



**Department of Energy**

**Ohio Field Office  
Fernald Area Office**

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**1952**

JAN 26 1999

Mr. Gene Jablonowski, Remedial Project Manager  
U.S. Environmental Protection Agency  
Region V, SRF-5J  
77 West Jackson Boulevard  
Chicago, Illinois 60604-3590

DOE-0354-99

Mr. Tom Schneider, Project Manager  
Ohio Environmental Protection Agency  
401 East 5<sup>th</sup> Street  
Dayton, Ohio 45402-2911

Dear Mr. Jablonowski and Mr. Schneider:

**RESPONSE TO ADDITIONAL OHIO ENVIRONMENTAL PROTECTION AGENCY  
COMMENTS ON SILOS INFRASTRUCTURE PROJECT DESIGN PACKAGE AND WETLAND  
PERMITTING CROSSWALK**

- References:
- 1) Letter from T. Schneider to J. Reising, "DOE-FEMP Comments: Response to Comments on Silos Infrastructure Project Design Package," dated November 24, 1998
  - 2) Letter from T. Schneider to J. Reising, "DOE-FEMP Comments: Substantive Wetland Permitting Crosswalk for Silos Infrastructure Project," dated November 24, 1998

Enclosed for your review are responses to the referenced comments on the design package and Wetland Permitting Crosswalk for the Silos Infrastructure Project. Also, enclosed are the following documents:

- A revised design package including drawings and specifications revised to reflect Ohio Environmental Protection Agency (OEPA) comments dated September 18, 1998, and November 24, 1998.
- Additional drawings and calculations as indicated in the comment responses.
- A revised Wetland Permitting Crosswalk

Mr. Gene Jablonowski  
Mr. Tom Schneider

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- An addendum to the December 30, 1998 WAC Attainment Report for Area 7 Soils (Silos Project Area) containing results of soil sampling of the Pilot Plant Drainage Ditch.

The enclosed comment responses were discussed with OEPA on December 8, 1998. The proposed modifications to maintain flow in the Pilot Plant Drainage Ditch, discussed in Comment Responses 3 and 4, were reviewed with OEPA on December 22, 1998.

If you have any questions, please contact Nina Akgündüz at (513) 648-3110 or Art Murphy at (513) 648-3132.

Sincerely,



Johnny W. Reising  
Fernald Remedial Action  
Project Manager

FEMP:Akgündüz

#### Enclosures

#### cc w/enclosures:

S. Fauver, EM-42/CLOV  
N. Hallein, EM-42/CLOV  
A. Murphy, OH/FEMP  
J. Saric, USEPA-V, SRF-5J  
R. Beaumier, TPSS/DERR, OEPA-Columbus  
T. Schneider, OEPA-Dayton (3 copies of enclosures)  
F. Bell, ATSDR  
M. Schupe, HSI GeoTrans  
R. Vandegrift, ODH  
F. Barker, Tetra Tech  
AR Coordinator, FDF/78

#### cc w/o enclosures:

A. Tanner, OH/FEMP  
S. M. Beckman, FDF/52-3  
T. Hagen, FDF/65-2  
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S. Hinnefeld, FDF/90  
D. Paine, FDF/52-4  
AR Coordinator, FDF/78  
ECDC, FDF/52

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**ENCLOSURES**

**Enclosure 1: Response to Ohio EPA Comments**

**Enclosure 2: Silos Infrastructure Project Design Package**

**Enclosure 3: Silos Infrastructure Project Site Drainage And Wetlands Plan**

**Enclosure 4: Calculation of Acres of Wetlands Impact**

**Enclosure 5: Substantive Wetland Permitting Crosswalk**

**Enclosure 6: Addendum to WAC Attainment Report for Area 7 Soils (Silos Project Area) containing results of soil sampling of the Pilot Plant Drainage Ditch.**

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ENCLOSURE 1

RESPONSE TO OHIO EPA COMMENTS

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RESPONSE TO COMMENTS ON INFRASTRUCTURE PROJECT DESIGN PACKAGE

Commenting Organization: OEPA		Commentor: OFFO	
Comment #	Date Received	Section / Page	Original Comment #
1	11/24/98	General Comment	
<p>Comment: The response to comment letter does not suggest DOE plans to resubmit a revised version of the design package. Ohio EPA believes submittal of a revised version of the document is necessary for our approval to start construction on this project.</p> <p>Response: Comment acknowledged</p> <p>Action: Enclosed with this comment response document is a revised design package reflecting responses to OEPA comments dated September 18, 1998 and November 24, 1998.</p>			
Commenting Organization: OEPA		Commentor: OFFO	
Comment #	Date Received	Section / Page	Original Comment #
2	11/24/98	General Comment	1
<p>Comment: This document will need to be submitted for Ohio EPA review and approval prior to approval of the Infrastructure Design Package and would be most effective if submitted with the revised design package.</p> <p>Response: Well abandonment activities are conducted under an ongoing program by Environmental Monitoring personnel and are documented in periodic reports to the ODNR, OEPA, and U.S. EPA. Wells are abandoned using previously approved well-specific abandonment methods. Abandonment of monitoring wells 11079, 1893, 1892, 1891, 3008, 4008, 1033, and 1837 in the Silos Infrastructure Project area is documented in letter DOE-0205-99, "Transmittal of Plugging and Abandonment Information for January 1997 through September 1998 and Well Logs for Type-4 Monitoring Wells" submitted to ODNR, Ohio EPA and U.S. EPA on December 9, 1998.</p> <p>Action: no additional action required.</p>			

Commenting Organization: OEPA		Commentor: OFFO	
Comment #	Date Received	Section / Page	Original Comment #
3	11/24/98	General Comment	2
<p><b>Comment:</b> Ohio EPA is unaware of any DOE plan to fill the Pilot Plant Drainage ditch. Additionally, simply because the wetlands have been accounted for in the mitigation strategy does not absolve DOE of the requirement to evaluate designs in order to minimize impacts to wetlands. Efforts to reduce the scale and duration of impacts to wetlands should be included in any design potentially involving wetlands at Fernald.</p> <p>Based upon Ohio EPA 1/23/98 field observations, DOE intends to fill within the stream channel. This is not adequately addressed in the original design package or the wetland permitting crosswalk.</p> <p><b>Response:</b> The location and design of the road was selected based upon space requirements for construction lay-down and fabrication areas and access to construction areas for Silo 1 and 2 Accelerated Waste Retrieval and Silo 3 Stabilization Projects. The road has been located and designed to minimize environmental impacts to the extent practical given the severe space constraints in the Silo area.</p> <p>Providing structural stability of the road bed will necessitate placement of rock within the current flow channel of the PPDD between stations 6 + 75 and 7 + 25. As illustrated on drawings 94X-6100-G-02213 and 94X-6100-G-02243, the design has been modified to re-contour approximately 53 linear feet of the south bank of the ditch and thereby maintain flow within the channel. As discussed during the December 8, 1998 meeting with OEPA, efforts will be made during excavation of the stream bank to minimize the impact of the construction zone and to maintain, to the extent practical, the natural contour of the stream bed. These proposed modifications were reviewed with OEPA on December 22, 1998.</p> <p><b>Action:</b> The revised design is reflected in the attached design package. In addition, the Wetland Permitting Cross-walk has been revised consistent with the new design.</p>			

Commenting Organization: OEPA		Commentor: OFFO	
Comment #	Date Received	Section / Page	Original Comment #
4	11/24/98		3

**Comment:** Ohio EPA has received the Wetland Permitting Crosswalk. Based upon our 11/23/98 field inspection, Ohio EPA does not believe that either the design package or the permit crosswalk represent the planned field activities based upon construction staking. The permitting crosswalk is not acceptable in that it does not represent planned field activities, stating that no permanent restrictions or impediments to flow will result from the work, while field staking shows placement of stone across the stream channel.

**Response:** Comment acknowledged. As discussed in Comment Response 3 above, the design has been modified to re-contour approximately 53 linear feet of the south bank of the ditch and thereby maintain flow within the channel. The Wetland Permitting Cross-walk has been revised to reflect the additional excavation and placement of fill material (stone, sod and/or matting) necessary to recontour the channel.

**Action:** The Wetland Permitting Cross-walk has been revised consistent with the modified design.

Commenting Organization: OEPA		Commentor: OFFO	
Comment #	Date Received	Section / Page	Original Comment #
5	11/24/98		4

**Comment:** As expected of other designs, this design package should include the WAC sampling data and associated design considerations for managing these wastes. As stated in the original comment the WAC Attainment Plan includes no provisions for temporary staging of above WAC material. Ohio EPA maintains that any above WAC soils must be immediately transferred to SP-7. Finally, based upon Tom Schneider's 11/23/98 telephone conversation with Sue Lorenz, this position is consistent with that of WAO.

**Response:** The report from the Area 7 WAC Attainment Soil sampling has been submitted to OEPA. Based upon this data, no above-WAC soils are expected to be encountered. Any above-WAC soil which is encountered will be staged by the Silos Infrastructure Project contractor, as described in the Waste Management Requirements section of the design package. This soil will be transported to SP-7 as soon as practical by the OSDF contractor.

**Action:** The Waste Management Requirements section of the design package has been revised consistent with the results of the WAC attainment sampling.

Commenting Organization: OEPA		Commentor: OFFO	
Comment #	Date Received	Section / Page	Original Comment #
6	11/24/98		5
<p>Comment: The plan of grading excess soil into that area inside the road is a obvious change from the original design package and requires additional explanation and justification. Ohio EPA still believes disposal of above FRL excess soils in the OSDF is the appropriate action. Based upon Tom Schneider's 11/23/98 telephone conversation with Sue Lorenz, this position is consistent with that of WAO.</p> <p>Response: Comment acknowledged.</p> <p>Action: As was discussed with Ohio EPA on January 12, 1999, the Waste Management Requirements section of the design package has been revised to require that above-FRL, below-WAC excess soil be staged at the location indicated on drawing 94X-5500-X-SK-1035. This soil will be transported to the OSDF by the OSDF contractor as soon as practical. If possible, soil will be transported to the OSDF during late FY-1999 during periods when material from the Southfield cannot be transported. Transfer of any remaining excess soil to the OSDF will be completed during the first quarter of FY-2000.</p>			
Commenting Organization: OEPA		Commentor: OFFO	
Comment #	Date Received	Section / Page	Original Comment #
7	11/24/98		8
<p>Comment: If no fill material from other areas is required, then the action should be to change the text to state, "no fill will be required from other areas."</p> <p>Response: Comment acknowledged</p> <p>Action: Specification 02110, Section 3.2 had been revised to specify that only material from excavations within the Silos Project Area may be reused as backfill.</p>			

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Commenting Organization: OEPA		Commentor: OFFO	
Comment #	Date Received	Section / Page	Original Comment #
8	11/24/98		10
<p>Comment: Ohio EPA recommends DOE reconsider the use of slag for this or any other on-site project. Considering the site FRL's and the fact this material will required disposal as waste following completion of activities, it would seem prudent to use a different material. If DOE insists on the use of slag, then analysis of the material prior to use on-site and incorporation of any additional contaminants of concern associated with the slag into excavation characterization and soil certification activities is necessary.</p> <p>Response: Comment acknowledged</p> <p>Action: Specification 02200, Section 2.1 has been revised to delete the reference to using slag as aggregate base material.</p>			
Commenting Organization: OEPA		Commentor: OFFO	
Comment #	Date Received	Section / Page	Original Comment #
9	11/24/98		11
<p>Comment: If the project does not include construction of a temporary storm water basin, then the specification should be revised to remove reference to constructing one. Use of generic specification is good for consistency among project but it should not include work not envisioned under the plan. The action should be revised to remove reference to the basin from the specification.</p> <p>Response: Comment acknowledged</p> <p>Action: Specification 02200, Section 3.1 has been revised to delete reference to construction of a temporary storm water basin.</p>			
Commenting Organization: OEPA		Commentor: OFFO	
Comment #	Date Received	Section / Page	Original Comment #
10			13
<p>Comment: The action should include the addition of text regarding the use of silt fences in addition to the proposed removal of reference to straw/hay bales.</p> <p>Response: Comment acknowledged</p> <p>Action: Specification 02220, Section 3.5 has been revised to specify installation of silt fence around catch basins.</p>			

Commenting Organization: OEPA		Commentor: OFFO	
Comment #	Date Received	Section / Page	Original Comment #
11	11/24/98		14
<p><b>Comment:</b> The OU5 Soils Project has switched their generic specs to include the coconut mesh material referenced by Ohio EPA based upon their successful use of the material. If DOE decides to use the non-biodegradable material on the infrastructure project, then we believe significantly more maintenance and inspections will be required by FDF along with Ohio EPA inspections.</p> <p>The ODNr manual specifies Excelsior or jute matting. ODNr does not specify "UV" stabilized plastic netting. If using Excelsior, photodegradable plastic netting is preferred by Ohio EPA. The UV stabilized netting is persistent and causes safety hazards for personnel (tripping) and wildlife (entrapment).</p> <p><b>Response:</b> Comment acknowledged</p> <p><b>Action:</b> Specification 02270, Section 2.1 has been revised to replace UV stabilized plastic netting with coir matting.</p>			
Commenting Organization: OEPA		Commentor: OFFO	
Comment #	Date Received	Section / Page	Original Comment #
12	11/24/98		20
<p><b>Comment:</b> In addition to providing the basin calculations, as suggested in the original comment, the specifications should be revised to address these filling and grading activities.</p> <p><b>Response:</b> The filling and grading within the basin at the northern portion of the Silos Infrastructure project area is specified on drawing number 94-X-6100-G-02209. Specifications for filling and grading are provided in Specifications 02200, Earthwork and 02220, Roadway Excavation and Embankment.</p> <p><b>Action:</b> No additional action required.</p>			
Commenting Organization: OEPA		Commentor: OFFO	
Comment #	Date Received	Section / Page	Original Comment #
13	11/24/98		22
<p><b>Comment:</b> The document should be revised to indicate that, although it is understood that silt fence is to be installed on the contour, this is a special case. The document should be revised to state that the silt fence will be installed as indicated in the response, for the reasons indicated, with the special conditions.</p>			

Response: Comment acknowledged			
Action: As agreed in a telephone conversation on December 2, 1998 with Joe Bartoszek of Ohio EPA, a notation has been added to drawing 94-X-6100-G-02213 to specify the conditions for the silt fence installation.			
Commenting Organization: OEPA		Commentor: OFFO	
Comment #	Date Received	Section / Page	Original Comment #
14	11/24/98		23
<p>Comment: Ohio EPA believes that incorporation of surface water flow paths are important to support regulatory review of the design submittal. Additionally, we would expect that DOE and FDF reviewers would see benefits to incorporating flow paths for their review and oversight of the contractor. The revised submittal should include a drawing with surface water flow paths.</p> <p>Response: Comment acknowledged</p> <p>Action: A drawing depicting surface water flow paths within the Silos Infrastructure Project area is enclosed with this submittal.</p>			

**COMMENTS ON WETLAND PERMITTING CROSSWALK**

Commenting Organization: OEPA		Commentator: OFFO	
Comment #	Date Received	Section/Page	Original Comment #
1	11/24/98	Obstruction of High Flows	
<p>Comment: The document is not consistent with the field conditions Ohio EPA observed on 11/23/98. The construction staking shows that stone will be placed within the stream channel of the pilot plant drainage ditch causing a permanent obstruction of high and low flows. The stake at location 10.7C shows the toe of stone located across the flow path of the pilot plant drainage ditch.</p> <p>Response: Comment acknowledged</p> <p>Action: As discussed in Comment Response 4 on the Silos infrastructure Design Package, the design has been modified to assure that flow is maintained in the Pilot Plant Drainage Ditch. A revised Wetland Permitting Crosswalk, reflecting the modified design, is enclosed with this submittal.</p>			

