UNITED STATES DEPARTMENT OF ENERGY
Albuquerque, New Mexico

Uranium Mill Tailings Remedial Action Project (UMTRAP)

Mexican Hat, Utah

Subcontract Documents
Preliminary Design for Review

Bid Schedule
Special Conditions
Specifications
Subcontract Drawings

January 1987

MORRISON-KNUDSEN ENGINEERS, INC.
A MORRISON KNUDSEN COMPANY

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THIS DRAFT DOCUMENT IS PART OF THE DELIBERATIVE PROCESS OF THE U.S. DEPARTMENT OF ENERGY (DOE) IN ITS DECISION-MAKING FUNCTION UNDER THE URANIUM MILL TAILINGS RADIATION CONTROL ACT OF 1978, THE NATIONAL ENVIRONMENTAL POLICY ACT, AND OTHER APPLICABLE LAW. IT IS PROVIDED TO THE RECIPIENT PARTICIPATING FEDERAL OR STATE AGENCY OR INDIAN TRIBE WITH THE EXPRESS UNDERSTANDING THAT IT IS ONLY TO BE USED FOR THE PURPOSE OF PROVIDING THE DOE WITH INPUT TO SUCH DECISION-MAKING PROCESS. THE RECIPIENT PARTICIPATING FEDERAL OR STATE AGENCY EXPRESSLY AGREES TO LIMIT DISTRIBUTION OF THIS DOCUMENT TO THOSE EMPLOYEES WHO WILL PROVIDE INPUT TO THE DOE.

UMTRA PROJECT - MEXICAN HAT, UTAH

SUBCONTRACT DOCUMENTS

PRELIMINARY DESIGN FOR REVIEW

JANUARY 1987

UMTRA PROJECT

MEXICAN HAT, UTAH

SUBCONTRACT DOCUMENTS

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HAT-PS-10-0909, Rev. A	Fence and Gate Details
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Bid Schedule

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BID SCHEDULE

Name of Bidder _____ Date: _____

Following are the prices bid for completion of the Work as required by the Subcontract Documents:

Item No.	Spec. Section	Description*	Unit	Approx. Quantity	Unit Price	Amount
000 - MOBILIZATION						
001	01019	Mobilization	L.S.	100%	N/A	_____
002	SC-22	Payment for Bond Premium	L.S.	100%	N/A	_____
200 - SITE PREPARATION						
201	02050	Demolition and Disposal of Structures	L.S.	100%	N/A	_____
202	02060	Removal and Abandonment of Existing Utilities	L.S.	100%	N/A	_____
203	02090	Sealing of Abandoned Wells	L.F.	980	_____	_____
204	02141	Dewatering and Drainage	L.S.	100%	N/A	_____
205	02200	Excavation for Temporary Drainage Facilities	C.Y.	3,700	_____	_____
206	02200	Fill for Temporary Drainage Facilities	C.Y.	8,200	_____	_____
207	02771	Membrane Liner	S.Y.	5,750	_____	_____

Item No.	Spec. Section	Description*	Unit	Approx. Quantity	Unit Price	Amount
400 - TAILINGS PILE						
401	02200	Upper Tailings Pile Excavation	C.Y.	1,180,000	_____	_____
402	02200	Windblown and Water-borne Tailings Excavation	C.Y.	325,000	_____	_____
403	02200	Displacement Monuments	Each	6	_____	_____
500 - COVER						
501	02200	Radon Barrier	C.Y.	603,000	_____	_____
502	02200	Bentonite	Ton	11,100	_____	_____
600 - EROSION PROTECTION						
601	02278	Riprap Material Type A	C.Y.	75,000	_____	_____
602	02278	Riprap Material Type B	C.Y.	44,000	_____	_____
603	02278	Riprap Material Type C	C.Y.	5,300	_____	_____
604	02278	Riprap Material Type D	C.Y.	3,600	_____	_____
605	02278	Bedding Material	C.Y.	62,000	_____	_____
700 - DECONTAMINATION						
701	02500	Decontamination Pad	L.S.	100%	N/A	_____
800 - SITE RESTORATION						
801	02200	Common Excavation for Finish Grading of the Site	C.Y.	152,000	_____	_____
802	02200	Rock Excavation for Finish Grading of the Site	C.Y.	58,000	_____	_____
803	02200	Fill for Finish Grading of the Site	C.Y.	28,000	_____	_____

Item No.	Spec. Section	Description*	Unit	Approx. Quantity	Unit Price	Amount
900 - FENCING						
901	02832	Chain Link Fence and Gates	L.F.	640	_____	_____
902	02833	Woven Wire Fence	L.F.	13,840	_____	_____
		TOTAL (SUBCONTRACT PRICE)				$_____

* For complete description of a Bid Item and measurement and payment provisions, see Part 4 of the Specification Section cited.

END OF BID SCHEDULE

Special Conditions

UMTRA PROJECT

MEXICAN HAT, UTAH

SUBCONTRACT DOCUMENTS

SPECIAL CONDITIONS

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SC-1 DEFINITIONS

A. Wherever used in the Subcontract Documents the following terms have the meanings indicated which are applicable to both the singular and plural thereof:

1. Access Control Area - Access control area shall include the areas occupied by and in the immediate vicinity of administration facilities including, but not limited to, Contractor's and Subcontractor's office trailers, access control trailer, sanitary facilities, decontamination pad and its contaminated water collection sump, equipment and materials laydown and storage area, employee and service vehicle parking area, roadway connecting vehicular gate to decontamination pad.

2. Addenda - Written and/or graphic instruments issued prior to opening of Bids which clarify, correct or change the bidding documents.

3. Bid - The offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

4. Bonds - Bid, performance and payment bonds.

5. Change Order - A document signed by Subcontractor and Contractor authorizing an addition, deletion or revision in the Work, or an adjustment in the Subcontract Price or the Subcontract Time, modified in writing and issued on or after the Effective Date of the Agreement.

5a. Contract Modification - A document issued to incorporate all Change Orders or to modify Subcontract when a change is necessary.

6. Construction Facilities - Construction facilities shall include the construction, operation and maintenance of temporary features required during the construction phase of the permanent facilities. These facilities shall include, but not be limited to, the following: Site drainage and dewatering systems as specified in Section 02141 for removal of water from contaminated and uncontaminated areas; construction, maintenance and removal of new fences and removal of decontamination pad and existing fences.

7. Contaminated Materials - Tailings and other materials having radioactive contamination levels greater than

specified in the applicable US Environmental Protection Agency Standards. Contamination levels will be as determined by the Contractor. These standards are presented in the Federal Register, January 5, 1983, Section 192.12 - Standards for Remedial Actions at Inactive Uranium Processing Sites.

8. Controlled Area - See Section SC-8, Paragraph A.7 of the Special Conditions. Also included are areas with access controlled by ribbons, signs and tags.

9. General Requirements - Division 1 of the Specifications.

10. Lower-Tier Subcontractor/Other Subcontractor:

    a. Lower-tier Subcontractor - An individual firm or corporation having a direct contract with the Subcontractor.

    b. Other Subcontractor - An individual firm or corporation (other than the Subcontractor) having a direct contract with the Contractor for other work on the project.

11. Notice of Award - The written notice by Contractor to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the conditions precedent enumerated therein, within the time specified, Contractor will sign and deliver the Agreement.

12. Notice to Proceed - A written notice given by Contractor to Subcontractor fixing the date on which the Subcontract Time will commence to run and on which Subcontractor shall start to perform Subcontractor's obligations under the Subcontract Documents.

13. Permanent Facilities - Permanent facilities shall include construction of permanent features including, but not limited to, the following: Demolition of structures and disposal of debris; abandonment and relocation of existing utilities; construction of tailings embankment; sealing of abandoned wells; construction of permanent drainage ditches; and finish grading.

14. Project - The total construction of which the Work to be provided under the Subcontract Documents may be the whole, or a part as indicated elsewhere in the Subcontract Documents.

15. Shop Drawings - All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for Subcontractor to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a Supplier and submitted by Subcontractor to illustrate material or equipment for some portion of the Work.

16. Site Manager - The authorized representative of the Contractor who is assigned to the site or any part thereof.

17. Specifications - Those portions of the Subcontract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.

18. Subcontract Drawings - The drawings which show the character and scope of the Work to be performed and which are referred to in the Subcontract Documents.

19. Subcontract Price - The moneys payable by Contractor to Subcontractor under the Subcontract Documents as stated in the Agreement.

20. Subcontract Time - The number of days or the date stated in the Agreement for the completion of the Work.

21. Temporary Facilities - Facilities specified in Section 01500 including, but not limited to, construction equipment and machinery, tools, accessories, fuel, power, light, heat, telephone, water, sanitary facilities, decontamination washwater facilities, equipment and material storage area, parking area for all field personnel including construction, maintenance and service personnel, temporary roads, temporary offices, incidentals etc. necessary for the construction and completion of the Work specified in the Subcontract.

22. Temporary Roads - Improvements to existing roads and construction of new roads, if any, by the Subcontractor, for his convenience in the performance of the Subcontract.

23. Uncontaminated Materials - Materials having radioactive contamination levels less than specified in

the applicable US Environmental Protection Agency Standards. These standards are presented in the Federal Register, January 5, 1983, Section 192.12 - Standards for Remedial Actions at Inactive Uranium Processing Sites.

24. Work - The entire completed construction required under the Subcontract Documents. Work is the result of performing services, furnishing labor and furnishing and incorporating materials and equipment into the construction, as required by the Subcontract Documents.

B. The other terms such as Contractor, Subcontractor, Government, DOE, Subcontract Administrator, Subcontract Documents, MK-F and Site of Work are defined in Article GP-2 of General Provisions.

SC-2 HOLIDAYS

A. The following days will be observed as holidays by MK-Ferguson Company, the Contractor:

New Year's Day
Martin Luther King Jr.'s Birthday
Presidents' Day
Memorial Day
Navajo Memorial Day
Independence Day
Labor Day
Veterans Day
Thanksgiving Day
Christmas Day

B. Holidays occurring on Saturday or Sunday will be observed on Friday or Monday.

SC-3 CONSTRUCTION RESTRAINTS

A. Concurrent Work: MK-Ferguson Company (Contractor) and other subcontractors may be engaged in work in the general areas covered by the Work under this Subcontract. Such personnel will have access to the areas and to the utilities. The Subcontractor shall cooperate to best utilize the available areas, roadways and facilities. Coordination shall be through the Contractor.

B. During the course of this Subcontract, the Contractor will conduct tests on excavated areas to determine whether additional contamination remains to be excavated. Results of such tests are generally available within four

hours during normal work hours; however, test equipment constraints may cause delays in testing time and the availability of results.

C. Upon apparent completion of contaminated material excavation in a distinct area, the Contractor will conduct a radiological verification survey to confirm that contaminated materials have been removed to EPA standards. This survey may take up to seven work days. The Subcontractor shall plan his work accordingly.

D. Stop Work in Case of Excessive Radionuclide or Other Toxic Concentrations: The Site Manager will monitor construction activities and may stop the Work or require modification of Subcontractor activities during periods of significant downwind airborne contaminations and in the event that gaseous or particulate radionuclide or other toxic concentrations associated with construction activities exceed allowable limits. Any work stoppage shall be a last resort response to such conditions; other responses including watering, vehicle speed reduction, covering of material emitting radon gas, etc., shall first be implemented by the Subcontractor.

E. Decontamination Wash Water: All water from decontamination of vehicles, equipment, tools and materials and from decontamination shower facilities shall be collected and disposed of in the wastewater retention basin. Contaminated water may be utilized in dust control operations or in moisture control during earthwork operations of contaminated materials.

SC-4 SITE LOCATION AND COORDINATION OF WORK

A. The location of the site is specified in Specification Section 01010.

B. The Subcontractor shall carefully coordinate all construction activities with the Site Manager to avoid conflicts and unnecessary delays in construction.

SC-5 LABOR, MATERIALS, EQUIPMENT AND TEMPORARY FACILITIES

A. Unless otherwise specified in the General Requirements, Subcontractor shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, and completion of the Work.

B. Pursuant to the provisions of Division 1 - General Requirements, during the construction period, the Subcontractor will be permitted on-site temporary storage of material at a location approved by the Site Manager.

SC-6 CLEANUP AND WASTE DISPOSAL

A. Cleanup: The Subcontractor will be required to clean up the construction work areas including access control trailers and dispose of waste material. Cleanup of the construction work areas will be required on a daily basis. At the close of each day's work all small quantities of waste and debris resulting from construction activities shall be gathered up and disposed of as designated in Paragraph B below. Waste and debris shall not be allowed to accumulate in large enough quantities to create an unsightly appearance, a safety or fire hazard, nor shall it interfere in any way with free access to, and operation of existing facilities. All construction areas shall be thoroughly cleaned to the satisfaction of the Contractor prior to final acceptance of the completed Subcontract.

B. Waste Disposal:

1. General: Material determined to be waste will be tested for radioactive contamination prior to removal from the construction site. Testing will be performed by the Contractor at no cost to the Subcontractor and the waste will be classified into the following categories for disposal purposes:

a. Uncontaminated Waste: Uncontaminated office waste and construction waste shall be disposed of as follows:

1) Office Waste: The Subcontractor shall provide suitable receptacles for all construction office waste material such as wrapping paper, discarded containers, scrap lumber, scrap metals, and alike. Such waste shall be disposed of offsite as Subcontractor's property. No waste material or debris shall be buried on the site. The Subcontractor shall be responsible for locating the dump for trash and debris, and for haul and disposal costs.

2) Construction Waste: This will include waste materials resulting from clearing, stripping,

excavation, demolition and drilling operations. This type of waste shall be disposed of as specified in Specification Sections 02110 and 02200.

b. Contaminated Waste: Waste materials identified as contaminated materials defined in Section SC-1 will be disposed of in the construction of the tailings embankment as specified in Specification Sections 02050 and 02200.

C. Hazardous Waste: The Site Manager shall be notified immediately if chemically hazardous or toxic wastes are encountered during construction. Such wastes will be identified and disposed of by others.

SC-7 CONSTRUCTION HEALTH AND SAFETY

A. Contractor Safety Program:

1. The Subcontractor shall comply with the Construction Safety and Health Management Program (Document No. MK-UMTRA-4). This document is available upon request from the Contractor's office in Albuquerque, New Mexico.

2. The successful bidder will be issued a copy of the Construction Safety and Health Management Program Document with the Notice of Award by the Contractor's Subcontract Administrator.

3. A table of contents for the Construction Safety and Health Management Program is listed below:

SAFETY AND HEALTH MANAGEMENT PROGRAM

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B. Construction Safety and Health Initial Indoctrination and Training:

1. All construction personnel working on the site shall receive the basic Construction Safety and Health Initial Indoctrination and Training. The Indoctrination and Training will cover such matters as first aid and medical responsibilities, emergency actions, etc. The indoctrination will be oral or written (approximately 30 minutes). It will be presented to construction personnel either individually or on a group basis and at the Subcontractor's convenience. The indoctrination will be presented to all personnel upon request, between the hours of 8:00 a.m. and 4:00 p.m., Monday through Friday (holidays excluded). No construction personnel will be permitted to work without having received this basic indoctrination.

2. The use of respirators may be necessary on this Project. If respirator use becomes necessary, the respirators will be provided by the Contractor and training in the proper use of respirators in the performance of specific tasks will be provided by the Contractor. This instruction is approximately two hours long and will be provided to the Subcontractor at no extra cost. The Subcontractor shall notify the Contractor's Representative at least one (1) week in advance of the time that the training is desired. Note, that individuals with beards or facial hair that interferes with a proper respirator seal will not be accepted for respirator training.

3. No payment will be made to the Subcontractor for his employees' attendance at Safety and Health Initial Indoctrination and Training Program or respirator training provided by the Contractor. Full compensation for such costs will be considered incidental to the Work of this Subcontract.

4. Based upon the criteria established by the Morrison-Knudsen Corporate Medical Director and upon the recommendations listed in the American National Standard, ANSI Z88.2-1980, "Practices for Respiratory Protection", all employees who will or may be required to wear respirators on this Project shall complete a medical questionnaire. There may be a need for further medical evaluation based on answers in the questionnaire. The Respirator Program Administrator or his designee will make this determination.

C. Electrical Precautions:

1. Personnel Ground Fault Protection: All electrical conductors used in construction, operating on single phase, 120 vac, 15 or 20 amperes circuits, shall be equipped with UL listed Ground Fault Circuit Interrupters set at five (5) milliamperes plus (+) or minus (-) one (1) milliampere. All portable electric tools and their usage shall be in compliance with applicable OSHA (29 CFR 1926) standards.

2. Electrical Clearance Requirement: All electrical circuit connections shall be made on de-energized systems. Working clearance for energized systems shall be 3 feet for 0 to 150 volts and 4 feet for 151 to 600 volts. The work shall be performed by a qualified journeyman electrician or by an apprentice electrician under the direct supervision of a qualified journeyman electrician.

D. Smoking, Drinking, Eating and Chewing Restrictions: No smoking will be permitted in the immediate vicinity of any flammable liquids, gases or highly combustible material, or in any area posted as a non-smoking area. No smoking, drinking, eating or chewing will be permitted in any controlled area.

E. Ladders, Scaffolds, and Man Lifts: All man-lift equipment, ladders, and scaffolding shall be in compliance with applicable OSHA (29 CFR 1926) standards and be subject to inspection by the Contractor prior to and during its use.

F. Trench/Excavation Barricades:

1. Trenching, excavation, shoring, bracing, and barricading requirements shall be in accordance with OSHA, CFR 1926, Subpart P.

2. The following forms of protection shall be required for open trenches/excavations adjacent to occupied buildings, crossing pedestrian crosswalks and paths, at street intersections, and crossing or adjacent to sidewalks and driveways:

a. Barricades shall be positioned on each side of the trench and stationed at a maximum of ten (10) foot intervals. Spacing on each side of the trench shall alternate to show that a front view depicts barricades at five (5) foot intervals.

b. Whenever possible, each barricade shall be positioned at least two (2) feet away from the open trench or excavation.

c. Each barricade shall be equipped with a yellow flasher of at least eight (8) inches in diameter. (NOTE: Temporary barricades used during daylight operations do not require flashers.) Street side flashers shall be directed parallel with the street, curb side flashers and flashers along pedestrian routes shall be facing in the direction of pedestrian traffic.

d. When continuous solid barricades are not provided, interconnecting ropes or tape shall be attached to all barricades. When rope is used, streamers shall be attached at 2-3 foot intervals.

e Walkways and/or bridges with standard guard rails, shall be provided at all pedestrian crossing points except for trench width 2'-0" and less where a barricade straddling the trench on either side of the walkway may be used.

f. Where vehicle traffic must cross trenching operations, metal plate covers shall be provided to support all motor vehicles.

g. Where trenches or excavations interrupt a doorway, ramp, or other exits/entrances to buildings, the doors shall be locked or blocked and a sign displayed to indicate the condition that exists.

G. Notification of Occurrences: Subcontractors shall advise the Contractor immediately upon occurrence of any non-routine events, occurrences, incidents, or accidents, etc., particularly in situations such as lost time accidents and ambulance calls.

H. Responsibility:

1. Subcontractor Safety Responsibility:

a. Each Subcontractor shall designate a qualified person to implement the Construction Safety and Health Management Program at the work site. The designated person shall have authority for actions and for control of work activity to prevent accidents.

b. Daily work area safety and health inspections are required and appropriate action shall be taken to correct noncompliance conditions.

2. Contractor Safety Responsibility:

a. Contractor Safety Department personnel or designated representatives will make regular continuing inspections of all facilities and operations within the scope of the Subcontract. These inspections will include the facilities and operations of all Subcontractors, but do not in any way relieve Subcontractors of their responsibility for compliance with the provisions of the Construction Safety and Health Management Program.

b. Daily work area safety and health inspections will be made by Contractor personnel.

I. Hazardous Materials Identification: If any of the materials are identified by the Site Manager to be hazardous, the Subcontractor will be notified immediately of the applicable standards to be complied with for personnel safety and health protection.

J. Galvanized Fence Materials: Personal respiratory protection or ventilation is required if a heat process takes place with galvanized fencing materials.

K. Back Up Alarms: It is mandatory for all heavy equipment to have functioning audible back up alarms while in use on an UMTRA project.

L. Asbestos:

1. In the event it is determined asbestos is present, in any materials that are to be handled, OSHA Safety and Health Standards 29 CFR 1910 shall be complied with by the Subcontractor. The specific standard is Subpart Z, Toxic and Hazardous Substances, 1910.1000 Asbestos.

2. Other required compliance is the Clean Air Act as Amended (1973), (42 USC 7412) Section 112, and National Emission Standard for Asbestos (40 CFR 61.20 - 61.25).

SC-8 HEALTH PHYSICS

The Subcontract work area is a radiologically controlled area. All work shall be governed by the essential requirements given in the following paragraphs:

A. Work Conditions:

1. Radiation/Contamination Areas: Radiation/contamination controlled areas shall be established on a case-by-case basis at the discretion of the Site Manager. Protective clothing for contamination control will be provided to the Subcontractor at no charge on a loan basis. Clothing will be issued by Contractor personnel when required at the access control gate.

2. Radiation Dressing Requirements:

   a. All controlled area protective clothing, when required, shall be put on and removed at the controlled area boundary. The Subcontractor shall ensure that removed items are properly stored and areas are maintained in proper order.

   b. When required, protective clothing for contamination control could consist of coveralls, gloves, and rubber boots, shoecovers or any combination of the above. Personnel will be required to change out of the protective clothing prior to leaving the controlled area.

3. Personnel Monitoring: All personnel will be required to self-monitor for radioactive contamination upon leaving the controlled area. Personnel will be instructed in self-monitoring procedures in accordance with paragraph 5 below defining Training Requirements.

4. Vehicles and Other Monitoring: Vehicles, equipment and tools from the controlled area will be monitored for radioactive contamination by the Contractor before leaving the area.

5. Training Requirements: In order to work in the controlled area, personnel shall be trained as Radiation Workers by the Contractor. The training course is approximately four hours long and is available to Subcontractor personnel at no cost for the instruction. Training the proper use of respirators for

performing specific tasks may be required. For respirator training and employee requirement, see Special Condition, SC-7.B.2 and SC-7.B.4. A test will be given to all personnel at the conclusion of training to establish qualifications as a Radiation Worker. Personnel must pass this test to work within the radiation control area.

6. Radiation Exposure Limits and Restrictions:

   a. Radiation exposure on this Project is expected to be well within allowable radiation exposures. Whole body radiation exposure in rem shall be determined by Personal Thermoluminescent Dosimeters (TLD) issued to each radiation worker.

   b. Prior to working at the construction site each employee shall provide prior radiation exposure records as applicable.

   c. While working at the construction site each employee is required to wear TLD badges issued and collected daily.

   d. No one under the age of 18 shall be permitted to enter or work in the controlled area.

7. Some areas on the construction site may have localized Health Physics restrictions. These are controlled by ribbons, signs, and tags. Such area restrictions shall be observed by the Subcontractor and applicable precautions taken.

B. Special Examinations:

1. Employees working in radiation control areas may be required to submit a bioassay sample prior to starting work in the radiation control areas and also upon termination or completion of the Subcontract. Additional bioassay samples may be required from some workers periodically during excavation of contaminated material. It is the Subcontractor's responsibility to ensure that each employee submits bioassay samples as required by the Subcontract.

2. The Subcontractor shall notify the Contractor of any personnel terminations or transfers within 8 working hours of termination or transfers. The Subcontractor shall also provide the Contractor with weekly lists

of all Subcontractor or subtier employees employed by or for the Subcontractor who have been issued TLD radiation exposure badges. These weekly listings shall include full name, social security number, hire date, and termination/transfer date (if applicable), of all such employees.

C. Health Physics (HP) Personnel: The Site Manager will monitor the construction work through HP personnel employed by him. The HP personnel will provide radiological surveillance over construction activities and advise supervision on matters concerning radiation safety as related to activities or conditions affecting the construction work.

D. Warning Signals: The Subcontractor may depend on direct verbal information from the Contractor's personnel for warning signals. The Subcontractor's foreman and employees shall take action as directed. The Subcontractor's representative shall obtain the name, position, and agency of the messenger providing such direction.

E. Disposition of Contaminated Equipment, Tools and Material:

1. The Subcontractor shall use his own or rental equipment in performing the required work under this Subcontract. All tools, vehicles, equipment and material will be inspected for radioactive contamination by the Site Manager or his designee prior to removal from the construction area.

2. Should the Subcontractor's tools, material, or equipment become contaminated, they will have to be decontaminated before removal from the area. If decontamination becomes necessary, the Site Manager will provide instructions for decontamination by the Subcontractor's employees. Decontamination may consist of steam cleaning, dry brushing, or washing with appropriate liquids. Decontamination required beyond these described will be handled under Article 4, "CHANGES" of the General Provisions.

3. If decontamination proves impracticable or impossible, the tools, material, or equipment in question will be retained by the Contractor and an equitable adjustment for same will be negotiated with the Subcontractor provided that:

a. There is no fault or negligence of the Subcontractor contributing to the contamination;

b. The Subcontractor has followed all the specific instructions of the authorized HP personnel who have surveillance over the work;

c. Items or equipment confiscated from the Subcontractor will be documented by a Confiscation Notice furnished to the Subcontract Administrator by the Contractor and signed by HP personnel and the Site Manager;

d. The Subcontractor allows reasonable time (a minimum of ten (10) working days, excluding weekends and holidays) in which to attempt decontamination of the item(s) in question. The reimbursement schedule will be as follows:

1) Tools valued less than $300.00 at 95% of replacement cost.

2) Tools/Equipment $300.00 and up: If less than one (1) year old or at top of depreciation schedule, at 75% of replacement cost; if at bottom of or off the depreciation schedule, at 50% of replacement cost.

e. Failure to agree upon equitable adjustment shall constitute a dispute within the meaning of article GP-7 of the General Provisions.

f. In view of the foregoing, the Subcontractor is encouraged to plan his work so as to minimize the transfer of equipment into and out of the construction area.

SC-9 SUBMITTALS

Pursuant to the provisions of Division 1 - General Requirements, the Subcontractor shall submit samples of materials, schedules and reports, shop drawings, product data, manufacturer's instructions, and design calculations and design drawings to the Contractor.

SC-10 QUALITY ASSURANCE

All work shall be performed to the requirements of the Contractor's Quality Assurance Program. This program meets the requirements of 10 CFR 50 Appendix B and ANSI/ASME NQA-1-79. The program will be wholly administered by the Contractor. All Quality Records will be generated by and maintained by Contractor's personnel.

SC-11 PERMITS

A. The Contractor will provide the following permits and notifications as required, except as noted below in Section SC-11.B:

[TO BE COMPLETED]

B. All other permits and notifications, including but not limited to the following, as required, shall be the responsibility of the Subcontractor in accordance with Article GP-13 of the General Provisions:

[TO BE COMPLETED]

C. The Contractor will provide the required permits and notifications for operation and use of the borrow areas shown on the Subcontract Drawings, if any. If the Subcontractor determines to use borrow areas other than those shown on the Subcontract Drawings, the Subcontractor shall be responsible for obtaining, or determining that the owner/ operator of an existing borrow pit has obtained the required permits and notifications for use of such borrow areas in accordance with the requirements of Article GP-13 of the General Provisions.

D. The Subcontractor shall comply with the provisions of the permits at all times during the execution of the Subcontract. The Contractor will make available to the Bidders the permits and their provisions for review by the Bidders.

E. Separate measurement or payment will not be made for work required of the Subcontractor for obtaining additional permits and for compliance with the provisions of all permits, unless specifically provided for in this Subcontract. All costs in connection with obtaining such permits and for compliance with such permits will be considered incidental to the Subcontract.

SC-12 ROAD CONSTRUCTION AND TRAFFIC CONTROL INCLUDING HAUL ROAD AND PUBLIC ROAD

A. The Subcontractor shall post construction areas and roads with traffic control signs or devices used for protection of workmen, the public and equipment. The signs or devices shall conform to the American National Standards Institute D6.1-1978, Manual on Uniform Traffic Control Devices for Streets and Highways.

B. Signs or traffic control devices shall be removed or covered as soon as they have served their purpose. It is particularly important to remove any markings on road surfaces which under conditions of poor visibility could cause a driver to turn off the road or into traffic moving in the opposite direction.

C. Barricades for protection of employees shall conform to the portions of the American National Standards Institute D6.1-1978, Manual on Uniform Traffic Control Devices for Streets and Highways, relating to barricades.

D. The Subcontractor shall be responsible for providing all necessary bonding required by the applicable city, county and state highway departments.

E. The Subcontractor shall be responsible for grading, repairs and other maintenance of public and private roads used for construction purposes.

SC-13 ENVIROMENTAL PROTECTION

A. Pollution of Waterways: The Subcontractor's construction and related activities shall be performed by methods that prevent entrance or accidental spillage of solid or liquid matter, contaminants, debris and other objectionable pollutants and wastes into streams, watercourses, flowing or dry, and underground water sources. Such pollutants and wastes will include, but will not be restricted to refuse, earth and earth products, garbage, cement, concrete, sewage effluent, industrial waste, radioactive substances, hazardous chemicals, oil and other petroleum products, aggregate processing tailings, and mineral salts. Pollutants and wastes shall be disposed of in accordance with applicable permit provisions or in a manner acceptable to and approved by the Contractor.

B. Storage and Disposal of Petroleum Products:

1. Petroleum products covered by this Section include gasoline, diesel fuel, lubricants, heating oils, and refined and used oil. During project construction, all petroleum products shall be stored in such a way as to prevent contamination of all ground and surface waters.

2. Storage facilities shall conform to the requirements of Construction Safety and Health Management Program specified in Section SC-7 of the Special Conditions.

3. Lubricating Oil: Lubricating oil may be brought into the project area in steel drums or other means, as the Subcontractor elects. If the total volume of stored oil is greater than 1320 gallons, then the Subcontractor shall provide secondary containment facilities. Used lubricating oil shall be stored in steel drums, or other approved means, and shall be returned to the supplier for disposal. It shall not be burned or otherwise disposed of at the project area.

4. If the total volume of stored petroleum products is greater than 1320 gallons and these products are stored above ground, the Subcontractor shall prepare

a spill prevention control and countermeasure plan in accordance with applicable EPA and other state and tribal regulations.

SC-14 SUBCONTRACTOR LABOR AND EQUIPMENT RATES

A. Subcontractor shall furnish to the Contractor in writing, within 15 calendar days after Notice of Award, a list of all equipment to be used on the Project. The list shall include as a minimum the following: make, model, type, year of manufacture, equipment no., and H.P. or capacity.

B. The Subcontractor shall provide, at the same time, a list of all labor rates including fringes, overhead and profit used on the Project and a list of rental rates for the above referenced equipment for the following time periods: hourly, daily, weekly and monthly. Said rates shall be broken down as follows: rental, operating and maintenance, and operator. These rates shall not exceed 60% of the current edition of the Rental Rate Blue Book for Construction Equipment.

C. The above rates will be used for changes or work which is not included in the original Subcontract.

SC-15 MODIFICATION PROPOSALS PRICE BREAKDOWN

The Subcontractor, in connection with any proposal he makes for a Subcontract modification, shall furnish a price breakdown, itemized as required by the Subcontract Administrator. Unless otherwise directed, the breakdown shall be in sufficient detail to permit an analysis of all material, labor, equipment, subcontract, and overhead costs, as well as profit, and shall cover all work involved in the modification, whether such work was deleted, added or changed. Any amount claimed for subcontracts shall be supported by a similar price breakdown and/or quotes from the Subcontractors. In addition, if the proposal includes a time extension, a justification therefore shall be furnished. The proposal, together with the price breakdown and time extension justification, shall be furnished by the date specified by the Subcontract Administrator.

SC-16 UNIT PRICE WORK

A. Where the Subcontract Documents provide that all or part of the Work is to be Unit Price Work, initially the Subcontract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Subcontract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Subcontractor will be made by the Contractor.

B. Each unit price will be deemed to include an amount considered by Subcontractor to be adequate to cover Subcontractor's overhead and profit for each separately identified item.

C. Variations in Quantities:

1. For Bid Items paid for on a unit price basis, variations in quantity of a Bid Item will be determined by comparing the total pay quantity of the Bid Item with the Contractor's estimated quantity in the Bid Schedule.

2. If the total pay quantity of a Bid Item, which has a total value (extended amount) of two percent or more of the total Subcontract Bid price, varies from the Contractor's quantity estimate by 10 percent or less, payment for the Bid Item will be made at the Subcontract unit price. If the total pay quantity of a Bid Item varies from the Contractor's quantity estimate by more than 10 percent, the compensation payable to the Subcontractor will be a subject of review by the Subcontractor and the Contractor, and an equitable adjustment will be made by means of a Change Order to credit the Contractor with any reduction in cost or to compensate the Subcontractor for any increase in cost resulting from variations between estimated and actual pay quantities. The adjustment review will be made at a time mutually acceptable to the Contractor and the Subcontractor.

3. The adjustment shall be as specified in Article GP-19 of the General Provisions.

4. Payment for a Bid Item which has a final total value of less than two percent of the total Subcontract Price will be made at the Subcontract unit price regardless of variations in quantities.

SC-17 LAWS AND REGULATIONS

Subcontractor shall give all notices and comply with all laws, ordinances, rules and regulations applicable to the Work. If Subcontractor observes that the Specifications or Subcontract Drawings are at variance therewith, Subcontractor shall give Contractor prompt written notice thereof, and any necessary changes shall be adjusted by an appropriate Modification. If Subcontractor performs any Work knowing or having reason to know that it is contrary to such laws, ordinances, rules and regulations, and without such notice to Contractor, Subcontractor shall bear all costs arising therefrom; however, it shall not be Subcontractor's primary responsibility to make certain that the Specifications and Subcontract Drawings are in accordance with such laws, ordinances, rules and regulations.

SC-18 REMEDIAL ACTIONS ON LANDS OF INDIAN TRIBES

A. Pursuant to Section 105 of Public Law 95-605, the Uranium Mill Tailings Radiation Control Act of 1978 and the Cooperative Agreement between the United States Department of Energy and the Navajo Nation, whenever remedial actions are required to be performed on sites located on lands belonging to Indian Tribes, all Subcontractors shall make full use of any local qualified members of Indian Tribe residents in the vicinity of the mill tailings site, vicinity properties, and designated disposal areas for remedial action performed on reservation lands.

B. The Subcontractor shall submit with his proposal a plan for assuring the maximum utilization of local Indian labor as referenced above.

SC-19 FUNDING LIMITATIONS

A. Of the total Subcontract Price, the sum of $_____ is presently available for payment to the Subcontractor under this Subcontract during fiscal year 1988. It is anticipated that additional funds will be allotted from time to time to this Subcontract subject to Government

appropriations available in this fiscal year or succeeding fiscal years. The responsibilities of Contractor are limited by this clause notwithstanding any contrary provision of the "Payments to Subcontractors" clause or any other clause of this Subcontract.

B. The Subcontractor agrees to perform or have performed work up to the point at which, in the event of termination of this Subcontract pursuant to the clause hereof entitled "Termination for Convenience", the total amount payable by the Contractor (including amounts payable in respect of lower-tier subcontracts and settlement costs), pursuant to paragraph E. thereof, would in the exercise of reasonable judgment by the Subcontractor approximate the total amount at the time allotted to this Subcontract. The Contractor shall not be obligated in any event to pay or reimburse the Subcontractor in excess of the amount from time to time allotted to this Subcontract, anything to the contrary in this clause or the clauses hereof entitled "Termination for Convenience" and "Payments to Subcontractors" notwithstanding.

C. It is contemplated that funds presently allotted to this Subcontract will cover the work to be performed until _____, 19__. In the event funds allotted are considered by the Subcontractor to be inadequate to cover the work to be performed until the above date, the Subcontractor shall notify the Subcontract Administrator when the work will reach a point at which, in the event of termination of this Subcontract pursuant to the clause hereof entitled "Termination for Convenience", the total amount payable by the Contractor (including amounts payable in respect of lower-tier subcontracts and settlement costs) pursuant to paragraph E. thereof, will approximate 85% of the total amount then allotted to this Subcontract. Such notice shall be in writing and shall be given not less than 45 days nor more than 60 days prior to the estimated date when such point will be reached. Such notice shall also state the estimated amount of additional funds required to continue performance to the above stated date. The Subcontractor shall, 30 days prior to the date above stated, advise the Subcontract Administrator in writing as to the estimated amount of additional funds which will be required for the timely performance of this Subcontract for the balance of the current fiscal year and the succeeding fiscal year. If after such latter notification, additional funds are not allotted by the date above written or by an agreed date in substitution thereof, the Subcontractor, by written notice delivered to the Subcontract Administrator at any

time before such additional funds are allotted, may elect to treat its responsibility to proceed with the work under this Subcontract as having been terminated. Such a termination shall be considered a termination pursuant to the clause hereof entitled "Termination for Convenience".

D. The Contractor may at any time prior to the Subcontractor's election to terminate as provided in Paragraph C. above, and with the written consent of the Subcontractor after such election to terminate, allot additional funds for continued performance of this Subcontract. The Subcontract Administrator will promptly notify the Subcontractor in writing, of any such allotment and the parties shall: (a) agree on the applicable period of Subcontract performance which shall be covered by such funding; (b) modify the date stated in Paragraph C. above in order to reflect such extended period of coverage; and (c) modify the amount stated in Paragraph A. above. The provisions of Paragraphs B. and C., above, shall apply to such additional allotted funds and modified date.

E. In the event the Subcontractor incurs additional costs, or is delayed in the performance of the work under this Subcontract, solely by reason of the failure of the Contractor to allot additional funds pursuant to Paragraph D. above in amounts sufficient for the timely performance of this Subcontract, and if additional funds are allotted by the Contractor pursuant to Paragraph D. for continued performance of this Subcontract, than an equitable adjustment may be made in the Subcontract Price (including appropriate target, billing and ceiling prices where applicable) or in the time required for the performance of the work, or both, and this Subcontract may be modified in writing accordingly; provided, that the Subcontractor provides to the Subcontract Administrator written notice of its claim of entitlement to an equitable adjustment prior to the date then stated in Paragraph C.

F. Nothing in this clause shall affect the right of the Contractor to terminate this Subcontract pursuant to the clause of this Subcontract entitled "Termination for Convenience".

SC-20 CERTIFIED PAYROLLS

In addition to the copies of certified payrolls that are to be submitted each week to the Subcontract Administrator, one copy will also be submitted to the Site Manager.

SC-21 SUBCONTRACTOR'S LIABILITY

The Subcontractor has total liability for all of his own equipment, supplies, tools, etc., brought on the job site or used in the performance of his Subcontract.

SC-22 MEASUREMENT AND PAYMENT

A. Unless otherwise provided in the Subcontract Documents, no separate measurement or payment will be made for compliance with the provisions of the General Provisions, General Conditions and Special Conditions. Full compensation for such work will be considered to be included in the related items of Bid Schedule or incidental to the Subcontract.

B. Payment for the cost of premiums paid by the Subcontractor to obtain performance and payment bonds will be as specified in Article GP-8.E of the General Provisions. The Subcontractor shall quote the price for the premiums by the lump sum in the Bid Schedule. (Bid Schedule Item 002)

END OF SPECIAL CONDITIONS

Division 1

General Requirements

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.1 DESCRIPTION OF THE PROJECT

A. Project Location: The Mexican Hat site is approximately five miles north of the Utah-Arizona border just southwest of Mexican Hat, Utah and lies within the Navajo Reservation. Major topographic features of the area include the San Juan River in the north and Alhambra Rock to the west. The topography slopes towards the northeast. The site is at 37° 07' 54" north latitude, and 109° 52' 30" west longitude (T42S and R18E).

B. The TZ borrow area for radon barrier is located approximately one mile north of the site.

C. Construction site access will be granted via an existing access road located northwest of the upper pile.

1.2 SCOPE OF WORK

A. General:

1. The Work is generally described as site work related to the excavation of contaminated residual radioactive materials from the upper tailings pile, and windblown areas of the abandoned uranium mill, and placement of these materials in tailings embankment over the lower tailings pile with a protective cover. The Work is outlined in Article 1.2.B below. Such Work is more fully detailed in the Specifications and Subcontract Drawings included herein.

2. The Work includes furnishing all plant, labor, tools, equipment, materials, transportation, and services, and performing all operations necessary for and properly incidental to the construction as shown and noted on the Subcontract Drawings and as specified in these Specifications.

B. The Work Includes:

1. Mobilization: Mobilization as specified in Section 01019.

2. Dust Control: Dust generated by vehicle use, temporary materials stockpiling, temporary stockpiling, mixing of contaminated materials and of uncontaminated materials, and other activities shall be controlled and minimized by the use of water and water-based surfactants sprayed from hoses or trucks. Dust control is specified in detail in Section 02200.

3. Temporary Facilities: Construction, operation, maintenance and removal of temporary facilities as specified in detail in Section 01500.

4. Construction Facilities: Construction facilities shall include the construction of temporary features required during the construction phase of the permanent facilities. These temporary features shall include, but not be limited to, the following:

   a. Operation, demolition and disposal of decontamination pad and the contaminated water collection system consisting of drainage ditches, pipes, sump, pumps and the like.

   b. Construction and removal of drainage facilities including dewatering and disposal of contaminated and uncontaminated water from construction areas, and construction of temporary drainage ditches. Dewatering and drainage are specified in Section 02141.

   c. Construction and removal of wastewater retention basin and dike for the collection of contaminated water and sediments from the construction areas and from the decontamination pad.

   d. Construction, maintenance and removal of new chain link and woven wire fences are specified in Sections 02832 and 02833 respectively.

5. Permanent Facilities: Permanent facilities shall include construction of permanent features including, but not be limited to, the following. Permanent facilities are specified in detail in various Specification Sections:

a. Construction of tailings embankment.

b. Construction of permanent drainage ditches.

c. Finish grading.

d. Sealing abandoned wells.

C. The above description of the Work is for general information only, and in no way limits the responsibility of the Subcontractor for completing the Work in strict accordance with the Subcontract Drawings and Specifications listed in the Table of Contents.

D. Environmental Observations: The Work shall be performed in strict accordance with the applicable requirements of EPA, Navajo Nation, and other involved state and federal agencies having jurisdiction, and in accordance with the requirements of General Provisions, General Conditions and Special Conditions.

1.3 CONSTRUCTION SEQUENCE

A. Unless otherwise specified, directed, or modified, the Subcontractor shall follow the sequence of operations as set forth below. Full compensation for conforming to such requirements will be considered as included in the related Bid Schedule items of Work and no additional compensation will be allowed therefor:

B. The sequence of operations:

1. Mobilization as specified in Section 01019.

2. Erection of site perimeter fences; removal of interior fences, and utilities; sealing of abandoned wells; and construction of temporary facilities as specified in Section 01500.

3. Construction of retention basin including dikes, spillways and temporary drainage ditches; and opening of borrow sites. Stockpiling contaminated material excavated from temporary drainage ditches for later disposal in the construction of the tailings embankment; stockpiling uncontaminated material excavated from spillway and temporary drainage ditches for later use as fill; and grading for site drainage.

4. Construction of the tailings embankment beginning with trimming of the existing dikes within the tailings embankment area. Construction operations will consist of excavation of upper tailings pile and north portion of lower tailings pile, excavation of contaminated off-pile materials and windblown areas by their assigned priority, construction of temporary diversion ditches, placement around and within the tailings pile and compaction, and placement of the demolished materials from the mill site into the tailings embankment. As the embankment construction nears its end, the dikes in the retention basin will be demolished and placed within the tailings embankment along with any contaminated sediment settled in the retention basin, spillway and the drainage ditch areas.

5. Construction of the radon barrier cover over the contaminated material in the tailings embankment. The cover shall consist of selected uncontaminated material obtained from designated borrow areas.

6. Placing erosion protection materials over the radon barrier cover. The erosion protection materials consist of a layer of bedding material topped by a layer of stone riprap.

7. Construction of aprons and permanent drainage ditches at the base of the tailings embankment.

8. Final site grading can proceed concurrently with the construction of the permanent drainage ditches.

9. Site Cleanup: Removal and disposal of stockpiled materials, closing of the borrow sites and removal of site perimeter fencing.

10. Site Restoration: Grading of the site and the borrow areas to provide drainage including placement of uncontaminated fill, and conditions for natural revegetation.

1.4 BORROW AREA LOCATION

A. The following potential borrow areas are identified and shown on the Subcontract Drawings:

[TO BE COMPLETED]

B. The Subcontractor shall be responsible for processing and selective quarrying to provide the materials conforming to the Specifications.

1.5 SUBCONTRACT DRAWINGS

A. A list of Subcontract Drawings and Titles is provided in the Table of Contents of these Subcontract Documents under "Subcontract Drawings".

B. Where "as shown," "as detailed," "as noted," or words of like meaning are used in the Subcontract Documents, it shall be understood that reference is being made to the Subcontract Drawings unless otherwise specified.

1.6 TIME OF COMPLETION

A. The Subcontractor shall commence Work under this Subcontract according to a written Notice to Proceed issued by the Contractor not later than _____, and shall complete the Work within _____ calendar days.

B. Termination for default, damages for delay and time extensions are specified in Article GP-6 of General Provisions.

1.7 CODES AND STANDARDS

A. Pursuant to Section GC-3 of the General Conditions, any material, method, or procedure specified by reference to the number, symbol, or title of a specific specification or standard, such as a Commercial Standard, American National Standard, Federal or State Specification, Industry or Government Code, a trade association code or standard, or other similar standard, shall comply with the requirements in the latest revision thereof and any amendments or supplements thereto in effect on the date of these Subcontract Documents, except as limited to type, class or grade, or modified in such reference.

B. The code, specification or standard referred to, except as modified in these Specifications, shall have full force and effect as though printed in these Specifications. These Specifications and standards are not furnished to bidders because manufacturers and trades involved are assumed to be familiar with their requirements. The Contractor will furnish, upon request, information as to how copies of the specifications and standards referred to may be obtained.

1.8 MANUFACTURERS' SPECIFICATIONS AND INSTRUCTIONS

A. Pursuant to Section GC-4 of the General Conditions, and unless otherwise indicated or specified, all manufactured materials, products, processes, equipment, or the like shall be installed or applied in accordance with the manufacturers' instructions, directions, or specifications. Said installation or application shall be in accordance with printed instructions furnished by the manufacturer of the material or equipment concerned for use under conditions similar to those at the jobsite. Two copies of such instructions shall be furnished to the Contractor and his acceptance thereof obtained before work is begun.

B. Any deviation from the manufacturers' printed recommendations shall be explained and acknowledged as correct for the circumstances, in writing by the particular manufacturer. Subcontractor will be held responsible for all installations contrary to the manufacturers' recommendations. If any item of material or equipment is found to be installed not in accordance with the manufacturer's recommendations, Subcontractor shall make all changes necessary to achieve such compliance.

1.9 WORK QUALITY

A. Shop and field work shall be performed by mechanics and workers skilled and experienced in the fabrication and installation of the work involved. All work on this Project shall be performed in accordance with the best practices of the various trades involved and in accordance with the Subcontract Drawings and these Specifications.

B. All Work shall be erected and installed plumb, level, square and true, or true to indicated angle, and in proper alignment and relationship to the work of other trades. All finished work shall be free from defects and damage.

C. The Contractor reserves the right to reject any materials and work which are not considered to be up to the highest standards of the various trades involved. Such inferior material or work shall be repaired or replaced, as directed. at no additional cost to the Contractor or extension of Subcontract time.

1.10 FIELD MEASUREMENT AND TEMPLATES

Subcontractor shall secure all field measurements required for proper and accurate fabrication and installation of the work included in this Subcontract. Exact measurements are the Subcontractor's responsibility. Subcontractor shall also furnish or obtain all templates, patterns, and setting instructions required for the installation of all work. All dimensions shall be verified by the Subcontractor in the field.

1.11 ACCESS TO WORK

A. Pursuant to the provisions of Article GP-11 of the General Provisions, the authorized agents of the following agencies will also have the right to inspect all work covered by these Subcontract Documents during the performance of this Subcontract. Reasonable facilities for the proper handling and inspection of the materials and the Work shall be furnished by the Subcontractor:

1. United States Department of Energy (DOE)

2. United States Nuclear Regulatory Commission (NRC)

3. Navajo Nation

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

PART 4 - MEASUREMENT AND PAYMENT

(Not Used)

END OF SECTION 01010

SECTION 01019

MOBILIZATION

PART 1 - GENERAL

1.1 SCOPE

A. This Specification Section covers the following:

1. Organization and mobilization of Subcontractor's forces and equipment;

2. Transporting construction plant and equipment to the site and setting up of same;

3. Transporting tools, materials, and equipment to the site; and

4. Erection of temporary buildings and facilities required for initial construction operations.

5. Maintenance of existing fences, subsequent removal of temporary facilities, construction equipment, materials, and supplies including decontamination of equipment and facilities, cleaning of equipment for salvage, cleaning of the site, and restoration and reseeding of the offsite temporary roads.

B. Temporary facilities and other mobilization items are specified in the General Conditions, Special Conditions and in Section 01500.

1.2 DESCRIPTION

A. Mobilization shall include:

1. Construction of temporary facilities and mobilization of all construction equipment, materials, supplies, appurtenances, and the like, manned and ready for commencing and performing the Work.

2. Assembly and delivery to the site of plant, equipment, materials, and supplies necessary for the performance of the Work but which are not intended to be incorporated in the work; the preparation of the Subcontractor's work area; the complete assembly, in working order, of equipment necessary to perform the required

work; personnel services preparatory to commencing actual work; and all other preparatory work required to permit commencement of the actual work on construction items for which payment is provided under the Subcontract.

