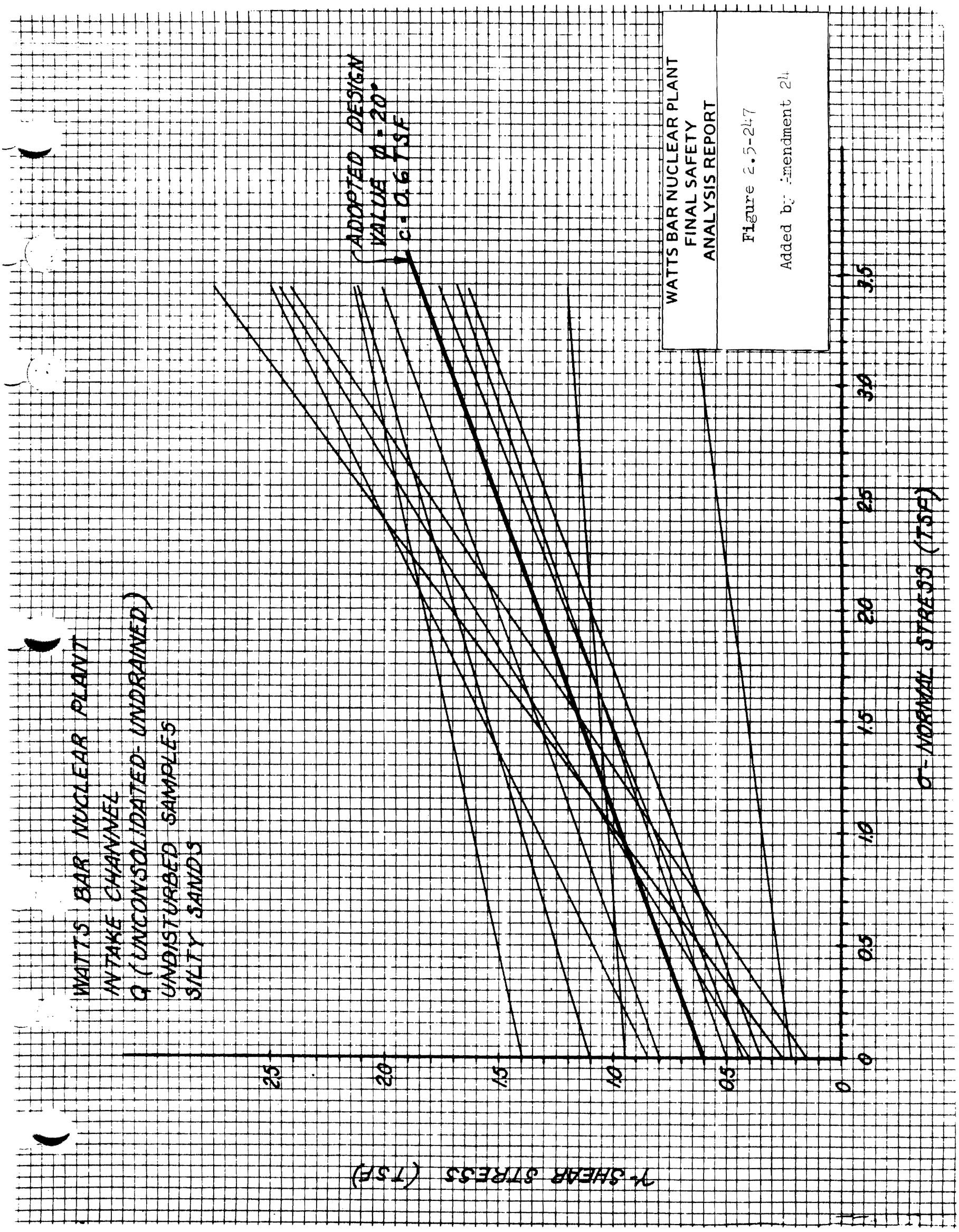


Figure 2.5-247 Intake Channel Q - (Unconsolidated - Undrained - Undisturbed Samples) Silty Sands

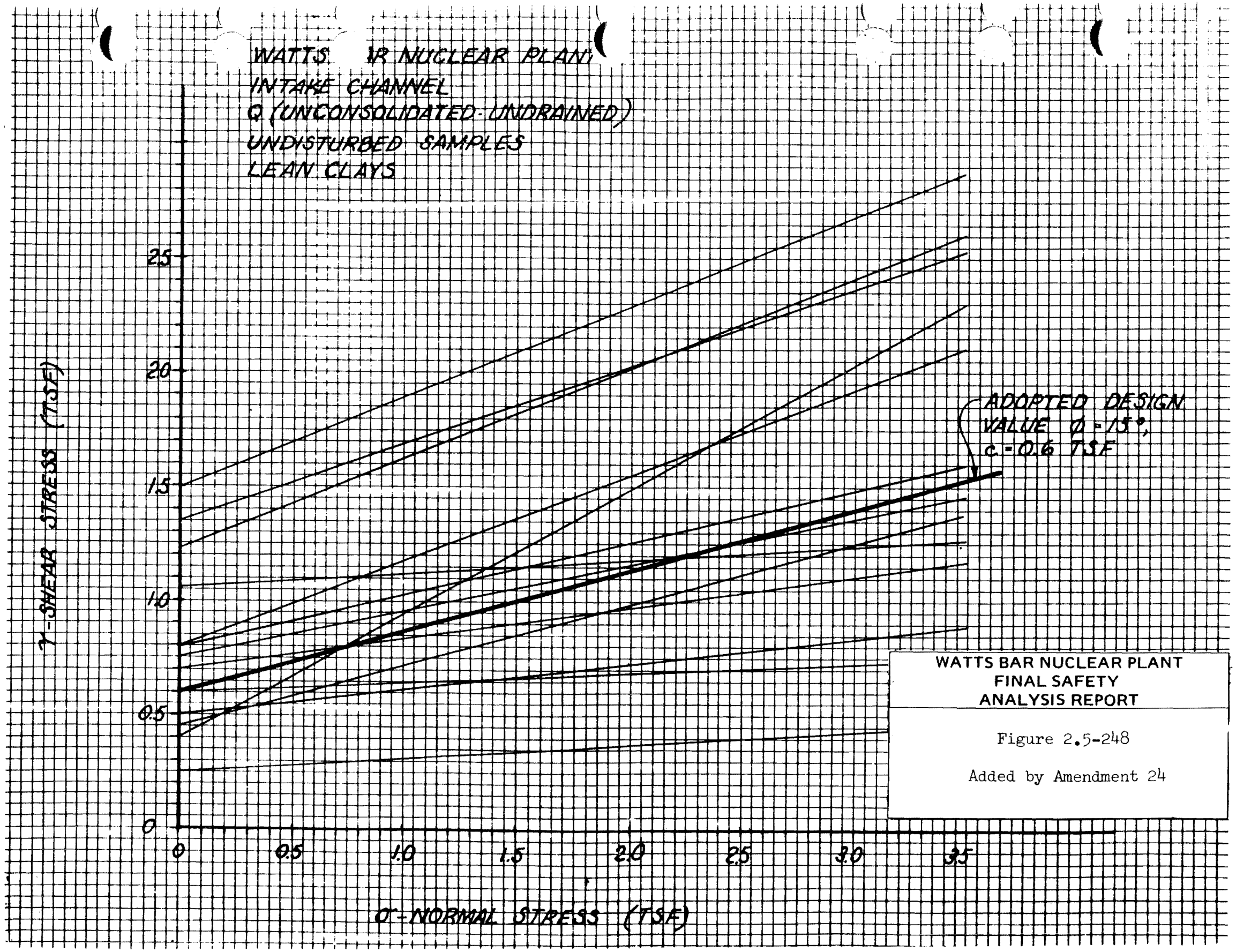
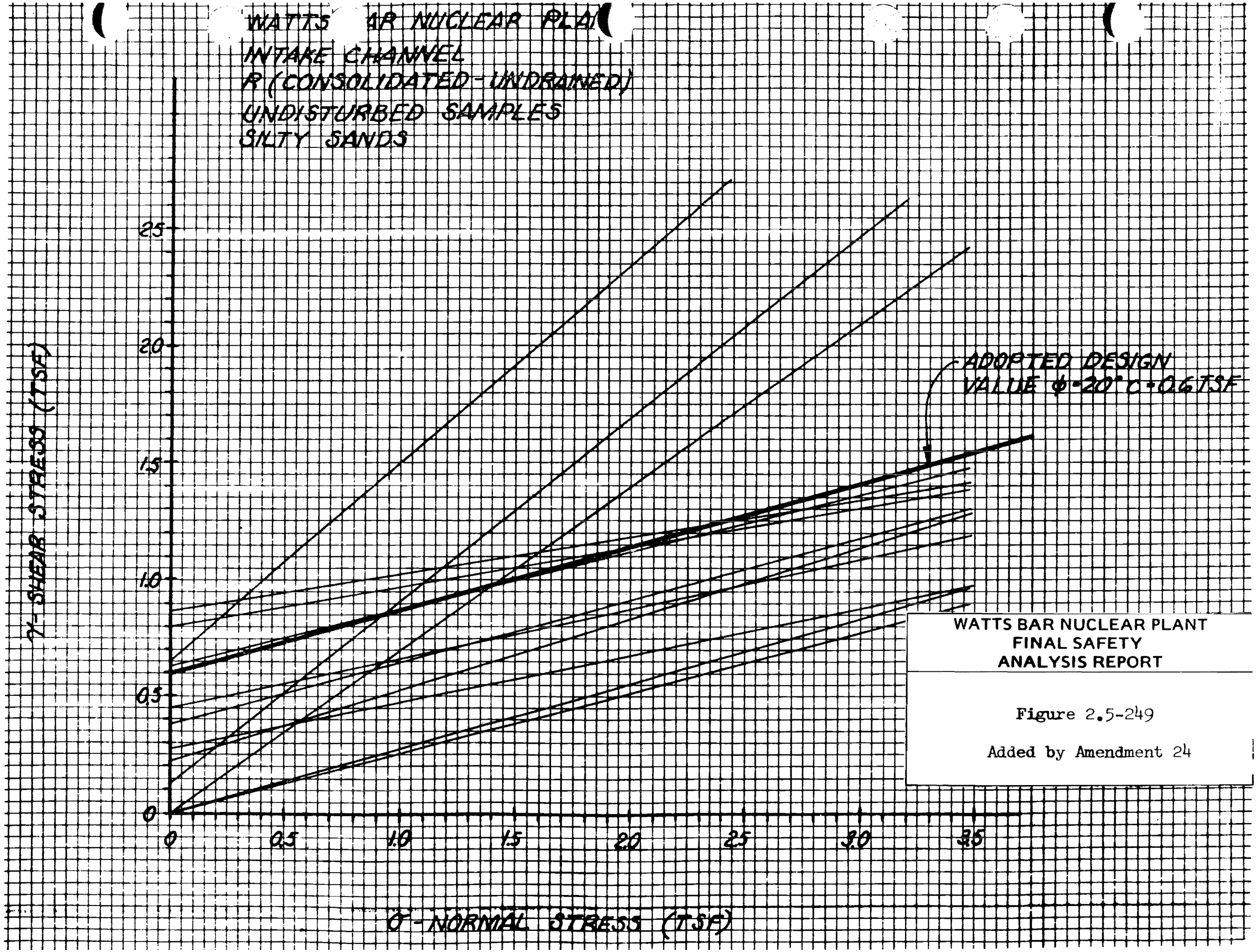


Figure 2.5-248 Intake Channel Q - (Unconsolidated-Undrained) Undisturded Samples Lean Clays



WATTS BAR NUCLEAR PLANT
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Figure 2.5-249

Added by Amendment 24

Figure 2.5-249 Intake Channel R - (Consolidated-Undrained) Undisturbed Samples Silty Sands

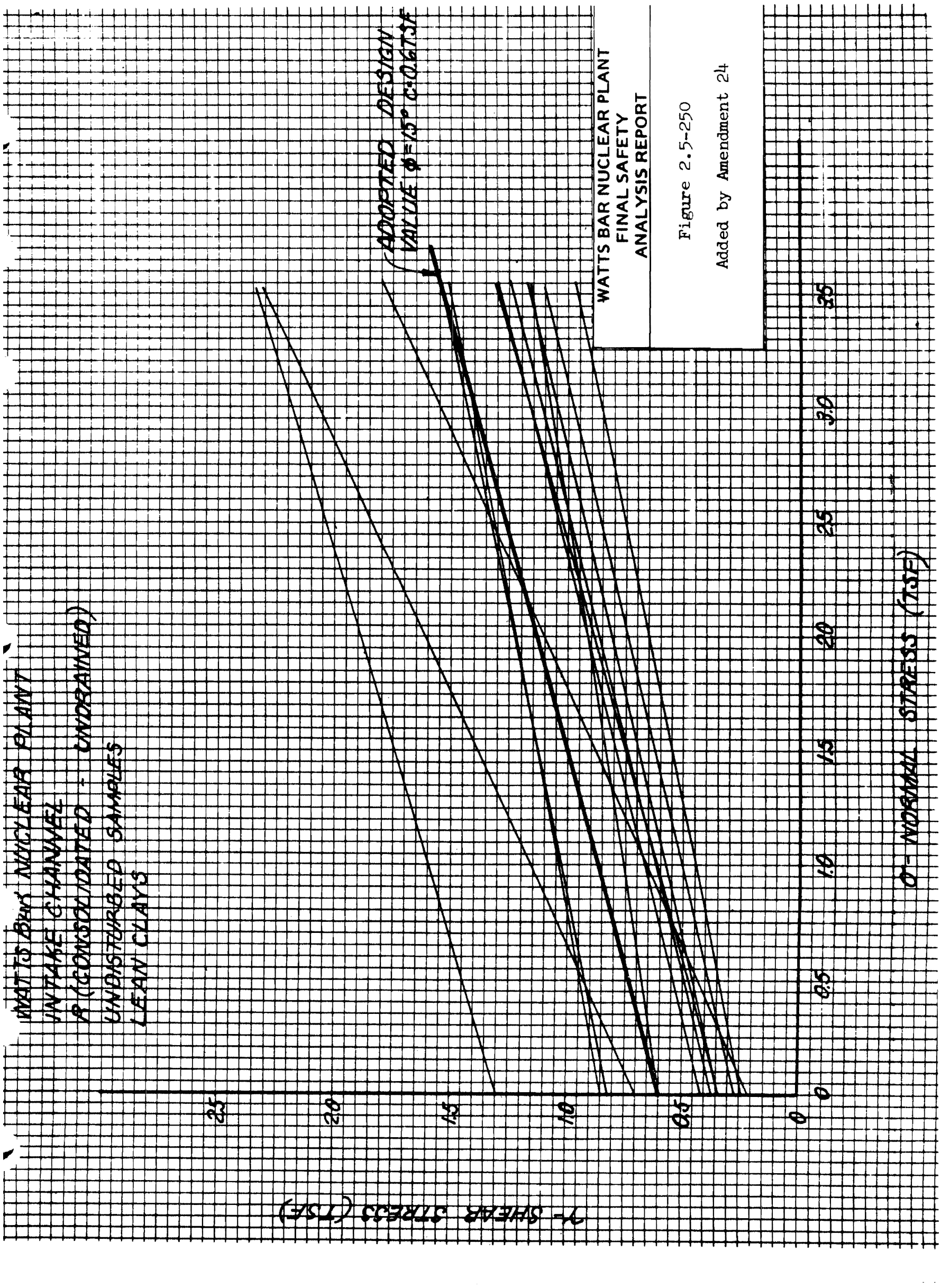


Figure 2.5-250

Added by Amendment 24

Figure 2.5-250 Intake Channel R - (Consolidated-Undrained) - Undisturbed Samples Lean Clays

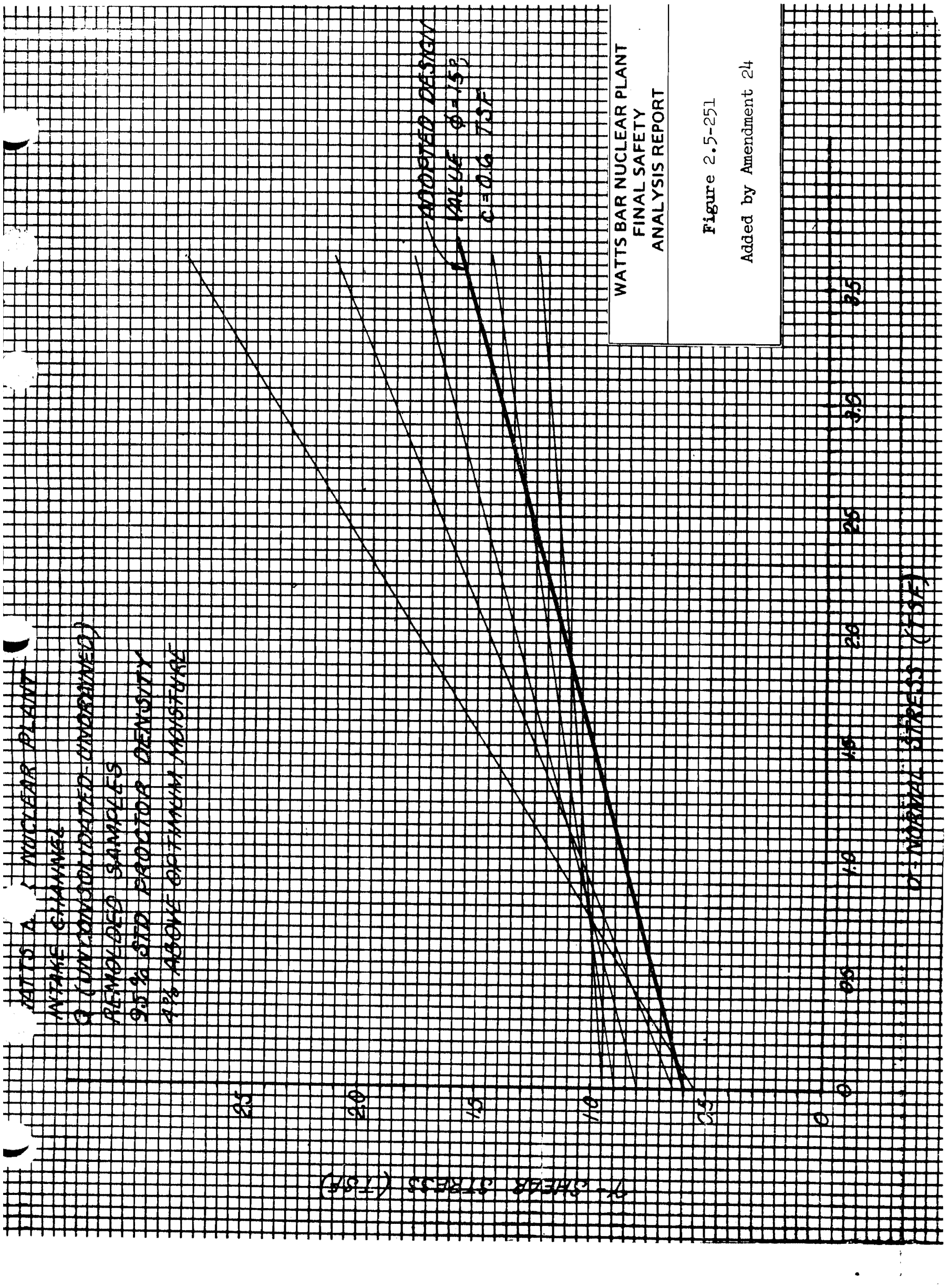
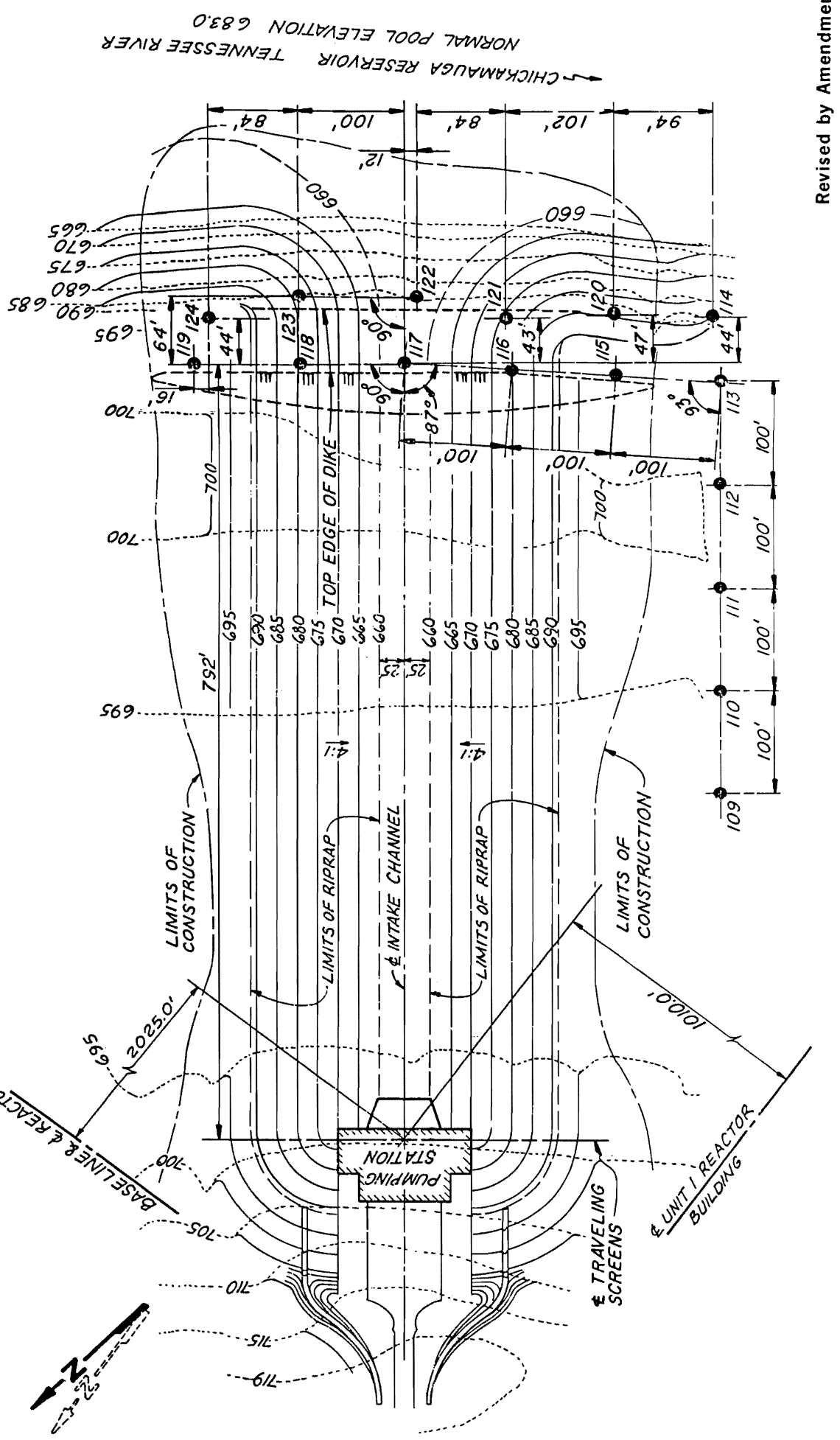


Figure 2.5-251

Added by Amendment 24

Figure 2.5-251 Intake Channel Q - (Unconsolidated Undrained) Remolded Samples 95% SDT Proctor Density 4% Above Optimum Moisture



Revised by Amendment 44

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
SITE STUDIES INTAKE CHANNEL ADDITIONAL SOILS INVESTIGATION TVA DWG NO. 10B333 R1 FIGURE 2.5-252

Figure 2.5-252 Site Studies Intake Channel Additional Soils Investigation

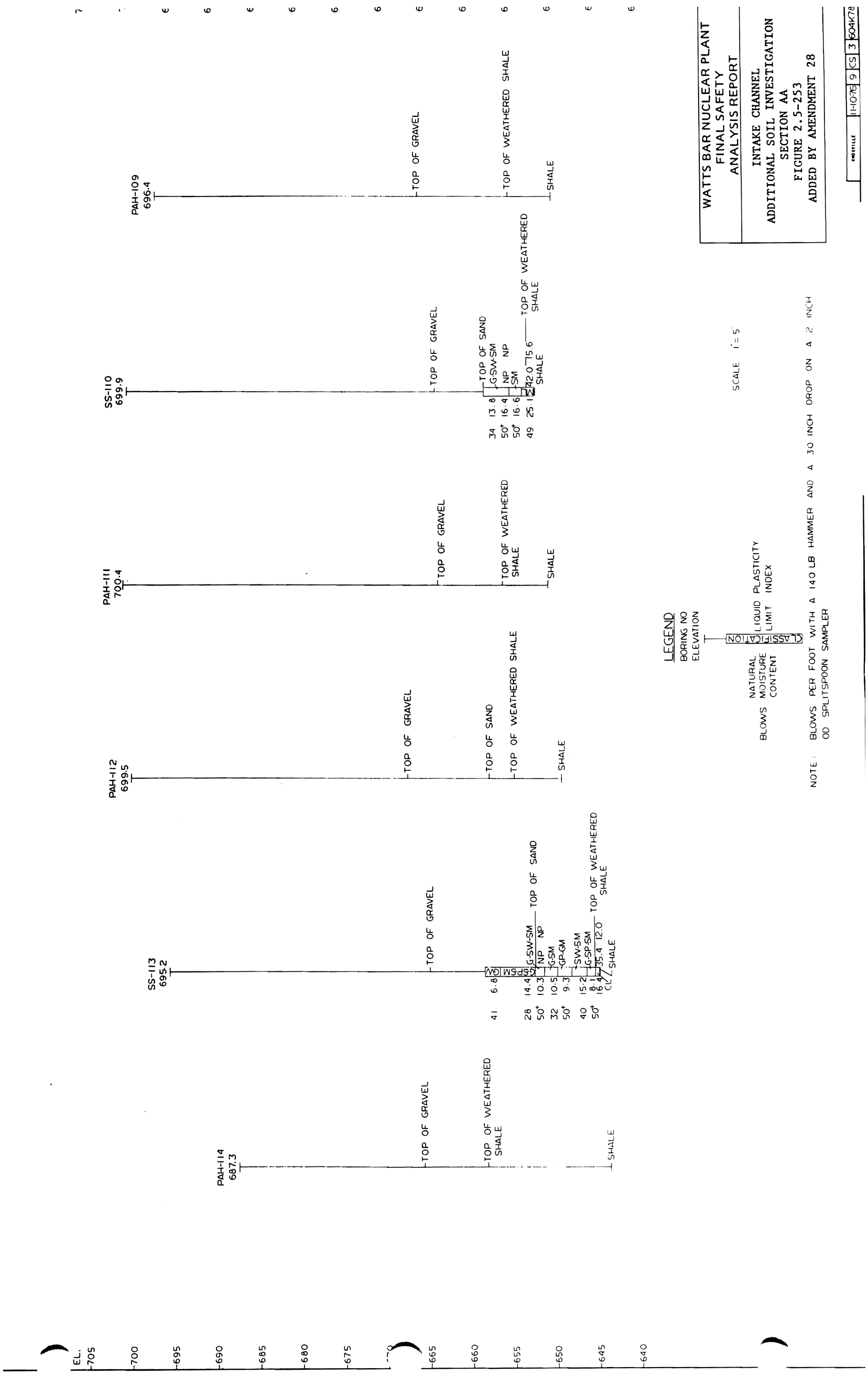
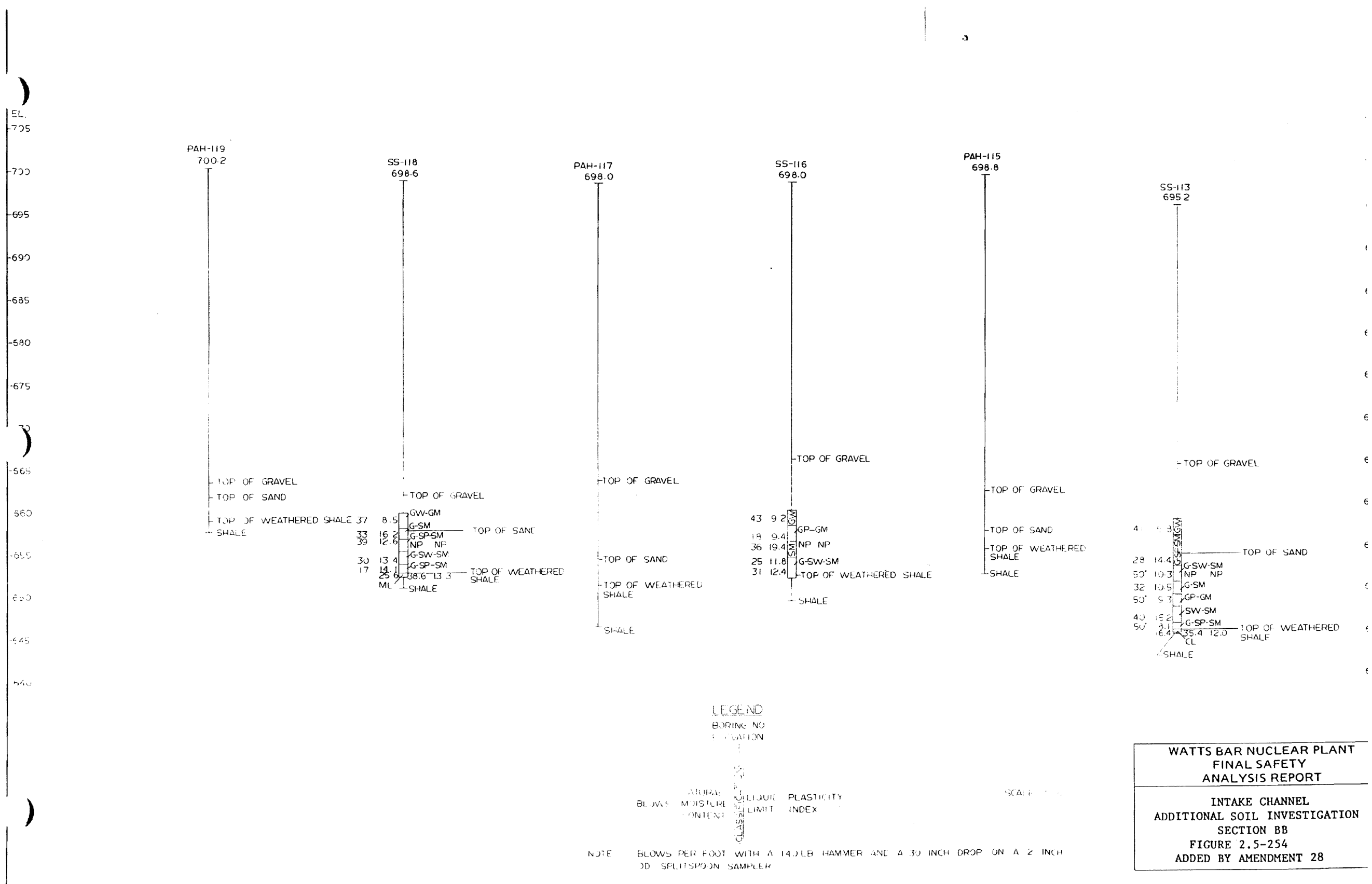


Figure 2.5-253 Intake Channel Additional Soil Investigation Section AA



WATTS BAR NUCLEAR PLANT
FINAL SAFETY
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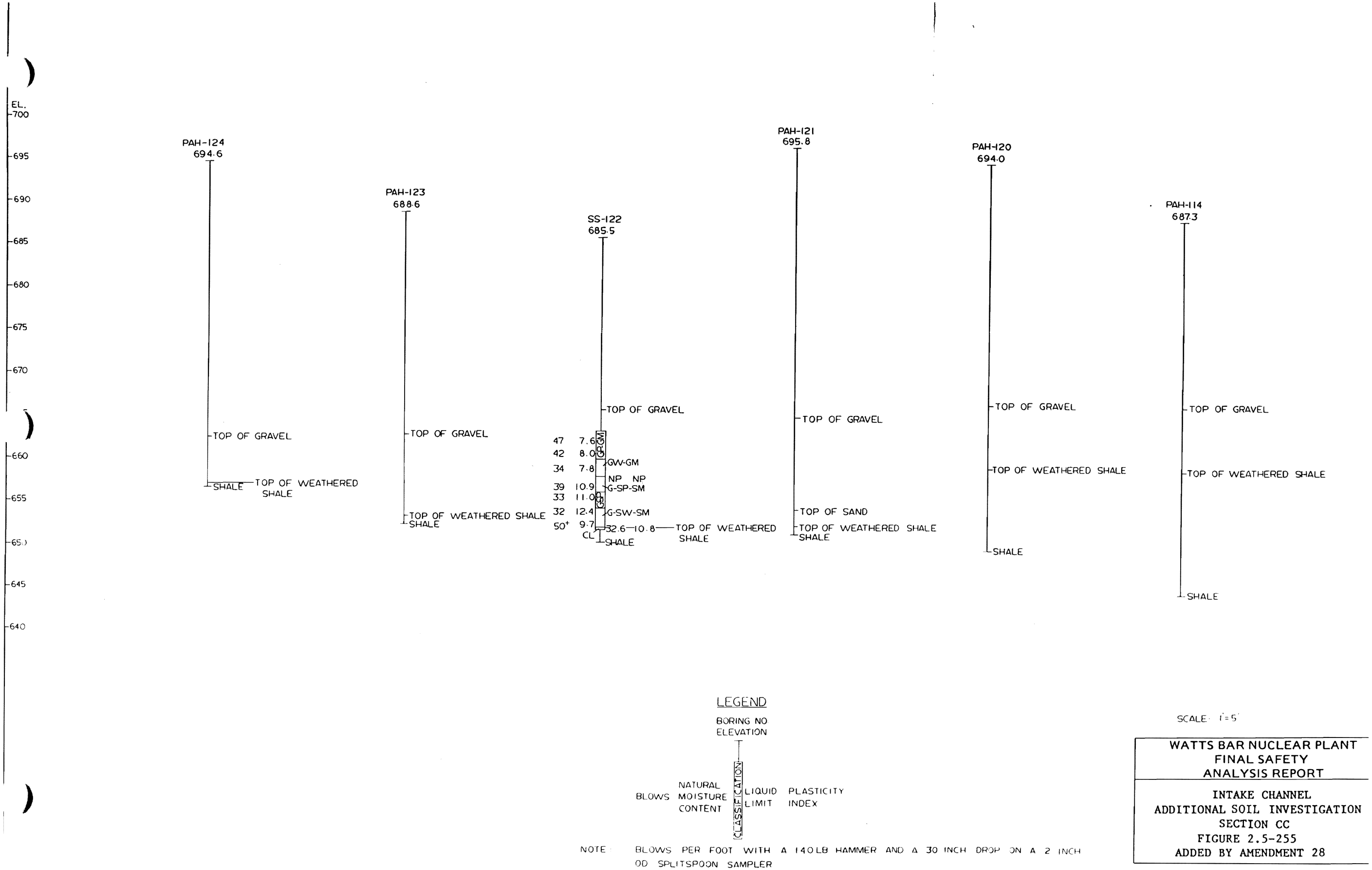
INTAKE CHANNEL
ADDITIONAL SOIL INVESTIGATION
SECTION BB
FIGURE 2.5-254
ADDED BY AMENDMENT 28

ENGINEERS	11-10-76	9	CS	3	604K78

Figure 2.5-254 Intake Channel Additional Soil Investigation Section BB



WATTS BAR NUCLEAR PLANT
FINAL SAFETY
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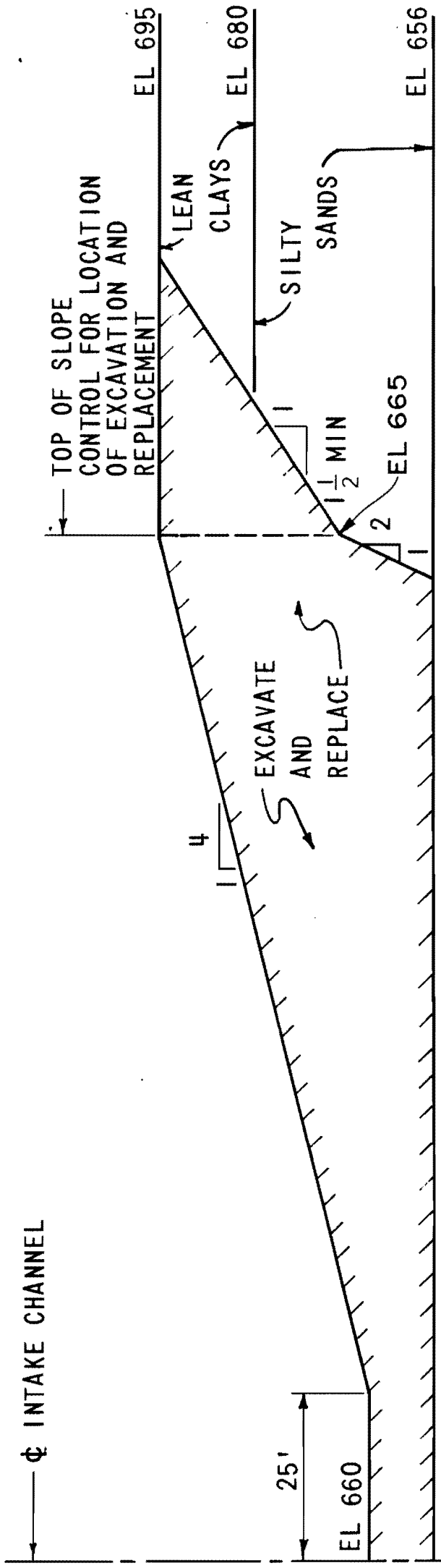
INTAKE CHANNEL
ADDITIONAL SOIL INVESTIGATION
SECTION CC
FIGURE 2.5-255
ADDED BY AMENDMENT 28

Figure 2.5-255 Intake Channel Additional Soil Investigation Section CC



INTAKE CHANNEL - LATERAL EXCAVATION AND REPLACEMENT
DOWNSTREAM SIDE OF INTAKE CHANNEL WITH BEDROCK AT 656

FIGURE 2.5-256
ADDED BY AMENDMENT 28

Figure 2.5-256 Intake Channel - Lateral Excavation and Replacement Downstream Side of Intake Channel with Bedrock at 656

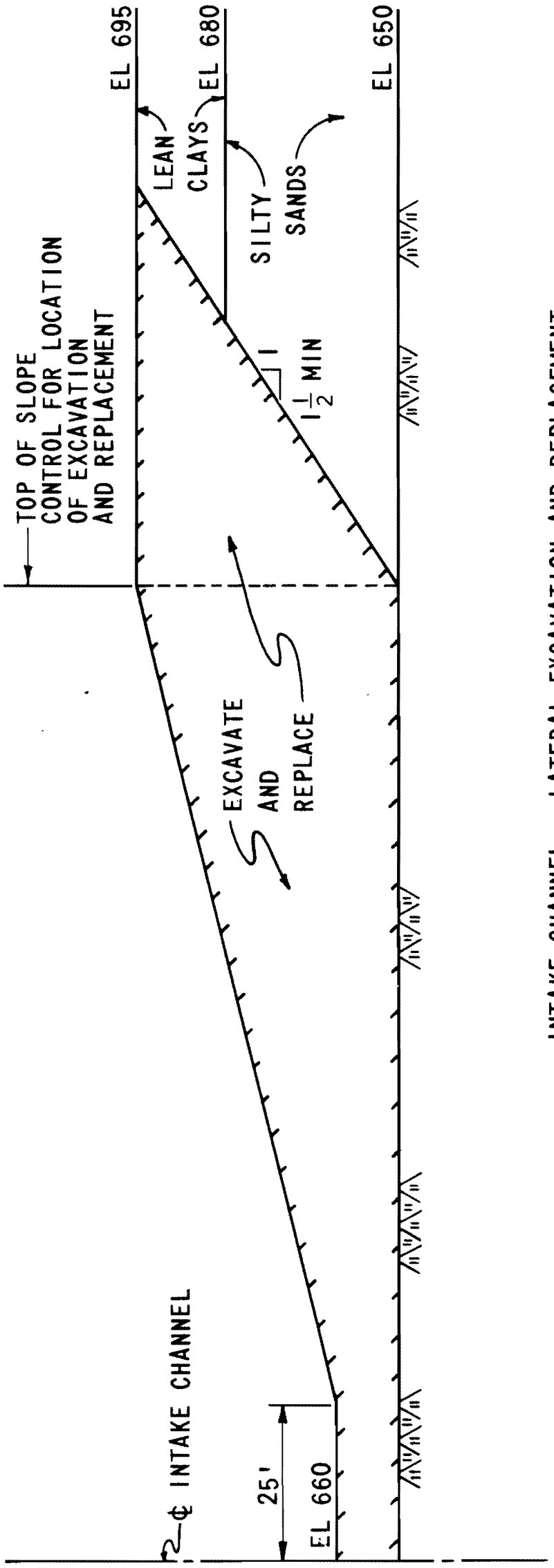
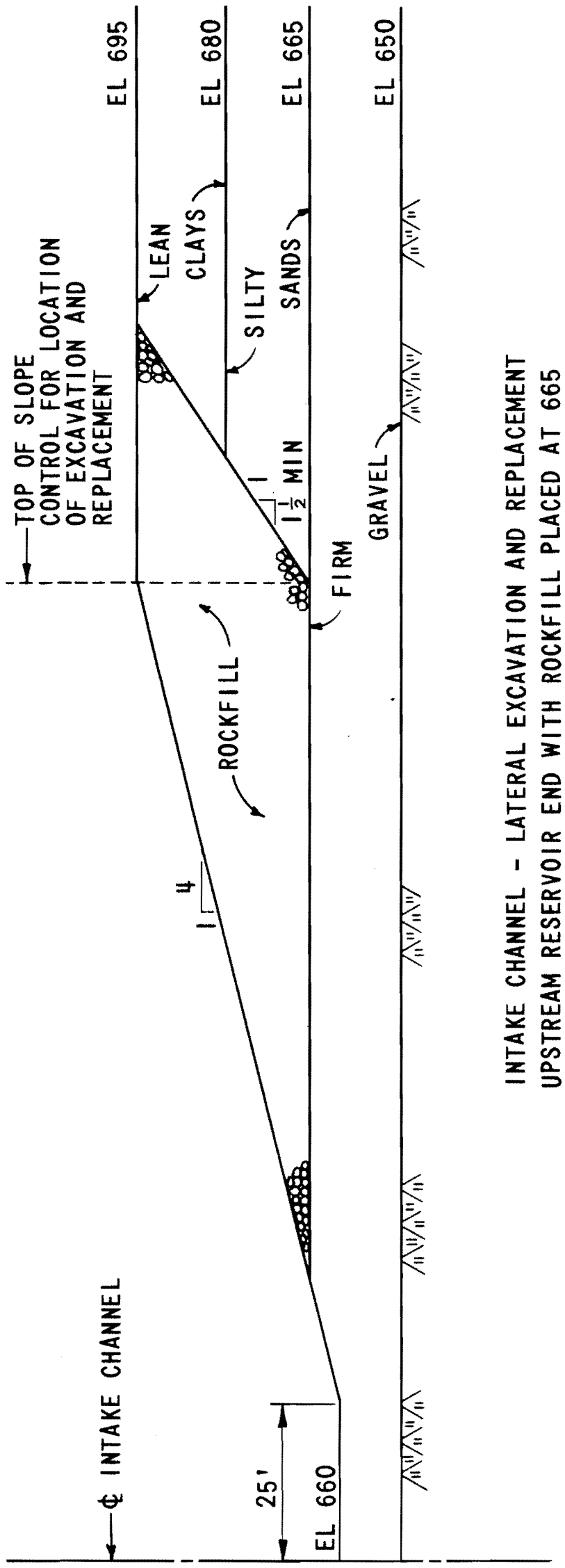


FIGURE 2.5-257
ADDED BY AMENDMENT 28

INTAKE CHANNEL - LATERAL EXCAVATION AND REPLACEMENT
DOWNSTREAM SIDE OF INTAKE CHANNEL WITH BEDROCK AT 650

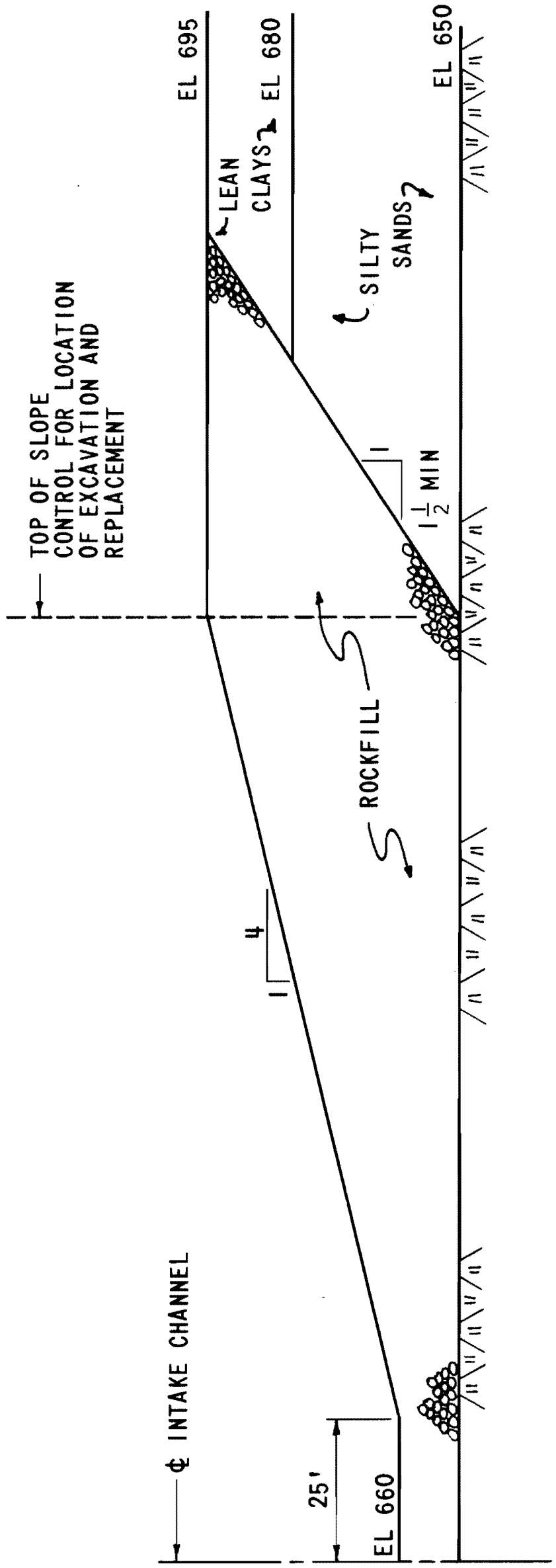
Figure 2.5-257 Intake Channel - Lateral Excavation and Replacement Downstream Side of Intake Channel with Bedrock at 650



INTAKE CHANNEL - LATERAL EXCAVATION AND REPLACEMENT
UPSTREAM RESERVOIR END WITH ROCKFILL PLACED AT 665

FIGURE 2.5-258
ADDED BY AMENDMENT 28

Figure 2.5-258 Intake Channel - Lateral Excavation and Replacement Upstream Reservoir End with Rockfill Placed at 665



INTAKE CHANNEL - LATERAL EXCAVATION AND REPLACEMENT
DOWNSTREAM RESERVOIR END WITH ROCKFILL PLACED AT EL 650

FIGURE 2.5-259
ADDED BY AMENDMENT 28

Figure 2.5-259 Intake Channel - Lateral Excavation and Replacement Downstream Reservoir End With Rockfill Placed at El. 650

TENNESSEE VALLEY AUTHORITY
SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SS, PA, HA, TP BORING)

Sheet 1 Of 1

Project WATTS BAR N. P. Feature BORROW AREA 7

Boring PAH-1 Station 15+53S Range 43+82W Surface El 699.1

Date Drilled 10-6-80 To 10-6-80 Prepared By JLB Checked By [illegible]

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0			ML	23.4	42	14		
	695			21.2	33	4		
5			CL	23.1	35	13		
	690							
10				24.2	30	9		
	685							▽ DISCONTINUED
15								
	680							
20								
25								
30								
35								

Added by Amendment 44

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE-BORROW AREA 7-BORING PAH-1
FIGURE 2.5-260

Figure 2.5-260 Soil Profile - Borrow Area 7, Boring PAH-1

TENNESSEE VALLEY AUTHORITY
SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SS, PA, HA, TP BORING)

Shee 1 Of 1

Project WATTS BAR N. P. Feature BORROW AREA 7

Boring PAH-2 Station 15+92S Range 45+78W Surface El 693.3

Date Drilled 10-6-80 To 10-6-80 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0			CL-ML	20.4	41	15		
	695							
5				20.8	33	12		
	690		ML					
10				26.3	34	13		
	685							DISCONTINUED
15								
	680							
20								
25								
30								
35								

Added by Amendment 44

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE-BORROW AREA 7-BORING PAH-2
FIGURE 2.5 261

Figure 2.5-261 Soil Profile - Borrow Area 7, Boring PAH-2

TENNESSEE VALLEY AUTHORITY
SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SS, PA, HA, TP BORING)

Sheet 1 Of 1

Project WATTS BAR N. P. Feature BORROW AREA 7

Boring PAH-3 Station 16+31S Range 47+74W Surface El 695.2

Date Drilled 10-7-80 To 10-7-80 Prepared By JLB Checked By [illegible]

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0	695		CL-ML	21.9	36	12		
				23.2	32	10		
5	690		CL	25.5	31	10		
10	685			26.2	32	12		
								DISCONTINUED
15	680							
20								
25								
30								
35								

Added by Amendment 44

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
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SOIL PROFILE-BORROW AREA 7-BORING PAH-3
FIGURE 2.5-262

Figure 2.5-262 Soil Profile - Borrow Area 7, Boring PAH-3

TENNESSEE VALLEY AUTHORITY
SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SS, PA, HA, TP BORING)

Sheet 1 Of 1

Project WATTS BAR N. P. Feature BORROW AREA 7

Boring PAH-4 Station 16+71S Range 49+70 Surface El 695.9

Date Drilled 10-7-80 To 10-7-80 Prepared By JLB Checked By [illegible]

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0	695		CL-ML	21.7	40	15		
5	690			22.7	38	13		
10	685		ML	27.7	43	13		
15	680		CL	25 1	45	25		
20	675			24.4	44	21		
25								
30								
35								

DISCONTINUED

Added by Amendment 44

WATTS BAR NUCLEAR PLANT
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SOIL PROFILE-BORROW AREA 7-BORING PAH-4
FIGURE 2.5-263

Figure 2.5-263 Soil Profile - Borrow Area 7, Boring PAH-4

TENNESSEE VALLEY AUTHORITY
SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SS, PA, HA, TP BORING)

Sheet 1 Of 1

Project WATTS BAR N. P. Feature BORROW AREA 7

Boring PAH-5 Station 17+51S Range 43+58W Surface El 700.-

Date Drilled 10-9-80 To 10-9-80 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0	700		ML	24.2	42	11		
5	695		CL-ML	20.7	28	5		
10	690			24.9	34	10		▽ NO RECOVERY-WET MATERIAL
15	685							DISCONTINUED
20								
25								
30								
35								

Added by Amendment 44

WATTS BAR NUCLEAR PLANT
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ANALYSIS REPORT

SOIL PROFILE-BORROW AREA 7-BORING PAH-5
FIGURE 2.5-264

Figure 2.5-264 Soil Profile - Borrow Area 7, Boring PAH-5

TENNESSEE VALLEY AUTHORITY
SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SS, PA, HA, TP BORING)

Sheet 1 Of 1

Project WATTS BAR N. P. Feature BORROW AREA 7

Boring PAH-6 Station 17+915 Range 45+54W Surface El 693.

Date Drilled 10-7-80 To 10-7-80 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0			ML	21.1	32	7		
	695							
5			CL	25.6	31	9		
	690							
10			CL-ML	24.1	27	6		
	685							DISCONTINUED
15								
	680							
20								
25								
30								
35								

Added by Amendment 44

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
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SOIL PROFILE-BORROW AREA 7-BORING PAH-6
FIGURE 2.5 265

Figure 2.5-265 Soil Profile - Borrow Area 7, Boring PAH-6

TENNESSEE VALLEY AUTHORITY
SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SS, PA, HA, TP BORING)

Sheet 1 Of 1

Project WATTS BAR N. P. Feature BORROW AREA 7

Boring PAH-7 Station 18+30S Range 47+50W Surface El 697.1

Date Drilled 10-7-80 To 10-7-80 Prepared By JLB Checked By WF

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0								
	695		CL-ML	21.9	49	18		
5				23.1	40	15		
	690							
10			CL	25.7	34	12		
	685							
								NO RECOVERY - WET MATERIAL
15								
	680							
								DISCONTINUED
20								
25								
30								
35								

Added by Amendment 44

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
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SOIL PROFILE-BORROW AREA 7-BORING PAH-7
FIGURE 2.5-266

Figure 2.5-266 Soil Profile - Borrow Area 7, Boring PAH-7

TENNESSEE VALLEY AUTHORITY
SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SS, PA, HA, TP BORING)

Sheet 1 Of 1

Project WATTS BAR N. P Feature BORROW AREA 7 **

Boring PAH-8 Station 18+69S Range 49+46W Surface El 697.1

Date Drilled 10-7-80 To 10-7-80 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0	695		CL	22.7	43	18		
5	690		CL-ML	23.6	38	13		
10	685		MH	26.9	53	23		
15	680		CL	24.7	42	19		
20	675							DISCONTINUED
25								
30								
35								

Added by Amendment 44

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE-BORROW AREA 7-BORING PAH-8
FIGURE 2.5-267

Figure 2.5-267 Soil Profile - Borrow Area 7, Boring PAH-8

WATTS BAR NUCLEAR PLANT
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ANALYSIS REPORT

SOIL PROFILE
(SS, PA, HA, TP BORING)
FIGURE 2.5-268
SHEET 1 OF 1

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SO ... NG)

Sheet 1 Of 1

Project WATTS BAR N. P. Feature BORROW AREA 7

Boring PAH-9 Station 19 + 89S Range 45 + 30W Surface El 699.0

Date Drilled 10-9-80 To 10-9-80 Prepared By JLB Checked By WJH

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0			CL	21.6	39	16		
	695							
5			CL-ML	23.6	41	16		
	690							
10			CL	22.5	39	16		
	685			24.9	33	12		
15								DISCONTINUED
	680							
20								
25								
30								
35								

APR 13 1989

Added by Amendment 62

Figure 2.5-268 Soil Profile - Borrow Area 7, Boring PAH-9 (SS, PA, HA, TP, Boring)

TENNESSEE VALLEY AUTHORITY
SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SS, PA, HA, TP BORING)

Sheet 1 Of 1

Project WATTS BAR N. P. Feature BORROW AREA 7

Boring PAH-10 Station 20+28S Range 47+26W Surface El 698.2

Date Drilled 10-9-80 To 10-9-80 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0			CL	25.2	47	22		
	695							
5			CL ML	25.1	46	18		
	690							
10			CH MH	26.5	52	23		
	685							
15			CL	25.7	48	23		
	680							DISCONTINUED
20								
	675							
25								
30								
35								

Added by Amendment 44

WATTS BAR NUCLEAR PLANT
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SOIL PROFILE-BORROW AREA 7-BORING PAH-10
FIGURE 2.5-269

Figure 2.5-269 Soil Profile - Borrow Area 7, Boring PAH-10

TENNESSEE VALLEY AUTHORITY
SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SS, PA, HA, TP BORING)

Sheet 1 Of 1

Project WATTS BAR N. P. Feature BORROW AREA 7

Boring PAH-11 Station 20+68S Range 49+26W Surface El 696.6

Date Drilled 10-9-80 To 10-9-80 Prepared By JLB Checked By

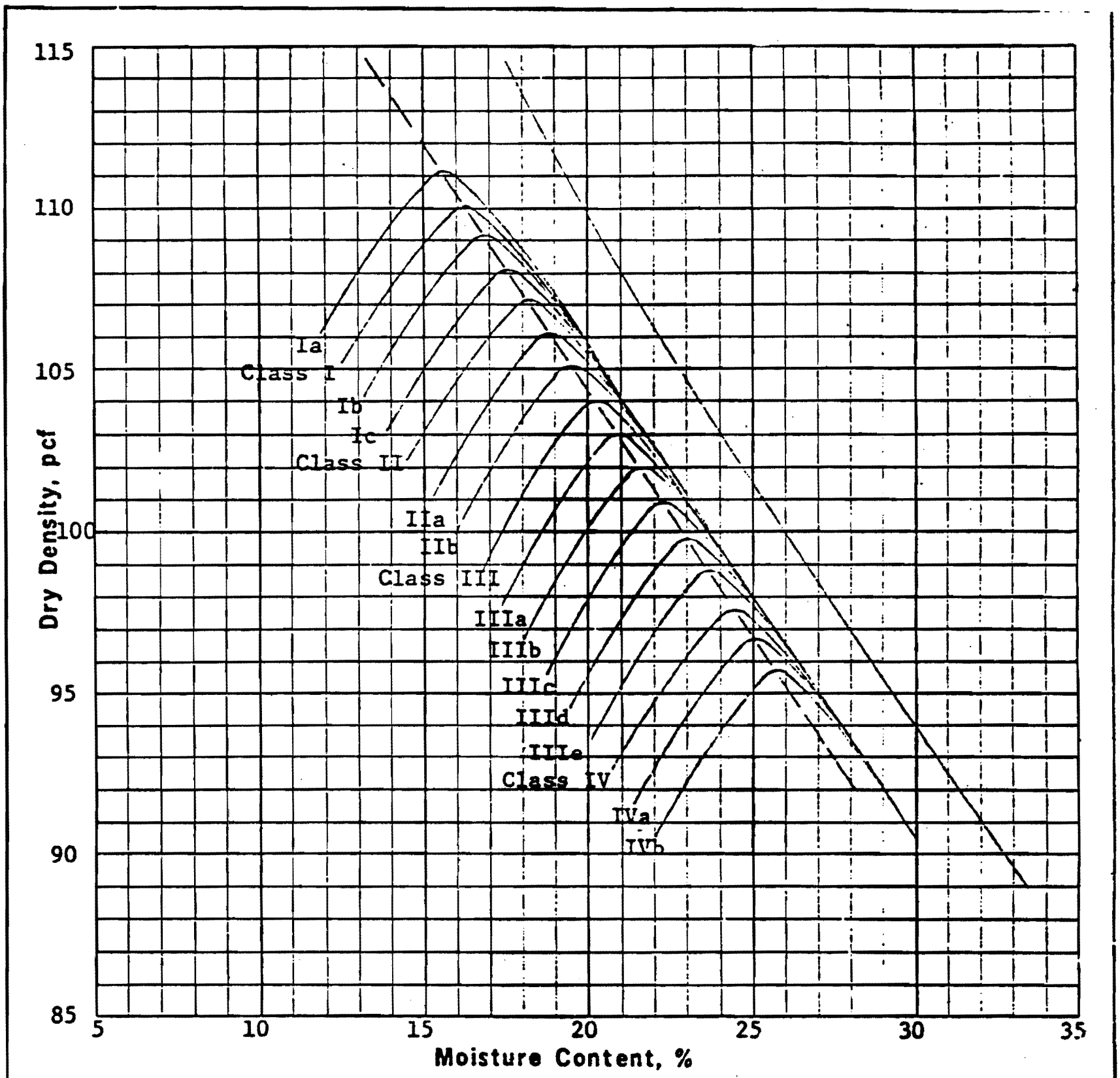
Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0	695		CL	21.0	49	23		
5				21.2	44	19		
	690							
				25.2	46	22		
10	685		CH-MH	33.7	54	25		
15	680							DISCONTINUED
20	675							
25								
30								
35								

Added by Amendment 44

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE-BORROW AREA 7-BORING PAH-11
FIGURE 2.5-270

Figure 2.5-270 Soil Profile - Borrow Area 7, Boring PAH-11



Soil Class	Gravel %	Sand %	Silt %	Clay %	Specific Gravity	LL %	PI %	Optimum Moisture, %	Maximum Density, pcf
I-CL	0	32	39	29	2.75	34	11	16.2	110.1
II-CL	0	34	35	31	2.72	34	12	18.2	107.2
III-CL	0	19	39	42	2.74	43	18	20.2	104.0
IV-CH-MH	0	6	42	52	2.74	54	25	24.4	97.7

Added by Amendment 44

Plus No. 4 Specific Gravity, S S D	
Plus No. 4 Absorption, %	

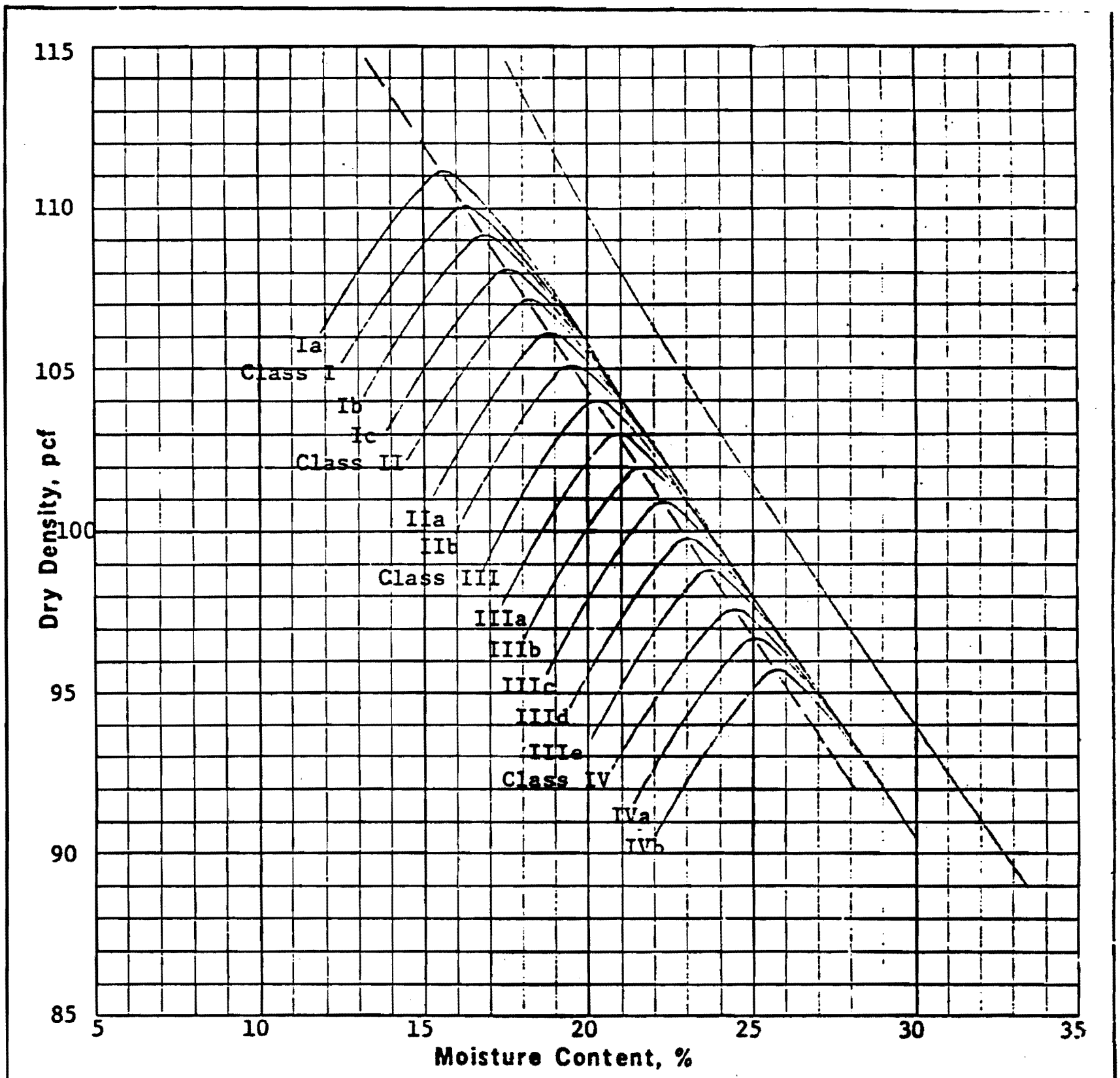
Remarks:

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

COMPACTION TEST (FAMILY OF CURVES)
BORROW AREA 7
FIGURE 2.5-271

TVA 10201 (CONST-12-76) Tested by: CHF Reviewed by: CEF

Figure 2.5-271 Compaction Test (Family of Curves) - Borrow Area 7



Soil Class	Gravel %	Sand %	Silt %	Clay %	Specific Gravity	LL %	PI %	Optimum Moisture, %	Maximum Density, pcf
I-CL	0	32	39	29	2.75	34	11	16.2	110.1
II-CL	0	34	35	31	2.72	34	12	18.2	107.2
III-CL	0	19	39	42	2.74	43	18	20.2	104.0
IV-CH-MH	0	6	42	52	2.74	54	25	24.4	97.7

Added by Amendment 44

Plus No. 4 Specific Gravity, S S D	
Plus No. 4 Absorption, %	

Remarks:

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

COMPACTION TEST (FAMILY OF CURVES)
BORROW AREA 7
FIGURE 2.5-271

TVA 10201 (CONST-12-76) Tested by: CHF Reviewed by: CEF

Figure 2.5-272 Moisture - Penetration Test - Borrow Area 7

Security-Related Information - Withheld Under 10CFR2.390

Figure 2.5-273 Yard Category I ERCW Piping and Conduits Plan

SOIL PROFILE (SS, PA, HA, TP BORING)

SHEET 1 OF 1

PROJECT WATTS BAR N. P. FEATURE 1E CONDUIT BANKS

BORING SS-171 STATION 760:1E RANGE 1276.9S SURFACE EL 721.2

DATE DRILLED 11-25-81 TO 12-1-81 PREPARED BY JLB CHECKED BY HPM

DEPTH	EL	SPT (N)	LOG	W	LL	PI	REMARKS
1"=5'							
0	720						1032 - GRAVEL FILL
5	715						
10	710	20	SM-SC	24.6	40	14	ALLUVIUM
		11		26.4	42	15	
		6	SM	26.7			
15	705	9	SP-SM	26.5	NP	NP	
		9		24.1			
		12		30.9			
20	700	50	SM	19.7	37	11	WEATHERED SHALE
		50/4"	ML	23.4	NP	NP	
25	695						BEDROCK
30							
35							

Added by Amendment 49

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
(SS, PA, HA, TP BORING)
1E CONDUIT BANKS
FIGURE 2.5-274

Figure 2.5-274 Soil Profile (SS, PA, HA, TP, Boring) 1E Conduit Banks

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SS, PA, HA, TP BORING)

SHEET 1 OF _

PROJECT WATTS BAR N. P. FEATURE 1 E CONDUIT BANKS

BORING SS-172 STATION 672.25E RANGE 1227.75S SURFACE EL 728.0

DATE DRILLED 12-7-81 TO 12-7-81 PREPARED BY JLB CHECKED BY HPM

DEPTH	EL	SPT (N)	LOG	W	LL	PI	REMARKS
1"=5'							
0							1032-GRAVEL FILL
	725	17	CL	19.4	34	15	
5		14		20.9			BACKFILL
		8		23.3	36	16	
	720	15		21.4	41	18	
10		17		19.9	36	13	
	715	34		19.2	38	15	
15		33	CL-ML	23.5	48	21	ALLUVIUM
		29	CL	20.6	39	17	
	710	15		26.1	40	17	
20		15		23.7	42	18	
	705	30	GM	13.8	34	9	
25		43	SM	22.0	35	8	
		50		22.5	36	10	
	700						WEATHERED SHALE Added by Amendment 49
		50+	SM-SC	21.2	35	11	
30		50		21.9	36	12	
	695	41	SM	22.6	36	11	
35							

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
(SS, PA, HA, TP BORING)
ID CONDUIT BANKS
FIGURE 2.5-275

Figure 2.5-275 Soil Profile (SS, PA, HA, TP, Boring) 1E Conduit Banks

SOIL PROFILE (SS, PA, HA, TP BORING)

SHEET 1 OF

PROJECT WATTS BAR N. P. FEATURE 1E CONDUIT BANKS

BORING SS-173 STATION 583.3E RANGE 1177.8 S SURFACE EL 728.1

DATE DRILLED 12-2-81 TO 12-3-81 PREPARED BY JLB CHECKED BY HI

DEPTH	EL	SPT (N)	LOG	W	LL	PI	REMARKS
1"=5'							
0							1032-GRAVEL FILL
	725	18	CL	22.3	46	20	
5		20	CL-ML	21.9	41	14	
	720	16	CL	19.3	40	16	
10		23	ML	20.4	39	13	ALLUVIUM
		25	SC	17.8	30	9	
	715	37		18.8	33	12	
15		28	ML-MH	25.0	49	17	
	710	25	SC	20.9	35	13	
20		20	SM-SC	20.6	37	12	
		28	SM	24.6	55	20	
	705		CH-MH		57	27	
		50+		22.9	42	14	
25		21		36.6	41	9	
	700	40	SM	23.5	48	11	WEATHERED SHALE
							Added by Amendment 49
30		25		25.8	36	10	
		34		24.9	39	13	
	695	30	SM-SC	20.5	33	9	
35							

WATTS BAR NUCLEAR PLANT
FINAL SAFETY ANALYSIS REPORT

SOIL PROFILE
(SS, PA, HA, TP BORING)
ID CONDUIT BANKS
FIGURE 2.5-276 (SHEET 1 OF 2)

Figure 2.5-276 Soil Profile (SS, PA, HA, TP, Boring) IE Conduit Banks Sheet 1 of 2

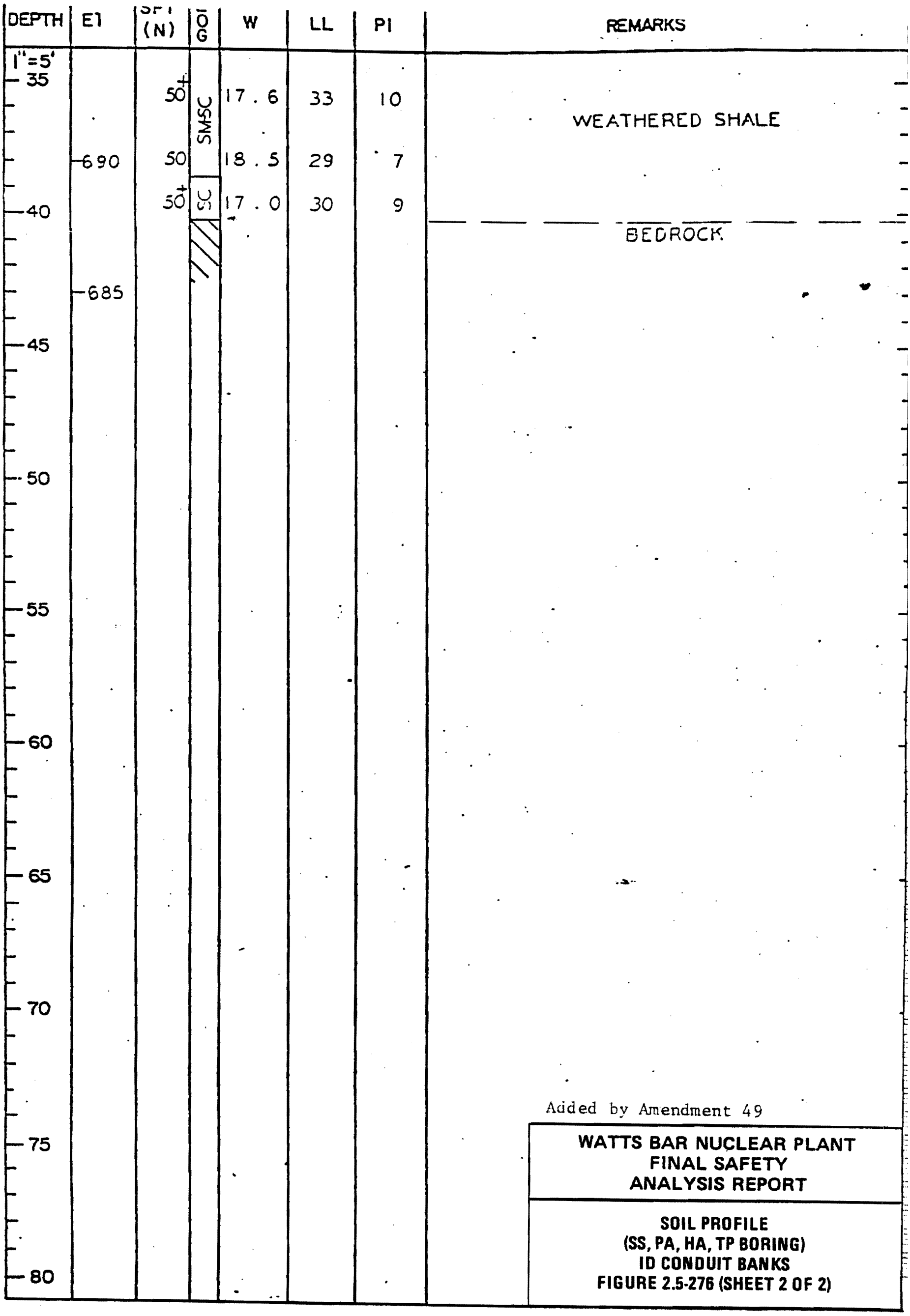


Figure 2.5-276 Soil Profile (SS, PA, HA, TP, Boring) ID Conduit Banks Sheet 2 of 2

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SS, PA, HA, TP BORING)

SHEET 1 OF _

PROJECT WATTS BAR N. P. FEATURE 1 E CONDUIT BANKS

BORING SS-174 STATION 490.75E RANGE 1123.75S SURFACE EL 728.0

DATE DRILLED 12-3-81 TO 12-4-81 PREPARED BY JLB CHECKED BY HPN

DEPTH	EL	SPT (N)	LOG	W	LL	PI	REMARKS
1"=5'							
0							1032-GRAVEL FILL
	725	40	ML	21.5	43	15	
5		18	CL	19.4	39	18	
		33	ML	21.9	44	15	
	720	47	CL	19.1	40	18	BACKFILL
10		47	ML	25 4	44	15	
		45		21.3	38	12	
	715	40	SC	15.5	32	13	
15		41	CL ML	19.0	39	15	
	710	50+	SM	18.3	NP	NP	ALLUVIUM
20		50+	GC	14.2	—	—	
		50+	CL ML	21.3	44	16	
	705	50+		—	—	—	
25		50+	ML	21.6	40	13	WEATHERED SHALE
	700	50+	SM	21.6	38	12	
		50+	SM-SC	18.8	32	8	
30							Added by Amendment 49
	695						WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
35							SOIL PROFILE (SS, PA, HA, TP BORING) ID CONDUIT BANKS FIGURE 2.5-277

Figure 2.5-277 Soil Profile (SS, PA, HA, TP, Boring) ID Conduit Banks

TENNESSEE VALLEY AUTHORITY
SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SS, PA, HA, TP BORING)

SHEET 1 OF

PROJECT WATTS BAR N. P. FEATURE I E CONDUIT BANKS

BORING SS-175 STATION 405.75E RANGE 1072.8S SURFACE EL 728.0

DATE DRILLED 12-3-81 TO 12-4-81 PREPARED BY JLB CHECKED BY HPA

DEPTH	EL	SPT (N)	LOG	W	LL	PI	REMARKS
1"=5'							
0	725						1032-GRAVEL FILL
5		14	SC	15.9	37	17	
		21	CL-ML	24.5	47	20	ALLUVIUM
10	720	19	SC	17.8	37	16	
		31	ML	20.8	40	13	
	715	38	SC	15.5	32	12	
15		22	CH	33.0	54	26	
	710	33		25.0	38	10	
20		47		23.6	39	12	WEATHERED SHALE
	705	42	SM	23.1	43	15	
		30		31.4	NP	NP	
25		41		25.7			
	700						DISCONTINUED
30							Added by Amendment 49
35							

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
(SS, PA, HA, TP BORING)
ID CONDUIT BANKS
FIGURE 2.5-278

Figure 2.5-278 Soil Profile (SS, PA, HA, TP, Boring) ID Conduit Banks

TENNESSEE VALLEY AUTHORITY
SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SS, PA, HA, TP BORING)

SHEET 1 OF _

PROJECT WATTS BAR N. P. FEATURE 1 E CONDUIT BANKS

BORING SS-176 STATION 377.25E RANGE 968.75S SURFACE EL 728.0

DATE DRILLED 12-7-81 TO 12-8-81 PREPARED BY JLB CHECKED BY HPM

DEPTH	EL	SPT (N)	LOG	W	LL	PI	REMARKS
1"=5'							
0							1032-GRAVEL FILL
	725	35	SC	15.5	32	12	
		29	SM	11.0	20	1	BACKFILL
5		47	SP-SM	5.3	NP	NP	
	720	50+	SM	11.1			
10		50+	SM-SC	27.2	26	5	
		50+	GP-GM	7.8			ALLUVIUM
	715	50+	GM	13.3	NP	NP	
15		50+		11.5			
		50+		13.0			
	710	50+	CL-ML	27.5	41	16	
20		47	SM-SC	21.5	39	13	
		50+		19.6	36	12	WEATHERED SHALE
	705	50+	CL-ML	23.8	40	13	
25		50+	SM-SC	20.6	36	11	
	700						DISCONTINUED
30							Added by Amendment 49
35							

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
(SS, PA, HA, TP BORING)
ID CONDUIT BANKS
FIGURE 2.5-279

Figure 2.5-279 Soil Profile (SS, PA, HA, TP, Boring) ID Conduit Banks

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SS,PA,HA,TP BORING)

SHEET 1 OF

PROJECT WATTS BAR N.P. FEATURE I.E. CONDUIT BANKS

BORING SS-177 STATION 353.25E RANGE 753.75S SURFACE El 728.0

DATE DRILLED 12-10-81 TO 12-10-81 PREPARED BY JLB CHECKED BY HPN

DEPTH	El	SPT (N)	LOG	W	LL	PI	REMARKS
1" = 5'							
0							1032-GRAVEL FILL
	725	50+	CL	16.7	34	15	BACKFILL
		50		8.5	NP	NP	
5		20		15.4	24	1	
	720	50+	SM	13.8			
10		50+		14.2			
		50+		SP-SM 9.2			
	715	50+		SW-SM 16.3			ALLUVIUM
15					NP	NP	
		50+	SM	11.2			
	710	50+		SP-SM 11.7			
20		50+	SM	13.1			
		50+		12.1 GP-GM			
	705	50+		8.2 SM-SC	26	6	
25							BEDROCK
	700						Added by Amendment 50
30							WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
							SOIL PROFILE (SS, PA, HA, TP BORING) ID CONDUIT BANKS FIGURE 2.5-280
35							

Figure 2.5-280 Soil Profile (SS, PA, HA, TP, Boring) ID Conduit Banks

Figure 2.5-281 (Actual Figure Located in Oversized Figures File) (Sheet 1 of 2)

Figure 2.5-281 (Actual Figure Located in Oversized Figures File) (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT ERCW
SOIL PROFILE

Boring SS-49 | Station 1821.9S Range 868.7E | Surface El 716.9 | Date Drilled 7-7-75 to 7-7-75

Boring SS-49A | Station 1820.3S Range 871.93E | Surface El 711.7 | Date Drilled 11-16-81 to 11-18-81

Prepared by JLB | Checked by HPM

El	SPT (N)	LOG	W	LL	PI	SPT (N)	LOG	W	LL	PI	REMARKS
715	30	MH	23.6	56.0	22.1						
	27		27.2	60.9	25.1						
	30		26.8	53.1	21.4						ROADBED GRAVEL
710	24	SM	15.4	29.4	5.4	17	CL-ML	21.1	32	8	
	23	SC	20.0	36.2	11.9	14		21.4	30	6	
705	19	SM	21.2	36.0	11.6	9		24.6	29	3	
	18		26.7	34.0	10.2	5		26.5	28	3	
		SM-SC						21.6	NP	NP	ALLUVIUM
	13		25.1	28.3	6.5	5		26.5			
700								29.0	23	1	
	14	ML	26.1			6		29.9			
				28.8	5.3						
	12		26.8			5		31.8	NP	NP	
								32.4	29	4	
695	9	ML-CL	31.9			6	ML	28.3	22	1	
				27.4	7.0			28.0	22	3	
	11		29.1			CL 5		27.8	NP	NP	
								28.7	28 23	17 1	
	6	SM	29.0			6	SM	30.0	NP	NP	
690				NP	NP						
	4		28.0			17		31.2	NP	NP	
								21.2			
	31		25.3			50+		18.9	37	13	WEATHERED SHALE
685	50		13.7				SM-SC				DISCONTINUED
	50	SC	14.8	37.5	14.9						
	50		12.7								
680	50+		13.5								
	50		GM 13.5	—	—						
675											

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-282

Figure 2.5-282 Soil Profile

**WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT**

**SOIL PROFILE
FIGURE 2.5-283
SHEET 1 OF 2**

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-131 Station 1755.0S Range 805.0E Surface El 713.9

Date Drilled 6-1-79 To 6-4-79 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0								ASPHALT
		25	ML	24.3	48.8	18.4		
	710	25		19.5	39.0	14.7		LEAN CLAY AND SILT FILL
5		21	CL	19.3				
					35.2	11.5		
		18		20.7				
	705							
10		10		25.9	37.1	13.3		ALLUVIAL LEAN CLAY AND SILT
		7	ML	22.2	28.5	5.2		
	700	4		28.1	30.8	6.9		▽
15								
		5		30.1				▽
					25.9	3.3		
		5	SM	29.7				ALLUVIAL SAND
	695							
20		7		26.2				
		7		24.0	NP	NP		
		50+	GSM	20.6				ALLUVIAL GRAVEL
	690							
25		50+	CL	17.2	38.0	14.9		
		50		15.8				
	685							
30		50+	SC	15.9	32.7	11.2		WEATHERED SHALE
		50+		14.9				
	680	16		14.1				Added by Amendment 50
35								

Figure 2.5-283 Soil Profile (Sheet 1 of 2)

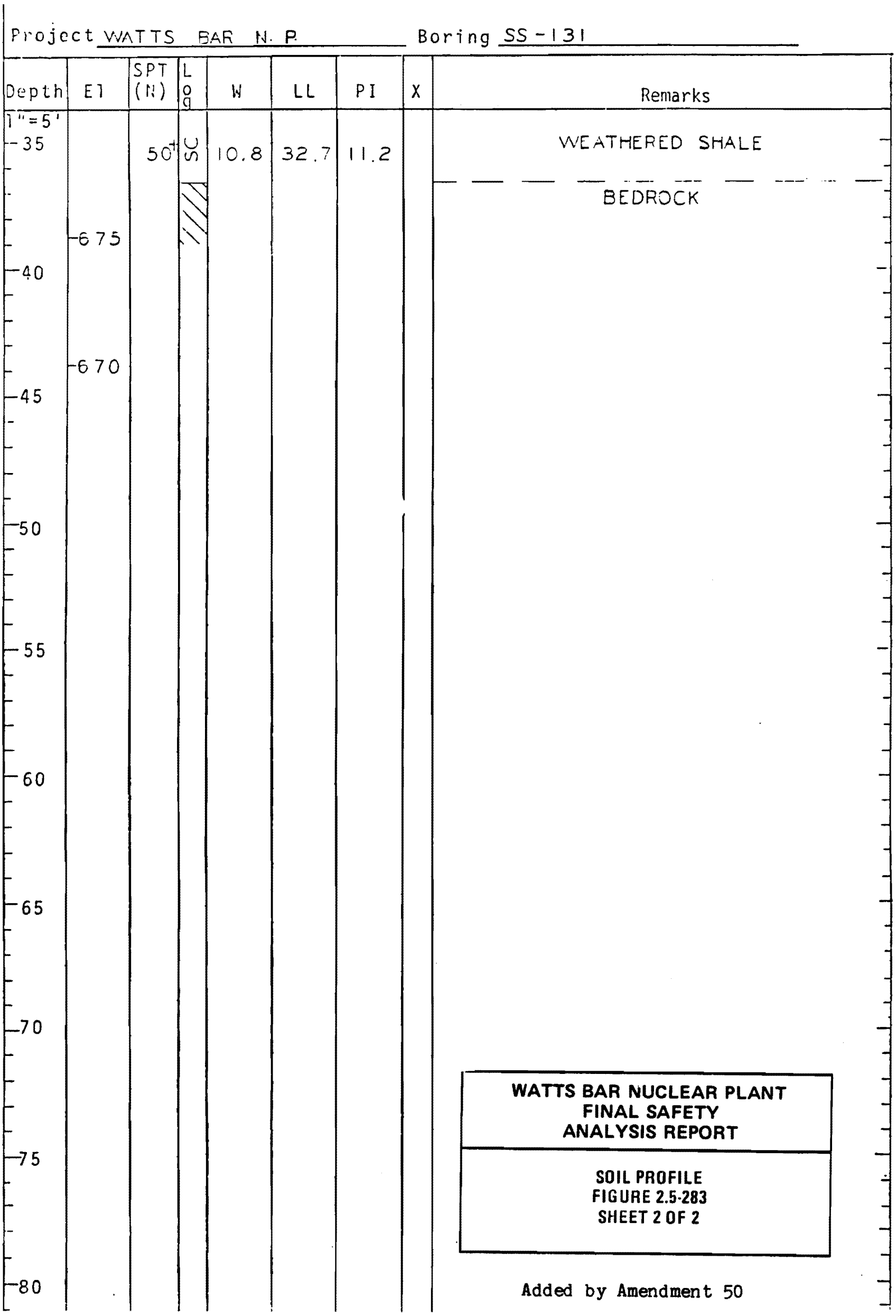


Figure 2.5-283 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT ERCW
SOIL PROFILE

Boring SS-50	Boring SS-50A	Prepared by JLB
Station 1664.7S Range 787.5E	Station 1668.7S Range 787.8E	Checked by HPM
Surface El 721.8	Surface El 717.2	
Date Drilled 7-23-75 to 7-23-75	Date Drilled 11-18-81 to 11-19-81	

El	SPT (N)	LOG	W	LL	PI	SPT (N)	LOG	W	LL	PI	REMARKS
720	25	CL	18.0	40.5	17.8						ROADBED GRAVEL
	18		22.5	43.3	18.5						
	23		21.3			22	CL-ML	19.9	43	16	FILL
715	13		20.0	44.2	16.0	16	ML	19.8	42	15	
	16		24.2			22		21.5	41	13	
710	25	ML	23.5	46.4	16.8	25		20.9			
	17		22.1	42.8	13.6	22		24.4	38	11	
	14		22.8			20		25.3	35	9	ALLUVIUM
705				37.5	11.3						
	10		22.1			14	SM	25.5	NP	NP	
	10	SM	22.4	34 1	7.6	11		28.8	27	2	
	8	CL	25.6	36.3	12.0			26.9	NP	NP	
700	5		28.2			13		27.4	26	2	
	8	SM	29.1					28.8	NP	NP	
						9		33.5			
695	2		31.5	NP	NP			34.5	NP	NP	
	10	G-SM	23.7			5		38.4			
	37		19.6					34.8	29	3	
690	50+	SC	15.4	34.0	10.9		SM	ML			
	50+	CL	15.2	36.9	13.5			25.1	NP	NP	
	50+		12.0			23		ML	37	10	WEATHERED SHALE
685				31.7	10.4						
	50+		14.9			50		20.1	35	12	DISCONTINUED
								SM-SC			
680	30	G-SC	15.2	29.3	9.1						
	50+		17.1	32 7	12.2						
	50+		5.1	25.5	7.8						
675	50+		7.3	—	—						
670											

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-284

Figure 2.5-284 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-285
SHEET 1 OF 2

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-132 Station 1560.0 S Range E 785.0 E Surface El 719.1

Date Drilled 6-4-79 To 6-5-79 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5								
0								
		22	CL	19.6				
	715	22		20.3				
5		19		22.3	44.7	17.9		ALLUVIAL SANDY LEAN CLAY
	710	14		21.3				
10		15		21.8				
		13		23.5				
	705	14		23.6	42.0	17.8		
15		13	ML	25.7	43.1	15.2		ALLUVIAL LEAN SILT
	700	15		23.4	45.8	17.5		
20		5	CL	25.9	40.4	16.8		
		50+		—	—	—		NO SAMPLE RECOVERY
	695	18	CL	22.7	40.8	16.6		LAMINATED RESIDUAL CLAY
25		29		19.3				
		50+	SC	20.2				
	690	50+		16.5	37.1	12.9		WEATHERED SHALE
30		50+		15.6				
	685							
35		48		16.6				Added by Amendment 50

Figure 2.5-285 Soil Profile (Sheet 1 of 2)

Project WATTS BAR N. P. Boring SS-132

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
35								
		37	SC	19.1	37.1	12.9		NO SAMPLE RECOVERY
		50+						
	680							BEDROCK
40								
	675							
45								
50								
55								
60								
65								
70								
75								
80								

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-285
SHEET 2 OF 2

Added by Amendment 50

Figure 2.5-285 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-286
SHEET 1 OF 2

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-133 Station 1361.0S Range 785.0E Surface El 725.0

Date Drilled 6-4-79 To 6-4-79 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0	725							AUGER
		23	CL	15.7				
5	720	18		16.6	39.9	20.5		
		16		18.9				LEAN CLAY TO SANDY LEAN CLAY, FILL
		12		19.7	42.6	17.4		
10	715							
		12		22.9				
		11		21.7	43.9	19.2		
15	710	9		22.5				
		2		23.6	37.7	16.3		
		4		32.9	39.1	16.7		
20	705		GSM					ALLUVIAL GRAVEL
		19		17.3	NP	NP		
		48	ML	20.1	42:8	13.8		
25	700	28		28.3				
		40		24.0	35.1	1.5		WEATHERED SHALE
		50/1"		20.8				
30	695	50/1"	SM	18.0				
					32.3	8.1		
		50		16.1				
35	690	50/1"	CL	12.7	31.7	11.0		Added by Amendment 50

Figure 2.5-286 Soil Profile (Sheet 1 of 2)

Project WATTS BAR N. P. Boring SS-133

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
-35	-690							
		50+	ML	11.1	28.6	5.1		WEATHERED SHALE
		50+		15.3				
-40	-685							BEDROCK
-45	-680							
-50								
-55								
-60								
-65								
-70								
-75								
-80								

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-286
SHEET 2 OF 2

Added by Amendment 50

Figure 2.5-286 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-287
SHEET 1 OF 2

Project WATTS BAR N.P. Feature ERCW ALIGNMENT

Boring SS-134 Station 1373.0S Range 900.0 E Surface El 726.5

Date Drilled 6-6-79 To 6-7-79 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0								
	725	10	CL	20.0				
		16		16.9	28.0	8.4		
5								
	720	14		18.9				ALLUVIAL SANDY LEAN CLAY
		15		18.7				
					36.2	17.1		
10		8		21.7				
	715	13		20.9				
					39.1	19.5		
		2		23.8				
15								
		3	SM	29.3				ALLUVIAL SAND
	710	8		27.5				
					NP	NP		
20		27		11.4				ALLUVIAL GRAVEL
		50+	GM	10.0				
	705							
		50+		18.1				
25								
		50+		18.1				
	700		CL		39.3	15.2		
		50+		16.5				
								WEATHERED SHALE
30		50+		16.6				
	695							
		50+		20.4				
			SC		36.7	13.5		
		42		16.2				
35								Added by Amendment 50

Figure 2.5-287 Soil Profile (Sheet 1 of 2)

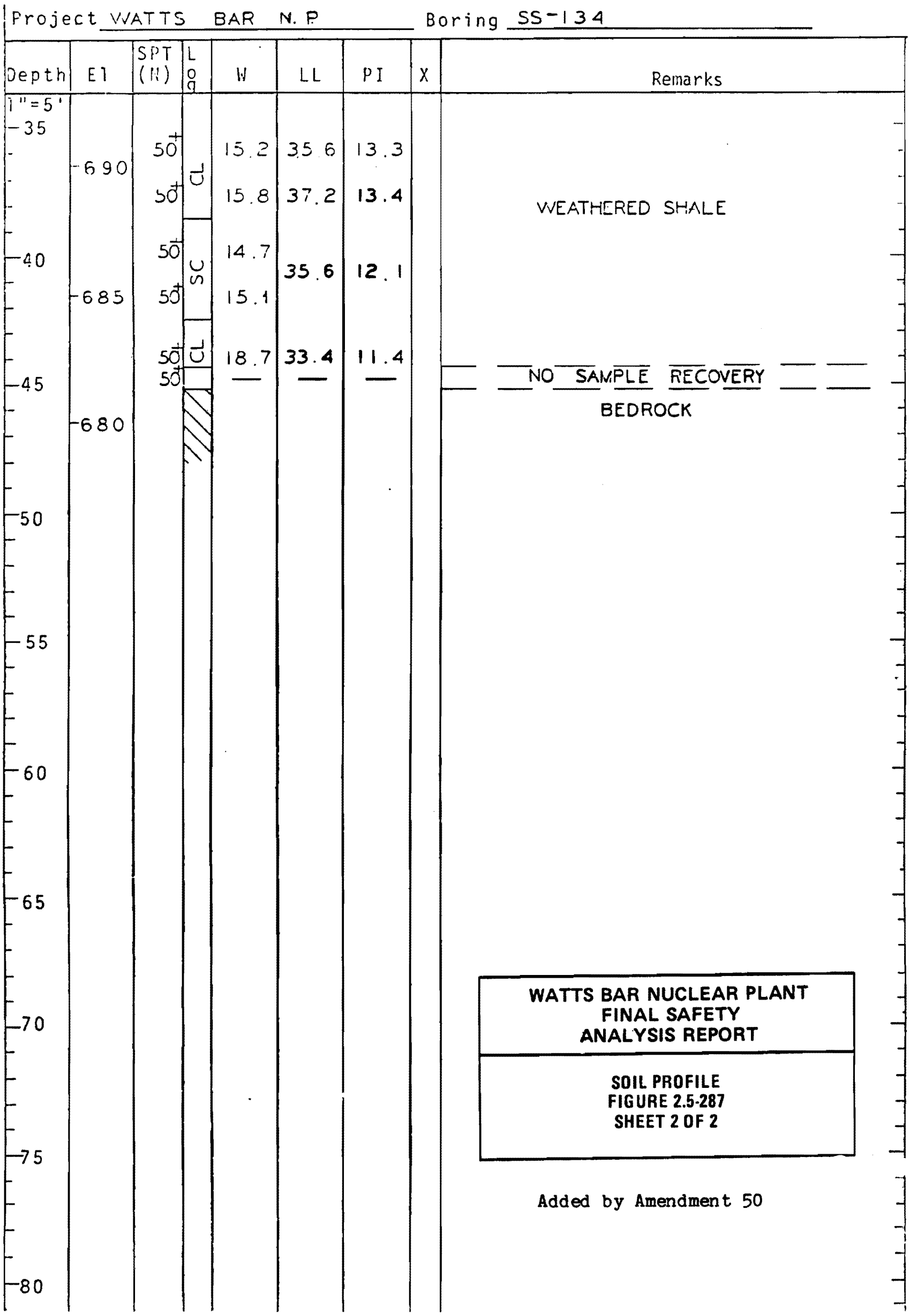


Figure 2.5-287 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT ERCW
SOIL PROFILE

Boring SS-134	Station 1370.0 S	Range 900.0E	Surface El 726.5	Date Drilled 6-6-79 to 6-7-79
Boring SS-134A	Station 1370.0 S	Range 905.0E	Surface El 725.5	Date Drilled 11-6-81 to 11-9-81

Prepared by JLB

Checked by HPM

El	SPT (N)	LOG	W	LL	PI	SPT (N)	LOG	W	LL	PI	REMARKS
725	10	CL	20.0			13	CL	13.4	29	10	FILL
	16		16.9	28.0	8.4	25		16.1	32	12	
720	14		18.9			17		15.6	35	17	
	15		18.7			13		19.8	31	12	
	8		21.7	36.2	17.1	10		21.8	41	20	
715	13		20.9			12		19.4	34	15	ALLUVIUM
	2		23.8			4		25.3	42	17	
	3	SM	29.3			4	SM	30.0	23	—	
710	8		27.5					29.1	NP	NP	
				NP	NP	9		27.9	24	2	
	27	GM	11.4					28.9	24	—	
705	50+		10.0			27		31.9	NP	NP	
								16.3	27	2	
	50+		18.1				SW-SM				
	50+	CL	18.1			39		11.2	NP	NP	
700	50+		16.5	39.3	15.2		GR-GM				
	50+		16.6								WEATHERED SHALE
	50+		20.4			50+	SM-SC				
695		SC		36.7	13.5	50+		20.7	40	15	
	42		16.2								DISCONTINUED
	50+	CL	15.2	35.6	13.3						
690	50+		15.8	37.2	13.4						
	50+		14.7								
		SC		35.6	12.1						
685	50+		15.1								
	50+	CL	18.7	33.4	11.4						
	50+										
680											

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-288

Figure 2.5-288 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-289
SHEET 1 OF 2

Project WATTS BAR N.P. Feature ERCW ALIGNMENT

Boring SS-135 Station 1370.0 S Range 1000.0 E Surface El 726.9

Date Drilled 5-30-79 To 6-1-79 Prepared By JLB Checked By CBG

Depth 1"=5'	El	SPT (N)	Log	W	LL	PI	X	Remarks
0								
	725	7		—	30.9	12.2		SANDY LEAN CLAY FILL
		13	CL	19.4	32.7	9.7		
5		13		19.3	37.8	19.6		
	720	21		—	48.0	19.6		ALLUVIAL SANDY SILT
		14	ML	26.7	46.5	16.5		
10		12		26.3	42.2	13.8		
	715	11		23.6	34.1	8.7		
		12		20.1	30.0	4.4		
15		8		—				ALLUVIAL SAND
	710	8	SM	—				
		8		—	NP	NP		
20		8		25.3				
	705	8		—	32.3	11.8		LAMINATED RESIDUAL CLAY
			CL					
25		22	G-SM	28.9	44.5	15.8		
	700	26		25.7	43.5	16.7		WEATHERED SHALE
		50	SM	20.4	38.9	12.7		
30		48		21.3	38.6	12.4		
	695	43		23.3	37.9	10.5		
35								Added by Amendment 50

Figure 2.5-289 Soil Profile (Sheet 1 of 2)

Project WATTS BAR N. P. Boring SS-135

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
35		50+	CL	17.9	34.3	11.3		
	690	50+	CL	—	35.1	13.1		
		50+	SC	15.6	34.1	12.0		WEATHERED SHALE
40		50+	SC	12.3	30.7	10.7		
	685	50+	CL	20.6	36.1	16.1		
		50+	CL	11.2	28.5	8.7		
45								BEDROCK
	680							
50								
	675							
55								
60								
65								
70								
75								
80								

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-289
SHEET 2 OF 2

Added by Amendment 50

Figure 2.5-289 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT ERCW
SOIL PROFILE

Boring SS-135	Station 1373.0 S	Range 1000.0E	Surface Elev 726.9	Date Drilled 5-30-79 To 6-1-79
Boring SS-135A	Station 1363.3 S	Range 1004.5E	Surface Elev 726.5	Date Drilled 11-9-81 To 11-10-81