Commenting Organization: OEPA		Commentator: OFFO	
Comment #	Date Received	Section/Page	Original Comment #
2	11/24/98	Bank Stabilization/Mitigation	
Response: In addition to use of stone for stabilization, Ohio EPA believes it is appropriate to utilize the permanent seeding mix for all disturbed areas near the pilot plant drainage ditch.			
Response: Comment acknowledged. Specification O2220, section 3.5, specifies that all slopes and disturbed areas shall be permanently seeded and mulched. Specification O2900 provides specifications for permanent seeding.			
Action: The Wetland Permitting Crosswalk has been revised to reflect permanent seeding of disturbed areas.			
Commenting Organization: OEPA		Commentator: OFFO	
Comment #	Date Received	Section/Page	Original Comment #
3	11/24/98	Acreage Limitation	
Comment: Please provide a map delineating expected wetland impacts and associated engineering features. This map should document how the 0.2 acre impact was defined.			
Response: Comment acknowledged.			
Action: A map delineating the impacted wetland area, and the calculation of the 0.2 acre area, are enclosed with this submittal			

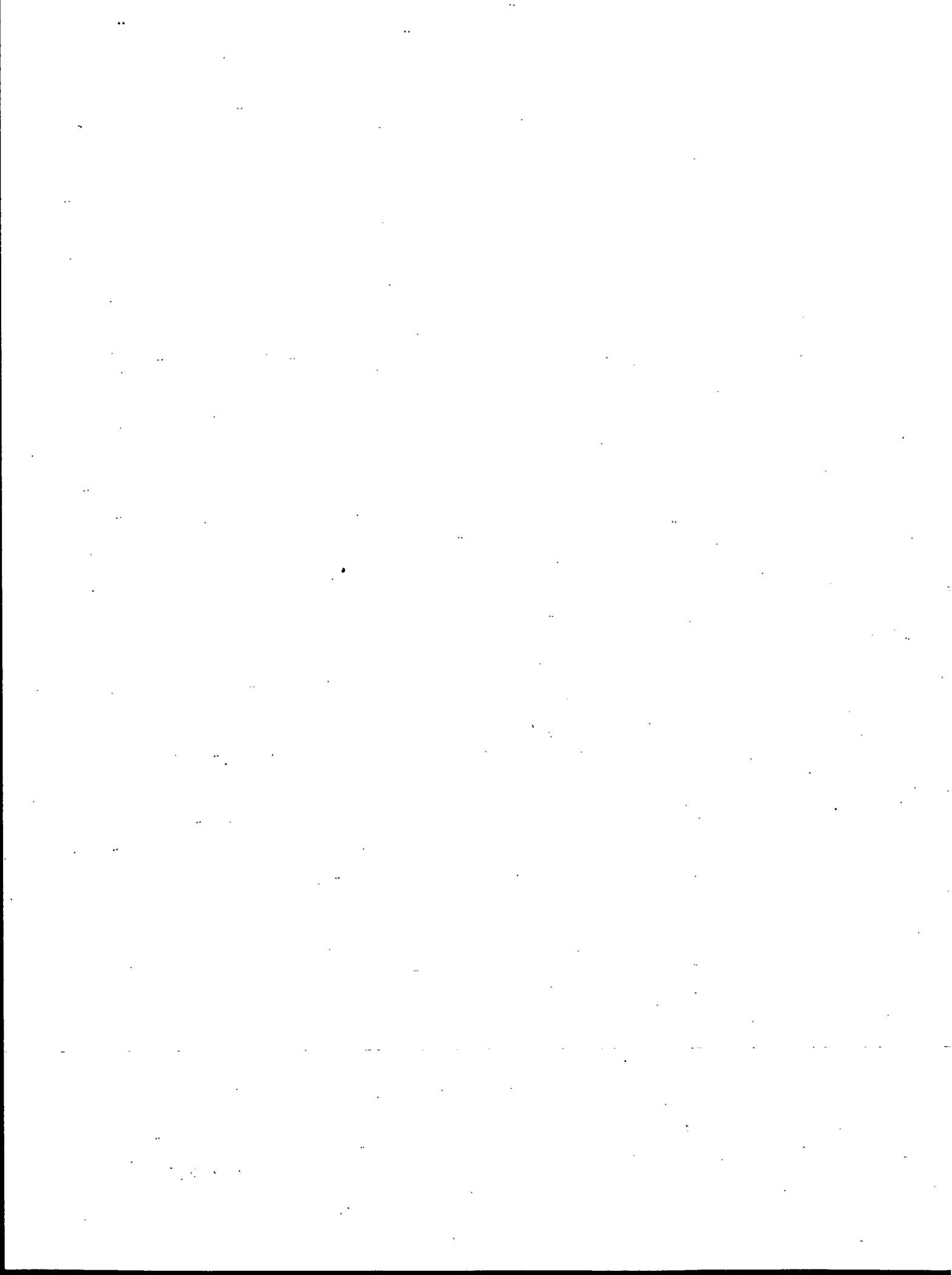
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**ENCLOSURE 2**

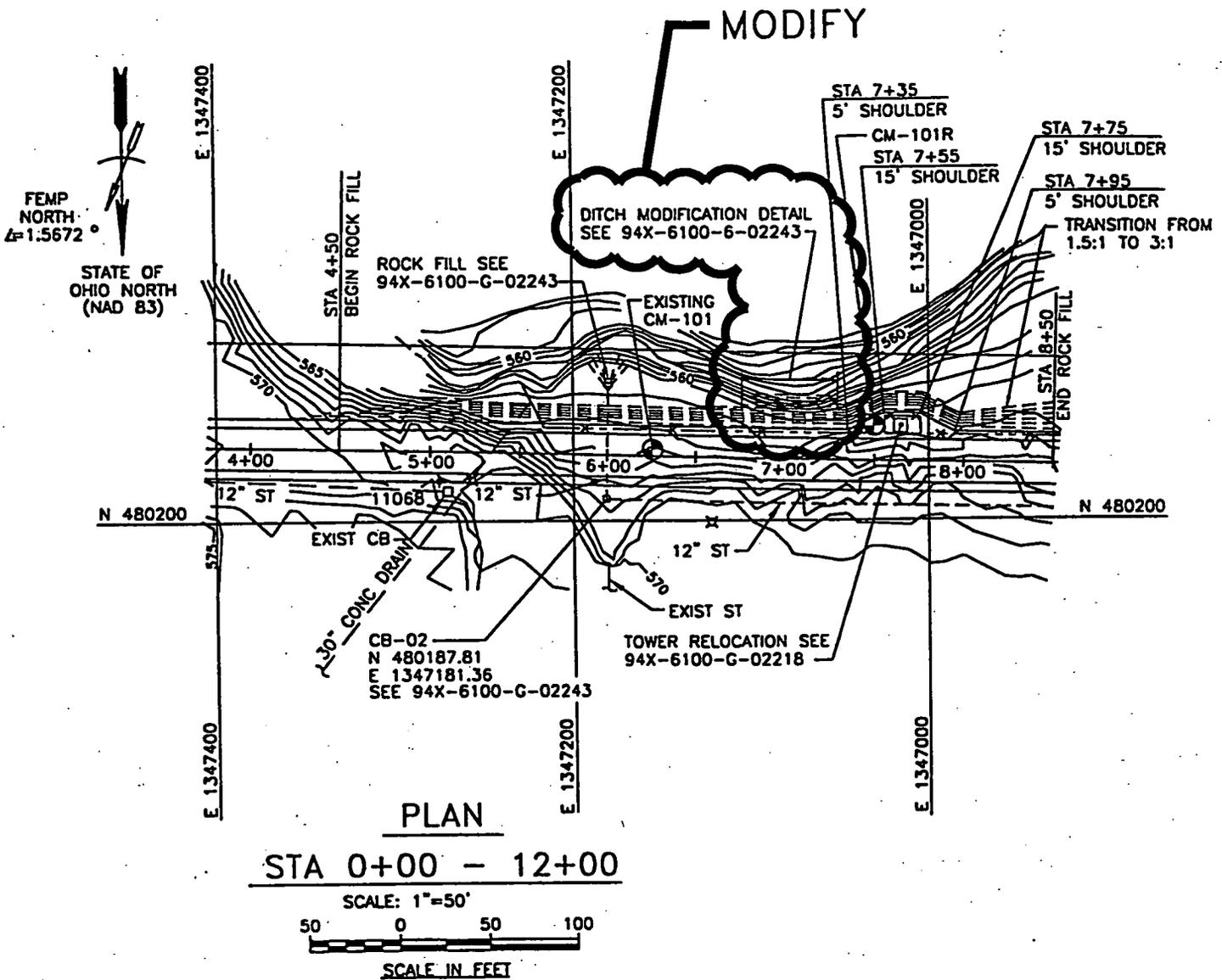
**SILOS INFRASTRUCTURE PROJECT DESIGN PACKAGE**

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PLAN

STA 0+00 - 12+00

SCALE: 1"=50'

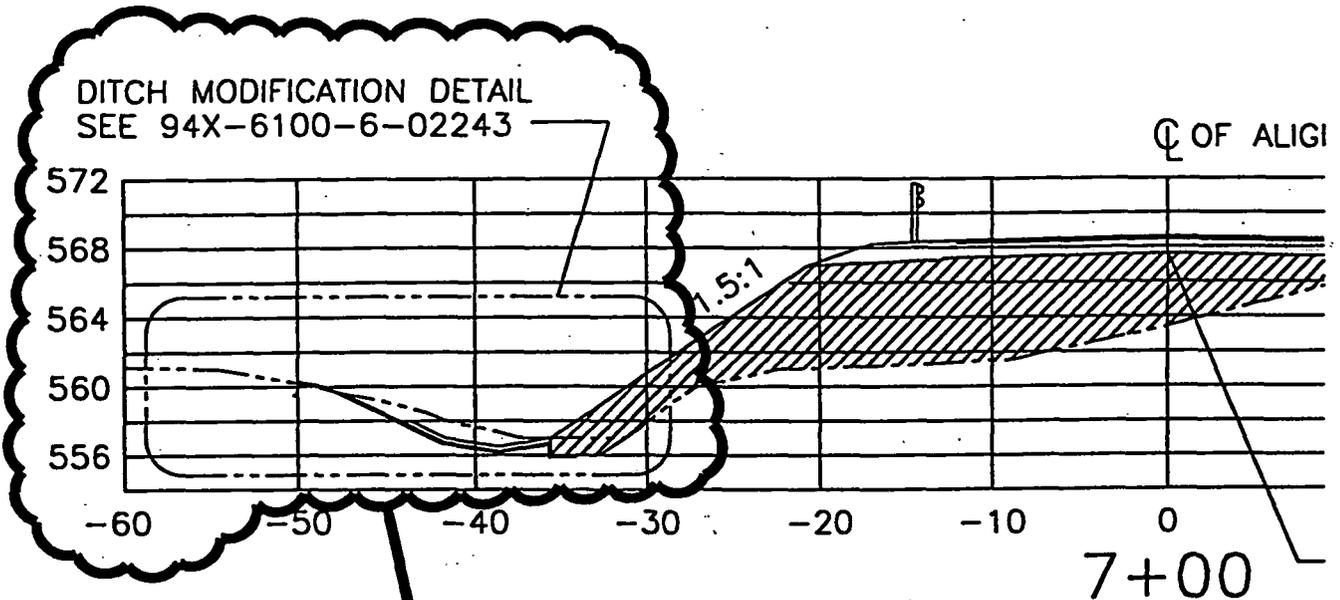


SCALE IN FEET

000014

 <b>FLUOR DANIEL NORTHWEST, INC.</b>		<b>DESIGN CHANGE NOTICE</b>	
<b>DESCRIPTION CHANGE:</b> MODIFY PLAN VIEW TO REFERENCE DITCH MODIFICATION		BASE DOC. NO. <b>94X-6100-G-02210</b>	
PREPARED BY: RS CHRISTENSEN		SHT/PG. 1	
DISCIPLINE ENGINEER: D MESSINGER		REV. 0	
DATE: 12/9/98		CADCODE: WIN95:ACD2:14.0:SS	
DISCIPLINE: CIVIL		DCN-40315-014	
DATE: 12/9/98		PAGE 2	REV. 0
CADFILE: DCN14.DWG			

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MODIFY

ADD NOTE TO  
94X-6100-G-02213

THE PLAN SHEET IDENTIFIES BASIC SILT BARRIER LOCATION. SPECIFICATION SECTION 02270, 3.1(B)(3) REQUIRES SILT BARRIERS FOLLOW THE TOPOGRAPHIC CONTOURS TO THE EXTENT POSSIBLE. THERE MAY BE INSTANCES WHERE THE SILT BARRIERS MAY NOT BE ABLE TO FOLLOW THE CONTOURS GIVEN THE SPACE LIMITATIONS. THESE INSTANCES SHOULD BE CONSIDERED A SPECIAL CASE AND NOT BE CONSTRUED AS BLANKET APPROVAL TO INSTALL SILT BARRIERS CONTRARY TO THE APPLICABLE SPECIFICATION. IMMEDIATE CORRECTIVE ACTION IS REQUIRED FOR ANY SILT FENCING BREACHED, UNDERCUT, FALLEN OR OTHERWISE IN DISREPAIR.

000015



FLUOR DANIEL NORTHWEST, INC.

DESIGN CHANGE NOTICE

DESCRIPTION CHANGE:

MODIFY CROSS SECTION AT STATION 7+00 TO SHOW MODIFICATION IN CHANNEL

BASE DOC. NO.

94X-6100-G-02213

94X-6100-G-02221

SHT/PG. 1

REV. 0

PREPARED BY: RS CHRISTENSEN

DATE: 12/9/98

CADCODE: WIN95:ACD2:14.0:SS

DISCIPLINE ENGINEER: D MESSINGER

DATE: 12/9/98

DCN-40315-014

PAGE

3

REV

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DISCIPLINE: CIVIL

CADFILE: DCN14.DWG



PART 6  
 CONTRACT NO. FSC 631  
 STATEMENT OF WORK  
 SILOS INFRASTRUCTURE

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**Exhibits**

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IFB NO. F98B157563

CONTRACT NO. FSC 631

SILOS INFRASTRUCTURE PROJECT

**PART 6  
STATEMENT OF WORK**

January 15, 1999

Rev.2

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PART 6  
CONTRACT NO. FSC 631  
STATEMENT OF WORK  
SILOS INFRASTRUCTURE

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## 1.0 GENERAL SCOPE OF WORK

Furnish all labor, supervision, administration, material, tools and equipment for construction of the Silos Infrastructure Project. Work shall be performed in accordance with the provisions of this Statement of Work and the drawings and specifications listed in *Part 7 - Technical Specifications and Drawings, Part 8 - Environmental Health and Safety/Training Requirements; and Part 9 - Quality Assurance Requirements*. The work shall include, but not be limited to, the civil/structural, electrical, and mechanical work to provide roadways, related drainage system, electrical system modifications to support access needs around Operable Unit 4 (OU4).

