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**Technical Specifications  
for  
Remediation Area 1, Phase II  
Sewage Treatment Plant Excavation Package**

**FDF Project No. 20712  
Document No. 20712-TS-0001  
Contract No. FSC622**

**September 1998  
Revision 0A**

**INFORMATION  
ONLY**

**Environmental Remedial Action Project  
Fernald Environmental Management Project  
Fernald, Ohio  
FDF Subcontract No. 98PC001322  
Task Order P-012**



**4055 Executive Park Drive  
Cincinnati, Ohio 45241**

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**4055 Executive Park Drive  
Cincinnati, Ohio 45241**

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U.S. DEPARTMENT OF ENERGY

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FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

REMEDATION AREA 1, PHASE II  
SEWAGE TREATMENT PLANT EXCAVATION PACKAGE  
TECHNICAL SPECIFICATIONS

PARSONS

Approved by:

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Carlton Schroeder, Project Manager

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Date

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Date: 09/21/98  
Rev.: 0A RE: CS

WBS No: 0.1.2.2.5  
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U.S. DEPARTMENT OF ENERGY  
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

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TECHNICAL SPECIFICATIONS

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REMEDATION AREA 1, PHASE II  
SEWAGE TREATMENT PLANT EXCAVATION PACKAGE  
TECHNICAL SPECIFICATIONS

Division 2

PARSONS

Prepared by:

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Date

Checked by:

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SECTION 13125  
RADIOLOGICAL CONTROL POINT FACILITIES 1727

**PART 1 GENERAL**

**1.1 SCOPE**

This section includes, but is not limited to:

- A. A personnel radiological control point facility composed of two nominal 14 feet by 60 feet modular units combining separate men's and women's locker rooms. Interior ceiling height shall be 8 feet 0 inches minimum. The facility shall consist of designed and shop fabricated modular trailer units. Units shall be hauled to the FEMP to a location designated by the Construction Manager. Installation will be by others.
- B. Mechanical and electrical systems.
- C. Fire and evacuation alarm system.

**1.2 REFERENCES**

- A. Conform to the OBBC and local building code. Where Hamilton County code requirements vary from the OBBC, the Hamilton County code shall govern.
- B. Cooperate with regulatory agency or authority and provide data as requested.
- C. American Society of Mechanical Engineers (ASME).
- D. American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE).
- E. National Fire Protection Association (NFPA):
  - 1. NFPA 70 National Electrical Code, 1996 Edition.
  - 2. NFPA 72-93 National Fire Alarm Code.

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- F. Underwriter's Laboratories, Inc. (UL):
  - 1. Electrical Construction Materials Directory - 97.
- G. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA)
- H. SK-A-04613, Floor Plan (See Attachment A).

**1.3 SYSTEM DESCRIPTION**

A. Design Requirements - Structural

- 1. System and components shall withstand dead loads, live loads, snow load, and wind load calculated in accordance with the Ohio Basic Building Code, OBBC. Design constants shall be as follows:
  - a. Ground Snow Load ( $P_g$ ): 25 psf
  - b. Snow Exposure Factor ( $C_e$ ): 0.7
  - c. Importance Factor (I): 1.0
  - d. Effective Velocity Pressure ( $P_e$ ): 20 psf (80 mph basic wind speed, Exposure C)
  - e. Floor Live Load: 50 psf
- 2. Provide drainage to exterior for water entering or condensation occurring within wall or roof system.
- 3. Assembly shall permit movement of components without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.
- 4. Size and fabricate wall and roof systems free of distortion or defects detrimental to appearance or performance.

B. Design Requirements - Mechanical

- 1. Thermal resistance of Wall System: R value of 11 minimum.
- 2. Thermal Resistance of Roof System: R value of 30 minimum.
- 3. Thermal Resistance of Floor System: R value of 19 minimum.

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4. Heating & Cooling: One 48,000 Btu/hr. capacity air source wall mount heat pump for each module. Each heat pump shall be equipped with supplemental electric resistance heaters, 15 kW @ 240 V, 1 phase.
5. Ductwork: Design in accordance with ASHRAE. Fabricate in accordance with methods given in the SMACNA Manuals.
6. Design potable water and drain systems in accordance with OBBC.

C. Design Requirements - Electrical

1. Electrical work shall be designed and installed in accordance with NFPA 70.
2. Electrical equipment shall be listed for the purpose specified and indicated according to Underwriter's Laboratories (UL) Electrical Construction Materials Directory.
3. All electrical features shall be 120/240 V, 1-Phase and shall be served from the 120/240 V, 1-Phase, 3-Wire panel.
4. The panel shall have a 150 amp main breaker minimum.
5. The panels shall be mounted on the same end of the trailer as the HVAC unit.
6. Wire: Use copper insulated wire in electrical circuits. Minimum wire size shall be 12 gauge unless noted otherwise.
7. Conduit: Electrical wiring shall be installed in EMT conduit. Minimum size shall be 1/2-inch conduit. A separate green grounding wire shall be installed. No conduit runs shall be used for equipment grounding.
8. Receptacle circuits shall be rated at 20 amps. Receptacle and light switches shall be labeled identifying the appropriate circuit breaker and shall have fixed labels to identify switched circuits. Provide dedicated circuits for PCMs, fire and evacuation alarm systems.
9. Exit Signs: Install low energy consumption solid state, LED, exit signs with battery back-up at exits.

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10. Emergency Lights: Provide emergency egress lighting with battery back-up to illuminate the paths to exits.
11. A lighting level of 60 footcandles shall be provided at a height of three feet above the floor.
12. Lighting shall be controlled by switches, not breakers.
13. General interior lighting shall be 4 feet 0 inches double tube surface fluorescent (T8) fixtures each with diffusers, electronic ballast and lights. Other interior and exterior lighting shall be incandescent.
14. Provide one 50 watt high pressure sodium light fixture with photo cell and light, outside of each exterior door. Teron Catalog No. CA50 or equal.
15. Telephone: The trailer shall be equipped with a minimum of three telephone outlets. Telephone raceways shall be 3/4 inch EMT conduits. Run conduit from each outlet to central junction box at the front of the trailer. Locate outlets as shown in Attachment A.
16. Telephone/communication junction boxes shall be located at the same end of the trailer and shall be surface mounted. Exterior junction boxes shall be rated NEMA 3R minimum and shall be mounted with taps to accommodate two-inch conduits.
17. Telephone/communication outlets shall be provided with a blank ivory cover plate for single outlet box (wire and receptacle to be supplied by telephone company, minimum three telephone outlets).
18. Electrical outlet devices shall be ivory with ivory cover plates.
19. Grounding: Trailer frame and metallic sheathing shall be grounded to breaker panel.

D. Design Requirements - Fire and Evacuation Alarm

1. Fire Alarm System: NFPA 72, manual and automatic local fire alarm system with connections to the central fire alarm equipment.
2. Install fire and evacuation alarm equipment specified herein and indicated on Attachment A. Honeywell, FDF's alarm systems Subcontractor, will make final terminations and perform acceptance testing of the new panel.

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**1.4 SUBMITTALS**

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- A. Provide submittals to the Construction Manager for review and approval..
- B. Submit a complete set of shop drawings within thirty calender days of Contract award indicating the following:
  - 1. Recommended location of structural supports and loads at each support point.
  - 2. Number and location of intermediate support columns and loads at each support point.
  - 3. Wall and roof system dimensions and general construction details.
  - 4. Number and location of downspouts.
  - 5. Tie-down locations and requirements for design wind loads.
- C. Product Data: Provide data on mechanical components within thirty calender days following award of contract.
- D. Submit with shipment, manufacturer's installation Instructions. Indicate recommended foundation design, site preparation requirements and assembly sequence.

**1.5 QUALITY ASSURANCE**

- A. Manufacturer: Company specializing in manufacturing the products specified in this Section with a minimum ten years of experience.

**1.6 WARRANTY**

- A. Provide five-year warranty.
- B. Warranty: Include coverage for exterior pre-finished surfaces to cover pre-finished color coat against chipping, cracking or crazing, blistering, peeling, chalking, or fading.

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**PART 2 PRODUCTS**

**2.1 MANUFACTURERS - BUILDING SYSTEM**

- A. Manufactured Structures Corporation, System OBBC.
- B. Other acceptable manufacturers offering equivalent systems.

**2.2 MATERIALS - MODULAR UNITS**

- A. Materials - Architectural/Structural
  - 1. Framing: Steel I beam with cross member outrigger.
  - 2. Under-floor Bottom Plate: Manufacturer's standard.
  - 3. Floor Underlayment: 3/4-inch plywood, pressure treated.
  - 4. Walls: Stud framing with gypsum board interior.
  - 5. Insulation: Batt glass fiber type, faced with reinforced foil.
  - 6. Roofing: Galvanized steel, 30 ga.
  - 7. Ceiling: 1/2-inch vinyl coated gypsum, Group 2 vinyl weight.
  - 8. Exterior Siding: Manufacturer's standard corrugated aluminum.
  - 9. Skirting: Manufacturer's standard corrugated aluminum.
  - 10. Interior Wall Covering: 1/2-inch vinyl coated gypsum, Group 2 vinyl weight.
  - 11. Flooring: Commercial grade sheet vinyl.
  - 12. Doors, Exterior: Hollow Metal type, 36 inches by 80 inches, 16 gauge, insulated, 6-inch by 30-inch wire reinforced glass vision panel, door closer, shop primed and finish painted. Keyed lock-set to accept "Best" core.
  - 13. Doors, Interior: Wood solid core, 36 inches by 80 inches, 24-inch square door grill, passage-set.
  - 14. Windows: Manufacturer's standard horizontal slider with insect screen where required by building code and where shown on Attachment A. Translucent glass in locker, shower or sink areas.
  - 15. Gutters & Downspouts: Fabricate of same material and finish as siding metal.

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B. Materials - HVAC

1. Heat Pump: Wall mounted self-contained air cooled, with hermetic reciprocating compressor, crankcase heater, and pressure service ports on refrigerant piping to evaporator and condenser. Adjustable outside air intake and return air through wall grille with two inch cleanable media filter. Thermostat shall be programmable and located five feet above floor in clean area.
2. Ductwork: Galvanized steel, fabricated and installed per SMACNA. Insulated with two inch fiberglass having vapor barrier. Flexible joint at HVAC unit outlet. Ceiling diffusers shall be white enamel aluminum with adjustable dampers.
3. Exhaust Fans: 300 CFM ceiling mount with roof cap in each shower room and breakroom. Fans in shower areas shall be corrosion resistant. Interlock fans with light switches.

C. Materials - Plumbing

1. Showers: Heavy gauge steel with baked enamel finish, 32-inch square nominal, center drain with tempered glass door in aluminum frame.
2. Water Heater: Electric 120 gallon storage type, 162 gallon per hour recovery, ASME tank 300 psig hydrostatic tested, glass-lined tank with anode rods and ASME pressure-temperature relief valves.
3. Shower Supply: Fixed spray shower head with 3 gpm maximum flow, single lever thermostatic mixing valve.
4. Faucets: Centerset with gooseneck spout and aerator, 4-inch wrist action handles.
5. Waste and Vent Piping: ABS DWV with solvent welded joints. Each unit shall have waste lines manifolded to one outlet under the unit.
6. Water Piping: Type "L" copper with soldered sweat fittings manifolded to one inlet. Solder shall contain no lead. Provide a single stub for a future connection to water service supply line. Stub to be under the trailer in an accessible location for future installation. Stub shall be sealed and protected from damage. Stubs for interunit connection must be

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accessible for installation and future relocation of units.

7. Fixture Traps and Drains: Chromium plated brass traps with screen inlet drains in lavatories. Shower drains, PVC or ABS with screen inlet. Provide adapters for dissimilar materials where required.

D. Materials - Fire and Evacuation Alarm

1. Fire Alarm Circuit Conductors: 18/2 wire; Initiating device insulation color coded red and yellow; Signal device circuit insulation color coded brown and yellow.
2. Wiring (Safety Devices): Fire Alarm Horns/Strobes - 18/2 yellow/brown wire; All Input Zones - 18/2 yellow/red wire; Cable to Building 18P panel - 8 pair, 16/2 - Belden Catalog Number 1041A.
3. Smoke Detectors: Ionization type; Honeywell TC805C or approved equal.
4. Heat Detectors: Combination rate-of-rise and fixed temperature; Honeywell T4057A (135 degrees F setting and 15 degrees F per minute rate-of-rise) or approved equal.
5. Manual Pull Stations: Honeywell S464A or approved equal.
6. Horn with Strobe: Flush/Surface mounted, audio/visual type with strobe; Honeywell SC716B1019 or approved equal.
7. End of Line Resistors: 1.91 K ohms.
8. Motorola Monitor II Pager with charger amplifier: Motorola's HOYUMC3112, HOYUMC3122, and NLN3039A or approved equal.
9. Fire Alarm Panel: Provide Honeywell LE Card, Catalog Number 14505128-002 for FS 90 panel in Building 18P.
10. Lightning Protectors shall be used on fire alarm branch circuits or evacuation branch circuits only when entering Building 18P.

E. Materials - Accessories

1. Lockers: Enamel finish sheet steel, double tier type, 12 inches wide by 15 inches deep by 72 inches high.

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2. Fire Extinguisher: 10 lb. capacity, ABC type, one mounted at each exit door.
3. Towel Bins: Sheet metal with enamel finish, 3 cubic feet minimum capacity.
4. Hand/Hair Dryers: Surface mount, cast iron with porcelain enameled finish, 115V, 20 amp. McMaster-Carr #2876k71 or equal.
5. Anti-C Storage Cabinets: Minimum 22 gauge metal with enamel finish, 36 inches wide by 18 inches deep by 72 inches high, 5 or 6 shelves.
6. Locker Room Benches: Lengths as indicated on Drawings. Benches shall be anchored to floor.
7. Counter Tops: Laminated plastic "Formica" top finish.
8. Soap Dispenser (One per sink): McMaster-Carr #2379K32 or equal.
9. Paper Towel Dispensers (One per each sink grouping): 22 gauge steel minimum.
10. Coat & Hat Wall Racks (Two per break room): Two shelf type, aluminum tubing construction, 72 inches long, McMaster-Carr #4711T31 or equal.
11. Coat & Hat Wall Hooks (Four units per monitoring room): Horizontal type, chrome plated steel, with 6 each double hooks per 36 inches long unit.
12. Mirrors (One per sink): 1/4-inch plate glass, stainless steel frame.
13. PCMs: Furnished by FDF.

**2.3 FINISHES**

- A. Framing Members: Clean, prepare, and coat with black asphalt undercoating, 3 mil minimum thickness.
- B. Exterior Surfaces of Wall Components and Accessories: Precoated enamel on aluminum, color as selected from manufacturer's standard range.
- C. Vinyl Sheet Flooring: Color and pattern as selected from flooring manufacturer's standard range.

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**PART 3 EXECUTION**

Not Used.

**END OF SECTION**

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**ATTACHMENT A**

**SKETCH SK-A-04613**

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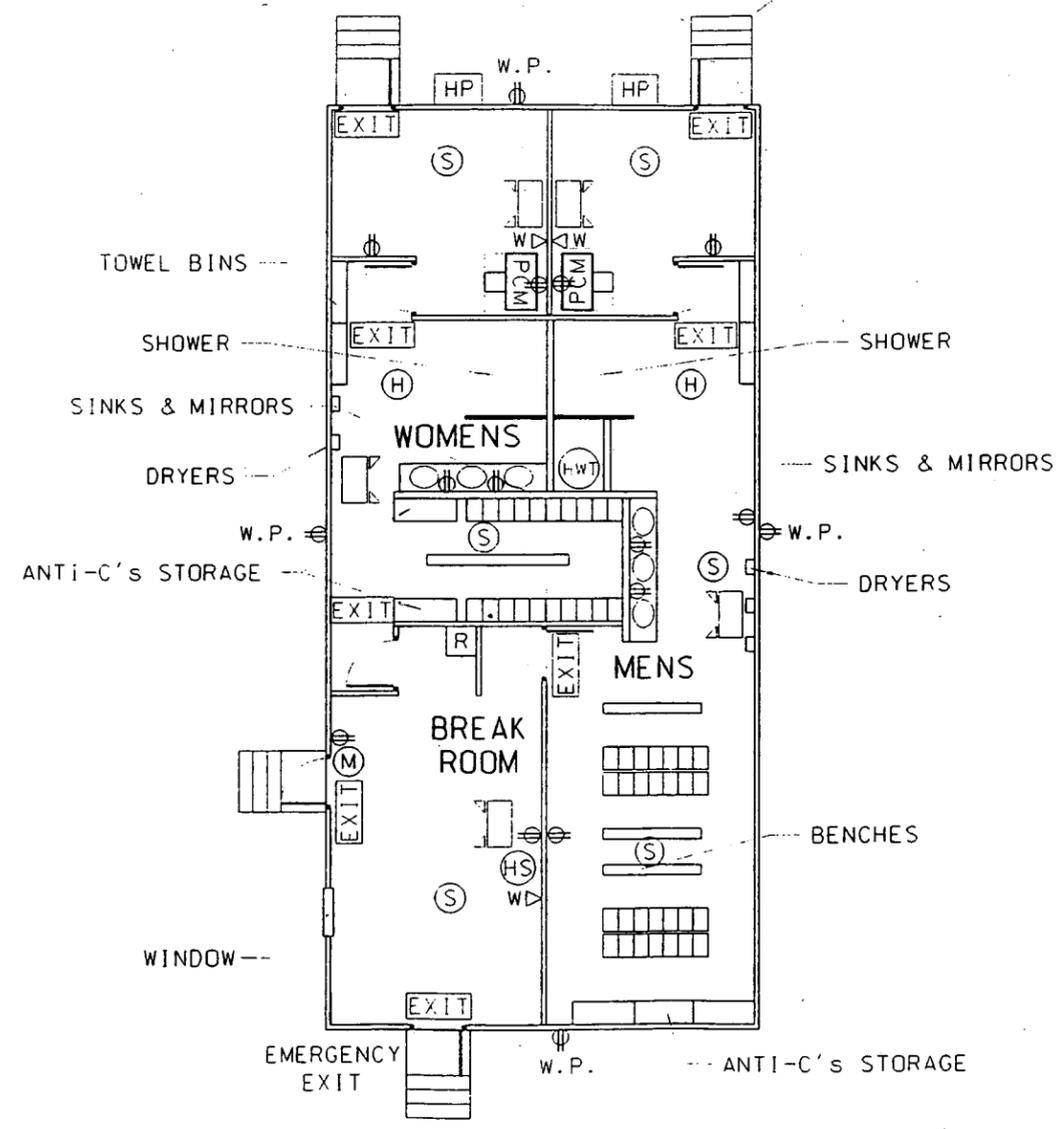
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**PRELIMINARY**  
NOT FOR CONSTRUCTION

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**RADIOLOGICAL CONTROL POINT FACILITY.**

--- STAIRS BY OTHERS (TYP)



**FLOOR PLAN**

NOTES

**LEGEND**

- LOCKERS: DOUBLE  
12"Wx18"Dx72"H
- PERSONNEL  
CONTAMINATION MONITOR  
(FDF PROVIDED)
- HEAT PUMP
- HOT WATER TANK
- PHONE LOCATIONS
- EXTERIOR WEATHER PROOF  
RECEPTACLE LOCATIONS
- DUPLEX RECEPTACLE  
LOCATIONS
- SMOKE DETECTOR
- HEAT DETECTOR
- MANUAL PULL STATION
- HORN STROBE
- RAPID RECEIVER FOR  
EVACUATION SYSTEM
- EXIT LIGHT
- TWO-LAMP EMERGENCY  
EGRESS LIGHT FIXTURE  
WITH RECHARGEABLE  
BATTERIES

SCALE

0A	CERTIFIED FOR CONSTRUCTION - DRAFT			
REV	ISSUE OR REVISION PURPOSE - DESCRIPTION		BY	DATE

**UNITED STATES**  
**DEPARTMENT OF ENERGY**  
**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**

THIS DRAWING PREPARED BY  
**PARSONS**  
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.  
CINCINNATI, OHIO

PROJECT NAME  
**REMEDIATION**  
**AREA 1, PHASE II**

DRAWING TITLE  
**ARCHITECTURAL**  
**PLAN**  
**RADIOLOGICAL CONTROL POINT FACILITY**

DRAWN BY	DATE	TECH LEAD	DATE	CREATED BY	DATE
DLLEGASPI	10-06-97	S. CHANTOUS		S. CHANTOUS	10/11/97
PLANTING NO.	FLOOR	SCALE	CLASS		
		NONE			

SUBMITTED FOR 30% ISSUE	SUBMITTED FOR 60% ISSUE	SUBMITTED FOR 90% ISSUE
TECH LEAD	TECH LEAD	TECH LEAD
DATE	DATE	DATE

PROJECT NUMBER	TOP PROJECT NO.	DRAWING SHEET CODE NO.	SHEET NO.	TOTAL SHEETS
TOP-012	20712	SK-A-04613	A0001	0A

ATTACHMENT A

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SECTION 02050  
SURVEYING

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**PART 1 GENERAL**

**1.1 SCOPE**

Section includes, but is not limited to:

- A. Setting limits and boundaries of construction activities.
- B. Performing surveys for:
  - 1. Verification of the existing conditions.
  - 2. Support surveys during the construction activities.
  - 3. Measurement and payment.
- C. Preparing and furnishing red-line and as-built survey documentation including: sketches, drawings, and field notes.

**1.2 RELATED SECTIONS AND PLANS**

- A. Section 02100 - Site Preparation.
- B. Section 02270 - Erosion and Sediment Control.
- C. Part 6 - Statement of Work.
- D. Part 8 - Environmental Health and Safety, and Training Requirements.

**1.3 REFERENCES**

- A. National Geodetic Survey Standards.

**1.4 QUALIFICATIONS**

- A. Oversight for survey work shall be provided and certified by a Land Surveyor licensed in the State of Ohio.

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- B. Survey work shall be performed under the direct supervision of a person who has at least 5 years of experience in construction surveying.
- C. Work performed in referencing of Fernald Environmental Management Project (FEMP) or United States survey monuments shall be stamped/certified by an Ohio licensed Land Surveyor.

**1.5 SUBMITTALS**

- A. Provide submittals as required in Part 6 of the Contract Documents. Unless specified otherwise, submittals shall be made to the Construction Manager for review and approval.
- B. Submit qualifications for land surveyor licensed in the State of Ohio and the survey supervisor in accordance with Part 6 of the Contract Documents. Provide resume demonstrating required years of experience as specified in Article 1.4.
- C. Submit daily survey sketches showing the locations and elevations of existing underground utilities and structures encountered during construction which are not shown on the Construction Drawings, and newly installed utilities.
- D. Submit electronic and hard copy of survey activities, survey notes, field notes, sketches and drawings for the following surveys within seven (7) calendar days of the completion of each survey:
  - 1. Preliminary surveys.
  - 2. Intermediate surveys.
  - 3. As-built, (Final) surveys.
- E. Submit as-built survey work documentation by the end of each week for the work of the preceding week, or as requested by the Construction Manager.

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- F. Submit 2 copies of field notes prepared by the licensed Land Surveyor on a bi-weekly basis (as a minimum) or upon request by the Construction Manager. Dated and signed field notes shall be legibly recorded in standardized field notebooks with format as defined in this section. Notation shall be consistently applied to surveying work; the stake marking format and the field book notation shall be compatible. Identify survey benchmarks on the field notes, sketches, and drawings.

**1.6 PROJECT RECORD DOCUMENTS**

- A. Maintain on site, a complete and accurate log documenting survey work as it progresses.
- B. Maintain on site, drawings clearly showing existing benchmarks and temporary survey control points, including coordinates and elevations, used to perform work. These drawings shall be updated the same day as new control points are set.
- C. Maintain on site, an accurate and current set of redline drawings with as-built locations. Data shall be incorporated within seven (7) calendar days of the respective construction activity.

**1.7 EXAMINATION OF EXISTING CONDITIONS**

- A. Prior to the start of work, verify the accuracy of the existing conditions shown on the Construction Drawings. Immediately notify the Construction Manager in writing of deviations from the existing conditions indicated on the Construction Drawings.
- B. Stake the locations of earthwork and stripping, as shown on the Construction Drawings and review proposed work with the Construction Manager in the field prior to start of excavation.

**1.8 SURVEY BENCHMARKS**

- A. Locate and verify benchmarks as shown on the Construction Drawings and identify any other survey monuments in the work area in accordance with this Section. The Construction Manager will provide coordinate and elevation data for FEMP control points if not shown on the Construction Drawings. Use only FEMP approved control points.
- B. Protect and preserve benchmarks.
- C. Survey Benchmarks damaged or disturbed during construction activities will be replaced/reset by the Construction Manager. The Contractor shall be responsible for the costs of replacing/resetting survey benchmarks.

**1.9 HEALTH AND SAFETY REQUIREMENTS**

- A. Environmental Health and Safety, and Training requirements shall be as specified in Part 8 of Contract Documents.

**PART 2 PRODUCTS AND INSTRUMENTS**

- A. Provide materials as required to perform the surveys, including, but not limited to: instruments, tapes, rods, mounts, tripods, stakes, hubs, nails, ribbon, and other reference markers.
- B. The survey instruments shall be precise and accurate to meet the needs of the project. Survey instruments shall be capable of reading to a precision of 0.01 feet with a setting accuracy of 8 seconds.

**PART 3 EXECUTION**

**3.1 GENERAL**

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- A. The accuracy of horizontal and vertical control shall meet or exceed Third-Order, Class I and Third-Order, respectively, as defined by National Geodetic Survey Standards. Elevation shall be referenced to National Geodetic Vertical Datum (NGVD) of 1929 and horizontal coordinates to North American Datum (NAD) 1983.
- B. Establish elevations, lines, and levels that are tied into the FEMP Survey Control System. Topographic contours shall be shown to the nearest foot. The Construction Manager shall provide data on these control points if not shown on the Construction Drawings. Field run data shall be taken to adjacent existing undisturbed area (100 ft. minimum overlap or to FEMP property line) to create a smooth contour transition.
- C. Maintain accurate and complete notes of surveys:
  - 1. Handwritten survey notes and information shall be documented in survey field books. A copy of the numbered, dated and signed field book pages shall be given to the Construction Manager weekly, or upon request, for use in reviewing the work.
  - 2. Electronically collected field survey information shall be collected and backup equipment shall be available in the event of equipment malfunction.
    - a. Electronic format for printed output of data collector's field survey notes shall be compatible with the field book notation format.
    - b. Electronic format for survey data shall be Intergraph Microstation 5.0 or other compatible system as approved by the Construction Manager.
- D. Measurement and payment surveys for elevation and for horizontal distance shall be to the nearest 0.1 foot +/- 0.05 foot.

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- E. Perform construction layout surveys in advance of scheduled construction activities. The Contractor is responsible for rework and/or construction delays caused by survey or staking errors.
- F. Set grade stakes and slope stakes for construction activities as work progresses in accordance with accepted surveying practices.
- G. Establish and maintain temporary survey control points (horizontal and vertical control), as necessary, to support construction activities.
- H. Temporary Benchmarks, Accuracy and Documentation:
  - 1. Record the following information in survey notebooks for each benchmark established:
    - a. Designation of survey benchmark. Coordinate through the Construction Manager for the designation protocol so as not to duplicate existing points.
    - b. State Plane Coordinates in North American Datum (NAD), 1983;
    - c. Elevation based on National Geodetic Vertical Datum (NGVD) of 1929;
    - d. Date of establishment;
    - e. Description and sketch of each survey benchmark location including reference to a minimum of three permanent features that can be seen from the survey benchmark with the corresponding measurement from the feature to the survey benchmark shown on the above referenced sketch.
  - 2. Document survey work in the field notebooks using the format and procedures described below:
    - a. Title and consecutive notebook number on the front cover;
    - b. Consecutively numbered pages;
    - c. Table of contents, indicated by survey task, on the first numbered page;
    - d. Legend indicating symbols and abbreviations used in survey notes;

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- e. Names of survey team for each task;
- f. Notes on weather, equipment, etc.;
- g. Date and time on each page to indicate when work was recorded;
- h. Notes in a uniform character such that they can be interpreted and used by anyone with survey knowledge;
- i. Description and/or sketches of the existing survey control used.

**3.2 SUPPORT SURVEYS**

A. Contractor shall temporarily mark in the field any new underground utilities and installations until the new as-built surveys are obtained and incorporated into the red-line markups.

B. Preliminary Surveys:

- 1. As part of the verification of existing conditions, perform topographic surveys of areas to be excavated prior to construction activities.
- 2. Initial topographic survey shall be at a minimum of 50-foot intervals with additional shots as required to define the topography for the impacted surface soil stripping and stockpile areas to be excavated.
- 3. Establish location for the installation of the erosion and sediment control measures specified in Section 02270.
- 4. Establish limits of earthwork shown on the Construction Drawings. Similarly provide the location and extent of all stockpile areas. Maximum staking interval shall be 50 feet unless otherwise directed by the Construction Manager.
- 5. Establish work limits required for installation of construction fencing and Radiological Control Boundary Fencing as specified in Section 02100 and as shown on the Construction Drawings unless otherwise directed by the Construction Manager.

C. Intermediate Surveys:

1. Perform surveys during progress of the construction activities to verify the accuracy of field work as directed by the Construction Manager.
2. Perform surveys for measurement and periodic progress payment as specified in this Section.
3. Perform surveys during progress of excavation to confirm limits of the excavation.
  - a. Perform surveys both before and after 6 inch excavation of Above WAC Tc-99 and Above WAC Uranium soil excavations to confirm removal of 6 inches of material.
  - b. Perform surveys both before and after excavation of all 6 inch stripping areas.
4. Survey daily and provide survey and red-line sketches showing the location and elevation of the newly installed and existing underground culverts and spillway, and structures encountered and left in place within the work area. Incorporate this information into the as-built documentation as specified in this section.
5. All new utilities, culverts, and their appurtenance shall be surveyed to verify correct placement prior to backfill.

D. As-built (Final) Surveys:

1. Final topographic survey shall be at a minimum of 50-foot intervals or as required to define the topography of final excavated areas at the Sewage Treatment Plant (STP) and the impacted surface soil stripping areas and the STP Borrow Area. Additionally, the following points shall be surveyed and noted as applicable.
  - a. Grade breaks.
  - b. Points of horizontal curvature and tangency.
  - c. Roads, ditches, pipes, culverts, channels and fences.
  - d. Limits of final excavation in the STP excavation and surface stripping areas.

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- e. Limits of trench excavation ~~1727~~ backfill, and final backfill elevations.
  - f. Spot elevations every 25 feet along the top and toe of slopes of the excavations.
  - g. Finish grades.
2. Horizontal and vertical locations of all utilities installed.
  3. Location of Transfer Line pipe supports and Transfer Line at 50' intervals (minimum).
  4. Perform survey for final measurement and payment.

**3.3 SURVEYS FOR MEASUREMENT AND PAYMENT**

- A. Perform surveys for periodic progress payments and final payment to determine quantities of work.
- B. Calculate and certify quantities of work and submit survey notes and calculations to the Construction Manager for review, evaluation and payment.
- C. Measurement and payment surveys for elevation and for horizontal distance shall be to the nearest 0.1 foot +/- 0.05 foot, respectively.

**END OF SECTION**

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SECTION 02100  
SITE PREPARATION

**PART 1 GENERAL**

**1.1 SCOPE**

This Section includes but is not limited to:

- A. Installation and relocation of construction fencing.
- B. Installation of Radiological Control Fence.
- C. Fugitive dust control.
- D. Protection of existing groundwater monitoring wells and survey benchmarks.
- E. Clearing, wood chipping, and stockpiling.
- F. Removal of existing chain link fencing.

**1.2 RELATED SECTIONS**

- A. Section 02050 - Surveying.
- B. Section 02150 - Traffic Control.
- C. Section 02205 - Impacted Material Excavation and Handling.
- D. Section 02270 - Erosion and Sediment Control.
- E. Part 6 - Statement of Work.
- F. Part 8 - Environmental Health and Safety, and Training Requirements.

**1.3 SUBMITTALS**

- A. Provide submittals as required by Part 6. Unless specified otherwise, submittals shall be made to the Construction Manager for review and approval.
- B. Submit a Fugitive dust control Plan in accordance with Part 6.
- C. Submit, along with the Fugitive dust control Plan, manufacturer's Material Safety Data Sheets (MSDS), and recommendations for material handling and usage in accordance with Part 6.
- D. Submit Construction Fence and Radiological Control Fence material specifications, including steel "T" posts.

**1.4 HEALTH AND SAFETY REQUIREMENTS**

- A. Environmental Health and Safety, and Training requirements shall be as specified in Part 8 of Contract Documents.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- A. Dust Suppression Agent shall be as specified for Crusting Agent in Section 02270.
- B. Construction fence shall be orange, high density polyethylene fabric, opening size approximately 4 inches by 1/2 inch, minimum tensile strength of 2000 lbs/ft of width. Posts shall be steel "T".
- C. Radiological Control fencing shall be the same as Construction Fence, except the color shall be yellow. Post shall be steel "T" as used for Construction Fence.

**PART 3 EXECUTION**

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**3.1 GENERAL**

- A. Verify existing conditions to include underground and aboveground utilities as specified in Section 02050.
- B. Notify Construction Manager prior to removal of all utilities and receive confirmation from Construction Manager that utilities to be removed or tapped have been properly isolated and de-energized prior to commencement of work. Construction Manager shall properly isolate and de-energize utilities that are to be removed, abandoned, disconnected, or tied into.
- C. Contractor shall notify the Construction Manager prior to movement of material for stockpiling.

**3.2 Fugitive dust control**

- A. Fugitive dust control shall be as specified in Part 6 and in accordance with the approved Fugitive Dust Control Plan.

**3.3 CONSTRUCTION FENCE/RADIOLOGICAL FENCE**

- A. Install "T" fence posts for buffer area.
- B. Prior to initiating excavation activities install and/or relocate construction fencing and as shown on the Construction Drawings. T-posts less than 4-foot in height above grade shall be capped with rebar safety cap.
- C. Initial Radiological Control Boundary will generally be the existing chain link fence at the perimeter of the STP. This Radiological Control Fence will be relocated to the new location after completion of excavation activities outside the fence. Contractor shall install fence posts for this relocated fence.
- D. Maintain and repair construction fences and Radiological Control fences until completion of the Contract.

**3.4 CLEARING**

- A. Remove all trees, shrubs, and woody undergrowth within areas to be excavated except as noted on Construction Drawings. All trees, shrubs, etc. shall be cut one foot above grade and handled as a non-impacted material. Vegetation shall be chipped and directly discharged into trucks prior to transportation to the Southern Waste Units (SWU) Woodchip Stockpile. Minimize contact with ground to prevent contamination of fallen trees.

**3.5 STORM DRAINS AND APPURTENANCES**

- A. Agricultural drain tiles encountered shall be handled as impacted material and excavated, transported, and unloaded as specified in Section 02205.
- C. Subject to the approval of the Construction Manager, the Contractor shall furnish and install additional temporary culverts(18" minimum size) and driveways as needed to access work areas These temporary culverts and driveways shall be removed, transported and unloaded as specified in Section 02205.

**3.6 HAULING**

- A. Materials shall be hauled their appropriate locations shown on the Construction Drawings, as specified in the approved Traffic Plan in accordance with Section 02150.

**3.7 PROTECTION OF EXISTING STRUCTURES**

- A. Prior to commencing construction activities, install a protective barrier around existing groundwater wells designated to remain as shown on the Construction Drawings. Use, at a minimum, standard construction fence offset 5-feet from the item requiring protection. If earthwork activities are to occur in proximity of monitoring wells and/or extraction wells and survey benchmarks designated to remain, hand excavate the area within the protective barrier. If damage to existing monitoring wells, extraction wells, existing properties or utilities occurs, repairs and/or replacement will be

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completed by the Construction Manager at the Contractor's expense. Survey benchmarks shall be replaced and verified as specified in Section 02050.

- B. Protect trees, plant growth, and features that are outside the work limits.
- C. Locate, identify, and protect from damage utilities that are to remain.
- D. Maintain existing roadways, within work limits, at the construction site, and provide Fugitive dust control in accordance with Part 6.

**END OF SECTION**

SECTION 02150  
TRAFFIC CONTROL

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**PART 1 GENERAL**

**1.1 SCOPE**

- A. This section includes, but is not limited to, the requirements for the Traffic Plan.

**1.2 RELATED SECTIONS AND PLANS**

- A. Section 02050 - Surveying.
- B. Section 02100 - Site Preparation.
- C. Section 02205 - Impacted Material Excavation.
- D. Section 02270 - Erosion and Sediment Control.
- E. Part 6 - Statement of Work.
- F. Part 8 - Environmental Health and Safety, and Training Requirements.

**1.3 REFERENCES**

- A. State of Ohio, Department of Transportation (ODOT): Construction and Material Specification, January 1, 1997, except as supplemented or otherwise modified herein and/or shown on the Construction Drawings.

**1.4 SUBMITTALS**

- A. Provide Traffic Plan as required in Part 6. Unless specified otherwise, submittals shall be made to the Construction Manager for review and approval.

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- B. The Traffic Plan shall include as a minimum:
1. Planned traffic routes for hauling excavated material from the following material sources to their appropriate destinations (some sources may yield several material types):

MATERIAL	SOURCE	DESTINATION
Topsoil	STP Backfill Borrow Area;	STP Backfill Borrow Area Topsoil Stockpile
Non-Impacted Soil	STP Backfill Borrow Area	STP Haul Road; Utility backfill outside STP deep excavation boundary;
Wood chips	Clearing;	SWU Woodchip Stockpile
Digester Sludge	Digester; East Sludge Drying Bed; West Chamber of Primary Settling Basin; Piping;	SP-7 Tc-99 Staging Area
Tc-99 Above WAC Soil;	Above WAC Excavations;	SP-7 Tc-99 Staging Area;
Uranium Above WAC Soil;	Above WAC Excavations;	SP-7 Uranium Staging Area;
Sludge Cake	East Sludge Drying Bed;	Special Materials Transfer Area
Stockpiled material from the East Sludge Drying Bed	Distribution box components, brush, miscellaneous debris	OSDF

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Impacted Material	STP 6" stripping; NAR 007 Stockpile; OSD 007 Stockpile; STP Deep Excavation; Utility Line Excavation; Stabilized Lead contaminated soil; sludge drying bed sands & gravels;	OSDF
Debris	STP excavation (general); trickling filter media; STP access road pavement; STP road pavements; foundations; handrails; pipe materials and appurtenances;	OSDF
Above WAC debris	STP road pavement; STP excavation (general);	SP-7
Special Materials - ACM	STP excavation (general);	OSDF
Special Materials - Other	STP excavation (general);	Special Material Transfer Area
Non-Impacted Sediments	Ditches around STP Backfill Borrow Area;	STP Backfill Borrow Area or as directed by Construction Manager
Impacted Sediments	Ditches or sumps designated by the Construction Manager;	OSDF
Above WAC Sediments	Ditches or sumps designated by the Construction Manager;	SP-7

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2. Access routes from NAR-007 & OSD-007 stockpiles to the haul roads and associated support components.
3. Planned traffic routes within the STP work limits.
4. Crossings for pedestrians and equipment.
5. Maintenance of STP Haul Road
6. Maintenance and cleaning of paved traffic routes, pedestrian crossings and equipment crossings.
7. Description of impact to other site traffic control during construction activities and during long breaks in the work.
8. Access control to and from radiological controlled areas and certified areas. Include provisions to provide equipment and wheel washing as required
9. Use of signs, flaggers, and other items or methods used to control traffic.
10. Planned crossings and protection of underground utilities. Planned crossings of major utilities (such as groundwater line and oil transmission line) and a plan to protect the existing utilities at the crossings. The crossing protection should be a minimum of a 1 inch thick steel plate or an equivalent alternative. Length and width of steel plate shall be as required to protect the existing utilities. Provide calculations to support equivalent alternatives to the 1 inch thick steel plate.
11. Times for crossing North Entrance Road.
12. Coordination of wheel washing and decontamination at the OSDF Wheel Wash and OSDF Equipment Wash facilities to be provided by others.

#### **1.5 HEALTH AND SAFETY REQUIREMENTS**

- A. Environmental Health and Safety, and Training requirements shall be as specified in Part 8.

#### **1.6 TYPE III CROSSINGS**

- A. A Type III crossing occurs from an uncontrolled area to an uncontrolled area crossing an uncontrolled road.

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**PART 2 PRODUCTS**

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**2.1 MATERIALS**

- A. Materials for traffic control shall be as defined by the Traffic Plan and shall conform to ODOT specifications unless otherwise approved by the Construction Manager.
- B. Type III crossing: Supply all equipment and materials necessary to install a 4-way traffic signal system. System shall be portable, with traffic actuations in two of the four directions.
- C. Stop signs conforming to ODOT.

**PART 3 EXECUTION**

**3.1 MATERIAL HAUL CROSSINGS**

- A. General - Contractor may be stopped at any crossing for more than 5 minutes during an emergency event in which site Emergency Response Team or fire fighting force is activated, Utility Engineer is investigating, or a nearby utility is in need of immediate repair.
- B. Type III Crossings - Site traffic will yield to Contractor at Type III crossings. Type III crossing shall be located in the same location as the existing Type III crossing indicated on the Construction Drawings.
- C. Install Stop signs on STP Access Road where it is crossed by the STP Backfill Borrow Area Haul Road.

**3.2 PARKING**

- A. Clean Contractor Laydown Area shall be within a support area.
- B. Contaminated Equipment Parking Area
  - 1. The contaminated equipment parking area shall be kept free of standing water.

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2. The contaminated equipment parking area shall be kept free of debris.
3. The contaminated equipment parking area shall be located as shown on the Construction Drawings.
4. See Section 02205 for additional requirements for contaminated equipment.

**END OF SECTION**

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SECTION 02205  
IMPACTED MATERIAL EXCAVATION AND HANDLING

**PART 1      GENERAL**

**1.1          SCOPE**

This Section includes the requirements for the excavation, loading, hauling, and unloading of impacted materials and related activities including, but not limited to:

- A.    Excavation of the following impacted materials: 6" stripping areas, stockpiles, debris, asphalt roads, underground utilities, soil, Above-Waste Acceptance Criteria (WAC) soil, sediment, Above-WAC sediment, Technetium-99 Above-WAC material, Uranium Above-WAC material, Above-WAC Sludge cake, Above-WAC Digester sludge, Trickling Filter media, Special Materials, unclassified impacted material, and existing STP access road and associated storm drains, as shown on the Construction Drawings.
  
- B.    Loading and hauling of the excavated unclassified impacted materials from the Sewage Treatment Plant (STP) area, excavated soils from the abandoned underground utility line trenches and stockpiles, and unloading of this material in the On-Site Disposal Facility (OSDF).
  
- C.    Regrading and associated activities in the SP-7 Stockpile to create separate areas for the Tc-99 Above WAC material and the Uranium Above WAC material. This shall include construction of a segregation ditch between the two materials and construction of the SP-7 berm on the Tc-99 area in which to place stabilized digester sludge and soil.
  
- D.    Loading and hauling of excavated Tc-99 and Uranium Above-WAC material and unloading and placing at the designated SP-7 stockpile areas shown on the Construction Drawings.

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- E. Loading, containerizing, and hauling Above-WAC sludge cake and staging of these containers in the Special Material Transfer Area shown on the Construction Drawings.
- F. Stabilizing Above WAC digester sludge with lime and Tc-99 Above WAC material in the STP area.
- G. Loading and hauling stabilized Above-WAC digester sludge and Tc-99 Above WAC material and unloading and placing in designated areas within SP-7.
- H. Additional stabilization of stabilized Above WAC digester sludge and Tc-99 Above WAC material in SP-7, if required.
- I. Loading of Special Materials, if encountered, and transferring to the Special Material Transfer Area shown on the Construction Drawings.
- J. Size reducing stumps in impacted areas.
- K. Excavating, handling, and sizing of abandoned underground utility lines and appurtenances, including but not limited to drinking water (DW), effluent (FT), fuel gas (FG), sanitary (SN), stormdrains (ST), culverts, and electrical duct shown on the Construction Drawings.
- L. Plugging existing ST-20 line at manhole 176B.
- M. Excavating or removing remaining structures, within the limit of work, excluding CG&E towers, including:
  - 1. Floor slabs.
  - 2. Foundation walls.
  - 3. Foundations, piers, and footings.
  - 4. Concrete block walls (UV building)
  - 5. Roof and roofing materials (UV building).
  - 6. Electric ductbank and manholes.
  - 7. Structural steel, miscellaneous metal and remaining equipment.
  - 8. Miscellaneous electrical and mechanical items.

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- 9. Remaining power poles and pole stubs.
- 10. Chain link and other fencing.

- N. Size reduction of debris as necessary to meet Impacted Materials Placement Plan (IMPP) Category 2 requirements.
- O. Excavating and handling other impacted material and debris encountered during excavation beyond the limits shown on the Construction Drawings, but within work limits, if required.
- P. Supplemental excavation, as required, during pre-certification.
- Q. Identification, handling, packaging, hauling and unloading Asbestoes Containing Waste Material (ACWM).
- R. Lead contaminated soil, which has been stabilized by others, may be excavated, loaded, hauled, and unloaded in the OSDF as an optional work item.
- S. Equipment washing as necessary to transport material.

**1.2 RELATED SECTIONS**

- A. Section 02050 - Surveying.
- B. Section 02206 - Earthwork.
- C. Section 02270 - Erosion and Sediment Control.
- D. Section 02900 - Seeding.
- E. Part 6 - Statement of Work.
- F. Part 8 - Environmental Health and Safety, and Training Requirements.

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### 1.3

#### REFERENCES

- A. Impacted Materials Placement Plan (IMPP), On Site Disposal Facility (OSDF), current revision.
- B. Waste Acceptance Criteria (WAC) Attainment Plan for On Site Disposal Facility (OSDF), 20100-PL-0007, current revision.
- C. Fernald Environmental Management Project Plan (FEMP) PL-2194, Spill Prevention Control and Countermeasure (SPCC) Plan, current revision.
- D. Fernald Environmental Management Project (FEMP) Procedure RP-00100, Identification and Movement of Radioactive Material, current revision.
- E. Fernald Environmental Management Project (FEMP) Procedure PT-0007 Packaging Low Level Waste for Off-Site Shipment, current revision.
- F. EPA SW 846 Method 9095 Paint Filter Test.
- G. Technical Reference Document - Design and As-Built Drawings of the Structures in the Sewage Treatment Plant (STP) Area.
- H. Fernald Environmental Management Project Procedure (FEMP) RM-0045 , Hoisting and Rigging Manual.
- I. Ohio Administrative Code (OAC), Chapter 3745-20, Asbestos Emission Control.
- J. Title 29, Code of Federal Regulations (CFR), Part 1926.1101, Asbestos.

### 1.4

#### SUBMITTALS

- A. Provide Excavation and Demolition Work Plan as required by Part 6 and Part 8.

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B. The Excavation and Demolition Work Plan shall be integrated into the Safe Work Plan specified in Part 6. The Excavation and Demolition Work Plan shall include, as a minimum, the following:

1. Detailed methods and procedures for excavation of the following impacted materials: 6 inch stripping areas, stockpiles, debris, asphalt roads, underground utilities, soil, Above-Waste Acceptance Criteria (WAC) soil, sediment, Above-WAC sediment, Technetium-99 Above-WAC material, Uranium Above-WAC material, Above-WAC Sludge cake, Above-WAC Digester sludge, trickling filter media, Special Materials, and unclassified impacted material and existing STP Access Road and associated storm drains, as shown on the Construction Drawings. Include methods for segregating category 2 and other categories of impacted material specified in the IMPP during excavation and size reduction methods to ensure the WAC in the IMPP are met.
2. Technical approach for the coordination and implementation of the excavation related activities including submittals, surveying, fence installation and removal, stump grinding and removal, loading requirements, haul road maintenance, material identification and documentation, supplemental excavation during pre-certification, seeding, stabilization of exposed excavated areas, and dewatering.
3. Integrated schedule for impacted material excavation with Contractor's Project Schedule as specified in Part 6, for the excavation, including loading, hauling and unloading, and excavation related activities showing sequence, duration, critical activities, resources for each activity, equipment, number of crews and crew size, and start and completion date of each activity.
4. Plan for coordinating personnel and equipment in the excavation areas.
5. Technical approach to construct and regrade SP-7 into sperate Tc-99 Above WAC and Uranium Above WAC areas. Also address construction of SP-7 berm in

- the Tc-99 Above WAC area in which to place and stabilize (if required) Above WAC digester sludge and Above WAC Tc-99 soil.
6. Methods for stabilizing Above WAC digester sludge with Tc-99 Above WAC soil within the STP area. Loading and hauling material to SP-7 (including spill prevention and control) and further stabilizing (if required) within SP-7.
  7. Methods for the excavation, management, loading, segregation, transfer, and staging of Special Materials, Technetium-99 Above-WAC Material, Uranium Above-WAC Material, Above-WAC sludge cake, and Above-WAC digester sludge. Provide specific details to address separation of Above WAC sludge cake, Above WAC digester sludge and geotextile separating the two materials.
  8. Methods for loading, hauling and unloading methods for the Technetium-99 Above-WAC Material, Uranium Above-WAC Material and Above-WAC digester sludge to the SP-7 Stockpile including:
    - a. Inclement weather operations.
    - b. Spreading, grading, and compaction.
    - c. Maintenance of surface conditions and drainage.
    - d. Temporary shutdown and work stoppage.
    - e. Methods to prevent haul equipment tires from coming in contact with Above-WAC Material.
  9. Methods for loading, containerizing, and hauling of the Above-WAC sludge cake and associated debris to the Special Materials Transfer Area.
  10. Loading, hauling, and unloading methods for impacted materials to the OSDF.
  11. Location, sequencing, and construction of interim working stockpiles, if necessary.
  12. Sequencing construction of ditches and sumps.
  13. Methods for complying with the FEMP Plan PL-2194 for spill prevention, control, and countermeasures.