Prepared By JLB

Checked By HPM

El	SPT (N)	LOG	W	LL	PI	SPT (N)	LOG	W	LL	PI	REMARKS
725	7		—	30.9	12.2	19	CL	16.1	28	7	FILL
	13	CL	19.4	32.7	9.7	20		16.6	33	13	
	13		19.3	37.8	19.6	21	CL-ML	19.8	40	15	
720	21		—	48.0	19.6	19	ML	24.7	41	13	
	14	ML	26.7	46.5	16.5	19		26.7	41	12	
	12		26.3	42.2	13.8	13	SM	24.3	31	3	
715	11		23.6	34.1	8.7	7		22.8			
	12		20.1	30.0	4.4	7		24.3	NP	NP	
710	8		—	—	—	5		34.2			ALLUVIUM
	8	SM	—	—	—	8		27.0	22	1	
	8		25.3	NP	NP	8	ML	32.1	27	2	
705	8		—	—	—				39	7	
	8		—	32.3	11.8	7	SM	32.1	25	2	
	22	CL-SM	28.9	44.5	15.8			30.9	NP	NP	
700	26		25.7	43.5	16.7	50/4"	GM-GC	16.7	—	—	
	50/4"		20.4	38.9	12.7	36/4"	GM	30.1	46	14	
	48	SM	21.3	38.6	12.4						DISCONTINUED
695	43		23.3	37.9	10.5						WEATHERED SHALE
	50/4"		17.9	34.3	11.3						
	50/4"	CL	—	35.1	13.1						
690	50/4"		15.6	34.1	12.0						
	50/4"	SC	12.3	30.7	10.7						
685	50/4"		20.6	36.1	16.1						
	50/4"	CL	11.2	28.5	8.7						
680											

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-290

Figure 2.5-290 Soil Profile

WATTS BAR NUCLEAR PLANT ERCW
SOIL PROFILE

Boring SS-65	Boring SS-65B	Prepared by JLB
Station 1374.8S Range 1097.5E	Station 1362.3S Range 1091.0E	Checked by HPM
Surface El 726.0	Surface El 727.2	
Date Drilled 7-25-75 to 7-25-75	Date Drilled 11-13-81 to 11-13-81	

El	SPT (N)	LOG	W	LL	PI	SPT (N)	LOG	W	LL	PI	REMARKS
725	50	GCL	15.4	36.3	15.6	11	SC	14.1	28	8	FILL
	35	CL	12.9	35.6	14.1	20	CL	12.5	32	14	
720	24	MH	28.2	50.7	17.7	25	MH	28.3	55	8	
	21		24.9			18		28.9	51	15	
	13	ML	24.5	40.4	13.0	12	ML	29.1	42	12	
715	16		29.2	46.1	15.6	14		26.7	35	6	ALLUVIUM
	12	SM	21.5	33.1	6.6	9	SM	25.7	29	2	
710	10		15.7	NP	NP	6		27.5	25	1	
	7		23.7	30.1	5.1	3		33.1 / 32.9	NP	NP	
	5		28.2	28.9	3.5	5		32.5	25	1	
705	8		—	—	—	7		27.1 / 30.8	26 / 25	2 / 1	
	20	GM	13.5	32.5	9.0	37		32.7 / 10.7	NP	NP	
700	18	SM	24.8	46.4	18.2			21.9	44	14	WEATHERED SHALE
	16		23.8								DISCONTINUED
	16	G-SM	24.7	43.4	15.9						
695	14		25.5								
	11	ML	40.7	47.1	13.4						
690	30		30.8	42.2	13.9						
	48	SC	19.8	34.4	11.2						
	50+		14.3								
685				36.6	12.0						
	16		19.1								
	41	G-SC	22.6								
680	45		17.1	33.8	10.5						
	50+		15.4								
				32.0	10.5						
	50		15.3								
675											

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-291

Figure 2.5-291 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-292
SHEET 1 OF 2

Project WATTS BAR N.P. Feature ERCW ALIGNMENT

Boring SS-136 Station 1373.7 S Range 1215.0 E Surface El 726.9

Date Drilled 6-22-79 To 6-22-79 Prepared By JLB Checked By AC2

Depth	El	SPT (N)	Log	W	LL	PI	X.	Remarks
1"=5'								
0								TOPSOIL
	725	19	CL	19.2	38.8	20.3		LEAN CLAY FILL
		6		22.5	49.7	24.2		
5		14	MH	25.8	51.1	20.4		
	720	17		26.5				ALLUVIAL SANDY SILT
					40.7	11.4		
10		14	ML	25.8				
	715	11		23.7				
					32.8	5.7		
		9		25.0				
15		5		26.3				
	710							ALLUVIAL SAND
		8	SM	28.5	NP	NP		
20		12		21.9				
		50+		15.1				ALLUVIAL GRAVEL
	705		GP-GM					
		50+		19.1				
25			ML-CL		41.7	16.7		
		50+		17.2				
	700							
		34	CL	20.3	37.2	13.4		WEATHERED SHALE
30		31		21.6				
					36.3	11.7		
	695	50+	SM	16.9				
		50+		17.4	34.0	7.0		
35								Added by Amendment 50

Figure 2.5-292 Soil Profile (Sheet 1 of 2)

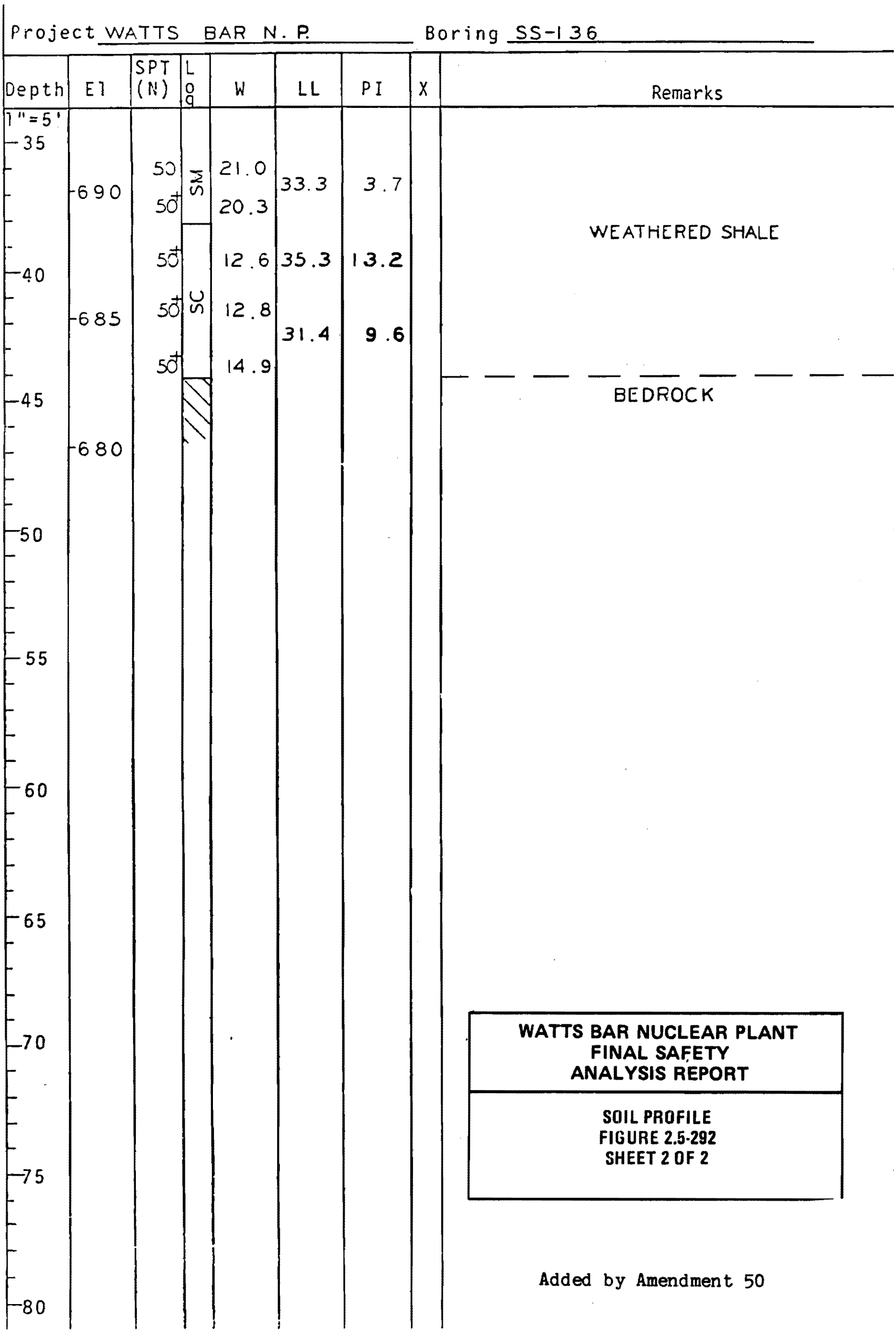


Figure 2.5-292 Soil Profile (Sheet 2 of 2

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-293
SHEET 1 OF 1

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-137 Station 1375.0 S Range 1300.0 E Surface El 726.9

Date Drilled 6-7-79 To 6-8-79 Prepared By JLB Checked By JCC

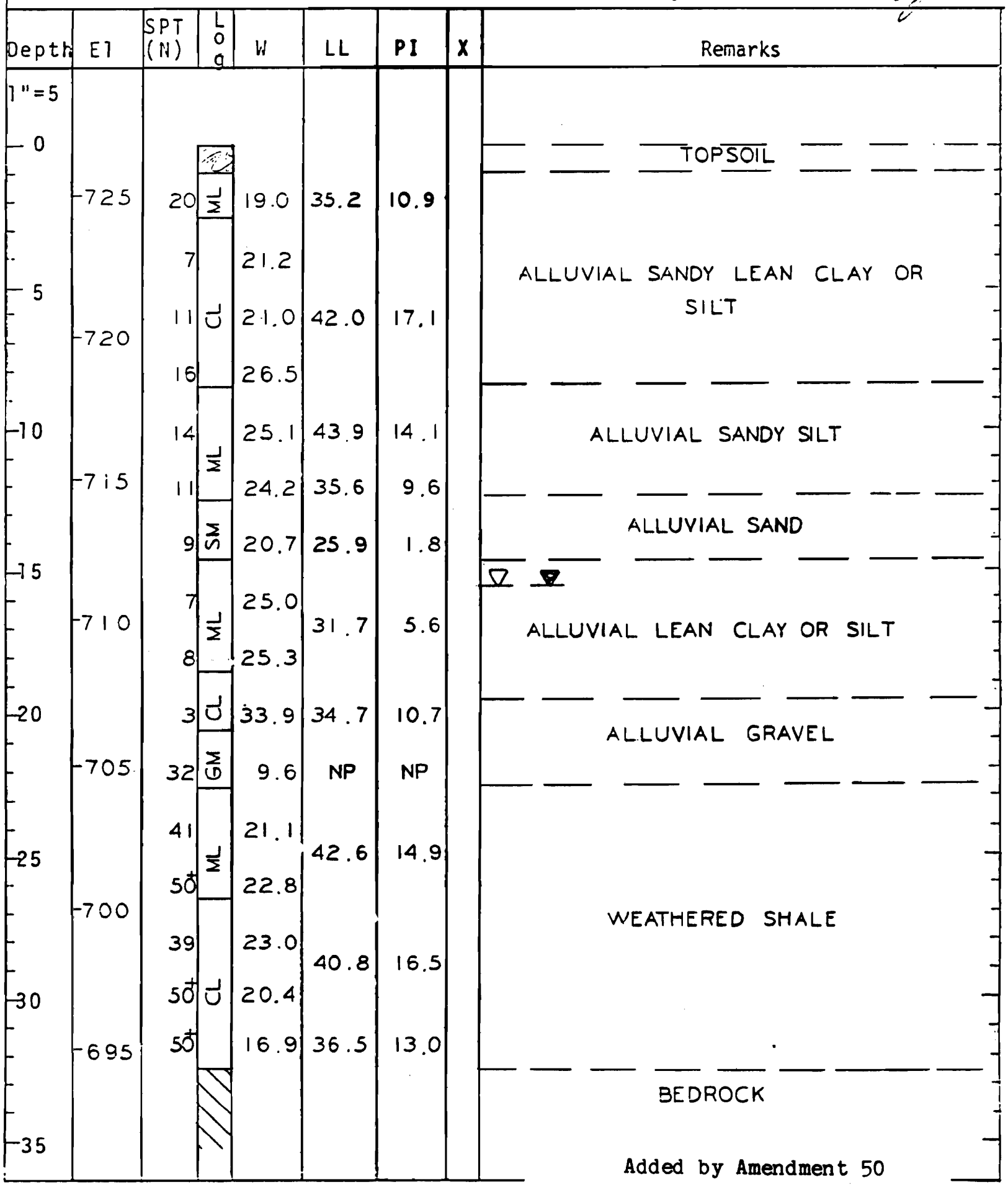


Figure 2.5-293 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-294
SHEET 1 OF 2

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-138 Station 1373.0 S Range 1400.0 E Surface El 727.2

Date Drilled 6-8-79 To 6-11-79 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0								TOPSOIL
	725	18	CL	15.7	34.3	16.9		
		23	MH	28.5	55.0	24.1		ALLUVIAL LEAN CLAY TO FAT SILT
5		15		27.5				
	720	13		30.1	48.0	19.7		
10		10	ML	25.6	40.2	14.5		ALLUVIAL SANDY SILT
	715	9		22.3	31.6	7.8		
		6	SM	23.4	28.1	2.5		ALLUVIAL SAND
15		7		24.5				
	710	7	ML	28.4	32.7	5.9		
20		5	ML-CL	29.6	27.0	5.1		ALLUVIAL SANDY SILT OR SANDY LEAN CLAY
	705	13	SM	15.0	26.4	2.3		ALLUVIAL SAND
		16		26.8				
25		43	G-SM	26.7				
	700	32		29.3	NP	NP		WEATHERED SHALE
30		50+		20.4				
		50+	SM	14.6				
	695							
		50+	SC	20.5	34.9	12.0		
35								Added by Amendment 50

Figure 2.5-294 Soil Profile (Sheet 1 of 2)

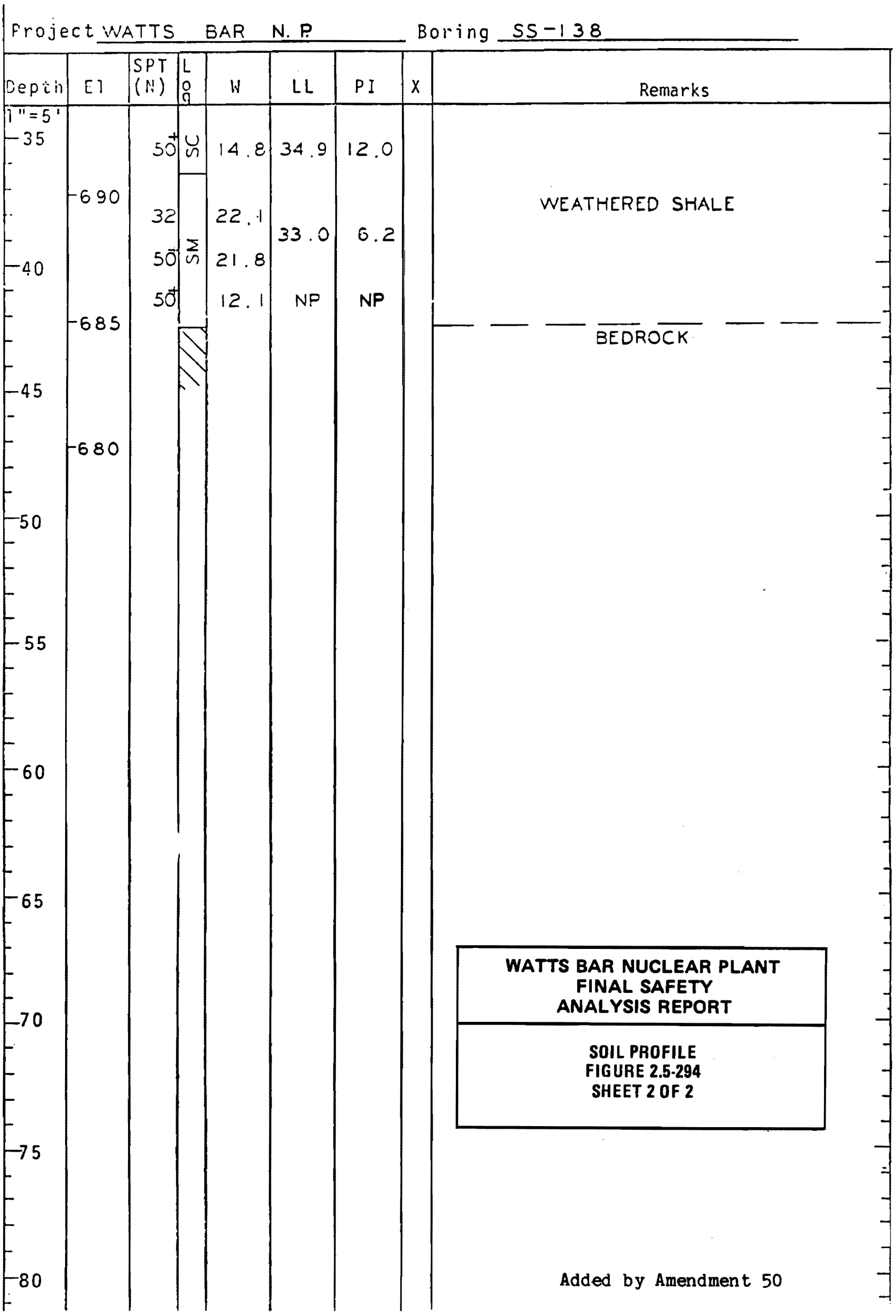


Figure 2.5-294 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT ERCW
SOIL PROFILE

Boring SS-138 | Station 1373.0S | Range 1400.0E | Surface El 727.2 | Date Drilled 6-8-79 to 6-11-79

Boring SS-138A | Station 1368.8S | Range 1406.5E | Surface El 726.7 | Date Drilled 11-12-81 to 11-12-81

Prepared by JLB | Checked by HPM

El	SPT (N)	LOG	W	LL	PI	SPT (N)	LOG	W	LL	PI	REMARKS
725	18	CL	15.7	34.3	16.9	50	GC	6.7	35	18	FILL
	23	MH	28.5	55.0	24.1						
	15		27.5			32	ML-MH	27.3	50	19	
720	13	ML	30.1	48.0	19.7	19		30.9	48	18	
	10		25.6	40.2	14.5	16	ML	27.1	39	13	
715	9		22.3	31.6	7.8	12		25.1	33	6	
	6	SM	23.4								
	7		24.5	28.1	2.5	8		25.1	29	3	ALLUVIUM
710	7	ML	28.4	32.7	5.9	8		22.1	NP	NP	
	5	ML-CL	29.6	27.0	5.1	12	SM	27.1	29	1	
	13	SM	15.0	26.4	2.3	4		35.6 / 28.1	28 / 25	2 / 2	
705	16		26.8			9		27.8 / 29.1	22 / NP	NP	
	43	G-SM	26.7				GM				
	32		29.3	NP	NP	22		10.6 / 38.4	NP	NP	WEATHERED SHALE
700	50+	SM	20.4			50+	SM	25.8	36	2	DISCONTINUED
	50+		14.6								
	50+	SC	20.5								
695	50+		14.8	34.9	12.0						
	32	SW	22.1								
	50+		21.8	33.0	6.2						
690	50+		12.1	NP	NP						
685											
680											

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-295

Figure 2.5-295 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-296
SHEET 1 OF 2

Project WATTS BAR N.P. Feature ERCW ALIGNMENT

Boring SS-139 Station 1375.0 S Range 1500.0E Surface El 727 5

Date Drilled 6-11-79 To 6-12-79 Prepared By JLB Checked By [illegible]

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0								TOPSOIL
	725	16	CL	15.8	34.7	17.3		SANDY LEAN CLAY FILL
		11		14.4				
5		9	CL-CH	22.0	50.1	25.0		ALLUVIAL LEAN TO FAT CLAY
	720	10		25.9				
10		15	ML	26.4	47.2	17.7		ALLUVIAL SANDY SILT
	715	13		23.8	36.9	11.0		
		9		19.2				
15		8	SM	15.5	NP	NP		ALLUVIAL SANDY SILT AND SILTY SAND
	710	9		18.2				
20		7	ML	32.8	31.0	3.9		
		14	SM	22.1	NP	NP		
	705	50+	GM	7.5				ALLUVIAL GRAVEL
25		49	CL	17.0	36.7	14.6		
		50+		18.9	33.1	11.5		
	700	50+	SC	13.7				WEATHERED SHALE
30		50+		16.0	32.9	12.6		
	695	50+		11.8				
35								Added by Amendment 50

Figure 2.5-296 Soil Profile (Sheet 1 of 2)

Project WATTS BAR N.P. Boring SS-139

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
35		50+	SM	15.0	NP	NP		
	690	50+		12.2				
		50+		13.1	30.6	10.0		
40		50+	CL	9.5	—	—		
	685	50+		10.7	—	—		WEATHERED SHALE
45		50+		18.0	—	—		
	680	50+	G-SC	10.1	30.7	10.3		
50		50+		16.6				
		50+	GSM SC	13.4	27.2	7.0		
	675	50+	G-SM	9.4	NP	NP		
55								BEDROCK
	670							
60								
65								
70								
75								
80								

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-296
SHEET 2 OF 2

Added by Amendment 50

Figure 2.5-296 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-297
SHEET 1 OF 2

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-140 Station 1334.2S Range 1560.8 E Surface El 726.7

Date Drilled 6-11-79 To 6-11-79 Prepared By JLB Checked By QCI

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0	725	21	CL	12.7	35.0	17.4		
		8		13.9	—	—		
5		9		20.0	43.1	19.0		
	720		CHMH					
		16		27.4	60.9	30.0		ALLUVIAL SILT AND CLAY
10		11		22.0				
					36.5	7.4		
	715	8		24.3				
		7	ML	24.6				
15					34.1	6.2		
		12		25.0				
	710							
		3		17.4				
					NP	NP		
20		4	SM	38.7				ALLUVIAL SAND
	705							LAMINATED RESIDUUM
		29	CL	17.4	43.1	18.4		
		44	ML-CL	18.3	44.2	18.7		
25								
		40	ML	21.9	35.2	6.1		WEATHERED SHALE
	700							
		50	CL	16.8	36.9	14.0		
30		41	SM	22.3	37.4	7.4		
			CL-ML					
	695	50+		20.0	36.3	13.2		
		50+	ML-CL	18.7	35.4	10.8		
35								Added by Amendment 50

Figure 2.5-297 Soil Profile (Sheet 1 of 2)

Project WATTS BAR N. P. Boring SS-140

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
35		50+	CL	11.3	32.2	11.4		WEATHERED SHALE
	-690	50+		—	—	—		— — — — — — — — — —
								BEDROCK
40								
	-685							
45								
50								
55								
60								
65								
70								
75								
80								

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-297
SHEET 2 OF 2

Added by Amendment 50

Figure 2.5-297 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-298
SHEET 1 OF 2

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-141 Station 1187. 5 S Range 1707. 5 E Surface El 724.6

Date Drilled 6-11-79 To 6-12-79 Prepared By JLB Checked By [illegible]

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5								
0		16	CL	14.6	29.7	13.8		
		14		15.7	32.1	15.7		
5	720	16	GCL	9.9	35.1	18.6		ALLUVIAL CLAY
		16		11.8	34.5	18.0		
10	715	9	CL	19.3	36.2	16.6		
		1		24.7				
		18	SP-SM	19.0	27.4	5.9		ALLUVIAL SAND
15	710	14	CL	23.7	27.6	7.2		ALLUVIAL CLAY
		23	G-SM	8.5	NP	NP		ALLUVIAL GRAVELLY SAND
20	705	17		7.8				
		31	CL	16.6	37:4	14.5		
	700	10		22.6				LAMINATED RESIDUUM
25		21	ML	20.7	36.7	6.8		
		50+	CL	14.2	34.7	11.8		
	695	50+		12.2	33.2	11.8		
30		50+		17.2	36.9	11.7		WEATHERED SHALE
		50+	ML	8.7	28.0	5.4		
35	690							Added by Amendment 50

Figure 2.5-298 Soil Profile (Sheet 1 of 2)

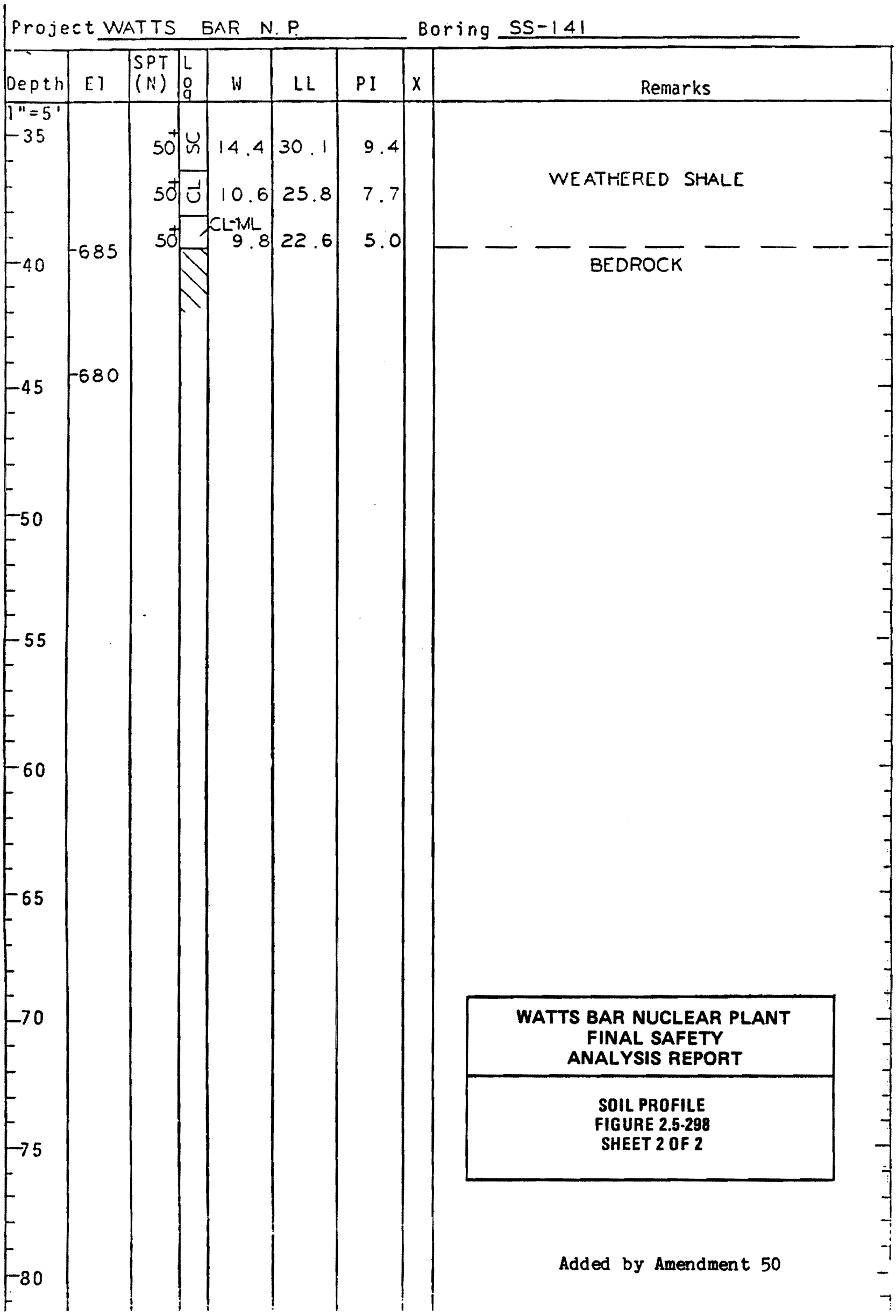


Figure 2.5-298 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-299
SHEET 1 OF 2

Project WATTS BAR N.P. Feature ERCW ALIGNMENT

Boring SS-142 Station 1012.5 S Range 1882.5 E Surface El 721.8

Date Drilled 6-12-79 To 6-13-79 Prepared By JLB Checked By ACL

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0								
	720	13	CL	14.1	33.9	19.0		
		24		13.9	31.7	14.2		
5		18	GCL	14.0	36.1	17.9		
	715	11	CL	14.8	37.9	-19.2		
		12	ML-CL	20.1	38.7	13.5		ALLUVIAL CLAY
10	710	15		22.4				
		11		—	38.4	15.0		
15		12		23.3				
	705	10	CL	21.9	36.7	16.4		
		16		17.0				
20		9		24.1	41.3	17.6		
	700	4		26.2	42.0	20.2		
25		11	GCL	19.0	48.4	26.6		
	695	33	CL	15.1	35.4	13.7		LAMINATED RESIDUUM
		24	ML-CL	17.9	35.8	12.3		
30		50+	CL	13.0	35.6	15.7		
	690	49	ML-CL	15.7	34.4	10.0		WEATHERED SHALE
35								Added by Amendment 50

Figure 2.5-299 Soil Profile (Sheet 1 of 2)

Project WATTS BAR N.P. Boring SS-142

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
35								
	685	41	G-SC	14.7	—	—		
		50+		11.3	31.5	10.6		
		50+		8.7				
40								
	680	50+	SC	7.6	26.7	8.1		WEATHERED SHALE
		50+		7.8				
45		50+		12.6				
	675							BEDROCK
50								
	670							
55								
60								
65								
70								
75								
80								

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-299
SHEET 2 OF 2

Added by Amendment 50

Figure 2.5-299 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-300
SHEET 1 OF 2

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-143 Station 965.0 S Range 1923.2 E Surface El 723.1

Date Drilled 6-14-79 To 6-14-79 Prepared By JLB Checked By JCS

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5								
0								
		10		16.3	31.9	16.8		
	720	24		16.4	30.5	12.7		
5		13	CL	15.9	35.3	17.0		
	715	10		20.9				
					35.4	16.1		
10		9		19.4				▼ ▽
		9		22.4	37.4	13.6		ALLUVIAL CLAY
	710	9	ML-CL	22.9	38.9	13.3		
15		9		22.7	36.2	11.5		
	705	6		21.8				
					39.3	18.2		
20		7		25.0				
		3	CL	29.0				
	700				42.2	22.4		
		4		25.6				
25		4		29.0	35.2	16.2		
		7						NO SAMPLE RECOVERY
	695							
			GSPSM					ALLUVIAL GRAVELLY SAND
30		9		13.5	NP	NP		
		2	CL	—	31.2	15.5		ALLUVIAL CLAY
	690							
		17		11.4	—	—		
35								Added by Amendment 50

Figure 2.5-300 Soil Profile (Sheet 1 of 2)

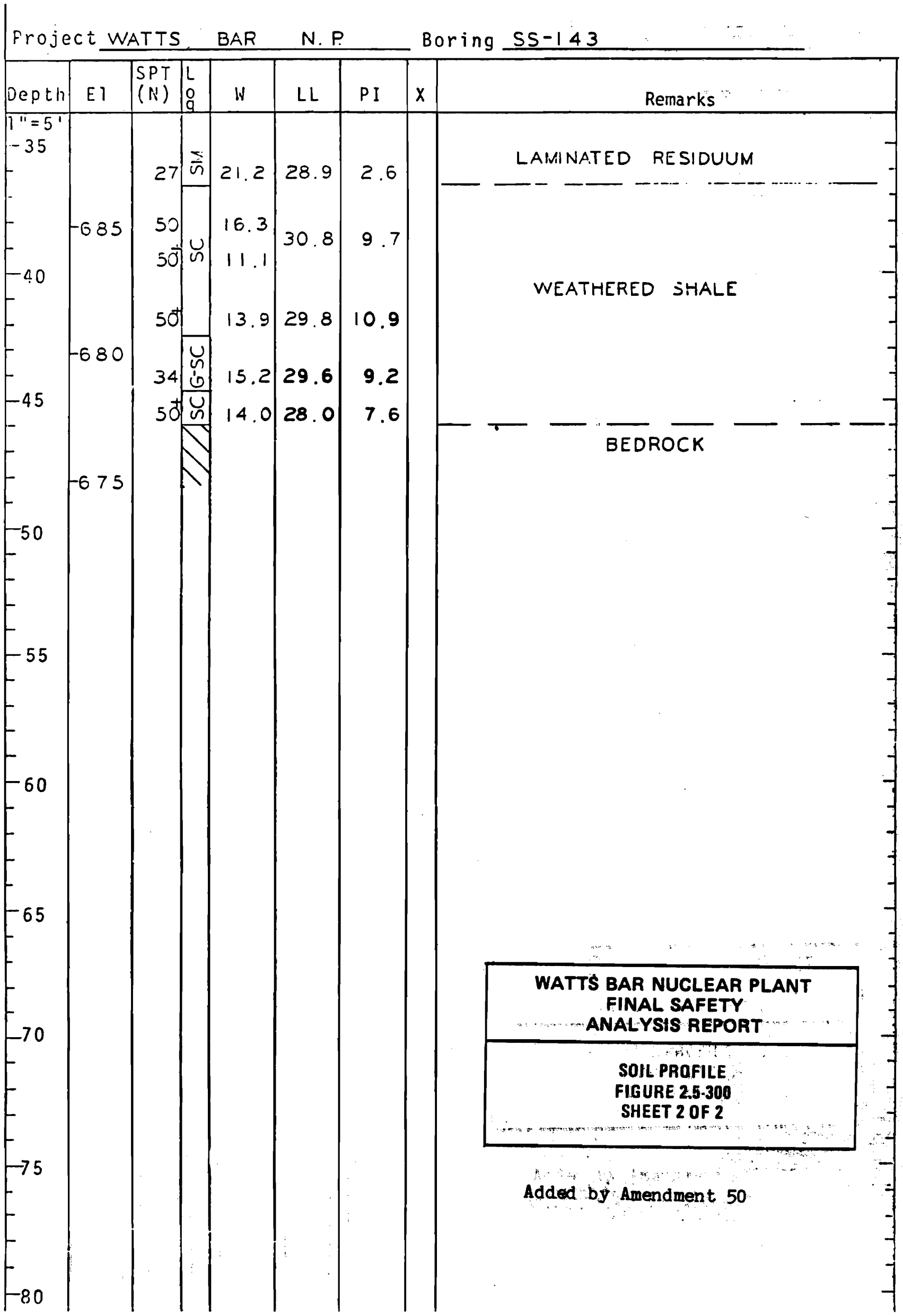


Figure 2.5-300 Soil Profile (Sheet 2 of 2)

ISSUED
JUN 26 1987

WATTS BAR NUCLEAR PLANT ERCW
SOIL PROFILE

Boring SS-143	Station 969.0S	Range 1923.2E	Surface El 723.1	Date Drilled 6-14-79 to 6-14-79

Boring SS-143A	Station 975.0S	Range 1930.0E	Surface El 723.0	Date Drilled 11-19-81 to 11-20-81

Prepared by JLB
Checked by HPM

El	SPT (N)	LOG	W	LL	PI	SPT (N)	LOG	W	LL	PI	REMARKS
											FILL
720	10		16.3	31.9	16.8	12	SC	15.0	33	16	
	24		16.4	30.5	12.7	20		13.3	31	13	
	13	CL	15.9	35.3	17.0	13	CL	19.6	35	16	
715	10		20.9	35.4	16.1	12	CL-ML	21.8	33	10	
	9		19.4			9	SC	22.4	29	10	
	9		22.4	37.4	13.6	4		36.5	41	20	
710	9	ML-CL	22.9	38.9	13.3	2	ML	30.1	43	13	
	9		22.7	36.2	11.5			21.6	39	11	
	6		21.8			8	CL	37.2	36	19	ALLUVIUM
705	7		25.0	39.3	18.2	1	SC	29.1	38	18	
	3	CL	29.0			0		41.4	39	20	
700	4		25.6	42.2	22.4	3	SM-SC	21.2	21	5	
	4		29.0	35.2	16.2	4	CL	24.9	25	8	
	7		—	—	—	8	SC	43.1	37	11	
695	9	G-SP-SM	13.5	NP	NP	16		33.8	34	12	
	2		—	31.2	15.5	31	SM	25.9	NP	NP	WEATHERED SHALE
690	17	CL	11.4	—	—						DISCONTINUED
	27	SM	21.2	28 9	2.6						
	50		16.3								
685	50+	SC	11.1	30.8	9.7						
	50+		13.9	29.8	10.9						
680	34	G-SC	15.2	29.6	9.2						
	50+	SC	14.0	28.0	7.6						
675											

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-301

Figure 2.5-301 Soil Profile

SOIL PROFILE (SS, PA, HA, TP BORING)

Project WATTS BAR N.P. Feature ERCW ALIGNMENT

Boring SS-144 Station 865.15 Range 1923.2 E Surface El 729.0

Date Drilled 6-13-79 To 6-14-79 Prepared By JLB Checked By SCJ

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0								
		11	CL	17.2	41.8	25.8		
	725	16		14.0	39.0	20.5		
5		19	ML-CL	20.8				
		20		20.2	36.6	-12.8		
	720	22		17.4				
10		18	CL	19.9				ALLUVIAL CLAY
	715	20		18.9	37.7	14.8		
15		20		20.2				
		15		25.3	41.8	25.8		
	710	19	ML-CL	24.7				
20		8		20.9	43.5	16.7		
	705	5	CL	24.4	42.6	16.7		
25		3		27.0	38.0	15.8		
		14	CL-CH	21.1	50.6	24.6		
	700	17	ML	22.6	—	—		
30								
		37	ML-CL	18.3	39.8	14.9		LAMINATED RESIDUUM
	695	16	SM-SC	26.4	35.1	11.5		
35								Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-302
SHEET 1 OF 2

Figure 2.5-302 Soil Profile (Sheet 1 of 2)

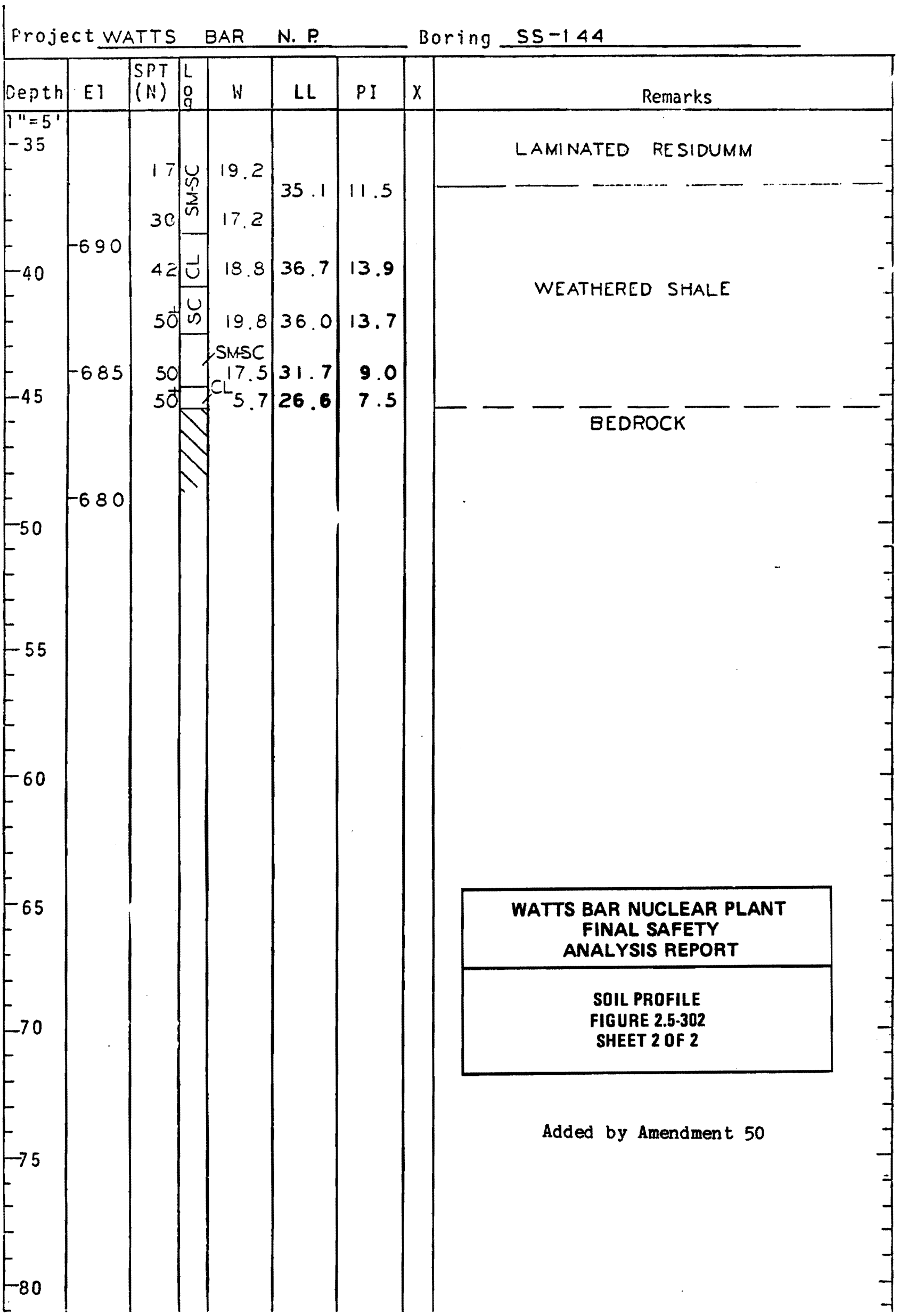


Figure 2.5-302 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-303
SHEET 1 OF 2

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-145 Station 665.0 S Range 1923.2 E Surface El 737.1

Date Drilled 6-14-79 To 6-19-79 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0								
	735	15	CL	17.3	41.6	23.2		
		21	ML-CL	19.0	39.1	14.3		CLAY FILL
5		25		17.9				
	730	23	ML	22.8	47.2	-19.1		
10		20	ML-CL	18.6	42.1	16.1		ALLUVIAL FILL
	725	17		19.0	41.3	16.6		
		16		17.3				
15		9	SM	17.1				ALLUVIAL SILTY SAND
	720	10		13.7	NP	NP		
20		14		9.3				
		21	GSPSM	11.0				
	715	22	GSM	14.5	23.8	3.6		ALLUVIAL GRAVELLY SAND
25		50+		7.1				
	710	37	G-SP-SM	8.7				
30		50+		8.5	NP	NP		
	705	35	GM	8.2				ALLUVIAL GRAVEL
		33	GPGM	8.2				Added by Amendment 50
35								

Figure 2.5-303 Soil Profile (Sheet 1 of 2)

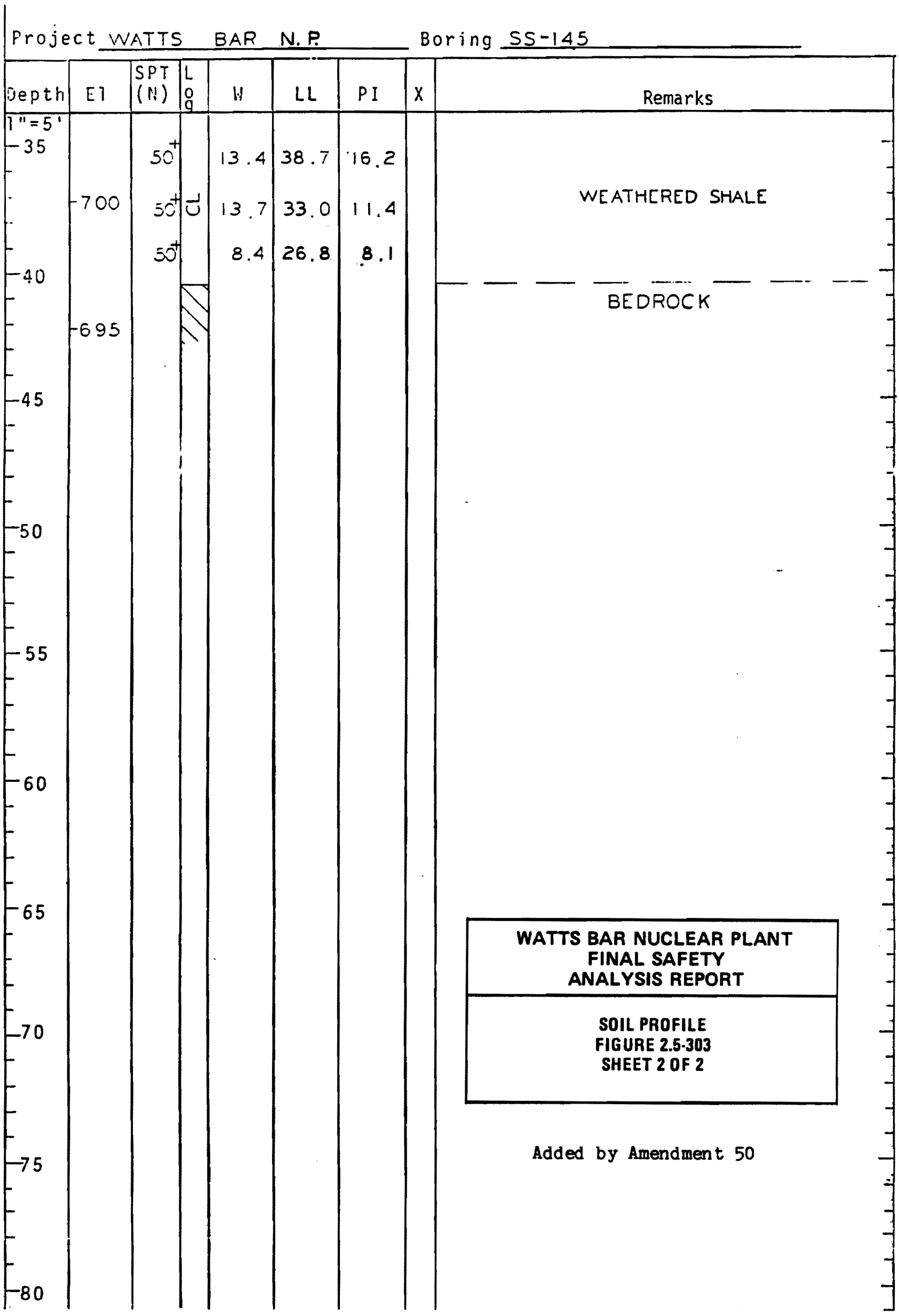


Figure 2.5-303 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-304
SHEET 1 OF 2

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-146 Station 565.0S Range 1923.2 E Surface El 741.4

Date Drilled 6-19-79 To 6-20-79 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0								
	740	17	CL	10.0	29.3	12.8		
		20		13.9	29.6	11.1		CLAY FILL
5								
	735	11		12.6	30.7	12.0		
		13		13.5	36.0	-19.2		
		14	CL-ML	14.2	47.7	21.2		
10								
	730	22	ML	13.4	44.9	14.9		ALLUVIAL SILT & CLAY
		21	CL-ML	10.2				
15					39.2	13.7		
	725	20		11.1				
			SM-SC					SILTY CLAYEY SAND
		13		12.3	28.4	6.3		
		16	G-SM	12.8				
20								
	720	10	SM	11.2				ALLUVIAL GRAVELLY SAND
		16	G-SM	7.1				
25								
	715	10		16.4	NP	NP		
		10	SM	16.5				ALLUVIAL SAND
30								
		14		8.4				
	710	39	GP	3.2				ALLUVIAL GRAVEL
		13	G-SM	14.6	21.6	1.9		ALLUVIAL GRAVELLY SAND
35								Added by Amendment 50

Figure 2.5-304 Soil Profile (Sheet 1 of 2)

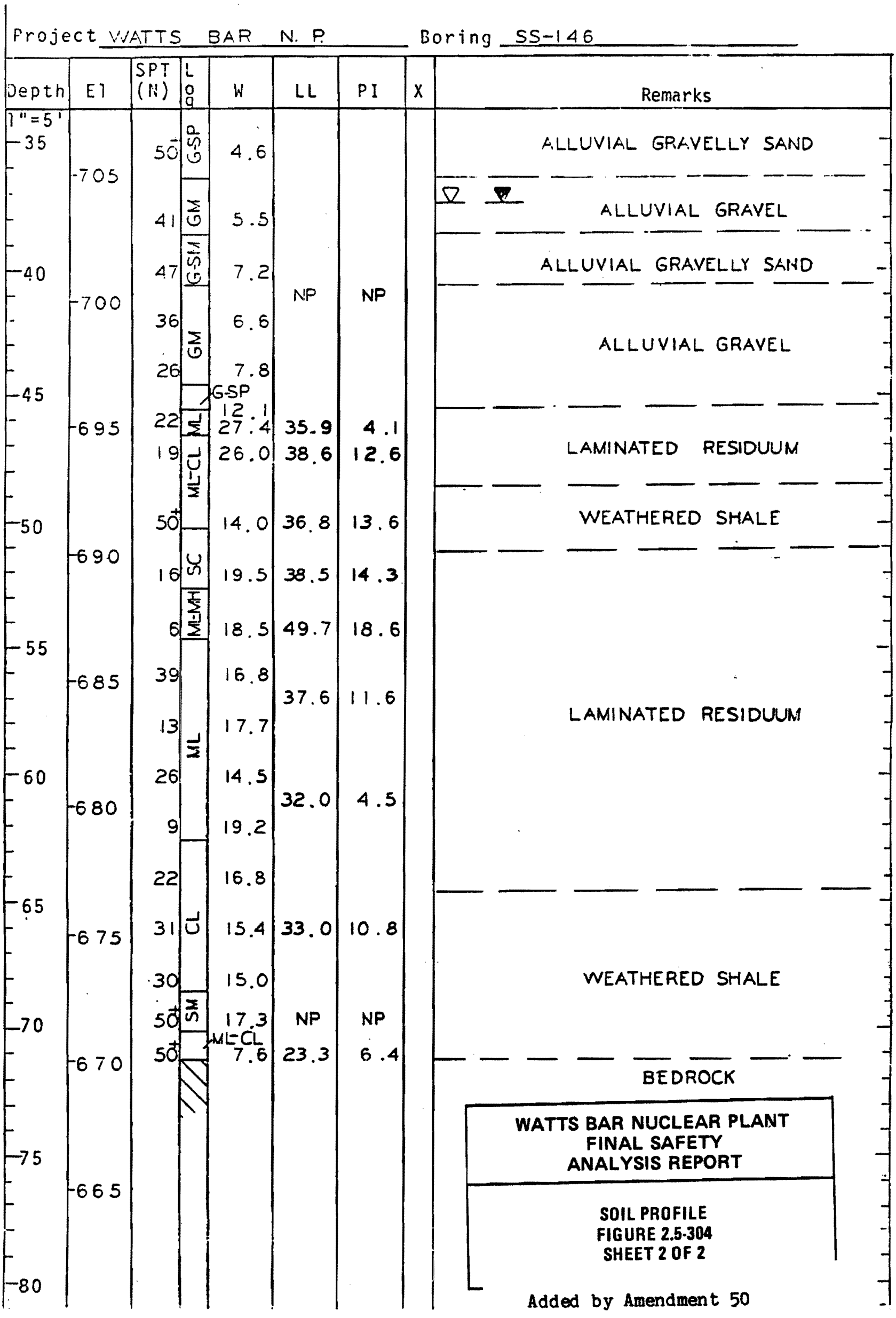


Figure 2.5-304 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-305
SHEET 1 OF 2

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-147 Station 464. 1S Range 1866.4 E Surface El 741.7

Date Drilled 6-20-79 To 6-21-79 Prepared By JLB Checked By gcf

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5								
0								
	740	16	CL	15.2				
		22		16.3	30.4	12.0		CLAY FILL
5		16		17.1				
	735	38	CL	14.3	34 .1	-17.6		
		31	CH	24.0	51 .3	24.5		
10	730	20		20.4	43 .1	17.4		ALLUVIAL CLAY
		25	CL-ML	20.5	39.7	15 .1		
15		15		17.4	—	—		
	725	10		14.4				
		11	SM	15.9				ALLUVIAL SAND
20	720	11		14.0	NP	NP		
		12	GSM	17.4				ALLUVIAL GRAVELLY SAND
25		14	SM	11.0				ALLUVIAL SAND
	715	15	GM-GC	12.2	24.6	4.8		
		28	GSPSM	5.8	NP	NP		ALLUVIAL GRAVEL
30	710	40	GSMSC	11.7	23 .4	4 .3		
		50+	GSPSM	7 .6	NP	NP		Added by Amendment 50
35								

Figure 2.5-305 Soil Profile (Sheet 1 of 2)

Project WATTS BAR N. P. Boring SS-147

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
35								
	705	50+	GP-GM	7.7				ALLUVIAL GRAVEL
		29		8.5	NP	NP		
			G-SM					▽
40		18		17.1				
	700	47		28.5	36.8	5.2		WEATHERED SHALE
		30		21.8	39.2	12.0		LAMINATED RESIDUUM
45								
	695	20	ML	34.1	48.2	10.5		
		50+		19.0	42.5	15.2		WEATHERED SHALE
50		43		20.5	37.8	11.9		
	690	21		25.0	44.4	16.8		LAMINATED RESIDUUM
		24		17:8	35.2	13.1		
55			CL					
	685	28		16.1	28.6	7.9		WEATHERED SHALE
		50+		10.7	29.1	7.3		BEDROCK
60								
	680							
65								
70								
75								
80								

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-305
SHEET 2 OF 2

Added by Amendment 50

Figure 2.5-305 Soil Profile (Sheet 2 of 2)

**WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT**

**SOIL PROFILE
FIGURE 2.5-306
SHEET 1 OF 1**

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-148A Station 265.0 S Range 1923.0 E Surface El 715.4

Date Drilled 6-19-79 To 6-19-79 Prepared By JLB Checked By JCL

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5								
0	715							
		10	CL	12.3	27.2	10.9		
		16		15.3				
5	710				33.7	16.5		ALLUVIAL CLAY
		17		15.3				
		25		15.8	28.3	10.4		
10	705	19		12.5	29.4	14.3		
		30		11.9	30.2	12.7		
		50+		16.6	31.4	13.4		DISCONTINUED
15	700							
20								
25								
30								
35								

Added by Amendment 50

Figure 2.5-306 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-307
SHEET 1 OF 2

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-148B Station 259.0S Range 1865.5 E Surface El 736.6

Date Drilled 6-19-79 To 6-21-79 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI.	X	Remarks
1"=5'								
0	735							NO SAMPLING ALLUVIAL CLAY
5	730							
10	725							
15	720	38	G-SM	8.2				ALLUVIAL GRAVELLY SAND
		26		11.2	NP	NP		
		23	GW-GM	7.0				ALLUVIAL GRAVEL
20	715	25		20.3	44.8	16.1		LAMINATED RESIDUUM
		50+		17.1	45.9	18.9		
25	710	50+	ML	19.4	36.3	10.2		WEATHERED SHALE
		50+		19.4				
30	705	37		20.1	38.8	11.2		
		46	CL-ML	17.6	40.9	15.2		Added by Amendment 50
35		41	CL	14.8	34.9	12.3		

Figure 2.5-307 Soil Profile (Sheet 1 of 2)

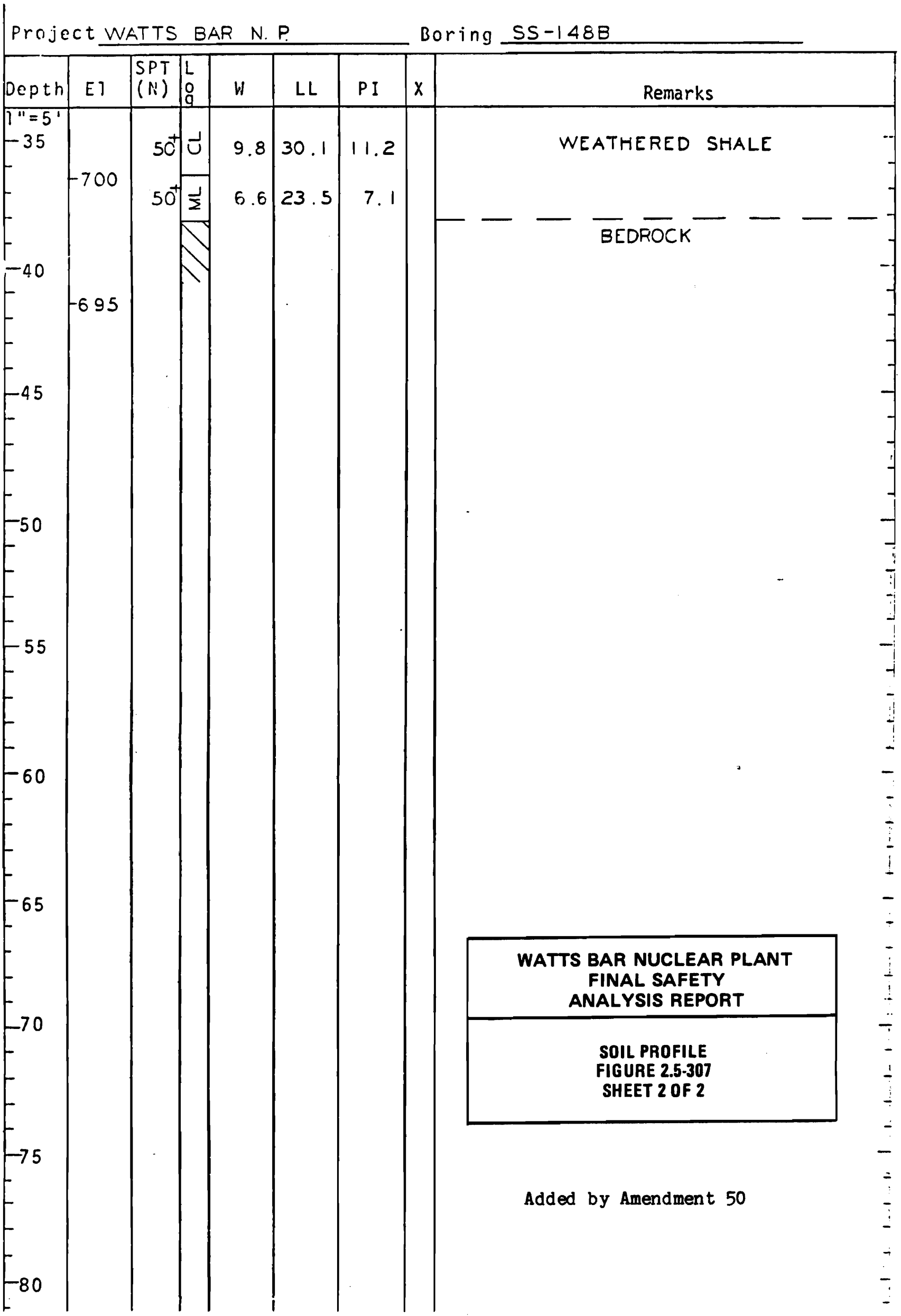


Figure 2.5-307 Soil Profile (Sheet 2 of 2)

TENNESSEE VALLEY AUTHORITY
SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SS, PA, HA, TP BORING)

Sheet 1 Of 2

Project WATTS BAR N P Feature ERCW ALIGNMENT

Boring SS-149 Station 65 0S Range 1923.5E Surface El 705.9

Date Drilled 6-20-79 To 6-21-79 Prepared By JLE Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0	705	7		14.4	32.5	16.8		ALLUVIAL CLAY
		11	CL	18.2	31.9	11.0		
5	700	10		20.5	36.1	16.0		
		13	SC	17.3	30.9	-11.7		ALLUVIAL CLAYEY SAND
10	695	23		23.7	43.4	15.0		LAMINATED RESIDUUM
		16	ML	25.8	36.4	4.9		
		29		21.9	38.6	8.1		
15	690	40	CL	19.3	45.0	19.3		
		25		22.9				
			ML		36.2	8.5		
20	685	35		20.5				
		30	CL-ML	17.4	32.4	8.8		WEATHERED SHALE
		43	SM	15.7	28.9	3.2		
25	680	50/4	GSMSC	12.7	29.1	6.1		
		50/4		9.5	31.4	10.4		
			ML					
30	675	50/4		14.9	27.8	3.6		
		50/4	SMSC	8.0	22.3	5.0		
				11.7				
35								

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE

Figure 2.5-308
SHEET 1 OF 2

Amendment 63

Figure 2.5-308 Soil Profile (Sheet 1 of 2)

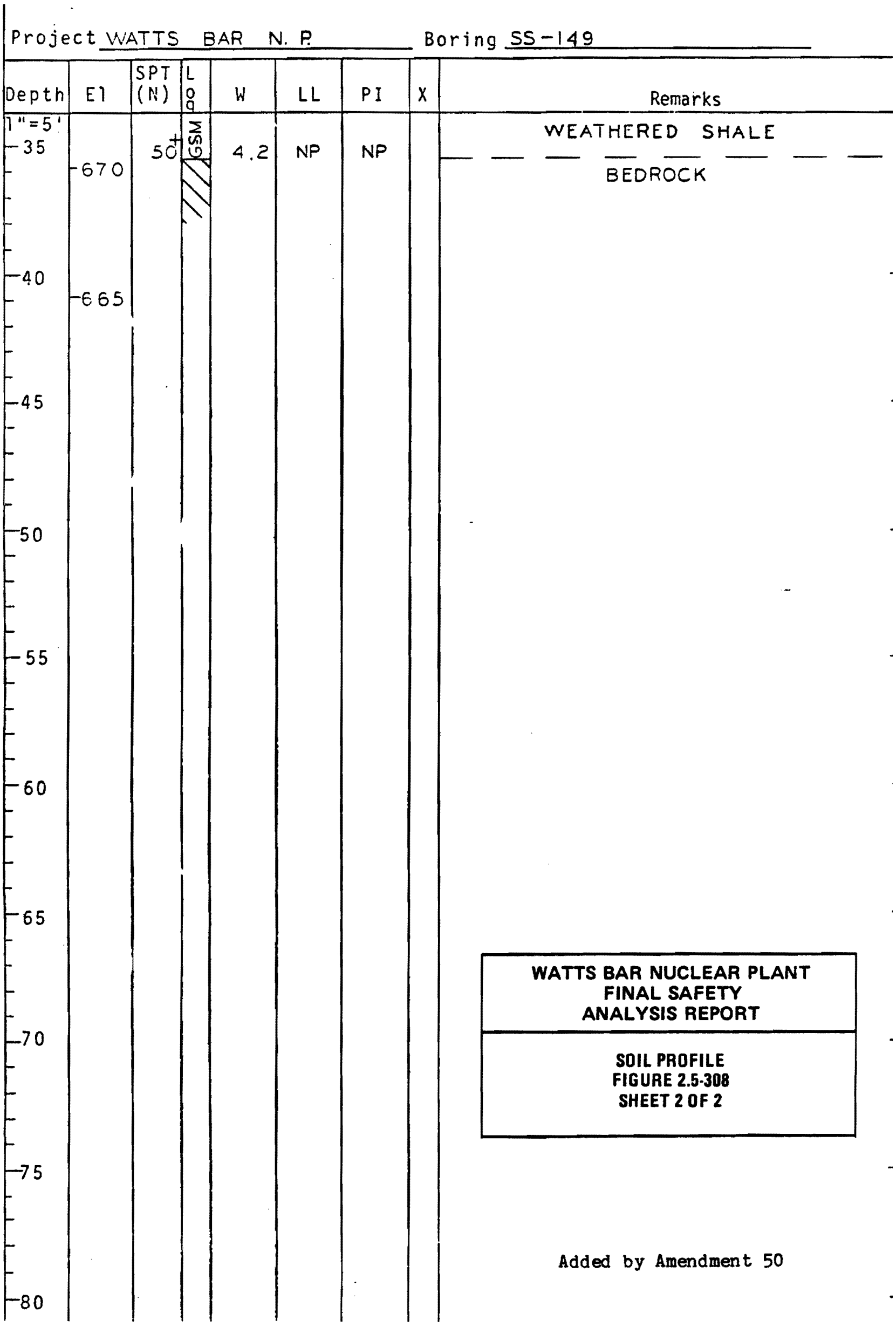


Figure 2.5-308 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-309
SHEET 1 OF 1

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-150 Station 135.0 N Range 1923.2 E Surface El 709.1

Date Drilled 6-22-79 To 6-22-79 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0								
		22	CL	14.8	27.3	8.9		ALLUVIAL CLAY
	705	13	CL	17.5				
5		16	CL	17.8	33.0	13.7		
		50	ML	20.7				
	700	50+	ML	17.3	30.5	4.5		
10								▽
		34	CL	14.9	33.2	11.4		WEATHERED SHALE
	695	50	CL	16.2	37.2	13.5		
15		50+	CL	12.8	29.4	9.0		
		50+	SM-SC	6.3				
					23.7	6.7		
	690	50+	SM-SC	8.3				
20								BEDROCK
	685							
25								
30								
35								

Added by Amendment 50

Figure 2.5-309 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-310
SHEET 1 OF 1

Project WATTS BAR N.P Feature ERCW ALIGNMENT

Boring SS-151 Station 285.8 ~~X~~N Range 1824.9E Surface El 717.5

Date Drilled 6-25-79 To 6-25-79 Prepared By JLB Checked By

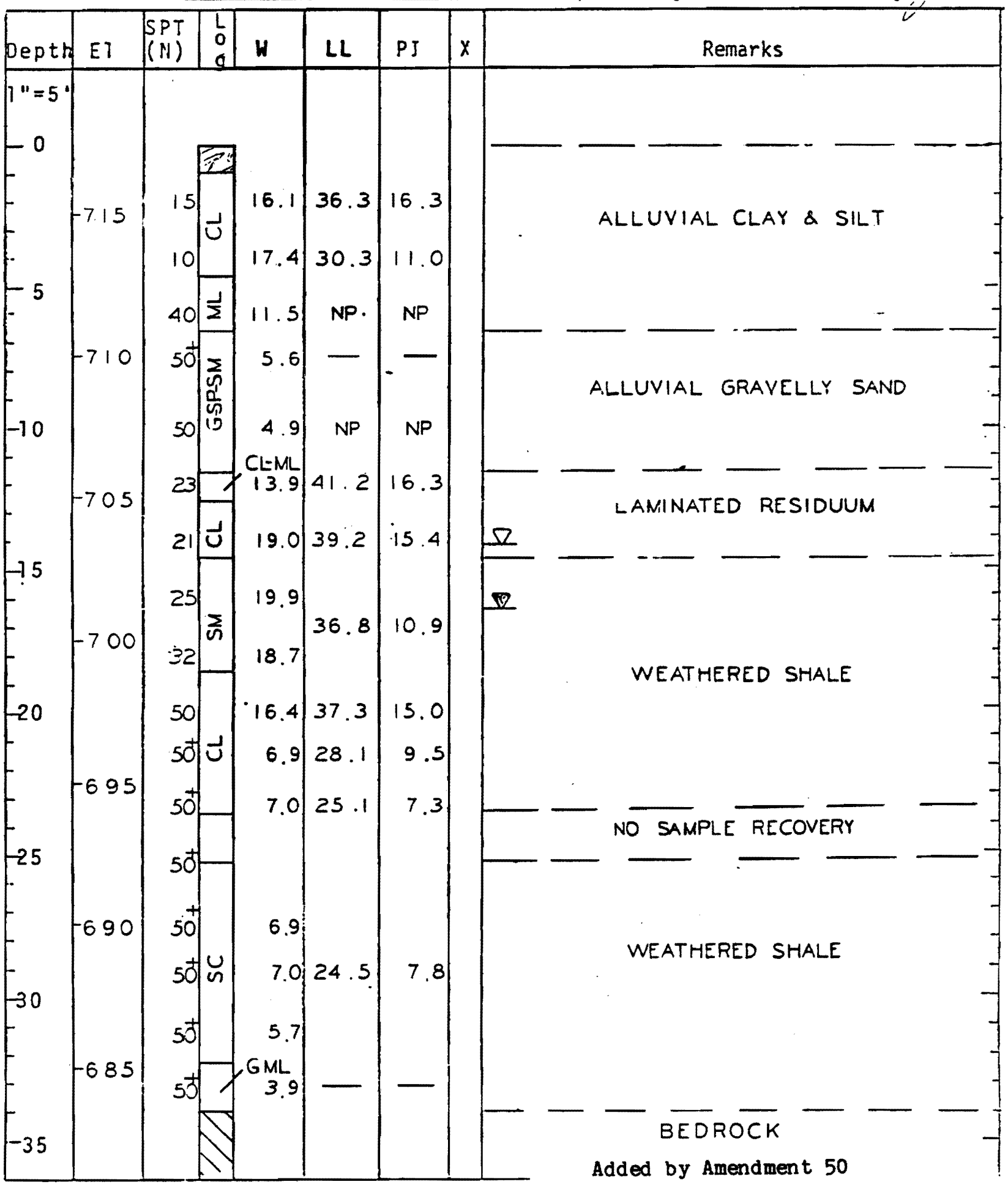


Figure 2.5-310 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-311
SHEET 1 OF 1

Project WATTS BAR N.P. Feature ERCW ALIGNMENT

Boring SS-152 Station 465.1N Range 1693.1E Surface El 719.6

Date Drilled 6-25-79 To 6-25-79 Prepared By JLB Checked By JCP

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0								
		23	CL	12.6	32.3	14.9		ALLUVIAL CLAY
	715	21	CL	17.8	27.9	10.6		
5		19	CL	17.5	34.8	18.7		
		22	CL	15.6	30.1	-11.1		
	710	50+	G-SM	4.6	NP	NP		ALLUVIAL GRAVELLY SAND
10			GSP-SM					
		23		13.9				
		24	ML	24.6	37.1	10.4		
	705		ML-CL					
15		19		22.4	41.3	16.0		LAMINATED RESIDUUM
		27	CL	26.2	40.8	17.0		
		50+	CL	15.3				
20	700				32.7	11.8		
		50+	CL	14.5				WEATHERED SHALE
		50+	CL	9.4	26.0	9.3		
25	695	50+	ML-CL	5.9	24.0	6.7		BEDROCK
30	690							
35								

Added by Amendment 50

Figure 2.5-311 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-312
SHEET 1 OF 1

Project WATTS BAR N.P. Feature ERCW ALIGNMENT

Boring SS-153 Station 585.0N Range 1540.0E Surface El 719.7

Date Drilled 6-26-79 To 6-26-79 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0		49	GCL	14.8	31.3	15.9		FILL
		18	CL-CH	19.4	49.1	28.6		
5	715	32	CL	13.5	23.5	7.5		ALLUVIAL CLAY
		13		14.7	28.3	-11.8		
10	710	50+	GSPSM	—	NP	NP		ALLUVIAL GRAVEL
		15	GSWSM	10.8				
		48	MLCL	20.2	48.5	21.4		
15	705	50+	CL-ML	16.3	38.1	13.3		
		50+		14.8				
		50+	CL	12.7	37 3	14.7		WEATHERED SHALE
20	700	50+		8.3	28.9	9.4		
		50+	SC	5.7	24.2	7.5		
25	695	50+		4.7				BEDROCK
30	690							
35								Added by Amendment 50

Figure 2.5-312 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-313
SHEET 1 OF 1

Project WATTS BAR N.P. Feature ERCW ALIGNMENT

Boring SS-154 Station 633.5 N Range 1444.4E Surface El 719.7

Date Drilled 6-26-79 To 6-26-79 Prepared By JLB Checked By

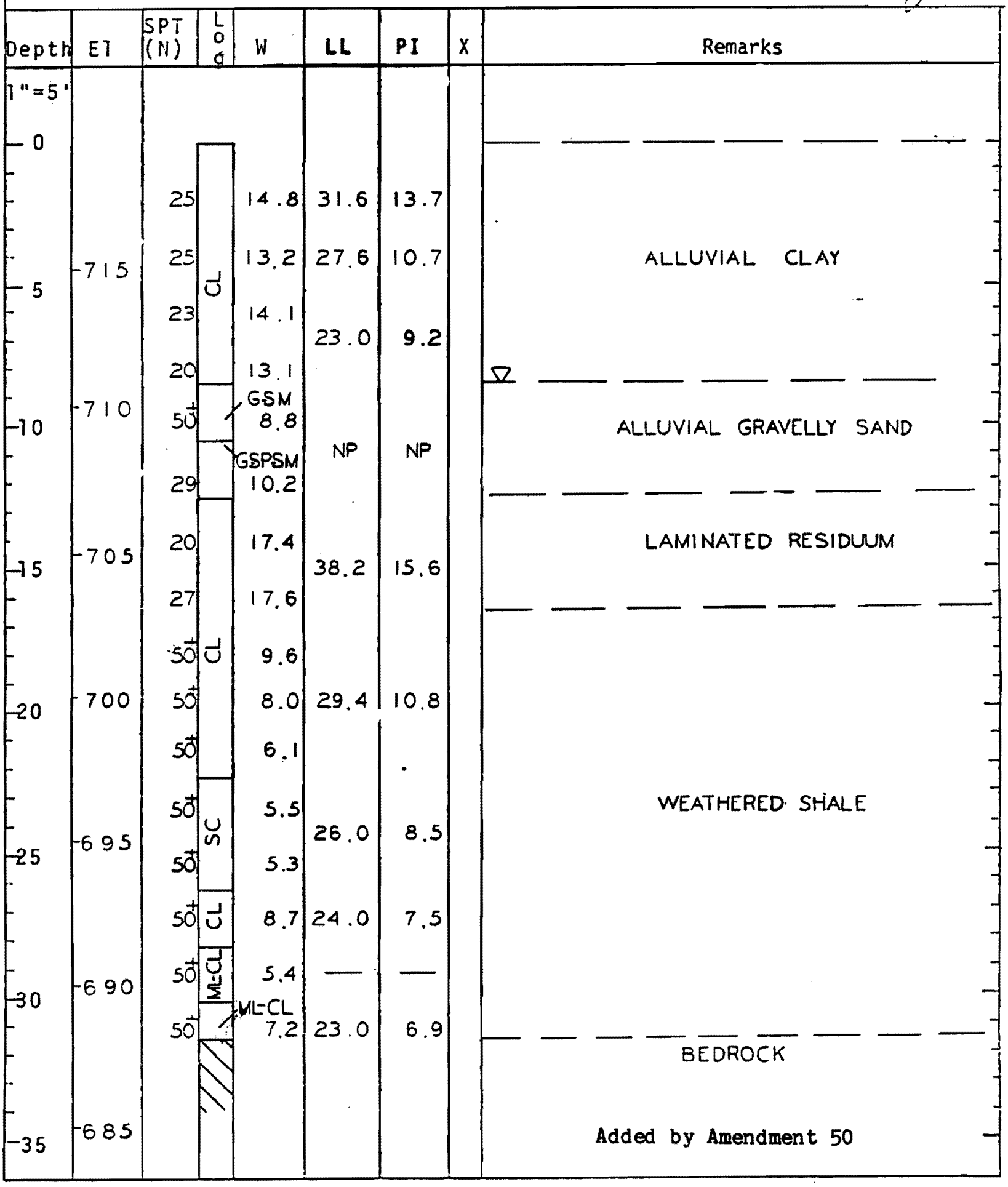


Figure 2.5-313 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-314
SHEET 1 OF 1

Project WATTS BAR N.P. Feature ERCW ALIGNMENT

Boring SS-155 Station 664.1 N Range 1410.0 E Surface El 719.5 '

Date Drilled 6-26-79 To 6-26-79 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI.	X	Remarks
1"=5								
0								FILL
		22	CL	16.3	26.8	10.7		
5	715	35	CL	12.9				ALLUVIAL CLAY
		20	CL	14.9	35.9	20.5		
		21	CL-ML	12.3	19.7	- 4.7		
10	710	32	GSM	17.5				ALLUVIAL GRAVELLY SAND
		23	GSM	12.5	NP	NP		
		36	GSPSM	11.7				
15	705	28	CL	16.0	38.0	16.0		LAMINATED RESIDUUM
		50+	CL	5.6				
		50+	CL	15.5	26.6	8.8		WEATHERED SHALE
20	700	50+	ML-CL	6.5	23.7	6.3		
								DISCONTINUED
25	695							
30								
35								Added by Amendment 50

Figure 2.5-314 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-315
SHEET 1 OF 1

Project WATTS BAR N.P. Feature ERCW ALIGNMENT

Boring SS-156 Station 664.8 N Range 1210.0 E Surface El 720.4

Date Drilled 6-26-79 To 6-26-79 Prepared By JLB Checked By

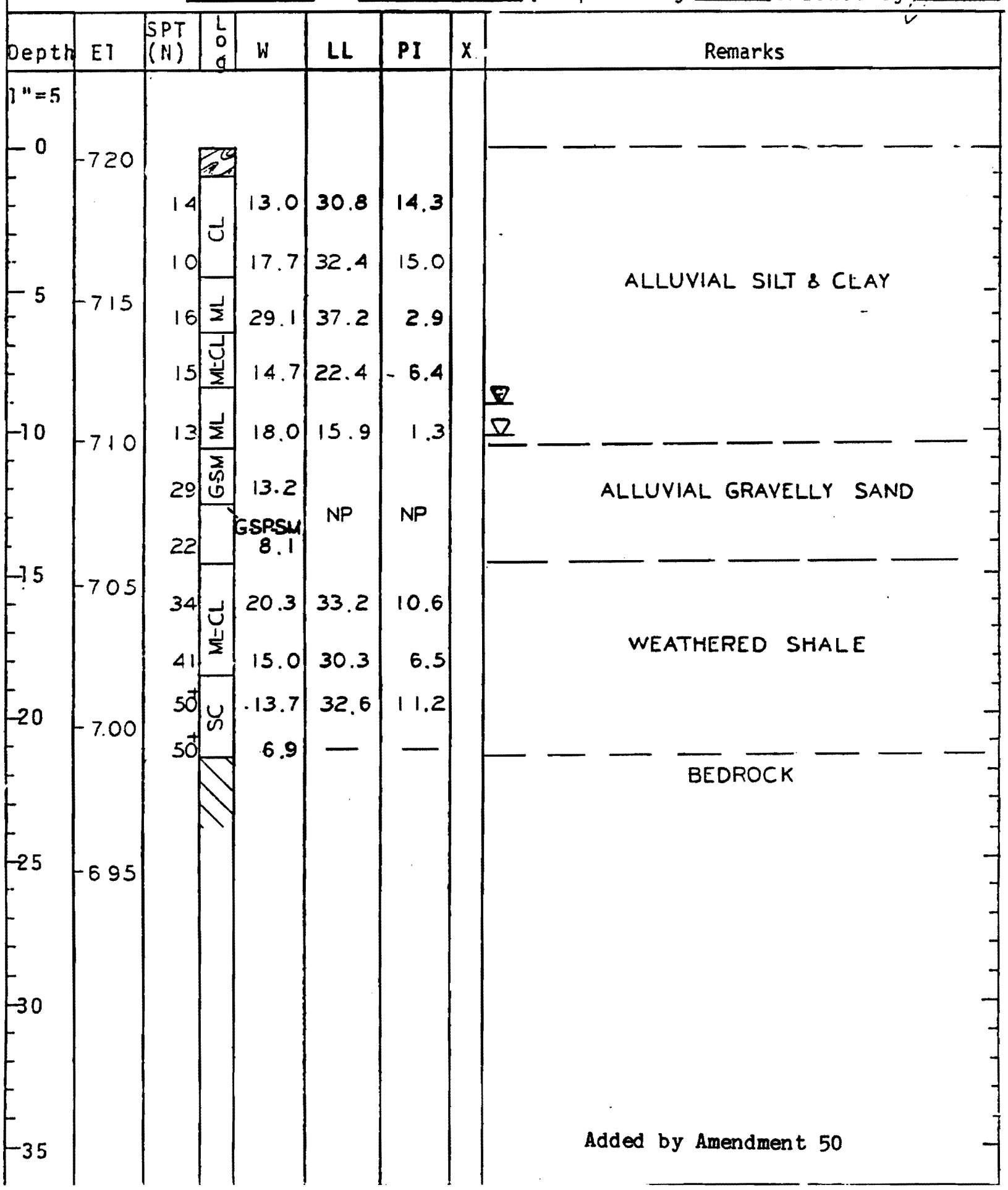


Figure 2.5-315 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-316
SHEET 1 OF 1

Project WATTS BAR N.P. Feature ERCW ALIGNMENT

Boring SS-157 Station 664.8 N Range 1110.0 E Surface El 723.5

Date Drilled 6-27-79 To 6-27-79 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5								
0								LIMESTONE-GRAVEL
		10	CL	15.4	29.3	13.1		CLAY FILL
	720	20		12.4	24.0	8.1		
5		19		18.6	38.7	17.7		
		17		17.9				ALLUVIAL CLAY
	715				33.2	16.3		
10		20		18.3				
		13		22.6	37.6	17.2		
	710	39	G-SM	13.3				ALLUVIAL GRAVELLY SAND
15		33		9.2				
		33	ML	23.2				
	705							
20		43		21.8	NP	NP		WEATHERED SHALE
		50+	SM	15.1				
	700	50+		16.4				
25		50+		10.6				BEDROCK
	695							
30								
35								Added by Amendment 50

Figure 2.5-316 Soil Profile (Sheet 1 of 1)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-317
SHEET 1 OF 1

Project WATTS BAR N.P. Feature ERCW ALIGNMENT

Boring SS-158 Station 664.8 N Range 1010.0 E Surface El 727.5

Date Drilled 6-26-79 To 6-27-79 Prepared By JLB Checked By ACS

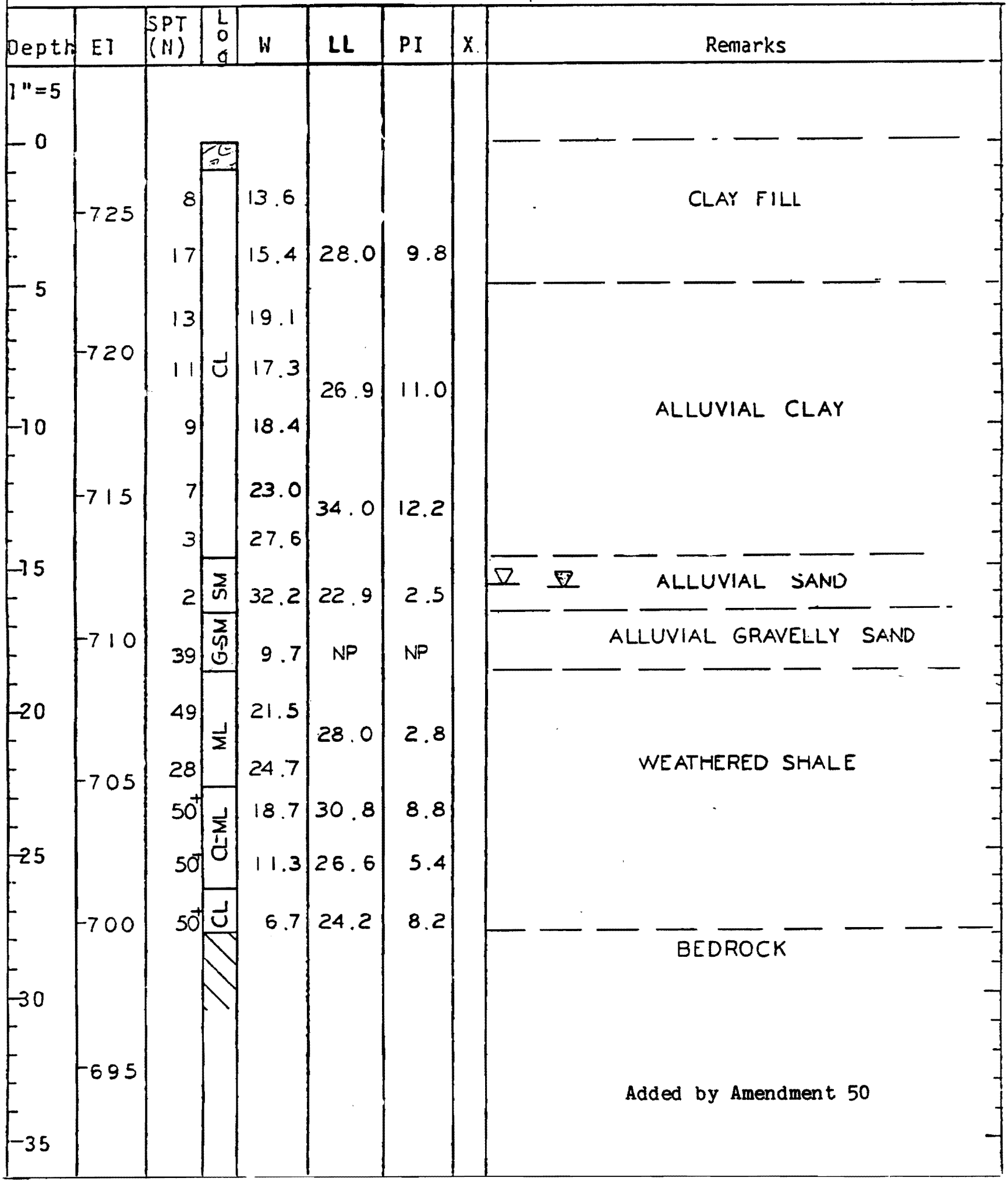


Figure 2.5-317 Soil Profile

WATTS BAR NUCLEAR PLANT ERCW
SOIL PROFILE

Boring SS-158
Station 664.8N Range 1010.0E
Surface El 727.5
Date Drilled 6-26-79 to 6-26-79

Boring SS-158A
Station 658.8N Range 1015.0E
Surface El 727.6
Date Drilled 11-20-81 to 11-20-81

Prepared by JLB
Checked by HPM

El	SPT (N)	LOG	W	LL	PI	SPT (N)	LOG	W	LL	PI	REMARKS
											GRAVEL ROADBED
725	8		13.6			20		16.1	26	9	FILL
	17		15.4	28.0	9.8	15	CL	21.2	43	23	
	13		19.1			15		21.0	36	15	
720	11	CL	17.3			19		23.2	41	18	
				26.9	11.0						
	9		18.4			15	ML	24.8	19	7	ALLUVIUM
715	7		23.0			8		25.2	32	8	
	3		27.6	34.0	12.2						
	2	SM	32.2	22.9	2.5	4	CL	30.6	31	13	
710	39	GSM	9.7	NP	NP	3	SC	27.8	35	15	
						50+	GM	24.1	NP	NP	
	49	ML	21.5			23	SM	24.5	31	6	WEATHERED SHALE
				28.0	2.8						
705	28		24.7								DISCONTINUED
	50+	CL-ML	18.7	30.8	8.8						
	50+		11.3	26.6	5.4						
700	50+	CL	6.7	24.2	8.2						
695											

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-318

Figure 2.5-318 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-319
SHEET 1 OF 1

Added by Amendment 50

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-159 Station 640.0 N Range 810.0 E Surface El 731.7

Date Drilled 6-27-79 To 6-27-79 Prepared By JLB Checked By QCL

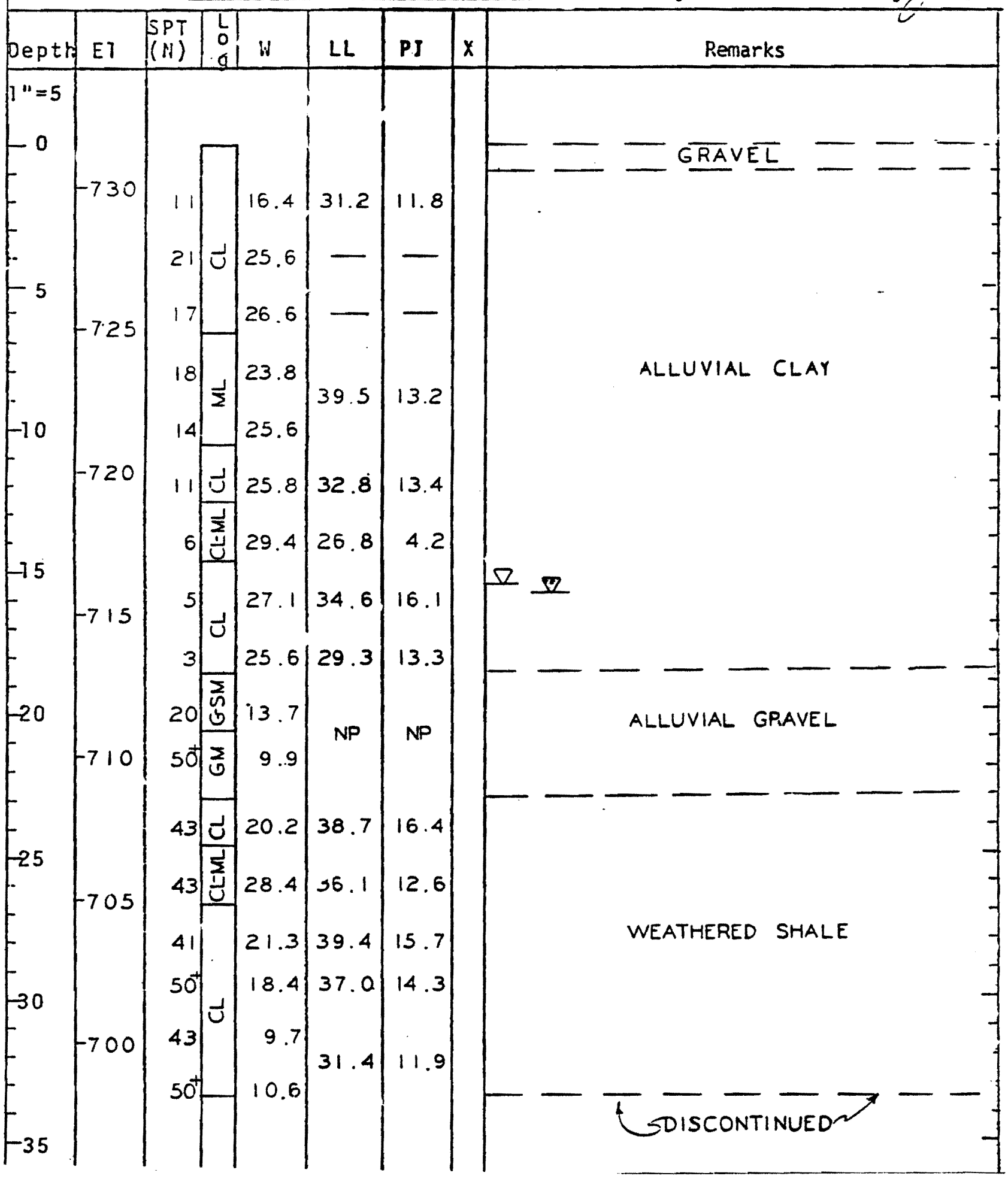


Figure 2.5-319 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-320
SHEET 1 OF 1

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-160 Station 566.0 N Range 740.0 E Surface El 732.9

Date Drilled 6-27-79 To 6-27-79 Prepared By JLB Checked By JCE

Depth	El	SPT (N)	Log	W	LL	PI.	X.	Remarks
1"=5								
0								CLAY FILL
	730	13	CL	21.5	35.8	17.9		
		21		22.8	39.2	16.1		ALLUVIAL CLAY
5		21		21.4				
	725	15		14.7	30.2	- 6.0		
10		13		24.0	30.0	6.0		
		15	SM	22.5	NP	NP		ALLUVIAL SAND
	720	7		23.8	24.2	1.7		
15		12		25.8	27.0	3.0		
	715	5	SM-SC	30.2	32.1	8.5		
20		21		22.0	26.2	2.2		ALLUVIAL GRAVEL
		5	GM	24.3				
	710	50+	GP-GM	9.6	NP	NP		
25		39	SM-SC	16.8	29.5	7.5		
	705	29	CL	21.1	38.7	16.3		WEATHERED SHALE
		50+	ML	16.9	30.6	6.7		
30		50+		15.1	23.7	15.9		
	700	50+	CL-ML	10.1				DISCONTINUED
35								Added by Amendment 50

Figure 2.5-320 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-321
SHEET 1 OF 2

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-161 Station 488.0N Range 670.0E Surface El 732.4

Date Drilled 6-28-79 To 6-28-79 Prepared By JLB Checked By [illegible]

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0								
	730	20	CH	26.2	57.6	30.0		
		14	ML	21.1	41.2	14.4		
5		9	CL-ML	25.1	43.0	16.5		ALLUVIAL SAND TO CLAY
	725	8	SC	28.2	34.4	-11.9		
10		5	CL	25.3	29.7	8.4		
		6	SC	25.3	30.8	9.4		
	720	9		18.4				
15			SM		NP	NP		▽ ALLUVIAL SILT & SAND
		10		21.5				
	715	3	CL-ML	35.8	36.8	13.2		
20		5	ML	30.9	25.7	2.3		
	710	37	GM	11.1	NP	NP		ALLUVIAL GRAVEL
		19	G-SM	12.7				
25		45		21.0				
	705	50+	CL-ML	16.8	41.1	16.6		
30		50+		18.6				WEATHERED SHALE
	700	25		19.8	38.9	14.3		
		50+	CL	22.2	46.1	20.4		
			SC	12.2	29.1	9.6		Added by Amendment 50
35								

Figure 2.5-321 Soil Profile (Sheet 1 of 2)

Project WATTS BAR N. P. Boring SS-161

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
-35		50+	SC	7.7	29.1	9.6		WEATHERED SHALE
	-695	50+		6.3				DISCONTINUED
-40								
	-690							
-45								
-50								
-55								
-60								
-65								
-70								
-75								
-80								

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-321
SHEET 2 OF 2

Added by Amendment 50

Figure 2.5-321 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT ERCW
SOIL PROFILE

Boring SS-161						Boring SS-161A						Prepared by JLB
Station 488.0 N Range 670.0 E						Station 488.0N Range 675.0E						Checked by HPM
Surface El 732.4						Surface El 732.9						
Date Drilled 6-28-79 to 6-28-79						Date Drilled 11-23-81 to 11-23-81						
El	SPT (N)	LOG	W	LL	PI	SPT (N)	LOG	W	LL	PI	REMARKS	
730	20	CH	26.2	57.6	30.0	33	CH	28.4	62	34		
	14	ML	21.1	41.2	14.4	26	SM	19.2	39	12		
	9	CL-ML	25.1	43.0	16.5	13	CL	24.3	36	13		
725	8	SC	28.2	34.4	11.9	12	SM-SC	21.8	32	8		
	5	CL	25.3	30.8	9.4	9	SC	22.4	28	8	ALLUVIUM	
	6	SC	25.3	29.7	8.4	10	SM	23.8	26	2		
720	9	SM	18.4	NP	NP	13		17.8 17.0	NP	NP		
	10		21.5			23	SC	14.0	29	9		
715	3	CL-ML	35.8	36.8	13.2	5	ML	35.7	38	12		
	5	ML	30.9	25.7	2.3	5	CL	33.0 32.4	32 27	13 9		
710	37	GM	11.1	NP	NP	50	SM	15.4				
	19	G-SM	12.7			40	GP-GM	10.3	NP	NP		
	45	CL-ML	21.0			16	SM	44.2			WEATHERED SHALE	
705	50		16.8	41.1	16.6						DISCONTINUED	
	50		18.6									
700	25	CL	19.8	38.9	14.3							
	50		22.2 12 2	46.1	20.4							
	50	SC	7.7	29.1	9.6							
695	50		6.3									
690												

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-322

Figure 2.5-322 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-323
SHEET 1 OF 1

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-162 Station 488.0 N Range 560.0E Surface El 733.8

Date Drilled 6-28-79 To 6-28-79 Prepared By JLB Checked By RCL

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5								
0		13	CL	14.4	37.1	21.4		LIMESTONE GRAVEL
	730	17	CH	21.6	67.1	41.7		ALLUVIAL CLAY
5		14		28.4				
		20	SM	16.4	31.6	- 7.1		
	725	34		22.7	31.0	6.6		
10		27	G-SM	20.7	29.1	3.8		ALLUVIAL SAND
	720	36		23.0	31.6	4.9		
15		20	SM	27.7	28.3	1.6		
		19		30.2	27.6	3.0		
	715	5		34.3				
20		11	GSW-SM	20.4	NP	NP		
		50+	GM	10.9				ALLUVIAL SAND & GRAVEL
25	710	50+	SM	12.3				
		50+	CL-ML	18.6	38.6	13.9		WEATHERED SHALE
	705	50+		14.3				
30		50+	CL	12.0	32.0	10.8		DISCONTINUED
	700							
35								Added by Amendment 50

Figure 2.5-323 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-324
SHEET 1 OF 1

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-163 Station 488.0 N Range 450.0 E Surface El 737.0

Date Drilled 6-28-79 To 6-28-79 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5								
0								GRAVEL.
	735	19	CL	18.3	31.7	13.3		ALLUVIAL CLAY
		17	GP-GM	3.4	NP	NP		ALLUVIAL GRAVEL
5		18	MH	25.2	54.0	20.9		
	730	10		24.7				ALLUVIAL CLAY & SILT
			CL-ML		40.0	15.3		
10		9		27.7				
	725	5	SM	19.7	NP	NP		
		5		27.1				
15		5	SM-SC	28.4	30.4	7.1		ALLUVIAL SAND
	720	6		26.9				
20		3		31.1	27.2	3.3		
	715	4	SM	33.5	29.7	4.7		
		17		27.3	28.7	3.8		
25		50+	GP-SM	7.8	NP	NP		ALLUVIAL GRAVEL
	710	50+	GP-GM	12.1				
30		50+		18.5	43.6	16.2		
		50+	ML	21.2	37.3	9.0		WEATHERED SHALE
	705	50+		2.7	—	—		
35								DISCONTINUED

Added by Amendment 50

Figure 2.5-324 Soil Profile

WATTS BAR NUCLEAR PLANT ERCW
SOIL PROFILE

Boring SS-163	Station 488.0 N	Range 450.0E	Surface El 737.0	Date Drilled 6-28-79 to 6-28-79
Boring SS-163A	Station 480.5N	Range 441.0E	Surface El 737.5	Date Drilled 11-24-81 to 11-24-81

Prepared by JLB

Checked by HPM

El	SPT (N)	LOG	W	LL	PI	SPT (N)	LOG	W	LL	PI	REMARKS
735	19	CL	18.3	31.7	13.3						ASPHALT
											GRAVEL ROADBED
	17	GP-GM	3.4	NP	NP						CLAY FILL
	18	MH	25.2	54.0	20.9	25	MH	31.9	60	24	
730	10		24.7			23	SM-SC	22.6	37	13	
	9	CL-ML	27.7	40.0	15.3	23	SC	22.5	33	10	
	5	SM	19.7	NP	NP	15		18.8	30	9	
725	5		27.1			9	SM	25.8	31	6	ALLUVIUM
	5	SM-SC	28.4	30.4	7.1	7		28.9	31	7	
720	6		26.9			11	SP-SM / CL	28.2	NP / 31	NP / 10	
	3	SM	31.1	27.2	3.3	4	SM	36.3	30	3	
	4		33.5	29.7	4.7	5	CL / SM	33.0 / 34.3	31 / 31	9 / 5	
715	17	G-SM	27.3	28.7	3.8	50+	SP-SM	16.2			
	50+		7.8	NP	NP	40		16.4	NP	NP	
710	50+	GP-GM	12.1			50+	GP-GM	13.9			
	50+	ML	18.5	43.6	16.2	50+	SM	13.2 / 20.5	40	12	WEATHERED SHALE
705	50+		21.2	37.3	9.0						DISCONTINUED
	50+		2.7	—	—						
700											

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-325

Figure 2.5-325 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-326
SHEET 1 OF 2