3. Decontamination of temporary facilities, equipment, materials, supplies, appurtenances; and cleaning of equipment for salvage.

4. Subsequent removal from the site of all construction equipment, materials, supplies, appurtenances, and the like upon completion of the Work.

5. Maintenance of existing fences; construction, operation, maintenance and subsequent removal and disposal of temporary facilities as required by the Contractor; cleaning of the site; and restoration and reseeding of the offsite temporary roads.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Measurement for payment for mobilization will be by the lump sum basis.

4.2 PAYMENT

A. Payment for mobilization will be made at the lump sum price quoted therefor in the Bid Schedule, and shall include all items as specified herein. Payment will be made as follows:

1. Payment of 50 percent of the lump sum price will be made upon completion of "move-in". Move-in is defined as organization of the Subcontractor's manpower and equipment, transporting equipment to the site, and installation of Subcontractor's field office and other supporting structures.

2. Payment of the remaining 50 percent of the lump sum price will be made upon completion of work corresponding to 10 percent of the total price quoted in the Bid Schedule exclusive of the price quoted for mobilization.

B. Payment for furnishing, installing, operating, maintaining and subsequent decontaminating and removing of temporary facilities will be considered to be included in the Bid Schedule item for Mobilization.

END OF SECTION 01019

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SCOPE

A. This Specification Section covers descriptions of measurement and payment as they apply to this Subconcract. The provisions of this Section shall be supplemental to the requirements specified in General Provisions, General Conditions and Special Conditions.

B. Measurement methods specified in the individual Sections of these Specifications shall govern if they differ from methods specified in this Section.

C. The Subcontractor shall compute all quantities. Where necessary, such computations will be based upon surveys performed by the Subcontractor.

1.2 RELATED WORK

A. General Provisions - Article GP-8: Payments to Subcontractor.

B. General Conditions - Section GC-4B: Reports and Progress Payments.

C. Special Conditions - Section SC-16: Variations in Quantities.

D. Section 01052 - Layout of Work and Surveys.

E. Section 01300 - Submittals: Schedule of Values and Progress Payment Schedule.

1.3 MEASUREMENT OF QUANTITIES

A. Measurement Standards: All work to be paid for at a Contract price per unit of measurement will be measured by the Contractor in accordance with United States Standard Measures. A ton shall consist of 2,000 pounds avoirdupois.

B. Measurement by Weight:

1. Reinforcing steel, steel shapes, castings, miscellaneous metal, metal fabrications, and similar items, to be paid for by weight, shall be measured by scale or by handbook weights for the type and quantity of material actually furnished and used.

2. Material to be measured and paid for by weight shall be weighed on accurate, Contractor-approved scales, furnished by and at the expense of the Subcontractor. Use platform scales of sufficient size and capacity to permit the entire vehicle or combination of vehicles to rest on the scale platform while being weighed. Combination vehicles may be weighed as separate units provided they are disconnected while being weighed. All scales shall be inspected and certified as often as the Contractor may deem necessary to ascertain accuracy. Costs incurred, as a result of regulating, adjusting, testing, inspecting, and certifying scales, shall be borne by the Subcontractor.

3. The Contractor may be present to witness the weighing and to check and compile the daily record of such scale weights; however, in any case, the Contractor will require that the Subcontractor furnish weigh slips and daily summary weigh sheets. A duplicate weigh slip or a load slip for each vehicle weighed shall be delivered to the Contractor at the point of delivery of the material.

4. If the material is shipped by rail, the certified car weights will be accepted, provided that only actual weight of material will be paid for and not minimum car used for assessing freight tariff. Car weights will not be acceptable for material to be passed through mixing plants.

5. Trucks used to haul material being paid for by weight, shall be weighed empty daily and at such additional times as the Contractor may require. Each truck shall bear a plainly legible identification mark. The Contractor may require the weight of the material verified by weighing empty and loaded trucks on such other scales as the Contractor may designate.

C. Measurement By Volume:

1. Measurement by volume will be by the cubic dimension listed or indicated in the Bid Schedule. Method of

volume measurement will be as determined or directed by the Contractor.

2. When material is to be measured and paid for on a volume basis and it is impractical to determine the volume by the specified method of measurement, or when requested by the Subcontractor in writing and accepted by the Contractor in writing, the material will be weighed in accordance with the requirements specified for weight measurement. Such weights will be converted to volume measurement for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the Contractor and shall be agreed to by the Subcontractor before such method of measurement of pay quantities will be accepted.

D. Measurement by Area: Measurement by area will be by the square dimension listed or indicated in the Bid Schedule. Method of square measurement will be as determined or directed by the Contractor.

E. Linear Measurement: Linear measurement will be by the linear dimension listed or indicated in the Bid Schedule. Method of linear measurement will be as determined or directed by the Contractor. Generally, items, components, or work to be measured will be measured at the centerline of the item in place.

F. Lump-Sum Measurement:

1. Lump-sum measurement will be for the entire item, unit of work, structure, or combination thereof, as listed or indicated in the Bid Schedule.

2. If the Subcontractor requests progress payments for lump-sum items or amounts in the Bid Schedule, such progress payments will be made in accordance with a Schedule of Values for that item as specified in Sections GC-4B of the General Conditions and SC-14 of the Special Conditions.

1.4 FIELD MEASUREMENT FOR PAYMENT

A. The Subcontractor shall compute all quantities of Work performed or of materials and equipment delivered to the site, for payment purposes.

B. The Subcontractor shall assist the Contractor in the taking of measurements by providing all equipment, workers, and survey crews, as required, for verification of quantities by the Contractor in accordance with the provisions of Section 01052 of these Specifications.

C. All such assistance in measurement services required of the Subcontractor, as specified, shall be performed under the direction and supervision of the Contractor.

1.5 PAYMENT

A. Payment will be full compensation for furnishing all labor, materials, tools, equipment, transportation, services, and incidentals, as specified, in Article GP-8 of the General Provisions and Section GC-4B of the General Conditions, and for performing all work necessary for completing the erection or installation of the item or work classification, including all adjusting and balancing, testing, cleaning, and all other incidental work.

B. Full compensation for all expense involved in conforming to the requirements for measuring materials or work shall be considered as included in the unit or lump-sum prices paid for the materials or work being measured, and no additional compensation will be permitted therefor.

1.6 VALUES OF UNIT PRICES

A. The number of units and quantities contained in the Bid Schedule are approximate only, and final payment will be made for the actual number of units and quantities which are incorporated in or made necessary by the Work included in this Subcontract.

B. In the event that work and/or materials or equipment are required to be furnished to a greater or lesser extent than is indicated by the Subcontract Drawings and Specifications, such work and/or materials or equipment shall be furnished in greater or lesser quantities, and the adjustment in unit price shall be made as specified in Section SC-16 of the Special Conditions.

1.7 REJECTED MATERIALS

Quantities of material wasted or disposed of in a manner not called for under the Subcontract; rejected loads of material, including material rejected after it has been placed by reasons of the failure of the Subcontractor to conform to the provisions of the Subcontract; material not unloaded from the transporting vehicle; material placed outside the limits indicated on the Subcontract Drawings or established by the Contractor; or material remaining on hand after completion of the Work, will not be paid for, and such quantities shall not be included in the final total quantities. No compensation will be permitted for loading, hauling, and disposing of rejected material.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Separate measurement for payment will not be made for work required under this Section.

4.2 PAYMENT

Separate payment will not be made for work required under this Section. All costs in connection with the work specified herein will be considered to be included in the related item of work in the Bid Schedule, or incidental to the Subcontract.

END OF SECTION 01025

SECTION 01052

LAYOUT OF WORK AND SURVEYS

PART 1 - GENERAL

1.1 SCOPE

A. This Specification Section covers the procedures and accuracy requirements for survey services for layout of work and field measurement of work quantities to be determined by surveys.

B. Before commencing any layout of work and surveys, the Subcontractor shall give the Contractor five working days written notice in advance so that the Contractor may witness such work.

C. The requirements specified herein are in addition to the requirements specified in Section GC-3 of General Conditions.

1.2 WORK NOT INCLUDED

Site markers and permanent boundary monuments will be furnished and installed by others.

1.3 DESCRIPTION

A. Reference Points: The reference points to be provided by the Contractor pursuant to Section GC-3A of General Conditions Paragraph 4.4 will include referenced monuments and elevation bench marks in the vicinity of the project. Initial reference points will be furnished by the Contractor. Replacement of survey stakes by the Contractor will be charged to the Subcontractor at a rate of $150 per hour. All other necessary reference points shall be established by the Subcontractor.

B. The Subcontractor shall furnish all necessary detail surveys including all lines, grades, and appropriate surveys as specified.

C. The Contractor reserves the right to perform any desired checking and/or correction of the Subcontractor's surveys but this shall not relieve the Subcontractor of responsibility for the adequate performance of the Work.

D. Equipment and Personnel: The Subcontractor's instruments and other survey equipment shall be accurate, suitable for the surveys required in accordance with recognized professional standards, and in proper condition and adjustment at all times.

E. Field Notes and Records: The Subcontractor shall record surveys in duplicate page field notebooks. The original pages of such records shall be furnished to the Contractor at intervals required by the Contractor. A duplicate of each field notebook shall be furnished to the Contractor when filled or completed.

F. Use by the Contractor: The Contractor may at any time use line and grade points and markers established by the Subcontractor. The Subcontractor's surveys are a part of the Work and may be checked by the Contractor or representatives of the Contractor at any time. The Subcontractor shall be responsible for any lines, grades, or measurements which do not comply with specified or proper tolerances, or which are otherwise defective, and for any resultant defects in the Work. The Subcontractor will be required to conduct re-surveys or check surveys to correct errors indicated by review of the field notebooks or otherwise detected.

1.4 SURVEYS FOR LAYOUT AND PERFORMANCE

The Subcontractor shall perform all surveys for layout and performance of the Work, and shall reduce the field notes and make all necessary calculations and drawings necessary to carry out the Work.

1.5 SURVEYS FOR MEASUREMENT FOR PAYMENT

When the Specifications or the Contractor require Bid Schedule items of work to be measured by surveying methods, the Subcontractor shall perform the surveys. All such surveys, including control surveys run for establishing the measurement reference lines, shall be performed in the presence of the Contractor (or a representative of the Contractor) who will witness the surveying operation by signing the field notes or keeping duplicate field notes, at the Contractor's option. The Subcontractor will reduce the field notes and calculate final quantities for payment purposes. A duplicate of the note reductions and calculations will be given to the Contractor.

1.6 SURVEYING ACCURACY AND TOLERANCES IN LAYOUT OF SURVEY STAKES

A. Tolerances in layout of Work shall not exceed the following:

Type of Line or Mark	Horizontal Position	Elevation
Permanent reference points	1 in 10,000	± .01 ft.
General Excavation and earthworks	1 in 2,000	± .10 ft.

B. Tolerances for designed thicknesses shown on Subcontract Drawings with the exception of erosion protection materials, and for elevations shown on the Subcontract Drawings shall be ± 0.10 foot. Tolerances on erosion protection material thicknesses are specified in Section 02278.

C. These tolerances shall not supersede stricter tolerances required by the Drawings or Specifications, or by the governing authorities, and shall not otherwise relieve the Subcontractor of responsibility for measurement in compliance therewith.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Separate measurement for payment will not be made for work required under this Section.

4.2 PAYMENT

Separate payment will not be made for work required under this Section. All costs in connection with the work specified herein will be considered to be included in the related item of work in the Bid Schedule, or incidental to the Subcontract.

END OF SECTION 01052

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Specification Section describes the requirements for the following submittals:

1. Cost Profile
2. Shop Drawings
3. Samples
4. Schedules and Reports
5. Product Data
6. Manufacturer's Instructions
7. Design Calculations and Design Drawings

B. The requirements specified in this Section shall be supplemental to requirements specified in General Provisions, General Conditions, Special Conditions and any other requirements specified in individual Sections.

C. All submittals shall be in English language.

D. The Subcontractor shall submit all technical submittals including, but not limited to, shop drawings, schedules and reports, product data, manufacturer's instructions, design calculations and design drawings etc. to the Site Manager. A copy of the submittal, marked information only, shall be sent to the Contractor's Subcontract Administrator by the Subcontractor. These submittals shall be numerically serialized by the Subcontractor. The submittal serial numbers shall be consecutive and not a part of another correspondence tracking system. The Site Manager will review the submittal and clearly label as follows and return to the Subcontractor:

Submittal Review Status:

- o Approved
- o Approved as Noted
- o Revise and Resubmit
- o Rejected

1.2 COST PROFILE

A. In compliance with the U.S. Department of Energy's fiscal year funding procedures, the Subcontractor shall submit a Cost Profile reflecting the schedule of work (Project Construction Schedule) to be performed. The Cost Profile shall include the scheduled costs by month through completion of the Work scope defined in the Subcontract Documents. The cost profile shall be submitted within 30 days of receiving the Notice to Proceed.

B. At the beginning of each fiscal year (October 1), the Contractor will evaluate the Subcontractor's fiscal requirements and determine if there are conflicts.

C. Where conflicts arise between the Subcontractor's anticipated Cost Profile and the available U.S. Department of Energy fiscal year funding, the Subcontractor will submit a revised schedule of Cost Profile to the Contractor for approval.

1.3 SHOP DRAWINGS

A. The procedure for submittal of shop drawings is set forth below and is supplemental to the requirements of Section GC-4 of the General Conditions.

B. Shop drawings shall establish the actual detail of all manufactured or fabricated items, indicate proper relation of adjoining work, and incorporate minor changes of design or construction to suit actual conditions. Shop drawings shall be drawn to scale and shall be completely dimensioned.

C. Sheet sizes of shop drawings shall be in multiples of 8-1/2 by 11 inches, preferably not exceeding 22 by 34 inches, unless there is a special requirement for larger size sheets.

D. A clear space of 3 inch by 3 inch shall be provided on each drawing for the Contractor's review stamp and comments.

E. Shop drawings shall be submitted to the Contractor in the form of a reproducible transparency, along with one blackline or blueline print. Manufacturers' literature, brochures, catalog cuts, and other pertinent printed matter or data shall be submitted in triplicate.

F. After the Contractor has performed his review of shop drawings, he will return one print to the Subcontractor with one of the notations indicated in Article 1.1.D above.

G. When shop drawings and other submittals are returned marked with either "Revise and Resubmit" or "Rejected", the Subcontractor shall make such revisions and corrections and resubmit the drawings or other material in the same manner as specified above.

H. The Contractor will review and return shop drawings within thirty days of receipt.

1.4 SAMPLES

A. The procedure for submittal of samples is set forth below and is supplemental to the requirements of Section GC-4A (3) of the General Conditions.

B. The Subcontractor shall furnish the Contractor samples of the various materials, together with the finish thereon, as specified for and intended to be used on or in the Work. Samples shall be sent to the Contractor.

C. Subcontractor shall submit all samples to the Contractor at least 21 days before purchasing, fabricating, applying, or installing such materials and finishes, unless otherwise stated. The Contractor will review the samples for visual aspects such as kind, color, pattern, and texture, and will approve or ask for resubmission of samples within fourteen days of the Subcontractor's submission. All approvals of samples will be given by the Contractor in writing.

D. Unless otherwise specified in the various sections of these Specifications, the Subcontractor shall submit all samples, other than field samples, in triplicate. A cover letter shall accompany the sample and shall list all items being transmitted, designating their particular usage and location in the Project.

E. After the Contractor has performed his review and analysis of samples, he will retain two samples and will return the remaining sample to the Subcontractor, along with the Contractor's comments.

F. Samples shall be submitted and resubmitted until approved as satisfactory. Approval of a sample shall not be taken in itself to change or modify any Subcontract requirement. All materials, color, pattern and texture in the completed

building or structure shall be equal in every respect to that of the approved samples.

G. Each sample shall be identified completely as to product, color, manufacturer, trade name, lot, style, model, location of use, and Subcontract Document reference, as well as the names of the Subcontractor, Supplier, Project, and Contractor.

H. Unless otherwise specified, all samples, where applicable, shall be furnished in sizes required by the Site Manager.

I. Test samples, as designated by the Contractor, will also be selected from the materials or equipment delivered by the Subcontractor to the site for use in the work, or as requested by the Contractor. If any test sample fails to meet the specification requirements, previous approval will be withdrawn, and such materials or equipment which fail the testing, shall be subject to removal and replacement by the Subcontractor with materials or equipment meeting the Specification requirements.

J. Field samples shall be prepared at the site by the Subcontractor in the manner and number as specified in these Specifications. Affected finish work shall not be commenced until the Contractor has approved the field samples, in writing.

1.5 SCHEDULES AND REPORTS: GENERAL

A. The Subcontractor shall prepare and submit schedules and reports in accordance with the requirements of Section GC-4B of General Conditions and the requirements of this Section. Where conflicts occur between the General Conditions and the General Requirements, the General Requirements will govern.

B. The Schedules and reports shall describe the Subcontractor's work plan in sufficient detail as delineated below to provide:

1. Assurance to the Contractor that the finished Work complies accurately with the Subcontract Documents, and the requirements of Section GC-4 of General Conditions are satisfied,

2. A basis for determining the progress of the work, and

3. A basis for the Contractor's internal planning activities.

C. Within ten calendar days after Notice to Proceed, the Subcontractor shall provide the schedules specified in this Section.

D. The schedules shall be in a reproducible form of the same scale or some of the schedules may be combined as required by the Contractor.

E. Unless otherwise specified, the schedules shall be presented in graphic format and shall be updated for each construction meeting, or at least monthly, and transmitted to the Contractor's Subcontract Administrator and Site Manager.

F. The Subcontractor shall obtain approval of the various schedules specified in this Section before submitting the first application for payment.

G. The Subcontractor's schedules and reports shall include the following:

1. Site Mobilization Schedule
2. Project Construction Schedule
3. Schedule of Values
4. Schedule of Submittals
5. Weekly Status Reports
6. Monthly Progress Reports

1.6 SITE MOBILIZATION SCHEDULE

A. Format: The Subcontractor shall present, at the preconstruction conference, the schedule for site mobilization in bar chart format. The schedule shall delineate the establishment of the temporary facilities identified in Section 01500 and the Subcontractor's plan for starting the work.

B. Written Narrative: The Site Mobilization Schedule shall be accompanied by a written narrative discussion of the schedule. The narrative shall provide a man-power level by month for the first three months of the job, transportation routes proposed for delivery of major construction equipment to be used on the project, identification of special permits required and when they are needed, and a description of the temporary facilities to be provided.

C. Status and Progress: The status of mobilization schedule items will be reported in the Weekly Status Report discussed below. An updated Site Mobilization Schedule will be included in the Monthly Progress Report.

1.7 PROJECT CONSTRUCTION SCHEDULE

A. Scheduling: A preliminary issue of the Project Construction Schedule shall be prepared for review at the preconstruction conference. Twenty days after receipt of Notice to Proceed the Subcontractor shall issue the Project Construction Schedule for approval and issue the approved Project Construction Schedule, ten days after receipt of approval and comments from the Contractor.

B. Format:

1. The preliminary issue distributed at the preconstruction conference will consist of:

   a. A time scaled Critical Path Method (CPM) Schedule which depicts proper restraints, activity durations, total float and free float for the entire duration of the Subcontract.

   b. Subcontractor's Manpower Usage Chart

   c. Method of Construction Narrative

   d. The following critical milestone dates shall be clearly identifiable in the Subcontractor's CPM:

      - o Start/complete mobilization
      - o Start/complete site preparation
      - o Start/complete excavation/placement of contaminated material
      - o Start/complete placement of radon cover
      - o Start/complete placement of erosion protection
      - o Start/complete site restoration
      - o Demobilization

2. The issued for approval Project Construction Schedule will consist of the revised items listed in B.1. above.

3. The approved Project Construction Schedule will consist of the following items, each compatible with the other and developed from the same basis:

   a. Method of Construction Narrative

b. CPM Schedule

c. Subcontractor's Manpower Usage Chart

d. Critical Milestone Dates identified in Article 1.7.B.1.d above.

C. Method of Construction: Method of construction submitted at the preconstruction conference with the preliminary schedule shall be a written discussion of the Subcontractor's Methods for completing the Work. The Subcontractor shall briefly describe his approach to the Subcontract.

D. Subcontractor's Manpower Usage Chart: The Subcontractor shall submit a chart showing the monthly estimated work force at the site from Notice to Proceed through Subcontract completion. The chart shall distinguish between manual and non-manual employees.

E. The Use of Scheduled Float: In as much as Subcontractor's Schedule represents the Project Construction Schedule, the calculated scheduled float for an activity is shared by the Subcontractor and Contractor. Adjustments to the scheduled float will be equitably resolved by the Contractor.

F. Computer Generated Schedule: The Subcontractor may generate the CPM Schedule manually or by using a computer. Samples of actual project applications and computer reports produced shall be provided. The CPM Schedule shall include all definable critical items of Work.

G. Comments incorporated: The Subcontractor shall incorporate the Contractor's comments into revisions of the Project Construction Schedule, adjust the manpower loading accordingly and resubmit the schedule to the Contractor, for approval along with a summary of the changes or other means showing the changes.

H. Approved Project Construction Schedule:

1. Upon approval the Subcontractor will issue for construction use the Project Construction Schedule.

2. Statusing Updating: The schedule shall be statused at least monthly by the Subcontractor and reviewed by the Contractor. The statused CPM Schedule shall indicate percent complete by activity, remaining duration of in-progress activities, total float and free float.

3. Revisions to the Schedule shall be accomplished to reflect the impact thereon of new developments and in accordance with the requirements of the Contractor. Revisions made to the schedule will be given a new revision number and submitted to the Contractor for approval.

1.8 SCHEDULE OF VALUES

A. Each time a construction schedule is submitted, it shall be accompanied by a Schedule of Values for the entire Scope of Work. The Schedule of Values shall be based upon that specific revision of the Construction Schedule, and presented in such a format to clearly provide total cost information by month and cumulative for the entire duration of the Subcontract. If specific funding limitations have been set forth, the Schedule of Values shall be within said limits.

B. The format and the substance of the finalized Schedule of Values shall be as approved by the Contractor.

1.9 SCHEDULE OF SUBMITTALS

A. Vendor Data Submittals list including data submittals, required return dates, and material deliveries shall be submitted to the Contractor's Site Manager.

B. Subcontractor Submittals List consisting of all submittals required under this Subcontract but are not included in the schedules listed in this Section shall be submitted to the Contractor's Site Manager.

C. Shop Drawings List:

1. A Shop Drawings list shall be submitted by the Subcontractor as a supplement to the Project Construction Schedule.

2. The list shall depict submittal delivery dates of the shop drawings by the Subcontractor's Vendors.

3. The list shall be continually updated for progress and revised upon issuance of changes which would substantially affect the list. The updates shall be furnished upon request by the Contractor.

4. Revisions to the Shop Drawings list shall be reflected on the Project Construction Schedule.

1.10 MONTHLY PROGRESS REPORTS

A. The Subcontractor shall submit a Monthly Progress Report, listing all construction activities and their scheduled completion dates. Activities shall show the percent of completion and the days required for completion, and shall include milestone events that occured during the month.

B. A Monthly Progress Report format will be furnished to the Subcontractor, by the Contractor, at the preconstruction conference.

C. Three copies of each Monthly Progress Report shall be forwarded to the Contractor no later than the fifth working day after the last working day included for payment in the Report.

D. Monthly Progress Reports shall refer to status of the Project as of the date of milestone event or, if no milestone event occurred within the month, as of last working date of month.

E. Other Requirements: Requests for progress payments shall be accompanied by the latest pertinent report.

1.11 WEEKLY STATUS REPORTS

The Subcontractor shall submit a Weekly Status Report to the Contractor by Friday noon. The report shall be on a form provided by the Contractor, and shall include items such as a Summary of Work completed and a Two-Week Look Ahead Bar Chart. Delinquency in submitting Weekly Status Reports may cause delays in progress payments.

1.12 PRODUCT DATA

A. Each copy shall be marked to identify applicable products, models, options, and other data; manufacturers' standard data shall be supplemented to provide information unique to the Work.

B. The Subcontractor shall submit the number of copies which the Subcontractor requires, plus two copies which will be retained by the Contractor.

1.13 MANUFACTURER'S INSTRUCTIONS

When required in individual Specification Sections, the Subcontractor shall submit manufacturer's printed instructions for delivery, storage, assembly, installation, adjusting, and finishing, in quantities specified for product data.

1.14 DESIGN CALCULATIONS AND DESIGN DRAWINGS

A. Design Calculations: When requested by the Contractor, design calculations shall be submitted to the Contractor for review with all pertinent data, assumptions, objective, criteria, applicable codes, standards and references. The calculations shall be on 8-1/2 by 11-inch or 11 by 17-inch sheets. Each design calculation set shall bear page numbers, titles, revision numbers, date and calculation number. Where multiple number of items are designed in a particular system, the calculations shall be preceded by a table of contents.

B. Design Drawings:

1. When requested by the Contractor, design drawings shall be submitted to the Contractor for review.

2. Pertinent requirements of Article 1.3 of this Section shall be applicable for submittal of design drawings.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Separate measurement for payment will not be made for work required under this Section.

4.2 PAYMENT

Separate payment will not be made for work required under this Section. All costs in connection therewith shall be considered to be incidental to the applicable items of work to which they pertain.

END OF SECTION 01300

SECTION 01500

TEMPORARY FACILITIES

PART 1 - GENERAL

1.1 SCOPE

A. The Subcontractor shall furnish and install all required temporary facilities as shown or specified herein plus such facilities and equipment as are required for proper performance of the Subcontract.

B. All such temporary facilities shall be located as shown on the Subcontract Drawings, or as directed, and maintained in a clean, safe and sanitary condition at all times until completion of the Subcontract; then removed from the site and disposed of as directed.

C. The requirements specified herein are in addition to any requirements specified elsewhere in the Subcontract Documents. Temporary facilities shall meet the requirements for all-weather service.

D. The trailers [including the Contractor-furnished trailers] shall be equipped with skirting all around them and the utilities shall be designed and constructed to provide uninterrupted service during winter.

E. All land disturbances related to temporary facilities shall be minimized to the greatest extent possible and the land restored, to the extent reasonable and practical, to its original contours by grading to provide positive drainage and by seeding the area to match existing vegetation.

1.2 RELATED WORK

Section 01019 - Mobilization: Payment

1.3 APPLICABLE PUBLICATIONS

A. The Publications listed below form a part of this Specification to the extent referenced. The Publications are referred to in the text by the basic designation only:

1. UMTRA Project Construction Safety and Health Management Program (MK-UMTRA-4)

2. State of Utah, Standard Specifications for Road and Bridge Construction, 1979 Edition and Subsequent Revisions, as applicable.

3. Uniform Building Code (UBC):
1985 Edition, applicable Chapters and Sections.

4. National Fire Protection Association (NFPA), as applicable.

B. All required facilities and equipment shall also be in accordance with applicable Federal, Navajo Nation, and Utility laws, rules, and regulations. Notwithstanding contrary provisions of General Provisions, General Conditions and Special Conditions, nothing in the Subcontract Drawings and Specifications shall be construed to permit work not conforming to the above.

1.4 SUBCONTRACTOR'S TEMPORARY OFFICE TRAILER

A. Subcontractor shall furnish and install, in good condition, on the site, at least one temporary office trailer of suitable size for himself and his office staff.

B. The trailer shall have a conference room of suitable size for consulting with the Contractor and DOE representative, etc.

C. The location of the trailer/s shall be approved by the Contractor prior to setting in place.

1.5 CONTRACTOR'S TEMPORARY OFFICE TRAILER [(No. 1)]

A. The Subcontractor shall furnish and install an office trailer for the Contractor's staff as shown on the Subcontract Drawings. The location of the trailer shall be approved by the Contractor prior to setting in place.

B. The size of the trailer shall be not less than 840 (14 ft. x 60 ft.) square feet. The trailer shall be provided with water, power and telephone, and shall be properly lighted and temperature conditioned for summer and winter use.

1.6 ACCESS CONTROL TRAILER

A. The Subcontractor shall furnish and install an access control trailer with the following facilities:

1. A minimum of 600 square feet office space for administrative, security and Contractor's Health Physics personnel.

2. Decontamination facilities including change facilities for all personnel working on the site, a single shower for occasional use by all personnel, and a sink.

1.7 PARKING AREAS

A. No personal vehicles will be permitted inside the construction area. Vehicles used for construction purposes will be allowed inside the area, but will be monitored for radioactive contamination at the access gate or control point before leaving the area.

B. Subcontractor shall provide parking facilities for construction personnel, delivery vehicles, the Contractor's representatives, and authorized visitors. Parking areas for personal cars shall be limited to the Contractor's and Subcontractor's office areas.

1.8 JANITORIAL SERVICE

A. The Subcontractor shall provide daily janitorial services including, but not limited to, the following for all Contractor's trailers, toilet facilities and the access control area:

1. Sweep, vacuum, and, if required, polish floors.

2. Clean toilets, doors and windows, office furniture.

3. Collect and dispose of office and yard solid waste.

4. Furnish paper, soap, cups, napkins, light bulbs, etc.

5. Operate and maintain trailer services including, but not limited to, the water supply and wastewater collection systems; heating, ventilating and air-conditioning system; and lighting and security systems.

1.9 TEMPORARY ROADS

A. General: Temporary roads shall meet the following requirements:

1. Construction shall be coordinated with and shall be as approved by the Contractor.

2. Thirty days prior to the start of Work the Subcontractor shall submit for review and approval improvement drawings to the Navajo Nation prior to initiation of any construction work on roads over which the Navajo Nation has jurisdiction. A copy of the drawings shall be submitted to the Contractor.

3. Erosion shall be kept to a minimum and suitable grades and radii of curves shall be maintained to facilitate ease of movement of vehicles and equipment.

B. Maintenance: Subcontractor shall maintain all roads during the construction period for the safe and efficient transport of equipment, supplies and personnel. Prior to Subcontract Closeout:

1. New roads built by the Subcontractor for his convenience shall be removed.

2. Existing roads used as temporary roads shall be repaired to meet conditions equal to or better than those prevalent prior to commencement of the Work and as otherwise required by permits or regulatory agencies.

1.10 DUST CONTROL

The Subcontractor shall be responsible for providing adequate dust and water pollution control measures during the construction of the temporary facilities.

1.11 STORAGE OF MATERIALS AND EQUIPMENT

A. Subcontractor shall make arrangements for exterior storage areas for materials, equipment, and debris. Locations and perimeters of such facilities shall be subject to the approval of the Contractor.

B. All operations of the Subcontractor, including storage of materials, shall be confined to areas approved. Subcon-

tractor shall be liable for any and all damage caused by him during such use by him of property of the Contractor or other parties. Subcontractor shall save the DOE, its officers and agents, the Contractor and his employees free and harmless from liability of any nature or kind arising from any use, trespass, or damage occasioned by his operations on premises of a third party.

C. Subcontractor shall store construction materials and equipment within boundaries of designated areas. Storage of gasoline or similar fuels shall conform to the requirements specified in Section SC-13 of the Special Conditions.

1.12 CONSTRUCTION EQUIPMENT

A. Subcontractor shall erect, equip, and maintain all construction equipment in accordance with all applicable statutes, laws, ordinances, rules and regulations of the Contractor or other authority having jurisdiction.

B. Scaffolding, staging, runways, hoists, barricades, and similar equipment required for performance of the Subcontract shall be provided and maintained by the Subcontractor. Hoists or similar equipment shall be provided with operators and signals, as required.

C. Subcontractor shall provide, maintain, and remove upon completion of the work, all temporary rigging, scaffolding, hoisting equipment, debris boxes, barricades around openings and excavations, fences, ladders, and all other temporary work, as required for all work hereunder, unless otherwise required by the Contractor.

D. Construction equipment and temporary work shall conform to all the requirements of State, County and Local authorities, OSHA, and underwriters which pertain to operation, safety, and fire hazard. Subcontractor shall furnish and install all items necessary for conformity with such requirements, whether or not called for under the separate sections of these Specifications.

1.13 TEMPORARY SANITARY FACILITIES

A. Subcontractor shall provide temporary sanitary facilities for use by all employees and persons engaged in the work, including other subcontractors, Contractor, DOE, and their employees.

B. Sanitary facilities include enclosed chemical toilets and washing sinks. These facilities shall meet the requirements of local public health standards. Open pit or trench latrines will not be permitted.

C. Two enclosed chemical toilets and one washing sink shall be provided for the exclusive use of the Contractor, DOE and their employees near Contractor's office trailer[s] as indicated on the Subcontract Drawings.

D. Additional chemical toilets and washing sinks shall be provided for use by the Subcontractor, his employees and all other workers and suppliers. The number required shall conform to the requirements specified in Section GC-6 of the General Conditions.

E. Wash sinks shall be connected to potable water supply and drained to a holding tank.

F. Sanitary facilities shall be located as shown on the Subcontract Drawings and as approved by the Contractor, and shall be maintained in a sanitary condition during the entire course of the Work. Subcontractor shall keep such facilities adequately supplied with toilet paper, paper toweling, paper cups, etc., as required.

G. At completion of the Work, sanitary facilities shall be properly disinfected and all evidence of the same, including buried tanks and concrete foundations, removed from the site to the satisfaction of the Contractor unless otherwise directed.

H. The holding tank(s) shall be kept pumped out at such intervals that the tank(s) will not overflow and contaminate the ground, flowing streams, or surface drainage. The discharge from the tanks shall be collected in the retention basins.

1.14 TEMPORARY ELECTRIC POWER

A. The Subcontractor shall provide and maintain during the course and progress of the work all electrical power and wiring requirements to facilitate the work of all trades and services associated with the Work. The Subcontractor shall make arrangements with the Utah Power & Light Company in Blanding, Utah, and shall pay all charges for providing and maintaining electrical service including usage costs at the site. All temporary wiring, feeders, and connections, and any standby generators or generating

capacity required in excess of the serving utility capacity shall be furnished by the Subcontractor.

B. Routing of temporary conductors, including welding leads shall not create a safety hazard nor interfere with operation and maintenance of existing facilities. Approval from Site Manager shall be obtained prior to making connections to existing power panels.

C. All temporary wiring installed by the Subcontractor shall be accomplished in accordance with the requirements of the National Fire Protection Association (NFPA) Codes 70 and 70E (latest edition), using acceptable code materials and equipment.

D. There may be times during the period of the subcontract when the Contractor will schedule power outages which will make temporary electrical power unavailable over any of the electrical transmission and distribution systems. Normally, these outages will be scheduled sufficiently in advance to give the Subcontractor prior notification; however, due to operational requirements, it may be necessary to "kill" the lines without prior notification. The Contractor assumes no liability for interruptions, delays, or inconveniences caused to the Subcontractor as a result of such electrical power outages or power failure, scheduled or unscheduled, except that any delay in completion of the work resulting directly from such power outages shall be deemed a delay due to unforeseeable causes beyond the control and without the fault or negligence of the Subcontractor within the meaning of the Article 6. "TERMINATION FOR DEFAULT-DAMAGES FOR DELAY TIME EXTENSIONS," of the General Provisions, and the Subcontractor shall be entitled to relief in accordance with the provisions of said Article 6, provided he gives written notice of such delay in accordance with the requirements thereof. There will be no adjustment in the Subcontract Price due to any such electrical power outage or power failure.

E. Subcontractor shall provide power and lighting to all trailers, and for all Work as required, at no extra cost to the Contractor, and as follows:

1. A minimum of 200A electric service to all Contractor's trailers including access control trailer and quality control trailer.

2. Adequate temporary lighting to all trailers, and for all Work, as required.

1.15 TEMPORARY WATER

A. Temporary water service (for potable and construction use) shall be provided at Subcontractor's expense.

B. The Subcontractor shall provide chilled drinking water to all Contractor's trailers including access control trailer without additional cost to the Contractor. The drinking water shall be furnished in bottles from an approved source.

1.16 DECONTAMINATION WASHWATER RECYLING SYSTEM

A. The Subcontractor shall design, furnish, install, operate, maintain, remove and dispose of a high-pressure, water recycling wash system for decontamination of hauling equipment. Decontamination pad shall be as specified in Section 02500.

B. The wash system shall, as a minimum, consist of a high-pressure (75 to 100 psi) pump, discharge pipe and nozzles, and holding tank or lined pond of at least 5,000-gallon capacity. The holding tank or pond shall consist of two compartments for separation of solids from the washwater. The system shall provide for removal of solids by mechanical equipment. Make-up water shall be provided to maintain the capacity of the holding tank or pond at least 2/3 full.

C. The Subcontractor shall submit his proposed wash system design including calculations, drawings, and equipment list with capacities, to the Contractor for reivew 60 days prior to start of hauling operations.

D. At the completion of the Subcontract, the Subcontractor shall remove and dispose of all equipment, and restore the area to near original conditions existing prior to the start of the Work.

1.17 TEMPORARY HEAT

Subcontractor shall provide, at his own expense, all temporary heat as necessary for the plant, the proper installation of work, equipment, and materials, and for the protection of work and materials, against injury from dampness, cold, and freezing.

1.18 TEMPORARY TELEPHONE SERVICE

A. The Subcontractor shall make all necessary arrangements with Continental Telephone Company of the West in Moab, Utah, for outside telephone service to his office, Contractor's offices, and access control trailer.

B. Internal telephone communications shall be provided between the following trailers:

1. Subcontractor's trailer and the Contractor's trailer.

2. Access control trailer and the Contractor's trailer.

C. All costs of telephone service connections, external and internal, shall be borne by the Subcontractor.

D. The Contractor will furnish telephones in the Contractor's and access control trailers. Monthly service charges and long distance calls chargeable to the Contractor's and access control trailers shall be billed separately to the Contractor.

1.19 BARRICADES, LIGHTS, AND FLAG PERSONS

A. Pursuant to Article GP-34 of General Provisions, Section GC-3D of General Conditions, and Sections SC-12 and SC-17 of Special Conditions, the Subcontractor shall construct and maintain fences, planking, barricades, lights, shoring, and warning signs as required by local authorities and Federal and State safety ordinances, and as required, to protect the Contractor's property from injury or loss and as necessary for the protection of the public, and provide walks around any obstructions made in a public place for carrying on the Work covered in this Subcontract. Leave all protection in place and maintain until removal is authorized.

B. In addition, the Subcontractor shall guard and protect all workers, pedestrians, and the public from excavations, blasting operations, construction equipment, all obstructions, and other dangerous items or areas by means of adequate railings, guard rails, temporary walks, barricades, warning signs, sirens, directional signs, overhead protection, planking, decking, danger lights, etc.

C. Flag persons, properly equipped with International Orange Protective clothing and flags, shall be provided at all such times, as necessary, to direct or divert pedestrian or vehicular traffic.

1.20 SHUT-DOWN TIME OF SERVICES

The Subcontractor shall not disconnect or shut down any part of the existing utilities and services, except by express permission of the Contractor. The Subcontractor shall submit schedule of estimated shut-down time in order to obtain such permission, and shall notify all interested parties, utilities, county authorities, etc., as required.

1.21 MAINTENANCE

A. Subcontractor shall maintain all temporary facilities as required by the Contractor during the construction period.

B. Subcontractor shall maintain all temporary roads including access control areas during the construction period for the safe and efficient transport of equipment, supplies and personnel.

1.22 REMOVAL AT COMPLETION

A. Upon completion of the Work, or prior thereto when so required by the Contractor, Subcontractor shall remove all temporary facilities including . . concrete foundations. Similarly, all areas utilized for temporary facilities shall be returned to substantially their original, natural state, or as otherwise indicated or directed.

B. Roads: Prior to Subcontract Closeout, the Subcontractor shall:

1. Repair existing roads used as temporary roads. Repair work may include regrading, recompacting and resurfacing, to at least equal or better than the original conditions existing prior to the start of the Subcontract Work.

2. Obliterate new roads built by the Subcontractor and restore the areas to their near original contours by grading to provide positive drainage and surface conditions to promote natural revegetation.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

PART 4 - MEASUREMENT AND PAYMENT

4.1 COST

A. With the exception of the item mentioned in Paragraph B below, separate measurement or payment will not be made for work required under this Section. All costs in connection with the work specified in this Section including, but not limited to, site preparation and earth work will be considered to be included in the Bid Schedule item for Mobilization.

B. Construction and removal of decontamination pad will be measured and paid for under related items of work specified in other Sections of these Specifications.

END OF SECTION 01500

Division 2

Sitework

SECTION 02050

DEMOLITION

PART 1 - GENERAL

1.1 SCOPE

A. This Specification Section describes the requirements for the demolition and disposal of the following facilities:

1. All existing structures except health clinic and sheet metal shop storage, including, but not limited to, crusher building, generator building, sulfuric acid tanks and equipment, truck scale, existing exposed, partially exposed or buried concrete foundations, slabs, equipment pads, existing fence and machinery as described in this Section.

2. Existing concrete drainage structures on the upper and lower piles.

3. Decontamination pad constructed under this Subcontract.

B. Approximate descriptions and data of other structures and facilities to be demolished are contained in Articles 1.3 through 1.18 of this Specification.

C. Sealing of abandoned wells is specified in Section 02090.

1.2 RELATED WORK

A. Special Conditions - Sections SC-7 and SC-8

B. Section 02060 - Existing Utilities

C. Section 02090 - Sealing Abandoned Wells

D. Section 02200 - Earthwork: Disposal of demolished materials and debris including asbestos.

1.3 SCALE HOUSE

Metal ribbed building, founded on a slab approximately 8 inches thick. The building is 10' x 12' in area and is 12 feet high at the roof peak. The windows have all been broken and wiring has been disconnected. There is a manhole on the west side of the building and a 3' x 6' x 6" slab on the north end of the structure.

1.4 SCALE PIT

Scale pit structure is approximately 48' long x 12' wide. There are 12' x 12' x 1' thick slabs on each end of the pit. The pit itself is constructed with 8-inch walls. The pit is 8 to 10 feet deep. There are five concrete guard posts surrounding the scale pit area. The diameter of the posts is 6 inches and the height is approximately 4 feet above the grade.

1.5 CONCRETE FOUNDATION (EAST OF SCALE HOUSE)

Concrete foundation is on grade. It is approximately 40' wide by 120' long, and is about 1' thick.

1.6 FOUNDATION EAST OF THE FOUR STORAGE TANKS

Foundation is approximately 100' x 342'. The walls are 8" thick and 4' high. Slab thickness varies, with the majority being 4 to 6 inches. The foundation walls in some areas are lined with corrugated metal panels. On the east side, the foundation also includes concrete masonry units. Steel columns have been cut off at slab level. Concrete piers on spread footings may be present under the slab supporting the columns. The columns indicate two bays from east to west. The first bay is 60 feet wide and the second is 30 feet wide. Columns are spaced 20 feet apart center to center from north to south.

1.7 CONCRETE FOUNDATION EAST END OF BUILDING AREA

Concrete foundation is on the east side of the building area. It is approximately 200' by 100', and is split level. Foundation walls are of reinforced concrete and are approximately 5 feet high. The slab on the south half of the foundation is approximately 6 to 8 inches thick. Presence of a slab on the northern half is not apparent. No foundation walls could be located on the east side. Some parts of this foundation are covered with earth that has been bulldozed up from the eastern side.

1.8 CRUSHER BUILDING

Crusher building is on a concrete foundation, with foundation walls and a 1-foot thick slab. The building is approximately 100' x 42' x 20' at the roof peak. The

building is comprised of light structural steel. The largest column appears to be a W12 x 35. The siding material is corrugated metal. Roof framing is light structural members with the skin removed. The window glass is broken. The pit on the east side of the building slopes from grade just outside the building to about 10 feet deep in the center. Small light structural steel frames the building at the pit entrance. Electrical service has been severed and much of the wire has been removed. Some large overhead light fixtures are still present in the room on the north end of the building. A heavy concrete equipment foundation approximately 10 feet high is present in the center of the building. Three miscellaneous footings are found outside and just south of the structure.

1.9 SHAFT STRUCTURE SOUTH OF THE CRUSHER BUILDING

Shaft is located 75 to 100 feet directly south of the Crusher Building. The opening to the shaft faces north and is 9 feet wide by 8 feet high with 1 foot thick walls. The structure is on an incline and runs 140 feet into the ground. The bottom of the shaft is estimated to be 20 feet below the grade.

1.10 MISCELLANEOUS FOUNDATIONS SOUTH OF THE SHAFT

Several small foundations are located approximately 75 feet directly south of the shaft. The overall dimensions are 30 feet by 42 feet. The structures appear to be constructed of 15-inch thick foundation walls and are approximately 4 feet high.

1.11 URANIUM STORAGE TANKS

A. Foundation for four uranium storage tanks consists of a 5-inch x 2-1/2-foot foundation wall with piers for columns. The piers are 1-1/2 foot square and support W8 x 40 columns. The beams and girders that support the tanks are W24 and W28 sections.

B. Tanks are constructed of 3/8-inch metal plate and are 20 feet in diameter. Access to the top of the tanks is by steel stairway in the north end corner. The top of the tanks is covered by a 120' x 25' x 1/4" checkered plate.

C. Eight 1.5' x 1.5' concrete piers are located between the tanks and the crusher building. They are on a 6-foot gage and approximately 50 feet on center.

1.12 SHEET METAL BUILDING

A. Sheet metal shop is an occupied structure. The building is a 60-foot by 40-foot pre-engineered metal building. It is about 12 feet high at the eaves and 20 feet high at the peak. There is a gas service and a water well located at the west entrance to the building. There is a manhole just east of the shop, a 4' by 5' sump off the northwest corner and a 15' x 18' x 6" slab off the southwest corner.

B. To the northwest of the sheet metal shop is a 4-inch slab that is 65' long x 35' wide. Also, north of the sheet metal shop is the diesel fuel storage tank foundation and earthen berm.

1.13 SUBSTATION

A. Substation area consists of an on-line substation approximately 60' x 40'. To the east is the foundation for and a diesel generator. The entire diesel generator pad is 70' x 45' and is built on 8" wide x 2' high foundation walls. The first 10 feet of slab east of the substation is 8 inches thick and appears to be covering a 10-foot deep pit. The remaining 60 feet of slab is on fill and is 4 inches in thickness. On the east end of the slab is the diesel generator and foundation. The foundation is of reinforced concrete and is 12' x 30' x 4' thick.

B. Diesel fuel storage tank foundation is a concrete slab 14' Ø by 1' thick. The slab is surrounded by an earthen berm approximately 25 feet square and 2 feet high. The storage tank has been removed.

1.14 TRADE SCHOOL AND WAREHOUSE FOUNDATION

A. Trade school slab has an 8-inch foundation wall 2 to 3 feet deep. The slab is 6 inches thick. The slab dimensions are 60' wide by 200' long.

B. About 150 feet west of the trade school is a loading dock slab approximately 20' x 20'. The slab is 4 inches thick. The retaining wall west of the slab is constructed of rough timber and it is approximately 3-1/2 feet high.

1.15 SECURITY BUILDING AND MISCELLANEOUS SLABS

Security building is a one story brick structure approximately 30' x 20'. The slab is 4 inches thick. Three of the walls and roof are missing. Southwest of the security building is a yard slab 25' x 45' x 4" located 50'-75' from the southeast corner of the trade school.

1.16 SULPHUR STORAGE TANK AND BIN

A. Sulphur storage tank is constructed on a 2-foot thick foundation slab. There are four concrete support walls, 1 foot thick with structural steel beams bearing on the walls and supporting the tank.

B. Tank itself is 18 feet in diameter by 22 feet high. It is of double wall steel construction. It is suspected that the material between the walls is asbestos.

C. Steel bin is just south of the sulphur tank. It has 1-foot thick concrete walls, approximately 3 feet high and is covered with steel hatches. The concrete walls inside are brick lined and a limited amount of small bore pipe was observed.

1.17 SULPHUR FURNACE AND TANK

A. Sulphur furnace is a 10' Ø brick and asbestos lined unit that is 25 feet in length. It sits on five concrete piers which are 1.5' wide by 10' long and is supported by five steel saddles.

B. Two acid tanks are 8' Ø by 22 feet high. They each sit on a four legged concrete foundation which is 12 feet high. The legs of the concrete support are 16 inches square.

C. Another sulphur storage tank with foundation is just south of the acid tanks. The storage tank is 10' Ø by 8' high and sits on two concrete grade beams and structural steel I-beams. The foundation is 12' by 18' with 8-inch foundation walls. The depth of these walls is assumed to be 3 feet. There are three minor equipment pedestals on 6-inch slab.

1.18 GRADE BEAMS AND MISCELLANEOUS FOUNDATIONS

A. Grade beams and foundations are located approximately 20 feet east of the sulphur storage tank and steel bin. There are ten grade beams which are 7" x 12" and are spaced at about 5 feet. There is a corrugated metal shed on 4-inch concrete walls in the northeast corner. The building is approximately 8' x 6' x 10' high.

B. Just south of the grade beams is a foundation with 8-inch walls that are about 2 feet high. Inside the walls are nine piers which are 1.5' x 1'. There is also a sump that is approximately 5' x 5' with 8-inch walls and 8 feet deep.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.1 DEMOLITION

A. During the execution of this Subcontract, if chemically hazardous or toxic waste material is suspected or encountered, the Site Manager shall be immediately notified for identification and subsequent disposition.

B. Asbestos removal and disposal shall comply with the standards listed in Section SC-7.L of Special Conditions.

C. Pollution Controls:

1. Water sprinkling, temporary enclosures, and other Contractor approved methods shall be used to limit the amount of airborne dust and dirt to the lowest practical level. Demolition work shall comply with governing regulations pertaining to environmental protection.