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14. Detailed methods and procedures for concrete and structure removal including the following:
  - a. Detailed method and sequence of dismantlement, including equipment to be used and rigging requirements.
  - b. Methods of sizing, including equipment to be used.
  - c. Methods for control of contaminants, including control of fugitive emissions during sizing activities to control visible dust emissions.
  - d. Methods of dismantling remaining railing, internal equipment and components such as valves, switches and other devices.
15. Methods for excavation and removal of trickling filter media.
16. Methods for utility excavation and removal.
17. Methods for plugging pipe into manhole 176B.
18. Methods for identification and handling of ACM.
19. Technical approach for loading, hauling, and unloading methods for stabilized lead contaminated soils from AlPII to the OSDF as directed by the Construction Manager (optional excavation).

- C. Technical documents and MSDS for lime.
- D. Catalog cuts and MSDS for non-shrink grout.
- E. Technical documents for mechanical and/or inflatable plug.

**1.5 EXISTING CONDITIONS**

- A. Prior to the start of excavation of the impacted material, examine and verify the existing conditions as specified in Section 02050.

**1.6 HEALTH AND SAFETY REQUIREMENTS**

- A. Environmental Health, Safety, and Training requirements shall be as specified in Part 8 of the Contract Documents.

1.7

**DEFINITIONS**

- A. **Impacted Material:** Impacted material is defined as material placed by previous DOE operations and soil and debris with contaminant levels above the established Final Remediation Levels (FRLs).
- B. **OSDF material categories:** The Contractor shall segregate impacted material into the categories as defined in the tables attached to this Section.
- C. **Unclassified Impacted Material:** Unclassified impacted material is defined as impacted material encountered during excavation, regardless of type, character, composition, and condition thereof, not otherwise specified in this Section. Categories of unclassified impacted material shall be as specified in the IMPP for the OSDF. Unclassified impacted material also includes debris encountered during excavation.
- D. **Debris:** Debris consists of impacted material such as construction materials, concrete, asphalt, steel rebar, ACM, trickling filter media, fencing and other materials not defined as a Special Material. Criteria for debris shall be as specified in the IMPP and WAC Attainment Plan for the OSDF.
- E. **Uranium Above-WAC Material:** Soil, soil mixed with debris, debris, or soil-like impacted material with total uranium concentrations above the OSDF total Uranium WAC or any other material that does not meet the OSDF WAC because of Uranium concentrations.
- F. **Technetium-99 Above-WAC Material:** Soil, soil mixed with debris, debris, or soil-like impacted material with Technetium-99 concentrations above the OSDF WAC or any other material that does not meet the OSDF WAC.
- G. **Sludge cake and associated debris:** Sludge cake and associated debris, including geotextile, from the East Drying Bed, located in the sludge drying bed area below

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the digester sludge and geotextile. This material is a Resource Conservation and Recovery Act (RCRA) listed hazardous waste.

- H. Above-WAC Digester sludge: Sludge originally located in the STP Digester, currently contained in the Digester, Sludge Drying Beds and west chamber of the Primary Settling Basin.
- I. Stabilized Above WAC digester sludge: Above WAC digester sludge that has been mixed with lime and Tc-99 Above WAC soil in the STP area. Stabilized Above WAC digester sludge shall be transported to SP-7.
- J. Special Material: Impacted material which requires special handling shall be as listed below:
  - 1. Nonpressurized containers, including drums, boxes, cans;
  - 2. Pressurized containers;
  - 3. Non-soil residues, including green salt, black oxide, orange oxide, sump cake;
  - 4. Transformers and electrical equipment;
  - 5. Lead acid batteries;
  - 6. Uranium metal, including derbies, ingots and irregularly shaped scrap;
  - 7. Medical/infectious waste;
  - 8. Tires;
  - 9. Miscellaneous debris, including oil and air filters, personal protective equipment (PPE), radiators, cables, wires, tools, heavy equipment, office materials and documents, and lead flashing.
  - 10. Acid brick.
- K. Non-process piping: Piping and appurtenances (pumps, valves, etc.) Such as potable water lines, fuel lines and electrical conduit which did not carry process related waste water.
- L. Process piping: Piping and appurtenances (pumps, valves, etc.) Which carried process waste water.

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- M. Sediment: Sediment material accumulated in ditches and in erosion and sediment control structures shall be managed as unclassified impacted material, as defined in this Section.
- N. STP Access Road: The STP Access Road is an existing asphalt road of which a section shall be removed after STP excavation, soil stripping, and trench backfill activities have been completed. The location of the road removal is shown on the Construction Drawings. For purpose of bid, the Contractor shall assume a typical section of 6 inch crushed stone base overlain by a 2 to 4 inch asphalt layer and as shown on the Construction Drawings.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- A. The Construction Manager will furnish metal boxes, lids, and fastening hardware for the Above WAC sludge cake and associated debris at the Contractor's clean laydown area. Each box shall be approximately 4' by 4' by 7' and weigh approximately 1,100 pounds when empty.
- B. The Construction Manager will furnish materials, equipment, and personnel for radiological characterization and monitoring of the impacted material.
- C. Signs for the radiological control areas and certified areas will be furnished by the Construction Manager. Sign posts shall be provided and installed by the Contractor.
- D. Contractor shall provide lime to stabilize Above WAC digester sludge.
- E. Contractor shall provide 20 mil sheets of Herculite or equivalent for loading areas within the STP area.

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- F. Diapers, bed liners and/or other materials as required to prevent spillage of free liquids from stabilized Above WAC digester sludge.
- G. Grout Plug: Grout plug shall be constructed of non-shrink grout. Non-shrink grout shall be Masterflow-928 by Master Builders, Inc., or equivalent approved by the Construction Manager.
- H. Pipe Plug:
  - 1. Mechanical plug shall be compression-type, without bypass, suitable for permanent seal as manufactured by CHERNE Industries, Inc. or approved equivalent, or
  - 2. Inflatable plug shall be non stretch, Kevlar matting imbedded in neoprene, without bypass, suitable for permanent seal as manufactured by Zumro, Inc. or approved equivalent.
- I. ODOT Item 304: As specified in Section 02206.

**2.2 Equipment**

- A. Provide equipment of size and type to excavate, size reduce, load, haul, and unload impacted material to meet the Contract requirements. Haul equipment must be equipped with placard carriers.
- B. Provide equipment of size and type to excavate, load, haul, unload, place, manage, and compact Technetium-99 Above-WAC Material and Uranium Above-WAC Material from the STP to the SP-7 Stockpile area, as appropriate.
- C. Equipment used to haul impacted material over the existing Southern Waste Units (SWU) Impacted Material Haul Road, STP Haul Road, OSDF Impacted Material Haul Road, and OSDF Borrow Area Haul Road as shown on the Construction Drawings shall be equal to or less than the gross vehicle weight, tire pressure and axle loading for a Caterpillar CAT D300E truck (gross vehicle weight of 106,700 pounds, tire pressure of 60 psi, and axle load of 37,400 pounds). Pavement width

of the existing two- way SWU Impacted Material Haul Road is 24 feet. Select equipment and equipment width to ensure safe operation on this road.

- D. Equipment to regrade and maintain SP-7. SP-7 shall be divided into separate Uranium Above WAC and Tc-99 Above WAC areas. Provide equipment to maintain SP-7 stockpile for duration of placement operations.
- E. Provide equipment to handle, mix and stabilize the Above WAC digester sludge to reduce free liquids to acceptable levels. Equipment shall be capable of thoroughly mixing the materials for stabilization.
- F. All excavation and haul equipment shall have enclosed cabs. Enclosed cab is defined as equipment cab isolated from outside environment (intact windows, doors, panels and floors surrounding driver with all windows and doors shut) which provides a barrier from intrusion of outside airborne particles. Any HVAC (heating, ventilating or air conditioning) units associated with the equipment cab must not provide a direct path for outside air to enter (air conditioner on air recirculate mode), directly from outside the cab unless the air is first passed through a HEPA filter.
- G. Provide water tank trucks, tank trucks for the dust suppressant/crusting agent, portable tanks, pressure distributors, or other equipment designed to apply water, dust suppressant and crusting agent uniformly and in controlled quantities to variable surface widths to provide dust suppression/erosion control as required in Part 6.
- H. Provide, install and maintain piping, valves, tanks and appurtenances as necessary to utilize the OSDF Construction Water Well as shown on the Construction Drawings.
- I. Provide portable wash equipment to wash vehicle tires and vehicle exteriors prior to entering haul roads, as necessary.

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J. Trucks used for hauling of the impacted material shall be equipped with automatic load cover tops.

K. Provide stump grinder or other equipment to meet contract requirements.

**PART 3 EXECUTION**

**3.1 GENERAL REQUIREMENTS**

A. Provide material identification and documentation in accordance with Part 6 and as shown by the Construction Drawings.

B. Continuously observe excavations and utility removal trenches. Stop excavation in the area and immediately notify the Construction Manager when Special Material is encountered.

C. The Construction Manager and regulatory agencies may collect impacted material samples from the excavation, haul equipment and in the OSDF at any time during the project.

D. During excavation, segregate Category 2 material larger than 12 inches and maximize volume of Category 1 material. Size reduce material to meet physical WAC specified in IMPP.

E. Stump Grinding in Impacted Areas: Grind stumps or otherwise size reduce to a minimum depth of 12 inches below grade or to the bottom of the root-mass within 18 inches of the stump in all horizontal directions. Grind the wood chips in pieces generally smaller than 12 inch dimensions. Excavate and dispose of the ground stump wood chips with the surrounding soils. The volume of organic material shall be less than one-fourth of the volume of the truck, as determined by visual observation by the Construction Manager.

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- F. Location of impacted material interim working stockpiles shall be within the limits of A1PII and as approved by the Construction Manager. Interim working stockpiles shall be removed within a maximum of thirty (30) calendar days.
- G. Blasting, including use of explosives or explosive devices, is not permitted.
- H. Unexpected discovery of cultural resources: Upon the unexpected discovery of any object suspected to be historic, prehistoric, or archeological site, feature or object, immediately cease ground disturbing activities around the find and contact the Construction Manager.
- I. The following requirements shall apply to equipment for excavation, stabilizing, mixing, handling, loading, hauling, and unloading:
1. Equipment used for excavation, loading, hauling and unloading of the impacted material shall be clearly marked. The Construction Manager will provide signs stating "Radioactive Material" in accordance with FEMP Procedure RP-00100.
  2. Equipment used during excavation, loading, stabilizing, mixing, handling, hauling, and unloading of the impacted material shall be kept within the boundary of the area being worked during non-work periods.
  3. Equipment used for excavation, loading, hauling, and unloading the impacted material shall not be permitted to leave the radiological control or lead control areas (optional) until equipment decontamination activities are completed by the Contractor and radiological survey of the equipment is approved by FEMP Radiological Control for the radiation control areas and by the Construction Manager for the lead control areas (optional). The automatic cover shall be in place during all periods of equipment movement on-site, whether empty or full.

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4. Equipment cab shall remain closed and operators shall not be allowed out of the equipment in any posted contamination area without appropriate Personal Protective Equipment (PPE) except in emergency situations.

J. Loading requirements:

1. During loading, the haul equipment shall be loaded in "buffer" areas that will be scanned by the Construction Manager. Buffer areas shall be existing paved areas within the STP. The buffer areas will be delineated in the field. The Contractor shall not access the buffer area directly from the active excavation areas. Contractor shall install fence posts to delineate buffer areas. Construction Manager will install rope fence on the fence posts. Contractor shall keep buffer areas clear and free of dirt and mud.
2. During loading the haul equipment shall remain in the buffer area and on asphalt pavement to the extent practical.
3. During loading, the loading equipment shall be in the excavation area, outside the buffer area. Loading equipment shall load the haul equipment while reaching over and into the buffer area and dumping directly into the haul equipment.
4. Haul equipment shall be loaded in a manner that prevents spillage and prevents impacted material from accumulating on wheels and components of the haul equipment. Remove all visible material that accumulates on edges and ledges of exterior of truck.
5. If spillage occurs, or at the discretion of the Construction Manager the loading area may be covered with a 20 mil sheet of Herculite or approved equivalent.
6. The Construction Manager will inspect and monitor haul equipment in the buffer area. The Construction Manager will allow the haul equipment to move after monitoring indicates that the equipment is not contaminated. The Contractor should allow 15 minutes for scanning of each piece

- of dry haul equipment if no contamination is found. Working in rain and/or wet weather will increase scanning time.
7. If radiological contamination is found on the outside of the haul equipment, the Contractor shall wash the equipment within the buffer area (with low volume, high pressure washer or approved equivalent). Construction Manager's radiological surveys of exterior of haul equipment must be made on dry surfaces. Drying time will delay scanning. Contractor shall allow 60 minutes for scanning for each piece of equipment that is washed with water; This shall include trucks exiting the OSDF Equipment Wash Facility. Wash water shall be collected in the STP excavation sumps.
  8. The Contractor may use multiple loading/buffer areas at any one time.
  9. Haul equipment shall be loaded so as to minimize load shifting during transit.
  10. Haul equipment shall be loaded to minimize spillage during the loading process. Material shall be below the top of the bed.
  11. Prior to loading and hauling, all material, designated for the OSDF, shall be void of free liquid under the guidelines of the EPA Paint Filter Test (EPA SW 846 Method 9095). The Construction Manager reserves the right to perform an EPA Paint Filter Test at any time. Any material that fails the Paint Filter Test shall be reworked as directed by the Construction Manager. Moisture content of impacted material before loading shall be as specified in the IMPP.

K. Hauling requirements:

1. The Construction Manager will perform radiological monitoring before equipment is released. If monitoring results indicate contamination, haul equipment shall be decontaminated by Contractor prior to leaving the STP Area.
2. When not in use and at night, park haul equipment in buffer areas or other areas designated by the Construction Manager.

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- 3. Haul equipment will be decontaminated and radiologically monitored by others at the OSDF Equipment Wash Facility.
- 4. Haul equipment shall remain on the haul roads designated on the Construction Drawings. Equipment that enters these roads shall not be allowed to exit, except at the OSDF, STP Excavation Area, stockpiles, and/or special material transfer areas without approval by the Construction Manager.
- 5. Tracked equipment shall be prohibited from operating or tracking on the OSDF Borrow Area Haul Road or the North Entrance Road.
  
- L. Perform stabilization of the excavated areas using crusting agent or seeding in accordance with Sections 02270 and 02900, respectively.
- M. Tolerances for excavation depths as shown on the Construction Drawings shall be 0 to +6 inches of over excavation. Tolerances for excavation of impacted surface soil (i.e., excavation depth of six (6) inches) shall be 0 to +6 inches of over excavation.
- N. Immediately notify the Construction Manager if any material suspected of or known to contain asbestos is encountered. Move excavation to another location at no additional cost to FDF.

**3.2 ABOVE-WAC MATERIAL EXCAVATION**

- A. Prior to initiating excavation activities, survey and stake limits of Above-WAC Uranium and Above-WAC Technetium-99 areas in accordance with Section 02050 and as shown on the Construction Drawings.
- B. Prepare SP-7 stockpile area to receive Above WAC material. Requirements for unloading and stockpiling the Above WAC material at the SP-7 Stockpile Area shall be:

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1. Construction of ingress/egress to the stockpile including access roads, ramps (separate ramp for Tc-99 and Uranium), and drainage improvements.
2. Constructing separate unloading areas (Tc-99 and Uranium) that prevents haul equipment tires from coming in contact with the Above WAC Material.
3. Placing material the stockpile at locations designated by the Construction Manager.
4. Immediately repair damage to the stockpile structures to the original condition (i.e., silt fence, perimeter fence, etc.) caused by the Contractor, at no additional cost to FDF.
5. Dust suppressant shall be in accordance with Part 6.
6. Crusting agent shall be applied, within seven (7) calendar days, upon completion of the stockpile or if the stockpile is to be inactive for more than forty-five (45) calendar days.
7. Surface of the stockpile in use shall be compacted/sealed at the close of each work day to prevent fugitive dust and runoff.
8. Equipment and material used in the placement and management of Above WAC impacted material in either the Uranium or Tc-99 area in the SP-7 Stockpile Area shall not be removed from either area without the approval of the Construction Manager. Equipment shall not be removed from either area before washing. Equipment washing shall be performed within the SP-7 Stockpile Area. Wheels, tires, undercarriage and body of equipment shall be washed free of visible mud, dirt and debris.
9. Stockpile side-slopes shall not exceed a maximum slope of 3H:1V and a height to base ratio 0.2.

C. Perform Above WAC digester sludge excavation and stabilization.

1. Stabilization shall occur in Primary Settling Basin and/or digester. Stabilization shall include placing material in the stabilization

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- stockpiles and mixing with lime and soil. Provide geomembrane liner and/or other methods to prevent contamination of adjacent below WAC material during excavation and stabilization activities.
2. Lime shall be added to increase the pH to 12 or higher. Thoroughly mix materials with auger or other mixing equipment and let stand for 2 hours.
  3. Add Above WAC Tc-99 material to reduce free liquids.
  4. Transport to SP-7 using spill prevention measures.
  5. Mix additional Tc-99 Above WAC soil, as required, within SP-7 to meet the guidelines of the EPA Paint Filter Test (EPA SW Method 9095).
- D. Excavate the Above-WAC Technetium-99 areas to a depth of six (6) inches and mix with digester sludge.
- E. Above-WAC Sludge cake
1. After excavating Above-WAC Digester sludge from within the Sludge Drying Bed, remove the geotextile, visually identify and excavate the sludge cake from the Sludge Drying Beds. Depth is anticipated to range from zero (0) to six (6) inches, actual limits of Above-WAC sludge cake will be determined by the Construction Manager in the field. Excavate sand filter layer and gravel base layer as unclassified impacted material. Cross-section of Sludge Drying Bed is as indicated on Construction Drawings.
  2. Construction Manager will deliver metal containers with lids and hardware. Notify the Construction Manager fourteen (14) days prior to the start of excavation for delivery of containers. Load the sludge cake and geotextile into white metal containers and haul to the Special Material Transfer Area. The Construction Manager will sample the material prior to the Contractor fastening the container lids and hauling to the Special Material Transfer Area. The containers shall be loaded and fastened per FEMP PT-0007.

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3. Loaded containers shall not exceed 9000 pounds in gross weight. Contractor shall estimate weight using volume and density. The sludge is expected to have bulk unit weights ranging from 90 to 125 pounds per cubic foot (pcf).
  4. Clean the exterior of loaded containers for monitoring by the Construction Manager prior to hauling to the Special Material Transfer Area.
- F. Excavate the Above-WAC Uranium areas to a depth of six (6) inches and haul to SP-7.
- G. During excavation of Above-WAC material, maintain the adjacent unclassified below-WAC areas at a higher elevation than the Above-WAC area such that no stormwater from the Above-WAC excavation drains over the below-WAC areas. Loading area shall be graded to drain into the Above-WAC excavation or the STP deep excavation.
- H. Maintain sumps within the Above-WAC excavation to collect water encountered during excavation and to prevent runoff of water onto below-WAC areas. Water collected in these sumps shall be pumped to the Primary Collection Sump and then to the STP Excavation Sump.

### **3.3 UNCLASSIFIED IMPACTED MATERIAL EXCAVATION**

- A. Select equipment and excavation methods to minimize obstruction of continuous visual observation of the excavation by the Construction Manager.
- B. Excavate the Stripping Areas outside the STP Deep Excavation Boundary to a depth of six (6) inches using standard excavation techniques as shown on the Construction Drawings and haul to the OSDF.
- C. After excavation of the Above-WAC material, excavate to the STP deep excavation boundary. All underground pipelines and underground utilities shall be excavated and removed as they are encountered. The excavation shall proceed using standard excavation techniques to

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the lines and grades shown on the Construction Drawings. Contractor shall refer to the Technical Reference Document for information on the STP Area. In no case will the Contractor be paid for over excavation without written approval from the Construction Manager.

- D. If unexpected Above-WAC or Special Materials are encountered, stop excavation, notify the Construction Manager, and move the excavation operation to another location as directed by the Construction Manager.

### 3.4 STRUCTURE REMOVAL AND TRANSPORT

- A. If dust is a result of removal operations (due to crumbling, cutting, etc.), dust suppression techniques must be employed during demolition and, if necessary, during transportation. Dust control shall be in conformance with Part 6 and the Fugitive Dust Control Plan.
- B. Prevent damage to any adjacent structures, materials, and equipment including underground utilities that are to remain intact, or those installed for performance of this work.
- C. All lifting and rigging required shall be in accordance with FEMP RM-0045, FDF Hoisting and Rigging Manual.
- D. Size Reduction.
1. All structures at the STP area and elsewhere indicated on the Construction Drawings are to be removed and disposed of in the OSDF, with the exception of the CG&E towers.
  2. All material destined for the OSDF shall be in accordance with the IMPP, including the following guidelines. The physical criteria (dimensions given are considered nominal) that shall be applied to material destined to the OSDF are:
    - a. The maximum thickness of concrete or other components of a building slab or substructure shall be 18 inches when the materials are part of a load of similar material. 000059

- b. The maximum thickness of an individual concrete member or other component of a building slab or substructure shall be 4 feet when the item is handled individually and is a regular, rectangular shape having no concrete protrusions greater than 18 inches.
  - c. Concrete reinforcement bars shall be cut within a nominal 12 inches of the concrete mass.
3. Embedded steel reinforcing is considered part of concrete.
- E. All structural material will be loaded in bulk and hauled to the OSDF in accordance with this section, including chain link fencing, posts, gates and appurtenances.
- F. Structural removal shall also include all handrails, equipment or other appurtenances attached or affixed to the concrete.

### 3.5 UTILITY REMOVAL

- A. Both process and non-process piping removed shall be visually monitored by the Construction Manager during excavation. Any piping (including conduit and ductwork) visibly stained with process related waste or having process related waste clinging to it, as determined by the Construction Manager, shall be size reduced and containerized as Above WAC debris. These containers shall be transferred to FDF Waste Management as directed by the Construction Manager. All other piping shall be sized reduced per OSDF WAC and disposed in the OSDF, unless otherwise directed by the Construction Manager.
- B. Utility removal outside the STP deep excavation boundary:
- 1. All utility lines indicated to be abandoned shall be excavated as indicated on the Construction Drawings. All utility lines indicated to be removed will have been capped, drained, purged and

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plugged prior to removal. Notify Construction Manager and stop work if material is encountered in utility lines. Backfill as specified in Section 02206.

2. All soil material, pipe materials and bedding materials removed during excavation of utilities shall be considered impacted material. Excavation of utilities will be monitored by the Construction Manager. Construction Manager may obtain grab samples of the material during excavation. The Contractor shall provide labor and equipment to assist in collection of soil samples from sides and bottom of utility trenches.
  3. Backfill utility trench excavations in accordance with Section 02206.
- C. Remove utilities within the STP deep excavation boundary as encountered during excavation in accordance with Article 3.3. If utilities within the STP deep excavation boundary are deeper than the proposed excavation limits indicated on the Construction Drawings, excavate the utilities to a maximum depth of 6 inches below the pipe and pipe bedding. Trench side slopes shall be excavated on a three horizontal to one vertical slope.

### 3.6 PLUGGING MANHOLE 176B

- A. Water typically discharge through Manhole 176B on a continuous basis. In order to assist the Contractor in plugging of the storm drain (ST-20") in Manhole 176B, The Construction Manager will reduce flow through this manhole for a maximum of 4 hours. The Contractor shall give the Construction Manager a minimum of 3 weeks advance notice to schedule a reduction in flow.
- B. Excavate around the manhole to expose the storm drain pipe. Prior to removal of the storm drain (ST-20") as shown on the Construction Drawings, install pipe plug into the storm drain from inside of the manhole. After the pipe plug is in place, cut pipe approximately 3 ft upstream of the pipe plug. Form grout plug from pipe

plug to cut end of pipe. Grout plug shall be mixed in accordance with manufacturer's recommendations.

- C. After grout plug has been installed, the remainder of the storm drain shall be removed. Backfill the area within 18 inches of Manhole 176B with ODOT Item 304 as directed by the Construction Manager. Remainder of excavation shall be backfilled with trench backfill material in accordance with Section 02206.

### **3.7 REMOVAL OF SEDIMENT**

- A. Notify Construction Manager two (2) weeks prior to removal of sediments and debris in ditches and erosion control devices. Construction Manager will sample and test sediment in ditches and at erosion and sediment control measures prior to removal.
- B. Remove accumulated sediment from existing ditches and erosion and sediment control measures as described in Section 02270 or as directed by the Construction Manager.
- C. Haul removed sediment to the OSDF as unclassified impacted material unless otherwise directed by the Construction Manager.
- D. Sediments accumulated in SP-7 shall be excavated, collected and placed in Above WAC Tc-99 area of SP-7

### **3.8 STOCKPILE EXCAVATION**

- A. Excavation of existing stockpiles NAR-007 and OSD-007 shall proceed to an elevation 6 inches below the original surface grade, followed by pre-certification monitoring by the Construction Manager. Original surface grade shall be considered the ground surface of the surrounding area at the base of the stockpile. Excavated material from the stockpiles shall be considered unclassified impacted material and hauled to the OSDF.

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- B. Construct/install temporary wheel wash facility (gravel wash pad and portable spray equipment), as shown on the Construction Drawings, to wash haul vehicles prior to entering North Entrance Road and OSDF Borrow Area Haul Road.
- C. Required temporary culverts, access ramps, wheel wash facilities and fencing shall be in place prior to excavation and shall be removed after pre-certification or as directed by the Construction Manager.

### **3.9 SPECIAL MATERIAL EXCAVATION**

- A. Special Materials identified during excavation shall be excavated, segregated, size reduced, loaded, transferred and staged at the Special Materials Transfer Area as directed by the Construction Manager.
- B. The Construction Manager will be responsible for final disposition of the Special Materials.
- C. Special Materials Transfer Area shall be located as shown on the Construction Drawings.

### **3.10 SUPPLEMENTAL EXCAVATION AND PRE-CERTIFICATION**

- A. After excavation is completed in an area to the limits shown on the Construction Drawings, the Contractor shall survey the excavated area in accordance with Section 02050. After survey, the Construction Manager will perform monitoring to pre-certify the areas as having attained FRLs. The Construction Manager will take up to ten (10) calendar days to perform monitoring of an area. If the monitoring indicates an area has not attained FRLs, perform supplemental excavation as directed by the Construction Manager until FRLs have been attained. Pre-certification monitoring by the Construction Manager will follow each lift of the supplemental excavation.

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- B. After pre-certification has been achieved, install rope fencing along the perimeter of the pre-certified area as directed by the Construction Manager and maintain erosion controls and drainage in the area. The Construction Manager will install signs.
- C. Supplemental excavation shall be considered as Unclassified Impacted Material excavation unless otherwise directed by the Construction Manager.

### **3.11 EXCAVATION AND REMOVAL OF ROAD**

- A. Leave STP Access Road from support area to North Entrance Road.
- B. Remove STP Access Road from support area to STP and haul to OSDF.
- C. Remove STP Haul Road and haul to OSDF.

### **3.12 ASBESTOS CONTAINING WASTE MATERIAL**

- A. FDF has provided the necessary notification of these activities as required by OAC 3745-20. The OSDF is an active asbestos waste disposal site in accordance with OAC 3745-20-06.
- B. The Contractor shall be responsible for:
  - 1. Adherence and compliance to work practices and procedures set forth in applicable federal regulations (CFR) and state codes (OAC).
  - 2. Ensuring Contractor's (inclusive of Subcontractor) employees are informed of the presence of ACWM in the project work area(s) in accordance with 29 CFR 1926.1101(d) and OAC 3745-20-06(B)(4).
  - 3. Establishing a restricted area adequate to deter the entry of unauthorized personnel within 100 feet of the ACWM work areas in accordance with OAC 3745-20-06(B)(4).
  - 4. Obtaining required training as defined in Part 8.
  - 5. Dust control in accordance with Part 6 and the Dust Control Plan.

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6. Using wet methods and other work practices and engineering controls to prevent creation of visible asbestos emissions during handling of ACWM.
  7. Personal air monitoring in accordance with 29 CFR 1926.1101(f) including sampling necessary to complete initial exposure assessment.
- C. The Contractor shall ensure an asbestos competent person is on-site anytime ACWM is being disturbed, excavated, handled, loaded, hauled, or unloaded.
- D. Contractor shall use the following project specific handling methods:
1. ACWM, which is determined not to be friable or to have the potential to become friable (non-friable ACWM), shall be considered as unclassified impacted material and shall be excavated, loaded, hauled and unloaded as specified in this Section.
  2. ACWM, which is determined to be friable or to have the potential to become friable (friable ACWM), as well as pieces of transite panels greater than 12 inches in greatest dimension, shall be considered ACWM and shall be either wetted with amended water (water mixed with surfactant) or encapsulated, and separated from the impacted material.
  3. Care shall be taken so that the ACWM does not break or crumble during handling. In the event that it breaks or crumbles during handling, encapsulate the exposed surfaces.
  4. ACWM components meeting the OSDF Waste Acceptance Criteria (WAC) physical size criteria and removed intact in large pieces shall be wrapped in two layers of polyethylene sheeting, secured with duct tape, and labeled in accordance with OAC 3745-20-05(C)(1). Multiple pieces may be grouped prior to wrapping, provided WAC physical size criteria are still met.
  5. Surfactants or encapsulants shall be applied during sizing of any large pieces of ACWM to meet the OSDF WAC physical size criteria.

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6. Pieces of ACWM not conducive to wrapping shall be bagged in a polyethylene bag, sealed, bagged in a second polyethylene bag, sealed, and labeled in accordance with OAC 3745-20-05(C)(1).
  7. ACWM with sharp-edged components (e.g., nails, screws, metal lath, tin sheeting) capable of tearing the polyethylene bags or sheeting shall be handled in one of the following ways:
    - a. Pad or wrap and secure the sharp-edged components in a manner to prevent tearing of the polyethylene, then wrap or bag in accordance with the respective preceding entries.
    - b. Place into Contractor-supplied, polyethylene-lined containers (i.e., fiberboard boxes or drums). Metal containers are not allowed.
    - c. Container size is subject to the Impacted Material Placement Plan for OSDF for Category 5 material. The polyethylene liner shall be sealed prior to sealing the container. The container shall be labeled in accordance with OAC 3745-20-05(C)(1).
  8. Wrapped, bagged, or containerized ACWM shall be segregated from other excavated material and accumulated at the Special Materials Transfer Area. When a sufficient quantity for a segregated load is accumulated, it shall be loaded and hauled to the OSDF. Loads shall be prepared and secured to prevent any visible emissions, load loss, and spillage or leakage of liquids.
  9. No ACWM shall be left exposed at the surface of the excavation at the end of the work day.
- E. Wrapped, bagged, or containerized ACWM shall be unloaded in the OSDF as Category 5 material in accordance with the Impacted Material Placement Plan for OSDF, which presents additional requirements.
- F. Each work day during disturbance, excavation, handling, hauling, loading, unloading or placement of ACWM, the Contractor's asbestos competent person shall conduct a daily inspection of the ACWM work area(s) and adjacent

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areas. If there is visual evidence of asbestos contamination (e.g., spills of ACWM) outside the demarcated ACWM work area(s), the Contractor shall take immediate action to abate the hazard. The incident shall be reported immediately to the Construction Manager.

**3.13 STABILIZED LEAD SOIL (OPTIONAL ITEM)**

- A. Stabilized Lead contaminated soil, within boundaries shown on Construction Drawings, which has been stabilized by others, shall be excavated so as to remove all stabilized soil. Lead contaminated soil will be stabilized insitu (Option A) or in a stockpile (Option B) within the Trap Range as shown on the Construction Drawings.
- B. Load trucks in a manner that keeps the vehicle out of the excavation area or provide a method to load and haul clean. Excavation shall be planned to eliminate tracking of equipment from unexcavated areas or active excavation areas to excavated areas to prevent cross contamination. Use portable wheel wash as necessary to prevent tracking soil out of the work area.
- C. The material shall be hauled and unloaded in the OSDF as indicated on the Construction Drawings and as directed by the Construction Manager.
- D. Regrade and seed the areas excavated to provide non-erosive positive drainage upon written direction from the Construction Manager. This direction will be based on verification that all remediation requirements have been met in accordance with Section 02900.

**END OF SECTION**

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**ATTACHMENT 1**

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**MATERIAL SEGREGATION GUIDANCE**

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\* NOTE: REVISIONS IN PROGRESS ON  
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Attachment 1 - Material Segregation Guidance  
Part 1 - OSDF Material Segregation Categories for Bulk Material

Profile No. (1)	OSDF Category No.	Category Description	Physical Requirements	Examples	Decision Process (2)
91000	Category 1	Soil and soil-like	<ul style="list-style-type: none"> <li>o Any hard agglomerations <math>\leq 12^\circ</math></li> <li>o Other than till or ash, at least 80% of particles finer than <math>1^\circ</math> (3)</li> <li>o Compactable using standard construction equipment *</li> </ul>	<ul style="list-style-type: none"> <li>o Fly ash</li> <li>o Majority of OU2 and OU5 soils.</li> </ul>	[1] Evaluate impacted soil and soil-like material for Category 1. If it fails, proceed to Category 2.
92000	Category 2	Materials that can be transported, placed, spread and compacted in mass, and meet the size criteria	<ul style="list-style-type: none"> <li>o Irregularly shaped metals &amp; finish/superstructure components <math>\leq 10'</math> long and <math>18''</math> thick</li> <li>o Concrete reinforcement bars cut within a nominal 12 inches of the mass</li> <li>o General building rubble (concrete, masonry, similar materials) - <math>\leq 10'</math> long and <math>18''</math> thick</li> <li>o Equipment - drained of all oils and liquids</li> <li>o Piping <math>\geq 12''</math> diameter - split in half</li> <li>o Intact drums must be empty and crushed (P) (4)</li> <li>o D&amp;D project debris may not include acid brick (P)</li> <li>o Material from soil excavations may not include any brick (P)</li> <li>o Transformers must be crushed or filled with grout (P) (5)</li> <li>o Moderately compactible using Caterpillar D-8 dozer or 815C compactor type equipment *</li> </ul>	<ul style="list-style-type: none"> <li>o Broken-up concrete foundations</li> <li>o Soil mixed with broken-up concrete</li> <li>o Other debris not requiring individual placement (see Category 3)</li> <li>o General building rubble, e.g., drywall, HVAC systems, electrical systems, plumbing systems, minor equipment</li> </ul>	<p>[2.a] Evaluate impacted soil and soil-like materials for Category 2. If it fails, proceed to Category 5.</p> <p>[2.b] Evaluate impacted debris for Category 2. If it fails, proceed to Category 3.</p>
93000	Category 3	Materials that require individual handling and placement, and meet the size criteria	<ul style="list-style-type: none"> <li>o Height <math>\leq 6'</math></li> <li>o Rectangular shaped</li> <li>o Concrete protrusions <math>\leq 18''</math></li> <li>o Void spaces <math>\geq 1'</math> filled with cohesionless material or a quick set grout</li> <li>o Concrete reinforcement bars cut within a nominal 12 inches of the mass</li> <li>o Equipment - drained of all oils and liquids</li> <li>o Transformers must be crushed or filled with grout (P)</li> <li>o Suitable for having soil/soil-like material placed around/against them *</li> <li>o Not compactible with standard compaction equipment *</li> </ul>	<ul style="list-style-type: none"> <li>o Equipment</li> </ul>	[3] Evaluate impacted debris for Category 3. If it fails, proceed to Category 5.
94000	Category 4	Materials with high organic content (e.g., humus or vegetation) or that are highly compressible	<ul style="list-style-type: none"> <li>o Highly compressible *</li> </ul>	<ul style="list-style-type: none"> <li>o Vegetation, i.e., trees, limbs, underbrush</li> <li>o Materials from the solid waste landfill</li> <li>o Lumber from building demolition</li> </ul>	<p>[4] Evaluate organic materials for Category 4.</p> <p>Note: Soils which contain organic materials should not be classified as Category 4. See Category 1.</p>

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**Attachment 1 - Material Segregation Guidance**  
**Part 1 - OSDF Material Segregation Categories for Bulk Material**

Profile No. <sup>(1)</sup>	Impacted Material Category No.	Category Description	Physical Requirements	Examples	Decision Process <sup>(2)</sup>
95000	Category 5	Materials that require case-by-case evaluation	<ul style="list-style-type: none"> <li>o Regulated ACM - Double-bagged (or equivalent) and delivered unmixed with other material</li> <li>o ACM brick and commingled debris - double-contained and segregated from other materials</li> <li>o ACM insulated piping - delivered unmixed with other material</li> <li>o Equipment - drained of all oils and liquids</li> <li>o Transformers must be crushed or filled with grout (P)</li> </ul>	<ul style="list-style-type: none"> <li>o Double bagged asbestos</li> <li>o ACM insulated pipe</li> <li>o Sludges</li> </ul>	<p>(5) Submit a request for disposal (RFD) to OSDF. Note: At this time, the OSDF does not anticipate accepting oversized debris under Category 5.</p>

- (1) Each of the listed Profile numbers represents a root Impacted Material Category waste stream. Numeric extension Profiles (e.g. 91001, 91,002...85,899) will be used to facilitate further delineation of waste streams, on an as-needed basis.
- (2) The selection of the appropriate category is a process of elimination beginning with Category 1. The majority of impacted material will be Category 1, second largest volume being Category 2, with the majority of the remainder being Category 3. Category 4 has limited applicability. Category 5 is for material that requires a Request For Disposal (RFD) per EW-1021, "Preparation of a PWID Report".
- (3) Items marked with an asterisk (\*) are primarily a material specification rather than WAC item. They are provided for information only.
- (4) Items marked with (P) reflect specific OSDF IMP Plan prohibitions. (P) indicates a high probability of applicability to the identified category. A complete list of prohibitions is provided in the Prohibited Items table.  
 Transformers and other types of debris may be classified under more than one OSDF material category, based on size.

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**Attachment 1 - Material Segregation Guidance**  
**Part 2 - Materials that Require Special Handling, Regardless of WAC Status**

Material	Examples	Protocols
Asbestos	Transite panels, floor tile, feeder cable, piping insulation	<p>General: Unprotected ACM may not be staged in the excavation area. If delays are expected prior to OSDF disposition, containerize and transport to Interim storage.</p> <p>Wrapped pipe: Size reduce, double bag or equivalent for OSDF Category 3 or 5. Pipe may be split axially or radially.</p> <p>Transite sheets: Band and manage as OSDF Category 3.</p> <p>Other ACM that meets OSDF Category 5: Double bag ACM that does not meet OSDF WAC: Containerize and transport to Interim storage for off-site evaluation.</p> <p>Note: OSDF Category 5 is evaluated on a case-by-case basis. A Request For Disposal (RFD) is required.</p>
Non-pressurized Containers	Intact drums, metal and wood boxes, cans	<p>Intact containers: Visually inspect for leaks and indication of contents. Overpack or repack leaking containers prior to movement from area of discovery. If safety considerations allow, open container and record description of contents on Visual Inspection Form. Transport to interim storage for further evaluation.</p> <p>Empty containers: Crush or size reduce and manage as OSDF Category 2.</p>
Pressurized Containers	Aerosol cans, freon containers, gas cylinders, propane tanks, fire extinguishers	<p>General: Handle intact containers as though they contain material. Evaluate container integrity. Intact containers: Overpack and move to FEMP Interim storage area for evaluation. If container is to be dispositioned in OSDF, it must be punctured, crushed or cut so that the interior is open to the atmosphere.</p> <p>Breached containers: Evaluate for OSDF Categories 2, 3 and 5. Category 5 is evaluated on a case-by-case basis and requires a RFD.</p>
Piping and Pumps	Drain lines, sewer lines, process piping, pumps	<p>General: Elevate one end of exposed pipe, cut, and empty flowable material into a container. Transport containers to Interim storage for evaluation.</p> <p>Process piping: Cap and remove pipe after emptying. Evaluate piping for OSDF Category 2. Containerize any piping that requires off-site disposition.</p> <p>General piping: Cap and remove pipe after emptying. Manage as OSDF Category 2.</p> <p>Pumps: Remove after emptying. Manage as OSDF Category 2.</p>
Non-soil Residues	Green salt, black oxide, sump cake	<p>Field screen to determine radionuclide content. Segregate uranium-bearing residues, containerize, and transport to interim storage for evaluation. Stockpile non-uranium residues and evaluate for OSDF Category 1 or 5. Category 5 requires a RFD.</p>
Transformers & other electrical equipment	Transformers, switch gears, capacitors	<p>General: Segregate and evaluate to determine if contains fluids.</p> <p>Empty transformers: Manage as OSDF Category 2, 3, or 5. Fill void spaces greater than 1 cf. with flowable, cohesionless material or a quick set grout. Category 5 requires an RFD.</p> <p>Transformers containing fluids: Drain fluids into a container and transport to Interim storage. Evaluate fluids for off-site disposition. Manage emptied transformer as described above.</p>
Lead Acid Batteries	Forklift and cart batteries	<p>Segregate, containerize and transport to interim storage for evaluation by WM&amp;SP.</p>

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**Attachment 1 - Material Segregation Guidance  
Part 2 - Materials that Require Special Handling, Regardless of WAC Status**

Material	Examples	Protocols
Uranium Metal	Derbies, ingots, billets, irregularly shaped scrap	Segregate, containerize, and transport to interim storage area for off-site evaluation by WM&SP.
Medical/Infectious Waste	Syringes, vials	Evaluate on case-by-case basis for OSDF Category 5 (requires a RFD). Containerize and move to interim storage if field operations do not allow timely completion of this evaluation. Medical/infectious waste not meeting OSDF requirements will be containerized and transported to interim storage for off-site evaluation by WM&SP.
Miscellaneous Debris	Oil/air filters, radiators, cable/wire, tools, heavy equipment, office materials, documents	Evaluate on case-by-case basis for OSDF Category 5 (requires a RFD). Containerize and move to interim storage if field operations do not allow timely completion of this evaluation. Miscellaneous debris not meeting OSDF requirements will be containerized and transported to interim storage for off-site evaluation by WM&SP.
Tires	Tires from miscellaneous equipment	Containerize and transport to interim storage for off-site evaluation by WM&SP.

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### Attachment 1 - Material Segregation Guidance Part 3 - Prohibited Items

This table is based on summary information derived from the "Waste Acceptance Criteria Plan for the OSDF (WAC Plan)". The table summary is provided as a reference, only, and is not intended to be used in lieu of the WAC Plan. The user should refer to the WAC Plan for further detail or clarification.

PROHIBITED ITEM	EXAMPLES / COMMENTS
Off-site waste that was not generated as a direct result of FEMP remediation (e.g., FEMP analytical residual waste from off-site laboratories is permitted)	Categorically excluded by ROD. OSDF is designated for Fernald material only.
Lead bullets from the South Field Firing Range and the associated soil that is identified as RCRA characteristic.	Categorically excluded by ROD. Material from the South Field Firing Range that does not pass TCLP will be sent off-site for disposal.
Acid-resistant brick generated from OU3 facility D&D activities. <sup>(1)</sup>	Categorically excluded by OU3 ROD.
Process related metals (i.e., piping and equipment that does not pass visual inspection), as defined in the OU3 ROD	Categorically excluded by ROD. Examples include derbies, ingots, billets, and uranium scrap.
Product, residues, other special materials (e.g., uranium and thorium inventories) as defined in the OU3 ROD	Categorically excluded by ROD. Examples include green salt and black oxide.
Contents of Silos 1, 2, and 3 from OU4	Categorically excluded by ROD.
Concrete from OU4 Silos 1 and 2 that exhibits highly-elevated direct radiation fields	Categorically excluded by ROD. A definitive threshold criterion for identifying the affected concrete will be established as part of the Remedial Design for OU4.
Waste pit contents from OU1, including any debris found within the waste pits	Categorically excluded by ROD.
Waste pit covers and liners from OU1	Categorically excluded by ROD.
Solvent saturated soils	Categorically excluded by ROD.
RCRA toxicity characteristic soil from the six geographic areas designated in the OU5 ROD, as well as any other material types excavated from these areas <sup>(4)</sup>	Material must be treated to below characteristic level to qualify for OSDF placement.
Lead sheeting generated from facility D&D activities within the boundaries of Operable Unit 3	Lead sheeting is prohibited unless it has been treated.
Equipment > 4' height	Equipment must be cut to meet Category 3, or request approval for disposition as Category 5.
Pressurizable gas cylinders that are still mechanically able to be pressurized	Must be non-pressurizable and meet size and void space requirements to qualify for OSDF disposal.

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### Attachment 1 - Material Segregation Guidance Part 3 - Prohibited Items

This table is based on summary information derived from the "Waste Acceptance Criteria Plan for the OSDF (WAC Plan)". The table summary is provided as a reference, only, and is not intended to be used in lieu of the WAC Plan. The user should refer to the WAC Plan for further detail or clarification.

PROHIBITED ITEM	EXAMPLES / COMMENTS
Intact drums	Drums must be empty and crushed.
Transformers	Transformers must be crushed, or filled with grout or another acceptable material. Used oil must be drained from all transformers.
Materials containing free liquids	Categorically excluded by OSDF IMP Plan. The intent of the exclusion of free liquids is to prevent contaminated liquid waste from being directly disposed in the OSDF. Materials that contain rainwater or, like sludges, that have an inherent moisture content are not prohibited.
Whole or shredded scrap tires	Categorically excluded by OSDF IMP Plan.
Used Oil	Categorically excluded by OSDF IMP Plan.
Planned blending	Dilution is not to be used to satisfy the WAC.
Material not meeting the physical WAC	Must be size reduced or repackaged to meet WAC, to qualify for OSDF disposal.
Soil and other materials from soil areas that exceed the chemical or radiological WAC	Soil and other materials that exceed the radiological WAC may not be dispositioned to the OSDF. Soil and other materials that exceed the chemical WAC, as generated, must be treated to meet the WAC to qualify for OSDF disposal.
Combustible liquids as defined in 29 CFR 1910.106 or flammable wastes as defined in Ohio Administrative Code 1301:7	Prohibited by OSDF Safety Assessment. Compliance with all other prohibitions will result in compliance with this safety requirement.

<sup>(1)</sup> Actual or suspected acid brick from the FEMP's soil excavation activities, including the excavation of the OU2 waste units, will be segregated from other debris during excavation and sent off site for disposal. The objective is to remove the vast majority of the brick (i.e., that brick which can be readily identified and safely removed during soil excavation and OSDF placement activities) to further minimize the chance that brick containing process residuals is placed in the OSDF.

<sup>(2)</sup> POTENTIALLY RCRA CHARACTERISTIC AREAS IDENTIFIED IN OU5 ROD:

- a Area between the KC-2 Warehouse and the adjacent railroad tracks (Remediation Area 3)
- b Trap Range (Remediation Area 1)
- c Paddy's Run streambank fill material, west of the Silos (Remediation Area 7)
- d Scrap Metal Pile (Remediation Area 3)
- e Area North of the Maintenance Building (Remediation Area 3)
- f Abandoned Sump West of the Pilot Plant (Remediation Area 4b)

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SECTION 02206  
EARTHWORK

**PART 1 GENERAL**

**1.1 SCOPE**

This Section includes: Development and excavation of backfill and fill materials at the STP Backfill Borrow Area, excavation and placement of fill for ditch and berm, placement of backfill material in trenches excavated during utility removal outside of STP excavation area and for underground installation of Transfer Line, incidental earthwork and subgrade preparation for gravel parking area.

**1.2 RELATED SECTIONS**

- A. Section 02100 - Site Preparation.
- B. Section 02205 - Impacted Material Excavation and Handling.
- C. Section 02270 - Erosion and Sediment Control.
- D. Section 02506 - Aggregate Surface.
- E. Section 02900 - Seeding.
- F. Part 6 - Statement of Work.
- G. Part 8 - Environmental Health and Safety, and Training Requirements.

**1.3 DEFINITION OF TERMS**

- A. Earth Excavation: Removal of materials not classified as rock within limits shown on Construction Drawings.
- B. Rock Excavation: Removal of materials classified as rock and disposal as specified herein. To be classified as rock, material must be boulders of 9 ft<sup>3</sup> or more in volume, solid or ledgerrock, or other hard material in

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place that cannot be excavated by heavy construction equipment, such as a Caterpillar 215C power excavator equipped with a short-tip radius rock bucket, or a Caterpillar D9 bulldozer equipped with a single tooth hydraulic ripper. Material classified as rock shall be removed by hydraulic ram, bull point wedging, or other methods as approved by the Construction Manager. Use of explosives is prohibited.

- C. Unauthorized Excavation: Excavation not required by specifications or drawings or not authorized in writing by the Construction Manager.
- D. Trench backfill: CL classified material obtained from the STP Backfill Borrow Area.
- E. Fill: Earth used to bring an existing grade to a specified grade.
- F. Undercutting: Removal of soft or undesirable materials determined by Construction Manager, encountered in undisturbed subgrade below grades specified for excavation.
- G. Shoring: A structure, such as a metal hydraulic, mechanical, or timber shoring system that supports sides of an excavation and which is designed to prevent cave-ins.
- H. Topsoil: Unless directed otherwise by the Construction Manager, topsoil shall be considered as the upper horizon extending from existing grade to a depth of 6 inches.

#### 1.4 REFERENCES

- A. State of Ohio, Department of Transportation (ODOT): Construction and Material Specifications, January 1, 1997, except as supplemented or otherwise modified herein and/or shown on the Construction Drawings.