Added by Amendment 50

Project WATTS BAR N.P. Feature DIKE ALIGNMENT

Boring SS-164 Station 488.0 N Range 230.0 E Surface El 741.0

Date Drilled 6-28-79 To 6-29-79 Prepared By JLB Checked By ACA

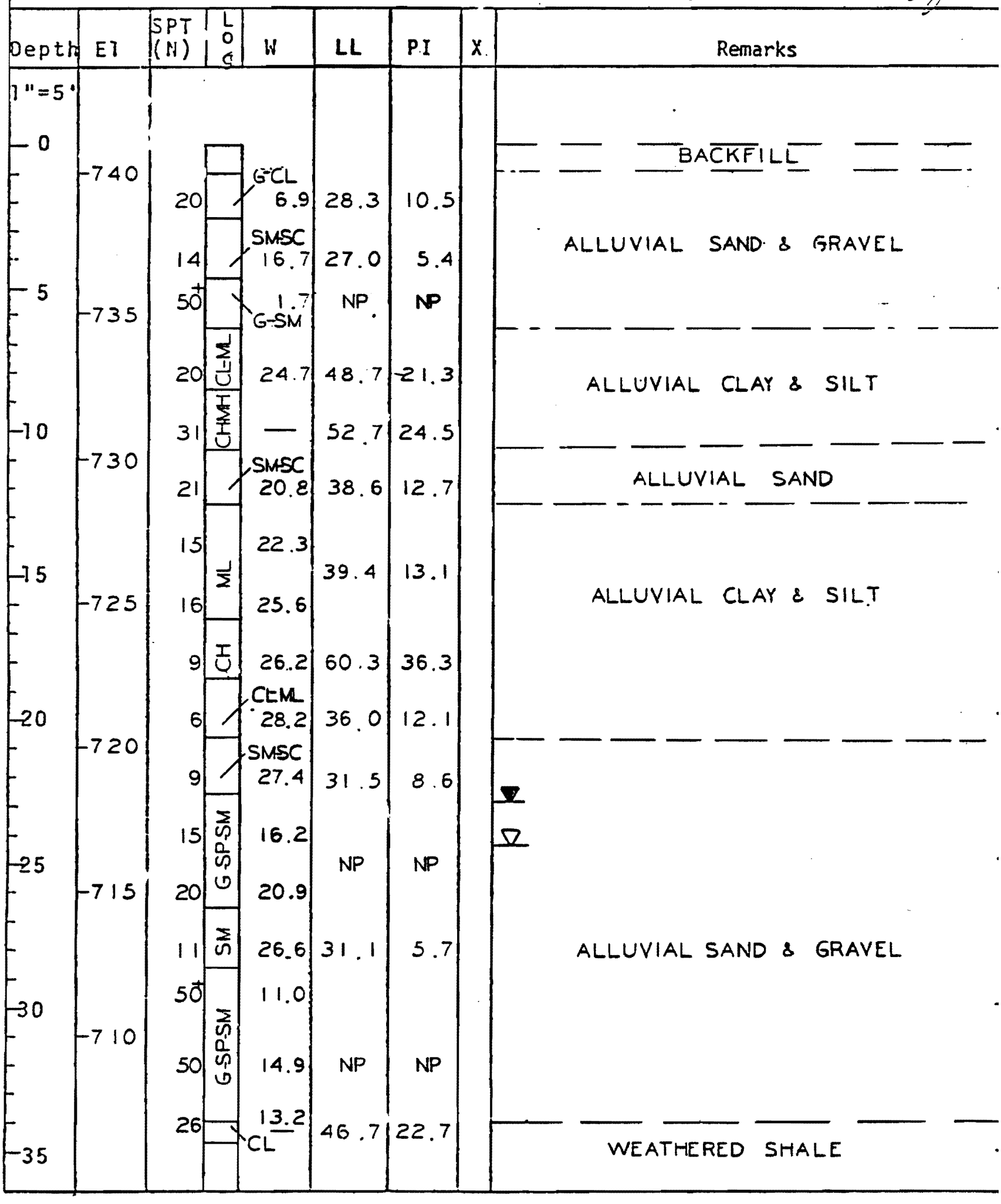


Figure 2.5-326 Soil Profile (Sheet 1 of 2)

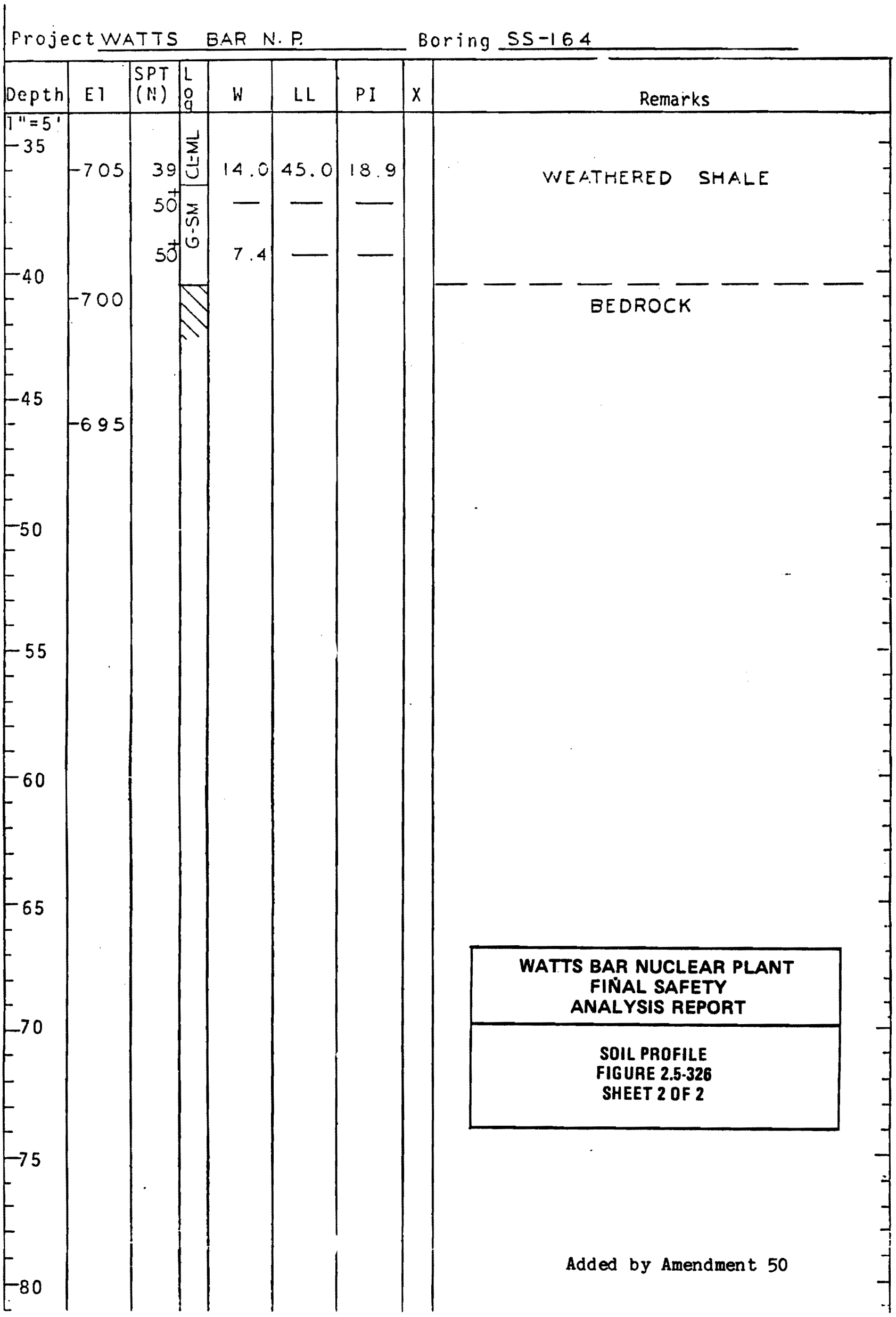


Figure 2.5-326 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-327
SHEET 1 OF 2

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-165 Station 488.0 N Range 120.0 E Surface El 740.7

Date Drilled 6-29-79 To 6-29-79 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5								
0	740	50+		—	—	—		SANDY SILT
5	735	13	CL	19.8	31.2	13.0		
		20	CL-CH	27.2	50.6	23.6		ALLUVIAL CLAY & SILT
10	730	18	ML	20.7	44.7	16.3		
		11	CL-ML	22.9	35.8	12.2		
		13	ML	28.5	44.5	16.6		
15	725	11	CL	26.7	36.7	14.4		
		12	SM	21.8	34.1	9.2		
20	720	5	ML	31.9	37.4	11.5		▼
		6	CL-ML	31.2	39.0	14.2		▽ ALLUVIAL SAND & SILT
		3	SM-SC	33.3				
25	715	2		34.4	30.7	8.1		
		27	GSC	17.7	—	—		
30	710	50	GP-GM	10.5				ALLUVIAL GRAVEL
		47		10.5	NP	NP		
		34	GW-GM	11.6				
35								Added by Amendment 50 —

Figure 2.5-327 Soil Profile (Sheet 1 of 2)

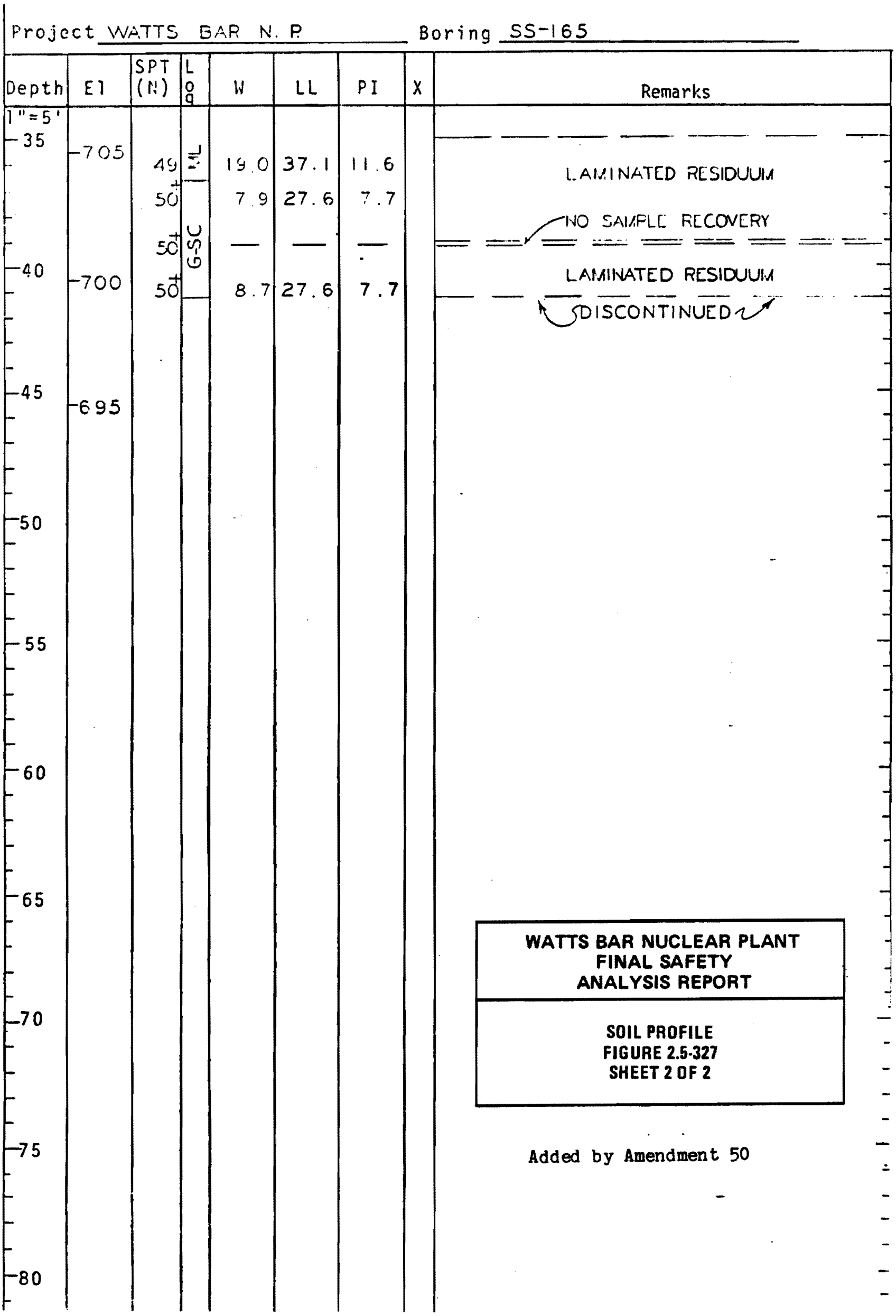


Figure 2.5-327 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-328
SHEET 1 OF 2

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-166 Station 488.0 N Range 10.0 E Surface El 740.5

Date Drilled 6-29-79 To 6-29-79 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5								
0	740	12	CL	20.5	38.5	18.4		FILL
		50+	GSM	3.0	NP	NP		
5	735	24	GP-GM	0 7				
		17	CL-ML	25.1	48.1	21.1		
10	730	17		24.0				
		21	CL	25.8	39.6	15.9		
		12	ML	24.2	30..0	5.6		
15	725	18	CL-ML	23.4	33.2	10.8		ALLUVIAL SILT & CLAY
		16		28.1	40.3	14 6		
20	720	13	ML	29.6	48.8	19.8		
		11		32.2				
			CL-ML					
		6		28.4	31 .4	9 .1		
25	715	5	CL	29 .3	36 . 8	14.3		
		5	SC	27. 1	26 . 7	9.6		
		50+	G-SP-SM	12 .6	NP	NP		ALLUVIAL SAND OR GRAVEL
30	710	50+		10 .1				
			CL-ML					
		50		15 .2	34 . 1.	10 .7		WEATHERED SHALE
35								Added by Amendment 50

Figure 2.5-328 Soil Profile (Sheet 1 of 2)

Project WATTS BAR N. P. Boring SS-166

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
35	705	50+	ML	13.8	31.5	7.4		WEATHERED SHALE
		50+		12.9	—	—		DISCONTINUED
40	700							
45								
50								
55								
60								
65								
70								
75								
80								

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-328
SHEET 2 OF 2

Added by Amendment 50

Figure 2.5-328 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-329
SHEET 1 OF 1

Added by Amendment 50

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-167 Station 420.0N Range 83.3W Surface El 739.7

Date Drilled 7-2-79 To 7-2-79 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5								
0		18	CL-ML	17.0	27.7	6.2		FILL
		12	CL	13.4	29.8	10.4		
5	735	13		21.8	43.2	25.0		
		25	G-SC	23.7	—	—		
10	730	23	CH-MH	25.6	51.9	23.4		
		21		22.6				
15	725	16	CL-ML	25.1	43.4	18.5		
		14		27.4	46.0	19.4		ALLUVIAL CLAY
		14		27.3	46.5	21.6		
20	720	13		28.8				
		10	CL	30.2	44.7	19.5		
		6		32.1				
25	715	5		31.8	32.7	12.1		
		2		34.1	31.0	15.2		
		50+	G-SM	10.1	NP	NP		ALLUVIAL GRAVELLY SAND
30	710	50+	CL-ML	12.8	26.2	4.6		
		50+		10.9	30.1	7.2		WEATHERED SHALE
35	705							BEDROCK

Figure 2.5-329 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-330
SHEET 1 OF 2

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-168 Station 319.8 N Range 65.3 W Surface El 739.6

Date Drilled 7-2-79 To 7-3-79 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI.	X	Remarks
1"=5'								
0		17	CL-ML	15.5	28.9	6.2		CLAY FILL
		11		16.5				
5	735	12		16.9	27.4	7.0		
		12	CL	17.3				
10	730	8		16.6	29.6	9.5		
		14		20.1	43.6	22.8		ALLUVIAL CLAY
15	725	18	CL-CH	25.9	50.7	27.2		
		9		25.6	41.8	20.5		
20	720	11		28.6	43.7	19.5		
		7	CL	31.1				
		2		29.0	36.7	18.6		
25	715	1		28.4	25.5	9.0		
		50+	GP-GM	9.5	NP	NP		ALLUVIAL GRAVEL
30	710	50+	GW-GM	8.9				
		50+		17.2	36.2	13.7		WEATHERED SHALE
		50+	CL	13.9	34.1	13.1		
35	705							Added by Amendment 50

Figure 2.5-330 Soil Profile (Sheet 1 of 2)

Project WATTS BAR N.P. Boring SS-168

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
35		50+	SC	8.5	27.3	8.0		WEATHERED SHALE
		50+		7.3				DISCONTINUED
	700							
40								
45								
50								
55								
60								
65								
70								
75								
80								

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-330
SHEET 2 OF 2

Added by Amendment 50

Figure 2.5-330 Soil Profile (Sheet 2 of 2)

Figure 2.5-331 Blank Page

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-332
SHEET 1 OF 2

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-169 Station 320.0 N Range 348.0 E Surface El 741.1

Date Drilled 7-2-79 To 7-2-79 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0	740	17	CL	16.7	31.2	11.8		ALLUVIAL CLAY
		18		14.9				
5	735	16		18.4	32.6	13.6		
		13		17.9	33.3	15.3		
10	730	14		16.8				
		19	CH	24.5	51.5	29.3		
		15	CL	21.0	44.6	24.7		
15	725	10		26.9	43.3	20.1		
		10	ML CL	27.6	42.1	17.3		
20		13	ML	32.3	48.4	17.2		
	720	8	CL-ML	31.8	43.0	17.0		ALLUVIAL SILT
		6		34.3	41.4	13.7		
25	715	6	ML	32.3				
		5		33.1	40.8	13.7		
30		50+	G-SM	10.4	NP	NP		ALLUVIAL GRAVEL
	710	50+	GP-GM	9.7				
		50+	CL-ML	14.7	36.8	12.0		WEATHERED SHALE
35								Added by Amendment 50

Figure 2.5-332 Soil Profile (Sheet 1 of 2)

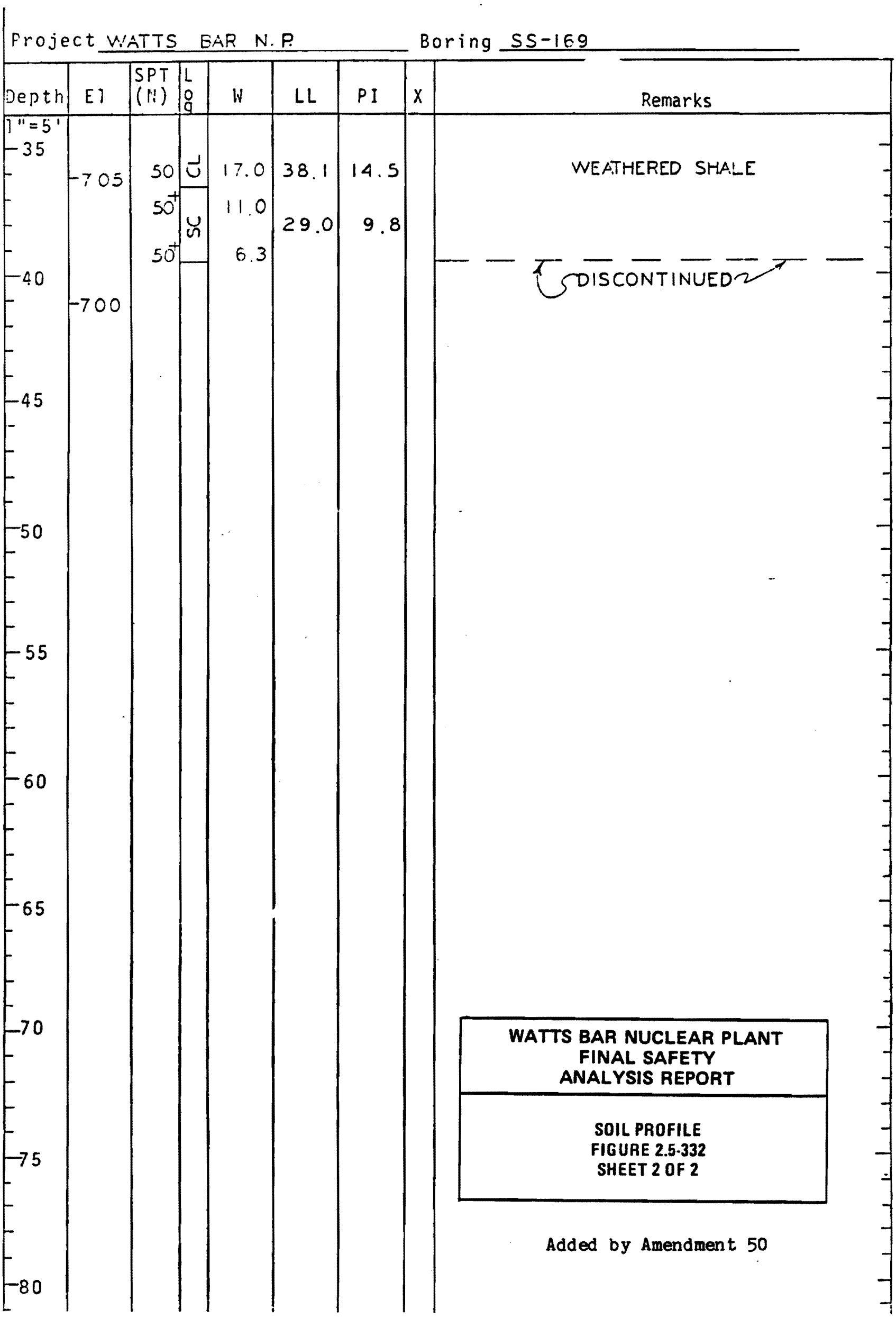


Figure 2.5-332 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-333
SHEET 1 OF 2

Project WATTS BAR N. P. Feature ERCW ALIGNMENT

Boring SS-170 Station 420.0N Range 348.0 E Surface El 741.2

Date Drilled 7-2-79 To 7-2-79 Prepared By JLB Checked By

Depth	El	SPT (N)	Log	W	LL	PI	X	Remarks
1"=5'								
0								SANDY SILT
	740	18	CL-ML	15.6	30.1	8.5		
		14		16.2	27.8	6.0		
5								
	735	15		15.8				
		24	CL	17.6	31.8	-12.3		ALLUVIAL CLAY
10		21	CH	25.2	61.5	34.2		
	730	13	CL	19.3	44.0	21.2		
		7		23.5	33.4	-13.7		
15								
	725	14	ML-CL	25.5	44.5	27.5		
		14		29.5				
20		12	SM	21.9	32.6	7.4		
	720	4	GSMSC	29.1	34.8	11.5		▽
		17		23.6				▼
25								ALLUVIAL SAND & GRAVEL
	715	18	GSWSM	19.2				
		31	GSM	12.1	NP	NP		
		50+	GSWSM	42.5				
30								
	710	50+	GSM	10.4				
		21	GM	17.8	—	—		
35								Added by Amendment 50

Figure 2.5-333 Soil Profile (Sheet 1of 2)

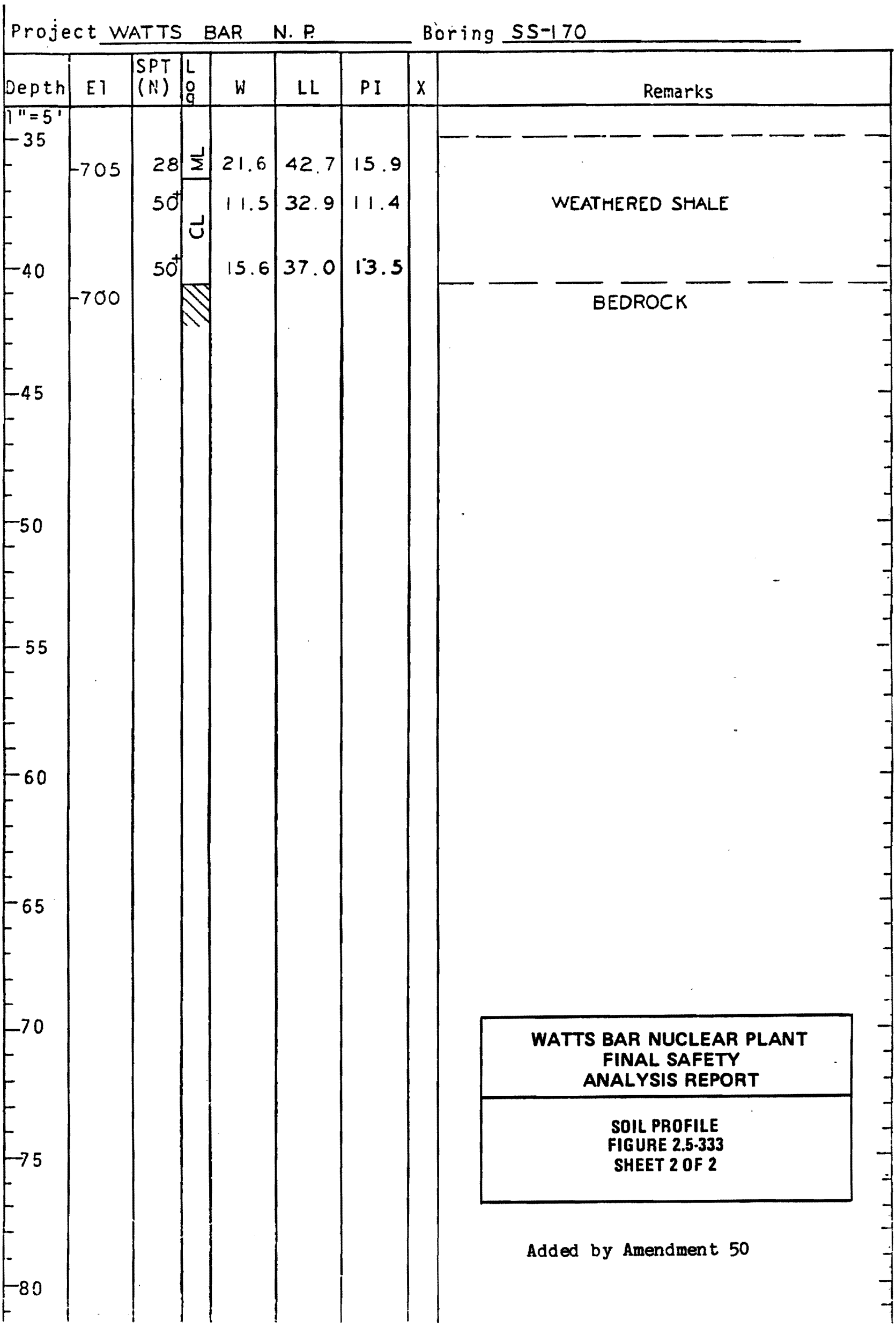


Figure 2.5-333 Soil Profile (Sheet 2of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-334
SHEET 1 OF 2

PROJECT: WATTS BAR N.P. FEATURE: VOL REDUC & SOLID SYS BLDG
BORING: SS-1 STATION: 1 RANGE: G SURFACE EL: 741.7
DATE DRILLED: 6-14-82 TO 6-14-82 PREPARED BY: MHD CHECKED BY:

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	740	26		13.3			TOPSOIL SI SD, DK BRN, MST, MIC, HOMO, (FL)
5		21	CL	15.6	29	12	CL SI SD, MD-DK BRN, MST, MIC, HOMO (FL)
	735	16		16.1			CL SI SD, DKBRN, MST, MIC, HOMO, (FL)
		50+		18.6			SD CL SI, DKBRN, MST, MIC, HOMO, (FL) 1032 GRAVEL - NO SAMPLE
10		24	CL	24.7	43	18	SI CL, MD-LT TN, MOTT, MST, HOMO, MIC (ALL.)
	730	22		22.1			SI SD, MD TN-YEL TN, MOTT, MST, HOMO (ALL.)
15		14	CL ML	24.2			CL SI, MD TN-YEL TN, MOTT, MST, HOMO (ALL.)
	725	18		29.1	39	14	CL SD SI, MD TN-YEL TN, MOTT, MST, HOMO (ALL.)
20							
	720	5	SM	31.0	30	2	SD CL SI, MD TN, MST, HOMO, MIC, (ALL.)
25							
	715	10	SM	25.2	25	3	SI SD, MD TN, V MST, HOMO, MIC, (ALL.)
30							
	710	50+	GP GM	10.2	NP	NP	GV SD, MD TN-BLK BRN, W, STRAT. (ALL.)
35							
1''=5'		* Lab. Classif.					Added by Amendment 50

Figure 2.5-334 Soil Profile (Sheet 1 of 2)

**WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT**

**SOIL PROFILE
FIGURE 2.5-334
SHEET 2 OF 2**

PROJECT: WATTS BAR N.P. FEATURE: VOL REDUC & SOLID SYS BLDG
BORING: SS-1 STATION: 1 RANGE: G SURFACE EL: 741.7
DATE DRILLED: 6-14-82 TO 6-14-82 PREPARED BY: MHD CHECKED BY:

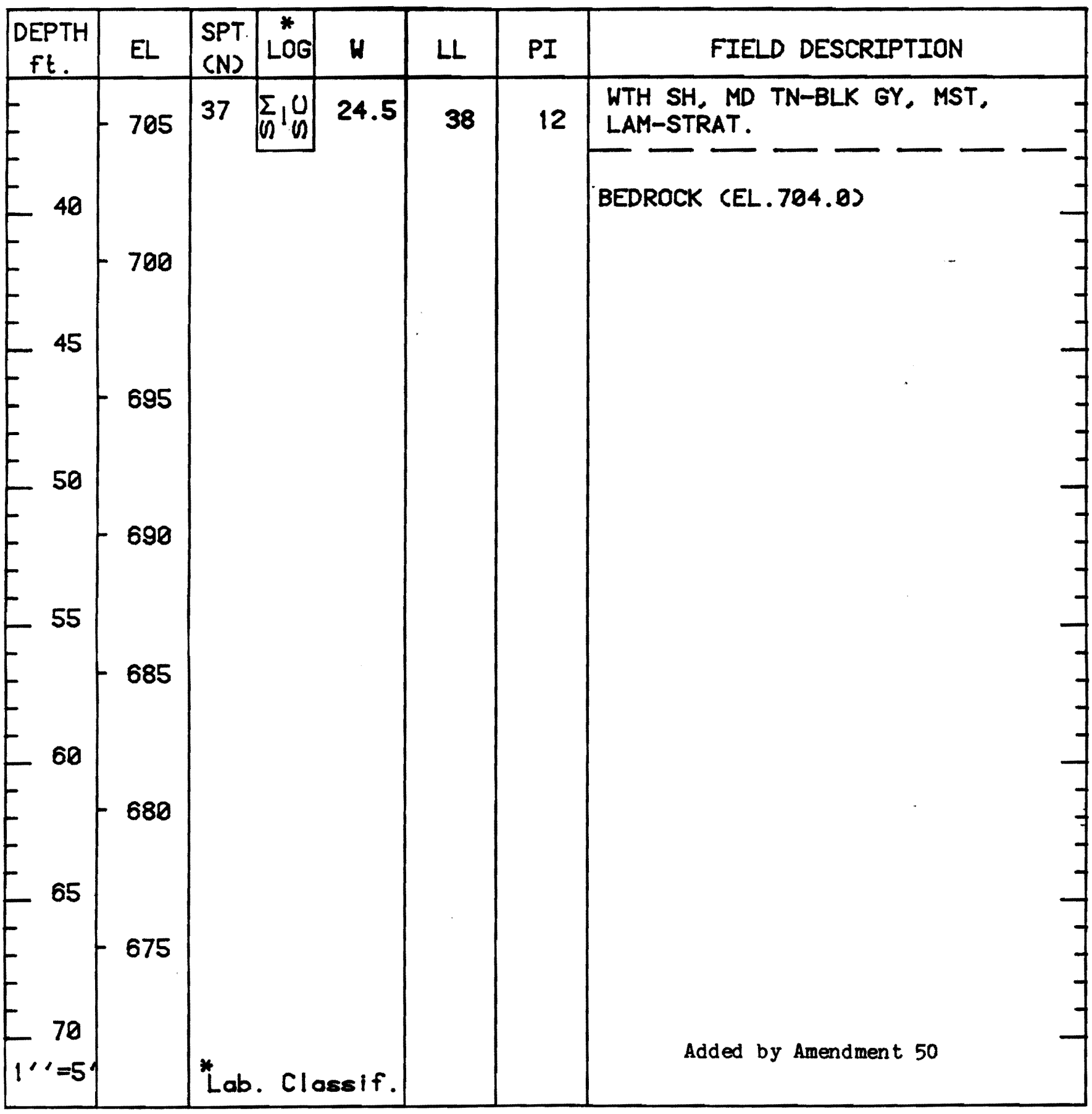


Figure 2.5-334 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-335
SHEET 1 OF 2

PROJECT: WATTS BAR N.P. FEATURE: VOL REDUC & SOLID SYS BLDG
BORING: SS-2 STATION: 1 RANGE: C SURFACE EL: 741.5
DATE DRILLED: 6-11-82 TO 6-11-82 PREPARED BY: MHD CHECKED BY:

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	740						TOPSOIL
		34	CL	13.4	30	11	DTY SD, MD-DKBRN, MST, MIC, HOMO (FL)
		20		15.9			CL SI SD, MD-DKBRN, MST, MIC, HOMO (FL)
5							
	735	17	CL	17.1	31	12	CL SI SD, MD BRN, MST, MIC, HOMO (FL)
		53+	SM	17.6			CL SD SI, MD BRN, MST, MIC, HOMO (FL)
				2.6	NP	NP	ANG LS GR
10		20	ML | MH	24.5	51	20	SD CL SI, MD-LT BRN, MST, MIC, HOMO (ALL.)
	730	22		26.4			SD CL SI, MD BRN-TN, MST, MIC, HOMO (ALL.)
		14		23.0			SD CL SI, MD BRN-TN, MST, MIC, HOMO (ALL.)
15							
	725	20	ML	31.5	43	14	CL SI, MD BRN-TN-WHT, MST, MIC, HOMO (ALL.)
20							
	720	6	SM | SC	26.3	29	6	DTY SD, MD BRN, W, MIC, HOMO, (ALL.)
25							
	715	4					NO RECOVERY
30							
	710	50+	GP | GM	12.0	NP	NP	GV SD, MD BRN, W, HOMO, (±45% SB RD GV) (ALL.)
35							
1"=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-335 Soil Profile (Sheet 1 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-335
SHEET 2 OF 2

PROJECT: WATTS BAR N.P. FEATURE: VOL REDUC & SOLID SYS BLDG
BORING: SS-2 STATION: 1 RANGE: C SURFACE EL: 741.5
DATE DRILLED: 6-11-82 TO 6-11-82 PREPARED BY: MHD CHECKED BY:

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	705	30	CL/U | CL/Σ	26.5	28	20	MD CL, MD BRN-GRN, MST, STRAT-SHLY (RES.)
40	700						REFUSAL (EL. 704.3)
45	695						
50	690						
55	685						
60	680						
65	675						
70							
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-335 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-336
SHEET 2 OF 2

PROJECT: WATTS BAR N.P. FEATURE: VOL REDUC & SOLID SYS BLDG
BORING: SS-3 STATION: 6 RANGE: D SURFACE EL: 741.5
DATE DRILLED: 6-8-82 TO 6-9-82 PREPARED BY: MHD CHECKED BY:

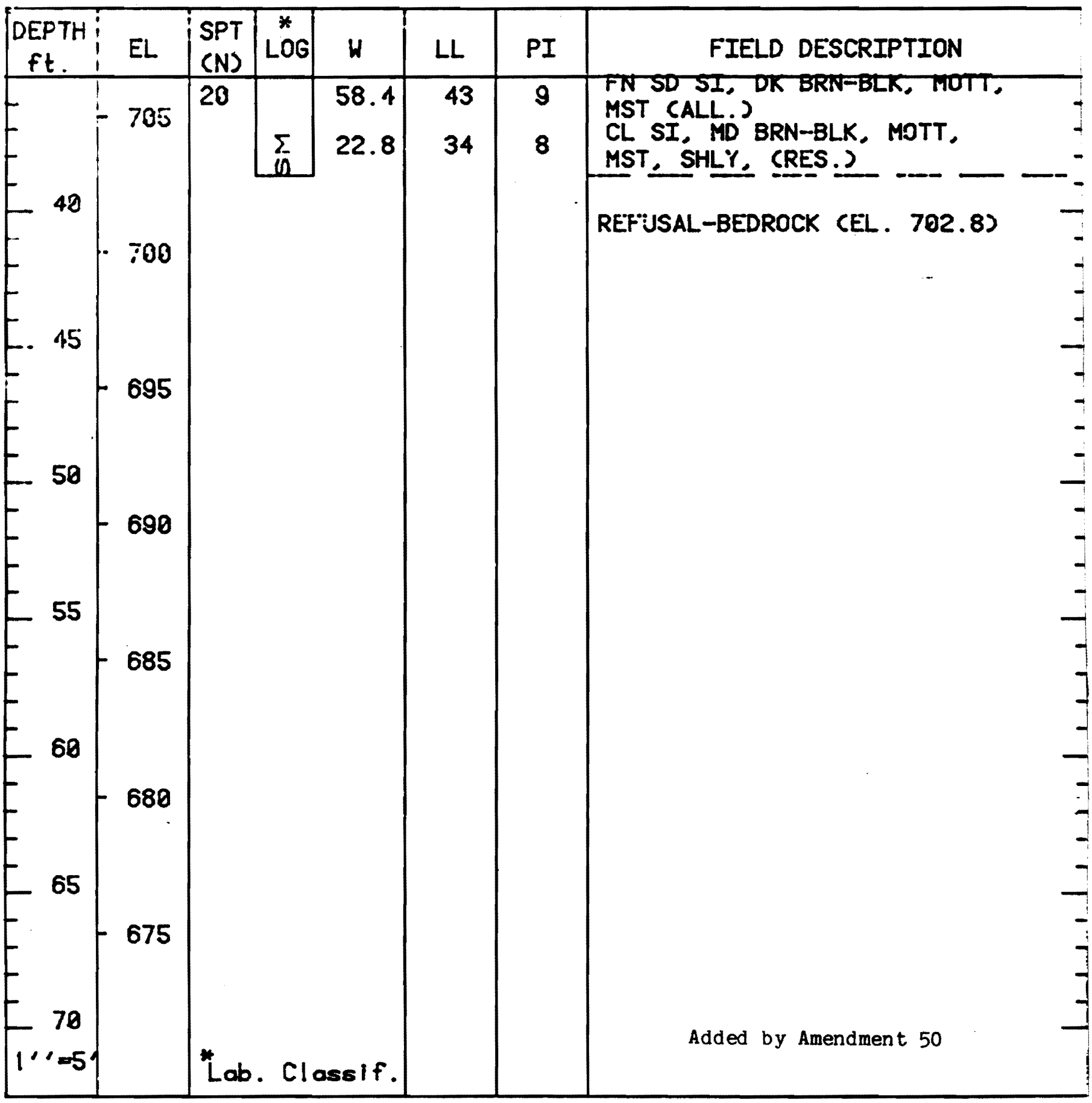


Figure 2.5-336 Soil Profile (Sheet 1 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-336
SHEET 2 OF 2

PROJECT: WATTS BAR N.P. FEATURE: VOL REDUC & SOLID SYS BLDG
BORING: SS-3 STATION: 6 RANGE: D SURFACE EL: 741.5
DATE DRILLED: 6-8-82 TO 6-9-82 PREPARED BY: MHD CHECKED BY:

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	705	20		58.4	43	9	FN SD SI, DK BRN-BLK, MOTT, MST (ALL.)
			Σ (0)	22.8	34	8	CL SI, MD BRN-BLK, MOTT, MST, SHLY, (RES.)
40	700						REFUSAL-BEDROCK (EL. 702.8)
45	695						
50	690						
55	685						
60	680						
65	675						
70							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-336 Soil Profile (Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-337
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: VOL REDUC & SOLID SYS BLDG
BORING: SS-4 STATION: 9 RANGE: H SURFACE EL: 740.7
DATE DRILLED: 6-15-82 TO 6-16-82 PREPARED BY: MHD CHECKED BY:

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	740						TOPSOIL
		9	CL	19.2	35	14	CL SI, MD BRN, MST, HOMO, MIC (FL)
		4		23.0			FN SD CL SI, MD BRN, MST, HOMO, MIC (FL)
5							
	735	4	CL	19.9	32	12	SAME AS ABOVE
		4		29.3			CL SI,DK BRN,V MST,HOMO,MIC(FL)
			SM	11.7	NP	NP	DTY SD,DK GY,VMST,HOMO(PGD)(FL)
			GM				
10		50+		8.5	NP	NP	1032
	730						
		25	CL	21.8	48	22	CL SD SI, MD TN-YEL TN-GY, MOTT, MST, HOMO (ALL.)
		22		24.9			CL SI SD, MD TN-YEL TN-GY, MOTT, MST, MIC, HOMO (ALL.)
15							
	725	16	CL ML	28.4	39	14	SD CL SI, MD TN-YEL TN-GY, MOTT, MST, MIC, HOMO (ALL.)
20							
	720	9	CL	30.8			SI CL, MD TN-GY-BLK, MOTT, MST, HOMO (ALL.)
					41	21	
25							
	715	5		31.2			MD CL, MD TN-LT BRN, MOTT, V. MST, HOMO (W/TR MIC) (ALL.)
30							
	710	50+	SP SM	9.8	NP	NP	GV SD, (40% SB RD GV) MD BRN, W, HOMO (ALL.)
		50+		11.2			WTH SH, MD GY, D, LAM (RES.)
35							
1''=5'		* Lab. Classif.					REFUSAL (EL. 705.5)

Added by Amendment 50

Figure 2.5-337 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-338
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: VOL REDUC & SOLID SYS BLDG
BORING: SS-5 STATION: 9 RANGE: B SURFACE EL: 737.1
DATE DRILLED: 6-9-82 TO 6-10-82 PREPARED BY: MHD CHECKED BY:

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							GRAVELLY ROADBED
	735	11	CL	17.7	28	11	CL SI, DK BRN, MST, HOMO, MIC (W/TR LS GV)(FL)
5		6		21.4			CL SI,DK BRN,MST,HOMO,MIC(FL)
		50+					1032 - NO SAMPLE RECOVERED
	730						
		16	CL	22.8	38	19	CL SD SI, BRN-GY, MST, STRAT, MIC (ALL.)
10		15		19.3			CL SI SD, LT BRN-GY, MST, STRAT (ALL.)
	725	18	CL	25.9	35	12	CL SI SD, LT BRN-GY, MST (ALL.)
		23	ML	26.8			CL SI SD, MD BRN-CRM, MST, BLKY (ALL.)
15		18		30.0	48	18	SI CL, MD-LT BRN, MOTT, MST, HOMO (ALL.)
	720						
20							
		4	CL	30.7	32	15	CL SD SI, MD BRN-TN, W, HOMO, MIC (ALL.)
	715						
25							
		50+	GP/GM	20.2	NP	NP	GV SD (±40% SB RD GV) MD BRN, W, HOMO (ALL.)
	710						
30							
					34	10	
	705	50+	SM/SC	15.9			WTH LS & CL, LT BLU-DK BRN-BLK, MST, LAM (3-IN. THK)(RES.)
35							REFUSAL (EL. 703.8)
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-338 Soil Profile

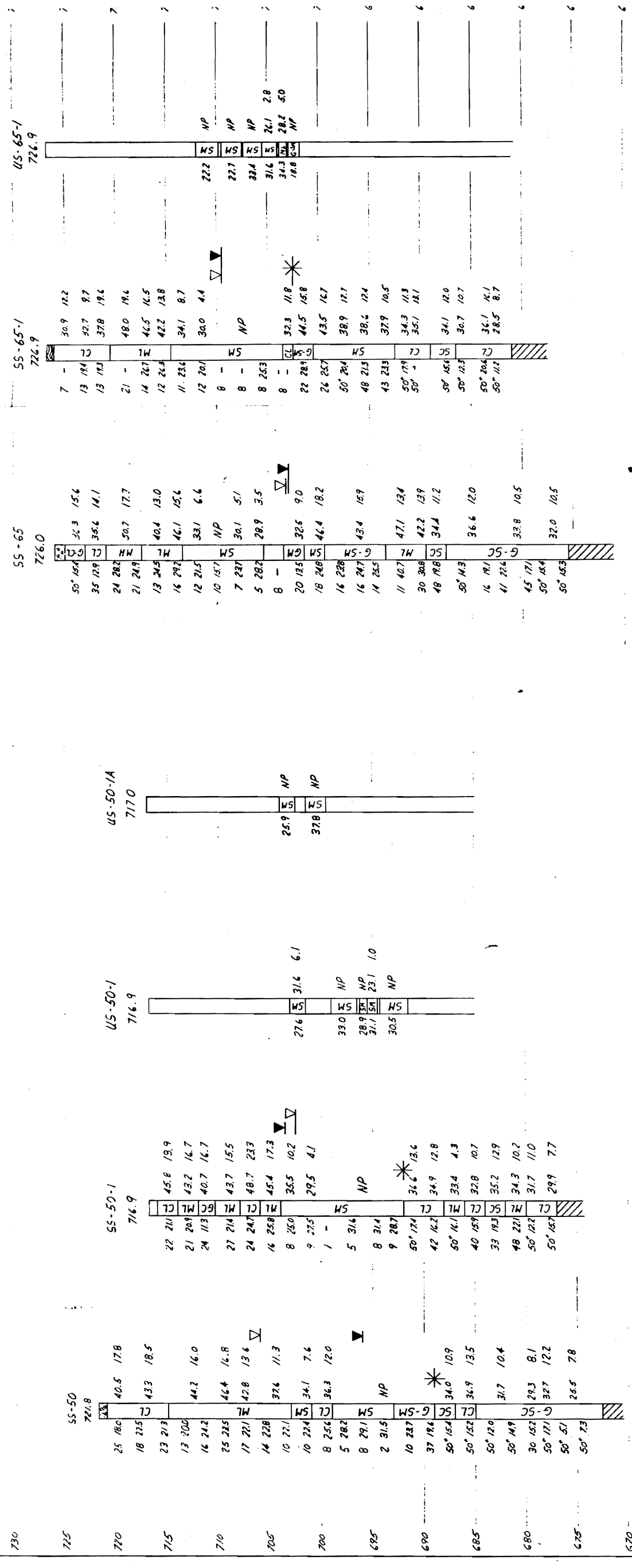
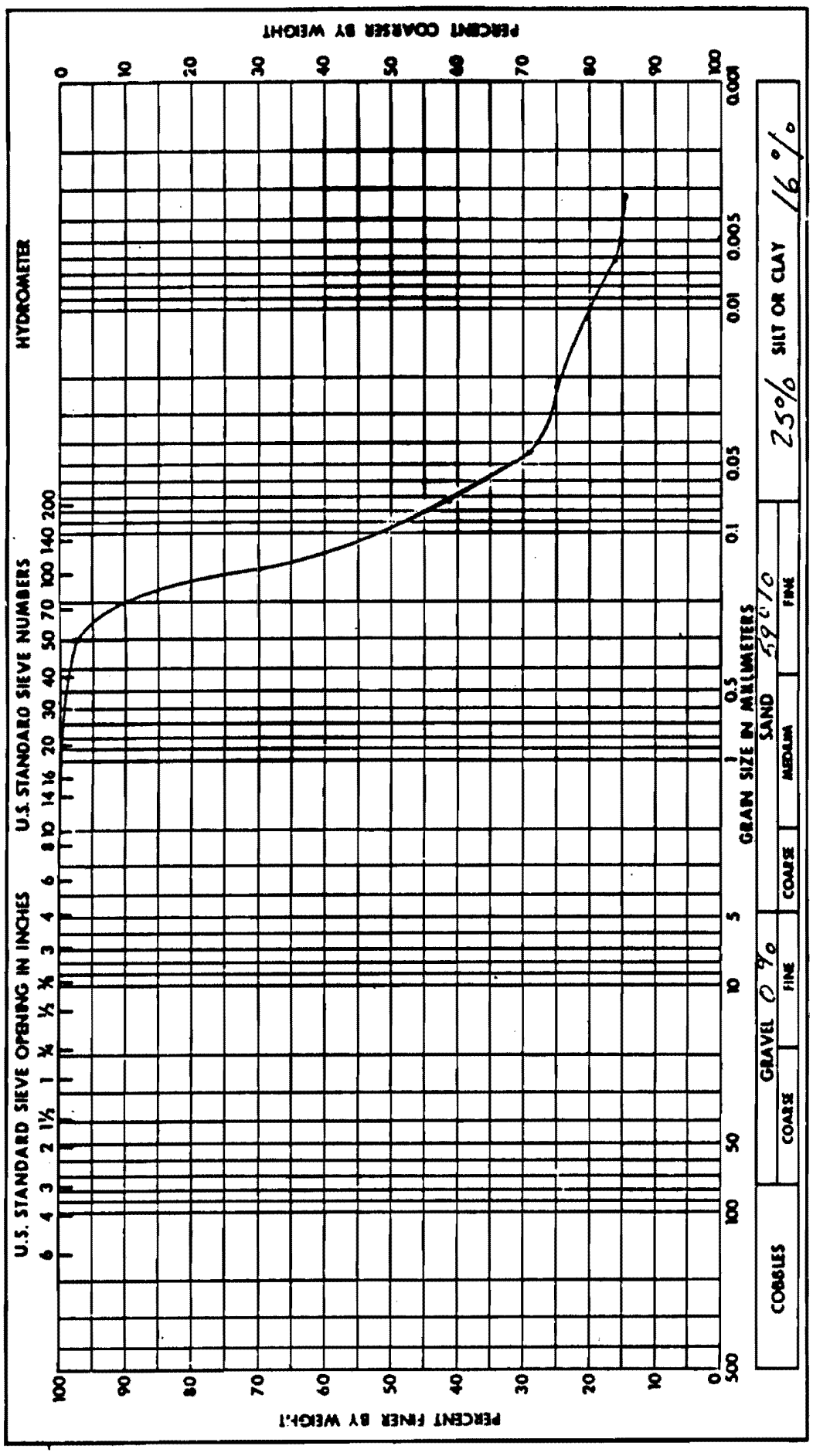


Figure 2.5-339 ERCW Route Liquefaction Evaluation Graphic Logs No. 50 & 65

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION
FIGURE 2.5-340



Project	WATTS BAR NP
Feature	ERCW LIQUEFACTION
Boring No.	WS-50-1
Station	1650.0 S
Date	8-1-79
Sample No.	1
Range	785.0E
Elevation	701.4-707

GRAIN SIZE ANALYSIS

Remarks:

Soil Symbol	SM			
Moisture Content, %	27.6			
Specific Gravity	2.73			
Liquid Limit, %				31.6
Plastic Limit, %				25.5
Plasticity Index, %				6.1
Shrinkage Limit, %				

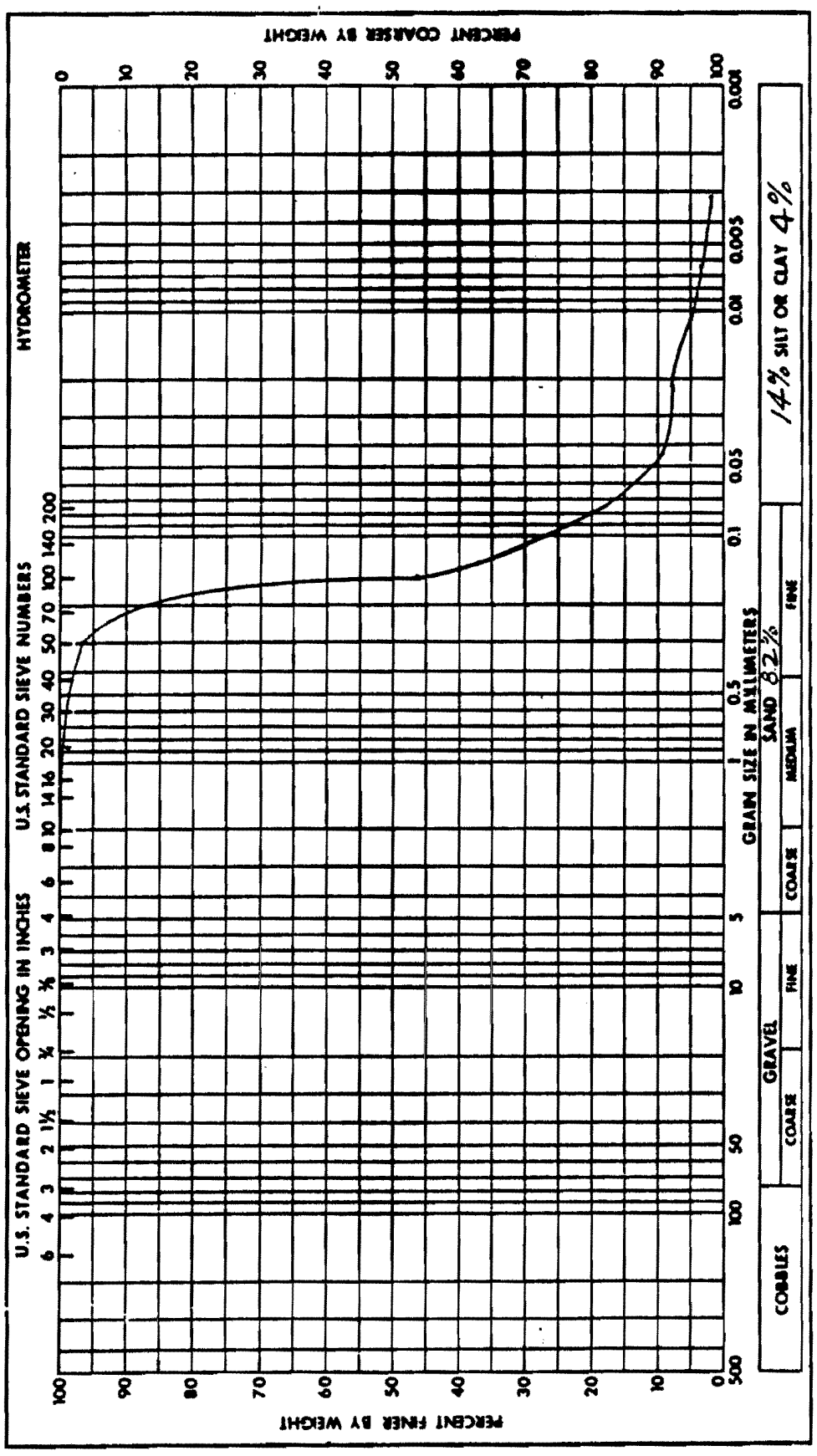
Figure 2.5-340 ERCW Liquefaction

Added by Amendment 50

ATTACHMENT 6
CONST-QCP 5.3

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION
FIGURE 2.5-341



Project	WATTS BAR NP
Feature	ERCW LIQUEFACTION
Boring No.	GS-50-1
Station	1650.0 S
Date	7-20-79
Sample No.	2
Range	785.0 E
Elevation	698.9-696.6

GRAIN SIZE ANALYSIS

Remarks:

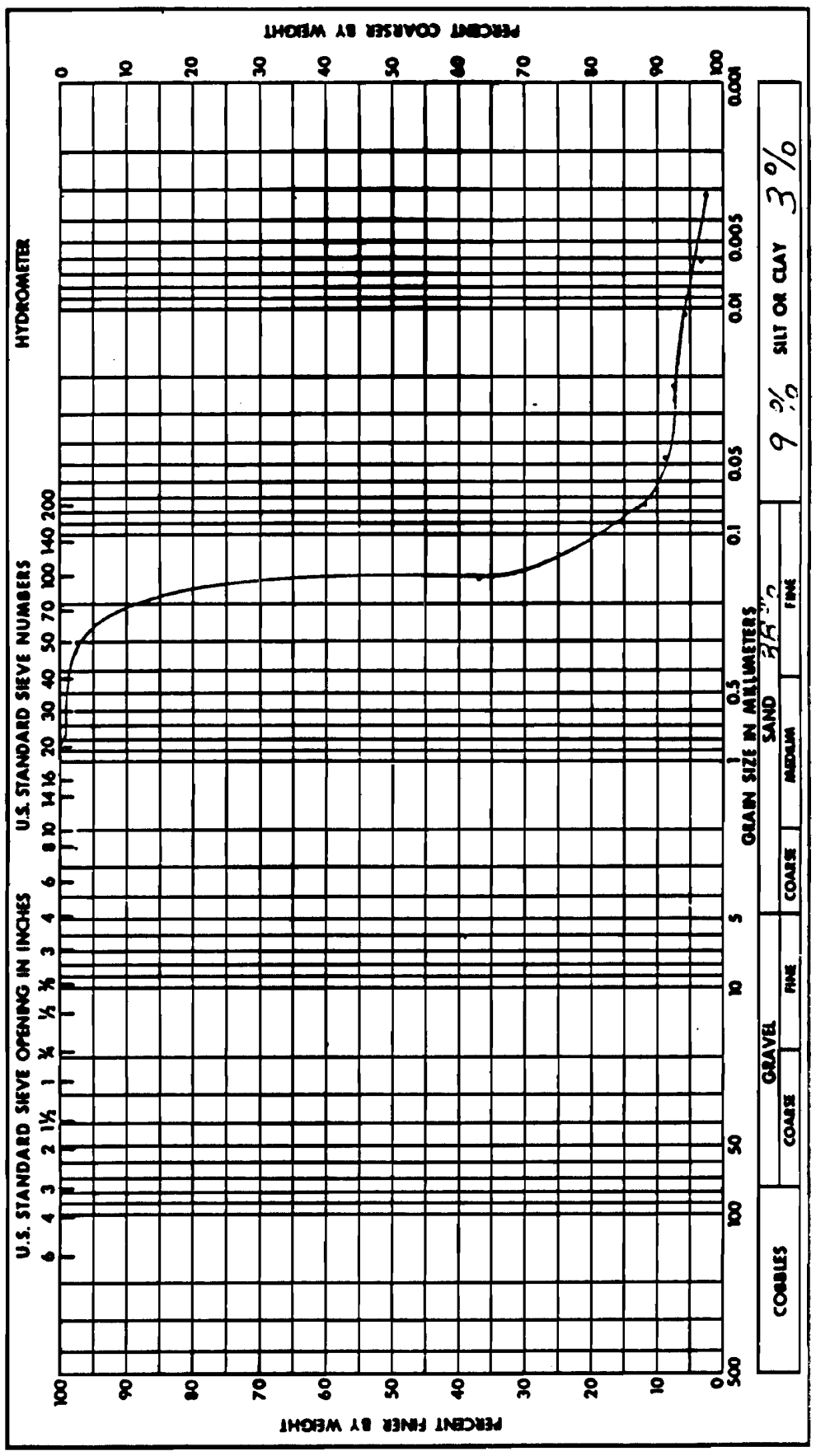
Soil Symbol	SM	Liquid Limit, %	NP
Moisture Content, %	33.0	Plastic Limit, %	NP
Specific Gravity	2.70	Plasticity Index, %	NP
		Shrinkage Limit, %	

Added by Amendment 50

Figure 2.5-341 ERCW Liquefaction

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

LIQUEFACTION
FIGURE 2.5-342



Project	Watts Bar N.P.
Feature	Liquefaction
Boring No.	WBN-50-1
Sample No.	3
Station	1650.0S
Range	785.0E
Date	7-16-79
Elevation	696.4-695.3

GRAIN SIZE ANALYSIS

Remarks:

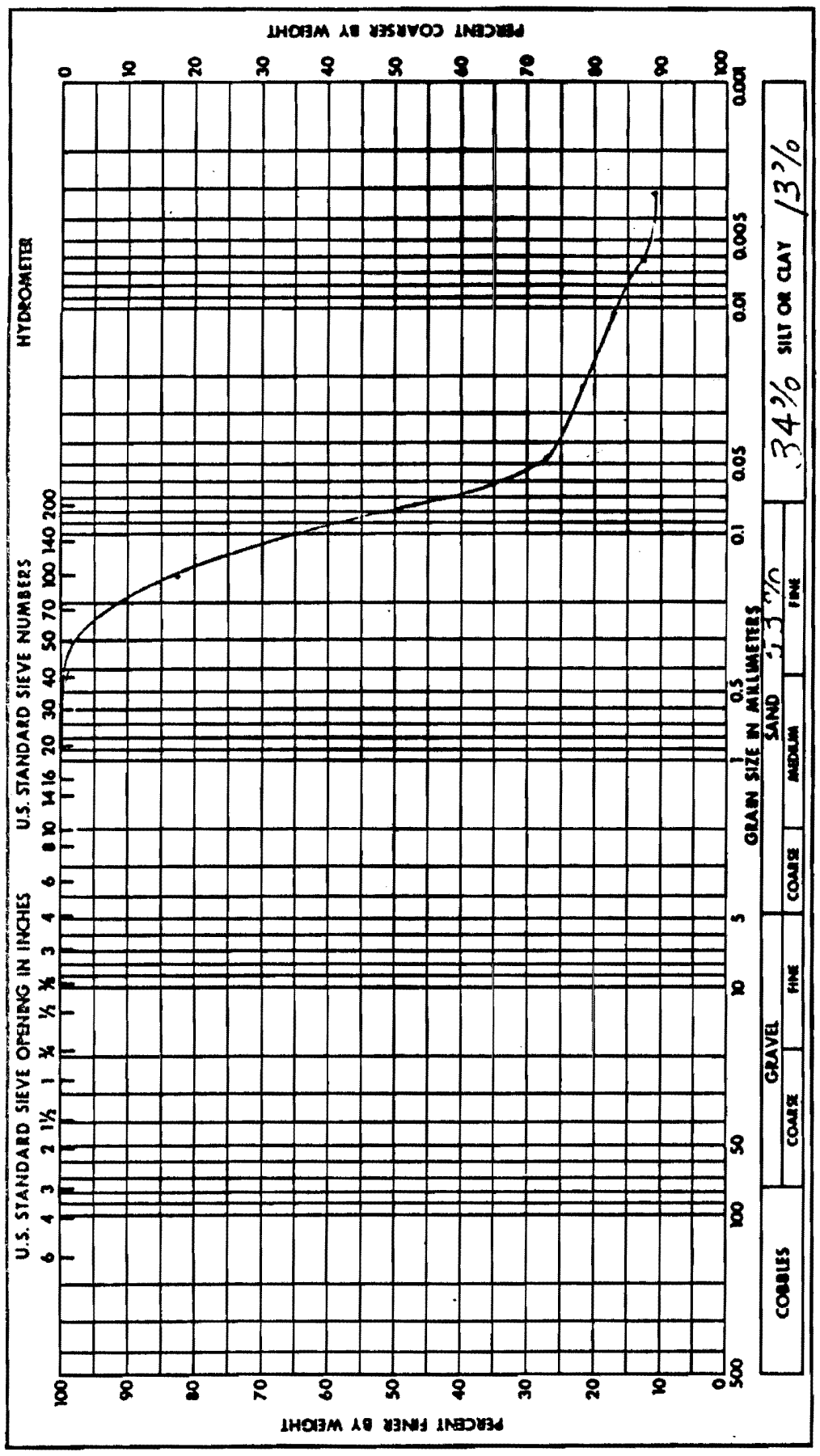
Soil Symbol	SM	Liquid Limit, %	N.P.	
Moisture Content, %	28.9	Plastic Limit, %	N.P.	
Specific Gravity	2.73	Plasticity Index, %	N.P.	
		Shrinkage Limit, %		

Figure 2.5-342 Liquefaction

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

LIQUEFACTION
FIGURE 2.5-343



Project	Watts Bar N.P.
Feature	Liquefaction
Boring No.	45-50-1
Station	1650.0S
Date	7-16-79
Sample No.	3
Range	785.0E
Elevation	695.3-694.5

GRAIN SIZE ANALYSIS

Remarks:

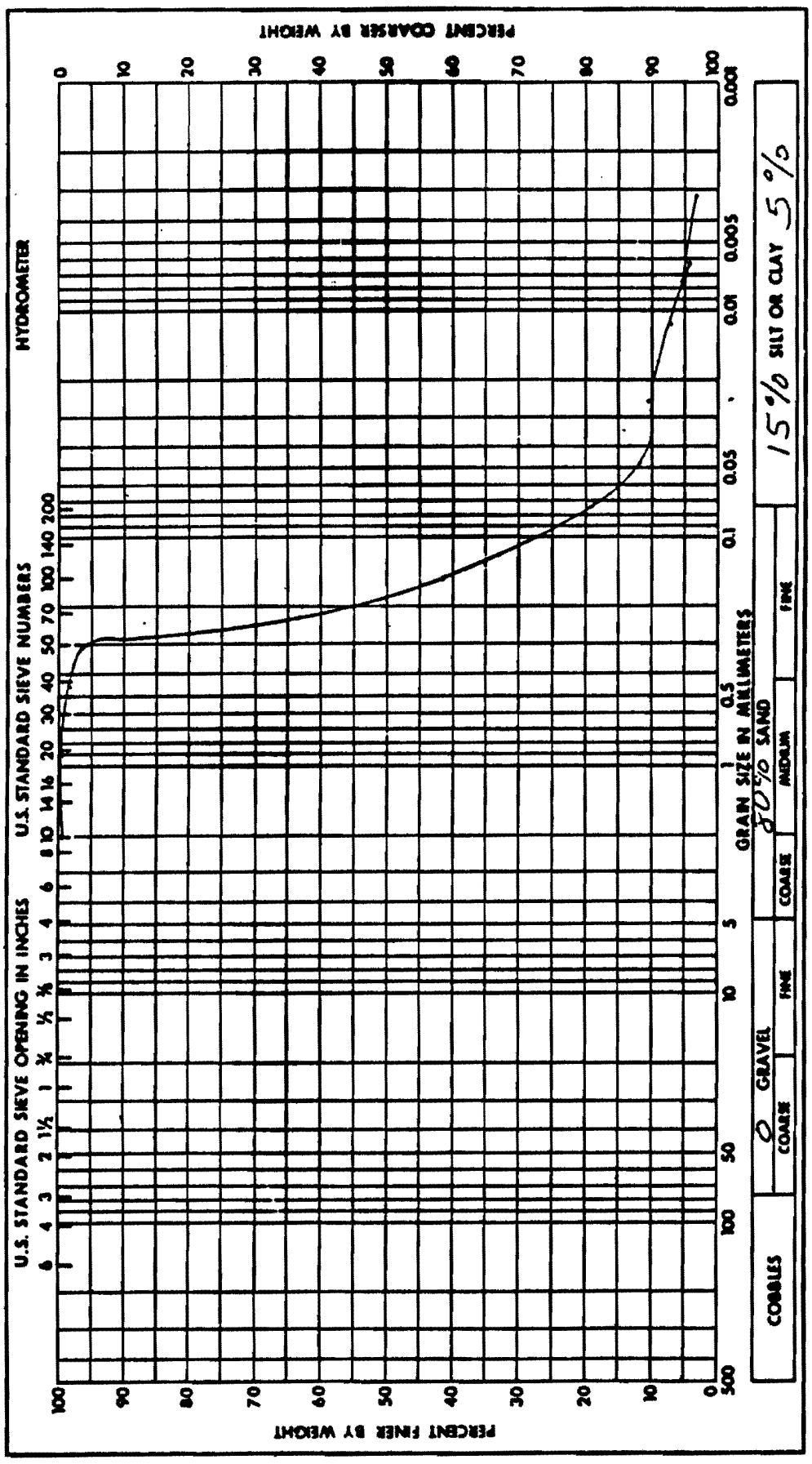
Soil Symbol	SM	Liquid Limit, %	23.1
Moisture Content, %	31.1	Plastic Limit, %	22.1
Specific Gravity	2.70	Plasticity Index, %	1.0
		Shrinkage Limit, %	

Figure 2.5-343 Liquefaction

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

LIQUEFACTION
FIGURE 2.5-344



Project Watts Bar N.P.	
Feature Liquefaction	
Boring No. US-50-1	Sample No. 4
Station 1650.05	Range 785.0 E
Date 7-13-79	Elevation 694.2-692.1
GRAIN SIZE ANALYSIS	

Remarks:

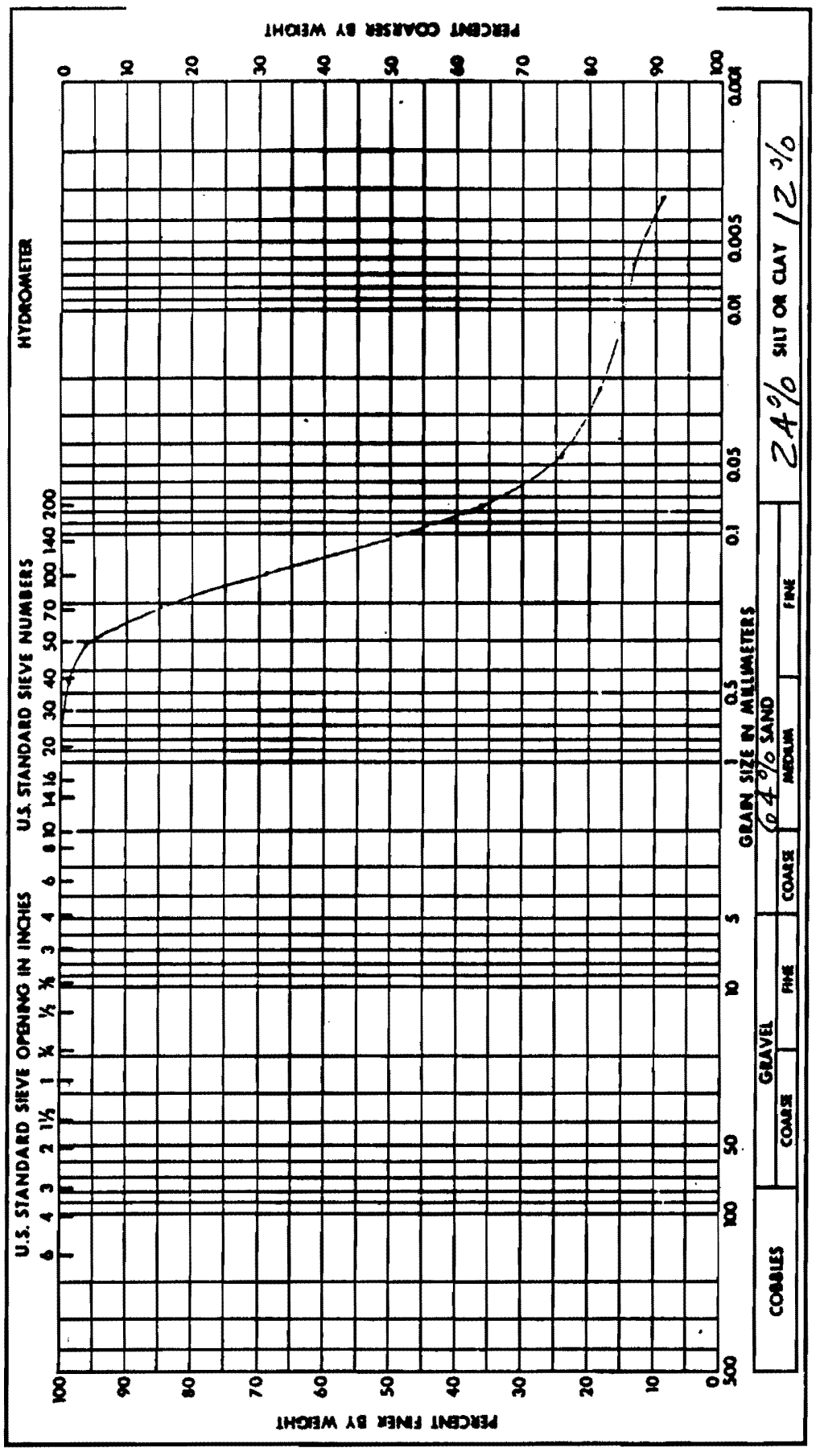
Soil Symbol	SM	NP
Moisture Content, %	30.5	NP
Specific Gravity	2.74	NP
		%
Liquid Limit, %		
Plastic Limit, %		
Plasticity Index, %		
Shrinkage Limit, %		

Figure 2.5-344 Liquefaction

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

LIQUEFACTION
FIGURE 2.5-345



Project	Watts Bar N.P.
Feature	Liquefaction
Boring No.	US-50-1A
Station	1645.0E
Date	7-13-79
Sample No.	1
Range	785.0E
Elevation	703.9-702

GRAIN SIZE ANALYSIS

Remarks:

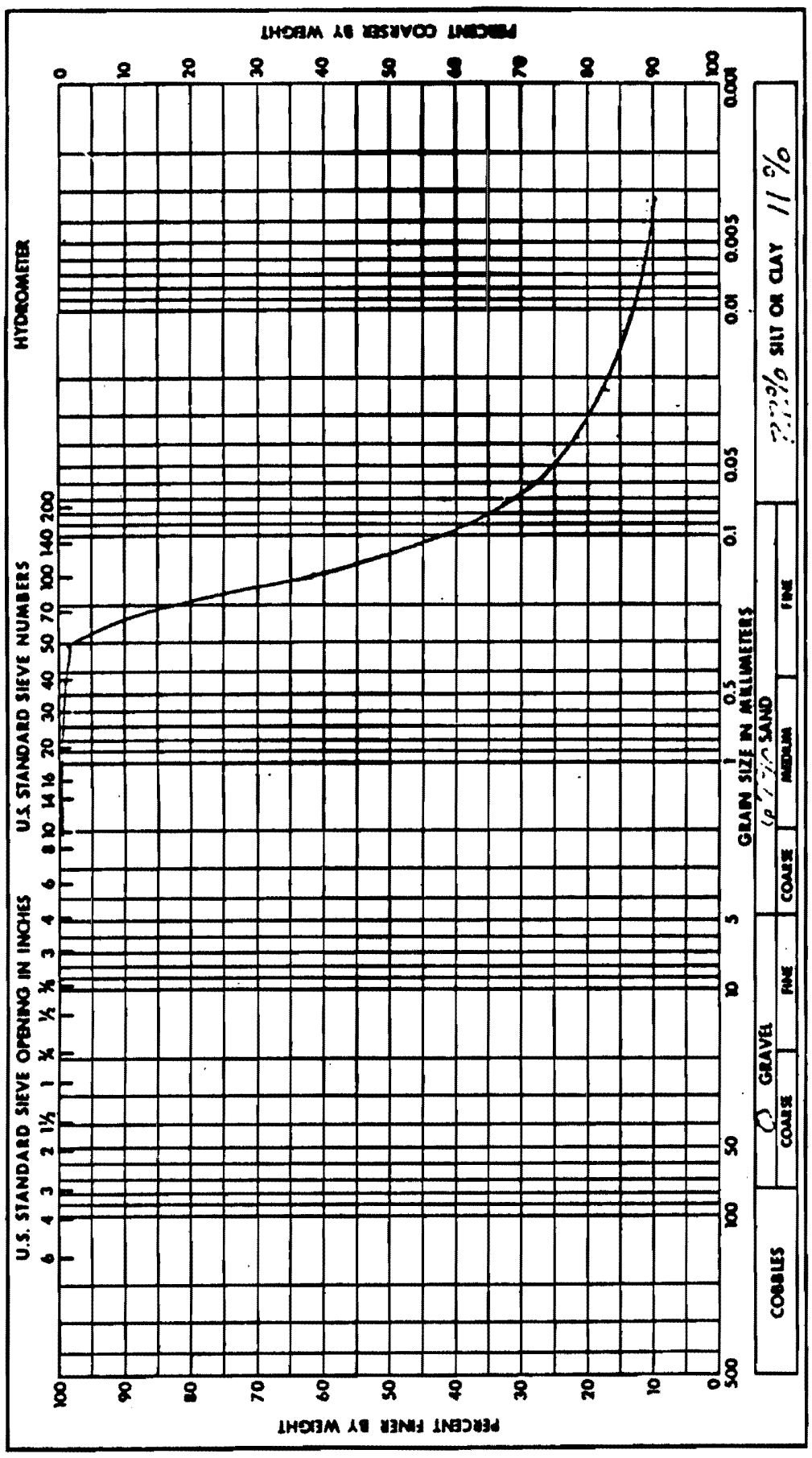
Soil Symbol	SM	
Liquid Limit, %	NP	
Plastic Limit, %	NP	
Moisture Content, %	25.9	
Plasticity Index, %	NP	
Specific Gravity	2.73	
Shrinkage Limit, %		

Figure 2.5-345 Liquefaction

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

LIQUEFACTION
FIGURE 2.5-346



Project	Watts Bar N.P.
Feature	Liquefaction
Boring No.	WBS 30-1A
Station	1645.05
Date	7-13-79
Sample No.	2
Range	785.0 E
Elevation	701.6-698.4

GRAIN SIZE ANALYSIS

Remarks:

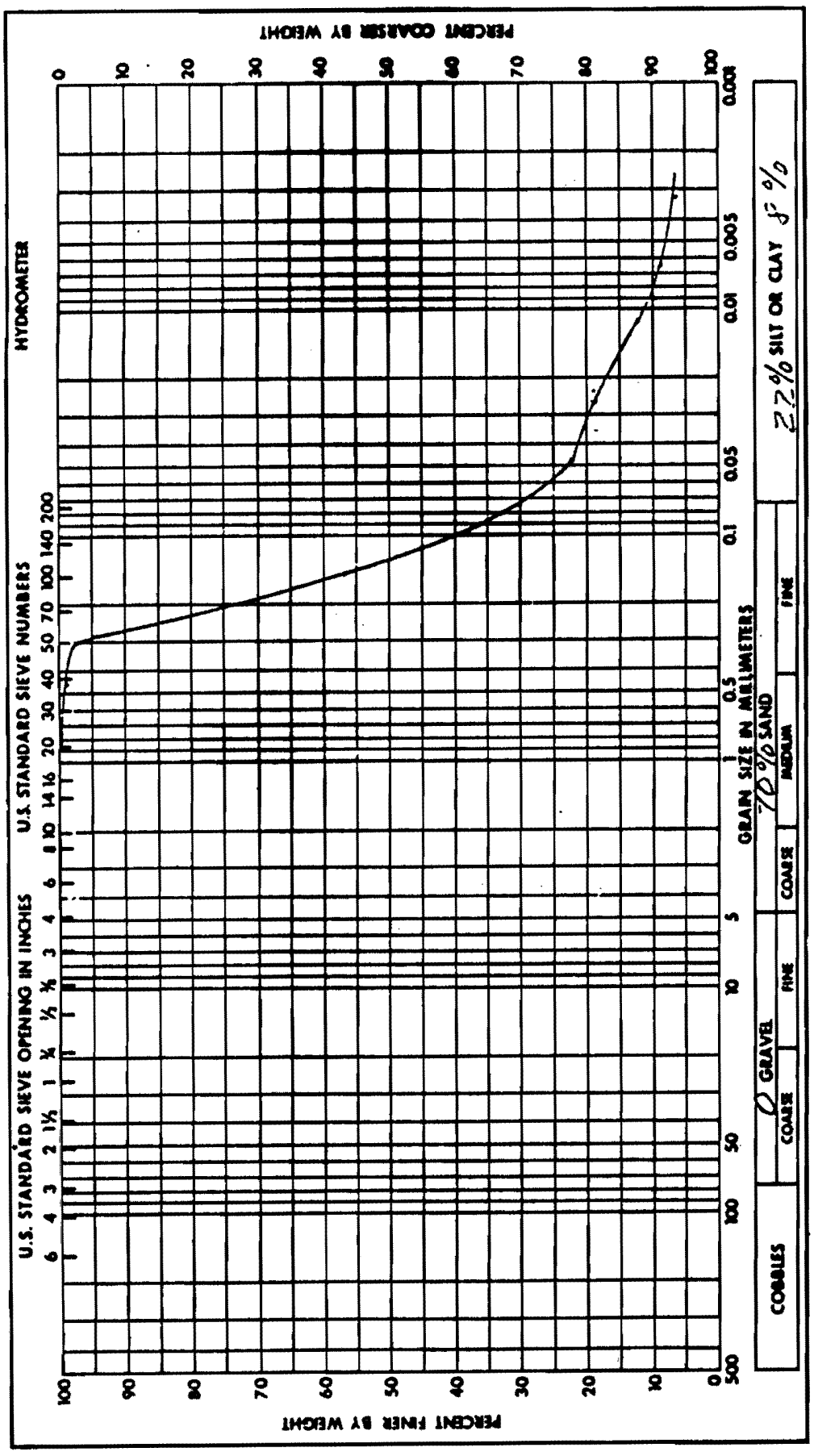
Soil Symbol	SM	
Moisture Content, %	37.8	
Specific Gravity	2.72	
Liquid Limit, %	NP	
Plastic Limit, %	NP	
Plasticity Index, %	NP	
Shrinkage Limit, %		

Added by Amendment 50

Figure 2.5-346 Liquefaction

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

LIQUEFACTION
FIGURE 2.5-347



Project	Watts Bar N.P.
Feature	Liquefaction
Boring No.	B-65-1
Station	1367.0 S
Date	7-13-79
Sample No.	1
Range	1005.7 E
Elevation	711.9-709.6

GRAIN SIZE ANALYSIS

Soil Symbol	SM
Moisture Content, %	22.2
Specific Gravity	2.70
Liquid Limit, %	
Plastic Limit, %	NP
Plasticity Index, %	NP
Shrinkage Limit, %	

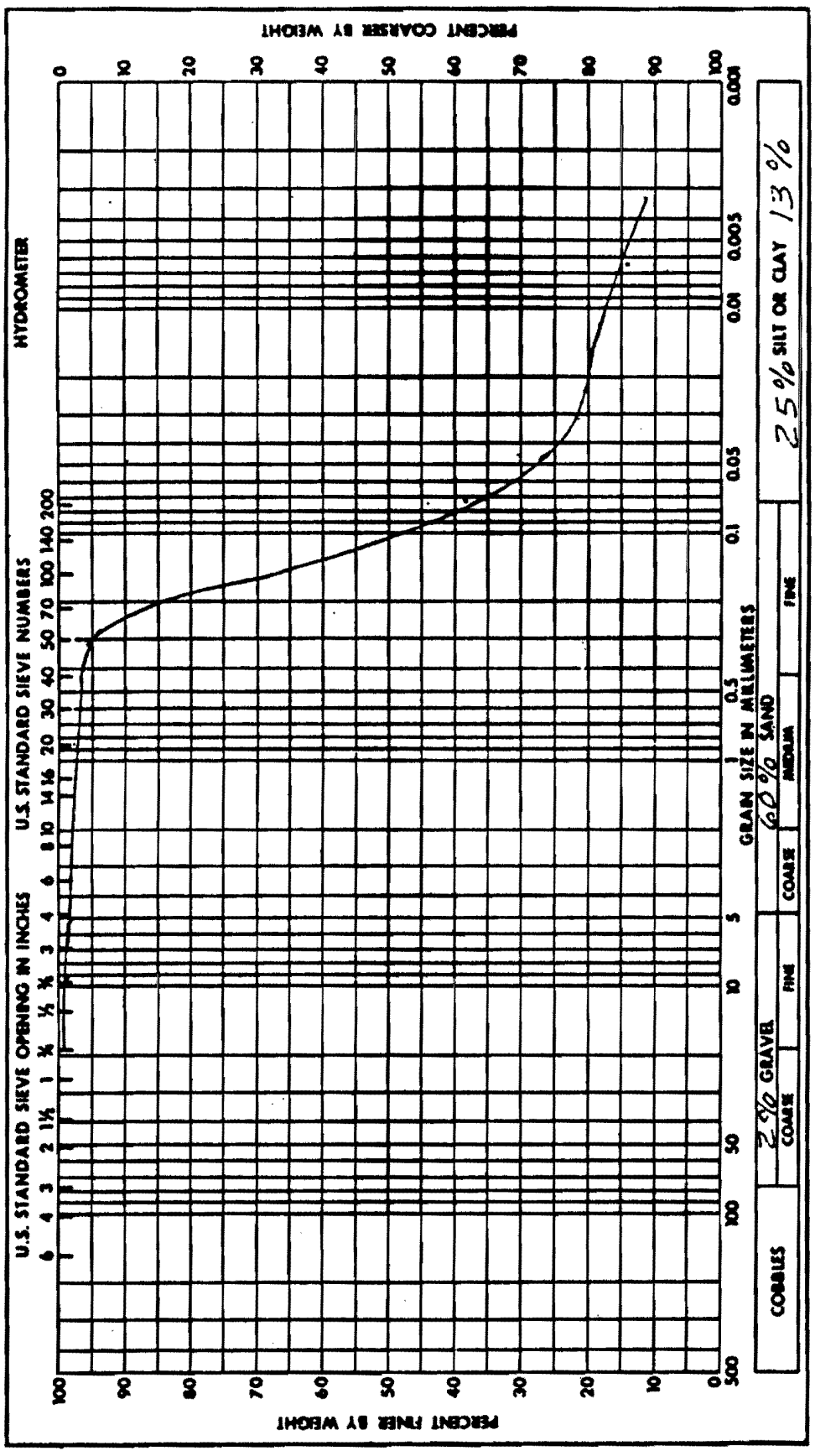
Remarks:

Figure 2.5-347 Liquefaction

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

LIQUEFACTION
FIGURE 2.5-348



Project	Watts Bar N.P.
Feature	Liquefaction
Boring No.	05-65-1 Sample No. 12
Station	1367.0 S Range 1005.7 E
Date	7-13-79 Elevation 709.4-707.3

GRAIN SIZE ANALYSIS

Remarks:

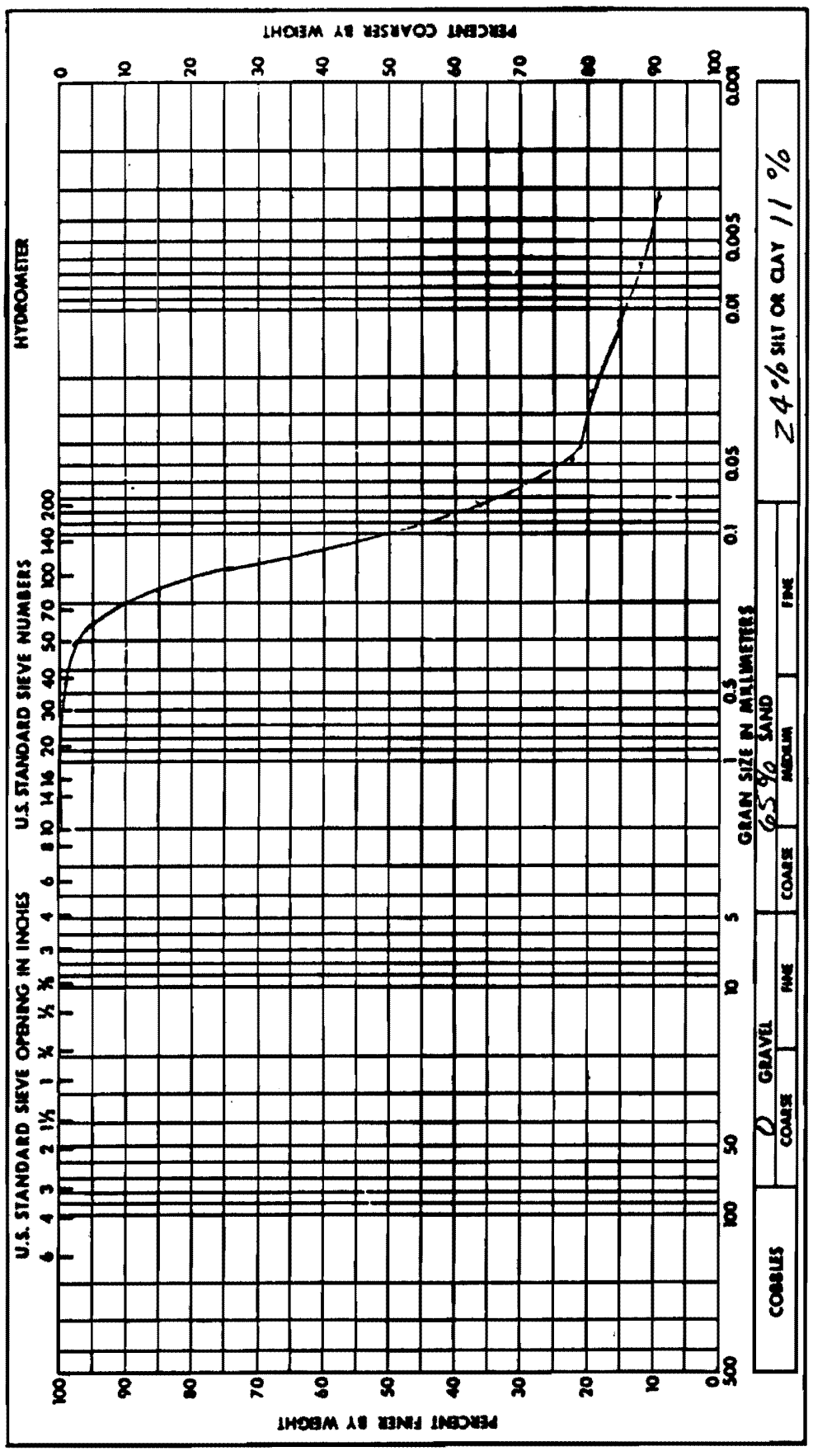
Soil Symbol	SM	Liquid Limit, %	NP
Moisture Content, %	22.7	Plastic Limit, %	NP
Specific Gravity	2.72	Plasticity Index, %	NP
		Shrinkage Limit, %	

Figure 2.5-348 Liquefaction

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

LIQUEFACTION
FIGURE 2.5-349



Project	Watts Bar N.P.
Feature	Liquefaction
Boring No.	15-65-1
Station	1367.0 S
Date	7-13-79
Sample No.	3
Range	1005.7 E
Elevation	707.2-705.2

GRAIN SIZE ANALYSIS

Remarks:

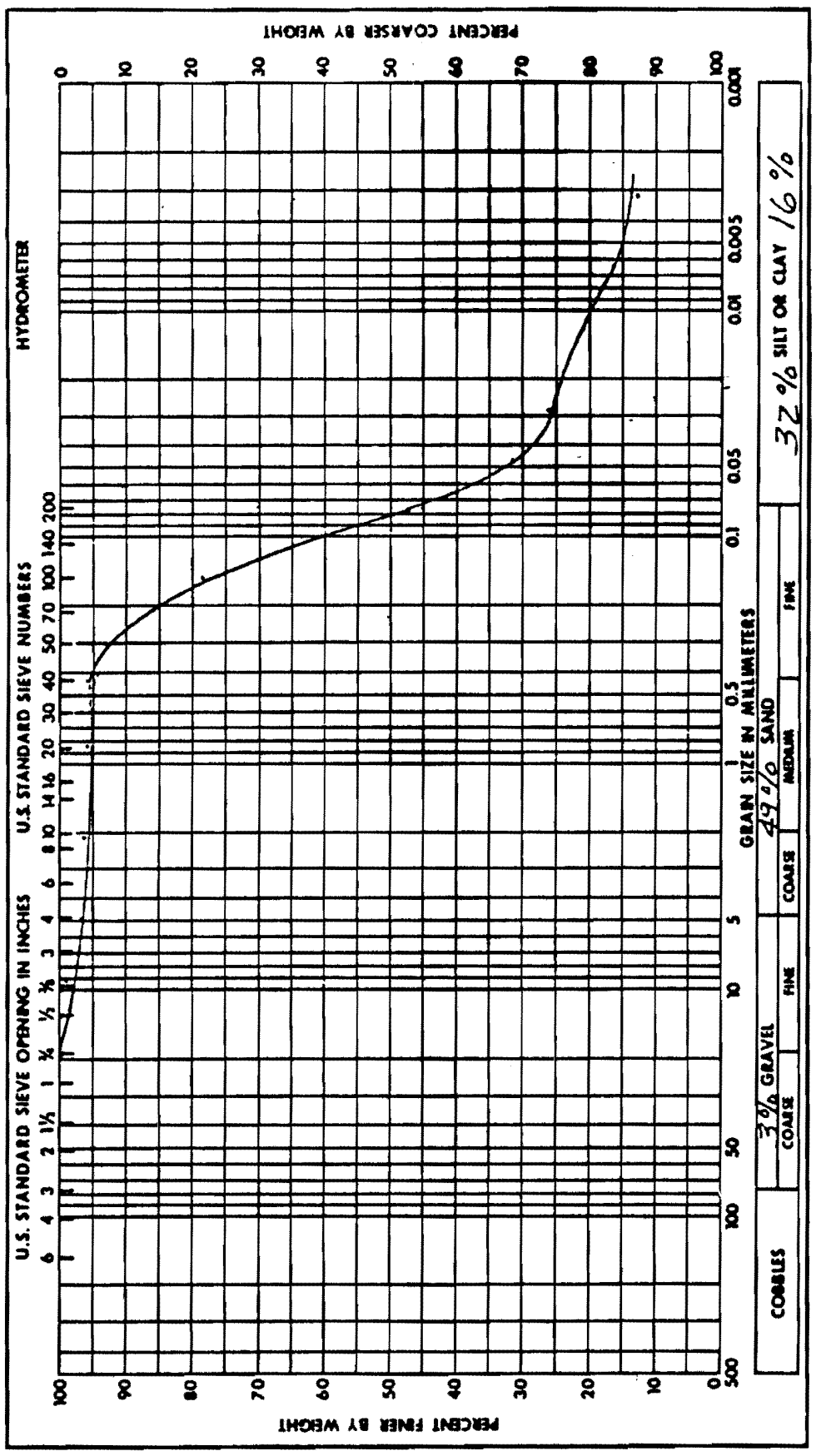
Soil Symbol	SM	Liquid Limit, %	NP
Moisture Content, %	33.4	Plastic Limit, %	NP
Specific Gravity	2.72	Plasticity Index, %	NP
		Shrinkage Limit, %	

Figure 2.5-349 Liquefaction

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

LIQUEFACTION
FIGURE 2.5-350



Project WATTS BAR NP	
Feature LIQUEFACTION	Sample No. 4
Boring No. WS-6501	Range 1005.7 E
Station 1367.0 S	Elevation 705.2-704.0
Date 7-13-71	

GRAIN SIZE ANALYSIS

Remarks:

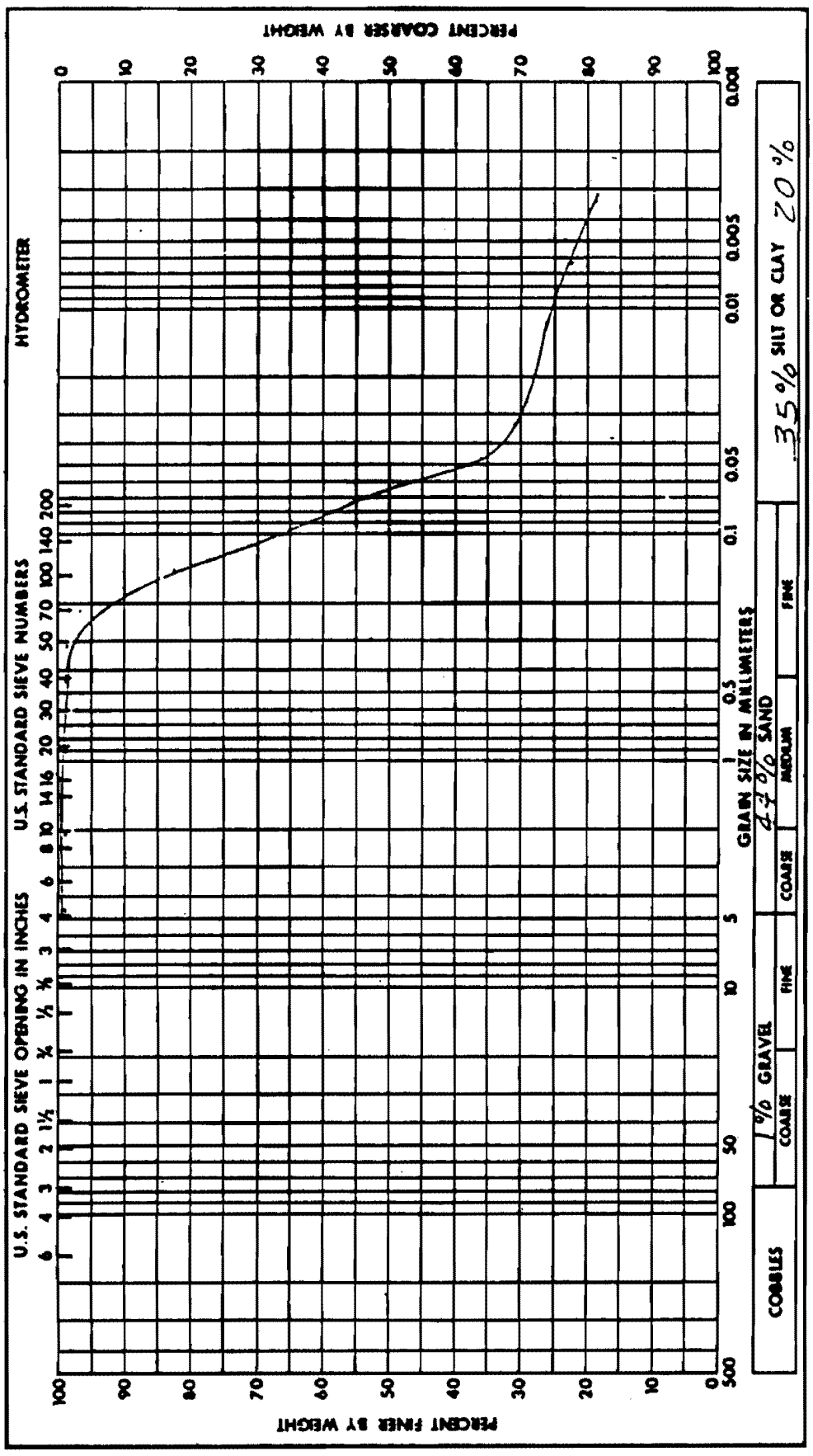
Soil Symbol	SM
Moisture Content, %	31.6
Specific Gravity	2.71
Liquid Limit, %	
Plastic Limit, %	
Plasticity Index, %	
Shrinkage Limit, %	

Figure 2.5-350 Liquefaction

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

LIQUEFACTION
FIGURE 2.5-351



Project	Watts Bar N.P.
Feature	Liquefaction
Boring No.	WS-65-1
Station	1367.0 S
Date	7-13-67

GRAIN SIZE ANALYSIS

Remarks:

Soil Symbol	ML
Moisture Content, %	34.3
Specific Gravity	2.71
Liquid Limit, %	28.2
Plastic Limit, %	23.2
Plasticity Index, %	5.0
Shrinkage Limit, %	