2. Water shall not be used if it is likely to create hazardous or objectionable conditions such as ice, flooding, or pollution. An approved water-based biodegradable wetting agent (surfactant) such as Dupont "Duponol WAQ" or equal may be used to reduce the quantity of water required.

D. Demolition work shall be carried out using equipment compatible to the structures to be demolished and by methods required to complete the Work in accordance with governing regulations. The structures shall be demolished and the materials and debris disposed of as specified in Section 02200.

E. Tanks and Vessels: Tanks and vessels shall be emptied of contents prior to removal and demolition. Tanks and vessels shall be cut to pieces not greater than 10 feet long by 8 feet wide.

F. Solid metals, concrete, masonry and wooden members shall be cut in pieces to be no greater than 3 feet in any dimension and no more than 27 cubic feet in volume.

G. Metal objects with voids shall be crushed to sizes no greater than 27 cubic feet in volume with least dimension not exceeding 6 inches.

H. Grading shall be performed, as required by the Contractor, to restore existing grades as indicated on the Subcontract Drawings and as specified in Section 02200.

I. Removal of existing utilities shall be as specified in Section 02060.

J. Sealing of abandoned wells shall be as specified in Section 02090.

3.2 DISPOSAL OF DEMOLITION DEBRIS

A. Demolished materials and debris including asbestos shall be disposed of in the tailings embankment, as specified in Section 02200 and as shown on the Subcontract Drawings.

B. Burning of materials removed from demolished structures will not be permitted.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement for payment for demolition and disposal of structures specified in this Section will be on a lump sum basis.

B. Separate measurement for payment will not be made for demolition and disposal of access control area and parking area.

4.2 PAYMENT

A. Payment for demolition and disposal of structures specified in this Section will be by the lump sum price quoted therefor in the Bid Schedule. The price quoted shall include full compensation for furnishing all labor, materials, equipment, incidentals, and for performing all work specified including, but not limited to, transportation and placement of demolished materials and debris in the tailings embankment.

B. Payment for demolition and disposal of access control area and parking area will be considered to be included in the Bid Schedule item for Mobilization as specified in Section 01500.

END OF SECTION 02050

SECTION 02060

EXISTING UTILITIES

PART 1 - GENERAL

1.1 WORK INCLUDED

A. This Section describes the requirements for the removal, plugging, abandoning and disposal of existing utilities shown on the Subcontract Drawings.

1.2 DEFINITIONS

Utility: For the purpose of this Section, utility means any service, such as electric power systems; gas distribution systems; telephone, water including fire protection water distribution; storm drain; sanitary sewer services; sand tailing lines; slurry lines; and associated services.

1.3 RELATED WORK

A. Special Conditions - Articles SC-6 and SC-7.

B. Section 02200 - Earthwork: Disposal of Demolished Materials and Debris

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.1 GENERAL

A. Removal or plugging of the utility shall not be undertaken until written approval for such work has been obtained from the Contractor.

B. Unless otherwise specifically indicated on the Subcontract Drawings or otherwise authorized in writing by the Contractor, all utilities shall be removed or plugged and abandoned.

C. Except for the utility lines shown to remain, all on-site aboveground utility lines will be removed. Relocation of lines, where required, will be performed by others. Abandoned surface lines left in place by the utility owners shall be removed by the Subcontractor. Abandoned subsurface lines left in place by the utility owners shall be disconnected and the ends plugged with a concrete grout by the Subcontractor. When the abandoned line is connected to a line that will continue to be used, the abandoned line shall be disconnected first and the in-use line shall be sealed before plugging the abandoned line. The Subcontractor shall remove all subsurface lines encountered in excavations and shall solidly plug the on-site ends with a concrete grout, unless otherwise directed. Subsurface lines to be plugged or removed shall include mains shown on the Subcontract Drawings and all sub-mains and laterals connecting the buildings to the mains even though not specifically shown on the Subcontract Drawings.

D. The Contractor will obtain approval from the affected utility companies including, but not limited to, Utah Power and Light Company in Blanding, Utah and Continental Telephone Company of the West in Moab, Utah before disturbing utilities. Utilities shall be protected from damage by demolition operations until they are removed from service.

E. Conduits, utility pipes, concrete and reinforcing steel shall be cut or broken up to be no greater than 10 feet in any dimension and no greater than 27 cubic feet in volume and shall be disposed of as specified in Section 02200 and as directed by the Site Manager.

3.2 DISPOSAL OF DEMOLISHED MATERIALS AND DEBRIS

Demolished materials and debris shall be dsiposed of in the tailings embankment as specified in Section 02200, or as required by the Site Manager.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Measurement for payment for removal and for plugging and abandoning of existing utilities will be on a lump sum basis.

4.2 PAYMENT

Payment for removal and for plugging and abandoning of existing utilities will be by the lump sum price quoted therefor in the Bid Schedule. The price quoted shall include full compensation for furnishing all materials, equipment, tools, accessories, incidentals, labor, and for performing all work specified including, but not limited to, the transportation and placing of demolished materials and debris in the tailings embankment.

END OF SECTION 02060

SECTION 02090

SEALING ABANDONED WELLS

PART 1 - GENERAL

1.1 SCOPE

A. This Specification Section describes the requirements for sealing of existing test wells. The approximate locations of the known wells to be sealed are shown on the Subcontract Drawings.

B. Table 02090-1 lists all known wells that are to be sealed. Wells not listed in Table 02090-1 shall be protected, unless otherwise directed by the Contractor.

1.2 APPLICABLE PUBLICATIONS

A. The Publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only:

1. Environmental Protection Agency (EPA): Manual of water Well Construction Practices, EPA-570/9-75-001.

2. American Society for Testing and Materials (ASTM): C150-85 Standard Specification for Portland Cement (Rev. A).

1.3 SITE CONDITIONS

Subcontract Drawings show all known wells on and in the vicinity of the site. Wells not designated to be sealed shall be protected to prevent damage during construction. Such wells, if damaged, shall be reconstructed by the Subcontractor at no cost to the Contractor.

TABLE 02090-1

WELLS TO BE SEALED AND ABANDONED

Well No.	Depth of Well (feet)	Well Diameter (inches)	Casing Diameter and Type (inches)	Casing Depth (ft)	Screen Interval (feet)
901	3	2.0	?	?	?
902	3	2.0	?	?	?
903	3	2.0	?	?	?
904	3	2.0	?	?	?
905	20	2.0	?	?	?
906	20	2.0	?	?	?
907	120	0.75	?	?	?
908	160	2.0	?	?	?
909	160	2.0	?	?	?
910	180	2.0	?	?	?
911	100	2.0	?	?	?
912	85	2.0	?	?	?
930	120	4.0	?	?	?

PART 2 - PRODUCTS

2.1 MATERIALS

A. Approved sealing materials are as follows:

1. Cement used for sealing mixtures shall meet the requirements of ASTM C150 "Standard Specification for Portland Cement," Type II (moderate sulfate resistance) or Type V (high sulfate resistance). The cement type shall be compatible with groundwater encountered in the wells to be sealed.

2. Cement grout shall be composed of one sack of Portland Cement (94 pounds), with 3 to 5 percent, by weight, of commercially processed sodium bentonite, to not more than 6 gallons of potable water in order to achieve a weight of not less than 15 pounds per gallon. The weight of the neat cement shall be sufficient to prevent flow of water into the well from any aquifer penetrated. Calcium chloride may be added to a Portland cement grout to accelerate the set, but it shall not exceed two (2) pounds per sack of dry cement.

PART 3 - EXECUTION

3.1 GENERAL

A. Wells shall be sealed in a manner that is compatible with the well design and so as not to act as a conduit for future contamination of groundwater. Detailed well sealing criterion are outlined in the Environmental Protection Agency (EPA) Manual of Water Well Construction Practices, EPA-570/9-75-001, Article 56, pages 133-142. The basic premise of the EPA criteria is to seal abandoned wells and to restore, as much as possible, the geohydrologic regime in existence before the well was constructed. The following criteria shall apply to all wells to be sealed on and in the vicinity of the site:

1. Well sealing operations shall be performed by a licensed drilling contractor, with demonstrated experience in sealing of wells.

2. All wells shall be sealed in such a manner that they will not act as a conduit for fluids to flow from the specific strata in which they were originally encountered.

3. All wells shall be located in the field and sealed by the Subcontractor prior to the beginning of stripping, grading or other surface-disturbing activities that will hinder the detection and sealing of wells. If any well cannot be located after a reasonable search, the Subcontractor shall, prior to the commencement of the well sealing operations, submit to the Contractor a written report documenting the well number, the areas covered and the effort spent in the search.

4. Upon discovery of any unknown wells during the earthwork operations, the Subcontractor shall give the Site Manager immediate verbal notice followed by written confirmation within 24 hours.

5. Wells shall be sealed according to the following procedures:

   a. The Subcontractor shall check each well to be sealed for obstructions that may interfere with the sealing operation and shall remove any such obstructions prior to starting filling operations.

   b. In order to seal the well properly it is preferable to remove the well casings by methods approved by the Contractor as outlined in Article 56 of the EPA Manual of Water Well Construction Practices. Upon removal, if the casings or the materials are found to be contaminated, they shall be decontaminated as required by the Contractor, or disposed of in the tailings embankment after breaking into lengths not greater than 10 feet. If casing removal is not feasible, the casing shall be perforated, ripped or otherwise disintegrated by methods outlined in Article 56, to ensure grouting of the entire annular space between the casing and the borehole.

   c. The approved methods for the placement of a grout seal shall be as follows:

      1) In wells where casing is removed, the cement grout shall be introduced at the bottom of the well or interval to be sealed (or filled) and placed progressively upward to the top of the well. The grout shall be placed by the use of grout pipe, drop pipe, tremie, cement bucket or dump bailer, in such a way as to avoid segregation or dilution of the sealing materials. Dumping grout material from the top of the well shall not be permitted.

      2) In wells where casing is not removed, the calculated amount of neat cement grout required to fill the well interval plus the annular space outside the lining shall be placed within the space to be grouted, running the grout through a special cementing packer manufactured for this purpose and installed immediately above the perforated or ripped

zone. The grout shall be injected at a pressure calculated to be at least 50 psi greater than the normal hydrostatic pressure within the well at the point of injection.

d. For all wells located in areas where the construction grade elevation will be greater than or equal to the existing grade surface, existing casings and cement grout seals shall be removed to a minimum depth of 2 feet below the existing grade surface, or as required by the Contractor. Grouting shall extend to 2 feet below the existing grade. The interval from the top of the grout to the existing grade surface shall be filled with a mixture of uncontaminated soil (ML or CL) and a minimum of 25 percent by weight of commercially processed sodium bentonite and shall be hand-tamped, as required.

e. For all wells located in areas where the construction grade surface will be less than the existing grade surface (i.e. in areas of proposed cut), the existing casings and cement grout seals shall be removed to a minimum of 2 feet below the grade cut elevation as shown on the Subcontract Drawings or as required by the Contractor. Grouting shall extend to 2 feet below the grade cut elevation. The interval from the top of the grout to the existing surface shall be filled with a mixture of uncontaminated soil (ML or CL) and a minimum of 25 percent by weight of commercially processed sodium bentonite and shall be hand-tamped, as required.

6. The Subcontractor shall provide the following notification of the well sealing operation:

a. The Subcontractor shall notify the Contractor one week prior to commencement of well sealing operations.

b. Within 30 days of the completion of well sealings, the Subcontractor shall submit a written well sealing report to the (Name and Address). This report shall contain a list and a map showing all wells that were sealed, a statement that all wells were sealed in accordance with Specification Section 02090, and an explanation of any deviation from the Specification. A copy of the report shall be submitted to the Contractor.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Measurement for payment for sealing of abandoned wells will be by the linear feet of wells sealed. The measurement will be from bottom of well to the top of seal.

4.2 PAYMENT

Payment for sealing of abandoned wells will be by the unit price per linear foot quoted therefor in the Bid Schedule. The price quoted shall include full compensation for furnishing all materials, equipment, tools, accessories, incidentals, labor, and for performing the work specified in this Section including decontamination and disposal of materials and equipment.

END OF SECTION 02090

SECTION 02110

SITE CLEARING

PART 1 - GENERAL

1.1 SCOPE

This Specification Section describes the requirements for clearing of vegetation, stripping of topsoil, and disposal of cleared and stripped materials.

1.2 DEFINITIONS

A. Clearing: Clearing is defined as removing brush, other vegetation and immature trees. All such vegetation and immature trees shall be cleared down to the natural ground surface.

B. Stripping of Topsoil: This shall consist of the removal of topsoil, including all roots, organic materials, vegetation, and other unsuitable material, by blading with a bulldozer or other equivalent means. Depth of stripping shall be 6 inches.

1.3 RELATED WORK

Section 02200 - Earthwork

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.1 PRESERVATION OF PROPERTY

Existing improvements, adjacent property, utility and other facilities, and trees and plants that are not to be removed shall be protected from injury or damage.

3.2 CLEARING

A. Clearing shall be performed on all areas of construction activities. Contaminated cleared materials shall be kept separate from uncontaminated cleared materials.

B. Uncontaminated cleared materials shall be disposed of as Subcontractor's property.

C. Contaminated cleared material shall be reduced in size as required by the Contractor and disposed of in the construction of the tailings embankment as specified in Section 02200.

3.3 STRIPPING

A. Uncontaminated Areas: Stripping will be required in the following areas:

1. Beneath all fills in areas where excavation is not otherwise required;

2. Beneath areas of riprap protection where excavation is not otherwise required.

3. In areas of excavation where excavated materials are to be used as fill.

B. Contaminated Areas: In areas of excavation where the contaminated surfaces are covered by vegetation, the removal of topsoil may be carried out together with the excavation in one operation.

C. Stripped material shall be disposed of as specified in Article 3.4.

3.4 STOCKPILING OF UNCONTAMINATED TOPSOIL

Stockpiling of uncontaminated topsoil shall be performed only when required by the Contractor upon his determination that there is sufficient uncontaminated organic topsoil in the area to justify the operation; otherwise the materials shall be disposed of in an approved spoil area shown on the Subcontract Drawings, or as Subcontractor's property. The topsoil from the stockpile shall be used in finish grading of the site.

3.5 BURNING OF CLEARED AND STRIPPED MATERIAL

Burning of cleared and stripped materials shall conform to the requirements of Navajo Nation.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Separate measurement for payment will not be made for work specified in this Section. All such work will be considered incidental to the applicable related items of work.

4.2 PAYMENT

Separate payment will not be made for work specified in this Section. Full compensation for such work will be considered incidental to the applicable related items of work.

END OF SECTION 02110

SECTION 02141

DEWATERING AND DRAINAGE

PART 1 - GENERAL

1.1 SCOPE

A. This Specification Section describes the requirements for dewatering and drainage of work areas and disposal of surface water.

B. If the groundwater level is higher than the bottom of excavation, the Subcontractor shall dewater the excavation, as required, for performance of work in the dry. Stormwater shall be removed from the excavation to maintain dry conditions.

C. A dewatering scheme for work in uncontaminated areas is not shown on the Subcontract Drawings. The Subcontractor shall, as required, design and construct additional gravity or pump systems or a combination of both systems for dewatering of uncontaminated water from work areas.

D. A gravity dewatering scheme for work in contaminated areas is limited to the temporary drainage ditches as shown on the Subcontract Drawings. The Subcontractor shall, as required, design and provide additional gravity or pump system or a combination of both systems for dewatering of contaminated water from work areas. Dewatering from windblown tailings and off-pile areas will be accomplished incrementally as removal of contaminated materials proceeds.

1.2 DESCRIPTION

A. The work of this Section includes, but is not limited to: dewatering the excavations by installing sump pumps in the excavations and disposal of water by providing drainage facilities including swales, ditches, interceptor dikes, pipes, and other drainage structures. Water from uncontaminated areas shall be pumped, or allowed to flow by gravity, to drainage ditches leading to the existing drainage courses that flow offsite. Water from contaminated areas shall be pumped, or allowed to flow by gravity, to drainage ditches leading to the wastewater retention basin.

B. The Subcontractor shall be responsible for designing, scheduling, utilizing, providing, and maintaining any dikes, ditches, channels, flumes, drains, sumps, pumping equipment, monitoring wells, other subsurface dewatering devices, and other temporary diversion and protective work necessary to ensure that construction shall be performed in areas free from water.

1.3 WORK NOT INCLUDED

Drainage work related to the construction of temporary facilities specified in Section 01500 is not included in the scope of work of this Section.

1.4 RELATED WORK

Section 02200 - Earthwork

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

The Subcontractor shall furnish all materials, equipment and appurtenances required for furnishing, installing and removing dewatering facilities, and shall also supply sufficient standby pumping and auxiliary equipment to preclude any interference to pumping operations during periods of breakdown and maintenance.

PART 3 - EXECUTION

3.1 DEWATERING PROCEDURES

A. Water from uncontaminated areas shall be pumped, or allowed to flow by gravity to natural drainage courses.

B. Water from contaminated areas shall be pumped or allowed to flow by gravity to nearby drainage ditches leading to the wastewater retention basins. Water from the wastewater retention basins may be used for dust control and moisture control in contaminated areas of work. [Silt fences may be required in some areas during excavation.]

C. The water level in excavation shall be maintained below the lowest point in the excavation until the backfilling of the excavation has been completed, unless otherwise approved by the Contractor.

3.2 TEMPORARY DRAINAGE DITCHES

Temporary drainage ditches shown on the Subcontract Drawings shall be excavated as specified in Section 02200.

3.3 WASTEWATER RETENTION BASIN DIKES AND DRAINAGE DITCHES

Wastewater retention basin dikes and spillways, and drainage ditches shown on the Subcontract Drawings shall be constructed as specified in Section 02200.

3.4 MAINTENANCE

The Subcontractor shall be responsible for the maintenance of drainage facilities during construction. Drainage ditches and pipes may require periodic cleaning. Pipes and ditches shall be kept free of sediment deposits, debris and other materials that may restrict or prevent drainage. The Subcontractor, when directed by the Contractor, shall remove and replace all items not functioning properly because of clogging, damage, or deterioration.

3.5 REMOVAL

A. When no longer required for water control:

1. Dewatering equipment shall be removed and disposed of as Subcontractor's property.

2. Contaminated sediments deposited in the wastewater retention basins shall be removed and placed in the tailings embankment as specified in Section 02200 and as required by the Contractor. Uncontaminated sediments may be used in the grading of uncontaminated areas of work.

3. Areas occupied by the wastewater retention basins, dikes, spillways, and temporary drainage ditches shall be restored and graded as specified in Section 02200.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement for payment for dewatering and drainage will be by the lump sum.

B. The following items will be measured separately for payment purposes:

1. Construction of the wastewater retention basin dikes, spillways, and temporary drainage ditches shown on the Subcontract Drawings.

2. Restoration of the areas occupied by the wastewater retention basins, dikes, spillways, and drainage ditches shown on the Subcontract Drawings.

3. Furnishing, placing and removal of membrane Liner

C. Measurement for payment for the construction of the wastewater retention basin dikes, spillways, and temporary drainage ditches shown on the Subcontract Drawings is specified in Section 02200.

D. Measurement for payment for restoration of the areas occupied by the wastewater retention basins, dikes, spillways, and temporary drainage ditches shown on the Subcontract Drawings is specified in Section 02200.

F. Measurement for payment for furnishing, placing and removal of membrane liner is specified in Section 02771.

4.2 PAYMENT

A. Payment for dewatering and drainage will be by the lump sum price quoted therefor in the Bid Schedule, which price shall include full compensation for furnishing all materials, equipment, labor, tools, accessories, incidentals, and for performing all work as specified in this Section including, but not limited to, the construction of additional lined and unlined temporary drainage ditches, construction of silt fences, check dams, temporary detention ponds or other facilities, the provision of pumps, sumps, other accessories and incidentals, pipes, pipe supports, excavation and backfill of pipes and pipe supports. etc., if required.

B. Payment for construction of the wastewater retention basin dikes, spillways, and temporary drainage ditches shown on the Subcontract Drawings is specified in Section 02200.

C. Payment for restoration of the areas occupied by the wastewater retention basins, dikes, spillways, and temporary drainage ditches shown on the Subcontract Drawings is specified in Section 02200.

D. Payment for furnishing, installing and removal of membrane liner is specified in Section 02771.

END OF SECTION 02141

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.1 SCOPE

A. This Specification Section covers the following:

1. Dust control.

2. The earthwork for, or related to, the following:

a. Excavation of contaminated materials and construction of the tailings embankment.

b. Temporary and permanent drainage ditches.

c. Construction of wastewater retention basin dikes.

d. Subgrade preparation for tailings embankment, temporary drainage ditches to be protected by membrane liner, decontamination pad, and apron.

e. Finish grading of the site, including backfilling and finish grading of site areas, as required, and restoration and regrading of temporary drainage ditches, wastewater retention basins, dikes and spillway area.

3. Disposal of demolished materials and debris resulting from work specified in Sections 02050 and 02060.

4. Furnishing and installing displacement monuments as shown on the Subcontract Drawings.

1.2 WORK NOT INCLUDED

A. Earthwork related to the construction of temporary facilities specified in Section 01500 is not included in this Section.

B. Earthwork for pipe trenches is not included in this Section.

1.3 RELATED WORK

A. Section 01300 - Submittals

B. Section 02050 - Demolition

C. Section 02110 - Site Clearing

D. Section 02141 - Dewatering and Drainage

E. Section 02278 - Erosion Protection

1.4 DEFINITIONS

A. Contaminated materials and uncontaminated materials are defined in Section SC-1 of the Special Conditions.

B. Contaminated Materials Excavation: Excavation of contaminated materials encountered regardless of the nature of the materials including organic material, soils, rock, tailings and demolition debris. Excavation will be carried out to reach lines and grades indicated in the Subcontract Drawings, as specified herein, or as required by the Contractor based on tests to determine radioactive contamination.

C. Uncontaminated Materials Excavation: With the exception of uncontaminated materials excavation for temporary drainage facilities, all other uncontaminated materials excavation shall be classified into common excavation and rock excavation in accordance with the following designations and classifications:

1. Rock Excavation: Rock excavation shall include blasting and excavating of material classified as rock and shall include the satisfactory removal of boulders 1/2 cubic yard or more in volume; solid rock; rock material that is in ledges, bedded deposits, and unstratified masses, which cannot be removed without systematic drilling and blasting; and conglomerate deposits that are so firmly cemented as to possess the characteristics of solid rock that is impossible to remove without systematic drilling and blasting. The Subcontractor shall not proceed with the excavation of this material until the Contractor has classified the materials as common excavation or rock excavation and cross sections are taken as required. Failure on the

part of the Subcontractor to uncover such material, notify the Contractor, and allow ample time for classification and cross sectioning of the undisturbed surface of such material will cause the forfeiture of the Subcontractor's right of claim to any classification or volume of material to be paid for other than that allowed by the Contractor for the areas of work in which such deposit occur.

2. Common Excavation: Common excavation shall include the satisfactory removal of all materials not classified as rock excavation defined above.

D. Overexcavation: Overexcavation is defined as excavation carried out beyond the lines and grades indicated on the Subcontract Drawings or in the Subcontract Specifications.

E. Slimes: Slimes are the fraction of the tailings consisting of silty clay, clay and clayey silt, generally defined as containing 70 percent or more by weight of minus No. 200 sieve material.

F. Percent Maximum Density: Percent maximum density is a percentage of the maximum density obtained by the test procedure presented in ASTM D698, as applicable.

G. Optimum Moisture Content: See ASTM D698.

H. Topsoil: Topsoil is the existing surface soil stripped to the depth indicated and consisting of natural, friable soil representative of productive soils in the vicinity. Topsoil shall be free of any admixture of subsoil, foreign matter, objects larger than 1 inch in any dimension, toxic substances, and any material or substance that may be harmful to plant growth.

I. Tailings Embankment: Tailings embankment shall consist of in situ tailings pile materials, relocated contaminated materials from other areas of the Site, demolished materials and debris (contaminated and uncontaminated), and the protective cover materials placed and compacted as shown on the Subcontract Drawings and as specified in this Section and Section 02278.

J. Subgrade Preparation: Subgrade preparation includes fine grading and compaction of excavations including temporary drainage (but excluding diversion) ditches to be protected by membrane liner, backfills, apron, and embankments upon which bedding materials, riprap, membrane liner, or other features are to be constructed.

K. Cover: Cover shall consist of layers of the following fill materials placed over the relocated contaminated materials in the tailings embankment as shown on the Subcontract Drawings:

1. Bedding material and riprap material.

2. Radon barrier materials.

L. Finish grading of the site shall include excavation, fill and backfill of the various areas of the site and the vicinity including, but not limited to, restoration of the areas occupied by retention basins, dikes, spillways, and temporary drainage ditches, as required and specified in this Section.

M. Demolition Debris: All materials resulting from the demolition work specified in Sections 02050 and 02060.

N. Temporary Drainage Facilities: For measurement and payment purposes, temporary drainage facilities shall be considered to include retention basin dikes, spillway and temporary drainage ditches.

1.5 APPLICABLE PUBLICATIONS

A. The Publications listed below form a part of this Specification to the extent referenced. The Publications are referred to in the text by the basic designation only:

1. American Society for Testing and Materials (ASTM):

C33-86	Specifications for Concrete Aggregates
D422-63	Method for Particle-Size Analysis of Soils
D698-78	Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 lb. (2.49-kg) Rammer and 12-in. (305-mm) Drop
D1140-54	Test Method for Amount of Material in Soils Finer than the No. 200 (75-um) Sieve
D1556-82	Test Method for Density of Soil in Place by the Sand-Cone Method
D2167-84	Test Method for Density and Unit Weight of Soil In-Place by the Rubber-Balloon Method

D2216-80 Test Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures

D2487-85 Test Method for Classification of Soils for Engineering Purposes

D2922-81 Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

2. Blasting practices shall generally be in accordance with the "Blasters Handbook" - 16th Edition by E. I. du Pont de Nemours and Co. (INC) of Wilmington, Delaware 19898.

1.6 PERMITS AND APPLICABLE LAWS

A. All required Federal, State, and local permits for blasting and explosives shall be obtained and paid for by the Subcontractor. Copies of such permits shall be furnished to the Contractor before any blasting operations are started.

B. All blasters and blasting foremen shall be properly qualified and licensed in accordance with the applicable laws and regulations of Federal, State, and local governments.

C. Transportation and storage of explosives shall be in accordance with the applicable laws and regulations of Federal, State and local governments.

1.7 QUALITY ASSURANCE

A. The Contractor will take soil samples and perform moisture-density, gradation and other tests to ascertain that the work is being performed in compliance with these Specifications. Samples may be taken at the place of excavation, stockpiles, or on the fill itself. The Contractor will conduct the density and other tests on the fill and related laboratory testing as frequently as the Contractor considers necessary. The Subcontractor shall remove surface material and render assistance as necessary to enable sampling and testing.

B. Methods of Sampling and Testing:

1. In-Place Density: ASTM D1556, D2167, or D2922

2. Particle Size Analysis: ASTM D422

3. Percentage Passing No. 200 Sieve: ASTM D1140

4. Moisture Content: ASTM D2216

5. Laboratory Moisture-Density Relations: ASTM D698

6. Soil Classification: ASTM D2487

C. Suitability of Materials: The suitability of all materials for foundations and backfill will be subject to approval by the Contractor. Fill material will be approved material from borrow areas or required excavations.

D. The Contractor may direct that inspection trenches or test pits be cut into fills to determine that the Specifications have been met. Such trenches or pits will be of limited depth and size, and shall be backfilled with the material excavated therefrom, or other fill material meeting the requirements for the zones cut into. Backfill shall be compacted to a density at least equal to that of the contiguous fill.

E. When the Contractor directs inspection trenches or test pits to be excavated into fills and/or backfills and materials are found to meet all Specification requirements, the excavation and refilling shall be paid for as additional work pursuant to the applicable provisions of the General Conditions. Inspection trenches or test pits, and the refilling of the same, shall be at the Subcontractor's expense when it is found that the materials do not meet the Specification requirements.

F. Tolerances: See Specification Section 01052, Article 1.6.

1.8 SUBMITTALS

A. General submittal requirements are specified in Section 01300.

B. The Subcontractor shall submit to the Contractor for approval, 30 days before he intends to dispose of any material in a spoil area, a plan showing the layout of his

proposed activities. The plan shall snow: location of rock spoil, location of excavated material, stockpile for topsoil, layout of any sediment traps, and any other measures for pollution control.

C. At least 30 days before commencing blasting operations, the Subcontractor shall submit to the Contractor for review a detailed blasting plan covering the area to be blasted. The blasting plan shall contain complete hole layouts, proposed loading, delays and all information required by this Section of this Specifications. The Contractor may require changes in the blasting plan if the results of blasting do not meet Subcontract requirements.

D. All changes in the blasting plan shall be submitted for approval at least 48 hours prior to the time of the proposed changes.

E. At least 48 hours before blasting within one-quarter mile of a stream course, the Subcontractor shall submit for approval a plan showing all details of his proposed blasting operation and the scheduled time for the blast.

F. The Contractor's review of the Subcontractor's proposed blasting procedures shall not be construed to relieve the Subcontractor of his responsibility to protect existing facilities and the work under construction. Any damage done by the Subcontractor's operations shall be repaired at Subcontractor's expense.

1.9 SAFETY PROVISIONS

A. Electrical Storms: No explosive material shall be handled, transported or in any way made use of during any period of electrical storm or lightning or other electrical phenomenon. In the event that any such condition should appear imminent or occur, of if some known leakage of electricity should occur in the neighborhood of, or in, the work, while the transport, handling, making-up or charging or other use of explosives is being effected, then the work shall be evacuated and abandoned completely until at least thirty minutes after the condition has ceased or the leakage stopped.

B. Firing Explosive Charges:

1. Only approved exploding devices shall be used for firing charges. Under no circumstances are lighting and power cables to be used for firing. All pipes, ducts, track, and other metal shall be properly grounded.

2. An adequate warning system shall be provided by the Subcontractor to ensure that all personnel, staff, visitors and anyone else is at a safe distance before blasting takes place.

3. No radio transmitter shall be operated within 75 feet of the area where electric blasting operations are in progress.

4. No naked lights or sparks are allowed anywhere in the vicinity of blasting operations on the surface.

5. Where firing is carried out electrically the Subcontractor shall take every precaution necessary to prevent premature explosions and misfires. Before connection of the firing wires to the firing cable the round shall be tested for electrical continuity in an approved manner with an approved testing device or meter. In the event that this testing should show a lack of continuity then the round shall be retested leaving out one detonator at a time until the fault is identified. Should this procedure identify a faulty detonator then stemming shall be carefully removed from the hole and an additional primer inserted and wired into the circuit in place of the defective one. No attempt shall be made to draw a defective detonator or primer. On satisfactory completion of the circuit all workers other than those immediately necessary shall be withdrawn to a safe distance before firing wires are connected to the firing cable, and the connection of the firing cable to the exploder shall be the last operation:

6. Where firing is carried out by electricity, following a blast, before any person returns to the work place affected by the operation,

   a. The firing cables shall be withdrawn from the battery, blasting machine or other source of electricity and shall be short circuited.

   b. The blasting switch shall be locked in the open position.

7. Blasting cables and wires shall be clearly distinguishable from other cables and wires and shall only be used for blasting.

C. Misfires of Explosive Charges:

1. Should a misfire occur, then the Subcontractor shall warn all persons affected, and no persons other than those required shall enter the workings until the charge has exploded or, in the case of electrical firing, an interval of at least twenty minutes, has elapsed after operation of the exploder.

2. A misfired detonator may only be removed from the face by means of approved apparatus which permits such an operation to be carried out with absolute safety. Under no circumstance shall charges which have misfired be otherwise tampered with. Should it prove impossible to extract the charge with safety, then the Contractor may authorize the Subcontractor to explode the charge by sympathetic detonation, the greatest care being taken to ensure that no new hole is drilled to intersect an old one or that the unexploded charge is in any other way affected. After the second shot is fired, the search shall be made for the unexploded charge.

D. The Subcontractor shall provide and operate at all times an instrument for the detection of approaching electrical storms, including an automatic alarm such as a Litton TSM/C.

1.10 PROTECTION

A. The Subcontractor shall protect the following:

1. Trees, shrubs and other features remaining as a portion of final grading.

2. Bench marks and monuments, existing structures, fences, walks, pavings, curbs, etc. from equipment and vehicular traffic.

3. Utilities not specified for removal.

4. Excavations from cave-in by shoring, bracing, sheetpiling, underpinning or by other methods.

5. Bottoms of excavations and soil adjacent to and beneath foundations from frost.

6. Perimeter of excavation top to prevent surface water runoff into excavation.

7. Monitor wells to be saved.

8. Finished work.

PART 2 - PRODUCTS

2.1 EXPLOSIVES

A. A record shall be maintained by the Subcontractor for storage and withdrawal of explosive stocks and detonators. The inventory record shall be subject to inspection at all times. The Subcontractor shall provide such reasonable and adequate protective facilities as may be necessary to prevent loss and theft of explosives and to minimize hazards of subversive action or sabotage. Loss or theft of explosives shall be reported to the Contractor immediately. Overnight storage of explosives and detonators outside of the magazine will not be permitted. Only qualified personnel shall be permitted to handle explosives.

2.2 FILL MATERIALS

A. General:

1. Fill materials shall be obtained from required excavations and from borrow areas shown on the Subcontract Drawings or from other approved borrow areas selected by the Subcontractor and approved by the Contractor. The Subcontractor shall be responsible for obtaining required permits and approvals for Subcontractor-selected borrow areas in accordance with the provisions of Section SC-11 of the Special Conditions. Designation of a borrow area by the Contractor does not indicate that all material within that area meets the Specification requirements specified herein.

2. The Subcontractor shall make his own determination of any processing or selective excavation that may be required, and shall perform testing as required to meet the Specifications for the various construction materials.

3. Submittals to the Contractor for approval of sources proposed for use by the Subcontractor shall include boring logs, borrow area maps and supporting labora-

tory test data. The Subcontractor also shall provide evidence of availability, right of access to private property and his plan for hauling the materials to the site. Submittals for approval of sources for uncontaminated fill materials shall be received by the Contractor at least 30 days (60 days for radon barrier material) before use of the material at the site. In addition, the Contractor shall be granted access to each proposed source to collect samples for testing. The Contractor may perform additional tests to determine if the materials meet the requirements specified herein. Approval will be based on evidence of compliance with the requirements specified herein and on verification by the Subcontractor that the volume of materials available is sufficient for construction requirements.

B. Gradations: Gradations specified shall be as determined after delivery to the site, except where normal compaction operations reduce materials to acceptable sizes, in which case in-place gradations shall be acceptable.

C. Uncontaminated Fill Materials:

1. General: Uncontaminated fill materials for general fill shall conform to the following requirements:

   a. Uncontaminated fill materials shall not contain more than 5 percent organic material, by volume, or other deleterious substances.

   b. Maximum particle size shall not be greater than the compacted lift thickness in any dimension, except as noted hereinafter. Individual large stones shall be distributed within the fill materials to provide visual void-free mass, and be able to meet the requirements of Article 3.5.C.1. For fill areas under pavement locations, maximum stone dimension allowed in the upper 6 inches of the fill shall be 4 inches. Larger stones may be utilized in initial backfill in the lower layers of finish grading of the site.

2. Radon Barrier Materials: Radon barrier materials shall conform to the following requirements:

   a. Radon barrier materials shall be uncontaminated soils obtained from the designated borrow area. Selective excavation and processing of the radon barrier material may be required by the Subcon-

tractor to ensure the material meets the requirements specified in Paragraph 2.b. below.

b. Radon barrier materials shall consist predominantly of soils with classification of CL, CH, ML, MH, SC or SM when classified in accordance with the requirements of ASTM D2487, and graded with maximum particle size of 2 inches. For the purpose of this Subcontract, the word "predominantly" shall mean that at least 8 test results out of each consecutive 10 test results shall meet the requirements of this Section. Compliance with these Specifications will be determined by the Contractor.

c. Material shall be compactable to the required density, at all moisture contents specified in Article 3.5.C.2.

d. Radon barrier material shall not contain clearly visible organic matter or other deleterious substances.

D. Bentonite: [To be Completed]

E. Demolition Debris: See Article 1.4.

PART 3 - EXECUTION

3.1 DUST CONTROL

A. Dust control shall consist of furnishing water supply, required equipment, additives, accessories and incidentals, and carrying out proper and efficient measures wherever and as often as necessary to reduce dust nuisance, and to prevent dust originating from construction operations and causing damage to crops, orchards, cultivated fields, and dwellings, or causing a nuisance to persons during the completion of the Subcontract, as required by the Contractor.

B. Water shall be applied by means of pressure-type distributors or pipe lines equipped with a spray system or hoses with nozzles that will insure a uniform application of water.

C. All equipment used for the application of water shall be equipped with a positive means of shut-off.

D. Unless otherwise permitted by the Contractor or unless all the water is applied by means of pipe lines, at least one mobile unit with a minimum capacity of 8,000 gallons shall be available in operating conditions for applying water on the project at all times.

E. To conserve water, the Subcontractor may use chemical additives in the dust control water. If such additives are used, furnishing and applying the additives shall be at the Subcontractor's expense.

F. The use, location of application, and the amount and type of additives proposed for use by the Subcontractor shall be subject to approval by the Contractor.

3.2 SEASONAL SHUTDOWNS

A. During seasonal shutdowns, the Subcontractor shall provide labor, materials and equipment as required by the Contractor to maintain and protect exposed surfaces of uncontaminated and contaminated materials against wind erosion and excessive stormwater erosion. Prior to the application of protective erosion control measures, the exposed surfaces shall be compacted with a smooth drum roller to eliminate ruts and ridges formed by construction equipment. Unless otherwise approved by the Contractor, acceptable methods of erosion protection are as follows:

1. Spraying with Water and Chemical Additives: Acceptable chemical additive is "Soil Seal Concentrate" as manufactured by Soil Stabilization Products Company of Merced, California, or approved equal. Mix and application shall be in accordance with the manufacturer's recommendations, or

2. Covering exposed surfaces with geotextile fabric such as "Supac" as manufactured by Phillips Fibers Corporation of San Jose, California, or approved equal. Handling and installation shall be as recommended by the manufacturer of the product.

3.3 EXCAVATION

A. Preparation:

1. Clearing and stripping shall be as specified in Section 02110.

2. Required lines, levels, contours and datum shall be identified before the start of excavation.

3. The Subcontractor shall verify the existing aboveground and underground utilities, identify them, and notify the Contractor immediately of his finding, if any, for appropriate action.

B. General:

1. Before beginning any other excavation work or demolition work in an area, the Subcontractor shall construct the temporary site drainage facilities for such area, and any other facilities to convey runoff from work areas to those facilities as specified in Section 02141.

2. At all times, the Subcontractor shall conduct his operations in such a manner as to prevent free standing water and contamination of uncontaminated materials. The Subcontractor shall, as a minimum, take the following measures to safeguard against such problems:

   a. Water leaving contaminated excavation area or contaminated area otherwise disturbed by construction activities shall be routed into the retention basin as specified in Section 02141.

   b. Exposed surfaces of contaminated materials excavations shall be protected from erosion as specified in Article 3.2 above.

3. The Subcontractor shall perform required excavation to the lines and grades indicated on the Subcontract Drawings or as directed by the Contractor. He shall remove all excavated material from the excavation site and dispose of it in fills required at the site or as initial backfill at the site or use it for other purposes, as approved by the Contractor. In order to avoid cross-contamination of uncontaminated material, the contaminated and uncontaminated materials shall be kept separated during excavation, stockpiling, and

placement. Stockpiles of contaminated materials shall be placed on contaminated ground, and the drainage from such stockpiles shall be collected in the retention basin.

4. Unsuitable or low density subgrade material not readily capable of in-place compaction shall be excavated as directed by the Contractor and disposed of as specified in Article 3.4.

5. Adequate working space for safety of personnel shall be provided within the limits of the excavation.

6. All unstable bottom material, large stones, and debris shall be removed from bottoms of the excavation to a minimum depth of 12 inches.

7. Except as otherwise noted, care shall be exercised to preserve the material below and beyond the lines of all excavation. Where excavation is carried below grade, the Subcontractor shall backfill to the required grade or to indicated invert grade, as specified, and recompact the backfill to meet the existing conditions.

8. Excavation for the convenience of the Subcontractor shall conform to the limits approved by the Contractor and shall be at no additional expense to the Contractor.

9. Excavated material shall be placed at sufficient distance from edge of excavations to prevent cave-ins or bank slides.

10. Where practicable, suitable materials removed from excavation shall be used as fill or backfill.

11. Excavations for radon barrier materials shall be carried out in the presence of a qualified technician employed by the Contractor.

C. Contaminated Materials Excavation: Contaminated materials excavation shall include excavation of contaminated materials from the existing tailings pile, and windblown and off-pile areas, including wet slimes, building debris and rippable rock. The Subcontractor shall minimize the open excavation area of contaminated materials at any time during excavation work to the extent practicable. The Subcontractor shall operate from one or two sides at one time, progressing uniformly to opposite sides for comple-

tion, unless directed otherwise by the Site Manager. Contaminated materials shall be excavated to the depths indicated on the Subcontract Drawings, or as required by the Contractor, and placed in the proper part of the tailings embankment. The contaminated material will be excavated generally in priority of its placement in the embankment to minimize rehandling and stockpiling and as specified. Excavation shall be carried out to the limits and grades required by the Health Physics personnel. Rock requiring drilling and blasting operations shall not be included in this excavation.

D. Uncontaminated Materials Excavation:

1. General: Uncontaminated materials excavation shall include excavations of uncontaminated materials from the various areas of the site. The excavated materials shall be used as fill in various areas of the site including the construction of berms, dikes, general fill, roadway fill, structure fill, backfill, and fill for the final grading of the site, as required. Uncontaminated excavated material may be stockpiled for later use.

2. Rock Excavation:

a. The Subcontractor shall perform required rock excavation to the dimensions shown on the Drawings or as directed by the Contractor.

b. Care shall be exercised to avoid excessive overbreak beyond or below grade lines of excavation.

c. Blasting methods and procedures shall be such that, upon completion of the excavation, all rock surfaces will be sound and relatively uniform. Explosives shall be of such quantity and power and shall be used in a manner that will minimize opening of seams and disturbing of rock outside the prescribed limits of excavation. As the excavation approaches its final limits, the depths of holes for blasting and the quantity of explosives used for each hole shall be reduced so that the rock underlying or adjacent to the final limits is not shattered or otherwise disturbed.

d. The Subcontractor shall remove all shattered material, debris, and rock excavation material unsuitable for placement in fill from the excavated area

and shall dispose of such material in the designated spoil area or if suitable for roadway construction, stockpiled for such use.

e. Rock excavation suitable for backfill shall be stockpiled in approved locations for later placement as fill.

3. Drainage Ditches Excavation:

a. General: Ditches shall be cut accurately to the cross sections and grades where indicated. All roots, stumps, rock, and foreign matter in the sides and bottom of ditches shall be trimmed and dressed or removed to conform to the slope, grade, and shape of section indicated. Care shall be taken not to excavate ditches below the grades indicated. Excessive ditch excavation shall be backfilled to grade with satisfactory, thoroughly compacted material. Ditches shall be maintained until final acceptance of the work.

b. Temporary Drainage Ditches:

1) Temporary drainage ditches shall be excavated at locations shown on the Subcontract Drawings to collect and transport storm runoff, wastewater and water-bound contaminated material to the retention basin during construction.

2) Temporary drainage ditches shall be excavated, fine graded, compacted, and maintained to provide drainage during construction.

4. Wastewater Retention Basin Dikes: The wastewater retention basin dikes shall be constructed to the lines and grades shown on the Subcontract Drawings. Contaminated materials shall first be excavated and stockpiled on contaminated ground, then the fill for the retention basin dikes shall be accomplished.

5. Borrow Area Excavation:

a. Where materials are not available in sufficient quantity from the required excavations, such materials shall be obtained from borrow areas of approved sources offsite.

b. The Subcontractor shall notify the Contractor at least 15 days in advance of opening any borrow

area so that adequate time will be allowed for testing the material.

c. Borrow areas shall meet all permit and negotiated requirements as required by the Contractor.

d. Necessary clearing, grubbing, and disposal of debris shall be performed by the Subcontractor as incidental operations to the borrow excavation.

e. After borrow excavations are completed, borrow areas shall be graded to drain.

f. The radon barrier material from borrow area shall be excavated after stripping the topsoil to a depth of 6 inches.

3.4 DISPOSAL OF EXCAVATED MATERIALS

A. Contaminated Materials: All contaminated materials excavated from the tailings piles, retention basin, windblown, and other areas of the site shall be used in the construction of the tailings embankment as specified herein. Contaminated material will be placed in the tailings embankment by priority generally as indicated on the Subcontract Drawings. Radiological monitoring of contaminated materials or construction expediency may change this priority, as directed by the Site Manager.

B. Uncontaminated Materials:

1. Materials excavated from the site, including excavations for temporary or permanent drainage ditches which do not classify as contaminated materials, shall be used as uncontaminated material fill for construction of various features including site grading, or stockpiled for later use, or wasted in the spoil area, as specified in this Section and as required by the Contractor.

2. Where used in fills, such material shall be transported directly from the excavation and placed in its final position in such fills whenever possible. If required by the Subcontractor's schedule, the material may be placed temporarily in stockpiles at approved locations. Material in stockpile shall be protected from contamination of any kind that would render it unsuitable for use in fills.

C. Clean, sound, unweathered rock, of suitable material, from the required excavation may be incorporated into fills, after processing as necessary, provided it meets the appropriate specifications.

D. Unsatisfactory or Excess Materials: Unsatisfactory and excess excavated uncontaminated material including rock generated during the Work and not approved for use in the Work shall be disposed of in [stockpile/spoil] areas approved by the Contractor.

E. Garbage, refuse, debris, oil, and any waste material which is harmful to the environment shall be removed from the job site and disposed of offsite in a manner approved by the authority having jurisdiction over the disposal site.

F. All operations in the [stockpile/spoil] areas throughout the Work shall be in strict conformity with the requirements of this Section. The Subcontractor shall ensure that silty water from the [stockpile/spoil] areas does not enter nearby waterways. If required, temporary berms, detention ponds, silt fence, or other facilities shall be constructed by the Subcontractor.

3.5 FILL CONSTRUCTION

A. General Requirements:

1. Clearing and stripping shall be as specified in Section 02110.

2. Fill materials shall be placed and compacted to the lines and grades shown on the Subcontract Drawings or as required by the Contractor.

3. Prior to placing uncontaminated fill materials, the subgrade will be radiologically surveyed by the Contractor to confirm that EPA standards have been met. These radiological surveys may cause delays to backfill operations of up to seven working days. The Subcontractor shall plan his work accordingly.

4. If any portion of the materials placed as fill does not meet the specified requirements, the Subcontractor shall remove such material and replace it with fill materials meeting the specification at no additional cost to the Contractor.

5. Fill materials shall be maintained to meet the requirements of this Specification until final completion and acceptance of the work. This shall include all measures to prevent erosion or contamination during construction, including contamination by radioactive material. During seasonal or other extended shutdowns, all exposed surfaces shall be protected with special treatments specified in Article 3.2 above.

B. Placing Requirements:

1. Prior to placement of materials, the in-place density of the top 6 inches of the area receiving the fill shall be at least 90 percent of maximum dry density as determined by ASTM D698. If necessary, the surface shall be plowed, harrowed, materials mixed, materials added or removed and compacted to obtain the specified density.

2. No materials shall be placed on any portion of the subgrade or against or upon any structure until consent to place such fill has been obtained from the Contractor.

3. Subgrade preparation, where required, shall be as specified in Article 3.6 below.

4. Fill materials may require moisture conditioning (wetting or drying) prior to compaction. Some tailings, particularly slimes, will require spreading, disking, and extended drying time prior to compaction.

5. Fill materials shall be placed in continuous and approximately horizontal layers for their full length and width unless otherwise specified or specifically permitted by the Contractor.

6. Contaminated materials excavated from the upper tailings pile shall be placed in the lower layers of the embankment, unless otherwise indicated. Contaminated materials excavated from the windblown and off-pile areas shall be placed on the sides and in the upper portions of the tailings embankment.

7. The method of dumping and spreading the materials shall ensure uniform distribution of the material.

8. The loose thickness of each layer of materials shall not be greater than that required to achieve the specified compaction, and in no case shall exceed 12 inches.

9. Fill materials shall be placed to a grade no flatter than 2 percent to facilitate drainage of water. In areas where ponding cannot be prevented or ponding has occurred and fill is required to be placed, placing shall begin only after the area is dewatered and permission to place is obtained from the Contractor.

10. Materials shall not be placed on frozen subgrade or embankment material foundations, nor shall frozen material be used as fill.

11. Disposing of bulky materials including demolition debris shall be done with care to minimize the volume of voids created in the disposal mass.

12. When no longer needed for control of contamination, as determined by the Contractor, the wastewater retention basin, the dikes, the spillway, and the temporary drainage ditches shall be removed and the area restored and finish graded as shown on the Subcontract Drawings.

C. Compaction Requirements:

1. Each layer of fill materials, except radon barrier material, shall be compacted to a minimum of 90 percent of maximum dry density as determined by ASTM D698. Radon barrier material shall be compacted to a minimum of 95 percent of maximum dry density as determined by ASTM D698.