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- B. American Society for Testing and Materials (ASTM):
  - 1. ASTM D698-91 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>).
  - 2. ASTM D2487-93 Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
- C. Occupational Safety and Health Administration (OSHA), Code of Federal Regulations (CFR):
  - 1. 29 CFR 1926.650 Subpart P - Excavations, latest revision.
- D. "Geotechnical Data and Evaluation Report for Southeast Field Borrow Areas" [Parsons, 1998]. This report contains geotechnical data for the subsurface soils in the STP Backfill Borrow Area.

**1.5 SUBMITTALS**

- A. Provide STP Backfill Borrow Area Development Plan as required by this section and Part 6.
- B. The STP Backfill Borrow Area Development Plan shall include a schedule outlining start dates and duration for earthwork activities.
- C. Submit for approval, name, address, and qualifications of an independent soil testing laboratory and resume of field technician. Provide copies of all lab/field soil tests performed by soil testing laboratory and contractor within seven (7) calendar days of obtaining samples for performing field test, or upon request by the Construction Manager.

**1.6 PROJECT/SITE CONDITIONS**

- A. Existing site surface and subsurface conditions, based on available site data, are indicated on the Construction Drawings and in the Reference Report specified in this Section.

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- B. The Contractor shall use the STP Backfill Borrow Area as the source of fill and backfill materials unless otherwise shown on the Construction Drawings. The STP Backfill Borrow Area is in a certified area.

**1.7 QUALITY ASSURANCE**

- A. Independent Soil Testing Laboratory:
  - 1. The Contractor shall arrange and pay for the services of a, independent soil testing laboratory to perform the laboratory and on-site construction quality testing of the materials and construction activities specified in this Section.
  - 2. The independent soil testing laboratory shall have a minimum of 5 years experience in providing the construction quality testing services and shall be equipped with the required equipment. Field technician(s) shall have a minimum of 3 years experience in construction quality testing.

**1.8 HEALTH AND SAFETY REQUIREMENTS**

- A. Environmental Health and Safety, and Training requirements shall be as specified in Part 8 of the Contract Documents.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- A. Suitable compacted fill material and backfill material shall be free of debris, foreign objects, large rock fragments, organics, and other deleterious materials. Visible rock shall be maximum dimension of 3 inches in any dimension.
- B. Geotextile fabric for construction of STP Haul Road shall be as specified in Section 02506.
- C. Utility trench backfill material outside of STP Deep Excavation Boundary shall be CL material from the STP Backfill Borrow Area as determined by ASTM D2487.

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D. Pipe bedding shall be ODOT Item 304.

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## 2.2 EQUIPMENT

- A. Choice of equipment to perform required operations in conformance with these specifications shall be the responsibility of the Contractor. However, any equipment that results in waste or damage of material, or inaccurate work, or is otherwise objectionable is to be promptly replaced as directed by the Construction Manager.
- B. Equipment used to haul impacted material over the existing Southern Waste Units (SWU) Impacted Material Haul Road, STP Haul Road, OSDF Impacted Material Haul Road, and OSDF Borrow Area Haul Road as shown on the Construction Drawings shall be equal to or less than the gross vehicle weight, tire pressure and axle loading for a Caterpillar CAT D300E truck (gross vehicle weight of 106,700 pounds, tire pressure of 60 psi, and axle load of 37,400 pounds).
- C. Furnish hand compaction equipment, such as walk-behind padfoot compactor, hand tampers, or vibratory plate compactor, for compaction of trench backfill and any other areas inaccessible to large compaction equipment.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Verify that subgrade is not soft, spongy, or composed of otherwise unstable materials. If unstable materials are encountered, notify Construction Manager.
- B. Verify that areas to be filled or backfilled are free of debris, snow, ice, or water and that surfaces are not frozen.
- C. Prior to any earthwork activity, verify that erosion and sediment control measures required for the drainage area are in place and functional.

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**3.2 GENERAL**

- A. Haul equipment or other equipment that travels between certified areas and non-certified areas shall remain on roads constructed of certified material or shall be wheel washed and monitored by the Construction Manager prior to re-entry into certified areas.
- B. Perform construction activities in such a manner that stormwater runoff from non-certified construction areas does not flow into certified areas.
- C. Upon the discovery of any suspected historic, prehistoric, or archeological site, feature, or object, immediately cease ground disturbing activities at the find and contact the Construction Manager.
- D. Dust control shall be in accordance with Section 02100 and Part 6.

**3.3 EXCAVATION**

- A. STP Backfill Borrow area development.
  - 1. Follow the approved STP Backfill Borrow Area Development Plan.
  - 2. The Contractor shall be responsible for providing sediment controls during borrow area operation. As a minimum, provide silt fence on the downhill side of proposed areas to be excavated. Silt fence shall be in accordance with Section 02270 and the Construction Drawings. After installation of erosion and sediment control measures, remove the top 6 inches of soil in areas proposed for borrow operations. This material shall be considered topsoil and stockpiled as directed by the Construction Manager.
  - 3. The boundary of the STP Backfill Borrow Area is located on the Construction Drawings. The Contractor shall excavate and grade in such a manner that positive drainage is provided to the OSDF Borrow Area Sediment Basin. Bottom slopes shall be a minimum of 1 percent at all times. Final side slopes shall be no steeper than 4H:1V.

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4. Topsoil shall not be removed more than 5 calendar days prior to beginning excavation activities. Topsoil shall be removed only from the area of anticipated excavation.
5. Topsoil removed shall be stockpiled within the boundary of the STP Backfill Borrow Area. Stockpile location shall be such that positive drainage to the OSDF Borrow Area Sediment Basin is provided.
6. Construct topsoil stockpiles no steeper than 3H:1V (horizontal:vertical), grade to drain, seal by tracking perpendicular to the slope contours with a bulldozer. Ensure working stockpiles are graded and compacted at the end of each day when they are in use.
7. Topsoil stockpile shall be stabilized using a crusting agent in accordance with Section 02270.
8. After borrow area activities are completed, scarify to a depth of 3 inches and seed in accordance with Interim Seeding requirements. The seeding seasons and seeding requirements shall be in accordance with Section 2900.
9. Maintain newly seeded areas until final acceptance by the Construction Manager. Prior to final acceptance, settled, eroded, or rutted areas shall be reestablished at the Contractor's expense.

C. Runon Diversion Ditch

1. A runon diversion ditch shall be excavated around a portion of the STP excavation area at the locations shown on the Construction Drawings.
2. Material excavated from ditch construction shall be used to create a berm adjacent to the ditch.
3. After construction of the runon diversion ditch to the required lines and grades, the area shall be seeded and fertilized in accordance with Section 02900.
4. After seeding and fertilizing, an erosion control blanket shall be installed in accordance with Section 02270.

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### 3.4 BACKFILL AND FILL

#### A. Utility Trenches outside of STP Excavation Area

1. After utility removal has been completed in accordance with Section 02205, FDF will perform monitoring and scanning. Allow 10 calendar days for monitoring. Promptly begin trench backfill activities when directed by the Construction Manager.
2. Any water collected in trenches shall be removed and disposed in the STP excavation sump as directed by Construction Manager.
3. Backfill materials shall be placed into open trench in 6 inch compacted lifts until reaching existing grade. Each lift shall be compacted with 5 passes of a mechanical tamper. Backfill material should be compacted to provide a firm surface as directed by the Construction Manager.
4. Trench excavation and backfilling activities shall be conducted in accordance with OSHA 1926, Subpart P.

#### B. Berm

1. The Contractor shall construct a berm around the perimeter of the STP Deep Excavation Area at locations shown on the Construction Drawings. The locations may be field adjusted as directed by the Construction Manager.
2. Minimum height for diversion berm shall be 18 inches and shall be constructed by placing fill material from the STP Backfill Borrow Area on top of existing grade. Side slopes for berms shall not exceed 2H:1V.
3. After construction of diversion berms the berms shall be seeded and fertilized in accordance with Section 02900.

#### C. Material excavation from Transfer Line trench shall be excavated, loaded, and hauled as impacted material in accordance with Section 02205. Transfer Line trench shall be backfill (above bedding) with material from the STP Backfill Borrow Area.

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- D. Transfer Line trench excavation and backfilling activities shall be conducted in accordance with OSHA 1926, Subpart P.

**3.5 INCIDENTAL EARTHWORK AND SUBGRADE PREPARATION**

- A. Following site clearing, the subgrade of parking area shall be proofrolled. Proofrolling shall be conducted with a tandem-axle truck, fully loaded, or other construction equipment with similar axle loads.
- B. Areas that pump, rut, or deform excessively during proofrolling shall be scarified, conditioned, and recompacted to stabilize areas. Subgrade material which cannot be conditioned to achieve a surface acceptable to the Construction Manager shall be undercut and replaced with fill material or other acceptable material as required by the Construction Manager.
- C. Subgrade material shall consist of soil free of debris, foreign objects, organics, and other deleterious materials.

**END OF SECTION**

SECTION 02270  
EROSION AND SEDIMENT CONTROL

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**PART 1 GENERAL**

**1.1 SCOPE**

This Section includes but is not limited to:

- A. Soil erosion and sedimentation control measures for work included in this contract, including additional areas disturbed by the Contractor.
- B. Installation, maintenance, and removal of all temporary erosion control facilities, including maintenance of existing erosion and sediment control measures and facilities as shown on the Construction Drawings.
- C. Control of surface water and management of ponded water in construction and excavation areas.

**1.2 RELATED SECTIONS AND PLANS**

- A. Section 02205 - Impacted Material Excavation and Handling.
- B. Section 02206 - Earthwork.
- C. Section 02900 - Seeding.
- D. Part 6 - Statement of Work.
- E. Part 8 - Environmental Health and Safety, and Training Requirements.

**1.3 REFERENCES**

- A. Title 40, Code of Federal Regulations, Part 261, Hazardous Waste Management System, Identification and Listing of Hazardous Waste.

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**1.4 SUBMITTALS**

- A. Provide submittals as required in Part 6.
- B. For each product proposed for use, submit the following:
  - 1. Manufacturer's product data and recommended methods of installation and maintenance; and
  - 2. Certification from supplier or manufacturer that the product meets the material requirements of this Section to include test results.
  - 3. Material Safety Data Sheet (MSDS) data, if applicable.
- C. Prepare and submit a Surface Water Management and Erosion and Sediment Control Plan that includes the following, at a minimum:
  - 1. Descriptions of the surface water management and erosion and sediment control measures to be implemented throughout the duration of the contract;
  - 2. Methods for installing and maintaining surface water management and erosion and sediment control measures;
  - 3. Drawings illustrating, in plan view, the location and sequencing of the surface water management and erosion and sediment control measures;
  - 4. Methods and measures for collection and discharge of surface water from the excavated areas and measures to minimize erosion of the excavated areas during progress of the work, inclement weather and at the end of each work day;
  - 5. Methods of minimizing sediment to the STP Excavation Dewatering Transfer Sump.
  - 6. Sequence of work to ensure that stormwater management and erosion and sediment control measures are maintained until completion of work.
- D. Contractor's records of inspection of erosion and sediment control measures as described herein shall be submitted weekly upon completion of the inspection report.

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**1.5 INSPECTION**

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- A. Inspect erosion and sediment control measures to evaluate the effectiveness of, and need for maintenance of, the control measures. Any repairs to the erosion and sediment control measures shall be corrected within 24 hours of problem discovery. Inspections shall occur, at a minimum, at the following frequencies by a representative of the Contractor and the Construction Manager:
  - 1. Weekly;
  - 2. Daily after each rain event exceeding 0.5 inches at the Fernald Environmental Management Project (FEMP). Information can be obtained from the Construction Manager for rain events.
  - 3. Daily inspections during rainfall events after two consecutive days of rainfall at the FEMP.
  
- B. All inspections shall be conducted and documented in accordance with this Section. The Contractor shall maintain a copy of the inspection records on site with the original submitted as specified in this Section.
  
- C. The inspection report shall summarize the scope of the inspection, name of the inspector(s), inspection date, observations relating to the implementation of the erosion and sediment control measures, destination of pumping ponded water, estimated quantity of ponded water and corrective action measures, if any, that are required. The report shall indicate if any areas are not in compliance or contain a certification that control measures are effective and in compliance with this Section.

**1.6 HEALTH AND SAFETY REQUIREMENTS**

- A. Environmental Health and Safety, and Training requirements shall be as specified in Part 8.

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**PART 2 PRODUCTS**

**2.1 MATERIALS**

- A. Silt fence shall at a minimum be composed of strong rot-proof polymeric fibers formed into a woven or non-woven fabric which have fabric and fence post properties and minimum dimensions as shown on the Construction Drawings.
- B. Seeding shall be in accordance with Section 02900.
- C. The erosion control blanket shall be a woven blanket-like fabric made of a biodegradable coir yarn and shall contain the following material properties:
  - 1. Coconut fiber content: 100 percent.
  - 2. Weight: 22 ounces per square yard.
  - 3. Thickness: 0.3 inches.
  - 4. Open Area: 38 percent.
  - 5. Tensile Strength: 1350 lb/ft by 626 lb/ft (length times width).
  - 6. Elongation: 34 percent by 38 percent (length times width).
- D. Blanket Anchors - Mad of wood, biodegradable, specifically made to anchor erosion control blankets.
- E. Crusting agent shall be as approved by the Construction Manager and shall meet the following requirements:
  - 1. The crusting agent shall be a pine sap emulsion comprised of a 100% organic emulsion produced from naturally occurring resins (pine sap). The crusting agent shall not be comprised of chloride, lignosulfonate, petroleum, or asphaltic type emulsions. The crusting agent must provide dust suppression and surface stability for exposed soils, both disturbed and undisturbed soils. The crusting agent shall be compatible with application via a hydro seeder, and must not require intense cleaning of equipment after application. Once cured, the crusting agent shall be non-tracking (i.e., will not stick to boots or tires).

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2. The crusting agent shall not have hazardous characteristics of ignitability, corrosivity, reactivity, or toxicity as defined in 40 CFR 261 for a hazardous waste in either its pre-applied or cured states.
3. The crusting agent shall have a flash point greater than 200°F. The crusting agent shall be neither a flammable nor combustible liquid per DOT definition. The crusting agent must not be susceptible to significant deterioration from exposure to the elements, including sunlight.

### **PART 3 EXECUTION**

#### **3.1 GENERAL**

- A. Construct and maintain erosion and sediment control measures as specified in this Section and as shown on the Construction Drawings. Maintain existing erosion and sediment control facilities and measures in accordance with this Section.
- B. Construction of diversion ditches and diversion berms shall be in accordance with Section 02206.

#### **3.2 SILT FENCES**

- A. Place at locations shown on Construction Drawings prior to start of excavation activities. Remove accumulated sediment when deposition reaches one-third the height of the silt fence or sooner if accumulated sediment prevents performance of silt fence as directed by the Construction Manager; remove accumulated sediment within 24 hours of discovery. Sediment shall be removed as specified in this Section.
- B. Install breaks and overlaps to allow equipment access to the construction area.

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**3.3 EROSION CONTROL BLANKETS**

- A. Install in accordance with manufacturer's recommendations in the ditches or as shown on the Construction Drawings. Anchor spacing shall be 24 inches on center.

**3.4 STABILIZATION OF INACTIVE EXPOSED EXCAVATION AND CONSTRUCTION AREAS**

- A. Stabilization of disturbed areas that are planned to be left idle for more than 45 calendar days shall be stabilized as soon as possible, but no longer than seven (7) days after the last activity. Soils shall be stabilized by one of the following methods as directed by the Construction Manager:
  - 1. Crusting agents shall be applied in accordance with manufacturer's recommendations as specified in this Section.
  - 2. Interim seeding shall be applied as specified in Section 02900.
  - 3. Permanent seeding shall be applied as specified in Section 02900.
- B. Forty-five (45) calendar days shall be the maximum time that a stockpile can be left in an exposed condition without stabilization. Stockpiles that are expected to be inactive for a period of more than 45 calendar days, as determined by the Construction Manager, shall be stabilized soon as possible, but no longer than seven (7) calendar days after the last activity. Stockpiles shall be stabilized by means of a crusting agent, as specified in this Section.
- C. Any area or stockpile expected to be left exposed for more than 6 months shall be stabilized with both interim seeding and crusting agents.

**3.5 SEDIMENT REMOVAL**

- A. Remove accumulated sediment from temporary sumps, STP Excavation Dewatering Sump, Channel 2, trap range ditches, other ditches, and sediment control measures as directed by the Construction Manager. In no case shall

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sediment reduce the available depth in the ditches and sediment control measures to less than two-thirds the depth shown on the Construction Drawings.

- B. Dispose of sediment as specified in Section 02205.
- C. Protect the STP Excavation Dewatering Transfer Sump Pump during removal of sediment.

**3.6 CRUSTING AGENT**

- A. The material shall be applied at the rates recommended by the manufacturer or as directed by the Construction Manager. Reapply as necessary to inhibit erosion and dust.
- B. Apply crusting agent according to manufacturers directions. Unless specified otherwise by manufacturer, dilute concentrate pine sap emulsion to ratio of four parts water to one part concentrate. Apply diluted solution at the rate of 2,500 gallons per acre.
- C. Dilution ratio and application rate are subject to further adjustment at direction of Construction Manager to optimize performance of crusting agent.

**3.7 REMOVAL OF TEMPORARY EROSION CONTROL FACILITIES**

- A. Remove silt fence at the direction of the Construction Manager after the disturbed areas are established with satisfactory conditions of seeding as specified in Section 02900.

**END OF SECTION**

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SECTION 02506  
AGGREGATE SURFACE

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**PART 1 GENERAL**

**1.1 SCOPE**

- A. This Section includes but is not limited to: Materials placement and compaction requirements for aggregate surfaces on parking area, equipment wash facilities and Special Material Transfer Area.

**1.2 RELATED SECTIONS**

- A. Section 02206 - Earthwork.
- B. Part 6 - Statement of Work.

**1.3 REFERENCES**

- A. State of Ohio, Department of Transportation (ODOT), Construction and Material Specifications, January 1, 1997, except as supplemented or otherwise modified herein and/or shown on the Construction Drawings.

**1.4 SUBMITTALS**

- A. Provide submittals as required in Part 6.
- B. Submit the following for review and approval:
  - 1. Submit Certificate of Compliance of aggregate material attesting to conformance with the material requirements in Article 2.1.
  - 2. Manufacturer of geotextile along with technical data and certification from the manufacturer or supplier that the geotextile fabric meets the material requirements specified in this Section.

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**PART 2 PRODUCTS**

**2.1 MATERIALS**

- A. Aggregate Base materials for parking areas and Special Materials Transfer Area shall conform to ODOT Item 304.
- B. Coarse Aggregate materials for wheel wash facilities shall conform to ODOT Item 703, #2 stone.
- C. Geotextile fabric shall conform to ODOT Item 712.09, Type D.

**PART 3 EXECUTION**

**3.1 INSPECTION**

- A. Verify that subgrade has been prepared in accordance with Section 02206.
- B. Subgrade surface shall be free of sticks, stones, or other materials which could damage the geotextile fabric.

**3.2 GEOTEXTILE PLACEMENT**

- A. Place geotextile on the prepared subgrade under the aggregate material in accordance with manufacturer's installation instructions and as follows:
  - 1. Take precautions to prevent damage to underlying subgrade, including rutting during placement of geotextile fabric.
  - 2. Geotextile fabric shall be placed directly over the subgrade. The geotextile fabric shall be placed and temporarily anchored in such a manner that placement of overlying materials will not tear or excessively stretch the fabric.
  - 3. Geotextile fabric shall be installed to the limits of aggregate surface as indicated on the Construction Drawings. The geotextile fabric shall be unrolled as smooth as possible on the prepared subgrade. Wrinkles and folds in the geotextile fabric shall be removed by stretching and placing of sod staples or small aggregate

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piles as required. The fabric shall be installed according to the manufacturer's suggestion at curve locations.

4. The geotextile fabric shall be field joined, factory seamed, or manufactured in seamless width. Methods of field joining shall include overlapping of adjacent edges and ends of geotextile fabric a minimum of 18-inches. Sand bags or other weights may be used for temporary anchoring.
5. The geotextile fabric shall extend to the edges of the aggregate surface.
6. Geotextile fabric shall be covered with the required aggregate the same day as fabric laydown.
7. Construction traffic shall not be permitted directly on the geotextile fabric.
8. Geotextile fabric is not required when additional aggregate material is to be added to existing aggregate surface, unless otherwise directed by the Construction Manager.

### 3.4 AGGREGATE BASE AND COARSE AGGREGATE MATERIAL PLACEMENT

- A. Construct the aggregate surface to the limits and thicknesses indicated on the Construction Drawings.
- B. End dumping or tailgate dumping shall not be permitted directly onto the geotextile fabric. The aggregate shall be dumped adjacent to the fabric or on previously placed stone. The aggregate shall be spread from the backdumped pile using a bulldozer, loader, track hoe, or grader, with care being taken to avoid damage to the fabric by blades, tracks, tires, or buckets.
- C. Immediately following spreading, the aggregate material shall be shaped to the required smoothness and thickness, and compacted. The initial lift of aggregate on the geotextile shall be a minimum thickness of 6 inches after compaction. The desired degree of compaction will be considered to have been reached when the surface is tightly bound and shows no undue rutting or displacement under operations of the roller or other equipment. The determination of undue rutting or displacement will be made by the Construction Manager.

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- D. When additional aggregate material is to be added to existing compacted aggregate, scarify existing aggregate to a depth of 3 inches.

**3.5 QUALITY CONTROL**

A. Tolerances:

1. Grade the aggregate surface to a smooth uniform surface.
2. The thickness of the finished aggregate surface shall be no less, at any point, than the thickness indicated on the Construction Drawings.

**END OF SECTION**

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SECTION 02668  
REMEDIATION GENERATED WATER TRANSFER LINE

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**PART 1 GENERAL**

**1.1 SCOPE**

This Section includes, but is not limited to:

- A. High density polyethylene and steel pipe and fittings for transfer line.
- B. Tie-in to existing Leachate Collection System clean-out.

**1.2 RELATED SECTIONS AND PLANS**

- A. Section 02100 - Site Preparation.
- B. Section 02206 - Earthwork.
- C. Section 02270 - Erosion and Sediment Control.
- D. Part 6 - Statement of Work.

**1.3 REFERENCES**

- A. American Society of Mechanical Engineers (ASME):
  - 1. ASME B31.3-96 Process Piping.
- B. American Society for Nondestructive Testing (ASNT):
  - 1. ASNT-SNT-TC-1A-96 Personnel Qualifications and Certification Recommended Practice, December 1992 Edition.
- C. American Society for Testing and Materials (ASTM) Standards:
  - 1. ASTM A53-96 Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

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2. ASTM A105/  
A105M-96 Standard Specification for Carbon Steel Forgings for Piping Applications.
3. ASTM A126-95 Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
4. ASTM D1248-84  
(1989)e1 Standard Specification for Polyethylene Plastics Molding and Extrusion Materials.
5. ASTM D3261-96 Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
6. ASTM D3350-96 Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
7. ASTM F714-97 Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter.

D. American Water Works Association (AWWA):

1. AWWA C207-94 Steel Pipe Flanges for Waterworks Service.
2. AWWA C600-93 Installation of Ductile-Iron Water Mains and Their Appurtenances.

**1.5 SUBMITTALS**

- A. Provide submittals as required in Part 6.
- B. Product Data: Provide data on all pipe materials, pipe fittings, valves, accessories, the methods and equipment for HDPE fusion welding.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements of this section.
- D. Submit welder and examiner qualifications, procedure qualification records, and welding procedure specifications.

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E. Pressure test and examination reports, within 7 1727  
calendar days after completion of test or examination.

F. Nondestructive testing personnel qualifications shall  
be in accordance with ASNT SNT-TC-1A.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

A. All pipes shall be new material that has not been  
previously used.

B. Pipe bedding shall be in accordance with Section 02205.

C. Transfer Line and Fittings:

1. Transfer pipe and fittings shall be 4" diameter  
Iron Pipe Size (IPS), high-density polyethylene  
(HDPE) PE 3408 pipe, Type III, Class C, Category  
5, Grade P34, in accordance with ASTM D1248, with  
cell classification 345434C in accordance with  
ASTM D3350, Minimum Pressure Class 150. All piping  
and fittings shall be of the same material and  
shall have a Dimension Ratio (DR) of 11. Pipe and  
fittings shall be from the same manufacturer. The  
manufacturer's name and DR shall be marked on the  
side of the pipe.
2. Water Transfer Hose: Synthetic rubber tube,  
reinforced with synthetic fabric and wire helix;  
100 psig working pressure; Goodyear Plicord Con-  
AG, or equal.
3. Mechanical Joints:
  - a. Mechanical joints shall be made using HDPE  
flange adapters. Provide nipple-end for butt  
fusion to transfer pipe. Flat-face suitable  
for use under pressure with flange sealing  
gasket.
  - b. Metal back-up rings shall be Class D, slip-on  
type, in accordance with ANSI/AWWA C207.  
Back-up rings shall be supplied by the  
manufacturer or supplier of HDPE pipe.

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- c. Bolts used with back-up rings on mechanical joints shall be semifinished hex head, Type Grade B8, UNC threads.
- d. Nuts shall be semifinished regular hex head, Grade 8F, UNC threads.
- 4. Butterfly Valves: Class 150, cast iron, ASTM A126, Class B, wafer style, 316 SS stem and disc, EPDM seat, integral flange seals, lever handle operator. Equip valve with locking device with not less than 3/8-inch diameter hole for lock.
- 5. Polyethylene Spacers: Provide 1" polyethylene spacers between flange face and valve as required to allow butterfly disc to swing freely.
- 6. Check Valve: Class 150, cast iron, ASTM A126, Class B, ball check valve type construction, flanged type with bolted cover. The ball shall be cast iron ASTM A126-B construction, coated with vulcanized Buna-N rubber.

D. Carbon Steel Pipe and Fittings (shop fabricate):

- 1. Materials, manufacture, welding, inspections, and testing shall be in accordance with ASME B31.3 for Category D fluid service.
- 2. Hose Couplings:
  - a. Coupler: Aluminum with Buna-N gasket, installed on hose; Civacon Twin-Cam No. 633-C, or equal.
  - b. Adaptor: Aluminum, female NPT; Civacon No. 633-A, or equal.
- 3. Pipe: Seamless carbon steel, ASTM A53 Grade B, standard weight, beveled ends.
- 4. Flanges: Class 150, carbon steel, RFSF, ASTM A105, weld neck (STD wt. bore).
- 5. Gaskets: Teflon, 1/8-inch thick.
- 6. Butterfly Valve: Same as for Transfer Line and Fittings.

D. Geotextile Fabric: Geotextile fabric shall be the same fabric as used for silt fence in accordance with Section 02270.

E. Construction Fencing: Construction Fencing shall be in accordance with Section 02100.

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**PART 3 EXECUTION****3.1 EXAMINATION**

- A. Verify existing conditions in area of work. Any discrepancies should be brought to Construction Manager's attention in a written statement immediately upon discovery.
- B. Verify that tie-in connection, line size, location, and inverts are as indicated.

**3.2 PREPARATION**

- A. Remove scale and dirt on inside and outside prior to assembly of pipe and fittings.

**3.3 ERECTION/INSTALLATION/APPLICATION**

- A. Installation - Pipe: From carbon steel to HDPE transition at pipe support to the tie-in with the Leachate Collection System (LCS) Clean-out, as indicated on the Construction Drawings.
- B. Join HDPE piping and fittings by butt weld fusion method, in accordance with ASTM D3261.
- C. Route pipe as shown on Construction Drawings. The minimum bending radius shall be as specified by the pipe manufacturer. Pipe shall be in a straight route at LCS Clean-out connection.
- D. Above Ground Installation:
  - 1. Locations of above ground installation shall be as indicated on the Construction Drawings.
  - 2. Place a geotextile fabric, 3 ft minimum width, on top of ground. Anchor edges every three (3) feet with biodegradable stakes as specified in Section 02270. At edges of geotextile, overlap a minimum 12 in. and stake.

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3. Install pipe on top of geotextile fabric allowing for expansion and contraction without stressing pipe or joints as per manufacturer's recommendation.
  4. The Contractor is responsible for the design and implementation of restraints for the transfer line.
- E. Below Ground Installation:
1. Locations of below ground installations shall be as indicated on Construction Drawings.
  2. Trenching and backfilling shall be in accordance with Section 02206.
- F. Steel Pipe: Welding procedures and qualifications, fabrication, assembly, and erection shall be in accordance with ASME B31.3.

**3.4 FIELD QUALITY ASSURANCE**

- A. Perform hydrostatic tests on Transfer Line in accordance with AWWA C600. Leakage shall be defined as the quantity of water that must be supplied into the newly lain pipe or any valved section thereof to maintain pressure within 5 pounds- per-square-inch of the specified test pressure after that pipe has been filled with water and the air expelled. Leakage shall not be measured as a drop in pressure in a test section over a period of time.

<u>SERVICE</u>	<u>MEDIUM CODE</u>	<u>MATERIAL CODE</u>	<u>DESIGN PRESSURE</u> (psig)	<u>TEST PRESSURE</u> (psig)
Stormwater	ST	A	100	150

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- B. Notify Construction Manager at least 24 hours in advance of planned testing. Submit report to Construction Manager within 1 week after completion of test. The Construction Manager will observe hydrostatic test. Coordinate disposal of test water with Construction Manager.

**END OF SECTION**

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SECTION 02900  
SEEDING

**PART 1 GENERAL**

**1.1 SCOPE**

This Section includes but is not limited to:

- A. Soil preparation.
- B. Interim seeding.
- C. Application of fertilizer.
- D. Application of mulch and mulch binder.
- E. Application of crusting agent.

**1.2 RELATED SECTIONS AND PLANS**

- A. Section 02270 - Erosion and Sediment Control.
- B. Part 6 - Statement of Work.
- C. Part 8 - Environmental Health and Safety, and Training Requirements.

**1.3 REFERENCES**

Title 40, Code of Federal Regulations (CFR), Part 161, Identification and Listing of Hazardous Waste.

**1.4 SUBMITTALS**

- A. Provide submittals as required in Part 6.
- B. Submit the following:
  - 1. Proposed seed mixes and application rates for seed, mulch, mulch binder, and fertilizers.

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2. Manufacturer's product data and recommended methods of application for seed, mulches, mulch binder, and fertilizer. Product data for fertilizer shall also include chemical analysis including uranium analysis to assure there is no resultant or derived uranium from fertilizer use.
  3. Material Safety Data Sheet (MSDS) for fertilizer and mulch binder.
- C. Submit certificate of compliance for the following. Do not sow seed until the Construction Manager has reviewed and approved the certificates.
1. Certificate stating seed mixture, guaranteed percentages of purity, weed content, germination of seed, name of seller, the test date for the seed, and the net weight and date of shipment;
  2. Manufacturer's certificate stating the available nutrients contained in the proposed fertilizer;
  3. Manufacturer's certificate stating the wood cellulose mulch meets the requirements of this Section; and
  4. Manufacturer's certificate stating the mulch binder meets the requirements of this Section.

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver containerized materials in uniform packages bearing the name of the manufacturer, the net weight and a statement of content. Deliver containerized materials to the site in original, properly labeled, unopened, clean containers each showing the manufacturer's guaranteed analysis conforming to applicable regulations and standards.
- B. Store materials in a dry area in a manner to prevent physical damage from the elements.

#### **1.6 HEALTH AND SAFETY REQUIREMENTS**

- A. Environmental Health and Safety, and Training requirements shall be as specified in Part 8.

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PART 2 PRODUCTS

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2.1 MATERIALS

- A. Furnish seed labeled in accordance with the U.S. Department of Agriculture (USDA) Rules and Regulations under the Federal Seed Act and applicable State seed laws. Furnish seed in sealed bags or containers bearing the date of expiration. Do not use seed after its expiration date. Each variety of seed shall: have a purity of not less than 90 percent, have a percentage of germination not less than 80 percent, have a weed to seed content of not more than 0.75 percent and contain no noxious weeds. The above percentages are by weight.
- B. For interim seeding, the seed mixture shall be:
  - 1. Annual Rye - 60 pounds pure live seed (pls)/acre
  - 2. Perennial Rye - 60 pounds pls/acreInterim seeding may be applied from October through May.
- C. Obtain water from the on-site sources shown on the Construction Drawings or specified in Part 6, unless otherwise approved by the Construction Manager.
- D. Fertilizer:
  - 1. Use fertilizer that is dry or liquid commercial grade fertilizer, uniform in composition that meets the requirements of all State and Federal regulations and standards of the Association of Agricultural Chemists.
  - 2. Fertilizer for summer and interim seeding shall be VCOTE 34-4-14 as manufactured by George W. Hill or equal.
  - 3. Fertilizer for permanent seeding shall be VCOTE 0-4-4.
- E. Furnish mulch meeting the following requirements:
  - 1. Mulch shall be straw or wood cellulose fiber, free of clay, stone, foreign substances, and reasonably free of weeds.

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2. Furnish straw that does not contain sticks larger than 1/4-inch diameter or other materials that may prevent matting down during application. Use straw that is free from mold and other objectionable material and in an air-dry condition suitable for placing with mulch blower equipment or other equipment as approved by the Construction Manager. Straw shall be generally 6 inches or more in length.
3. Mulch applied by hydrospraying shall be a wood cellulose processed into a uniform fibrous physical state. Use wood cellulose fiber containing a green dye that will provide for easy visual inspection for uniformity of slurry spread. The wood cellulose fiber including dye, shall contain no growth or germination inhibiting properties. The wood cellulose fiber shall be manufactured in such a manner that, after addition and agitation in slurry tanks with water, the fibers in the material become uniformly suspended to form a homogeneous material. When sprayed on the ground, the material shall allow absorption and percolation of moisture. The wood cellulose fiber shall meet the following requirements:

<u>Item</u>	<u>Specification Limit</u>
Particle Length	0.375 inch (maximum)
Particle Thickness	0.047 inch (maximum)
pH	4.0 to 8.5
Ash Content	1.6 percent (maximum)
Water Holding Capacity (based on fiber dry weight)	500 percent (minimum)

F. Mulch binder agent shall be as approved by the Construction Manager and shall meet the following requirements:

1. The mulch binder shall be a pine sap emulsion comprised of a 100% organic emulsion produced from naturally occurring resins (pine sap) and be nontoxic to plants. The mulch binder shall not be

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comprised of chloride, lingsulfonate, petroleum, or asphaltic type emulsions. The mulch binder shall be compatible with application via a hydro seeder, and must not require intense cleaning of equipment after application. Once cured, the mulch binder shall be non-tracking (i.e., will not stick to boots or tires).

- 2. The mulch binder shall not have hazardous characteristics of ignitability, corrosivity, reactivity, or toxicity as defined in 40 CFR Part 161, Subpart C, for a hazardous waste in either its pre-applied or cured states.
- 3. The mulch binder shall have a flash point greater than 200°F. The mulch binder shall be neither a flammable nor combustible liquid per DOT definition. The mulch binder must not be susceptible to significant deterioration from exposure to the elements, including sunlight.
- 4. The pine sap emulsion shall be provided in concentrated solution and prepared so that it will not change in transportation or storage.

G. Erosion Control Blanket and Crusting Agent shall be in accordance with Section 02270.

**2.2 EQUIPMENT**

- A. Provide equipment of size and type to perform work specified in this Section.

**PART 3 EXECUTION**

**3.1 GENERAL**

- A. Stabilization of disturbed areas by seeding or by use of a crusting agent shall be performed at completion of excavation or within seven (7) calendar days of knowing a disturbed area will be idle for more than forty-five (45) calendar days, whichever is sooner.

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- B. Interim seeding is required for disturbed areas and soil piles which are scheduled to or may be further disturbed within two (2) years, but do not have significant potential of spreading contamination.
- C. Disturbed areas and soil piles which are scheduled to be significantly disturbed within two (2) years, are destined for the On-Site Disposal Facility, and/or need effective erosion control immediately, are to be stabilized with use of a crusting agent as specified in Section 02270.
- D. Stabilization of permanent slopes exceeding 2H:1V shall utilize an erosion control blanket as specified in Section 02270 after application of seed mixture. This does not include slopes within the STP excavation that will be backfilled upon certification.
- E. Area(s) to be seeded shall be generally free of debris, rock, root material, and other objects which may impede soil preparation and seeding activities. Perform soil preparation by tilling/cultivating, to a depth of approximately 2 inches, to eliminate uneven areas and low spots. Maintain lines, levels and contours.
- F. Repeat cultivation in areas where equipment used for hauling and spreading has compacted subgrade.

### **3.2 APPLICATION**

- A. Seeding season for interim seeding is October through May.
- B. Apply fertilizer, seed, mulch, and mulch binder to disturbed areas and areas excavated and graded in this Contract requiring seeding unless otherwise indicated or directed by the Construction Manager. All seeding seasons and all application rates for seed and related materials are subject to adjustment as directed or approved by the Construction Manager.

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- C. Application of Fertilizer:
1. Apply fertilizer at a uniform rate of 1 pound per 1000 square feet.
  2. Disc fertilizer thoroughly into upper 2 inches.
  3. Lightly water to aid the distribution of fertilizer.
- D. Sequence of application of seeding mixture, mulch and mulch binder.
1. Apply seed mixture at the minimum rate as specified in this Section. Seeding shall be done by hydroseeding, broadcasting, or by drilling to a depth of 1/4 inch followed by cultipacking. When hydroseeding, the mixture tank shall be cleaned prior to use to ensure remnant seed is not introduced to the proposed seed mixture.
  2. Do not seed areas in excess of that which can be mulched within 24 hours.
  3. Apply mulch within 24 hours of seeding.
  4. Spread straw mulch in a uniformly thick layer.
  5. Apply water with a fine spray immediately after each area has been straw mulched. Wet soil at approximately a rate of 120 gallons per 1,000 square feet.
  6. Apply mulch binder at the rate specified in this Section.
- E. Spread straw mulch, either by hand or by blowing method, at the rate of 2 air-dried tons per acre. During June through September, increase straw mulch application rate to 3 air-dried tons per acre. Application of straw mulch by the blowing method is exempt from the dust control requirements specified in Part 6.
- F. Apply sprayed wood cellulose fiber at a net dry weight of 2,000 pounds per acre. Mix the wood cellulose fiber with water at a ratio of 50 pounds of wood cellulose fiber per 100 gallons of water.

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- G. Maintain mulching material in place with a pine sap emulsion binder. Apply mulch binder according to manufacturer's directions. Unless specified otherwise by the manufacturer, dilute concentrated pine sap emulsion to ratio of four (4) parts water to one (1) part concentrate. Apply diluted pine emulsion at a rate of 2,500 gallons per acre.

### 3.3 MAINTENANCE

- A. Maintain the seeded areas in satisfactory condition until acceptance of the seeding by the Construction Manager. Maintenance of the seeded areas includes repairing eroded areas, revegetating when necessary, watering and mowing (if applicable). A satisfactory condition of the vegetated area is defined as follows:
1. An area shall have a predominant stand of the seeded vegetation.
  2. Within 3 weeks, germination must occur over 95 percent of the area with no single bare area greater than 3 square feet.
  3. Within 3 months, 95 percent of the area must be covered with mature vegetation.
- B. Areas that fail to meet these requirements shall be repaired or reseeded as necessary to produce an acceptable stand of vegetation, as specified in this Section.
- C. Maintain areas applied with a crusting agent to ensure proper erosion control. The crusting agent shall be reapplied to eroded and bare areas as necessary.

### 3.4 WARRANTY

- A. Seeded areas shall be subject to a warranty period of not less than 12 months from initial establishment of vegetation over 100 percent of the seeded areas.
- B. At the end of the warranty period, the Construction Manager will perform an inspection upon written request by the Contractor. Seeded areas not demonstrating satisfactory condition of vegetation as specified

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herein, shall be repaired, reseeded and maintained to meet all requirements as specified herein at the Contractor's expense.

**3.5 ACCEPTANCE**

- A. The seeded areas shall be accepted at the end of the warranty period if a satisfactory condition exists as defined in this Section.
- B. After all disturbed areas are stabilized and all necessary corrective work has been completed, the Construction Manager will certify in writing the final acceptance of the seeded areas.

**END OF SECTION**

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FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

REMEDATION AREA 1, PHASE II  
SEWAGE TREATMENT PLANT EXCAVATION PACKAGE  
TECHNICAL SPECIFICATIONS

Division 15

PARSONS

Prepared by:

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Date

Checked by:

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Date

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SECTION 15160  
STP EXCAVATION DEWATERING PUMPS

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**PART 1 GENERAL**

**1.1 SCOPE**

This Section includes, but is not limited to:

- A. One automatically controlled dewatering transfer sump pump (No. PMP-1) and motor.
- B. Two automatically controlled dewatering pumps (No. PMP-2 and 3) and motors.

**1.2 RELATED SECTIONS**

- A. Part 6 - Statement of Work.
- B. Part 8 - Environmental Health and Safety, and Training Requirements.

**1.3 REFERENCES**

- A. American National Standards Institute (ANSI):
  - 1. ANSI B16.1-89 Cast Iron Pipe Flanges and Flanged Fittings.

**1.4 SUBMITTALS**

- A. Provide submittals as required in Part 6. Unless specified otherwise, submittals shall be made to the Construction Manager for review and approval.
- B. Product Data: Certified pump curves showing performance characteristic with pump and system operating point plotted, including minimum and maximum flow, within thirty calendar days after award.
- C. Completed Pump Data Sheets, with bid.

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- D. Motor Product Data: Provide full load amps, impedances, normal and short-circuit current ratings, NEMA frame size, and additional standard nameplate data. Provide efficiency and power factor for each of 1/2, 3/4, and full load. Provide dimensional enclosure details. Submit within thirty calendar days after award.
- E. Certificates: Certificates of conformance to specification requirements, and certificates guaranteeing performance at design point, within thirty calendar days after award.
- F. Installation instructions, start-up and troubleshooting instructions, operational and maintenance data, lubrication instructions, and spare parts list, with shipment.
- G. Test results, within fifteen calendar days after test.
- H. Transfer Pump Plan: In conjunction with the Excavation Work Plan, the Contractor shall submit a Transfer Pump Plan which shall include, as a minimum, the following:
1. Installation layout of the transfer pump in the existing U.V. Building.
  2. Methodology to be utilized for sediment removal from building and provision for access to pump when building is submerged.
  3. Layout of discharge line at U.V. Building.
  4. Structure or apparatus on which pump will sit in an upright position in intermediate and final locations.
  5. Methodology to be used for placing transfer pump in intermediate and final locations as indicated on the Construction Drawings.
  6. Layout of discharge pipe lines at intermediate and final or secondary pump locations.
  7. Methodology to be used for moving and placing the dewatering pumps in their intermediate and final locations.

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**1.5 QUALITY ASSURANCE**

- A. The Quality Assurance Plan of the Contractor shall be submitted to the Construction Manager for approval fifteen days prior to the start of fabrication or installation.
- B. Tests will be witnessed by the Construction Manager. The Contractor shall provide testing procedures fifteen days prior to the test.

**1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Store in a clean, dry place and protect from weather prior to shipment. Provide protection from weather and from damage during transit.
- B. Loose items shall be tagged and delivered in a standard commercial package. The package shall be protected from the weather, from climate conditions including temperature and humidity variations, and from dirt, dust, and other contaminants that could adversely affect assembly and operation.

**PART 2 PRODUCTS**

**2.1 MANUFACTURER**

- A. KSB, Inc. Model KRT, or equal.

**2.2 EQUIPMENT**

- A. See Attachment A - Pump Data Sheet. Written exception shall be taken to any requirements a proposed pump - motor combination does not meet.
- B. Motor Requirements.
  - 1. Motors shall be suitable for driven equipment.
  - 2. Motor Service Factor: Furnish motors with service factor not less than 1.1. Motor size in hp shall be selected to serve the driven equipment over its full design performance range as though the service factor were 1.0. (This is not to be

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confused with the pump desired operating range of the Pump Data Sheet.)

3. Motor shall be pump manufacturer's high efficiency standard motor for this application.
  4. Watertight Integrity: Static seals at watertight mating surfaces shall be of the "O" ring type. Use of auxiliary sealing compounds shall not be required. The power and control cables shall enter the motor through a terminal housing. The pump and electrical cables shall be capable of continuous submergence without loss of waterproof integrity. The watertight integrity of the motor housing and shaft seal shall be tested during manufacture by pressurizing the motor cavity and submerging in water with motor operating.
  5. Motor Protection: The motor shall be equipped with internal thermal and moisture switches. Three separate thermostatic switches (minimum) shall be embedded into the stator windings (one per phase). Each switch shall open independently and terminate motor operation if temperature of the protected winding reaches the high temperature setpoint. A mechanically activated, moisture-sensing, micro switch shall be installed in the motor housing. The switch shall be capable of detecting airborne moisture and terminate operation of motor before liquid enters the cavity. Use of probes or floats that rely on the presence of liquid to initiate signal are not acceptable.
  6. Starts per hour: Motor shall be capable of 10 starts per hour.
- C. Impeller shall be of cast iron and precision balanced. Balancing shall not deform or weaken the impeller. Impeller fasteners shall be non-corroding.
- D. Components: Other major pump components such as stator housing, seal housing, and bearing brackets shall be of structural grade steel or cast iron. Exposed fasteners and lock washers shall be of stainless steel.

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## E. Shaft Seal:

1. The pump shaft shall be sealed against leakage by a double mechanical seal.
2. The rotating seal faces shall be lubricated from an oil-filled reservoir between pump and motor, the oil serving as both lubricating and cooling media. The reservoir shall have separate oil fill and drain plugs to ensure accuracy when measuring lubricant level, and for ease of maintenance.
3. Seal shall require no special maintenance or routine adjustment. However, it shall be easily inspected or replaced. No seal damage shall result from operating the pump for short periods without liquid.

**2.3 FABRICATION**

- A. Prior to shipment, the pump shall be cleaned of all dirt, dust, grease, grime, weld spatter, and other foreign material. Open end connections shall be sealed to prevent the entrance of foreign material.

**2.4 LABELING**

- A. Equipment Identification: Pumps shall be provided with permanently attached stainless steel nameplates indicating equipment name, number, model number, and rated capacity. Lettering shall be a minimum of 3/8-inch high and shall be stamped.

**PART 3 EXECUTION****3.1 ERECTION/INSTALLATION/APPLICATION**

- A. The installation of the equipment specified and shown on the drawings shall be in accordance with the manufacturer's instructions.
- B. A copy of the manufacturer's installation instructions, start-up and troubleshooting instructions, operation and maintenance data, lubrication instructions, and spare parts list shall be available at the site.

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**3.2 QUALITY CONTROL**

- A. Acceptance operating tests shall be performed by the Contractor after installation. If the results are unsatisfactory, the Contractor shall adjust or replace the equipment to meet the specification requirements and retest the equipment.
- B. The Contractor shall notify the Construction Manager of testing and inspection activities at least 24 hours prior to the start of all tests and inspections.
- C. Testing shall not start until the testing procedure has been approved by the Construction Manager.
- D. Demonstrate ability to meet operating point as shown on pump curve. Vibration shall be within manufacturer's acceptable range.

**3.3 TURN OVER**

- A. Upon completion of project, pumps (installed plus spares) shall be turned over to the Construction Manager in good working condition.

**END OF SECTION**

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**ATTACHMENT A**

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**PUMP DATA SHEETS**

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PUMP DATA SHEET											
PROJECT TITLE: Remediation Area 1, Phase II						PROJECT ORDER: 175					
PUMP NAME: STP Excavation Dewatering Transfer Sump Pump						QUANTITY: 1					
TYPE PUMP: Submersible centrifugal						DRAWING NUMBER					
TYPE DRIVER: Submersible electric motor			SUPPLY W/PUMP			X YES		NO			
MANUFACTURER AND MODEL NO.: KSB, Inc., Model KRT K40-250, or equal						EQUIP NO.: PMP-1					
OPERATING CONDITIONS											
FLUID PUMPED: Stormwater					AT A PUMPING TEMPERATURE OF: 60°F						
SPECIFIC GRAVITY: 1.0		AT 60°F			AT P.T.		VISCOSITY: AT P.T.				
SOLIDS IN FLUID: 1-5		WT%		DENSITY: NA			SIZE: ≤1/2" dia.		ABRASIVE: Yes		
NATURE OF SOLIDS: See Note 2					FLUID VAPOR PRESSURE:		N.A. FT. of FLUID @ P.T.				
DESIGN CAPACITY: 100 GPM AT 40 FT. TH at P.T.				DESIRED RANGE: 80 GPM TO 110 GPM							
SUCTION PRESS: NA FT.			PSIG		DISCHARGE PRESS: FT.			PSIG		NPSH AVAIL: NA at P.T.	
PUMP SPECIFICATIONS											
TYPE PUMP: Centrifugal, direct-connected						NO. STAGES: 1		RPM: 1750 max.			
TYPE IMPELLER: Non-clogging						SIZE: IN.		MAX SIZE: IN.			
EFFICIENCY AT DESIGN CAPACITY: 52 (min)%				BHP @ DESIGN CAPACITY: 1.9		MAXIMUM BHP: 2.5					
TYPE BEARINGS: Oil-lubricated, anti-friction											
TYPE COUPLING:						LUBRICATION:					
TYPE OF SEAL: Double Mechanical											
CONNECTIONS - SIZE & RATING											
SUCTION: Note 4			IN.		LB.		Flange			DISCHARGE: 3 IN. Hose Conn. Note 3	
VENT:			IN.		LB.		DRAIN:			IN.	
CONSTRUCTION MATERIALS											
RESTRICTIONS:											
CASING: Cast iron					IMPELLER: Cast iron						
SHAFT: Carbon steel					SHAFT SLEEVE: Stainless steel						
CASE RING:					IMP. RING:						
DISCHARGE ELBOW:					RELIEF VALVE:						
ELECTRIC MOTOR											
VOLTS	PHASE	HERTZ	H.P.	NON-OVERLOAD	CLASS	GROUP	RPM	TYPE			
460	3	60	5.5	YES			1750				
NOTES:											
1) Vendor shall complete data sheet as required.											
2) Suspended solids (silt and clay-sized); some sharp grained fine to medium sand											
3) Connection shall have a 3-inch hose shank in a vertical orientation. Pump flanges, if used, shall be ANSI Class 125.											
4) Provide pump with suction strainer sized to match pump's solids handling capability.											