Sample No.	S
Range	1005.7 E
Elevation	703.8-703.4

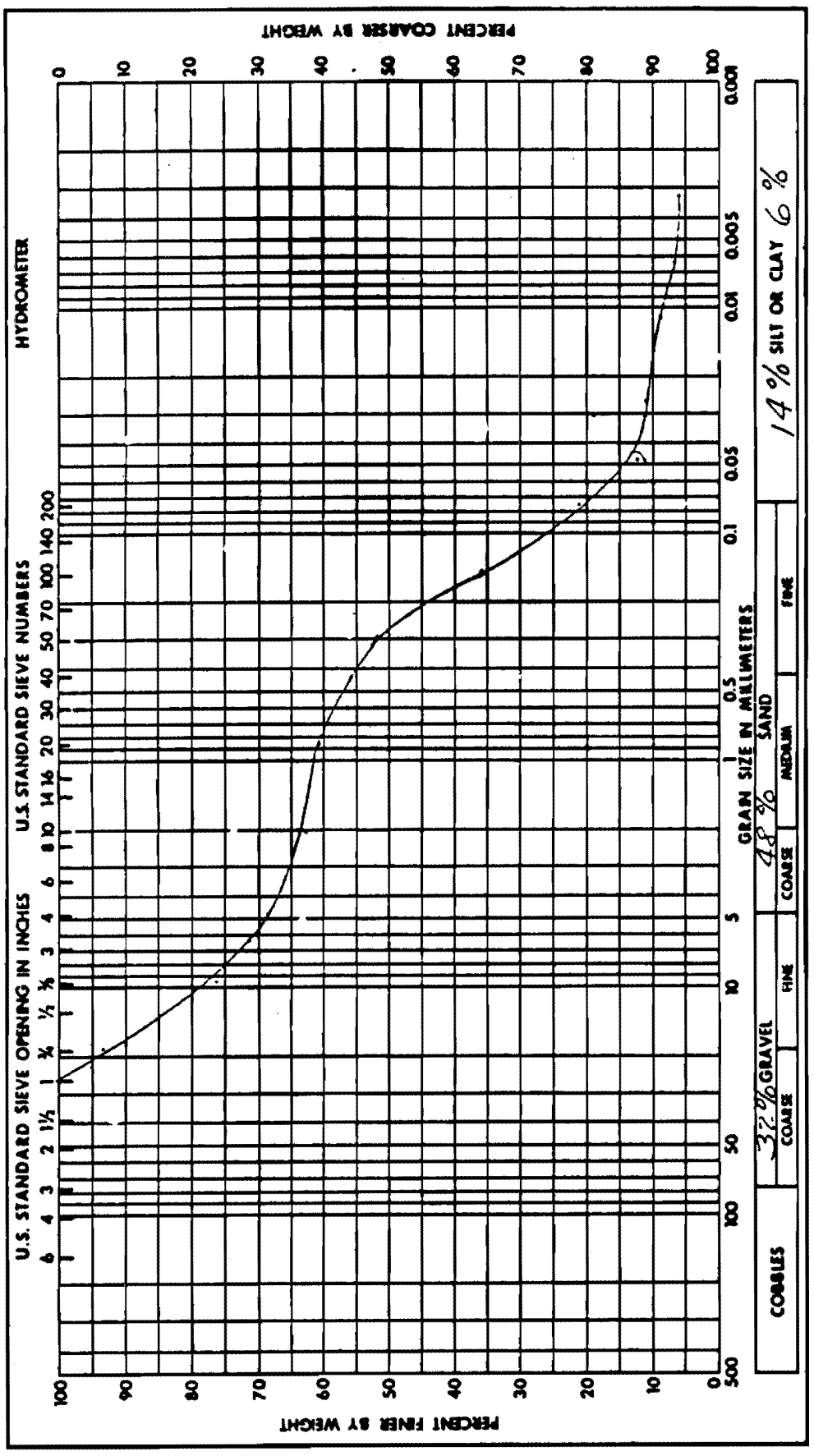
35% SILT OR CLAY 20%
43% SAND

Figure 2.5-351 Liquefaction

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

LIQUEFACTION
FIGURE 2.5-352



Project	Watts Bar N.P.
Feature	Liquefaction
Boring No.	WS-65-1
Station	1367.0 S
Date	7-13-79
Sample No.	6
Range	1005.7 E
Elevation	703.0-701.8

GRAIN SIZE ANALYSIS

Remarks:

Soil Symbol	G-SM	Liquid Limit, % NP
Moisture Content, %	16.6	Plastic Limit, % NP
Specific Gravity	2.70	Plasticity Index, % ND
		Shrinkage Limit, %

Figure 2.5-352 Liquefaction

Added by Amendment 50

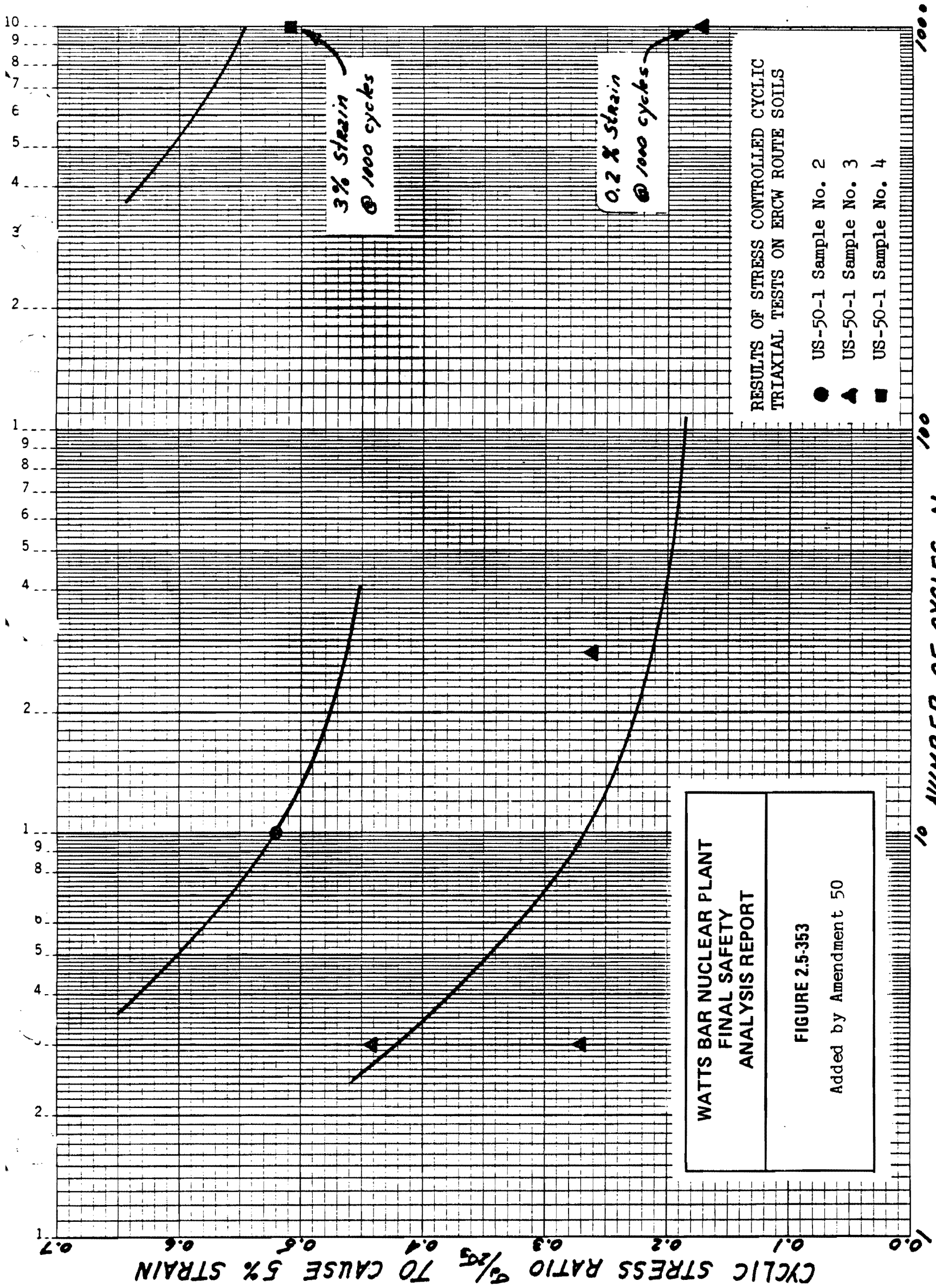
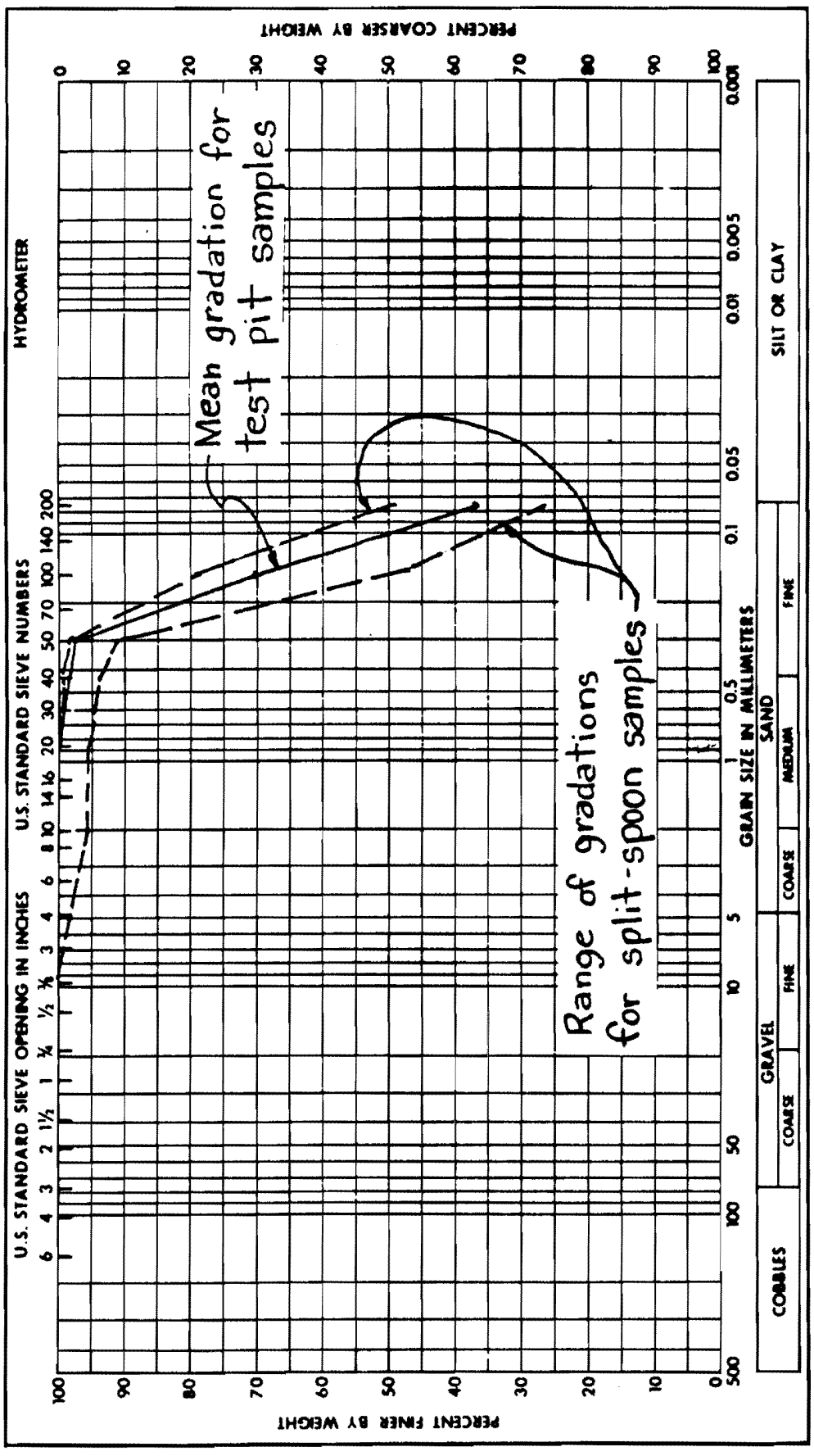


Figure 2.5-353 Results Of Stress Controlled Cyclic Triaxial Tests On ERCW Route Soils

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

LIQUEFACTION STUDY
ERCW PIPELINE
FIGURE 2.5-354



Soil Symbol		Liquid Limit, %	
Moisture Content, %		Plastic Limit, %	
Specific Gravity		Plasticity Index, %	
		Shrinkage Limit, %	

Remarks: Comparison of Test Pit #1 samples with SM samples from split-spoon borings 134, 134A, & 135A

Project	Watts Bar Nuclear Plant
	Liquefaction Study
Feature	ERCW Pipeline
	Figure 1

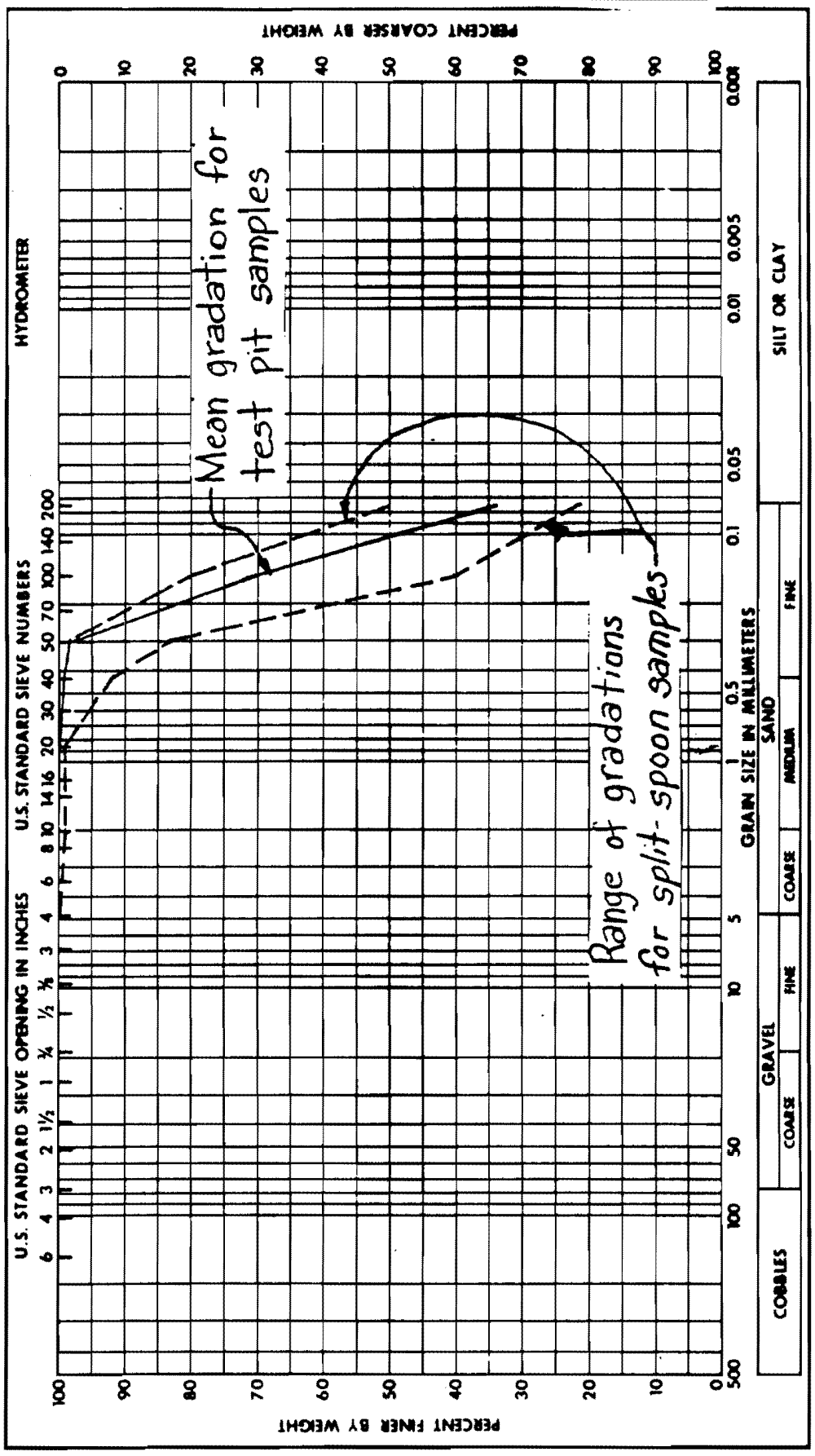
GRAIN SIZE ANALYSIS

Figure 2.5-354 Liquefaction Study ERCW Pipeline

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

LIQUEFACTION STUDY
ERCW PIPELINE
FIGURE 2.5-355



Soil Symbol			
Moisture Content, %			
Specific Gravity			

Liquid Limit, %			
Plastic Limit, %			
Plasticity Index, %			
Shrinkage Limit, %			

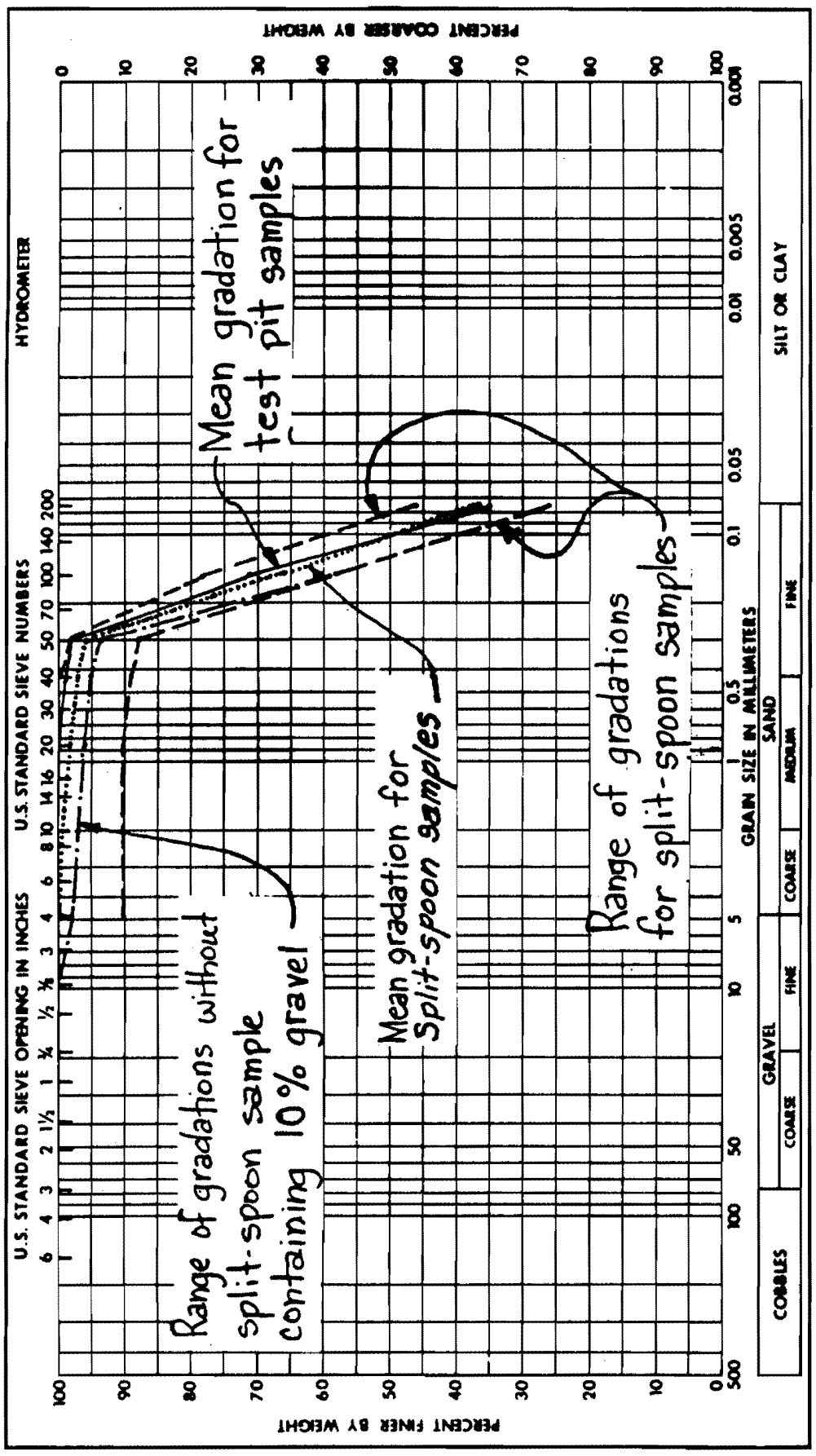
Remarks: Comparison of Test Pit #2 samples with SM (without gravel) samples from split-spoon borings 138, 138A, 138B, 138C, & 139

Figure 2.5-355 Liquefaction Study ERCW Pipeline

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

LIQUEFACTION STUDY
ERCW PIPELINE
FIGURE 2.5-356



Project	Watts Bar Nuclear Plant
	Liquefaction Study
Feature	ERCW Pipeline
	Figure 3
	GRAIN SIZE ANALYSIS

Soil Symbol		Liquid Limit, %	
Moisture Content, %		Plastic Limit, %	
Specific Gravity		Plasticity Index, %	
		Shrinkage Limit, %	

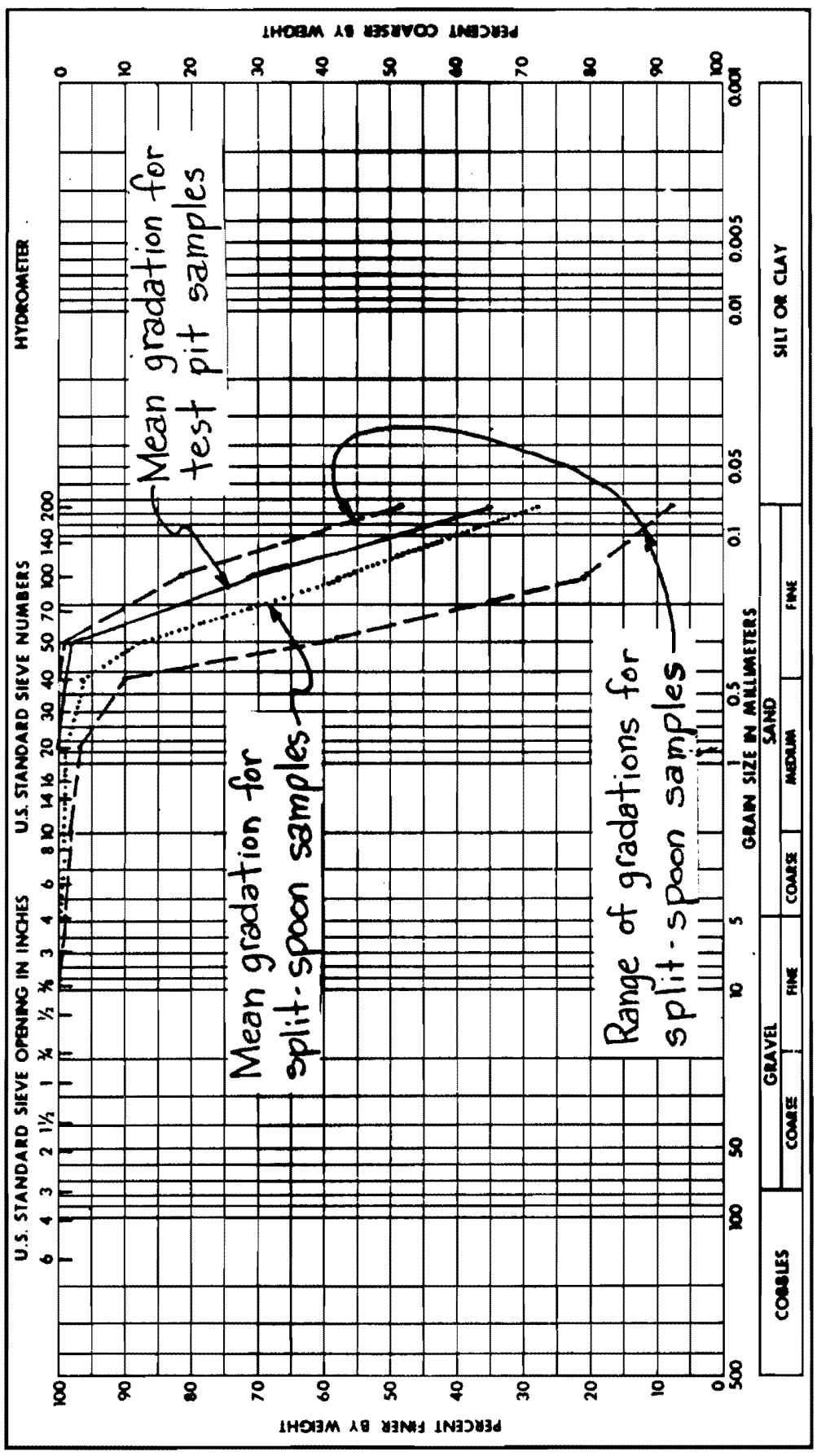
Remarks: Comparison of test pit samples with split-spoon samples from south of the cooling towers

Figure 2.5-356 Liquefaction Study ERCW Pipeline

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

LIQUEFACTION STUDY
ERCW PIPELINE
FIGURE 2.5-357



Soil Symbol			
Moisture Content, %	Liquid Limit, %		
Specific Gravity	Plastic Limit, %		
	Plasticity Index, %		
	Shrinkage Limit, %		

Remarks: Comparison of test pit samples with split-spoon samples from the main plant area

Figure 2.5-357 Liquefaction Study ERCW Pipeline

Added by Amendment 50

Figure 2.5-358 Additional Soil Investigations Category I Soil Supported Structures

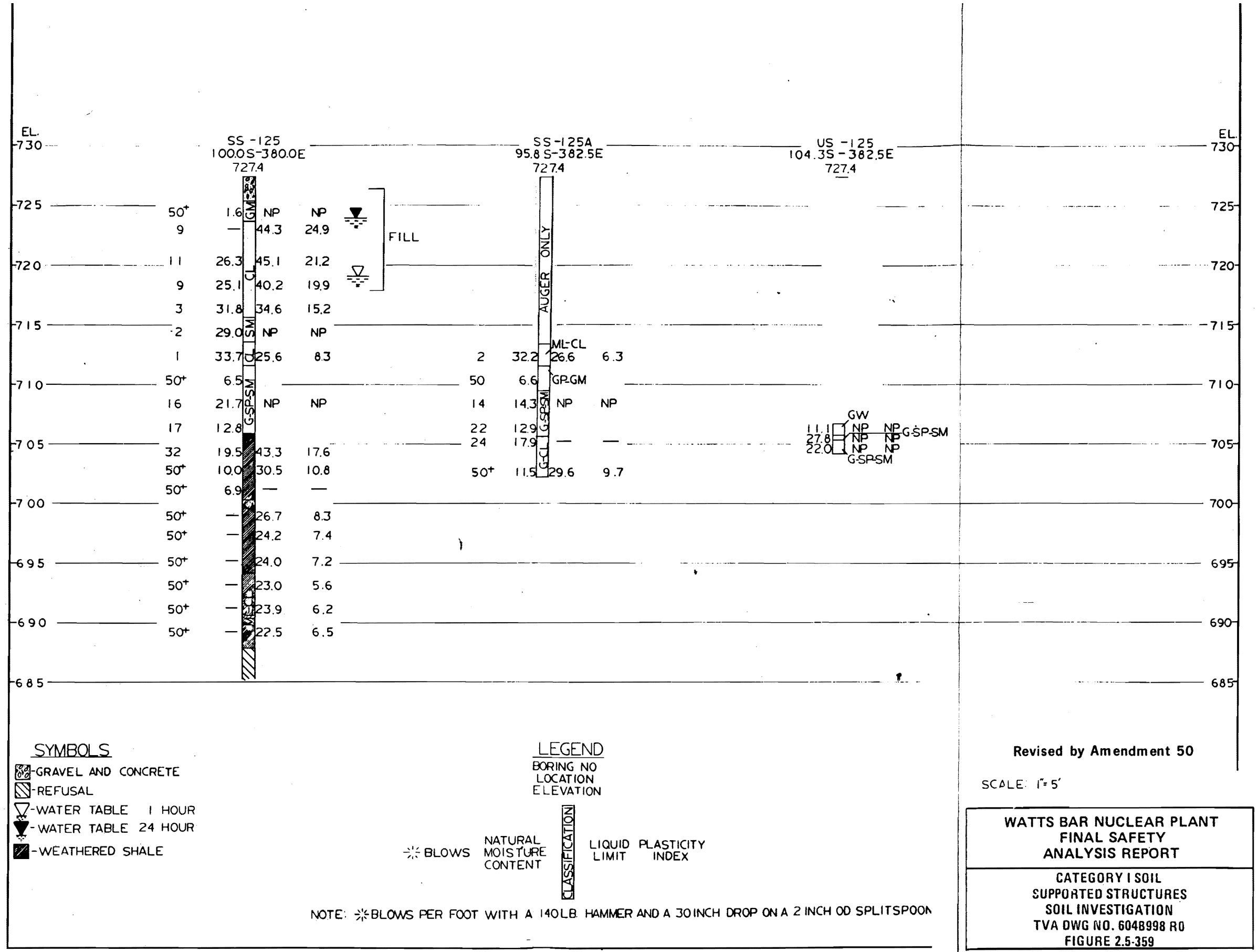


Figure 2.5-359 Category I Soil Supported Structures Soil Investigation

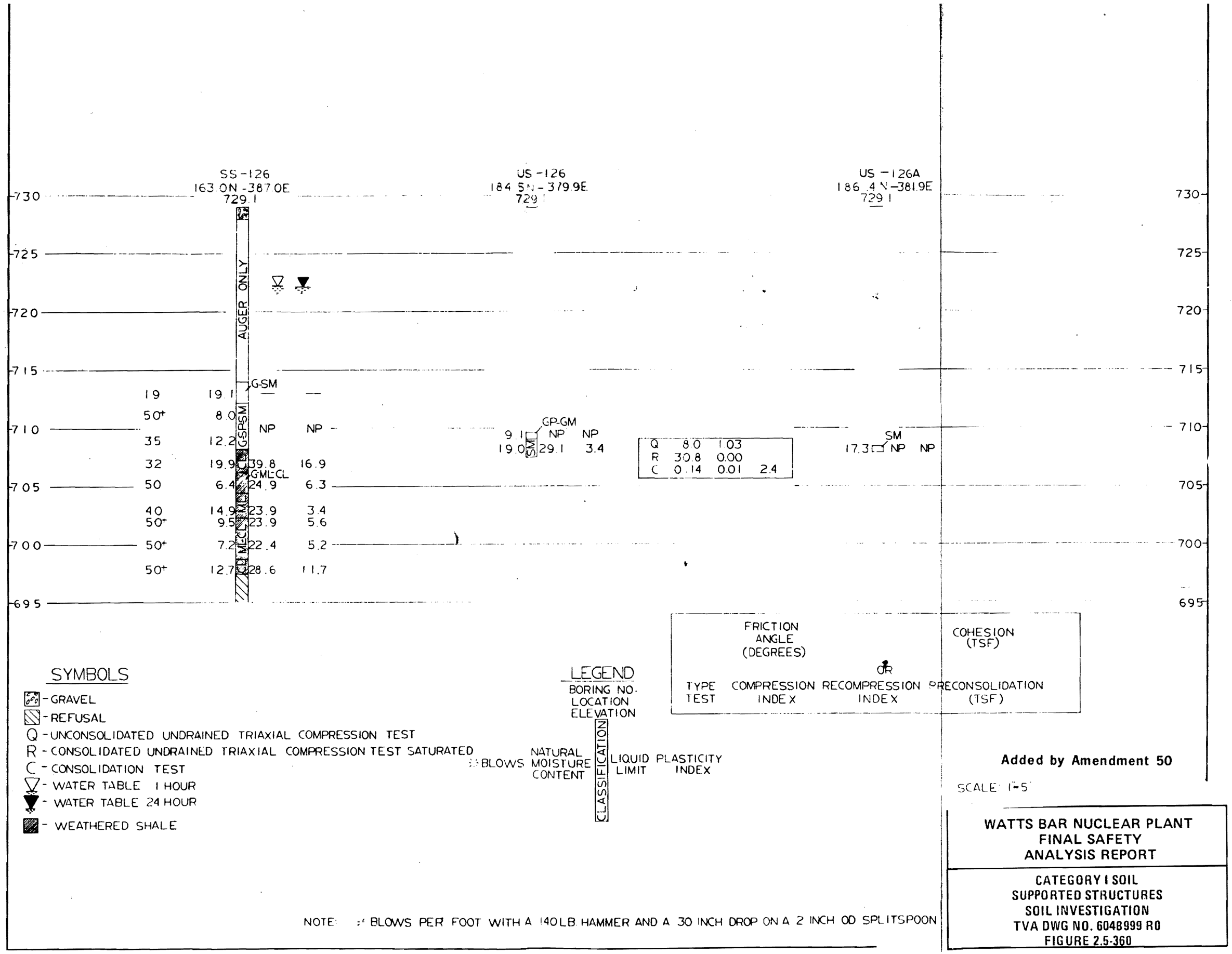
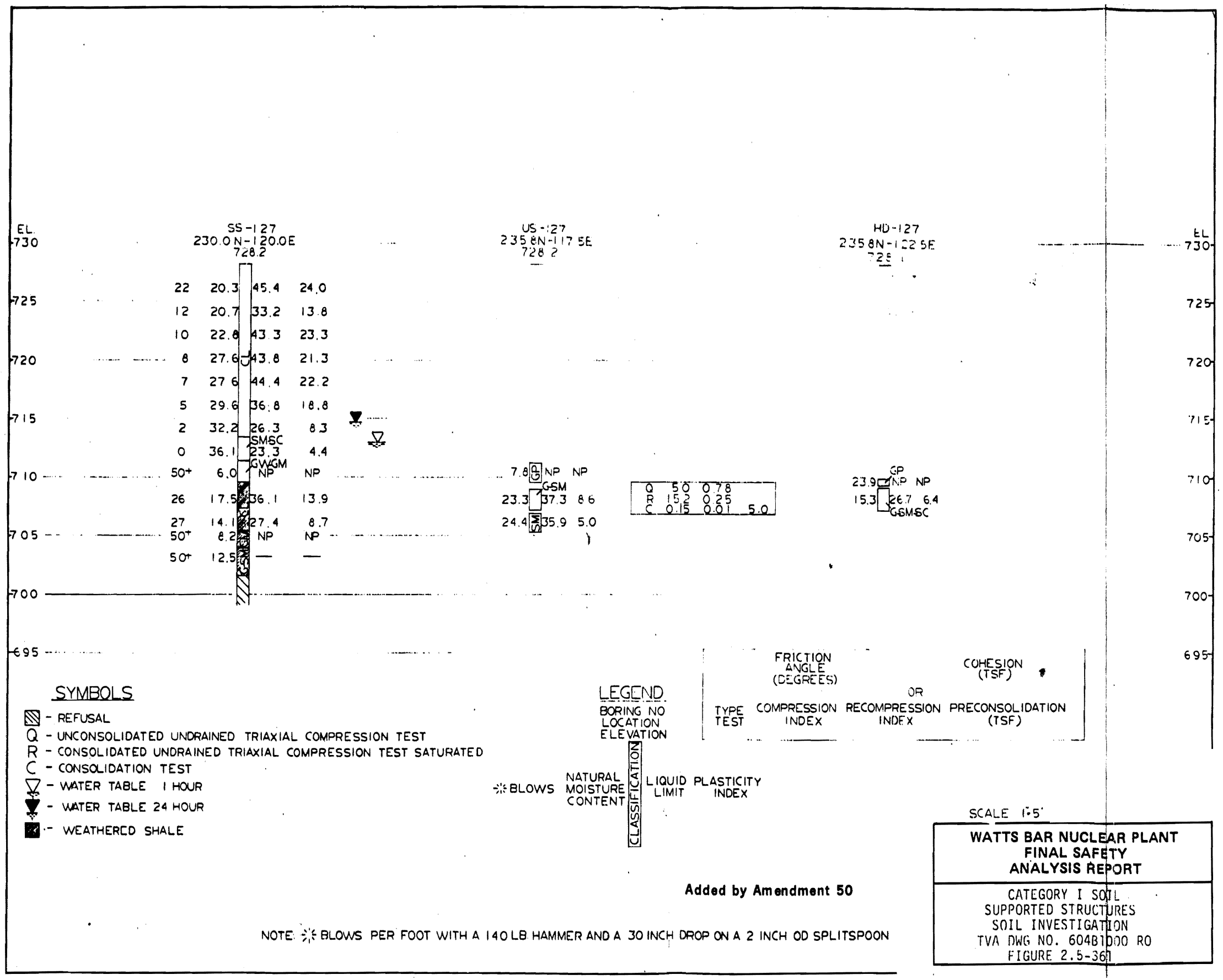


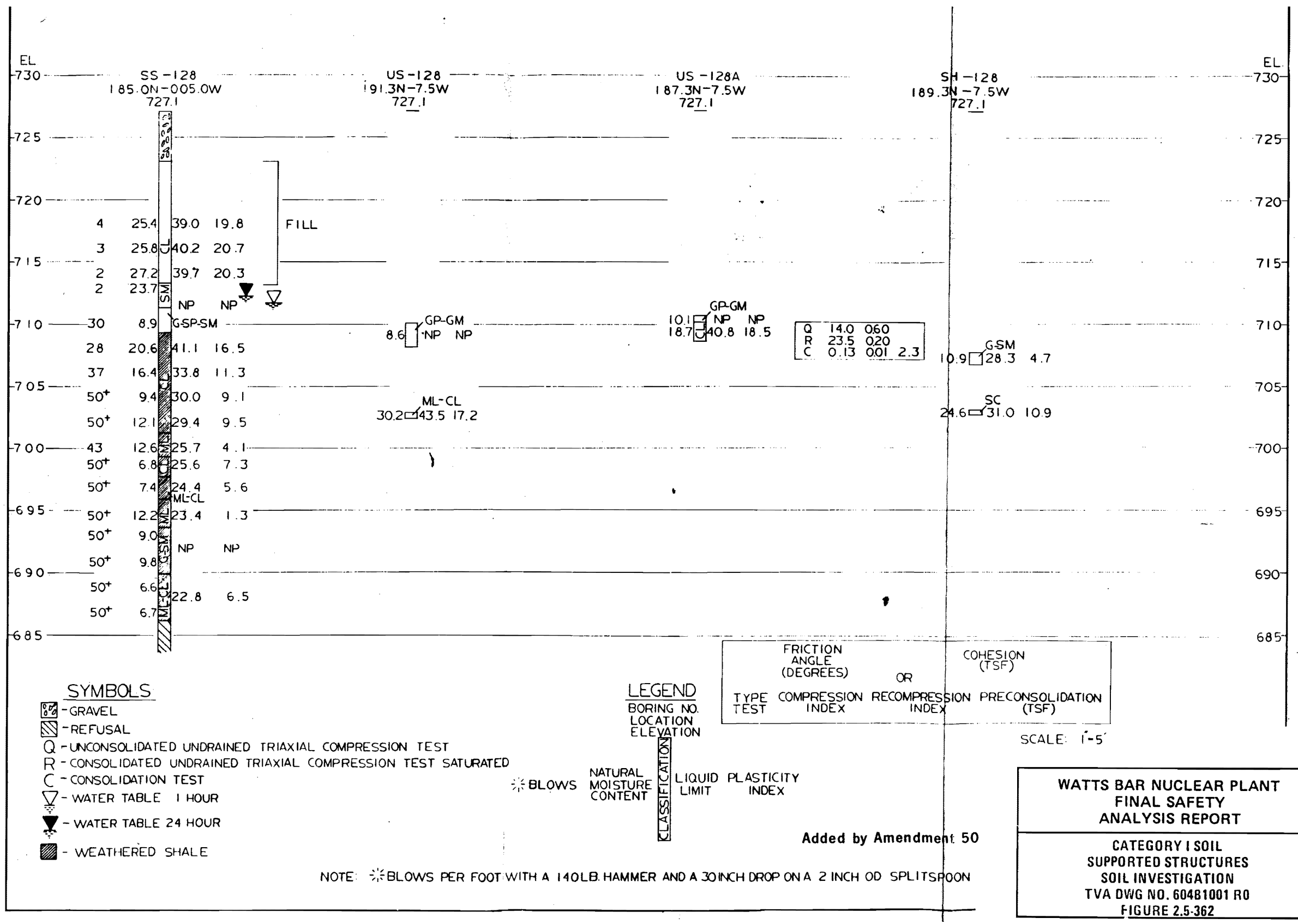
Figure 2.5-360 Category I Soil Supported Structures Soil Investigation



Added by Amendment 50

NOTE: BLOWS PER FOOT WITH A 140 LB HAMMER AND A 30 INCH DROP ON A 2 INCH OD SPLITSPOON

Figure 2.5-361 Category I Soil Supported Structures Soil Investigation



Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY ANALYSIS REPORT

CATEGORY I SOIL SUPPORTED STRUCTURES SOIL INVESTIGATION
TVA DWG NO. 60481001 R0
FIGURE 2.5-362

Figure 2.5-362 Category I Soil Supported Structures Soil Investigation

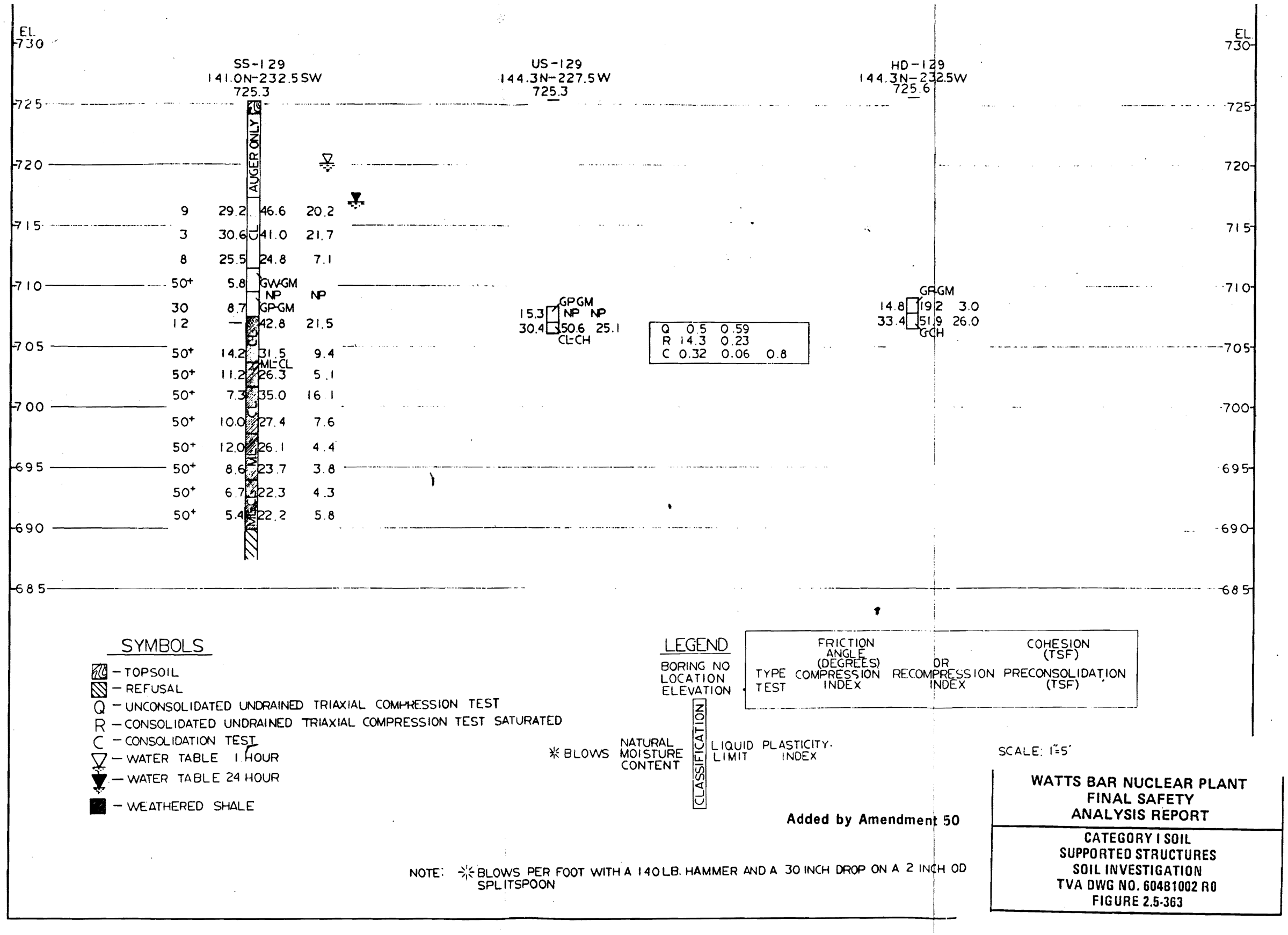


Figure 2.5-363 Category I Soil Supported Structures Soil Investigation

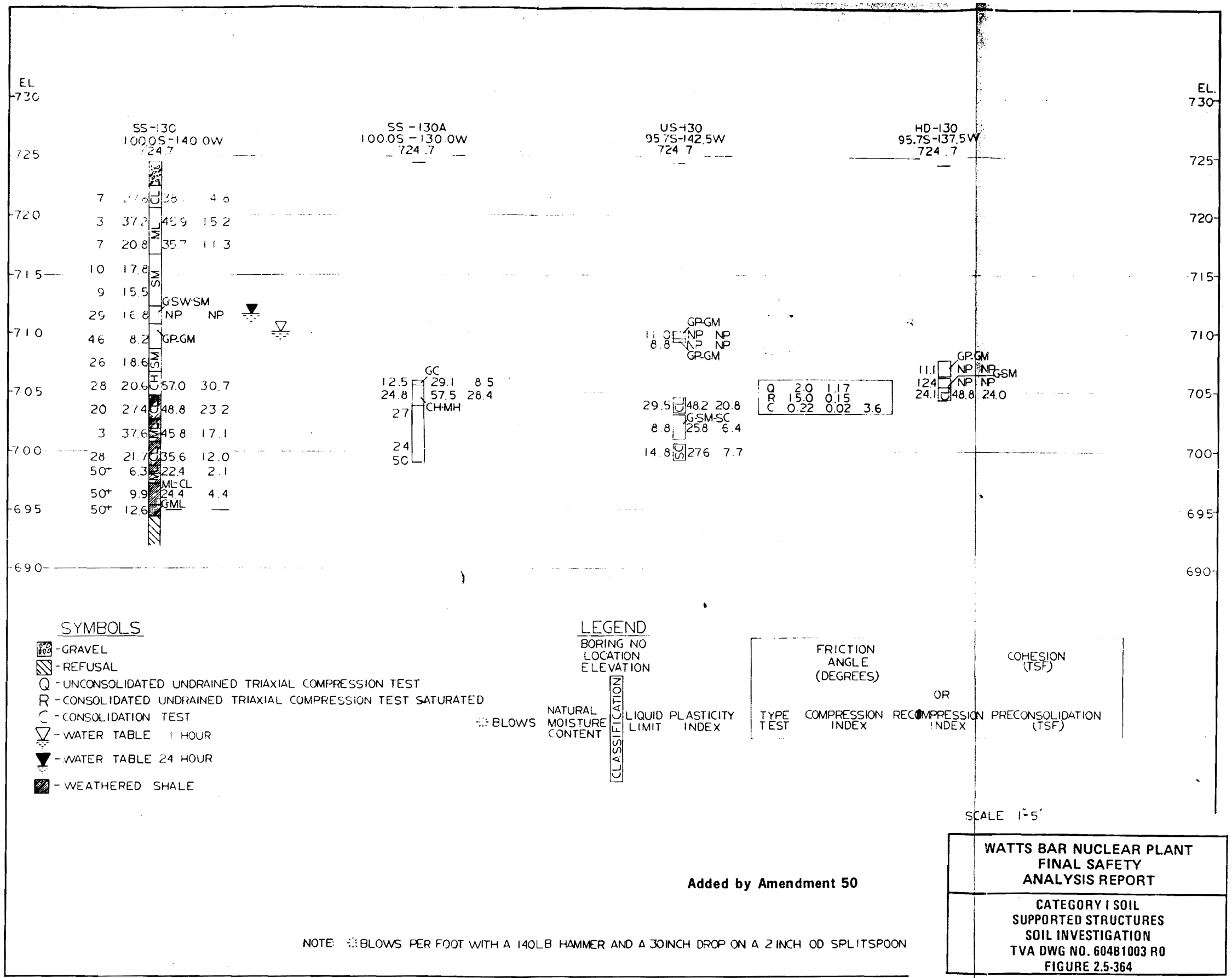


Figure 2.5-364 Category I Soil Supported Structures Soil Investigation

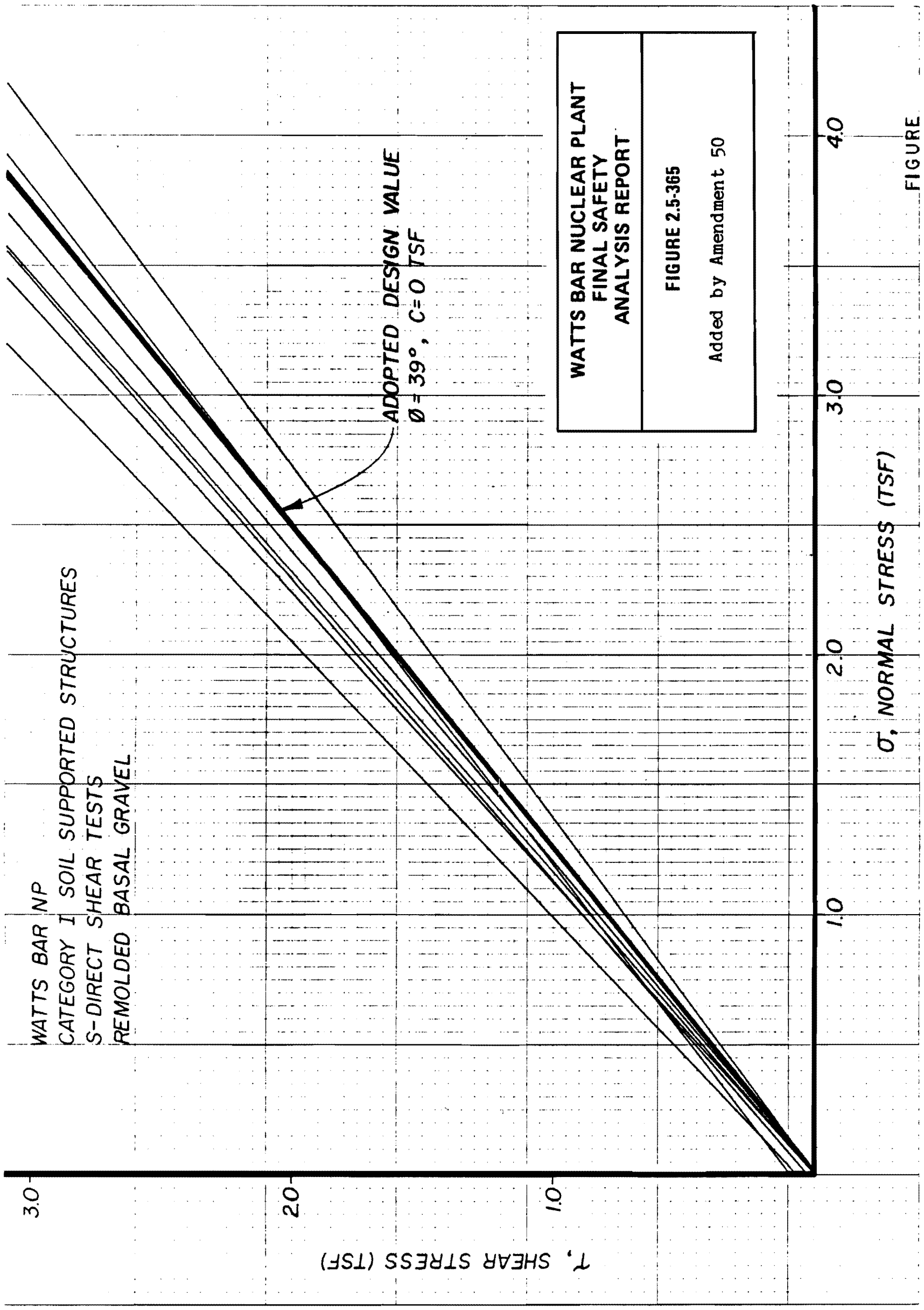
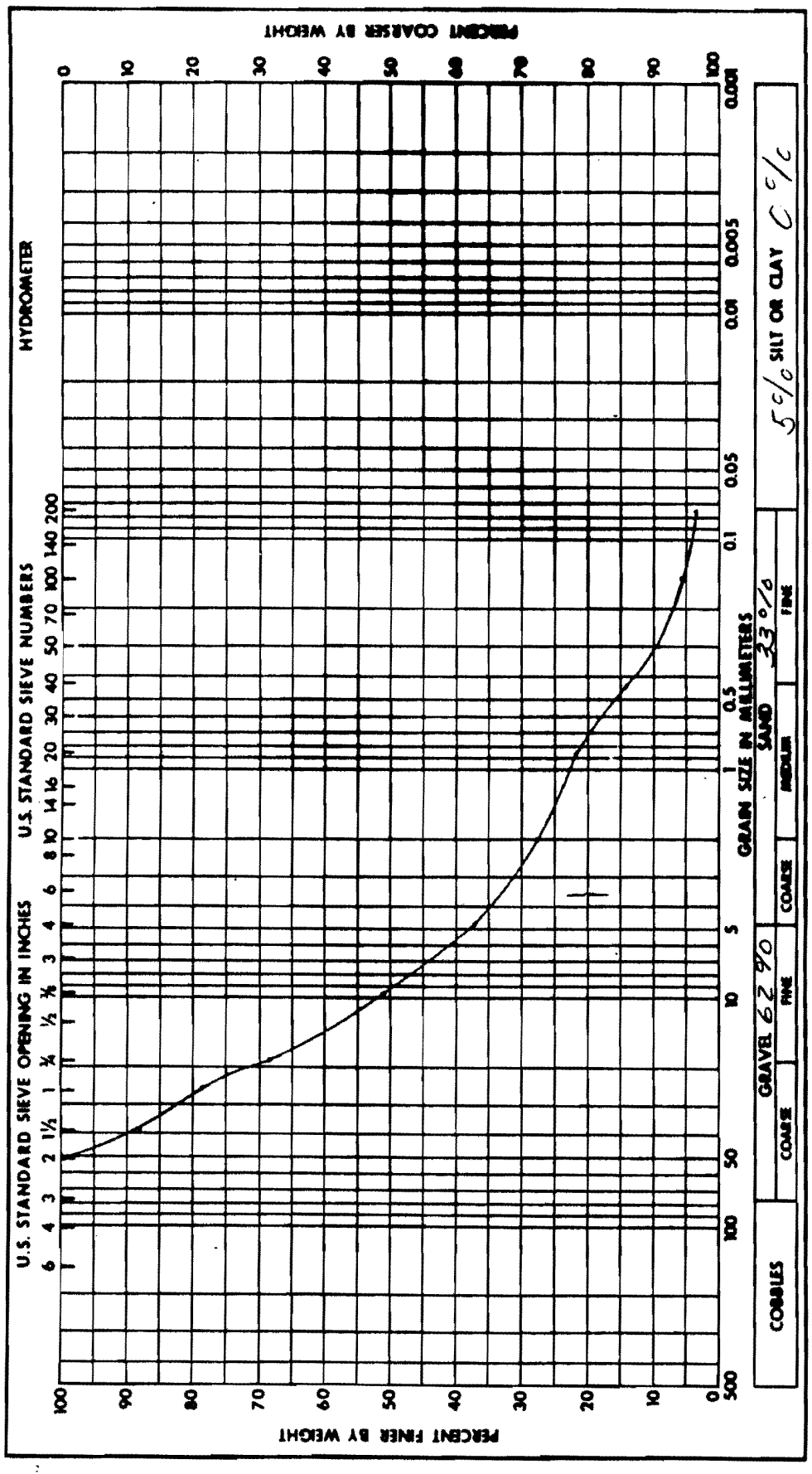


Figure 2.5-365 Category I Supported Structures S-Direct Shear Test Remolded Basal Gravel

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL SUPPORTED STRUCTURES
FIGURE 2.5-366



Remarks:

Project	WATTS BAR N.P.
Feature	Soil Supported Structures
Boring No.	US-125 Sample No. 3 Pt. 2
Station	104.3 S Range 382.5 E
Date	8-3-72 Elevation 706.8-705.8

GRAIN SIZE ANALYSIS

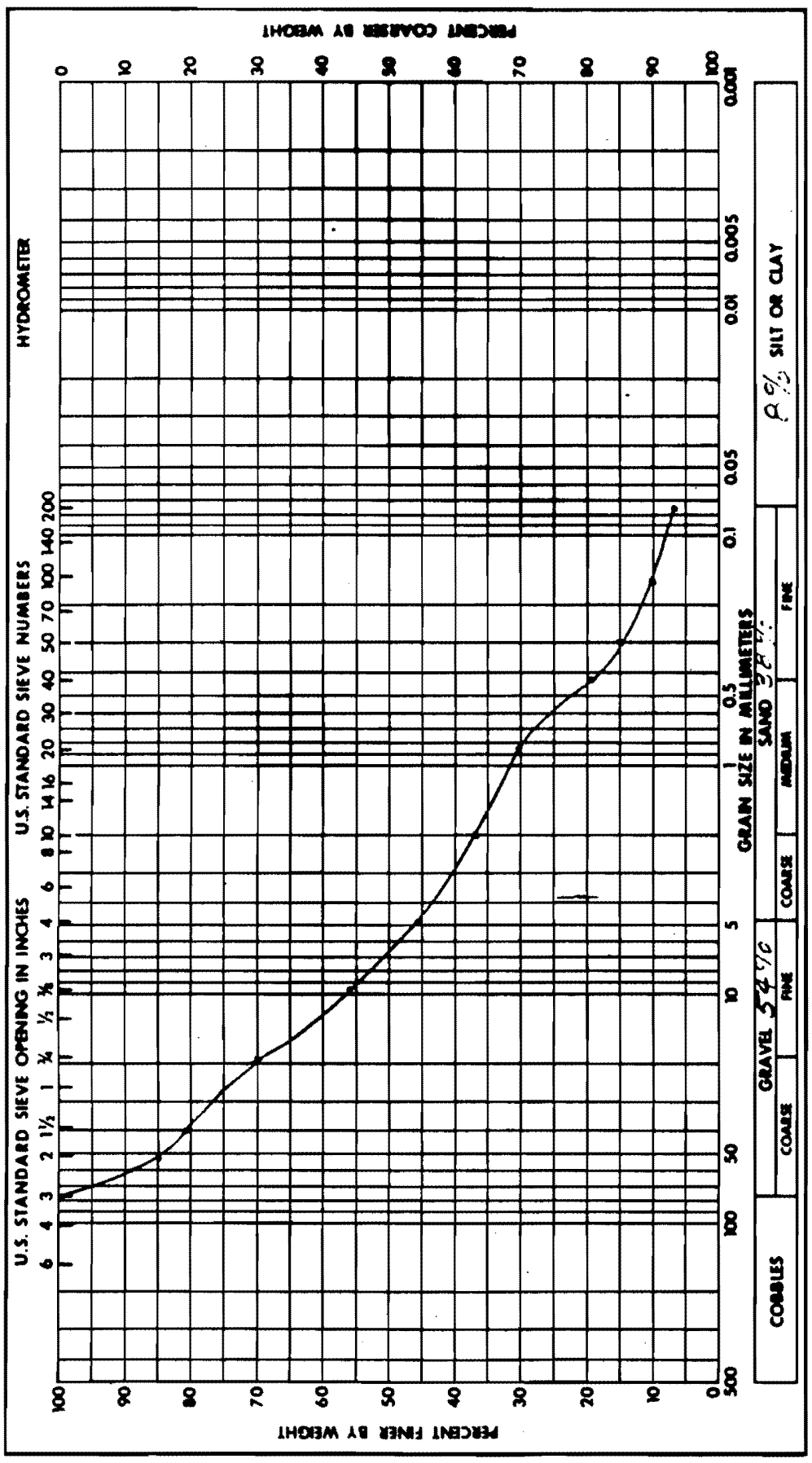
Soil Symbol	GW	Liquid Limit, %	NP
Moisture Content, %	11.1	Plastic Limit, %	NP
Specific Gravity	2.58	Plasticity Index, %	N.P.
		Shrinkage Limit, %	

Figure 2.5-366 Soil Supported Structures

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL SUPPORTED STRUCTURES
FIGURE 2.5-367



Soil Symbol	SP-SM	Liquid Limit, %	NP
Moisture Content, %	9.1	Plastic Limit, %	NP
Specific Gravity	2.61	Plasticity Index, %	NP
		Shrinkage Limit, %	

Remarks:

Project WATTS BAR NUP
Feature Soils Supported Structure
Boring No. US-12A Sample No. 4 R1
Station 184.5N Range 379.9E
Date 8-31-79 Elevation 709.6-708.1

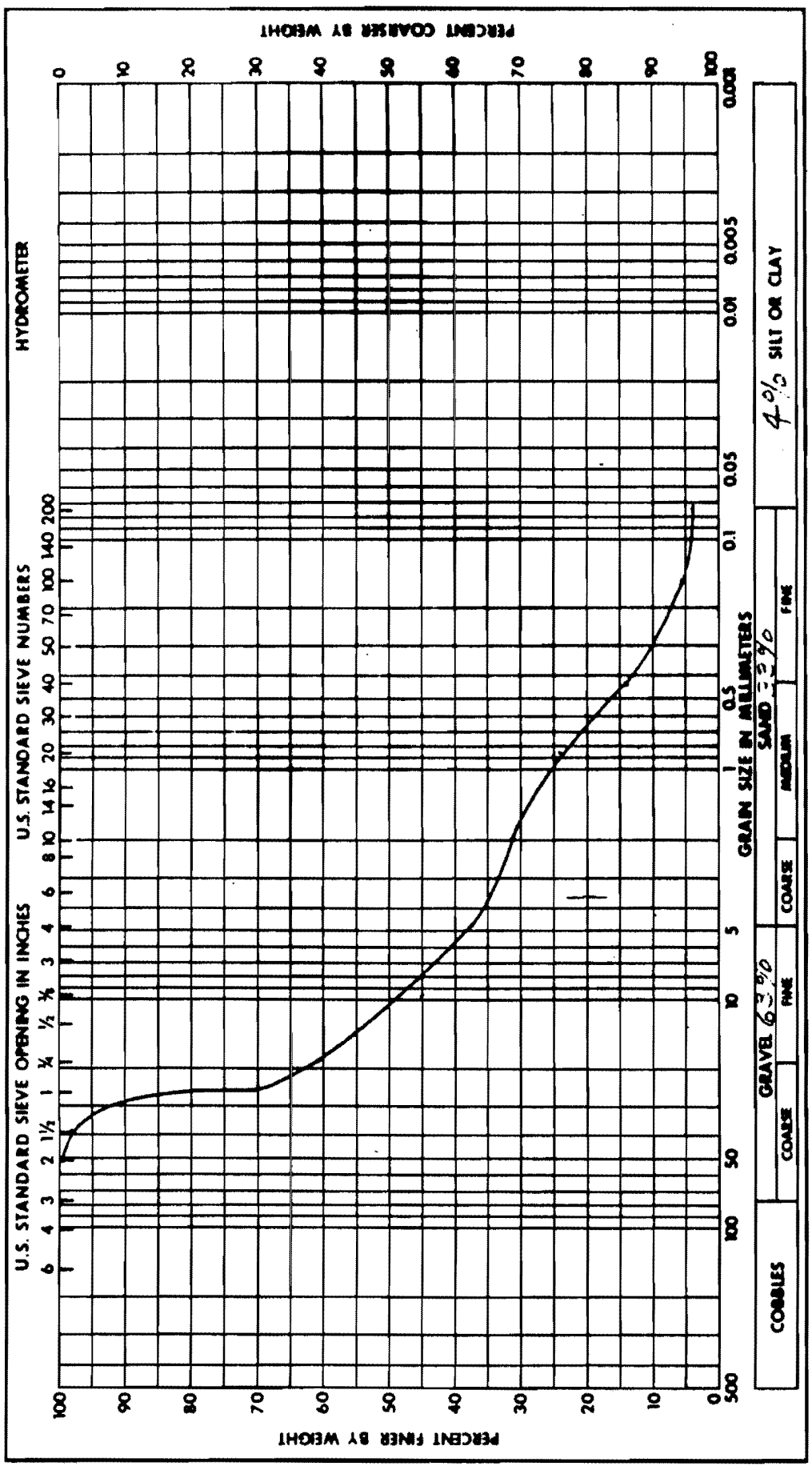
GRAIN SIZE ANALYSIS

Figure 2.5-367 Soil Supported Structures

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL SUPPORTED STRUCTURES
FIGURE 2.5-368



Project WATTS BAR NP					
Feature SOIL SUPPORTED STRUCTURES					
Boring No WBS-127	Sample No. 1				
Station 235.8 N	Range 117.5E				
Date 8-6-79	Elevation 714-709.6				
GRAIN SIZE ANALYSIS					

Remarks:

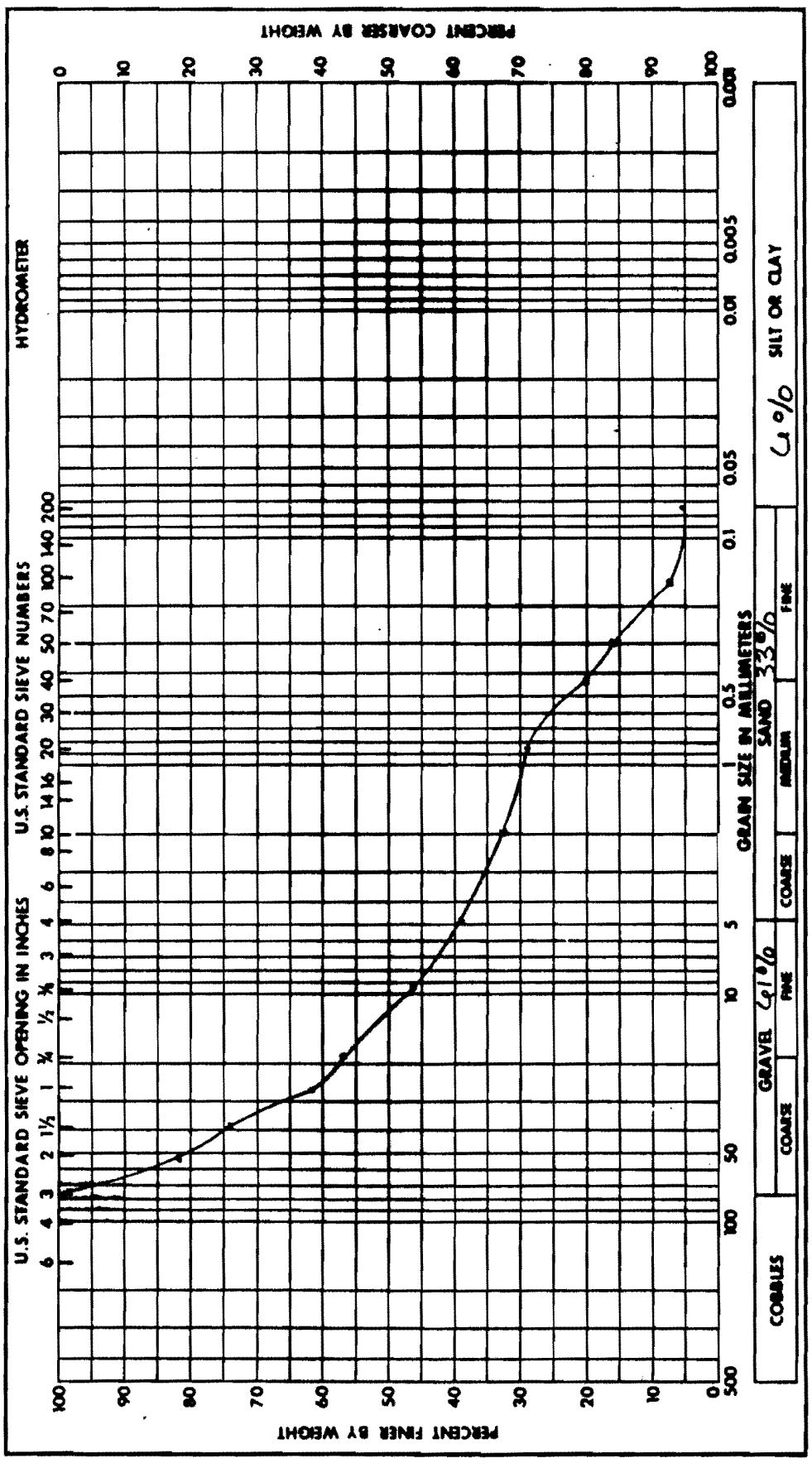
Soil Symbol	GP	Liquid Limit, %	NP
Moisture Content, %	7.8	Plastic Limit, %	NP
Specific Gravity	2.58	Plasticity Index, %	NP
		Shrinkage Limit, %	

Figure 2.5-368 Soil Supported Structures

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL SUPPORTED STRUCTURES
FIGURE 2.5-369



Project	WATTS BAR UP
Feature	Soil Supported Structures
Boring No.	US-128
Station	191.3N
Date	8-31-79
Sample No.	8
Range	7.5W
Elevation	710-704

GRAIN SIZE ANALYSIS

Remarks:

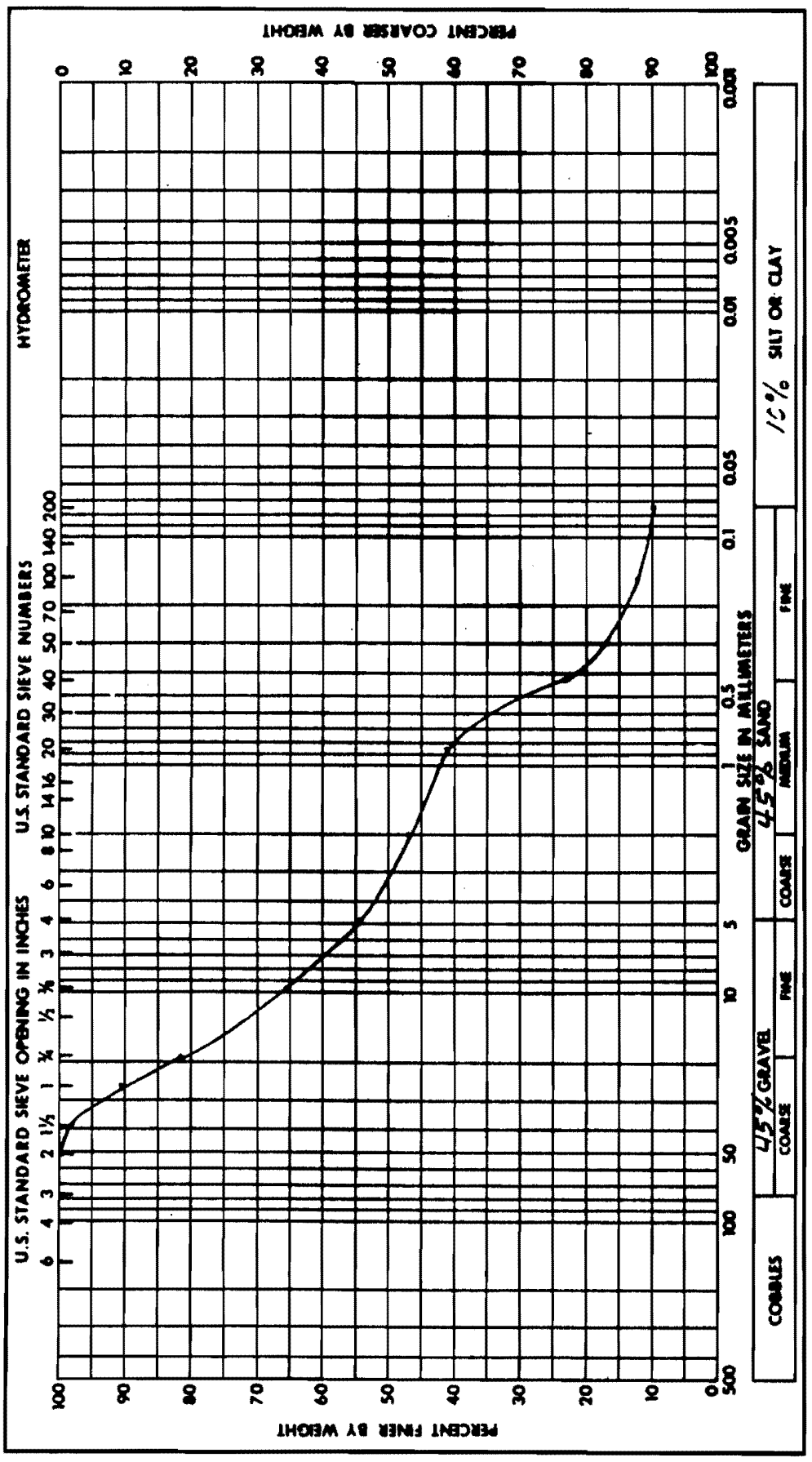
Soil Symbol	GP-GM	Liquid Limit, %	NP
Moisture Content, %	8.4	Plastic Limit, %	NP
Specific Gravity	2.62	Plasticity Index, %	NP
		Shrinkage Limit, %	

Figure 2.5-369 Soil Supported Structures

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL SUPPORTED STRUCTURES
FIGURE 2.5-370



Project Watts Bar N.P

Feature Soil Support of Structures

Boring No. GS-129 | Sample No. 3, P-2

Station 1443N | Range 227.5' W

Date 9-4-79 | Elevation 708.3-710.3

GRAIN SIZE ANALYSIS

Remarks:

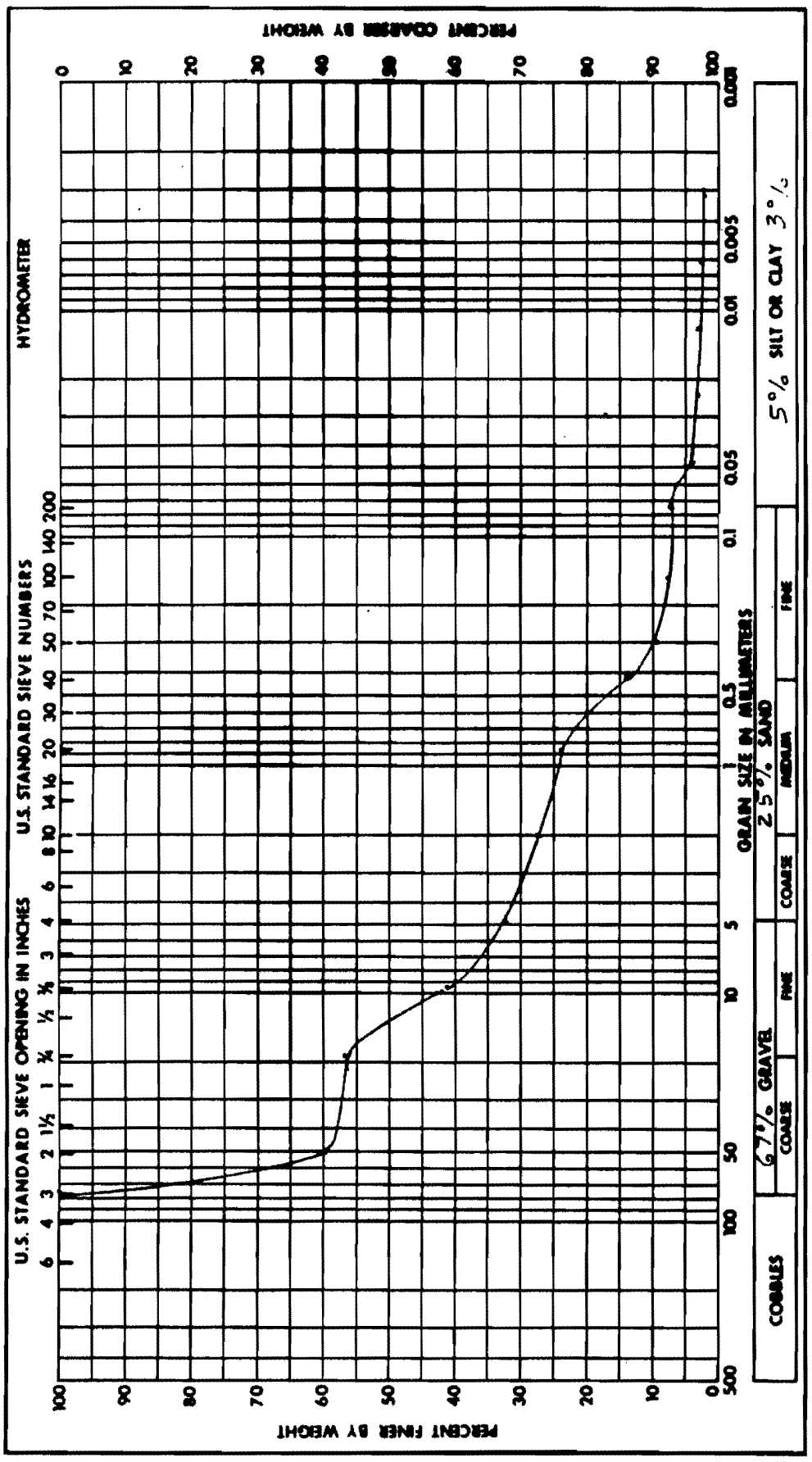
Soil Symbol	GP-GM	Liquid Limit, %	NP
Moisture Content, %	15.3	Plastic Limit, %	NP
Specific Gravity	2.62	Plasticity Index, %	NP
		Shrinkage Limit, %	

Figure 2.5-370 Soil Supported Structures

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL SUPPORTED STRUCTURES
FIGURE 2.5-371



Project	WATTS BAR
Feature	Soil Supported Structure
Boring No.	US-130
Station	95+75
Date	9-4-79

GRAIN SIZE ANALYSIS

Remarks:

Soil Symbol	GP GM	Liquid Limit, %	NP
Moisture Content, %	8.8	Plastic Limit, %	NP
Specific Gravity	2.59	Plasticity Index, %	NP
		Shrinkage Limit, %	--

Figure 2.5-371 Soil Supported Structures

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
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GRAVEL BORING NO. 125
FIGURE 2.5-372

Added by Amendment 50

Figure 2.5-372 Gravel Boring No. 125

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

GRAVEL BORING NO. 129
FIGURE 2.5-373

Added by Amendment 50

Figure 2.5-373 Gravel Boring No. 129

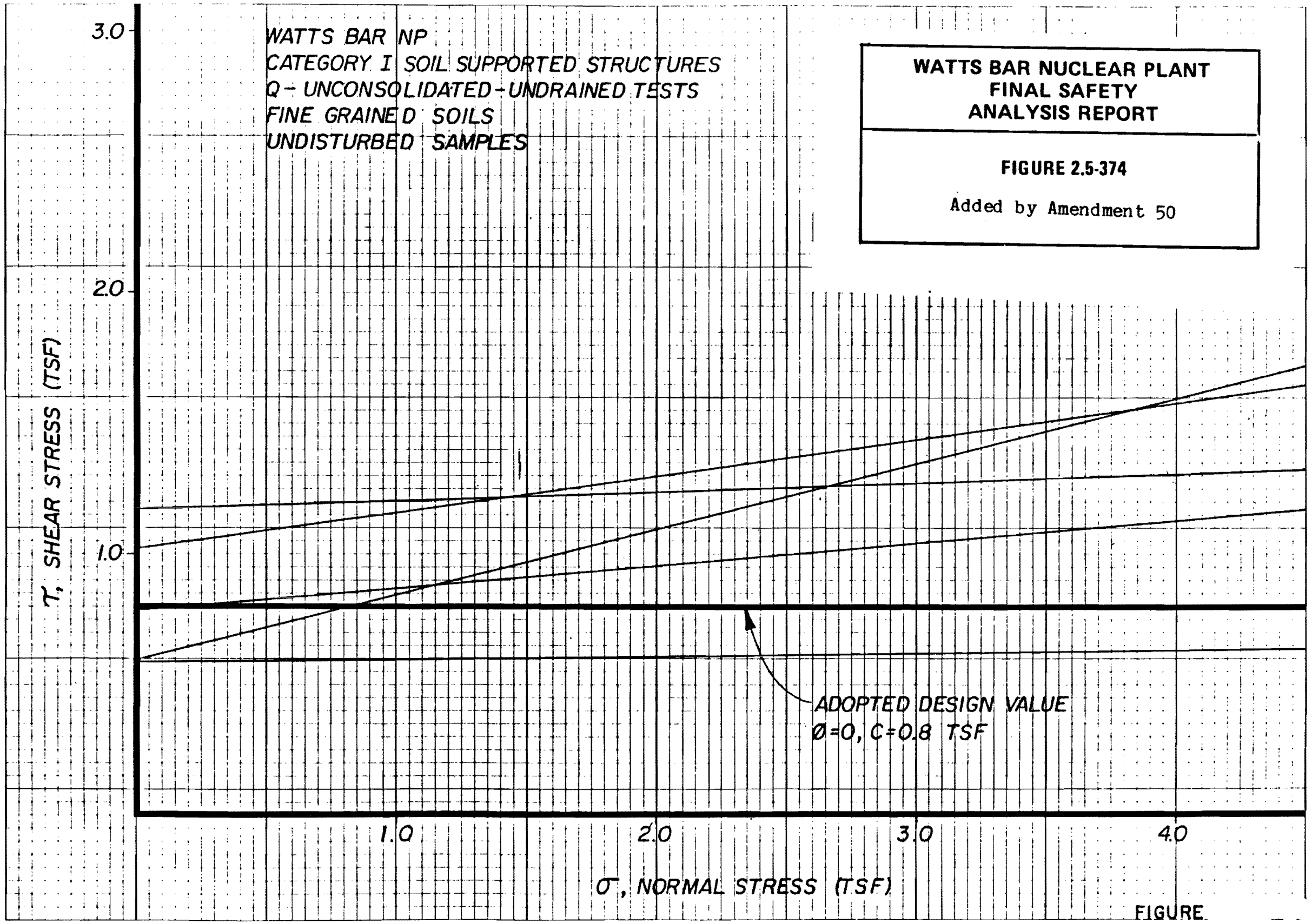

Figure 2.5-374 Watts Bar Nuclear Plant Category I Soil Supported Structures Q - (Unconsolidated - Undrained) Test Fine Grained Soils (Undisturbed Samples)

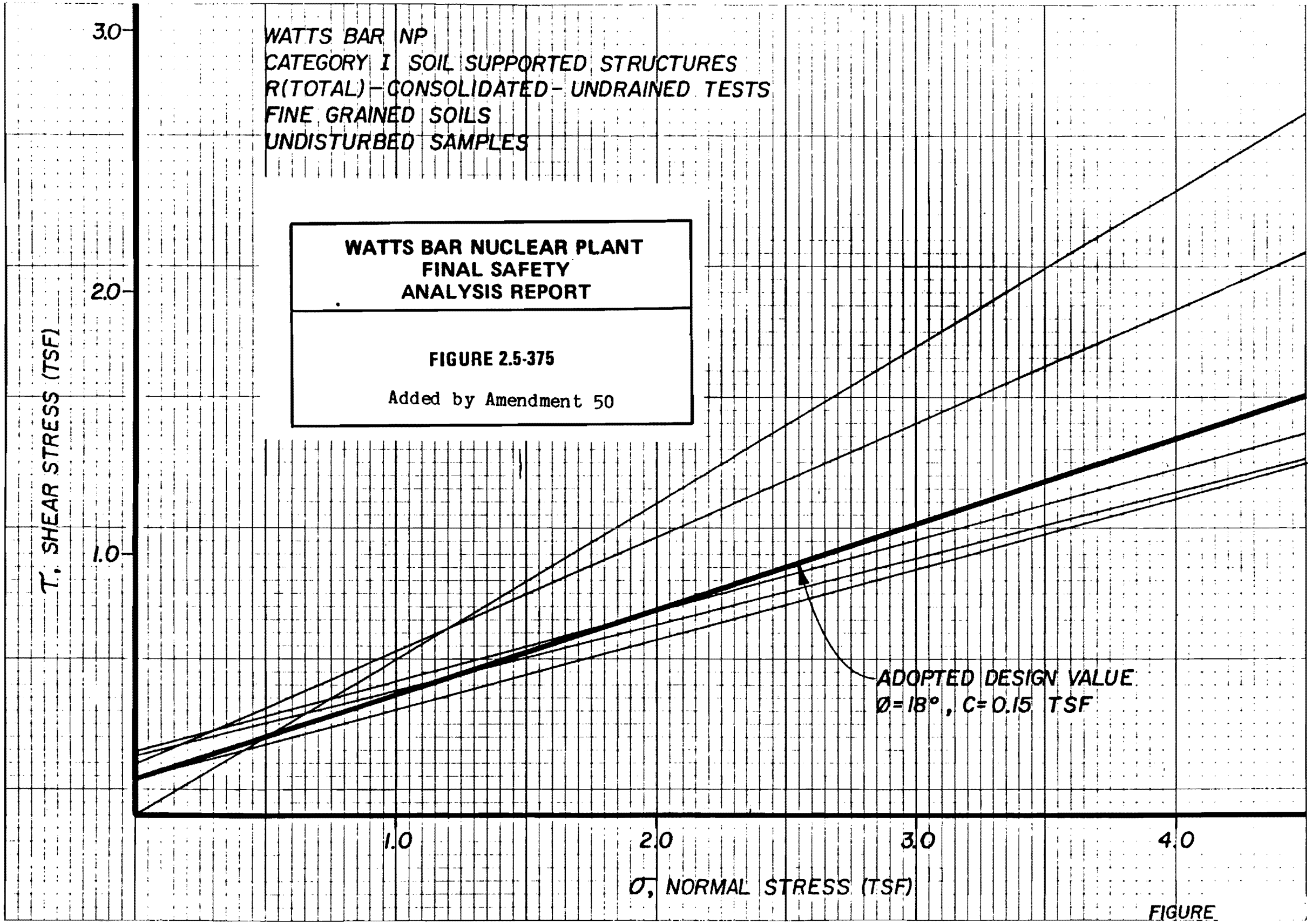

Figure 2.5-375 Watts Bar Nuclear Plant Category I Soil Supported Structures R (Total) - (Consolidated - Undrained) Test Fine Grained Soils (Undisturbed Samples)

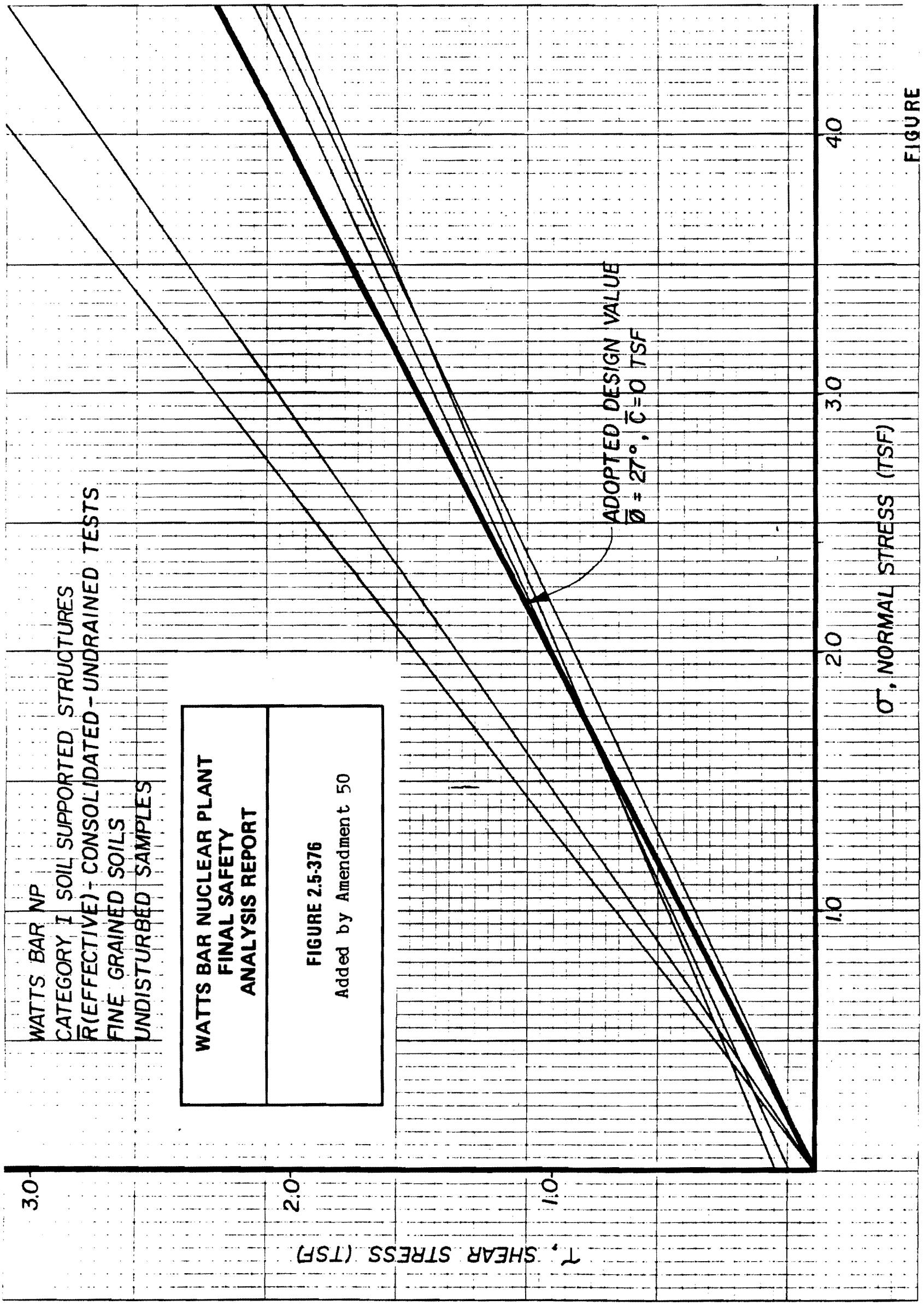

Figure 2.5-376 Watts Bar Nuclear Plant Category I Soil Supported Structure R (Effective) - (Consolidated -Undrained) Test Fine Grained Soils (Undisturbed Samples)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
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SOIL PROFILE
FIGURE 2.5-377
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: ERCW TRENCH A
BORING: PAH-1 STATION: 8+65.2 RANGE: SURFACE EL: 730.2
DATE DRILLED: 5/30/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	730						TOPSOIL
			SC	12.2	29	12	GV CL, BRN, MST, SP FL
5	725		SC	13.0	29	12	GV CL, BRN, V MST, SP FL
10	720			8.8			(SHALE SHOTROCK) CL GV, GY, MST, SP FL
15	715			7.3			(SHALE SHOTROCK) CL GV, GY, MST, SP FL
20	710		SM SC	25.8	29	7	SD SI, R-BRN, MST, MIC, ALL ORIG SOIL
25	705		SM	16.5	NP	NP	SI SD, R-BRN, V MST, ALL
			CL	10.6	33	14	SI SD, ±20% GV, R-BRN, W, ALL
				26.3			ROU AUGG - GV WEATHERED SHALE
30	700						DISCONTINUED. EL 700.7
35							

1''=5'

*Lab. Classif.

Added by Amendment 50

Figure 2.5-377 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-378
SHEET 1 OF 1

Added by Amendment 50

PROJECT: WATTS BAR N.P. FEATURE: ERCW TRENCH A
BORING: PAH-2 STATION: 7+00 RANGE: SURFACE EL: 733.4
DATE DRILLED: 5/27/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0							
	730		SC	11.8	30	13	SD GV, BRN-GY, WOOD, MST, SP FL
5							
	725		SC	10.3	30	13	SD GV, BRN; WOOD, WIRE & PLASTIC DBR, MST, SP FL
10							
	720		SC	12.1	30	13	GV SI CL, BRN, MST, SP FL
15							
	715		SC	20.3	30	13	SI CL, TR GV, BRN, V MST, SP FL
20			SC	16.2	30	13	GV CL, BRN, MST, SP FL
	710		SC	22.0	30	13	SI CL, BRN, MST, ALL, ORIG SOIL
25							
	705		SM/SC	32.5	27	5	SD SI, R-BRN, V MST, ALL, MIC
30							
	700		SM/SC	32.3	27	5	SD SI, R BRN, V MST, ALL, MIC
35							
1''=5'			* Lab. Classif.	18			WEATHERED SHALE
							DISCONTINUED EL 697.2

Figure 2.5-378 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-379
SHEET 1 OF 1

Added by Amendment 50

PROJECT: WATTS BAR N.P. FEATURE: ERCW TRENCH A
BORING: PAH-3 STATION: 5+50 RANGE: SURFACE EL: 728.9
DATE DRILLED: 5/27/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							SPOIL FILL
			US	12.0	30	13	GV CL, BRN-GY, MST, WOOD, SP FL
5	725						
			CL	15.5	33	14	SI CL, BRN, MST, SP FL
10	720		SC	22.6	30	13	SI CL - FT CL MIX, BRN-GY, V MST, SP FL
15	715		SC	18.9	30	13	SI CL, BRN, MST, ALL, ORIG SOIL
20	710		SC	20.0	30	13	SI CL, BRN, MST, ALL
25	705		SC	18.8	30	13	SI CL, BRN, V MST, ALL
			SM/SC	24.5	29	7	CL SI SD, BRN, W, ALL
30	700		CH	34.9	54	35	FT CL, GY, V MST, MIC, ALL
				17.6			WEATHERED SHALE
35	695						DISCONTINUED. EL 696.5
1''=5'			*Lab. Classif.				

Figure 2.5-379 Soil Profile

**WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT**

**SOIL PROFILE
FIGURE 2.5-380
SHEET 1 OF 1**

Added by Amendment 50

PROJECT: WATTS BAR N.P. FEATURE: ERCW TRENCH A
BORING: PAH-4 STATION: 4+00 RANGE: SURFACE EL: 720.5
DATE DRILLED: 5/27/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	720						SOD - TOPSOIL
			SC	10.4	25	8	GV CL SD, GY-R, MST, SP FL
5	715		SC	11.2	25	8	GV CL SD, GY-R, MST, SP FL
10	710		CL	17.7	27	11	SI SD, GY, V MST, ALL
15	705		CL	20.1	27	11	SI SD CL, BRN, W, ALL
			CL	20.5	27	11	SD CL, TR GV, BRN, V MST, ALL
20	700		SP-SM	28.3	NP	NP	SI SD, BRN, W, ALL
25	695						REFUSAL - SHALE. EL 698.5
30	690						
35							
1''=5'			*Lab. Classif.				

Figure 2.5-380 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-381
SHEET 1 OF 1

Added by Amendment 50

PROJECT: WATTS BAR N.P. FEATURE: ERCW TRENCH A
BORING: PAH-5 STATION: 2+50 RANGE: SURFACE EL: 712.3
DATE DRILLED: 5/31/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
	710		CL	21.1	36	16	SI CL, BRN, MST, ALL
5							
	705		CL	23.0	36	16	SI CL, BRN, MST, ALL
10							
	700		CL	22.7	36	16	SI CL, BRN, MST, ALL
			CL	22.9	36	16	SI CL, TR RD GV, BRN, MST, ALL
15							
	695		CL	20.0	36	16	SI CL, TR RD GV, BRN, V MST, ALL
20							
	690		CL	20.8	27	11	SI CL, DK BRN, V MST, ALL
			CL	26.2	27	11	CL SI, DK BRN, W, ALL
25				17.9			
	685						WEATHERED SHALE
							DISCONTINUED. EL 685.8
30							
	680						
35							
1''=5'			*Lab. Classif.				

Figure 2.5-381 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-382
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: ERCW TRENCH A
BORING: PAH-6 STATION: 1+00 RANGE: SURFACE EL: 707.1
DATE DRILLED: 5/31/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0	705		CL	17.7	33	14	GV CL, BRN, MST, SP FL
5	700		SM SC	22.4	29	7	SD CL, TN, MST, ALL (ORIG SOIL)
10	695		SM SC	23.7	29	7	SD CL, TN V MST, ALL
15	690		SM SC	35.8	27	5	CL SD, TR RD FN GV, TN, W, ALL
				17.8			WEATHERED SHALE
20	685						DISCONTINUED. EL 688.1
25	680						
30	675						
35							

1''=5'

*Lab. Classif.

Added by Amendment 50

Figure 2.5-382 Soil Profile

**WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT**

**SOIL PROFILE
FIGURE 2.5-383
SHEET 1 OF 2**

PROJECT: WATTS BAR N.P. FEATURE: ERCW TRENCH B
BORING: PAH-1 STATION: 1+00 ℄ RANGE: SURFACE EL: /12.0
DATE DRILLED: 5/31/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0	710		CL	18.4	26	8	SD SI CL, BRN, MST, FL
5			CL	14.7	35	13	SI CL, BRN, MST, TR GV, FL
	705		CL	17.2	35	13	SD CL, BRN, MST, ALL (ORIG SOIL)
10							
	700		CL	20.6	26	8	SD CL, BRN, MST, ALL
15							
	695		CL	25.0	26	8	SI CL, BRN, MST, ALL
20							
	690		SM	25.1	27	3	ALT STRATA - SI SD & CL SI, TN-BRN, V MST, ALL
25							
	685		SM	30.2	NP	NP	ALT STRATA - SI SD & CL SI, TN-BRN, W, ALL
30			SM	26.7	NP	NP	SI SD, GY-TN, V MST, ALL
	680						
35			SM	21.0	NP	NP	SI SD, TN, V MST, ALL
1''=5'			*Lab. Classif.				Added by Amendment 50

**Figure 2.5-383 Soil Profile
(Sheet 1 of 2)**

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-383
SHEET 1 OF 2

PROJECT: WATTS BAR N.P. FEATURE: ERCW TRENCH B
BORING: PAH-1 STATION: 1+00 ℄ RANGE: SURFACE EL: /12.0
DATE DRILLED: 5/31/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0	710		CL	18.4	26	8	SD SI CL, BRN, MST, FL
5			CL	14.7	35	13	SI CL, BRN, MST, TR GV, FL
	705		CL	17.2	35	13	SD CL, BRN, MST, ALL (ORIG SOIL)
10							
	700		CL	20.6	26	8	SD CL, BRN, MST, ALL
15							
	695		CL	25.0	26	8	SI CL, BRN, MST, ALL
20							
	690		SM	25.1	27	3	ALT STRATA - SI SD & CL SI, TN-BRN, V MST, ALL
25							
	685		SM	30.2	NP	NP	ALT STRATA - SI SD & CL SI, TN-BRN, W, ALL
30							
	680		SM	26.7	NP	NP	SI SD, GY-TN, V MST, ALL
35			SM	21.0	NP	NP	SI SD, TN, V MST, ALL
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-383 Soil Profile
(Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-384
SHEET 1 OF 2

PROJECT: WATTS BAR N.P. FEATURE: ERCW TRENCH B
BORING: PAH-2 STATION: 2+25 RANGE: SURFACE EL: 713
DATE DRILLED: 6/1/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	710		CL	19.2	35	13	SI CL, TR GV, BRN, MST, FL
10	705		CL	21.3	35	13	SI CL, BRN, MST, ALL
15	700		CL	24	35	13	SI CL, BRN, MST, ALL
20	695		SM | SC	27.4	31	8	CL SD, BRN, W, ALL
25	690		SM	27.5	NP	NP	ALT STRATA - SI SD & CL SI, TN-BRN, V MST, ALL
30	685		SM	26.7	NP	NP	ALT STRATA - SI SD & CL SI, TN-BRN, V MST, ALL
35	680		SP | SM	17.3	NP	NP	GV SD, BRN-TN, W, ALL
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-384 Soil Profile
(Sheet 1 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-384
SHEET 2 OF 2

PROJECT: WATTS BAR N.P. FEATURE: ERCW TRENCH B
BORING: PAH-2 STATION: 2+25 RANGE: SURFACE EL: 713
DATE DRILLED: 6/1/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
40	675			12.8			WEATHERED SHALE
45	670						DISCONTINUED. EL 674.0
50	665						
55	660						
60	655						
65	650						
70	645						
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-384 Soil Profile
(Sheet 2 of 2)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE2.5-385
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: ERCW TRENCH B
BORING: PAH-3 STATION: 3+50 RANGE: SURFACE EL: 701.3
DATE DRILLED: 6/1/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0	700		SM SC	24.2	31	8	SD SI CL, BRN, MST, ALL
5	695		SM	37.0	28	4	SD SI, BRN, V MST, ALL
10	690		SM SC	26.4	31	8	SD SI, TN, V MST, ALL
15	685		SM	29.2	28	4	SI SD, R-TN, V MST, ALL
				20.3			WEATHERED SHALE
							DISCONTINUED. EL 684.8
20	680						
25	675						
30	670						
35							
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-385 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-386
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: ERCW TRENCH B
BORING: PAH-4 STATION: 4+75 RANGE: SURFACE EL: 700.4
DATE DRILLED: 6/2/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	700		CL	28.2	26	8	SD SI CL, GY, W, ALL
5	695		SM	18.0	NP	NP	SD SI, GY, W, ALL
10	690		ML	26.7 24.9	23	5	SD SI, GY, W, ALL WEATHERED SHALE
15	685						DISCONTINUED. EL 688.9
20	680						
25	675						
30	670						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-386 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-387
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: ERCW TRENCH B
BORING: PAH-5 STATION: 6+00 RANGE: SURFACE EL: 702.7
DATE DRILLED: 6/2/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0	700		CL	20.6	26	8	SD SI CL, TN-GY, MST, ALL
5	695		CL	30	26	8	SL SD SI, TN-GY, V MST, ALL
10			CL	22.9 15.3	30	13	LAM RESD CL, MST WEATHERED SHALE
	690						DISCONTINUED. EL 691.2
15							
	685						
20							
	680						
25							
	675						
30							
	670						
35							

1''=5' *Lab. Classif.