2. During compaction the moisture content of fill material shall be maintained to achieve specified density. Uniform moisture distribution shall be obtained by disking, blading, or other methods approved by the Contractor prior to compaction of a layer. During compaction of radon barrier materials, moisture content shall be maintained within plus three percent and minus one percent of optimum moisture as determined by ASTM D698.

3. If the rolled surface of any layer of the fill in place is too wet for proper compaction of the layer of fill material to be placed thereon, it shall be removed, allowed to dry or worked with harrow, scarifier, or other suitable equipment to reduce the water content to the required amount, and then re-compacted before the next succeeding layer of fill is placed.

4. Fill placed at densities lower than the specified minimum density or at moisture contents outside the specified acceptable range of moisture content shall be reworked to meet the density and moisture requirements or removed and replaced by acceptable fill compacted to meet these requirements.

5. Uncontaminated fill material in the spoil areas shall be placed by spreading with a bulldozer and track walking. Lift thickness before consolidation shall not exceed one foot. Consolidation shall be accomplished by routing of hauling and spreading equipment units.

6. Compaction of radon barrier shall be accomplished by the use of sheep-foot or other tamping-foot rollers. The final layer of each of the contaminated material, radon barrier material and bedding material shall be compacted by the use of a smooth roller.

D. Field Quality Control:

1. General: The Contractor will take samples and perform tests throughout the construction period, and the Subcontractor shall cooperate in providing access for the Contractor to areas where testing is to be performed and shall schedule his placing to avoid interference with the testing operations.

2. Tests: The Contractor will perform the following tests on a regular basis; these tests are a minimum requirement:

   a. In-place density and moisture content tests, a minimum of one test per 1000 cubic yards of contaminated and uncontaminated material placed, and a minimum of one test per 500 cubic yards of radon barrier material placed.

   b. Classification tests, minimum of one test per 2000 cubic yards of fill placed. This requirement shall not be applicable to the placement of contaminated materials.

   c. Gradation tests, minimum of one test per 2000 cubic yards of fill placed. This requirement shall not be applicable to the placement of contaminated materials.

3. The placing and consolidation of the spoil area fills will be subject to the approval of the Contractor.

3.6 SUBGRADE PREPARATION

A. Apron and Decontamination Pad: The entire surface of the subgrade shall be plowed, harrowed, and mixed to a depth of at least 6 inches. Compaction shall be carried out for the full width below finished subgrade to at least 100 percent of maximum density as determined by ASTM D698. Soft spots developed during working shall be corrected.

B. Temporary Drainage Ditches (To be protected by membrane liner): Top 6 inches of the subgrade of temporary drainage ditch to be protected by membrane liner specified in Section 02771 shall be compacted to a minimum of 95 percent of maximum density as determined by ASTM D698. After compaction has been completed, fine finishing shall be done in such a manner that the side-slopes are smooth surfaces. All rocks, brush, roots, large clods, and other objects shall be removed before placement of the membrane liner.

3.7 DISPOSAL OF DEMOLITION DEBRIS

Demolition debris resulting from demolition work specified in Sections 02050 and 02060 shall be disposed of in tailings embankment conforming to the applicable provisions of this Section and as required by the Contractor.

3.8 DISPLACEMENT MONUMENTS

Displacement monuments shall be furnished and installed by the Subcontractor as shown on the Subcontract Drawings after placement of contaminated material but before placing radon barrier material.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement for payment for the following items of excavation will be by the cubic yards of material excavated. The quantities for payment will be computed from the lines and dimensions shown on the Subcontract Drawings, or in areas where lines and dimensions are not shown, by the average end area method from surveys conducted before and after excavation operations, or by the methods determined by the Contractor:

1. Uncontaminated material for temporary drainage facilities. (Bid Schedule Item 205)

2. Uncontaminated common material for finish grading of the site including permanent drainage ditches and removal of wastewater retention basin dikes. (Bid Schedule Item 801).

3. Uncontaminated rock material for finish grading of the site including permanent drainage ditches. (Bid Schedule Item 802).

4. Contaminated materials from upper tailings pile. (Bid Schedule Item 401)

5. Windblown and water-borne tailings material. (Bid Schedule Item 402)

B. Measurement for payment for the following items of fill will be by the cubic yards of material placed. The quantities for payment will be computed from the lines and dimensions shown on the Subcontract Drawings, or in areas where lines and dimensions are not shown, by the average end area method from surveys conducted before and after fill operations, or by the methods determined by the Contractor:

1. Uncontaminated material for the construction of temporary drainage facilities. (Bid Schedule Item 206)

2. Radon barrier. (Bid Schedule Item 501)

3. Uncontaminated material for finish grading of the site. (Bid Schedule Item 803)

C. Measurement for payment for bentonite will be by the ton. (Bid Schedule Item 502)

D. Separate measurement for payment will not be made for the following items, and such work will be considered incidental to the related items of work:

1. Excavation and backfill of pipe trenches.

2. Subgrade preparation of tailings embankment including any required trimming and compacting of contaminated material already located within the limits of the final tailings embankment.

3. Subgrade preparation of permanent drainage ditches.

4. Stockpiling of materials including incidental activities such as clearing, stripping, placing, grading, shaping and compacting.

5. Disposal in spoil of excess uncontaminated material including incidental activities specified in D.4 above.

6. Dust control.

7. Borrow area excavation, restoration, reseeding, and incidental activities.

8. Blasting.

E. Measurement for payment for furnishing and installing displacement monuments will be by the number of monuments installed. (Bid Schedule Item 403)

F. Overexcavation for the Subcontractor's convenience or due to error or lack of control by the Subcontractor will not be measured for payment and, instead, shall be backfilled with compacted uncontaminated fill, as required, at the Subcontractor's expense.

G. No separate measurement for payment will be made for any other excavations or fills specified in this Section.

4.2 PAYMENT

A. Payment for the items of Article 4.1.A above will be by their applicable unit prices per cubic yard quoted therefor in the Bid Schedule. The prices quoted shall include full compensation for excavation and for disposal in stockpile or spoil area, where required. The prices quoted for Items 4.1.A.4 and 4.1.A.5 will also include full compensation for disposal of excavated materials in the tailings embankment including, but not limited to, transporting, placing and compacting materials in the tailings embankment as specified in this Section.

B. Payment for the items of Article 4.1.B above will be by their applicable unit prices per cubic yard quoted therefor in the Bid Schedule. The prices quoted shall include full compensation for fill construction including furnishing material from other excavations, stockpiles, or from borrow areas. The price quoted for tailings embankment (Article 4.1.B.2) shall also include full compensation for placement of contaminated materials from all sources including demolished materials and debris from other areas of the site.

C. Payment for bentonite will be by the unit price per ton quoted therefor in the Bid Schedule. The price quoted shall include full compensation for furnishing bentonite and blending with material excavated from the radon barrier borrow area.

D. Separate payment will not be made for the items mentioned in Article 4.1.D above. All costs for such work will be considered to be included in the prices quoted for the applicable related items of work.

E. Payment for furnishing and installing displacement monuments will be by the unit price per each quoted therefor in the Bid Schedule.

F. Separate payment will not be made for any other excavations or fills specified in this Section. All costs for excavations or for furnishing and placing such fills will be considered to be included in the related items of excavation.

END OF SECTION 02200

SECTION 02278

EROSION PROTECTION

PART 1 - GENERAL

1.1 SCOPE

This Specification Section describes the requirements for furnishing and placing riprap and bedding materials for tailings embankment cover, drainage ditches, apron and gullies.

1.2 WORK NOT INCLUDED

Erosion protection related to the construction of temporary facilities specified in Section 01500 is not included in the scope of work of this Specification.

1.3 RELATED WORK

A. Section 01300 - Submittals

B. Section 02200 - Earthwork: Subgrade Preparation

1.4 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only:

1. American Society for Testing and Materials (ASTM):

C88-83	Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
C127-84	Test Method for Specific Gravity and Absorption of Coarse Aggregate
C131-81	Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
C295-85	Practice for Petrographic Examination of Aggregates for concrete.

1.5 PERMITS

The Contractor will provide permits for the use of borrow areas shown on the Subcontract Drawings as specified in Section SC-11 of Special Conditions. If the Subcontractor uses other sources for erosion protection materials, he shall be responsible for obtaining all required permits.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Material Sources: Erosion protection materials shall be obtained from sources approved by the Contractor. The approved source for erosion protection materials is [To be Completed].

B. Approval of source as a borrow area does not mean that all materials excavated will meet the requirements of this Specification. Processing or selective quarrying may be necessary to meet the quality requirements of this Section.

C. The materials shall be free from radioactive or other contamination.

D. Riprap Materials:

1. Individual pieces shall be dense, sound, resistant to abrasion, and shall be free from cracks, seams, and other defects as shown in the petrographic examination.

2. The shape of at least 75 percent of the material, by weight, shall be such that the minimum dimension is not less than one third of the maximum dimension.

3. Quality: [To Be Completed]

Tests	Designation	Requirements
Specific Gravity (Saturated Surface Dry Basis)	ASTM C127	Not less than ____.
Absorption	ASTM C127	Not more than ___ percent.

Tests	Designation	Requirements
Soundness	ASTM C88	Na_2SO_4 Test: Not more than _ percent loss of weight after 5 cycles.
Abrasion (Los Angeles Machine)	ASTM C131	Not more than ___ percent loss of weight after 500 revolutions.
Petrographic Examination	ASTM C295	The Subcontractor shall furnish a report for review by the Contractor.

4. Gradation: Riprap materials shall be reasonably well graded within the following limits:

U.S. Standard Sieve Size (Square Openings)	Percent Passing (by weight)
Type A	
3-inch	100
2-inch	25-100
1-inch	0-15
1/2-inch	0-10
Type B	
6-inch	100
4-inch	20-100
3-inch	10-25
2-inch	0-15
1-inch	0-10
Type C	
10-inch	100
8-inch	50-100
6-inch	20-50
4-inch	10-25
2-inch	0-10
Type D	
14-inch	100
10-inch	45-100
6-inch	10-30
4-inch	0-15
2-inch	0-10

E. Bedding Materials:

1. Bedding materials shall be obtained from borrow areas approved by the Contractor. The Subcontractor shall process the materials to meet the gradation requirements specified below.

2. Gradation: Bedding materials shall be reasonably well graded within the following limits:

U.S. Standard Sieve Size (Square Openings)	Percent Passing (by weight)
3-inch	100
2-inch	70-100
1-inch	35-65
1/2-inch	20-40
No. 4	0-15
No. 50	0-5

F. Source Quality Control: The materials will be inspected and tested by the Contractor at the borrow area to ensure that they meet all requirements of this Specification with the exception of the gradation requirement. Gradation requirements will be tested at the placement location.

PART 3 - EXECUTION

3.1 PLACEMENT AND COMPACTION

A. Subgrade preparation for apron shall conform to Specification Section 02200.

B. Where the required bedding material thickness is 6 inches, the bedding material shall be spread and compacted in one layer.

C. Each layer of bedding material shall be compacted by four passes of a 2- to 3-ton working weight vibratory smooth-drum roller operating across the slope, over the entire area of placement.

D. Riprap material shall be placed so that the larger pieces are uniformly distributed and the smaller pieces serve to fill the spaces between them to provide well-keyed, densely placed layers of riprap of the specified thicknesses.

E. Riprap material may be placed by end-dumping and may be spread by bulldozers or other suitable equipment.

F. Construction equipment other than spreading and compaction equipment shall not be allowed to move over the placed riprap material and bedding material layers except at equipment crossovers as designated by the Contractor. Each crossover shall be cleaned of all contaminating materials and approved by the Contractor before additional materials are placed in these areas.

3.2 TOLERANCES

A. The material layers shall be placed generally to the limits and thicknesses shown on the Subcontract Drawings within the following tolerances:

1. Top of bedding material shall be within 0.1 foot of elevations shown on the Subcontract Drawings.

2. The minimum in-place thickness shall not be less than 90 percent of the thickness shown.

3. The maximum in-place thickness shall not be more than 125 percent of the thickness shown.

4. Local irregularities will be permitted provided that such irregularities do not form noticeable mounds, ridges, swales or depressions which in the opinion of the Contractor could cause concentrations of surface runoff or form ponds or gullies.

3.3 FIELD QUALITY CONTROL

A. The placement of the materials will be inspected and tested by the Contractor during and after placement to ensure that the following requirements are met:

1. The correct type of material is being placed.

2. The material being placed is clean and free of unsuitable material.

3. The material is being loaded, transported and placed in a manner which minimizes segregation.

4. The material is being placed to line and grade within the tolerances and limits designated in Article 3.2 above.

5. The material placed meets the gradation requirements specified.

B. Materials segregated or not placed according to the above requirements shall be regraded or adjusted, using appropriate equipment, to conform with the tolerances and limits given above, at no additional cost to the Contractor.

C. Materials not meeting the requirements of this Section shall be removed and replaced with specified materials at no additional cost to the Contractor. Rejected materials shall be disposed of at designated disposal sites and at no additional cost to the Contractor. Materials not meeting the grading requirements shall be reprocessed or discarded. The Contractor may require modification of the processing and grading operations to ensure that the specified grading requirements are met.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement for payment for the following materials will be by the cubic yards of material placed. The quantities shall be calculated from the lines and dimensions shown on the Subcontract Drawings:

1. Riprap Material, Type A
2. Riprap Material, Type B
3. Riprap Material, Type C
4. Riprap Material, Type D
5. Bedding Material

4.2 PAYMENT

Payment for the items of Article 4.1.A above, will be by their applicable unit prices per cubic yard quoted therefor in the Bid Schedule. The prices quoted shall include full compensation for furnishing labor, materials, tools, equipment and incidentals and for performing specified work including development of the source (where applicable), obtaining required permits (if applicable), clearing, stripping and excavating; processing the materials; testing and evaluating the materials; transporting to placement locations; placing; compacting and consolidating complete in place.

END OF SECTION 02278

SECTION 02500

PAVING AND SURFACING

PART 1 - GENERAL

1.1 SCOPE

This Specification Section describes the requirements for the Construction of the base course and Portland cement concrete pavement for the decontamination (decon) pad.

1.2 WORK NOT INCLUDED

Roadways and other areas constructed by the Subcontractor for his own use or convenience are excluded.

1.3 RELATED WORK

Section 022J0 - Earthwork: Earthwork and Subgrade Preparation

1.4 REFERENCES

A. Pertinent provisions of the following listed codes and standards shall apply to the work of this Section, except as they may be modified herein, and are hereby made a part of this Specification to the extent required:

1. State of Utah, Standard Specifications for Road and Bridge Construction (Utah State Standard Specifications). All references to "Engineer" shall mean "Site Manager"; all references to Department shall mean "Contractor"; and all references to "Contractor" shall mean "Subcontractor". The provisions for measurement and payment shall not be applicable. All references to "special provisions" shall not be applicable. Measurement and payment provisions shall be as specified in this Section.

1.5 QUALITY ASSURANCE

A. Base Course:

1. Base course materials and operations may be subject to inspection, sampling and testing by a soil testing laboratory employed by the Contractor. Laboratory personnel shall have unrestricted access to the work.

2. The soil testing laboratory will analyze and test materials in the laboratory as directed by the Site Manager to determine conformance with there Specifications.

B. Portland Cement Concrete:

1. Subcontractor shall submit certification that Portland cement concrete mixture meets material requirements specified herein.

2. Mixing plant may be inspected by the Contractor. The inspector shall be provided with access to all facilities and processes involved in the production and testing of the paving materials and mixture.

3. An independent laboratory, employed by the Contractor, may perform tests upon paving materials and mixtures, and obtain core samples upon direction of the Site Manager. Such testing shall be for the Contractor's purposes, not as a contractual obligation for assistance in the construction of the work.

1.6 SUBMITTALS

A. The Subcontractor shall submit three copies of certification of analysis by manufacturer or supplier prior to the use of any materials for which the Site Manager requires that such a certificate be furnished.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Base course shall be constructed when the atmospheric temperature is above 35 degrees F. When the temperature falls below 35 degrees F., the Subcontractor shall protect all areas of completed base by approved methods against detrimental effects of freezing. Areas of completed base course damaged by freezing, rainfall, or other weather conditions shall be corrected to meet specified requirements at no additional cost to the Contractor.

PART 2 - PRODUCTS

2.1 EQUIPMENT

The Subcontractor shall provide all equipment and facilities required to perform the work of this Specification. The equipment and facilities shall be subject to approval by the Contractor.

2.2 MATERIALS

A. Base course materials shall meet the requirements for Untreated Base Course, Subsections 301.02 and 301.03 of the Utah State Standard Specifications. All references to gradation tolerances, acceptance tests, pay factor, and tables 301.1 and 301.2 shall not be applicable to this Section.

B. Portland Cement Concrete Mix Design: Portland cement concrete materials shall meet the requirements for Portland cement concrete pavement, Subsections 408.02 through 408.12 of the Utah State Standard Specifications.

PART 3 - EXECUTION

3.1 EARTHWORK AND SUBGRADE PREPARATION

A. Earthwork and subgrade preparation shall be as specified in Section 02200.

B. Before placing and spreading base course material the subgrade shall be cleaned of all foreign substances and shall contain no frozen material. It shall be inspected by the Contractor for adequate compaction and surface tolerances.

3.2 CONSTRUCTION OF BASE COURSE

A. The construction of the base course shall conform to the requirements of Subsections 301.04 through 301.06 of the Utah State Standard Specifications.

3.3 CONSTRUCTION OF PORTLAND CEMENT CONCRETE PAVEMENT

A. The construction of the Portland cement concrete pavement shall be in accordance with Section 408 of the Utah State Standard Specifications except as modified herein and as approved by the Contractor.

B. Requirements of Subsections 408.13, 408.16, 408.20, 408.26, 408.27 and 408.28 of the Utah State Standard Specifications shall not apply.

C. One longitudinal joint shall be constructed along the center line of the decontamination pad. Seven transverse joints on 12.5 foot centers shall be constructed.

3.4 CLEAN-UP AND PROTECTION

A. After completion of paving operations, surfaces shall be cleaned of excess and spilled paving materials.

B. Vehicular traffic shall be diverted from pavement until the compressive strength of the concrete has reached 3000 p.s.i.

3.5 MAINTENANCE

Maintenance and necessary repairs to the decontamination pad shall be provided such that the decontamination pad surface is kept free of holes, deep cracks or ruts, or other defects that will prevent surface drainage of all wash water and runoff to the drainage ditch, or that will impair efficient movement of traffic.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Measurement for payment for construction of decontamination pad will be on a lump sum basis.

4.2 PAYMENT

Payment for construction of decontamination pad will be by the lump sum price quoted therefor in the Bid Schedule. The price quoted shall include full compensation for furnishing all equipment, materials, labor, tools,

incidentals and for performing all work for the construction including site clearing, earthwork, subgrade preparation, base course, Portland cement concrete pavement, ditch, membrane liner and for protection and maintenance work as shown on the Subcontract Drawings, as specified in these Specifications, and as required by the Site Manager.

END OF SECTION 02500

SECTION 02771

MEMBRANE LINER

PART 1 - GENERAL

1.1 SCOPE

This Specification Section describes the requirements for furnishing and installing membrane liner systems for temporary drainage ditches and wastewater retention basin dikes.

1.2 SYSTEM DESCRIPTION

A. Liner system shall consist of liner, adhesives and accessories required for sterilizing ground and installing liner, and other appurtenances.

B. The retention basin dikes and ditches, where lining is required, will carry water produced from stormwater runoff, decontamination and dewatering operations, including minor amounts of sediment transportation. Major contaminants in the water will consist of the following maximum concentrations:

Chlorides	2,400 mg/l
Sulfates ($NaSO_4$)	7,000 mg/l
Total Dissolved Solids	11,000 mg/l
pH	5.6 - 9.3

1.3 RELATED WORK

A. Section 01300 - Submittals

B. Section 02200 - Earthwork

1.4 APPLICABLE PUBLICATIONS

A. The Publications listed below form a part of this Specification to the extent referenced. The Publications are referred to in the text by the basic designation only:

1. American Society for Testing and Materials (ASTM):

D638-86	Test Method for Tensile Properties of Plastics
D792-66	Test Methods for Specific Gravity and Density of Plastics by Displacement (R1979)
D1004-66	Test Method for Initial Tear Resistance of Plastic Film and Sheeting (R1981)
D1593-81	Specification for Nonrigid Vinyl Chloride Plastic Sheeting
D2301-84	Specification for Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape

2. Federal Standards (FS):

101C	Test Methods for Packaging of Materials

1.5 QUALITY ASSURANCE

A. Manufacturer:

1. The liner material shall be the product of a manufacturer successfully engaged in the business of manufacturing liner materials for the last ten years.

2. The manufacturer of the liner shall have manufactured, fabricated and supervised installation of at least 1,000,000 square feet of membrane liners.

B. Installation Worker Qualifications: The installation workers shall have installed a minimum of 500,000 square feet of membrane liners.

C. Installation Supervisor: Installation of the membrane liner shall be performed under the supervision of an Installation Supervisor qualified and approved by the manufacturer.

1.6 SUBMITTALS

A. General submittal requirements are specified in Section 01300.

B. The Subcontractor shall submit the following to the Contractor for review and approval 30 days before placement of the material:

1. Product data.

2. Samples of material and accessories.

3. Certificate signed by the manufacturer that the system proposed meets the Specification.

4. Installation details.

5. Manufacturer's installation instructions.

6. Test reports.

1.7 WARRANTY

Liner materials and factory seams shall be warranteed to be free from defects in materials and workmanship for a period of 3 years from the date of acceptance. Installation and field seams shall be warranteed free of defects for a period of 3 years from the date of acceptance.

PART 2 - PRODUCTS

2.1 MATERIAL

A. The thermoplastic elastomer lining material shall be manufactured from a synthetic rubber compound and shall be polyethylene (PE) or chlorinated polyethylene (CPE), specifically compounded for use in hydraulic facilities.

B. The lining shall be of unreinforced construction consisting of calendered synthetic rubber sheeting.

C. Physical Properties:

Property	Test Method	Data
Density	ASTM D792	0.930 gms/cc, min.
Thickness	ASTM D1593 or D2301	CPE 30 mil, nominal PE 40 mil, nominal

Property	Test Method	Data
Puncture Resistance	FED STD 101C, Method 2031	130 lbs. min.
Tensile Strength @ Yield @ Break	ASTM D638,	 45 lbs/inch, min. 105 lbs/inch, min.
Elongation @ Break	ASTM D638	650 percent, min.
Tear Resistance	ASTM D1004	15 lbs., min.

2.2 FABRICATION

The roll goods shall be factory fabricated into optimum sized panels up to 20,000 square feet, using an approved seaming method as prescribed by the manufacturer. When the seam is tested to shear, failure of the material including the seam shall not occur at the bonded surfaces.

PART 3 - EXECUTION

3.1 GENERAL

The liner systems shall be installed as shown on the Subcontract Drawings and as recommended by the manufacturer.

3.2 GROUND SURFACE PREPARATION

A. Surfaces to be lined shall be smooth and free of sharp rocks or vegetation. If the liner is not applied within 15 days of surface preparation, the surface shall be protected against growth of vegetation by the application of a suitable short-lived soil sterilant as approved by the Contractor.

B. Certification from an Installation Supervisor shall be required stating that the surface on which the liner is to be placed is acceptable. No installation of lining shall commence until this certification is furnished to the Contractor. The receiving surface shall be kept in the accepted condition until the installation of the lining is accomplished.

3.3 FIELD SEAMS

All field seams shall be performed using only the manufacturer's approved methods, adhesives and application directions. The minimum width of overlap of field seams shall be 4 inches. The contact surfaces of the panel overlap shall be cleaned to remove all dirt, dust or other foreign materials. A nominal 6-inch overlap of liner panels shall be allowed to keep dirt out of the field seams. When bonding the seams, the temperature of the sheet and adhesive shall be not less than 55°F. Artificial heat shall be applied if ambient conditions create lower temperatures.

3.4 INSPECTION

A. All field seams shall be 100 percent inspected by the Installation Supervisor.

B. The site shall be available at all reasonable times for inspection of finished work or work in progress by the Contractor. Any seams or areas found to be defective shall be repaired according to the manufacturer's instructions at no cost to the Contractor. In no case shall these be less rigorous than the specifications for field seaming.

3.5 ANCHORING

During and after installation, necessary precautions shall be taken to insure that the liner will not be damaged or moved by wind, rain or dust.

3.6 RUNOFF AND SEDIMENT COLLECTION-CONSTRUCTION PHASE

A. Synthetic membrane shall be placed on the temporary ditches and wastewater retention basin dikes, with anchoring trenches, as shown on the Subcontract Drawings. Subgrade preparation is specified in Section 02200.

B. Membrane edges to be joined are overlapped and sealed as recommended by the manufacturer.

C. The Subcontractor shall maintain and if required, repair synthetic membrane to provide efficient protection from runoff erosion and contamination.

3.7 REMOVAL AND DISPOSAL OF MEMBRANE LINER

After the completion of the construction phase, the synthetic membrane shall be removed, decontaminated and disposed of as required by the Contractor. If the membrane cannot be decontaminated by practical means, it shall be disposed of by cutting into strips, shredding and placing in the tailings embankment in a manner that would not induce settlement, inhibit water migration, or exceed the 5 percent limit on organic material by volume.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement for payment for membrane liner for wastewater retention basin dikes will be by the square yards of material installed. The quantities for payment will be calculated from the lines and dimensions shown on the Subcontract Drawings. The surfaces shall be measured parallel to the liner material installed.

B. Measurement for payment for preparation of subgrade shall be as specified in Section 02200.

4.2 PAYMENT

A. Payment for membrane liner for wastewater retention basin dikes will be by the unit price per square yard quoted therefor in the Bid Schedule. The price quoted shall include full compensation for furnishing all materials, tools, equipment, Installation Supervisor, incidentals and for performing all work including installation, maintenance, removal and disposal of liner as specified.

B. Payment for preparation of subgrade shall be as specified in Section 02200.

END OF SECTION 02771

SECTION 02832

CHAIN LINK FENCE AND GATES

PART 1 - GENERAL

1.1 SCOPE

This Specification Section describes the requirements for furnishing, installing, maintaining and removing chain link fencing including gates, posts, fittings, hardware, and concrete footings.

1.2 RELATED WORK

Section 02833 - Woven Wire Fences

1.3 APPLICABLE PUBLICATIONS

A. The Publications listed below form a part of this Specification to the extent referenced. The Publications are referred to in the text by the basic designation only:

1. Chain Link Fence Manufacturers Institute:

a. Standards for Galvanized Steel Chain Link Fence Fabric

b. Inustrial Steel Specifications for Fence Posts, Gates, and Accessories

c. Standards for Chain Link Fence Installation

2. American Society for Testing and Materials (ASTM.):

A90-81 Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles

A120-84 Specification for Pipe, Steel, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless, for Ordinary Uses

A123-84 Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

A153-82	Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
A239-73	Test Method for Locating the Thinnest Spot in a Zinc (Galvanized) Coating on Iron or Steel Articles by the Preece Test (Copper Sulfate Dip) (R1983)
A370-77	Methods and Definitions for Mechanical Testing of Steel Products
A392-84	Specification for Zinc-Coated Steel Chain-Link Fence Fabric
C33-86	Specification for Concrete Aggregates
C94-86	Specification for Ready-Mixed Concrete
C150-85	Specification for Portland Cement (Rev. A)
F552-83	Standard Definitions of Terms Relating to Chain Link Fencing

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Fencing shall include fabric, framework, concrete footings, gates, closure at grade depressions, hardware, and all appurtenances and accessories as required for a complete installation. All members, except fittings, shall be steel, hot-dip galvanized after fabrication. Fittings shall be malleable iron, wrought iron, or pressed steel, hot-dip galvanized after fabrication. Fence fabric and tension wire shall be zinc-coated as specified. Heights of fences shall be as shown on the Subcontract Drawings. Tolerance for fabric height is ±1 inch.

B. Fence Fabric: No. 9 gage, chain-link steel wire helically woven into 2-inch diamond mesh, hot-dip galvanized, conforming to ASTM A392. Fabric shall be twisted and barbed on the top selvage and knuckled on the bottom selvage. Loops of knuckled selvage shall be closed or nearly closed with a space not exceeding the diameter of the wire. The twisted wire shall be twisted in a closed helix of 1-1/2 machine turns equivalent to three full twists, and cut at

an angle to provide sharp barbs. The wire ends beyond the twist shall be at least 1/4-inch long. Steel wire for the fabric, when drawn to the wire gage specified, shall have a minimum tensile strength of 75,000 pounds per square inch when tested in accordance with ASTM A370. Coating of fabric shall be Class II, 2.0 ounces of hot-dip zinc galvanizing per square foot of uncoated wire surface. The Standard length of fabric roll shall be 50 linear feet ±1 percent. Each roll shall be a one-piece length. Tolerance for fabric heights shall be plus or minus 1 inch.

C. Posts:

1. Post shall be Schedule 40 galvanized pipe. Use shall be in accordance with the following table except as noted on the Subcontract Drawings. All pipe shall conform to ASTM A120 for weight and galvanized coating. Line post shall be spaced at no more than 10-foot centers.

Post Type and Shape	Nominal Pipe Size, Inches
2. End, Corner and Pull Posts:	
Round	2.5
3. Intermediate or Line Posts:	
Round	2.0
4. Gate Posts:	
Single Leaf Gate Opening Width:	
6 Feet and Less:	
Round	2.5
6 to 13 Feet:	
Round	3.5
13 to 18 Feet:	
Round	6.0
Over 18 Feet:	
Round	8.0

D. Post-Bracing Assembly: Horizontal braces shall be 1-1/4 inch Schedule 40 steel pipe, conforming to ASTM A120. Diagonal truss type braces shall be 3/8-inch diameter galvanized steel rods with turnbuckle adjustment. Couplings, fittings, and attachment accessories shall be included as

required. Horizontal braces (intermediate rails) shall be provided at all corners, terminals, pulls, and at gate posts.

E. Wire Ties and Clips: Wire ties or clips shall be provided for attaching fabric to line posts, top rail, or tension wire. Wire ties and clips shall be at intervals not greater than 15 inches when attaching fabric to line posts, and the space interval shall not exceed 24 inches when attaching fabric to top rails or tension wire. Wire ties and clips shall be not less than the fabric wire gage size and of the same material and coatings. The minimum weight for zinc coated wire ties and clips is 0.8 ounces of zinc per foot of coated surface area.

F. Tension Wire, Zinc-Coated Steel: Tension wire for top and bottom edge support of fence fabric shall be No. 7 gage marcelled or crimped coil spring hard tempered carbon steel wire with minimum tensile strength of 70,000 psi, and zinc coating of not less than 1.20 ounce per square foot of coated area.

G. Post Caps: Post caps shall be standard malleable iron, wrought iron, or pressed steel, galvanized, designed as a weathertight closure cap for tubular posts.

H. Stretcher Bars: Stretcher bars shall be one-piece lengths equal to full height of fabric with a minimum crosssection of 3/16 inch by 3/4 inch. Provide one stretcher bar for each gate and end post, and 2 for each corner and pull post.

I. Stetcher Bar Bands: Bands shall be heavy pressed steel, or malleable iron, spaced not over 15 inches on center to secure stretcher bars to end, corner, pull, and gate posts.

J. Gates:

1. Gates shall be of chain link fabric, single- or double-leaf swing type as shown on the Subcontract Drawings and furnished complete with all hardware and accessories as required. For this Subcontract, the size of the gate shall be measured in terms of the horizontal clear distance between the gate posts.

2. Gate Frames: Frames shall be round pipe to match posts in accordance with the following table:

Gate Size	Nominal Pipe Size
Leaf Width 8 Feet or Less: Round	1-1/4 Inch Schedule 40
Leaf Width Over 8 Feet: Round	1-1/2 Inch Schedule 40

3. Fabrication of Gates: Assemble gate frames by welding or with fittings and rivets for rigid connections. When fittings are used as the construction method for gate frames, the frames shall be fitted with 5/16-inch minimum diameter truss rods. The frames shall be zinc-coated after fabrication. When frames are not zinc-coated after fabrication the welds shall be coated with a zinc rich paint. Use same fabric as for fence. Install fabric with stretcher bars at vertical edges, and tie wires at top and bottom edges. Attach stretcher bars to gate frame at not more than 15 inches on center. Attach hardware with rivets or by other means which will provide security against removal or breakage. Provide additional horizontal and vertical members to ensure proper gate operation and for attachment of fabric, hardware, and accessories. Provide diagonal crossbracing consisting of 3/4-inch diameter adjustable length truss rods on gates where necessary to provide frame rigidity without sag or twist. All gates shall be constructed so that they may be operated by one person.

4. Gate Hardware: Provide the following hardware and accessories for each gate:

   a. Gate Hinges: Gate hinges shall be of adequate strength for the gate, and shall have large bearing surfaces for clamping or bolting in position. Hinge action shall be such that gates may be easily opened and closed by one person. Hinges shall provide for full 180° swing of gate leaf.

   b. Latch: Forked type or plunger-bar type to permit operation from either side of gate. Provide padlock eye as integral part of latch. Locking devices shall be constructed so that the center drop rod or plunger bar cannot be raised when locked.

c. Keeper: Provide keeper, which automatically engages the gate leaf and holds it in the open position until it is manually released, for each gate leaf.

d. Double Gates: Provide gate stops for double gates, consisting of mushroom type or flush plate with anchors. Set in concrete to engage the center drop rod or plunger bar. Provide locking device and padlock eyes as an integral part of the latch, requiring one padlock for locking both gate leaves.

K. Accessories: Furnish all miscellaneous materials and accessories, ties, clips, anchors and fastenings as required for a complete installation. Unless otherwise specified, all ferrous items shall be hot dip zinc-coated with an average weight of not less than 1.2 ounces of zinc per square foot of coated surface area.

L. Galvanizing:

1. Fence and gate framework, hardware and appurtenances shall be hot dip galvanized per ASTM A120, A123, or A153 as applicable.

2. Galvanizing of wire fabric shall be after weaving in accordance with ASTM A392, immersions when tested in accordance with ASTM A239.

2.2 FABRICATION

Chain link fencing shall be fabricated and pre-assembled by the manufacturer in the factory or shop as far as practicable.

2.3 CONCRETE

Concrete: ASTM C94; 2500 psi at 28 days; normal Portland cement conforming to ASTM C150; 3-inch slump; maximum 1-inch size aggregates conforming to ASTM C33; and clean water.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation of fencing shall be in accordance with the Subcontract Drawings, shop drawings, and the manufacturer's detailed installation drawings, instructions, and recommendations. All posts shall be plumb and rigid after installation. Chain-link fabric shall be smooth and uniformly stretched tight and straight. Tension wires shall be pulled taut.

B. Chain-link fabric shall be extended to provide approximately 4 inches clearance to the surfaces of grade depressions, drainage swales or ditches. The extended fabric shall be the same piece of the fencing material or a piece of fabric securely attached or welded to adjacent fabric of the fencing. A stretcher bar shall be provided through the vertical height of the fence at the lowest point in the depression to stiffen the extended fabric. The stretcher bars shall be threaded through and attached to the fabric by wire ties. At drainage ditches or swales, no line posts shall be installed within 5 feet of the centerline of the drainage ditches or swales. Line posts shall be spaced evenly from the centerline of the ditch or swale.

C. Gates shall be installed plumb, level, and secure for full opening without interference. Install ground-set items in concrete for anchorage as recommended by the fence manufacturer. Adjust hardware for smooth operation and lubricate. Gates shall operate smoothly and easily to minimize noise.

D. All posts shall be embedded into concrete except intermediate or line posts, which may be mechanically driven 3'6" into the ground, as shown on the Subcontract Drawings.

E. Dimensions of drill holes for post footings and concrete embedment of the posts shall be as shown on the Subcontract Drawings.

F. Line posts shall be spaced at no more than 10-foot centers.

G. Corner posts shall be installed at all changes in direction where the deflection angle exceeds 30 degrees.

3.2 CONCRETE PLACEMENT

Concrete shall be placed around posts in a continuous pour. Each post shall be checked for vertical and top alignment, and shall be held in position during placement and finishing operations.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Measurement for payment for chain link fence and gates will be by the linear feet of fence and gates installed and removed as shown on the Subcontract Drawings and as accepted by the Contractor. Measurements will be made along the top of the fence and gates to the nearest foot.

4.2 PAYMENT

Payment for chain link fence and gates will be by the unit price per linear foot quoted therefor in the Bid Schedule. Payment shall include full compensation for furnishing all labor, tools, equipment, and incidentals, and for performing all work involved in constructing, maintaining, and removing fences, including any clearing, stripping, tree removal, excavation, concrete or cement, complete in place, as shown on the Drawings and as accepted by the Contractor.

END OF SECTION 02832

SECTION 02833

WOVEN WIRE FENCE

PART 1 - GENERAL

1.1 SCOPE

This Specification Section describes the requirements for furnishing, installing, maintaining and removing woven wire fence as shown on the Subcontract Drawings and as specified in this Section.

1.2 APPLICABLE PUBLICATIONS

A. The Publications listed below form a part of this Specification to the extent referenced. The Publications are referred to in the text by the basic designation only:

1. American Society for Testing and Materials (ASTM):

A116-81	Specification for Zinc-Coated (Galvanized) Steel Woven Wire Fence Fabric
A121-81	Specification for Zinc-Coated (Galvanized) Steel Barbed Wire
C33-86	Specification for Concrete Aggregates
C94-86	Specification for Ready-Mixed Concrete
C150-85	Specification for Portland Cement (Rev. A)

PART 2 - PRODUCTS

2.1 MATERIALS

A. Fencing shall include woven wire, posts, barbed wire, and all appurtenances and accessories required for complete installation.

B. Barbed wire shall conform to the requirements of ASTM A121, and shall consist of three lines of double stranded 12-1/2-gage galvanized wire with either 2-point or 4-point barbs spaced at 5-inch intervals. Galvanizing shall be Class 3.

C. Rectangular woven wire shall be 12-1/2-gage galvanized steel wire conforming to the requirements of ASTM A116 Class 3 coating. The height shall be 32 inches consisting of eight horizontal wires with vertical stays spaced 6 inches apart.

D. Line post shall be tee, channel or U-bar shape, 1.33 lbs. per foot.

E. Braces shall be 1-1/4-inch Schedule 40 steel pipe, or steel angle section, 2 x x 3/16 inches.

F. End, corner and pull posts shall be 2-inch Schedule 40 steel pipe, or steel angle section 2-1/2 x 2-1/2 x 1/4 inches.

G. Hardware for connecting members shall conform to commercial standards.

2.2 CONCRETE

Concrete: ASTM C94; 2500 psi at 28 days; normal Portland cement conforming to ASTM C150; 3-inch slump; maximum 1-inch size aggregates conforming to ASTM C33; and clean water.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Wire fence shall be constructed in accordance with the details shown on the Subcontract Drawings unless otherwise directed by the Contractor.

B. Line posts shall be set plumb and to the depth and spacing shown on the Subcontract Drawings.

C. Fence wire shall be stretched by mechanical stretcher or other device designed for such use. The length between pull posts shall not exceed 660 feet for woven wire.

3.2 CONCRETE PLACEMENT

Concrete shall be placed around posts in a continuous pour. Each post shall be checked for vertical and top alignment, and shall be held in position during placement and finishing operations.

3.3 MAINTENANCE AND REMOVAL

The fence constructed under the Subcontract shall be maintained during the excavation of the Subcontract and removed and disposed of as Subcontractor's property when no longer required.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Measurement for payment for woven wire fence will be by the linear feet of fence installed and removed as shown on the Subcontract Drawings and as accepted by the Contractor. Measurements will be made along the top of the fence to the nearest foot.

4.2 PAYMENT

Payment for woven wire fence will be by the unit price per linear foot quoted therefor in the Bid Schedule. Payment shall include full compensation for furnishing all labor, tools, equipment, and incidentals, and for performing all work involved in constructing fences, including any clearing, stripping, tree removal, excavation, concrete or cement, complete in place, maintaining, removing, and disposing of, as shown on the Subcontract Drawings.

END OF SECTION 02833

Subcontract Drawings

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PRELIMINARY REVIEW		
E & D MANAGER	CHIEF ENGINEER	QA MANAGER

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HAT, UTAH

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

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APPROVED | DATE | DOE PROJECT ENGINEER | DATE

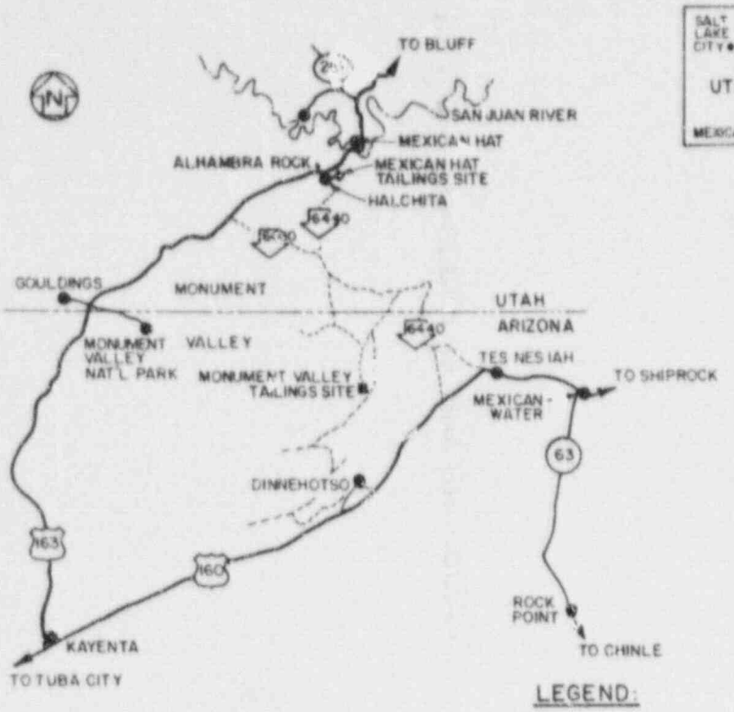
MEXICAN HAT SITE
MEXICAN HAT, UTAH

TITLE SHEET

	REVISIONS	BY	CK	E&D MGR.	CHIEF ENG.	TAC REV.	DOE APP.
	ISSUED FOR PRELIMINARY REVIEW	---	---	---	---	---	---

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT
100 HOWARD ST. SAN FRANCISCO, CA 94105

PROJECT NO. DE-AC04-83AL18796
DRAWING NO. HAT-PS-10-0901 | REV. A



LEGEND:

- 163 U.S. HIGHWAY
- 261 STATE HIGHWAY
- 6440 INDIAN SERVICE ROUTE
- 63 COUNTY ROAD

LOCATION MAP

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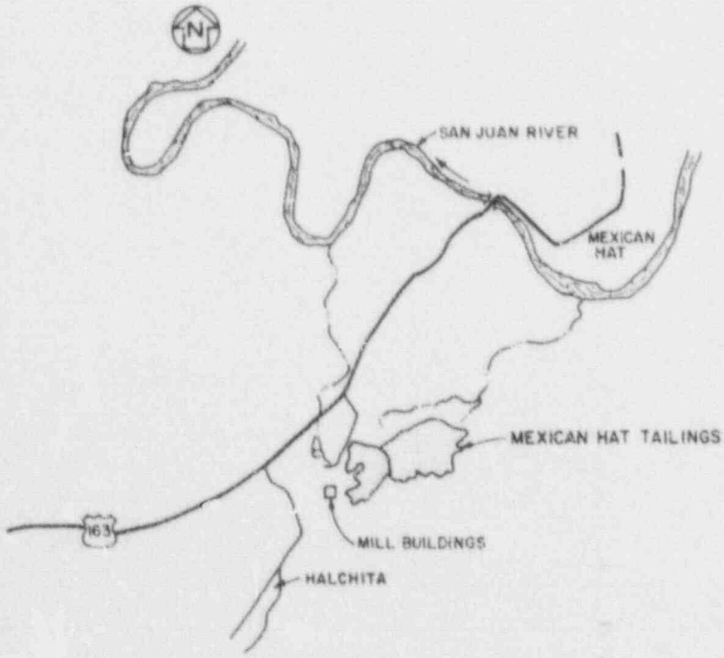
SCALE MILES



VICINITY MAP

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SCALE MILES

PRELIMINARY REVIEW		
E & D MANAGER	CHIEF ENGINEER	QA MANAGER

LIST OF DRAWINGS

DRAWING NO.	DRAWING TITLE
HAT-PS-10-0901	TITLE SHEET
HAT-PS-10-0902	VICINITY MAP, LOCATION MAP & LIST OF DRAWINGS
HAT-PS-10-0903	SITE PLAN
HAT-PS-10-0904	POTENTIAL BORROW AREA LOCATIONS
HAT-PS-10-0905	CONSTRUCTION FACILITIES AND SITE DRAINAGE
HAT-PS-10-0906	ACCESS CONTROL AND STAGING AREA - SECTIONS AND DETAILS
HAT-PS-10-0907	RETENTION BASIN NO.1 - SECTIONS AND DETAILS
HAT-PS-10-0908	TEMPORARY SITE DRAINAGE
HAT-PS-10-0909	FENCE AND GATE DETAILS
HAT-PS-10-0910	EXISTING UTILITIES AND DEMOLITION PLAN
HAT-PS-10-0911	UPPER TAILINGS PILE EXCAVATION PLAN
HAT-PS-10-0912	WINDBLOWN MATERIALS EXCAVATION PLAN
HAT-PS-10-0913	TAILINGS EMBANKMENT PLAN
HAT-PS-10-0914	TAILINGS EMBANKMENT SECTIONS
HAT-PS-10-0915	TAILINGS EMBANKMENT DETAILS
HAT-PS-10-0916	FINAL SITE GRADING AND DRAINAGE PLAN
HAT-PS-10-0917	SITE DRAINAGE (SHEET 1 OF 3)
HAT-PS-10-0918	SITE DRAINAGE (SHEET 2 OF 3)
HAT-PS-10-0919	SITE DRAINAGE (SHEET 3 OF 3)
HAT-PS-10-0920	TAILINGS EMBANKMENT EROSION PROTECTION
HAT-PS-10-0921	BORING LOCATION PLAN
HAT-PS-10-0922	GEOLOGIC CROSS SECTIONS
HAT-PS-10-0923	BORROW AREAS (TO BE ISSUED IN FINAL DESIGN)

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED	DRAWN	CHECKED	INSPECTED	RELEASED FOR BID	APPROVED	DATE
	RBC					

MEXICAN HAT SITE
MEXICAN HAT, UTAH

VICINITY MAP, LOCATION MAP & LIST OF DRAWINGS

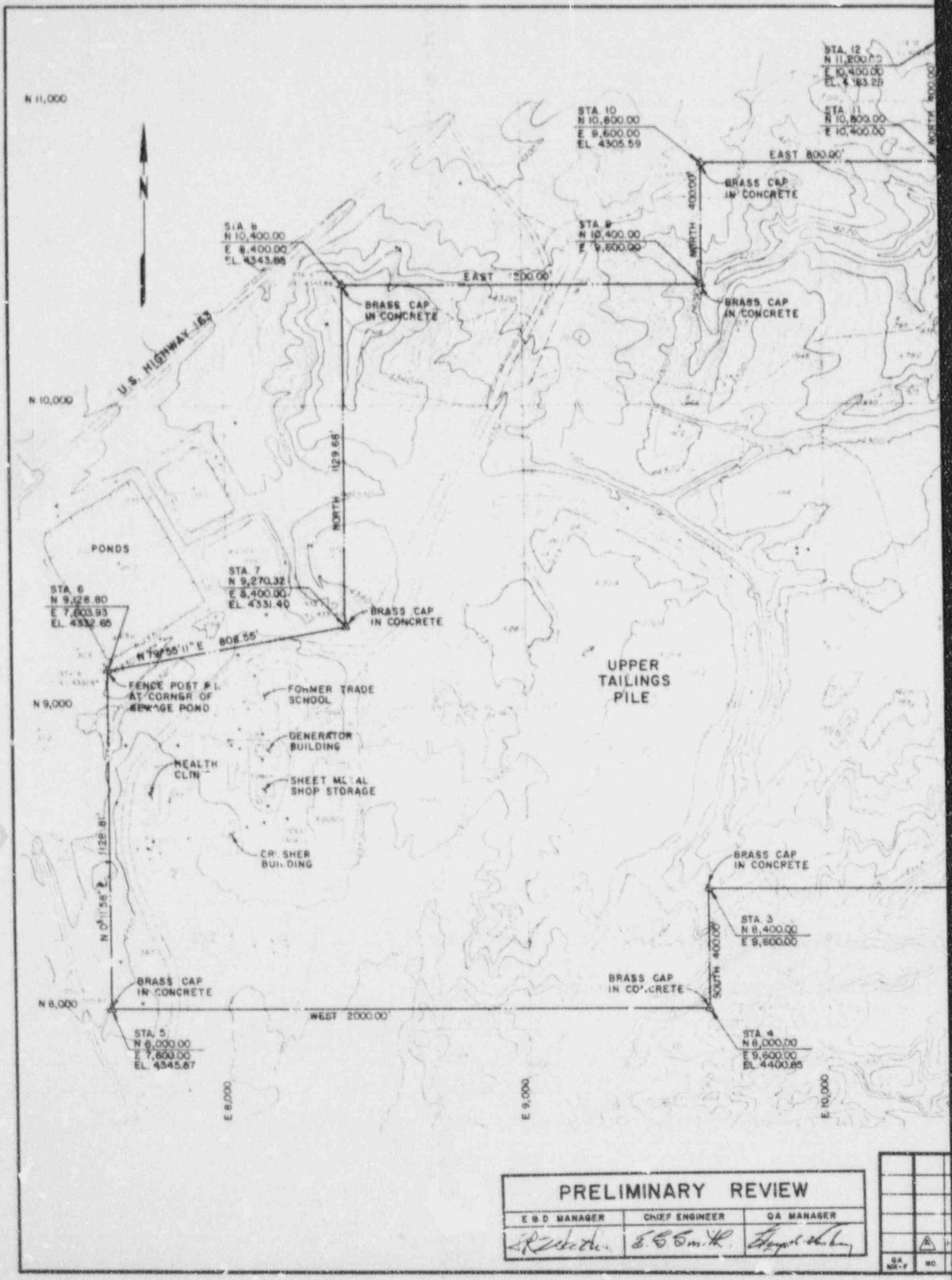
DOE PROJECT ENGINEER | DATE

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT
180 HOWARD ST. SAN FRANCISCO, CA 94105