## 2.0 SPECIFIC DESCRIPTION OF WORK

### 2.1 Initial Survey

Initial survey control points have been provided by FDF. These include monuments with coordinates and elevation bench marks. The locations are indicated on the drawings. Reference points that are damaged or destroyed by the Contractor will be reestablished by FDF at the Contractor's expense. The Contractor shall furnish, place, and maintain construction layout stakes necessary for proper execution of work.

The Contractor shall locate and reference the centerline of the road and intersects and streets, and shall be responsible for having the finished work conform to the lines, grades, elevations and dimensions called for in the drawings.

### 2.2 Road Construction

Road construction of approximately 3,500 feet includes all labor, materials, and equipment to perform the following:

- Mobilization - erection of temporary fencing, and maintenance of pedestrian access and access to the Vitrification Pilot Plant and associated trailers.
- Site clearing - removal of surface debris, topsoil, excavation, and fencing.
- Installation of erosion control.
- Installation of used or new fencing.

- Earthwork - excavation, backfill and compaction, sampling and testing, trenching for utilities, and site grading.
- Stabilization of the creek bank south of Silo 1. ~~Rerouting of the existing creek bed as specified in DCN 40315-014~~
- Installation of culvert and catch basins, backfill, compaction, and rough and finish grading.
- Paving (base course and surface course placement) roadway in accordance with the drawings and specifications.
- Painting of roadway lines and crosswalks.
- Installation of traffic signs.
- Installation of guard rails and bollards.
- Seeding and stabilization of the disturbed soil.
- Relocation of the existing survey monument 101 to the foundation of the relocated camera tower.

### 2.3 Electrical

Electrical construction includes all labor, materials, and equipment to perform the following:

- Installation of new wood poles for power, and lighting.
- Removal of existing poles and electrical wiring.
- Removal of existing transformer and poles on 34.5KV line.
- Relocation of electrical feeders.
- Rerouting of overhead 480V lines.
- Installation of a new 480V feeder from the Vitrification Pilot Plant.
- Rerouting of overhead lines to cameras and radon monitors.
- Installation of a new 34.5KV/480V 1000KVA XFMR and 480V SWGR with breakers.
- Installation of feeder and embedded conduits as shown on drawings.

- Installation of new road way lighting.
- Installation of fence grounding and other grounding in accordance with the drawings and specifications.
- Relocation of 2 light poles.
- Removal of a 480V generator, panels, and wiring as shown on drawings and specifications.
- ~~Install conduit and wiring for automating the emergency generator. D.C.N. 40315-012.~~

#### 2.4 Camera Tower

Camera tower relocation includes all labor, materials, and equipment to perform the following:

- Concrete foundation pouring.
- Disconnection of electrical power and signal cable.
- Relocation of the tower to new location.
- Connection of electric power and signal cable.

#### ~~2.5 Disposition of Excess Soil~~

~~Establishment of temporary working pile for soil in accordance with the Waste Management Requirements Section and the specifications.~~

~~Construction of a temporary gravel loading area adjacent to the Haul Road. The gravel loading area will require relocation of existing fencing and shall consist of ODOT 304 gravel aggregate base placed to a depth of 8 inches. The area shall be 20 feet in width from the edge of the Haul Road and run approximately 120 feet along the Haul Road.~~

### 3.0 GENERAL REQUIREMENTS

The following general requirements shall be applicable to all phases of the project.

#### 3.1 General Construction Requirements

##### 3.1.1 Safe Work Plans

The Contractor shall develop and issue Safe Work Plans for each task associated with construction. The Safe Work Plan will provide instructions and provide documentation/records to document construction activities, including in-process testing

(reference *ACR-002 in Part 7 - Section 2.1*).

Safe Work Plans are documentation packages assembled for each task. These packages shall contain all related documentation/records, material receipt inspections, drawings, specifications, and manufacturer instructions, as required for construction.

Each Safe Work Plan not in use in the field shall be returned to the designated, secured, and controlled storage location. These documentation files shall be maintained current by the Contractor.

FDF shall review and concur with each Safe Work Plan prior to implementation. Prior to the issuance of the Safe Work Plan, FDF has the option to note FDF hold points for inspections, Quality Assurance oversight, or confirmation of work performed on the documentation/records. The Contractor shall provide FDF with copies of the approved Safe Work Plans.

Submittal of the Safe Work Plan(s) shall be in accordance with the Contractor's Submittal Register (*Exhibit 6.2*).

The Contractor shall provide daily instruction to his supervision, craft personnel, and appropriate FDF personnel on the specifics of the Safe Work Plans being used to perform work that day.

### 3.1.2 Construction Waste Management

The Contractor shall be responsible for the proper disposal of all waste materials generated from construction activities. Material disposition shall be in accordance with the **Waste Management Requirements and ACR-007 (Part 7 - Section 2.1)**.

### 3.1.3 Construction Acceptance Testing (CAT)

The Contractor shall develop a Construction Acceptance Test Plan (CAT) in accordance with the requirements identified below, and submit the CAT Plan for FDF concurrence review. The Contractor shall utilize the Safe Work Plans to perform and document the CAT activities.

The CAT Plan shall describe:

- Test Planning
- Testing Execution
- Documentation of activities and testing to ensure that construction is in accordance with:
  - Design Requirements;
  - Regulations;
  - Codes;
  - Standards; and
  - Components, systems, and structures are installed and constructed correctly, and operate as intended.

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### 3.1.4 Special Requirements

The Contractor shall schedule the start of work on the road at the K-65 Trench Crossing and proceed in a northerly direction.

All soil removed during construction of the roadway shall be maintained and stored according to requirements listed in the *Waste Management Requirements*.

The Contractor shall be aware that during construction of the roadway, other contractors will require access to the area. The area of concern is the existing 2nd Street, north of the Vitrification Pilot Plant. The Contractor shall allow access on a scheduled basis for the projects listed below:

- AWWT Project
- ARASA Project
- SWP Project (Access to Waste Pit # 2)

### 3.1.5 Fugitive Dust Control

The Contractor shall perform fugitive dust control and submit a Fugitive Dust Control Plan in accordance with *Exhibit 6.4*.

## 4.0 MATERIAL, OR EQUIPMENT FURNISHED BY THE CONTRACTOR

The Contractor shall furnish material and/or equipment required to perform the work as specified in this document.

## 5.0 INTERFACES AND RESTRAINTS

The Contractor will interface with FDF and other organizations through the Construction Contracts Manager (CCM) as required, and must allow for resulting delays as identified in *Table 6-1*.

The Soils and Water Project shall have construction activities require access from the Haul Road along 2nd Street to the northwest corner of the Bio Surge Lagoon. Construction activities are scheduled to occur from March 1999 to October 1999.

The OU2 Haul Road, shown on *94X-5500-G-5000X, Space Allocation Site Plan OU4*, which is used for across site soil transport is forecast to be in use during the Silos Infrastructure Project activities as follows: June 1998 to November 1998, March 1999 to November 1999, and March 2000 to November 2000 (approximate periods subject to change).

Section 5.0  
(continued)

**TABLE 6-1  
FDF TURN AROUND TIME**

TASK	FREQUENCY	APPROXIMATE DURATION	RESPONSIBLE GROUP
Respirator Issue	As Required	5 min.	Rad Safety
Tool & Equipment Entry Inspection	Per Delivery	1.5 hrs.	FDF Health and Safety
Delivery Truck Inspections	Per Delivery	0.5 hrs.	FDF Health and Safety
Confined Space Monitoring	Daily	0.5 hrs.	FDF Health and Safety
Exit Monitoring	As Required	1.5 hrs.	FDF Rad Safety
Removal of Tools & Equipment from Site	As Required	Up to 5 Days	FDF Rad Safety
Container Prep Material	As Required	10 Days	FDF Waste Management
Delivery of Washable PPE	Daily	10 Days	FDF Construction Coordinator
Permits	As Required	10 Days	FDF Construction Coordinator
Container Delivery	As Required	10 Days After Notification	FDF Waste Management
Swipe Test for Equipment and Material Release	As Required	2 hrs	FDF Rad Safety
Haul Road Crossings	As Required	*Up to .5 hr	FDF Rad Safety

- Note: The Haul Road shall provide crossing access for 5 minutes on each half hour between the hours of 6:30 AM to 5:00 PM five days a week. All other times, the Haul Road crossing shall remain open.

## 5.1 Delivery of Contractor Furnished Material and Equipment

All shipments to the Contractor shall be marked with the Contractor's name and FDF Contract number.

Upon arrival of common carrier or Contractor delivery shipments, FDF will notify the Contractor by radio or phone.

For all shipments, the Contractor shall provide a qualified escort (refer to note below) and escort the carrier to the Contractor's unloading point for unloading by the Contractor.

Deliveries by the Contractor's truck shall be made at the main gate. FDF will contact the Contractor who is required to send an escort within one-half hour. The Contractor shall escort his truck to the Contractor's unloading point for unloading by the Contractor.

The Contractor shall provide trained personnel to serve as escorts and coordinate the dates and times that escorts will be required. Escorts are to be RAD I trained to enter Controlled Areas and RAD II trained to enter Contamination Areas:

NOTE: The Contractor is responsible for the following:

1. All drivers must be escorted unless they are trained in accordance with the site requirements.
2. The driver must be issued a TLD badge.

## 6.0 TEMPORARY FACILITIES AND UTILITIES

### 6.1 Utilities

The Contractor will be given access, without charge, to limited electrical, and water services in the vicinity of their work site. The quantities and characteristics of these utilities will be limited to that which is available from existing outlets in the following locations:

- Power: 100 Amp 3 Phase 480 V at Pole #681, a 200 Amp 1 Phase 240 V, for an office/break trailer at Pole #673. The location of the panels are identified on *drawing 94X-6100-E-02230*.

Non-Potable Water: Water line availability is identified on project *Sketch 94X-5500-X-SK-1033*. The Contractor shall be responsible for maintaining this line during the project, including cold weather protection during the winter.

## 6.2 Telephone Lines

FDF will provide two telephone lines and a facsimile line to the Contractor's office trailer. This service includes two telephones and telephone service. Only FDF telephone equipment shall be used on the site, additional telephone equipment will be made available, upon request, at the Contractor's cost. Communications services may be suspended if misused.

## 6.3 Drinking Water

The Contractor shall be required to furnish all drinking water. Locations for drinking water will be submitted to FDF in accordance with *Part 8 - Section B.3.3*.

## 6.4 Temporary Buildings

The Contractor may bring temporary field offices, break trailers, tool trailers, etc., onto site for use during performance of the Contract. A general location of these facilities is shown on *Sketch 94X-5500-X-SK-1033*. The Contractor shall submit the number, type, size and a sketch of the proposed location of each facility for approval by FDF prior to mobilization. These temporary facilities shall meet the requirements outlined in *ACR-006* (reference *Part 7 - Section 2.1*).

## 6.5 Protection of Utilities

The Contractor shall install barricades, bollards, steel plates, signage, etc. as required to protect utilities from damage.

## 7.0 SITE LOCATION, ACCESS, LAY DOWN AREAS AND LIMITS OF CONSTRUCTION AREA

### 7.1 Job-Site Location

- The exact job-site location and access to the job-site are shown on *Drawing 94X-6100-X-02208*.

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7.2 FDF Address

Mailing	Shipping
Fluor Daniel Fernald Attn.: <u>Jodi Gordon</u> Mail Stop 52-3 P. O. Box 398704 Cincinnati, OH 45239-8704	Fluor Daniel Fernald Attn.: _____ 7400 Willey Road Fernald, OH 45030

7.3 Contractor Activities

- Contractor activities shall be limited to the construction boundaries shown on *Drawing 94X-6100-X-02208*.

7.4 Contractor Storage Areas

- Contractor storage areas are shown on *Sketch 94X-5500-X-SK-1033*. All Contractor storage areas are to be restored to original conditions prior to contract completion.

7.5 Construction Zone Fencing

- The Contractor shall install construction zone fencing (orange snow fencing) around the work area as identified by *Sketch 94X-5500-X-SK-1034*.

8.0 PAY ITEM DESCRIPTIONS

8.1 Pay Item Descriptions

- The Pay Item Descriptions, defined in *Exhibit 6.1*, list the activities for which the Contractor shall report progress and use for invoicing.

8.2 Proposed Value Submission

Within ten calendar days after Notice to Proceed, the Contractor shall submit a proposed value for each pay item (reference *Part 4 - Pay Item Schedule Invoice*). The values shall correspond to the descriptions of the activities in the Pay Item Description; including profit, overhead, insurance, and training. Submittal documents not specifically listed as a pay item shall be allocated to each pay item proportional to its value. FDF will review each pay item value to ensure that the value is consistent with the work to be performed. Pay item values not found acceptable, shall be revised and resubmitted. Payments cannot be made until FDF approves the pay item values.

## 9.0 CONTRACTOR'S PROJECT SCHEDULE

The Contractor's Project Schedule shall be a Critical Path Method Schedule (CPM) with two levels that clearly identify all logic ties, and project critical path from Notice to Proceed through project completion. The first level being at the Pay Item level (Pay Item Layout) and the second level being at the activity level (Detailed Layout). Activities will roll up to support the Pay Items.

The schedule shall be submitted for compliance review within 10 days after Notice to Proceed. The initial Contractor's Project Schedule, once approved by FDF, will be known as the Baseline Schedule. This schedule will be used for comparison with the updated monthly project schedule and shall not be revised without concurrence from FDF.

### 9.1 Schedule Layouts

- Pay Item Layout

The Pay Item Layout is a roll up of the Contractor's Detailed Layout by pay item. This layout will only contain pay item activities sorted by early start dates. The percent complete of these pay items will be the basis for determining percent complete and dollar value earned on the monthly submitted invoice.

- Detailed Layout

This schedule layout will show activities and provide the ability to: analyze schedule performance, analyze trends, identify recovery/corrective action plans, identify opportunities for improvement, and forecast future achievements. Activities are defined as schedule elements of sufficient detail to adequately evaluate percent of activity completion on a weekly basis. Activities shall, at a minimum, be grouped by *Pay Items* and sorted by *Early Start Dates*. The activity may be a pay item when it is of sufficient detail to meet the definition of the activity. The schedule activities shall also be coded with their corresponding Pay Item ID code.

The Detailed Layout shall be resource loaded by activity to show man-hours by craft (carpenters, laborers, operators, etc.) expected to be utilized for each activity. Activities will also be resource loaded with a breakdown of pay item values.

## 9.2 Monthly Updates

The Project Schedule shall be updated monthly with the baseline schedule shown as target in each layout.

Approximately 5 working days prior to the monthly invoice cut-off dates (reference *Part 4 - Exhibit 5*), the Contractor shall schedule a "progress review meeting" with FDF. The percent complete for each activity will be summarized by Pay Item in the Contractor's Project Schedule and shall be the basis for the amount invoiced for that pay item. A final copy of the updated Project Schedule shall be submitted to FDF by the month end cut-off date.

Monthly Project Schedule Update shall include:

- Actual or projected start and finish dates;
- Activity percent complete and remaining duration;
- Bar Chart Schedule comparing the current schedule to the baseline schedule; and
- Revisions to the craft resource, actual to date and estimate to complete in man-hours.