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## PUMP DATA SHEET

PROJECT TITLE: Remediation Area 1, Phase II							PROJECT ORDER: 175	
PUMP NAME: STP Excavation Dewatering Pumps							QUANTITY: 2	
TYPE PUMP: Submersible centrifugal							DRAWING NUMBER	
TYPE DRIVER: Submersible electric motor			SUPPLY W/PUMP		X YES		NO	92X-5900-N-00502
MANUFACTURER AND MODEL NO.: KSB, Inc., Model KRT K40-250, or equal					EQUIP NO.: PMP-2 and 3			
<b>OPERATING CONDITIONS</b>								
FLUID PUMPED: Stormwater				AT A PUMPING TEMPERATURE OF:				60°F
SPECIFIC GRAVITY: 1.0		AT 60°F		AT P.T.		VISCOSITY:		AT P.T.
SOLIDS IN FLUID: 1-5		WT%		DENSITY: NA		SIZE: ≤1/2" dia.	ABRASIVE: Yes	
NATURE OF SOLIDS: See Note 2				FLUID VAPOR PRESSURE:		N.A.		FT. of FLUID @ P.T.
DESIGN CAPACITY: 50			GPM AT 30		FT. TH at P.T.		DESIRED RANGE: 30	
SUCTION PRESS: NA			FT.		PSIG		DISCHARGE PRESS: FT.	
							PSIG	
							NPSH AVAIL: NA	
							at P.T.	
<b>PUMP SPECIFICATIONS</b>								
TYPE PUMP: Centrifugal, direct-connected						NO. STAGES: 1		RPM: 1750 max.
TYPE IMPELLER: Non-clogging						SIZE:		IN.
EFFICIENCY AT DESIGN CAPACITY: 42						(min)%		BHP @ DESIGN CAPACITY: 1.0
TYPE BEARINGS: Oil-lubricated, anti-friction						MAXIMUM BHP: 1.5		
TYPE COUPLING:						LUBRICATION:		
TYPE OF SEAL: Double						Mechanical		
<b>CONNECTIONS - SIZE &amp; RATING</b>								
SUCTION: Note 4		IN.		LB.		Flange		DISCHARGE: 3 IN.
VENT:		IN.		LB.		DRAIN:		IN.
<b>CONSTRUCTION MATERIALS</b>								
RESTRICTIONS:								
CASING: Cast iron				IMPELLER: Cast iron				
SHAFT: Carbon steel				SHAFT SLEEVE: Stainless steel				
CASE RING:				IMP. RING:				
DISCHARGE ELBOW:				RELIEF VALVE:				
<b>ELECTRIC MOTOR</b>								
VOLTS	PHASE	HERTZ	H.P.	NON-OVERLOAD	CLASS	GROUP	RPM	TYPE
460	3	60	5.5	YES			1750	
NOTES:								
1) Vendor shall complete data sheet as required.								
2) Suspended solids (silt and clay-sized); some sharp grained fine to medium sand								
3) Connection shall have a 2-inch hose shank in a vertical orientation. Pump flanges, if used, shall be ANSI Class 125.								
4) Provide pump with suction strainer sized to match pump's solids handling capability.								
5) If necessary, provide discharge orifice sized to allow pump to meet specified total head. Orifice shall be mounted between pump discharge flange and hose shank.								

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FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

REMEDATION AREA 1, PHASE II  
SEWAGE TREATMENT PLANT EXCAVATION PACKAGE  
TECHNICAL SPECIFICATIONS

Division 16

PARSONS

Prepared by:

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Date

Checked by:

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Date

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SECTION 16050  
BASIC ELECTRICAL MATERIALS AND METHODS

**PART 1 GENERAL**

**1.1 SCOPE**

This Section includes, but is not limited to:

- A. Circuit breakers.
- B. Disconnect switches.
- C. Combination magnetic motor starters.
- D. Selector switches.
- E. Receptacles.
- F. Relays.
- G. Conduit.
- H. Wire and cable.
- I. Instrument cable.
- J. Nameplates.
- K. Wire markers and cable tags.
- L. Wireway and auxiliary gutters.
- M. Splicing and termination components.
- N. Boxes.
- O. Supporting devices.
- P. Electrical testing.

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**1.2 RELATED SECTIONS**

- A. Section 15160 - Dewatering Pump.
- B. Section 16170 - Grounding and Bonding.
- C. Section 16370 - Overhead Power Distribution.
- D. Section 16462 - Dry Type Transformer/Panelboards.
- E. Part 6 - Statement of Work.
- F. Part 8 - Environmental Health and Safety, and Training Requirements.

**1.3 REFERENCES**

- A. American National Standards Institute (ANSI):
  - 1. ANSI C80.1-90 Rigid Steel Conduit (RGS) - Zinc Coated.
  - 2. ANSI C80.6-94 Intermediate Metal Conduit (IMC) - Zinc Coated.
- B. InterNational Electrical Testing Association (NETA):
  - 1. NETA ATS-95 Acceptance Testing Specification for Electrical Power Distribution Equipment.
- C. National Fire Protection Association (NFPA):
  - 1. NFPA 70 National Electrical Code, 1996 Edition.
- D. National Electrical Manufacturers Association (NEMA):
  - 1. NEMA AB 1-93 Molded Case Circuit Breakers and Molded Case Switches.
  - 2. NEMA ICS 1-93 Industrial Control and Systems General Requirements.

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- |     |               |   |
|-----|---------------|---|
| 3.  | NEMA ICS 2-93 | Industrial Control and System<br>Controllers, Contactors, and<br>Overload Relays Rated Not More<br>Than 2000 Volts AC or 750<br>Volts DC. |
| 4.  | NEMA ICS 4-93 | Industrial Control and Systems<br>Terminal Blocks.  |
| 5.  | NEMA ICS 6-93 | Industrial Control and Systems<br>Enclosures.   |
| 6.  | NEMA KS 1-90  | Enclosed and Miscellaneous<br>Distribution Equipment<br>Switches (600 Volts Maximum).   |
| 7.  | NEMA OS 1-89  | Sheet-Steel Outlet Boxes,<br>Device Boxes, Covers, and Box<br>Supports.   |
| 8.  | NEMA WD 1-83  | General Requirements for<br>Wiring Devices.   |
| 9.  | NEMA WD 6-88  | Wiring Devices - Dimensional<br>Requirements.   |
| 10. | NEMA 250-91   | Enclosures for Electrical<br>Equipment (1,000 Volts<br>Maximum).  |

E. State of Ohio, Department of Transportation (ODOT):  
Construction and Material Specifications, January 1,  
1997, except as supplemented or otherwise modified herein  
and/ or shown on the Construction Drawings.

F. Underwriters Laboratories Inc. (UL):

- |    |            |  |
|----|------------|--|
| 1. | UL 360-96  | UL Standard for Safety Liquid-<br>Tight Flexible Steel Conduit.                                    |
| 2. | UL 486A-91 | UL Standard for Safety Wire<br>Connectors and Soldering Lugs<br>for Use with Copper<br>Conductors. |
| 3. | UL 510-94  | UL Standard for Safety<br>Polyvinyl Chloride,<br>Polyethylene and Rubber<br>Insulating Tape.       |
| 4. | UL 854-96  | Service-Entrance Cables.   |

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5. UL 870-95 UL Standard for Safety Wireways, Auxiliary Gutters, and Associated Fittings.
6. Electrical Construction Materials Directory - 97.

#### **1.4 SUBMITTALS**

- A. Provide submittals as required by Part 6. Unless specified otherwise, submittals shall be made to the Construction Manager for review and approval.
- B. Submit the following within thirty (30) calendar days from Notice to Proceed:
  1. Catalog sheets for all equipment and materials.
  2. All procedures and record forms for required testing.
- C. Submit all test reports within two (2) calendar days after completing of tests.

#### **1.5 QUALITY ASSURANCE PROGRAM**

- A. Work shall comply with NFPA 70. Use of conduit for equipment ground is prohibited.
- B. Products shall be listed in the UL Electrical Construction Materials Directory, for the purpose specified and indicated.

### **PART 2 PRODUCTS**

#### **2.1 EQUIPMENT**

- A. Molded Case Circuit Breaker for Existing Substation
  1. NEMA AB 1 with integral thermal and instantaneous magnetic trip in each pole. Provide common trip handle for all poles. Terminals, minimum 75 degrees C rated.

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2. Provide one Siemens ITE SBA800, circuit breaker with 800 AF, trip as indicated for existing Substation N18-2. Do not procure this breaker until authorized by the Construction Manager. FDF may have an existing spare available (previously used in substation N78-1).
  3. Substation N18-2 Nameplate Information: Siemens ITE RC III, Series 6, S. O. 17-18930-1, 480V/277Y, MAWF 3/93.
- B. Disconnect Switches - Fusible Switch Assemblies: NEMA KS 1, Type HD quick-make, quick-break, visible blade, load interrupter knife switch in Type 3R or 4 enclosures, NEMA 250, for outdoor use, with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse Clips: FS W-F-870. Designed to accommodate Class R fuses. Terminals, minimum 75 degrees C rated.
- C. Combination Magnetic Motor Starters
1. Combination Magnetic Motor Starters: NEMA ICS 1, NEMA ICS 2, AC general purpose Class A magnetic starter for induction motors for the rated horsepower combined with a magnetic circuit breaker, NEMA AB 1, with instantaneous magnetic trip in each pole. Starter, circuit breaker, and control power transformer shall be in a common enclosure. Terminals, minimum 75 degrees C rated.
  2. Provide externally operable handle interlocked to prevent opening of cover with circuit breaker in the ON position. Allow handle to be lockable in the OFF position.
  3. Contactor Coil Operating Voltage: 120 V, 60 Hz.
  4. Overload Relay: NEMA ICS 2, bimetal.
  5. Control Power Transformer: 120 V secondary, 50 VA minimum. Provide fused secondary of transformer, and ground unfused leg of secondary to enclosure.
  6. Enclosure: NEMA ICS 6, Type 3R or 4, outdoor; or Type 12, indoor.

7. Heater elements shall be included, as required, for the described service conditions.

8. Two auxiliary contacts (electrically dry), one each, normally closed and normally open, in addition to the hold-in contact, shall be provided.

D. Selector Switches

1. Enclosure, NEMA ICS 6, Type 3R or 4.
2. Three-position, spring return, as indicated.

E. Receptacles - Convenience Receptacle: 125 V, 15/20 A, NEMA WD 1, heavy-duty, general use with metal cover plate; conforming to NEMA WD 6, Configuration 5-20. 125 V, 30 A, NEMA WD 1, heavy-duty, general use with metal cover plate; conforming to NEMA WD 6, Configuration 5-30. Furnish with weatherproof "while in use" covers for outdoors, wet or industrial locations.

F. Relays - NEMA ICS 2, contacts rated 5A at 120 V.

G. Time delay relays.

**2.2 MATERIALS**

A. Conduit

1. Rigid steel, heavy wall, galvanized conduit conforming to ANSI C80.1. Intermediate metal conduit (IMC), conforming to ANSI C80.6, shall be acceptable for interior spaces. Conduit shall be 1/2-inch diameter minimum.
2. Liquid-tight flexible metal conduit conforming to UL 360. Conduit shall be 1/2 inch diameter minimum, 5 feet in length (maximum) unless indicated on Construction Drawings .
3. Conduit connections shall be threaded.

B. Wire and Cable - Single and multi-conductor, 600 volt insulated copper conductor. Conductors for power and lighting branch circuits shall not be smaller than No. 12

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AWG. Conductors No. 14 AWG and larger shall be stranded. Conductors for control shall not be smaller than No. 14 AWG stranded. Conductors for Class 1 remote-control and signal circuits shall be enclosed in cable and shall comply with NFPA 70. Power and lighting conductor insulation shall be rated 90 degrees C in accordance with NFPA 70 and shall be insulation Type THHN, THWN-2, XHHW, XHHW-2. Direct burial cable shall be type USE-2, conforming to UL 854. Armored cable shall be for outdoor use with A1 interlocked armor.

- C. Nameplates shall be engraved, three-layer laminated plastic, 5/16-inch bold style, black letters on white background.
- D. Wire Markers and Cable Tags
1. Wire markers shall be single-conductor slip on, heat-shrinkable sleeve with typed or printed black letters on a white background. Wire markers shall be W. H. Brady Co. computer-printable "Bradysleeve" or approved equal.
  2. Cable tags shall be rectangular, flat, non-heat shrinkable tags with 1/8-inch-high letters. Cable markers shall be Raychem-type TMS or approved equal.
- E. Wireway and Auxiliary Gutters
1. Wireway and Auxiliary Gutters: General purpose, NEMA ICS 6, Type 3R enclosure with knockouts on bottom.
  2. Size: As required.
  3. Cover: Screw cover with full gasketing.
  4. Fittings: UL 870, lay-in type with removable top, bottom, and side; captive screws.
  5. Material: Carbon steel.
  6. Finish: Rust-inhibiting primer coating with gray enamel finish.
- F. Splicing and Termination Components
1. Wire connectors, UL 486A, as applicable.

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2. Insulation tape, UL 510.
3. Provide solderless terminal lugs, rated 75 degrees C minimum, on stranded conductors.

G. Boxes and Cover Plates

1. Junction and Pull Boxes

- a. Junction and pull boxes shall be sized as indicated in accordance with NFPA 70, Article 370.
- b. Junction and pull boxes located indoors shall be code-gauge, galvanized sheet steel and shall be of welded construction with conduit knockouts or raceway openings and hinged or screwed covers as indicated. Type 3R, according to NEMA 250.
- c. Junction and pull boxes located outdoors shall be code-gauge, galvanized sheet steel and shall be of welded construction and have screwed, gasketed covers, and watertight hubs. Type 3R, according to NEMA 250.

2. Device and Outlet Boxes

- a. Device and outlet boxes shall be pressed steel, zinc, or cadmium coated in accordance with NEMA OS 1 unless otherwise indicated.
- b. Outlet boxes shall not be smaller than 4 inches octagonal by 1-1/2 inches deep and shall be provided with the proper size knockouts for the conduits intended. Unused knockouts shall remain closed or shall be sealed with knockout closures.
- c. Device or outlet boxes shall be of unit construction of a size required for the number of switches or outlets called for on the Construction Drawings. No sectional device boxes shall be permitted.
- d. Surface-mounted outlet boxes for receptacles, switches, or similar devices shall be cast type.

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H. Supporting Devices

1. Support Channel shall be galvanized or painted steel.
2. Support hardware and accessories shall be corrosion resistant.
3. Supports shall be of all-welded construction.

I. Underground Warning Tape - 4-inch-wide plastic tape, colored yellow with suitable warning legend describing buried electrical lines.

**PART 3 EXECUTION**

**3.1 SITE CONDITIONS**

A. Ensure site is ready to receive work before start of construction.

**3.2 ERECTION/INSTALLATION/APPLICATION**

A. Conduit

1. Route conduit parallel or at right angles to building lines. Provide conduit supports at approximately 8-foot intervals. Route conduit so as not to create a hazard for tripping or to compromise head clearance. Minimum height above floor shall be 7 feet, 6 inches.
2. Cut conduit square using saw or pipecutter. Cut ends of conduit shall be reamed smooth.
3. Install no more than the equivalent of three 90 degree bends between junction boxes. Use hydraulic one-shot conduit bender or factory elbows for conduit diameter larger than 1-1/2 inch.
4. Use Form 8 conduit bodies to make sharp changes in direction. Avoid moisture traps, provide junction box with weep hole.
5. Provide cast metal boxes such as FS or FD in damp or wet locations.

6. Provide 1/8-inch nylon pull cord in empty conduits. Cap empty conduits to prevent entry of moisture and foreign objects.
7. Final conduit connections to motors or other vibrating equipment shall be made with approximately 3-foot liquid-tight flexible metal conduit.
8. Conduit and supports are to be field routed. They are not indicated explicitly on Construction Drawings .

B. Wire and Cable

1. Swab conduit before installing cable. Remove burrs, dirt, or other debris. For existing conduit, pull a mandrel through before pulling cable to verify roundness and bending radii.
2. When pulling cable into conduit, use wire pulling compound.
3. Splices shall be made only in outlet or junction boxes.
4. Provide equipment grounding conductor along with phase conductors in conduits.
5. Multiconductor cables shall contain an integral ground conductor.
6. Grounding conductors shall be connected to equipment with compression lugs. Grounding connections shall be made to clean, dry surfaces. Scale, rust, grease, and dirt shall be removed from surfaces to which grounding connections are to be made.
7. Conductors shall be color coded. Conductors No. 6 AWG and larger shall be identified using colored tape at terminals and splice points. Conductors No. 8 AWG and smaller shall be identified using colored insulation or jacket. Color coding shall be as follows:

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480Y/277V	Phase A	Yellow
	Phase B	Orange
	Phase C	Brown
	Neutral (grounded)	Gray
	Ground	Green
208Y/120V	Phase A	Black
	Phase B	Red
	Phase C	Blue
	Neutral (grounded)	White
	Ground	Green
	Plant Fire	Red and Yellow
	Alarm System	Brown and Yellow

C. Nameplates

1. Clean surfaces prior to installing nameplates.
2. Install nameplates parallel to equipment lines. Secure nameplates to equipment fronts using self-tapping screws.

D. Wire and Cable Markers

1. Provide wire markers on each conductor in pull boxes and junction boxes and at each load connection. Provide cable tags in pull boxes for multiconductor cables.
2. Wire and cable tags shall identify panel and circuit number or control wire number, as required.

E. Disconnect Switches

1. Mounting supports shall not be fastened to or penetrate wall panels.

F. Receptacles

1. Install convenience receptacles 48 inches above finished grade. Receptacle mounting supports shall not be fastened to or penetrate wall panels.
2. Label receptacles with panelboard and circuit number from which they are served.

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G. Combination Magnetic Motor Starters

1. Install motor controllers where indicated on Construction Drawings .
2. Install motor controller with center line of disconnect operator 54 inches above finished grade.
3. Install overload heater element in motor controller to match motor characteristics.
4. Provide engraved nameplate identifying motor served.

H. Selector Switches and Pushbuttons

1. Mount selector switches at a mounting height of 54 inches above finished grade adjacent to the equipment controlled. Provide slotted channel mounting supports where building column or wall is not suitable for support.

I. Clearances

1. Clearances from points of access to electrical equipment and other devices shall conform to the requirements of NFPA 70.
2. Equipment control devices and other electrical equipment requiring operation or maintenance shall have a minimum working clearance of 3 feet from the surface of operation or access, unless greater clearance is required by NFPA 70.

J. Boxes

1. Coordination of Box Locations
  - a. Provide electrical boxes as indicated and as required for splices, taps, wire pulling, and equipment connections.
  - b. Electrical box locations indicated are approximate unless dimensioned.
  - c. Locate and install boxes to allow access.
  - d. Do not install boxes back to back in walls. Provide 6-inches (minimum) separation in non-acoustic rated walls and 24 inches (minimum) separation in acoustic rated walls.

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- e. Coordinate mounting heights of boxes and locations of outlets mounted above counters, benches, and backsplashes to ensure locations are useful.
- f. Align wall-mounted outlet boxes for switches, thermostats, and similar devices.

2. Outlet Box Installation

- a. Firmly secure in place outlet or utility boxes concealed in the construction. Set outlet or utility boxes true, square, and flush with the finish surfaces for the application of the appropriate cover plate.
- b. Provide knockout closures for unused knockout openings.
- c. Support boxes independently of conduit except for cast boxes when connected to two rigid metal conduits, both supported within 12 inches of the box to be supported.
- d. Use multiple gang boxes where more than one device is mounted together. Do not use sectional boxes. Provide barriers to separate wiring of different voltage systems.

3. Pull and Junction Box Installation

- a. Support pull and junction boxes independently of conduit.

K. Cabinets

- 1. Install cabinet fronts plumb.

L. Supporting Devices

- 1. Installation of structural steel framing, concrete pads, etc., shall be complete before installing supporting devices.
- 2. Fasten hanger rods, conduit clamps, and outlet and junction boxes to building structures in accordance with manufacturer's recommendations as indicated.
- 3. Use expansion anchors for support on concrete surfaces.

4. Do not fasten supports to piping, ductwork, mechanical equipment, or conduit.
5. Do not drill structural steel members for installing support devices.
6. Fabricate supports from structural steel or steel channel. Rigidly bolt to structural steel to present a neat appearance. Use hexagon head bolts with spring lock washers under nuts.
7. Install freestanding electrical equipment on concrete pads. Concrete shall conform to ODOT Item 499, Class F, 3000 psi compressive strength at 28 days, and Item 511.
8. Install surface mounted cabinets and enclosures with four anchors (minimum). Provide steel channel supports to stand cabinets and enclosures 1 inch from the wall.

### 3.3 QUALITY CONTROL

#### A. Electrical Inspection and Testing - General

1. Electrical inspection and testing for work in this Section and in other electrical Sections shall conform to the following requirements and to NETA ATS. Tests required by NETA ATS for electrical work on this project shall be performed unless specific instruction is provided otherwise. Any additional requirements or exceptions shall be as noted in the other electrical sections for the specific electrical work of that Section only.
2. Testing shall be witnessed by FDF, CQC Consultant-Quality Control personnel (who must approve results) and manufacturer's service representative(s), if required. Notice of testing must be furnished seven (7) days in advance.
3. Submit test results and calibration data on approved forms.
4. Perform operational tests to demonstrate control and interlocking wiring.

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5. Visual inspections shall be performed for phasing and connections. Phasing shall be A, B, C clockwise at all three phase disconnects.
6. Repair or replacement of components where test results are unacceptable, including those damaged during testing process, is required.

B. Electrical Inspection and Testing

1. Perform continuity and operation tests on power and control circuits. Low voltage thermographic survey of cable connections required by NETA ATS are not required. Wire insulation for conductors No. 6 AWG and larger shall be megger tested between each conductor and ground. A 1000-volt megger shall be used for insulation rated 600 volts. Minimum resistance shall be 100 megohms.
2. Insulation resistance tests shall not be performed on solid state equipment unless authorized by its manufacturer and in strict accordance with the manufacturer's recommendations. Solid state equipment includes static ground fault devices, such as ground fault circuit interrupters.
3. Confirm that electrical connections to utilization equipment have been made in accordance with manufacturer's instructions.
4. Perform motor tests according to NETA ATS.
5. Motor windings shall be checked for continuity.
6. Motor windings rated 460 volts nominal shall be megger tested with a 1,000-volt megger prior to connection of power leads. Minimum acceptable resistance shall be 100 megohms. Motor and phase rotation shall be checked with a phase rotation tester manufactured by G. Biddle Company (Catalog No. 56060) or equal on equipment which could be damaged by reverse rotation.
  - a. Motor and phase rotation shall be verified before energizing motors.

- b. Motors shall be "bumped" to check for proper direction of rotation prior to performing operational tests on the equipment in the presence of the Construction Manager.

**END OF SECTION**

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SECTION 16170  
GROUNDING AND BONDING

**PART 1 GENERAL**

**1.1 SCOPE**

This section includes, but is not limited to:

- A. Grounding electrodes and conductors.
- B. Equipment grounding conductors.
- C. Bonding.

**1.2 RELATED SECTIONS**

- A. Section 16050 - Basic Electrical Materials and Methods.
- B. Section 16370 - Overhead Power Distribution.
- C. Part 6 - Statement of Work.
- D. Part 8 - Environmental Health and Safety, and Training Requirements.

**1.3 REFERENCES**

- A. InterNational Electrical Testing Association (NETA):
  - 1. NETA ATS-95 Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- B. National Fire Protection Association (NFPA):
  - 1. NFPA 70 National Electrical Code, 1996 Edition.

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- C. Underwriters Laboratories, Inc. (UL):
  - 1. UL 467-93 UL Standard for Safety Grounding and Bonding Equipment.
  - 2. Electrical Construction Materials Directory-97.

**1.4 SYSTEM DESCRIPTION**

- A. Rod electrode and grounding connections.
- B. Grounding System Resistance: 5 ohms maximum.

**1.5 SUBMITTALS**

- A. Provide submittals as required by Part 6. Unless specified otherwise, submittal shall be made to the Construction Manager for review and approval.
- B. Submit the following within thirty (30) calendar days from Notice to Proceed:
  - 1. Catalog sheets for all equipment and materials.
  - 2. Certification of ground testing instrumentation.
  - 3. All procedures and record forms for required testing.
- C. Submit the following within two (2) calendar days after completing of tests:
  - 1. All test reports.
  - 2. Record of as-built locations of grounding electrodes.

**1.7 QUALITY ASSURANCE PROGRAM**

- A. Conform to requirements of NFPA 70.
- B. Furnish products listed in the UL Electrical Construction Materials Directory as suitable for the purpose specified and indicated.
- C. Provide certification of ground testing instrumentation according to NETA ATS.

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**PART 2 PRODUCTS****2.1 MANUFACTURERS**

- A. Acceptable Manufacturers
  - 1. Mechanical Connectors
    - a. Burndy.
    - b. Ideal.
    - c. Ilsco.
  - 2. Exothermic Connections
    - a. Cadweld.
    - b. Thermoweld.

**2.2 MATERIALS**

- A. Rod Electrode
  - 1. Copper-clad steel, 3/4-inch diameter, 10-foot length.
- B. Mechanical Connectors
  - 1. Bronze.
- C. Wire
  - 1. Stranded copper.
    - a. Grounding Conductor: Size to meet NFPA 70 requirements.
- D. Grounding and bonding materials shall conform to UL 467.

**PART 3 EXECUTION****3.1 SITE CONDITIONS**

- A. Verify that final backfill and compaction have been completed before driving rod electrodes.
- B. Verify that underground utilities will not interfere with the proposed rod locations prior to driving rod electrodes.

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**3.2 ERECTION/INSTALLATION/APPLICATION**

- A. Install products in accordance with manufacturer's instructions.
- B. Install additional rod electrodes as required to achieve specified resistance to ground.
- C. Equipment Grounding Conductor: Provide separate, insulated conductor with each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.
- D. Connect ground conductors to reinforcing bars in foundation before pouring concrete. Tie to structural steel members when they are installed, by exothermic connection.
- E. Ground metal equipment enclosures by attachment to ground rod system, the building steel, or existing periphery grounding system.
- F. Ground pole-mounted equipment and static line conductors as indicated on the Construction Drawings.
- G. Drive ground rods until the top is below grade.

**3.3 QUALITY CONTROL**

- A. Inspect grounding and bonding system conductors and connections for tightness and proper installation as defined by specifications, Construction Drawings and manufacturer's instructions. Accurately record as-built locations of grounding electrodes if required, and submit as specified in this Section. Test instrumentation shall conform to NETA ATS. Provide certification for instrumentation.

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- B. Measure the system's resistance to the ground; perform testing in accordance with instrument manufacturer's recommendations. Measure resistance at each pole and at each 480 V service as a minimum. Provide written test reports indicating overall resistance to ground and resistance of each electrode to ground.

**END OF SECTION**

SECTION 16370  
OVERHEAD POWER DISTRIBUTION

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**PART 1 GENERAL**

**1.1 SCOPE**

This section includes, but is not limited to:

- A. Poles.
- B. Pole hardware.
- C. Line conductors.
- D. Anchors.

**1.2 RELATED SECTIONS**

- A. Section 16050 - Basic Electrical Materials and Methods.
- B. Section 16170 - Grounding and Bonding.
- C. Part 6 - Statement of Work.
- D. Part 8 - Environmental Health and Safety, and Training Requirements.

**1.3 REFERENCES**

- A. National Fire Protection Association (NFPA):
  - 1. NFPA 70 National Electrical Code, 1996 Edition.
- B. American National Standards Institute (ANSI):
  - 1. ANSI C2-97 National Electrical Safety Code.
  - 2. ANSI C135.1-79 Galvanized Steel Bolts and Nuts for Overhead Line Construction.
  - 3. ANSI O5.1-92 Wood Poles Specifications and Dimensions.

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- C. American Society for Testing and Materials (ASTM):
  - 1. ASTM A36/A36M-96 Standard Specification for Carbon Structural Steel.
  - 2. ASTM A475-95 Standard Specification for Zinc-Coated Steel Wire Strand.
  
- D. American Wood-Preservers Association (AWPA):
  - 1. AWPA C4-89 Poles - Pressure Process.
  - 2. AWPA C25-89 Standard for the Preservative Treatment of Crossarms by the Pressure Process.
  
- E. National Electrical Manufacturers Association (NEMA):
  - 1. NEMA WC 7-88 Cross-Linked Thermosetting Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
  
- F. Underwriters Laboratories, Inc. (UL):
  - 1. Electrical Construction Materials Directory-97.

**1.4 SUBMITTALS**

- A. Provide submittals as required by Part 6. Unless specified otherwise, submittals shall be made to the construction manager for review and approval.
  
- B. Submit the following within thirty (30) calendar days from Notice to Proceed:
  - 1. Catalog sheets for all equipment and materials.
  - 2. All procedures and record forms for required testing.
  - 3. Any MSDSs where applicable.
  
- C. Submit the following within two (2) calendar days after completing of tests:
  - 1. All test reports.

**1.5 QUALITY ASSURANCE PROGRAM**

- A. Conform to requirements of NFPA 70 and ANSI C2.

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- B. Furnish products, where available, listed in the 1727  
Electrical Construction Materials Directory, as  
suitable for the purpose specified and indicated.
- C. Installation shall comply with ANSI C2, Heavy Loading  
District, Grade B Construction.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Protect poles from damage and decay by stacking to  
provide free circulation of air. Maintain 1 foot  
minimum spacing between bottom pole and ground or  
ground vegetation. Do not store poles above decayed or  
decaying wood.
- B. Stack poles stored for more than 2 weeks on decay-  
resistant skids arranged to support poles without  
noticeable pole distortion.
- C. Handle treated poles with tools which will not produce  
an indentation greater than 1 inch deep. Do not drag  
treated poles along ground. Do not apply tools to that  
section of treated poles between 1 foot above and  
2 feet below ground line.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- A. Poles
1. Wood Poles: ANSI O5.1; treated southern pine poles  
of length and class indicated.
  2. Select poles for straightness, minimum sweeps, and  
short crooks.
  3. Preservative: ANSI O5.1 and AWPA C4,  
Pentachlorophenol.
  4. Apply preservative to poles as required by AWPA C4  
with minimum net retention of 12 lbs/ft<sup>3</sup>. Obtain  
complete sapwood penetration.
- B. Pole Hardware
1. Pole Hardware: Hot-dipped galvanized after  
fabrication and as indicated on the Construction  
Drawings.
  2. Eye Bolts and Nuts: ANSI C135.1.

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3. Guy Strand: High strength, seven-strand steel cable galvanized to ASTM A475, Class A or B.
- C. Line Conductors
  1. Secondary Conductors: aluminum, three insulated conductors and messenger/ground wire with 600 volt cross-linked polyethylene insulation for phase conductors conforming to NEMA WC 7.
- D. Anchors
  1. Helical Screw Anchors: Galvanized steel, ASTM A36/36M.

**PART 3 EXECUTION**

**3.1 SITE CONDITIONS**

- A. Verify that field measurements are as shown on Construction Drawings.
- B. Verify that there are no underground utilities located below the poles prior to installation.
- C. Use small diameter steel probe to verify area is free of underground obstructions prior to installation of anchors.

**3.2 ERECTION/INSTALLATION/APPLICATION**

- A. Install products in accordance with manufacturer's instructions.
- B. Plug unused holes in poles using treated wood dowel pins. Treat field-cut gains and field-bored holes with preservative.
- C. Shorten poles when required by cutting from top end. Apply hot preservative to shortened end of pole.
- D. Set poles in straight line. Place curved poles with curvature in line with lead pole. Maintain an even grade.

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- E. Dig setting holes large enough to permit use of power tampers to full depth. Place earth in maximum 6-inch layers and power tamp. 1727
- F. Rake poles located at corners, angles, and dead ends so that poles are vertical after line installation.
- G. Do not install poles along the edge of cuts and embankments or where soil may be washed out.
- H. Identify each pole using aluminum marker stamped with characters 2-1/2 inches high, minimum. Locate to provide maximum visibility from roadway and fasten with aluminum nails. Obtain identifying numbers from the Construction Manager.
- I. Minimum depths in normal firm ground, measured from lower side of pole:

OVERALL LENGTH	DEPTH FOR STRAIGHT LINES	DEPTH AT CURVES, CORNERS, AND POINTS OF EXTRA STRAIN
30'	5'-6"	5'-6"
35'	6'-0"	6'-0"
40'	6'-6"	6'-6"
45'	7'-0"	7'-6"
50'	7'-6"	8'-0"
55'	7'-6"	8'-0"

- J. Install conductors to ANSI C2. Maintain clearances required by ANSI C2, except as follows: above roads, 480 V conductors - 23 feet, over buildings, all conductors, 8 feet, 40 inches between communication lines and power lines.
- K. Make aluminum connections to copper or other material using only splices, connectors, lugs, or fittings designed for that specific purpose.
- L. Install guys and anchors according to ANSI C2 requirements.

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- M. Bond metal enclosures on poles to pole ground wire in accordance with NFPA 70, ANSI C2 and manufacturer's instructions.

**END OF SECTION**

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SECTION 16462  
DRY TYPE TRANSFORMER/PANELBOARDS

**PART 1      GENERAL**

**1.1          SCOPE**

This section includes, but is not limited to:

- A.      Dry type, two-winding transformers integrated with primary and secondary main breakers and feeder breakers.
- B.      Dry type, two-winding transformers.

**1.2          RELATED SECTIONS**

- A.      Section 16050 - Basic Electrical Materials and Methods.
- B.      Section 16170 - Grounding and Bonding.
- C.      Part 6 - Statement of Work.
- D.      Part 8 - Environmental Health and Safety, and Training Requirements.

**1.3          REFERENCES**

- A.      InterNational Electrical Testing Association (NETA):
  - 1.      NETA ATS-95                      Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- B.      National Electrical Manufacturers Association (NEMA):
  - 1.      NEMA AB 1-93                      Molded Case Circuit Breakers and Molded Case Switches.
  - 2.      NEMA PB 1-90                      Panelboards.

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3. NEMA PB 1.1-91 General Instructions for Proper Installation, Operation, and Maintenance of Panelboards Rated 600 Volts or Less.
  4. NEMA ST 20-92 Dry Type Transformers for General Applications.
  5. NEMA 250-91 Enclosures for Electrical Equipment (1000 Volts Maximum).
- C. National Fire Protection Association (NFPA):
1. NFPA 70 National Electrical Code, 1996 Edition.
- D. Underwriters Laboratories, Inc. (UL):
1. Electrical Construction Materials Directory-97.

**1.4 SUBMITTALS**

- A. Provide submittals as required by Part 6. Unless otherwise specified, submittals shall be made to the Construction Manager for review and approval.
- B. Submit the following within thirty (30) calendar days from Notice to Proceed:
1. Catalog sheets and shop drawings for all equipment and materials.
  2. Product data to include outline and support point dimensions of enclosures and accessories; unit weight; voltage; kVA, number of phases, impedance ratings, and characteristics; X/R ratio; tap configurations; insulation system type; rated temperature rise; and main bus ampacity, integrated short circuit ampere rating, circuit breaker, arrangement, and sizes.
  3. Factory test reports: NEMA ST 20. Indicate loss data; efficiency at 25, 50, 75, and 100 percent rated loads; and sound level.
  4. All procedures and record forms for required testing.

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- C. Submit the following within two (2) calendar days after completing of tests:
  - 1. All field test reports: Indicate primary and secondary voltages as measured, according to NETA ATS.

**1.5 QUALITY ASSURANCE PROGRAM**

- A. Conform to requirements of NFPA 70.
- B. Furnish products listed in the UL Electrical Construction Materials Directory for the purpose specified and indicated.

**1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver transformers/panelboards individually wrapped for protection and mounted on shipping skids.
- B. Accept transformers/panelboards on site. Inspect for damage.
- C. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- D. Handle in accordance with manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to transformer/panelboards' internal components, enclosure, and finish.

**PART 2 PRODUCTS**

**2.1 MANUFACTURERS**

- A. Siemens.
- B. Westinghouse.
- C. Square D.

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## 2.2

### EQUIPMENT

#### A. Two-winding transformers

1. Description: NEMA ST 20, factory-assembled, air-cooled, dry type transformers; ratings as indicated on Construction Drawings.
2. Insulation system and average winding temperature rise for rated kVA as follows:
  - a. 1-30 kVA: Class 185 with 115 degrees C rise.
  - b. 16-500 kVA: Class 220 with 115 degrees C rise.
3. Case Temperature: Do not exceed 40 degrees C rise above ambient at warmest point.
4. Winding Taps:
  - a. Transformers: NEMA ST 20. Transformers shall have four full current taps, two at 2-1/2 percent each above and two at 2-1/2 percent each below normal voltage.
5. Sound Levels: NEMA ST 20, not to exceed 85 dBA at 3 feet.
6. Basic Impulse Level: 10 kV.
7. Ground core and coil assembly to enclosure by means of a visible, flexible copper grounding strap.
8. Mounting: Suitable for wall mounting, except where indicated otherwise on Construction Drawings.
9. Coil Conductors: Continuous windings with terminations brazed or welded.
10. Enclosure: NEMA ST 20. Provide lifting eyes or brackets.
11. Isolate core and coil from enclosure, using vibration-absorbing mounts.
12. Nameplate: Include connection data and overload capacity based on rated allowable temperature rise.

#### B. Branch Circuit Panelboards

1. Lighting and Appliance Branch Circuit Panelboards: NEMA PB 1; circuit breaker type.
2. Enclosure: NEMA PB 1; Type 3R conforming to NEMA 250.

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3. Cabinet Size: As shown on manufacturer's drawings.
4. Cabinet Front: Hinged cover with paddle lock hinge.
5. Provide an integrated unit with transformer. Finish in manufacturer's standard gray enamel.
6. Provide panelboards with copper bus, ratings as scheduled on drawings. Provide copper ground bus in each panelboard.
7. Minimum Integrated Short Circuit Rating: 10,000 amperes rms symmetrical.
8. Molded Case Circuit Breakers: NEMA AB 1; plug-on type thermal magnetic trip circuit breakers, with common trip handle for all poles, rated for 75 degrees C copper conductors. Provide circuit breakers UL listed as Type SWD for lighting circuits. Provide UL Class A and Class B ground fault interrupter (GFCI) circuit breakers where required. Provide 20 percent spare breakers installed in the panelboard, including at least one 30 mA GFCI breaker, unless otherwise indicated on Construction Drawings.

### **PART 3 EXECUTION**

#### **3.1 ERECTION/INSTALLATION/APPLICATION**

- A. Install transformer/panelboards in accordance with NEMA PB 1.1.
- B. Install plumb, and in accordance with manufacturer's instructions, and as indicated on Construction Drawings.
- C. Height (transformer/ panelboard combination only): 6 feet, 6 inches to top of transformer section.
- D. Provide grounding connections in accordance with Section 16170.
- E. Provide filler plates for unused spaces in panelboards.

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- F. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads.
- G. Provide engraved plastic nameplates identifying transformer/panelboard equipment number.
- H. After initial energizing of transformers, measure the secondary voltage and adjust to nominal voltage by changing taps.

**3.2 QUALITY CONTROL**

- A. Test according to general requirements of Section 16050 and to the relevant requirements of NETA ATS.
- B. Visual and mechanical inspection: Inspect for physical damage, proper alignment, anchorage, grounding, and conformance of installation to contract documents and manufacturer's instructions. Check tightness of wiring and mounting connections for circuit breakers and transformer prior to energizing.
- C. Record primary and secondary voltages; submit to the Construction Manager.
- D. Measure steady state load currents at each panelboard feeder. Rearrange circuits in the panelboard to balance the phase loads to within 20 percent of each other. Maintain proper phasing for multi-wire branch circuits.

**END OF SECTION**

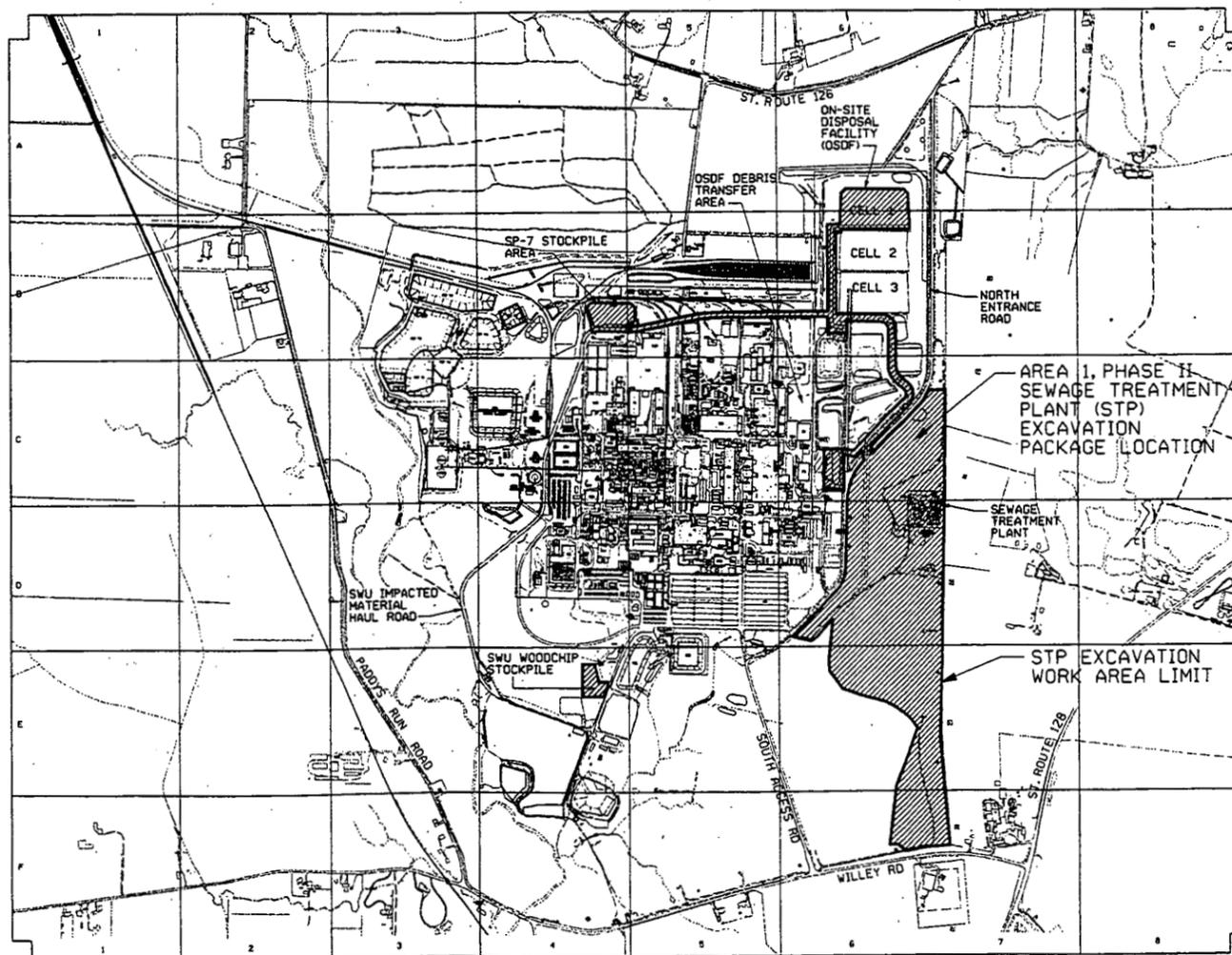
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# UNITED STATES DEPARTMENT OF ENERGY FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

## REMEDIATION AREA 1, PHASE II SEWAGE TREATMENT PLANT EXCAVATION PACKAGE

CONTRACT NO. FSC632  
FDF PROJECT NO. 20712

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RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-X-00490	LEGEND AND GENERAL NOTES	X0003

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NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	DATE	BY
0A	CERTIFIED FOR CONSTRUCTION - DRAFT	FMP 9/21/98	C.S. 9/21/98

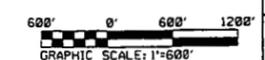
**UNITED STATES  
DEPARTMENT OF ENERGY  
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**

THIS DRAWING PREPARED BY  
**PARSONS**  
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.  
CINCINNATI, OHIO

PROJECT NAME  
**REMEDIATION AREA 1, PHASE II  
SEWAGE TREATMENT PLANT EXCAVATION PACKAGE**  
DRAWING TITLE

PROJECT TITLE SHEET

DRAWN BY	DATE	TECHNICAL LEAD	DATE	CHECKED BY	DATE
J.G. ASHWORTH	8/14/98	F.M. PARTON, JR.	8/14/98	F.M. PARTON, JR.	8/14/98
PLANT/BLDG. NO.	FLOOR	SCALE	CLASS	1"=600'	
SUBMITTED FOR 30% ISSUE	DATE	SUBMITTED FOR 60% ISSUE	DATE	SUBMITTED FOR 90% ISSUE	DATE
TECH LEAD N/A		TECH LEAD N/A		TECH LEAD N/A	



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ARCHITECTS - ENGINEERS  
CINCINNATI, OHIO

PG. NUMBER	FDF PROJECT NO.	DRAWING SHEET CODE NO.	SHEET NO.	REV. NO.
TOP-012	20712	92X-5900-X-00488	X0001	0A

NOTES

- DRAWING NUMBERS ARE FOR FILE REFERENCE. DRAWINGS ARE ORDERED BY SHEET NUMBER.
- CONTRACTOR SHALL REFER TO THE TECHNICAL REFERENCE DOCUMENT FOR INFORMATION ON FOUNDATIONS AND UNDERGROUND UTILITIES. CONTRACTOR SHALL OBTAIN CONVERSION VALUES BETWEEN THE FEMP COORDINATE SYSTEM (SHOWN ON THE TECHNICAL REFERENCE DOCUMENT) AND NAD 1983 COORDINATE SYSTEM FROM THE CONSTRUCTION MANAGER.