PROJECT NO. DE-AC04-83AL18796

DRAWING NO. HAT-PS-10-0902 | REV. A

DATE	REVISIONS	BY	CK	F&D MGR	CHIEF ENG	TAC REV	DOE APP
	ISSUED FOR PRELIMINARY REVIEW						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EL. 4305.59
EAST 800.00'
NORTH 400.00'
BRASS CAP IN CONCRETE
STA. 8
N 10,400.00
E 8,400.00
EL. 4343.85
STA. 9
N 10,400.00
E 9,600.00
EAST 1200.00'
BRASS CAP IN CONCRETE
BRASS CAP IN CONCRETE
U.S. HIGHWAY 163
NORTH 1129.68'
PONDS
STA. 7
N 9,270.32
E 8,400.00
EL. 4331.40
BRASS CAP IN CONCRETE
STA. 6
N 9,128.80
E 7,603.93
EL. 4332.65
N 79°55'11" E 808.55'
FENCE POST P.I. AT CORNER OF SEWAGE POND
FORMER TRADE SCHOOL
GENERATOR BUILDING
HEALTH CLINIC
SHEET METAL SHOP STORAGE
CRUSHER BUILDING
UPPER TAILINGS PILE
N 0°11'58" E 1128.81'
BRASS CAP IN CONCRETE
BRASS CAP IN CONCRETE
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N 8,400.00
E 9,600.00
SOUTH 400.00'
BRASS CAP IN CONCRETE
WEST 2000.00'
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EL. 4400.85
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CHIEF ENGINEER
QA MANAGER
QA REV. F
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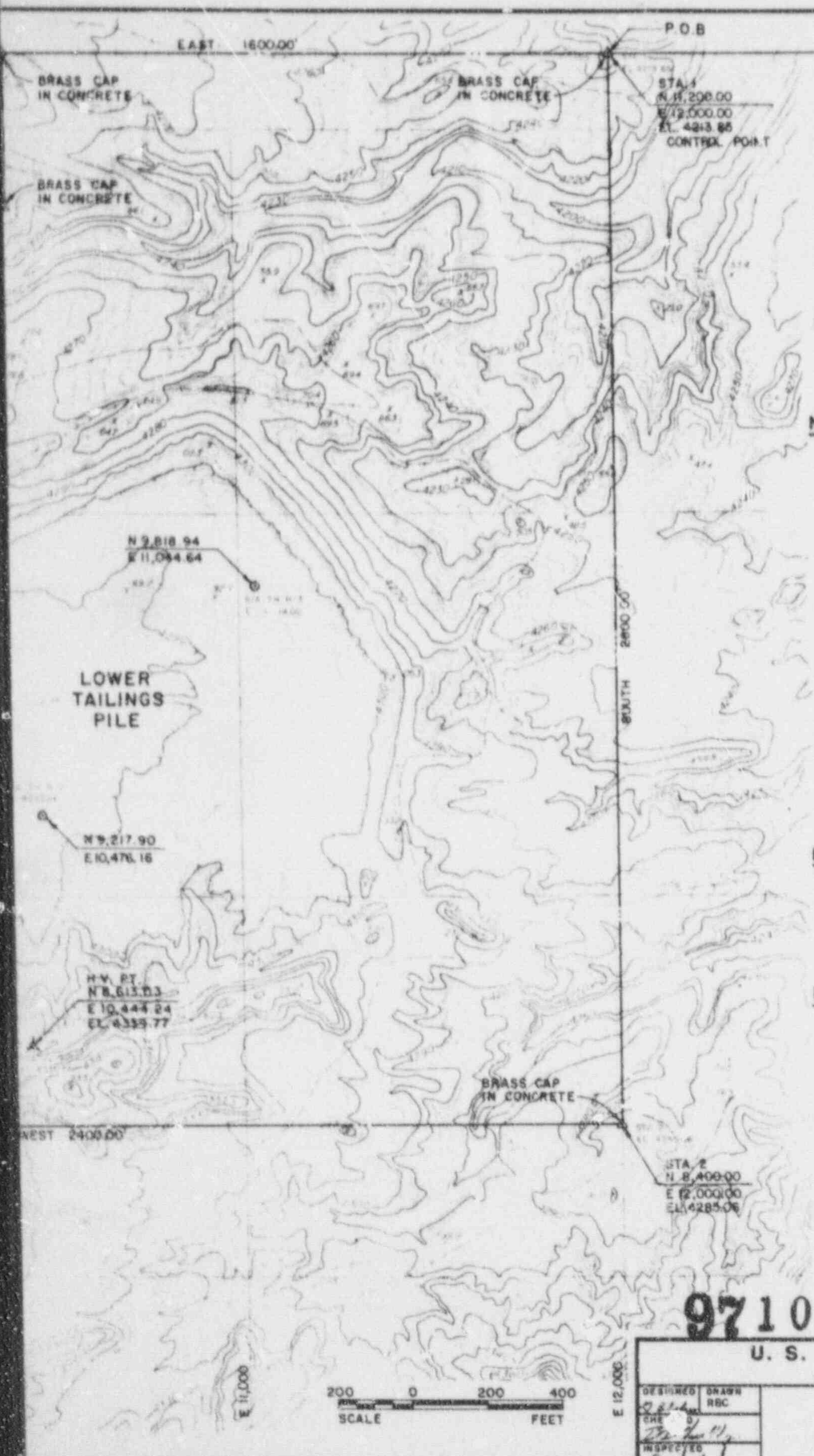

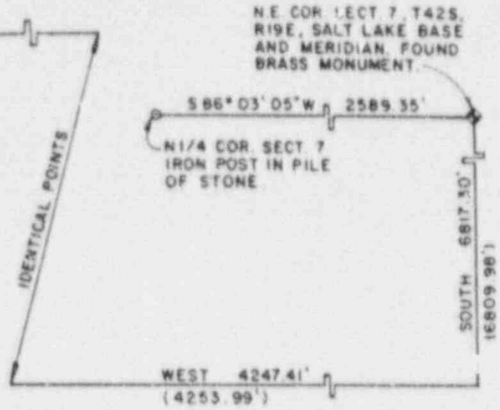

NOTES:

1. SECTION CORNER TIE SHOWN IN PARENTHESIS IS PER CONTROL FOUND ON STAKE OUT OF HALCHETA HOUSING DEVELOPMENT.
2. FOR HORIZONTAL AND VERTICAL CONTROL, THE SUBCONTRACTOR SHALL USE POINTS MARKED THUSLY: ▲ (BRASS CAP IN CONCRETE). SUBCONTRACTOR MAY USE OTHER CONTROL POINTS AFTER VERIFICATION BY SURVEY.
3. HORIZONTAL AND VERTICAL CONTROL POINTS ESTABLISHED BY WESTERN DESIGN CONSULTANTS OF SALT LAKE, UTAH.
4. GRID SYSTEM IS BASED ON UTAH COORDINATES SYSTEM.
5. TOPOGRAPHIC SURVEY CONDUCTED BY WESTERN DESIGN CONSULTANTS ON AUG. 11, 1982. ELEVATIONS ARE TWO FEET INTERVALS AND ARE TIED TO DATUM POINT NORTHEAST CORNER SECT. 7, T42S, R19E, SALT LAKE BASE AND MERIDIAN.
6. THE SUBCONTRACTOR SHALL SURVEY THE SITE IN ORDER TO ESTABLISH THE MISSING MONUMENTS. THESE MONUMENTS WILL BE IDENTIFIED IN THE FINAL DESIGN.

REFERENCE DRAWINGS:

ANSTEC APERTURE CARD

Also Available on Aperture Card

LEGEND:

~~	EXISTING SITE FEATURES AND CONTOURS
— - —	SITE BOUNDARY
E10,000	CONSTRUCTION GRID COORDINATE
⊙	TEST HOLE
▲	BRASS CAP IN CONCRETE

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U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

MEXICAN HAT SITE
MEXICAN HAT, UTAH

SITE PLAN

DESIGNED / DRAWN RBC / CHECKED / INSPECTED / RECOMMENDED / APPROVED / DATE / DOE PROJECT ENGINEER / DATE

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT
180 HOWARD ST. SAN FRANCISCO, CA 94105

PROJECT NO. DE-AC04-83AL18796

DRAWING NO. HAT-PS-10-0903 REV. A

DATE	REVISIONS	BY	DR	ENG MGR	CHIEF ENG	TAC REV.	DOE APP
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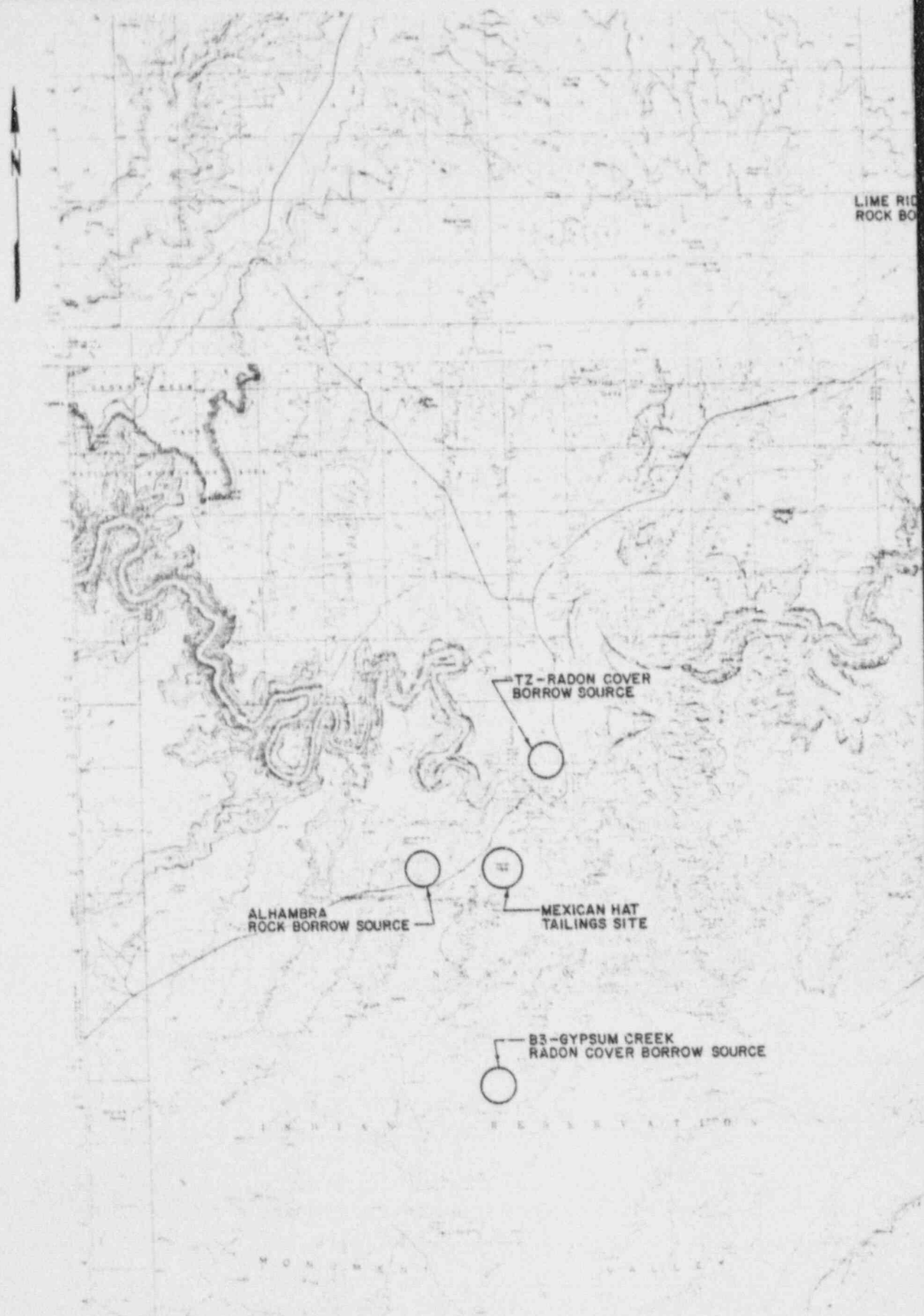

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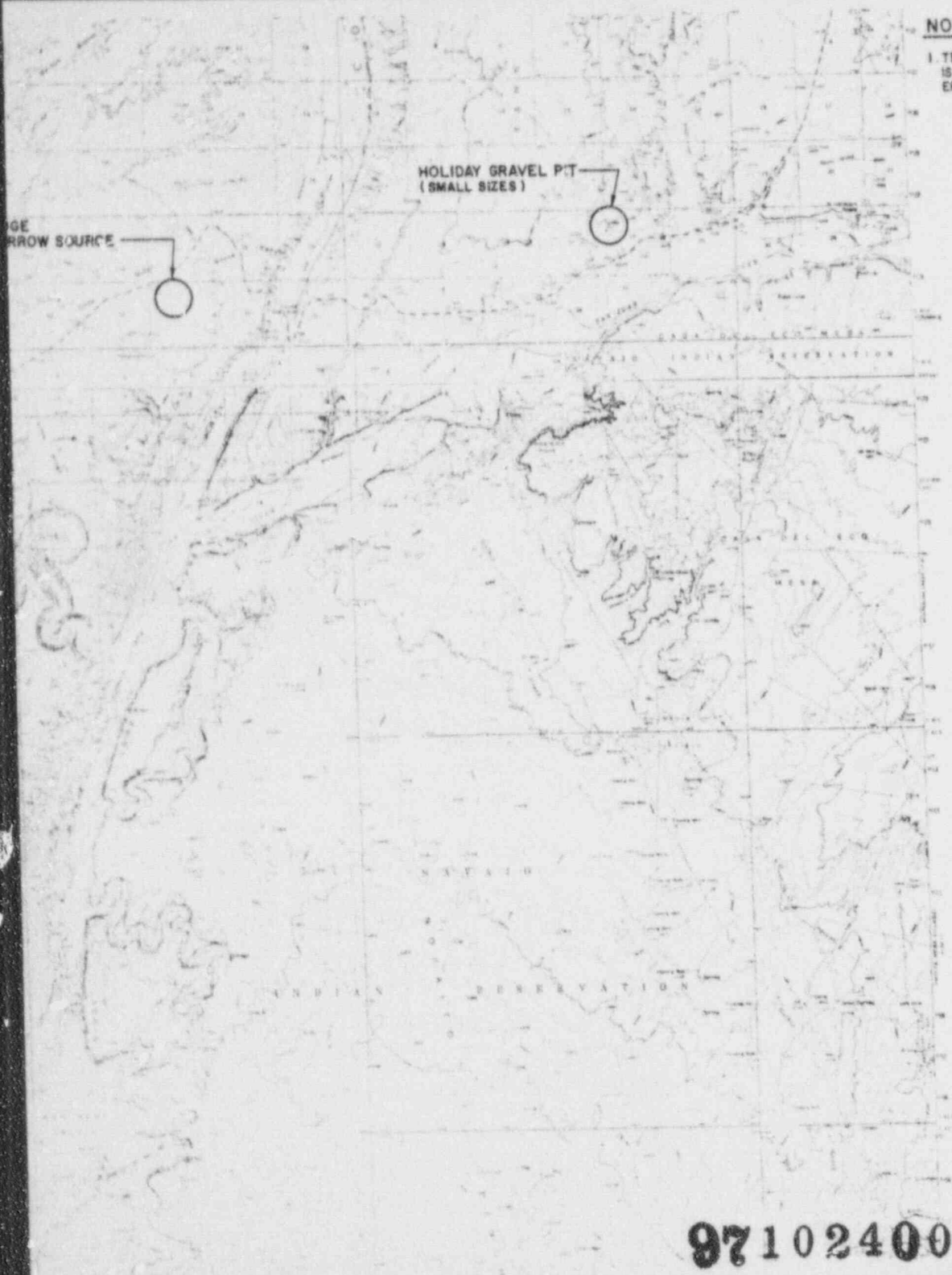
E & D MANAGER	CHIEF ENGINEER	QA MANAGER
	E S. Smith	

1 1/2 0 1 2
SCALE MILES



NOTES:

1. TERRACE GRAVEL NEAR BLANDING, UTAH, IS AN ADDITIONAL SOURCE OF GRAVEL FOR EROSION PROTECTION.

9710240078-04

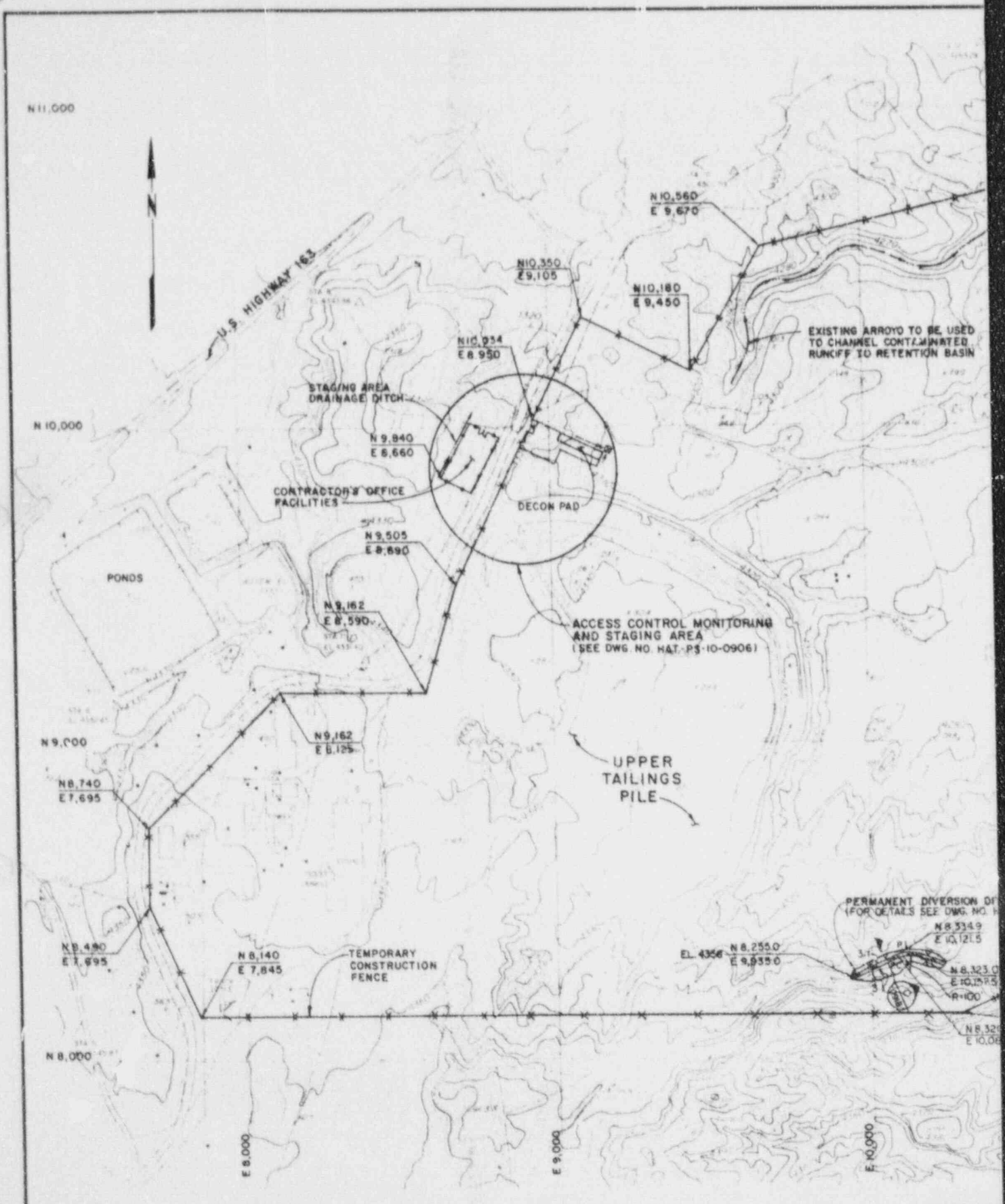
U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED	DRAWN RBC	MEXICAN HAT SITE MEXICAN HAT, UTAH
CHECKED		POTENTIAL BORROW AREA LOCATIONS
INSPECTED		
RECOMMENDED		
APPROVED	DATE	DOE PROJECT ENGINEER / DATE

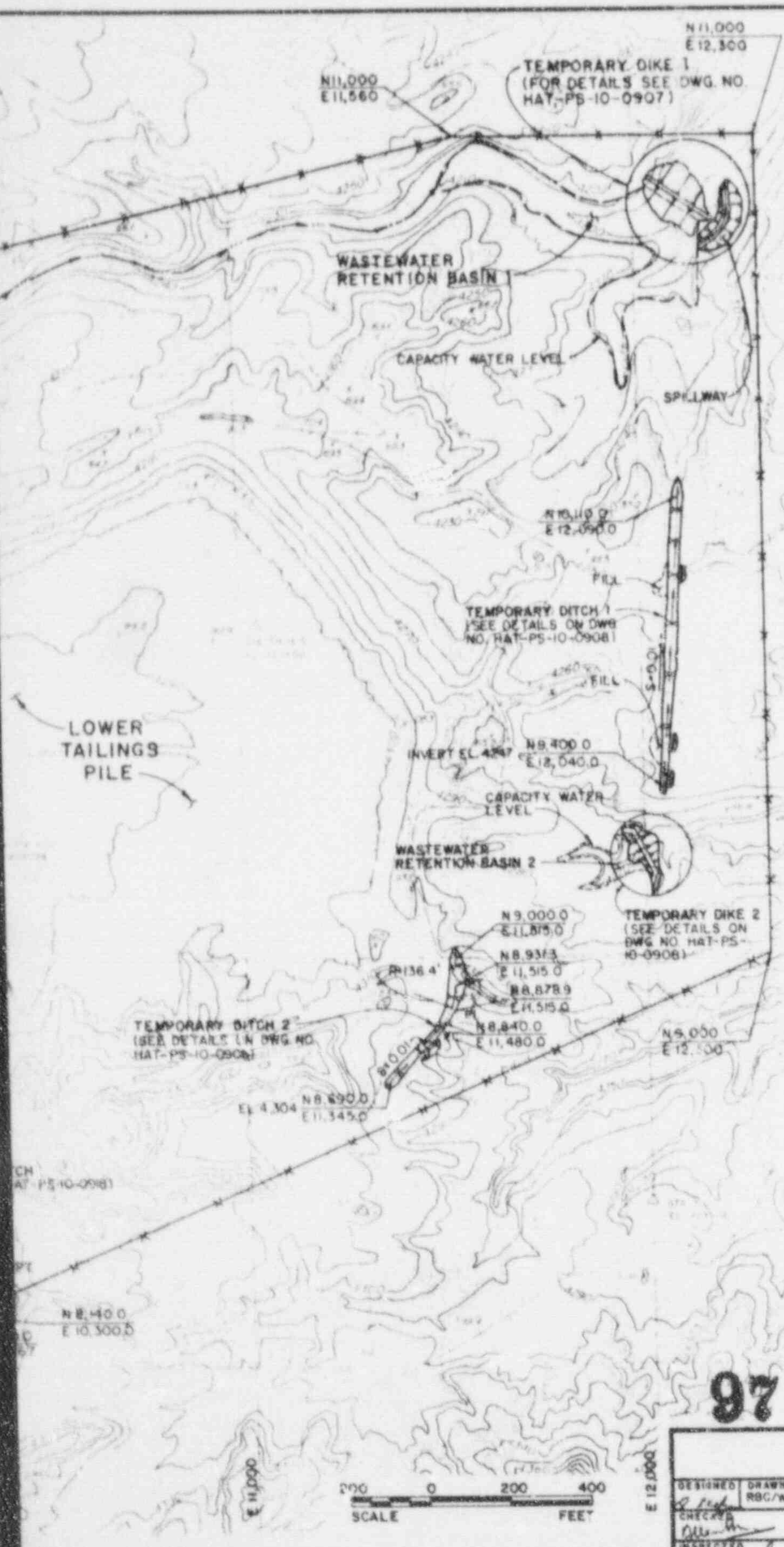
DATE	REVISIONS	BY	CK	E&G MGR	CHIEF ENG.	T&C REV.	DOE APP.
1-18-87	ISSUED FOR PRELIMINARY REVIEW	—	—	—	—	—	—

MORRISON-KNUDSEN ENGINEERS, INC.
A MORRISON KNUDSEN COMPANY
UMTRA PROJECT
180 HOWARD ST. SAN FRANCISCO, CA 94105

PROJECT NO. DE-ACC -83AL18796
DRAWING NO. HAT-PS-10-0904
REV. A



PRELIMINARY REVIEW		
E & D MANAGER	CHIEF ENGINEER	QA MANAGER



NOTES:

1. SUBCONTRACTOR SHALL REMOVE WINDBLOWN CONTAMINATED MATERIALS FROM THE STAGING AND MONITORING AREAS PRIOR TO THE LAYOUT OF ANY CONSTRUCTION FACILITIES IN THAT AREA.
2. SUBCONTRACTOR SHALL ESTABLISH THE DRAINAGE PATTERN WITHIN ALL WORK AREAS. CONTAMINATED RUNOFF WITHIN THE SITE SHALL BE DIRECTED TO THE WASTEWATER RETENTION BASINS.
3. SUBCONTRACTOR SHALL PROVIDE AND MAINTAIN EXISTING ACCESS ROAD DURING THE CONSTRUCTION.
4. SUBCONTRACTOR SHALL PROVIDE HOLDING TANK AND PUMP TO HANDLE CONTAMINATED WASH WATER.
5. SUBCONTRACTOR SHALL PROVIDE PUMP AND HOSE TO HANDLE CONTAMINATED WATER PERCHED AT THE EXISTING TAILINGS PILE DURING RELOCATION OF THE TAILINGS.
6. LOCATION OF SPOIL AREA WILL BE DETERMINED IN FINAL DESIGN.

REFERENCE DRAWINGS:

HAT-PS-10-0906	ACCESS CONTROL AND STAGING AREA - SECTIONS AND DETAILS
HAT-PS-10-0907	RETENTION BASIN 1-SECTIONS AND DETAILS
HAT-PS-10-0908	TEMPORARY SITE DRAINAGE
HAT-PS-10-0918	SITE DRAINAGE (SHEET 2 OF 3)

ANSTEC APERTURE CARD

Also Available on Aperture Card

LEGEND:

—x—x—	WOVEN WIRE FENCE
—•—•—	CHAIN LINK FENCE
—T—T—	TOP OF CUT
—⊥—⊥—	TOP OF FILL

9710240078-05

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

MEXICAN HAT SITE
MEXICAN HAT, UTAH

CONSTRUCTION FACILITIES AND SITE DRAINAGE

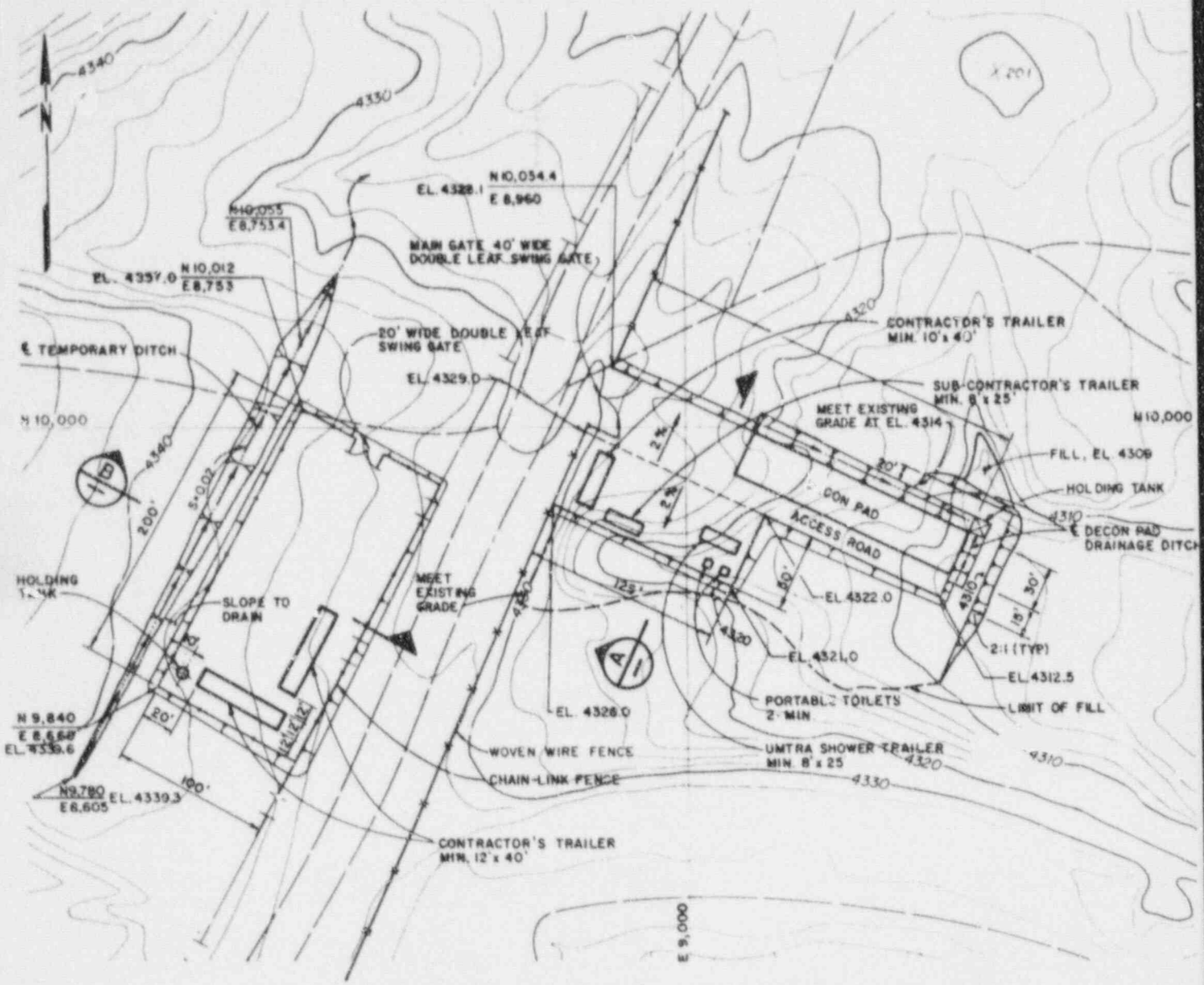
DESIGNED / DRAWN RBC/WSO / CHECKED / INSPECTED / RECOMMENDED / APPROVED / DATE / DOE PROJECT ENGINEER / DATE

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT
180 HOWARD ST. SAN FRANCISCO, CA 94105

PROJECT NO. DE-AC04-83AL18796

DRAWING NO. HAT-PS-10-0905 REV A

DATE	REVISIONS	BY	CK	E&O HGR	CHIEF ENG	TAC REV	PGE APV
0-87	ISSUED FOR PRELIMINARY REVIEW	—	—	—	—	—	—



ACCESS CONTROL MONITORING AND STAGING AREA

(HAT-PS-10-0905)

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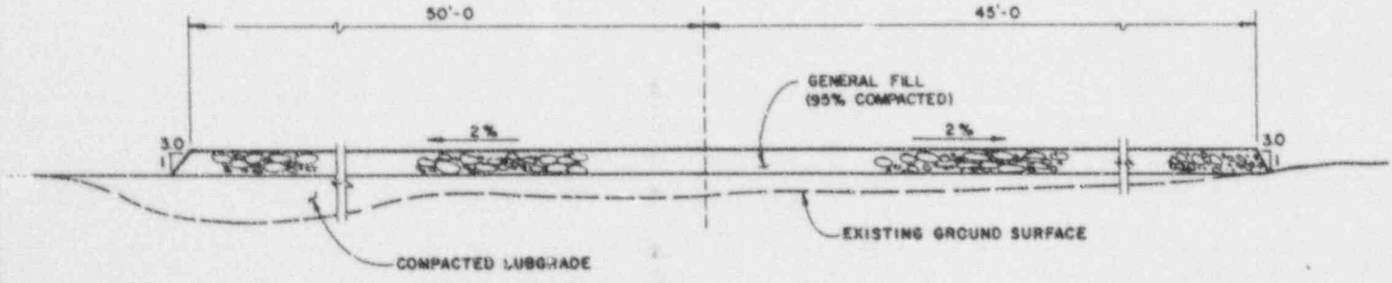
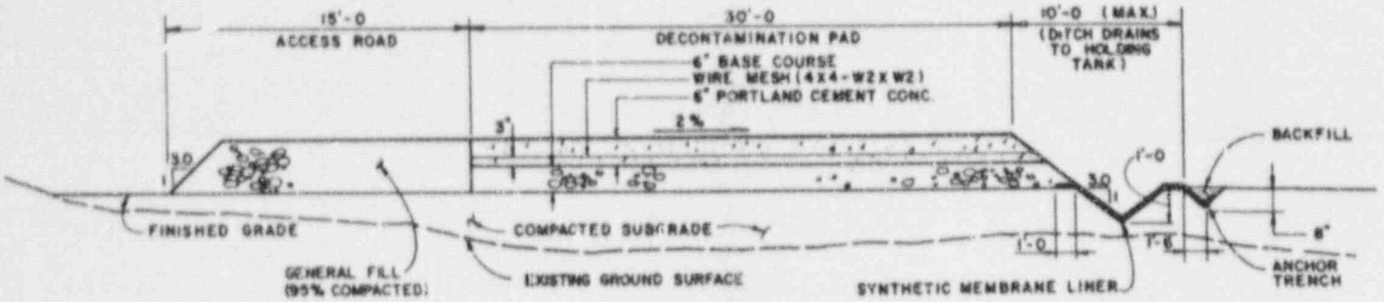
SCALE FEET



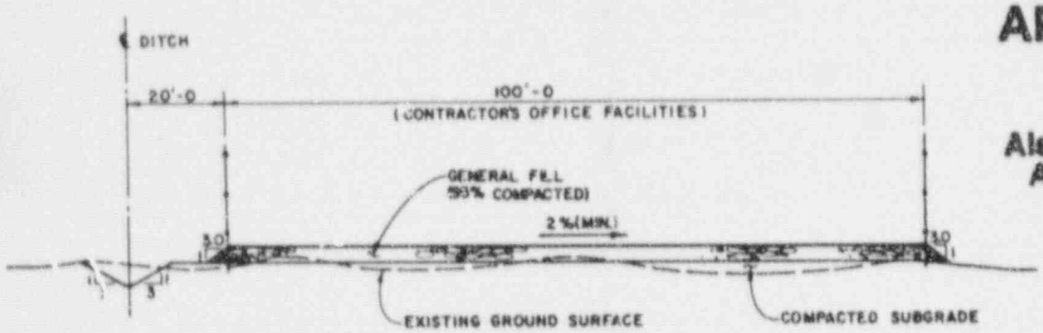
SECTION (A/—)
NOT TO SCALE

PRELIMINARY REVIEW		
E & D MANAGER	CHIEF ENGINEER	QA MANAGER

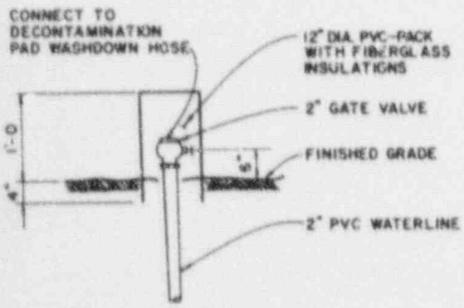


TYPICAL DECONTAMINATION PAD SECTION

NOT TO SCALE

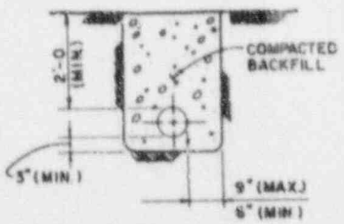


SECTION B
NOT TO SCALE



TYPICAL STUB DETAIL

(NOT TO SCALE)



TYPICAL BEDDING AND BACKFILL FOR UTILITIES

(NOT TO SCALE)

9710240078 - 06

NOTES:

1. SUBCONTRACTOR SHALL IMPROVE EXISTING ACCESS ROAD TO PROVIDE SMOOTH APPROACH AND EXIT CONDITIONS FOR THROUGH TRAFFIC.

REFERENCE DRAWINGS:

HAT-PS-10-0905	CONSTRUCTION FACILITIES AND SITE DRAINAGE

LEGEND:

- TOP OF FILL
- WOVEN WIRE FENCE
- CHAIN LINK FENCE

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

MEXICAN HAT SITE
MEXICAN HAT, UTAH

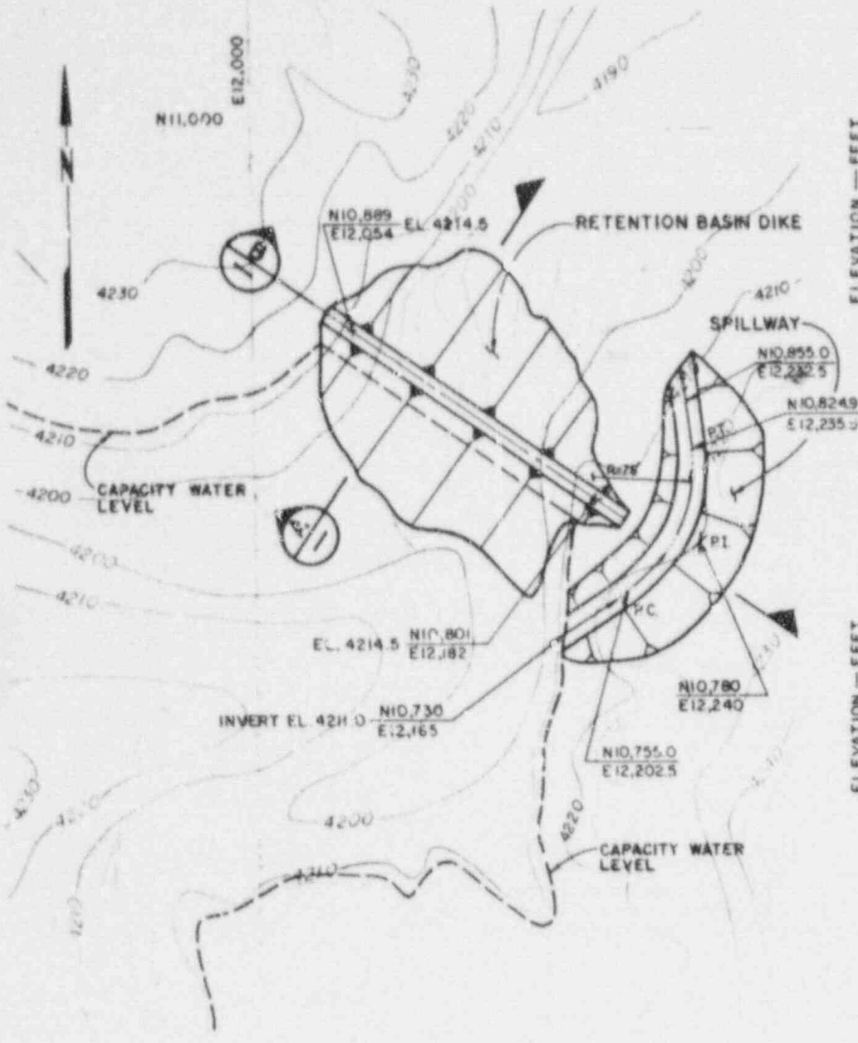
ACCESS CONTROL AND STAGING AREA SECTIONS AND DETAILS

DESIGNED: DRAWN RBC/WSC
CHECKED
INSPECTED
RECOMMENDED
APPROVED DATE
DOE PROJECT ENGINEER DATE

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT

PROJECT NO. DE-AC04-83AL18796
DRAWING NO. HAT-PS-10-0906 REV. A

NO.	REVISIONS	BY	CK	E&D MGR	CHIEF ENG.	TAC REV.	DOE APP.
0	ISSUED FOR PRELIMINARY REVIEW	---	---	---	---	---	---

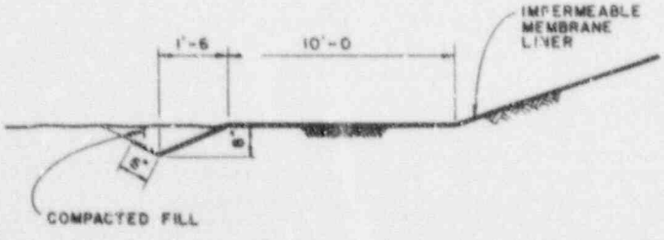


RETENTION BASIN I PLAN

(HAT-PS-10-0905)

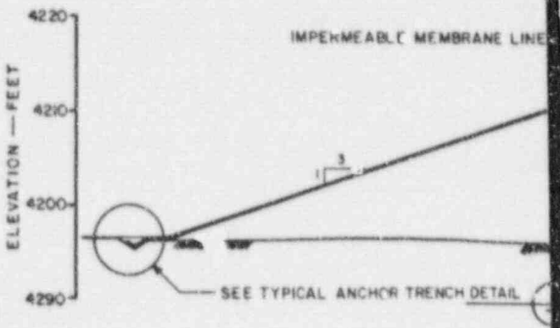
50 0 50 100

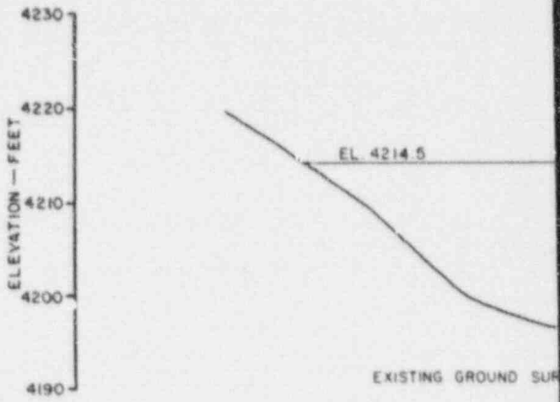
SCALE FEET

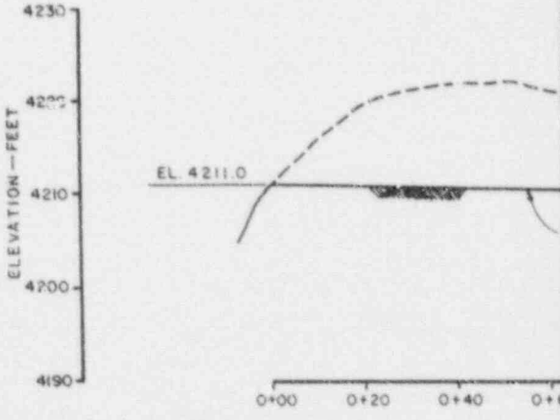


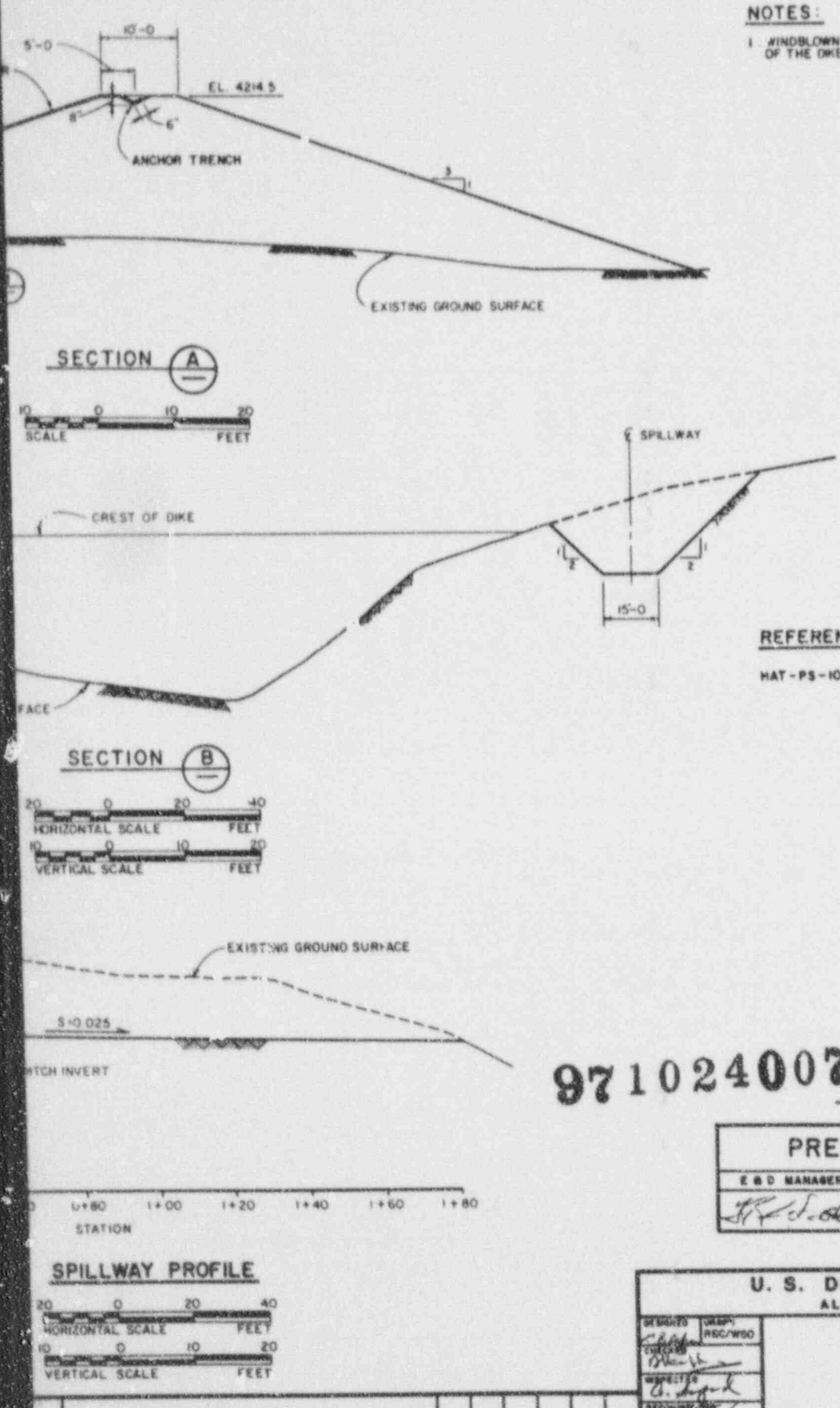
TYPICAL ANCHOR TRENCH DETAIL

NOT TO SCALE









NOTES:

1. WINDBLOWN CONTAMINATES SHALL BE REMOVED IN THE LOCATION OF THE DIKE PRIOR TO IT'S CONSTRUCTION.

ANSTEC APERTURE CARD

Also Available on Aperture Card

REFERENCE DRAWINGS:

HAT-PS-10-0905 CONSTRUCTION FACILITIES AND SITE DRAINAGE

9710240078 - 07

PRELIMINARY REVIEW		
E & D MANAGER	CHIEF ENGINEER	QA MANAGER
[signature]	E. S. Smith	[signature]