## 9.3 Four Week Rolling Schedule

The Contractor shall develop a rolling schedule which windows four (4) weeks of the Contractor Detailed Layout. This schedule will consist of the past week, present week and the next two weeks to come. The Contractor shall meet with the FDF Construction Scheduler to review/prepare the weekly Four Week Schedule prior to the Weekly Contractor Coordination Meeting throughout the duration of the project. The format is shown in *Exhibit 6.3*.

## 9.4 Contractor's Schedule Software

The Contractor is required to use the latest version of *Primavera's P3* software to prepare the required project schedules. A computer disk containing the updated project schedule shall be submitted along with the schedule update.

## 10.0 SUBMITTALS

### 10.1 Contractor Submittal Register

- The Contractor shall make all submittals as listed on *Exhibit 6.2* or as otherwise specified by this document.
- The Contractor shall provide submittals in accordance with *ACR-001*, listed in *Part 7 - Section 2.1*.
- The Contractor is responsible for making all submittals required to perform the work as specified in this Contract.

EXHIBIT 6.1  
PAY ITEMS

PAY ITEM NO.	PAY ITEM DESCRIPTION	DETAILED PAY ITEM DESCRIPTION
1.0	Performance and Payment Bond and Insurance	The Contractor shall procure and provide performance and payment bond and insurance certificates on self and sub-tiered contractors.
2.0	Mobilize	<ul style="list-style-type: none"> <li>The Contractor shall develop a Health and Safety Plan.</li> <li>The Contractor shall submit for approval, subcontractor list.</li> <li>The Contractor shall submit Quality Plan, proposed value for each pay item, and a Safe Work Plan to include dust control.</li> <li>The Contractor shall submit a Detailed Construction Schedule.</li> <li>The Contractor shall place office trailers, deliver necessary equipment, tools, and materials.</li> <li>The Contractor shall provide protection for the abandoned and active wells, install perimeter fencing, and submit Traffic Control Plan.</li> </ul>
3.0	Roadwork	
3.1	Clearing and Grubbing	<ul style="list-style-type: none"> <li>The Contractor shall remove and stockpile 6" of topsoil.</li> <li>The Contractor shall remove and reinstall fencing.</li> </ul>
3.2	Prepare Grade for Road	<ul style="list-style-type: none"> <li>The Contractor shall excavate for the road and ditches.</li> <li>The Contractor shall place fill material and compact.</li> <li>The Contractor shall proof roll and subgrade.</li> </ul>
3.3	Temporary Erosion and Sediment Controls	<ul style="list-style-type: none"> <li>Filter fabric fence.</li> </ul>
3.4	Install Culvert Piping	The Contractor shall excavate for piping; backfill for piping; place bedding material for piping; dispose of on site, excess excavated material; install piping and flared ends; install outfall protection; and, compact subgrade.
3.5	Asphalt Paving	The Contractor shall install asphalt paving.
4.0	ELECTRICAL	
4.1	Demolition of existing poles, wiring, and transformers	<ul style="list-style-type: none"> <li>Removal of existing electrical poles, electrical wiring, and transformers as shown on drawings and specifications.</li> </ul>
4.2	Installation of electrical poles, wiring, and transformers	<ul style="list-style-type: none"> <li>Installation of new wood poles for power and lighting.</li> <li>Relocation of electrical feeders, rerouting of overhead 480V lines.</li> <li>Installation of embedded conduits, grounding per drawings and specification.</li> </ul>
4.3	Installation of 34.5KV/480V 1000KVA XFMR and 480V SWGR with breaker	<ul style="list-style-type: none"> <li>Installation of 34.5KV/480V 1000KVA XFMR and 480V SWGR with breakers per drawings and specification.</li> </ul>

EXHIBIT 6.1  
PAY ITEMS  
(continued)

PAY ITEM NO.	PAY ITEM DESCRIPTION	DETAILED PAY ITEM DESCRIPTION
4.4	Camera and Radon Monitors	<ul style="list-style-type: none"> <li>Relocation of existing camera, new camera tower foundation, connection of electrical and signal cables, electrical and signal cables to radon monitors per drawings and specification.</li> </ul>
4.5	Roadway Lighting	<ul style="list-style-type: none"> <li>Installation of new roadway lighting and relocation of existing roadway lighting per drawings and specification.</li> </ul>
4.6	480V Generator	<ul style="list-style-type: none"> <li>Removal of existing 480V generator and associated hardware per drawings and specification.</li> </ul>
5.0	Installation of Traffic Signs	The Contractor shall install curve signs and posts, speed signs and posts, stop signs and posts.
6.0	Asphalt Striping	The Contractor shall perform asphalt striping of edge line, center line, channeling line, stop line, and transverse line.
7.0	Final Seeding and Mulching	The Contractor shall be responsible for seeding, mulching, and fertilizing.
8.0	Dust Control	Per Contractor's Dust Control Plan.
9.0	Excess Soil Disposal	
9.1	Option 1	The Contractor shall load RCRA contaminated soil into boxes for FDF disposal. The volume of each box is 3.7 cubic yards. The estimated volume of RCRA material is 250 cubic yards.
9.2	Option 2	Soil that exceeds the OSDF WAC for Technetium 99 and/or total uranium shall be staged north of the high nitrate tank as shown on drawing 94X-5500-X-SK-1035. The Contractor shall then load the soil into trucks provided by a current site Contractor. The estimated volume is 1500 cubic yards.
<del>9.3</del>	<del>Disposition of Excess Soil</del>	<del>The Contractor shall install a temporary gravel loading area, establish temporary soil piles in accordance with the Waste Management Requirements.</del>
10.0	Demobilize	The Contractor shall complete the execution of the final punchlist items, provide as-built drawings, decontaminate equipment (final) and remove all equipment from the jobsite.

PART 6  
C. NO. FSC 631  
SOW

EXHIBIT 6.2  
CONTRACTOR SUBMITTAL REGISTER

Submittal Due Dates

Contract No. _____ Contract Title _____ Contractor _____	Submittal No. (1)	Submittal Type (2)	Document Family (3)	Document Description (4)	Submittal Due Date (5)	PDF Review (6)
	40315-631-P2-001	INF	Procurement	Performance Bond	☒	N/A
	40315-631-P2-002	INF	Procurement	Payment Bond	☒	N/A
	40315-631-P2-003	INF	Procurement	PLA Letter of Assent	☒	N/A
	40315-631-P2-004	INF	Procurement	Statement of Acknowledgment	☒	N/A
	40315-631-P2-005	CFC	Procurement	Subcontracting Plan/Subcontract List	☒	50, 30, 15, 10, 5, 2 days
	40315-631-P3-001	INF	Procurement	Certified Payrolls	Monthly	N/A
	40315-631-P4-001	INF	Construction	*Entry Check List	J	N/A
	40315-631-P4-002	CFC	Engineering	Red Line Drawings	N	30 days
	40315-631-P4-003	INF	Construction	List of Contractor's Tools and Equipment	L	N/A
	40315-631-P4-004	INF	Procurement	Invoices	Monthly	N/A
	40315-631-P4-005	INF	Construction	*Daily Reports	Daily	N/A
	40315-631-P4-006	INF	Construction	*Contractor Termination Check List	V	N/A
	40315-631-P4-007	INF	Construction	Fuel Storage Tank	K	N/A
	40315-631-P4-008	INF	Construction	Fastener Quality Act	R	N/A

- A = 15 days prior to notice to proceed  
 B = 30 days from notice to proceed  
 C = 90 days from notice to proceed  
 D = 30 days prior to start of the activity  
 E = Prior to start of activity  
 F = Prior to purchase  
 G = 30 days after preliminary design  
 H = 90 days prior to start of construction  
 I = 30 days prior to start of construction  
 J = 5 days prior to site access  
 K = 2 days prior to entry  
 L = 10 days prior to bringing on site  
 M = 10 days after completion of activity  
 N = 20 days after completion of activity  
 O = 60 days prior to turnover to start-up  
 P = 30 days prior to turnover to start-up  
 Q = 20 days prior to readiness review  
 R = Upon completion of project  
 S = 2 days prior to site access  
 T = 10 days after notice to proceed  
 U = 60 days prior to scheduled use  
 V = Prior to leaving FEMP

\* Submitted directly to the FDF CCM

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EXHIBIT 6.2  
CONTRACTOR SUBMITTAL REGISTER  
(continued)

Submittal Due Dates

Contract No. _____	A = 15 days prior to notice to proceed B = 30 days from notice to proceed C = 90 days from notice to proceed D = 30 days prior to start of the activity E = Prior to start of activity F = Prior to Purchase G = 30 days after preliminary design H = 90 days prior to start of construction I = 30 days prior to start of construction J = 5 days prior to site access K = 2 days prior to entry	L = 10 days prior to bringing on site M = 10 days after completion of activity N = 20 days after completion of activity O = 60 days prior to turnover to start-up P = 30 days prior to turnover to start-up Q = 20 days prior to readiness review R = Upon completion of project S = 2 days prior to site access T = 10 days after notice to proceed U = 60 days prior to scheduled use V = Prior to leaving FEMP
Contract Title _____		
Contractor _____		
* Submitted directly to the FDF CCM		

Submittal No. (1)	Submittal Type (2)	Document Family (3)	Document Description (4)	Submittal Due Date (5)	FDF Review (6)
40315-631-P8-001	INF	Procurement	* Project Schedule Updates	Monthly	N/A
40315-631-P8-002	INF	Procurement	Baseline Schedule	T	10 Days
40315-631-P8-003	INF	Construction	Submittal Register	T	N/A
40315-631-P8-004	CFC	Construction	Fugitive Dust Control Plan	I	30 Days
40315-631-P8-005	CFC	Construction	Safe Work Plan(s)	D	30 Days
40315-631-P8-006	INF	Construction	4 Week Rolling Schedule	Weekly	N/A
40315-631-P8-007	CFC	Construction	Pay Item Schedule	T	30 Days
40315-631-P7-001	CFC	Engineering	Technical Submittals	F	10 Days
<del>40315-631-P7-001</del>	<del>CEQ</del>	<del>HEALTH AND SAFETY</del>	<del>HAZARDOUS WASTE</del>	<del>D</del>	<del>NO DAYS</del>
40315-631-P8-001	INF	Health and Safety	Substance Abuse Plan	E	N/A
40315-631-P8-002	INF	Health and Safety	Daily Safety Briefing	Daily	N/A
40315-631-P8-003	CFC	Health and Safety	Contractor's Health and Safety Program	A	30 Days
40315-631-P8-004	INF	Health and Safety	Certification of Training	E	N/A
40315-631-P8-005	INF	Health and Safety	Request for Access	J	N/A
<del>40315-631-P8-006</del>	<del>CEQ</del>	<del>HEALTH AND SAFETY</del>	<del>PROTECTIVE EQUIPMENT</del>	<del>I</del>	<del>NO DAYS</del>

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EXHIBIT 6.2  
CONTRACTOR SUBMITTAL REGISTER  
(continued)

Submittal Due Dates

- L = 10 days prior to bringing on site
- M = 10 days after completion of activity
- N = 20 days after completion of activity
- O = 60 days prior to turnover to start-up
- P = 30 days prior to turnover to start-up
- Q = 20 days prior to readiness review
- R = Upon completion of project
- S = 2 days prior to site access
- T = 10 days after notice to proceed
- U = 60 days prior to scheduled use
- V = Prior to leaving FEMP

- A = 15 days prior to notice to proceed
- B = 30 days from notice to proceed
- C = 90 days from notice to proceed
- D = 30 days prior to start of the activity
- E = Prior to start of activity
- F = Prior to Purchase
- G = 30 days after preliminary design
- H = 90 days prior to start of construction
- I = 30 days prior to start of construction
- J = 5 days prior to site access
- K = 2 days prior to entry

Contract No. \_\_\_\_\_  
Contract Title \_\_\_\_\_  
Contractor \_\_\_\_\_

\* Submitted directly to the FDF CCM

Submittal No. (1)	Submittal Type (2)	Document Family (3)	Document Description (4)	Submittal Due Date (5)	FDF Review (6)
40315-631-P8-007	INF	Health and Safety	Monthly Manpower Report	Monthly	N/A
40315-631-P8-008	CFC	Health and Safety	Hazardous Chemical List	I	30 Days
40315-631-P8-009	CFC	Health and Safety	Lifting Plan	E	10 Days
40315-631-P8-010	INF	Health and Safety	Mobile Cranes/Boom Truck Inspection Report	R	N/A
40315-631-P8-011	INF	Health and Safety	Form FS-F-5077 Scaffold Inspection Check List	R	N/A
40315-631-P8-012	INF	Health and Safety	Form FS-F-4932 Full Body Harness & Lanyard Inspection Sheet	R	N/A
40315-631-P8-013	CFC	Health and Safety	Fall Protection Equipment Training Certificates	D	30 Days
40315-631-P8-014	INF	Health and Safety	Aerial Lifts, Vehicular Mounted Elevating and Rotating Platforms, etc. Operators Safety Instruction Documentation.	R	N/A
40315-631-P8-015	INF	Health and Safety	Motorized Equipment Daily Inspection Documents	R	N/A
40315-631-P8-016	INF	Health and Safety	Excavation Entry and Daily Inspection Records	R	N/A
40315-631-P8-001	CFC	Quality	Quality Assurance Plan	B	30 days

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EXHIBIT 6.3  
FOUR WEEK SCHEDULE

SILOS INFRASTRUCTURE PROJECT		YEAR 19							
Contractor		MONTH							
ACTIVITY NUMBER	ACTIVITY DESCRIPTION	FOREMAN	WEEK	LAST WEEK	THIS WEEK	NEXT WEEK	SECOND WEEK	REMARKS	
			DATE	DATE	DATE	DATE			
			S	M	T	W	T	F	
			S	M	T	W	T	F	
	SCH. BAR								
	CRAFT QTY.								
	SCH. BAR								
	CRAFT QTY.								
	SCH. BAR								
	CRAFT QTY.								
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	CRAFT QTY.								
	SCH. BAR								
	CRAFT QTY.								

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EXHIBIT 6.4  
FUGITIVE DUST CONTROL REQUIREMENTS

**1.0 FUGITIVE DUST CONTROL PLAN**

- 1.1** The Contractor shall develop a Dust Control plan based on the requirements stated in this document for controlling fugitive dust emissions and ensuring compliance with standards and site-specific limits defined in this document.
- 1.2** The Contractor shall submit the Dust Control Plan to Fluor Daniel Fernald for compliance review. This plan shall be part of the "Safe Work Plan" (reference *ACR-002* listed in *Part 7 - Section 2.1*). The Dust Control Plan shall demonstrate the Contractor's understanding of the importance of dust suppression on this project. It shall be adequate for all work areas. FDF's compliance review of this plan does not relieve the Contractor of any responsibilities regarding the suppression of dust under the terms of this subcontract. This plan shall include but not be limited to the following:
- A listing of specific types and quantities of equipment to be used to suppress dust.
  - A listing of proposed methods and materials that will be used to proactively suppress dust and the frequency that routine dust suppression is to take place.
  - A narrative description of how the Contractor field personnel will implement the Dust Control Plan and how they will monitor for excessive or visible dust, including how records will be kept and where they will be maintained.
  - A description of the notification process that the Contractor intends for FDF to utilize during non-work periods to inform the Contractor of a Dust Alert.

**2.0 FUGITIVE DUST CONTROL REQUIREMENTS**

- 2.1** The Contractor shall proactively suppress dust releases from each field activity by applying Best Available Technology (BAT) dust control, such as the application of water, dust suppression agents, or other appropriate methods approved by appropriate FDF personnel and/or implementing BAT work practices at the beginning and during each field activity.
- Project field activities shall be continuously monitored by the Contractor for visible emissions.