Added by Amendment 50

Figure 2.5-387 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-388
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: ERCW BORROW AREA 9
BORING: PAH-1 STATION: 1592.0E RANGE: 190.6S SURFACE EL: 738.8
DATE DRILLED: 06/02/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL - GV
5	735		CL	15.3	28	13	SI CL, TR GV, TN, MST, FL
10	730		ML	22.0	43	14	SI CL, R, MST, ALL
15	725		ML	24.0	41	14	SI CL, R-BRN, MST, ALL
							DISCONTINUED. EL 723.8
20	720						
25	715						
30	710						
35	705						

1"=5'

*Lab. Classif.

Added by Amendment 50

Figure 2.5-388 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-389
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: ERCW BORROW AREA 9
BORING: PAH-2 STATION: 1618.7E RANGE: 323.5S SURFACE EL: 740.4
DATE DRILLED: 6/2/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	740						TOPSOIL
			ML	18.8	43	14	SI CL, GY-TN, MOTT, MST, ALL
5	735		ML	24.6	41	14	SI CL, R, MST, ALL
10	730		ML	23.2	41	14	SD CL, R, MST, ALL
15	725						DISCONTINUED. EL 725.4
20	720						
25	715						
30	710						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-389 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-390
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: ERCW BORROW AREA 9
BORING: PAH-3 STATION: 1605.2E RANGE: 465.2S SURFACE EL: 742.1
DATE DRILLED: 6/2/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	740						TOPSOIL
5			ML	21.4	43	14	SD SI CL, R, MST, ALL
	735						
10			ML	24.4	41	14	SD SI CL, R, MST, ALL
	730						
			ML	18.4	41	14	SD CL, R-BRN, MST, ALL
15							
	725						DISCONTINUED. EL 727.1
20							
	720						
25							
	715						
30							
	710						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-390 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-391A
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: ERCW BORROW AREA 9
BORING: PAH-4 STATION: 1606.0E RANGE: 616.6S SURFACE EL: 743.3
DATE DRILLED: 6/2/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL - MIXED W/GRAVEL
	740						
5			ML	20.3	43	14	SD SI, R, MST, ALL
	735						
10			ML	23.2	41	14	SD SI CL, R, MST, ALL
	730		ML	21.0	41	14	SD SI CL, R, MST, ALL
15							
							DISCONTINUED. EL 728.3
	725						
20							
	720						
25							
	715						
30							
	710						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-391a Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-392
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: ERCW BORROW AREA 9
BORING: PAH-5 STATION: 1604.9E RANGE: 767.3S SURFACE EL: 737.8
DATE DRILLED: 6/2/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
	735		CL	18.5	33	17	SI CL, BRN, MST, ALL
5							
			CL	20.8	33	17	SI CL, BRN, MST, ALL
	730						
10			ML	22.9	43	14	SD CL SI, R, MST, ALL
	725						
15							DISCONTINUED. EL 723.8
	720						
20							
	715						
25							
	710						
30							
	705						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-392 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-393
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: ERCW BORROW AREA 9
BORING: PAH-6 STATION: 1576.3E RANGE: 902.2S SURFACE EL: 735.6
DATE DRILLED: 6/2/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	735						TOPSOIL
			CL	15.4	29	14	SI CL, TN-BRN, MST, FL
5	730		CL	20.4	33	17	(BURIED TOPSOIL) SI TO SI CL, TN-BRN, MST-V MST, ALL
10	725		ML	24.0	43	14	SI CL, BRN, MST, ALL
15	720						DISCONTINUED. EL 720.6
20	715						
25	710						
30	705						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-393 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-394
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: ERCW BORROW AREA 9
BORING: PAH-7 STATION: 1730.2E RANGE: 160.1S SURFACE EL: 735.7
DATE DRILLED: 6/3/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	735						TOPSOIL
			CL	16.3	29	14	SI CL, BRN, MST, ALL
5	730		CL	17.8	33	17	SI CL, GY, MST, ALL
10	725		CL	20.4	33	17	SI CL, GY, MST, ALL
			ML	14.6	41	14	SD SI, GY, MST, ALL
15	720						DISCONTINUED. EL 720.7
20	715						
25	710						
30	705						
35							

1''=5' *Lab. Classif.

Added by Amendment 50

Figure 2.5-394 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-395
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: ERCW BORROW AREA 9
BORING: PAH-8 STATION: 1785.7E RANGE: 290.0S SURFACE EL: 737.3
DATE DRILLED: 6/3/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	735		OL	20.3	28	13	TOPSOIL SI CL, TN, MST, ALL
5	730		CL	18.8	35	17	SI CL, BRN, MST, ALL
10	725		ML	20.5	41	14	SI CL, R, MST, ALL
15	720						DISCONTINUED. 723.3
20	715						
25	710						
30	705						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-395 Soil Profile

**WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT**

**SOIL PROFILE
FIGURE 2.5-396
SHEET 1 OF 1**

PROJECT: WATTS BAR N.P. FEATURE: ERCW BORROW AREA 9
BORING: PAH-9 STATION: 1802.0E RANGE: 439.7S SURFACE EL: 740.0
DATE DRILLED: 6/3/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL 740	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
			CL	13.6	28	13	SI CL, BRN, MST, ALL
5	735		CL	23.0	43	14	SI CL, R, MST, ALL
10	730		ML	20.9	41	14	SD SI CL, R, MST, ALL
15	725						DISCONTINUED. EL 726.0
20	720						
25	715						
30	710						
35	705						
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-396 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-397
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: ERCW BORROW AREA 9
BORING: PAH-10 STATION: 1787.1E RANGE: 584.7S SURFACE EL: 744.2
DATE DRILLED: 6/3/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
			CL	13.2	28	13	SI CL, TR GV, BRN, MST, FL
5	740						
			CL	17.7	29	14	SI CL, BRN, MST, ALL (ORIG SOIL)
10	735		ML	22.8	43	14	SI CL, R, MST, ALL
15	730						DISCONTINUED. EL 730.2
20	725						
25	720						
30	715						
35	710						
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-397 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-398
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: ERCW BORROW AREA 9
BORING: PAH-11 STATION: 1750.5E RANGE: 726.7S SURFACE EL: 740.9
DATE DRILLED: 6/3/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	740						TOPSOIL
			CL	16.8	29	14	SI CL, BRN, MST, ALL
5	735		CL	18.1	33	17	SI CL, BRN, MST, ALL
10	730		CL	19.8	35	17	SI CL, BRN, V MST, ALL
			ML	22.3	43	14	SD SI, BRN, V MST, ALL
15	725						DISCONTINUED. EL 725.9
20	720						
25	715						
30	710						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-398 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-399
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: ERCW BORROW AREA 9
BORING: PAH-12 STATION: 1708.3E RANGE: 866.6S SURFACE EL: 739.1
DATE DRILLED: 6/3/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	735		CL	13.7	28	13	SI CL, BRN, MST, ALL
			CL	25.1	35	17	SI CL, BRN, V MST, ALL
10	730		CL	22.4	35	17	SI CL, BRN, V MST, ALL
15	725						DISCONTINUED. EL 725.1
20	720						
25	715						
30	710						
35	705						
1"=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-399 Soil Profile

**WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT**

SOIL PROFILE
FIGURE 2.5-400
SHEET 1 OF 1

PROJECT: WATTS BAR N. P. FEATURE: BORROW AREA 10
BORING: PAH-1 STATION: 11+23.2E RANGE: 3+68.2N SURFACE EL: 733.8
DATE DRILLED: 6/6/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	730		CL ML	25.2	41	15	SI CL, R-BRN, MST, ALL
10	725		CL ML	24.0	41	15	SI CL, R-BRN, MST, ALL
15	720		CL ML	23.9	41	15	SI CL, R-BRN, MST, ALL
20	715						
25	710						
30	705						
35	700						
1''=5'		*Lab. Classif.					

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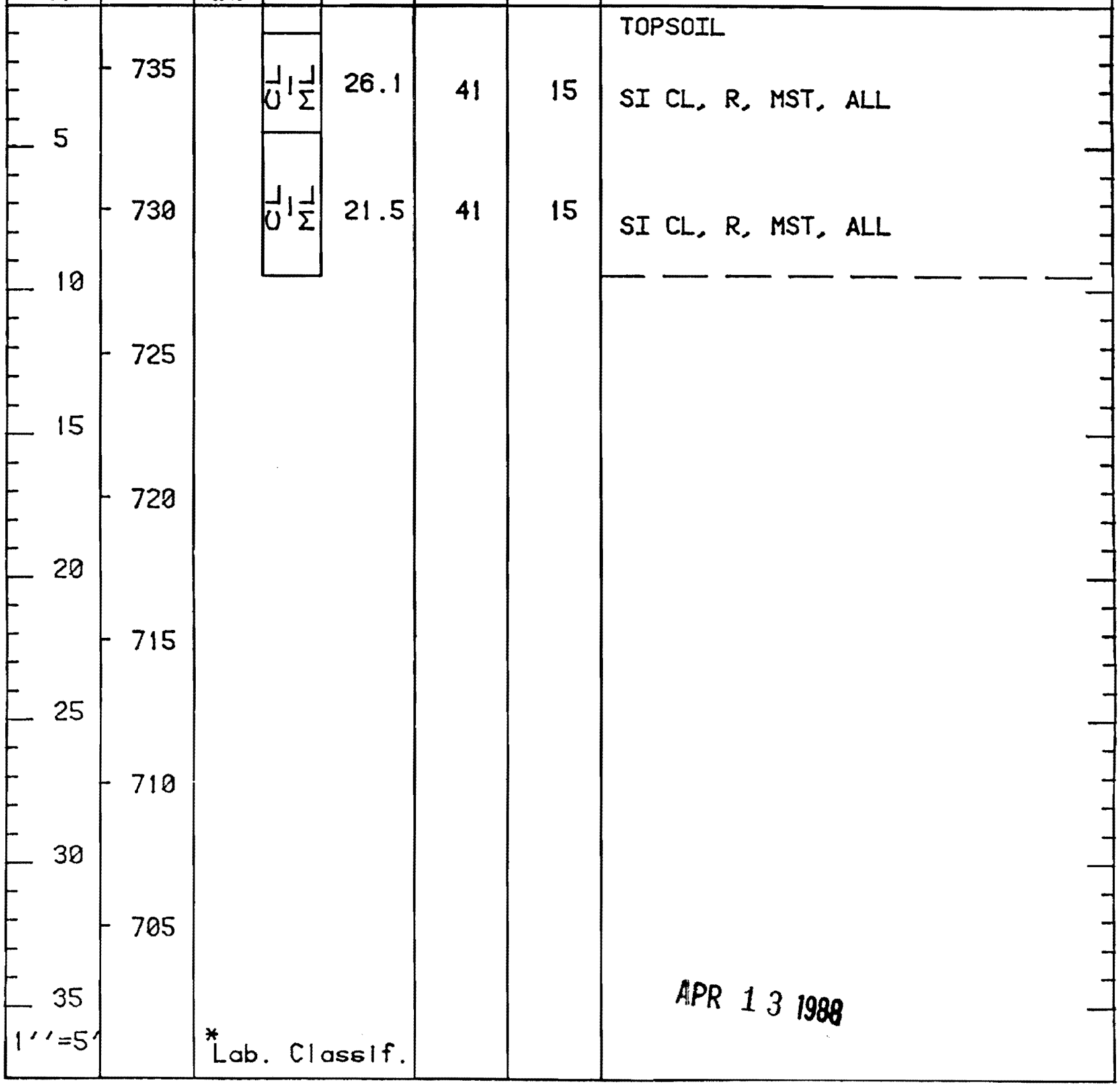
Revised by Amendment 62

Figure 2.5-400 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-401
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 10
BORING: CH-2 STATION: 9+72.1E RANGE: 4+08.5N SURFACE EL: 737.2
DATE DRILLED: 6/7/83 TO PREPARED BY: MHD CHECKED BY: BA



Revised by Amendment 62

Figure 2.5-401 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-402
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 10
BORING: CH-3 STATION: 9+84.6E RANGE: 4+91.1N SURFACE EL: 734.5
DATE DRILLED: 6/7/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0	734		CL/ML	22.7	41	15	SI CL, BRN, MST, ALL
5	730		CL/ML	27.6	45	19	FT CL, BRN, MST, ALL
10	725						
15	720						
20	715						
25	710						
30	705						
35	700						
1''=5'		* Lab. Classif.					

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Added by Amendment 62

Figure 2.5-402 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-403
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 11
BORING: PAH-1 STATION: 6+06.9W RANGE: 1+48.4S SURFACE EL: 736.1
DATE DRILLED: 6/6/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	735		ML	28.1	44	16	CL SI, R, MST, ALL
10	730		ML	30.4	45	16	CI SI, R, MST, ALL
15	725		ML	28.7	45	16	CL SI, BRN, V MST, ALL
20	720						
25	715						
30	710						
35	705						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-403 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-404
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 11
BORING: PAH-2 STATION: 7+60.1W RANGE: 1+89.0S SURFACE EL: 742.0
DATE DRILLED: 6/6/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	740						GRAVEL
5	735		ML	27.1	44	16	SI CL, R, MST, ALL
10	730		ML	33.7	45	16	CL SI, R-BRN, MST, ALL
15	725		ML	27.9	45	16	CL SI, R-BRN, MST, ALL
20	720						
25	715						
30	710						
35							
1''=5'		* Lab. Classif.					Added by Amendment 50

Figure 2.5-404 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-405
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 11
BORING: PAH-3 STATION: 6+93.1W RANGE: 1+15.2S SURFACE EL: 741.9
DATE DRILLED: 6/6/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0	740						GRAVEL
5	735		ML	23.4	44	16	SI CL, R-BRN, MST, ALL
10	730		ML	26.7	44	16	SI CL, R-BRN, MST, ALL
15	725		ML	23.2	44	16	SI CL, BRN, MST, ALL
20	720						
25	715						
30	710						
35							

1''=5'

*Lab. Classif.

Added by Amendment 50

Figure 2.5-405 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-406
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 11
BORING: PAH-4 STATION: 7+16.8W RANGE: 0+83.0S SURFACE EL: 741.1
DATE DRILLED: 6/6/83 TO PREPARED BY: MHD CHECKED BY: EA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	740						GRAVEL
5	735		SL	26.8	44	16	CL SI, R-BRN, MST, ALL
10	730		SL	27.8	44	16	CL SI, R-BRN, MST, ALL
15	725		SL	27.0	44	16	CL SI, R-BRN, MST, ALL
20	720						
25	715						
30	710						
35							

1''=5'

*Lab. Classif.

Added by Amendment 50

Figure 2.5-406 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-407
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 11
BORING: PAH-5 STATION: 8+39.7W RANGE: 1+40.2S SURFACE EL: 738.7
DATE DRILLED: 6/6/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							GRAVEL
5	735		ML	22.6	45	16	SI CL, R-BRN, MST, ALL
10	730		ML	26.8	49	15	SI CL, R-BRN, MST, ALL
15	725		ML	22.8	45	16	SD SI CL, BRN, MST, ALL
20	720						
25	715						
30	710						
35	705						
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-407 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-408
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 12
BORING: PAH-1 STATION: RANGE: SURFACE EL: 709.6
DATE DRILLED: 6/3/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	705		CL	25.7	40	17	SI CL, BRN, MST, ALL
10	700		CL	27.1	40	17	SI CL, BRN, MST, ALL
15	695		CL	26.6	40	17	SI CL, BRN, V MST, ALL
							DISCONTINUED.
20	690						
25	685						
30	680						
35	675						
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-408 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-409
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 12
BORING: PAH-2 STATION: RANGE: SURFACE EL: 708.3
DATE DRILLED: 6/3/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	705		ML	24.7	40	13	SI CL, R-BRN, MST, ALL
10	700		ML	27.4	40	13	SI CL, R-BRN, MST, ALL
15	695		ML	25.6	40	13	SI CL, R-BRN, V MST, ALL
							DISCONTINUED.
20	690						
25	685						
30	680						
35	675						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-409 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-410
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 12
BORING: PAH-3 STATION: RANGE: SURFACE EL: 711.5
DATE DRILLED: 6/6/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0	710		CL	25.1	40	17	FT CL, R, MST, ALL
5	705		ML	23.7	40	13	FT CL, R, MST, ALL
10	700		CL	25.7	40	17	SI CL, R-BRN, MST, ALL
15	695						DISCONTINUED.
20	690						
25	685						
30	680						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-410 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-411
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 12
BORING: PAH-4 STATION: RANGE: SURFACE EL: 707.7
DATE DRILLED: 6/6/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
	705		Σ	23.2	40	13	SI CL, R-BRN, MST, ALL
5							
	700		Σ	24.1	40	13	SI CL, R-BRN, MST, ALL
10							
	695		Σ	25.9	40	13	SI CL, BRN, V MST, ALL
15							
	690						DISCONTINUED.
20							
	685						
25							
	680						
30							
	675						
35							
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-411 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-412
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 12
BORING: PAH-5 STATION: RANGE: SURFACE EL: 709.7
DATE DRILLED: 6/6/83 TO PREPARED BY: MHD CHECKED BY: EA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	705		ML	26.7	40	13	FT CL, R, MST, ALL
10	700		ML	23.8	40	13	SI CL, R-BRN, MST, ALL
15	695		ML	25.2	40	13	SI CL, R-BRN, MST, ALL
							DISCONTINUED.
20	690						
25	685						
30	680						
35	675						
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-412 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-413
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 12
BORING: PAH-6 STATION: RANGE: SURFACE EL: 705.7
DATE DRILLED: 6/6/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	705						TOPSOIL
5	700		CL	26.2	40	17	FT CL, BRN, MST, ALL
10	695		CL	26.1	40	17	FT CL, BRN, MST, ALL
15	690		CL	23.7	40	17	SI CL, BRN, MST, ALL
20	685						DISCONTINUED.
25	680						
30	675						
35							
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-413 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-414
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 12
BORING: PAH-7 STATION: RANGE: SURFACE EL: 706.0
DATE DRILLED: 6/6/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0	705		CL	25.7	40	17	FT CL, R-BRN, MST, ALL
5	700		ML	25.8	40	13	SI CL, R-BRN, MST, ALL
10	695		ML	23.6	40	13	SI CL, BRN, MST, ALL
15	690						DISCONTINUED.
20	685						
25	680						
30	675						
35							

1''=5'

*Lab. Classif.

Added by Amendment 50

Figure 2.5-414 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-415
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-7 STATION: RANGE: SURFACE EL: 744.0 est.
DATE DRILLED: 6/8/83 TO PREPARED BY: MHD CHECKED BY: EA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	740		CL	22.5	42	18	FT CL, R, MST, ALL
			CL	24.9	42	18	SI CL, R, MST, ALL
10	735		CL	20.1	35	14	CL SI, TN, MST, RESD
15	730		CL	22.0	35	14	CL SI, TN, MST, RESD
20	725						DISCONTINUED.
25	720						
30	715						
35	710						
1''=5'		* Lab. Classif.					Added by Amendment 50

Figure 2.5-415 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-416
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 12
BORING: PAH-8 STATION: RANGE: SURFACE EL: 706.3
DATE DRILLED: 6/6/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	705		ML	23.7	40	13	TOPSOIL FT CL, R, MST, ALL
5	700		ML	23.3	40	13	SI CL, BRN, MST, ALL
10	695		CL	23.5	40	17	SI CL, BRN, MST, ALL
15	690						DISCONTINUED.
20	685						
25	680						
30	675						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-416 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-417
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 12
BORING: PAH-9 STATION: RANGE: SURFACE EL: 703.7
DATE DRILLED: 6/6/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	700		CL	22.3	40	17	SI CL, R-BRN, MST, ALL
10	695		ML	25.6	40	13	MD CL, R-BRN, MST, ALL
15	690		ML	24.6	40	13	SI CL, BRN, V MST, ALL
20	685						DISCONTINUED.
25	680						
30	675						
35	670						
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-417 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-418
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 12
BORING: PAH-10 STATION: RANGE: SURFACE EL: 706.0
DATE DRILLED: 6/6/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0	705		ML	25.7	40	13	FT CL, R-BRN, MST, ALL
5	700		SM SC	25.1	30	8	SI CL, R-BRN, MST, ALL
10	695		SM SC	20.2	29	6	SI CL, BRN, MST, ALL
15	690						DISCONTINUED.
20	685						
25	680						
30	675						
35							
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-418 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-419
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 12
BORING: PAH-11 STATION: RANGE: SURFACE EL: 710.4
DATE DRILLED: 6/6/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	710						
			CL	24.9	40	13	SI CL, R-BRN, MST, ALL
5	705		SM SU	21.6	29	6	SD SI CL, R-BRN, MST, ALL
10	700		SM SU	19.5	29	6	SI SD, R-BRN, MST, ALL
15	695						DISCONTINUED.
20	690						
25	685						
30	680						
35							Added by Amendment 50
1''=5'			*Lab. Classif.				

Figure 2.5-419 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-420
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 13
BORING: PAH-1 STATION: RANGE: SURFACE EL: 723.1
DATE DRILLED: 8/26/83 TO PREPARED BY: MHD CHECKED BY: WH

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0	720		CL/ML	21.3	35	11	TOPSOIL SI CL, BRN, MST, RESD
5			CL	23.0	43	20	SI CL, BRN, MST, RESD
10	715		CL	22.3	43	20	SI CL, BRN, MST, RESD
15	710		CL	20.4	43	20	SI CL, BRN, MST, RESD
20	705						DISCONTINUED.
25	700						
30	695						
35	690						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-420 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-421
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 13
BORING: PAH-2 STATION: RANGE: SURFACE EL: 728.6
DATE DRILLED: 8/26/83 TO PREPARED BY: MHD CHECKED BY: CEG

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL, SPOIL GRAVEL
5	725		CL	27.6	36	13	SI CL, PURP, MST, RESD
10	720		CL	23.9	36	13	SI CL, PURP, MST, RESD
15	715		CL	20.2	36	13	SI CL, PURP, MST, RESD
20	710						DISCONTINUED.
25	705						
30	700						
35	695						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-421 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-422
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 13
BORING: PAH-3 STATION: RANGE: SURFACE EL: 723.4
DATE DRILLED: 8/26/83 TO PREPARED BY: MHD CHECKED BY: CBG

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	720		CL/ML	14.9	35	11	SI CL, BRN, MST, RESD
10	715		CL	31.9	43	20	SI CL, BRN, SAT, RESD
15	710						DISCONTINUED (WET).
20	705						
25	700						
30	695						
35	690						
1''=5'			* Lab. Classif.				Added by Amendment 50

Figure 2.5-422 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-423
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 13
BORING: PAH-4 STATION: RANGE: SURFACE EL: 742.1
DATE DRILLED: 8/26/83 TO PREPARED BY: MHD CHECKED BY: [illegible]

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
	740		CL/SM	14.9	35	11	CL SI, BRN, MST, RESD
5							
	735		CL/SM	22.5	35	11	CL SI, BRN, MST, RESD
10							
	730		CL/SM	25.7	45	17	CL SI, BRN, MST, RESD
15							
	725		CL/SM	28.3	45	17	CL SI, BRN, MST, RESD
20							
	720						DISCONTINUED.
25							
	715						
30							
	710						
35							
1''=5'		* Lab. Classif.					Added by Amendment 50

Figure 2.5-423 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-424
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 13
BORING: PAH-5 STATION: RANGE: SURFACE EL: 723.5
DATE DRILLED: TO PREPARED BY: MHD CHECKED BY: CRG

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	720		ML	22.2	42	14	CL SI, BRN, MST, RESD
10	715		ML	23.1	42	14	CL SI, BRN, MST, RESD
15	710		ML	20.9	42	14	CL SI, BRN, MST, RESD
20	705		ML	22.1	42	14	CL SI, BRN, MST, RESD
							DISCONTINUED.
25	700						
30	695						
35	690						
1''=5'		* Lab. Classif.					Added by Amendment 50

Figure 2.5-424 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-425
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 13
BORING: PAH-6 STATION: RANGE: SURFACE EL: 730.5
DATE DRILLED: 8/26/83 TO PREPARED BY: MHD CHECKED BY: CBG

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	730						TOPSOIL
5	725		ML	22.3	42	14	CL SI, BRN, MST, RESD
10	720		ML	15.3	42	14	CL SI, BRN, MST, RESD
			CL	17.2	36	13	CL SI, PUR-BRN, MST, RESD
15	715		CL	13.7	36	13	CL SI, PUR-BRN, MST, RESD
20	710						DISCONTINUED.
25	705						
30	700						
35							
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-425 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-426
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 13
BORING: PAH-7 STATION: RANGE: SURFACE EL: 728.8
DATE DRILLED: 8/26/83 TO PREPARED BY: MHD CHECKED BY: CBE

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	725		CL ML	18.1	35	11	CL SI, BRN, MST, RESD
10	720		ML	19.9	42	14	CL SI, LT BRN, MST, RESD
15	715		CL	21.5	36	13	CL SI, PUR-BRN, MST, RESD
20	710		CL	18.0	36	13	CL SI, PUR-BRN, MST, RESD
25	705						DISCONTINUED.
30	700						
35	695						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-426 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-427
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 13
BORING: PAH-8 STATION: RANGE: SURFACE EL: 740.1
DATE DRILLED: 8/26/83 TO PREPARED BY: MHD CHECKED BY: CHG

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	~~740~~						TOPSOIL
			CL	22.6	36	13	CL SI, BRN, MST, RESD
5	735		CL	24.8	36	13	CL SI, BRN, MST, RESD
10	730		CL	24.2	36	13	CL SI, BRN, MST, RESD
15	725		CL-ML	21.5	45	17	CL SI, BRN, V MST, RESD
20	720						DISCONTINUED.
25	715						
30	710						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-427 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-428
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 13
BORING: PAH-9 STATION: RANGE: SURFACE EL: 714.2
DATE DRILLED: 8/26/83 TO PREPARED BY: MHD CHECKED BY: CBL

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	710		CL	18.9	43	20	CL SI, LT BRN, MST, RESD
			CL	20.9	43	20	CL SI, LT BRN, MST, RESD
10	705		CL/ML	17.7	37	12	CL SI, LT BRN, MST, RESD
15	700		CL/ML	18.0	37	12	CL SI, LT BRN, MST, RESD
20	695						DISCONTINUED.
25	690						
30	685						
35	680						
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-428 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-429
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 13
BORING: PAH-10 STATION: RANGE: SURFACE EL: 713.0
DATE DRILLED: 8/26/83 TO PREPARED BY: MHD CHECKED BY: CBC

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							SPOIL FILL
5	710		CL ML	21.0	37	12	CL SI, LT BRN, MST, RESD
10	705		CL ML	20.8	37	12	CL SI, LT BRN, MST, RESD
15	700		CL ML	16.3	37	12	CL SI, LT BRN, MST, RESD
20	695		CL ML	18.5	37	12	CL SI, LT BRN, MST, RESD
							DISCONTINUED.
25	690						
30	685						
35	680						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-429 Soil Profile

**WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT**

**SOIL PROFILE
FIGURE 2.5-430
SHEET 1 OF 1**

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 13
BORING: PAH-11 STATION: RANGE: SURFACE EL: 730.5
DATE DRILLED: 8/26/83 TO PREPARED BY: MHD CHECKED BY: CEG

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	730						TOPSOIL
5	725		CL ML	21.0	35	11	CL SI, BRN, MST, RESD
10	720		CL ML	18.4	35	11	CL SI, TR GV, BRN, MST, RESD
15	715		CL ML	17.4	35	11	CL SI, BRN, MST, RESD
20	710						DISCONTINUED
25	705						
30	700						
35							
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-430 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-431
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 13
BORING: PAH-12 STATION: RANGE: SURFACE EL: 745.8
DATE DRILLED: 8/26/83 TO PREPARED BY: MHD CHECKED BY: CLG

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0	745		CL/SC	18.2	35	11	TOPSOIL CL SI, BRN, MST, RESD
5	740		SC	25.6	52	17	CL SI, BRN, MST, RESD
10	735		SC	27.4	52	17	CL SI, TR BENT, BRN, MST, RESD
15	730		SC	29.7	52	17	CL SI, BRN, MST, RESD
20	725						
25	720						
30	715						
35							

1''=5'

* Lab. Classif.

Added by Amendment 50

Figure 2.5-431 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-432
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 13
BORING: PAH-13 STATION: RANGE: SURFACE EL: 701.0
DATE DRILLED: 8/26/83 TO PREPARED BY: MHD CHECKED BY: CEE

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	700						TOPSOIL, SPOIL
			CL	23.1	44	16	CL SI, BRN, MST, RESD
5	695		CL	19.1	44	16	CL SI, BRN, MST, RESD
10			ML	16.4	44	16	SI CL, IR BENI, BRN, MST, RESD
	690						DISCONTINUED.
15	685						
20	680						
25	675						
30	670						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-432 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-433
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 13
BORING: PAH-14 STATION: RANGE: SURFACE EL: 698.9
DATE DRILLED: 8/26/83 TO PREPARED BY: MHD CHECKED BY: CEE

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	695		CL ML	16.6	35	11	CL SI, BRN, MST, RESD
10	690		CL	21.3	40	18	SI CL, TR BENT, BRN, MST, RESD
			CL	22.1	40	18	SI CL, TR BENT, BRN, MST, RESD
15	685		CL	20.4	40	18	SI CL, TR BENT, BRN, MST, RESD
20	680						DISCONTINUED.
25	675						
30	670						
35	665						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-433 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-434
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 13
BORING: PAH-15 STATION: RANGE: SURFACE EL: 733.1
DATE DRILLED: 8/26/83 TO PREPARED BY: MHD CHECKED BY: RLG

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							CUT SURFACE, TOPSOIL
5	730		ML	26.4	44	16	SI CL, TR BENT, BRN, MST, RESD
10	725		CL	28.6	40	18	SI CL, TR BENT, BRN, MST, RESD
15	720		CL/ML	18.6	35	11	CL SI, BRN, MST, RESD
20	715		CL/ML	20.0	35	11	CL SI, BRN, MST, RESD
25	710						DISCONTINUED.
30	705						
35	700						

1"=5'

*Lab. Classif.

Added by Amendment 50

Figure 2.5-434 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-435
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 13
BORING: PAH-16 STATION: RANGE: SURFACE EL: 745.3
DATE DRILLED: 8/26/83 TO PREPARED BY: MHD CHECKED BY: CBG

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	745						TOPSOIL
			CL ML	17.3	35	11	CL SI, BRN, MST, RESD
5	740						
			CL ML	24.1	35	11	CL SI, BRN, MST, RESD
10	735						
			ML	27.1	44	16	CL SI, BRN, MST, RESD
15	730						
			ML	28.6	44	16	CL SI, BRN, MST, RESD
20	725						
							DISCONTINUED.
25	720						
30	715						
35							
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-435 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-436
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 13
BORING: PAH-17 STATION: RANGE: SURFACE EL: 693.0
DATE DRILLED: 8/26/83 TO PREPARED BY: MHD CHECKED BY: CBC

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	690		ML	23.5	44	16	SI CL, BRN, MST, RESD
10	685		ML	25.7	44	16	SI CL, BRN-GY, MST, RESD
			CL	18.6	40	18	SI CL, BRN-GY, MST, RESD
15	680						DISCONTINUED (GV).
20	675						
25	670						
30	665						
35	660						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-436 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-437
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 13
BORING: PAH-18 STATION: RANGE: SURFACE EL: 697.9
DATE DRILLED: 8/26/83 TO PREPARED BY: MHD CHECKED BY: CBE

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	695		ΣΣ	19.7	44	16	CL SI, BRN, MST, RESD
10	690		ΣΣ	26.7	44	16	CL SI, TN, MST, RESD
15	685		ΣΣ	22.3	44	16	CL SI, TN, MST, RESD
20	680		ΣΣ	20.3	44	16	CL SI, TN, MST, RESD
25	675						DISCONTINUED.
30	670						
35	665						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-437 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-438
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: FAH-1 STATION: RANGE: SURFACE EL: 714.2
DATE DRILLED: 6/7/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	710		CL	18.2	29	12	SI CL, TN-BRN, MST, ALL
			SM SC	20.5	26	7	CL SD, ±20% FN RD GV, TN, V MST, ALL
10	705						SD GV, ±40% FN RD GV, ALL
			CL	19.5	29	12	FT SI, GRN-GY, MST, RESD
15	700						WTH GY SHL
							DISCONTINUED.
20	695						
25	690						
30	685						
35	680						
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-438 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-439
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-2 STATION: RANGE: SURFACE EL: 722.1
DATE DRILLED: 6/7/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	720						TOPSOIL
5			CL/ML	27.5	38	13	SI CL, R, MST, ALL
	715		CL/ML	29.6	38	13	SI CL, R-BRN, MST, ALL-
10							
	710		SC	27.2	34	14	SI CL, R-TN, V MST, ALL
15			SC	27.9	34	14	CL SI SD, BRN, V MST, ALL
	705						W SI SD
20							DISCONTINUED.
	700						
25							
	695						
30							
	690						
35							
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-439 Soil Profile

**WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT**

**SOIL PROFILE
FIGURE 2.5-440
SHEET 1 OF 1**

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-3 STATION: RANGE: SURFACE EL: 717.2
DATE DRILLED: 6/7/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0	715		CL/SC	20.6	38	13	SI CL, TN, MST, ALL
5			SC	24.3	34	14	SI CL, TN, MST, ALL
10	710		SC	26.1	34	14	SD SI CL, TN, V MST, ALL
15	705						W SD SI CL
20	700						DISCONTINUED.
25	695						
30	690						
35	685						

1''=5'

*Lab. Classif.

Added by Amendment 50

Figure 2.5-440 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-441
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-4 STATION: RANGE: SURFACE EL: 718
DATE DRILLED: 6/7/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	715		CL	21.1	29	12	SI CL, TN-BRN, V MST, ALL
10	710						DISCONTINUED.
15	705						
20	700						
25	695						
30	690						
35	685						
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-441 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-442
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-5 STATION: RANGE: SURFACE EL: 723.1
DATE DRILLED: 6/8/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	720		CL ML	19.6	42	16	CL SI, TN, MST, ALL
10	715		CL	24.8	42	18	CL SI, TN, MST, ALL
15	710						W CL SI
20	705						DISCONTINUED.
25	700						
30	695						
35	690						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-442 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-443
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-6 STATION: RANGE: SURFACE EL: 735.6
DATE DRILLED: 6/8/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	735						TOPSOIL
			CL ML	28.4	42	16	FT CL, R, MST, ALL
5	730		CL	23.3	35	14	SI CL, TN, MST, ALL
10	725		CL	22.7	35	14	SI CL, TN, MST, ALL
15	720		CL	22.9	31	11	CL SI, TN, V MST, ALL
20	715						DISCONTINUED.
25	710						
30	705						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-443 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-444
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-8 STATION: RANGE: SURFACE EL: 749.1
DATE DRILLED: 6/8/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	745		CL	20.8	33	13	SI CL, BRN, MST, ALL
10	740		CL/ML	23.7	42	16	SI CL, R, MST, ALL
15	735		CL/ML	25.6	42	16	FT CL, R, MST, RESD
20	730		CL	20.8	39	16	FT SI, DK R, MST, RESD (SL AUGG)
25	725						DISCONTINUED.
30	720						
35	715						
1''=5'		* Lab. Classif.					Added by Amendment 50

Figure 2.5-444 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-445
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-10 STATION: RANGE: SURFACE EL: 713.4
DATE DRILLED: 6/7/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	710		CL	17.4	29	12	CL SI, TN, MST, RESD
10	705		CL	14.3	29	12	CL SI, GRN-TN, MST, RESD
							DISCONTINUED.
15	700						
20	695						
25	690						
30	685						
35	680						

1''=5' *Lab. Classif.

Added by Amendment 50

Figure 2.5-445 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-446
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-11 STATION: RANGE: SURFACE EL: 723.4
DATE DRILLED: 6/7/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0	720						
5			CL/SM	25.3	38	13	SI CL, R-BRN, MST, ALL
10	715		CL/SM	24.3	38	13	CL SI SD, BRN, MST, ALL
15	710						SI CL SD, W
20	705						DISCONTINUED.
25	700						
30	695						
35	690						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-446 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-447
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-12 STATION: RANGE: SURFACE EL: 724.3
DATE DRILLED: 6/7/83 TO PREPARED BY: MHD CHECKED BY: BM

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	720		CL ML	26.2	38	13	SI CL, R-BRN, MST, ALL
10	715		CL ML	26.4	38	13	CL SI SD, R-BRN, V MST, ALL
15	710						W CL SI SD
							DISCONTINUED.
20	705						
25	700						
30	695						
35	690						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-447 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-448
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-13 STATION: RANGE: SURFACE EL: 718.7
DATE DRILLED: 6/8/83 TO PREPARED BY: MHD CHECKED BY: BH

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	715		CL	19.3	34	14	SI CL, BRN, V MST, ALL
							SI CL, W
10	710						DISCONTINUED.
15	705						
20	700						
25	695						
30	690						
35	685						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-448 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-449
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-14 STATION: RANGE: SURFACE EL: 730.0
DATE DRILLED: 6/8/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	~~730~~						SPOIL FILL & BURIED TOPSOIL
5	725						
			CL	20.3	39	18	SI CL, TN-BRN, MST, ALL
10	720						
			CL	26.5	39	18	FT CL, R-BRN, MST, ALL
15	715						
			CL MI	25.9	42	16	SI CL, R-BRN, MST, ALL
20	710						
							DISCONTINUED.
25	705						
30	700						
35	695						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-449 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-450
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-15 STATION: RANGE: SURFACE EL: 739.7
DATE DRILLED: 6/7/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	735		CL/ML	25.0	42	16	FT CL, R, MST, RESD
10	730		CL	23.6	39	18	FT CL, R, MST, RESD
15	725		CL	23.0	42	18	FT SI, TN, MST, RESD
20	720		CL	22.8	39	18	FT SI, TN, MST, RESD
							DISCONTINUED.
25	715						
30	710						
35	705						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-450 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-451
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-16 STATION: RANGE: SURFACE EL: 749.8
DATE DRILLED: 6/7/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	745		CH MH	30.5	64	31	FT SI, DK R, MST, RESD
10	740		CL	27.1	39	16	FT SI, DK R, MST, RESD
15	735		CL	27.6	39	16	FT SI, DK R, MST, RESD
20	730		CL	25.0	39	16	FT SI, DK R, MST, RESD
							DISCONTINUED.
25	725						
30	720						
35	715						
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-451 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-452
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-17 STATION: RANGE: SURFACE EL: 713.7
DATE DRILLED: 6/7/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL - V MST
5	710		SM	17.1	NP	NP	SD SI, LT TN, V MST, ALL
							DISCONTINUED.
10	705						
15	700						
20	695						
25	690						
30	685						
35	680						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-452 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-453
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-18 STATION: RANGE: SURFACE EL: 722.9
DATE DRILLED: 6/7/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	720		CL ML	25.7	38	13	SD SI CL, R-BRN, MST, ALL
10	715		CL ML	26.8	38	13	CL SD SI, R-BRN, V MST, ALL
15	710						DISCONTINUED.
20	705						
25	700						
30	695						
35	690						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-453 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-454
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-19 STATION: RANGE: SURFACE EL: 721.8
DATE DRILLED: 6/7/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0	720		CL	21.8	34	14	SI CL, R-TN, MST, ALL
5							
	715		CL	25.6	34	14	SI CL, R-TN, V MST, ALL
10							
	710						W CL SD
15							DISCONTINUED.
	705						
20							
	700						
25							
	695						
30							
	690						
35							
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-454 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-455
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-20 STATION: RANGE: SURFACE EL: 722.5
DATE DRILLED: 6/8/83 TO PREPARED BY: MHD CHECKED BY: BJ

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0	720						
5	715		CL	18.6	34	14	CL SI, BRN, MST, ALL
10	710		CL	23.2	34	14	SI CL, BRN, V MST, ALL
15	705						DISCONTINUED.
20	700						
25	695						
30	690						
35							

1''=5'

*Lab. Classif.

Added by Amendment 50

Figure 2.5-455 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-456
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-21 STATION: RANGE: SURFACE EL: 733.2
DATE DRILLED: 6/8/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	730		CL	23.3	39	18	SI CL, R-BRN, MST, ALL
10	725		CL	28.5	33	13	CL SI, DK R, MST, RESD
15	720		CL/ML	26.2	42	16	SI CL, TN-BRN, MST, RESD
20	715						DISCONTINUED.
25	710						
30	705						
35	700						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-456 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-457
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-22 STATION: RANGE: SURFACE EL: 747.8
DATE DRILLED: 6/7/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	745		IU I IΣ	32.6	64	31	FT SI, DK R, MST, RESD
10	740		CL	31.2	39	16	FT SI, DK R, MST, RESD
15	735		CL	26.9	39	16	FT SI, DK R, MST, RESD
20	730		CL	24.3	39	16	FT SI, DK R, MST, RESD
25	725						DISCONTINUED.
30	720						
35	715						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-457 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-458
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-23 STATION: RANGE: SURFACE EL: 759.9
DATE DRILLED: 6/7/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	755		CL/SL	22.8	42	16	SI CL, R, MST, ALL
10	750		CL/SL	27.5	42	16	FT CL, R, MST, ALL
15	745		CL/SL	29.4	42	16	FT CL, R, MST, ALL
20	740		CL	23.2	39	16	FT SI, DK R, MST, RESD
25	735						DISCONTINUED.
30	730						
35	725						
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-458 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-459
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-24 STATION: RANGE: SURFACE EL: 757.3
DATE DRILLED: 6/7/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	755		CL	24.3	42	18	FT SI, R-BRN, MST, ALL
10	750		CL	28.4	42	18	FT SI, R-BRN, MST, ALL
15	745		CL	29.2	35	14	SI CL, R, V MST, ALL
20	740		CL	28.7	39	18	CL SI, GY-TN, MST, RESD
25	735						DISCONTINUED.
30	730						
35	725						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-459 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-460
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-25 STATION: RANGE: SURFACE EL: 714.2
DATE DRILLED: 6/9/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0							TOPSOIL
5	710		SM	26.2	18	1	SD SI, GY, W, ALL
							DISCONTINUED.
10	705						
15	700						
20	695						
25	690						
30	685						
35	680						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-460 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-461
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-26 STATION: RANGE: SURFACE EL: 716.0
DATE DRILLED: 6/9/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0	715						TOPSOIL
			CL	18.8	29	12	SI SD CL, BRN, V MST, ALL
5	710						W GY-IN SI SD
							DISCONTINUED.
10	705						
15	700						
20	695						
25	690						
30	685						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-461 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-462
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-27 STATION: RANGE: SURFACE EL: 720.7
DATE DRILLED: 6/9/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	720						TOPSOIL
			CL	19.9	29	12	SI CL, BRN, V MST, ALL
5	715		CL/ML	23.2	38	13	SI CL, BRN, V MST, ALL-
10	710						W SD CL
15	705						DISCONTINUED.
20	700						
25	695						
30	690						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-462 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-463
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-28 STATION: RANGE: SURFACE EL: 727.0
DATE DRILLED: 6/8/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	725		CL	20.5	39	18	SI CL, TN-BRN, MST, ALL
10	720		CL	20.9	35	14	SI CL, TN-BRN, MST, ALL
15	715		CL	25.0	35	14	CL SI, TN, V MST, ALL
20	710						W CL SI DISCONTINUED.
25	705						
30	700						
35	695						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-463 Soil Profile

**WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT**

**SOIL PROFILE
FIGURE 2.5-464
SHEET 1 OF 1**

SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-29 STATION: RANGE: SURFACE EL: 733.1
DATE DRILLED: 6/8/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0	730		CL	21.4	42	18	SI CL, TN, MST, ALL
5			CL	28.3	39	18	FT CL, TN, MST, RESD
10	725		CL	30.0	42	18	FT SI, TN, MST, RESD
15	720		CL	25.9	42	18	FT SI, TN, MST, RESD
20	715						DISCONTINUED.
25	710						
30	705						
35	700						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-464 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-465
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-30 STATION: RANGE: SURFACE EL: 740.5
DATE DRILLED: 6/8/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	740						TOPSOIL
5	735		CL	20.9	39	18	SI CL, TN, MST, ALL
10	730		CL	19.1	39	18	CL SI, TN, MST, RESD
15	725		CL	22.6	35	14	SI CL, TN, MST, RESD
20	720		CL	21.5	42	18	SI CL, TN, MST, RESD
							DISCONTINUED.
25	715						
30	710						
35							
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-465 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-466
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-31 STATION: RANGE: SURFACE EL: 743.0 est.
DATE DRILLED: 6/8/83 TO PREPARED BY: MHD CHECKED BY: BP

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	740		CL/ML	22.2	42	16	SI CL, R, MST, ALL
10	735		CL/ML	21.7	42	16	SI CL, R, MST, ALL
15	730		CL	21.2	39	18	SI CL, BRN, MST, RESD
20	725		CL	20.1	43	20	SI CL, BRN, MST, RESD
25	720						DISCONTINUED.
30	715						
35	710						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-466 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-467
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-32 STATION: RANGE: SURFACE EL: 713.7
DATE DRILLED: 6/9/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	710		CL	20.6	29	12	CL SI, TN, V MST, ALL
10	705						W CL SI
15	700						DISCONTINUED.
20	695						
25	690						
30	685						
35	680						
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-467 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-468
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-33 STATION: RANGE: SURFACE EL: 721.1
DATE DRILLED: 6/9/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	720						TOPSOIL
5	715		CL/ML	23.5	38	13	SI CL, R-BRN, MST, ALL
			CL/ML	26.1	38	13	SD SI CL, R, MST, ALL
10	710		CL	27.6	34	14	SD CL SI, TN, V MST, ALL
15	705						W SD SI DISCONTINUED.
20	700						
25	695						
30	690						
35							

1''=5'

*Lab. Classif.

Added by Amendment 50

Figure 2.5-468 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-469
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-34 STATION: RANGE: SURFACE EL: 722.7
DATE DRILLED: 6/9/83 TO PREPARED BY: MHD CHECKED BY: BA

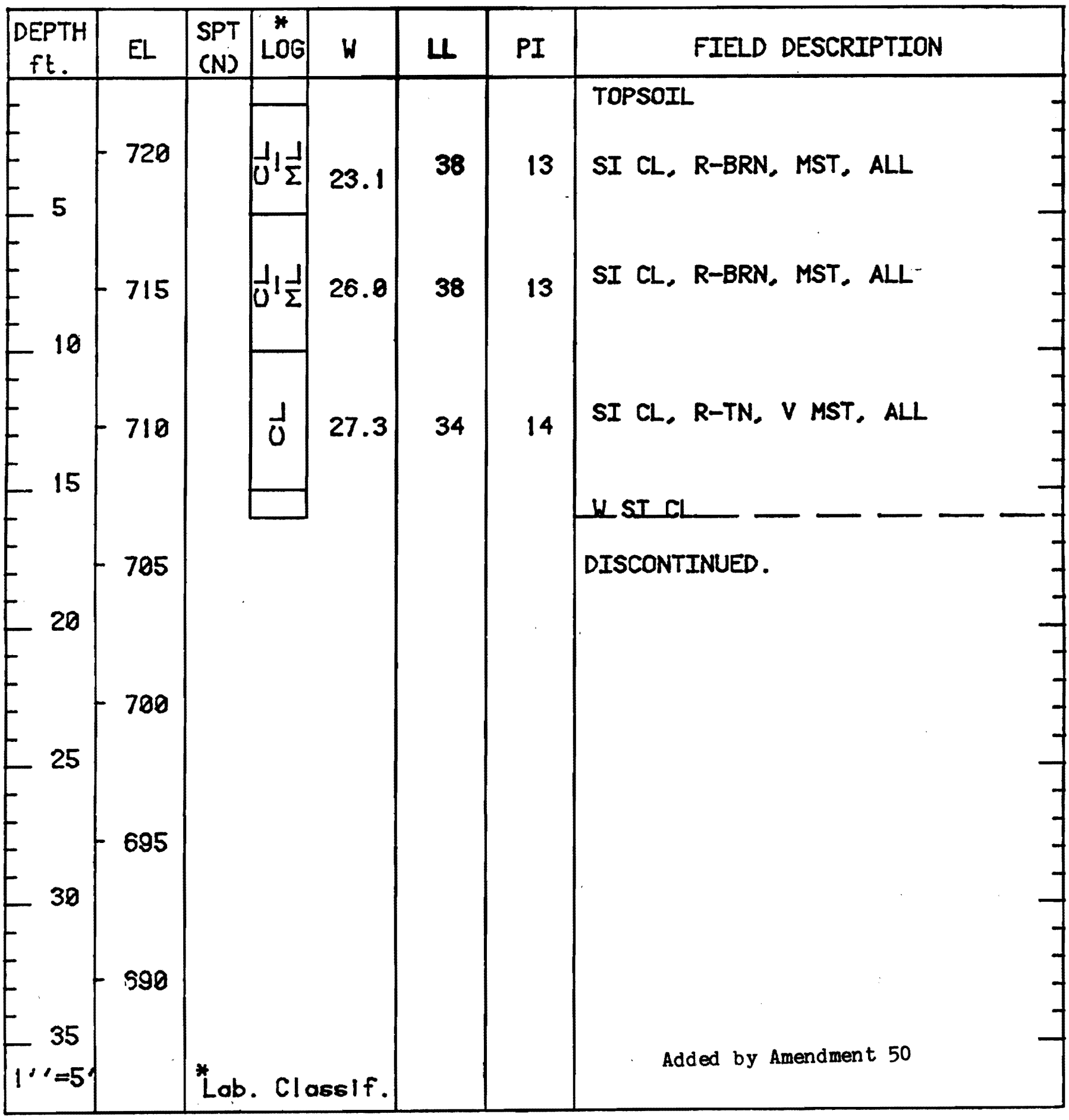


Figure 2.5-469 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-470
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-35 STATION: RANGE: SURFACE EL: 724.6
DATE DRILLED: 6/8/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	720		CL/ML	19.9	38	13	SI CL, BRN, MST, ALL
10	715		CL/ML	26.1	38	13	SI CL, BRN-TN, MST, ALL
			CL	26.3	34	14	SI CL, TN, V MST, ALL
15	710						W CL SD
							DISCONTINUED.
20	705						
25	700						
30	695						
35	690						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-470 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-471
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-36 STATION: RANGE: SURFACE EL: 728.2
DATE DRILLED: 6/8/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	725		CL	20.2	35	14	SI CL, TN-BRN, MST, ALL
10	720		CL	22.0	42	18	CL SI, R-BRN, MST, RESD
15	715		CL	21.5	42	18	CL SI, R-BRN, MST, RESD
20	710		CL	21.7	35	14	CL SD SI, TN, MST, RESD
25	705						DISCONTINUED.
30	700						
35	695						
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-471 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-472
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-37 STATION: RANGE: SURFACE EL: 733.3
DATE DRILLED: 6/9/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	730		CL	21.0	35	14	SI CL, TN, MST, ALL
10	725		CL	23.0	42	18	SI CL, TN, MST, ALL
15	720		CL	23.7	39	18	CL SI, TN, MST, RESD
20	715						DISCONTINUED.
25	710						
30	705						
35	700						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-472 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-473
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-38 STATION: RANGE: SURFACE EL: 738.4
DATE DRILLED: 6/8/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							GV DBR & TOPSOIL
5	735		CL-ML	22.1	42	16	SI CL, TN, MST, ALL
10	730		CL	21.9	42	18	CL SI, TN, MST, RESD
15	725		CL	23.8	42	18	CL SI, TN, MST, RESD
20	720						DISCONTINUED.
25	715						
30	710						
35	705						

1''=5'

*Lab. Classif.

Added by Amendment 50

Figure 2.5-473 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-474
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-39 STATION: RANGE: SURFACE EL: 716.5
DATE DRILLED: 6/9/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	715						TOPSOIL
5			CL/ML	20.7	38	13	SD SI CL, R-BRN, V MST, ALL
	710						
10			CL/ML	19.2	38	13	SD SI CL, TR GV, R-BRN, V MST, ALL
	705						
15							W CL SD
	700						DISCONTINUED.
20							
	695						
25							
	690						
30							
	685						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-474 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-475
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-40 STATION: RANGE: SURFACE EL: 721.1
DATE DRILLED: 6/9/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	720		CL ML	24.6	38	13	TOPSOIL SI CL, R-BRN, MST, ALL
5	715		CL ML	24.8	38	13	SI CL, R-BRN, MST, ALL
10	710						W SI CL DISCONTINUED.
15	705						
20	700						
25	695						
30	690						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-475 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-476
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-41 STATION: RANGE: SURFACE EL: 720.6
DATE DRILLED: 6/9/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	720						TOPSOIL
			CL ML	25.4	38	13	SI CL, R-BRN, MST, ALL
5	715		CL ML	27.4	38	13	SI CL, R-BRN, V MST, ALL
10	710						W SI CL
							DISCONTINUED.
15	705						
20	700						
25	695						
30	690						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-476 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-477
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-42 STATION: RANGE: SURFACE EL: 723.0
DATE DRILLED: 6/9/83 TO PREPARED BY: MHD CHECKED BY: EA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	720		CL/SL	22.3	42	16	SI CL, BRN, MST, ALL
10	715		CL	19.7	42	18	CL SI, R-TN, MST, ALL
15	710		CL	24.7	42	18	CL SI, TN, V MST, ALL
20	705						W CL SI
25	700						DISCONTINUED.
30	695						
35	690						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-477 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-478
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-43 STATION: RANGE: SURFACE EL: 730.6
DATE DRILLED: 6/9/83 TO PREPARED BY: MHD CHECKED BY: RA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	730						
5	725		CL ML	21.8	42	16	SI CL, R-BRN, MST, ALL
10	720		CL ML	21.4	42	16	CL SI, TN-BRN, MST, RESD
15	715		CL	20.0	33	13	CL SI, DK R, MST, RESD
20	710						DISCONTINUED.
25	705						
30	700						
35							

1''=5' *Lab. Classif.

Added by Amendment 50

Figure 2.5-478 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-479
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-44 STATION: RANGE: SURFACE EL: 736.1
DATE DRILLED: 6/8/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	735						ROADBED GRAVEL
			CL	18.3	39	18	SI CL, TN-BRN, MST, ALL
5							
	730		CL ML	26.5	42	16	SI CL, R, MST, ALL
10							
	725		CL	23.6	42	18	CL SI, TN, MST, ALL
15							
	720		CL ML	22.8	42	16	CL SI, TN, MST, ALL
20							SD & GV
	715						DISCONTINUED.
25							
	710						
30							
	705						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-479 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-480
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-45 STATION: RANGE: SURFACE EL: 736.4
DATE DRILLED: 6/8/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	735						GRAVEL - SPOILED SOILS
5	730		CL	23.4	42	18	SI CL, R, MST, ALL
10			CL	21.4	42	18	CL SI, R, MST, ALL
	725		CL	24.1	42	18	CL SI, TN, MST, RESD
15	720		CL	22.7	42	18	CL SI, TN, MST, RESD
20	715						DISCONTINUED.
25	710						
30	705						
35							
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-480 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-481
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-46 STATION: RANGE: SURFACE EL: 729.0 est
DATE DRILLED: 6/9/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	725		CL	22.5	33	13	SI CL, BRN, MST, ALL
10	720		CL	23.2	42	18	CL SI, R-BRN, MST, ALL
15	715		CL	25.0	42	18	CL SI, R-BRN, MST, ALL
20	710		CL	24.0	42	18	CL SI, R-BRN, MST, ALL
							DISCONTINUED.
25	705						
30	700						
35	695						
1''=5'			* Lab. Classif.				Added by Amendment 50

Figure 2.5-481 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-482
SHEET 1 OF 1

SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-47 STATION: RANGE: SURFACE EL: 721.0 est.
DATE DRILLED: 6/10/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	720						TOPSOIL
			CL/ML	21.2	38	13	SI CL, R-BRN, MST, ALL
5							
	715		CL	28.0	29	12	SI CL, R-BRN, MST, ALL
10							
	710						W SI CL (NO SAMPLE)
							DISCONTINUED.
15							
	705						
20							
	700						
25							
	695						
30							
	690						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-482 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-483
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-48 STATION: RANGE: SURFACE EL: 713.7
DATE DRILLED: 6/9/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	710		CL	19.4	29	12	SI CL, BRN-TN, MST, ALL SD SI CL, TN, W
10	705						DISCONTINUED.
15	700						
20	695						
25	690						
30	685						
35	680						
1''=5'		* Lab. Classif.					Added by Amendment 50

Figure 2.5-483 Soil Profile

**WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT**

**SOIL PROFILE
FIGURE 2.5-484
SHEET 1 OF 1**

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-49 STATION: RANGE: SURFACE EL: 729.7
DATE DRILLED: 6/9/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	725		CL	19.6	43	20	SI CL, BRN, MST, ALL
			CL	23.4	33	13	SI CL, DK BRN-TN, MST, ALL
10	720		CL-ML	22.9	42	16	SI CL, R, MST, ALL
15	715		CL	22.7	42	18	CL SI, TN-BRN, MST, ALL
20	710						W CL SI
							DISCONTINUED.
25	705						
30	700						
35	695						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-484 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-485
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-50 STATION: RANGE: SURFACE EL: 730.0
DATE DRILLED: 6/9/83 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	~~730~~						
5	725		CL	18.4	43	20	SI CL, TR FN GV, TN-BRN, MST, ALL
10	720		CL	18.6	39	18	CL SI, TN, MST, RESD
15	715		CL	19.2	35	14	CL SI, TN, V MST, RESD
							W SI
20	710						DISCONTINUED.
25	705						
30	700						
35	695						
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-485 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-486
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-51 STATION: RANGE: SURFACE EL: 739.8
DATE DRILLED: 6/9/83 TO PREPARED BY: MHD CHECKED BY: EA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							ROADFILL
5	735		CL	21.3	39	18	SI CL, R-BRN, MST, ALL
10	730		CL/ML	22.9	42	16	SI CL, R, MST, ALL
15	725		CL/ML	24.2	42	16	SI CL, R, MST, ALL
							DISCONTINUED.
20	720						
25	715						
30	710						
35	705						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-486 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-487
SHEET 1 OF 1

PROJECT: WATTS BAR N.P.
BORING: PAH-52 STATION:
DATE DRILLED: 6/9/83 TO

FEATURE: BORROW AREA 2C
RANGE: SURFACE EL: 743.7
PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							RANDOM ROADFILL
5	740		CL/ML	23.1	42	16	SI CL, R-BRN, MST, ALL
10	735		CL/ML	22.7	42	16	SI CL, R-BRN, MST, ALL
15	730		CL	21.9	39	18	SI CL, R-BRN, MST, ALL
20	725						DISCONTINUED.
25	720						
30	715						
35	710						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-487 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-488
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA 2C
BORING: PAH-53 STATION: RANGE: SURFACE EL: 750.6
DATE DRILLED: 6/9/83 TO PREPARED BY: MHD CHECKED BY:

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	750						RANDOM ROADFILL
5	745		CL ML	23.5	42	16	SI CL, R-BRN, MST, ALL
10	740		CL ML	23.6	42	16	SI CL, R, MST, ALL
15	735		CL ML	37.1	42	16	SI CL, R V MST, ALL
20	730						W SI CL DISCONTINUED.
25	725						
30	720						
35							
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-488 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-489
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-56 STATION: RANGE: SURFACE EL: 769.0 est
DATE DRILLED: 8/24/83 TO PREPARED BY: MHD CHECKED BY: CBE

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							CUT SURFACE; SP FL
5	765		CL	23.2	44	19	FT CL, BRN, MST, RESD
10	760		CL/ML	24.2	42	16	FT CL, BRN, MST, RESD
15	755		CL	26.7	48	21	FT CL, BRN, MST, RESD
20	750						
25	745						
30	740						
35	735						
1''=5'		* Lab. Classif.					Added by Amendment 50

Figure 2.5-489 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-490
SHEET 1 OF 1

PROJECT: WATTS BAR N.P.
BORING: PAH-57 STATION:
DATE DRILLED: 8/25/83 TO

FEATURE: BORROW AREA EXT 2C
RANGE: SURFACE EL: 774.1
PREPARED BY: MHD CHECKED BY: CBE

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							CUT SURFACE
5	770		CL	11.5	33	11	CL SI, BRN, MST, RESD
10	765		CL	20.4	44	19	CL SI, BRN, MST, RESD
15	760		CL ML	20.6	40	14	CL SI, BRN, MST, RESD
20	755		CL ML	24.9	36	12	CL SI, BRN, V MST, RESD
							DISCONTINUED.
25	750						
30	745						
35	740						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-490 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-491
SHEET 1 OF 1

PROJECT: WATTS BAR N.P.
BORING: PAH-58 STATION:
DATE DRILLED: 8/25/83 TO

FEATURE: BORROW AREA EXT 2C
RANGE: SURFACE EL: 798.0
PREPARED BY: MHD CHECKED BY: [illegible]

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							CUT SURFACE
	795		I/U I/Σ	26.6	53	24	CL SI, BRN, MST, RESD
5							
	790		CL I/Σ ML	21.3	36	12	CL SI, BRN, MST, RESD
10							
	785		CL I/Σ ML	26.3	40	14	CL SI, BRN, MST, RESD
15							
	780		CL U	22.6	39	17	CL SI, TN-BRN, MST, RESD
20							
	775						
25							
	770						
30							
	765						
35							
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-491 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-492
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-59 STATION: RANGE: SURFACE EL: 755.0
DATE DRILLED: 8/24/83 TO PREPARED BY: MHD CHECKED BY: CJE

DEPTH ft.	EL 755	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
			CL	12.7	33	11	SI CL, BRN, MST, RESD
5	750		CL	21.4	45	22	SI CL, BRN, MST, RESD
10	745		CL	18.8	48	21	SI CL, TN, TR LS GV, MST, RESD
15	740		CL ML	22.2	42	16	CL SI, GRN-TN, MST, RESD
20	735						DISCONTINUED.
25	730						
30	725						
35	720						Added by Amendment 50

1''=5'

*Lab. Classif.

Figure 2.5-492 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-493
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-60 STATION: RANGE: SURFACE EL: 748.2
DATE DRILLED: 8/24/83 TO PREPARED BY: MHD CHECKED BY: OEG

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0	745		CL	17.5	44	20	(PREVIOUSLY CUT SURFACE) SI CL, TN, MST, TERRACE ALL
5			ML	16.1	37	11	GV SI, DK BRN, MST, TERRACE ALL
10	740		SM | SC	17.9	35	11	SI CL, BRN, TR GV
15	735		CL | ML	20.1	40	14	CL SI, R-BRN, MST, RESD
20	730						DISCONTINUED.
25	725						
30	720						
35	715						Added by Amendment 50

1''=5' * Lab. Classif.

Figure 2.5-493 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-494
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-61 STATION: RANGE: SURFACE EL: 745.0 esl
DATE DRILLED: 8/24/83 TO PREPARED BY: MHD CHECKED BY:

DEPTH ft.	EL 745	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
			SM/SU	15.5	35	11	CUT SURFACE GV CL, DK BRN, MST, TERRACE ALL
5	740						
			CL/SM	20.3	40	14	GV CL, DK BRN, MST, TERRACE ALL
10	735						DISCONTINUED.
15	730						
20	725						
25	720						
30	715						
35	710						Added by Amendment 50
1''=5'		* Lab. Classif.					

Figure 2.5-494 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-495
SHEET 1 OF 1

Added by Amendment 50

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-62 STATION: RANGE: SURFACE EL: 731.0 es
DATE DRILLED: 8/25/83 TO PREPARED BY: MHD CHECKED BY:

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	730		CH/MH	23.1	53	24	CUT SURFACE SI CL, BRN, MST, RESD
5	725		CH/MH	23.3	53	24	CL SI, BRN, MST, RESD
10			CH/MH	22.2	53	24	CL SI, BRN, MST, RESD
	720						REFUSAL. BEDROCK.
15	715						
20	710						
25	705						
30	700						
35							
1''=5'			*Lab. Classif.				

Figure 2.5-495 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-496
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-63 STATION: RANGE: SURFACE EL: 730.8
DATE DRILLED: 8/25/83 TO PREPARED BY: MHD CHECKED BY:

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	730		SS / US	16.4	35	11	CUT SURFACE CL SI, BRN, MST, RESD
5	725		US / SS	24.6	53	24	FT CL, LT BRN, MST, RESD
10	720		SS	18.0	37	11	CL SI, R-BRN, MST, RESD
15	715		SS	16.7	37	11	CL SI, R-BRN, MST, RESD
20	710						DISCONTINUED.
25	705						
30	700						
35							Added by Amendment 50

1''=5'

*Lab. Classif.

Figure 2.5-496 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-497
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-64 STATION: RANGE: SURFACE EL: 744.1
DATE DRILLED: 8/24/83 TO PREPARED BY: MHD CHECKED BY: CBP

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							TOPSOIL
5	740		ML	19.0	37	11	SI CL, BRN, D, RESD
10	735		ML	23.6	37	11	SI CL, BRN, MST, RESD
15	730		ML	23.3	37	11	SI CL, BRN, MST, RESD
							V MST W/SH & W/BENTANITE
							DISCONTINUED.
20	725						
25	720						
30	715						
35	710						
1"=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-497 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-498
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-65 STATION: RANGE: SURFACE EL: 766.0
DATE DRILLED: 8/24/83 TO PREPARED BY: MHD CHECKED BY: [illegible]

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	765		CL/ML	14.3	40	14	SI CL, R-BRN, MST, RESD
5							
	760		ML	19.8	67	29	SI CL, R-BRN, MST, RESD
10							
	755		CL/ML	15.8	40	14	SI CL, R-BRN, MST, RESD, TR GV
15							
	750		CL	15.7	44	19	SI CL, TR GV, R-BRN, MST, RESD
20							
	745						DISCONTINUED.
25							
	740						
30							
	735						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-498 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-499
SHEET 1 OF 1

PROJECT: WATTS BAR N.P.
BORING: PAH-66 STATION:
DATE DRILLED: 8/24/83 TO

FEATURE: BORROW AREA EXT 2C
RANGE: SURFACE EL: 776.9
PREPARED BY: MHD CHECKED BY: [illegible]

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							CUT SURFACE
	775		CL ML	13.6	40	14	SI CL, R-BRN, MST, RESD
5							
	770		CL ML	19.1	40	14	SI CL, R-BRN, MST, RESD
10							
	765		CL ML	16.1	37	12	CL SI, TR GV, BRN, MST, RESD
15							
	760		CL ML	17.5	37	12	CL SI, TR GV, BRN, MST, RESD
20							DISCONTINUED.
	755						
25							
	750						
30							
	745						
35							
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-499 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-500
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-67 STATION: RANGE: SURFACE EL: 815.0
DATE DRILLED: 8/25/83 TO PREPARED BY: MHD CHECKED BY: CPE

DEPTH ft.	EL 815	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	810		IM	29.2	67	29	FT CL, R, MST, RESD
10	805		IM	32.7	67	29	FT CL, R, MST, RESD
15	800		CL	24.7	44	20	CL SI, TN, MST, RESD
20	795		CL	22.1	44	20	CL SI, TN, MST, RESD
							DISCONTINUED.
25	790						
30	785						
35	780						
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-500 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-501
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-68 STATION: RANGE: SURFACE EL: 824.0
DATE DRILLED: 8/25/83 TO PREPARED BY: MHD CHECKED BY: [illegible]

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							CUT SURFACE
5	820		CL	12.9	35	15	CL SI, TN, MST, RESD
10	815		CL/ML	19.5	53	24	CL SI, YEL-TN, MST, RESD
15	810		CL	20.6	39	17	CL SI, TN, MST, RESD
20	805		CL/ML	14.5	36	12	CL SI, TN, MST, RESD
							DISCONTINUED.
25	800						
30	795						
35	790						
1''=5'			* Lab. Classif.				Added by Amendment 50

Figure 2.5-501 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-502
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-69 STATION: RANGE: SURFACE EL: 802.2
DATE DRILLED: 8/24/83 TO PREPARED BY: MHD CHECKED BY: JBE

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
0	800		CL	11.2	35	15	CUT SURFACE SI CL, R-BRN, D, RESD
5	795		CL	21.3	44	19	SI CL, TR GV, D, RESD
10	790		CH/MH	20.1	53	24	CL SI, MST, RESD
15	785		CL/ML	18.3	36	12	CL SI, MST, RESD
20	780						DISCONTINUED.
25	775						
30	770						
35							
1''=5'		* Lab. Classif.					Added by Amendment 50

Figure 2.5-502 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-503
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-70 STATION: RANGE: SURFACE EL: 772.0
DATE DRILLED: 8/24/83 TO PREPARED BY: MHD CHECKED BY: JBL

DEPTH ft.	EL	SPT (N)	*LOG	W	LL	PI	FIELD DESCRIPTION
	770		CL	17.3	33	11	CUT SURFACE SI CL, R-BRN, MST, RESD
5	765		CL/ML	24.7	53	24	SI CL, R-BRN, MST, RESD
10	760		CL	24.8	44	20	SI CL, R-BRN-WHT, MST, RESD
15	755		CL	24.4	44	20	SI CL, R-BRN-WHT, MST, RESD
20	750						DISCONTINUED.
25	745						
30	740						
35							
1"=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-503 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-504
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-71 STATION: RANGE: SURFACE EL: 742.0
DATE DRILLED: 8/25/83 TO PREPARED BY: MHD CHECKED BY: CBL

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							CUT SURFACE
	740		CL	8.9	33	11	CL SI, BRN, D, RESD
5							
	735		CL	13.4	35	15	CL SI, BRN, MST, RESD
10							
	730		CL/ML	17.2	37	12	CL SI, BRN, MST, RESD
15							
	725		CL	20.3	45	22	SI CL, BRN, MST, RESD
20							
	720						DISCONTINUED.
25							
	715						
30							
	710						
35							
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-504 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-505
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-72 STATION: RANGE: SURFACE EL: 725.8
DATE DRILLED: 8/25/83 TO PREPARED BY: MHD CHECKED BY:

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	725						FL SP
			CL	15.8	39	17	CL SI, BRN, MST, RESD
5			CL	16.9	39	17	CL SI, LT BRN-BRN, MST, RESD
	720						
			CL	26.4	45	22	CL SI, BRN, MST,
10							
	715						DISCONTINUED.
15							
	710						
20							
	705						
25							
	700						
30							
	695						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-505 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-506
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-73 STATION: RANGE: SURFACE EL: 721.0
DATE DRILLED: 8/25/83 TO PREPARED BY: MHD CHECKED BY:

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	720		CL/SC	23.0	40	14	CUT SURFACE CL SI, BRN, MST, RESD
5	715		ML	19.0	22	2	CL SI, GY, V MST, RESD
			SC	18.7	22	2	SI CL, BRN, MST, RESD
10	710		CL/SC	17.4	37	12	SI CL, DK BRN, MST, RESD
							DISCONTINUED.
15	705						
20	700						
25	695						
30	690						
35							
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-506 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-507
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-74 STATION: RANGE: SURFACE EL: 736.5
DATE DRILLED: 8/25/83 TO PREPARED BY: MHD CHECKED BY:

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	735		I/U I/Σ	34.4	53	24	CUT SURFACE CL SI, TN, V MST, RESD
5	730		CL	39.6	48	21	CL SI, TN, V MST, RESD
10	725		CL	40.4	48	21	CL SI, TN, V MST, RESD
15	720		ML	26.8	22	2	SI CL, (BENT), GRN-TN, V MSI, RESD
							DISCONTINUED.
20	715						
25	710						
30	705						
35							
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-507 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-508
SHEET 1 OF 1

PROJECT: WATTS BAR N.P.
BORING: PAH-75 STATION:
DATE DRILLED: 8/25/83 TO

FEATURE: BORROW AREA EXT 2C
RANGE: SURFACE EL: 742.3
PREPARED BY: MHD CHECKED BY:

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	740		CL	8.7	34	13	CUT SURFACE SL CI, TN, D, RESD
5	735		CL ML	14.5	37	12	CL SI, TN, MST, RESD
10	730		CL ML	24.2	37	12	CL SI, TN, MST, RESD
15	725		CL ML	24.3	42	16	
20	720						DISCONTINUED.
25	715						
30	710						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-508 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-509
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-76 STATION: RANGE: SURFACE EL: 787.0
DATE DRILLED: 8/24/83 TO PREPARED BY: MHD CHECKED BY: LEG

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							CUT SURFACE
	785		CL	16.6	34	13	SI CL, TR GV, D, RESD
5							
	780		CL ML	16.2	36	12	CL SI, MST, RESD
10							
	775		CL	17.8	30	11	CL SI, MST, BRN, RESD
15							
	770		CL	16.8	30	11	CL SI, MST, BRN, RESD
20							DISCONTINUED.
	765						
25							
	760						
30							
	755						
35							
1"=5'		* Lab. Classif.					Added by Amendment 50

Figure 2.5-509 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-510
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-77 STATION: RANGE: SURFACE EL: 836.0
DATE DRILLED: 8/24/83 TO PREPARED BY: MHD CHECKED BY: [illegible]

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	835		CL	20.1	34	13	CUT SURFACE SI CL, TN, MST, RESD
5	830		CL	16.9	33	12	SI CL, PK-TN, MST, RESD
10	825		CL ML	12.1	36	12	SI CL, TN, MST, RESD, TR GV
15	820		CL ML	14.6	36	12	SI CL, TN, MST, RESD
20	815						DISCONTINUED.
25	810						
30	805						
35							
1''=5'			* Lab. Classif.				Added by Amendment 50

Figure 2.5-510 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-511
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-78 STATION: RANGE: SURFACE EL: 882.3
DATE DRILLED: 8/24/83 TO PREPARED BY: MHD CHECKED BY: CBF

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	880		US	12.4	40	16	CUT SURFACE CL SI, TN, MST, RESD
5	875		SC	10.3	40	16	CL SI, TN, MST, RESD
10	870		CL/ML	9.9	36	12	CL SI, TN, TR GV, MST, RESD
15	865		CL/ML	8.6	36	12	CL SI, TN, TR GV, MST, RESD
20	860						DISCONTINUED.
25	855						
30	850						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-511 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-512
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-79 STATION: RANGE: SURFACE EL: 777.0
DATE DRILLED: 8/25/83 TO PREPARED BY: MHD CHECKED BY: CEG

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	775						TOPSOIL
5			CL	15.5	33	12	CL SI, BRN, MST, RESD
	770		CL	14.6	34	12	CL SI, TR GV, BRN, MST, RESD
10							
	765		CL	16.5	34	12	CL SI, TR GV, R-BRN, MST, RESD
15							
	760		CL	16.7	34	12	CL SI, BRN, MST, RESD
20							
	755						DISCONTINUED.
25							
	750						
30							
	745						
35							
1''=5'		*Lab. Classif.					Added by Amendment 50

Figure 2.5-512 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-513
SHEET 1 OF 1

PROJECT: WATTS BAR N.P.
BORING: PAH-80 STATION:
DATE DRILLED: 8/25/83 TO

FEATURE: BORROW AREA EXT 2C
RANGE: SURFACE EL: 744.0
PREPARED BY: MHD CHECKED BY: CBG

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							CUT SURFACE
5	740		CL	13.8	34	13	CL SI, TN, MST, RESD
10	735		CL	22.6	39	17	CL SI, TN, MST, RESD
15	730		CL	21.9	44	20	CL SI, TN, MST, RESD
20	725		CL	21.4	44	20	CL SI, TN, MST, RESD
							DISCONTINUED.
25	720						
30	715						
35	710						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-513 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-514
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-81 STATION: RANGE: SURFACE EL: 802.0
DATE DRILLED: 8/24/83 TO PREPARED BY: MHD CHECKED BY: CBE

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	800		CL	7.8	33	12	CUT SURFACE CL SI, TR GV, TN, MST, RESD
5	795		CL	11.1	30	11	CL SI, TR GV, TN, MST, RESD
10	790		CL	14.2	30	11	CL SI, TR LS GV, R-BRN, MST, RESD
15	785		CL	12.3	30	11	CL SI, TR LS GV, R-BRN, MST, RESD
20	780						DISCONTINUED.
25	775						
30	770						
35							

1''=5'

*Lab. Classif.

Added by Amendment 50

Figure 2.5-514 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-515
SHEET 1 OF 1

PROJECT: WATTS BAR N.P.
BORING: PAH-82 STATION:
DATE DRILLED: 8/25/83 TO

FEATURE: BORROW AREA EXT 2C
RANGE: SURFACE EL: 884.0
PREPARED BY: MHD CHECKED BY:

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							CUT SURFACE
	880		SC	11.4	40	16	CL SI, D, RESD
5			SC	11.6	40	16	CL SI, D, RESD
	875		SC	12.8	40	16	CL SI, TR GV, D, RESD
10							
	870		SC	12.4	40	16	CL SI, D, RESD
15							
	865						DISCONTINUED.
20							
	860						
25							
	855						
30							
	850						
35							
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-515 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-516
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-83 STATION: RANGE: SURFACE EL: 872.0
DATE DRILLED: TO 8/25/83 PREPARED BY: MHD CHECKED BY: [illegible]

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	870		CL	16.7	35	15	CUT SURFACE CL SI, R-BRN, D, RESD
5	865		SM	10.1	22	1	CL SI, TR GV, TN, MST, RESD
10	860		CL	10.2	33	12	CL SI, TR GV, BRN, MST, RESD
15	855		CL	8.1	30	11	CL SI, GV, BRN
20	850						DISCONTINUED.
25	845						
30	840						
35							
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-516 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-517
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-84 STATION: RANGE: SURFACE EL: 846.0
DATE DRILLED: TO 8/25/83 PREPARED BY: MHD CHECKED BY:

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	845		CL/ML	20.3	36	12	CUT SURFACE CL SI, BRN, MST, RESD
5	840		CL	21.4	33	11	CL SI, R-BRN, MST, RESD
			CL	22.5	34	12	SI CL, BRN, MST, RESD
10	835		CL	21.0	44	19	SI CL, BRN, MST, RESD
15	830		CL	19.7	34	12	SI CL, R-BRN, MST, RESD
20	825						DISCONTINUED.
25	820						
30	815						
35							

1''=5'

*Lab. Classif.

Added by Amendment 50

Figure 2.5-517 Soil Profile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-518
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-85 STATION: RANGE: SURFACE EL: 834.0
DATE DRILLED: TO 8/25/83 PREPARED BY: M... CHECKED BY: ...

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							CUT SURFACE
5	830		CL	18.8	34	13	CL SI, TN, MST, RESD
10	825		CL / ML	12.3	36	12	CL SI, TN, MST, RESD
15	820		CL / ML	13.0	36	12	CL SI, TN, MST, RESD
20	815		CL	13.4	33	12	CL SI, YEL-TN, MST, RESD
							DISCONTINUED.
25	810						
30	805						
35	800						
1''=5'			*Lab. Classif.				Added by Amendment 50

Figure 2.5-518 Soil Profile

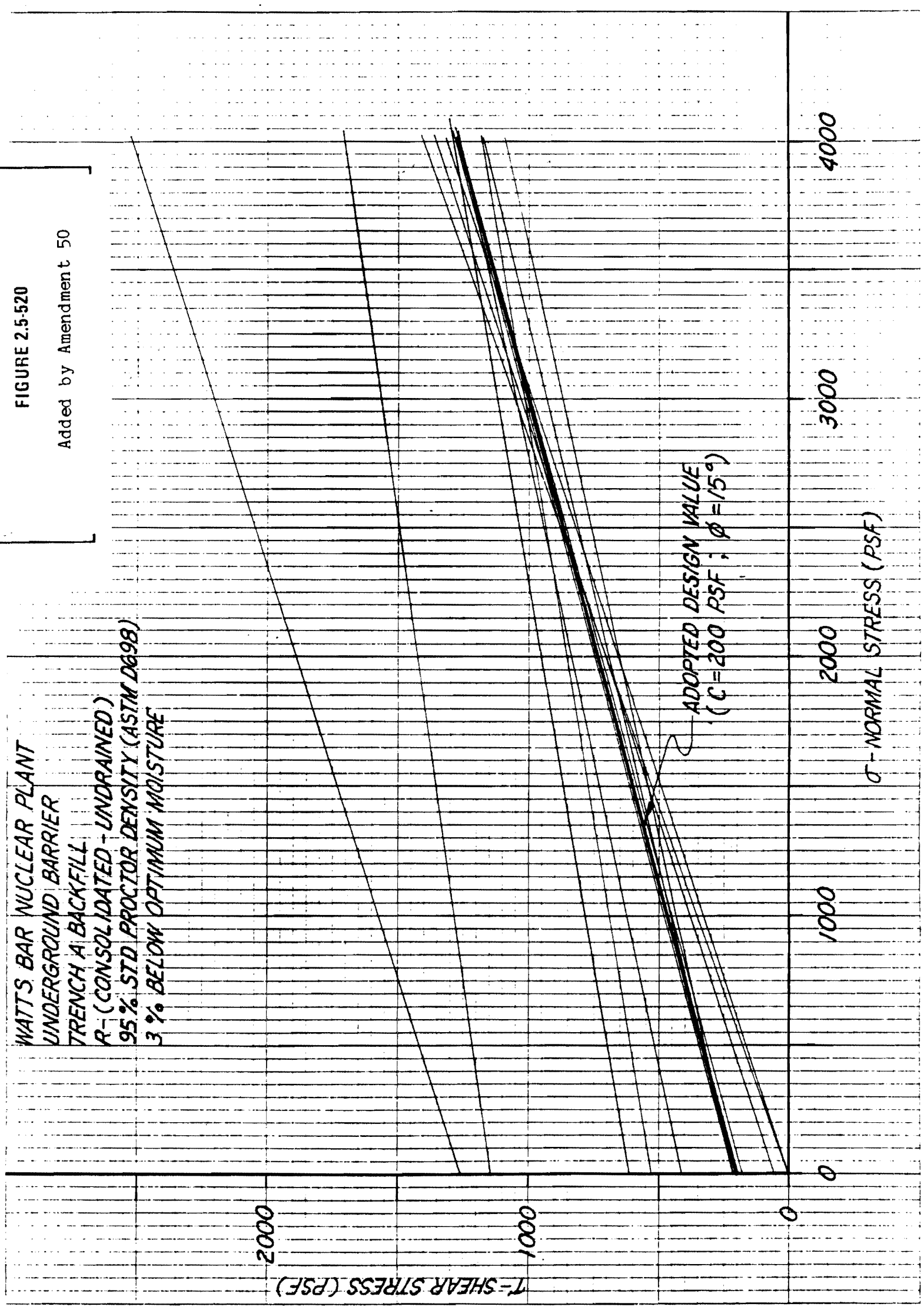
WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SOIL PROFILE
FIGURE 2.5-519
SHEET 1 OF 1

PROJECT: WATTS BAR N.P. FEATURE: BORROW AREA EXT 2C
BORING: PAH-86 STATION: RANGE: SURFACE EL: 802.0
DATE DRILLED: 8/25/83 TO PREPARED BY: MHD CHECKED BY: CEG

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							CUT SURFACE
	800		CL	13.6	34	13	CL SI, TN, MST, RESD
5							
	795		CL/ML	18.5	36	12	CL SI, TN, MST, RESD
10							
	790		CL/ML	18.7	36	12	CL SI, TN, MST, RESD
15							
	785		CL/ML	16.4	36	12	CL SI, TN, MST, RESD
20							
	780						DISCONTINUED.
25							
	775						
30							
	770						
35							
1''=5'			* Lab. Classif.				Added by Amendment 50

Figure 2.5-519 Soil Profile



WATTS BAR NUCLEAR PLANT
FINAL SAFETY
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FIGURE 2.5-520

Added by Amendment 50

Figure 2.5-520 Watts Bar Nuclear Plant Underground Barrier Trench A Backfill R - (Consolidated -Undrained) 95% STD Proctor Density (ASTM D698) 3% Below Optimum Moisture

FIGURE 2.5-521

Added by Amendment 50

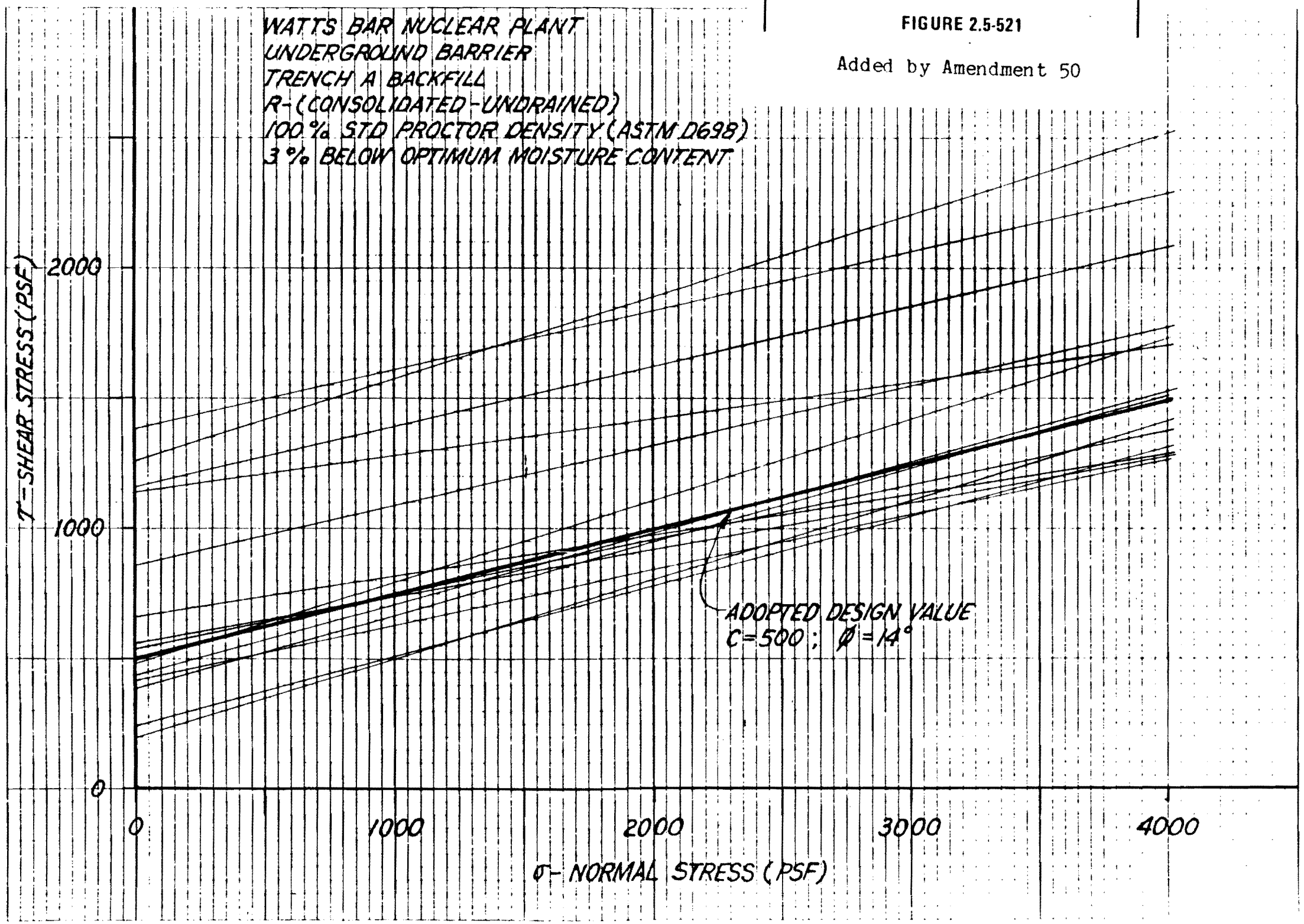

Figure 2.5-521 Watts Bar Nuclear Plant Underground Barrier Trench A Backfill R (Consolidated -Undrained) 100% STD Proctor Density (ASTM D698) 3% Below Optimum Moisture Content

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
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FIGURE 2.5-522

Added by Amendment 50

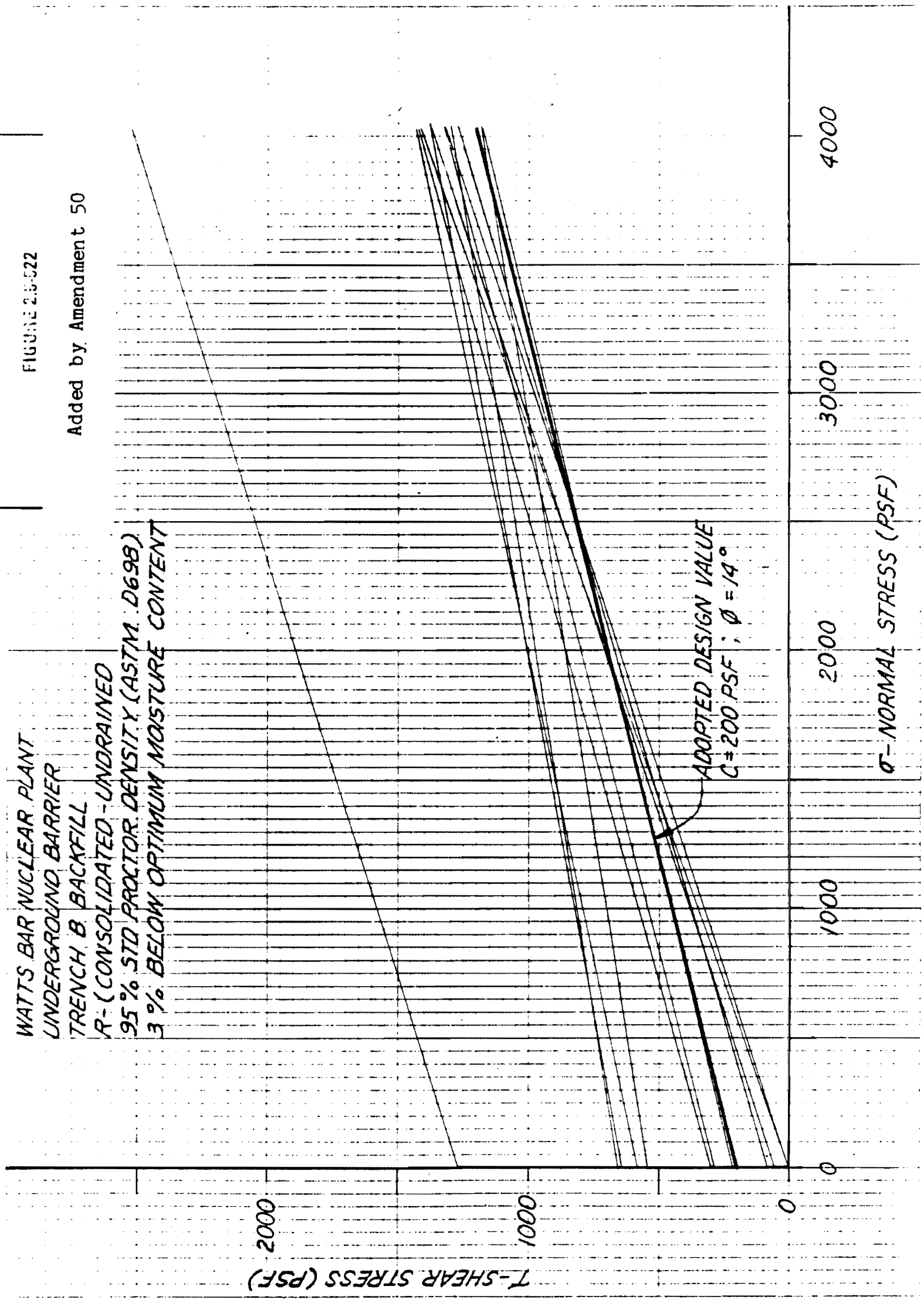
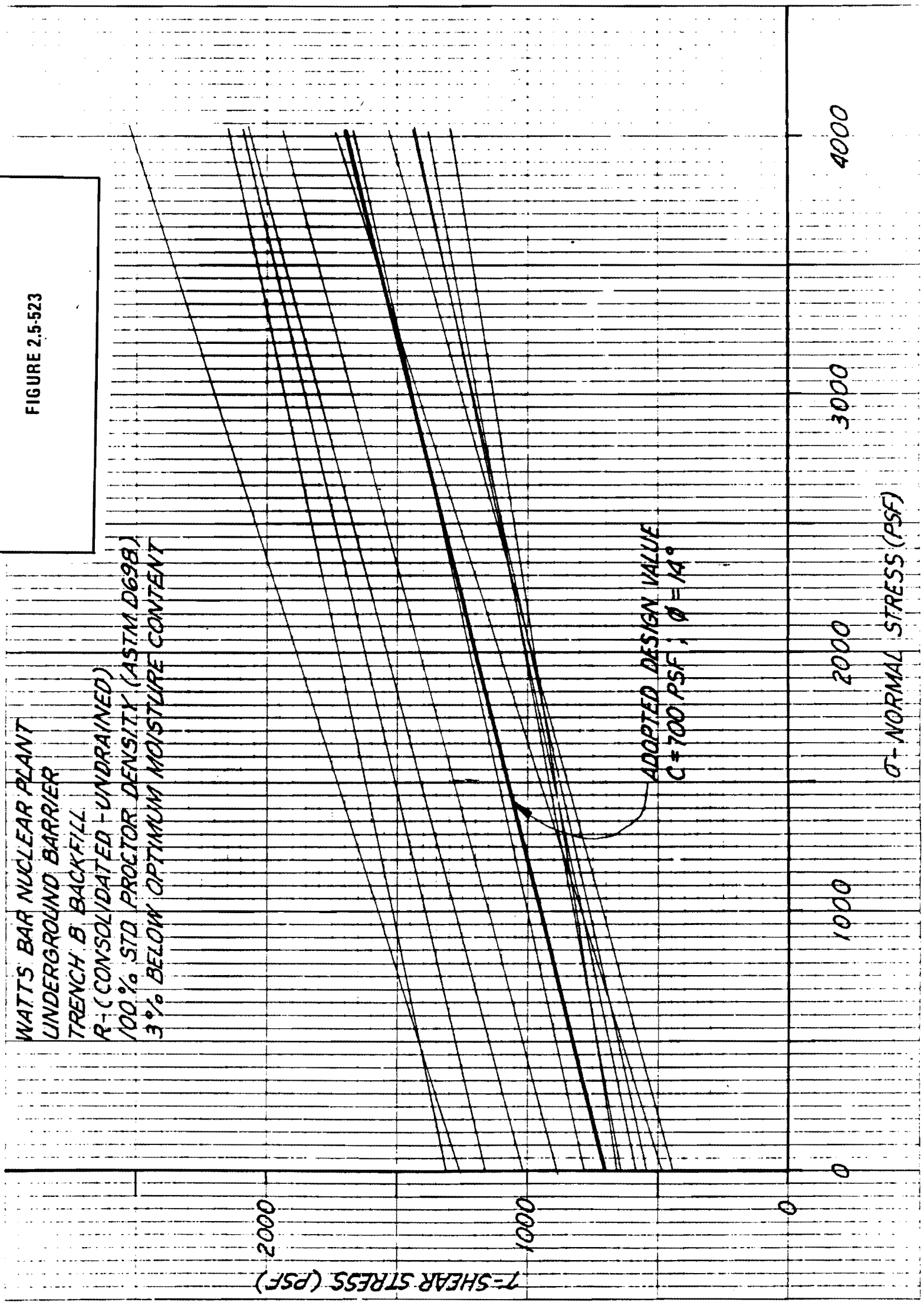


Figure 2.5-522 Watts Bar Nuclear Plant Underground Barrier Trench B Backfill R (Consolidated - Undrained) 95% STD Proctor Density (ASTM D698) 3% Below Optimum Moisture Content

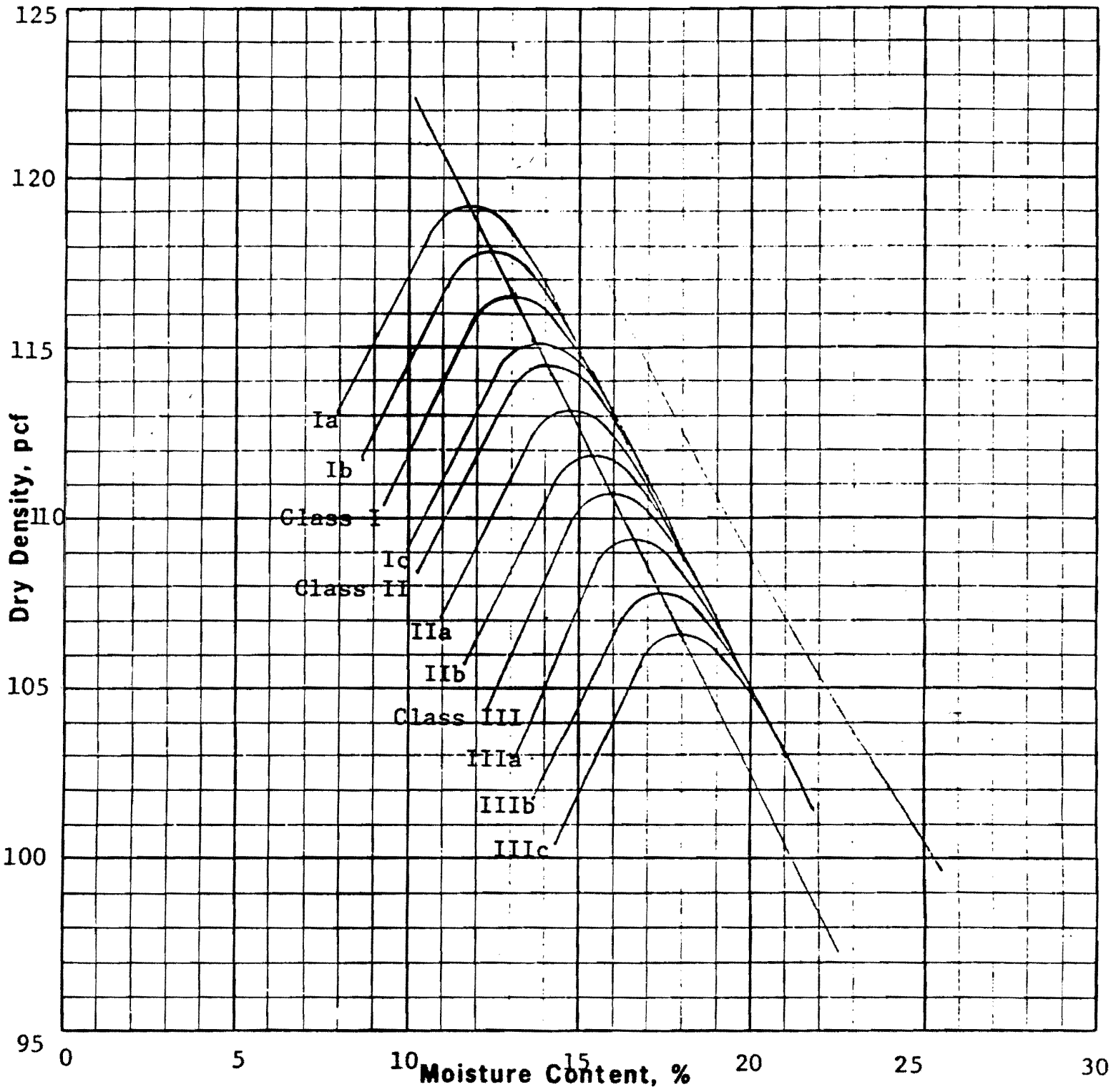


WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

FIGURE 2.5-523

Added by Amendment 50

Figure 2.5-523 Watts Bar Nuclear Plant Underground Barrier Trench B Backfill R (Consolidated -Undrained) 100% STD Proctor Density (ASTM D698) 3% Below Optimum Moisture Content