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

MEXICAN HAT SITE
MEXICAN HAT, UTAH

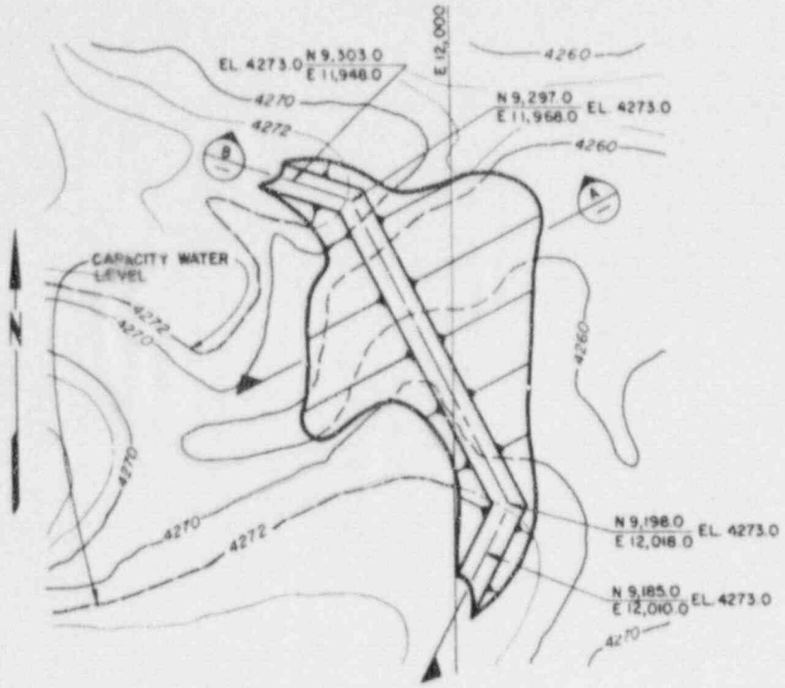
RETENTION BASIN 1
SECTIONS AND DETAILS

DESIGNED / DRAWN / CHECKED / INSPECTED / RECOMMENDED / APPROVED / DATE / DOE PROJECT ENGINEER / DATE

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT

PROJECT NO. DE-AC04-83AL18796
DRAWING NO. HAT-PS-10-0907 REV. A

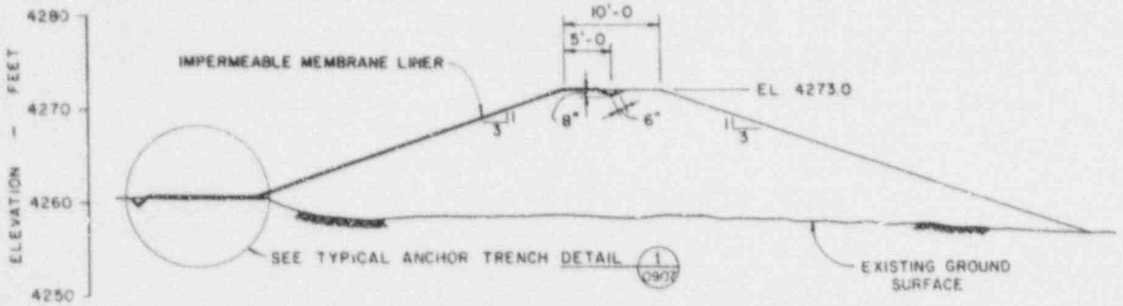
DATE	REVISIONS	BY	CK	E&D MGR	CHIEF ENG.	TAC REV	DOE APR
-87	ISSUED FOR PRELIMINARY REVIEW	—	—	—	—	—	—



RETENTION BASIN 2 DIKE

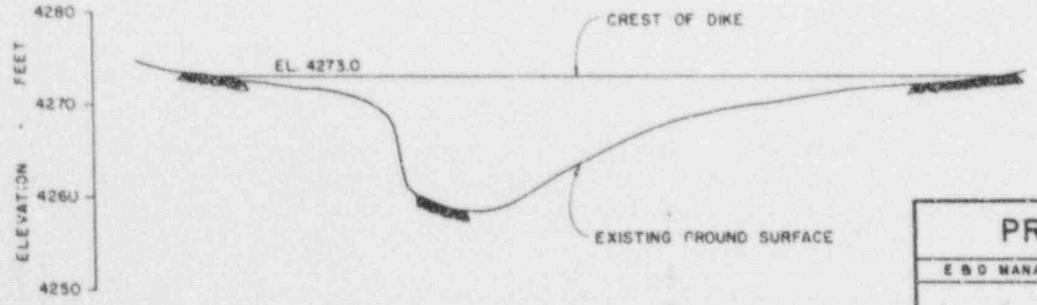
(HAT-PS-10-0905)

30 0 30 60
SCALE FEET



SECTION A

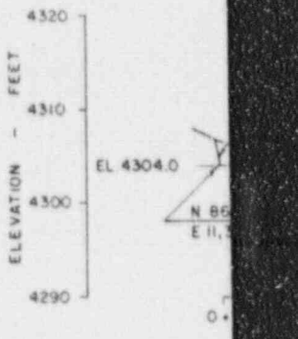
10 0 10 20
SCALE FEET



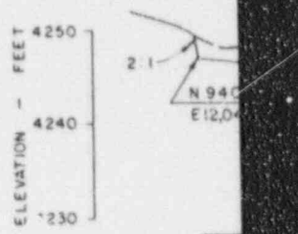
SECTION B

20 0 20 40
HORIZONTAL SCALE FEET

10 0 10 20
VERTICAL SCALE FEET



PROFILE



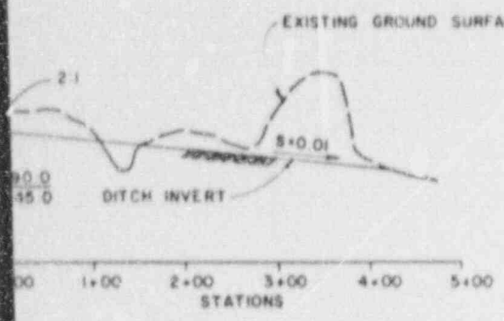
PR

COMPACTED FILL

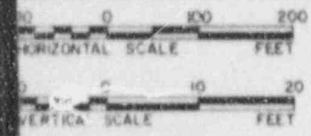
PRELIMINARY REVIEW		
E & O MANAGER	CHIEF ENGINEER	QA MANAGER

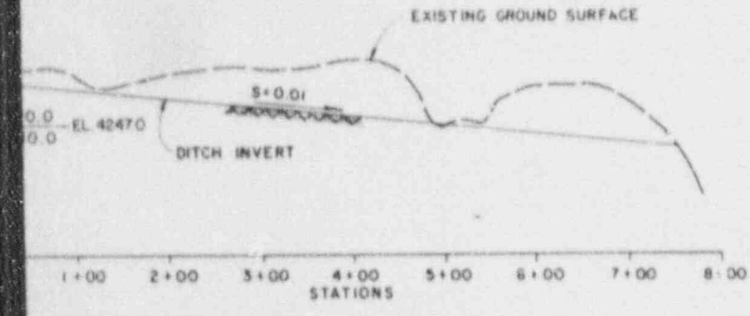
NOTE:

1. WINDBLOWN CONTAMINATES SHALL BE REMOVED FROM THE LOCATION OF THE DIKE PRIOR TO CONSTRUCTION.

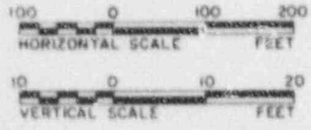


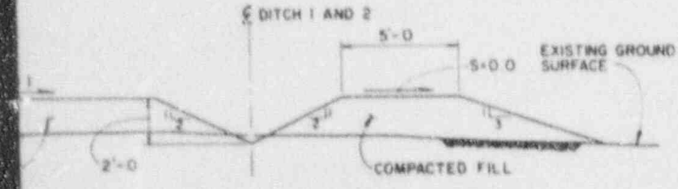
OF TEMPORARY DRAINAGE DITCH 2





OFILE OF TEMPORARY DRAINAGE DITCH 1





TYPICAL SECTION IN FILL
TEMPORARY DITCH 1 AND 2

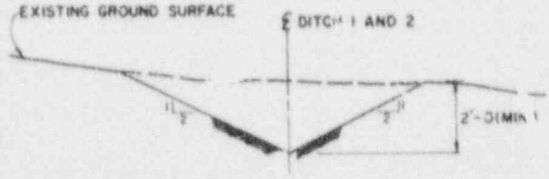
REFERENCE DRAWINGS:

HAT-PS-10-0905	CONSTRUCTION FACILITIES AND SITE DRAINAGE
HAT-PS-10-0907	RETENTION BASIN 1 - SECTIONS AND DETAILS

LEGEND:

TOP OF FILL

9710240078 - 08



TYPICAL SECTION IN CUT
TEMPORARY DITCH 1 AND 2

ANSTEC APERTURE CARD

Also Available on Aperture Card

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

MEXICAN HAT SITE
MEXICAN HAT, UTAH

TEMPORARY SITE DRAINAGE

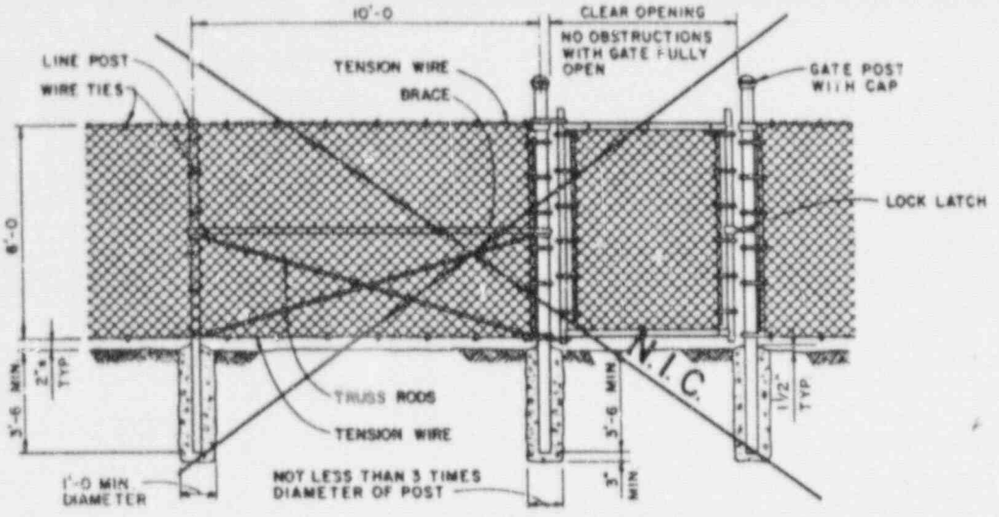
DESIGNED	DRAWN	CHECKED	INSPECTED	RECOMMENDED	APPROVED	DATE	DOE PROJECT ENGINEER	DATE
DAL	WSO							

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT

PROJECT NO. DE-AC04-83AL18796

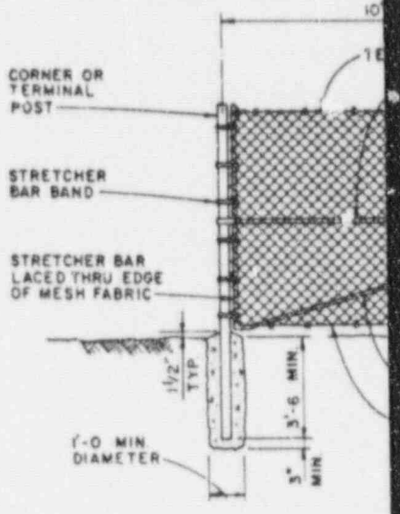
DRAWING NO. HAT-PS-10-0908 REV A

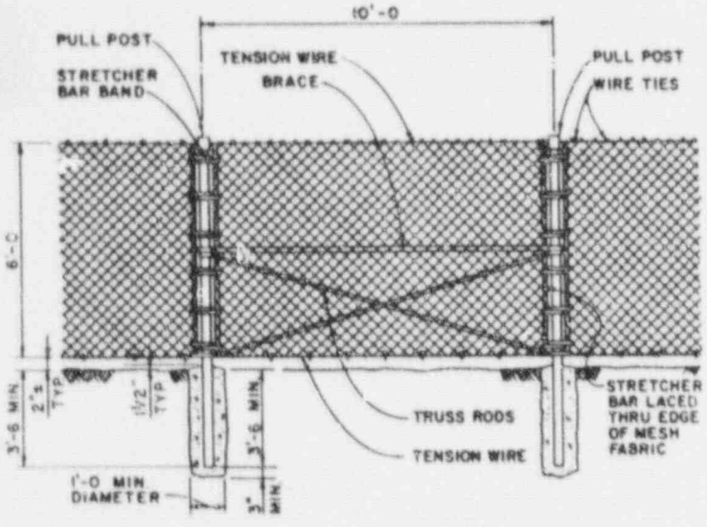
BY	REVISIONS	BY	CK	ENG MGR	CHIEF ENG	TAC REV	DOE APP
BP	ISSUED FOR PRELIMINARY REVIEW	---	---	---	---	---	---



TYPICAL SINGLE SWING GATE DETAIL

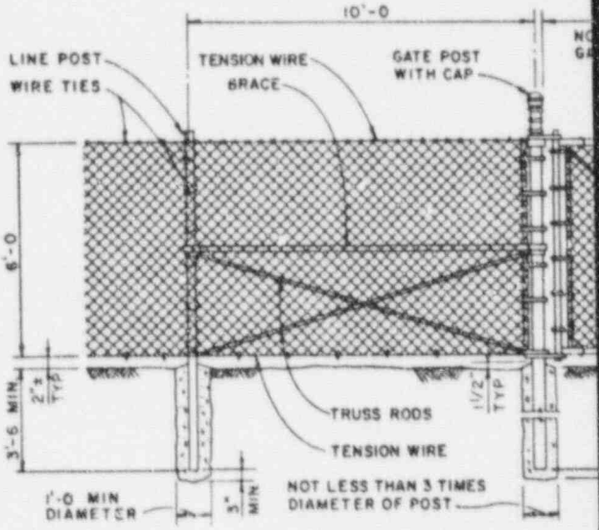
(NOT TO SCALE)





TYPICAL PULL POST ASSEMBLY

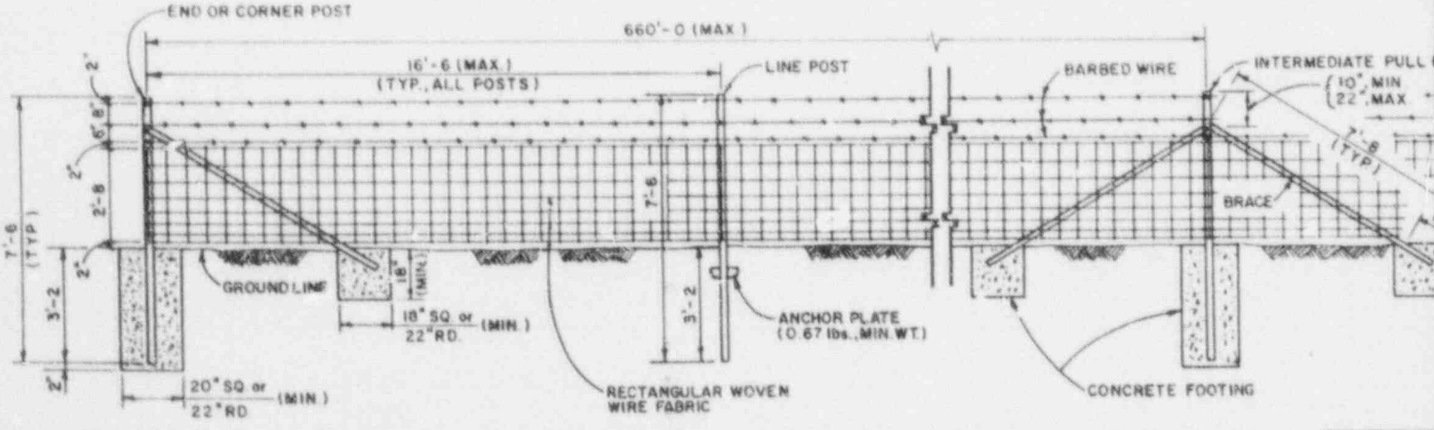
(NOT TO SCALE)



TYPICAL DOUBLE SWING GATE

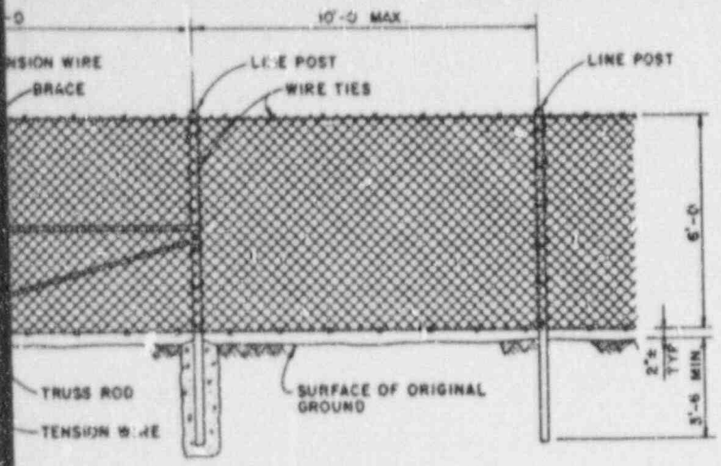
(NOT TO SCALE)

CHAIN LINK FENCE



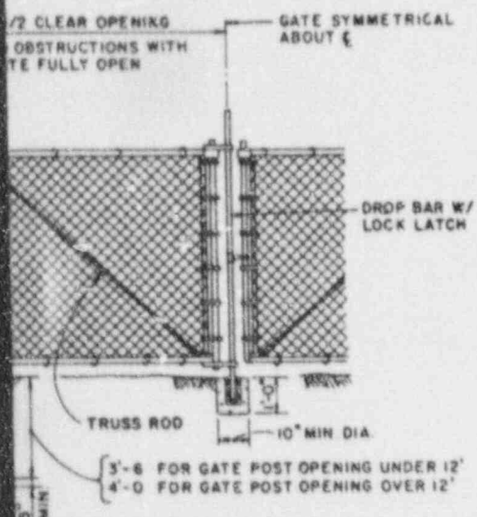
TYPICAL RECTANGULAR WOVEN WIRE FENCE ASSEMBLY

(NOT TO SCALE)

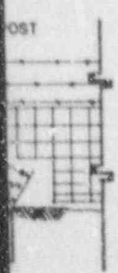


TYPICAL CORNER AND TERMINAL DETAIL

(NOT TO SCALE)



ASSEMBLY



NOTES:

1. MINOR ADJUSTMENTS TO DETAILS SHOWN WILL BE ACCEPTABLE IN ORDER TO CONFORM TO LOCAL STANDARD PRACTICE.
2. ALL GATES WILL BE CHAIN LINK TYPE.

REFERENCE DRAWINGS:

HAT-PS-10-0905	CONSTRUCTION FACILITIES AND SITE DRAINAGE
HAT-PS-10-0906	ACCESS CONTROL AND STAGING AREA SECTIONS & DETAILS

PRELIMINARY REVIEW		
E & D MANAGER	CHIEF ENGINEER	QA MANAGER

-87	ISSUED FOR PRELIMINARY REVIEW	—	—	—	—	—	—
ATE	REVISIONS	BY	CK	E&D MGR	CHIEF ENG.	T&C REV.	DOE APP.

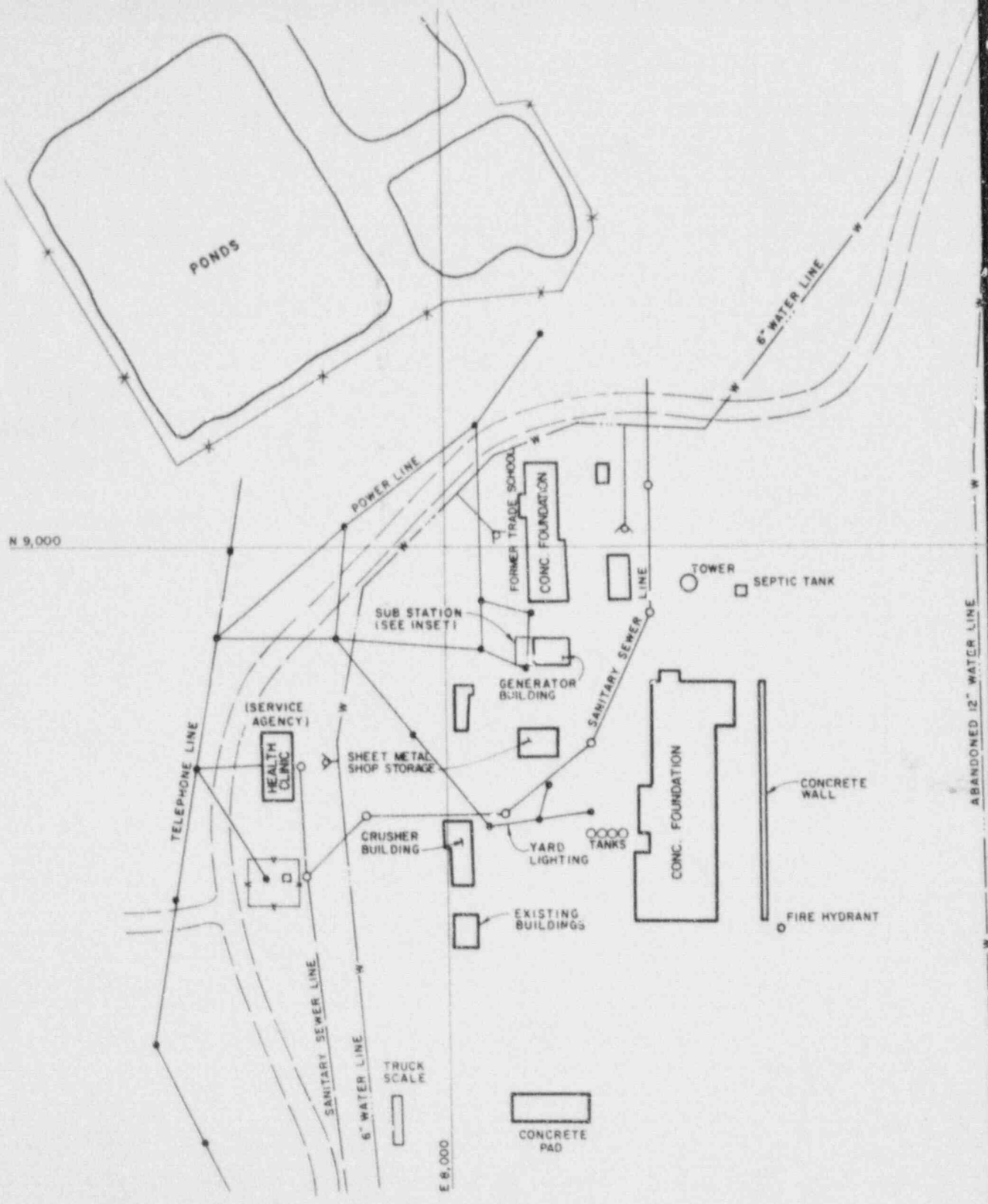
U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED DOK | DRAWN RBC
CHECKED
INSPECTED
RECOMMENDED
APPROVED | DATE | DOE PROJECT ENGINEER | DATE

MEXICAN HAT SITE
MEXICAN HAT, UTAH

FENCE AND GATE DETAILS

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT
PROJECT NO. DE-AC04-83AL18796
DRAWING NO. HAT-PS-10-0909 | REV A

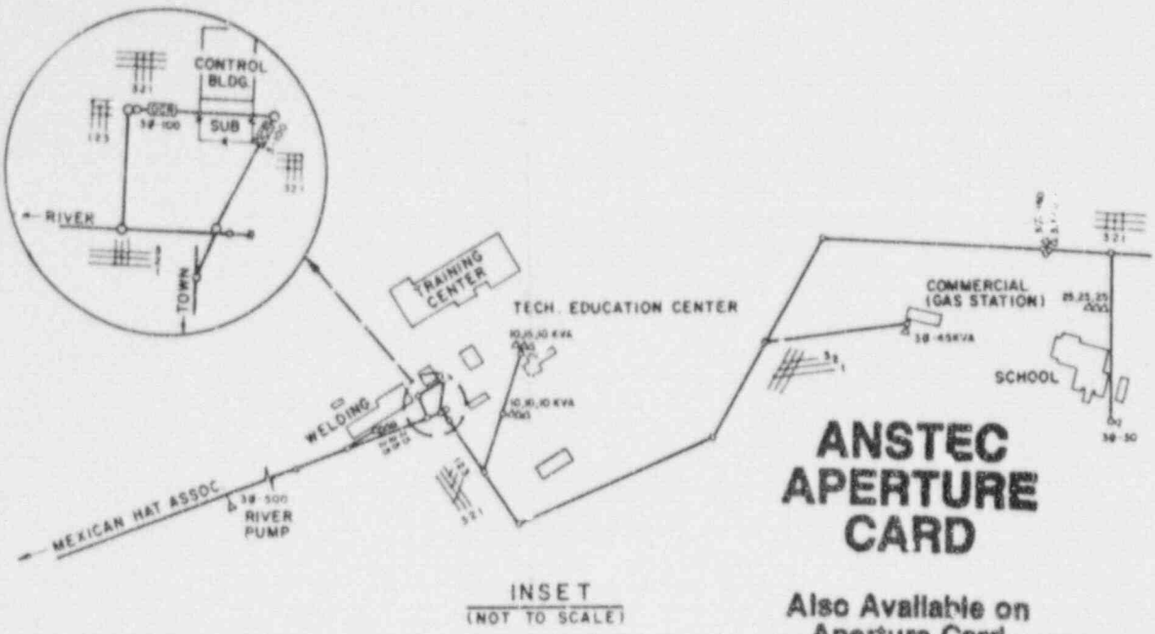


EXISTING UTILITIES LOCATION PLAN

100 0 100 200
SCALE FEET

PRELIMINARY REVIEW		
E & D MANAGER	CHIEF ENGINEER	QA MANAGER

	△	
	△	
	△	
	△	
	△	
	A	
QA MK-F	NO.	04



NOTES:

1. THIS DRAWING IS FOR INFORMATION ONLY.
2. WATER- DOMESTIC WATER FOR MEXICAN HAT IS SUPPLIED FROM A WELL BETWEEN THE TOWN & THE SAN JUAN RIVER. THE WELL IS A CONVERTED OIL EXPLORATION WELL, IN WHICH THE WATER IS NOT TREATED.
3. SEWER SYSTEM- A NEW SEWER SYSTEM WAS INSTALLED IN MEXICAN HAT IN 1984. THE SYSTEM IS CONNECTED TO TWO LAGOONS LOCATED WITHIN THE SITE BOUNDARIES.
4. TELEPHONE- CONTINENTAL TELEPHONE COMPANY OF THE WEST IN MOAB, UTAH, PROVIDES SERVICE FOR MEXICAN HAT.
5. GAS- THERE IS NO NATURAL GAS SERVICE IN MEXICAN HAT. BOTTLED PROPANE SERVICE IS AVAILABLE FROM DOXOL PROPANE IN KAYENTA, ARIZONA.
6. ELECTRICITY- ELECTRICITY FOR MEXICAN HAT IS PROVIDED BY UTAH POWER AND LIGHT COMPANY IN BLANDING.
7. ALL EXISTING STRUCTURES AND UTILITIES SHALL BE DEMOLISHED EXCEPT FOR THE HEALTH CLINIC AND SHEET METAL SHOP STORAGE BUILDINGS AND ASSOCIATED UTILITIES CONNECTED TO THESE STRUCTURES.
8. RESULTS OF SITE INVESTIGATION FOR DEMOLITION WILL BE ADDED IN FINAL DESIGN.

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED | DRAWN R. CORDOVA
CHECKED
INSPECTED
RECOMMENDED
APPROVED | DATE | DOE PROJECT ENGINEER | DATE

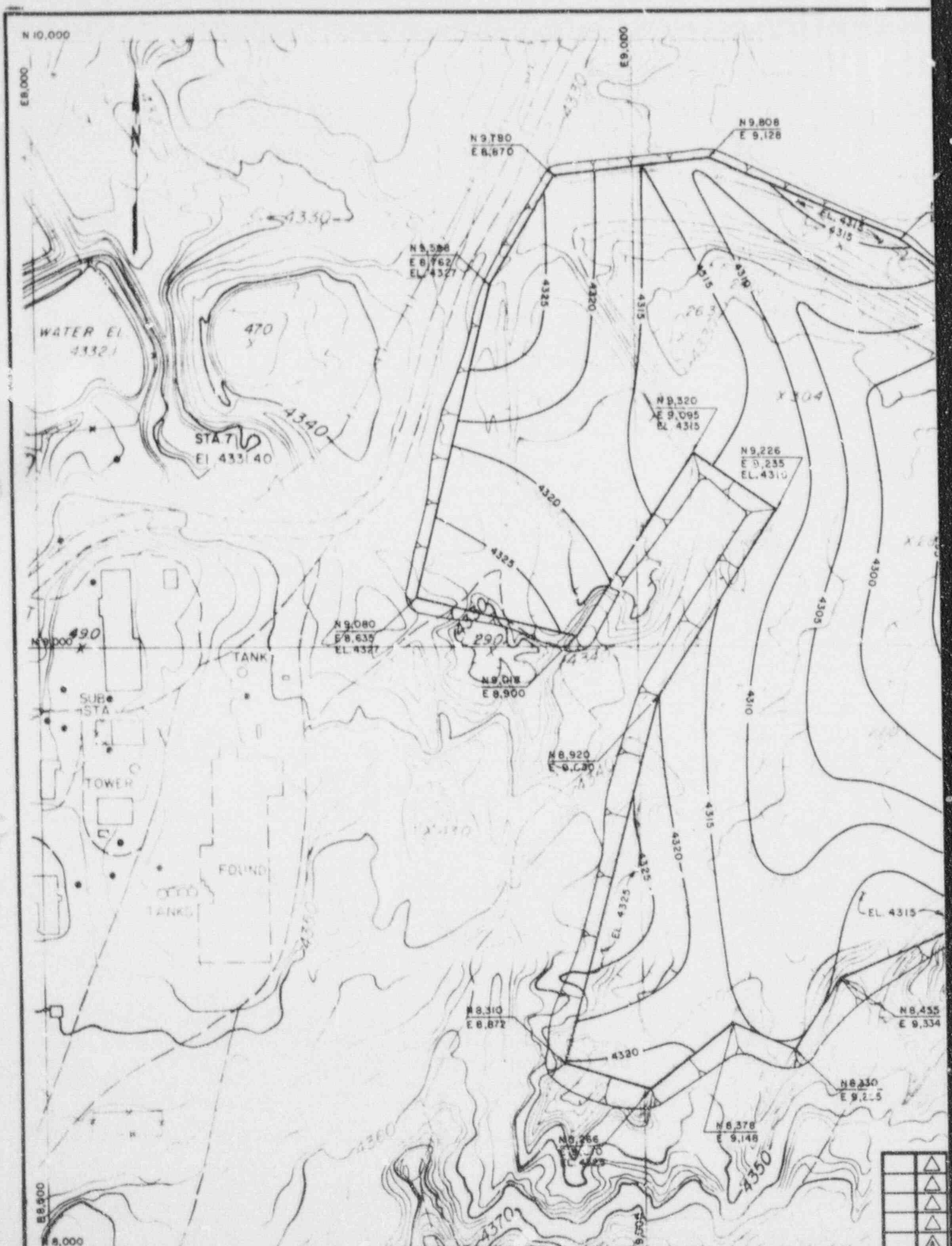
MEXICAN HAT SITE
MEXICAN HAT, UTAH

EXISTING UTILITIES AND DEMOLITION PLAN

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT
100 HOWARD ST. SAN FRANCISCO, CA 94105

PROJECT NO. DE-AC04-83AL18796
DRAWING NO. HAT-PS-10-0910
REV. A

NO.	REVISIONS	BY	CK	E&D MGR	CHIEF ENG.	TAC REV	DOE APP
1	ISSUED FOR PRELIMINARY REVIEW	—	—	—	—	—	—


N 10,000
E 8,000
E 9,000
N 9,780
E 8,870
N 9,808
E 9,128
EL. 4315
4330
N 9,586
E 8,762
EL. 4327
WATER EL.
4332.1
470
STA. 7
EL. 4331.40
4340
N 9,320
E 9,095
EL. 4315
N 9,226
E 9,235
4320
4325
4300
4305
4310
4315
N 9,080
E 8,635
EL. 4327
N 9,000
490
290
TANK
N 9,018
E 8,900
SUB
STA
TOWER
N 8,920
FOUND
TANKS
EL. 4325
EL. 4315
N 8,310
E 8,872
N 8,455
E 9,334
N 8,330
N 8,376
E 9,148
4350
4360
4370
E 8,000
N 8,000

NOTES:

1. ALL EXCAVATED CUT SLOPES SHALL BE 2(H):1(V) MAXIMUM.
2. COORDINATES SHOWN ARE ESTIMATED LIMIT OF EXCAVATION. FINAL EXCAVATION LIMITS WILL BE DETERMINED BY THE CONTRACTOR DURING CONSTRUCTION.
3. EXCAVATION WITHIN THE FINAL TAILINGS EMBANKMENT DOES NOT EXTEND TO THE BOTTOM OF THE TAILINGS. THE SUBCONTRACTOR SHALL EXCAVATE TO THE LIMITS SHOWN IN THIS AREA.

REFERENCE DRAWINGS:

LEGEND:

LIMIT OF CUT

PRELIMINARY REVIEW		
E&D MANAGER	CHIEF ENGINEER	QA MANAGER

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED | DRAWN RBC
CHECKED
INSPECTED
RECOMMENDED
APPROVED | DATE | DOE PROJECT ENGINEER | DATE

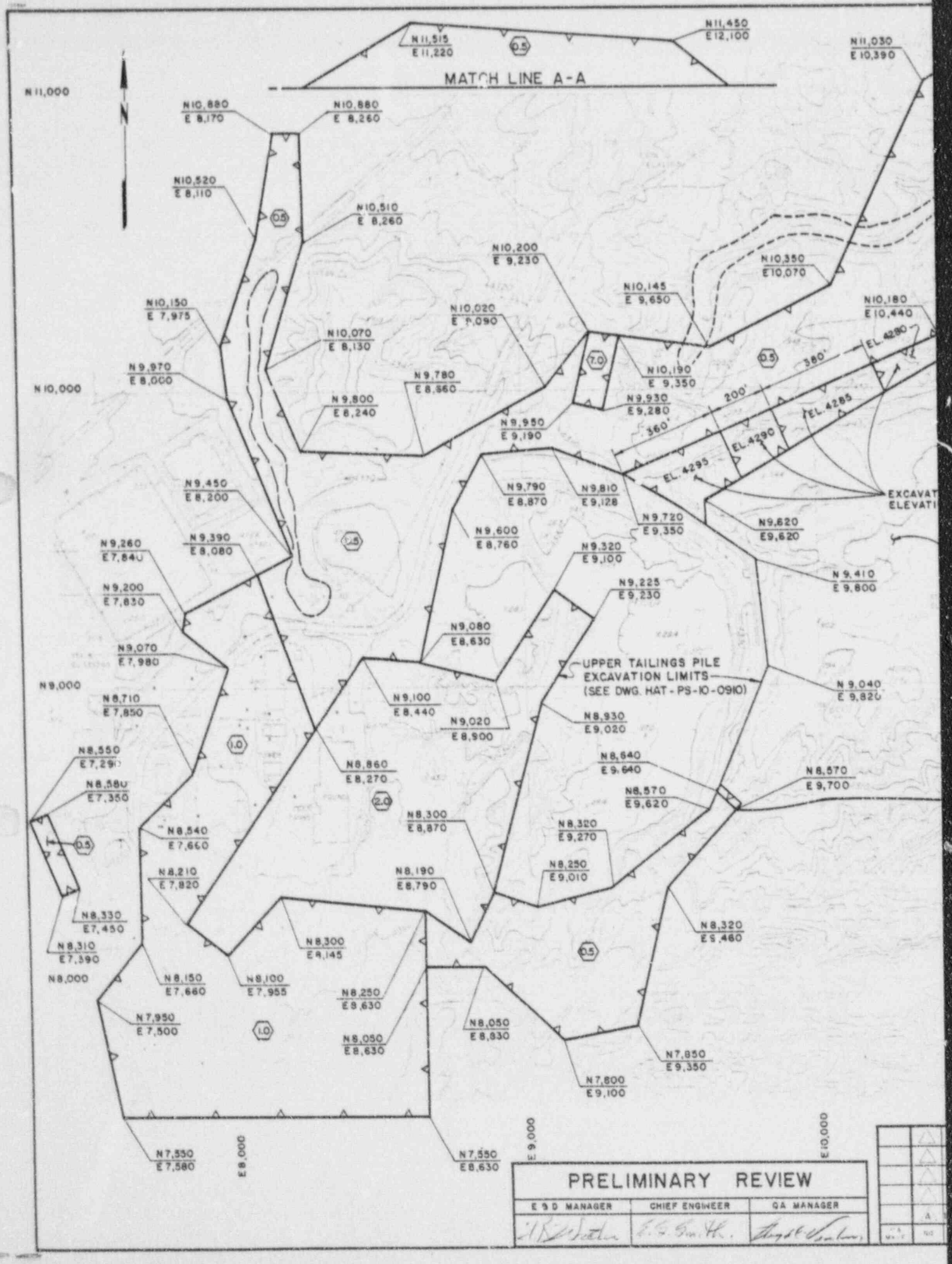
MEXICAN HAT SITE
MEXICAN HAT, UTAH

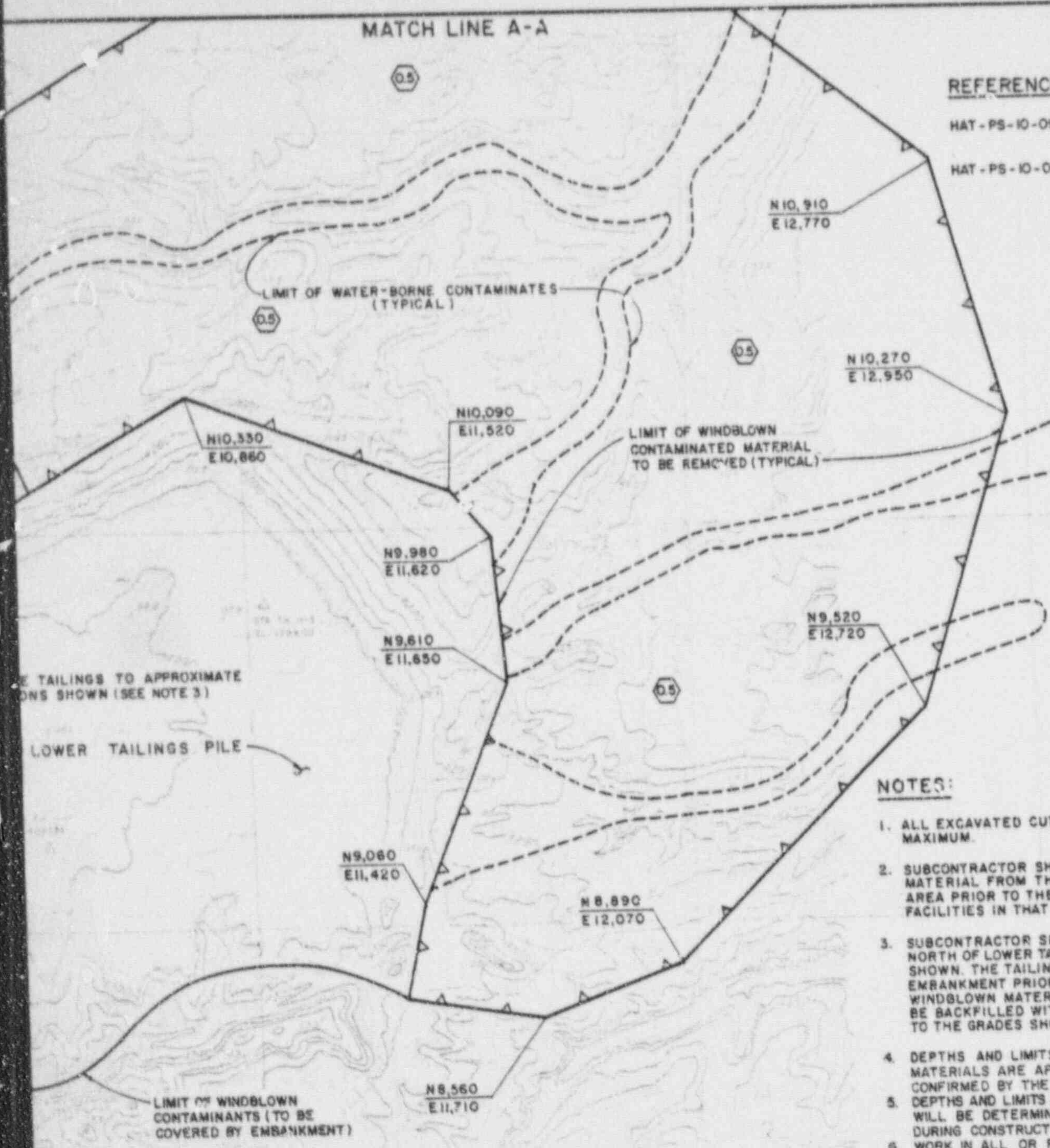
UPPER TAILINGS PILE EXCAVATION PLAN

NO	REVISIONS	BY	CK	E&D MGR	CHIEF ENG.	TAC REV	DOE APP.
0	ISSUED FOR PRELIMINARY REVIEW	—	—	—	—	—	—
DATE							

MORRISON-KNUDSEN ENGINEERS, INC.
A MORRISON KNUDSEN COMPANY
UMTRA PROJECT
180 HOWARD ST SAN FRANCISCO, CA 94105

PROJECT NO. DE-AC04-83AL18796
DRAWING NO. HAT-PS-10-0911 REV A


MATCH LINE A-A
N11,515 E11,220
N11,450 E12,100
N11,030 E10,390
N11,000
N10,880 E 8,170
N10,880 E 8,260
N10,520 E 8,110
N10,510 E 8,260
N10,200 E 9,230
N10,350 E10,070
N10,145 E 9,650
N10,150 E 7,975
N10,020 E 9,090
N10,180 E10,440
N10,070 E 8,130
N9,970 E 8,000
N10,000
N9,780 E 8,860
N10,190 E 9,350
N9,930 E9,280
N9,800 E 8,240
N9,950 E 9,190
EL. 4280
380'
200'
EL. 4285
360'
EL. 4290
EL. 4295
N9,450 E 8,200
N9,790 E 8,870
N9,810 E9,128
N9,720 E 9,350
N9,620 E9,620
N9,600 E 8,760
N9,390 E 8,080
N9,260 E7,840
N9,320 E9,100
N9,410 E 9,800
N9,200 E7,830
N9,225 E9,230
N9,080 E8,630
N9,070 E7,980
UPPER TAILINGS PILE EXCAVATION LIMITS (SEE DWG. HAT-PS-10-0910)
N9,000
N9,040 E 9,820
N8,710 E7,850
N9,100 E 8,440
N9,020 E 8,900
N8,930 E9,020
N8,550 E7,290
N8,860 E8,270
N8,640 E9,640
N8,580 E7,350
N8,570 E9,700
N8,570 E9,620
N8,540 E7,660
N8,300 E8,870
N8,320 E9,270
N8,210 E7,820
N8,250 E9,010
N8,190 E8,790
N8,330 E7,450
N8,320 E8,460
N8,310 E7,390
N8,300 E8,145
N8,000
N8,150 E7,660
N8,100 E7,955
N8,250 E8,630
N7,950 E7,500
N8,050 E8,630
N8,050 E8,830
N7,850 E9,350
N7,800 E9,100
N7,550 E7,580
E 8,000
N7,550 E8,630
N 9,000
E 10,000
PRELIMINARY REVIEW
E & D MANAGER
CHIEF ENGINEER
QA MANAGER



REFERENCE DRAWINGS:

HAT-PS-10-0910 UPPER TAILINGS PILE EXCAVATION PLAN.

HAT-PS-10-0916 FINAL SITE GRADING AND DRAINAGE PLAN.

ANSTEC APERTURE CARD

Also Available on Aperture Card

NOTES:

1. ALL EXCAVATED CUT SLOPES SHALL BE 2(H):1(V) MAXIMUM.
2. SUBCONTRACTOR SHALL REMOVE WINDBLOWN MATERIAL FROM THE STAGING AND MONITORING AREA PRIOR TO THE LAYOUT OF ANY CONSTRUCTION FACILITIES IN THAT AREA.
3. SUBCONTRACTOR SHALL EXCAVATE TAILINGS NORTH OF LOWER TAILINGS PILE TO ELEVATIONS SHOWN. THE TAILINGS SHALL BE PLACED ON THE EMBANKMENT PRIOR TO THE PLACEMENT OF WINDBLOWN MATERIAL. EXCAVATED AREAS SHALL BE BACKFILLED WITH UNCONTAMINATED MATERIAL TO THE GRADES SHOWN ON DWG. HAT-PS-10-0916
4. DEPTHS AND LIMITS OF WIND BLOWN CONTAMINATED MATERIALS ARE APPROXIMATE AND WILL BE CONFIRMED BY THE CONTRACTOR DURING CONSTRUCTION
5. DEPTHS AND LIMITS OF WATER-BORNE CONTAMINATES WILL BE DETERMINED BY THE CONTRACTOR DURING CONSTRUCTION.
6. WORK IN ALL OR PORTIONS OF THE ARROYO AREAS MAY BE QUALIFIED UNDER SUPPLEMENTAL STANDARDS. EXTENT OF REMOVAL OF CONTAMINATED MATERIALS MAY BE MODIFIED AS APPLICABLE.

LEGEND:

Symbol	Meaning
------	WATER TRANSPORT LIMITS
N 9,000	CONSTRUCTION GRID COORDINATES
(1.0)	DEPTH OF EXCAVATION IN FEET
△ △	LIMIT OF EXCAVATION

9710240078 - 12

E11,000 E12,000

200 0 200 400
SCALE FEET

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

MEXICAN HAT SITE
MEXICAN HAT, UTAH

WINDBLOWN MATERIALS
EXCAVATION PLAN

RBC

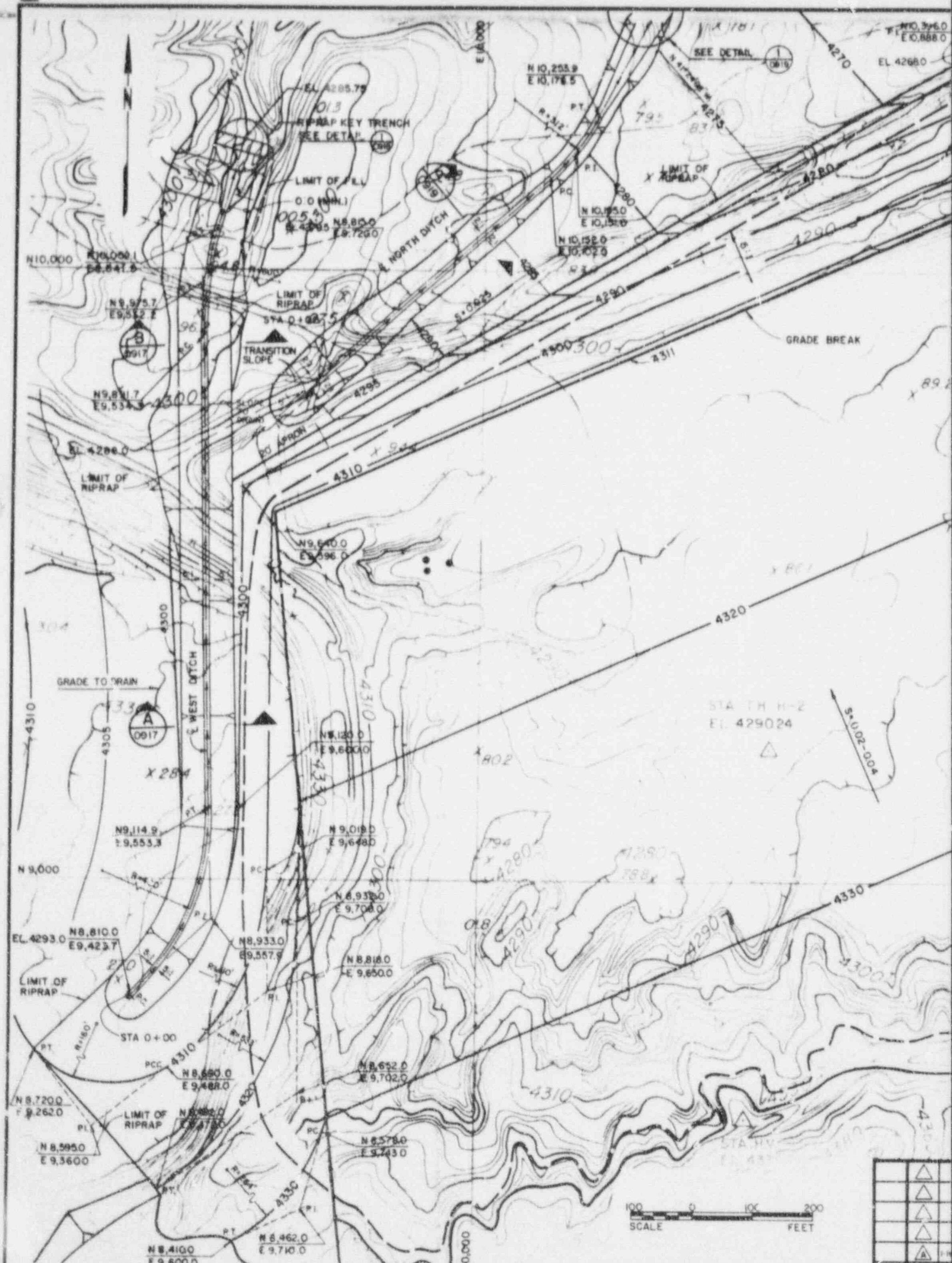
MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT

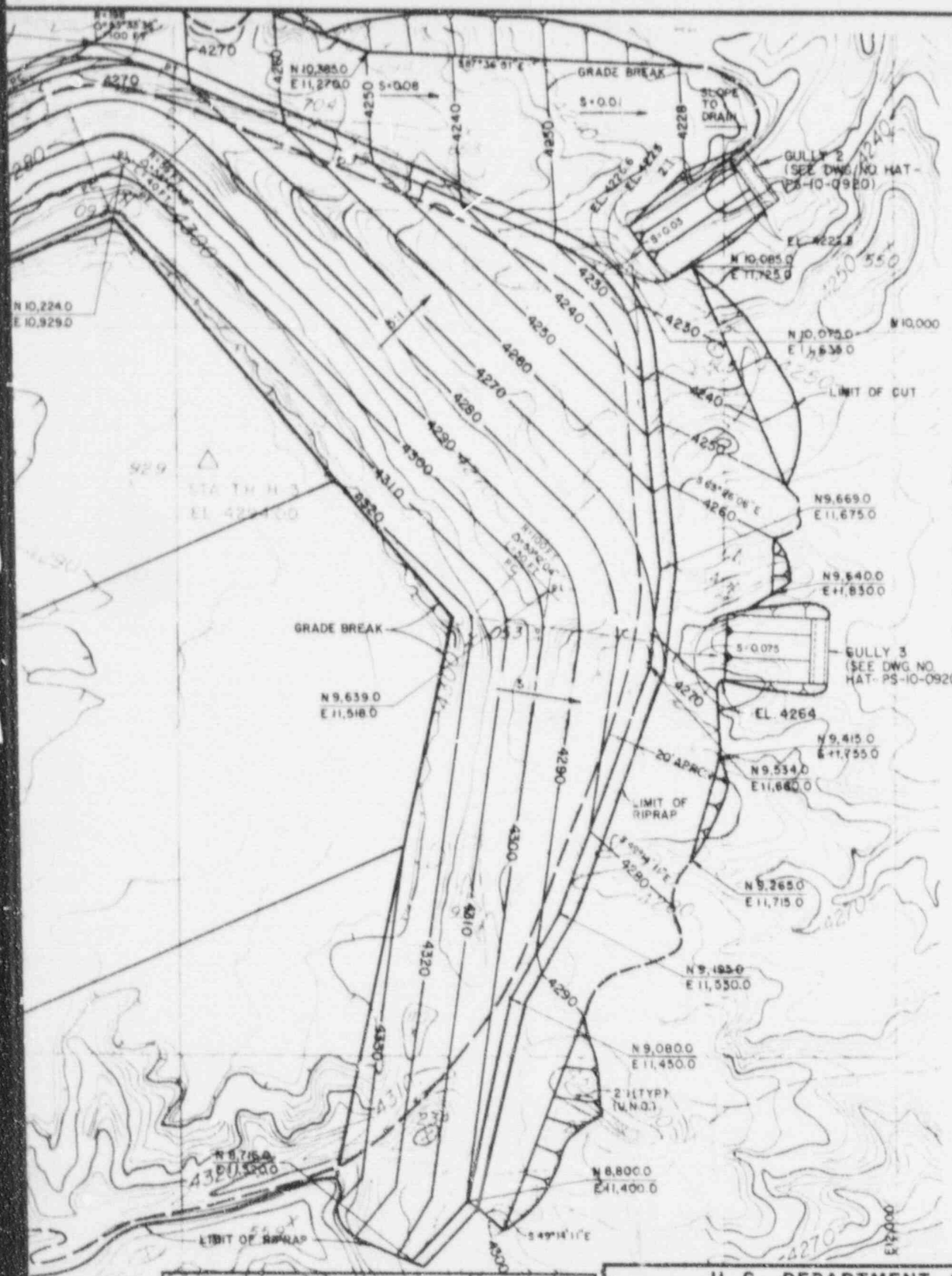
DE-AC04-83AL18796

HAT-PS-10-0912 A

ISSUED FOR PRELIMINARY REVIEW

REVISIONS


N
SEE DETAIL
EL. 4285.75
RIPRAP KEY TRENCH
SEE DETAIL
LIMIT OF FILL
LIMIT OF RIPRAP
N 10,253.9
E 10,176.5
N 10,135.0
E 10,151.0
N 10,152.0
E 10,102.0
N10,396.0
E10,888.0
EL. 4268.0
N8,810.0
E9,720.0
N10,000
NORTH DITCH
LIMIT OF RIPRAP
STA 0+92.75
N9,975.7
E9,532.2
TRANSITION SLOPE
GRADE BREAK
N9,871.7
E9,534.3
APRON
EL. 4288.0
LIMIT OF RIPRAP
N9,640.0
E9,596.0
4320
4310
4300
4290
4280
4330
WEST DITCH
GRADE TO DRAIN
STA TH H-2
EL. 4290.24
N9,120.0
E9,600.0
N9,114.9
E9,553.3
N9,019.0
E9,648.0
N 9,000
N8,931.0
E9,708.0
EL.4293.0
N8,810.0
E9,423.7
N8,933.0
E9,557.9
N8,818.0
E9,650.0
LIMIT OF RIPRAP
STA 0+00
N8,650.0
E9,488.0
N8,652.0
E9,702.0
N8,720.0
E9,262.0
LIMIT OF RIPRAP
N8,595.0
E9,360.0
N8,579.0
E9,743.0
N8,462.0
E9,710.0
N8,410.0
E9,600.0
E10,000
SCALE
FEET
100
0
100
200
NO.