**EXHIBIT 6.4  
FUGITIVE DUST CONTROL REQUIREMENTS  
(continued)**

- FDF will provide Opacity monitoring for each project and forward the information to the Contractor.
  - All dust-generating field activities in an observed area shall cease immediately if a fugitive dust limit is exceeded. An increase in BAT dust controls and/or work practices shall be implemented to bring the fugitive dust emissions below the limit during dust-generating activities (including wind erosion). Work shall not be restarted until FDF is completely satisfied that the method to suppress the fugitive dust has been executed by the Contractor.
- 2.2** The Contractor shall have personnel on-call as defined in the plan during non-work periods seven (7) days per week (including holidays) to respond to an off hours dust alert. The Contractor shall provide a list of his personnel that will be on-call during non-work periods. Dust suppression is to begin no more than two (2) hours after notification by FDF during non-work periods.
- The Contractor shall apply enough BAT dust control material to bring the fugitive dust emissions below the standard or site-specific limit during dust-generating activities (e.g. wind erosion).
  - The Contractor shall not leave the site without FDF concurrence that sufficient controls are in place.

**2.3** Activities May Include

Some of the activities which may require dust suppression are as follows:

- Hauling material and equipment;
- Vehicle and equipment traffic;
- Excavation;
- Trenching;
- Loading/Unloading;
- Transportation to Defined Roadway (paved or unpaved);
- Load-in/Load-out on Storage Piles;
- Materials Placement into Onsite Disposal Cell;
- Vehicle Traffic on Storage Piles; and
- Wind Erosion from Working Faces.

EXHIBIT 6.4  
FUGITIVE DUST CONTROL REQUIREMENTS  
(continued)

2.4 Definitions

***Paved Roadway or Paved Parking Area:*** a predetermined area designed and improved specifically for vehicle traffic. Improvements to the predetermined area are the application of materials such as asphalt or concrete that forms a firm level surface for travel.

***Unpaved Roadway or Unpaved Parking Area:*** a predetermined area designed and improved specifically for vehicle traffic. Improvements to the predetermined area include the application of gravel, shredded shingles, cinders, compaction, etc. to the delineated area.

***Wind Erosion of Storage Piles:*** fugitive emissions from storage piles strictly created by the wind (and not by material handling equipment or vehicle traffic).

***Visible Particulate (Fugitive) Emissions:*** visible airborne particulate that are generated from the operation of heavy equipment, equipment wheels or tracks, any tools, or vehicle wheels. Visible particulate emissions are also those generated by wind erosion. [Regulatory methods that will be used for visual determination of fugitive emissions are 40 CFR 60 Appendix A, Method 9 (used by FDF); "Visual Determination of Opacity of Emissions from Stationary Sources;" and, Method 22 (used by the Contractor) "Visual Determination of Fugitive Emissions from Materials Sources and Smoke Emission from Flares".]

***Material Handling/Vehicle Traffic on Storage Piles:*** includes activities such as loading in and loading out of materials, excavation, and vehicle traffic on storage piles. Fugitive emissions created by the above activities on storage piles shall be subjected to the standard defined in this section. Fugitive emissions that can not be distinguished between material handling activities and wind erosion will be also subjected to the standard defined in this section.

2.5 Site-Specific Limit

The Contractor shall apply the following site-specific limits:

- Visible particulate emissions from any paved roadway or paved parking area shall not exceed one minute during any sixty-minute observation period.

**EXHIBIT 6.4**  
**FUGITIVE DUST CONTROL REQUIREMENTS**  
(continued)

- Visible particulate emissions from any unpaved roadway, unpaved parking area, project field activities, or wind erosion from storage piles shall not exceed three minutes during any sixty-minute observation period.
- Verification of compliance with this limit shall be performed using 40 CFR Part 60 Appendix A, Method 22 "Visual Determination of Fugitive Emissions from Materials Sources and Smoke Emissions from Flares."

**2.6 Actions**

The Contractor shall apply the following:

- At the start of each day and periodically during the day, project personnel (FDF and Contractor) shall tour paved and unpaved roads, paved and unpaved parking areas, storage piles, and project field activities taking place and proactively apply BAT fugitive dust controls and/or work practices to minimize dust generation.
- Before fugitive emissions are visible, BAT dust controls and/or work practices must be implemented or increased.
- If the limit is exceeded, all mechanical dust-generating activities such as traffic on roadway in the observed area must cease immediately. An increase of BAT dust controls and/or work practices shall be implemented to bring the fugitive emissions to, at a minimum, below the limit during dust-generating activities (including wind erosion).

**2.7 BAT Dust Controls/Work Practices**

The Contractor shall implement the following BAT Dust Control/Work Practices as applicable:

- Seal off work areas, stock piles, working piles, etc. before the end of each shift.

EXHIBIT 6.4  
FUGITIVE DUST CONTROL REQUIREMENTS  
(continued)

- In dry conditions, initiate dust control before each work shift and during lunch breaks.
- Wet sweep or otherwise remove any clods, clumps, tracks, or visible deposits of soil or mud from paved roadways or paved parking areas, applying appropriate dust control measures to suppress the generation of visible dust that may result from the sweeping or removal process.
- Remove, as practical, any clods, clumps, tracks, or visible deposits of soil or mud from unpaved roadways or unpaved parking areas, applying appropriate dust control measures to suppress the generation of visible dust that may result from the removal process.
- Repair or resurface roadways/parking areas as needed or use an alternative road surface as a last resort for unpaved roadways and parking areas.
- Maintain roadway shoulders.
- Minimize the amount of unnecessary traffic on roadways, parking areas and areas around field activities.
- Limit speed to 15 miles per hour operation of vehicles or equipment.
- Reduce the seed limit as required to minimize dust generation.
- Apply appropriate dust suppression agents such as water or surfactant to the materials being transported by truck load beds to ensure the transported materials will not become airborne. Soil and soil like material shall not be visible above the vehicle body.

**EXHIBIT 6.4**  
**FUGITIVE DUST CONTROL REQUIREMENTS**  
(continued)

- Cover truck load beds when transported materials are still likely to become airborne.
- Change configuration of material being transported (e.g. place less in truck).
- Minimize the height of drop during loading and unloading.
- Apply dust suppression materials approved by FDF such as water, resin, or equivalent combination of surfactant or crusting agents. .
- Cover storage piles with a tarpaulin, plastic, etc., if practical.
- Roll soils in work areas and placed in stockpiles at the end of each work day.
- For extended periods of planned inactivity, vegetate as a last resort if protective cover or periodic application of surfactant or crusting agents proves ineffective.
- Change method of excavation/transport (e.g., from a front-end loader dumping into a truck to a self-propelled pan) when feasible.
- Wheel Washing.

**3.0 TRAINING**

- 3.1 Contractor personnel shall review and understand the information contained in this document and shall be trained in the plan pertaining to an individual's responsibilities.
- 3.2 The Contractor shall designate individuals that will require the appropriate training.
- 3.3 Personnel involved in performing compliance surveillance to ensure fugitive dust emissions from project field activities are meeting fugitive dust standards or limits, must have the following FDF provided training:
  - 40 CFR 60, Appendix A, Method 22 "Visual Determination of Fugitive Emissions from Material Sources and Smoke Emission from Flares."

EXHIBIT 6.4  
FUGITIVE DUST CONTROL REQUIREMENTS  
(continued)

4.0 RECORDS

- 4.1 The Contractor shall complete a ***Control of Fugitive Dust Daily Record Form (Attachment 1)*** each time an application of dust suppression material is performed and submit the completed form(s) to FDF weekly.

Provide the following information:

- Identification of area that was treated and/or cleaned. Record using sketch on back of the form, or by attaching similar diagram at appropriate scale.
  - The date the designated area was treated and/or cleaned.
  - The manner in which the designated area was treated and/or cleaned.
  - The application rate of dust suppression material; at a minimum, the tank truck load capacity and number of truckloads applied per unit of time per area (or segment) to which applied.
  - The equipment operator (at a minimum, the name of the Contractor).
- 4.2 The Contractor shall document the "Visual Determination of Fugitive Emission" on the ***Contractor Daily Activity Report, Part 4 - Exhibit 1*** when performing visible emission monitoring for paved and unpaved roadways, paved and unpaved parking areas, and wind erosion from storage piles and submit the completed forms to FDF daily.

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SECTION 02270  
EROSION AND SEDIMENT CONTROL

## PART 1 GENERAL

## 1.1 SCOPE

- A. Soil erosion and sedimentation control for areas of the Subcontractor's work area which are graded or disturbed as a part of the contract work. For all other requirements, reference *Part 6, Statement of Work*.
- B. Installation, maintenance, and removal of all temporary erosion control facilities.
- C. Placement of dumped rock fill, erosion control blankets, and geotextile, for ditches and erosion control areas.
- D. Management of erosion and sediment control measures installed by this contract and existing erosion and sediment control measures and facilities as shown on the Contract Drawings.
- E. Control of surface water and management of ponded water in construction and excavation areas.

## 1.2 RELATED SECTIONS

- A. *Section 01010 - General Requirements.*
- B. *Section 02110 - Site Clearing.*
- C. *Section 02200 - Earthwork.*
- D. *Section 02720 - Storm Sewerage.*
- E. *Section 02900 - Seeding*

## 1.3 REFERENCE DRAWINGS

- A. See *Section 01012* for the Schedule of Drawings.

## 1.4 REFERENCES

- A. State of Ohio, Department of Transportation (ODOT):
  - 1. Construction and Material Specifications, January 1, 1997. Except as supplemented or otherwise modified herein and/or shown on the construction drawings, the entire work under this section shall be in compliance with the provisions of ODOT.
- B. State of Ohio, Department of Natural Resources (ODNR):

1. Rainwater and Land Development, Ohio's Standard Urban Stream Protection - 1996.

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

1. ASTM D1777-96 Standard Test Method for Thickness of Textile Materials.
2. ASTM D3776-96 Standard Test Method for Mass Per Unit Area (Weight) of Woven Fabric.
3. ASTM D3786-87 Standard Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics - Diaphragm Bursting.
4. ASTM D4491-95 Standard Test Method for Water Permeability of Geotextiles by Permissivity.
5. ASTM D4533-91 Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
6. ASTM D4632-91 Standard Test Method for Grab Breaking Load and Elongation of Textiles.
7. ASTM D4751-95 Standard Test Method for Determining Apparent Opening Size of Geotextile.
8. ASTM D4833-88 Standard Test Method for Index Geotextiles, Geomembranes, and Related Products.

1.5 SUBMITTALS

- A. Reference *ACR-001* for all submittal general requirements and procedures.
- B. Material suppliers shall be required to certify that supplied materials meet specifications prior to use.

1.6 QUALITY ASSURANCE PROGRAM

- A. Subcontractor shall inspect and 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 qualified representative of the Contractor and the Construction Manager:
  1. Weekly;
  2. Daily after each rain event exceeding 0.5 inches at the Fernald

3. At least daily during prolonged rainfall events 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, frequency; duration, destination of pumping ponded water, estimated quantity of ponded water and corrective action measures, if any 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 the Section.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. Stakes: ~~Stakes used with staples to fasten the matting:~~
  - Stakes shall be a minimum of 18 inches in height and 2 inches by 2 inches or more in depth and width and made from hardwood. Use 50 stakes per matting panel facing upstream at a 45° angle.
- B. Silt Fence: Materials shall be as specified in ODNR's Rainwater and Land Development and the construction drawings.
- C. Dumped Rock Fill: Dumped rock fill used for channel protection shall meet the requirements of *ODOT Item 601.07* for type specified on drawings.
- D. Non-woven geotechnical fabric used as a separator beneath dumped rock fill shall conform to *ODOT Item 712.09*, Type B.
- E. Erosion Control Blankets (Matting): The matting shall be made from 100% commercial grade Coir yarn (spun from coconut fibers) containing approximately 45% Lignin, 55% cellulose. The erosion control blanket shall be 100% biodegradable with a maximum service life expectancy of 10 years for use on slopes of 1:1 or greater and where shown on the drawings. The blanket shall have the following physical properties.
  1. Material Content
    - a. Coir Yarn: 100 percent; containing 45% Lignin, 55% Cellulose (approx.).
  2. Physical Specifications (Roll)
    - a. Weight: 83.6 lbs; 22.7 oz/sq. yd (approx).
    - b. Average Mesh: 0.4" x 0.5"
    - c. Open Area: 38% (approx)

- d. Tensile Strength: 1350 lb/ft x 626 lb/ft - Fabric  
55 lb dry, 49 lb wet - Yarn
- e. Elongation: 34% x 38% - Fabric  
29% dry, 35% wet - Yarn

F. Staples: Staples and wood stakes used to fasten the matting.

- Staples shall be made from 0.3 m (12-inch) lengths of No. 8 gage steel wire bent into narrow "U" shape with the ends of the staples approximately 25 mm (1 inch) apart. For clay, shale, and other heavy soils, a 75 mm (3 inch) steel staple, at least 9 gage with points approximately 25 mm (1 inch) apart will be used as may be required by the Engineer.

G. Seed and mulching materials shall be as specified in *Section 02900*.

H. Crusting agent shall be as approved by the Construction Manger and shall meet the following requirements:

1. The dust suppression/crusting agent shall be a pine sap emulsion comprised of 100% organic emulsion produced from naturally occurring resins (pine sap). The dust suppression/crusting agent must provide dust suppression and surface stability for exposed soils, both disturbed and undisturbed soils. The dust suppression/crusting agent shall be compatible with application via a hydro seeder, and must not require intense cleaning of equipment after application. Once cured, the dust suppression/crusting agent shall be non-tracking (i.e., will not stick to boots or tires).
2. The dust suppression/crusting agent shall not have hazardous characteristics or 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 dust suppression/crusting agent shall have a flash point greater than 200° F. The dust suppression/crusting agent shall be neither a flammable nor combustible liquid per DOT definition. The dust suppression/crusting agent must not be susceptible to significant deterioration from exposure to the elements, including sunlight.
4. Seeding shall be in accordance with *Section 02900*.

Similar products may be substituted with FDF prior approval. See *ACR-001* for all submittal general requirements and procedures.

## PART 3 EXECUTION

### 3.1 FIELD CONDITIONS

#### A. Protective Measures

1. Construct and maintain erosion and sediment control measures as specified herein, and as required on the contract drawings. Maintain existing erosion and sediment control facilities and measures in accordance with *Part 6*.
2. Silt Fence: Conform to requirements on the construction drawings and as specified in this Section.
3. Excavations shall be sloped to sumps and/or graded to drain to ditches or channels discharging to a sediment basin, sediment trap, or other locations as directed by the Construction Manager. Excavations are to be kept free of standing water.
4. As excavation progresses, excavated depressions in the excavated area to be used as temporary sumps. Water accumulated in sumps shall be pumped, via portable sump pump system and flexible hose, to the nearest ditch or channel discharging to the sediment basin or sediment trap upon approval of the Construction Manager.
5. Stabilization of disturbed areas by interim seeding or by use of a crusting agent shall be performed at completion of excavation or which are planned to be left idle for more than forty-five (45) days shall be stabilized within seven (7) days after the last activity. Soils shall be stabilized by one of the following methods as directed by the Construction Manager:
  - a. Crusting agents shall be applied in accordance with manufacturer's recommendations as specified in this Section.
  - b. Interim seeding shall be applied as specified in *Section 02900*.
6. 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 45 calendar days or more, as determined by the Construction Manager, shall be stabilized within seven (7) calendar days after last activity. Stockpiles shall be stabilized by means of a crusting agent, as specified in this Section. Slopes on pile shall not exceed 2:1 in steepness and shall be less than 15 feet in height. Pile shall be shaped with a drainage pitch of at least 2 per cent on all areas. The perimeter of the pile shall have proper sediment controls (i.e., silt fence). The subcontractors is responsible for maintaining the controls on the piles until final acceptance or disposition.
7. Pipeline installation (trenching, pipe laying, and backfill) is to be kept to 500 feet or less in length of exposed, denuded conditions. Completed, backfilled sections can be covered with mulch, temporary seed, erosion fabric, or other method as approved by FDF, prior to final cover. Proper sediment controls (i.e., silt fence, matting) shall be used at denuded trench areas. Sediment controls can be re-used, if

not disrepair.