Soil Class	Gravel %	Sand %	Silt %	Clay %	Specific Gravity	LL %	PI %	Optimum Moisture, %	Maximum Density, pcf
I-SM-SC	0	70	15	15	2.66	24	5	13.1	116.6
II-SC	0	51	24	25	2.69	28	11	14.1	114.4
III-CL	0	40	29	31	2.69	34	15	15.9	110.8

Plus No. 4 Specific Gravity, S S D	---
Plus No. 4 Absorption, %	--

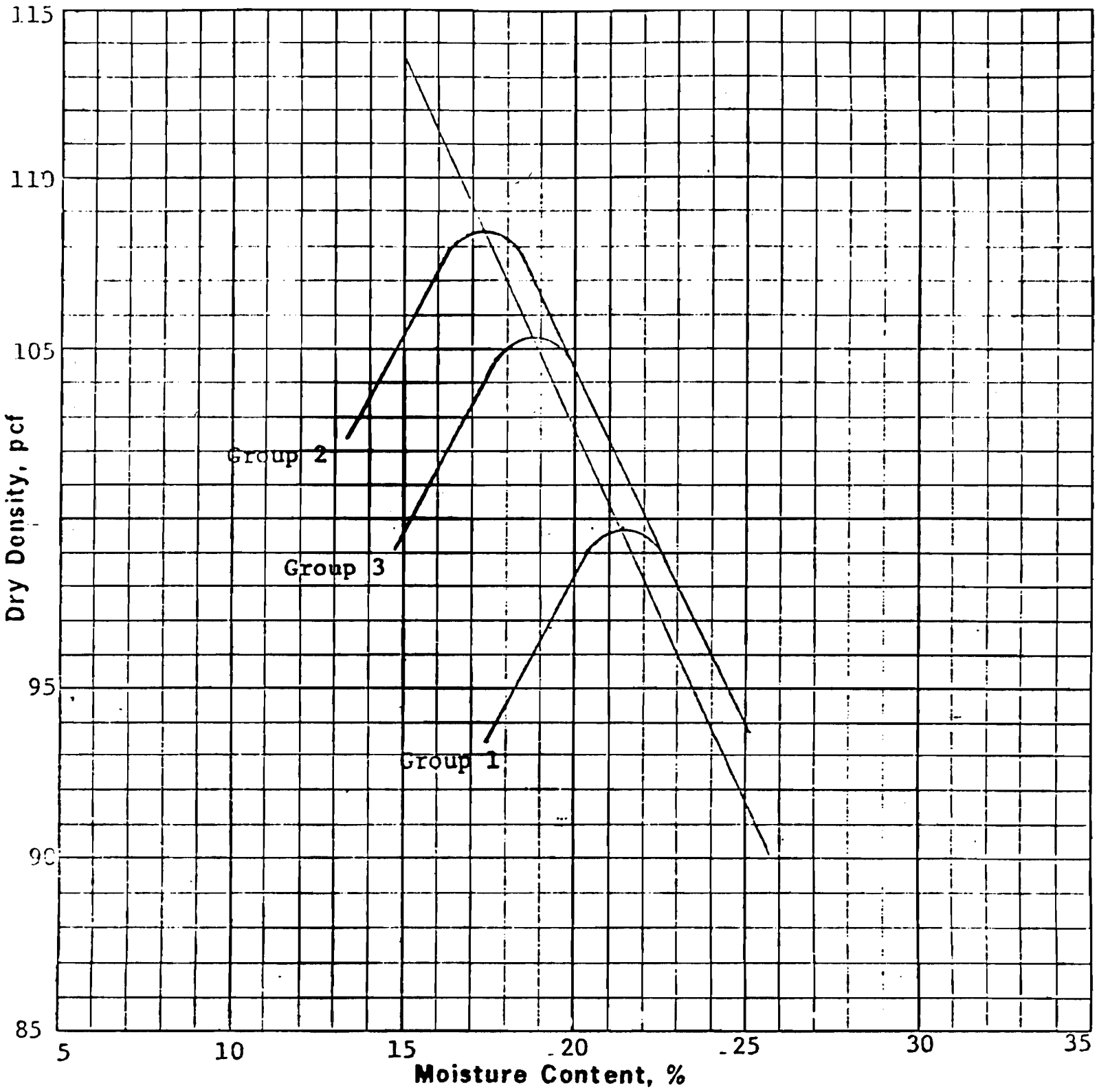
Remarks:

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION
TRENCH A, BORROW
FIGURE 2.5-524

Figure 2.5-524 ERCW Liquefaction Trench A Borrow



Soil Group	Gravel %	Sand %	Silt %	Clay %	Specific Gravity	LL %	PI %	Optimum Moisture, %	Maximum Density, pcf
1-ML	0	16	44	.40	2.73	47	18	21.4	99.7
2-SM	0	54	31	15	2.72	26	1	17.3	108.4
3-ML	0	43	35	22	2.73	34	8	18.8	105.3

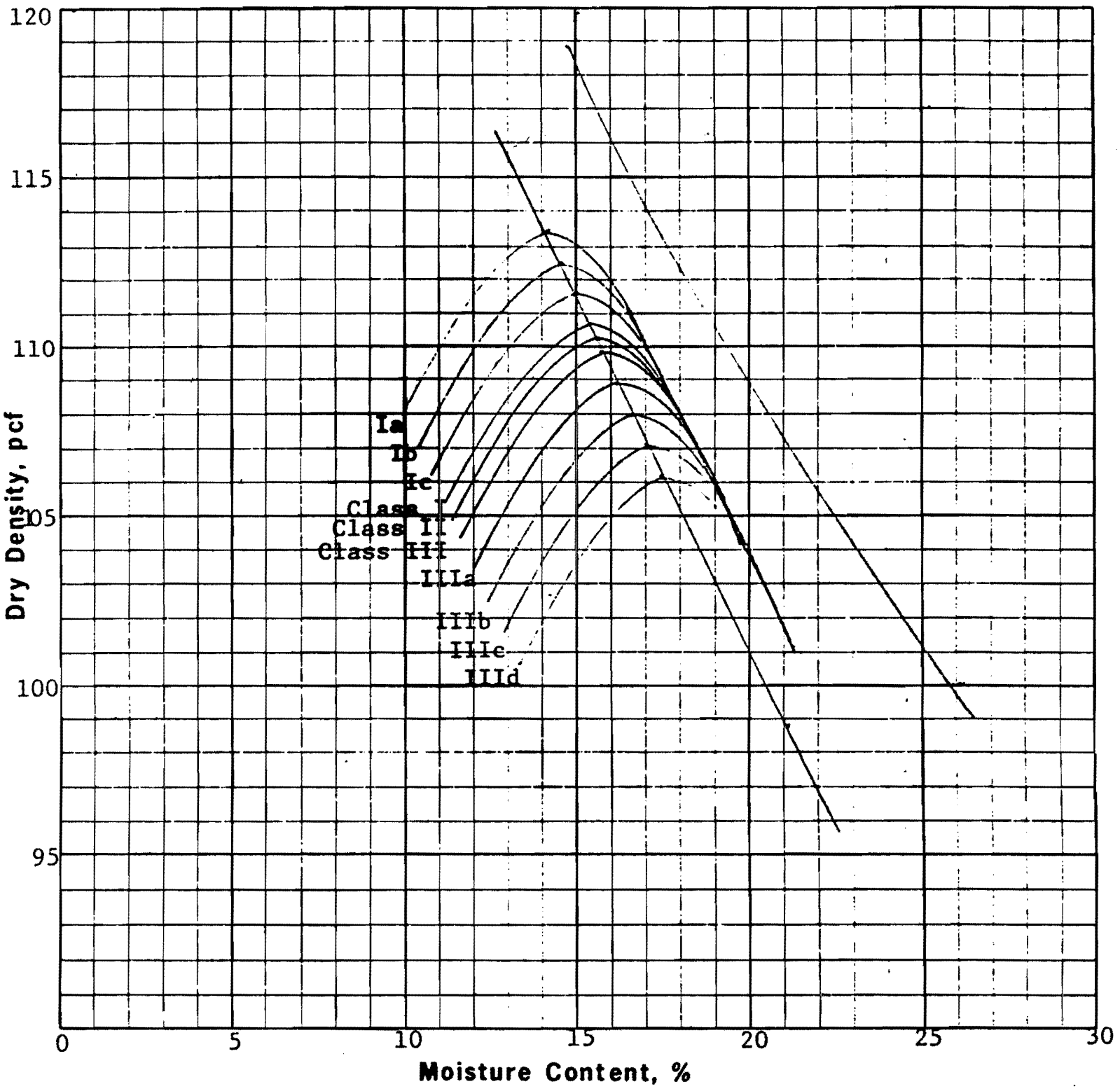
Plus No. 4 Specific Gravity, S S D	--
Plus No. 4 Absorption, %	--

Remarks:
Group 1 Silty sand fraction, upper
Group 2 Sand fraction, lower
Group 3 Composite, stockpile

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION, TRENCH A
SUPPLEMENTAL BORROW
FIGURE 2.5-525
Added by Amendment 50

Figure 2.5-525 ERCW Liquefaction Trench A Supplemental Borrow



Soil Class	Gravel %	Sand %	Silt %	Clay %	Specific Gravity	LL %	PI %	Optimum Moisture, %	Maximum Density, pcf
I-SM	0	66	22	12	2.65	NP	NP	15.3	110.7
II-SM-SC	0	55	24	21	2.67	28	6	15.6	110.3
III-CL	0	43	28	29	2.69	30	11	15.8	109.8

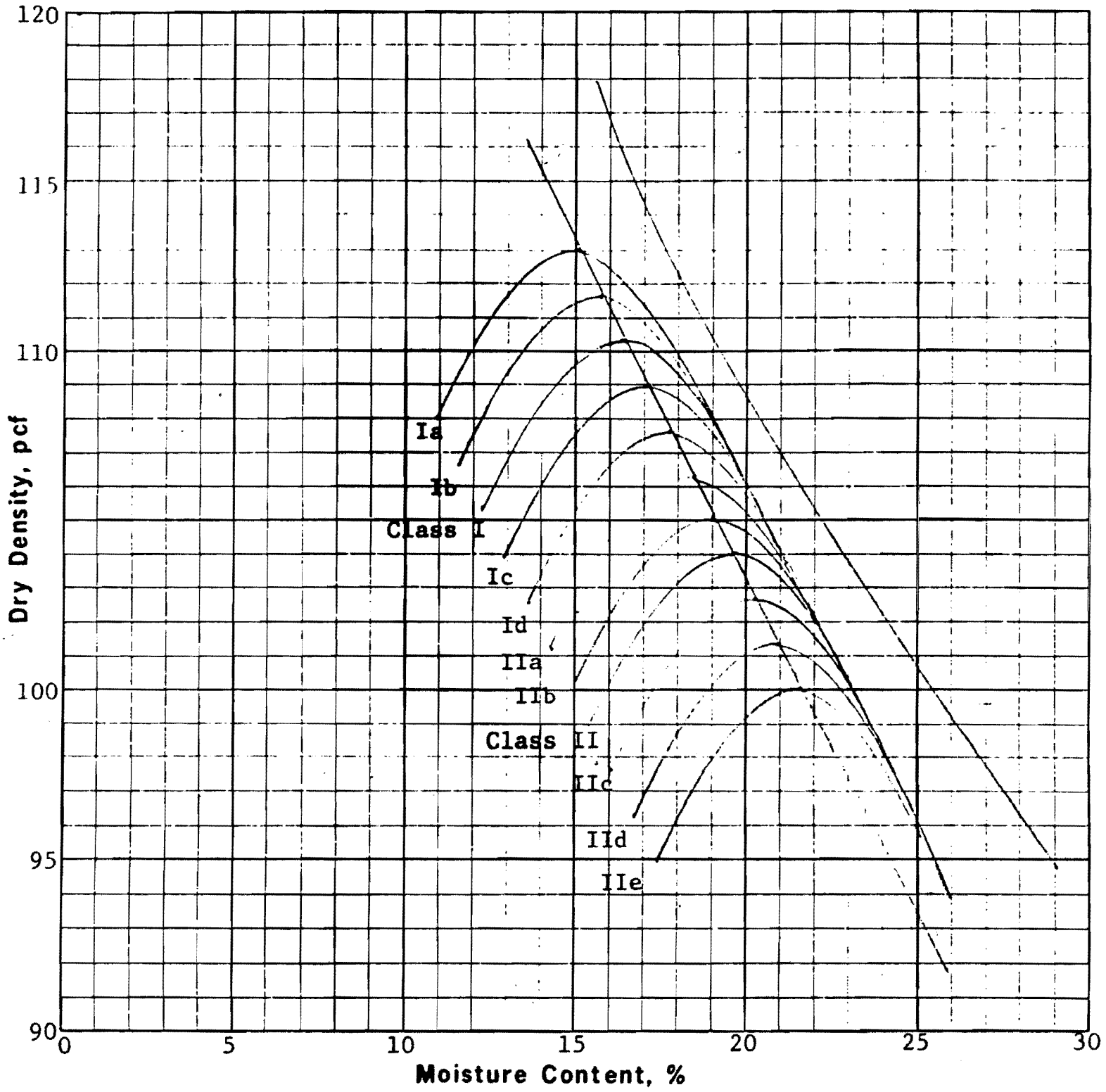
Plus No. 4 Specific Gravity, S S D	--
Plus No. 4 Absorption, %	--

Remarks:
Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION
TRENCH B
FIGURE 2.5-526

Figure 2.5-526 ERCW Liquefaction Trench B



Soil Class	Gravel %	Sand %	Silt %	Clay %	Specific Gravity	LL %	PI %	Optimum Moisture, %	Maximum Density, pcf
I-CL	0	24	40	36	2.66	31	16	16.4	110.3
II-CL-ML	0	32	27	41	2.70	40	15	19.6	104.0

Plus No. 4 Specific Gravity, S S D	--
Plus No. 4 Absorption, %	--

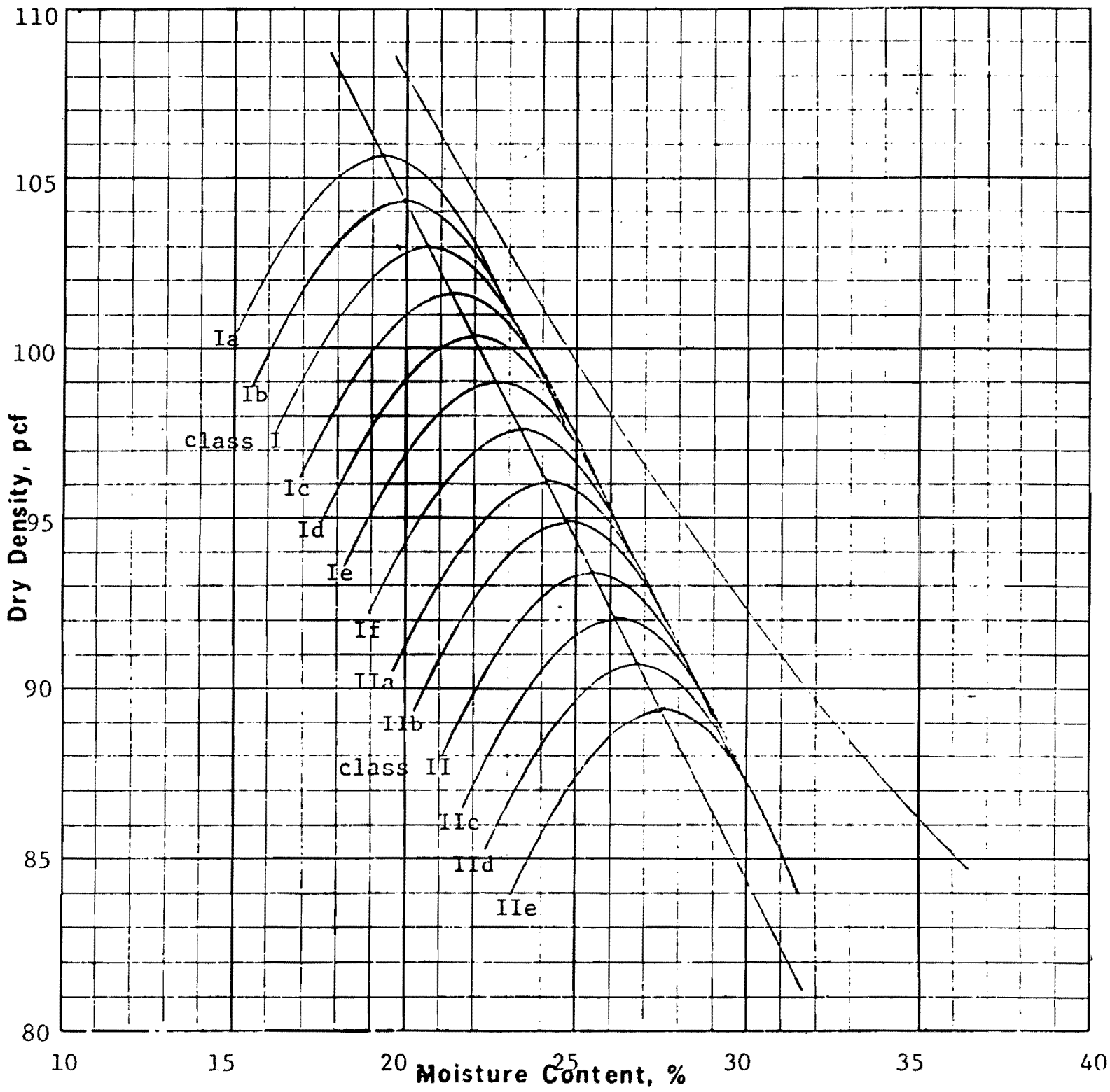
Remarks:

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION
BORROW AREA 9
FIGURE 2.5-527

Figure 2.5-527 ERCW Liquefaction Borrow Area 9



Soil Class	Gravel %	Sand %	Silt %	Clay %	Specific Gravity	LL %	PI %	Optimum Moisture, %	Maximum Density, pcf
I-CL	0	33	31	36	2.65	39	16	20.6	103.0
II-CL-ML	0	19	33	48	2.65	45	19	25.4	93.3

Plus No. 4 Specific Gravity, S S D	--
Plus No. 4 Absorption, %	--

Remarks:

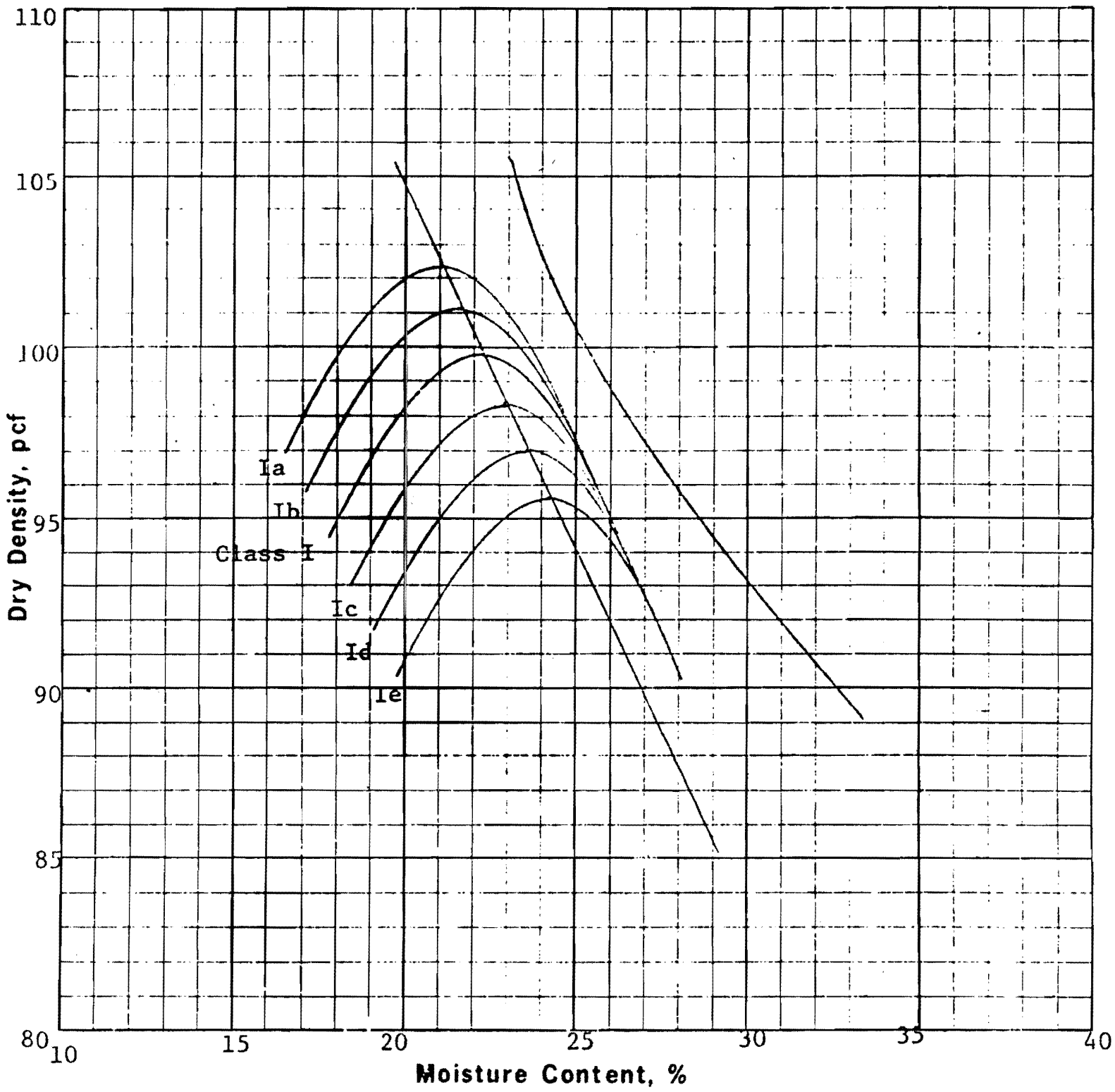
Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION
BORROW AREA 10
FIGURE 2.5-528

TVA 10201 (CONST 6-77)

Figure 2.5-528 ERCW Liquefaction Borrow Area 10



Soil Class	Gravel %	Sand %	Silt %	Clay %	Specific Gravity	LL %	PI %	Optimum Moisture, %	Maximum Density, pcf
I-ML	0	21	35	44	2.71	44	15	22.2	99.8

Plus No. 4 Specific Gravity, S S D	--
Plus No. 4 Absorption, %	--

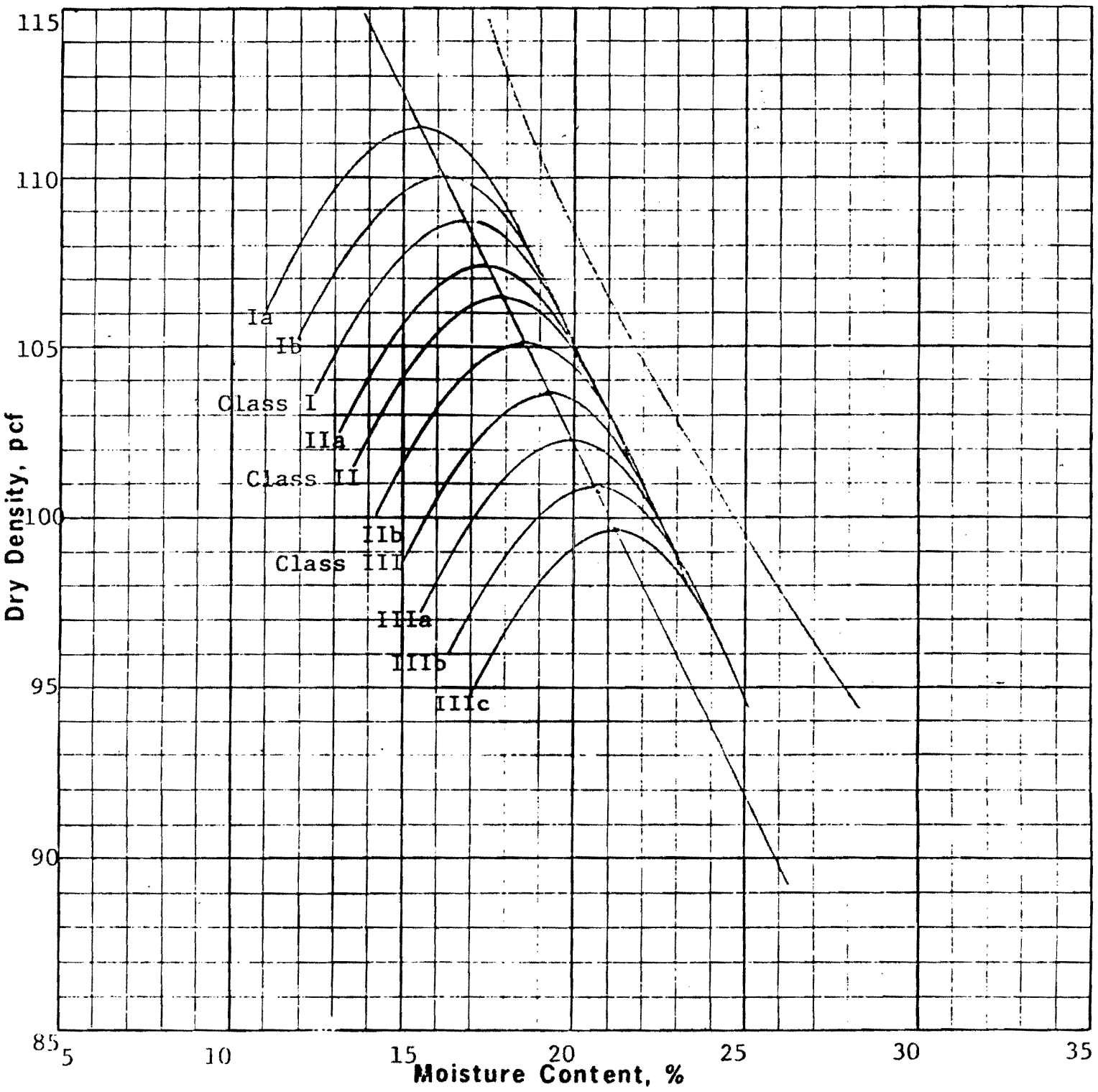
Remarks:

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION
BORROW AREA 11
FIGURE 2.5-529

Figure 2.5-529 ERCW Liquefaction Borrow Area 11



Soil Class	Gravel %	Sand %	Silt %	Clay %	Specific Gravity	LL %	PI %	Optimum Moisture, %	Maximum Density, pcf
I-SM	0	50	26	24	2.69	32	7	16.8	108.8
II-CL-ML	0	22	39	39	2.70	40	15	17.8	106.5
III-CL-ML	0	22	40	38	2.66	42	16	19.2	103.7

Plus No. 4 Specific Gravity, S S D	--
Plus No. 4 Absorption, %	--

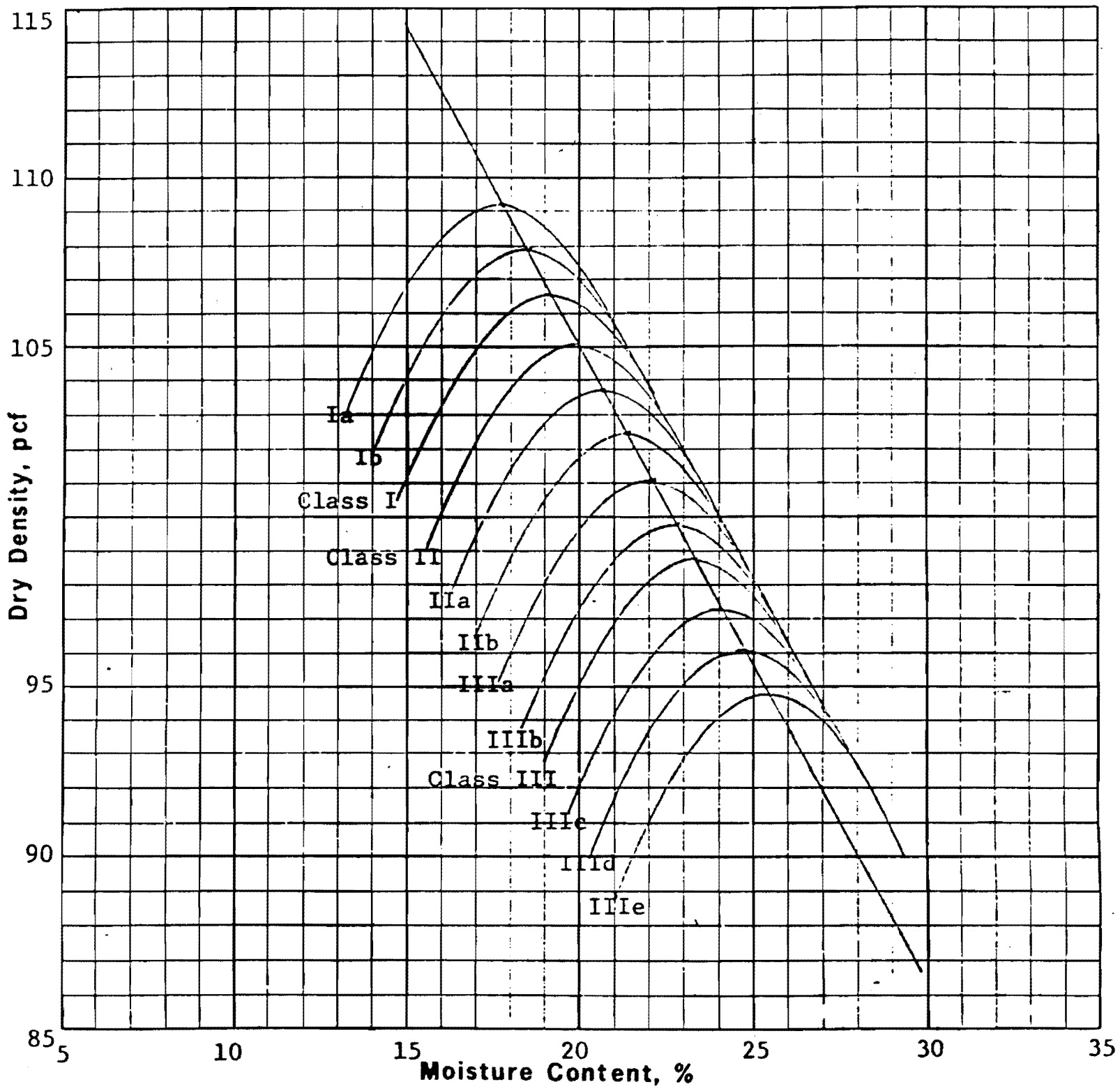
Remarks:

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION
BORROW AREA 12
FIGURE 2.5-530

Figure 2.5-530 ERCW Liquefaction Borrow Area 12



Soil Class	Gravel %	Sand %	Silt %	Clay %	Specific Gravity	LL %	PI %	Optimum Moisture, %	Maximum Density, pcf
I-ML	0	24	42	34	2.71	37	11	19.2	106.6
II-ML	0	23	39	38	2.73	41	14	20.0	105.1
III-MH	0	12	41	47	2.74	52	17	23.3	98.8

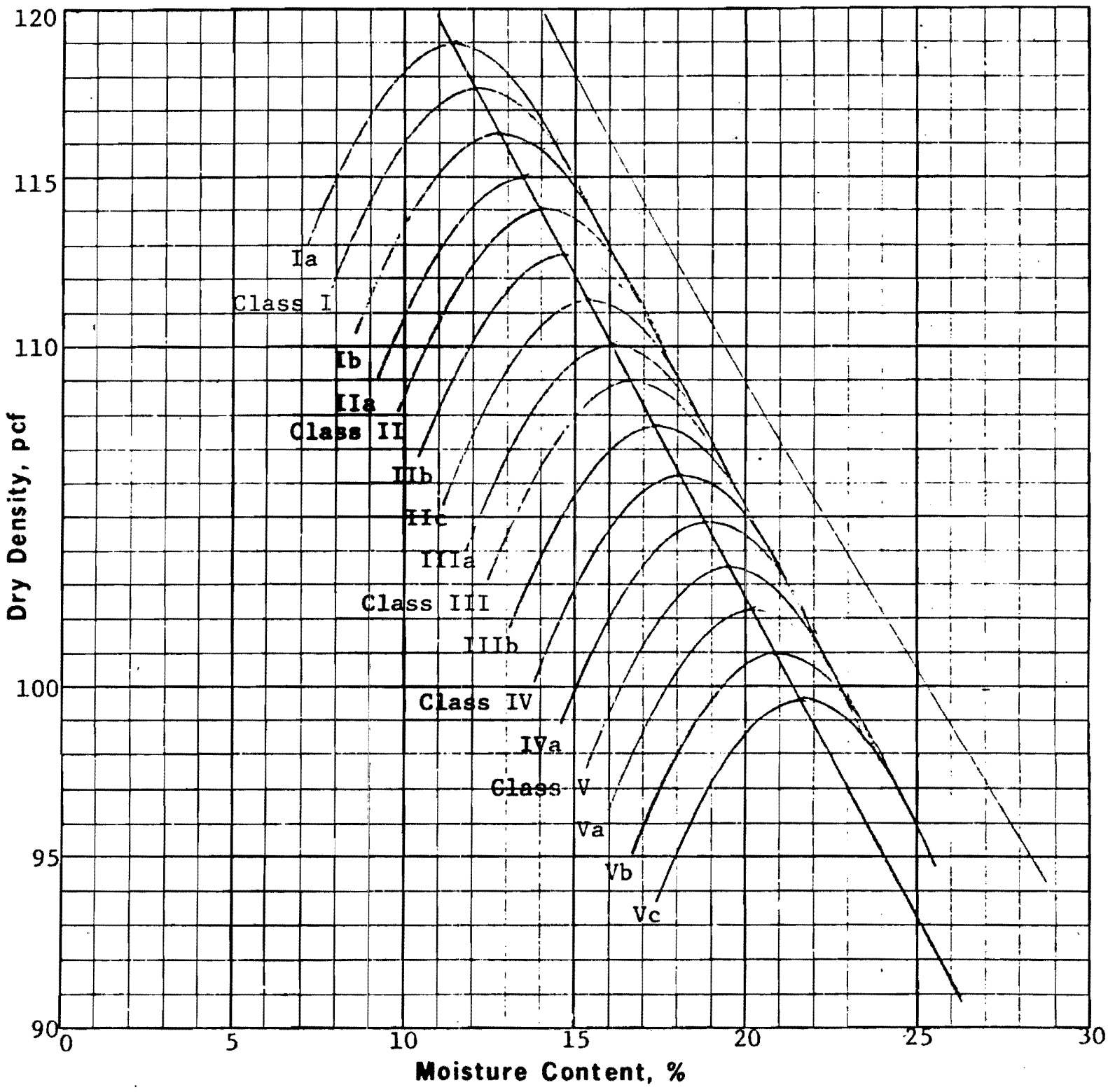
Plus No. 4 Specific Gravity, S S D	--
Plus No. 4 Absorption, %	--

Remarks:
Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION
BORROW AREA 13
FIGURE 2.5-531

Figure 2.5-531 ERCW Liquefaction Borrow Area 13



Soil Class	Gravel %	Sand %	Silt %	Clay %	Specific Gravity	LL %	PI %	Optimum Moisture, %	Maximum Density, pcf
I-ML	0	48	40	12	2.63	NP	NP	12.1	117.7
II-SM-SC	0	65	16	19	2.68	25	6	13.9	114.0
III-CL	0	48	23	29	2.67	36	14	16.6	109.0
IV-CL	0	30	34	36	2.68	41	17	18.1	106.2
V-CL-ML	0	23	39	38	2.70	44	17	19.5	103.5

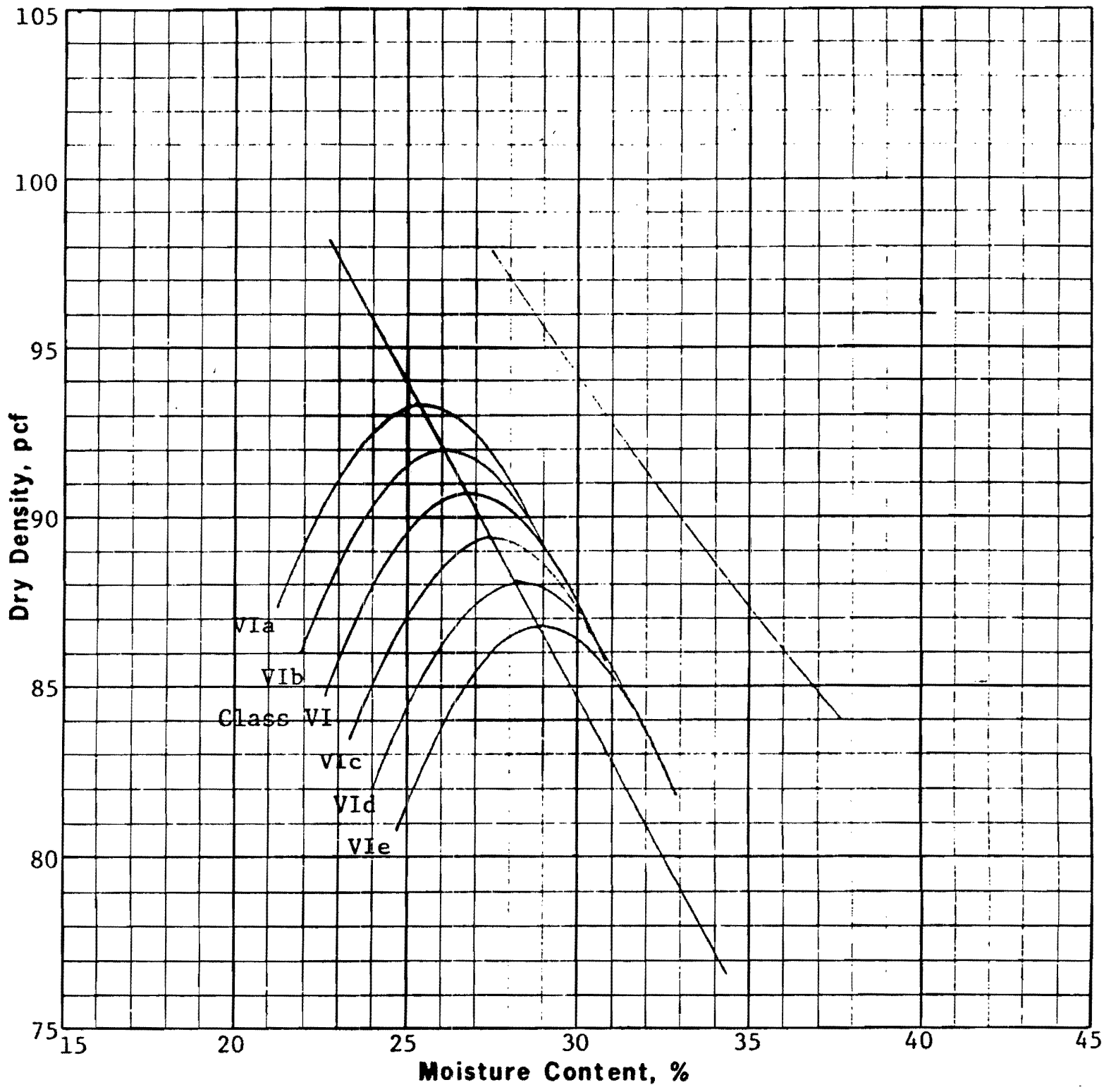
Plus No. 4 Specific Gravity, S S D	--
Plus No. 4 Absorption, %	--

Remarks:
Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION
BORROW AREA 2C
FIGURE 2.5-532

Figure 2.5-532 ERCW Liquefaction Borrow Area 2C



Soil Class	Gravel %	Sand %	Silt %	Clay %	Specific Gravity	LL %	PI %	Optimum Moisture, %	Maximum Density, pcf
VI-MH	0	5	40	55	2.74	62	27	26.8	90.8

Plus No. 4 Specific Gravity, S S D	--
Plus No. 4 Absorption, %	--

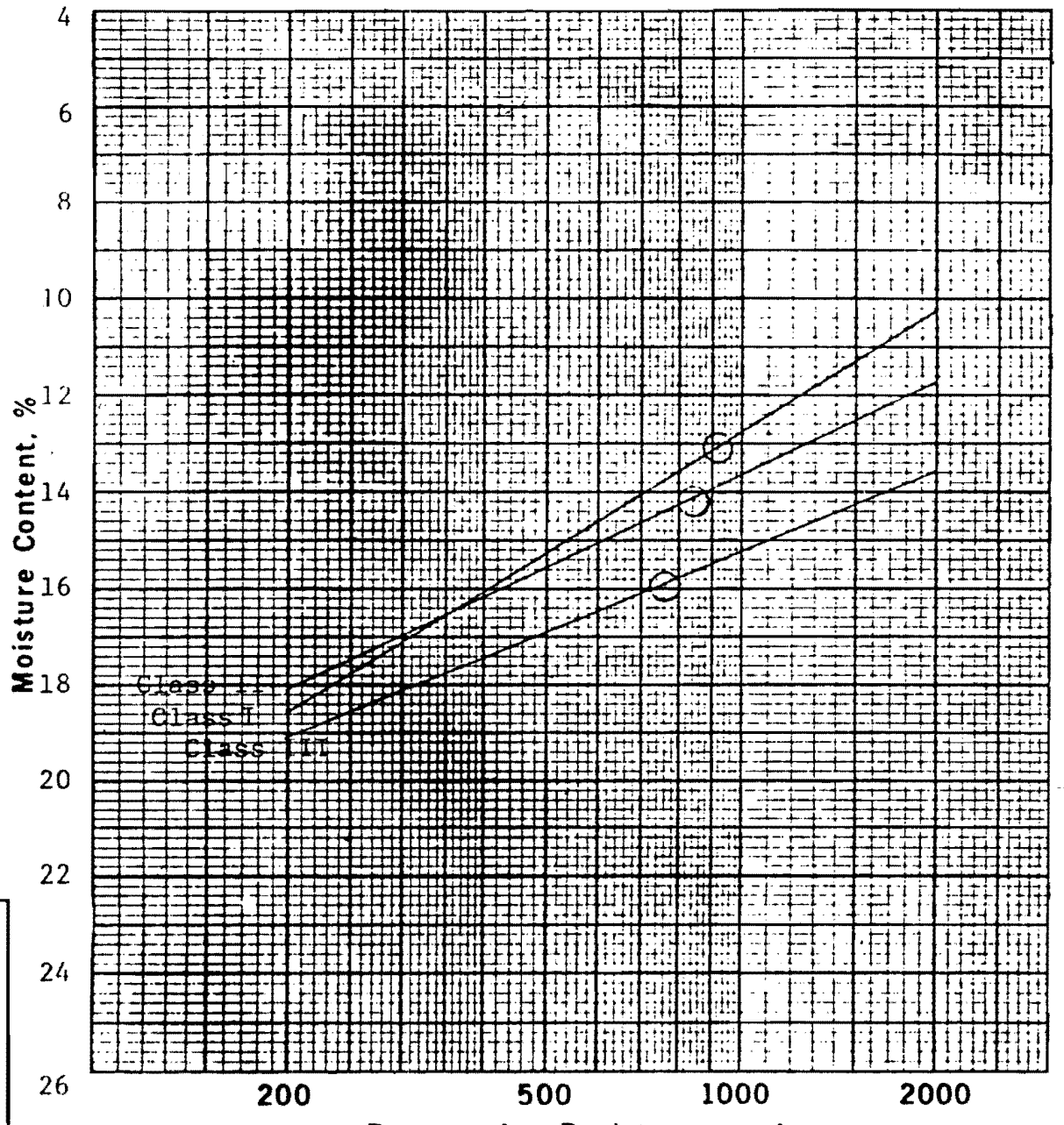
Remarks:

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION
BORROW AREA 2C
FIGURE 2.5-533

Figure 2.5-533 ERCW Liquefaction Borrow Area 2C



Soil Class	Optimum Moisture, %	Maximum Density, pcf	Penetration Resistance, psi
I-SM-SC	13.1	116.6	910
II-SC	14.1	114.4	840
III-CL	15.9	110.8	760

Remarks:

◯ Denotes Optimum Moisture

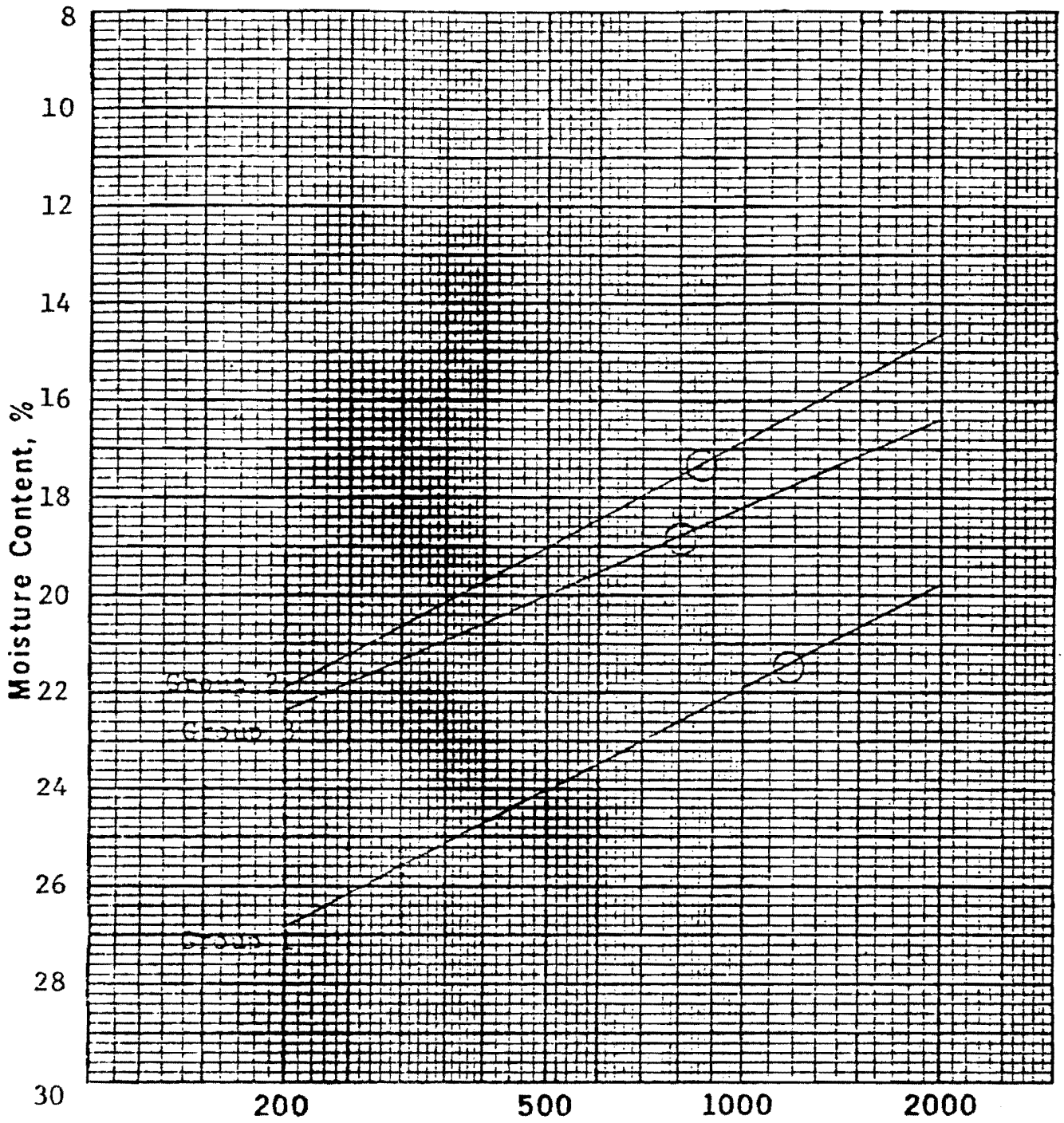
Project Watts Bar Nuclear Plant
ERCW Liquefaction
Feature Trench A
ASTM Designation D 698A
Date Tested 6-6-83
MOISTURE - PENETRATION TEST

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION
TRENCH A
FIGURE 2.5-534

Figure 2.5-534 ERCW Liquefaction Trench A



Soil Group	Optimum Moisture, %	Maximum Density, pcf	Penetration Resistance, psi
1-ML	21.4	99.7	1180
2-SM	17.3	108.4	860
3-ML	18.8	105.3	800

Remarks:

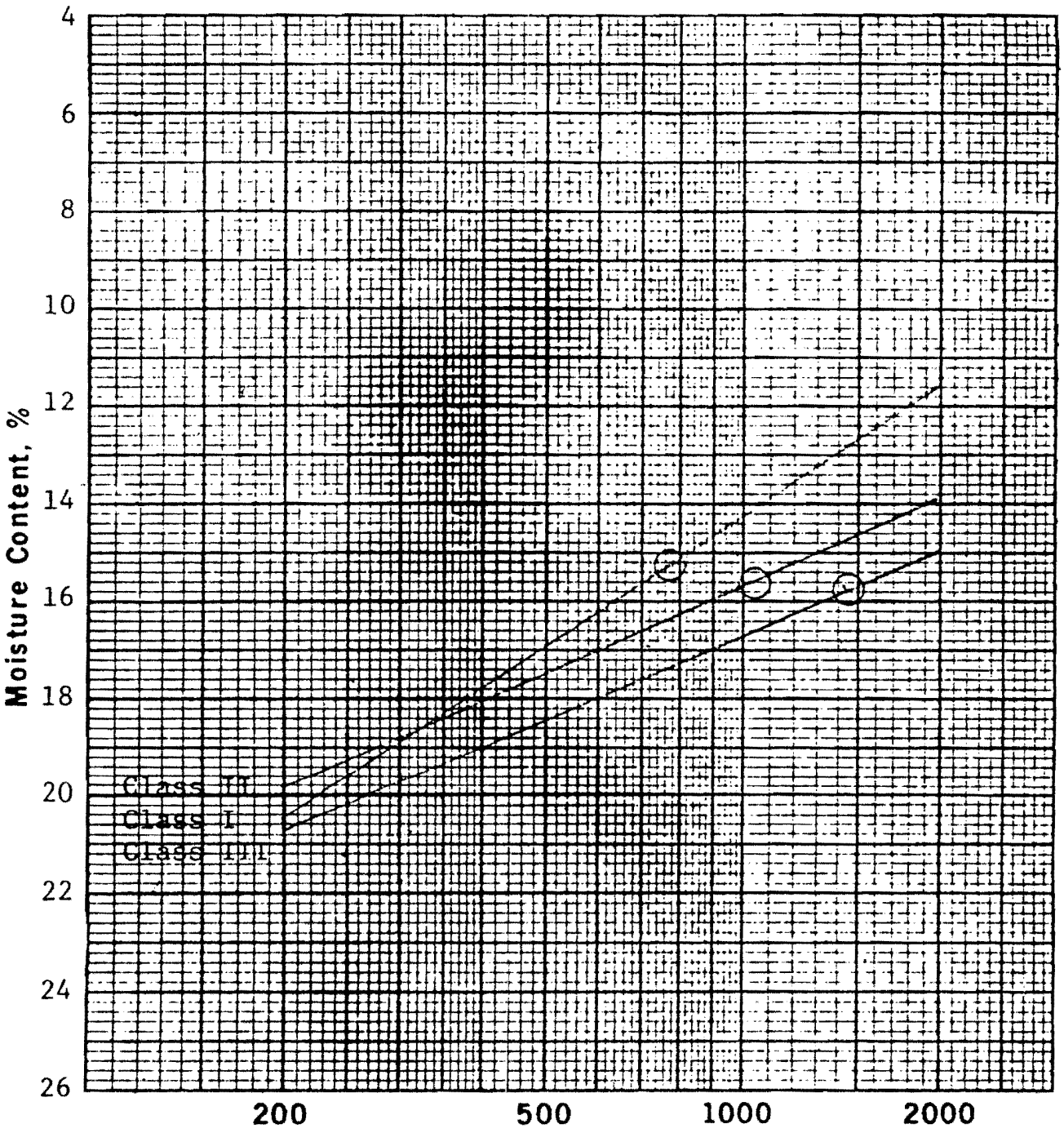
◯ Denotes Optimum Moisture

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION, TRENCH A
SUPPLEMENTAL BORROW
FIGURE 2.5-535

Added by Amendment 50

Figure 2.5-535 ERCW Liquefaction Trench A Supplemental Borrow



Soil Class	Optimum Moisture, %	Maximum Density, pcf	Penetration Resistance, psi
I-SM	15.3	110.7	770
II-SM-SC	15.6	110.3	1025
III-CL	15.8	109.8	1425

Remarks:

Added by Amendment 50

◯ **Denotes Optimum Moisture**

WATTS BAR NUCLEAR PLANT
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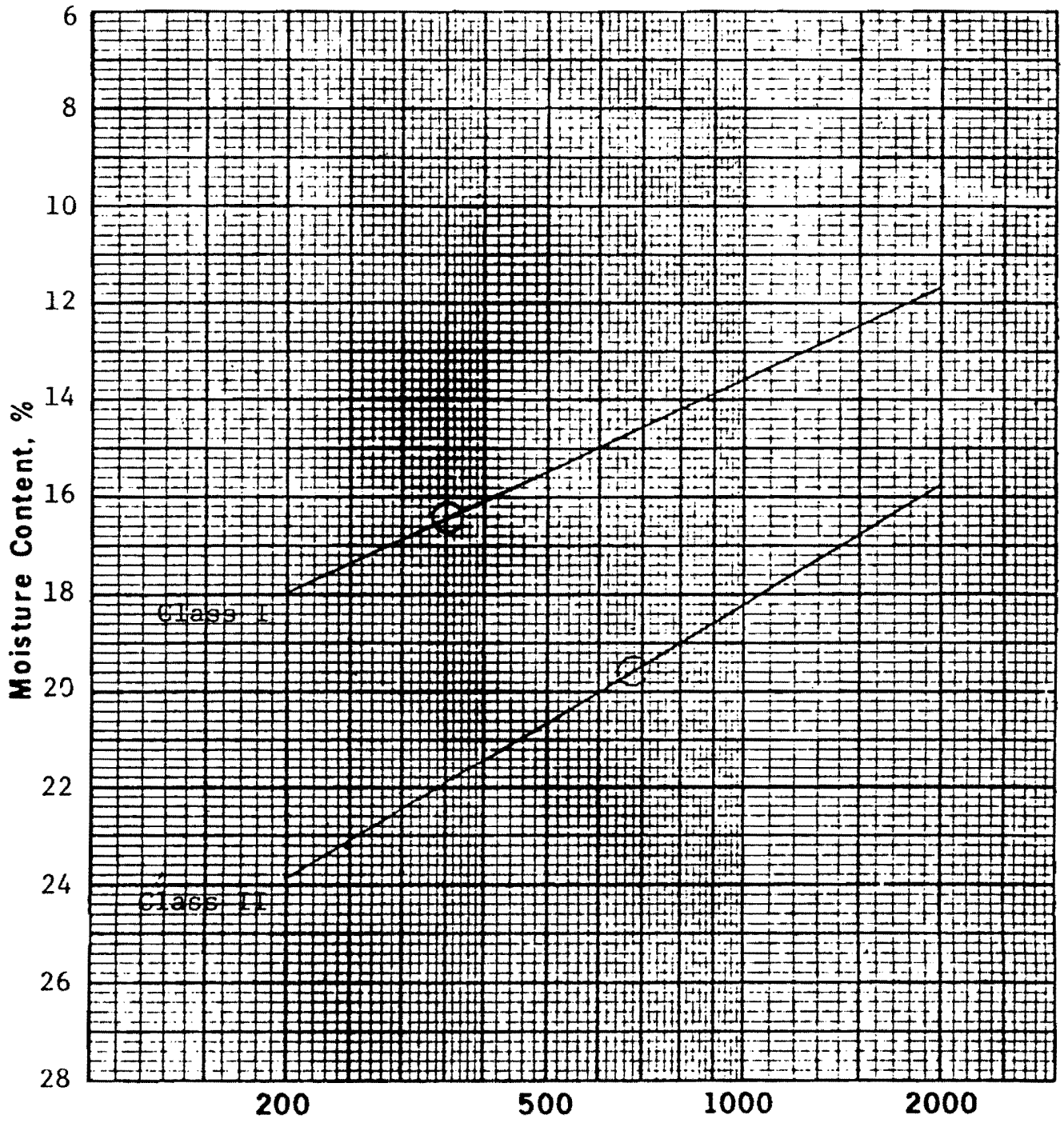
ANALYSIS REPORT

ERCW LIQUEFACTION
TRENCH B
FIGURE 2.5-536

Figure 2.5-536 ERCW Liquefaction Trench B



Soil Class	Optimum Moisture, %	Maximum Density, pcf	Penetration Resistance, psi
I-CL	16.4	110.3	350
II-CL-ML	19.6	104.0	680

Added by Amendment 50

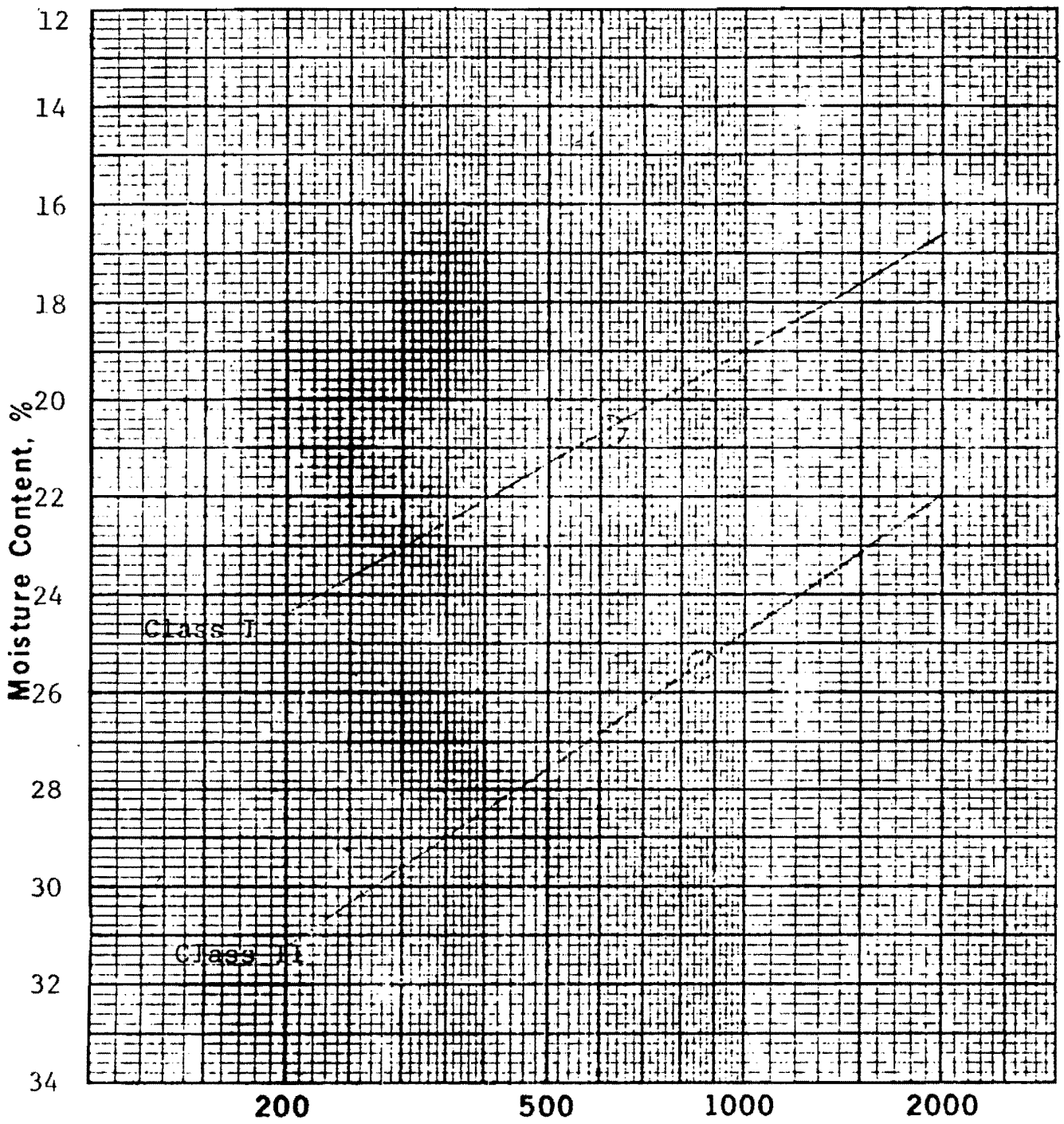
Remarks:

◯ Denotes Optimum Moisture

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION
BORROW AREA 9
FIGURE 2.5-537

Figure 2.5-537 ERCW Liquefaction Borrow Area 9



Soil Class	Optimum Moisture, %	Maximum Density, pcf	Penetration Resistance, psi
I-CL	20.6	103.0	620
II-CL-ML	25.4	93.3	860

Added by Amendment 50

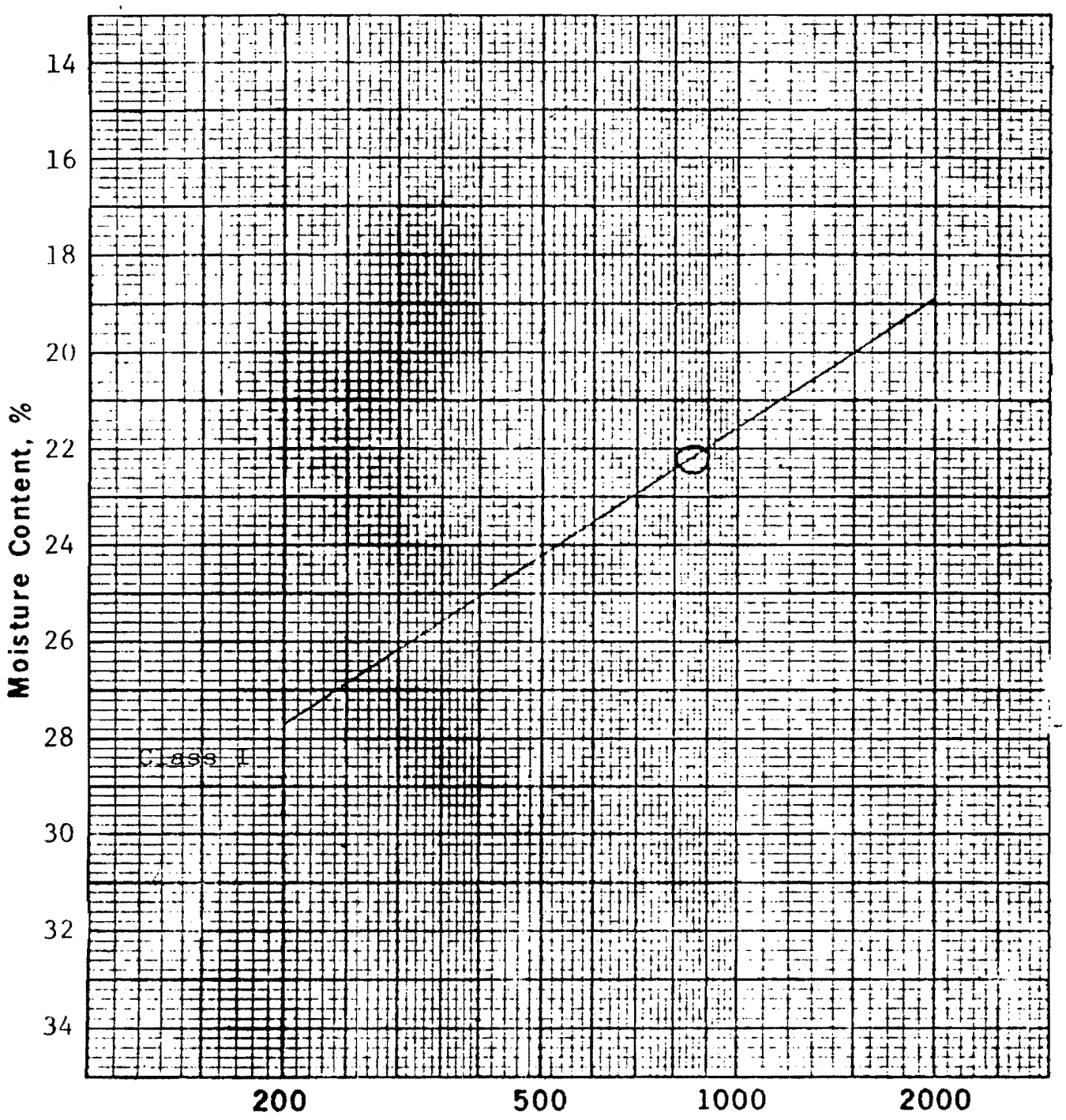
Remarks:

◯ Denotes Optimum Moisture

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION
BORROW AREA 10
FIGURE 2.5-538

Figure 2.5-538 ERCW Liquefaction Borrow Area 10



Soil Class	Optimum Moisture, %	Maximum Density, pcf	Penetration Resistance, psi
I-ML	22.2	99.8	850

Added by Amendment 50

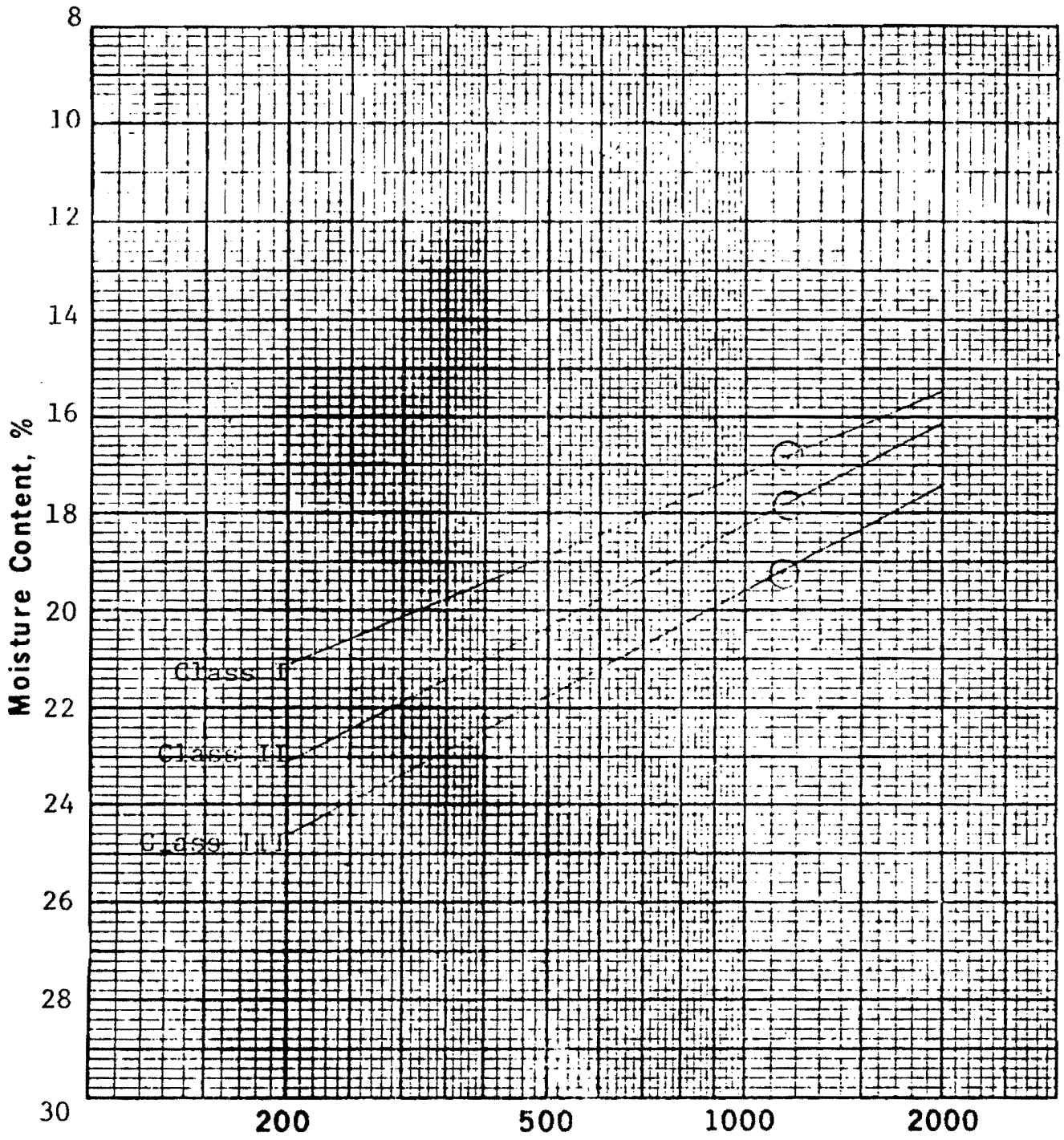
Remarks:

◯ Denotes Optimum Moisture

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION
BORROW AREA 11
FIGURE 2.5-539

Figure 2.5-539 ERCW Liquefaction Borrow Area 11



Soil Class	Optimum Moisture, %	Maximum Density, pcf	Penetration Resistance, psi
I-ML	16.8	108.8	1165
CL-II-ML	17.8	106.5	1150
CL-III-ML	19.2	103.7	1145

Added by Amendment 50

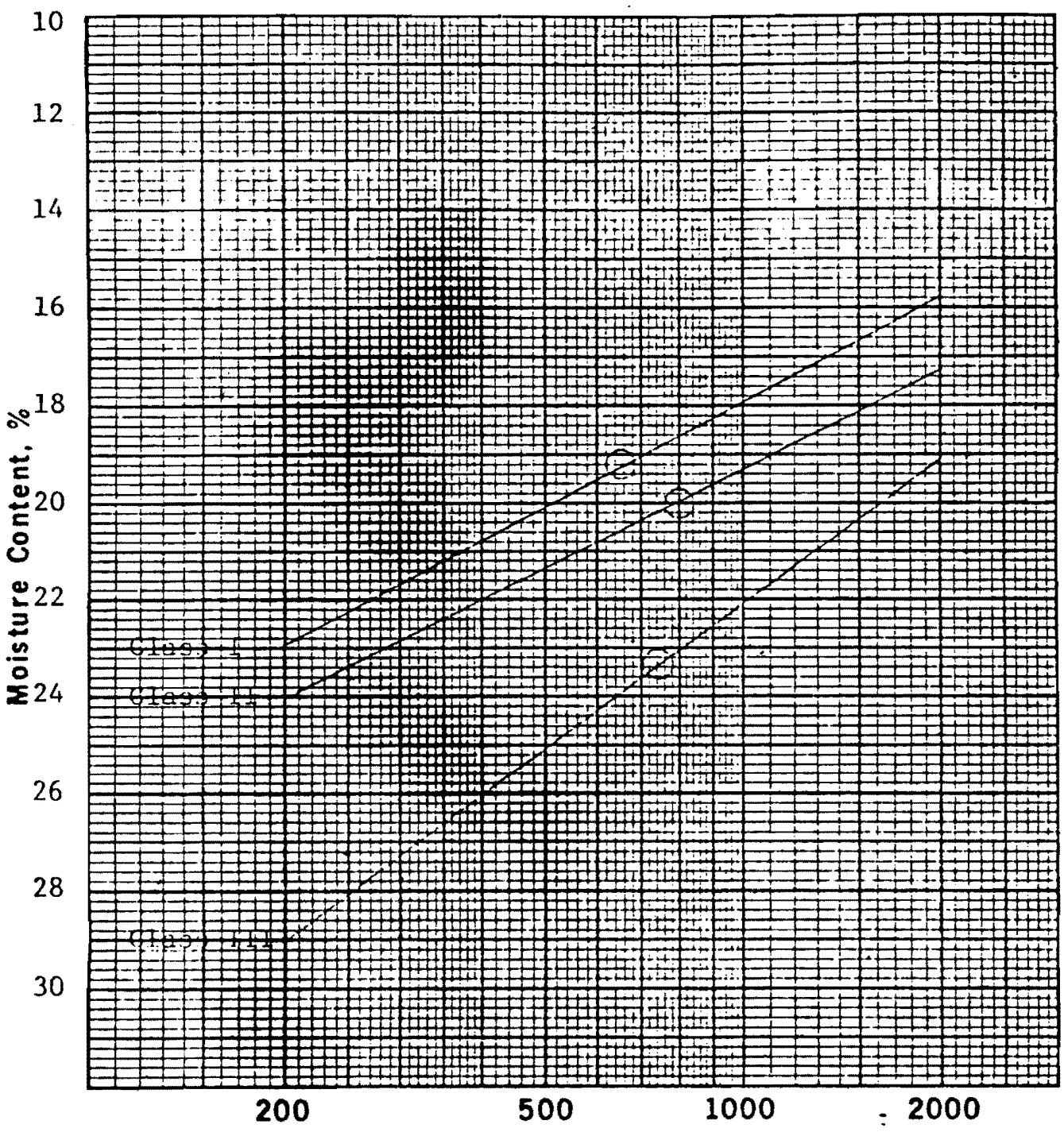
Remarks:

◯ Denotes Optimum Moisture

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION
BORROW AREA 12
FIGURE 2.5-540

Figure 2.5-540 ERCW Liquefaction Borrow Area 12



Soil Class	Optimum Moisture, %	Maximum Density, pcf	Penetration Resistance, psi
I-ML	19.2	106.6	650
II-ML	20.0	105.1	800
III-MH	23.3	98.8	740

Added by Amendment 50

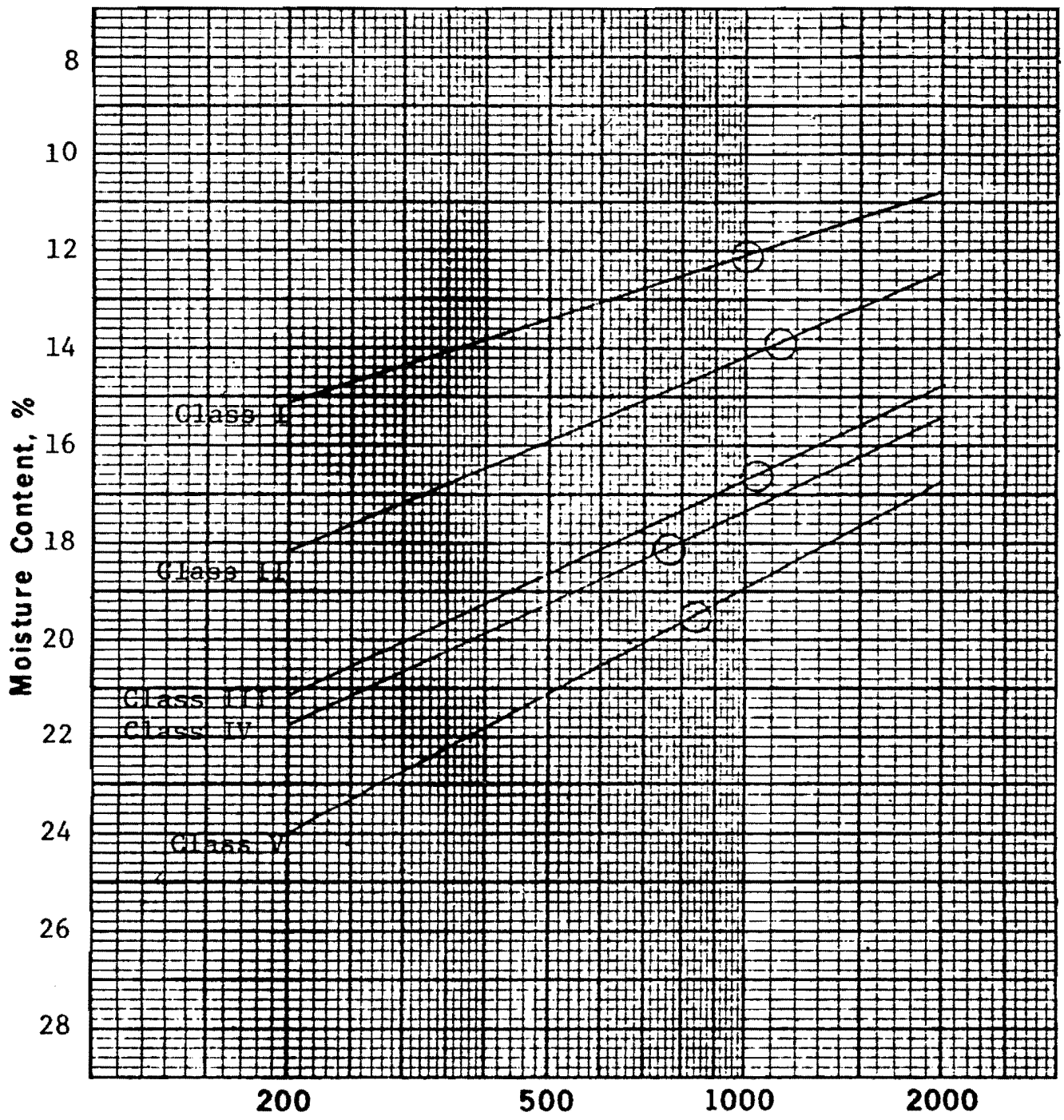
Remarks:

◯ Denotes Optimum Moisture

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION
BORROW AREA 13
FIGURE 2.5-541

Figure 2.5-541 ERCW Liquefaction Borrow Area 13



Soil Class	Optimum Moisture, %	Maximum Density, pcf	Penetration Resistance, psi
I-ML	12.1	117.7	1000
II-SM-SC	13.9	114.0	1125
III-CL	16.6	109.0	1050
IV-CL	18.1	106.2	760
V-CL-ML	19.5	103.5	840

Remarks:

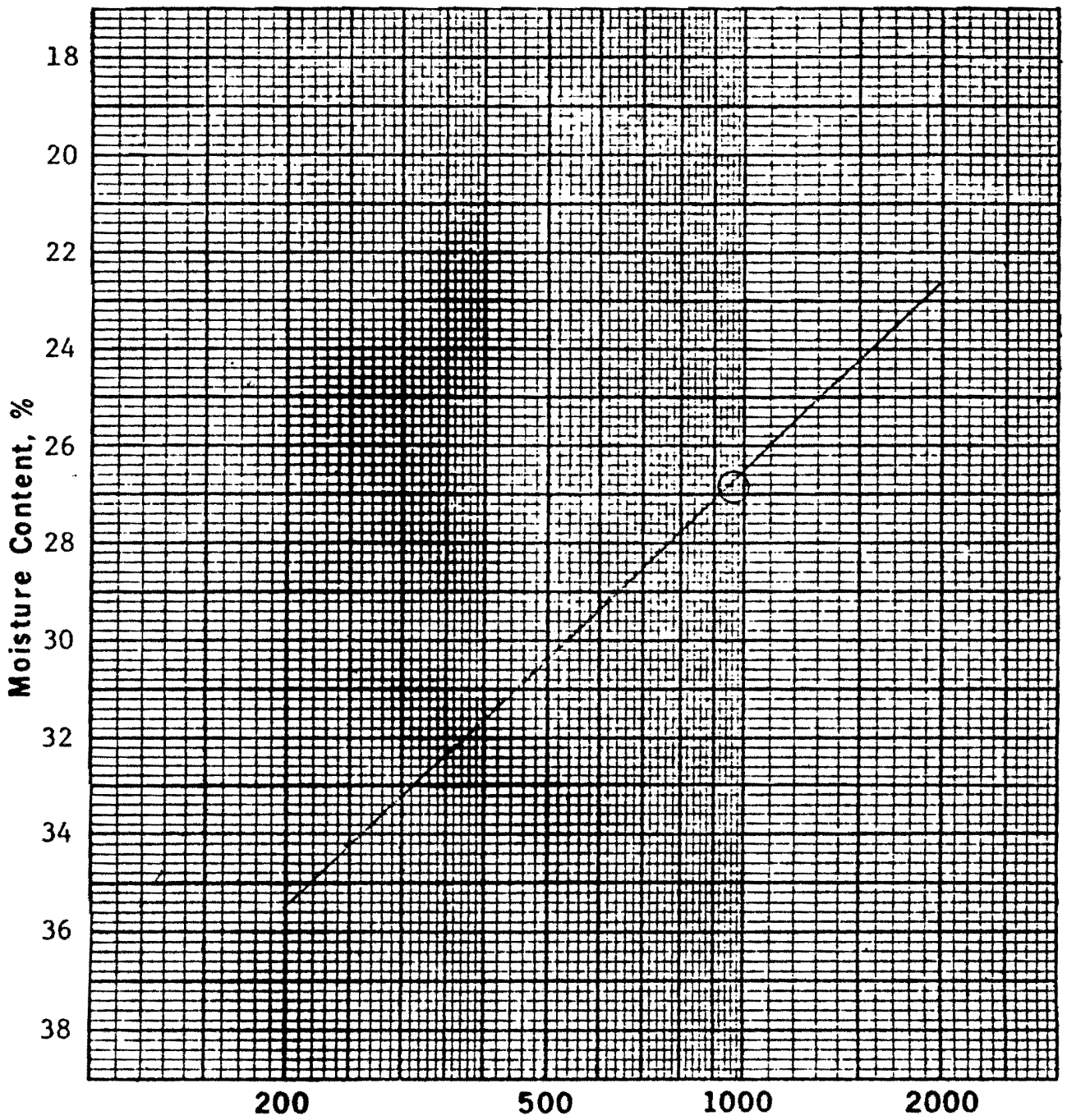
○ Denotes Optimum Moisture

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION
BORROW AREA 2C
FIGURE 2.5-542

Figure 2.5-542 ERCW Liquefaction Borrow Area 2C



Soil Class	Optimum Moisture, %	Maximum Density, pcf	Penetration Resistance, psi
VI-MH	26.8	90.8	950

Remarks:

◯ Denotes Optimum Moisture

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW LIQUEFACTION
BORROW AREA 2C
FIGURE 2.5-543

Figure 2.5-543 ERCW Liquefaction Borrow Area 2C

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

FIGURE 2.5-544

Added by Amendment 50

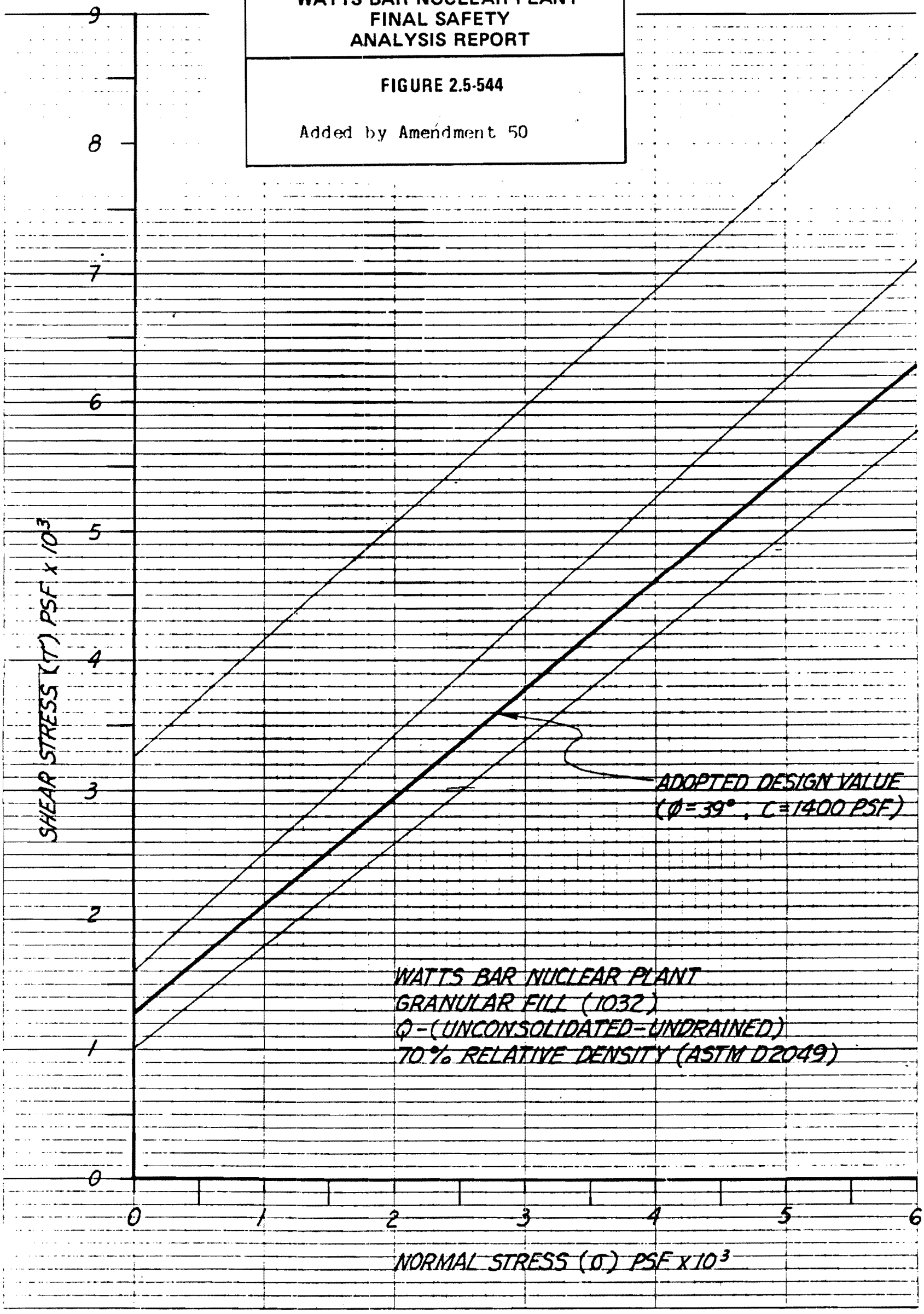


Figure 2.5-544 Watts Bar Nuclear Plant Granular Fill (1032) Q-(Unconsolidated-Undrained) 70% Relative Density (ASTM D2049)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

FIGURE 2.5-545

Added by Amendment 50

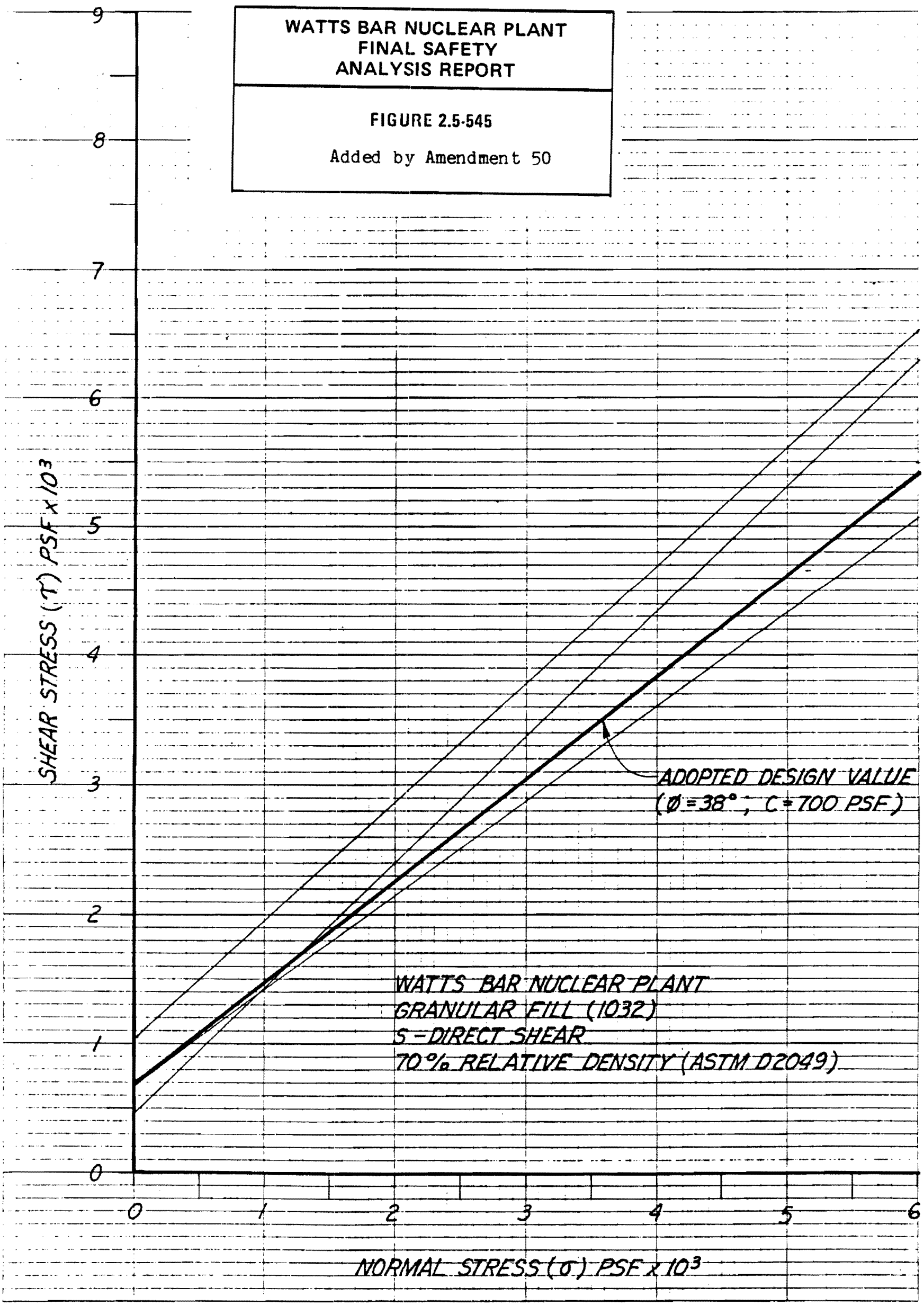


Figure 2.5-545 Watts Bar Nuclear Plant Granular Fill (1032) S-Direct Shear 70% Relative Density (ASTM 02049)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

FIGURE 2.5-546

Added by Amendment 50

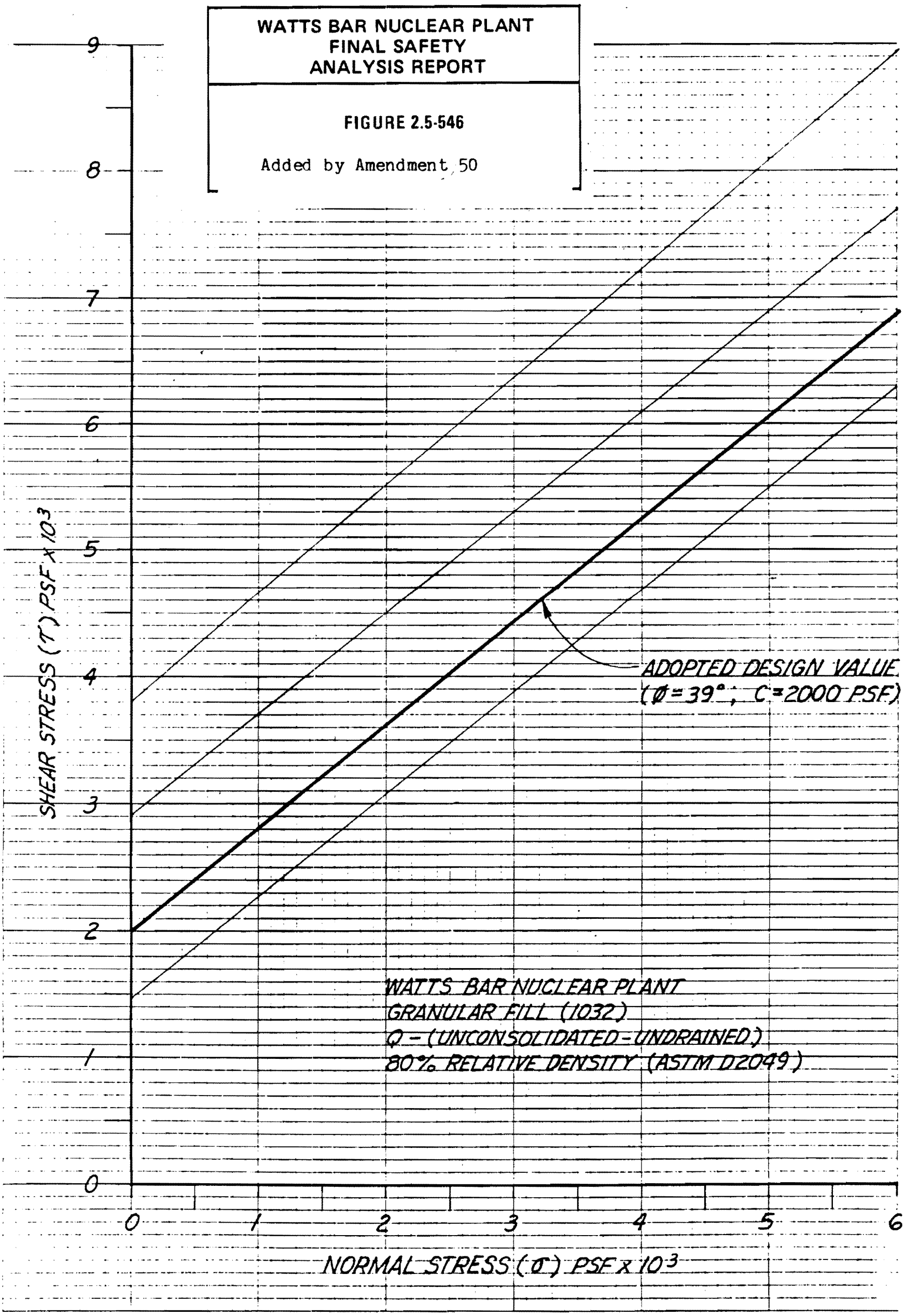


Figure 2.5-546 Watts Bar Nuclear Plant Granular Fill (1032) Q- (Unconsolidated - Undrained) 80% Relative Density (ASTM D2049)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

FIGURE 2.5-547

Added by Amendment 50

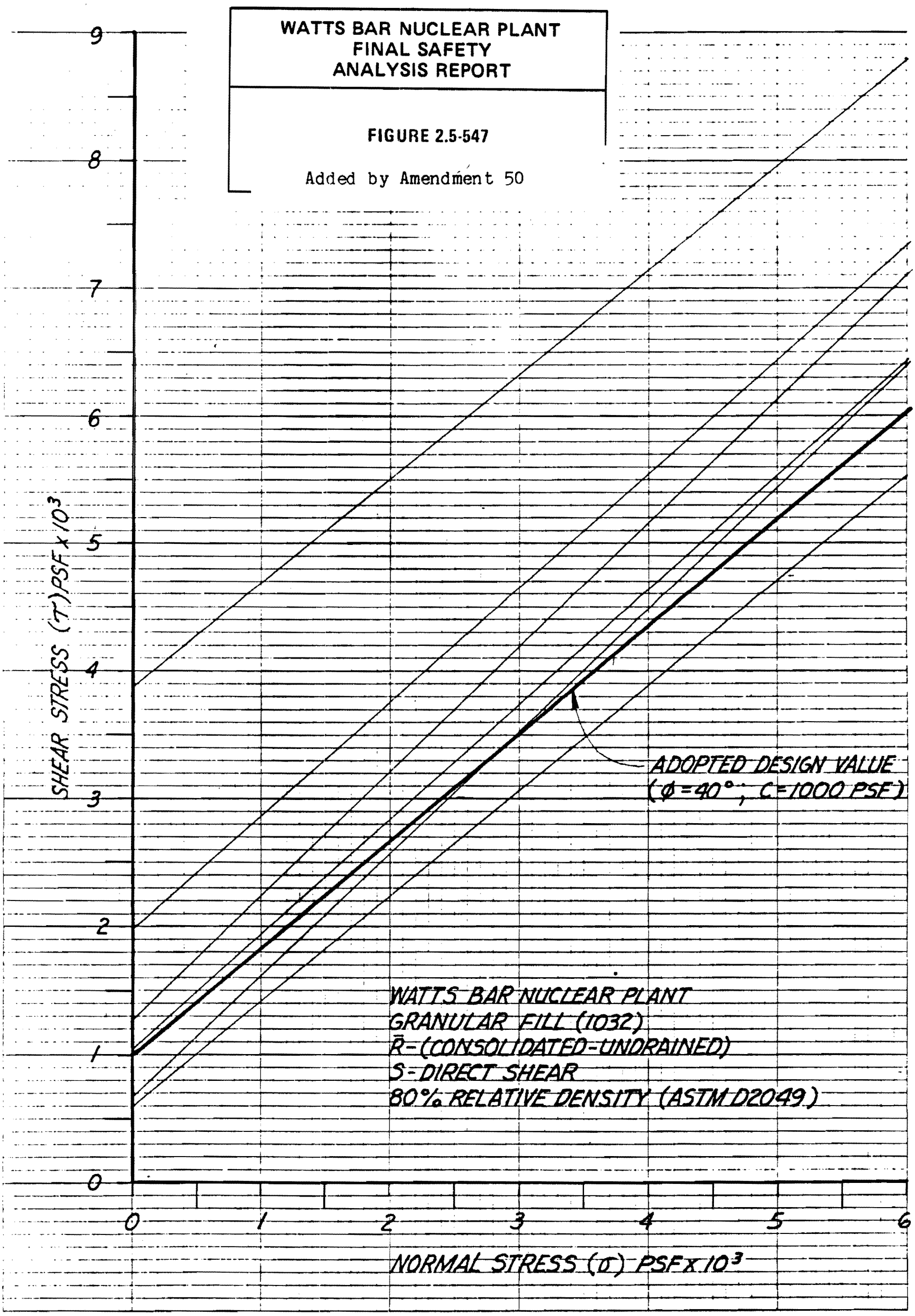


Figure 2.5-547 Watts Bar Nuclear Plant Granular Fill (1032) R- (Consolidated-Undrained) S-Direct: Shear 80% Relative Density (ASTM D2049)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

FIGURE 2.5-548

Summary of granular fill test data - relative density

Feature: DIESEL GENERATOR BUILDING

Period: 3-28-75 to 4-24-75 Test No. _____ to _____

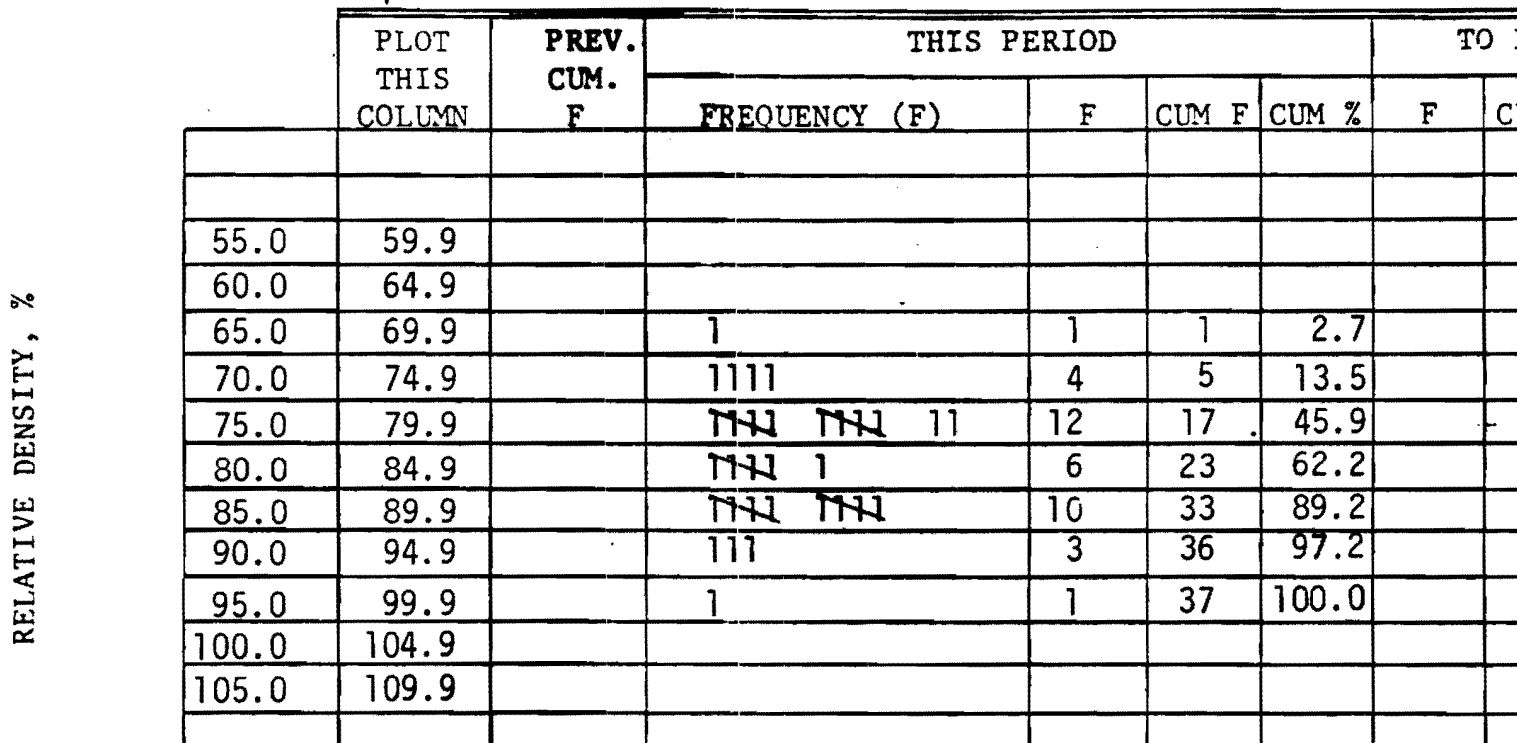
Part II Section _____ Prepared by _____

	PLOT THIS COLUMN	PREV. CUM. F	THIS PERIOD FREQUENCY (F)	F	CUM F	CUM %	TO DATE F	CUM F	CUM %
55.0	59.9								
60.0	64.9								
65.0	69.9		1	1	1	2.7			
70.0	74.9		1111	4	5	13.5			
75.0	79.9		𝍸 𝍸 11	12	17	45.9			
80.0	84.9		𝍸 1	6	23	62.2			
85.0	89.9		𝍸 𝍸	10	33	89.2			
90.0	94.9		111	3	36	97.2			
95.0	99.9		1	1	37	100.0			
100.0	104.9								
105.0	109.9								
TOTALS			- -	- -	37	- -	- -		- -

Specification Source 1032 MATERIAL

	PREV.	THIS PERIOD	TO DATE
Avg. Relative Density			81.0%

Specified Min. 70 % AS DETERMINED BY ASTM D2049



Remarks THESE TESTS COVER ALL DENSITY TESTS FOR THE CRUSHED STONE PLACED BELOW THE DIESEL GENERATOR BUILDING AT WATTS BAR NUCLEAR PLANT.