ANSTEC APERTURE CARD

Also Available on Aperture Card

REFERENCE DRAWINGS:

HAT-PS-10-0917
SITE DRAINAGE (SHEET 1 OF 3)

HAT-PS-10-0918
SITE DRAINAGE (SHEET 2 OF 3)

HAT-PS-10-0919
SITE DRAINAGE (SHEET 3 OF 3)

HAT-PS-10-0920
TAILINGS EMBANKMENT EROSION PROTECTION

LEGEND:

- EXISTING CONTOURS
- 4320 FINAL CONTOURS
- DRAINAGE DITCH
- N10,000 CONSTRUCTION GRID COORDINATE
- TOP OF CUT
- TOP OF FILL
- LIMIT OF CONTAMINATED MATERIAL

PRELIMINARY REVIEW

E&D MANAGER	CHIEF ENGINEER	QA MANAGER

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

MEXICAN HAT SITE
MEXICAN HAT, UTAH

TAILINGS EMBANKMENT PLAN

DESIGNED	DRAWN	CHECKED	INSPECTED	RECOMMENDED	APPROVED	DATE	DOE PROJECT ENGINEER	DATE
N. Miyamoto	RBC/WSO							

9710240078-13

REV	REVISIONS	BY	CK	E&D MGR	CHIEF ENG	TAC REV	DOE APP
0	ISSUED FOR PRELIMINARY REVIEW						

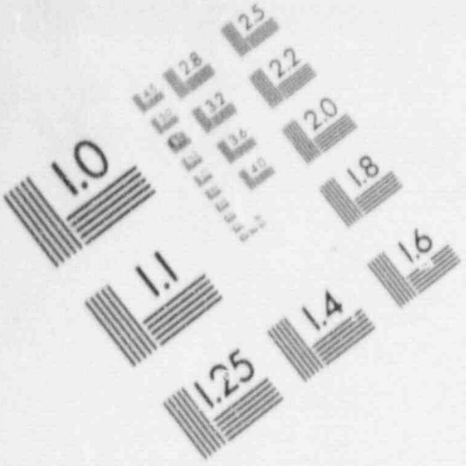
MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT
50 HOWARD ST. SAN FRANCISCO CA 94105

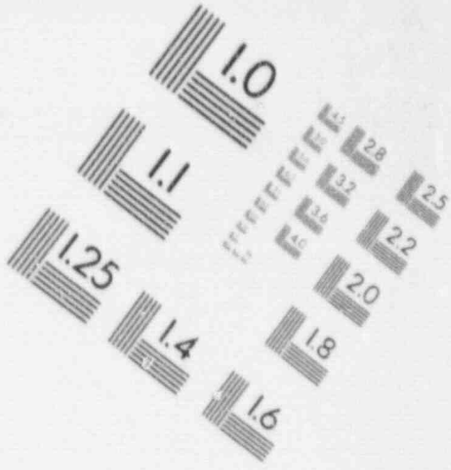
PROJECT NO. DE-AC04-83AL18796

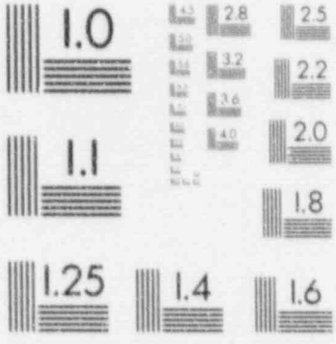
DRAWING NO. HAT-PS-10-0913 REV A

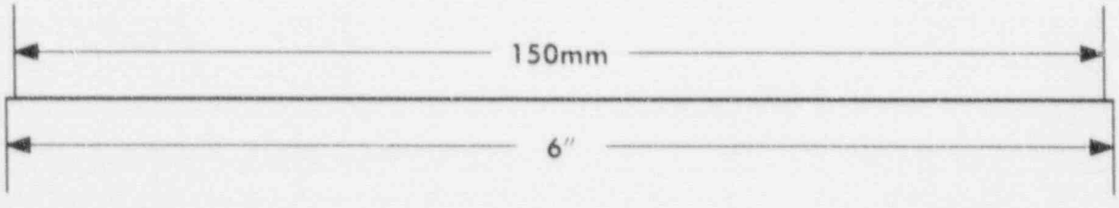
2

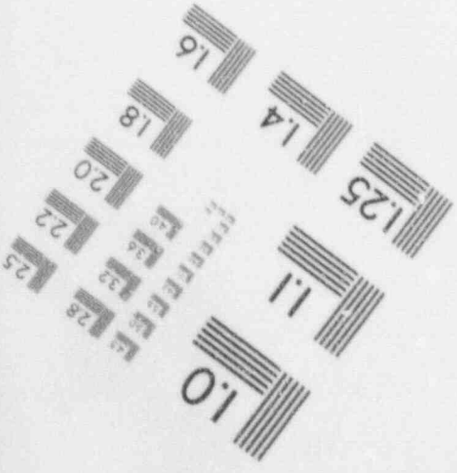
IMAGE EVALUATION TEST TARGET (MT-3)

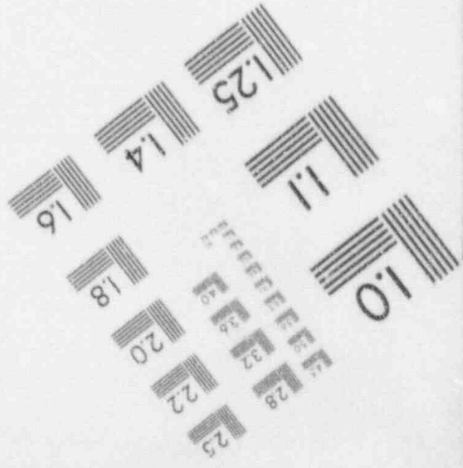








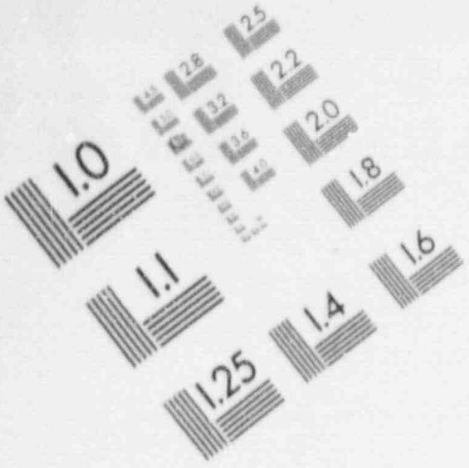


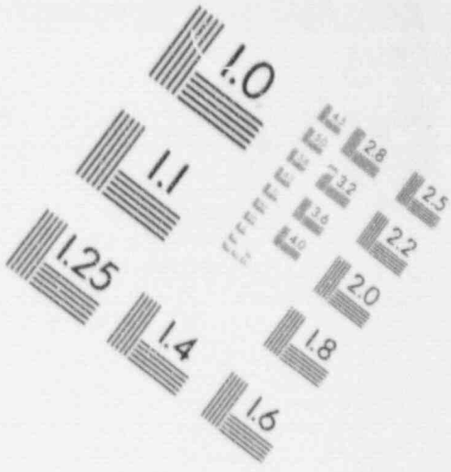


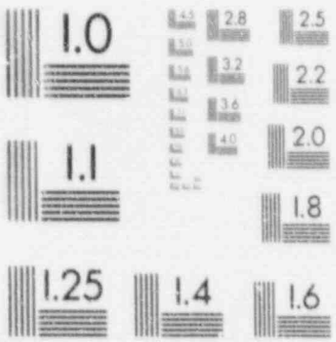
PHOTOGRAPHIC SCIENCES CORPORATION
770 BASKET ROAD
P.O. BOX 338
WEBSTER, NEW YORK 14580
(716) 265-1600

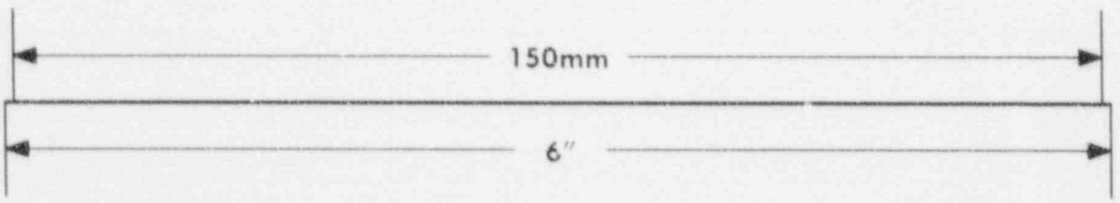
2

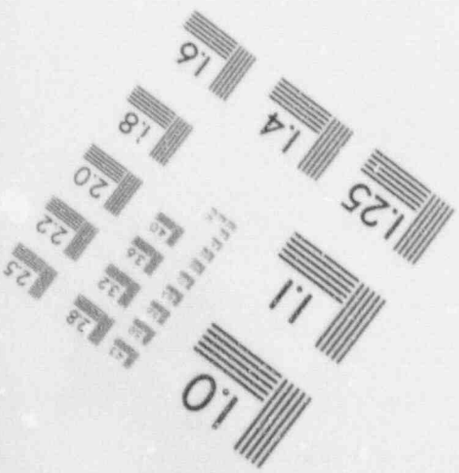
IMAGE EVALUATION TEST TARGET (MT-3)

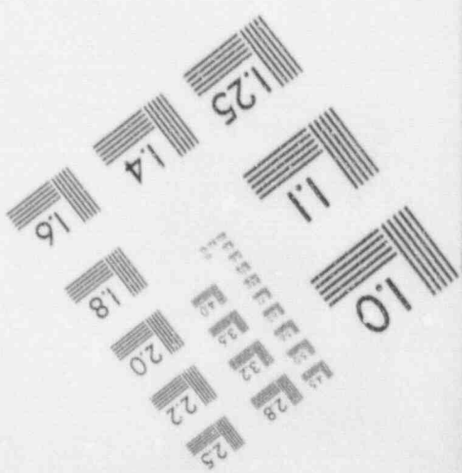












PHOTOGRAPHIC SCIENCES CORPORATION
770 BASKET ROAD
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WEBSTER, NEW YORK 14580
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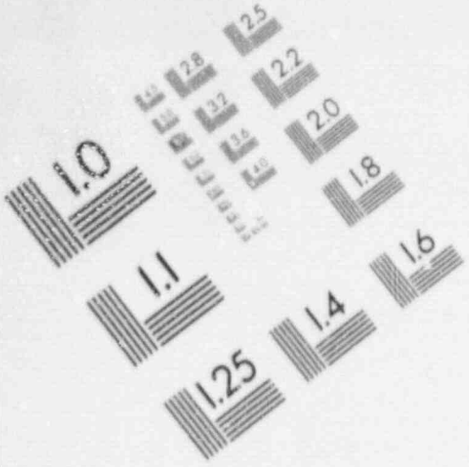
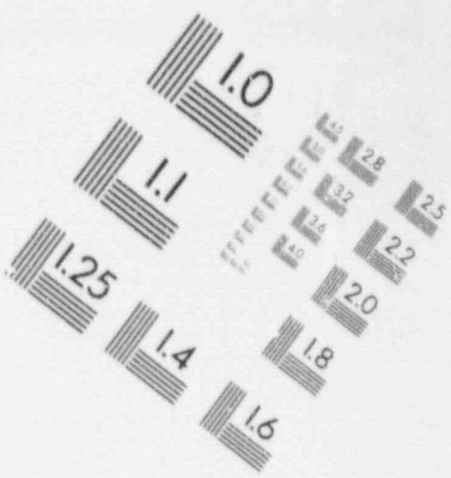
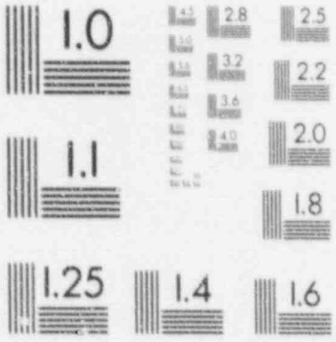
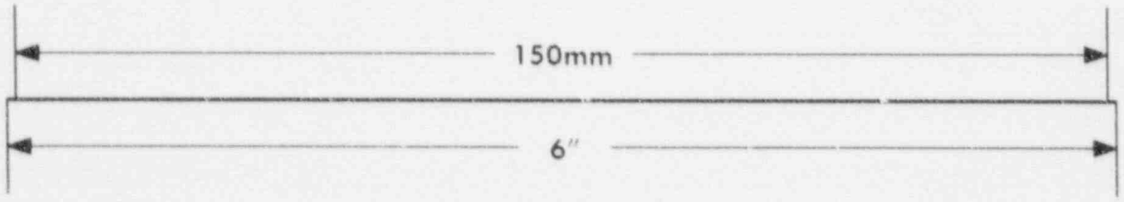
2

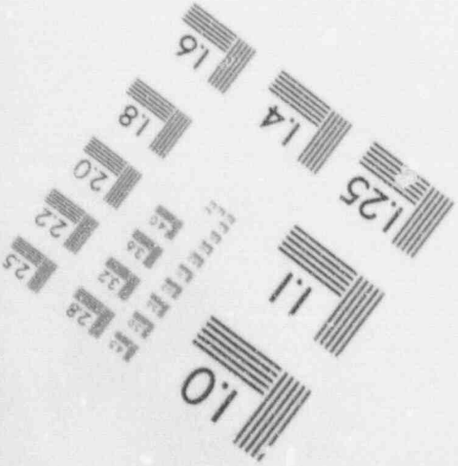
IMAGE EVALUATION TEST TARGET (MT-3)

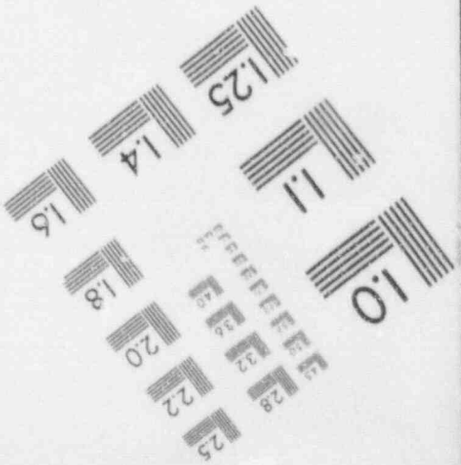












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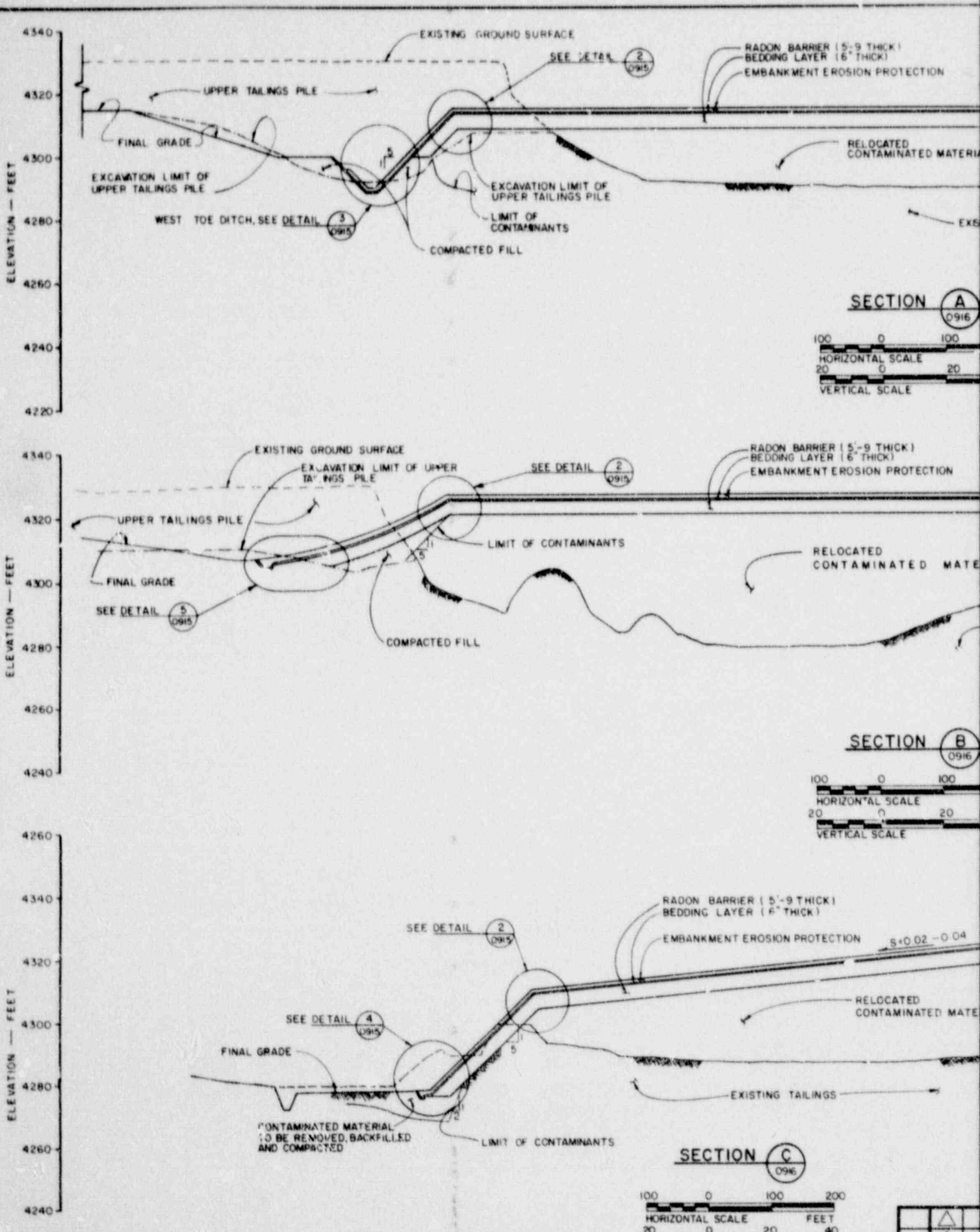
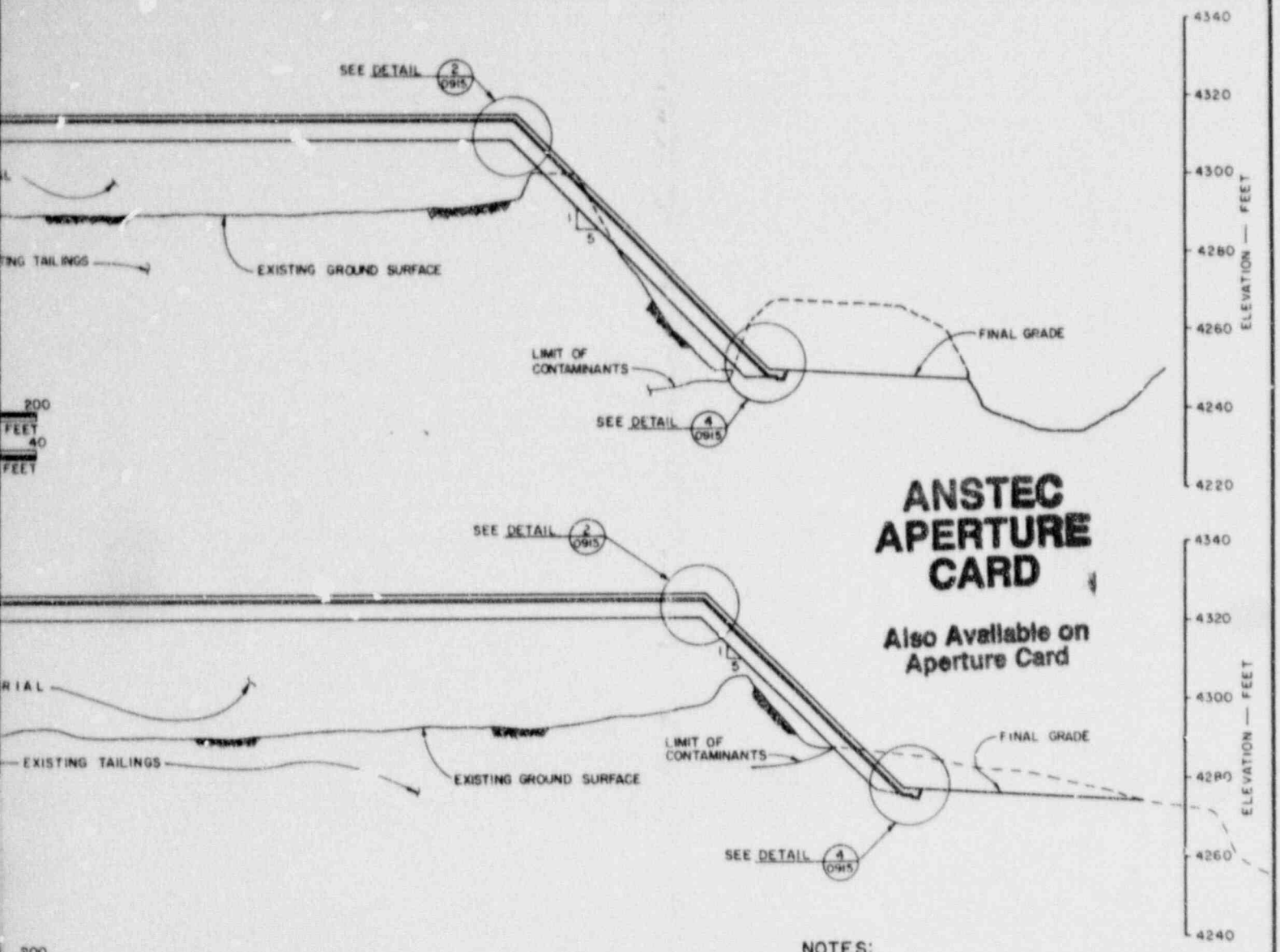
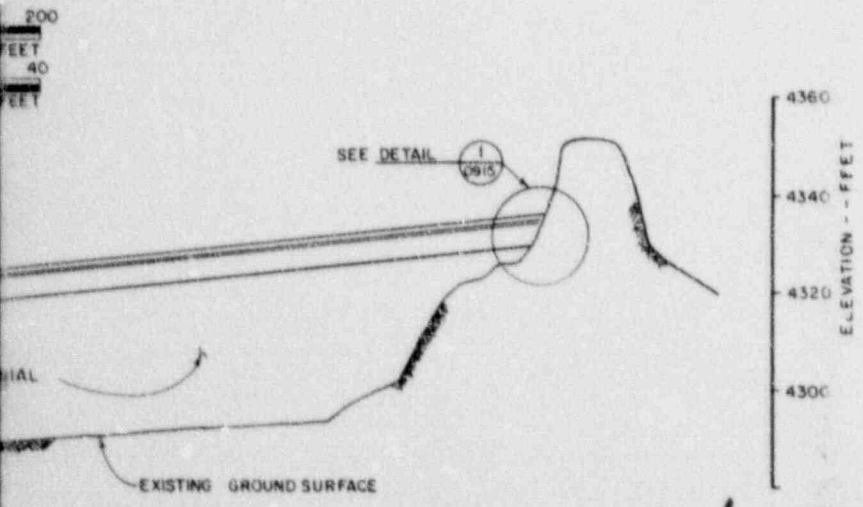
(716) 265-1600


ELEVATION — FEET
4340
4320
4300
4280
4260
4240
4220
EXISTING GROUND SURFACE
SEE DETAIL 2 0915
RADON BARRIER (5'-9 THICK)
BEDDING LAYER (6" THICK)
EMBANKMENT EROSION PROTECTION
UPPER TAILINGS PILE
FINAL GRADE
EXCAVATION LIMIT OF UPPER TAILINGS PILE
WEST TOE DITCH, SEE DETAIL 3 0915
COMPACTED FILL
LIMIT OF CONTAMINANTS
RELOCATED CONTAMINATED MATERIA
EXS
SECTION A 0916
100 0 100
HORIZONTAL SCALE
20 0 20
VERTICAL SCALE
ELEVATION — FEET
4340
4320
4300
4280
4260
4240
EXISTING GROUND SURFACE
EXCAVATION LIMIT OF UPPER TAILINGS PILE
SEE DETAIL 2 0915
RADON BARRIER (5'-9 THICK)
BEDDING LAYER (6" THICK)
EMBANKMENT EROSION PROTECTION
UPPER TAILINGS PILE
LIMIT OF CONTAMINANTS
RELOCATED CONTAMINATED MATE
FINAL GRADE
SEE DETAIL 5 0915
COMPACTED FILL
SECTION B 0916
100 0 100
HORIZONTAL SCALE
20 0 20
VERTICAL SCALE
ELEVATION — FEET
4260
4340
4320
4300
4280
4260
4240
SEE DETAIL 2 0915
RADON BARRIER (5'-9 THICK)
BEDDING LAYER (6" THICK)
EMBANKMENT EROSION PROTECTION
S=0.02 – 0.04
RELOCATED CONTAMINATED MATE
SEE DETAIL 4 0915
FINAL GRADE
EXISTING TAILINGS
CONTAMINATED MATERIAL TO BE REMOVED, BACKFILLED AND COMPACTED
LIMIT OF CONTAMINANTS
SECTION C 0916
100 0 100 200
HORIZONTAL SCALE FEET
20 0 20 40
VERTICAL SCALE FEET





NOTES:

1. THICKNESS OF RADON BARRIER MAY BE REVISED BY THE CONTRACTOR AS REQUIRED IN FINAL ANALYSIS.

REFERENCE DRAWINGS:

HAT-PS-10-0915 TAILINGS EMBANKMENT DETAILS
HAT-PS-10-0916 FINAL SITE GRADING AND DRAINAGE PLAN

PRELIMINARY REVIEW		
E & D MANAGER	CHIEF ENGINEER	QA MANAGER

9710240078 - 14

REVISIONS	BY	CK	E&D MGR	CHIEF ENG.	TAC REV	DOE APP
0 ISSUED FOR PRELIMINARY REVIEW						

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

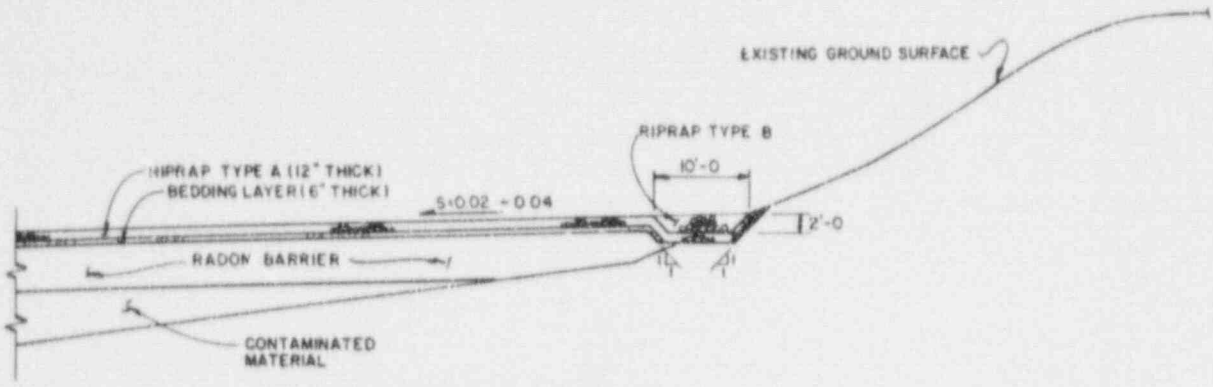
DESIGNED | DRAWN RBC/
CHECKED
INSPECTED
RECOMMENDED
APPROVED | DATE | DOE PROJECT ENGINEER | DATE

MEXICAN HAT SITE
MEXICAN HAT, UTAH

TAILINGS EMBANKMENT SECTIONS

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT

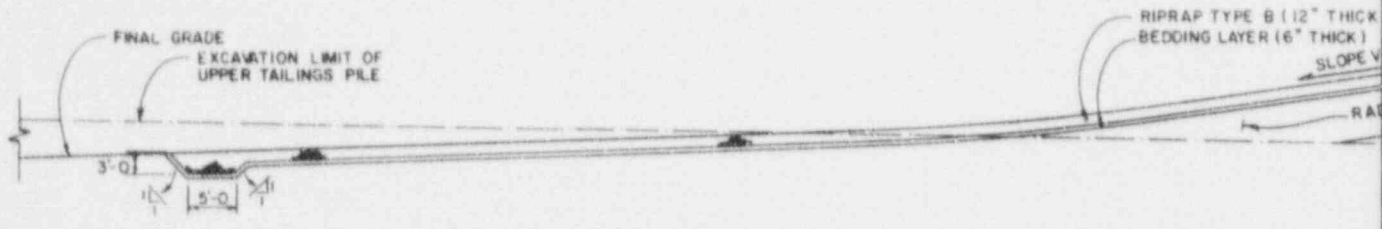
PROJECT NO. DE-AC04-83AL18796
DRAWING NO. HAT-PS-10-0914 REV. A



TYPICAL KEY FOR SOUTH TOE

DETAIL 1/0914

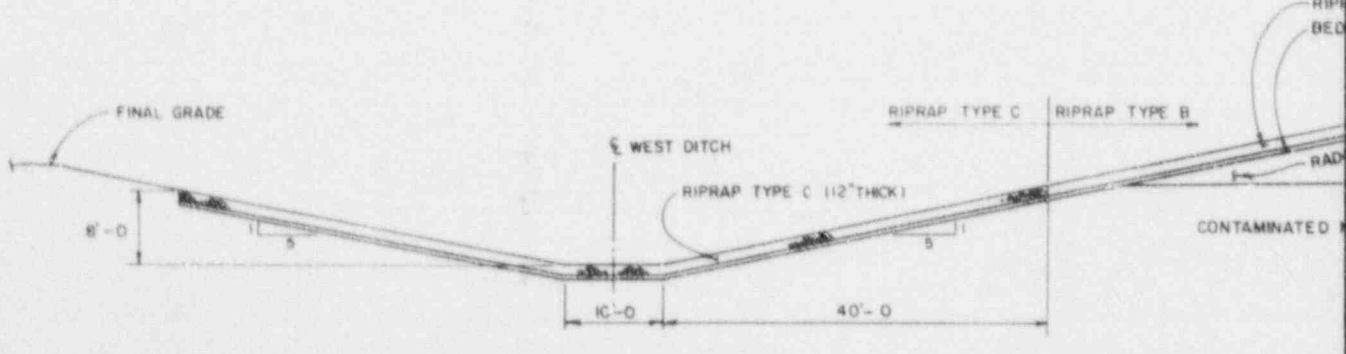
10 0 10 20
SCALE FEET



TYPICAL KEY FOR WEST TOE

DETAIL 5/0914

10 0 10 20
SCALE FEET

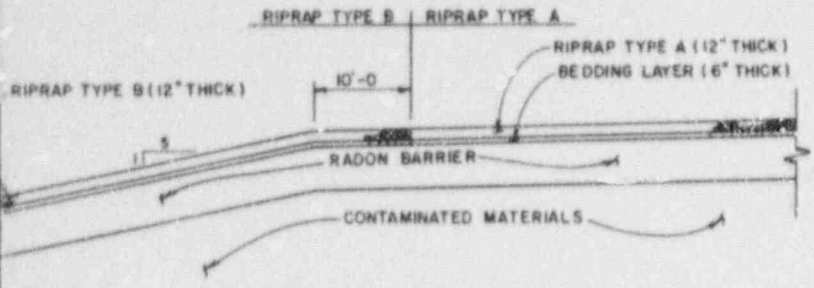


EMBANKMENT TOE WITH DITCH

DETAIL 3/0914

10 0 10 20
SCALE FEET

PRELIMINARY REVIEW		
E & D MANAGER	CHIEF ENGINEER	QA MANAGER

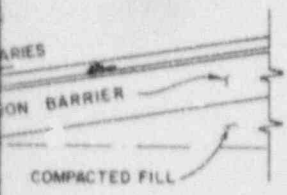


TYPICAL TRANSITION FROM RIPRAP TYPE A TO TYPE B

DETAIL 2 / 0914

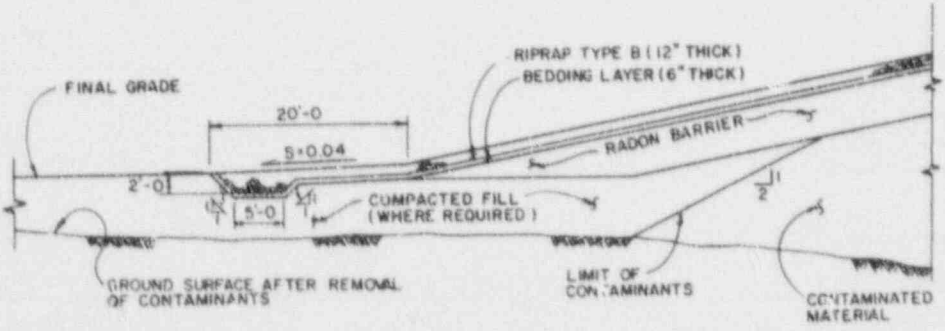
REFERENCE DRAWINGS:

HAT-PS-10-0914 TAILINGS EMBANKMENT SECTIONS



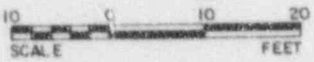
ANSTEC APERTURE CARD

Also Available on Aperture Card



TYPICAL NORTH AND EAST APRON

DETAIL 4 / 0914



9710240078-15

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

MEXICAN HAT SITE
MEXICAN HAT, UTAH

TAILINGS EMBANKMENT DETAILS

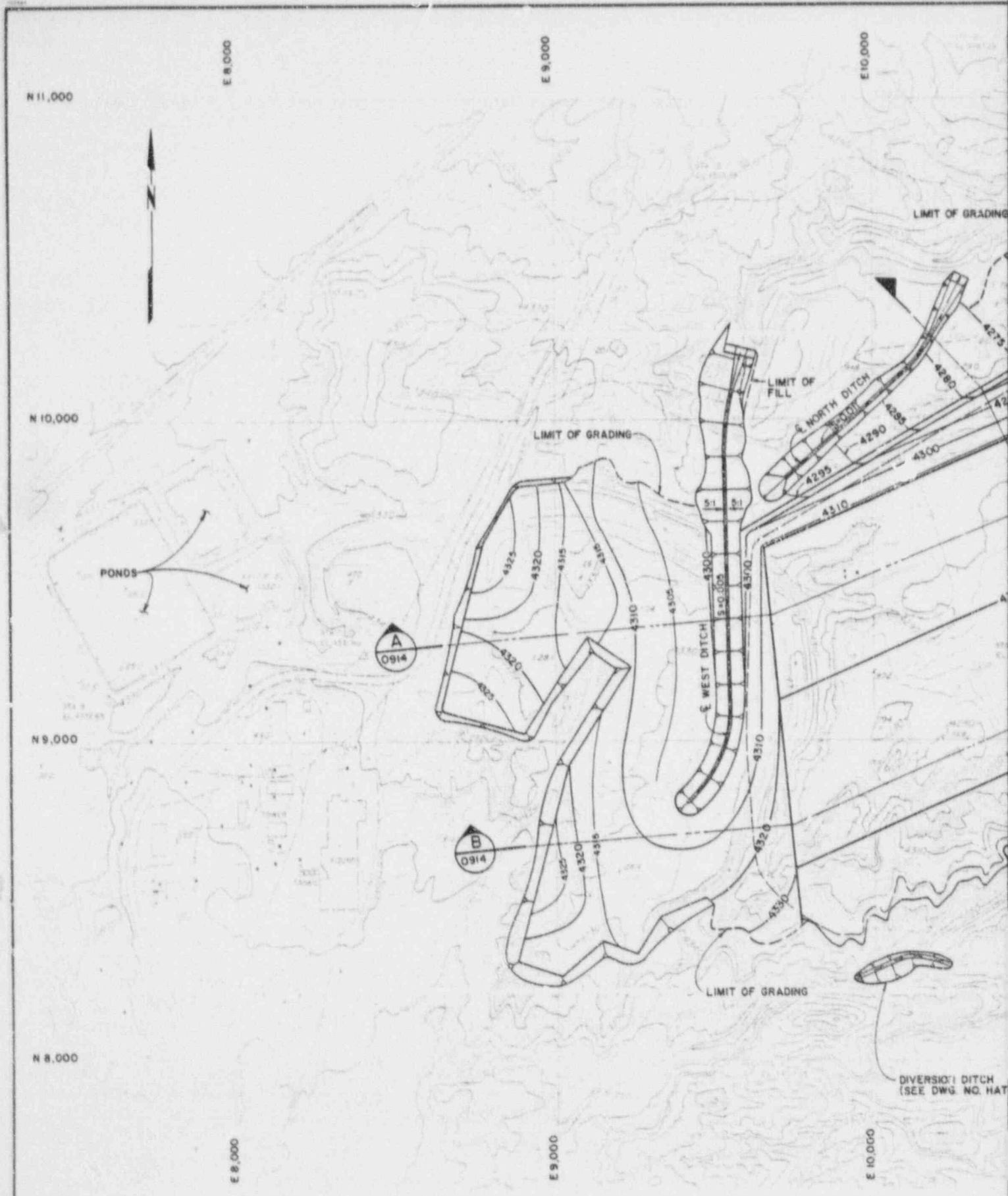
DRAWN	DATE
RBC	
DESIGNED	
RECOMMENDED	
APPROVED	DATE
DOE PROJECT ENGINEER	DATE

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT

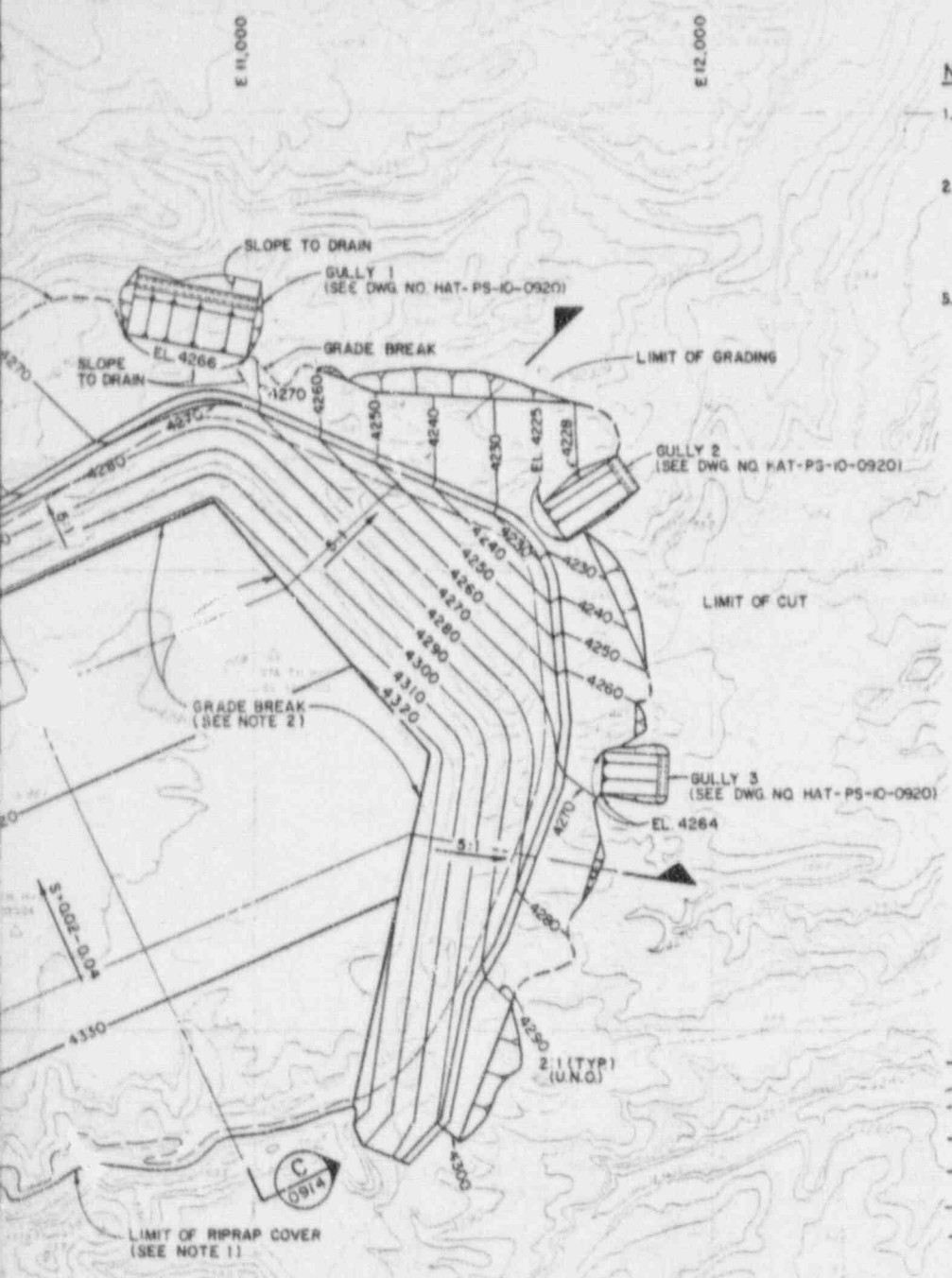
PROJECT NO. DE-AC04-83AL18796

DRAWING NO. HAT-PS-10-0915 REV. A

NO.	REVISIONS	BY	CK	T&D MGR	CHIEF ENG.	TAC REV.	DOE APP.
0	ISSUED FOR PRELIMINARY REVIEW	—	—	—	—	—	—



PRELIMINARY REVIEW		
E & D MANAGER	CHIEF ENGINEER	QA MANAGER



NOTES:

1. EMBANKMENT CONTOURS SHOWN ARE REFERENCED TO TOP OF EROSION PROTECTION LAYER.
2. THE ACTUAL LOCATION OF THE GRADE BREAK BETWEEN THE EMBANKMENT TOP AND THE 5:1 SIDESLOPES WILL VARY ON THE AMOUNT OF CONTAMINATED MATERIAL PLACED IN THE EMBANKMENT. THE EMBANKMENT SHOWN HAS A RELOCATED CONTAMINATED MATERIAL CAPACITY OF APPROXIMATELY 1.6 MILLION CUBIC YARDS.
3. SURFACE DISPLACEMENT MONUMENTS WILL BE ADDED IN FINAL DESIGN.