1727

000156

RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00488	PROJECT TITLE SHEET	X0001
92X-5900-X-00490	LEGEND AND GENERAL NOTES	X0003

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0A	CERTIFIED FOR CONSTRUCTION - DRAFT	FMP	CS
REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	DATE	INITIALS AND DATE

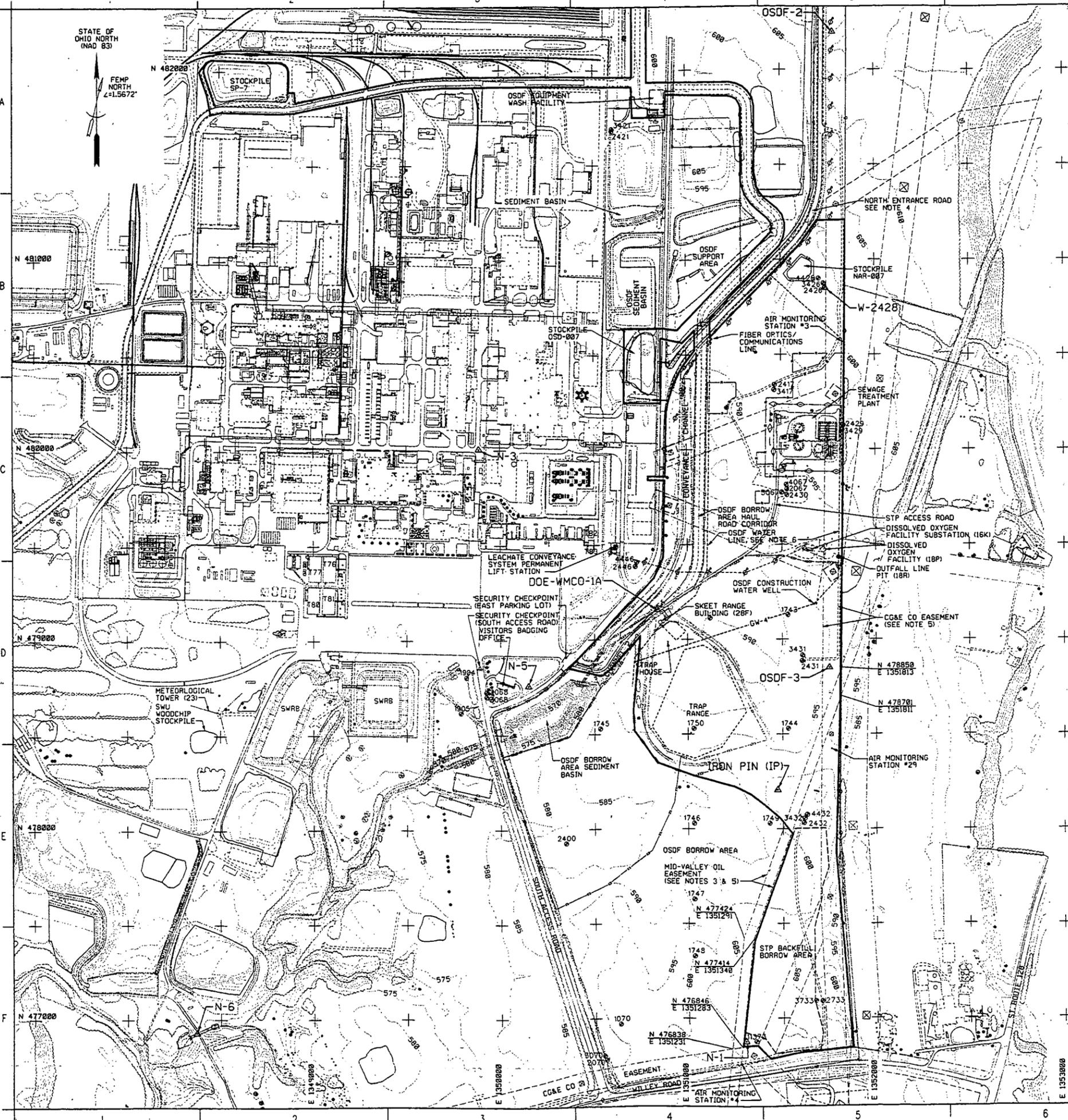
**UNITED STATES**  
**DEPARTMENT OF ENERGY**  
**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**  
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 THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.  
 CINCINNATI, OHIO  
 PROJECT NAME  
**REMEDIATION AREA 1, PHASE II**  
**SEWAGE TREATMENT PLANT EXCAVATION PACKAGE**  
 DRAWING TITLE

DRAWING INDEX			
DRAWN BY	DATE	TECHNICAL LEAD	CHECKED BY
J.G. ASHWORTH	8/14/98	F.M. PARTON, JR.	F.M. PARTON, JR.
PLANT/BLDG. NO.	FLOOR	SCALE	CLASS
		NONE	
SUBMITTED FOR 30% ISSUE	SUBMITTED FOR 60% ISSUE	SUBMITTED FOR 90% ISSUE	
TECH LEAD N/A	TECH LEAD N/A	TECH LEAD N/A	
DATE	DATE	DATE	
PG NUMBER	PG OF PROJECT NO.	DRAWING INDEX CODE NO.	SHEET NO. REV. NO.
TOP-012	20712	92X-5900-X-00489	X0002 0A

INDEX OF DRAWINGS

INDEX CODE NO.	DRAWING NO.	SHEET NO.	REVISION NO.	DRAWING TITLE	REMARKS
	92X-5900-X-00488	X0001	0A	PROJECT TITLE SHEET	
	92X-5900-X-00489	X0002	0A	DRAWING INDEX	
	92X-5900-X-00490	X0003	0A	LEGEND AND GENERAL NOTES	
	92X-5900-G-00486	G0001	0A	CIVIL - EXISTING CONDITIONS PLAN	
	92X-5900-G-00492	G0002	0A	CIVIL - MASTER KEY PLAN	
	92X-5900-G-00463	G0003	0A	CIVIL - SITE PREP & GENERAL UTILITY REMOVAL PLAN	
	92X-5900-G-00458	G0004	0A	CIVIL - GENERAL EXCAVATION PLAN	
	92X-5900-G-00434	G0005	0A	CIVIL - ABOVE WAC EXCAVATION AND STP AREA UTILITY REMOVAL PLAN	
	92X-5900-G-00503	G0006	0A	CIVIL - STP DEEP EXCAVATION PLAN	
	92X-5900-G-00504	G0007	0A	CIVIL - LEAD CONTAMINATED SOIL EXCAVATION PLAN	
	92X-5900-G-00505	G0008	0A	CIVIL - SP-7 STOCKPILE	
	92X-5900-G-00506	G0009	0A	CIVIL - STP BACKFILL BORROW AREA	
	92X-5900-G-00493	G0010	0A	CIVIL - TRAFFIC ROUTES	
	92X-5900-G-00517	G0011	0A	CIVIL - TRANSFER LINE PLAN & PROFILE	
	92X-5900-G-00507	G0012	0A	CIVIL - PHASE I STP EXCAVATION DEWATERING SYSTEM	
	92X-5900-G-00508	G0013	0A	CIVIL - PHASE II STP EXCAVATION DEWATERING SYSTEM	
	92X-5900-G-00498	G0014	0A	CIVIL - DETAIL SHEET	
	92X-5900-G-00509	G0015	0A	CIVIL - CROSS SECTIONS - SHEET 1 OF 3	
	92X-5900-G-00510	G0016	0A	CIVIL - CROSS SECTIONS - SHEET 2 OF 3	
	92X-5900-G-00516	G0017	0A	CIVIL - CROSS SECTIONS - SHEET 3 OF 3	
	92X-5900-G-00487	G0018	0A	CIVIL - MATERIAL TRACKING PLAN	
	92X-5900-E-00472	E0001	0A	ELECTRICAL - SINGLE LINE DIAGRAM & PANEL SCHEDULE LP-1	
	92X-5900-E-00471	E0002	0A	ELECTRICAL - ELEMENTARY DIAGRAMS	
	92X-5900-E-00519	E0003	0A	ELECTRICAL - INTERCONNECTION DIAGRAMS AND DETAILS	
	92X-5900-E-00473	E0004	0A	ELECTRICAL - POWER PLAN	
	92X-5900-E-00478	E0005	0A	ELECTRICAL - ELEVATIONS AND DETAILS	
	92X-5900-N-00464	N0001	0A	MECHANICAL PROCESS - PIPING AND INSTRUMENTATION DIAGRAM - SYMBOLS AND LEGEND	
	92X-5900-N-00502	N0002	0A	MECHANICAL PROCESS - PIPING AND INSTRUMENTATION DIAGRAM - WATER COLLECTION AND TRANSFER SYSTEM	





STATE OF OHIO NORTH (NAD 83)  
 FEMP NORTH  
 Z=15672'

- NOTES
- FOR UTILITIES SEE SHEETS G0003 AND G0005.
  - BORINGS AND WELLS SHOWN WERE PROVIDED BY FOF. ADDITIONAL WELLS AND BORINGS OUTSIDE THE WORK AREA NOT SHOWN.
  - THERE SHALL BE NO WORK PERFORMED OR EQUIPMENT TO ENTER THE MID-VALLEY OIL EASEMENT WITHOUT WRITTEN AUTHORIZATION FROM THE CONSTRUCTION MANAGER.
  - CONTOURS SHOWN ALONG THE PHASE I NORTH ENTRANCE ROAD RELOCATION WERE DEVELOPED FROM CFC DRAWINGS. AS-BUILT CONDITIONS MAY BE DIFFERENT. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND NOTIFY THE CONSTRUCTION MANAGER IN WRITING OF ANY DEVIATIONS PRIOR TO INITIATING ANY WORK IN THIS AREA.
  - MID VALLEY OIL EASEMENT AND CG&E EASEMENT WILL BE FLAGGED IN THE FIELD BY FOF PRIOR TO CONSTRUCTION. COORDINATES SHOWN ARE FOR APPROXIMATE LOCATION ONLY.
  - EXISTING OSDF WATER LINE IS ON TOP-OF-GROUND AND IS SHOWN IN APPROXIMATE LOCATION ONLY. CONTRACTOR TO VERIFY ACTUAL LOCATION PRIOR TO CONSTRUCTION.

1727

BENCHMARK INFORMATION				
BENCHMARK	NORTHING	EASTING	ELEVATION	REMARKS
N-1	476876.20	1351301.43	607.88	EXISTING
N-3	480007.25	1349883.72	579.44	EXISTING
N-5	478758.71	1350146.60	580.37	EXISTING
N-6	476928.55	1348359.68	551.99	EXISTING
IRON PIN (IP)	478205.58	1351472.81	603.32	EXISTING
DOE-WMCO-1A	479157.89	1350835.05	585.57	EXISTING
W-2428	488850.13	1351732.75	608.79	EXISTING
OSDF-2	482199.94	1351779.16	615.82	EXISTING
OSDF-3	478850.42	1351749.33	595.61	EXISTING

000158

RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-X-00490	LEGEND AND GENERAL NOTES	X0003
92X-5900-G-00463	SITE PREP AND GENERAL UTILITY PLAN	G0003
92X-5900-G-00434	ABOVE WAC EXCAVATION AND STP AREA UTILITY REMOVAL PLAN	G0005

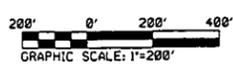
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OA	CERTIFIED FOR CONSTRUCTION - DRAFT	FMP	05
		9/2/98	9/1/01
REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	DATE	INITIALS AND DATE

**UNITED STATES DEPARTMENT OF ENERGY**  
**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**  
 THIS DRAWING PREPARED BY  
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 CINCINNATI, OHIO

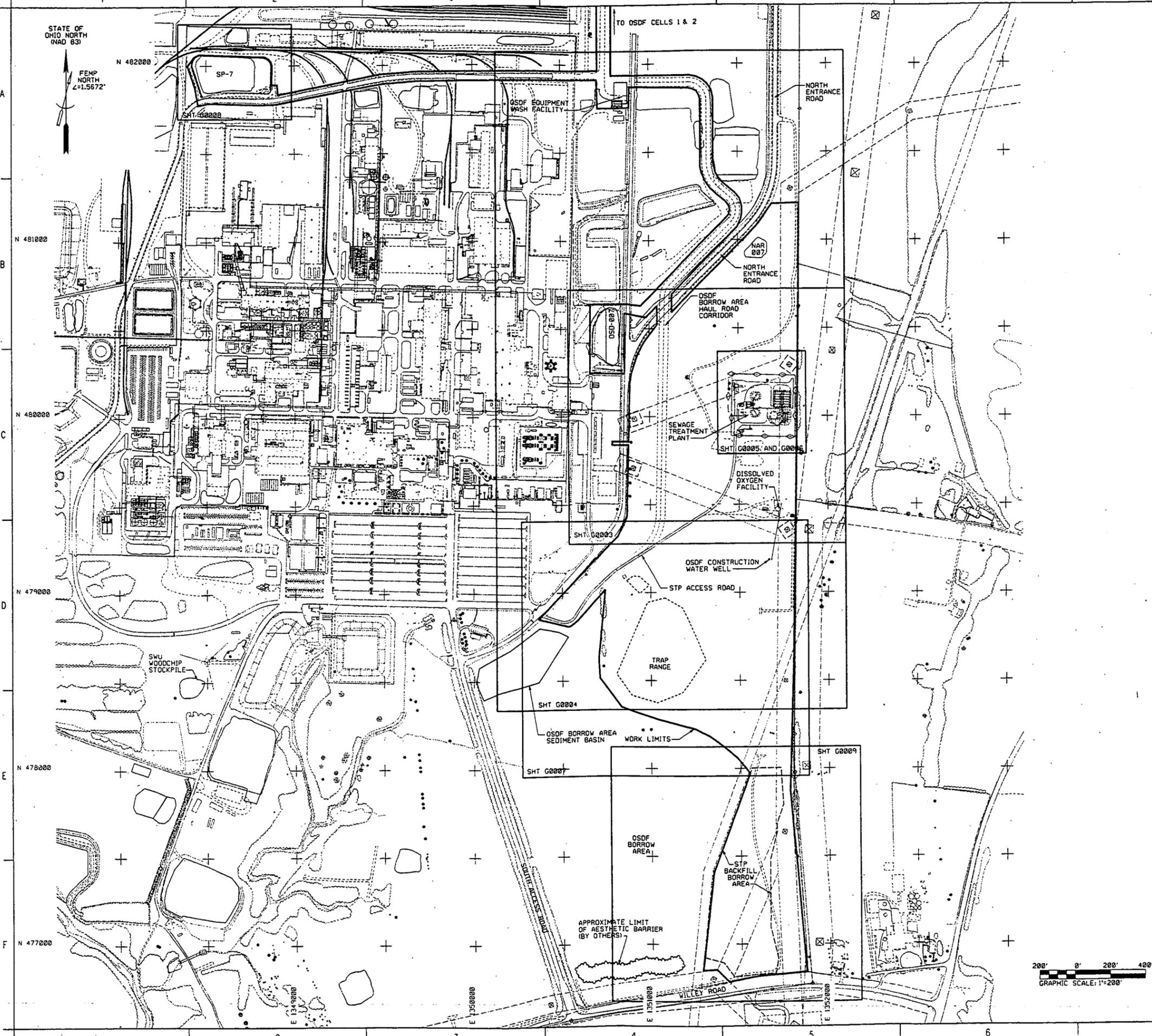
PROJECT NAME  
**REMEDIATION AREA 1, PHASE II**  
**SEWAGE TREATMENT PLANT EXCAVATION PACKAGE**  
 DRAWING TITLE  
**CIVIL**  
**EXISTING CONDITIONS PLAN**

DRAWN BY	DATE	TECHNICAL LEAD	DATE	CHECKED BY	DATE
J.G. ASHWORTH	8/14/98	F.M. PARTON, JR.	8/14/98	S. HAY	8/14/98
PLANT/BLDG. NO.	FLOOR	SCALE	CLASS		
		1"=200'			
SUBMITTED FOR 30% ISSUE	SUBMITTED FOR 60% ISSUE	SUBMITTED FOR 90% ISSUE			
TECH LEAD N/A	TECH LEAD N/A	TECH LEAD N/A			
DATE	DATE	DATE			
PO NUMBER	FOF PROJECT NO.	DRAWING INDEX CODE NO.	SHEET NO.	REV. NO.	
TOP-012	20712	92X-5900-G-00486	G0001	0A	



STATE OF OHIO NORTH  
NAD 83

FEMP  
NORTH  
Z=1.5672



NOTES

1. FOR EXISTING CONDITIONS SEE SHEET G0001. FOR EXISTING UTILITIES SEE SHEETS G0003 AND G0005.

1727

000159

RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-X-00490	LEGEND AND GENERAL NOTES	X0003
92X-5900-G-00486	EXISTING CONDITIONS PLAN	G0001
92X-5900-G-00463	SITE PREP & GENERAL UTILITY REMOVAL PLAN	G0003
92X-5900-G-00458	GENERAL EXCAVATION PLAN	G0004
92X-5900-G-00434	ABOVE WAC EXCAVATION AND STP AREA UTILITY REMOVAL PLAN	G0005
92X-5900-G-00503	STP DEEP EXCAVATION PLAN	G0006
92X-5900-G-00504	LEAD CONTAMINATED SOIL EXCAVATION PLAN	G0007
92X-5900-G-00506	STP BACKFILL BORROW AREA	G0009

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REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	DATE	BY
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**UNITED STATES  
DEPARTMENT OF ENERGY  
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**

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CINCINNATI, OHIO

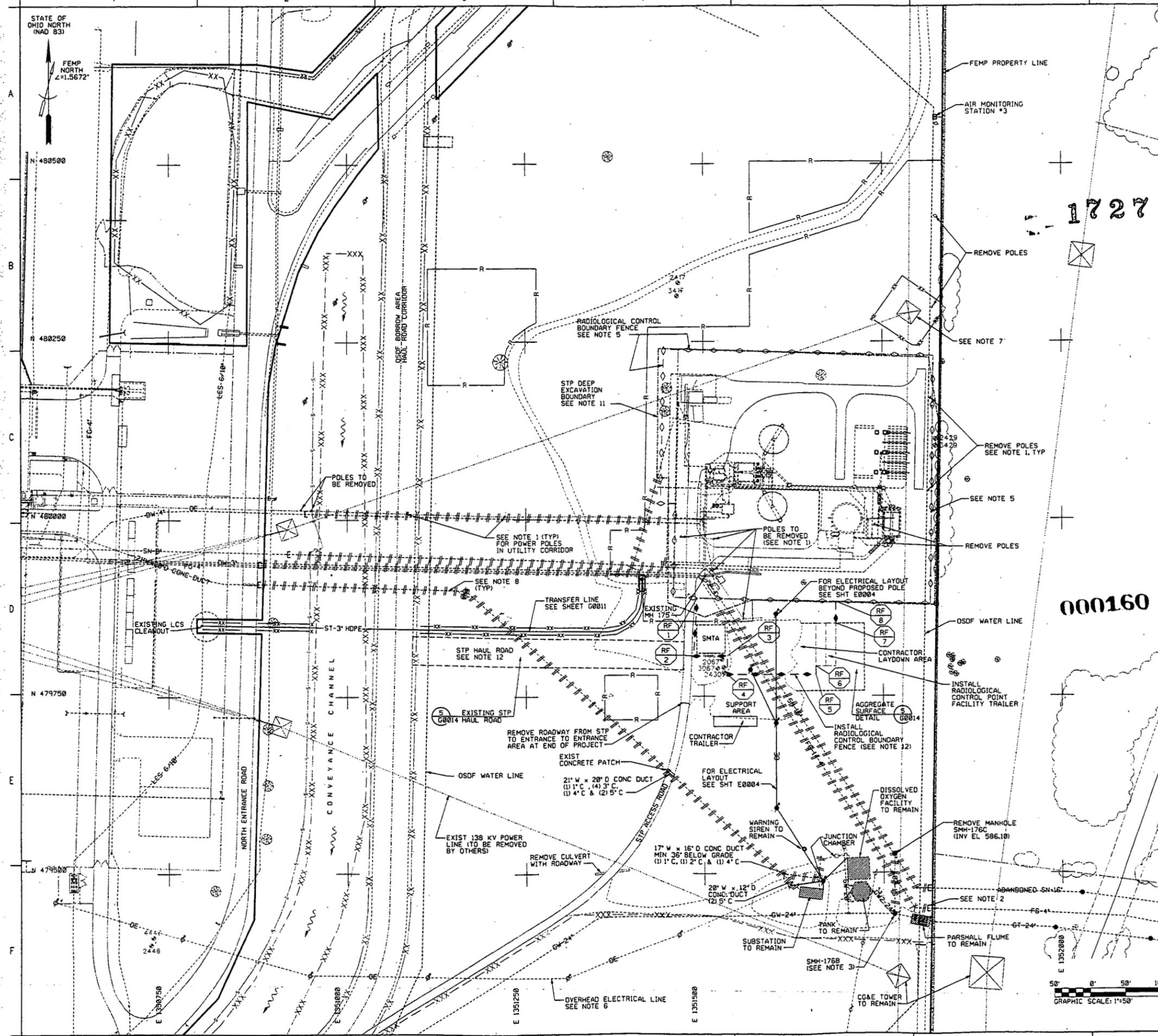
PROJECT NAME  
**REMEDIATION AREA 1, PHASE II  
SEWAGE TREATMENT PLANT EXCAVATION PACKAGE**

DRAWING TITLE  
**CIVIL  
MASTER KEY PLAN**

DESIGNED BY J.D. ASHWORTH	DATE 8/14/98	TECHNICAL LEAD F.M. PARTON, JR.	DATE 8/14/98	CHECKED BY F.M. PARTON, JR.	DATE 8/14/98
PLANT/BLDG. NO.	FLOOR	SCALE 1"=200'	CLASS		
SUBMITTED FOR 307 ISSUE	TECH LEAD N/A	DATE	SUBMITTED FOR 607 ISSUE	TECH LEAD N/A	DATE



PO NUMBER TOP-012	TOP PROJECT NO. 20712	DRAWING INDEX CODE NO. 92X-5900-G-00492	SHEET NO. G0002	REV. NO. 0A
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NOTES

- REMOVE THE REMAINDER OF THE POLES WHICH WERE CUT OFF APPROXIMATELY 2' ABOVE GRADE.
- EXISTING UTILITIES TO BE REMOVED HAVE BEEN CUT, PURGED, AND CAPPED. UTILITY LINES SHALL BE REMOVED PER SECTION 02205. CG&E HAS CUT, PURGED AND CAPPED THE FUEL GAS LINE (FG-4) AT THE PROPERTY LINE. CONTRACTOR TO REMOVE LINE TO CG&E CAP.
- SEAL OPENING IN MANHOLE 1768 PRIOR TO REMOVAL OF ST-20" IN ACCORDANCE WITH SECTION 02205.
- LOCATIONS GIVEN FOR RADIOLOGICAL CONTROL FENCE AND ACCESS CORRIDOR MAY BE FIELD ADJUSTED WITH APPROVAL FROM CONSTRUCTION MANAGER.
- THE INITIAL RADIOLOGICAL CONTROL BOUNDARY SHALL GENERALLY FOLLOW THE EXISTING STP CHAIN LINK FENCE AS SHOWN ON THIS DRAWING. AFTER REMOVAL OF UTILITIES AND 6' STRIPPING AREAS OUTSIDE STP AREA, AND EXCAVATION OF ABOVE WAC MATERIALS, (INCLUDING DIGESTER SLUDGE AND SLUDGE CAKE), RADIOLOGICAL CONTROL BOUNDARY SHALL BE MOVED TO THE LOCATION SHOWN ON SHEET G0004. AFTER WHICH, THE STP CHAIN LINK FENCE SHALL BE REMOVED.
- NEW OVERHEAD POWER LINES ARE PROPOSED AND ARE TO BE INSTALLED BY OTHERS PRIOR TO THE START OF CONSTRUCTION FOR THIS PROJECT. LOCATION SHALL BE CONFIRMED BY CONTRACTOR PRIOR TO THE START OF WORK.
- SEE SHEET G0004 FOR OPERATIONAL REQUIREMENTS AROUND CG&E TOWER.
- FOR TYPICAL UTILITY CONDITIONS AND TYPICAL UTILITY PIPE REMOVAL, SEE DETAIL 2, SHEET G0014.
- SOME ABOVE GROUND STRUCTURES AND FACILITIES IN STP AREA HAVE BEEN REMOVED. SEE SHEET G0005 FOR DESCRIPTIONS OF FORMER FACILITIES.
- FOR LOCATION OF STP DEEP EXCAVATION BOUNDARY AND 6' STRIPPING AREA, SEE SHEET G0004.
- RADIOLOGICAL CONTROL BOUNDARY FENCE INCLUDES AREA BOUNDED BY STP CHAIN LINK FENCE, EXISTING RADIOLOGICAL CONTROL FENCE AND NEW RADIOLOGICAL CONTROL FENCE.
- STP HAUL ROAD TO BE CONSTRUCTED BY OTHERS AT THE APPROXIMATE LOCATION SHOWN PRIOR TO BEGINNING OF THIS PROJECT. CONTRACTOR TO VERIFY LOCATION. SEE SHEET G0014 FOR DETAILS OF CONSTRUCTION AND MINIMUM REQUIREMENTS FOR MAINTAINING SURFACE OF CERTIFIED SOIL.
- RADIOLOGICAL CONTROL POINT FACILITY TRAILER TO BE PROVIDED BY CONSTRUCTION MANAGER. CONTRACTOR SHALL COORDINATE WITH CONSTRUCTION MANAGER FOR WORK AROUND FACILITY.

POINT	NORTHING	EASTING	DESCRIPTION
1	479888	1351490	MEET EXIST FENCE
2	479807	1351485	BEND
3	479807	1351533	BEND
4	479781	1351533	BEND
5	479781	1351655	BEND
6	479792	1351655	MEET TRAILER
7	479852	1351683	MEET TRAILER
8	479883	1351683	MEET EXIST FENCE

RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-X-00490	LEGEND AND GENERAL NOTES	X0003
92X-5900-E-00473	ELECTRICAL - POWER PLAN	E0004
92X-5900-G-00434	ABOVE WAC EXCAVATION AND STP AREA UTILITY REMOVAL PLAN	G0005
92X-5900-G-00517	TRANSFER LINE PLAN & PROFILE	G0011
92X-5900-G-00498	DETAIL SHEET	G0014

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ISSUE OR REVISION PURPOSE - DESCRIPTION	INITIALS AND DATE				

**UNITED STATES DEPARTMENT OF ENERGY**  
**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**

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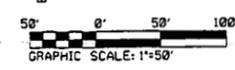
PROJECT NAME  
**REMEDIAION AREA 1, PHASE II SEWAGE TREATMENT PLANT EXCAVATION PACKAGE**

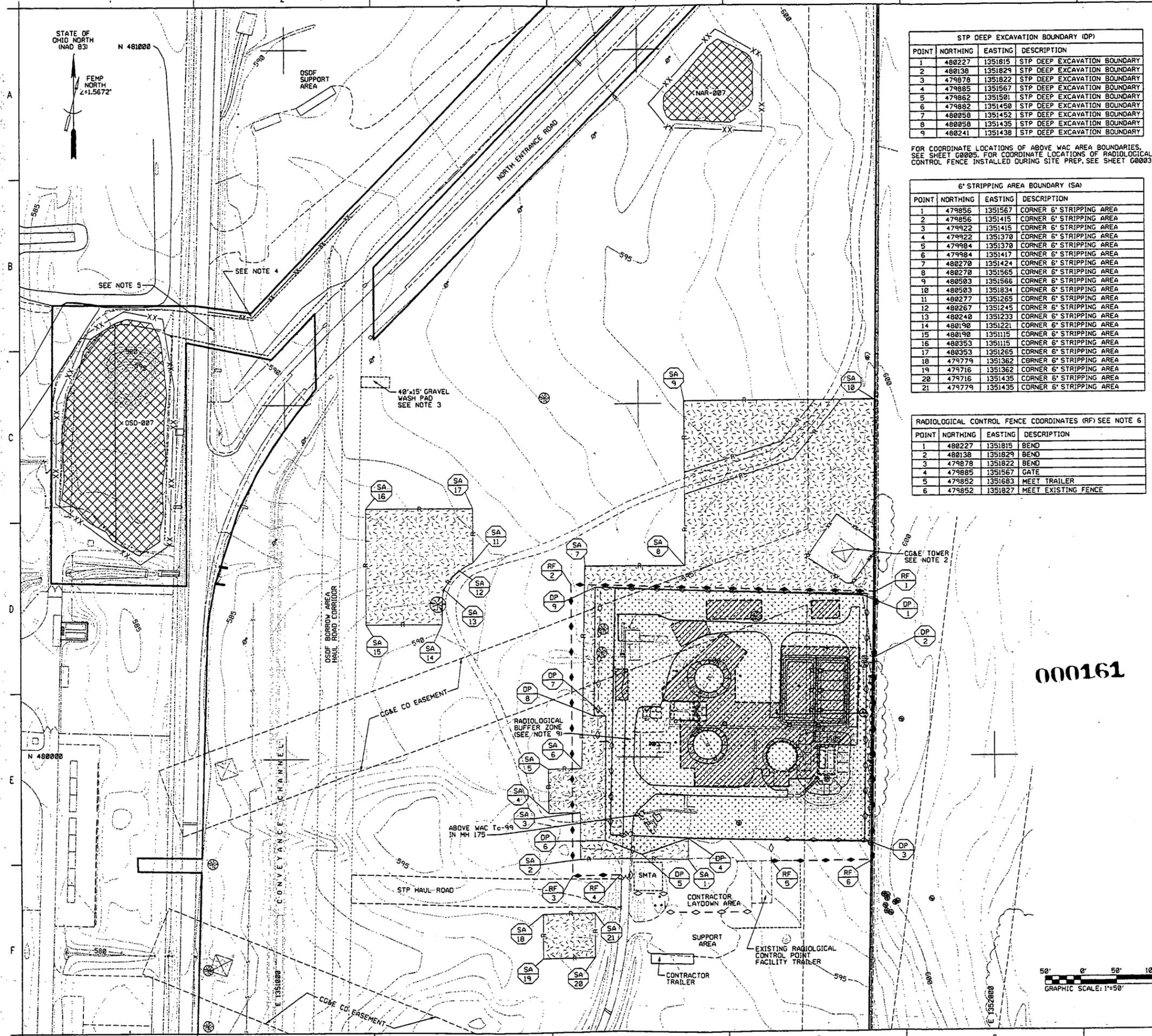
DRAWING TITLE  
**CIVIL SITE PREP & GENERAL UTILITY REMOVAL PLAN**

DRAWN BY J.G. ASHWORTH	DATE 8/14/98	TECHNICAL LEAD F.M. PARTON, JR.	DATE 8/14/98	DRAWN BY F.M. PARTON, JR.	DATE 8/14/98
PLANT/BLDG. NO.		SCALE 1"=50'		CLASS	
SUBMITTED FOR JOB ISSUE TECH LEAD K. GERARD DATE 6/28/97	SUBMITTED FOR JOB ISSUE TECH LEAD N/A DATE	SUBMITTED FOR JOB ISSUE TECH LEAD K. GERARD DATE 11/19/97			
PG NUMBER TOP-012	TOP PROJECT NO. 20712	DRAWING INDEX CODE NO. 92X-5900-G-00463	SHEET NO. G0003	REV. NO. 0A	

1727

000160





STP DEEP EXCAVATION BOUNDARY (DP)

POINT	NORTHING	EASTING	DESCRIPTION
1	480227	1351815	STP DEEP EXCAVATION BOUNDARY
2	480138	1351829	STP DEEP EXCAVATION BOUNDARY
3	479878	1351822	STP DEEP EXCAVATION BOUNDARY
4	479885	1351567	STP DEEP EXCAVATION BOUNDARY
5	479862	1351581	STP DEEP EXCAVATION BOUNDARY
6	479882	1351458	STP DEEP EXCAVATION BOUNDARY
7	480058	1351452	STP DEEP EXCAVATION BOUNDARY
8	480058	1351435	STP DEEP EXCAVATION BOUNDARY
9	480241	1351438	STP DEEP EXCAVATION BOUNDARY

FOR COORDINATE LOCATIONS OF ABOVE WAC AREA BOUNDARIES, SEE SHEET G0005. FOR COORDINATE LOCATIONS OF RADIOLOGICAL CONTROL FENCE INSTALLED DURING SITE PREP, SEE SHEET G0003.

6' STRIPPING AREA BOUNDARY (SA)

POINT	NORTHING	EASTING	DESCRIPTION
1	479856	1351567	CORNER 6' STRIPPING AREA
2	479856	1351415	CORNER 6' STRIPPING AREA
3	479922	1351415	CORNER 6' STRIPPING AREA
4	479922	1351378	CORNER 6' STRIPPING AREA
5	479984	1351378	CORNER 6' STRIPPING AREA
6	479984	1351417	CORNER 6' STRIPPING AREA
7	480270	1351424	CORNER 6' STRIPPING AREA
8	480270	1351565	CORNER 6' STRIPPING AREA
9	480503	1351566	CORNER 6' STRIPPING AREA
10	480503	1351834	CORNER 6' STRIPPING AREA
11	480277	1351265	CORNER 6' STRIPPING AREA
12	480267	1351245	CORNER 6' STRIPPING AREA
13	480240	1351233	CORNER 6' STRIPPING AREA
14	480190	1351221	CORNER 6' STRIPPING AREA
15	480190	1351115	CORNER 6' STRIPPING AREA
16	480353	1351115	CORNER 6' STRIPPING AREA
17	480353	1351265	CORNER 6' STRIPPING AREA
18	479779	1351362	CORNER 6' STRIPPING AREA
19	479716	1351362	CORNER 6' STRIPPING AREA
20	479716	1351435	CORNER 6' STRIPPING AREA
21	479779	1351435	CORNER 6' STRIPPING AREA

RADIOLOGICAL CONTROL FENCE COORDINATES (RF) SEE NOTE 6

POINT	NORTHING	EASTING	DESCRIPTION
1	480227	1351815	BEND
2	480138	1351829	BEND
3	479878	1351822	BEND
4	479885	1351567	GATE
5	479852	1351683	MEET TRAILER
6	479852	1351827	MEET EXISTING FENCE

- NOTES
- REMOVE SOIL WITHIN THE 6' STRIPPING AREA AS IMPACTED MATERIAL IN ACCORDANCE WITH SPECIFICATION SECTION 02205.
  - INSTALL CONSTRUCTION FENCE 25' FROM CG&E TOWER. DO NOT EXCAVATE WITHIN CONSTRUCTION FENCE.
  - FIELD LOCATE WASH PAD AS DIRECTED BY CONSTRUCTION MANAGER.
  - FIELD LOCATE HAUL ROAD CORRIDOR AS DIRECTED BY CONSTRUCTION MANAGER.
  - INSTALL 24" CMP IN EXISTING DITCH. INSTALL RAMP FROM NORTH ENTRANCE ROAD OVER CULVERT TO OSDF BORROW AREA HAUL ROAD. INSTALL CONSTRUCTION FENCE ALONG NORTH SIDE OF ACCESS CORRIDOR FROM NORTH SIDE OF ENTRANCE ROAD TO OSDF BORROW AREA HAUL ROAD TO PROVIDE SEGREGATION FROM OSDF SUPPORT AREA.
  - LOCATIONS GIVEN FOR RADIOLOGICAL CONTROL FENCE MAY BE FIELD ADJUSTED WITH APPROVAL FROM CONSTRUCTION MANAGER.
  - NEW RADIOLOGICAL CONTROL FENCE SHALL BE INSTALLED AND STP FENCE REMOVED BEFORE START OF STP DEEP EXCAVATION.
  - EXISTING ASPHALT PAVEMENT AREAS SHALL BE USED AS A LOADING BUFFER AREA AS DIRECTED BY CONSTRUCTION MANAGER.

1727

- EXCAVATION TYPES:
- ABOVE WAC - Tc-99  
- SLUDGE (SEE SHEET G0005)
  - ABOVE WAC - URANIUM (SEE SHEET G0005)
  - ABOVE WAC - DIGESTER SLUDGE
  - STP DEEP EXCAVATION BOUNDARY (SEE SHEET G0003)
  - 6' STRIPPING AREA (SEE NOTE 1)
  - STOCKPILES - NAR 007 & OSD 007
  - LEAD CONTAMINATED SOIL (SEE SHEET G0007)
  - UTILITY REMOVALS - OUTSIDE STP AREA (SEE SHEET G0003) IN STP AREA (SEE SHEET G0005)

RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-X-00490	LEGEND AND GENERAL NOTES	X0003
92X-5900-G-00463	SITE PREP & GENERAL UTILITY REMOVAL PLAN	G0003
92X-5900-G-00434	ABOVE WAC EXCAVATION AND STP AREA UTILITY REMOVAL PLAN	G0005
92X-5900-G-00583	STP DEEP EXCAVATION PLAN	G0006
92X-5900-G-00584	LEAD CONTAMINATED SOIL EXCAVATION PLAN	G0007

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000161

0A	CERTIFIED FOR CONSTRUCTION - DRAFT	FMP 9/2/98	65 9/2/98
REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	DATE	BY

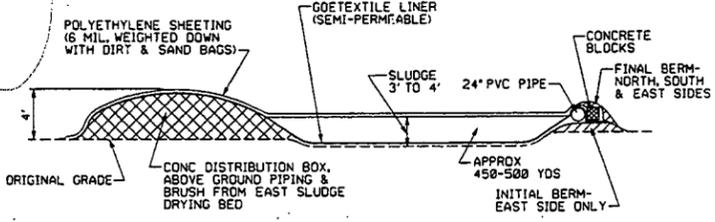
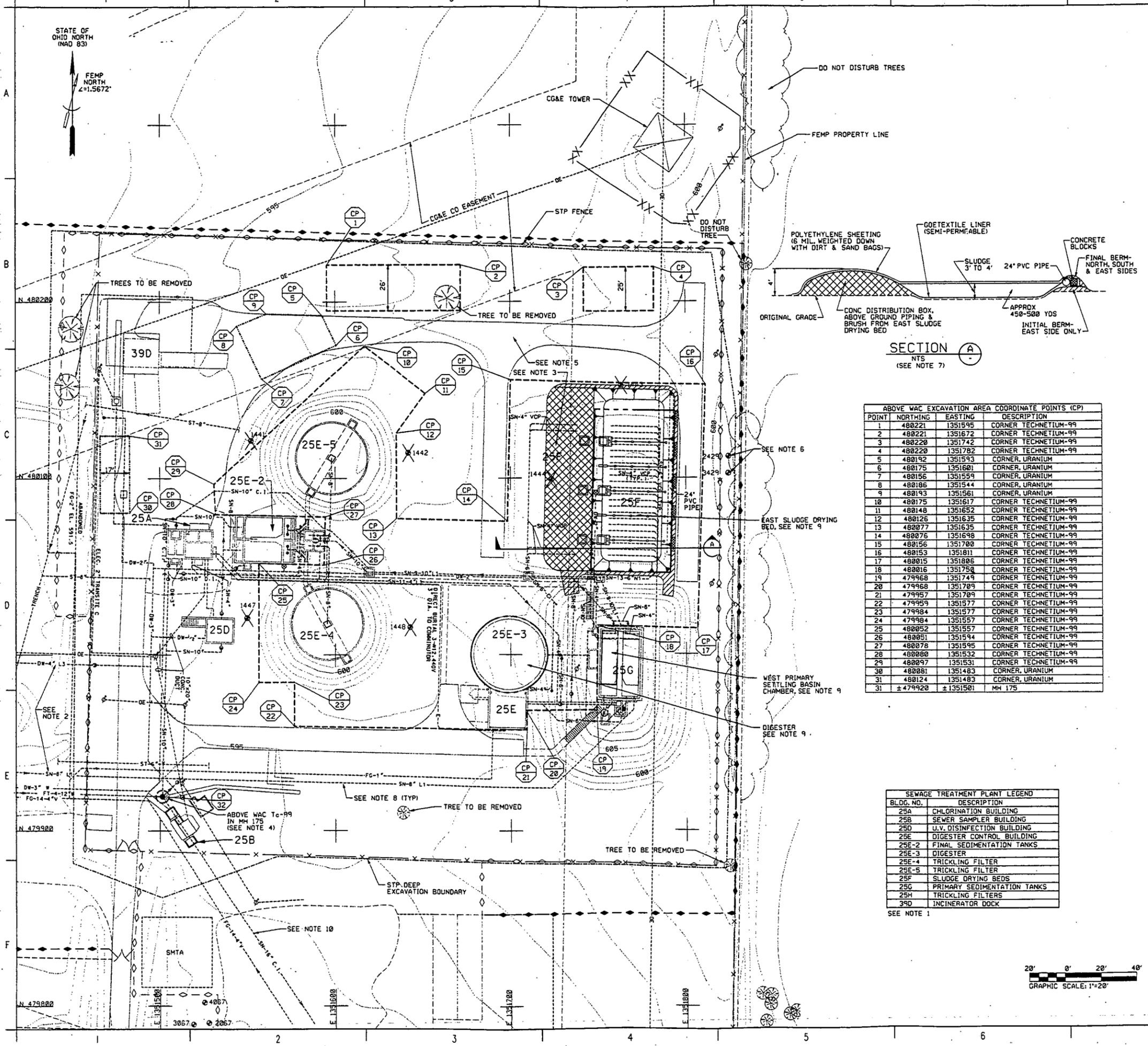
**UNITED STATES DEPARTMENT OF ENERGY**  
**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**

THIS DRAWING PREPARED BY  
**PARSONS**  
 THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.  
 CINCINNATI, OHIO

PROJECT NAME  
**REMIEDIATION AREA 1 - PHASE II**  
**SEWAGE TREATMENT PLANT EXCAVATION PACKAGE**

DRAWING TITLE  
**CIVIL EXCAVATION PLAN**

DRAWN BY	DATE	TECHNICAL LEAD	DATE	CHECKED BY	DATE
J.G. ASHWORTH	8/14/98	F.M. PARTON, JR.	8/14/98	F.M. PARTON, JR.	8/14/98
PLANNING NO.	FLOOR	SCALE	1"=50'	CLASS	
SUBMITTED FOR 307 ISSUE	DATE	TECH LEAD N/A	DATE	TECH LEAD K. GERARD	DATE
PO NUMBER	TOP-012	PROJECT NO.	20712	DRAWING INDEX CODE NO.	92X-5900-G-00458
SHEET NO.	G0004	REV. NO.	0A		

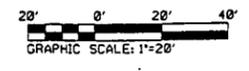


SECTION A  
NTS  
(SEE NOTE 7)

ABOVE WAC EXCAVATION AREA COORDINATE POINTS (CP)			
POINT	NORTHING	EASTING	DESCRIPTION
1	480221	1351595	CORNER TECHNETTIUM-99
2	480221	1351672	CORNER TECHNETTIUM-99
3	480220	1351742	CORNER TECHNETTIUM-99
4	480220	1351782	CORNER TECHNETTIUM-99
5	480192	1351593	CORNER URANIUM
6	480175	1351601	CORNER URANIUM
7	480156	1351559	CORNER URANIUM
8	480186	1351544	CORNER URANIUM
9	480193	1351561	CORNER URANIUM
10	480175	1351617	CORNER TECHNETTIUM-99
11	480148	1351652	CORNER TECHNETTIUM-99
12	480126	1351635	CORNER TECHNETTIUM-99
13	480077	1351635	CORNER TECHNETTIUM-99
14	480076	1351698	CORNER TECHNETTIUM-99
15	480156	1351700	CORNER TECHNETTIUM-99
16	480153	1351811	CORNER TECHNETTIUM-99
17	480015	1351806	CORNER TECHNETTIUM-99
18	480016	1351750	CORNER TECHNETTIUM-99
19	479968	1351749	CORNER TECHNETTIUM-99
20	479968	1351709	CORNER TECHNETTIUM-99
21	479957	1351709	CORNER TECHNETTIUM-99
22	479959	1351577	CORNER TECHNETTIUM-99
23	479984	1351577	CORNER TECHNETTIUM-99
24	479984	1351557	CORNER TECHNETTIUM-99
25	480052	1351557	CORNER TECHNETTIUM-99
26	480051	1351594	CORNER TECHNETTIUM-99
27	480078	1351595	CORNER TECHNETTIUM-99
28	480080	1351532	CORNER TECHNETTIUM-99
29	480097	1351531	CORNER TECHNETTIUM-99
30	480081	1351483	CORNER URANIUM
31	480124	1351483	CORNER URANIUM
31	± 479920	± 1351501	MH 175

SEWAGE TREATMENT PLANT LEGEND	
BLDG. NO.	DESCRIPTION
25A	CHLORINATION BUILDING
25B	SEWER SAMPLER BUILDING
25D	U.V. DISINFECTION BUILDING
25E	DIGESTER CONTROL BUILDING
25E-2	FINAL SEDIMENTATION TANKS
25E-3	DIGESTER
25E-4	TRICKLING FILTER
25E-5	TRICKLING FILTER
25F	SLUDGE DRYING BEDS
25G	PRIMARY SEDIMENTATION TANKS
25H	TRICKLING FILTERS
39D	INCINERATOR DOCK

SEE NOTE 1



NOTES

- SOME AT GRADE FEATURES HAVE BEEN REMOVED BY OTHERS. SEE PART 6 OF CONTRACT FOR REMAINING FACILITIES TO BE REMOVED. SEE TECHNICAL REFERENCE DOCUMENT FOR DRAWINGS OF EXISTING FACILITIES, FOR DEPTH AND SIZE OF FOUNDATIONS, BELOW GRADE WALLS, UTILITIES ETC.
- ALL AT GRADE AND BELOW GRADE FEATURES (FOUNDATIONS, UTILITIES, ETC.) WITHIN STP DEEP EXCAVATION BOUNDARY ARE TO BE REMOVED. STP FENCE, CONCRETE SLABS AND FOUNDATIONS SHALL BE REMOVED IN ACCORDANCE WITH SPECIFICATION SECTION 02205. REMOVE ALL UNDERGROUND UTILITIES WITHIN STP DEEP EXCAVATION BOUNDARY. SIZE MATERIAL TO MEET OSDF PHYSICAL WAC.
- WEST SLUDGE DRYING BED WAS NOT COMPLETED OR USED.
- ABOVE WAC Tc-99 SEDIMENTS ARE LOCATED WITHIN MH 175. UPPER PORTION SHALL BE REMOVED AS IMPACTED MATERIAL. LOWER PORTION (4') SHALL BE REMOVED AS ABOVE WAC Tc-99 IN ACCORDANCE WITH SECTION 02205.
- EXISTING ASPHALT PAVEMENT SHALL BE USED AS A BUFFER AREA FOR LOADING PURPOSES IN ACCORDANCE WITH SECTION 02205.
- PROTECT EXISTING MONITORING WELLS IN ACCORDANCE WITH SECTION 02100.
- PLAN VIEW AND CROSS SECTION OF SLUDGE DRYING BEDS TAKEN FROM VISUAL OBSERVATION. VERIFY CONDITION OF EAST SLUDGE DRYING BED PRIOR TO CONSTRUCTION.
- WHERE UTILITY REMOVAL IS DEEPER THAN STP DEEP EXCAVATION, EXCAVATE BELOW UTILITY LINE 6 INCHES. TRENCH SIDE SLOPES SHALL BE 3' HORIZONTAL TO 1' VERTICAL.
- ABOVE WAC DIGESTER SLUDGE HAS BEEN PLACED IN EAST SLUDGE DRYING BED AND WEST CHAMBER OF PRIMARY SETTLING BASIN. SOME ABOVE WAC DIGESTER SLUDGE REMAINS IN DIGESTER. THE ABOVE WAC SLUDGE CAKE AND ABOVE WAC DIGESTER SLUDGE ARE SEPARATED BY A GOETEXTILE. EXCAVATE AND TRANSPORT IN ACCORDANCE WITH SECTION 02205.
- FOR EXTENT OF UTILITY LINE REMOVAL BEYOND STP DEEP EXCAVATION, SEE SHEET G0003.

1727

RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-X-00490	LEGEND AND GENERAL NOTES	X0003
92X-5900-G-00463	SITE PREP & GENERAL UTILITY REMOVAL PLAN	G0003

000162

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FOR INFORMATION ONLY

REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	DATE	BY
0A	CERTIFIED FOR CONSTRUCTION - DRAFT	FMP 9/21/98	CS 9/11/98

**UNITED STATES  
DEPARTMENT OF ENERGY  
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**

THIS DRAWING PREPARED BY  
**PARSONS**  
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.  
CINCINNATI, OHIO

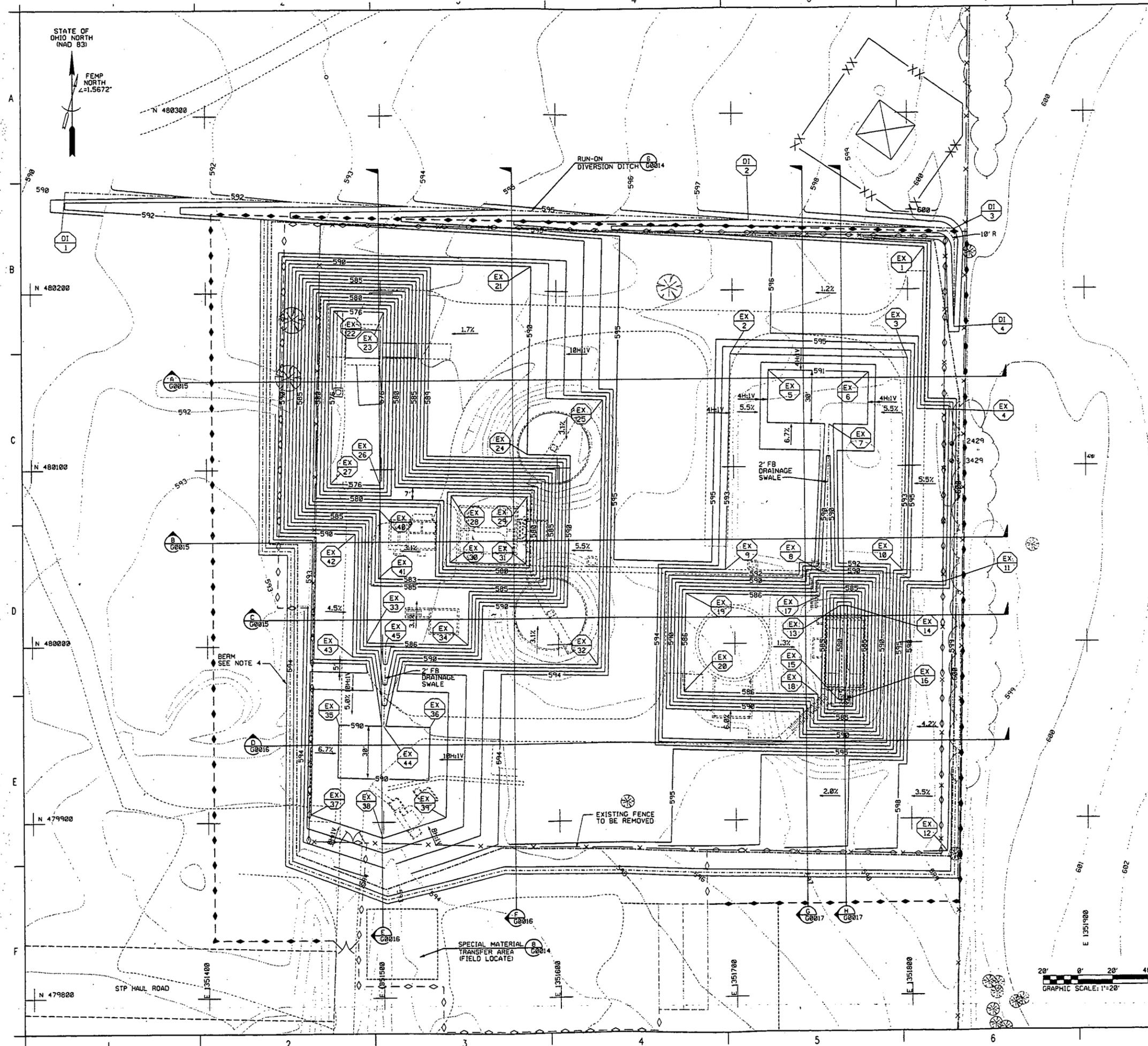
PROJECT NAME  
**REMIEDIATION AREA 1, PHASE II  
SEWAGE TREATMENT PLANT EXCAVATION PACKAGE**

DRAWING TITLE  
**CIVIL  
ABOVE WAC EXCAVATION AND STP AREA  
UTILITY REMOVAL PLAN**

DRAWN BY J.G. ASHWORTH	DATE 8/11/98	CHECKED BY F.M. PARTON, JR.	DATE 8/11/98	DESIGNED BY F.M. PARTON, JR.	DATE 8/11/98
SUBMITTED FOR 307 ISSUE		SUBMITTED FOR 607 ISSUE		SUBMITTED FOR 907 ISSUE	
TECH LEAD K. GERARD		TECH LEAD N/A		TECH LEAD K. GERARD	
DATE 6/20/97		DATE		DATE 11/19/97	

PO NUMBER: TOP PROJECT NO.: DRAWING INDEX CODE NO.: SHEET NO.: REV. NO.