Added by Amendment 50

Figure 2.5-548 Summary. of Granular Fill Test Data -Relacive"Density Diesel Generator Building

Figure 2.5-549 ERCW Pipeline Section A-A (Actual Figure Located in Oversized Figures File) (Sheet 1 of 4)

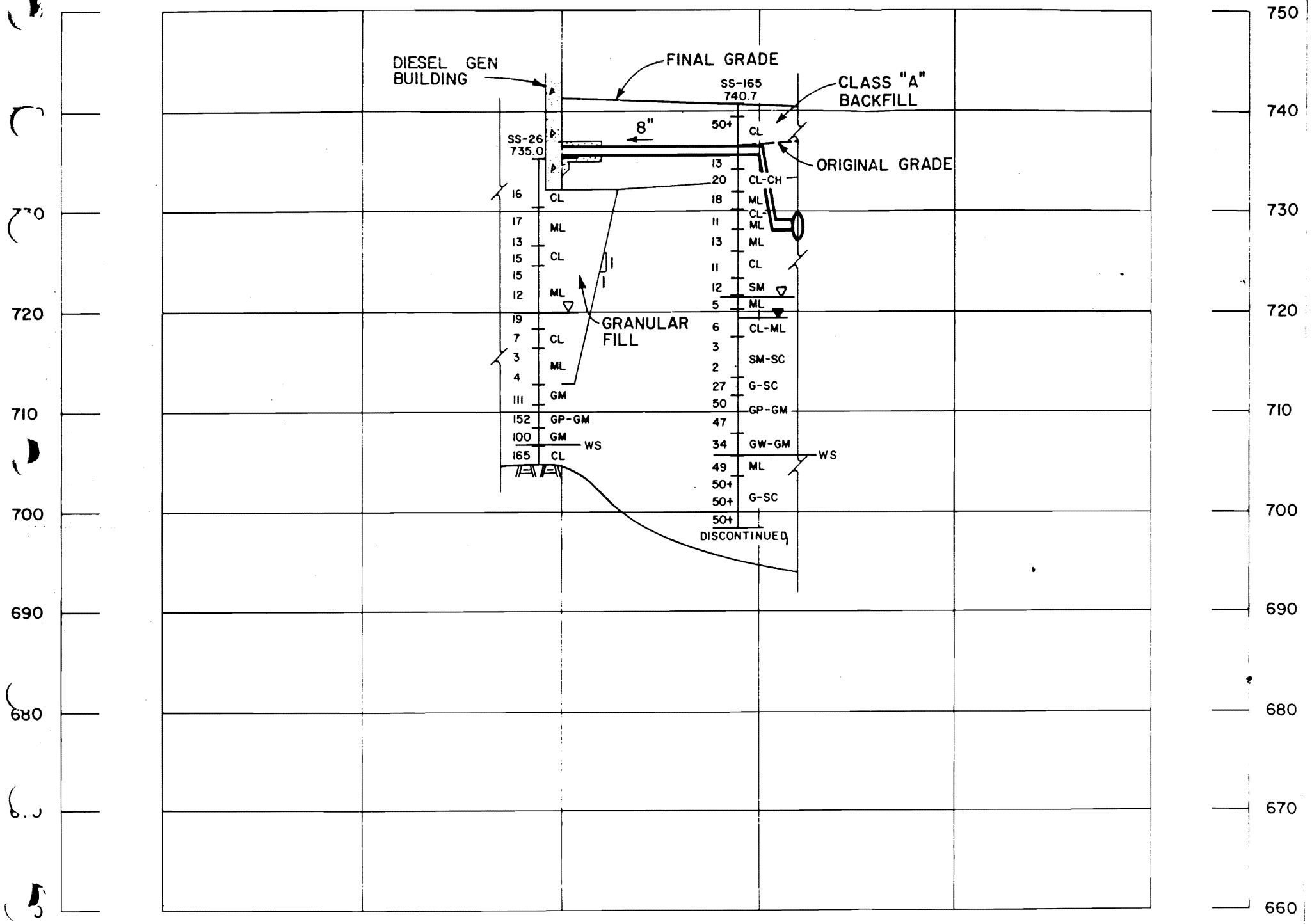
Figure 2.5-549 ERCW Pipeline Section A-A (Actual Figure Located in Oversized Figures File) (Sheet 2 of 4)

Figure 2.5-549 ERCW Pipeline Section A-A (Actual Figure Located in Oversized Figures File) (Sheet 3 of 4)

Figure 2.5-549 ERCW Pipeline Section A-A (Actual Figure Located in Oversized Figures File) (Sheet 4 of 4)

Figure 2.5-550 ERCU Pipeline Section B-B (Actual Figure Located in Oversized Figures File)

Figure 2.5-551 ERCU Pipeline Section C-C (Actual Figure Located in Oversized Figures File)



D-D

▽ DESIGN WATER TABLE

▼ WATER TABLE (24 HR)

MH SOIL CLASSIFICATION

13 BLOW COUNT

▨ POTENTIALLY LIQUEFIABLE (SEE NOTE)

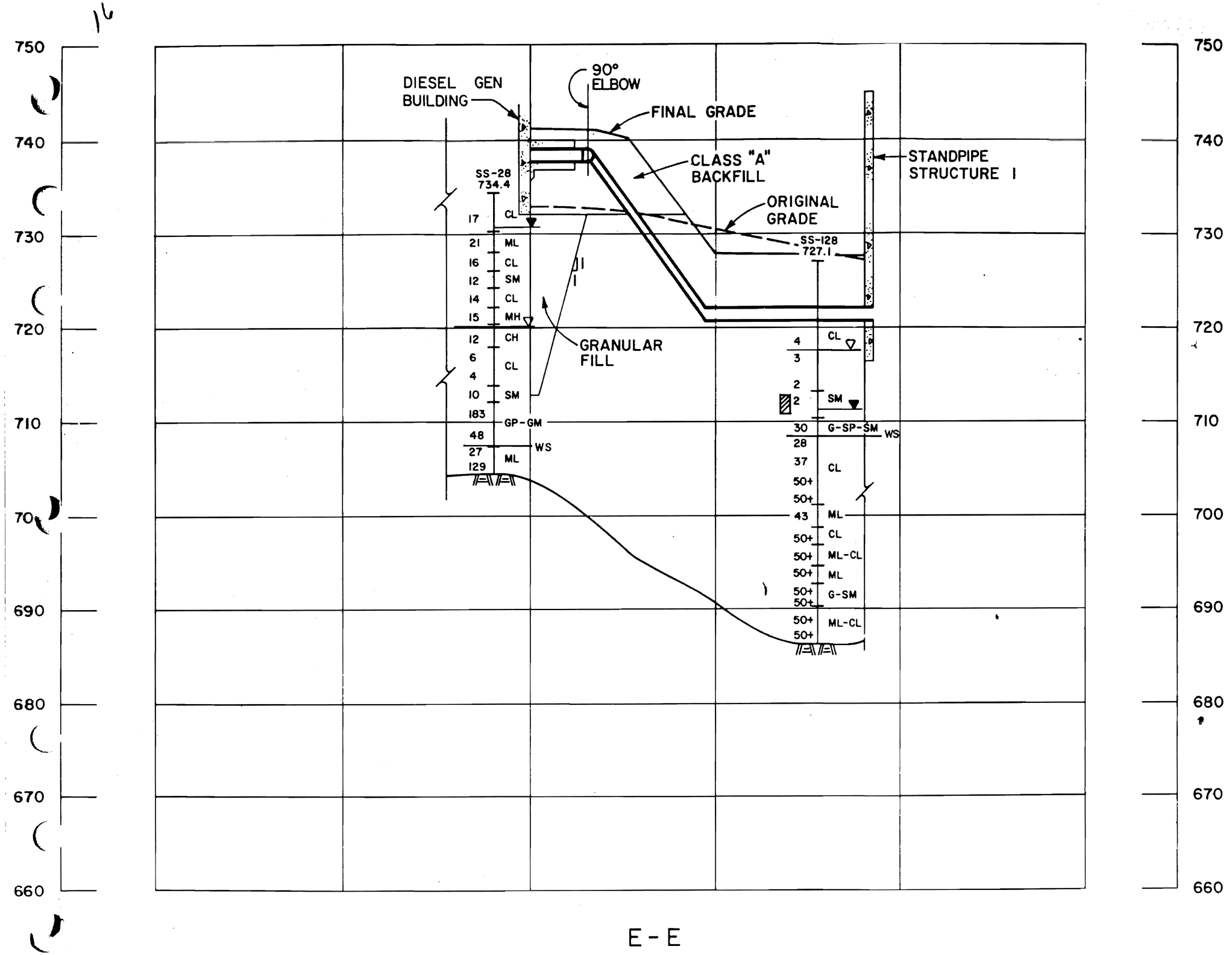
-WS WEATHERED SHALE

NOTE: LIQUEFACTION BASED ON TOP OF GROUND ACCELERATION OF 0.22g AN SEED-IDRISS (1981) CORRELATION FOR SANDS.

Added by Amendment 50

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
ERCW PIPELINE SECTION D-D FIGURE 2.5-552

Figure 2.5-552 ERCW Pipeline Section D-D



▽ DESIGN WATER TABLE

▼ WATER TABLE (24HR)

MH SOIL CLASSIFICATION

13 BLOW COUNT

▨ POTENTIALLY LIQUEFIABLE (SEE NOTE)

–WS WEATHERED SHALE

NOTE: LIQUEFACTION BASED ON TOP OF GROUND ACCELERATION OF 0.22g AND SEED-IDRISS(1981) CORRELATION FOR SANDS.

Added by Amendment 50

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
ERCW PIPELINE SECTION E-E FIGURE 2.5-553

Figure 2.5-553 ERCW Pipeline Section E-E

Figure 2.5-554 Category I Electrical Conduits Section F-F (Actual Figure Located in Oversized Figures File)(Sheet 1 of 2)

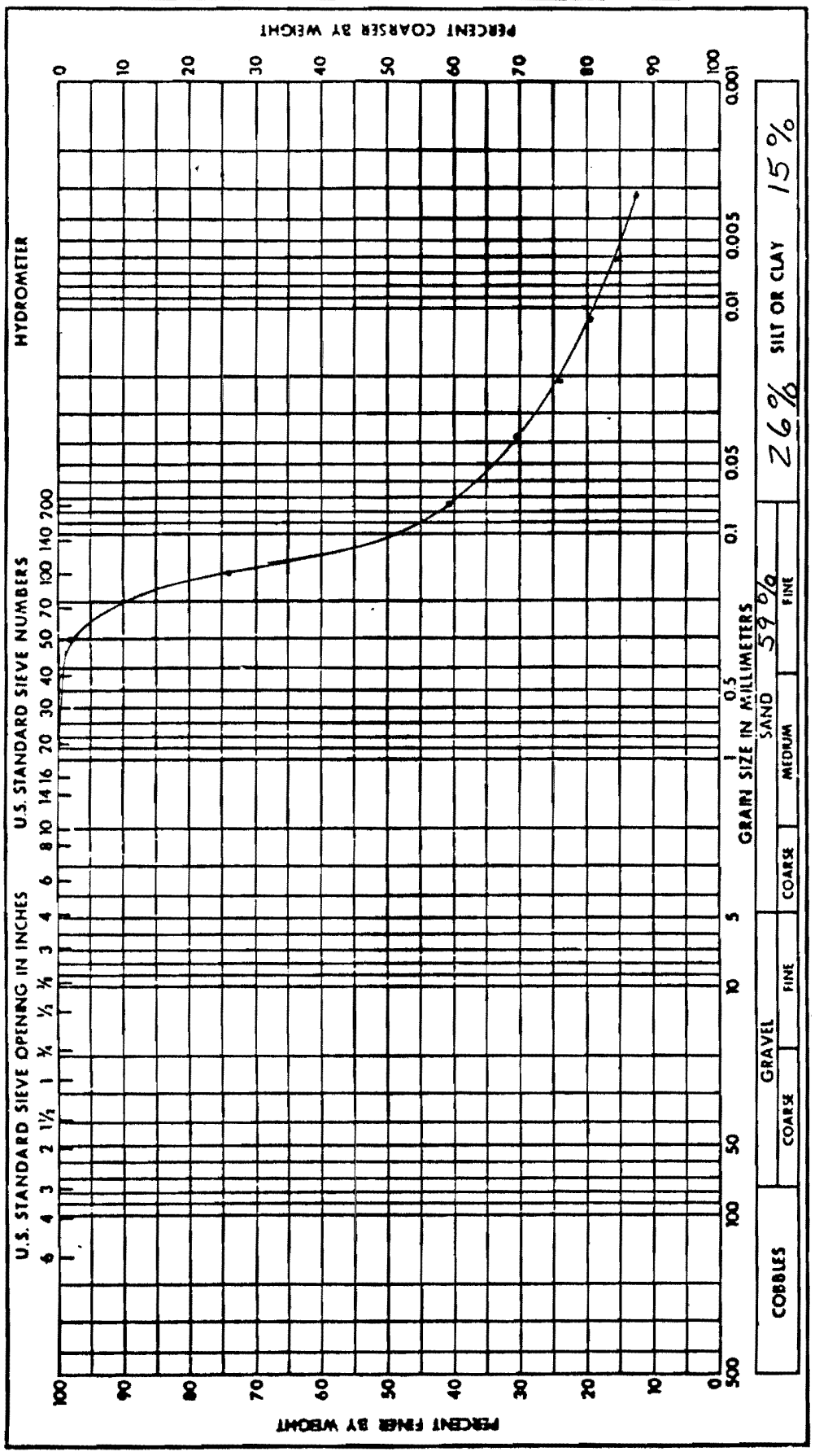
Figure 2.5-554 Category I Electrical Conduits Section F-F (Actual Figure Located in Oversized Figures File)(Sheet 2 of 2)

Figure 2.5-555 Category I Electrical Conduits Section G-G (Actual Figure Located in Oversized Figures File)

Figure 2.5-556 Category I Electrical Conduits Section H-H (Actual Figure Located in Oversized Figures File)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

CLASS IE CONDUIT
FIGURE 2.5-557



Project	Watts Bar N.P.		
Feature	CLASS 1E CONDUIT	Sample No.	GP. 9
Boring No.	SS-50	Offset	
Station		Elevation	-75
Date	10-1-75		

GRAIN SIZE ANALYSIS

Remarks:
N=5
ω = 28.2

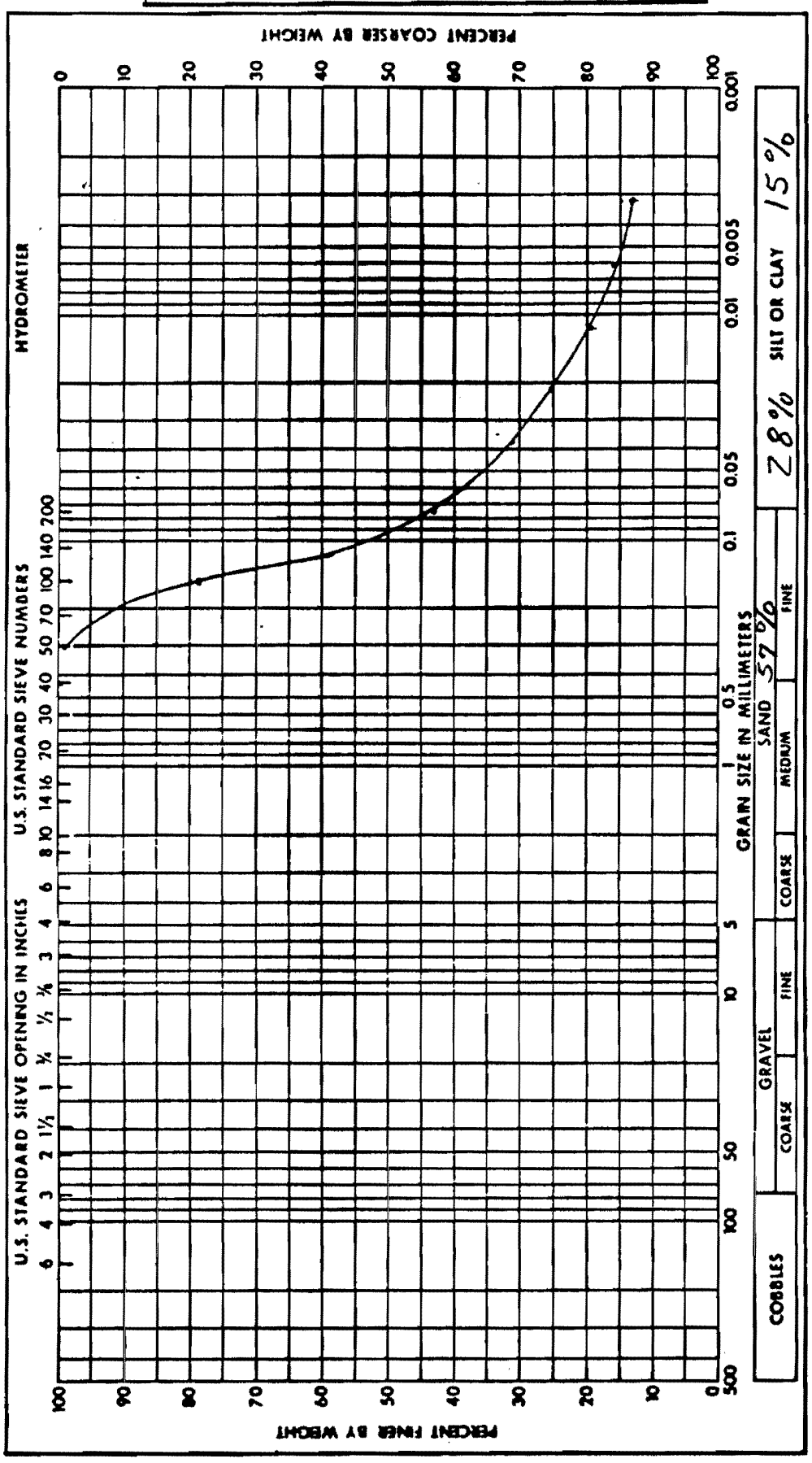
Soil Symbol	SM	Liquid Limit, %	NP
Moisture Content, %		Plastic Limit, %	NP
Specific Gravity		Plasticity Index, %	NP
		Shrinkage Limit, %	

Figure 2.5-557 Class IE Conduit

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

CLASS IE CONDUIT
FIGURE 2.5-558



Soil Symbol	SM	Liquid Limit, %	NP
Moisture Content, %		Plastic Limit, %	NP
Specific Gravity		Plasticity Index, %	NP
		Shrinkage Limit, %	

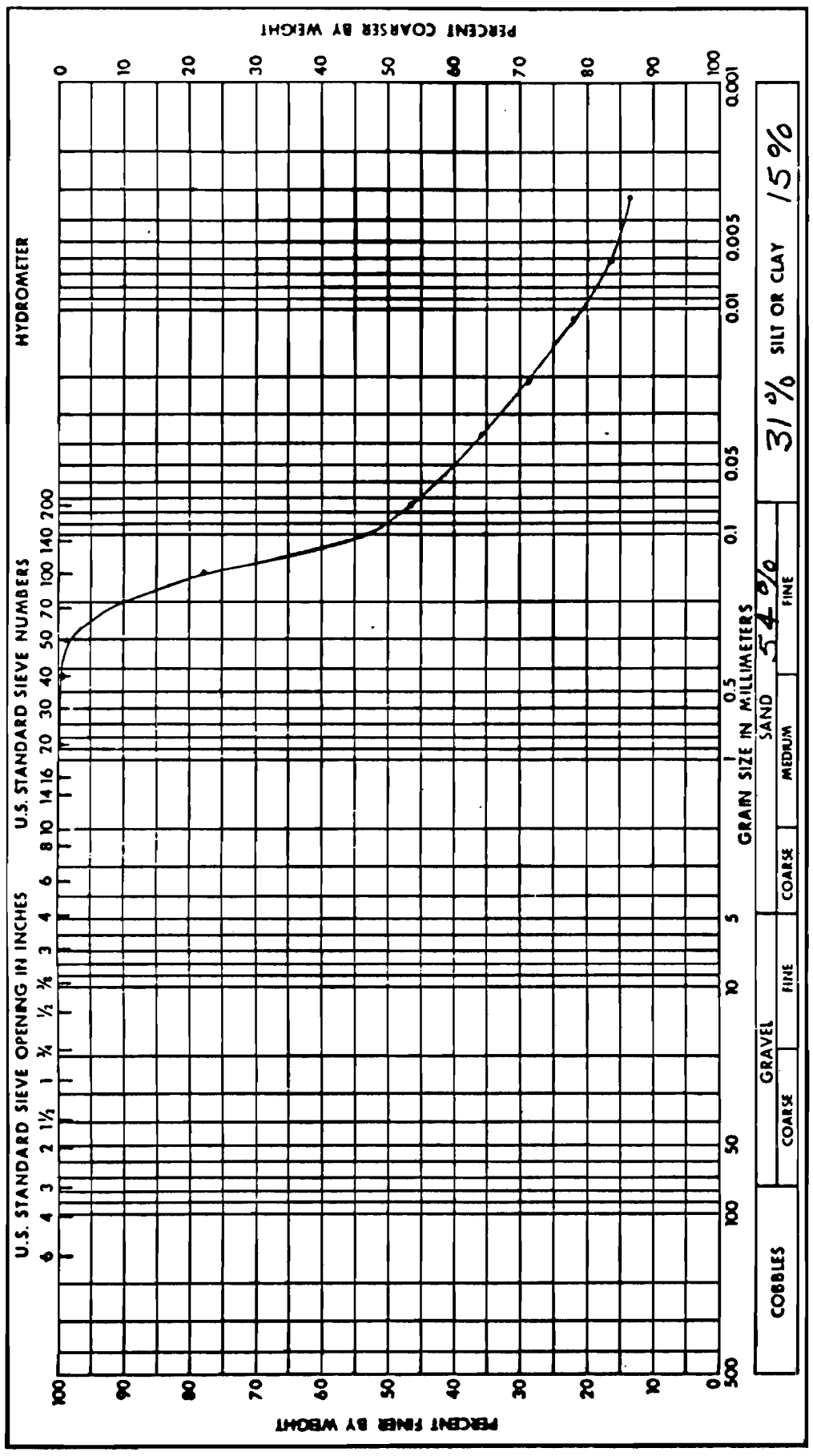
Remarks:
N = 8
ω = 29.1

Figure 2.5-558 Class IE Conduit

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

CLASS IE CONDUIT
FIGURE 2.5-559



Project WATTS BAR N.P.	
Feature CLASS 1E CONDUIT	Sample No. GP. 11
Boring No. SS-50	Offset
Station	Elevation
Date 10-7-75	

GRAIN SIZE ANALYSIS

Remarks:
N = 2
w = 31.5

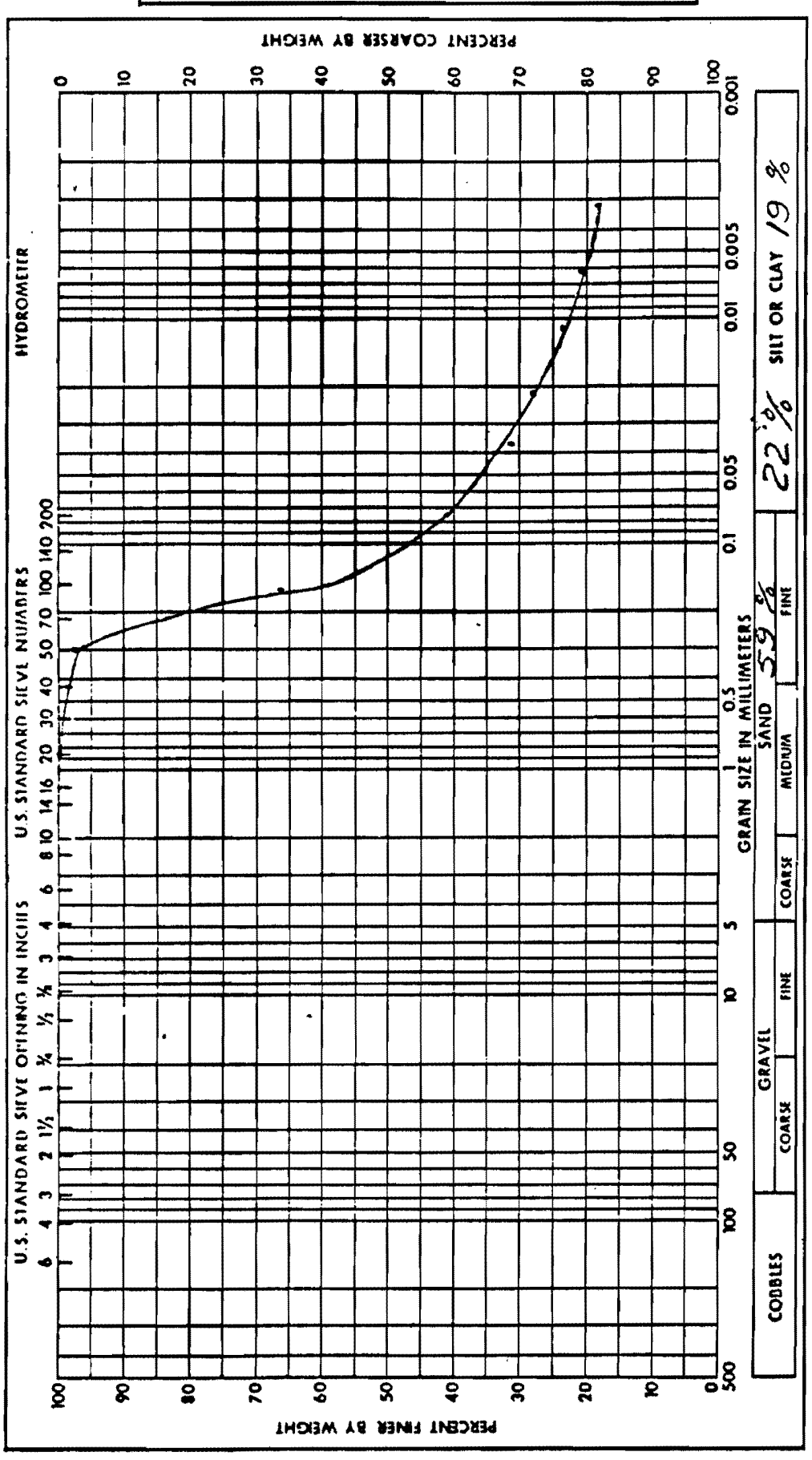
Soil Symbol	SM	Liquid Limit, %	NP
Moisture Content, %		Plastic Limit, %	NP
Specific Gravity		Plasticity Index, %	NP
		Shrinkage Limit, %	

Added by Amendment 50

Figure 2.5-559 Class IE Conduit

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

IE CONDUIT
FIGURE 2.5-560



Remarks:
N = 15
ω = 20.9

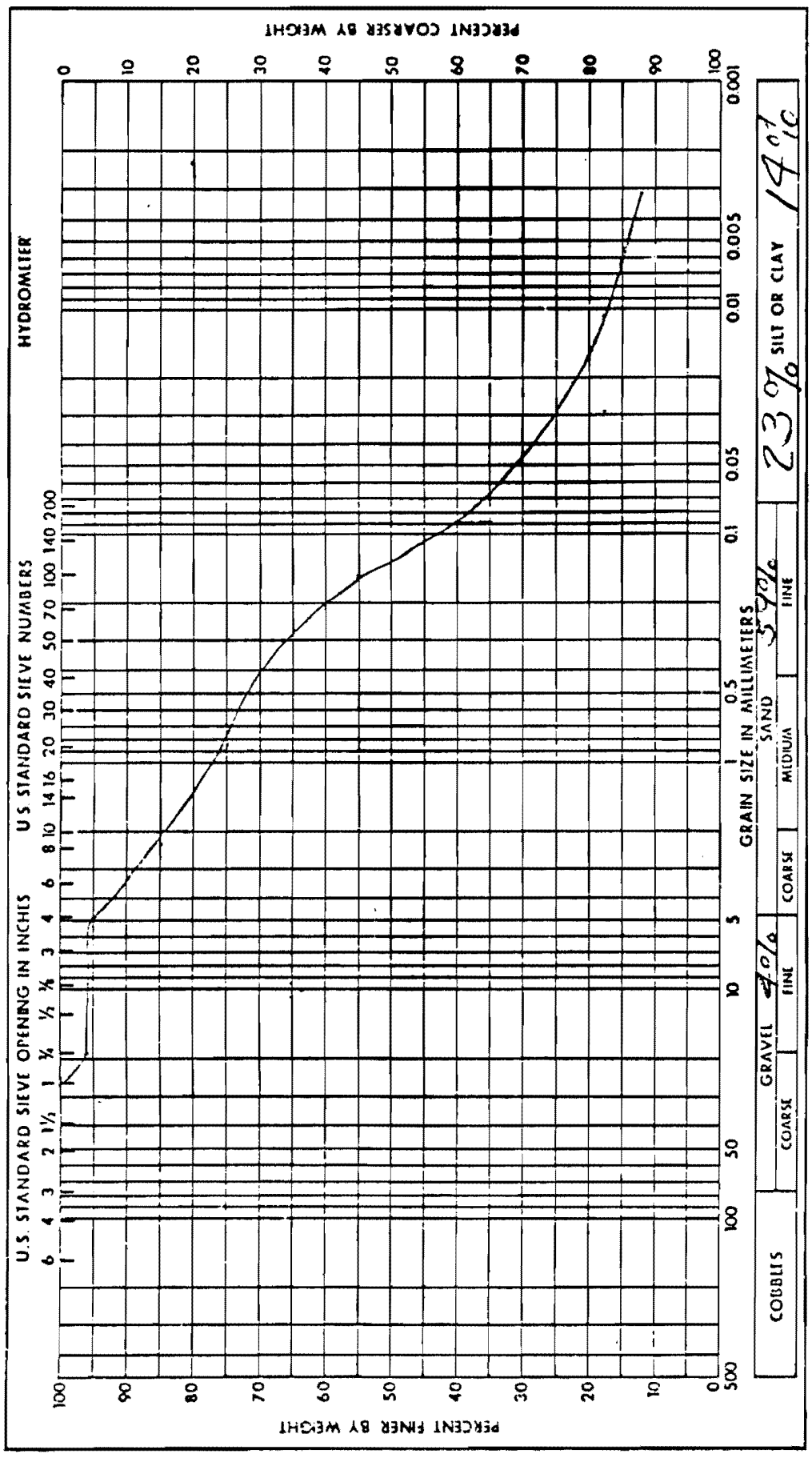
Soil Symbol	SM	Liquid Limit, %	29.7
Moisture Content, %		Plastic Limit, %	28.1
Specific Gravity		Plasticity Index, %	1.6
		Shrinkage Limit, %	

Figure 2.5-560 Class IE Conduit

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

IE CONDUIT
FIGURE 2.5-561



Project Watts Bar NP
Feature IE Conduit
Boring No. CS-60 Sample No. 104
Station Offset
Date 1-16-71 Elevation
GRAIN SIZE ANALYSIS

Remarks:
N = 12
w = 11.2

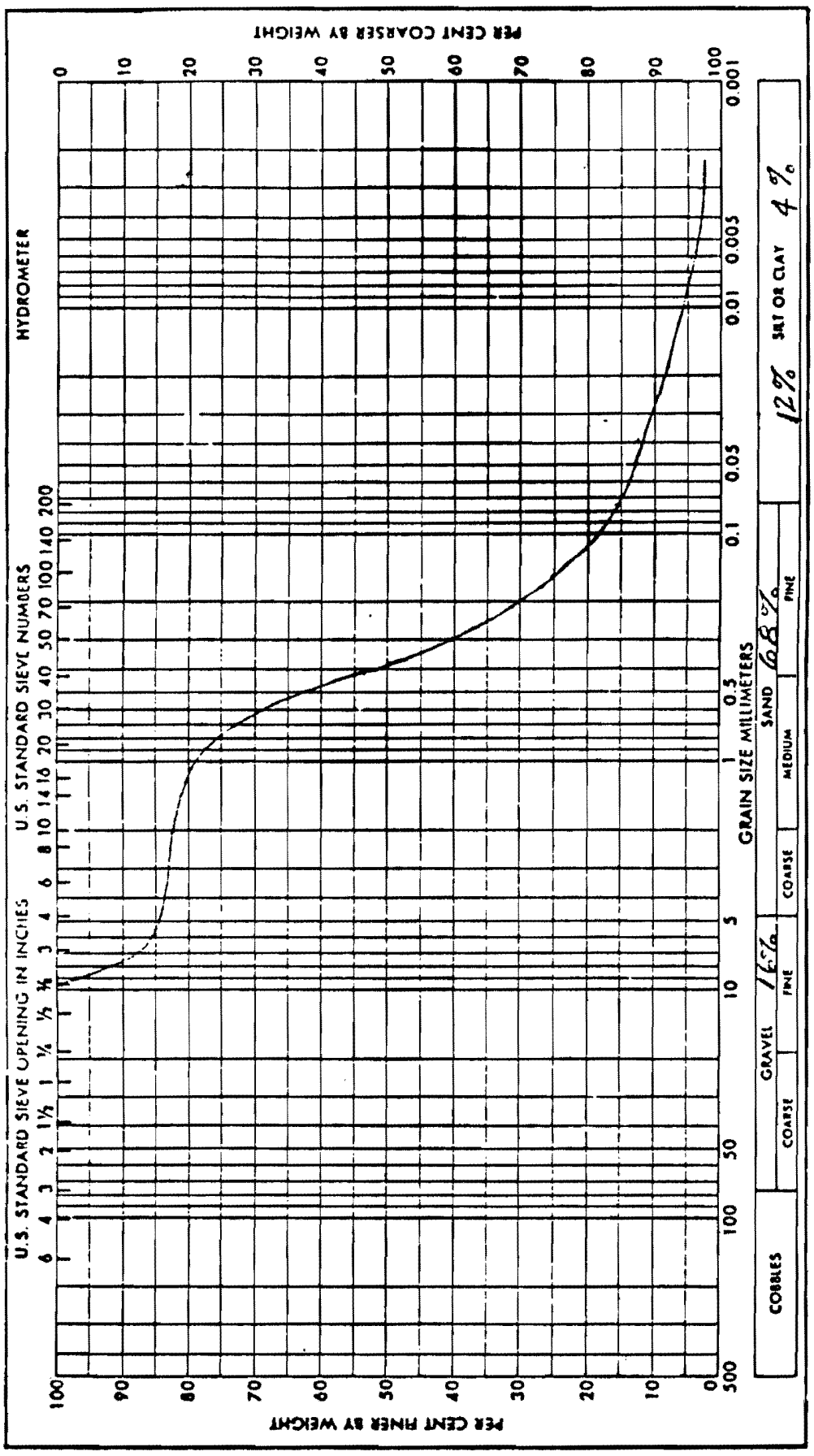
Soil Symbol	SM	Liquid Limit, %	NP
Moisture Content, %		Plastic Limit, %	NP
Specific Gravity		Plasticity Index, %	NP
		Shrinkage Limit, %	

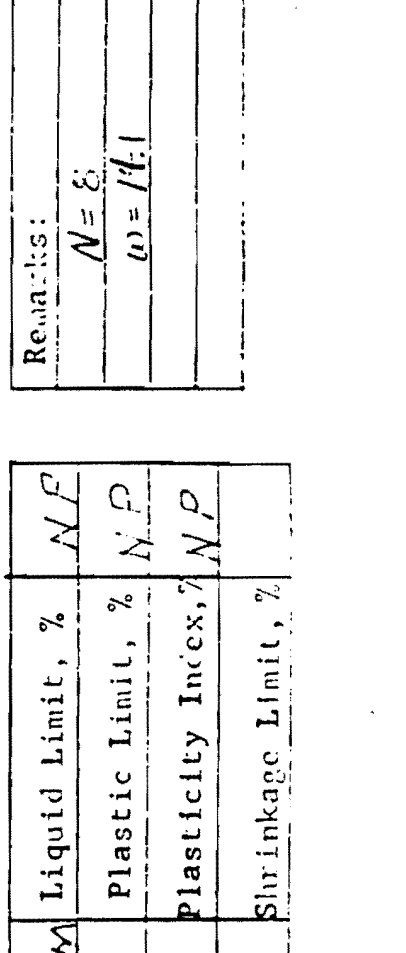
Added by Amendment 50

Figure 2.5-561 Class IE Conduit

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

FIGURE 2.5-562



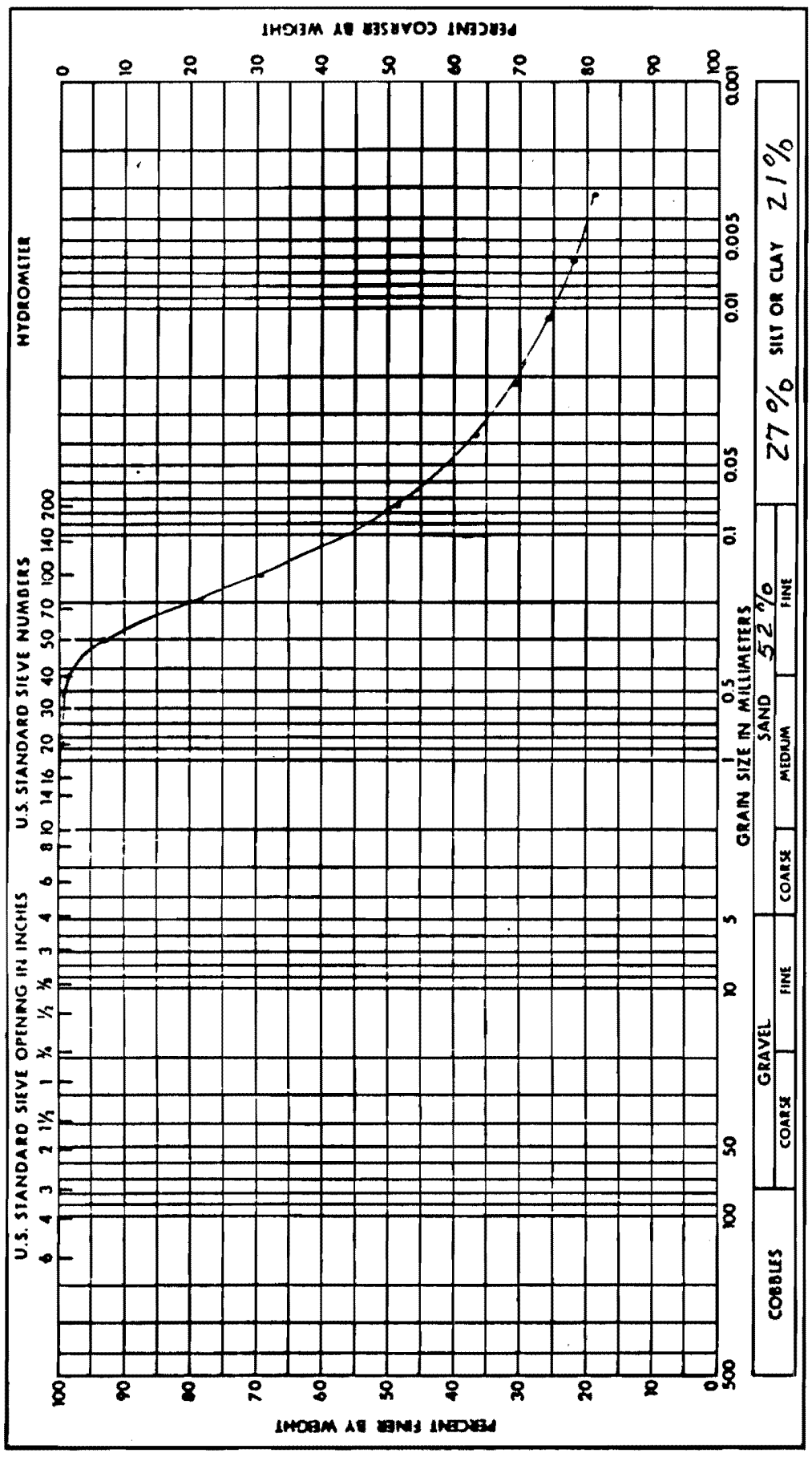


Added by Amendment 50

Figure 2.5-562 Class IE Conduit

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

CLASS IE CONDUIT
FIGURE 2.5-563



Project	WATTS BAR N.P
Feature	CLASS 1E CONDUIT
Boring No.	SS-63
Station	
Date	[illegible]
Sample No.	[illegible]
Offset	
Elevation	

GRAIN SIZE ANALYSIS

Remarks:
N = 10
ω = 20.7

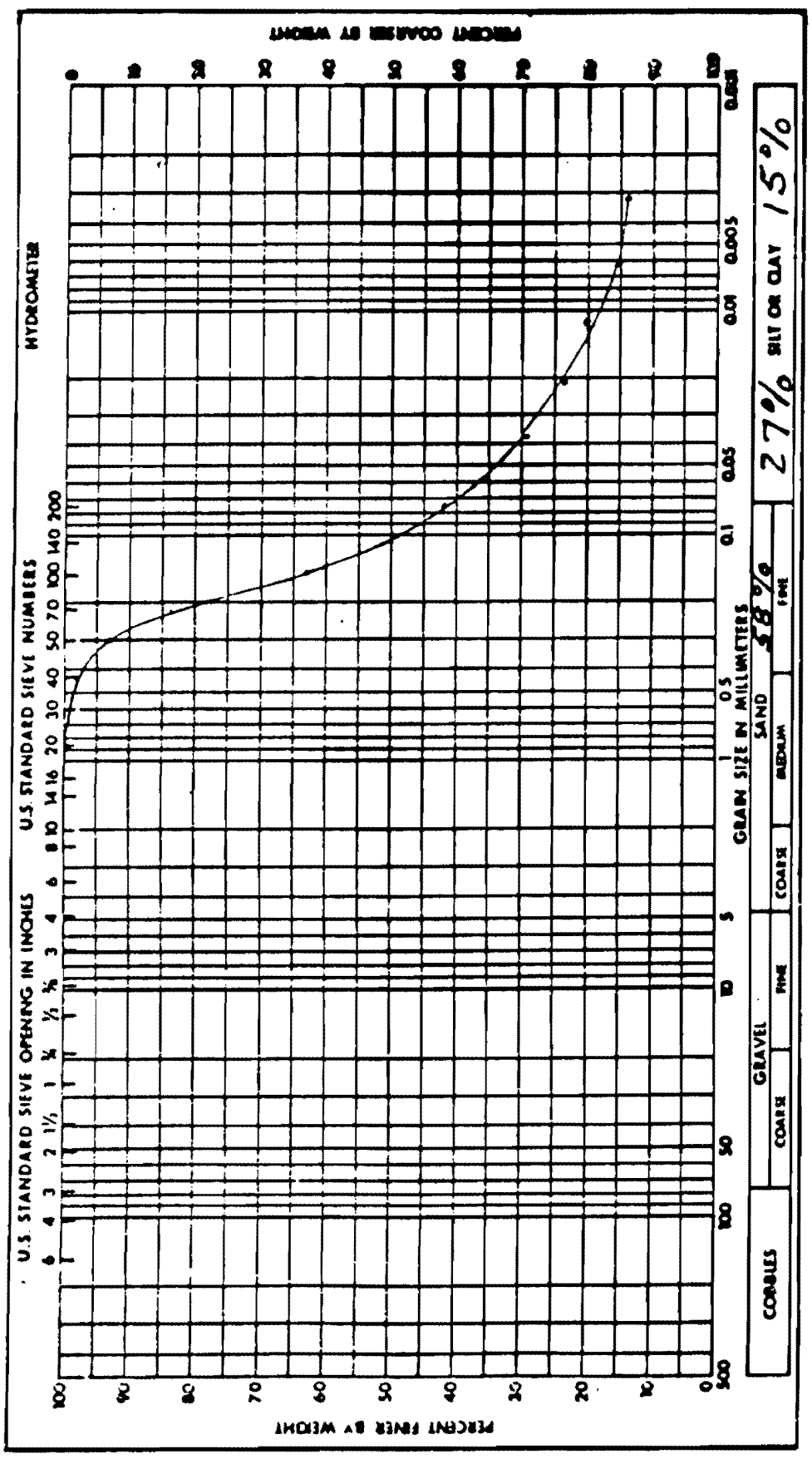
Soil Symbol	SM	
Moisture Content, %		36.0
Specific Gravity		26.0
		10.0
	Liquid Limit, %	
	Plastic Limit, %	
	Plasticity Index, %	
	Shrinkage Limit, %	

Added by Amendment 50

Figure 2.5-563 Class IE Conduit

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW & HPFP SYSTEM
FIGURE 2.5-564



Project	WATTS BAR N.P.
Feature	ERCW & HPFP SYSTEM
Boring No.	SS-92
Sample No.	3A4A
Station	Offset
Date	11-26-75
Elevation	719.7 to 720.5

GRAIN SIZE ANALYSIS

Remarks:
N=5

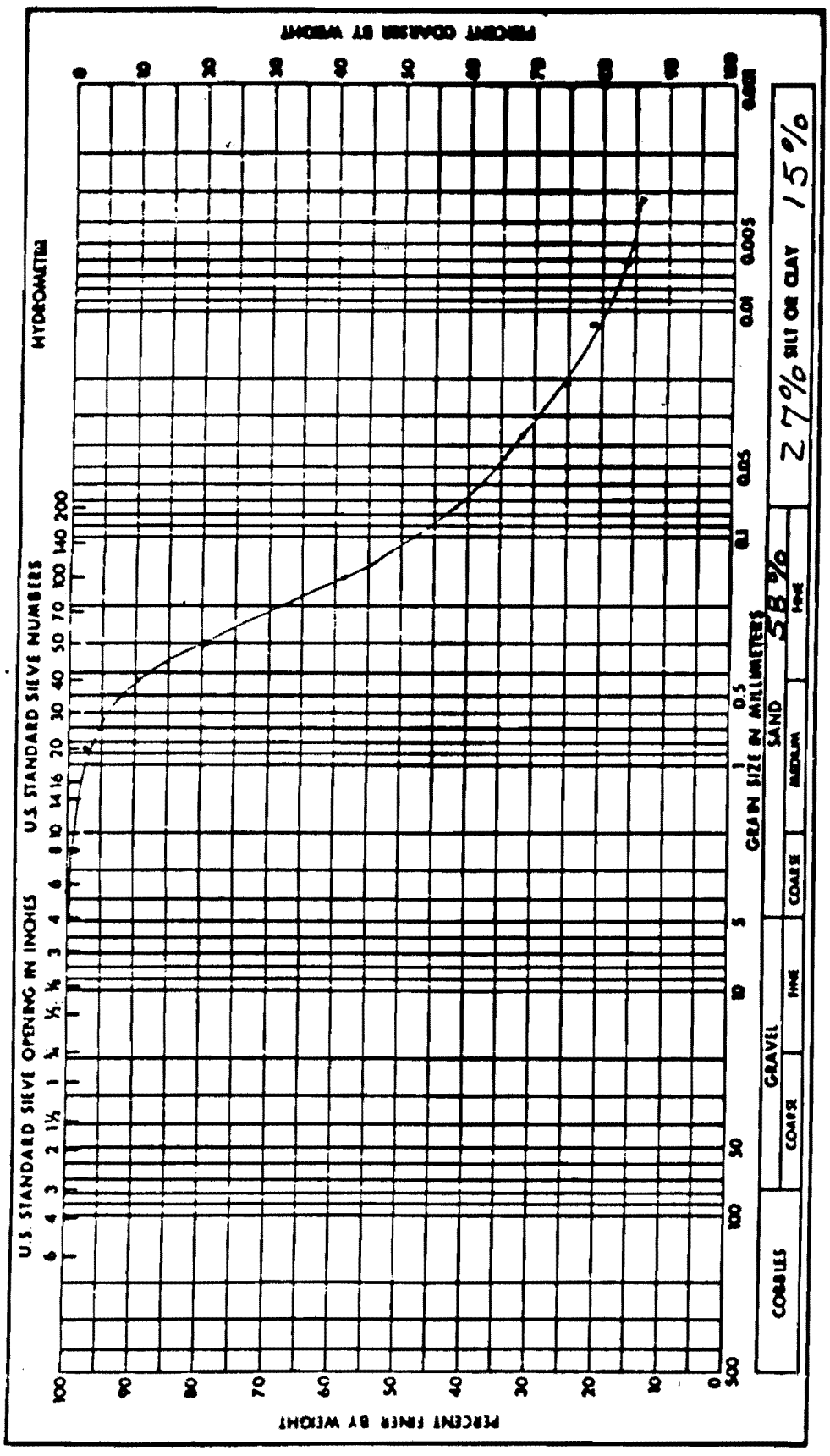
Soil Symbol	SM	Liquid Limit, %	28.0
Moisture Content, %		Plastic Limit, %	22.8
Specific Gravity		Plasticity Index, %	5.2
		Shrinkage Limit, %	

Added by Amendment 50

Figure 2.5-564 ERCU & HPFP System

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW & HPFP SYSTEM
FIGURE 2.5-565



Project	WATTS BAR N.P.
Feature	ERCW & HPFP SYSTEM
Boring No.	SS-92
Sample No.	SA
Station	
Offset	
Date	11-26-75
Elevation	716.9

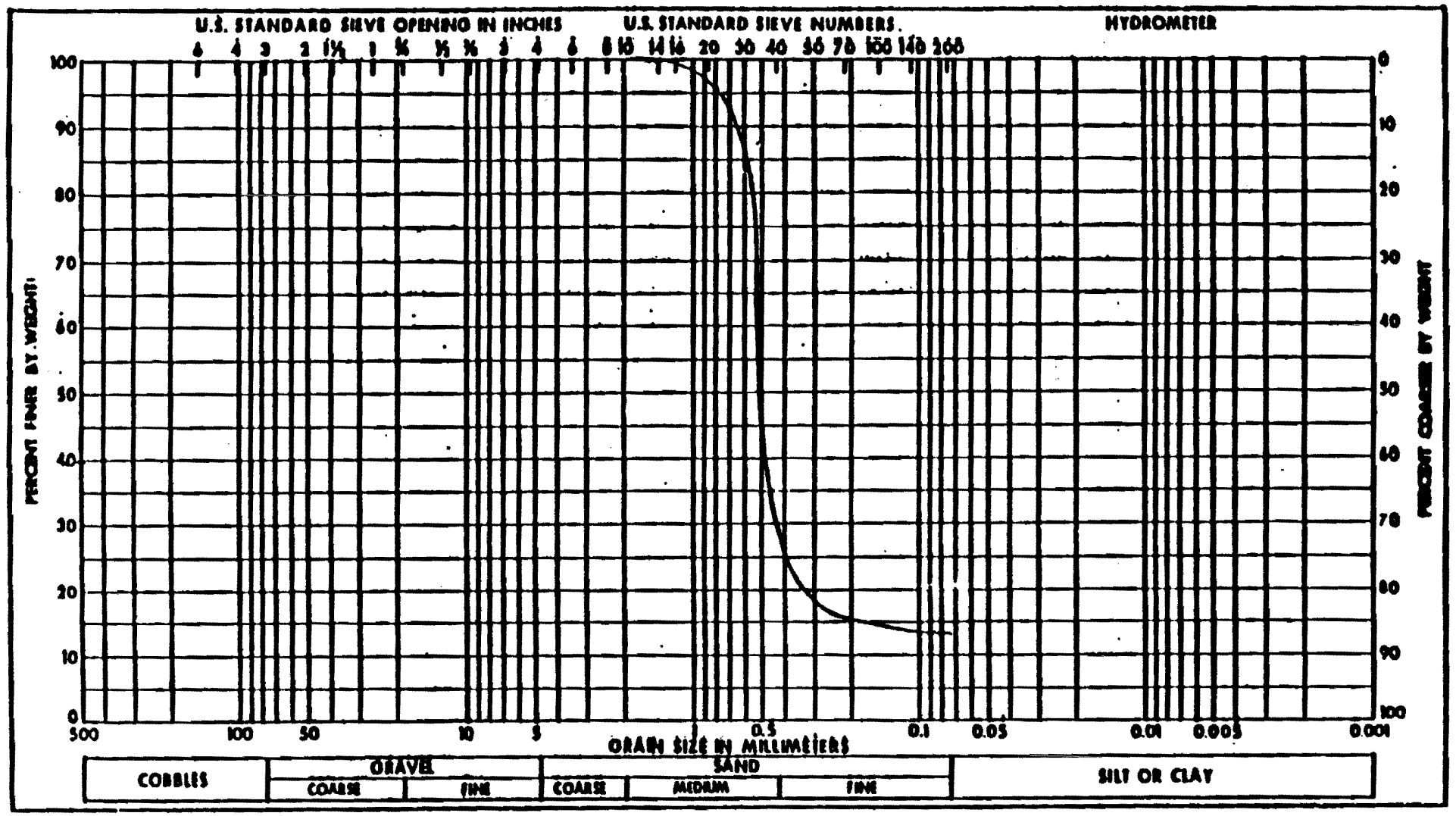
GRAIN SIZE ANALYSIS

Remarks:

Soil Symbol	SM
Moisture Content, %	20.1
Specific Gravity	
Liquid Limit, %	26.0
Plastic Limit, %	22.1
Plasticity Index, %	3.9
Shrinkage Limit, %	

Added by Amendment 50

Figure 2.5-565 ERCU & HPFP System



Amendment 63

Soil Symbol	SM	Liquid Limit, %	
Moisture Content, %		Plastic Limit, %	
Specific Gravity		Plasticity Index, %	
		Shrinkage Limit, %	

Remarks:
D_{60} = 0.53

γ_D 96.1 pcf
W 12.4 %

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

INTAKE CHANNEL

GRAIN SIZE ANALYSIS

Figure 2.5-566

Figure 2.5-566 Intake Channel Grain Size Analysis

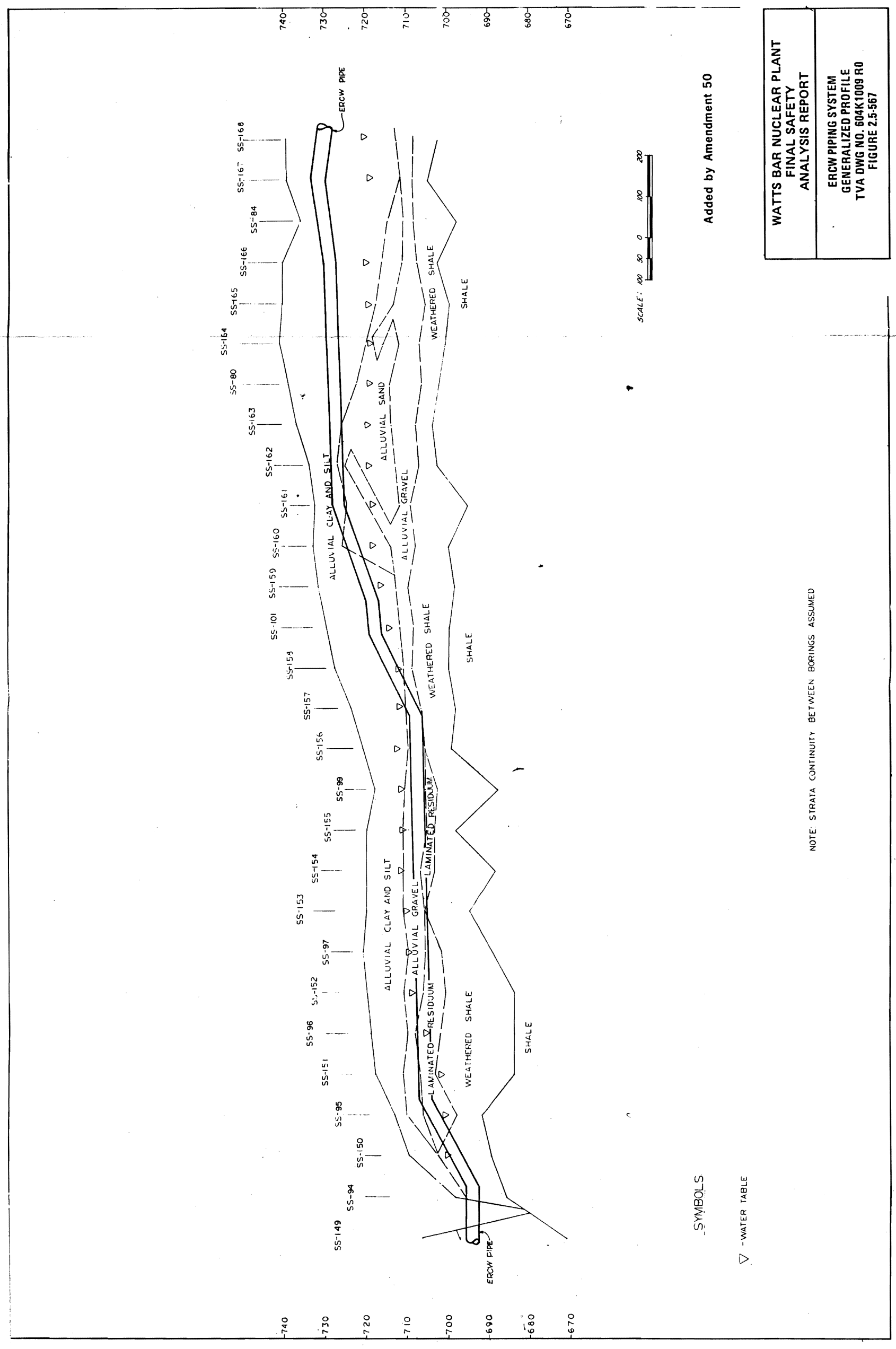
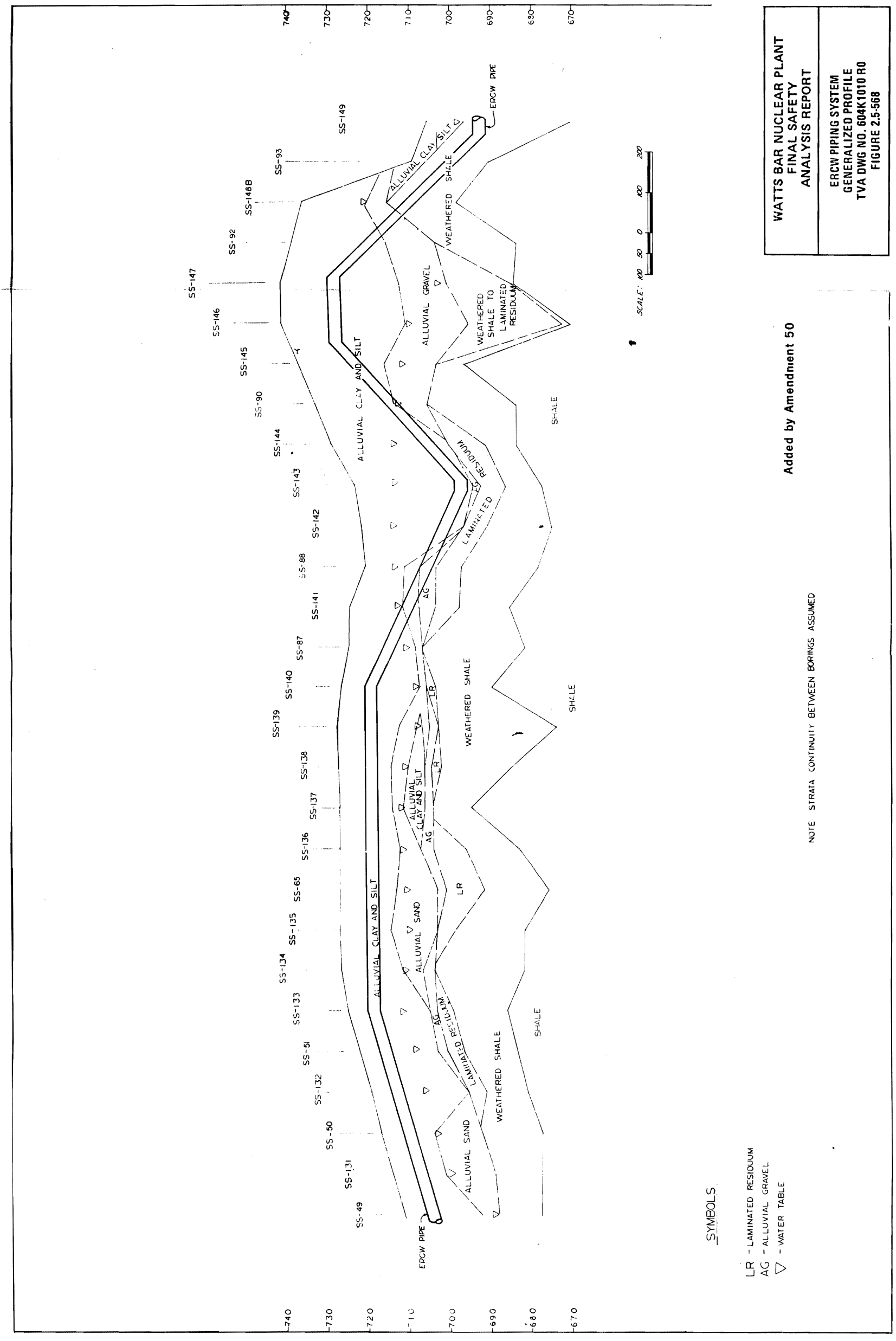


Figure 2.5-567 ERCW Piping System - Generalized Profile TVA DWG NO. 604K1009 RO

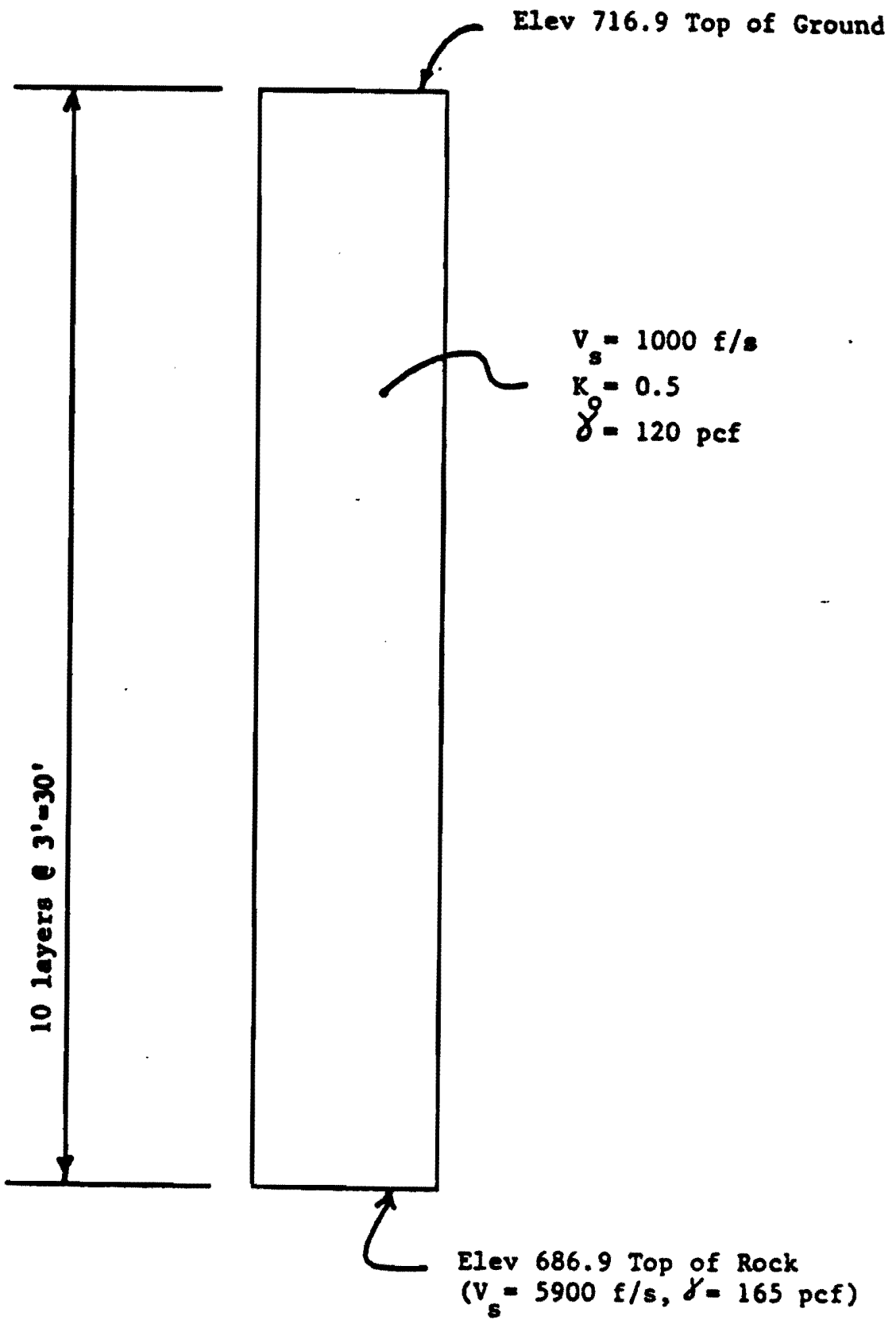


WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

ERCW PIPING SYSTEM
GENERALIZED PROFILE
TVA DWG NO. 604K1010 R0
FIGURE 2.5-568

Added by Amendment 50

Figure 2.5-568 ERCW Piping System - Generalized Profile TVA DWG NO. 604K1010 RO



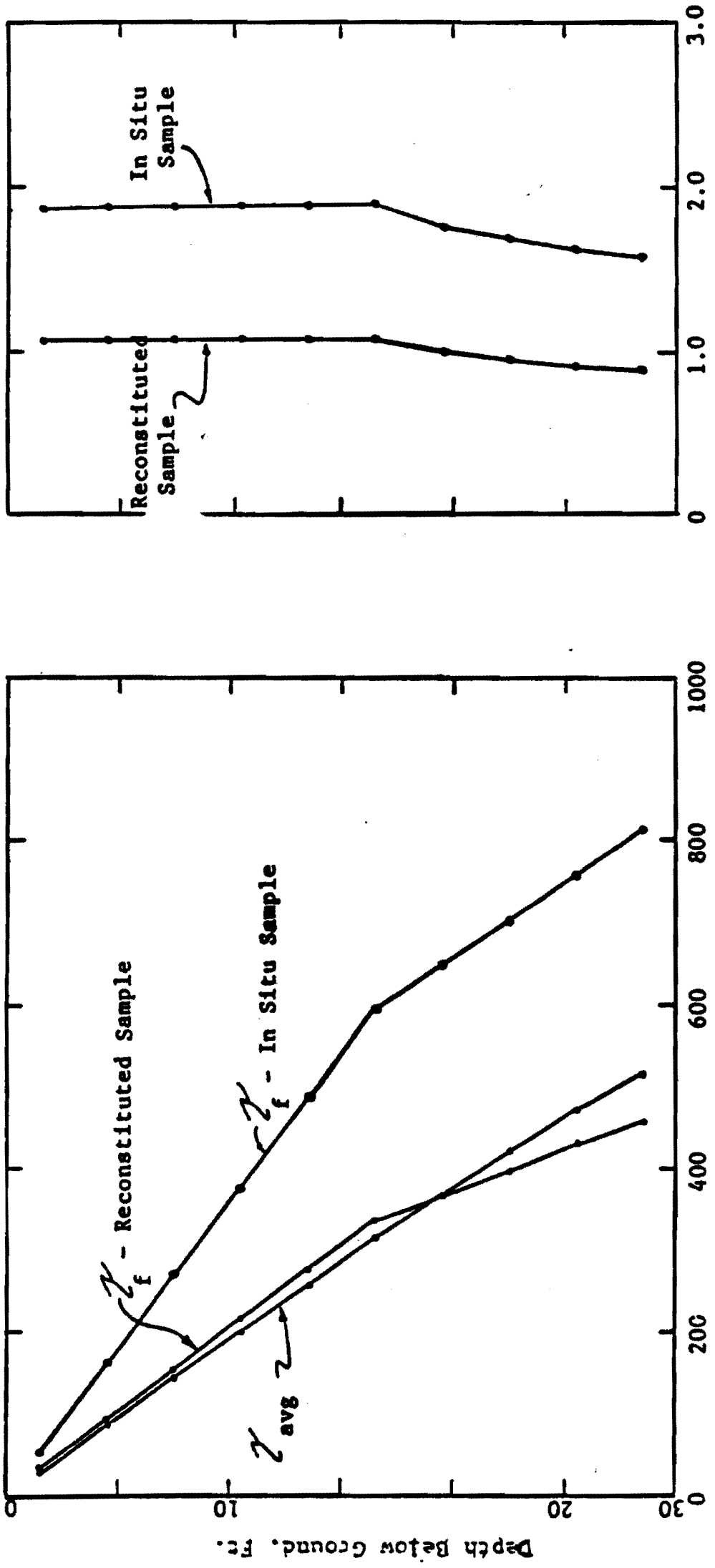
One-Dimensional Soil Profile Used for Liquefaction Evaluation

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

FIGURE 2.5-569

Figure 2.5-569 One-Dimensional Soil Profile Used for Liquefaction Evaluation



Comparison of Induced Shear Stress (τ_{avg}) and Shear Stress Required to cause 5% strain (γ_f) and Resulting Factors of Safety with Depth Below Ground Surface.

Added by Amendment 50

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
FIGURE 2.5-570

Figure 2.5-570 Comparison of Induced Shear Stress and Shear Stress Required to Cause 5% Strain and Resulting Factors Of Safety With Depth Below Ground Surface

Figure 2.5-571 ERCW Pipeline Section A-A
(Actual Figure Located in Oversized Figures File)(Sheet 1 of 4)

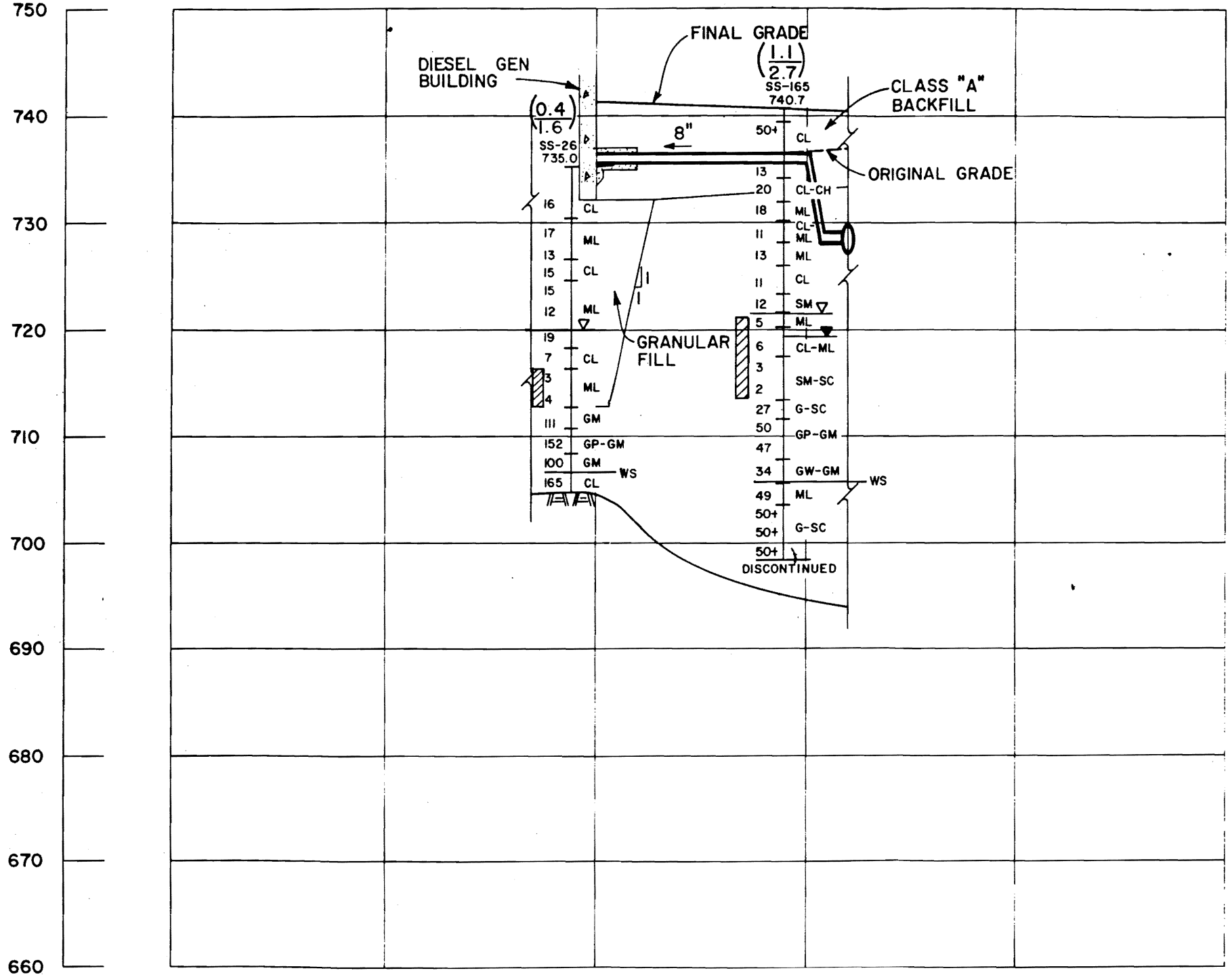
Figure 2.5-571 ERCW Pipeline Section A-A
(Actual Figure Located in Oversized Figures File)(Sheet 2 of 4)

Figure 2.5-571 ERCW Pipeline Section A-A
(Actual Figure Located in Oversized Figures File)(Sheet 3 of 4)

Figure 2.5-571 ERCW Pipeline Section A-A
(Actual Figure Located in Oversized Figures File)(Sheet 4 of 4)

Figure 2.5-572 ERCW Pipeline Section B-B

Figure 2.5-573 (Actual Figure Located in Oversized Figures File)



D-D

(1.1/2.7) POTENTIAL SETTLEMENT BASED ON 1.5 % ε CRITERIA (INCHES) / POTENTIAL SETTLEMENT BASED ON 6% ε CRITERIA (INCHES)

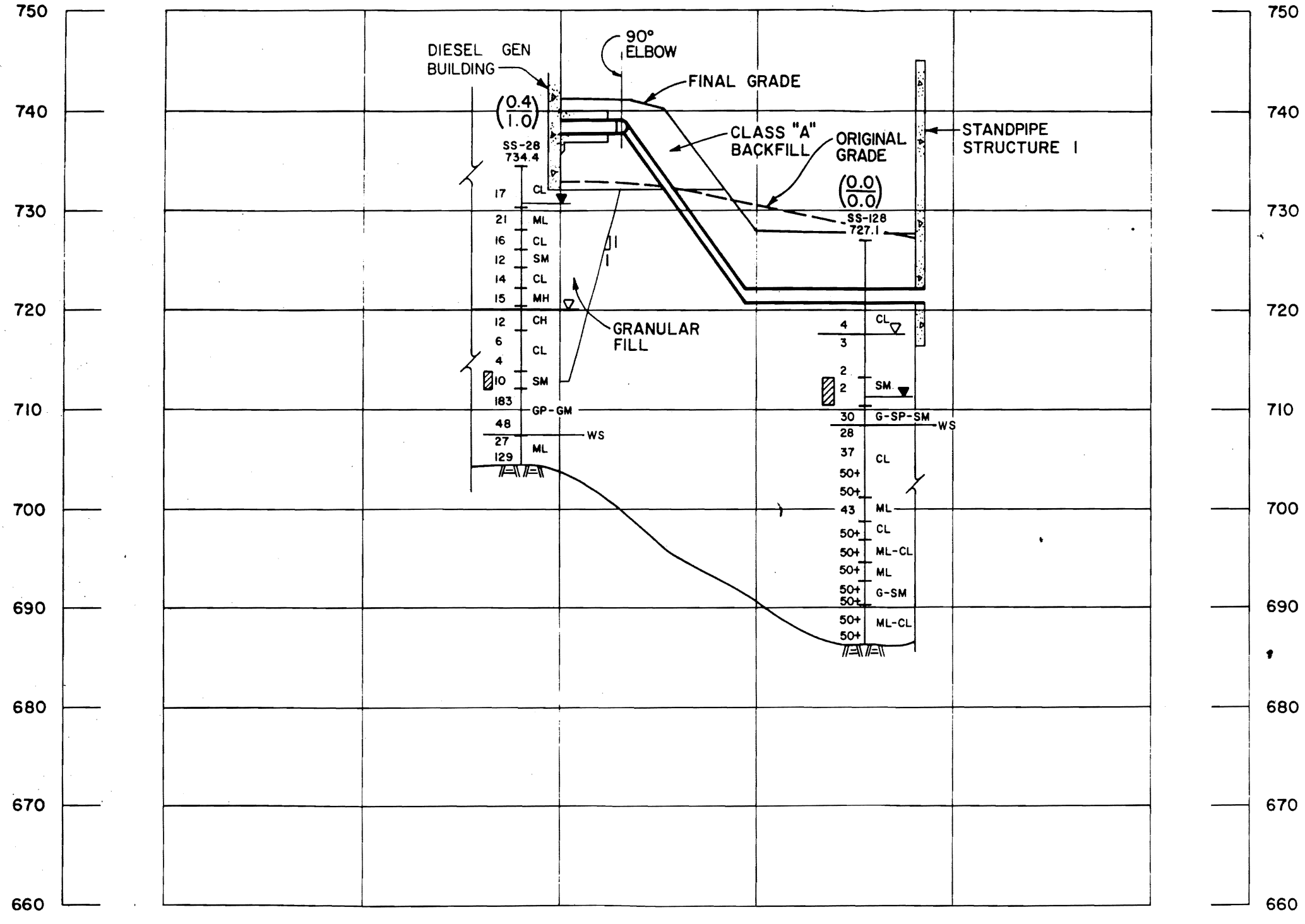
- ▽ DESIGN WATER TABLE
- ▼ WATER TABLE (24 HR)
- MH SOIL CLASSIFICATION
- 13 BLOW COUNT
- ▨ POTENTIALLY LIQUEFIABLE SOIL (SEE NOTE)
- -WS WEATHERED SHALE

NOTE:
1. LIQUEFACTION BASED ON TOP OF GROUND ACCELERATION OF 0.4g AND SEED - IDRISS (1971) CORRELATION FOR SANDS.

Added by Amendment 50

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
ERCW PIPELINE SECTION D-D FIGURE 2.5-574

Figure 2.5-574 ERCW Pipeline Section D-D



E - E

(0.4/1.0) POTENTIAL SETTLEMENT BASED ON 1.5 % & CRITERIA (INCHES) / POTENTIAL SETTLEMENT BASED ON 6% & CRITERIA (INCHES)

- ▽ DESIGN WATER TABLE
- ▼ WATER TABLE (24HR)
- MH SOIL CLASSIFICATION
- 13 BLOW COUNT
- ▨ POTENTIALLY LIQUEFIABLE SOIL (SEE NOTE)
- -WS WEATHERED SHALE

NOTE:

1 LIQUEFACTION BASED ON TOP OF GROUND ACCELERATION OF 0.4g AND SEED - IDRISS (1971) CORRELATION FOR SANDS.

Added by Amendment 50

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
ERCW PIPELINE SECTION E-E FIGURE 2.5-575

Figure 2.5-575 ERCW Pipeline Section E-E

Figure 2.5-576 Category I Electrical Conduits Section F-F
(Actual Figure Located in Oversized Figures File)(Sheet 1 of 2)

Figure 2.5-576 Category I Electrical Conduits Section F-F
(Actual Figure Located in Oversized Figures File)(Sheet 2 of 2)

Figure 2.5-577 Category I Electrical Conduits Section G-G
(Actual Figure Located in Oversized Figures File)

Figure 2.5-578 Category I Electrical Conduits Section H-H
(Actual Figure Located in Oversized Figures File)

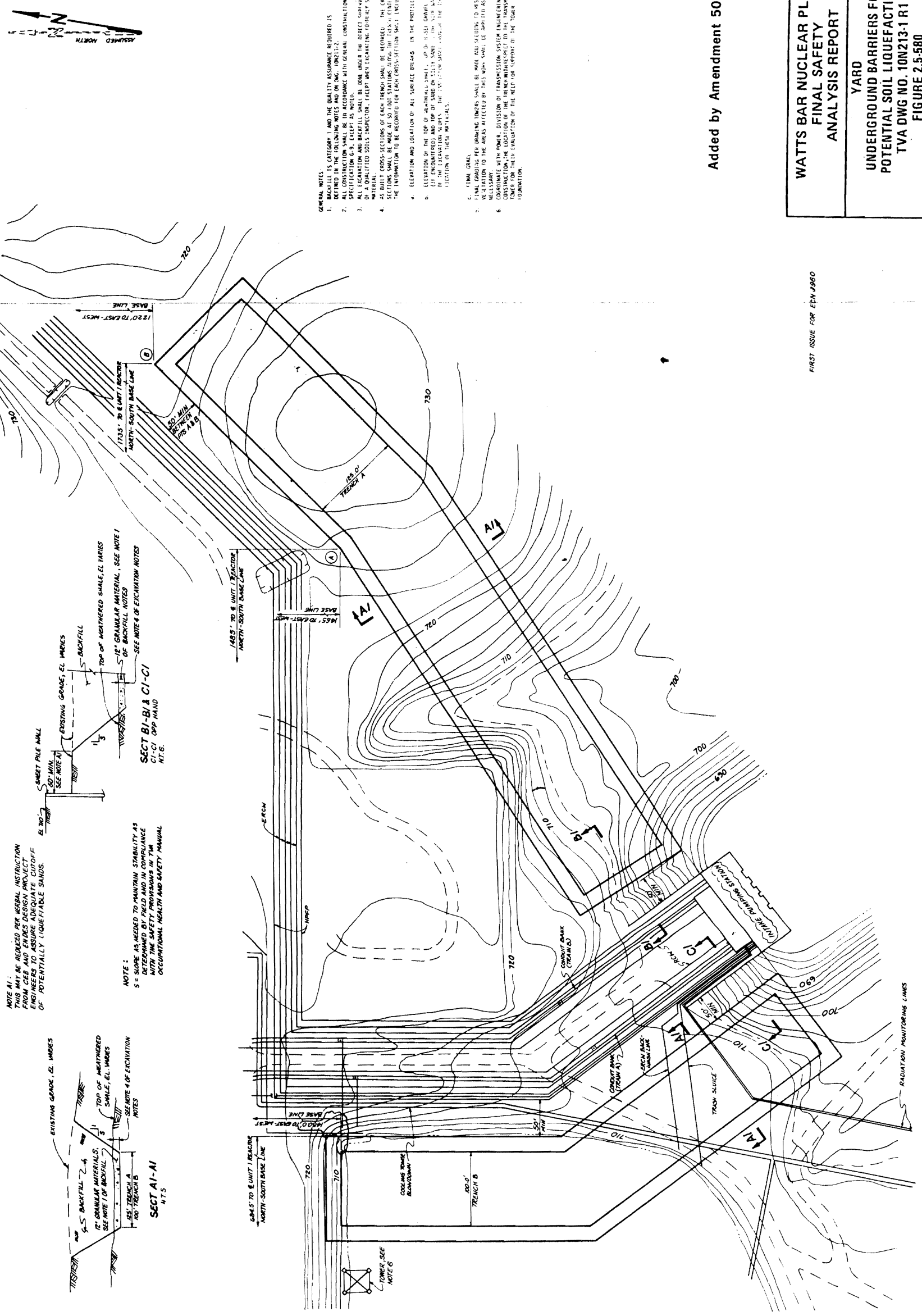
Figure 2.5-579 Miscellaneous ERCW Piping and IE Conduit Soil Borings
(Actual Figure Located in Oversized Figures File)

Added by Amendment 50

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
YARD UNDERGROUND BARRIERS FOR POTENTIAL SOIL LIQUEFACTION TVA DWG NO. 10N213-1 R1 FIGURE 2.5-580

GENERAL NOTES:

1. BACKFILL IS CATEGORY I AND THE QUALITY ASSURANCE REQUIRED IS DEFINED IN THE FOLLOWING NOTES AND ON DWG. 10N213-2.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH GENERAL CONSTRUCTION SPECIFICATION G-9, EXCEPT AS NOTED.
3. ALL EXCAVATION AND BACKFILL SHALL BE DONE UNDER THE DIRECT SUPERVISION OF A QUALIFIED SOILS INSPECTOR, EXCEPT WHEN EXCAVATING TO OBTAIN SPOILS MATERIAL.
4. AS BUILT CROSS-SECTIONS OF EACH TRENCH SHALL BE RECORDED. THE CROSS SECTIONS SHALL BE MADE AT 50 FOOT STATIONS ALONG THE TRENCH CENTERLINE. THE INFORMATION TO BE RECORDED FOR EACH CROSS-SECTION SHALL INCLUDE:
   a. ELEVATION AND LOCATION OF ALL SURFACE BREAKS IN THE PROFILE
   b. ELEVATION OF THE TOP OF IMPERVIOUS SHALE, TOP OF RESIDUAL GRAVEL (IF ENCOUNTERED) AND TOP OF SAND OR SILTY SAND AT THE SIDE WALLS OF THE EXCAVATION SLOPES. THE ELEVATION SHALL BE DETERMINED BY PROBING THE SIDE WALLS WITH A STEEL ROD TO DETECT ANY CHANGE IN RESISTANCE OF THESE MATERIALS
   c. FINAL GRADE
5. FINAL GRADING PER DRAWING 10N245 SHALL BE MADE AND SEEDING TO RESTORE VEGETATION TO THE AREAS AFFECTED BY THIS WORK SHALL BE APPLIED AS NECESSARY.
6. COORDINATE WITH POWER, DIVISION OF TRANSMISSION SYSTEM ENGINEERING AND CONSTRUCTION, THE LOCATION OF THE TRENCH WITH RESPECT TO THE TRANSMISSION TOWER FOR THEIR EVALUATION OF THE NEED FOR SUPPORT OF THE TOWER FOUNDATION.



FIRST ISSUE FOR ECN 4960

Figure 2.5-580 Yard Underground Barriers for Potential Soil Liquefaction TVA DWGNO. 10N213-1 R1

EXCAVATION NOTES:

1. A STOCKPILE AREA FOR FINE GRAINED CLAYS AND SILTS, AND A SEPARATE STOCKPILE AREA FOR THE SANDS AND SILTY SANDS ARE TO BE ESTABLISHED. SEPARATE STOCKPILES FOR EACH TRENCH MAY BE ESTABLISHED AT THE OPTION OF THE FIELD. AS EACH TRENCH IS EXCAVATED THE FINE GRAINED CLAYS AND SILTS ARE TO BE VISUALLY SEPARATED FROM THE SANDS AND SILTY SANDS AND DISTRIBUTED TO THE APPROPRIATE STOCKPILE. THE STOCKPILE AREAS ARE TO BE ESTABLISHED IN A MANNER THAT WILL ALLOW DRAINAGE OF THE STOCKPILED MATERIAL IN ORDER THAT IT CAN BE RECLAIMED FOR BACKFILL. THE SURFACES OF THE STOCKPILE AREAS ARE TO BE GRADED TO PREVENT PONDING AND TO MINIMIZE INFILTRATION OF RAINFALL AND RUNOFF.
2. MATERIAL ENCOUNTERED IN THE EXCAVATION THAT WAS PREVIOUSLY SPOILED DURING PLANT CONSTRUCTION SHALL BE SPOILED IN A NEW LOCATION.
3. BASEL GRAVEL MAY BE ENCOUNTERED BELOW THE SANDS AND SILTY SANDS IN MANY AREAS OF THE TRENCH EXCAVATION. THE BASEL GRAVEL SHALL BE SPOILED.
4. EACH TRENCH IS TO BE EXCAVATED TO THE WEATHERED SHALE (SAPROLITE). THE EXCAVATION IS TO BE CARRIED INTO THE WEATHERED SHALE TO A DEPTH WHERE THE SAPROLITE MATERIAL EXHIBITS ROCK-LIKE CHARACTERISTICS SUCH AS BEDDING STRUCTURE AND JOINTS. THE DEPTH OF EXCAVATION INTO THE WEATHERED SHALE SHALL BE DETERMINED BY A QUALIFIED SOILS INSPECTOR. EXCAVATION TO SOUND, UNWEATHERED ROCK IS NOT REQUIRED.
5. BEST MANAGEMENT PRACTICE FOR RUNOFF SHOULD BE USED FOR STOCKPILES AND SPOILPILE AREAS.
6. EACH TRENCH SHALL BE DEWATERED AND MAINTAINED IN A MANNER THAT WILL ALLOW THE EXCAVATION AND PLACEMENT OF EARTHFILL TO BE DONE IN AN ENVIRONMENT SUFFICIENTLY DRY TO COMPLY WITH THE MOISTURE CONTENT REQUIREMENTS OF EARTHFILL NOTE 3. DEWATERING IS ALSO NECESSARY TO MAINTAIN THE STABILITY OF EXCAVATION SLOPES AND ADJACENT STRUCTURES AND FEATURES. THE DEWATERING TECHNIQUES USED BY CONST MUST BE EFFECTIVE AND RELIABLE AND MEET THE APPROVAL OF EN DES. PARTICULAR CARE SHALL BE TAKEN TO PREVENT THE MOVEMENT, MIGRATION, FLOW, SLUMPING, OR LOSS OF THE SANDS AND SILTY SANDS IN THE TRENCH EXCAVATIONS. PROGRESSIVELY GRADED REVERSE FILTERS OF SANDS, GRAVELS, AND/OR CRUSHED STONE, AS APPROPRIATE, SHALL BE IMMEDIATELY PLACED OVER ANY SANDY MATERIALS THAT EXHIBIT TENDENCIES FOR MOVEMENT, MIGRATION, FLOW, SLUMPING, OR LOSS.
7. PRIOR TO PLACEMENT OF ANY BACKFILL, THE SURFACE OF THE WEATHERED SHALE SHALL BE REASONABLY WELL CLEANED OF ANY SOIL OR LOOSE DEBRIS AND/OR ANY ROCK OVER 4" THAT MAY REMAIN AFTER THE EXCAVATION PROCESS. AIR OR WATER SHALL NOT BE USED IN THE CLEANUP OF THE WEATHERED SHALE SURFACE.
8. THE PROCESS OF EXCAVATING INTO THE WEATHERED SHALE TO THE SPECIFIED DEPTH, CLEANING THE SURFACE, AND PLACEMENT OF THE GRANULAR MATERIAL AS SPECIFIED IN EARTHFILL NOTE 1 SHALL BE KEPT AS SHORT AS REASONABLE TO PREVENT DETERIORATION OF THE WEATHERED SHALE SURFACE.

EARTHFILL NOTES:

AFTER THE TRENCH HAS BEEN EXCAVATED TO THE SPECIFIED DEPTH (EXCAV NOTE 4) THE FOLLOWING STEPS SHALL BE TAKEN TO BACKFILL EACH TRENCH:

1. PLACE AND COMPACT A MINIMUM OF 12 INCHES OF GRANULAR MATERIAL MEETING THE REQUIREMENTS OF SECTION 1075 (BOTTOM LAYER) OF GENERAL CONSTRUCTION SPECIFICATION T-1. THE FOLLOWING GRADATION IS ALSO ACCEPTABLE.

SQUARE SIEVE SIZE	PERCENT PASSING BY WEIGHT
1-1/2 INCHES	100
3/4 INCH	30-75
3/8 INCH	5-15
NO. 4	0-5

THE GRANULAR MATERIAL SHALL BE PLACED IN MAXIMUM 10 INCH LOOSE LIFTS AND COMPACTED WITH A MINIMUM OF 6 COMPLETE PASSES BY A DYNAPAC CA25 VIBRATORY ROLLER, OR AN EN DES APPROVED EQUAL.

2. EARTHFILL TO FILL THE TRENCHES SHALL BE OBTAINED FROM STOCKPILES AND BORROW AREAS APPROVED BY EN DES. THE PURPOSE OF THE BACKFILLING SEQUENCE PROVIDED BELOW IS TO PLACE THE SANDS AND SILTY SANDS AT A HIGHER ELEVATION AND AT A HIGHER DENSITY THAN THEY NATURALLY EXIST. THE MATERIAL FOR BACKFILLING THE TRENCHES SHALL BE OBTAINED FROM THE FOLLOWING SOURCES IN THE ORDER SHOWN.
   (a) MATERIAL FROM THE STOCKPILE OF FINE-GRAINED CLAYS AND SILTS ESTABLISHED DURING THE TRENCH EXCAVATION. THIS MATERIAL SHOULD BE DISTRIBUTED UNIFORMALLY AND COMPACTED ALONG THE LENGTH OF THE TRENCH.
   (b) MATERIAL FROM THE STOCKPILE OF SANDS AND SILTY SANDS, ESTABLISHED DURING THE TRENCH EXCAVATION. THIS MATERIAL SHOULD BE DISTRIBUTED UNIFORMALLY AND COMPACTED ALONG THE LENGTH OF THE TRENCH.
   (c) MATERIAL FROM APPROVED BORROW AREAS MAY BE USED TO SUPPLEMENT ANY ADDITIONAL MATERIAL NEEDED FOR FILLING THE TRENCHES.
   (d) MATERIAL FOR BACKFILLING TRENCH A SHALL BE OBTAINED FROM TRENCH A STOCKPILE, BORROW AREAS 9,10, AND 2C, AND MATERIAL FROM REGRADING FUTURE 161 KV SWITCHYARD.
   (e) MATERIAL FOR BACKFILLING TRENCH B SHALL BE OBTAINED FROM TRENCH B STOCKPILE, BORROW AREAS 12,13, AND 2C, AND MATERIAL FROM REGRADING FUTURE 231 KV SWITCHYARD.

   A MINIMUM OF 10 FEET OF FINE GRAINED MATERIAL FROM CATEGORIES (a) AND (c) ABOVE SHALL BE PLACED BEFORE MATERIAL FROM CATEGORY (b) CAN BE PLACED.

3. EARTHFILL SHALL BE UNIFORMLY COMPACTED IN LAYERS WHICH WHEN COMPACTED DO NOT EXCEED A THICKNESS OF 6 INCHES. COMPACTION SHALL BE ACCOMPLISHED WITH A TAMPING (SHEEPSFOOT) ROLLER (REX PACTOR 3-50, OR AN EN DES APPROVED EQUAL). TWO EARTHFILL TYPES ARE DEFINED AS FOLLOWS:
   (a) TYPE A; EARTHFILL COMPACTED TO AT LEAST 95% OF MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698 (STANDARD PROCTOR).
   (b) TYPE A1; EARTHFILL COMPACTED TO AT LEAST 100% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698.