8. In storm water ditches where the water velocity is between 2 and 3 fps erosion control blankets (matting) shall be used. Where the velocity is above 3 fps check dams shall be installed to slow the velocity and to prevent erosion. Where the velocity exceeds 4 fps, the ditch shall be lined with rock.
9. Straw bales are prohibited as sediment control devices.

**B. Silt Fences**

1. Install in accordance with ODNR and manufacturer's recommendations. Place at locations shown on drawings prior to start of earthwork.
2. Silt fence shall be constructed before up slope land disturbance begins.
3. All silt fence shall be placed as close to the contour as possible so that water will not concentrate as low points in the fence and so that small swales or depressions which may carry small concentrated flows to the silt fence are dissipated along its length.
4. To prevent water ponded by the silt fence from flowing around the ends, each end shall be constructed up slope so that the ends are at a higher elevation.
5. The minimum height of the silt fence shall be a 16 inches above the original ground surface.
6. Seams between section of silt fence shall be overlapped with the end stakes of each section wrapped together before driving into the ground.
7. Install breaks and overlaps to allow equipment access to the construction area.

**C. Erosion Control Blankets (Matting)**

1. Install in accordance with ODNR and manufacturer's recommendations. All blankets shall be properly anchored with wire staples and wood stakes in patterns and sizes recommended by manufacturer. Bury edges in 6 inches deep trench, rake area smooth, and seed.
2. Erosion control blanket shall be used on all slopes steeper than 4H:1V and at all ditch inverts, to a ditch depth of 1 foot.

**D. Check Dam**

1. The check dam shall be constructed of 4-8 inch diameter stone, place so that it completely covers the width of the channel.
2. The top of the check dam shall be constructed so that the center is approximately 6 inches lower than the outer edges, so water will flow across the center and not around the ends.
3. The maximum height of the check dam at the center of the weir shall not exceed 3 feet.
4. Spacing between dams shall be as shown on the drawings or as directed by FDF.

E. Dumped Rock Fill

- Place and maintain dumped rock fill material for rock channel protection as indicated on the Contract Drawings and in accordance with *ODOT Item 601.07* and *601.08*.

F. Crusting Agent

- 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.

### 3.2

#### ADJUSTING

- A. Sediment shall be removed and temporarily placed onto the bank of the channel, ditch, or trap to dewater and , when necessary, for sampling. Excavation, sampling and disposal of sediment shall be as specified in *Section 02200* and consistent with site regulations and Subcontract *Part 6 Scope of Work*.
- B. Remove accumulated sediment, debris, and obstructions as necessary from ditches and the channels as directed by the Construction Manager. In no case shall sediment reduce the available depth in the ditches and channels to less than one-third the depth shown on the Construction Drawings.
- C. Remove accumulated sediment form the sediment trap before available depth is reduced to one-half its design depth.
- D. Removal of Temporary Erosion Control Facilities
  - Erosion control facilities shall be removed at the direction of FDF after the disturbed areas are stabilized and established with grass or other measures approved by FDF.

END OF SECTION

**SECTION 02237  
CONTROLLED DENSITY FILL**

**PART 1 GENERAL**

**1.1 REFERENCES**

A. The following documents and others referenced therein form part of this Contract to the extent designated in this section:

1. American Society for Testing and Materials (ASTM):
  - ASTM C 33 - 93 Concrete Aggregates.
  - ASTM C 94 - 96 Ready-Mixed Concrete.
  - ASTM C 150 - 96 Portland Cement.
  - ASTM C 260 - 95 Air-Entraining Admixtures for Concrete.
  - ASTM C 618 - REV. A-96 Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
2. Code of Federal Regulations (CFR)
  - Title 40 Protection of Environment
  - Part 249 Guideline for Federal Procurement of Cement and Concrete Containing Fly Ash
3. Ohio State Department of Transportation (ODOT)
  - Construction and Material Specification, (1997)

**1.2 SUBMITTAL**

A. Approval Required

1. Fill Mix
  - Before ordering, submit fill materials, mix design, and mix proportions. Identify each material to be used in fill, including amount, by weight, to be utilized in each m<sup>3</sup> (yd<sup>3</sup>) of plastic mix.

2. Test Data

- Before mixing, submit laboratory trial batches, or field trial data, to verify mix compressive strength.

B. Approval Not Required

None

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Reference *Part 6, Section 5.1, Delivery of Contractor Furnished Material and Equipment* for all delivery, storage, and handling requirements and procedures.

1.4 SITE CONDITIONS

- A. Do not place fill mix on frozen ground or during rain.
- B. Start and maintain placement when ambient temperature is at least 1 °C (34 °F) and rising. Stop placement when ambient temperature is 3 °C (38 °F) and falling.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Cement
- ASTM C 150, Type II, low alkali.
- B. Fly Ash
- ASTM C 618, Class F in accordance with recommendations of 40 CFR 249.12 and 249.13.
- C. Aggregates
- ASTM C 33, 10 mm (3/8 inch) maximum.
- D. Air-entraining admixtures
- ASTM C 260.
- E. Mixes
- Measure and mix specified materials and deliver mixture in accordance with ASTM C 94 or WSDOT M 41-10, Section 6-02.3. Provide fill compressive strength of 345 to 690 kPa (50 to 100 psi) at 28 days.

PART 3 EXECUTION

3.1 PLACEMENT

- A. Place mixture in accordance with ASTM C 94. Discharge directly from truck by pumping or another approved method.

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- B. Place mixture on or against firm, damp surfaces which are free of frost, ice and water. Obtain required compaction of earth subsurfaces before placement. Dampen earth surfaces to receive fresh fill.
- C. To maximum extent practicable, perform placement continuously.

**3.2****PROTECTION**

- A. After placement, protect mixture from construction activities for 24 hours minimum.

**END OF SECTION**

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**SECTION 02220  
ROADWAY EXCAVATION AND EMBANKMENT**

**PART 1 GENERAL**

**1.1 REFERENCES**

A. The following documents and others referenced therein form part of this Contract to the extent designated in this section:

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

- ASTM D 653 - 97 Terminology Relating to Soil, Rock, and Contained Fluids.
- ASTM D 1556 - 90 Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
- ASTM D 1557 - 91 Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.
- ASTM D 2922 - 91 Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- ASTM D 3017 - 88 Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
- ASTM D 4253 - 93 Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.

2. Code of Federal Regulations (CFR)

- Title 29 Labor
- Part 1926 Safety and Health Regulations for Construction

3. Fluor Daniel Fernald (FDF)

- "Contractor Environmental Safety and Health Program (CESH)"

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4. Ohio Department of Transportation (ODOT)

- Construction and Material Specifications January 1, 1997

1.2 SUBMITTAL

A. Reference *Part 6, Section 10.0* for submittals *and ACR-001* for procedures.

B. Approval Required

Damage Prevention Procedure

- Before excavation, submit procedure to prevent over stressing existing structures, and interrupting existing services.

C. Approval Not Required

Competent Person

- Before excavation and in writing, submit identity of individual designated Competent Person as defined in 29 CFR 1926.650 and required by [CESH 20].

1.3 QUALITY ASSURANCE

A. Deliverable Documentation

The following documents and records, required by this section, shall be retained by FDF for documentation:

Document  
Work Permit

Radiological Work Permit

Excavation/Trenching/Penetration Permit

Confined Space/Evaluation Permit

Lockout/Tagout Permit

1.4 PERMITS

A. Obtain permits from FDF. Post before starting work under this section.

B. See Part 8 B.2.7 for permit listing and requirements.

C. See Part 6, Table 6-1 for turn around time.

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## 1.5 SITE CONDITIONS

- A. Do not place backfill and/or embankment on frozen or muddy ground. Secure subgrade approval from FDF prior to placement of embankment or backfill.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. Use materials free of frozen particles, lumps, organic matter and trash for backfill, embankment, and bedding. Materials used as backfill, embankment and bedding shall conform to ODOT 203.08.
- B. Backfill and embankment shall be obtained from excavation or locations designated or approved by FDF.
1. Backfill and embankment materials and associated items shall be defined in accordance with ODOT 203.02;
  2. Borrowed material shall conform to the requirements of ODOT 203.03; and
  3. Controlled Density Fill (CDF) may be used as common and structural backfill if approved by FDF. Reference *Section 02237*.
- C. Bedding for Utility Lines
- Sand as defined in ASTM D 653 or excavated sandy material having less than 20% gravel particles. Gravel particles shall have a maximum dimension of 12 mm (½ inch).
- D. Location Marker
- 75-mm (3-inch) wide, detectable plastic tape imprinted at maximum 1, 220-mm (4-foot) intervals with warning such as "CAUTION - BURIED INSTALLATION BELOW." "Terra Tape Sentry Line 620" with "Terra Clips," both by Reef Industries, or approved substitute.
- E. Stabilization
- Seeding and mulching materials shall be in accordance with *Section 02900*.

## PART 3 EXECUTION

### 3.1 EXCAVATION

- A. This item shall consist of all earthwork activities as described in ODOT 203.01 including excavation and backfill of utility crossings and culvert construction. Notify FDF before excavating.
- B. Locate and expose underground utilities by hand tools.
- C. If cultural properties (e.g., bones and artifacts) are encountered, stop excavation and notify FDF. Obtain approval before resuming excavation.

- D. If unexpected debris is encountered, stop excavation, clear personnel to 9.1 m (30 feet) from debris, and notify FDF. Obtain approval before resuming excavation.
- E. Excavation, embankment and backfill work shall conform to the applicable portions of ODOT 203, regardless of whether directly referenced by subsection number. Where conflict exists between this specification and ODOT then this specification shall control.
- F. Tolerances
1. Roadway Excavation and Embankment
    - Construct excavation and embankments to the contours and elevations shown on the drawings within the tolerances called for in ODOT 203.06. The top 12 inches of rock embankment shall consist of Granular Material as defined in ODOT 203.02.
  2. Excavation for Utility Trenches
    - Excavate deep enough to allow laying utility lines at line and grade shown on the drawings after placement and compaction of bedding. If excavation will be in undisturbed sand or if utility lines will be encased in concrete, excavate to line and grade shown on the drawings. Make trench wide enough to permit connection of utility lines. Excavate with near vertical sides from bottom of trench up to 300 mm (12 inches) above top of utility lines. Correct over-excavation by placing and compacting backfill. Pare holes in trench bottoms for pipe couplings so pipe will bear full length of pipe barrel or pipe section.
- G. Construction methods shall conform with ODOT 203.09. Allow concrete to achieve specified strength before placing backfill or embankment against concrete.
1. Salvage excavated soil for use as backfill and fill material. Contaminated soil can be used as backfill as long as it is in accordance with Waste Management procedures and practices;
  2. FDF will conduct in-place density tests using a nuclear density gage. Conduct operations in manner which will facilitate tests; and
  3. Dispose of contaminated soil, not used for backfill, and unearthed material/debris in accordance with the *Waste Management Plan* and ACR-007.

### 3.2 BACKFILL AND EMBANKMENT

- A. Prepare subgrade and construct embankment in accordance with ODOT 203.10 through 203.13.
- B. Remove debris and organic material from area to be backfilled. Reference *Part 6, Statement of Work and the Waste Management Plan*.

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- C. Do not backfill by sluicing or flooding unless written approval is obtained from FDF.

### 3.3 BACKFILL AND FILL - NONSTRUCTURAL

- A. Place specified common backfill and fill in even, loose layers not more than 300 mm (12 inches).
- B. Compact uniformly over full width of each layer by at least 1 pass of a vibratory-type or rammer-type compactor, pneumatic-tired roller, loader scraper wheel, grader wheel, or power roller.
- C. Mound over top layer to 25 mm (1 inch) for each 300 mm (12 inches) of backfill and fill to maximum mound height of 150 mm (6 inches).

### 3.4 BACKFILL AND FILL - UTILITY LINES

- A. Before laying utility lines, place specified bedding in a 100-mm (4-inch) layer. Compact layer uniformly to 95% of maximum density as determined by specified compaction tests.
- B. Keep trenches free of standing water during laying of utility lines.
- C. After laying utility lines, ensure that lines have been pressure tested before backfilling and filling. Place loose 200-mm (8-inch) layers of specified bedding under haunches, around sides and up to 300 mm (12 inches) above top of utility line. Compact each layer uniformly to 95% of maximum density as determined by specified compaction tests. During compaction, exercise care to avoid pipe misalignment and to provide uniform bearing along pipe barrel.
- D. Place loose 100-mm (4-inch) layers of backfill and fill in remaining trench depth. Use specified structural backfill and fill under foundations. Use specified common backfill and fill at other locations. Compact each layer uniformly to 95% of maximum density as determined by specified compaction tests.
- E. Place specified location marker continuously and directly over buried utility lines at depth of 300 mm (12 inches) below finish grade. Place marker continuously and directly over each outside line of multiple lines and if spacing between outside line markers exceeds 1200 mm (4 feet), place sufficient intermediate markers to maintain 1200 mm (4 feet) maximum spacing between adjacent markers.
- F. Prohibit passage of heavy construction equipment over buried utility lines until at least 600 mm (24 inches) of backfill and fill have been placed over lines and compacted or until bridging approved by FDF has been placed across trenching.

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### 3.5

#### FINISH GRADING AND STABILIZATION

- A. Grade each area to contours and elevations shown on the drawings.
- B. Remove surface cobbles larger than 150 mm (6 inches). Dispose of excess material and debris in accordance with the *Waste Management Plan* and *ACR-007*.
- C. Stabilize area with a 75-mm (3-inch) course of specified stabilization material. Finish stabilization course to elevations shown on the drawings.
- D. After finishing grading and stabilization, remove surface markers and flags.
- E. All slopes and disturbed areas shall be permanently seeded and mulched in accordance with *Section 02900*.
- F. The Contractor shall be required to place erosion control measures as directed by FDF. The type and location as shown on the drawings is subject to adjustment by FDF depending on field conditions. ~~Silt fences~~ shall be placed around new and existing catch basins and culvert inlets within 50 feet of road centerline and as shown on the drawings.

### 3.6

#### FIELD QUALITY CONTROL

- A. Compaction Testing
  1. Test compacted bedding, backfill, and fill at the following intervals; which, FDF will also use for testing. Conduct operations in manner conducive to sampling and testing by FDF.
    - a. Bedding: For each 76 m (250 feet) of trench or portion thereof, 1 test of each layer.
    - b. Backfill and fill: 1 test of each layer.
  2. Perform compaction testing in accordance with the following standards. Provide report required by each standard.
    - a. Compaction control: ASTM D 1557.
    - b. In-place density: ASTM D 2922.
    - c. Water content: ASTM D 3017.