TOP-012 20712 92X-5900-G-00434 G0005 0A



NOTES

- EXCAVATION CONTOURS SHOWN ARE APPROXIMATE AND ARE BASED ON FOF MODELED FRL DEPTH OF CONTAMINATION AND DEPTH OF FOUNDATIONS FROM AS-BUILT DRAWINGS. EXCAVATE TO CONTOURS SHOWN.
- ALL SLOPES SHALL BE 2H:1V UNLESS OTHERWISE NOTED.
- COMPLETE 6" STRIPPING PRIOR TO CONSTRUCTING BERM. FIELD LOCATE BERM AROUND PERIMETER OF DEEP EXCAVATION. BERM SHALL BE A MINIMUM 18" HIGH. STABILIZE BERM BY SEEDING OR APPLYING CRUSTING AGENT AFTER CONSTRUCTION.

1727

RUN-ON DIVERSION DITCH COORDINATES (DI)				
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	480258	1351320	592.0	CENTERLINE DITCH
2	480248	1351789	596.0	CENTERLINE DITCH
3	480234	1351827		POINT OF INTERSECTION
4	480178	1351826	598.0	CENTERLINE DITCH

STP EXCAVATION COOR. (EX)				STP EXCAVATION COOR. (EX)			
PT	NORTHING	EASTING	EL.	PT	NORTHING	EASTING	EL.
1	480224	1351809	597.0	26	480091	1351499	576.0
2	480164	1351699	593.0	27	480092	1351471	576.0
3	480161	1351800	593.0	28	480085	1351539	578.0
4	480132	1351821	596.0	29	480084	1351583	578.0
5	480155	1351720	591.0	30	480047	1351538	578.0
6	480153	1351777	591.0	31	480046	1351582	578.0
7	480124	1351754	590.3	32	479988	1351622	591.0
8	480039	1351752	589.0	33	480002	1351491	586.0
9	480042	1351695	593.0	34	480000	1351548	586.0
10	480041	1351796	593.0	35	479955	1351475	590.0
11	480034	1351818	596.0	36	479954	1351526	590.0
12	479801	1351820	599.0	37	479904	1351450	591.0
13	480021	1351760	580.0	38	479891	1351500	591.0
14	480021	1351764	580.0	39	479903	1351535	591.0
15	479968	1351759	580.0	40	480077	1351499	583.0
16	479968	1351763	580.0	41	480038	1351498	583.0
17	480026	1351748	586.0	42	480064	1351484	590.0
18	479971	1351747	586.0	43	479994	1351483	590.0
19	480029	1351672	586.0	44	479955	1351500	589.0
20	479973	1351671	586.0	45	480002	1351502	586.0
21	480214	1351586	590.0				
22	480190	1351473	576.0				
23	480189	1351502	576.0				
24	480108	1351583	590.0				
25	480139	1351626	591.0				

000163

RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-X-00490	LEGEND AND GENERAL NOTES	X0003
92X-5900-G-00498	DETAIL SHEET	G0014
92X-5900-G-00509	CROSS SECTIONS - SHEET 1 OF 3	G0015
92X-5900-G-00510	CROSS SECTIONS - SHEET 2 OF 3	G0016
92X-5900-G-00516	CROSS SECTIONS - SHEET 3 OF 3	G0017

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0A	CERTIFIED FOR CONSTRUCTION - DRAFT	FMP	CS
		9/2/98	9/11/98
REV.	ISSUE OR REVISION PURPOSE - DESCRIPTION	INITIALS	DATE

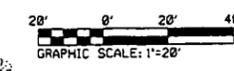
**UNITED STATES DEPARTMENT OF ENERGY**  
**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**  
 THIS DRAWING PREPARED BY  
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 CINCINNATI, OHIO

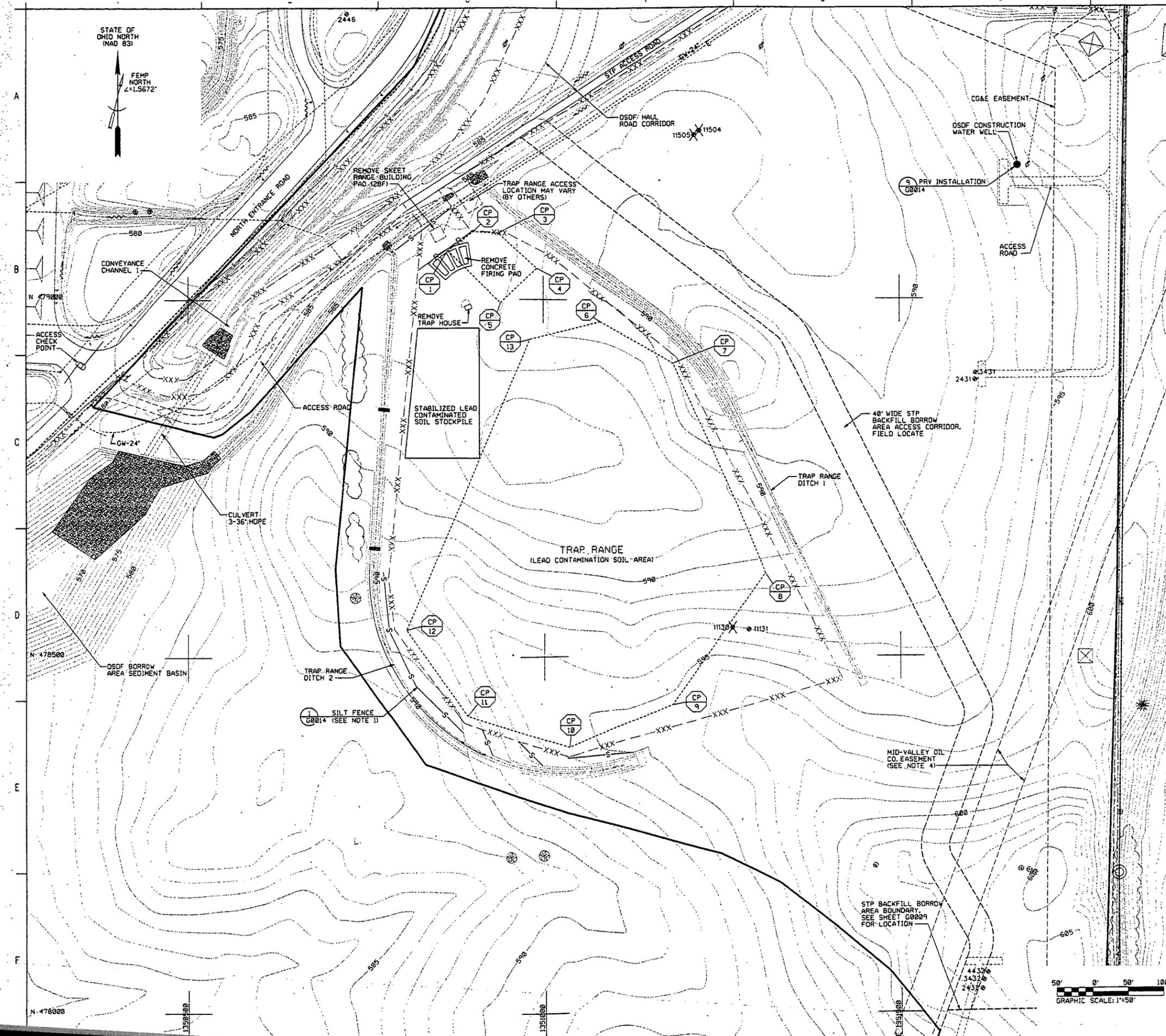
PROJECT NAME  
**REMEDIATION AREA 1, PHASE II SEWAGE TREATMENT PLANT EXCAVATION PACKAGE**  
 DRAWING TITLE  
**CIVIL STP DEEP EXCAVATION PLAN**

DRAWN BY	DATE	TECHNICAL LEAD	DATE	DRAWN BY	DATE
J.G. ASHWORTH	07/31/98	F.M. PARTON	08/11/98	F.M. PARTON	08/11/98
PLANNING NO.		FLOOR		SCALE	1"=20'

SUBMITTED FOR 302 ISSUE	SUBMITTED FOR 602 ISSUE	SUBMITTED FOR 902 ISSUE
TECH LEAD N/A	TECH LEAD N/A	TECH LEAD N/A
DATE	DATE	DATE

PO NUMBER	TEF PROJECT NO.	DRAWING INDEX CODE NO.	SHEET NO.	REV. NO.
TOP-012	20712	92X-5900-G-00503	G0006	0A





- NOTES
1. SILT FENCE LOCATIONS SHOWN ARE APPROXIMATE. ADD AND OR ADJUST TO MEET FIELD CONDITIONS.
  2. LEAD CONTAMINATED SOIL WHICH HAS BEEN STABILIZED BY OTHERS, SHALL BE EXCAVATED SO AS TO REMOVE ALL STABILIZED SOIL. LEAD CONTAMINATED SOIL WILL BE STABILIZED INSITU (OPTION A) OR STOCKPILED (OPTION B) WITHIN TRAP RANGE AS SHOWN.
  3. CONTRACTOR SHALL MAINTAIN TRAP RANGE DITCHES 1 & 2. CONSTRUCTION FENCE AND ALL EROSION AND SEDIMENT CONTROLS AROUND TRAP RANGE.
  4. THERE SHALL BE NO WORK PERFORMED OR EQUIPMENT TO ENTER THE MID-VALLEY OIL EASEMENT WITHOUT WRITTEN AUTHORIZATION FROM THE CONSTRUCTION MANAGER.

1727

LEAD CONTAMINATED SOIL EXCAVATION AREA COORDINATE POINTS (CP)			
POINT	NORTHING	EASTING	DESCRIPTION
1	479869	1350866	CORNER
2	479895	1350902	CORNER
3	479893	1350937	CORNER
4	479844	1350991	CORNER
5	478995	1350940	CORNER
6	478964	1351081	CORNER
7	478910	1351183	CORNER
8	478617	1351310	CORNER
9	478432	1351181	CORNER
10	478373	1351034	CORNER
11	478418	1350892	CORNER
12	478538	1350887	CORNER
13	478945	1350982	CORNER

000164

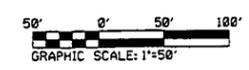
RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-X-00490	LEGEND AND GENERAL NOTES	X0003
92X-5900-G-00506	STP BACKFILL BORROW AREA	G0009
92X-5900-G-00498	DETAIL SHEET	G0014

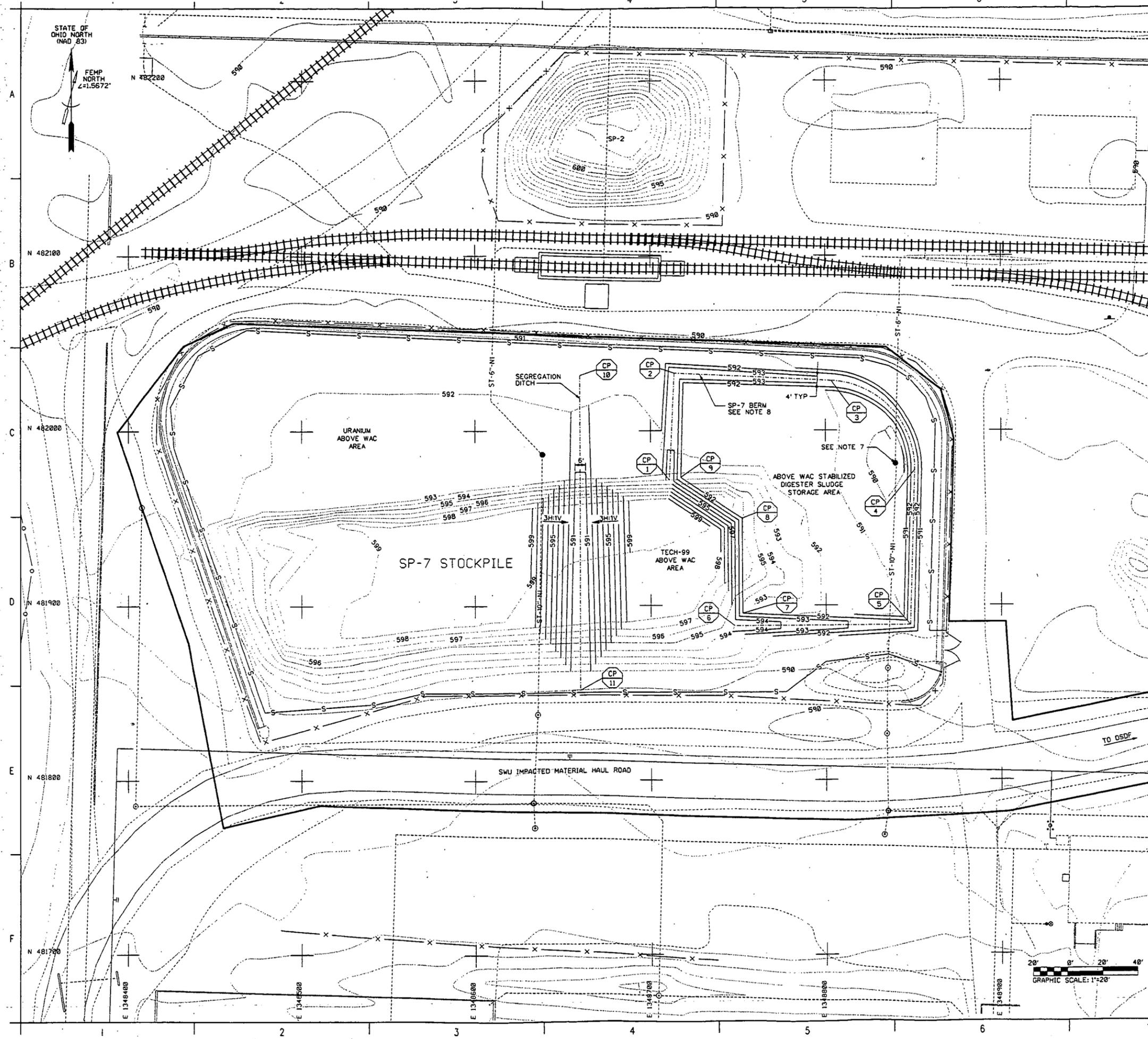
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FOR INFORMATION ONLY

REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	DATE	BY	INITIALS AND DATE
0A	CERTIFIED FOR CONSTRUCTION - DRAFT	FMP 9/21/98	CS	1/10/98

**UNITED STATES DEPARTMENT OF ENERGY**  
**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**  
 THIS DRAWING PREPARED BY  
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 THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.  
 CINCINNATI, OHIO  
 PROJECT NAME  
**REMEDIATION AREA 1 - PHASE II**  
**SEWAGE TREATMENT PLANT EXCAVATION PACKAGE**  
 DRAWING TITLE  
**CIVIL**  
**LEAD CONTAMINATED SOIL EXCAVATION PLAN**

DRAWN BY	DATE	TECHNICAL LEAD	DATE	CHECKED BY	DATE
J.G. ASHWORTH	8/14/98	F.M. PARTON, JR.	8/14/98	F.M. PARTON, JR.	8/14/98
PLM/ALD/ML		FL/BOB		SCALE	CLASS
				1"=50'	
SUBMITTED FOR 30% ISSUE	TECH LEAD N/A	SUBMITTED FOR 60% ISSUE	TECH LEAD N/A	SUBMITTED FOR 90% ISSUE	TECH LEAD N/A
DATE	DATE	DATE	DATE	DATE	DATE
PROJECT NO.	20712	DRAWING PROJECT CODE NO.	92X-5900-G-00504	SHEET NO.	REV. NO.
				00007	0A





NOTES

- EXISTING TOPOGRAPHY BASED ON EXISTING CONDITIONS AS OF AUGUST 1998. ADDITIONAL MATERIAL HAS BEEN PLACED WITHIN SP-7. VERIFY EXISTING CONDITIONS PRIOR TO BEGINNING EXCAVATION.
- MATERIAL EXCAVATED FOR CONSTRUCTION OF THE SEGREGATION DITCH SHALL BE CONSIDERED ABOVE WAC TECH-99 CONTAMINATED MATERIAL. IT SHALL BE USED TO CONSTRUCT BERM AND STOCK-PILED ON ABOVE WAC TECH-99 SIDE OF SP-7.
- THE EASTING LINE (E 1348660) SHALL SEPARATE THE URANIUM ABOVE WAC AREA FROM THE TECH-99 ABOVE WAC AREA AFTER CONSTRUCTION OF THE SEGREGATION DITCH.
- SEGREGATE AND PLACE TECH-99 ABOVE WAC STABILIZED DIGESTER SLUDGE MATERIAL AND ABOVE WAC URANIUM MATERIAL AS SHOWN ON THIS DRAWING.
- CONSTRUCTION VEHICLES ENTERING AND LEAVING SP-7 STOCKPILE AREA SHALL BE CLEANED AS NECESSARY TO PREVENT TRACKING OF SOILS ONTO ROADWAYS.
- ALL SLOPES ARE 2H:1V UNLESS NOTED OTHERWISE.
- PLACE 4' X 4' X 3/4" PLATE STEEL OVER TOP OF EXISTING CATCHBASIN/GRATE PRIOR TO PLACEMENT OF SLUDGE MATERIAL.
- SP-7 BERM SHALL BE A MINIMUM 2' HIGH, 4' TOP WIDTH, WITH 2H:1V SIDE SLOPES.

1727

COORDINATE POINTS (CP)			
PT	NORTHING	EASTING	DESCRIPTION
1	481972	1348711	594.0 BEGIN BERM
2	482033	1348714	593.7 PI
3	482029	1348803	N/A PC, R=50'
4	481977	1348851	N/A PT
5	481889	1348848	N/A PI
6	481888	1348748	594.0 END BERM
7	481896	1348752	592.0 GRADE BREAK
8	481950	1348752	592.0 GRADE BREAK
9	481973	1348717	592.0 GRADE BREAK
10	482032	1348660	591.4 BEGIN SEGREGATION DITCH
11	481852	1348660	590.0 END SEGREGATION DITCH

000165

RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-X-00490	LEGEND AND GENERAL NOTES	X0003

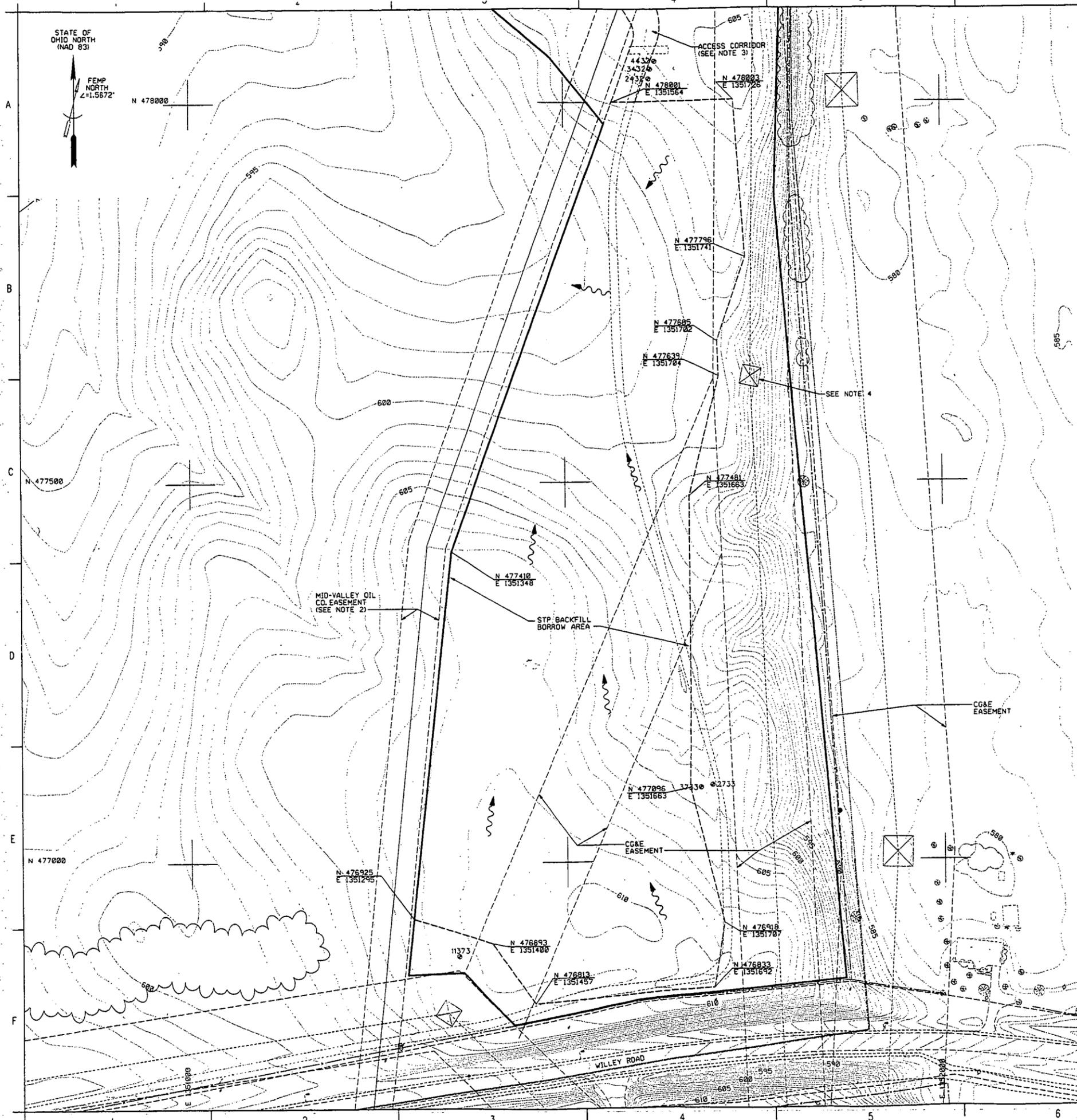
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NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	DATE	BY
0A	CERTIFIED FOR CONSTRUCTION - DRAFT	FMP 9/18/98	CF 4/14/98

**UNITED STATES DEPARTMENT OF ENERGY**  
**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**  
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**PARSONS**  
 THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC. CINCINNATI, OHIO  
 PROJECT NAME:  
**REMEDIATION AREA 1, PHASE II SEWAGE TREATMENT PLANT EXCAVATION PACKAGE**  
 DRAWING TITLE:  
**CIVIL SP-7 STOCKPILE**

DRAWN BY	DATE	TECHNICAL LEAD	DATE	CHECKED BY	DATE
J.G. ASHWORTH	7/31/98	F.M. PARTON, JR.	8/14/98	F.M. PARTON, JR.	8/14/98
PLANT/BLDG. NO.	FLOOR	SCALE	1"=20'	SCALE	0.75"
SUBMITTED FOR 30% ISSUE	TECH LEAD N/A	SUBMITTED FOR 60% ISSUE	TECH LEAD N/A	SUBMITTED FOR 90% ISSUE	TECH LEAD N/A
DATE	DATE	DATE	DATE	DATE	DATE

NO.	REVISION	DATE	BY
TOP-012	20712	92X-5900-G-00505	G0008 0A



NOTES

1. DEVELOP STP BACKFILL BORROW AREA IN ACCORDANCE WITH SPECIFICATION SECTION 2206 AND BORROW AREA DEVELOPMENT PLAN.
2. THERE SHALL BE NO WORK PERFORMED OR EQUIPMENT TO ENTER THE MID-VALLEY OIL EASEMENT WITHOUT WRITTEN AUTHORIZATION FROM THE CONSTRUCTION MANAGER.
3. ACCESS CORRIDOR SHALL BE FIELD LOCATED BY CONTRACTOR IN APPROXIMATE LOCATION SHOWN ON THIS SHEET AND SHEET G0007 TO BEST FACILITATE ACCESS TO AND FROM STP BACKFILL BORROW AREA.
4. NO WORK SHALL OCCUR WITHIN 25' OF THE CG&E TOWER LEGS.

1727

000166

RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-X-00490	LEGEND AND GENERAL NOTES	X0003
92X-5900-G-00504	LEAD CONTAMINATED SOIL EXCAVATION PLAN	G0007

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QA CERTIFIED FOR CONSTRUCTION - DRAFT	FMP	CS
	9/21/98	9/21/98
REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	INITIALS AND DATE

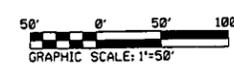
**UNITED STATES  
DEPARTMENT OF ENERGY**  
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

THIS DRAWING PREPARED BY  
**PARSONS**  
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CINCINNATI, OHIO

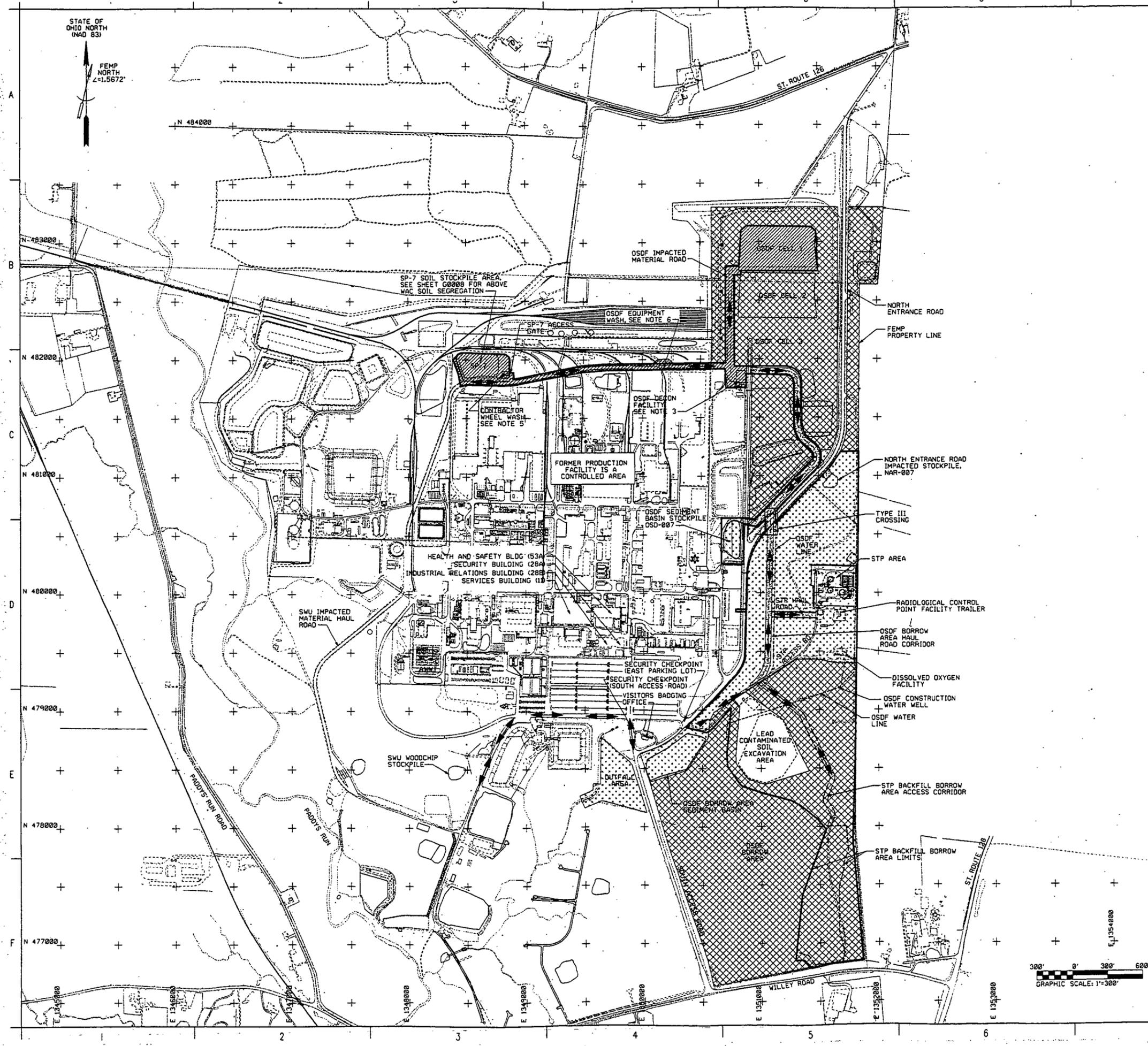
PROJECT NAME  
**REMEDIATION AREA 1, PHASE II  
SEWAGE TREATMENT PLANT EXCAVATION PACKAGE**

DRAWING TITLE  
**CIVIL  
STP BACKFILL BORROW AREA**

DRAWN BY J.G. ASHWORTH	DATE 07/23/98	TECHNICAL LEAD F.M. PARTON, JR.	DATE 8/14/98	CHECKED BY F.M. PARTON, JR.	DATE 8/14/98
PLANT/BLDG. NO.	FLOOR	SCALE 1"=50'	CLASS		
SUBMITTED FOR 30% ISSUE	TECH LEAD	DATE	SUBMITTED FOR 60% ISSUE	TECH LEAD	DATE



PO NUMBER TOP-012	POF PROJECT NO. 20712	DRAWING INDEX CODE NO. 92X-5900-G-00506	SHEET NO. G0009	REV. NO. 0A
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- NOTES
- VEHICLES SHALL NOT CROSS OVER THE CERTIFICATION LIMITS AS INDICATED BY THE CERTIFICATION ROPE EXCEPT WHERE SHOWN. SEE SHT G0001 FOR CERTIFICATION ROPE FENCE LOCATIONS AND PART 6 FOR CERTIFICATION AREA ACCESS REQUIREMENTS.
  - CONSTRUCTION VEHICLES SHALL USE THE NORTH ENTRANCE ROAD AS SITE ACCESS ROUTE FOR INGRESS AND EGRESS. INTERNAL ROUTES AND TRAFFIC PATTERNS WITHIN PROJECT AREA TO BE DETERMINED BY CONTRACTOR AND TO BE SHOWN ON THE CONTRACTOR'S TRAFFIC PLAN SUBMITTAL.
  - USE THE OSOF DECON FACILITY TO WASH EQUIPMENT TRAVELING FROM SWU IMPACTED MATERIAL HAUL ROAD OR OSOF IMPACTED MATERIAL ROAD.
  - PERFORM DUST CONTROL WITHIN THE DUST CONTROL/WORK LIMITS, MATERIAL STOCKPILES, ACCESS ROADS, AND OTHER AREAS OF WORK SPECIFIED IN PART 6 AND TECHNICAL SPECIFICATIONS OF THE CONTRACT DOCUMENTS.
  - CONTRACTOR MUST USE WHEEL WASH PRIOR TO LEAVING SP-7 STOCKPILE AREA.
  - CONTRACTOR MUST USE OSOF EQUIPMENT WASH FACILITY PRIOR TO ENTERING SP-7 STOCKPILE AREA.
  - STP BACKFILL BORROW AREA HAUL ROAD IS CONSTRUCTED WITHIN CERTIFIED AREA. OSOF BORROW AREA HAUL ROAD AND STP HAUL ROAD IS CONSTRUCTED WITHIN NON-CERTIFIED AREA WITH MATERIAL FROM CERTIFIED AREA. CONTRACTOR SHALL WHEEL WASH PRIOR TO ENTERING ROADS FROM NON-CERTIFIED AREAS.
- 1727
- LEGEND:
- IMPACTED MATERIAL HAUL ROAD
  - CLEAN ROAD
  - CERTIFIED AREA/ NON-IMPACTED SOIL STOCKPILE
  - CONTROLLED AREA
  - CONTAMINATED AREA
  - UNCONTROLLED AREA
  - LIMITS OF WORK AREA AND CONTRACTOR DUST CONTROL LIMITS (SEE NOTE 4)
  - HAUL ROUTE

RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-X-00490	LEGEND AND GENERAL NOTES	X0003
92X-5900-G-00486	EXISTING CONDITIONS PLAN	G0001
92X-5900-G-00505	SP-7 STOCKPILE	G0008

000167

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REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	DATE	BY	CHKD BY	REV'D BY
0A	CERTIFIED FOR CONSTRUCTION - DRAFT	FMP 9/21/98	04	9/20/98	

**UNITED STATES DEPARTMENT OF ENERGY**  
**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**

THIS DRAWING PREPARED BY  
**PARSONS**  
 THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.  
 CINCINNATI, OHIO

PROJECT NAME  
**REMEDIATION AREA 1, PHASE II**  
**SEWAGE TREATMENT PLANT EXCAVATION PACKAGE**

DRAWING TITLE  
**CIVIL**  
**TRAFFIC ROUTES**

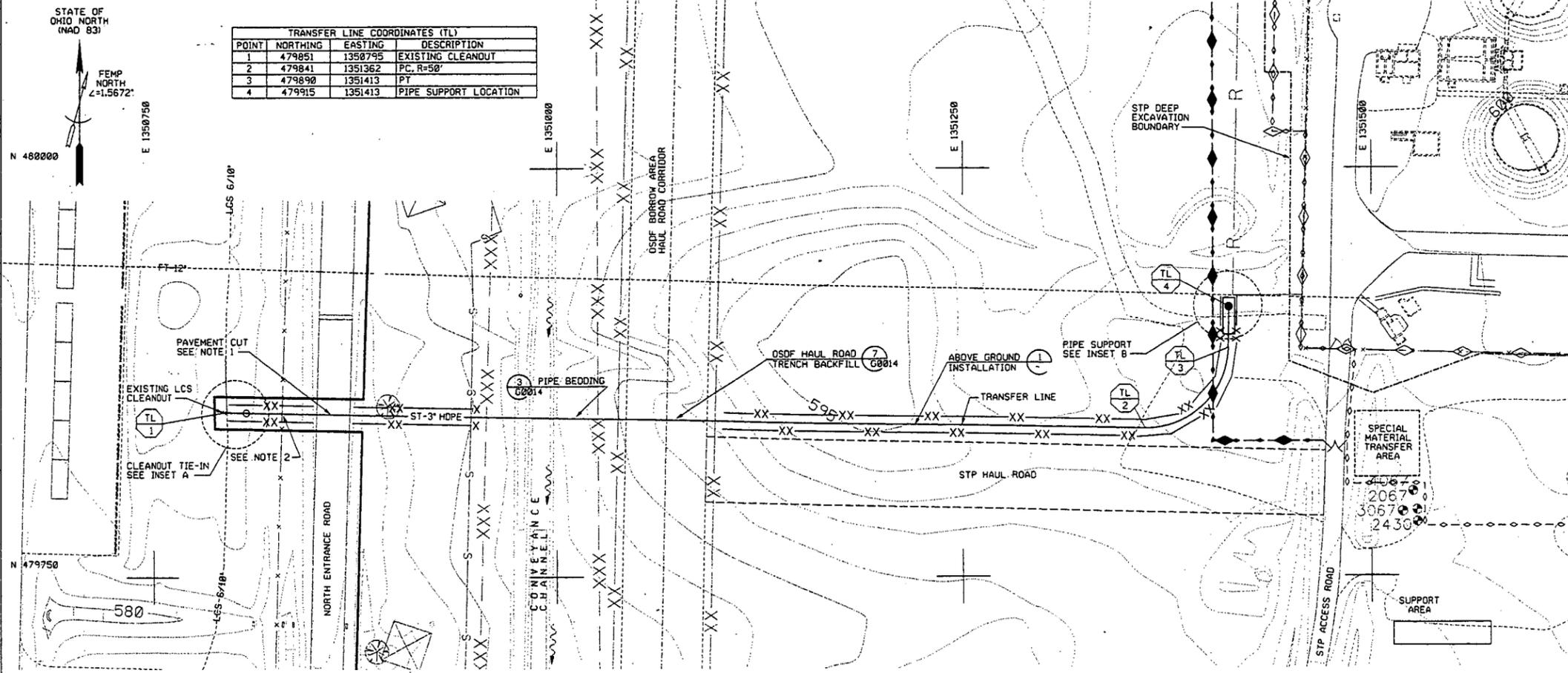
DRAWN BY	DATE	TECHNICAL LEAD	DATE	CHECKED BY	DATE
J.G. ASHWORTH	8/14/98	F.M. PARTON, JR.	8/14/98	F.M. PARTON, JR.	8/14/98

SCALE: 1"=300'

GRAPHIC SCALE: 1"=300'

DATE	ISSUE	ISSUED FOR	ISSUED BY
8/14/98	FOR 30% ISSUE	TECH LEAD N/A	TECH LEAD N/A
8/14/98	FOR 60% ISSUE	TECH LEAD N/A	TECH LEAD N/A
8/14/98	FOR 90% ISSUE	TECH LEAD N/A	TECH LEAD N/A

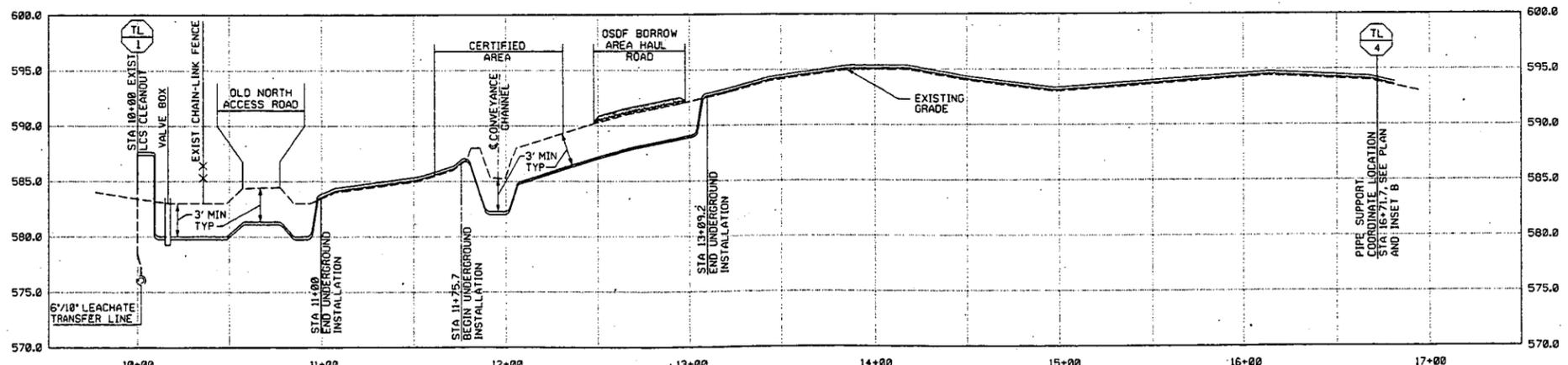
PO NUMBER: TOP-012    TOP PROJECT NO.: 20712    DRAWING INDEX CODE NO.: 92X-5900-G-00493    SHEET NO.: G0010    REV. NO.: 0A



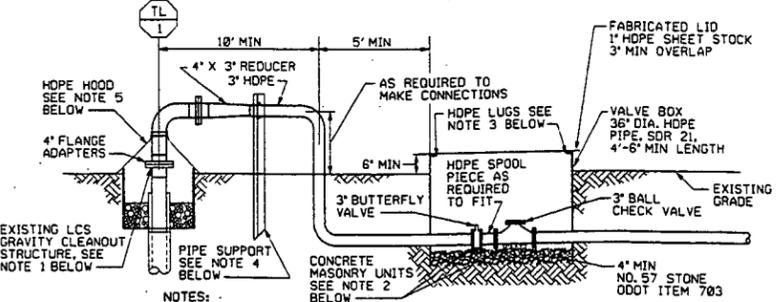
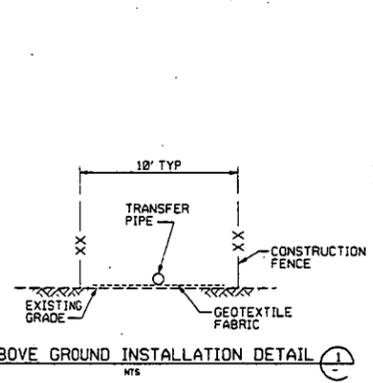
- NOTES
1. SAWCUT EXISTING ASPHALT PAVEMENT AS NECESSARY TO INSTALL TRANSFER LINE. PATCH PAVEMENT TO MATCH EXISTING PAVEMENT THICKNESSES.
  2. REMOVE EXISTING FENCE AS NECESSARY FOR INSTALLATION OF PIPE. REPAIR AND/OR REPLACE FENCE AFTER INSTALLATION AS DIRECTED BY THE CONSTRUCTION MANAGER.
  3. BURIAL DEPTHS SHOWN ARE TO TOP-OF-PIPE.
  4. AFTER BACKFILLING TRENCH TO ORIGINAL EXISTING GRADE, REPAIR OSDF HAULROAD BY PLACING NEW GEOTEXTILE FABRIC ON GRADE AND COVERING BY A MINIMUM OF 1' OF FILL MATERIAL FROM THE STP BACKFILL BORROW AREA.

1727

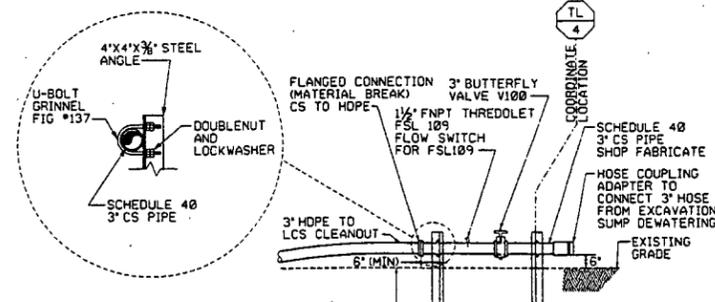
RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-X-00490	LEGEND AND GENERAL NOTES	X0003
92X-5900-G-00498	DETAIL SHEET	G0014



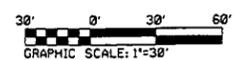
**TRANSFER LINE PROFILE**  
SCALE: 1"=30' HORIZ  
1"=5' VERT



- NOTES:
1. REMOVE 4" BLIND FLANGE COVER PLATE FROM CLEANOUT BOLT NEW FLANGE ADAPTER TO CLEANOUT.
  2. USE STANDARD SIZED CONCRETE MASONRY UNITS AS REQUIRED FOR SUPPORT.
  3. HOPE LUGS SHALL BE 1" X 1" X 1/4" TOTAL, EQUALLY SPACED AROUND PERIPHERY OF LID. LOCATE LUGS APPROXIMATELY 1/4" FROM INSIDE FACE OF PIPE AND EXTRUSION WELDED TO BOTTOM OF LID.
  4. DETAIL FOR PIPE SUPPORT SHALL BE AS SHOWN FOR CS SCHEDULE 40 PIPE IN INSET B. EXCEPT GRINNEL UBDOT HANGER SHALL BE SIZED TO ACCOMMODATE HOPE PIPE.
  5. FABRICATE HOPE HOOD OUT OF 60 MIL MIN HOPE SHEET STOCK. CUT TO FIT AND CLAMP TO PIPE RISER USING SERIES 300 STAINLESS STEEL SCREW OR BAND CLAMPS.



- NOTES:
1. ADJUST HEIGHT OF SUPPORT AS NEEDED TO SUPPORT PIPE.
  2. SUPPORT OF ANGLES IS BASED ON MEDIUM STIFF SOIL CONDITIONS (SPT 14-28). CONTRACTOR IS TO FIELD VERIFY CONDITIONS PRIOR TO CONSTRUCTION.
  3. THE PIPE SUPPORT MATERIALS SHALL MEET THE FOLLOWING SPECIFICATIONS:  
STEEL ANGLE: ASTM A36  
BOLTS & NUTS: ASTM A307  
PAINTING: 1 COAT OF PRIMER & 1 COAT OF ENAMEL SUITABLE FOR STEEL



**CHECK PRINT**  
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REV.	DATE	ISSUE OR REVISION PURPOSE - DESCRIPTION	INITIALS AND DATE
0A		CERTIFIED FOR CONSTRUCTION - DRAFT	FMP 9/21/98 CS 9/21/98

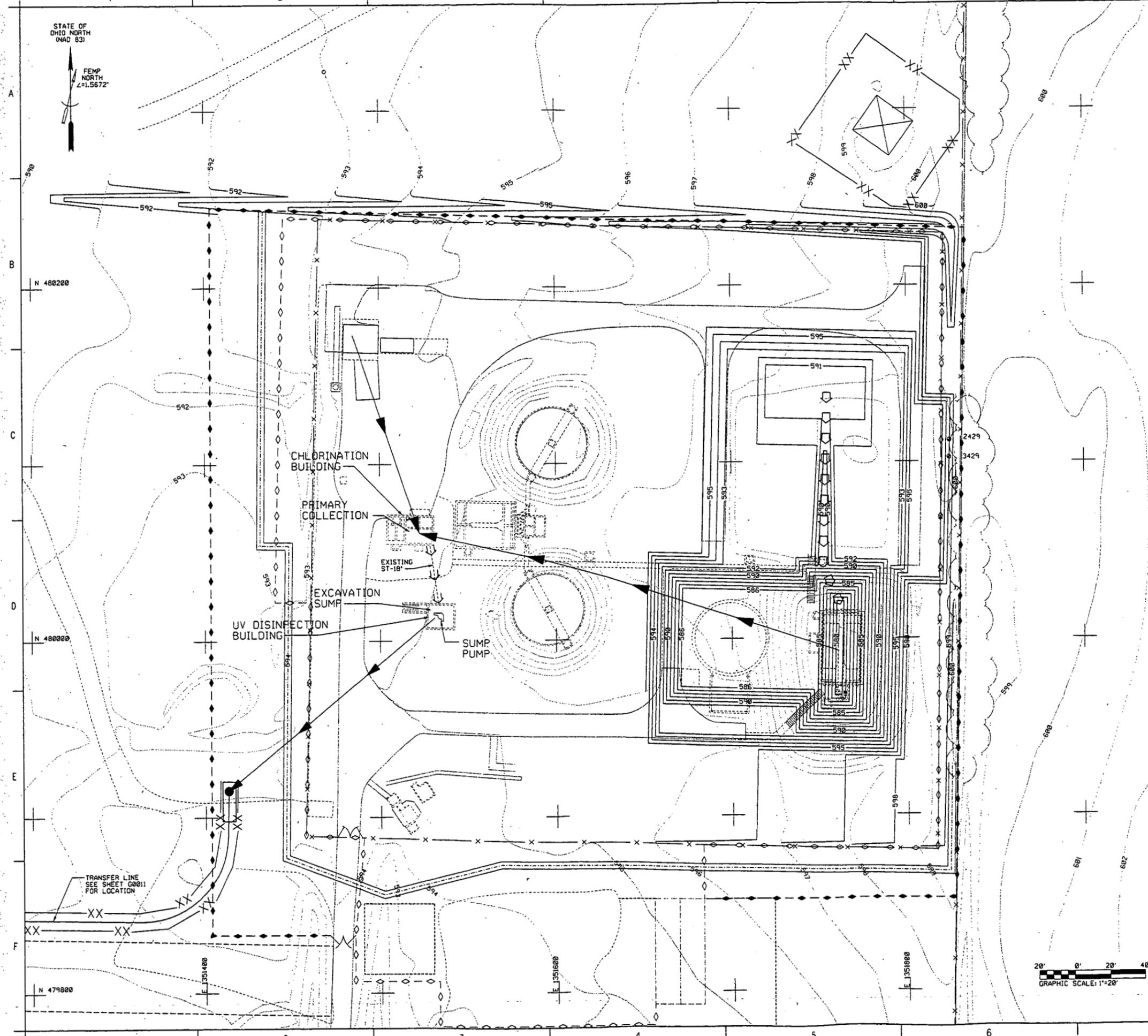
**UNITED STATES DEPARTMENT OF ENERGY**  
**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**  
THIS DRAWING PREPARED BY  
**PARSONS**  
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.  
CINCINNATI, OHIO

PROJECT NAME  
**REMEDIATION AREA 1, PHASE II SEWAGE TREATMENT PLANT EXCAVATION PACKAGE**

DRAWING TITLE  
**CIVIL TRANSFER LINE PLAN & PROFILE**

DRAWN BY	DATE	TECHNICAL LEAD	DATE	CHECKED BY	DATE
J.G. ASHWORTH	8/29/98	F.M. PARTON, JR.	09/01/98	F.M. PARTON, JR.	09/01/98

PO NUMBER	PO PROJECT NO.	DRAWING INDEX CODE NO.	SHEET NO.	REV. NO.
TOP-012	20712	92X-5900-G-00517	G0011	0A



STATE OF OHIO NORTH (NAD 83)  
 FEMP NORTH  
 ±1.5672'

N 480200

N 480000

N 479800

E 1351480

E 1351680

E 1351880

TRANSFER LINE  
 SEE SHEET G0011  
 FOR LOCATION

CHLORINATION BUILDING

PRIMARY COLLECTION

EXISTING ST-18

EXCAVATION SUMP

UV DISINFECTION BUILDING

SUMP PUMP

- NOTES
1. SEAL AND/OR PLUG ALL OPENINGS TO MAKE UV BUILDING WATER TIGHT. INSTALL PRIMARY COLLECTION SUMP PUMP IN THE UV BUILDING PRIOR TO ANY ABOVE WAC EXCAVATION AND REMOVAL.
  2. INSTALL EXCAVATION PUMPS IN REMOTE STP EXCAVATIONS THAT PUMP INTO CHLORINATION BUILDING. UTILIZE EXISTING PIPES TO CONVEY FLOW FROM CHLORINATION BUILDING TO UV BUILDING DURING PHASE I.
  3. WHERE POSSIBLE ALL SURFACE WATER IN STP EXCAVATION AREA SHALL BE GRADED TO DRAIN INTO EXCAVATION SUMP DURING INITIAL ABOVE WAC EXCAVATION OPERATIONS. PONDED WATER IN EXCAVATIONS SHALL BE MOVED BY EXCAVATION PUMPS AS DESCRIBED IN NOTE 2.
  4. SEQUENCE EXCAVATION TO MAINTAIN EXISTING PAVEMENT (AND BUFFER AREAS FOR LOADING) AS LONG AS POSSIBLE. THE SEQUENCE OF CONSTRUCTION WILL BE IN ACCORDANCE WITH EXCAVATION WORK PLAN.
  5. MAINTAIN SUMP PUMP IN UV BUILDING UNTIL EXCAVATION OF PHASE II EXCAVATION SUMP PUMP LOCATION (AS PER SHEET G0013) IS CONSTRUCTED.
- 1727
- ← PUMPED FLOW
- □ □ □ □ GRAVITY FLOW

RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-X-00490	LEGEND AND GENERAL NOTES	X0003
9XX-5900-G-00517	TRANSFER LINE PLAN & PROFILE	G0011
92X-5900-G-00508	PHASE II STP EXCAVATION DEWATERING SYSTEM	G0013

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**000169**

0A	CERTIFIED FOR CONSTRUCTION - DRAFT	FMP	9/21/98	CS	9/14/98
REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	FL	PM	REV'D BY	INITIALS AND DATE

**UNITED STATES DEPARTMENT OF ENERGY**  
**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**

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**PARSONS**  
 THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.  
 CINCINNATI, OHIO

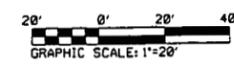
PROJECT NAME  
**REMEDATION AREA 1, PHASE II**  
**SEWAGE TREATMENT PLANT EXCAVATION PACKAGE**

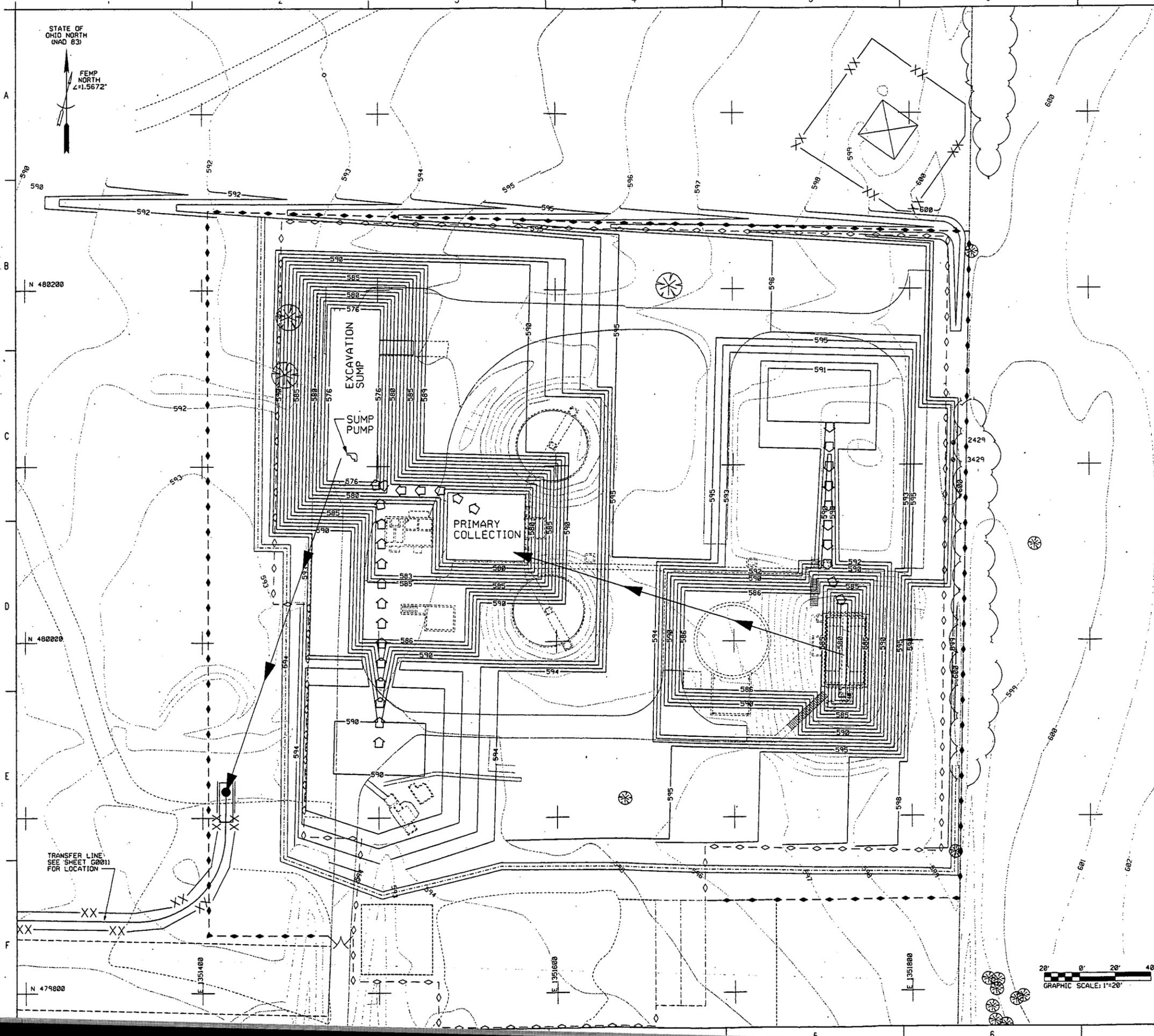
DRAWING TITLE  
**CIVIL**  
**PHASE I STP EXCAVATION DEWATERING SYSTEM**

DRAWN BY T.J. BROWN	DATE 8/14/98	TECHNICAL LEAD F.M. PARTON, JR.	DATE 8/14/98	CHECKED BY F.M. PARTON, JR.	DATE 8/14/98
PLANT/RELDC NO.	FLOOR	SCALE 1"=20'	CLASS		

SUBMITTED FOR 302 ISSUE TECH LEAD N/A DATE	SUBMITTED FOR 602 ISSUE TECH LEAD N/A DATE	SUBMITTED FOR 902 ISSUE TECH LEAD N/A DATE
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NO NUMBER TOP-012	TOP PROJECT NO. 20712	DRAWING SHEET CODE NO. 92X-5900-G-00507	SHEET NO. G0012	REV. NO. 0A
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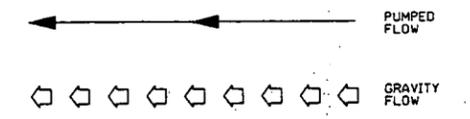




NOTES

1. CONTOURS INDICATED AS PROPOSED ARE USED TO CONVEY EXCAVATION AND DEWATERING CONCEPT. CONTRACTOR SHALL SEQUENCE EXCAVATION AND DEWATERING PER THE APPROVED EXCAVATION WORK PLAN IN ACCORDANCE WITH SECTION 02205.