   MOISTURE CONTENT OF ALL EARTHFILL SHALL BE WITHIN ± 2% OF OPTIMUM MOISTURE CONTENT.

4. EARTHFILL PLACEMENT INSTRUCTIONS:
   (a) GENERAL: THE DATUM FOR FILL PLACEMENT SHALL BE A PLANE SURFACE CONNECTING THE TOP OF SHALE ON OPPOSING TRENCH SIDEWALLS AS DETERMINED AT THE 50 FOOT CROSS-SECTION STATIONS AS IDENTIFIED BY THE SOILS INSPECTOR. (SEE GENERAL NOTE 4b). IN CASES WHERE IRREGULARITIES IN THE TRENCH BOTTOM RESULT IN LESS THAN THE REQUIRED DEPTH OF TYPE A1 EARTHFILL NOTIFY EN DES GEOLOGY AND GEOTECHNICAL ENGINEERING GROUP OF THE CIVIL ENGINEERING SUPPORT BRANCH (CEB). SUCH CASES WILL BE EVALUATED ON AN INDIVIDUAL BASIS AND VERBAL INSTRUCTIONS PROVIDED TO THE FIELD.
   (b) TRENCH A:
      (1) TYPE A1 EARTHFILL SHALL BE PLACED FROM THE GRANULAR 1075 MATERIAL TO A LINE 10 FEET ABOVE THE DATUM.
      (2) TYPE A EARTHFILL SHALL BE USED FROM THE TOP OF THE TYPE A1 MATERIAL TO FINAL GRADE.
   (c) TRENCH B: EARTHFILL PLACEMENT INSTRUCTIONS FOR TRENCH B ARE A FUNCTION OF THE DEPTH FROM FINAL GRADE TO THE DATUM.
      (1) FOR 25 FEET OR LESS: TYPE A1 EARTHFILL SHALL BE PLACED FROM THE GRANULAR 1075 MATERIAL TO WITHIN 8 FEET OF FINAL GRADE. THE REMAINDER OF THE TRENCH SHALL BE TYPE A EARTHFILL.
      (2) FOR A DEPTH GREATER THAN 25 FEET BUT LESS THAN 40 FEET: GRANULAR MATERIAL MEETING THE REQUIREMENTS OF EARTHFILL NOTE 1 SHALL BE PLACED TO WITHIN 25 FEET OF FINAL GRADE. TYPE A1 EARTHFILL SHALL BE PLACED FROM A DEPTH OF 25 FEET TO 8 FEET. THE REMAINDER OF THE TRENCH SHALL BE TYPE A EARTHFILL.
      (3) FOR A DEPTH GREATER THAN 40 FEET OR FOR CASES OF UNUSUAL EXCAVATION GEOMETRY. CONTACT THE GEOLOGY AND GEOTECHNICAL ENGINEERING GROUP IN CEB FOR INSTRUCTIONS. SUCH CASES WILL BE EVALUATED ON AN INDIVIDUAL BASIS AND VERBAL INSTRUCTIONS PROVIDED TO THE FIELD.

5. IN-PLACE DRY DENSITY TESTS USING THE SAND CONE (ASTM D1556) OR RUBBER BALLOON (ASTM D2167) TEST METHODS SHALL BE MADE AT A RATE OF 1 TEST FOR EACH 2000 CUBIC YARDS OF EARTHFILL PLACED (IN PLACE VOLUME). BLOCK SAMPLES SHALL BE OBTAINED AS OUTLINED IN SECTION 11.3 OF GENERAL CONSTRUCTION SPECIFICATION G-9, EXCEPT THAT THE MINIMUM FREQUENCY OF SAMPLING SHALL CONFORM TO EACH OF THE FOLLOWING:
   (a) ONE SAMPLE SHALL BE TAKEN FOR EACH 50,000 CUBIC YARDS OF FILL PLACED THROUGHOUT THE COURSE OF THE WORK.
   (b) ONE SAMPLE SHALL BE TAKEN FOR EACH 20 DAYS OF FILL PLACING THROUGHOUT THE COURSE OF THE WORK.
   (c) A MINIMUM OF THREE SAMPLES SHALL BE TAKEN IN EACH TRENCH. A MINIMUM OF ONE OF THESE THREE SAMPLES IN EACH TRENCH SHALL BE TAKEN IN THE SAND OR SILTY SAND (SEE EARTHFILL NOTE 2b) IF MORE THAN 10,000 CUBIC YARDS ARE PLACED. A MINIMUM OF ONE OF THESE THREE SAMPLES IN EACH TRENCH SHALL BE TAKEN FROM THE FILL COMPACTED TO 100% OF MAXIMUM DRY DENSITY.

   IN LIEU OF MEETING THE REQUIREMENTS OF THE FIRST TWO SENTENCES OF THE FOURTH PARAGRAPH OF SECTION 11.2 OF GENERAL CONSTRUCTION SPECIFICATION G-9, THE FOLLOWING TESTING TO CONFIRM CORRELATION WITH THE LABORATORY COMPACTION CURVES SHALL BE MADE. AT LEAST ONE 3-POINT MOISTURE-DENSITY COMPACTION TEST SHALL BE PERFORMED FOR EACH 50 ROUTINE TESTS ON SOIL BEING USED FOR FILL, REGARDLESS OF SOIL TYPES.

6. EXCEPTIONS AND SUBSTITUTIONS TO THE ABOVE MATERIAL OR PLACEMENT SEQUENCE ARE:
   (a) GRANULAR MATERIAL MEETING THE REQUIREMENTS OF SECTION 1032 OF GENERAL CONSTRUCTION SPECIFICATION T-1 MAY BE USED IN LIEU OF ANY OF THE ABOVE EARTHFILL MATERIALS. THE GRANULAR MATERIAL SHALL BE PLACED IN A MAXIMUM LOOSE LIFT THICKNESS OF 10 INCHES AND UNIFORMALLY COMPACTED WITH A VIBRATORY ROLLER TO AN AVERAGE RELATIVE DENSITY OF 80% OR GREATER FOR ALL TESTS, WITH A MINIMUM OF 80% RELATIVE DENSITY FOR INDIVIDUAL TESTS AS DETERMINED BY ASTM D4253 PROCEDURES.

   THE MOISTURE CONTENT SHALL BE ADJUSTED AS NECESSARY TO ASSURE ADEQUATE COMPACTION. IN-PLACE DENSITY TESTS USING THE SAND CONE (ASTM D1556) OR RUBBER BALLOON (ASTM D2167) OR NUCLEAR MOISTURE-DENSITY GAUGE (ASTM D2922 AND D3017) TEST METHODS SHALL BE MADE AT A RATE OF 1 PER EVERY 500 CUBIC YARDS OF GRANULAR MATERIAL PLACED WITH A MINIMUM OF ONE TEST EACH DAY THE MATERIAL IS PLACED. COMPLETE DOCUMENTATION OF QUANTITY AND LOCATIONS WHERE THE MATERIAL WAS USED SHALL BE RECORDED AND SUBMITTED TO EN DES FOR REVIEW WITH THE MONTHLY FILL QUALITY CONTROL REPORTS REQUIRED BY G-9.
   (b) EARTHFILL FROM BORROW AREAS APPROVED FOR USE IN THE TRENCHES BY EN DES MAY BE SUBSTITUTED FOR ANY OF THE MATERIALS EXCAVATED FROM THE TRENCHES AND STOCKPILED FOR USE AS BACKFILL.
   (c) FOR BACKFILLING BELOW AND AROUND THE CCW BLOWDOWN LINE, MATERIAL MEETING THE GRADATION REQUIREMENTS OF EARTHFILL NOTE 1 MAY BE USED. THE MATERIAL SHALL BE PLACED IN MAXIMUM 6 INCH LOOSE LIFTS AND COMPACTED AS FOLLOWS:

   DIRECTLY BELOW THE PIPE THE GRANULAR MATERIAL SHALL BE COMPACTED AS REASONABLE AS POSSIBLE, IN THE INSPECTORS JUDGEMENT, USING SMALL PLATE COMPACTORS (WACKER) FROM BOTH SIDES. WHERE SMALL VIBRATORY ROLLERS (BOMAG BW60) CAN BE OPERATED, IN THE INSPECTORS JUDGEMENT, A MINIMUM OF 6 TO 8 PASSES SHALL BE MADE.

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

YARD
UNDERGROUND BARRIERS FOR
POTENTIAL SOIL LIQUEFACTION
TVA DWG NO. 10N213-2 R6
FIG. 2.5-581

REVISED BY AMENDMENT 59

Figure 2.5-581 Yard Underground Barriers for Potential Soil Liquefaction
TVA DWGNO. 10N213-2 R6

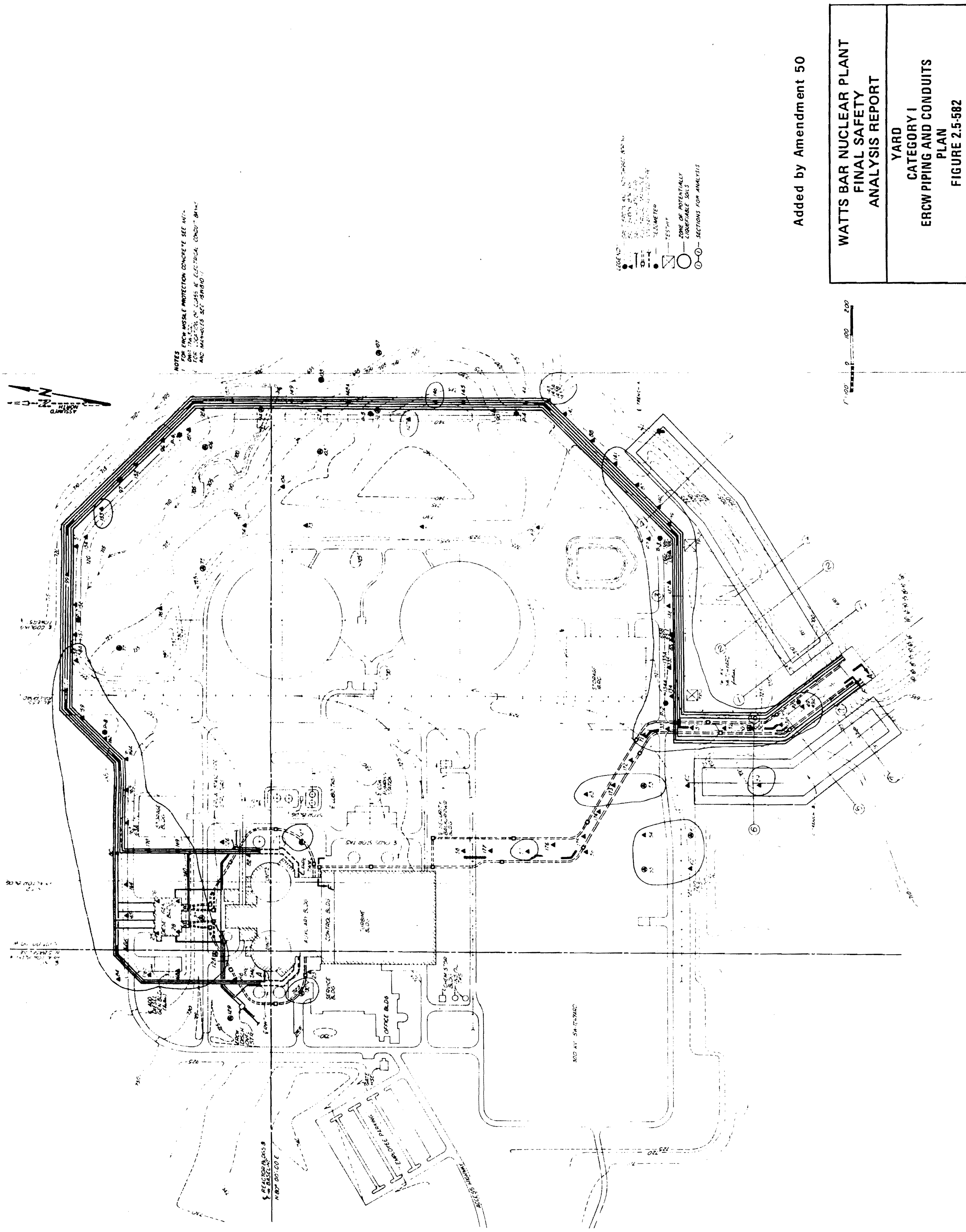


Figure 2.5-582 Yard Category I ERCW Piping and Conduits - Plan

Figure 2.5-583 Remedial Treatment for Potential Soil Liquefaction -Stability Analysis Summary (Actual Figure Located in Oversized Figures File)

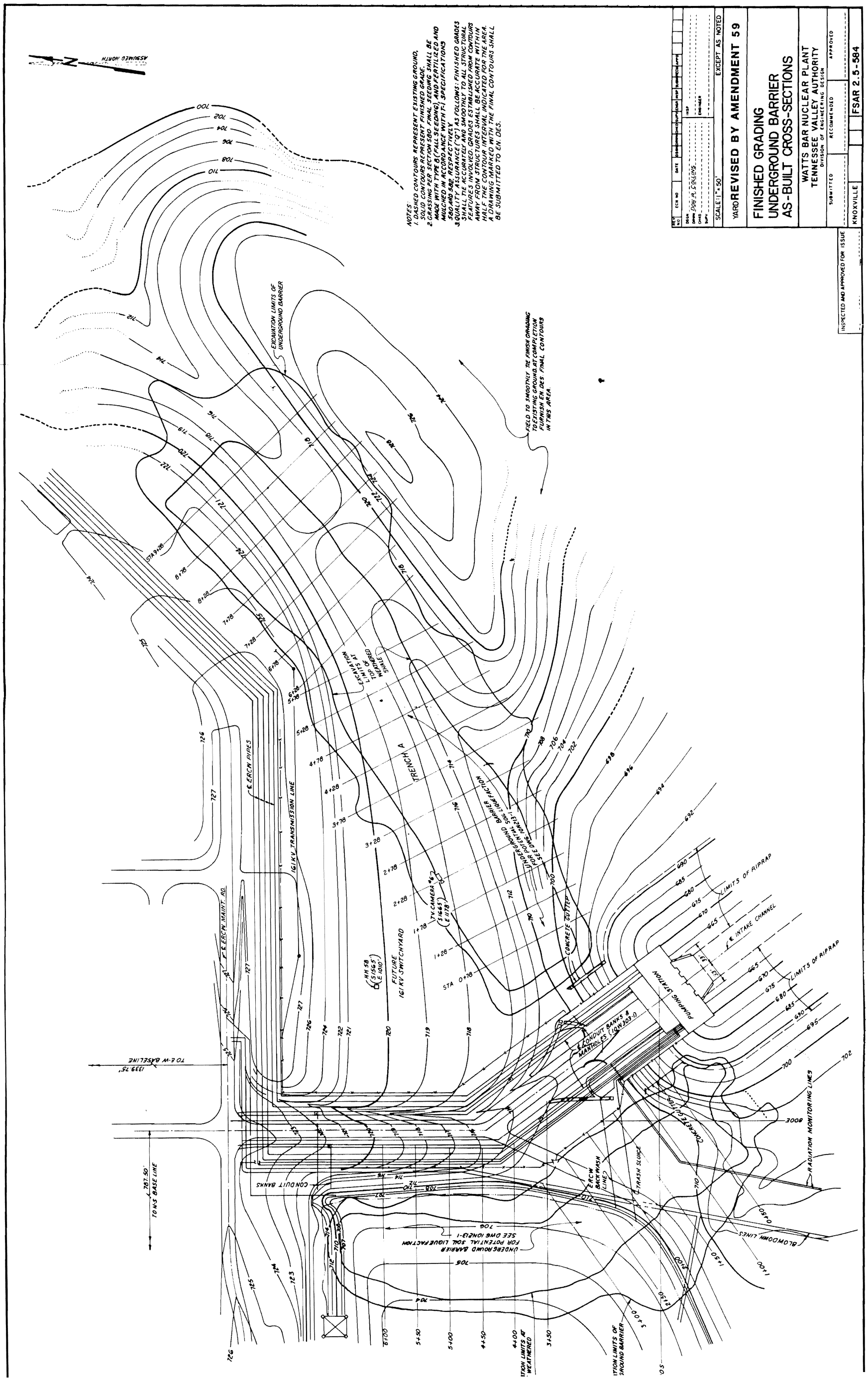
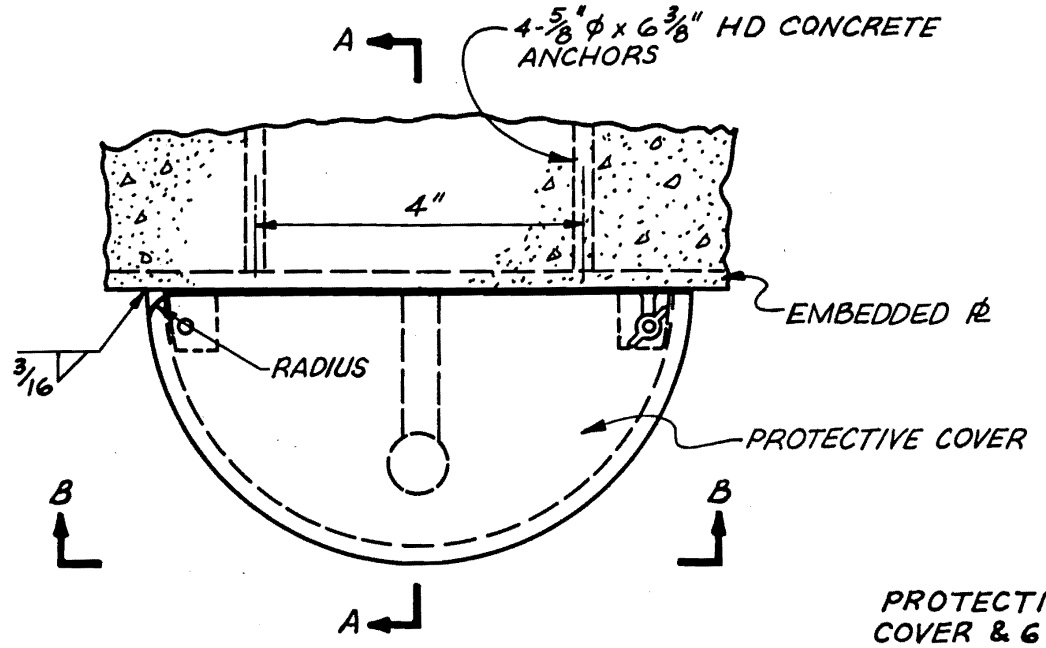


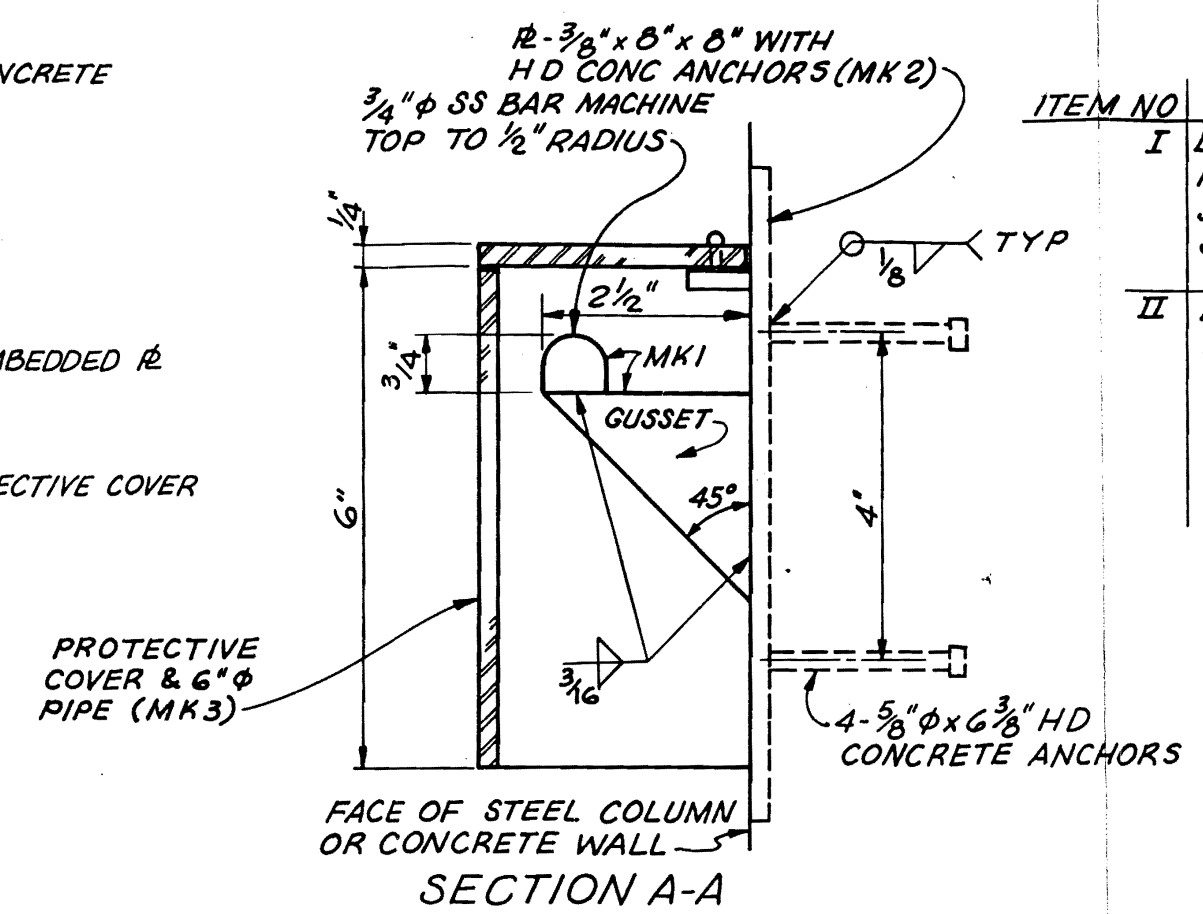
Figure 2.5-584 Finished Grading - Underground Barrier As-Built Cross-Sections

41

SEE NRT FOR USE OF THIS DRAWING USED FOR ANS. TO NRC QUES 362.2 ON WBN FSAR

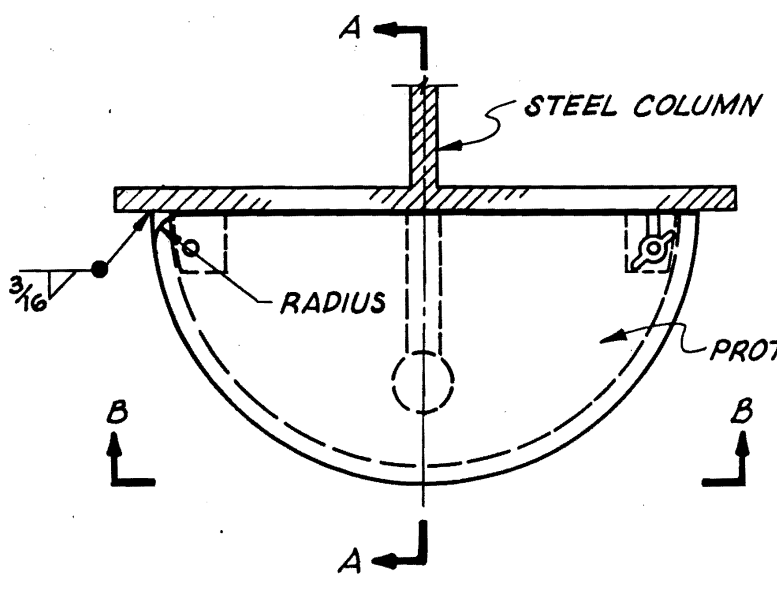


PLAN
TYP ON CONC WALLS

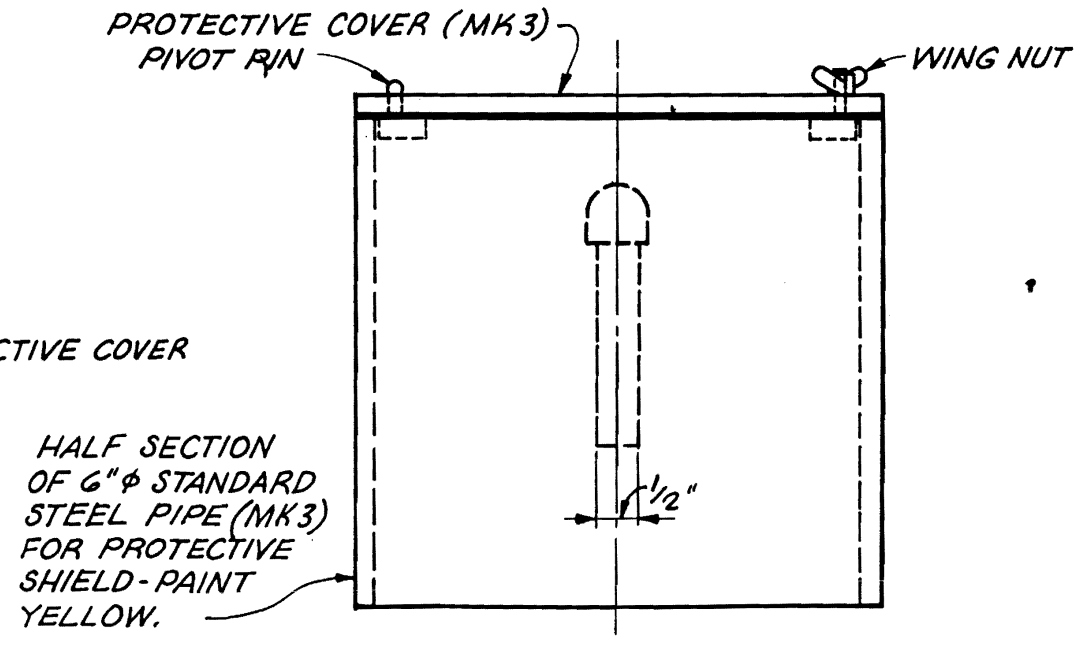


SECTION A-A

ITEM NO	
I	LOCATED ON STEEL COLUMN- MK1 & MK3 REQ'D: SS-22, SS-25, SS-29, SS-30, SS-31, SS-32 SS-33, SS-42, SS-43.
II	LOCATED ON CONCRETE WALL- MK1, MK2, & MK3 REQ'D: SS-2, SS-3, SS-5, SS-6, SS-7, SS-10, SS-13, SS-14, SS-15, SS-17, SS-18 SS-19, SS-20, SS-21, SS-23, SS-24, SS-26, SS-26, SS-27, SS-27, SS-28 SS-28, & SS-44



PLAN
TYP ON STEEL COLS



SECTION B-B

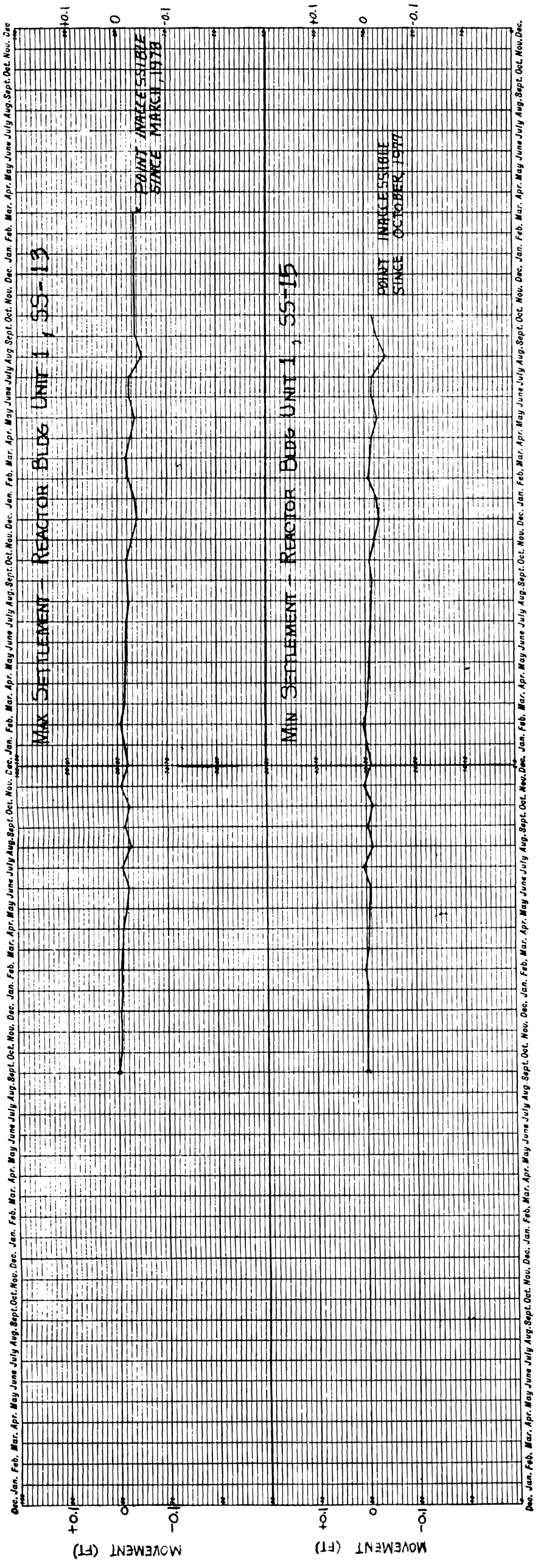
NOTES:
1. FOR REFERENCE AND LOCATIONS OF SETTLEMENT STATIONS, SEE DWG NO 10N 203-1&2.
2. FABRICATION COVERED BY FF-37.

NOT TO SCALE

Added by Amendment 50

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
POWERHOUSE SETTLEMENT STATIONS BENCH MARK ASSEMBLY FIGURE 2.5-585

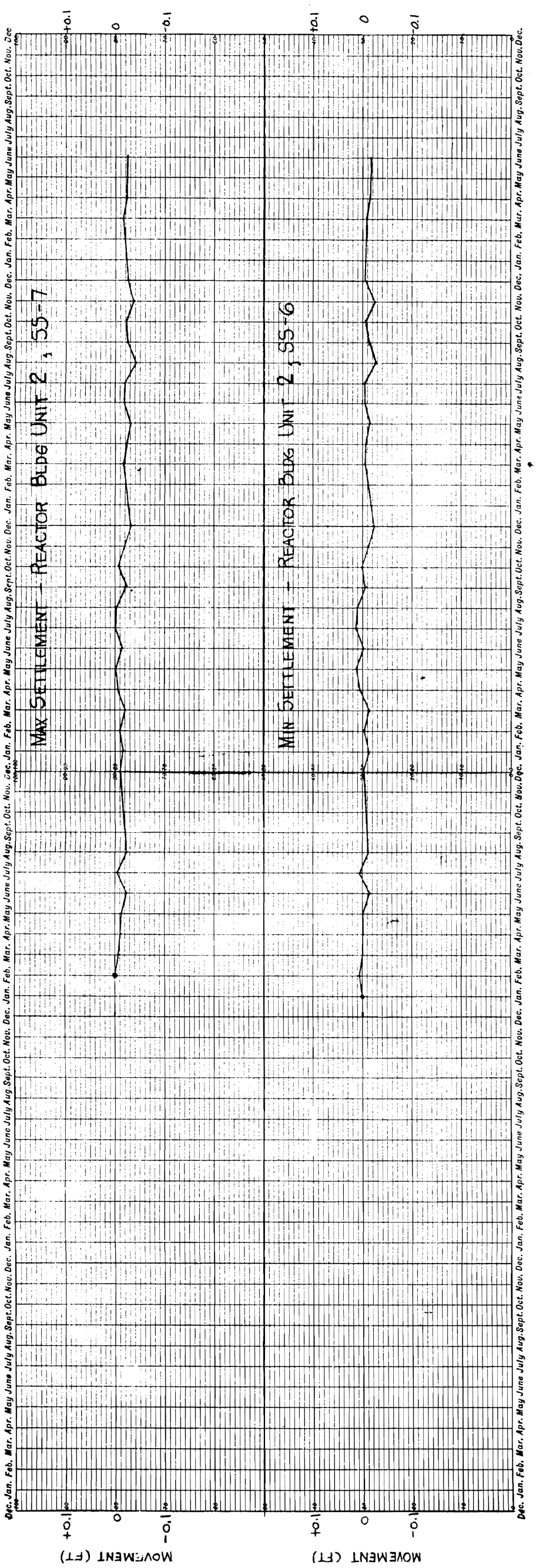
Figure 2.5-585 Powerhouse -Settlement Stations -Bench Mark Assembly



Added by Amendment 50

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
SETTLEMENT VS. TIME FOR UNIT 1 REACTOR BUILDING FIGURE 2.5-586

Figure 2.5-586 Settlement VS. Time For Unit 1 Reactor Building



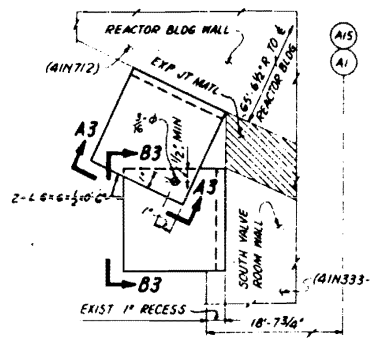
Added by Amendment 50

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
SETTLEMENT VS. TIME FOR UNIT 2 REACTOR BUILDING FIGURE 2.5-587

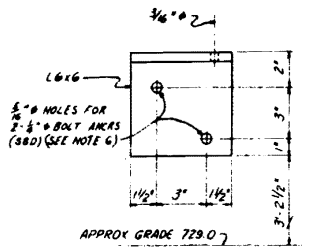
Figure 2.5-587 Settlement VS. Time For Unit 2 Reactor Building

Figure 2.5-588 Maximum Settlement -Auxiliary Building Settlement Station 10; Minimum Settlement -Auxiliary Building Settlement Station 20 (1973-1982)
(Actual Figure Located in Oversized Figures File)

Figure 2.5-589 Maximum Settlement - Diesel Generator Building Settlenent Station 1 & Intake Pumping Station Settlement Station 3A; Minimum Settlement Diesel Generator Building Settlement Station 4 & Intake Pumping Station Settlement Station 4 (1975-1982) (Actual Figure Located in Oversized Figures File)

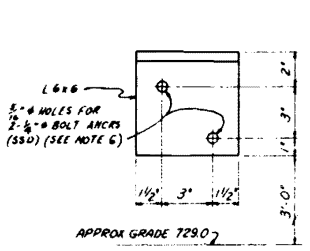


PLAN RMD-1 & PLAN RMD-11 OPP H



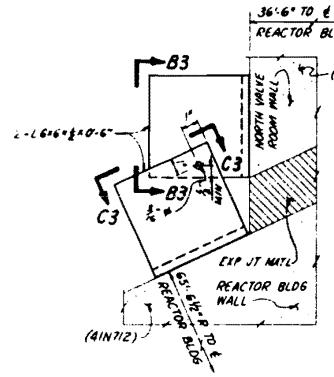
A3-A3

1 PLACE - AS SHOWN
PLACE - OPP HAND

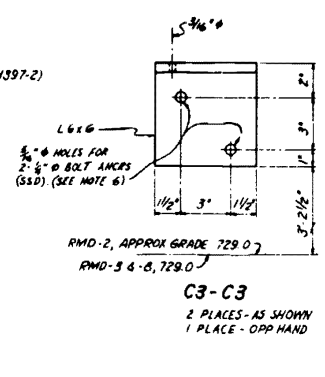


B3 - B3

3 PLACES - AS SHOWN
2 PLACES - OPP HAND

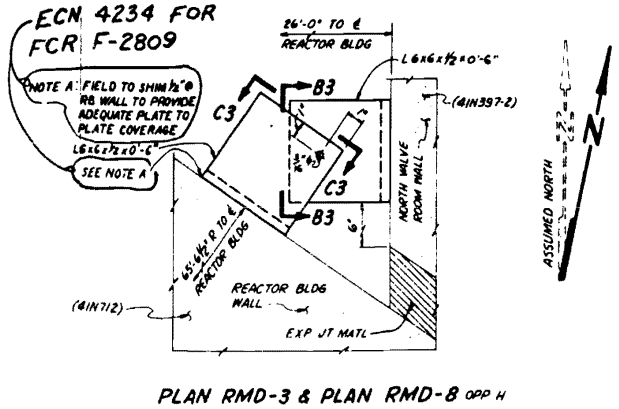


PLAN RMD-2

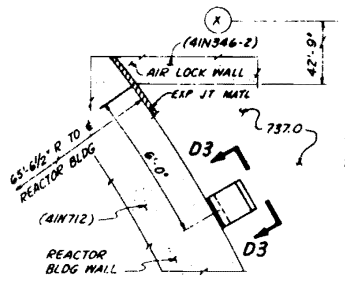


C3-C3

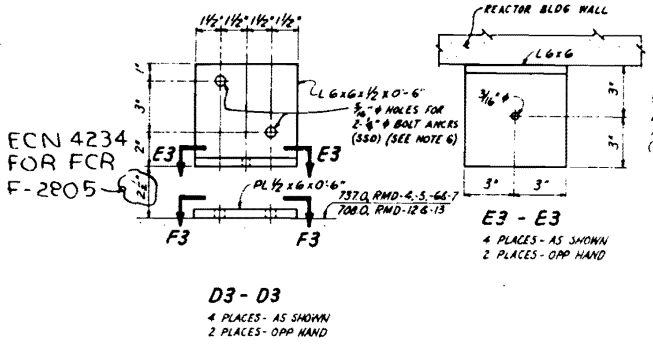
2 PLACES - AS SHOWN
1 PLACE - OPP HAND



PLAN RMD-3 & PLAN RMD-8 OPP H

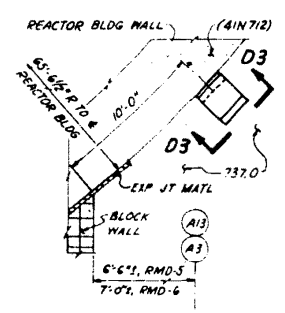


PLAN RMD-4

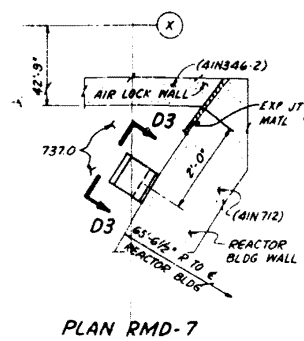


D3 - D3

4 PLACES - AS SHOWN
2 PLACES - OPP HAND



PLAN RMD-5 & PLAN RMD-6 OPP H

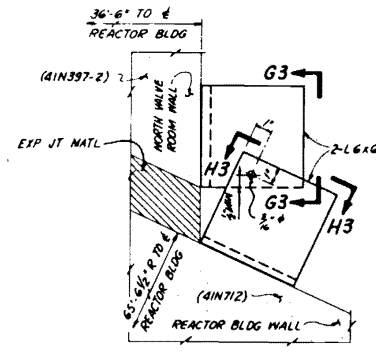


PLAN RMD-7

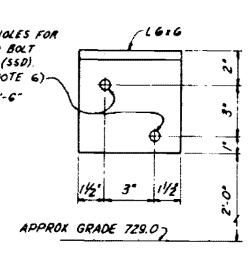
ECN 4234 FOR FCR F-2743

NOTES:
1. FOR ADDITIONAL NOTES AND LOCATION OF RMD's SEE 10N203-1.
2. ALL ANGLES SHOULD BE OF A NEW QUALITY ALUMINUM OR STAINLESS STEEL. FIELD MAY USE ¾" STAINLESS STEEL PLATE IN FABRICATION OF ALL ANGLES TO FACILITATE CONSTRUCTION.
3. ALL SAWN SURFACES SHOULD BE DEBURRED.
4. ANGLES SHOULD BE MOUNTED ON SMOOTH CONCRETE SURFACES.
5. HORIZONTAL SURFACES OF EACH ANGLE AND/OR PLATE SHOULD BE LEVELED AT TIME OF INSTALLATION.
6. ALL ANCHORS TO BE PHILLIPS "RED HEAD" (⅛ SSD) OR APPROVED EQUIVALENT. QUALIFICATIONS, INSTALLATION, AND INSPECTION IN ACCORDANCE WITH G-32 IS NOT REQUIRED FOR THIS APPLICATION.
7. APPROPRIATE LOCKABLE PROTECTIVE COVERING FOR EACH DEVICE BY FIELD
8. INSTALLATION SHOULD BE COORDINATED WITH M.L. DeWITT IN THE CIVIL ENGINEERING SUPPORT BRANCH OF EN DES (EXTENSION 6773, KNOXVILLE)
9. CONSTRUCTION SHOULD PURCHASE A MICROMETER DEPTH GAGE, 0 - 6 INCH RANGE, 3-INCH BASE, .001-INCH GRADUATION, NO. 445A-6RL (AS MANUFACTURED BY L. S. STARRETT COMPANY, ATHOL, MASSACHUSETTS) OR APPROVED EQUIVALENT.
10. FOR INFORMATION CONCERNING READING SCHEDULES AND DATA PROCESSING CONTACT M.L. DEWITT. SEE NOTE 8.
11. FIELD MAY MOVE RMD'S ± 6" FROM THEORETICAL LOCATION TO FACILITATE CONSTRUCTION.

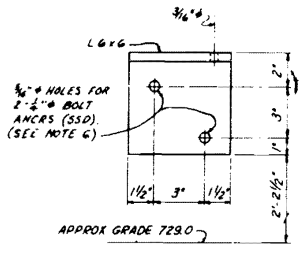
ECN 4234 FOR FCR F-2809



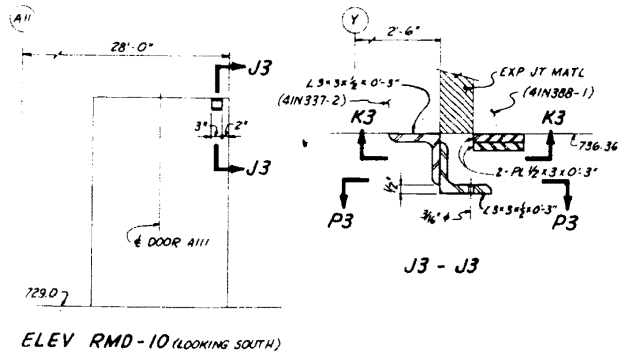
PLAN RMD-9



G3 - G3

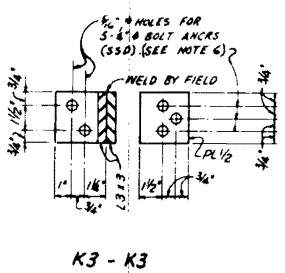


H3 - H3

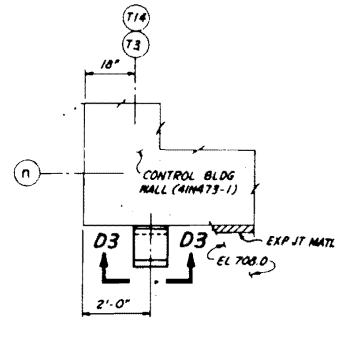


ELEV RMD-10 (LOOKING SOUTH)

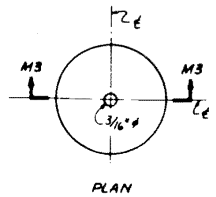
J3 - J3



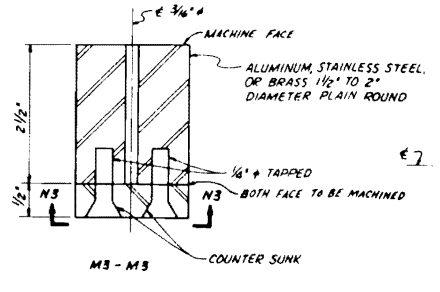
K3 - K3



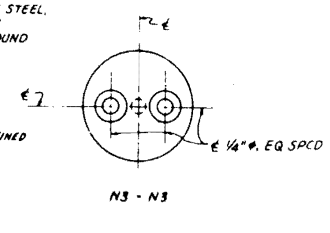
PLAN RMD-12 & PLAN RMD-13 OPP H



PLAN

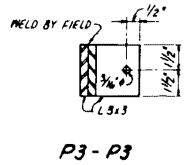


M3 - M3



N3 - N3

DET L3
CALIBRATION DEVICE



P3 - P3

COMPANION DRAWINGS
10N203-1 & -2

RO ISSUE PER ECN 3833

Added by Amendment 50

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
GENERAL LOCATION OF RELATIVE MOVEMENT DETECTORS TVA DWG NO. 10N203-3 R1 FIGURE 2.5-590

Figure 2.5-590 General Location Of Relative Movement Detectors TVA DWG NO. 10N203-3 R1

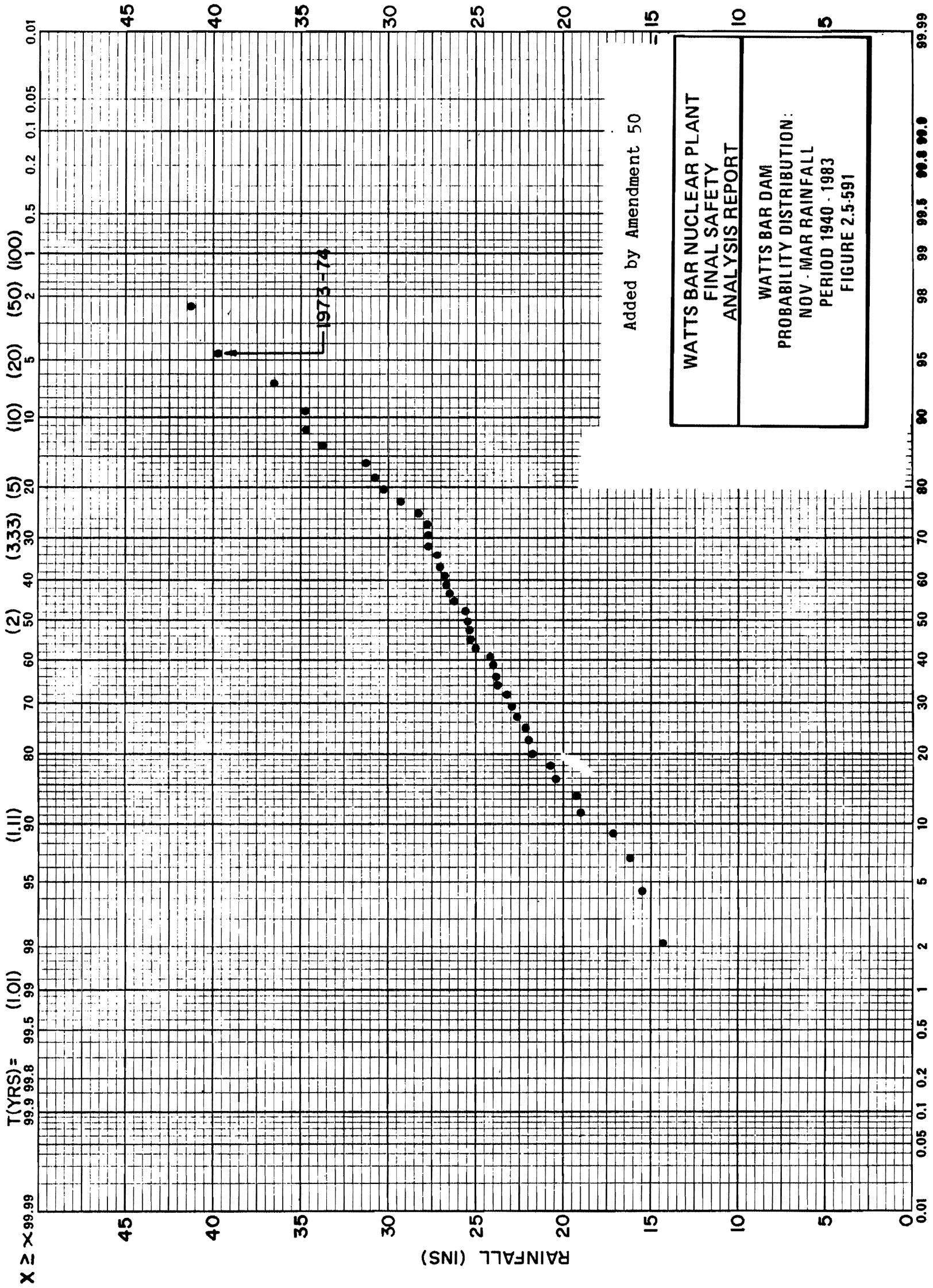


Figure 2.5-591 Watts Bar Dam Probability Distribution: November - March Rainfall Period 1940 - 1983

Security-Related Information - Withheld Under 10CFR2.390

Figure 2.5-592 Yard ERCW Pipeline EST. 25-YR High Water Table

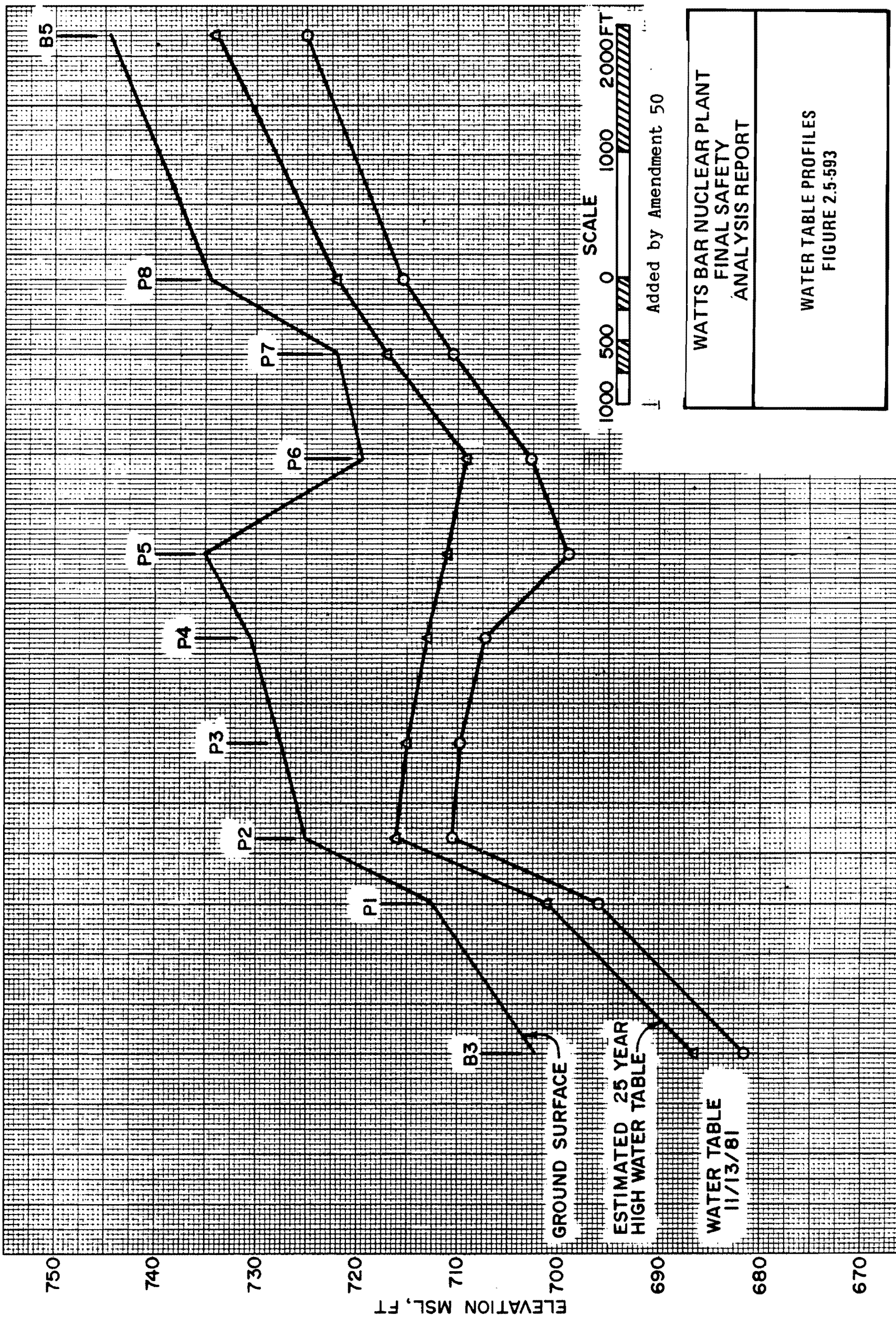


Figure 2.5-593 Water Table Profiles

Figure 2.5-594 Yard Underground Barrier Trench A STA 1 + 78
(Actual Figure Located in Oversized Figures File)

Figure 2.5-595 Yard Underground Barrier Trench A STA 3 + 78
(Actual Figure Located in Oversized Figures File)

Figure 2.5-596 Yard Underground Barrier Trench A STA 5 + 78
(Actual Figure Located in Oversized Figures File)

Figure 2.5-597 Yard Underground Barrier Trench A STA 7 + 78
(Actual Figure Located in Oversized Figures File)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SUMMARY OF EARTHFILL
TEST DATA - DENSITY
FIGURE 2.5-598

CP-2.01 ~~11~~ SWJ
ient F R4 11-5-83

SI

2 of 2

FEATURE: UNDERGROUND BARRIER — TRENCH A - 95% γ_{DMAX} FILL

DATE: 9-30-83 TO: 10-22-83 TEST NO.: 1351 TO: 1390

PART: I SECTION: 52A (A) PREPARED BY: W.S. WOODLEE

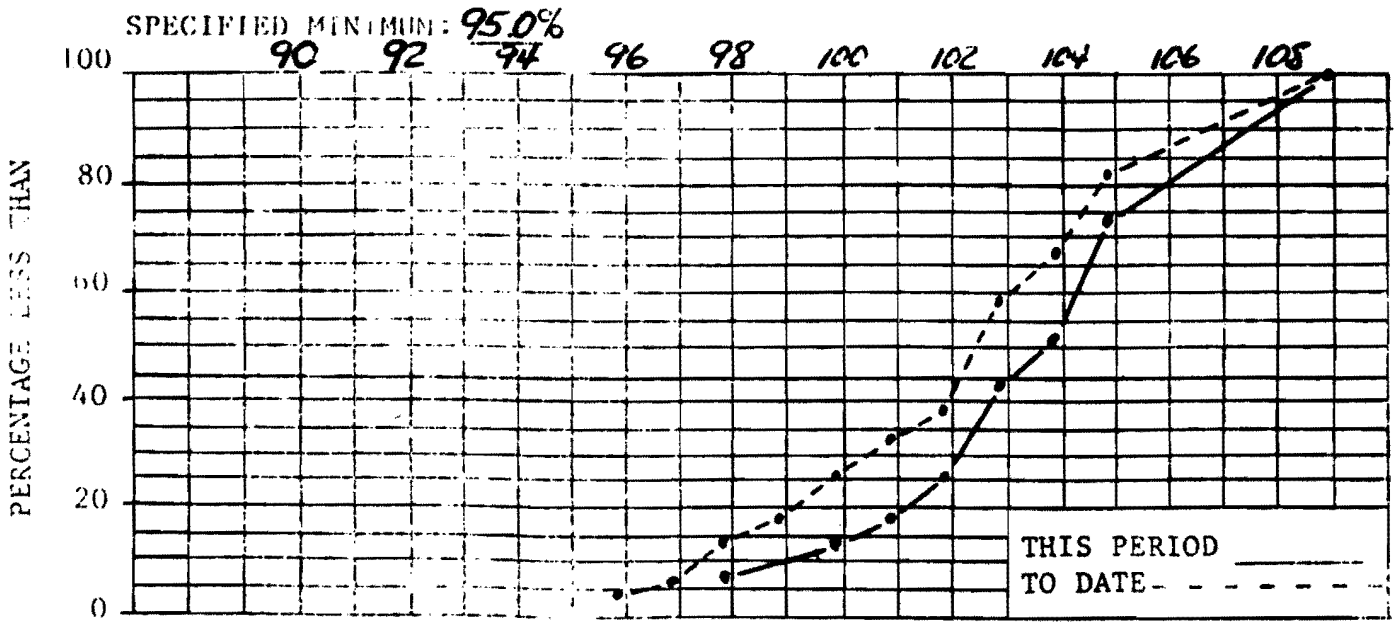
PERCENT COMPACTION (γ_{df} - γ_{dL}) X 100

	PLOT THIS COL	PREV CUM F	THIS PERIOD FREQUENCY (F)	F	CUM F	CUM %	TO DATE F	CUM F	CUM %
90.0	91.9								
92.0	92.9								
93.0	93.9								
94.0	94.9								
95.0	95.9	3					3	3	4.5
96.0	96.9	4					1	4	6.0
97.0	97.9	8	II	2	2	7.4	6	10	14.9
98.0	98.9	10					2	12	17.9
99.0	99.9	13	II	2	4	14.8	5	17	25.4
100.0	100.9	14	I	1	5	18.5	2	19	28.4
101.0	101.9	19	II	2	7	25.9	7	26	38.8
102.0	102.9	27	IIII	5	12	44.4	13	39	58.2
103.0	103.9	31	II	2	14	51.9	6	45	67.2
104.0	104.9	35	IIII-I	6	20	74.1	10	55	82.1
105.0	108.9	40	IIII-II	7	27	100.0	12	67	100.0
TOTALS		40	- -	- -	27	- -	- -	67	- -

SPECIFICATION SOURCE: DWG #10N213-2 R2

	PREV	THIS PERIOD	TO DATE
AVG FILL DRY DENSITY, γ_{df}, pcf	105.5	105.8	105.6
AVG MAXIMUM DRY DENSITY, γ_{dL}, pcf	104.0	102.6	103.4
MEAN VARIATION γ_{df} - γ_{dL}, pcf	+1.5	+3.2	+2.2

SPECIFIED MINIMUM: 95.0%



SWJ 11-5-83

REMARKS: THIS IS THE FINAL ANALYSIS FOR TYPE A FILL COMPACTION.

INSPECTED/CHECKED/VERIFIED IN ACCORDANCE WITH REV 4 OF WBNP-QCP-2.01. SWJ

W. Scott Woodlee 11-5-83
INSPECTOR Date

ADDED BY AMENDMENT 59

Figure 2.5-598 Summary of Earthfill Test Data - Density

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT

SUMMARY OF EARTHFILL TEST DATA - MOISTURE CONTENT FIGURE 2.5-599

WBNP-QCP-2.01 ~~R3~~ SW
Attachment G R4 11-5-83
QCP

SUM

Sheet 2 of 2

FEATURE: UNDERGROUND BARRIER – TRENCH A - 95% δ_{DMAX} FILL

DATE: 9-30-83 TO: 10-22-83 TEST NO.: 1351 TO: 1390

PART: I SECTION: 52A (A) PREPARED BY: W.S. WOODLEE

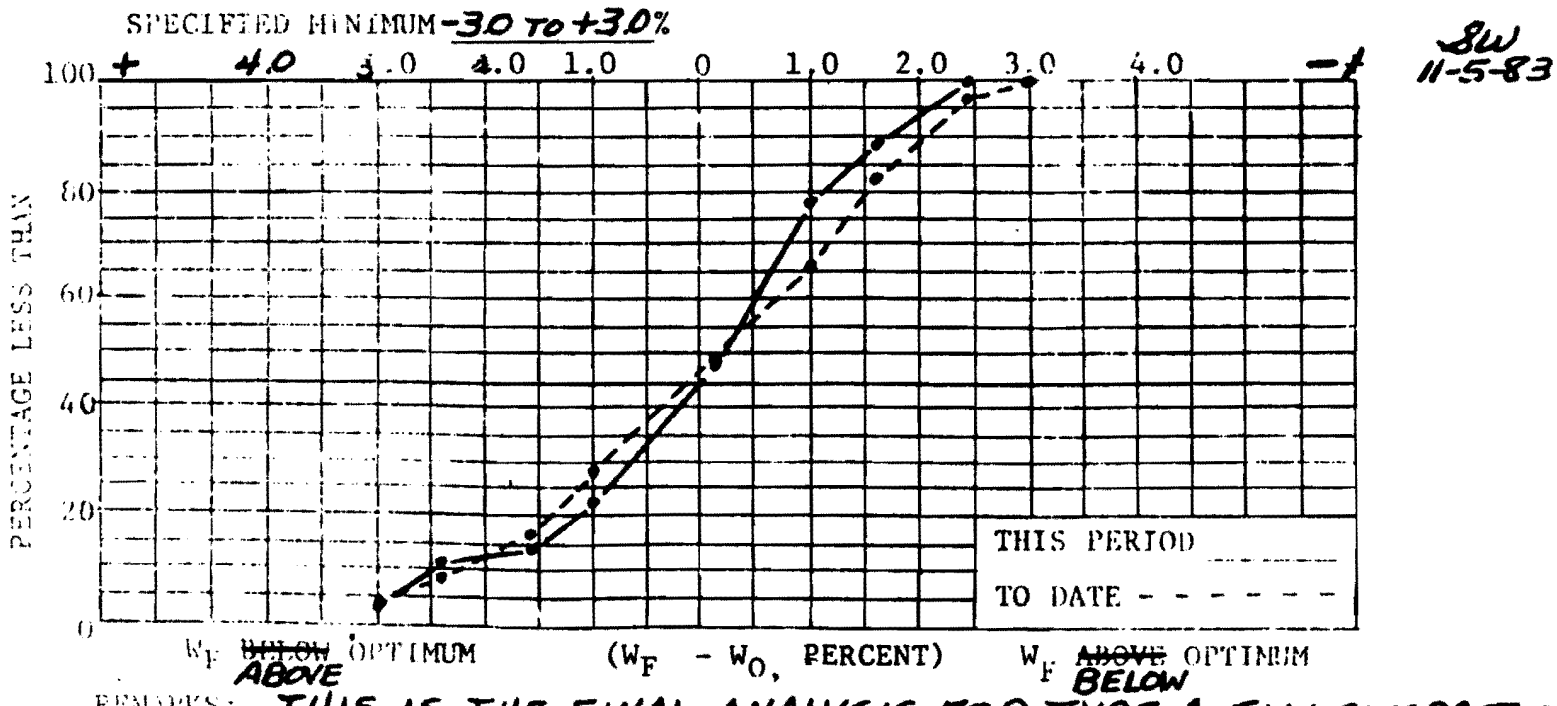
		PLOT THIS COL.	PREV CUM F	THIS PERIOD FREQUENCY (F)	F	CUM F	CUM %	TO DATE F	CUM F	CUM %
W_F ABOVE OPT	+4.6	5.2								
	3.9	4.5								
	3.1	3.8								
	2.5	3.0	2	I	1	1	3.7	3	3	4.5
	1.8	2.4	3	II	2	3	11.1	3	6	9.0
	1.1	1.7	7	I	1	4	14.8	5	11	16.4
	0.4	1.0	13	II	2	6	22.2	8	19	28.4
PLOT	+0.3	-0.3	20	NW-II	7	13	48.1	14	33	49.3
	0.4	1.0	23	NW-III	8	21	77.8	11	44	65.7
	1.1	1.7	32	III	3	24	88.9	12	56	83.6
W_F BELOW OPT	1.8	2.4	38	III	3	27	100.0	9	65	97.0
	2.5	3.0	40					2	67	100.0
	3.1	3.8								
	3.9	4.5								
	-4.6	5.2								
	TOTALS	NA	40	--	--	27	--	--	67	--

($W_F - W_O$), PERCENT

SPECIFICATION SOURCE: DWG. #10N213-2 R2

	PREV	THIS PERIOD	TO DATE
AVG FILL MOISTURE CONTENT, W_F, %	18.9	19.8	19.3
AVG OPTIMUM MOISTURE CONTENT, W_O, %	19.4	20.0	19.6
MEAN VARIATION ($W_F - W_O$), %	-0.5	-0.2	-0.3

SPECIFIED MINIMUM -3.0 TO +3.0%



SW 11-5-83

REMARKS: THIS IS THE FINAL ANALYSIS FOR TYPE A FILL COMPACTION.

INSPECTED/CHECKED/VERIFIED IN ACCORDANCE WITH R 4 OF WBNP-QCP-2.01. SW

W. Scott Woodlee 11-5-83
INSPECTED

ADDED BY AMENDMENT 59

Figure 2.5-599 Summary Of Earthfill Test Data -Moisture Content

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SUMMARY OF EARTHFILL
TEST DATA - DENSITY
FIGURE 2.5-600

WBNP-QCP-2.01 ~~R3~~ SW
Attachment F R4 11-5-83
QCP

Sheet 4 of 4

FEATURE: UNDERGROUND BARRIER – TRENCH A – 100% γ_{dMAX} FILL

DATE: 9-30-83 TO: 10-9-83 TEST NO.: 1347 TO: 1364

PART: I SECTION: 52A (A1) PREPARED BY: W.S. WOODLEE

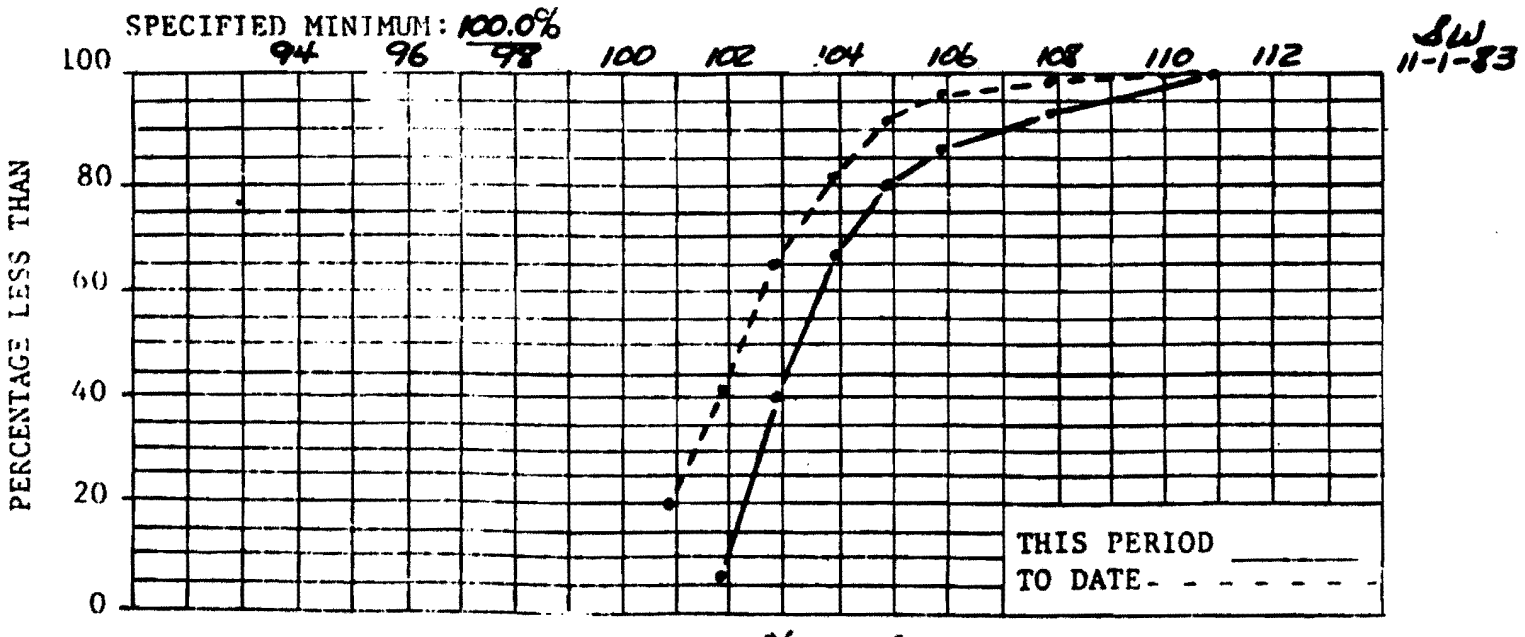
PERCENT COMPACTION ($\gamma_{df} - \gamma_{dL}$) X 100

	PLOT THIS COL.	PREV CUM F	THIS PERIOD FREQUENCY (F)	F	CUM F	CUM %	TO DATE F	CUM F	CUM %
95.0	95.9								
96.0	96.9								
97.0	97.9								
98.0	98.9								
99.0	99.9								
100.0	100.9	16					16	16	20.0
101.0	101.9	32	I	1	1	6.7	17	33	41.3
102.0	102.9	46	IIII	5	6	40.0	19	52	65.0
103.0	103.9	55	IIII	4	10	66.7	13	65	81.3
104.0	104.9	61	II	2	12	80.0	8	73	91.3
105.0	105.9	64	I	1	13	86.7	4	77	96.3
106.0	106.9								
107.0	107.9	65	I	1	14	93.3	2	79	98.8
108.0	108.9								
109.0	110.9		I	1	15	100.0	1	80	100.0
TOTALS		65	– –	– –	15	– –	– –	80	– –

SPECIFICATION SOURCE: DWG. *10N213-2 R2

	PREV	THIS PERIOD	TO DATE
AVG FILL DRY DENSITY, γ_{df}, pcf	104.4	105.2	104.6
AVG MAXIMUM DRY DENSITY, γ_{dL}, pcf	102.1	101.2	101.9
MEAN VARIATION $\gamma_{df} - \gamma_{dL}$, pcf	+2.3	+4.0	+2.7

SPECIFIED MINIMUM: 100.0%



SW 11-1-83

REMARKS: THIS IS THE FINAL ANALYSIS FOR TYPE A1 FILL COMPACTION. SW

INSPECTED/CHECKED/VERIFIED IN ACCORDANCE WITH REV 4 OF WBNP-QCP-2.01.

W. Scott Woodlee 11-5-83
INSPECTOR Date

ADDED BY AMENDMENT 59

Figure 2.5-600 Summary Of Earthfill Test Data -Density

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SUMMARY OF EARTHFILL
TEST DATA - MOISTURE CONTENT
FIGURE 2.5-601

WBNP-QCP-2.01 ~~11~~ R4 SW 11-5-83
Attachment G
LOP

Sheet 4 of 4

FEATURE: UNDERGROUND BARRIER – TRENCH A - 100% γ_{DMAX} FILL
DATE: 9-30-83 TO: 10-9-83 TEST NO.: 1347 TO: 1364
PART: I SECTION: 52A (A1) PREPARED BY: W.S. WOODLEE

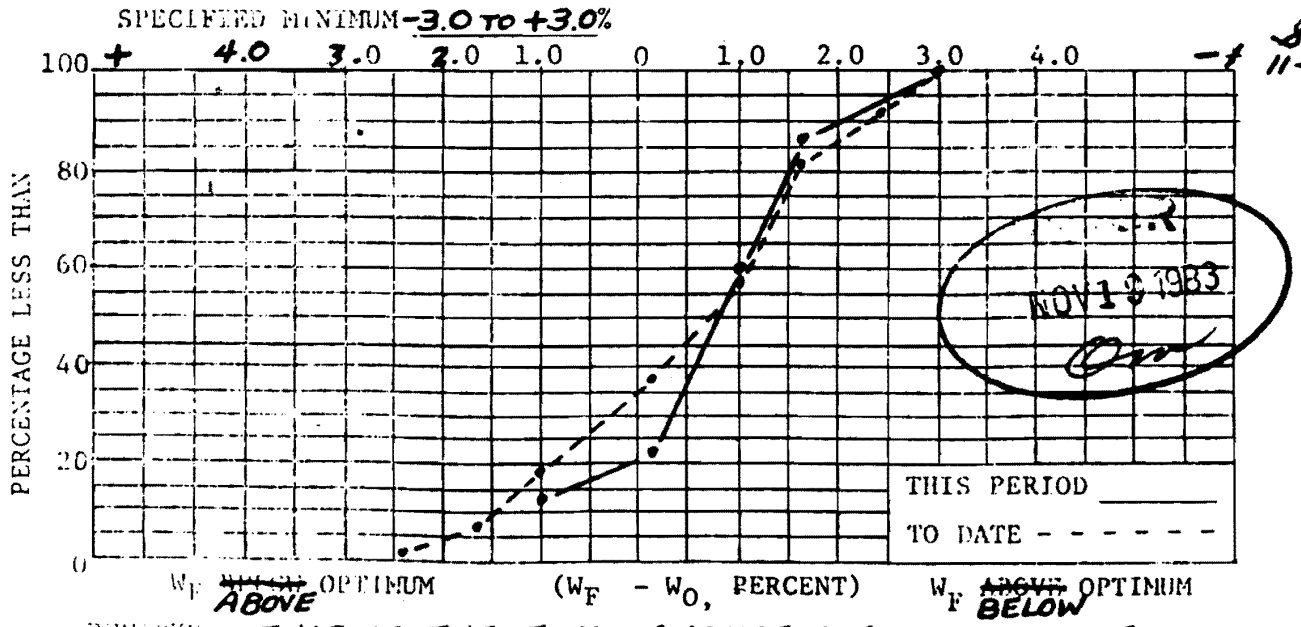
	PLOT THIS COL.	PREV CUM F	THIS PERIOD: FREQUENCY (F)	THIS PERIOD: F	THIS PERIOD: CUM F	THIS PERIOD: CUM %	TO DATE: F	TO DATE: CUM F	TO DATE: CUM %
W_F ABOVE OPT	+4.6	5.2							
	3.9	4.5							
	3.1	3.8							
	2.5	3.0							
	1.8	2.4	1				1	1	1.3
	1.1	1.7	6				5	6	7.5
PLOT	0.4	1.0	13	II	2	2	13.3	9	15	18.8
	+0.3	-0.3	25	II	2	4	26.7	14	29	36.3
	0.4	1.0	38	IIII	5	9	60.0	18	47	58.8
	1.1	1.7	52	IIII	4	13	86.7	18	65	81.3
W_F BELOW OPT	1.8	2.4	61					9	74	92.5
	2.5	3.0	65	II	2	15	100.0	6	80	100.0
	3.1	3.8								
	3.9	4.5								
	-4.6	5.2								
	TOTALS	NA	65	--	--	15	--	--	80	--

(W_F - W_O), PERCENT

SPECIFICATION SOURCE: DWG.*10N213-2 R2

	PREV	THIS PERIOD	TO DATE
AVG FILL MOISTURE CONTENT, W_F, %	19.7	19.9	19.7
AVG OPTIMUM MOISTURE CONTENT, W_O, %	20.4	20.8	20.5
MEAN VARIATION (W_F - W_O), %	-0.7	-0.9	-0.8

SPECIFIED MINIMUM -3.0 TO +3.0%



SW 11-5-83

NOV 10 1983

REMARKS: THIS IS THE FINAL ANALYSIS FOR TYPE A1 FILL COMPACTION. SW
INSPECTED/CHECKED/VERIFIED IN ACCORDANCE WITH R 4 OF WBNP-QCP-2.01.

W. Scott Woodlee 11-5-83
INSPECTOR

ADDED BY AMENDMENT 59

Figure 2.5-601 Summary Of Earthfill Test Data -Moisture Content

Figure 2.5-602 Yard Underground Barrier Trench B STA 1 + 100
(Actual Figure Located in Oversized Figures File)

Figure 2.5-603 Yard Underground Barrier Trench B STA 2 + 50
(Actual Figure Located in Oversized Figures File)

Figure 2.5-604 Yard Underground Barrier Trench B STA 3 + 00
(Actual Figure Located in Oversized Figures File)

Figure 2.5-605 Yard Underground Barrier Trench B STA 4 + 50
(Actual Figure Located in Oversized Figures File)

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SUMMARY OF FILL TEST
DATA - DENSITY
FIGURE 2.5-606

NP-QCP-2.01 R6
tachment F
P

Sheet 1 of ____

FEATURE: UNDERGROUND BARRIER - TRENCH B-95% γ_{pMAX} FILL

DATE: 11-2-83 TO: 6-28-84 TEST NO.: 1397 TO: 1475

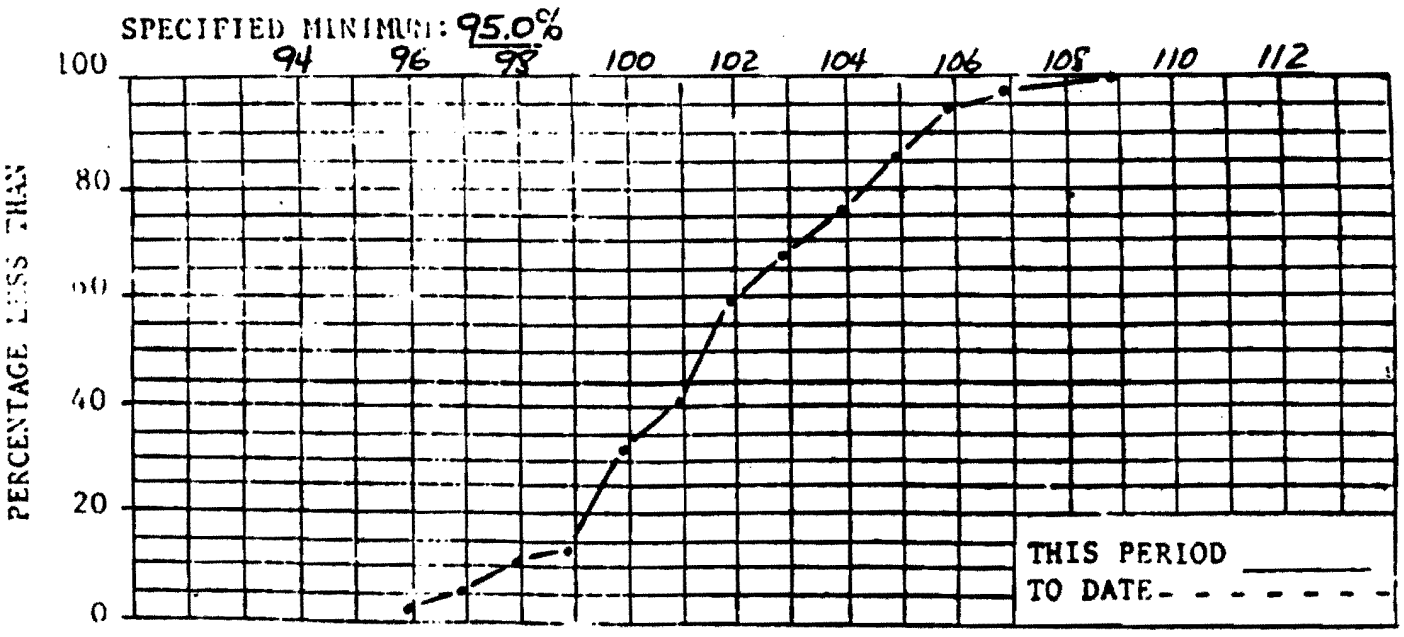
PART: I SECTION: 52B (A) PREPARED BY: W.S. WOODLEE

PERCENT COMPACTION ($\gamma_{df} - \gamma_{dL}$) x 100	PLOT THIS COL	PREV CUM F	THIS PERIOD FREQUENCY (F)	F	CUM F	CUM %	TO DATE F	TO DATE CUM F	TO DATE CUM %
95.0	95.9		I	1	1	2.7			
96.0	96.9		I	1	2	5.4			
97.0	97.9		II	2	4	10.8			
98.0	98.9		I	1	5	13.5			
99.0	99.9		NW-II	7	12	32.4			
100.0	100.9		III	3	15	40.5			
101.0	101.9		NW-II	7	22	59.5			
102.0	102.9	NA	III	3	25	67.6	NA	NA	NA
103.0	103.9		III	3	28	75.7			
104.0	104.9		IIII	4	32	86.5			
105.0	105.9		III	3	35	94.6			
106.0	106.9		I	1	36	97.3			
107.0	107.9								
108.0	108.9		I	1	37	100.0			
109.0	110.9								
TOTALS			- -	--	37	--	--		

SPECIFICATION SOURCE: DWG. #10N213-2 R4

	PREV	THIS PERIOD	TO DATE
AVG FILL DRY DENSITY, γ_{df}, pcf	NA	107.0	107.0
AVG MAXIMUM DRY DENSITY, γ_{dL}, pcf	NA	105.3	105.3
MEAN VARIATION $\gamma_{df} - \gamma_{dL}$, pcf	NA	+1.7	+1.7

SPECIFIED MINIMUM: 95.0% / 98



SW 7-3-84

REMARKS: FAILED TESTS NOT INCLUDED IN THIS ANALYSIS. SW

INSPECTED/CHECKED/VERIFIED IN ACCORDANCE WITH REV 6 OF WBNP-QCP-2.01.

ADDED BY AMENDMENT 59 W. Scott Woodlee 7-3-84
INSPECTOR Date

Figure 2.5-606 Summary of Fill Test Data -Density

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SUMMARY OF EARTHFILL
TEST DATA - MOISTURE CONTENT
FIGURE 2.5-607

IP-QCP-2.01 R6
achment C

S

Sheet 1 of ____

FEATURE: UNDERGROUND BARRIER – TRENCH B - 95% γ_{OMAX} FILL

DATE: 11-2-83 TO: 6-28-84 TEST NO.: 1397 TO: 1475

PART: I SECTION: 52B (A) PREPARED BY: W.S. WOODLEE

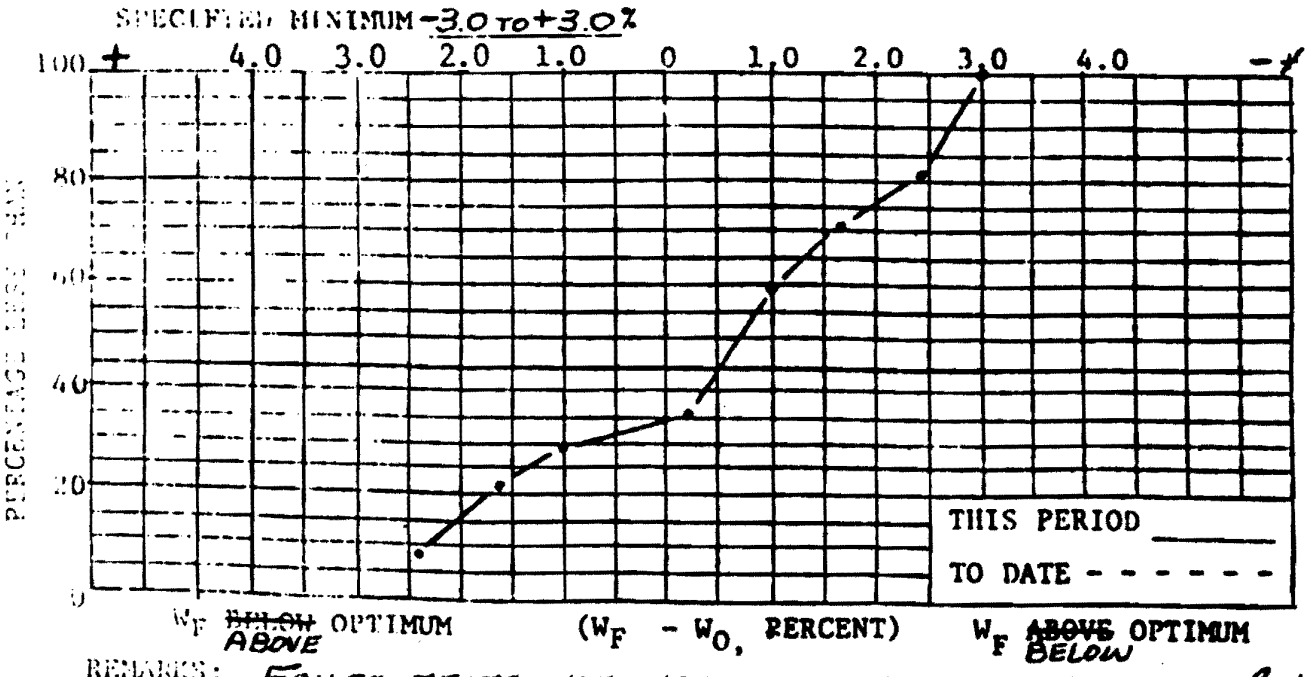
		PLOT THIS COL	PREV CUM F	THIS PERIOD FREQUENCY (F)	F	CUM F	CUM %	TO DATE F	CUM F	CUM %
W_F ABOVE OPT	+4.6	5.2								
	3.9	4.5								
	3.1	3.8								
	2.5	3.0								
	1.8	2.4		III	3	3	8.1			
	1.1	1.7		IIII-	5	8	21.6			
	0.4	1.0		III	3	11	29.7			
PLOT	+0.3	-0.3	NA	II	2	13	35.1	NA	NA	NA
	0.4	1.0		IIII-IIII	9	22	59.5			
	1.1	1.7		IIII	4	26	70.3			
W_F BELOW OPT	1.8	2.4		IIII	4	30	81.1			
	2.5	3.0		IIII-II	7	37	100.0			
	3.1	3.8								
	3.9	4.5								
	-4.6	5.2								
	TOTALS	NA		- -	--	37	--	--		--

(W_F - W_O), PERCENT

SPECIFICATION SOURCE: DWG.#10N213-2 R4

	PREV	THIS PERIOD	TO DATE
AVG FILL MOISTURE CONTENT, W_F, %	NA	18.4	18.4
AVG OPTIMUM MOISTURE CONTENT, W_O, %	NA	19.0	19.0
MEAN VARIATION (W_F - W_O), %	NA	-0.6	-0.6

SPECIFIED MINIMUM -3.0 TO +3.0 %



SW 7-3-84

REMARKS: FAILED TESTS NOT INCLUDED IN THIS ANALYSIS. SW

INSPECTED/CHECKED/VERIFIED IN ACCORDANCE WITH R 6 OF WBNP-QCP-2.01

ADDED BY AMENDMENT 59 W. Scott Woodlee 7-3-84
INSPECTOR

Figure 2.5-607 Summary of Earthfill Test Data - Moisture Content

WBNP-QCP-2.01 R6
Attachment F
1 of

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT
SUMMARY OF FILL TEST DATA - DENSITY

Sheet 2 of 2

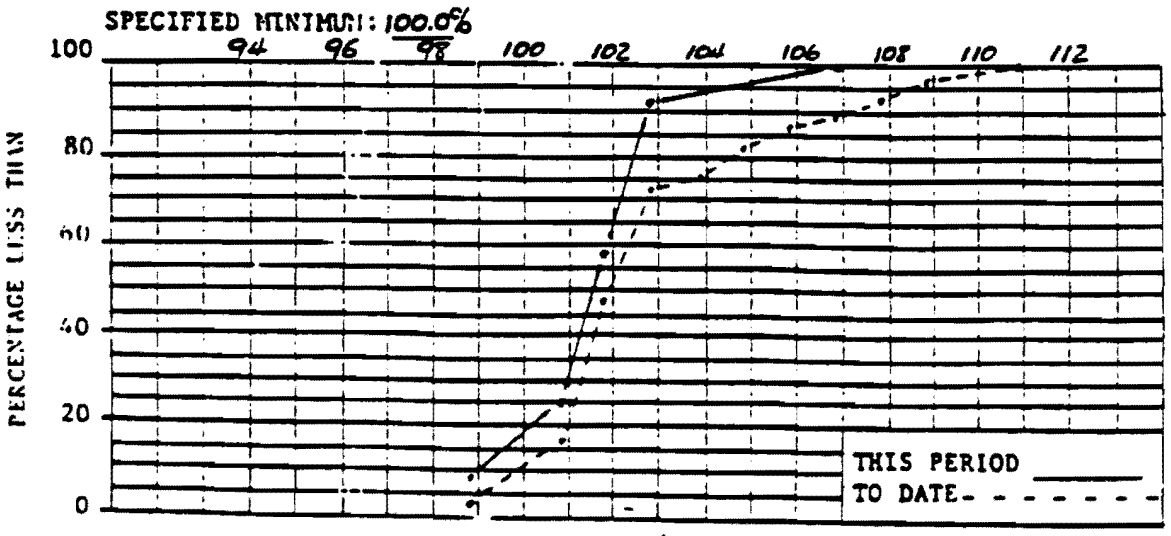
FEATURE: UNDERGROUND BARRIER - TRENCH A - 100% LOWER FILL.
DATE: 11-25-83 TO: 5-31-84 TEST NO.: 1408 TO: 1438
PART: I SECTION: 52B (A1) PREPARED BY: W.S. WOODLEE.

PERCENT COMPACTION ($\gamma_{df} - \gamma_{dL}$) x 100	PLOT THIS COL	PREV CUM F	THIS PERIOD FREQUENCY (F)	F	CUM F	CUM %	TO DATE F	CUM F	CUM %
95.0	95.9								
96.0	96.9								
97.0	97.9								
98.0	98.9		I	1	1	8.3	1	1	3.4
99.0	99.9								
100.0	100.9	2	II	2	3	25.0	4	5	17.2
101.0	101.9	7	IIII	4	7	58.3	9	14	48.3
102.0	102.9	10	IIII	4	11	91.7	7	21	72.4
103.0	103.9	11					1	22	75.9
104.0	104.9	13					2	24	82.8
105.0	105.9	14					1	25	86.2
106.0	106.9		I	1	12	100.0	1	26	89.7
107.0	107.9	15					1	27	93.1
108.0	108.9	16					1	28	96.6
109.0	110.9	17					1	29	100.0
TOTALS		17	- -	--	12	--	--	29	--

SPECIFICATION SOURCE: DWG. 10N213-2 R4.

	PREV	THIS PERIOD	TO DATE
AVG FILL DRY DENSITY, γ_{df}, pcf	104.7	105.6	105.1
AVG MAXIMUM DRY DENSITY, γ_{dL}, pcf	101.0	103.6	102.1
MEAN VARIATION $\gamma_{df} - \gamma_{dL}$, pcf	+3.7	+2.0	+3.0

SPECIFIED MINIMUM: 100.0%



SW
8-29-84

REMARKS: ANALYSIS ISSUED TO REFLECT CHANGE DUE TO MISTAKE ON SANDCONE TEST #1426.
INSPECTED/CHECKED/VERIFIED IN ACCORDANCE WITH REV 6 OF WBNP-QCP-2.01. NCR #5804

W. Scott Woodlee 8-29-84
INSPECTOR Date

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
SUMMARY OF FILL TEST DATA DENSITY
Figure 2.5-608

Amendment 63

Figure 2.5-608 Summary of Earthfill Test Data -Density

WBNP-QCP-2.01 R6
Attachment C
LOP

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT
SUMMARY OF EARTHFILL TEST DATA - MOISTURE CONTENT Sheet 2 of 2

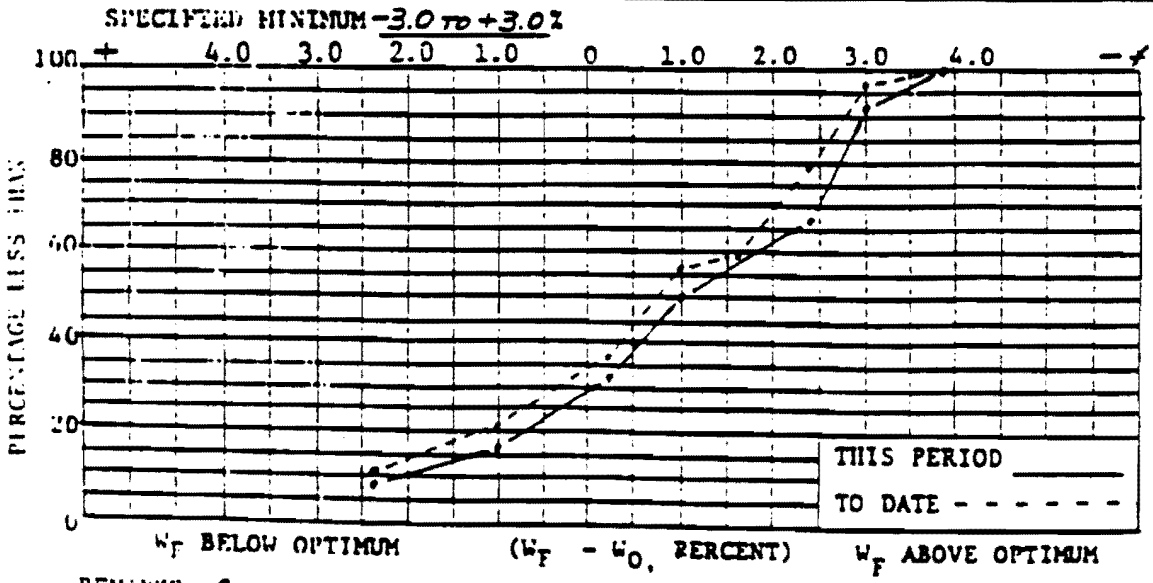
FEATURE: UNDERGROUND BARRIER – TRENCH B - 100% Y-12 FILL
DATE: 11-25-83 TO: 5-31-84 TEST NO.: 1408 TO: 1438
PART: I SECTION: 52B (A1) PREPARED BY: W.S. WOODLEE

$(W_F - W_O)$, PERCENT		PLOT THIS PERIOD	PREV CUM F	THIS PERIOD FREQUENCY (F)	F	CUM F	CUM %	TO DATE F	CUM F	CUM %
W_F ABOVE OPT	+4.6	5.2								
	3.9	4.5								
	3.1	3.8								
	2.5	3.0								
	1.8	2.4	2	II	1	1	8.3	3	3	10.3
	1.1	1.7								
	0.4	1.0	4	II	1	2	16.7	3	6	20.7
	+0.3	-0.3	7	III	2	4	33.3	5	11	37.9
	0.4	1.0	10	III	2	6	50.0	5	16	55.2
	1.1	1.7	11					1	17	58.6
	1.8	2.4	15	III	2	8	66.7	6	23	79.3
	2.5	3.0	17	III	3	11	91.7	5	28	96.6
	3.1	3.8		I	1	12	100.0	1	29	100.0
W_F BELOW OPT	3.9	4.5								
	-4.6	5.2								
	TOTALS	NA	17	--	--	12	--	--	29	--

SPECIFICATION SOURCE: DWG #10N213-2 R4

	PREV	THIS PERIOD	TO DATE
AVG FILL MOISTURE CONTENT, W_F, %	20.2	18.7	19.6
AVG OPTIMUM MOISTURE CONTENT, W_O, %	21.1	20.2	20.7
MEAN VARIATION ($W_F - W_O$), %	-0.9	-1.5	-1.1

SPECIFIED MINIMUM -3.0 TO +3.0%



SW 8-29-84

REMARKS: ANALYSIS ISSUED TO REFLECT CHANGE DUE TO MISTAKE ON SANDCONE TEST #1426. NCR #5604
INSPECTED/CHECKED/VERIFIED IN ACCORDANCE WITH R 6 OF WBNP-QCP-2.01.
W. Scott Woodlee 8-29-84

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
SUMMARY OF EARTHILL TEST DATA MOISTURE CONTENT
Figuure 2.5-609

Amendment 63

Figure 2.5-609 Summary of Earthfill Test Data - Moisture Content

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SUMMARY OF GRANULAR FILL TEST DATA - RELATIVE DENSITY
FIGURE 2.5-610

WBNP-QCP-2.06 R4
Attachment F
LOP
Sheet 2 of ___

Summary o

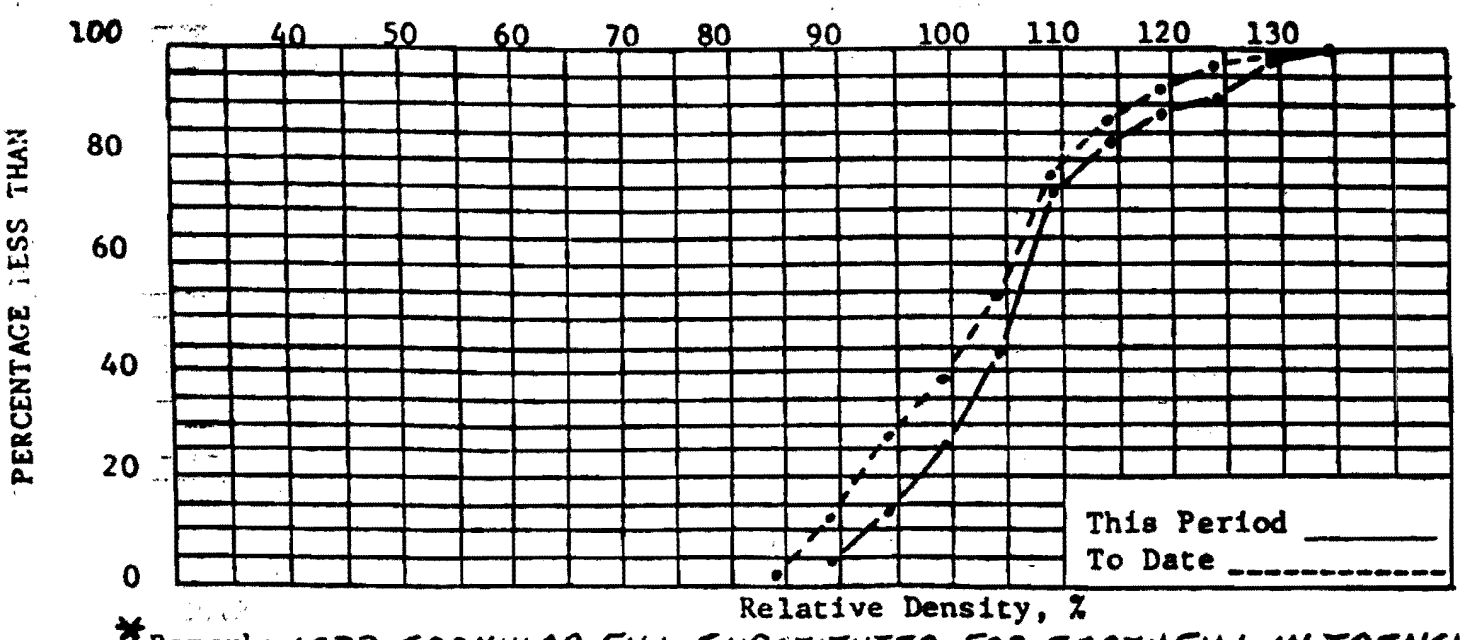
*Feature: UNDERGROUND BARRIER – TRENCH B - 1032 CRUSHED STONE
Period: 4-27-84 to 5-31-84 Test No. 2046 to 2092
Part II Section 29 Prepared by W.S. WOODLEE

	PLOT THIS COLUMN	PREV. CUM. F	THIS PERIOD				TO DATE		
			FREQUENCY (F)	F	CUM F	CUM %	F	CUM F	CUM %
60.0	64.9								
65.0	69.9								
70.0	74.9								
75.0	79.9								
80.0	84.9	2					2	2	2.7
85.0	89.9	7	II	2	2	4.7	7	9	12.3
90.0	94.9	14	IIII	4	6	14.0	11	20	27.4
95.0	99.9	17	NW	5	11	25.6	8	28	38.4
100.0	104.9	21	NW-III	8	19	44.2	12	40	54.8
105.0	109.9	24	NW-NW-III	13	32	74.4	16	56	76.7
110.0	114.9	27	IIII	4	36	83.7	7	63	86.3
115.0	119.9	30	II	2	38	88.4	5	68	93.2
120.0	124.9		III	3	41	95.3	3	71	97.3
125.0	129.9		I	1	42	97.7	1	72	98.6
130.0	134.9		I	1	43	100.0	1	73	100.0
TOTALS		30	--	--	43	--	--	73	--

Specification Source DWG.*10N213-2 R4

	PREV.	THIS PERIOD	TO DATE
Avg. Relative Density	98.5	106.3	103.1

Specified Min. 80 min 95 AVG. %



*Remarks 1032 GRANULAR FILL SUBSTITUTED FOR EARTHFILL IN TRENCH B

Inspected/checked/verified in accordance with R 4 of WBNP-QCP-2.06

W. Scott Woodlee — Inspector
6-11-84 — Date

ADDED BY AMENDMENT 59

Figure 2.5-610 Summary of Granular Fill Test Data - Relative Density