REFERENCE DRAWINGS:

HAT-PS-10-0905	CONSTRUCTION FACILITIES AND SITE DRAINAGE
HAT-PS-10-0914	TAILINGS EMBANKMENT SECTIONS
HAT-PS-10-0918	SITE DRAINAGE (SHEET 2 OF 2)
HAT-PS-10-0919	SITE DRAINAGE (SHEET 3 OF 2)
HAT-PS-10-0920	TAILINGS EMBANKMENT EROSION PROTECTION
HAT-PS-10-0911	UPPER TAILINGS PILE EXCAVATION PLAN
HAT-PS-10-0913	TAILINGS EMBANKMENT PLAN

LEGEND:

4300	EXISTING CONTOURS
4320	FINAL CONTOURS
	DRAINAGE DITCH
N11,000	CONSTRUCTION GRID COORDINATE
	TOP OF FILL
	TOP OF CUT
	LIMIT OF TAILINGS

1	ISSUED FOR PRELIMINARY REVIEW	—	—	—	—	—	—
NO.	REVISIONS	BY	CK	ENG APP	CHIEF ENG	ENG DEV	DOE APP

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED	DRAWN
	RBC/ECG
CHECKED	
APPROVED	
APPROVED	

MEXICAN HAT SITE
MEXICAN HAT, UTAH

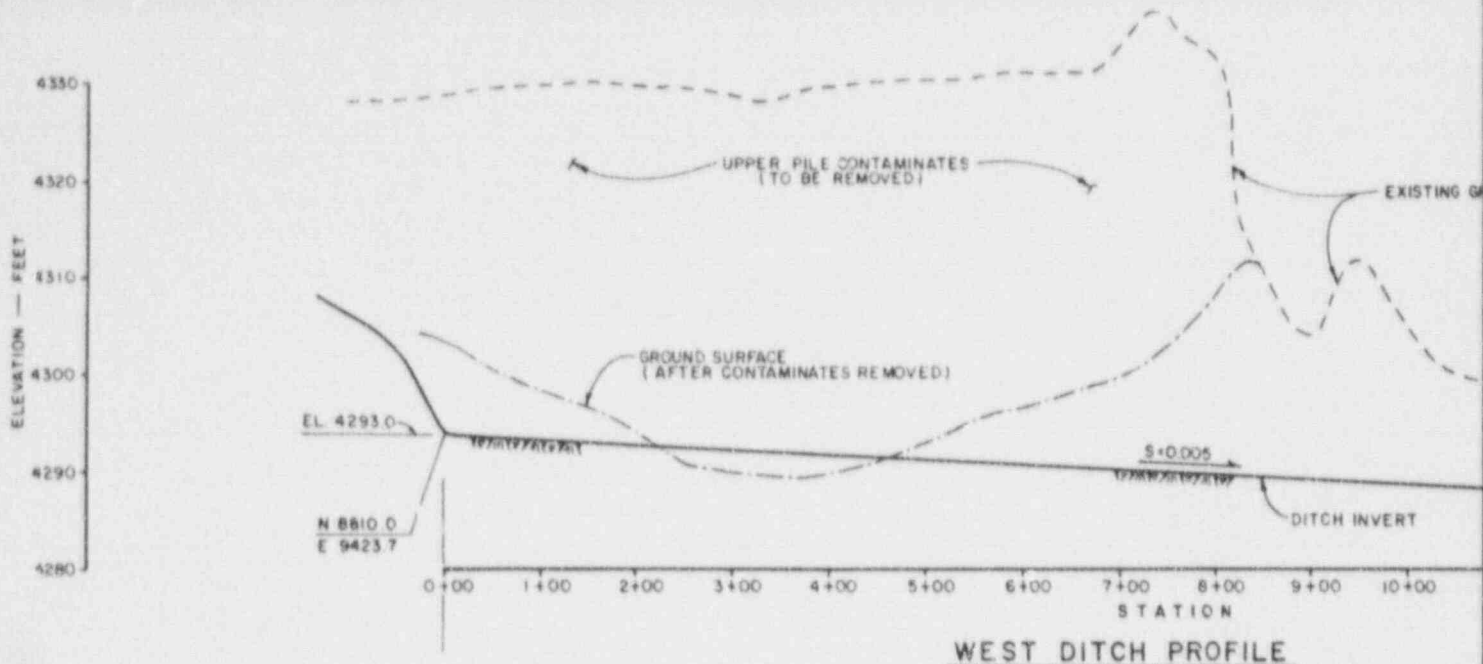
FINAL SITE GRADING AND DRAINAGE PLAN

APPROVED	DATE	DOE PROJECT ENGINEER	DATE

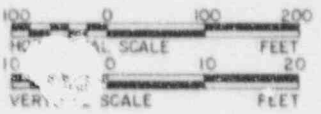
MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT

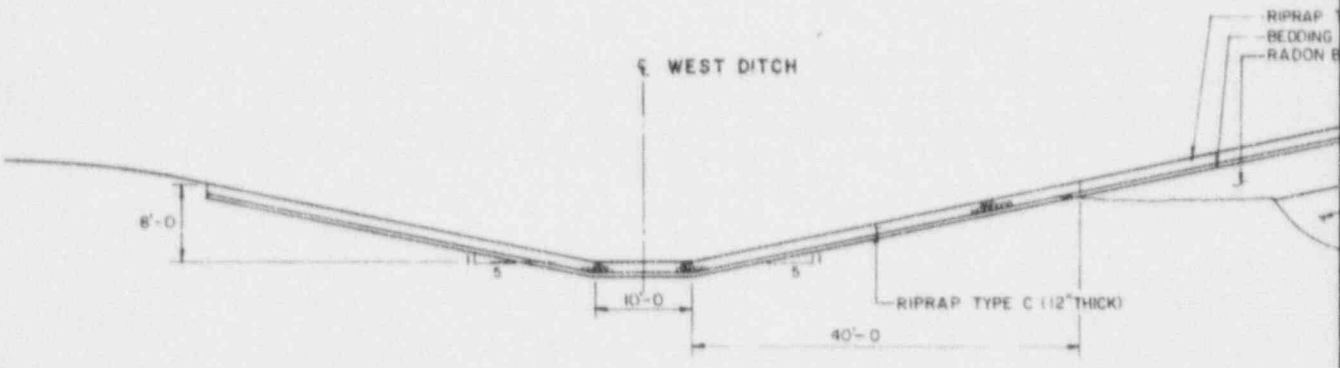
PROJECT NO. DE-AC04-83AL18796

DRAWING NO. HAT-PS-10-0916 REV. A

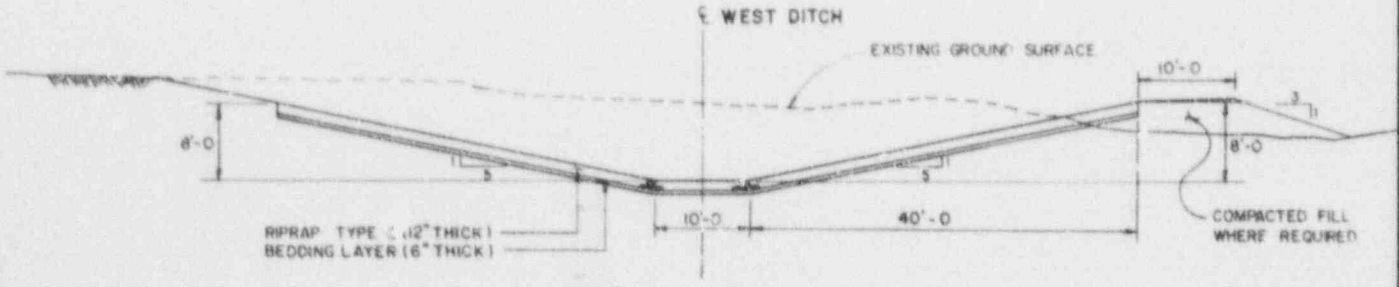


WEST DITCH PROFILE

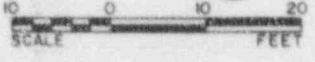


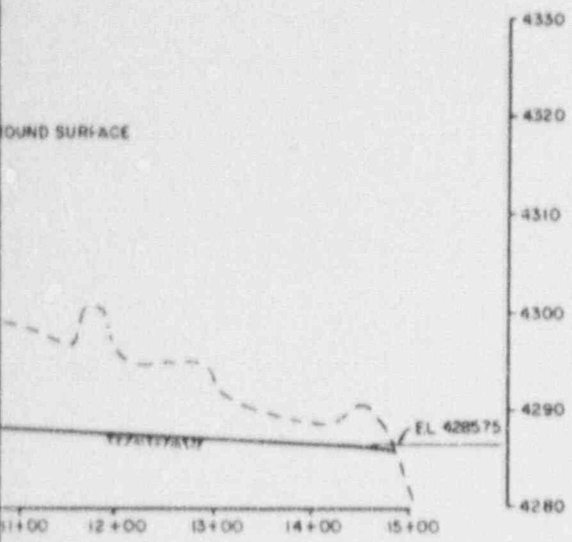


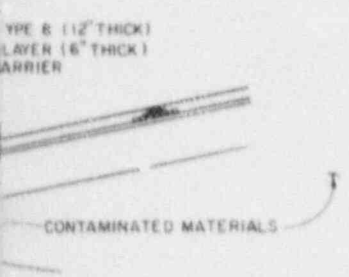
SECTION A (0913)



SECTION B (0913)







NOTES:

REFERENCE DRAWINGS:

HAT-PS-10-0913 TAILINGS EMBANKMENT PLAN

ANSTEC APERTURE CARD

Also Available on Aperture Card

PRELIMINARY REVIEW		
E & D MANAGER	CHIEF ENGINEER	QA MANAGER

9710240078-17

ISSUED FOR PRELIMINARY REVIEW							
REVISIONS	BY	CK	E&D MGR	CHIEF ENG	TAC REV	DOE APP	

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

MEXICAN HAT SITE
MEXICAN HAT, UTAH

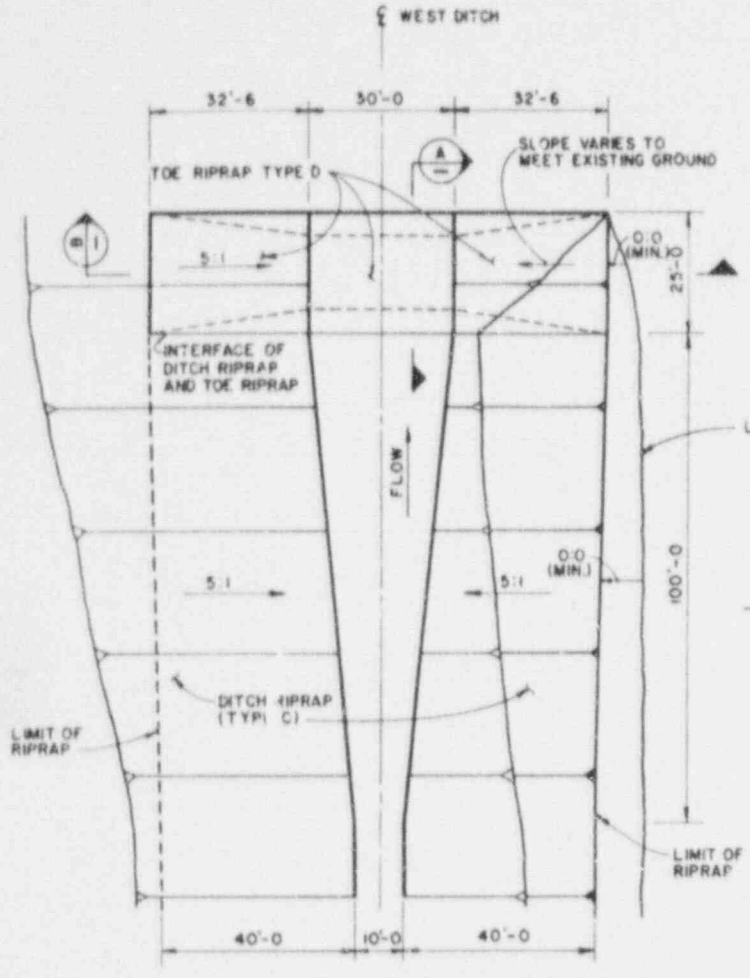
SITE DRAINAGE
(SHEET 1 OF 3)

DESIGNED | DRAWN RBC/ | CHECKED | INSPECTED | RECOMMENDED | APPROVED | DATE | DOE PROJECT ENGINEER | DATE

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT

PROJECT NO. DE-AC04-83AL18796

DRAWING NO. HAT-PS-10-0917 REV A

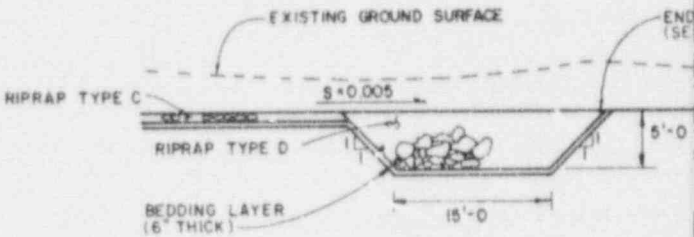


WEST DITCH TOE OUTLET

DETAIL 1 (0913)

20 0 20 40

SCALE FEET

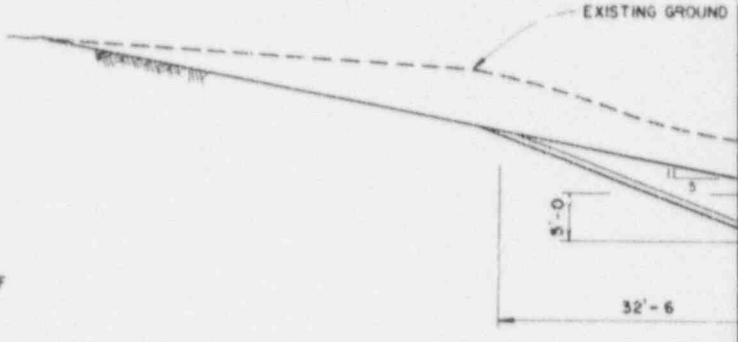


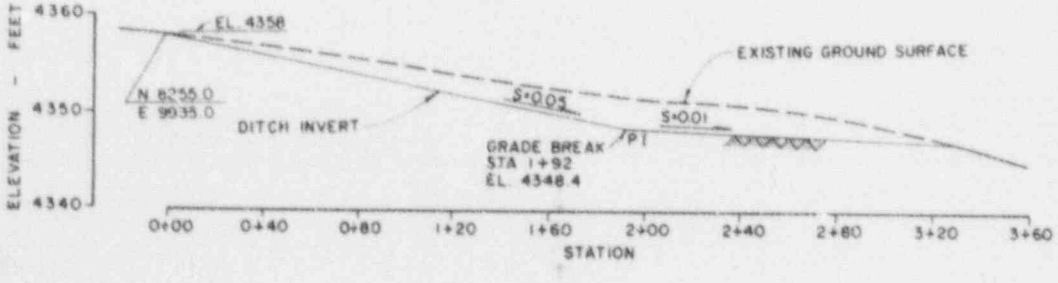
WEST DITCH OUTLE

SECTION A

10 0 10

SCALE FEE





PROFILE OF DIVERSION DITCH

(HAT-PS-10-0905)

40 0 40 80

HORIZONTAL SCALE FEET

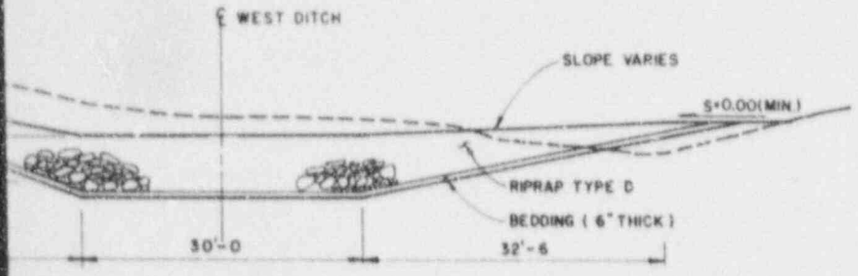
10 0 10 20

VERTICAL SCALE FEET

OF DEFINED DITCH EL. 4285.75
DWG. NO. HAT-PS-10-0913)

NOTES:

URFACE

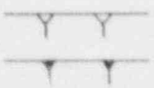


WEST DITCH OUTLET
SECTION (B)

REFERENCE DRAWINGS:

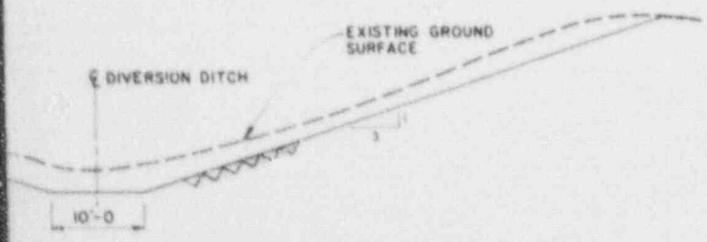
HAT-PS-10-0905	CONSTRUCTION FACILITIES AND SITE DRAINAGE
HAT-PS-10-0913	TAILINGS EMBANKMENT PLAN
HAT-PS-10-0916	FINAL SITE GRADING AND DRAINAGE PLAN

LEGEND:

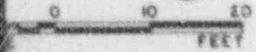


TOP OF CUT

TOP OF FILL



VERSION DITCH
YP. SECTION (C 0905)



PRELIMINARY REVIEW		
E & D MANAGER	CHIEF ENGINEER	QA MANAGER

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED | DRAWN: E.C.G./W.S.D.
TRACED
INSPECTED
RECOMMENDED
APPROVED | DATE | DOE PROJECT ENGINEER | DATE

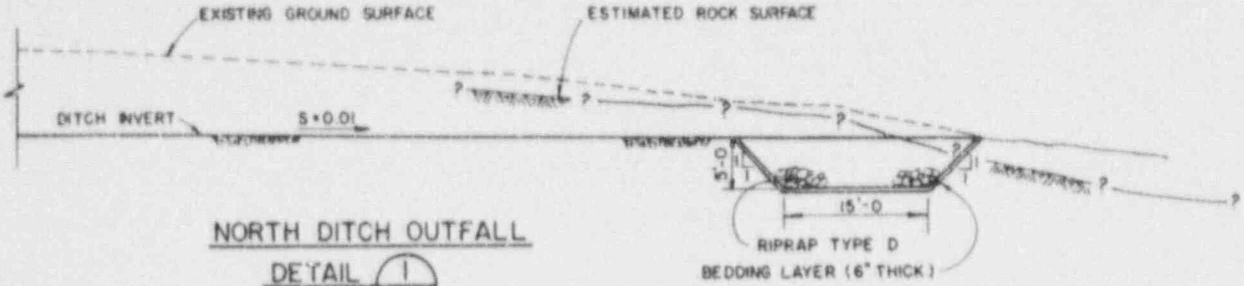
MEXICAN HAT SITE
MEXICAN HAT, UTAH
SITE DRAINAGE
(SHEET 2 OF 3)

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT

PROJECT NO. DE-AC04-83AL18796
DRAWING NO. HAT-PS-10-0918 | REV. A

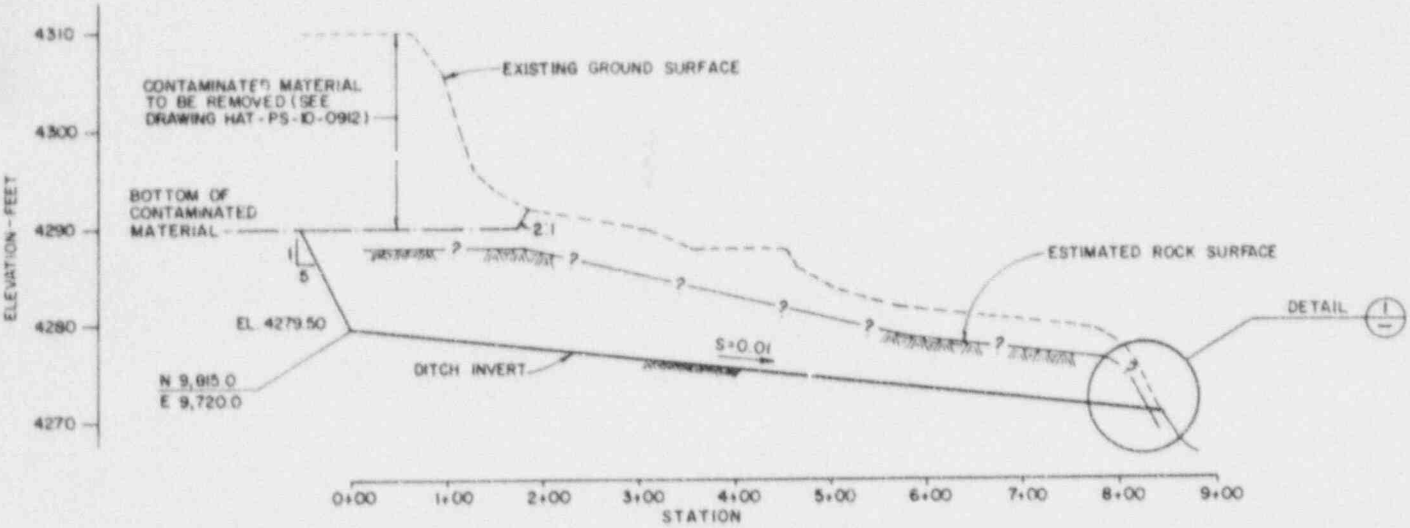
BY	REVISIONS	BY	CK	E&D MGR	CHIEF ENG.	TAC REV.	DOE APV.
BT	ISSUED FOR PRELIMINARY REVIEW	—	—	—	—	—	—

9710240078-18

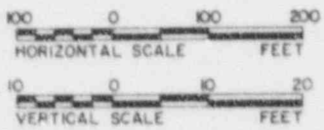


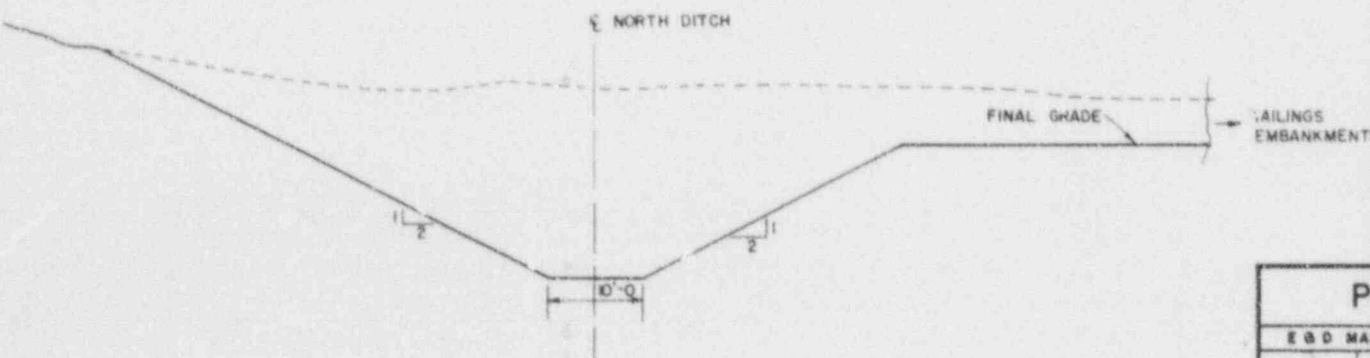
NORTH DITCH OUTFALL

DETAIL 1



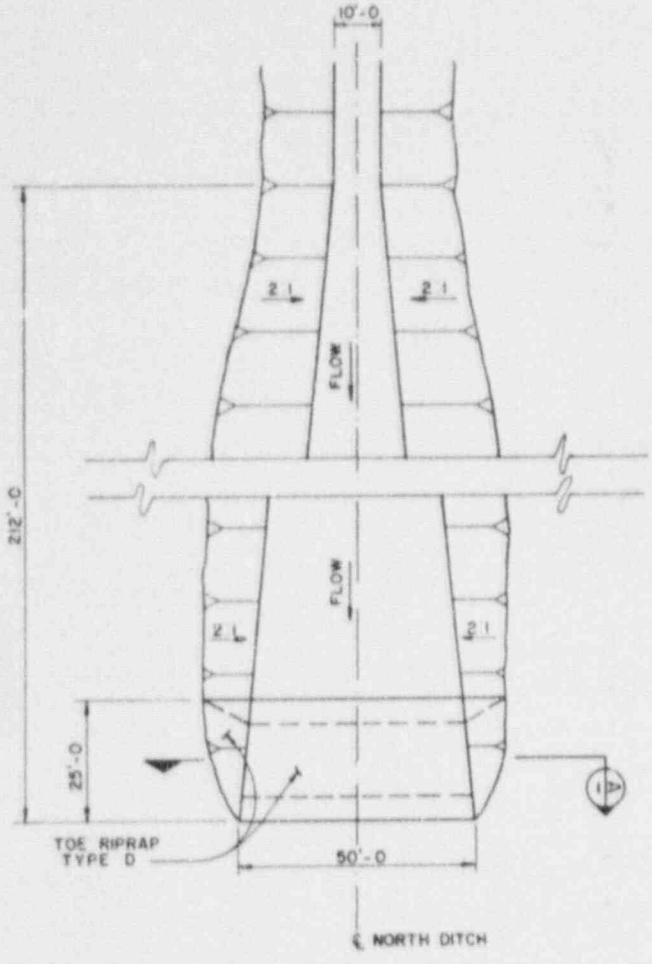
NORTH DITCH PROFILE





TYPICAL CROSS SECTION - NORTH DITCH

SECTION C



NORTH DITCH TOE OUTLET

DETAIL (1) 0916

20 0 20 40

SCALE FEET

NOTES:

1. THE LOCATION OF THE ROCK SURFACE AS SHOWN IS APPROXIMATE AND WILL BE VERIFIED DURING CONSTRUCTION.

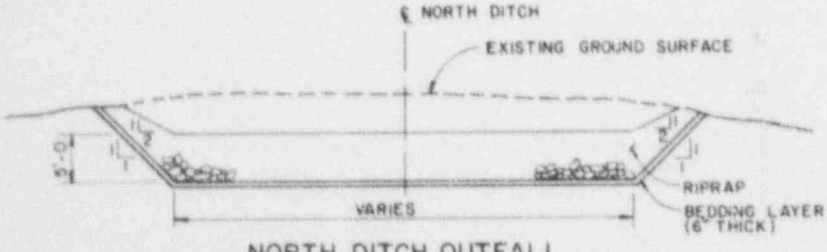
REFERENCE DRAWINGS:

HAT - PS - 10 - 0912, WINDBLOWN MATERIAL EXCAVATION PLAN

HAT - PS - 10 - 0916, FINAL SITE GRADING AND DRAINAGE PLAN

LEGEND:

TOP OF CUT



NORTH DITCH OUTFALL

SECTION (A) —

10 0 10 20

ELIMINARY REVIEW

GER	CHIEF ENGINEER	QA MANAGER
	E.S. Smith	

87	ISSUED FOR PRELIMINARY REVIEW	—	—	—	—	—	—
PE	REVISIONS	BY	CK	EQP MGR.	CHIEF ENG	TAC REV	DOE APP

U. S. DEPARTMENT OF ENERGY

ALBUQUERQUE, NEW MEXICO

DESIGNED	DRAWN E.C.G.
CHECKED H. Richards	
INSPECTED A. Smith	
RECOMMENDED	

MEXICAN HAT SITE
MEXICAN HAT, UTAH

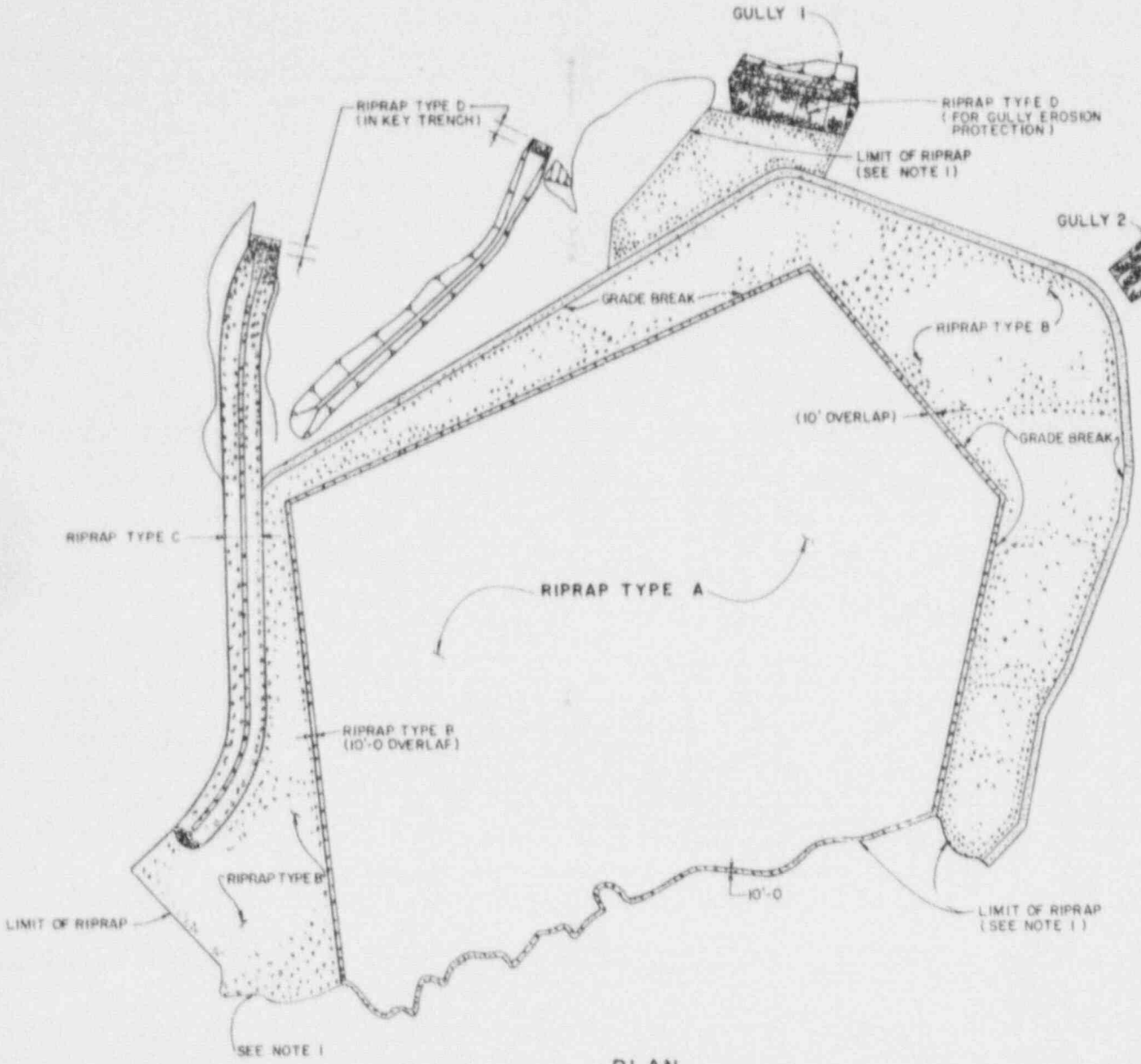
SITE DRAINAGE
(SHEET 3 OF 3)

APPROVED	DATE	DOE PROJECT ENGINEER	DATE

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT

PROJECT NO. DE-AC04-83AL18796

DRAWING NO. HAT-PS-10-0919 REV. A

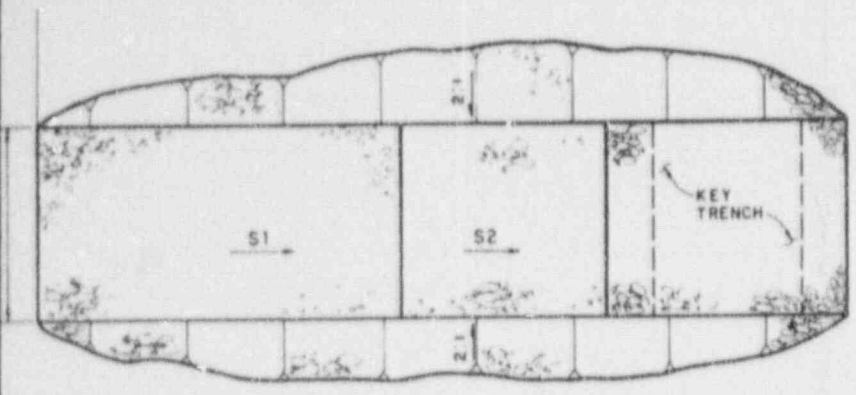


PLAN
EROSION PROTECTION

200 0 200 400
SCALE FEET

GULLY	
1	
2	
3	

PRELIMINARY REVIEW		
E & D MANAGER	CHIEF ENGINEER	QA MANAGER



PLAN

EROSION PROTECTION AT GULLIES

NOT TO SCALE

NOTES:

1. THE OUTER LIMIT OF RIPRAP COVER SHOWN IS APPROXIMATE AND SHALL BE DETERMINED IN THE FIELD.

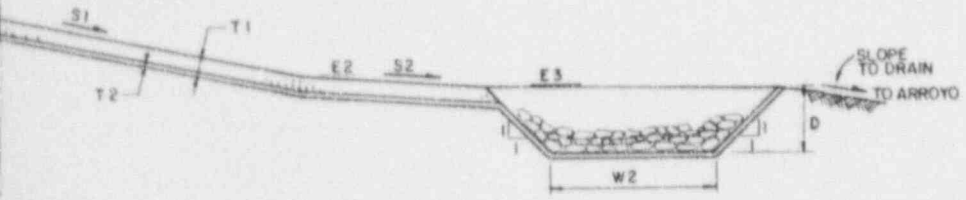
YPE D

LLY 3

REFERENCE DRAWINGS:

HAT-PS-10-0913 TAILINGS EMBANKMENT PLAN

P TYPE D
TRENCH



PROFILE

EROSION PROTECTION AT GULLIES

(SEE TABLE 1 FOR DIMENSIONS)

NOT TO SCALE

LEGEND:

TOP OF CUT

TOP OF FILL

TABLE 1. APRON AND KEY TRENCH SETTING AND DIMENSIONS

APRON WIDTH (FT.) W1	ELEVATION (FT.)			SLOPE		APRON THICKNESS (FT.)		KEY TRENCH SIZE (FT.)	
	E1	E2	E3	S1	S2	T1	T2	D (MIN.)	W2
270	4266.00	4250.00	4249.16	0.20	0.04	1.5	0.5	5.0	15.0
90	4225.00	–	4223.00	0.01	0.01	1.5	0.5	5.0	15.0
90	4264.00	–	4260.00	0.11	0.11	1.5	0.5	5.0	15.0

9710240078-20

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED	DRAWN	CHECKED	INSPECTED	RECOMMENDED	APPROVED	DATE
	RBC/WSO					

MEXICAN HAT SITE
MEXICAN HAT, UTAH

TAILINGS EMBANKMENT
EROSION PROTECTION

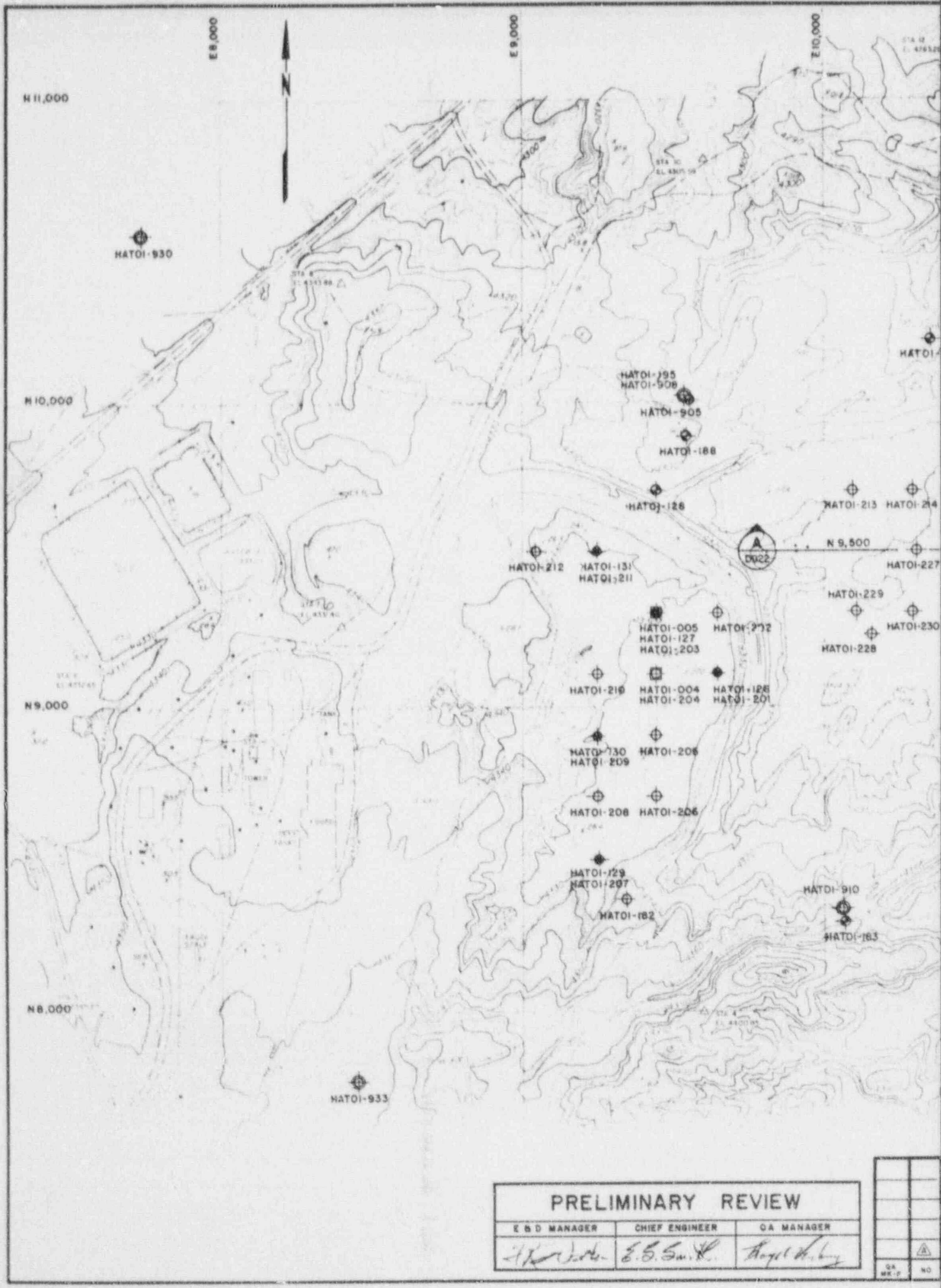
DOE PROJECT ENGINEER | DATE

MORRISON-KNUDSEN ENGINEERS, INC.
A MORRISON-KNUDSEN COMPANY
UMTRA PROJECT
180 HOWARD ST. SAN FRANCISCO, CA 94105

PROJECT NO. DE-AC04-83AL18796

DRAWING NO. HAT-PS-10-0920 | REV. A

NO.	REVISIONS	BY	CK	E&D MGR	CHIEF ENG	TAC REV	DOE APP
6-87	ISSUED FOR PRELIMINARY REVIEW	—	—	—	—	—	—



E 8,000
E 9,000
E 10,000
N
N 11,000
N 10,000
N 9,000
N 8,000
N 9,500
HATOI-930
HATOI-195
HATOI-908
HATOI-905
HATOI-188
HATOI-128
HATOI-213
HATOI-214
HATOI-227
HATOI-212
HATOI-131
HATOI-211
HATOI-229
HATOI-005
HATOI-127
HATOI-203
HATOI-230
HATOI-228
HATOI-210
HATOI-004
HATOI-204
HATOI-201
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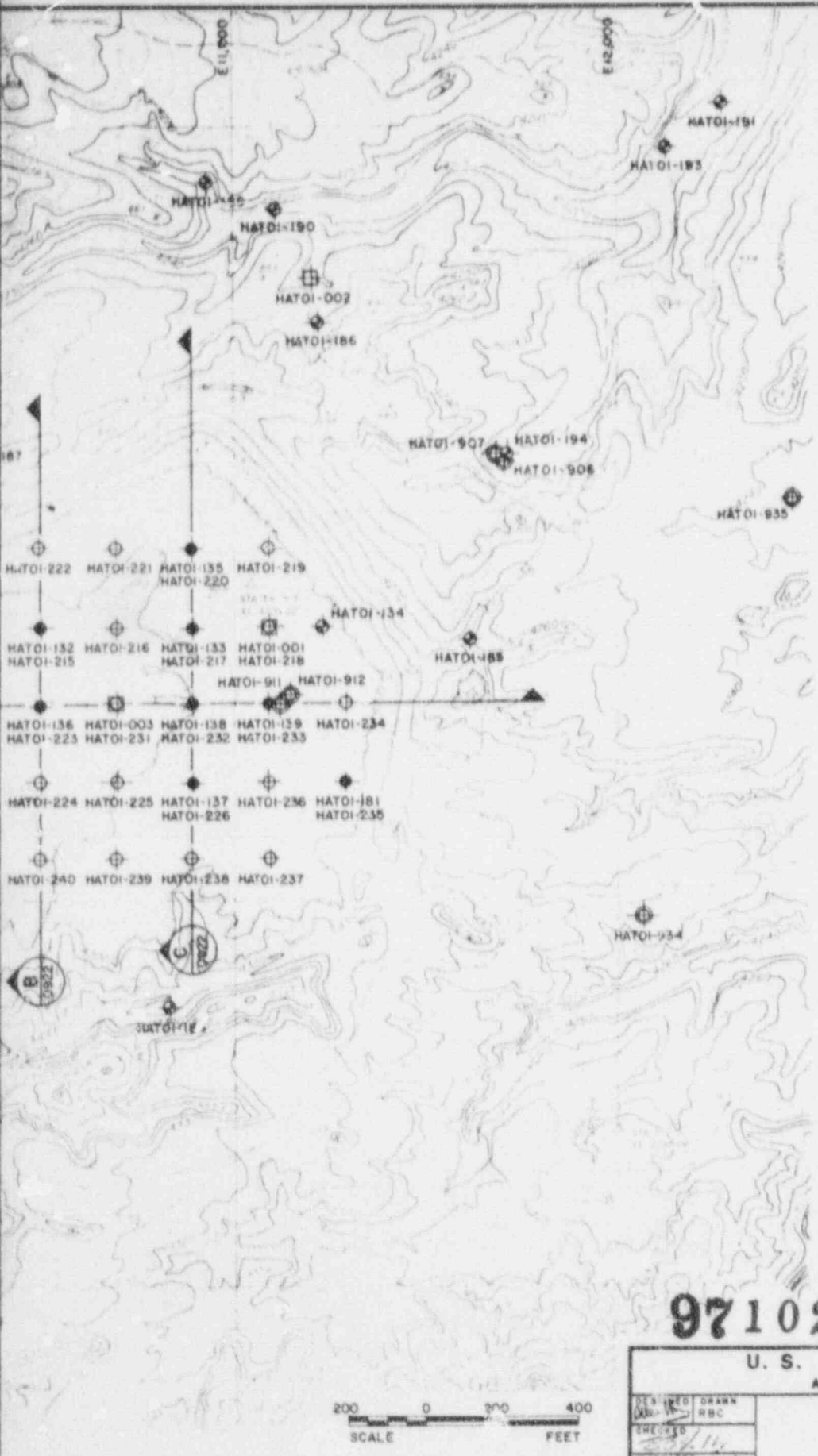
HATOI-208
HATOI-129
HATOI-207
HATOI-182
HATOI-910
HATOI-183
HATOI-933
A
D022
TANK
TOWER
PRELIMINARY REVIEW
E & D MANAGER
CHIEF ENGINEER
QA MANAGER
NO



NOTES:

1. GEOTECHNICAL INVESTIGATIONS WERE CONDUCTED BY DOE IN LATE 1984 AND EARLY 1985. A TOTAL OF 40 PIEZOCONE SOUNDINGS, 17 BORINGS AND FOUR TESTS PITS WERE MADE ON THE EXISTING TAILINGS PILES. ADDITIONAL 27 BORINGS AND ONE TEST PIT WERE MADE IN THE VICINITY OF THE PILES. FOURTEEN OF THE BORINGS WERE CASED AND COMPLETED AS MONITORING WELLS. THREE BORINGS AND FOUR MONITORING WELLS WHICH ARE LOCATED AWAY FROM THE TAILINGS PILE AREA ARE NOT SHOWN HERE. (REF. DOC NOS 5025-HAT-R-03-00198-00/SECT. 3.4 AND D4, 5025-HAT-X-09-00088-00, 5025-HAT-D-04-00080-00 AND 5025-HAT-C-09-00315-00).

REFERENCE DRAWINGS:

HAT-PS-10-0922 GEOLOGIC CROSS SECTIONS

LEGEND:

- PIEZOCONE SOUNDINGS
- BORINGS
- BORING AND PIEZOCONE SOUNDING IN SAME LOCATION
- TEST PITS
- TEST PIT AND PIEZOCONE SOUNDING IN SAME LOCATION
- TEST PIT, BORING AND PIEZOCONE SOUNDING IN SAME LOCATION
- MONITORING WELLS

200 0 300 400
SCALE FEET

9710240078-21

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED | DRAWN RBC
CHECKED
INSPECTED
RECOMMENDED
APPROVED | DATE | DOE PROJECT ENGINEER | DATE

MEXICAN HAT SITE
MEXICAN HAT, UTAH

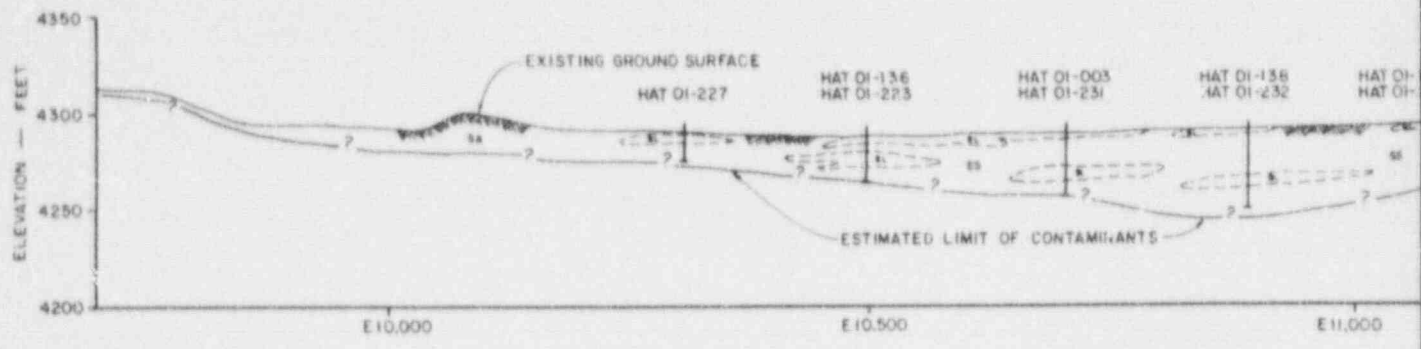
BORING LOCATION PLAN

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT

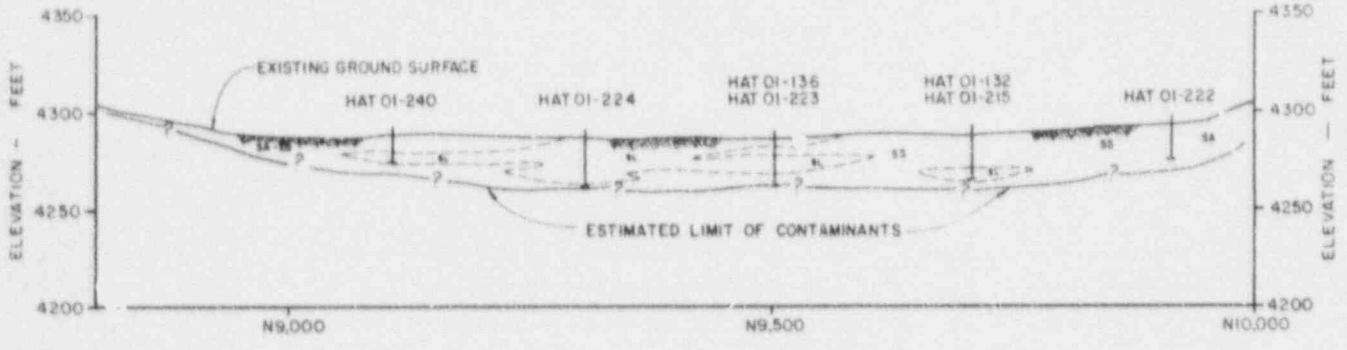
PROJECT NO. DE-AC04-83AL18796

DRAWING NO. HAT-PS-10-0921 REV. A

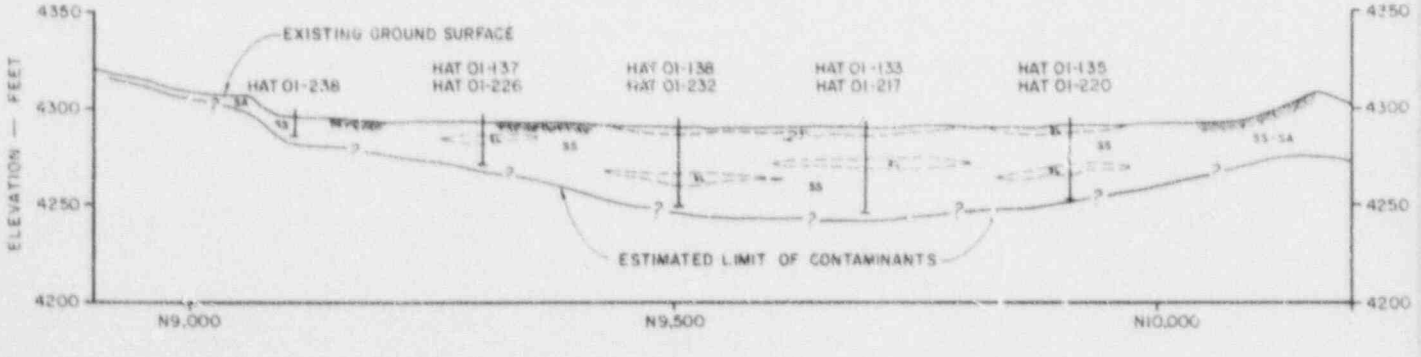
DATE	REVISIONS	BY	CK	END MGR	CHIEF ENG	TAC REV	DOE APP
10-87	ISSUED FOR PRELIMINARY REVIEW	---	---	---	---	---	---



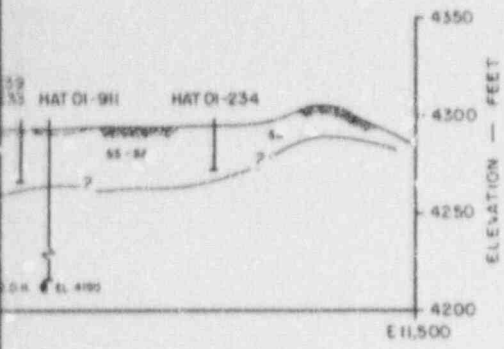
SECTION A @ N9,500
0921



SECTION B @ E10,500
0921



SECTION C @ E10,900
0921



NOTES:

1. LOCATION AND EXTENT OF MATERIALS AS SHOWN ON THE GEOLOGIC SECTIONS IS APPROXIMATE, AND IS MEANT ONLY TO REPRESENT THE HIGHLY VARIABLE SOIL CONDITIONS EXISTING WITHIN THE LOWER TAILINGS EMBANKMENT.

REFERENCE DRAWINGS:

HAT-PS-10-0921 BORING LOCATION PLAN

LEGEND:

SL	SLIMES	SEE NOTE 1
SS	SAND-SLIMES	
SA	SANDS	

PRELIMINARY REVIEW		
E & D MANAGER	CHIEF ENGINEER	QA MANAGER

9710240078-22

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED | DRAWN HBC
CHECKED
INSPECTED
RECOMMENDED
APPROVED | DATE | DOE PROJECT ENGINEER | DATE

MEXICAN HAT
MEXICAN HAT, UTAH

GEOLOGIC CROSS SECTIONS

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT

PROJECT NO. DE-AC04-83AL18796
DRAWING NO. HAT-PS-10-0922 REV A

REVISIONS	BY	CK	E&D Mgr	CHIEF ENG.	TAC REV	DOE APP.
6-87 ISSUED FOR PRELIMINARY REVIEW	---	---	---	---	---	---