1727



RELATED DWG. NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-X-00490	LEGEND AND GENERAL NOTES	X0003
92X-5900-G-00517	TRANSFER LINE PLAN & PROFILE	G0011

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000170

QA CERTIFIED FOR CONSTRUCTION - DRAFT.	FMP 65 9/21/98
REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION
	INITIALS AND DATE

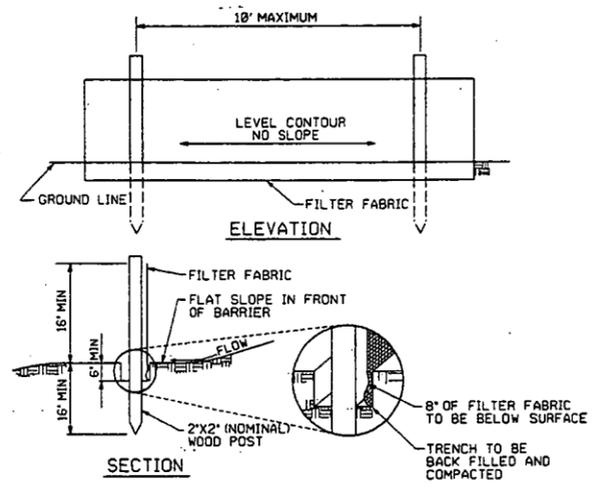
**UNITED STATES  
DEPARTMENT OF ENERGY  
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**

THIS DRAWING PREPARED BY:  
**PARSONS**  
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.  
CINCINNATI, OHIO

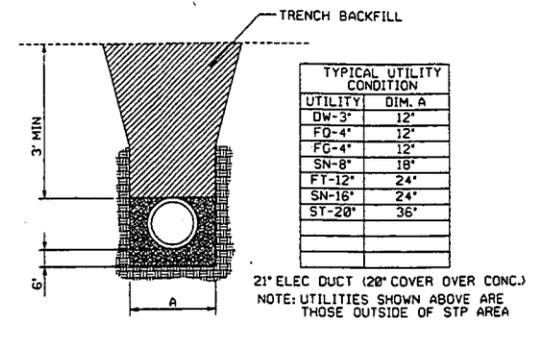
PROJECT NAME:  
**REMEDIATION AREA 1, PHASE II  
SEWAGE TREATMENT PLANT EXCAVATION PACKAGE**

DRAWING TITLE:  
**CIVIL  
PHASE II STP EXCAVATION  
DEWATERING SYSTEM**

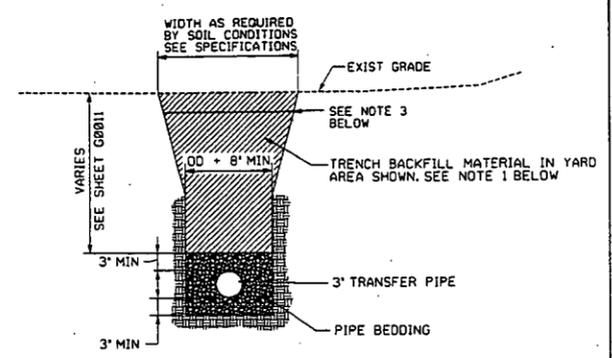
DESIGN BY T.J. BROWN	DATE 8/14/98	TECHNICAL LEAD F.M. PARTON, JR.	DATE 8/14/98	CHECKED BY F.M. PARTON, JR.	DATE 8/14/98
PLANT/BLDG. NO.	FLOOR	SCALE 1"=20'	CLASS		
SUBMITTED FOR 30% ISSUE	TECH LEAD N/A	SUBMITTED FOR 60% ISSUE	TECH LEAD N/A	SUBMITTED FOR 90% ISSUE	TECH LEAD N/A
DATE	DATE	DATE	DATE	DATE	DATE
PO NUMBER TOP-012	TOP PROJECT NO. 20712	DRAWING INDEX CODE NO. 92X-5900-G-00508	SHEET NO. G0013	REV. NO. 0A	



**SILT FENCE DETAIL** (1) REF G0014 G0007  
NTS

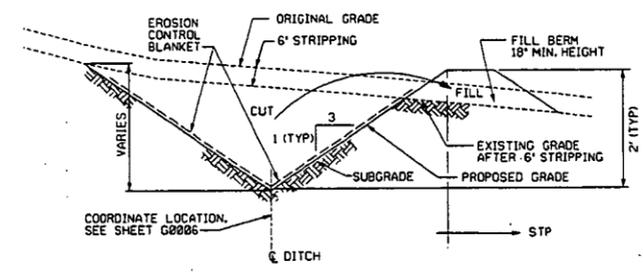


**UTILITY REMOVAL DETAIL** (2) REF G0014 G0003  
NTS

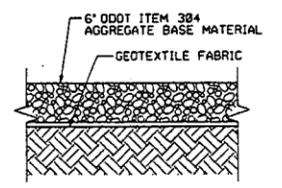


**PIPE BEDDING DETAIL** (3) REF G0014 G0011  
NTS

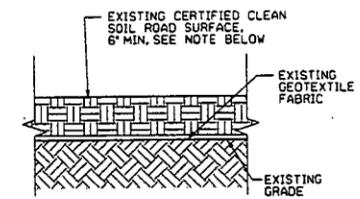
- NOTES:
- WHERE TRANSFER LINE CROSSES ASPHALT PAVEMENT, TRENCH FILL MATERIAL SHALL BE ODOT ITEM 304, FULL DEPTH.
  - WHERE TRANSFER LINE CROSSES ASPHALT PAVEMENT, REPLACE PAVEMENT WITH EQUAL THICKNESS IN ACCORDANCE WITH ODOT ITEM 252.



**RUN-ON DIVERSION DITCH DETAIL** (4) REF G0014 G0005  
NTS

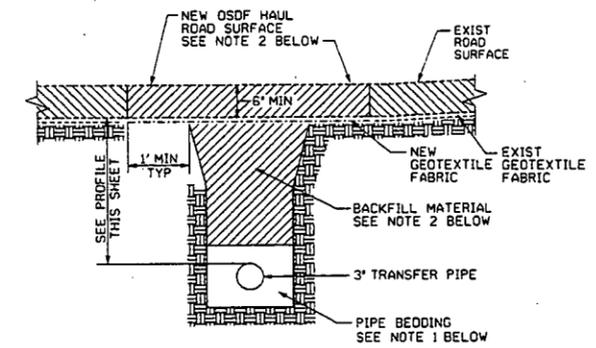


**AGGREGATE SURFACE DETAIL** (5) REF G0014 G0003  
NTS



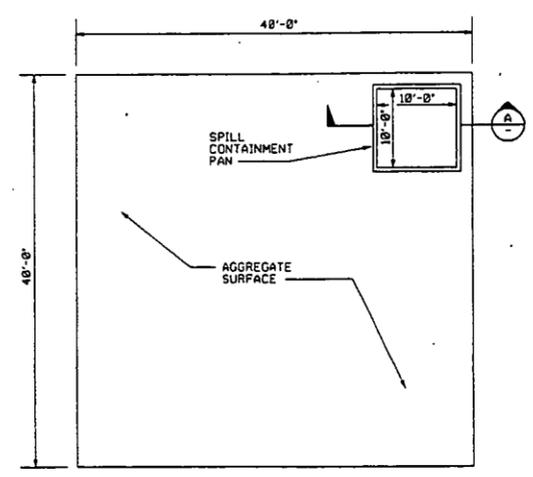
**EXISTING STP HAUL ROAD** (6) REF G0014 G0003  
NTS

- NOTE:
- MAINTAIN 6' MIN THICKNESS ROAD SURFACE CONSISTING OF CERTIFIED CLEAN SOIL OBTAINED FROM THE STP BACKFILL BORROW AREA.

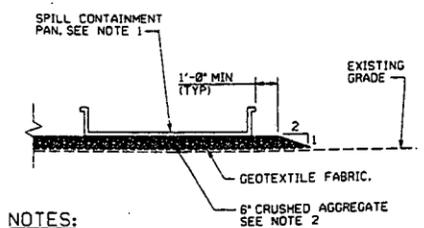


**OSDF HAUL ROAD TRENCH BACKFILL** (9) REF G0014 G0011  
NTS

- NOTES:
- SEE DETAIL 3, THIS SHEET FOR TRENCHING AND PIPE BEDDING DETAILS.
  - NEW OSDF HAUL ROAD SURFACE AND TRENCH BACKFILL MATERIAL SHALL BE FROM STP BACKFILL BORROW AREA.

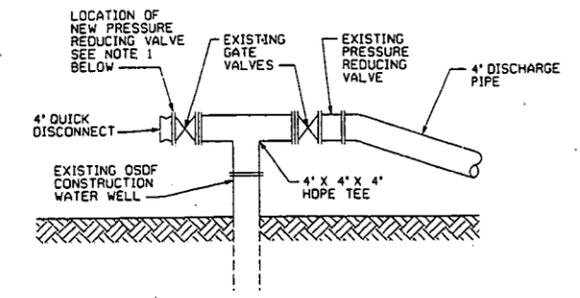


**SPECIAL MATERIAL TRANSFER AREA DETAIL** (8) REF G0014 G0003  
NTS



- NOTES:
- SPILL CONTAINMENT PAN SHALL BE DURABLE METAL APPROXIMATELY 18 FOOT BY 4 INCHES IN DIMENSION, LEAK PROOF, RESISTANT TO THE EFFECTS OF EXPOSURE TO THE ELEMENTS (OR APPROVED EQUAL).
  - AGGREGATE SURFACE SHALL BE ODOT ITEM 304.

**SECTION A**  
NTS



- NOTE:
- INSTALL NEW 4" PRESSURE REDUCING VALVE (PRV) BETWEEN GATE VALVE AND QUICK DISCONNECT. CONNECTIONS ARE BOLTED-FLANGED CONNECTIONS. PRV SHALL BE A CLA-VAL CO., MODEL NO. 98-01/690-01 PRESSURE REDUCING VALVE, OR EQUAL AS A MINIMUM. AFTER INSTALLATION OF PRV, REINSTALL QUICK DISCONNECT.

**PRV INSTALLATION** (9) REF G0014 G0007  
NTS

1727

000171

RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-X-00490	LEGEND AND GENERAL NOTES	X0003
92X-5900-G-00463	SITE PREP & GENERAL UTILITY REMOVAL PLAN	G0003
92X-5900-G-00503	STP DEEP EXCAVATION PLAN	G0006
92X-5900-G-00504	LEAD CONTAMINATED SOIL EXCAVATION PLAN	G0007
92X-5900-G-00517	TRANSFER LINE PLAN & PROFILE	G0011

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0A	CERTIFIED FOR CONSTRUCTION - DRAFT	FMP	9/21/98	CS	9/22/98
REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	FL	PH	REV. BY	INITIALS AND DATE

**UNITED STATES DEPARTMENT OF ENERGY**  
**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**  
 THIS DRAWING PREPARED BY  
**PARSONS**  
 THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC. CINCINNATI, OHIO  
 PROJECT NAME  
**REMEDIATION AREA 1, PHASE II SEWAGE TREATMENT PLANT EXCAVATION PACKAGE**  
 DRAWING TITLE  
**CIVIL DETAIL SHEET**

DESIGN BY J.G. ASHWORTH	DATE 8/14/98	TECHNICAL LEAD F.J.M. PARTON, JR.	DATE 8/14/98	DECKED BY F.J.M. PARTON, JR.	DATE 8/14/98
PLANT/BLDG. NO.	FLOOR	SCALE	NONE	CLASS	
SUBMITTED FOR 302 ISSUE	DATE	SUBMITTED FOR 602 ISSUE	DATE	SUBMITTED FOR 902 ISSUE	DATE
TECH LEAD N/A		TECH LEAD N/A		TECH LEAD N/A	

PO NUMBER TOP-012	PO PROJECT NO. 20712	DRAWING INDEX CODE NO. 92X-5900-G-00498	SHEET NO. G0014	REV. NO. 0A
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1. STRUCTURES SHOWN ARE APPROXIMATE IN LOCATION AND DEPTH. SEE TECHNICAL REFERENCE DRAWINGS FOR ACTUAL LOCATIONS.

1727

LEGEND

-  ABOVE WAC EXCAVATION
-  6" STRIPPING AREA
-  EXISTING STRUCTURE

000172

RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-X-00490	LEGEND AND GENERAL NOTES	X0003
92X-5900-G-00503	STP DEEP EXCAVATION PLAN	G0006

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BA	CERTIFIED FOR CONSTRUCTION - DRAFT	FMP	65
		9/2/98	9/14/98
REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	DATE	BY
			INITIALS AND DATE

**UNITED STATES  
DEPARTMENT OF ENERGY  
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**

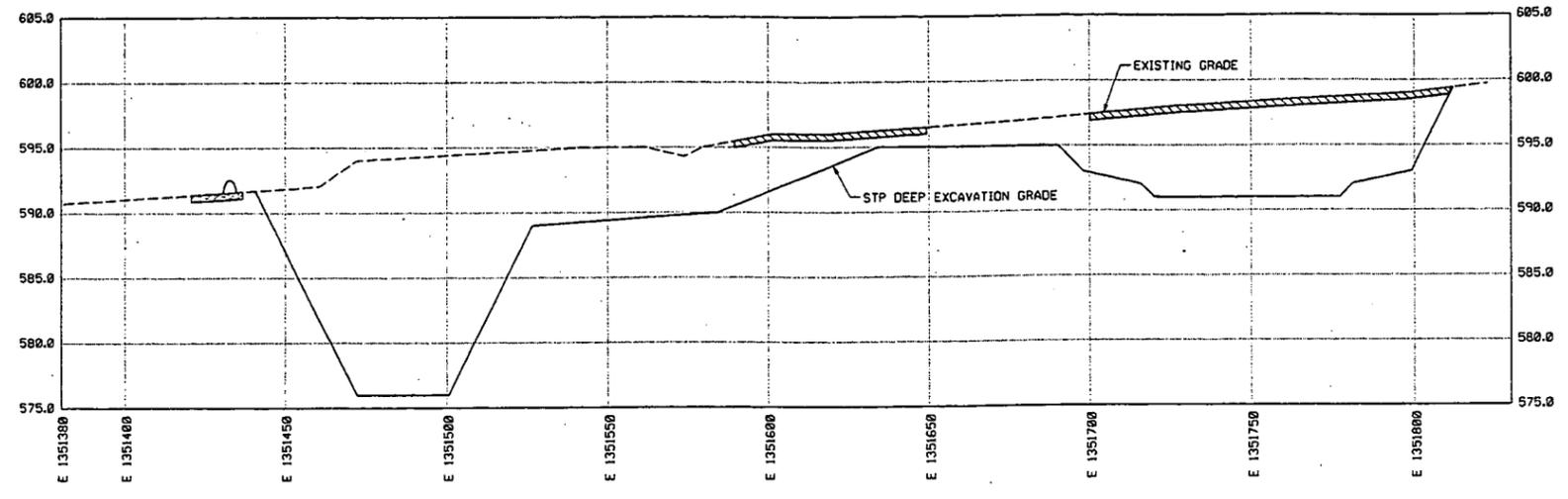
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CINCINNATI, OHIO

PROJECT NAME  
**REMEDIATION AREA 1, PHASE II  
SEWAGE TREATMENT PLANT EXCAVATION PACKAGE**

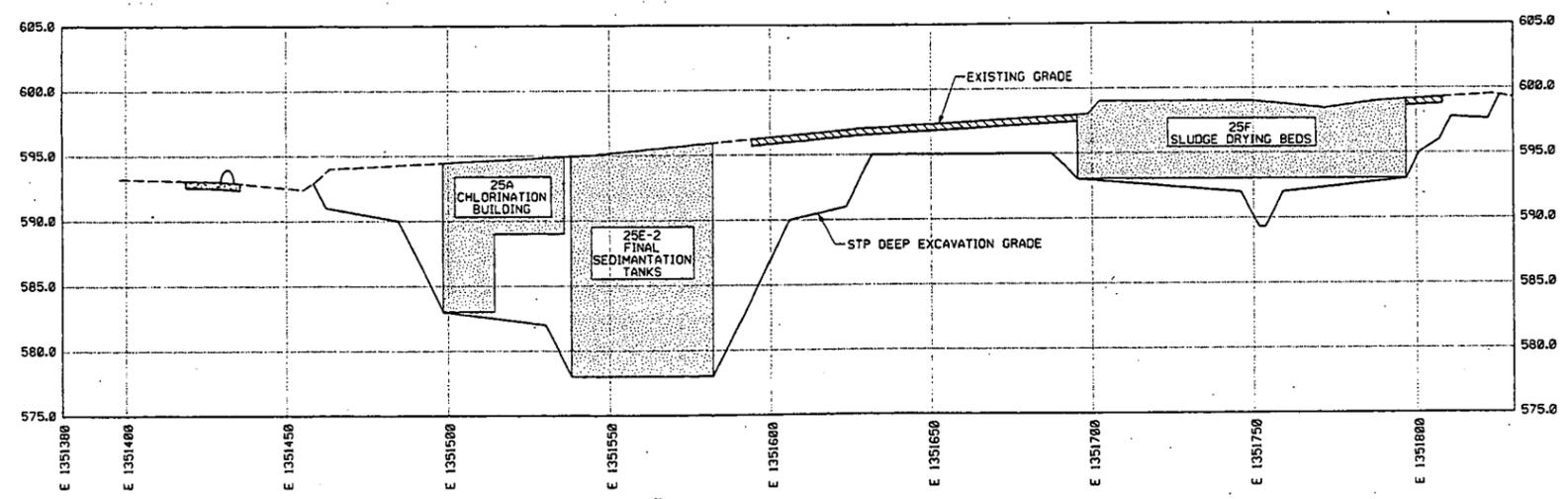
DRAWING TITLE  
**CIVIL  
CROSS SECTIONS - SHEET 1 OF 3**

DRAWN BY J.G. ASHWORTH	DATE 07/31/98	TECHNICAL LEAD F.M. PARTON, JR.	DATE 8/11/98	CHECKED BY F.M. PARTON, JR.	DATE 8/14/98
PLANT/SEC. NO.	FLOOR	SCALE 1"=20'	CLASS		
SUBMITTED FOR 902 ISSUE	DATE	SUBMITTED FOR 602 ISSUE	DATE	SUBMITTED FOR 902 ISSUE	DATE
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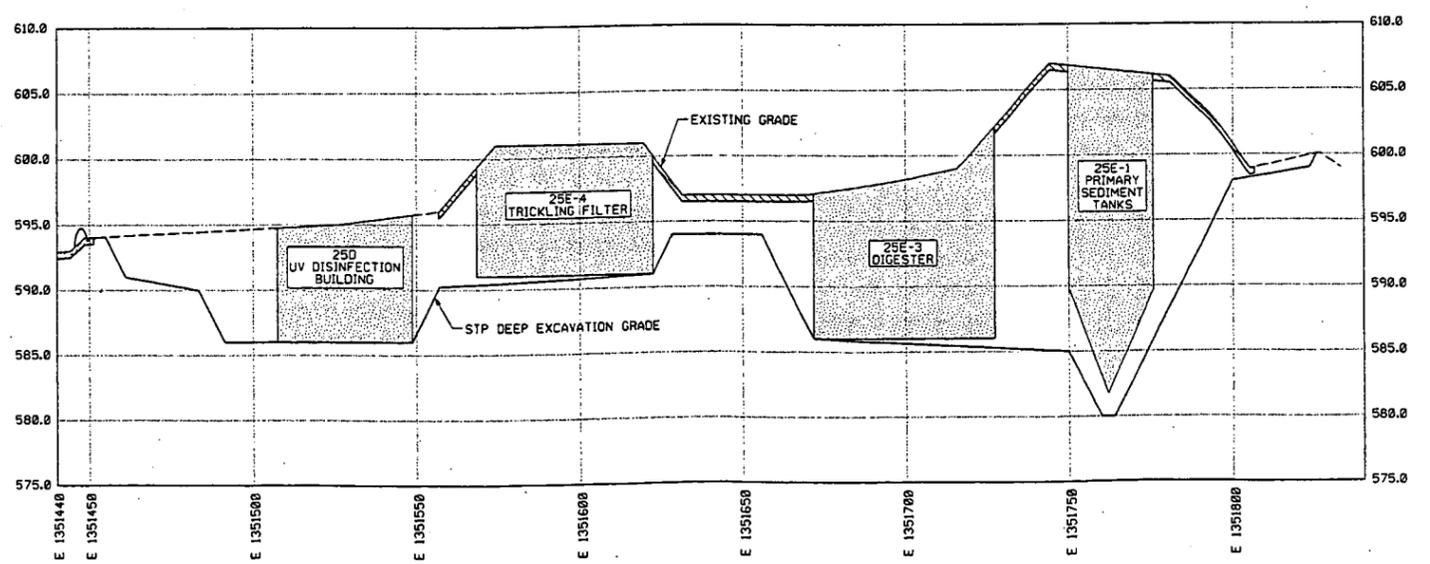
PO NUMBER TOP-012	FOR PROJECT NO. 20712	DRAWING INDEX CODE NO. 92X-5900-G-00503	SHEET NO. G0015	REV. NO. 0A
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**SECTION @ N 480150**  
SCALE: HOR. 1"=20'  
VER. 1"=5'



**SECTION @ N 480059**  
SCALE: HOR. 1"=20'  
VER. 1"=5'



**SECTION @ N 480015**  
SCALE: HOR. 1"=20'  
VER. 1"=5'



NOTES

1. STRUCTURES SHOWN ARE APPROXIMATE IN LOCATION AND DEPTH. SEE TECHNICAL REFERENCE DRAWINGS FOR ACTUAL LOCATIONS.

1727

LEGEND

-  ABOVE WAC EXCAVATION
-  6' STRIPPING AREA
-  EXISTING STRUCTURE

000174

RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-X-00490	LEGEND AND GENERAL NOTES	X0003
92X-5900-G-00503	STP DEEP EXCAVATION PLAN	G0006

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0A	CERTIFIED FOR CONSTRUCTION - DRAFT	FMP 9/21/98	CS 9/24/98
REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	INITIALS	REV. BY

**UNITED STATES  
DEPARTMENT OF ENERGY**  
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

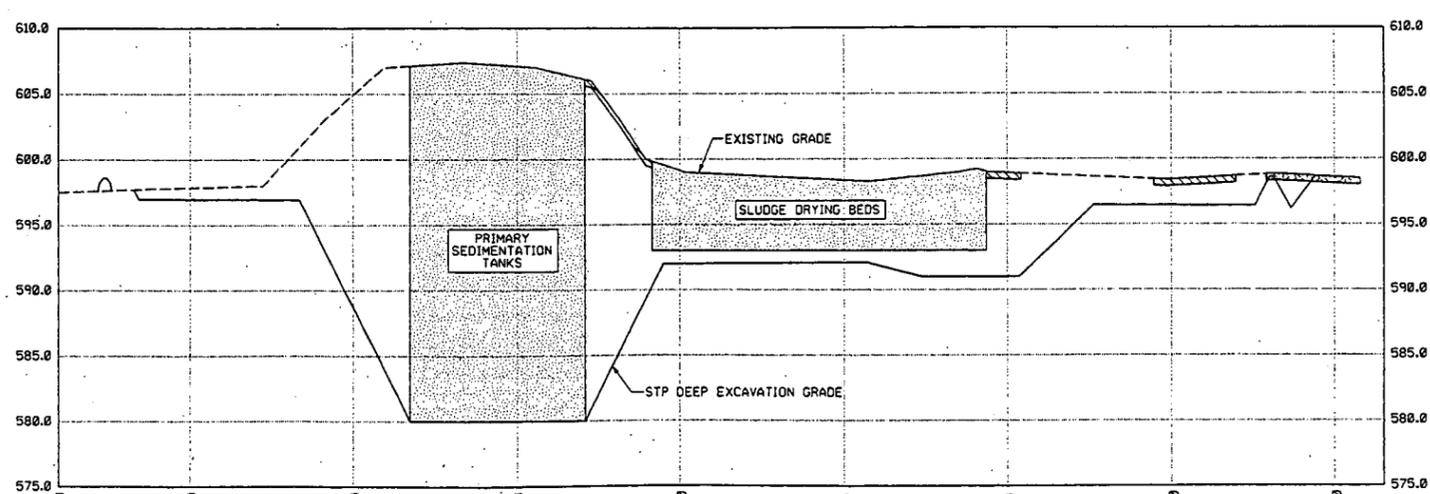
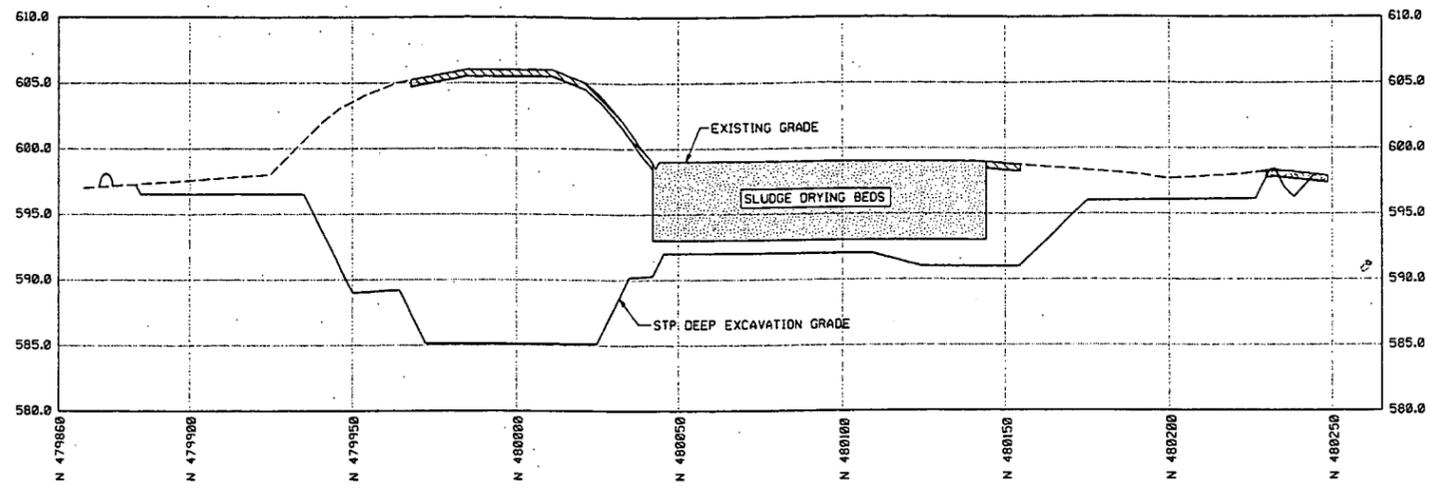
THIS DRAWING PREPARED BY  
**PARSONS**  
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.  
CINCINNATI, OHIO

PROJECT NAME  
**REMEDIATION AREA 1, PHASE II  
SEWAGE TREATMENT PLANT EXCAVATION PACKAGE**

DRAWING TITLE  
**CIVIL  
CROSS SECTIONS - SHEET 3 OF 3**

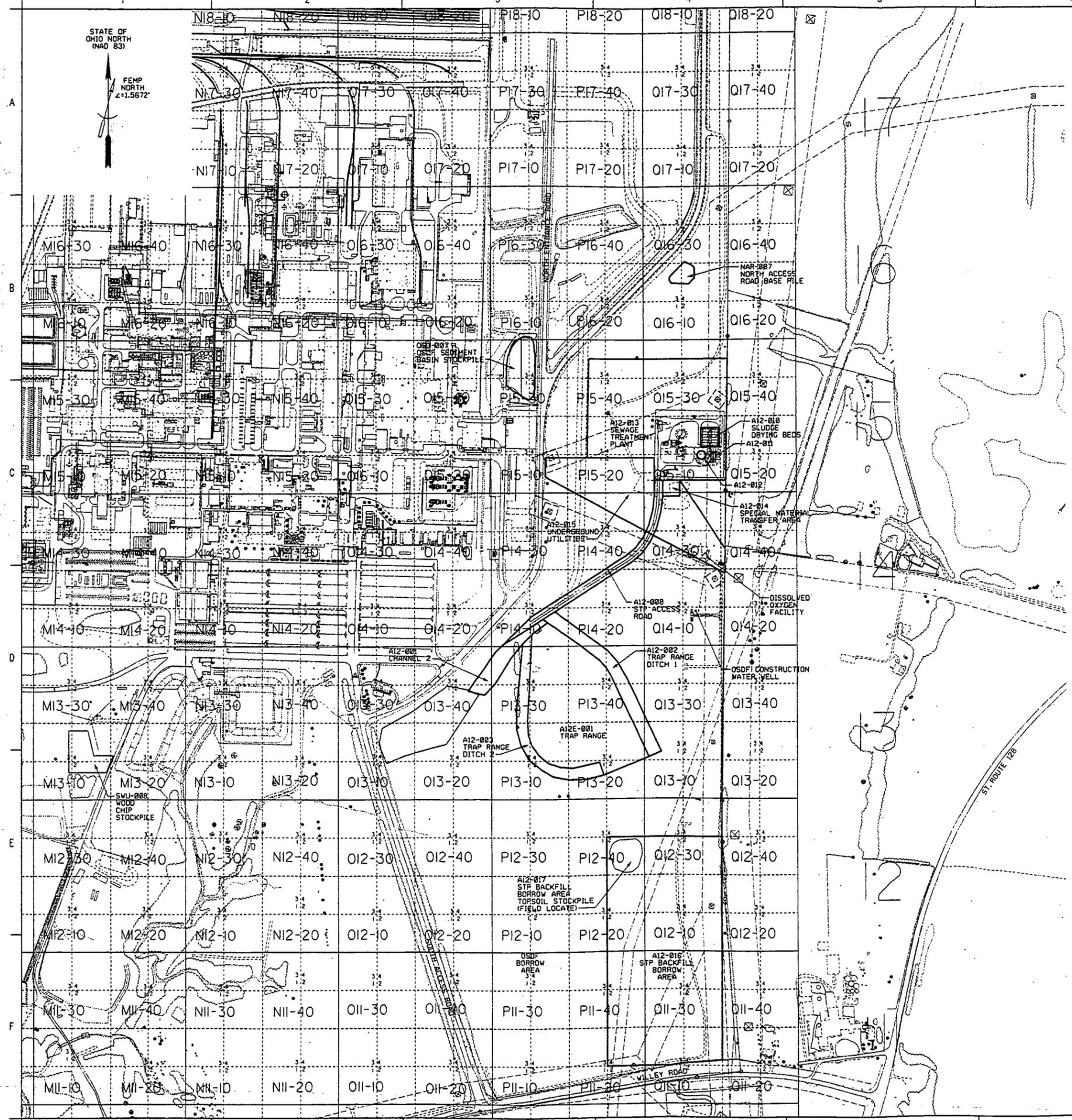
DRAWN BY J.G. ASHWORTH	DATE 07/31/98	TECHNICAL LEAD F.M. PARTON, JR.	DATE 8/14/98	CHECKED BY F.M. PARTON, JR.	DATE 8/14/98
PLANT/BLDG. NO.	FLOOR	SCALE 1"=20'	CLASS		
SUBMITTED FOR 30% ISSUE TECH LEAD N/A	DATE	SUBMITTED FOR 60% ISSUE TECH LEAD N/A	DATE	SUBMITTED FOR 90% ISSUE TECH LEAD N/A	DATE

PO NUMBER TOP-012	POP PROJECT NO. 20712	DRAWING CHECK CODE NO. 92X-5900-G-00516	SHEET NO. G0017	REV. NO. 0A
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A  
B  
C  
D  
E  
F

A  
B  
C  
D  
E  
F



- NOTES
1. THE CONTRACTOR SHALL PROVIDE IN WRITING THE CONSTRUCTION MANAGER WITH THE QUANTITY, MATERIAL TYPE, SOURCE LOCATION (MTL), AND DESTINATION LOCATION (MTD) OF ALL MATERIALS MOVED BETWEEN MTL'S DAILY. SOIL MOVED WITHIN A MTL DOES NOT NEED TO BE TRACKED.
  2. THE MATERIAL TYPES WILL BE TOPSOIL, SOIL, DEBRIS (CONCRETE, GRAVEL, WOOD, METAL, ASPHALT, REMOVED STRUCTURES), WOODCHIPS CLEARING AND GRUBBING MATERIAL.
  3. THE SOURCE LOCATIONS ARE SHOWN ON THIS DRAWING.
  4. THE QUANTITIES SHALL BE RECORDED TO THE NEAREST 3 CUBIC YARDS.
  5. THE QUANTITIES SHALL BE RECORDED BY MATERIAL TYPE PER LOCATION PER DAY.
  6. O16-20 - TYPICAL FDF MATERIAL TRACKING DESIGNATION.
  7. SEE SHT G0008 FOR ABOVE WAC SP-7 STOCKPILE AREA.

1727

000175

RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-X-00490	LEGEND AND GENERAL NOTES	X0003

**CHECK PRINT**  
FOR INFORMATION ONLY

QA CERTIFIED FOR CONSTRUCTION - DRAFT	FMP 9/21/98	CS 1/14/98
REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	INITIALS AND DATE

**UNITED STATES  
DEPARTMENT OF ENERGY**  
**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**

THIS DRAWING PREPARED BY  
**PARSONS**  
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.  
CINCINNATI, OHIO

PROJECT NAME  
**REMEDIATION AREA 1, PHASE II  
SEWAGE TREATMENT PLANT EXCAVATION PACKAGE**

DRAWING TITLE  
**CIVIL  
MATERIAL TRACKING PLAN**

DRAWN BY	DATE	TECHNICAL LEAD	DATE	CHECKED BY	DATE
J.G. ASHWORTH	8/11/98	F.M. PARTON, JR.	8/11/98	F.M. PARTON, JR.	8/11/98
PLANT/BLDG. NO.	FLOOR	SCALE	CLASS		
		1"=200'			
SUBMITTED FOR 30% ISSUE	TECH LEAD N/A	DATE	SUBMITTED FOR 60% ISSUE	TECH LEAD N/A	DATE

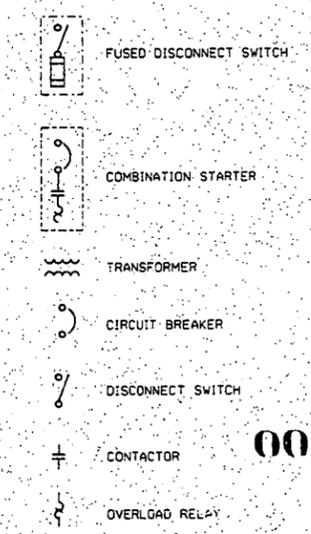


PO NUMBER	FDF PROJECT NO.	DRAWING INDEX CODE NO.	SHEET NO.	REV. NO.
TOP-012	20712	92X-5900-G-00487	G0018	0A

- FOR POWER PLAN, SEE DRAWING 92X-5900-E-00473, E0003.
- PLACE BREAKER IN EXISTING CUBICLE ABOVE BREAKER FEEDING THE D. O. BUILDING MOTOR CONTROL CENTER.
- CABLE INCLUDES WIRING FOR PMP-1 MOISTURE DETECTOR AND HIGH BEARING TEMPERATURE INTERLOCKS.

1727

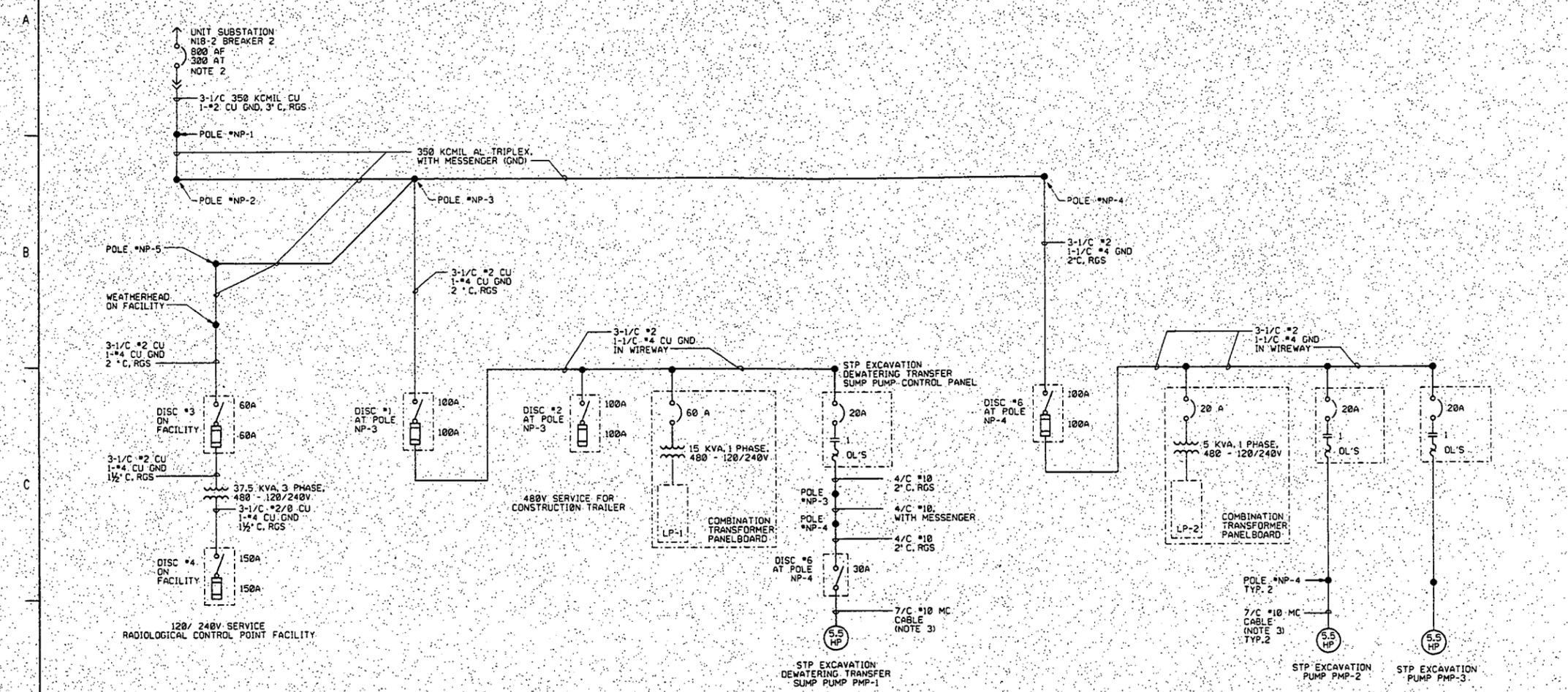
LEGEND:



000176

RELATED DWG. NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00499	DRAWING INDEX	X0002
92X-5900-E-00473	POWER PLAN	E0004

PRELIMINARY  
NOT FOR CONSTRUCTION



LIGHTING PANEL LP-1										
VOLTAGE		240/120V, 1 PHASE		REMARKS: 1. * INDICATES 6MA GFCI CLASS A, ** INDICATES 30MA GFCI CLASS B						
MAIN BKR		80 AMPS		2. LIGHTING PANEL LP-1 HAS BEEN SIZED TO INCLUDE 12 KW OF HEAT TRACING (FUTURE).						
MOUNTING		SURFACE								
DIRECTORY	WATTS LOAD	CKT. NO.	WIRE SIZE	BKR AMPS	L1	L2	DIRECTORY	WATTS LOAD	CKT. NO.	
FSL102	20	1	12	20	30	2	SPARE			
POLE MTD HPS LIGHT	250	3	12	20	30	4	SPARE			
120 VAC RECEPTACLE	160	5	12	20		6	SPARE			
SPACE		7				8	SPACE			
SPACE		9				10	SPACE			
SPACE		11				12	SPACE			
SPACE		13				14	SPACE			
SPACE		15				16	SPACE			
SPACE		17				18	SPACE			
SPACE		19				20	SPACE			
SUB-TOTALS		180	250		NEUTRAL BUS		SUB-TOTALS			
		L1	L2		L1	L2				
TOTAL WATTS L1		180		TOTAL WATTS L2		250		TOTAL WATTS		430

LIGHTING PANEL LP-2										
VOLTAGE		240/120V, 1 PHASE		REMARKS: 1. * INDICATES 6MA GFCI CLASS A, ** INDICATES 30MA GFCI CLASS B						
MAIN BKR		30 AMPS								
MOUNTING		SURFACE								
DIRECTORY	WATTS LOAD	CKT. NO.	WIRE SIZE	BKR AMPS	L1	L2	DIRECTORY	WATTS LOAD	CKT. NO.	
RECEPTACLES, MONITORING	2400	1	6	20		2	SPACE			
120 VAC RECEPTACLE	160	3	12	20		4	SPACE			
SPACE		5				6	SPACE			
SPACE		7				8	SPACE			
SUB-TOTALS		2400	160		NEUTRAL BUS		SUB-TOTALS			
		L1	L2		L1	L2				
TOTAL WATTS L1		2400		TOTAL WATTS L2		160		TOTAL WATTS		2560

0A	CERTIFIED FOR CONSTRUCTION - DRAFT	9/11/91	05
REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	DATE	BY

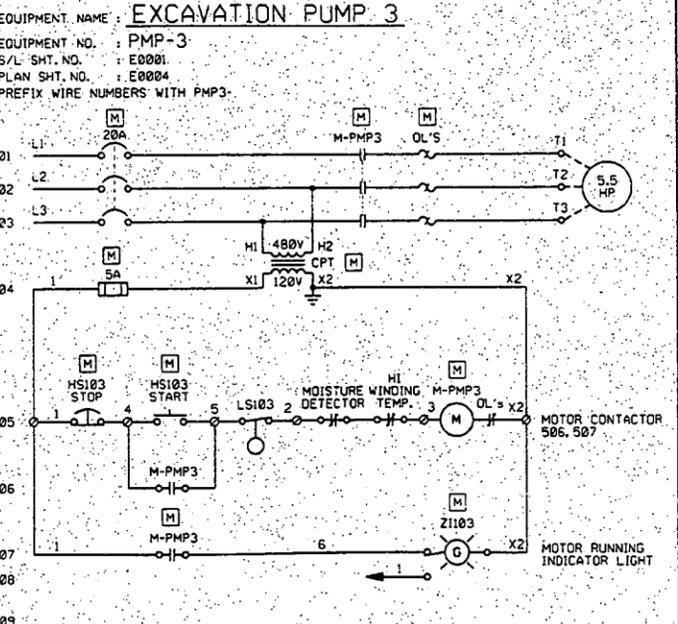
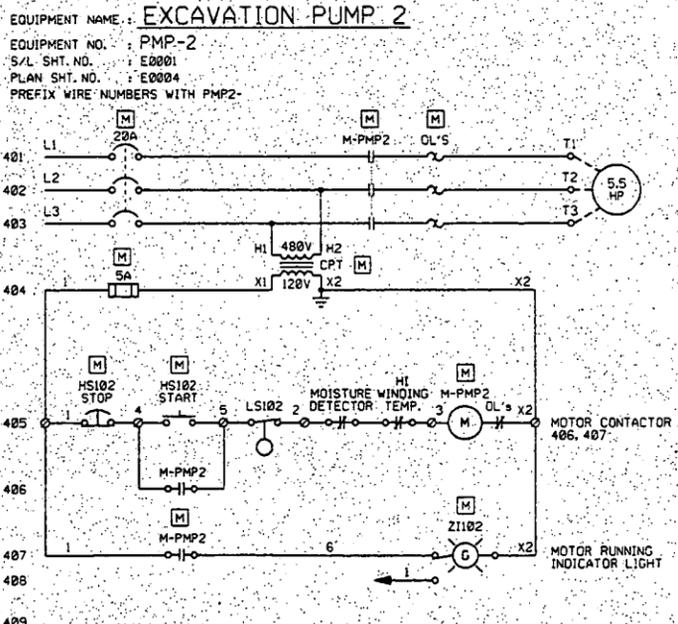
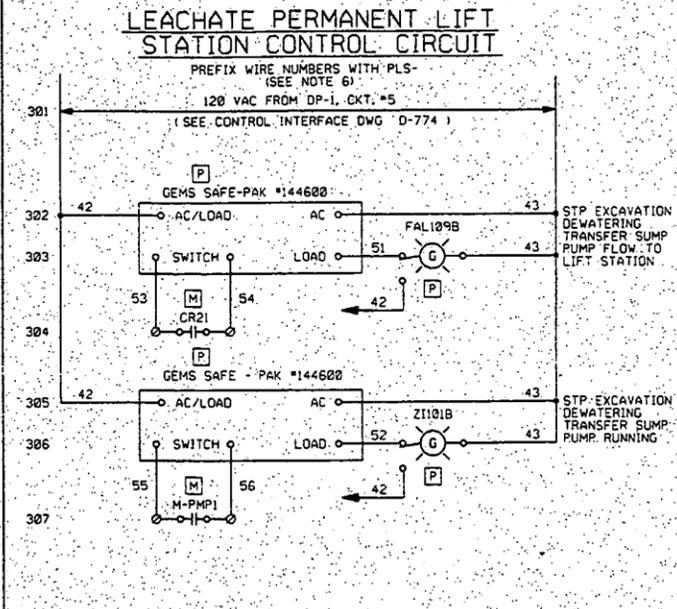
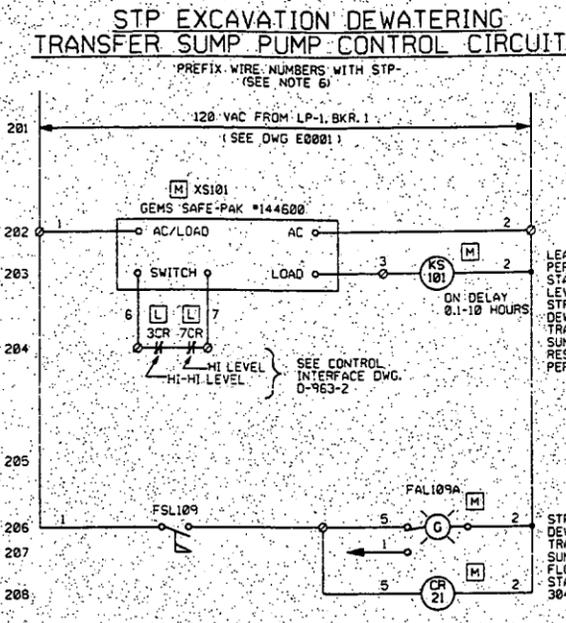
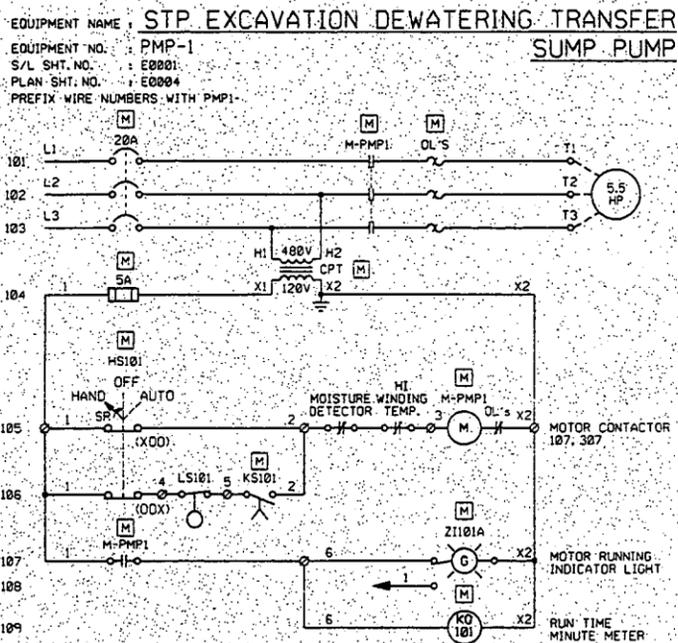
UNITED STATES  
DEPARTMENT OF ENERGY  
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

THIS DRAWING PREPARED BY  
**PARSONS**  
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.  
CINCINNATI, OHIO

PROJECT NAME  
REMEDIATION AREA 1, PHASE II

DRAWING TITLE  
ELECTRICAL  
SINGLE LINE DIAGRAM & PANEL SCHEDULES

DESIGNED BY J. SATOVIC	DATE 09/29/91	TECHNICAL LEAD T. FERRELL	DATE 11/04/91	DRAWN BY J. L. COOPER	DATE 10/30/91
PLANT/ENGINEER NO.	FLOOR	SCALE NONE	CLASS	REV. NO.	REV. DATE
SUBMITTED FOR 30% ISSUE TECH LEAD N/A DATE	SUBMITTED FOR 60% ISSUE TECH LEAD N/A DATE	SUBMITTED FOR 90% ISSUE TECH LEAD DATE			
PROJECT NO. P0175	PROJECT NO. 00-90701	DRAWING INDEX CODE NO. 92X-5900-E-00472	SHEET NO. E0001	REV. NO. 0A	



NOTES  
 1. UNLESS OTHERWISE NOTED, ALL DEVICES ARE LOCATED LOCAL (AT EQUIPMENT).  
 2. UNLESS OTHERWISE NOTED, ALL DEVICES SHOWN OR INDICATED ON THIS DRAWING ARE TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR.