END OF SECTION

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SECTION 02851  
STEEL GUARD RAIL AND GUARD POSTS

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Supply and installation of steel guardrails and steel posts.

**1.2 RELATED SECTIONS**

- A. *Section 02200 - Earthwork.*  
B. *Section 02900 - Seeding.*  
C. *Section 03001 - Concrete.*

**1.3 REFERENCE DRAWINGS**

- A. Reference *Section 01012* for the Schedule of Drawings.

**1.4 REFERENCES**

- A. 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, the entire work under this section shall be in compliance with the provisions of ODOT.

**1.5 SYSTEM DESCRIPTION**

- A. This work shall consist of the construction of guardrail and guard posts in accordance with these specifications and conformity with the lines and grades shown on the plans.

**1.6 SUBMITTALS**

- A. Reference *Part 6, Section 10.0* for submittals and *ACR-001* for procedures.

**PART 2 PRODUCTS**

## 2.1 MATERIALS

- A. Guardrail shall be deep beam rail, type 4, single face. Steel posts, rails, bolts, fittings, and other accessories shall be galvanized. Specific materials shall be as follows:

<u>Subject</u>	<u>ODOT Item No.</u>
Deep beam rail and hardware	710.06
Galvanizing	711.02
Steel guardrail posts	710.15

- B. Guard Posts: Steel pipe, ASTM A53, Schedule 40.

## PART 3 EXECUTION

### 3.1 GENERAL

- A. Guardrail shall be installed in accordance with ODOT Item 606.

### 3.2 ERECTION/INSTALLATION/APPLICATION

- A. Setting Guard Rail Posts

1. A power auger shall be used to drill post holes;
2. Posts shall be set plumb in holes;
3. After posts are set, the holes shall be backfilled in 4-inch layers and well tamped; and
4. Posts shall be spaced 12 feet, 6 inches on centers measured along the centerline of the rail. Guardrail shall be constructed with flared end section at each end.

- B. Erecting Rail Elements

- Rail elements shall be erected in a manner resulting in a smooth, continuous installation. All bolts shall be drawn tight. Bolts shall be sufficiently long to extend at least 1.4 inch beyond the nuts. All metal shall be fabricated in the shop. No burning or welding shall be done in the field. Field punching, cutting, and drilling may be permitted if approved by FDF after it has been demonstrated that it will not result in damage to the surrounding metal. Galvanized surfaces which have been abraded so that the base metal is exposed, threaded portions of all fittings and fasteners, and cut ends of bolts shall be given a field coat of compatible galvanizing compound.

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**C. Installation guard post**

1. Excavate for post and concrete in accordance with *Section 02200*;
2. Hand trim and remove loose material in excavation;
3. Position pipe in hole, maintaining clearances as specified on drawings;
4. Place concrete around and in pipe in accordance with *Section 03001*;  
and
5. Paint post after concrete cures in accordance with ODOT Item 514.

**END OF SECTION**

SECTION 01010  
GENERAL REQUIREMENTS

**PART 1 GENERAL**

**1.1 SCOPE**

- A. These general requirements form a part of the technical divisions of these specifications. For all other requirements, reference *Part 6, Statement of Work*.
- B. In all cases where the words "A/E Subcontractor" appear in these specifications, it shall be understood to refer to Fluor Daniel Fernald (FDF) or to such other individuals or organizations acting within the scope of the specific duties entrusted to them.
- C. In all cases where the term "Vendor," "Seller," "Manufacturer," "Offeror," or similar term appears in these specifications or in the appendices to these specifications, they shall be understood to refer to an individual or firm(s) providing materials, equipment, and services, as noted, under a subcontract to FDF.
- D. In all cases where the words "Owner's Agent" or "Construction Manager" appear, they shall be understood to refer to FDF.
- E. All work shall be accomplished in accordance with the following code requirements:
  - 1. Ohio Basic Building Code (OBBC) 1995.
  - 2. Uniform Building Code (UBC) 1994.
  - 3. Code for Safety to Life from Fire in Buildings and Structures (NFPA 101, Life Safety Code) 1994.

**1.2 SITE AND SCOPE**

- A. The intent of these specifications is to provide the technical information required and to perform and complete the work required by the Contractor.
- B. The Contractor shall provide all labor, services, materials, and equipment, and perform the work necessary to accomplish this within the limits of work as defined in the Contract.
- C. Environmental Conditions
  - 1. Environment
    - a. Outdoor, low-level radioactive, contaminated area.

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2. Plant Condition
  - a. Location: Fernald, Ohio.
  - b. Elevation: 578 feet above Mean Sea Level (MSL).
  - c. Ambient Temperature: -10 to 110 degrees Fahrenheit (F).
  - d. Barometric Pressure: 29.31 inches Hg. Absolute (mean at 70 degrees F).
  - e. Relative humidity: 20 to 90 percent.

### 1.3 LIST OF MATERIALS, MANUFACTURERS, OR EQUIPMENT SUPPLIERS

- A. The listing of materials, equipment, manufacturers, or equipment suppliers in these specifications in no way precludes the Offerer from proposing alternate materials, equipment, manufacturers, or equipment suppliers for any of the items to be furnished within the scope of these specifications, except where specifically precluded by these specifications. These lists are intended to identify the types and general quality of those items that shall be included in the Offerer's proposal. The Offerer shall be responsible for proposing the materials, manufacturers, or equipment which is best suited for this project in terms of quality and price.

### 1.4 SUBMITTAL

- A. Reference *Part 6, Section 10.0* for submittals and *ACR-001* for procedures.

### 1.5 REFERENCE DRAWINGS

- A. Each publication listed in the technical specifications shall be the latest revision and addendum in effect at the time of Contract and specification issuance unless notified otherwise. Except as modified herein or on drawing details, work included in this specification shall conform to the applicable provisions of these publications.

### 1.6 SPECIFICATION EXPLANATION

- A. General

The technical specifications are the abbreviated, simplified, or streamlined type and include incomplete sentences. Omissions of words or phrases such as "the Contractor shall," "in conformity therewith," "shall be," "as noted on the drawings," "according to the plans," "a," "the," and "all" are intentional. Omitted words or phrases are supplied by inference in the same manner as they are when a "note" occurs on the drawings.

The Contractor shall provide all items, articles, materials, operations, or methods listed, mentioned, or scheduled either on the drawings, or specified herein, or both, including all labor, materials, equipment, and incidentals necessary and required for their completion and installation.

For convenience of reference and to facilitate the letting of contracts, the specifications may be separated into titled divisions. Such separations, however, shall not operate to make the A/E Subcontractor an arbitrator to

establish the limits of subcontracts in any manner. The following defines the separations referred to in the specifications:

1. Division Divisions (broad) of specifications (e.g., Div.16);
2. Section Sections (specific) of a division (e.g., Sec. 16020); and
3. Article Articles of a subsection (e.g., Article 2.1).

#### B. Definitions

Certain terms and words as used throughout the specifications shall be defined as follows, unless otherwise particularly specified:

1. *Provide* Furnish and install complete, in place;
2. *Indicated* As shown on the drawings and/or specified;
3. *Directed* Shall be as directed, authorized, or permitted by FDF;  
*Authorized*  
*Permitted*
4. *Selected* Shall be as selected by FDF;
5. *Satisfactory* Satisfactory or acceptable to FDF;  
*Acceptable*
6. *Necessary* As necessary, required, or suitable for the intended  
*Required* purpose as determined by FDF; and  
*Suitable*
7. *Submit* Submit to FDF unless otherwise specified.

### 1.7 QUALITY ASSURANCE

#### A. Testing

1. Use instruments which bear valid calibration stamps showing dates of calibration and expiration dates of stamps. Calibration and accuracy of test instruments shall be certified by an independent testing laboratory, having standards traceable to National Institute of Standards and Technology.

#### B. Perform work in accordance with ODOT Standard Specifications, except as modified specifically otherwise herein.

- Maintain a copy of the ODOT Standard Specifications in the field office of the Contractor for use by FDF, as well as by the Contractor and the Contractor's employees. Do not remove from the field office.

#### C. The Contractor shall notify FDF at least 24 hours prior to date of anticipated inspection.

#### D. The Contractor shall identify Section 7 Division inspection, testing, and documentation requirements as required by *Part 9, Quality Assurance Requirements*.

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## 1.8

**ABBREVIATIONS OF REFERENCED STANDARDS AND SPECIFICATIONS**

- A. The following list denotes abbreviations used in the technical portions of these specifications:

<u>Abbreviation</u>	<u>Authority</u>
AASHTO	American Associations of State Highway & Transport.
ACI	American Concrete Institute
AGC	Associated General Contractors of America
AISC	American Institute of Steel Construction
AISI	American Iron And Steel Institute
ANSI	American National Standards Institute
APA	American Plywood Association
API	American Petroleum Institute
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWPA	American Wood Preserver's Association
AWS	American Welding Society
AWWA	American Water Works Association
CAT	Construction Acceptance Test
CESH	Contractor Environmental Safety and Health Program
CFC	Certified for Construction
CFR	Code of Federal Regulations
FM	Factory Mutual System
FS	Federal Specifications
IEEE	Institute of Electrical and Electronics Engineers
IFB	Invitation for Bid
IMIAC	International Masonry Industry All-Weather Council
MSL	Mean Sea Level
NCMA	National Concrete Masonry Association
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code
NETA	International Electrical Testing Association
NFPA	National Fire Protection Association
NIST	National Institute of Science and Technology
ODNR	Ohio Department of Natural Resources
ODOT	Ohio Department of Transportation
OMUTCD	Ohio Manual of Uniform Traffic Control Devices
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
UL	Underwriters Laboratories
USQ	Unreviewed Safety Question

**END OF SECTION**

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SECTION 02050  
DEMOLITION**PART 1 GENERAL****1.1 REFERENCES**

Not Used

**1.2 SUBMITTALS****A. Approval Required****Demolition and Salvage Plans**

- Before demolition, submit Safe Work Plans for accomplishment of work. Procedures shall provide for safe conduct of work; careful removal and disposition of materials specified to be salvaged; handling of recyclable materials in accordance with *Part 6, Safe Work Plans 3.7.1.* and the Waste Management Plan; protection of property to remain undisturbed; coordination with other work in progress; and, timely disconnection of affected services. Include detailed descriptions of methods and equipment to be used for each operation, and sequence of operations.

**B. Approval Not Required**

None

**1.3 PERMITS**

- A.** Obtain permits from FDF. Post before starting the work within this section:
- B.** See Part 8, B.2.7 for permit listing and requirements.
- C.** See Part 6, Table 6-1 for turn around time.

**PART 2 PRODUCTS**

Not Used

**PART 3 EXECUTION**

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### **3.1 EXAMINATION**

- A. Before beginning cutting or demolition, survey existing work and examine the drawings and specifications to determine extent of work. Coordinate work within this section with other work.

### **3.2 PREPARATION**

- A. Personnel Protection
- Personnel protection is provided per the Work Permit in accordance with SPR 2-8. It designates safeguards, including warning signs, barricades, temporary closures, and personnel equipment required for protection of construction personnel and others during demolition and removal operations.
- B. Property Protection
- Take precautions to prevent damage to existing work and equipment that will remain in place, be reused, or remain U.S. Government property.
- C. Ensure that structural elements are not overloaded as a result of cutting, removal, or demolition. Construct and maintain shoring, bracing, and supports as required.
- D. Disconnect existing affected services as directed by FDF and in compliance with the Lockout/Tagout Permit and procedures.

### **3.3 PERFORMANCE**

- A. Perform demolition work in accordance with approved procedures.
- B. Drainage Structures, Fences and Misc. Items
- Remove existing structures, curbs, gutters and other items indicated.
- C. Remove portions of existing facilities as shown on the drawings and, subject to approval by FDF, as necessary to facilitate new or re-construction.
- D. Notify FDF before oxy-fuel cutting in accordance with the Open Flame and Welding Permit.
- E. Removal of Utilities
- Remove existing utilities shown on the drawings. If utility lines not shown on the drawings are encountered, proceed as directed by FDF.
- F. Control amount of dust resulting from demolition to prevent spread of dust and avoid creation of dust in surrounding area in accordance with Part 6, Exhibit 6.4.
- G. Prevent the spread of dust from contaminated areas.

## H. Salvage

1. Title to salvageable materials and equipment to be demolished is vested in the U.S. Government. Remove salvageable materials and equipment as directed by FDF.
2. Store reusable salvage (material and equipment) as directed by FDF. If salvaged material is to be reused in work covered by specifications, repair and refinish, as required, before reuse.
3. Salvage the following materials:
  - a. Structural steel;
  - b. Gratings; and
  - c. Electrical panels.
4. Unsalvageable Materials
  - Dispose of nonrecyclable concrete, masonry, and other combustible and noncombustible materials (other than concrete permitted to remain in place), in accordance with the Waste Management Plan.

## 3.4 CLEANING

- A. Dispose of debris in accordance with *ACR-007 and the Waste Management Plan*.

END OF SECTION

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SECTION 01012  
SCHEDULE OF DRAWINGS

1.1 DRAWINGS

- A. Procurement and construction of the infrastructure road, and electrical power transmission and signal distribution may be conducted through multiple contracts. The following drawings constitute the overall design and will be made part of individual contracts, as appropriate.