1727

LEGEND:  
 [L] LEACHATE PERMANENT LIFT STATION LEVEL CONTROL PANEL  
 [P] LEACHATE PERMANENT LIFT STATION PUMP CONTROL PANEL  
 [M] COMBINATION MOTOR STARTER  
 [CR] TERMINAL INSIDE MOTOR STARTER

000177

RELATED DWG. NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-E-00472	SINGLE LINE DIAGRAM & PANEL SCHEDULES	E0001
92X-5900-E-00519	INTERCONNECTION DIAGRAMS AND DETAILS	E0003
92X-5900-E-00473	POWER PLAN	E0004
D-963-2	CONTROL INTERFACE, INC. - PERMANENT LIFT STATION LEVEL CONTROL PANEL	
D-774	CONTROL INTERFACE, INC. - PERMANENT LIFT STATION PUMP CONTROL PANEL	

PRELIMINARY  
 NOT FOR CONSTRUCTION

NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	INITIALS AND DATE
0A	CERTIFIED FOR CONSTRUCTION - DRAFT	JLF CS 1/18/97

UNITED STATES DEPARTMENT OF ENERGY  
 FERNALD ENVIRONMENTAL MANAGEMENT PROJECT  
 THIS DRAWING PREPARED BY  
**PARSONS**  
 THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.  
 CINCINNATI, OHIO

PROJECT NAME  
 REMEDIATION AREA 1, PHASE II

DRAWING TITLE  
 ELECTRICAL ELEMENTARY DIAGRAMS

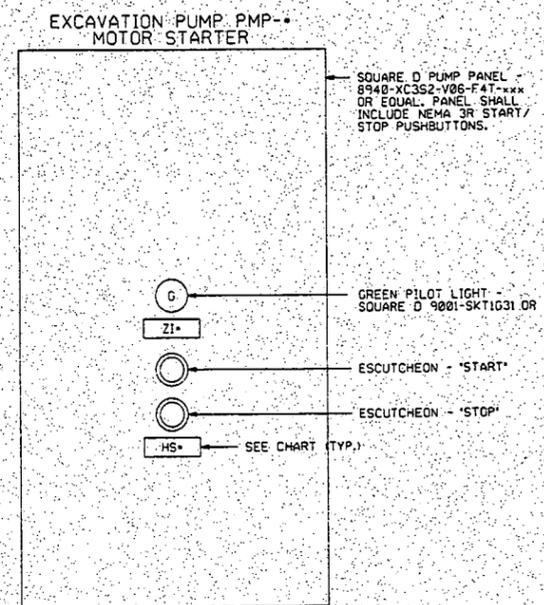
DRAWN BY	DATE	TECHNICAL LEAD	DATE	CHECKED BY	DATE
J. SAYATOVIC	09/29/97	T. FERRELL	11/04/97	J.L. COOPER	10/30/97

PO NUMBER	PLP PROJECT NO.	DRAWING INDEX CODE NO.	SHEET NO.	REV. NO.
PO175	00-90701	92X-5900-E-00471	E0002	0A

- ALL TERMINAL BLOCKS SHOWN ON THIS DRAWING ARE TO BE SUPPLIED BY CONTRACTOR. TERMINAL BLOCKS SHALL BE 600V, 30A, NEMA TYPE G, BOX LUG TERMINATION TYPE.
- NAMEPLATES SHALL BE 1" x 3" WITH BLACK LETTERING ON WHITE BACKGROUND, FOR SCREW FASTENING TO DOOR.
- OVERSIZED STARTER SHALL INCLUDE THE FOLLOWING ADDITIONAL DEVICES MOUNTED ON THE INSIDE BACK PANEL (NOT SHOWN):  
A) GEMS SAFE-PAK #14600  
B) CR21 (SQUARE D #501-X020-V02)  
C) XSI01 (SQUARE D #9258-FS15)
- CONTRACTOR SHALL INSTALL 2 INSTANTANEOUS, CONVERTIBLE CONTACT BLOCKS TO EXISTING RELAYS 3CR & 7CR. FOR REFERENCE SEE CONTROL INTERFACE DRAWING D-963-2.
- GROUND CABLE ARMOR.
- SEE ELEVATION E2, DRAWING 92X-5900-E-00473 FOR AUXILIARY PANEL DETAIL.
- NAMEPLATE IS FOR EXISTING LEACHATE PERMANENT LIFT STATION PUMP CONTROL PANEL. SEE ELEVATION E2, DRAWING 92X-5900-E-00473. MATCH EXISTING NAMEPLATE STYLE.

EXCAVATION PUMPS INSTRUMENT TAG NO. CHART

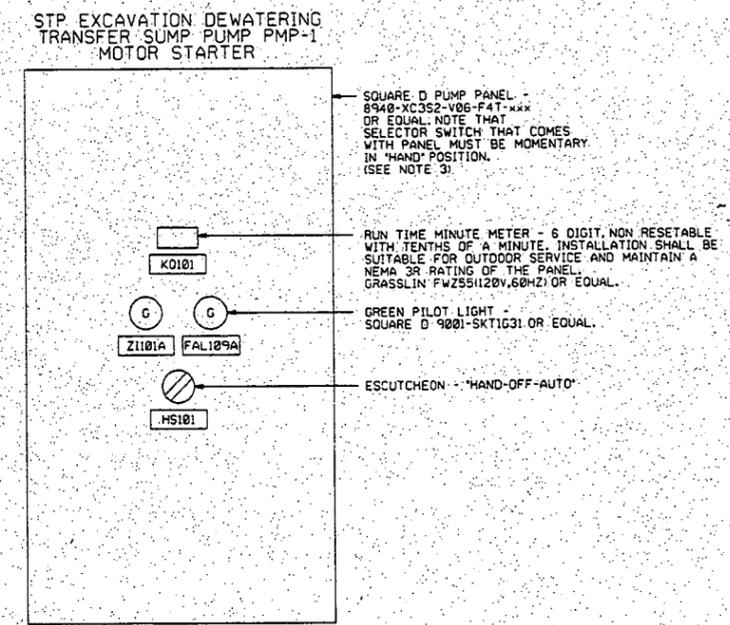
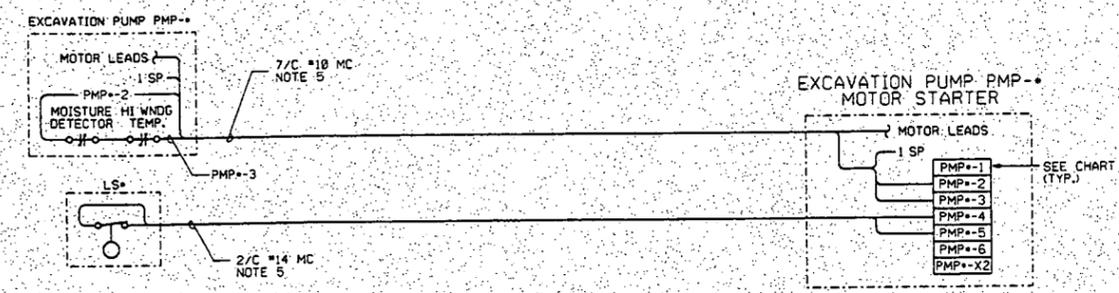
PUMP	HS	LS	ZI
PMP-2	102	102	102
PMP-3	103	103	103



DETAIL D4 REF E00519 E00473 NTS

TAG	FIRST LINE	SECOND LINE	SEE CHART (TYP.)
ZI	EXCAVATION PUMP	PMP-2 RUNNING	
HS	EXCAVATION PUMP	PMP-2 CONTROL	

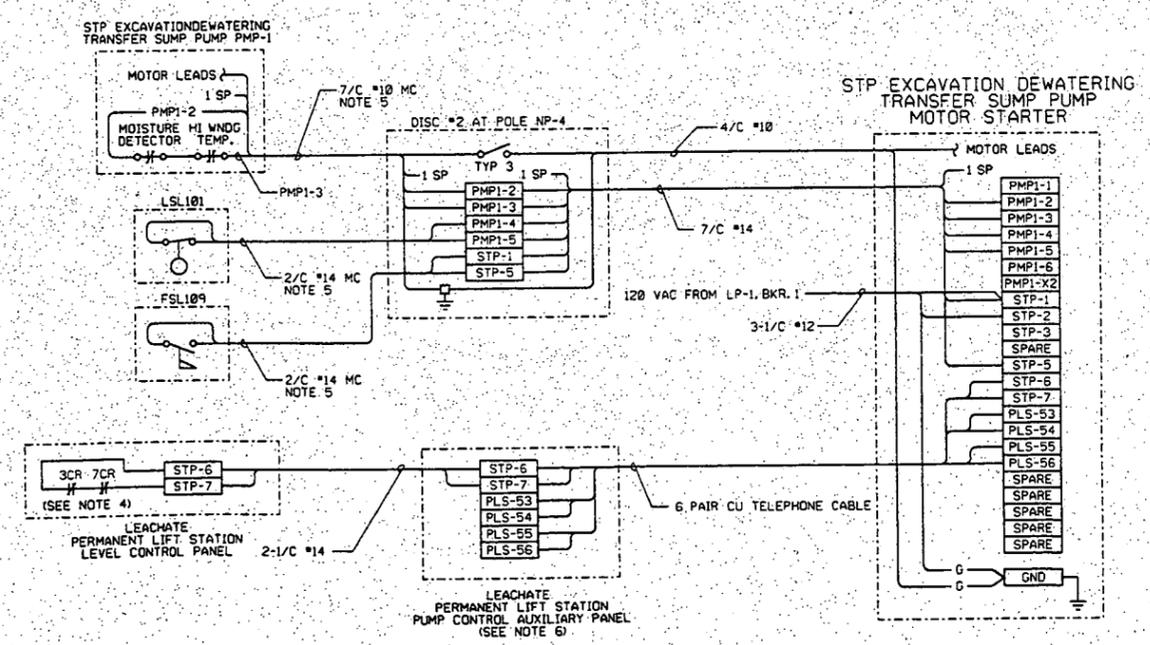
NAMEPLATE SCHEDULE (SEE NOTE 2)



DETAIL D3 REF E00519 E00473 NTS

TAG	FIRST LINE	SECOND LINE	THIRD LINE	SEE NOTE 7
KO101	STP EXCAVATION DEWATERING	TRANSFER SUMP PUMP	PMP-1 RUN TIME	
Z1101A	STP EXCAVATION DEWATERING	TRANSFER SUMP PUMP	PMP-1 RUNNING	
Z1101B	STP EXCAVATION DEWATERING	TRANSFER SUMP PUMP	PMP-1 RUNNING	
FAL109A	STP EXCAVATION DEWATERING	TRANSFER SUMP FLOW	TO LIFT STATION	
FAL109B	STP EXCAVATION DEWATERING	TRANSFER SUMP FLOW	TO LIFT STATION	
HS101	STP EXCAVATION DEWATERING	TRANSFER SUMP PUMP	PMP-1 CONTROL	

NAMEPLATE SCHEDULE (SEE NOTE 2)



1727

000178

RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-E-00472	SINGLE LINE DIAGRAM & PANEL SCHEDULES	E0001
92X-5900-E-00471	ELEMENTARY DIAGRAMS	E0002
92X-5900-E-00473	POWER PLAN	E0004
D-963-2	CONTROL INTERFACE, INC. - PERMANENT LIFT STATION LEVEL CONTROL PANEL	
D-774	CONTROL INTERFACE, INC. - PERMANENT LIFT STATION PUMP CONTROL PANEL	

PRELIMINARY  
NOT FOR CONSTRUCTION

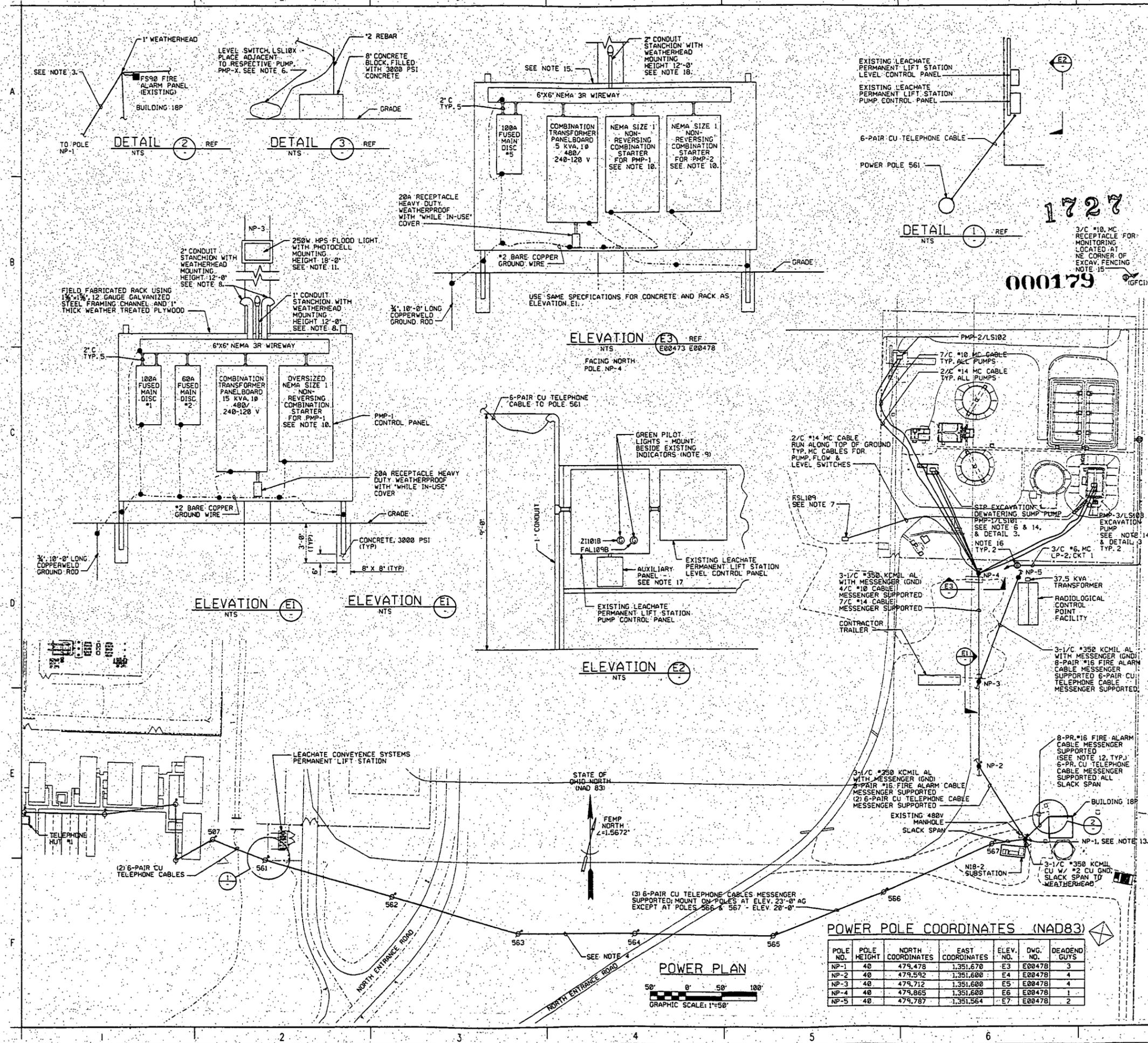
DA	CERTIFIED FOR CONSTRUCTION - DRAFT	CS	4/1/80
REV	ISSUE OR REVISION PURPOSE - DESCRIPTION	INITIALS AND DATE	

**UNITED STATES DEPARTMENT OF ENERGY**  
**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**  
 THIS DRAWING PREPARED BY  
**PARSONS**  
 THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.  
 CINCINNATI, OHIO

PROJECT NAME  
**REMEDIATION AREA 1, PHASE II**

DRAWING TITLE  
**ELECTRICAL INTERCONNECTION DIAGRAMS AND DETAILS**

DESIGN BY S. STEVENS	DATE 06/28/98	TECHNICAL LEAD T. FERRELL	DATE	CHECKED BY	DATE
PLANT/BLDG. NO.	FLOOR	SCALE	NONE	CLASS	
SUBMITTED FOR 90% ISSUE	TECH LEAD N/A	DATE	SUBMITTED FOR 90% ISSUE	TECH LEAD	DATE
PO NUMBER P0175	PO PROJECT NO. 00-90701	DRAWING SHEET CODE NO. 92X-5900-E-00519	SHEET NO. E0003	REV. NO. 0A	



NOTES

- ALL CONDUIT IS 3/4" RIGID GALVANIZED UNLESS OTHERWISE NOTED.
- CONDUCTOR CLEARANCES OVER ROADS AND OTHER GRADES SHALL BE A MINIMUM OF 18 FEET.
- FIELD ROUTE FIRE ALARM AND TELEPHONE CABLE FROM FS90 IN BUILDING 18P TO RADIOLOGICAL CONTROL FACILITY, VIA NP-2, NP-3, & NP-5. AT BUILDING 18P, ROUTE BOTH FIRE ALARM AND TELEPHONE CABLES THRU A 1" WEATHERHEAD AND CONDUIT TO BUILDING 18P FS90 PANEL.
- 13.2 KV ELECTRICAL LINE ON POLES WILL BE IN PLACE OR UNDER CONSTRUCTION DURING REMEDIATION AREA I, PHASE II PROJECT EXECUTION.
- PROVIDE AND INSTALL 6-PAIR CU TELEPHONE CABLE FROM LEACHATE PERMANENT LIFT STATION PUMP CONTROL PANEL TO DEWATERING PUMP CONTROL PANEL. INSTALL CABLE 23 FEET ABOVE GRADE.
- LSL101 - LSL103 MAGNETROL T10-S104-020 W/ ACCESSORY KIT 89-5209-001, OR EQUAL. INSTALL FOR MIN. DEADBAND OF 18 INCHES. INSTALL PMP-X/LSL10X AS A UNIT AT EACH LOCATION.
- FURNISH FSL109 - DWYER MODEL V4-SS-2-4 WITH ALL 316SS PARTS, OR EQUAL.
- SEE ELEVATION VIEW E5 ON DRAWING 92X-5900-E-00478.
- FURNISH AND INSTALL GREEN PILOT LIGHT - SQUARE D 9801-SKT1G31, OR EQUAL.
- FOR COMBINATION STARTER LAYOUT SEE DETAIL ON DRAWING 92X-5900-E-00519.
- AIM SOUTHWEST FOR MAXIMUM COVERAGE, WITNESSED BY CONSTRUCTION MANAGER.
- BELDEN CABLE NO. 1078A.
- PROBE FOR UNDERGROUND DUCTBANK OR OTHER UTILITIES PRIOR TO SETTING POLES. ALSO CONFIRM LOCATION OF UNDERGROUND UTILITIES TO BE REMOVED AND THAT POLE LOCATIONS DO NOT CONFLICT.
- ALLOW FOR SUFFICIENT CABLE FOR OTHER EXCAVATION DEWATERING SUMP LOCATIONS. (SEE G0012 & G0013.)
- ROUTE CABLE AS IN NOTE 16; TAP EXISTING CIRCUIT FOR AIR MONITORING STATION 3 (SEE DWG 00X-5500-E-01853)
- SUPPORT MC CABLE EVERY 10 FEET MINIMUM WITH GALVANIZED FRAMING CHANNEL, 3 FEET ABOVE GRADE. ATTACH WITH CONDUIT STRAP TO CHANNEL. ADD JB FOR MC CABLE AND SPLICE TO ONE FOOT OF #12 WIRE AT EACH RECEPTACLE. DRIVE CHANNEL MIN. 3'-0" BELOW GRADE.
- HINGED COVER PANEL NEMA 3R, 10"x8"x6" DEEP WITH REAR PANEL FOR MOUNTING 2 SAFE-PAK RELAYS (GENS #14600) AND TERMINAL BLOCK.
- SEE ELEVATION VIEW E6 ON DRAWING 92X-5900-E-00478.

LEGEND

- EXISTING POWER POLE(S)
- NEW POWER POLE(S)
- GUY ANCHOR & GUY WIRE(S) ASSEMBLY
- 120V WP RECEPTACLE WITH "WHILE IN USE" COVER (GFCI)

RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0001
92X-5900-E-00472	SINGLE LINE DIAGRAM & PANEL SCHEDULES	E0001
92X-5900-E-00519	INTERCONNECTION DIAGRAMS AND DETAILS	E0003
92X-5900-E-00478	ELEVATIONS AND DETAILS	E0005

PRELIMINARY  
 NOT FOR CONSTRUCTION

UNITED STATES  
DEPARTMENT OF ENERGY  
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

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**PARSONS**  
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.  
CINCINNATI, OHIO

PROJECT NAME  
**REMEDIATION AREA 1, PHASE II**

DRAWING TITLE  
**ELECTRICAL  
POWER PLAN**

DESIGN BY	DATE	TECHNICAL LEAD	DATE	CHECKED BY	DATE
J. SAYATOVIC	10/03/97	T. FERRELL	11/4/97	J. L. COOPER	10/30/97

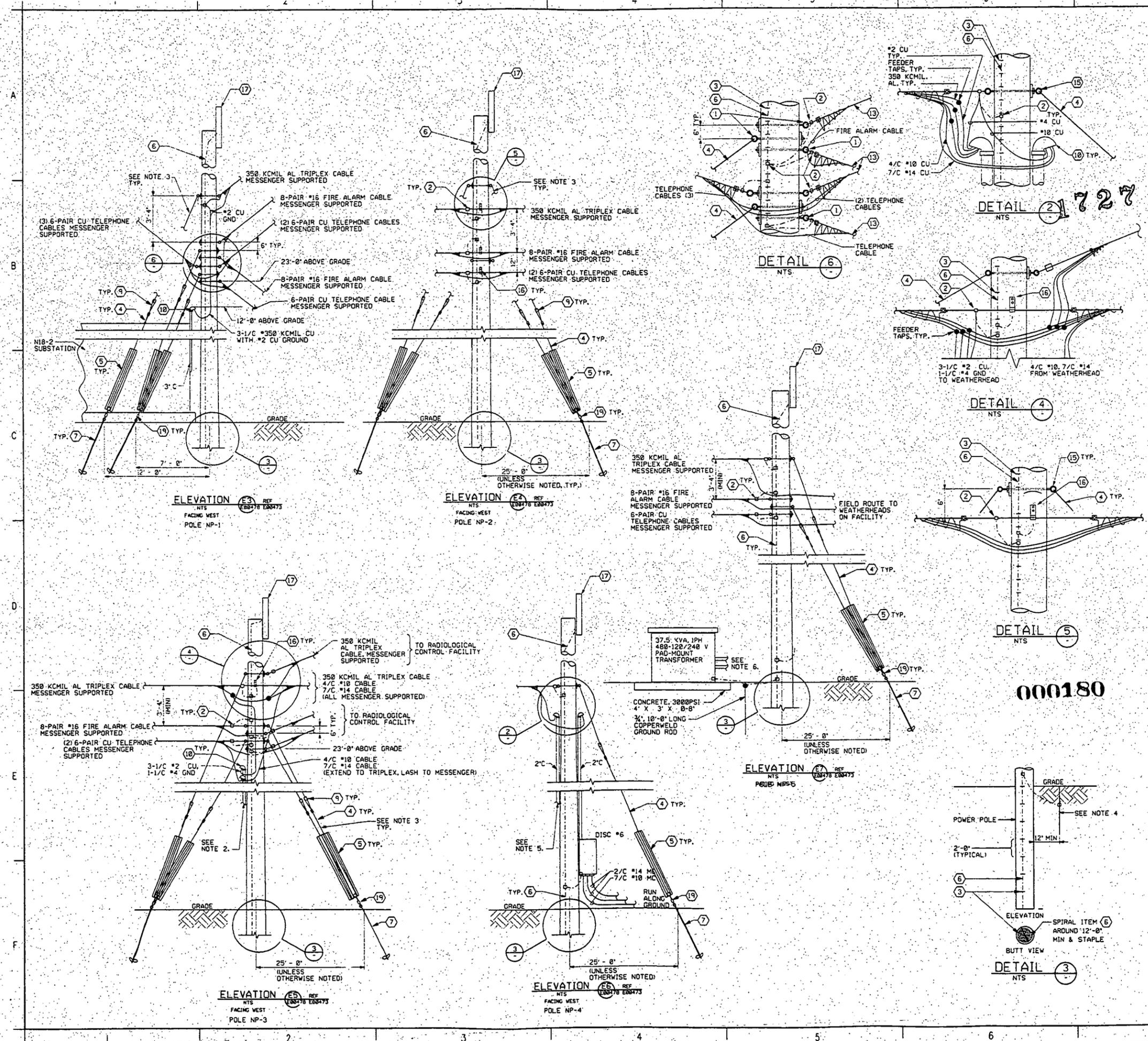
SUBMITTED FOR 30% ISSUE      SUBMITTED FOR 60% ISSUE      SUBMITTED FOR 90% ISSUE

TECH LEAD N/A      TECH LEAD N/A      TECH LEAD T. FERRELL

DATE      DATE      DATE

NO. NUMBER      PROJECT NO.      DRAWING CODE NO.      SHEET NO.      REV. NO.

P0175      00-90701      92X-5900-E-00473      E0004      0A



NOTES

1. FIELD ROUTE CONDUIT AND SUPPORT WITH FRAMING CHANNEL APPROXIMATELY EVERY 8 FEET.
2. FOR CONTINUATION SEE ELEVATION VIEW 'E1' ON DRAWING 92X-5900-E-00473.
3. SET GUYS IN LINE WITH CABLES ON DEADENDS. SEE DRAWING 92X-5900-E-00473, E0003 FOR ALIGNMENT ANGLES.
4. GROUND ROD IS TYPICAL FOR POLES NP-1, 2, & 4 ONLY.
5. FOR CONTINUATION SEE ELEVATION VIEW 'E3' ON DRAWING 92X-5900-E-00473.
6. FIELD ROUTE 120/240V SERVICES TO RADIATION CONTROL POINT FACILITY & 480 V SERVICE TO TRANSFORMER. ALL CONDUIT 1-1/2". TRANSFORMER LOCATION RELATIVE TO POLE IS SCHEMATIC. DISC #3 (480V) & DISC #4 (240V) ARE ON FACILITY.

POLE MATERIAL LIST

- 1 EYE BOLT, OVAL EYE TYPE, FOR DEAD-END, 3/8" DIA. WITH ONE SQUARE NUT, ADDITIONAL NUTS, WASHERS, AND LENGTH AS REQUIRED WITH APPROPRIATE THIMBLE AND CLAMPS.
- 2 GUY GRIP, FOR MESSNER WIRE, PREFORMED WIRE TYPE AND GROUND CLAMP.
- 3 STAPLE, COPPERCLAD, 1/2" LONG.
- 4 3/8" DIA. GALVANIZED STEEL STRUCTURAL ROPE WITH A MINIMUM BREAKING STRENGTH OF 30,000 LBS.
- 5 GUY WIRE MARKER, HALF ROUND, 2" WIDE, 84" LONG, W/ REQ'D HARDWARE, UV RESISTANT.
- 6 #4 AWG. BARE SOLID COPPER GROUND CONDUCTOR.
- 7 12" DIA. HELICAL SCREW TYPE GUY ANCHOR WITH MINIMUM PULLOUT CAPACITY OF 23000 POUNDS.
- 8 1/2" THREADED ROD WITH NUTS, LENGTH AS REQUIRED.
- 9 GUY STRAIN INSULATOR, ANSI CLASS 54-4, FOR 3/8" GUY WIRE.
- 10 WEATHERHEAD
- 11 GROUND WIRE CLAMP, USED TO ATTACH STATIC WIRE TO BAYONET
- 12 STATIC WIRE SUPPORT, CORNER BAYONET TYPE
- 13 3/8" DIAMETER, 7 X 8-STRANDED CONSTRUCTION, GALVANIZED STEEL STRAND.
- 14 1 1/2" X 1 1/2" 12 GA. GALVANIZED STEEL FRAMING CHANNEL WITH PIPE CLAMPS.
- 15 EYE BOLT, OVAL EYE TYPE, FOR DEAD-END, 3/8" DIA. WITH ONE THIMBLEYE NUT, ADDITIONAL NUTS, WASHERS, AND LENGTH AS REQUIRED WITH APPROPRIATE THIMBLE AND CLAMPS.
- 16 CLAMP, SUSPENSION, FOR 3/8" MESSNER AND 3/8" BOLT, WASHER, AND NUTS AS REQUIRED.
- 17 POLE BAYONET, STRAIGHT, MIN. 4'-0"
- 18 PLASTIC INSULATING BUSHING
- 19 CLAMP, PARALLEL GROOVE' GUY, FOR 3/8" GUY WIRE

RELATED DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-E-00473	POWER PLAN	E0003

PRELIMINARY  
NOT FOR CONSTRUCTION

NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	DATE	BY	REV. BY	INITIALS AND DATE
0A	CERTIFIED FOR CONSTRUCTION - DRAFT	11/21/97	JL	TS	

**UNITED STATES  
DEPARTMENT OF ENERGY**  
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

THIS DRAWING PREPARED BY  
**PARSONS**  
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.  
CINCINNATI, OHIO

PROJECT NAME  
**REMEDIATION AREA 1, PHASE II**

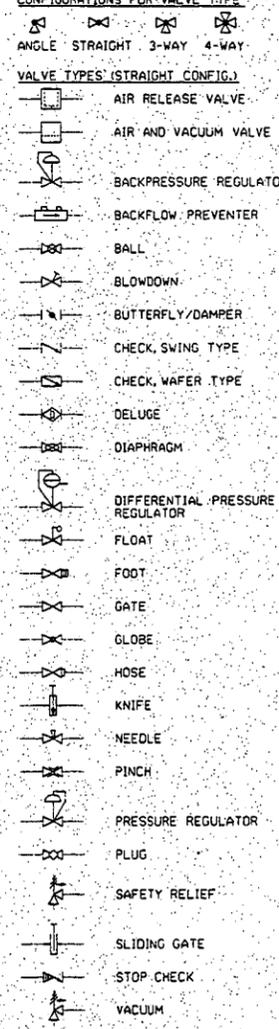
DRAWING TITLE  
**ELECTRICAL  
ELEVATIONS AND DETAILS**

DRAWN BY	DATE	TECHNICAL LEAD	DATE	CHECKED BY	DATE
J. SAYATOVIC	10/24/97	T. FERRELL	11/4/97	J. L. COOPER	10/20/97

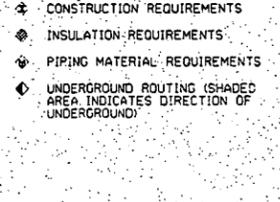
SUBMITTED FOR 30% ISSUE	SUBMITTED FOR 60% ISSUE	SUBMITTED FOR 90% ISSUE
TECH LEAD N/A	TECH LEAD N/A	TECH LEAD
DATE	DATE	DATE

PO NUMBER	PO PROJECT NO.	DRAWING INDEX CODE NO.	SHEET NO.	REV. NO.
PO175	00-90701	92X-5900-E-00478	E0005	0A

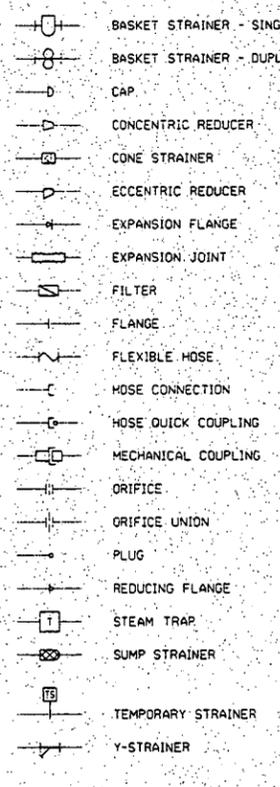
PIPING VALVES



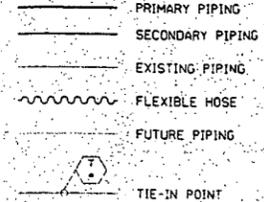
PIPING SEGMENT BREAKS



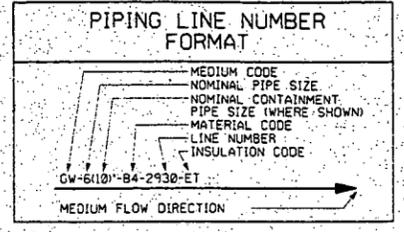
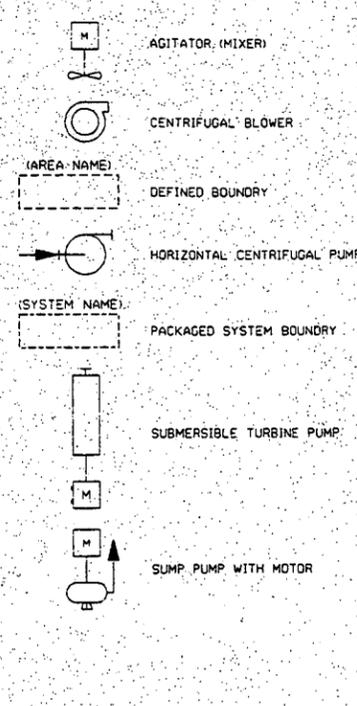
PIPING FITTINGS



PIPING SYMBOLLOGY



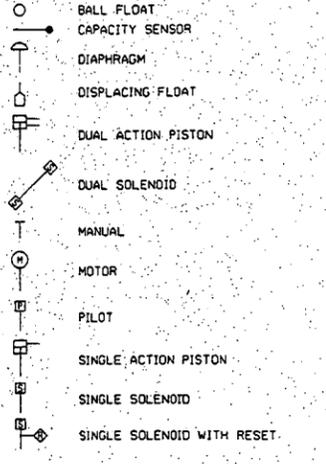
EQUIPMENT SYMBOLS



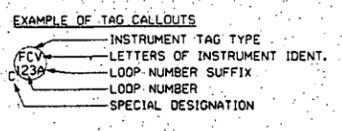
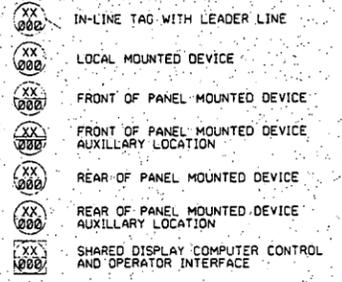
ABBREVIATIONS table listing various codes and their descriptions, including AC (AIR TO CLOSE), AG (AGITATOR), AQ (AIR TO OPEN), ARV (AIR RELEASE VALVE), etc.

PIPING SPECIFICATIONS table listing FLOWING MEDIUM, MED. CODE, and MATL. CODE. Includes descriptions for materials like A (A53 SEAMLESS CARBON STEEL), A7 (CORRUGATED METAL PIPE), etc.

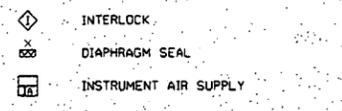
INSTRUMENT ACTUATOR LABELS



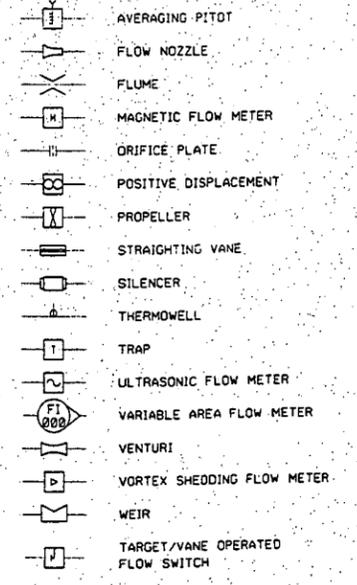
INSTRUMENT DEVICE TAG TYPES



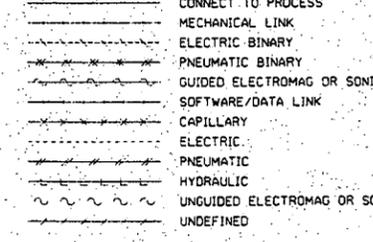
MISC. INSTRUMENTATION SYMBOLS



INSTRUMENT IN-LINE DEVICES



INSTRUMENT SIGNAL LINES



INSTRUMENT SPECIAL DESIGNATIONS

INSTRUMENT SPECIAL DESIGNATIONS table with columns for DESIGNATION and FUNCTION / ABBREVIATION. Includes C (CLOSED), DIF (DIFFERENTIAL), EX (EXISTING INSTRUMENTATION), etc.

LETTERS OF INSTRUMENT IDENTIFICATION

LETTERS OF INSTRUMENT IDENTIFICATION table with columns for LETTER, 1ST LETTER, 2ND LETTER, 3RD OR 4TH LETTER. Includes A (ANALYSIS), B (BURNER FLAME), C (CAMERA), etc.

FUNCTION LABELS

FUNCTION LABELS table with columns for SYMBOLS and DESCRIPTION. Includes averaging, bias minus, bias plus, bias plus/minus, derivative, dividing, etc.

1727 000181

REF DWG NO. 92X-5900-X-00489, DRAWING TITLE DRAWING INDEX, SHEET NO. X0002

PRELIMINARY NOT FOR CONSTRUCTION

QA CERTIFIED FOR CONSTRUCTION - DRAFT, ISSUE OR REVISION PURPOSE - DESCRIPTION, INITIALS AND DATE

UNITED STATES DEPARTMENT OF ENERGY FERNALD ENVIRONMENTAL MANAGEMENT PROJECT. THIS DRAWING PREPARED BY PARSONS. THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC. CINCINNATI, OHIO. PROJECT NAME: REMEDIATION AREA 1, PHASE II.

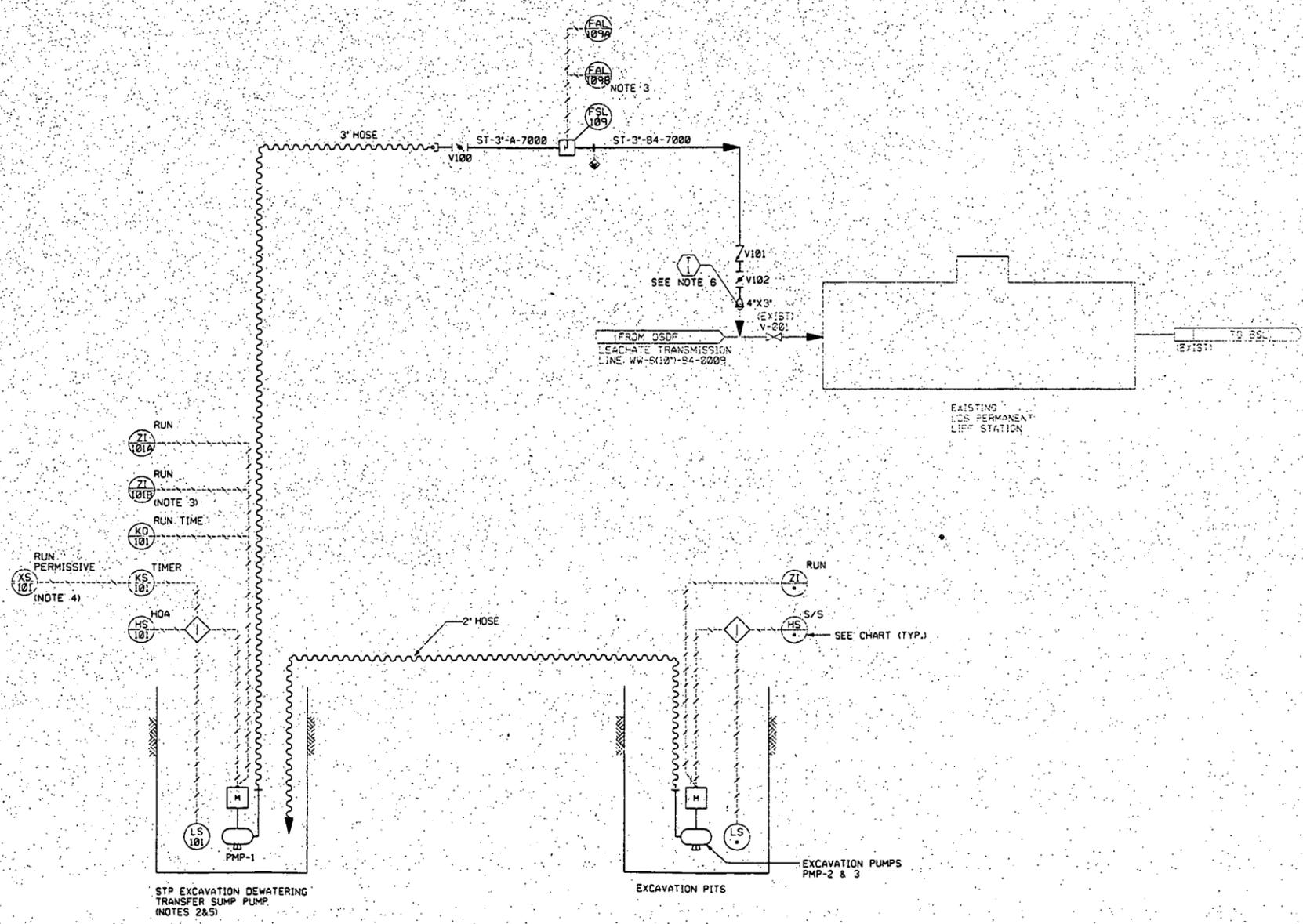
DRAWING TITLE: MECHANICAL PROCESS PIPING AND INSTRUMENTATION DIAGRAM SYMBOLS AND LEGEND. Includes fields for DRAWN BY, DATE, CHECKED BY, etc.

1. PIPING SYSTEM MUST BE DRAINED DURING FREEZING WEATHER.
2. POSITION PUMP TO MINIMIZE SILT ENTRAINMENT.
3. DEVICE IS TO BE LOCATED AT LEACHATE CONVEYANCE SYSTEM PERMANENT LIFT STATION PUMP CONTROL PANEL.
4. THIS LEVEL SWITCH DEVICE WHICH IS LOCATED AT THE PERMANENT LIFT STATION LEVEL CONTROL PANEL IS ALSO USED TO CLOSE THE LEACHATE CONVEYANCE SYSTEM MOTOR OPERATED VALVE V-801.
5. INITIAL LOCATION OF STP EXCAVATION DEWATERING TRANSFER SUMP IS PLANNED AT THE FORMER UV BUILDING.
6. TIE IN IS AT END OF 4' CLEAN-OUT.

1727

EXCAVATION PUMPS INSTRUMENT TAG NO. CHART

PUMP	HS	LS	ZI
PMP-2	102	102	102
PMP-3	103	103	103



LAST VALVE NUMBER V102

000182

REF DWG NO.	DRAWING TITLE	SHEET NO.
92X-5900-X-00489	DRAWING INDEX	X0002
92X-5900-N-00464	P & ID SYMBOLS AND LEGEND	N0001

**PRELIMINARY**  
NOT FOR CONSTRUCTION

0A	CERTIFIED FOR CONSTRUCTION - DRAFT	DATE	CS	DATE
REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	INITIALS	DATE	BY

**UNITED STATES DEPARTMENT OF ENERGY**  
**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**  
 THIS DRAWING PREPARED BY  
**PARSONS**  
 THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.  
 CINCINNATI, OHIO

PROJECT NAME  
**REMEDIATION AREA 1, PHASE II**

DRAWING TITLE  
**MECHANICAL PROCESS PIPING AND INSTRUMENTATION DIAGRAM WATER COLLECTION AND TRANSFER SYSTEM**

DRAWN BY D. PIPKIN	DATE 4/16/98	TECH LEAD D.W. CARLSON	DATE 5/12/98	CHECKED BY D.G. KNIGHT	DATE 5/16/98
PLANT/SPEC. NO.	FLOOR	SCALE	NONE	CLASS	
SUBMITTED FOR 30% ISSUE	TECH LEAD N/A	DATE	SUBMITTED FOR 60% ISSUE	TECH LEAD N/A	DATE
SUBMITTED FOR 90% ISSUE	TECH LEAD N/A	DATE	SUBMITTED FOR 30% ISSUE	TECH LEAD N/A	DATE

PO NUMBER	TOP-012	TOP PROJECT NO.	20712	DRAWING INDEX CODE NO.	92X-5900-N-00502	SHEET NO.	N0002	REV. NO.	0A
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