<u>Drawing Number</u>	<u>Drawing Title</u>	
1)	94X-6100-X-02208	Title Sheet (vicinity map and drawing list)
2)	94X-6100-G-02209	Site Plan & Gen. Notes
3)	94X-6100-G-02210	Plan & Profile
4)	94X-6100-G-02211	Plan & Profile
5)	94X-6100-G-02212	Plan & Profile
6)	94X-6100-G-02213	X-Sections
7)	94X-6100-G-02214	X-Sections
8)	94X-6100-G-02215	X-Sections
7)	94X-6100-G-02216	X-Sections
8)	94X-6100-G-02217	X-Sections
9)	94X-6100-G-02218	Typical Roadway Section and Drainage Details
10)	94X-6100-G-02219	Intersection Details
11)	94X-6100-G-02220	Signing and Pavement Marking
12)	94X-6100-G-02221	Temporary Erosion Control
13)	94X-6100-E-02222	Existing Overhead Utilities - Silo Infrastructure - Feeder Modifications
14)	94X-6100-E-02223	Existing Overhead Utilities - Silo Infrastructure - Site Plan (Demolition)
15)	94X-6100-E-02224	Existing Overhead Utilities - Silo Infrastructure - Site Plan (Modifications)
16)	94X-6100-E-02225	Existing Overhead Utilities - Silo Infrastructure - Enlarge Plan (Plan and Details)
17)	94X-6100-E-02226	Existing Overhead Utilities - Silo Infrastructure - Pole Elevations
18)	94X-6100-E-02227	Existing Overhead Utilities - Silo Infrastructure - Pole Elevations
19)	94X-6100-E-02228	Existing Overhead Utilities - Silo Infrastructure - Pole Elevations
20)	94X-6100-E-02229	Existing Overhead Utilities - Silo Infrastructure - Site Plan (Demolition)
21)	94X-6100-E-02230	Existing Overhead Utilities - Silo Infrastructure - Site Plan (Modifications)

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- |     |                  |  |
|-----|------------------|--|
| 22) | 94X-6100-E-02231 | Existing Overhead Utilities - Silo Infrastructure - Pole Elevations  |
| 23) | 94X-6100-E-02232 | Existing Overhead Utilities - Silo Infrastructure - Pole Elevations  |
| 24) | 94X-6100-E-02233 | Existing Overhead Utilities - Silo Infrastructure - Pole Elevations  |
| 25) | 94X-6100-E-02234 | Existing Overhead Utilities - Silo Infrastructure - Pole Elevations  |
| 26) | 94X-6100-E-02235 | Existing Overhead Utilities - Silo Infrastructure - Miscellaneous Details                                    |
| 27) | 94X-6100-E-02236 | Existing Overhead Utilities - Silo Infrastructure - Below Grade Duct Banks (Miscellaneous Details)           |
| 28) | 94X-6100-E-02237 | Existing Overhead Utilities - Silo Infrastructure - Below Grade Duct Banks (Miscellaneous Details)           |
| 29) | 94X-6100-E-02238 | Existing Overhead Utilities - Silo Infrastructure - 34.5KV Overhead Utilities (Pole & 1000 KVA Xfmr Details) |
| 30) | 94X-6100-E-02239 | Existing Overhead Utilities - Silo Infrastructure - Below Grade Duct Banks (Typical Details)                 |
| 31) | 94X-6100-E-02240 | Existing Overhead Utilities - Silo Infrastructure - Roadway Lighting (Plan)                                  |
| 32) | 94X-6100-E-02241 | Existing Overhead Utilities - Silo Infrastructure - Roadway Lighting (Details)                               |
| 33) | 94X-6100-E-02242 | Existing Overhead Utilities - Silo Infrastructure - Vitrification Pilot Plant (Aerial Cable Connection)      |
| 34) | 94X-6100-G-02243 | Miscellaneous Details  |

**END OF SECTION**

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## Specification Revision Record Sheet

Project Order #

Title  
Record Sheet 1 of 2

Spec. Number	Description	Fernald Approval
02110, Rev. 1	Revised per DCN 40315-014, for OEPA comment on soil usage and height	
02200, Rev. 1	Revised per DCN 40315-014, for OEPA comment on ODOT specification date, soil height, and erosion and soil control	
02220, Rev. 1	Revised per DCN 40315-014, for OEPA comment on ODOT specification date and usage of straw bales / silt fencing	
02270, Rev. 1	Revised per DCN 40315-014, for OEPA comment on stockpiled soil material and silt fencing	
02720, Rev. 1	Revised per DCN 40315-014, for OEPA comment on ODOT specification date	
02851, Rev. 1	Revised per DCN 40315-014, for OEPA comment on ODOT specification date	
02900, Rev. 1	Revised per DCN 40315-014, for OEPA comment on soils and typographical errors	
02910, Rev. 0	New specification per DCN 40315-014, for OEPA comment on site drainage	
16370, Rev. 1	Revised typographical error	
16400, Rev.1	Revised per DCN 40315-012, for generator automatic start	
02050, Rev. 1	Revised per DCN 40315-0XX, incorporate review sheet comments and corrected grammatical errors	
02110, Rev. 2	Corrected grammatical errors	
02270, Rev. 2	Revised per DCN 40315-0XX, incorporate review sheet comments Corrected grammatical errors	
Note: Shaded areas in specification indicate current revisions (e.g., <u>date</u> )		



U.S. DEPARTMENT OF ENERGY  
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

WBS NO. 2.1.3.G.R  
TECHNICAL SPECIFICATIONS

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16370	Electrical Power Transmission	1	12/03/98
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**Silos Infrastructure Project  
Technical Specifications  
No. 40315-TS-0001**

Operable Unit 4  
WBS 2.1.3.G.R  
DOE Project No. 40315  
January 19, 1999  
REV 2



acting under Contract No. DE-AC24-92OR21972 with  
the United States Department of Energy

Construction work located at The Department of Energy's  
Fernald Environmental Management Project  
Fernald, Hamilton County, Ohio

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U.S. DEPARTMENT OF ENERGY  
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

DOE Project No. 40315

Silos Infrastructure Project  
Technical Specifications No. 40315-TS-0001

APPROVAL SHEET

Prepared by:

Jay Thompson 1/19/99  
Date

Approved by:

JL Stuart 1/19/99  
Date

SECTION 02110  
SITE CLEARING

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Removal of surface debris.
- B. Clearing of site plant life and grass, where it affects construction only.
- C. Removal of fencing.
- D. Removal of only designated underground and aboveground utilities.

**1.2 RELATED SECTIONS**

- A. *Section 02200 - Earthworks.*
- B. *Section 02900 - Seeding.*

**1.3 REFERENCE DRAWINGS**

- A. Reference *Section 01012* for the Schedule of Drawings.

**PART 2 PRODUCTS**

Not used.

**PART 3 EXECUTION**

**3.1 PREPARATION**

- A. Verify that existing utilities designated to remain are staked, flagged, and identified.
- B. Verify that existing utilities have been properly isolated and deenergized prior to commencement of work on that system. FDF will verify with Contractor that the system has been properly isolated and deenergized.
- C. Where possible, prior to any site clearing activities, erosion control measures (silt fences, check dams, matting, etc.) shall be in place.

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### 3.2

## ERECTION/INSTALLATION/APPLICATION

### A. Clearing

1. Clear only areas required for access to site and execution of work. Obtain written approval of clearing limits from FDF; and
2. Clear undergrowth and dead wood without disturbing subsoil; and
3. Provide dust control using clean, potable water to the satisfaction of FDF. (Reference Part 6 - Dust Control Plan)

### B. Removal

1. Remove debris, rock, and extracted plant life;
2. Remove existing fence as necessary for construction, as directed by FDF. Stockpile fence in a tied roll, and stack posts in a neat pile at location on site determined by FDF; and
3. All excess debris, waste generated, surplus soil, and contaminated material encountered as a result of the work shall be containerized or stockpiled by the Contractor as described in the *Waste Management Plan*.

### C. Utilities

1. All utilities identified on plans are to be removed. This is to include all excavation, line removal including valves, and backfill;
2. At the end of all utility lines removed, the pipe remaining is to be properly end plugged with similar pipe materials in accordance with drawing details; and
3. Excavation is to be backfilled and compacted to grade in accordance with *Section 02200*. Soil material from other excavations within the Silos Infrastructure Project may be used if suitable (as per *Section 02200* and the Waste Management Plan).

### D. Topsoil Excavation

1. Excavate topsoil separately from areas to be graded; and
2. Temporary stockpile in area designated on site to a height not exceeding 8 feet. Protect and cover from erosion. Remove excess topsoil, do not re-used from the stockpile, move to a site designated by FDF.

### 3.3

## PROTECTION

- A. Locate, identify, and protect from damage all utilities that remain.
- B. Protect trees, plant growth, and features designated to remain as final landscaping.

- C. Protect survey benchmarks, monitoring wells, and existing structures from damage or displacement.
- D. Construct temporary roads and maintain existing roadways at the construction site, including dust control.

**END OF SECTION**

SECTION 02200  
EARTHWORK

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Site grading.
- B. Excavating.
- C. Backfilling and compacting.
- D. Landscape grading.
- E. Redistribution of topsoil.
- F. Sampling and testing.
- G. Trenching for utilities.
- H. Soil and aggregate materials.
- I. Remove surface debris and paving.
- J. Clear and grub site affected by construction.
- K. Dust Control.

**1.2 RELATED SECTIONS**

- A. *Section 02110 - Site Clearing.*
- B. *Section 02900 - Seeding.*

**1.3 REFERENCE**

- A. American Society for Testing and Materials (ASTM)
  - ASTM C136-92 Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
  - ASTM D422-63 Standard Test Method for Particle-Size Analysis of Soils (reapproved 1990).
  - ASTM D698-91 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>) (600 kN-m/m<sup>3</sup>).

- ASTM D1556-90 Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
- ASTM D2487-92 Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
- ASTM D2922-91 Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- ASTM D3017-88 Standard Test Methods for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

B. Ohio Department of Transportation (ODOT), Construction and Materials Specifications, January 1, 1997:

- ODOT 200 Earthwork;
- ODOT 203 Roadway Excavation and Embankment;
- ODOT 207 Temporary Soil Erosion and Sediment Control; and
- ODOT 304 Aggregate Base.

**1.4 SUBMITTALS**

- A. Reference *Part 6, Section 10.0* for submittals and *ACR-001* for procedures.
- B. Material suppliers shall be required to certify that supplied materials meet specifications prior to use.
- C. Submit name and address of soil testing laboratory for approval.
- D. Dewatering plan, if needed, shall be submitted for review prior to dewatering activities.
- E. Traffic control plan with details of the type of barricades, signs, and other material to be used.

**1.5 QUALITY ASSURANCE**

- A. Unless noted otherwise, all work shall be performed in accordance with ODOT Section 200.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- A. Every effort shall be made to re-use surplus materials generated by the project before importing material from off site.

- B. Subsoil Type S1: Excavated and re-used material; graded; free of lumps larger than 3 inches, rocks larger than 2 inches and debris; and, conforming to ASTM D2487 Group Symbol CL, ML, CH.
- C. Subsoil Type S2: Imported material; graded; free of lumps larger than 3 inches, rocks larger than 2 inches and debris; and, conforming to ASTM D2487 Group Symbol CL, ML, SC.
- D. Subsoil Type S3: Excavated and re-used material; graded; free of roots, rocks larger than 1/2 inch, subsoil, debris, weeds, and foreign matter not suitable for subsequent seeding operations and maintenance; conforming to ASTM D2487 Group Symbol OH.
- E. Coarse Aggregate Type A2/Conforming to ~~ODOT Item 304~~:

- 1. The aggregate shall be crushed carbonated, crushed gravel, or other type of suitable material meeting the requirements of this item. Crushed carbonate stone or mixtures of crushed and granulated ~~admixture~~ shall meet the following gradation requirements:

Sieve	Percent Passing
2 inches	100
1 inch	70-100
3/4 inch	50-90
No. 4	30-60
No. 30	7-30
No. 200	0-13

- F. Fine Aggregate Type A3: Sand - natural river or bank sand; washed; free of silt, clay, loam, friable or soluble materials, and organic matter; graded in accordance with ASTM C136 and D2487; within the following limits:

Sieve Size	Percent Passing
No. 4	90-100
No. 30	7-40
No. 200	0-10

- G. Dust control materials shall be nonhazardous; domestic water or other materials shall be used.

**PART 3 EXECUTION**

**3.1 PREPARATION**

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- A. The Contractor shall be responsible for all earthwork layout.
- B. No backfill shall be placed around or upon any structure/foundation until it is shown that the concrete has attained satisfactory strength.
- C. Erosion and sediment control measures shall be installed in accordance with *Section 02270*.
- D. Traffic control measures shall be installed in accordance to the traffic control plan.
- E. Contractor shall clear only areas required for site access and execution of work.
- F. Removal
1. Remove debris, rock, and extracted plant life;
  2. Saw cut and remove existing pavement as indicated on drawings;
  3. Do not interfere with 45-degree bearing splay of foundations;
  4. Stockpile excess soil in the area designated on contract drawings;
  5. Perform grading and other operations to maintain site drainage. No water shall be permitted to accumulate in excavations under paving areas or equipment pads. Control water by means of ditches, dams, temporary pumps and piping, plastic coverings, tarps, or other methods; and
  6. Areas that are disturbed or that lose firmness before concrete is poured shall be undercut, backfilled, and compacted as specified in Article 3.3, Paragraph E. At the Contractor's option, a lean concrete (2,500 psi at 28 days) may be installed.
- G. Topsoil Excavation
1. ~~Remove~~ topsoil from ~~the~~ area to be excavated ~~and stockpile~~ to a height not exceeding 8 feet in the area designated ~~by EDE~~; and
  2. Protect stockpile from erosion.
- H. Trenching
1. Cut trenches sufficiently wide to enable installation of utilities and allow inspection;
  2. Hand-trim excavation and leave free of loose matter;
  3. Support pipe during placement and compaction of bedding fill; and
  4. Backfill trenches to required contours and elevations.
- I. Tracing Wire Installation
1. Install trace wire continuous over top of pipe, buried 6 inches below finish grade, above pipe line; in accordance with *Section 02220*.

**J. Filling and Backfilling for all Excavations**

1. Prepare subgrade as follows:
  - a. Compact exposed subgrade to density requirements for subsequent backfill materials; and
  - b. Cut out soft areas of subgrade not capable of in situ compaction. Backfill with Type A3 fill and compact to density equal to or greater than requirement for subsequent fill material.
2. Backfill areas to contours and elevations shown. Use unfrozen and unsaturated materials as follows:
  - a. Backfill with fill material required for specific area. Compact to density required for the area.
3. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
4. Unless noted otherwise, place and compact fill materials in continuous layers not exceeding 8 inches loose depth.
5. Employ a placement method so as not to disturb or damage foundations or utilities in trenches.
6. Maintain moisture content within  $\pm 3$  percent of optimum moisture as determined by ASTM D698.
7. Backfill against foundations and pads as specified in Article 3.2, Paragraph E.
8. Slope grade away from foundations and pads a minimum 1/4 inch per foot, unless noted otherwise.
9. Backfill simultaneously on each side of unsupported foundation walls.
10. No organic fill is to be placed below the top foot in any fill or embankment.

**K. Backfill Over Underground Utilities**

1. Initial backfill from top of bedding to 1 foot minimum above pipe, Type A3 material compacted in 6-inch layers, minimum density 95 percent Standard Proctor (ASTM D698); and
2. Final backfill Type S1 or S2, A2, or A3 from top of initial backfill to subgrade, compacted to 95 percent Standard Proctor (ASTM D968).

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**L. Placing Topsoil**

1. Clean up and restore areas disturbed by construction operations and/or previously occupied by the Contractor. Place a minimum of 4 inches to a maximum of 12 inches of compacted topsoil on all such areas for final acceptance of the project by FDF;
2. Prepare subsoil to eliminate uneven areas and low spots. Maintain lines, levels, profiles, and contours. Make changes in grade gradual. Blend slope into level areas;
3. Remove large stones, roots, grass, weeds, debris, and foreign material while spreading;
4. Roll placed topsoil; and
5. Leave stockpile area and site clean, raked, and with positive drainage, ready to be seeded.

**M. Material Stockpiles**

1. Separate differing materials with dividers, or stockpile apart to prevent mixing;
2. Direct surface water away from stockpile site to prevent erosion or deterioration of materials; and
3. Provide storm water runoff controls at pile to prevent sediment from leaving stockpile area.

**N. Dust Control**

- Provide dust control using potable water or other approved materials as per *Part 6, Exhibit 6.4*.

**O. Dewatering**

1. Should dewatering be required, a written plan of drainage procedures shall be submitted for review; and
2. Dewatering shall be achieved by gravity or by pumps. All methods shall be of sufficient capacity to keep excavations/trenches sufficiently dewatered.

**P.** Except as supplemented or otherwise modified herein and/or shown on the construction drawings, the entire work under this section shall be in compliance with the provision of DDO Items 203 and 207.

**3.2 FIELD QUALITY ASSURANCE**

- A.** Proof rolling: The existing subgrade shall be proof rolled to identify soft areas. Proof rolling shall be by a pneumatic-tired vehicle with a minimum loaded weight of 20 tons.
- B.** Compaction testing will be performed in accordance with ASTM D422.

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**C. Frequency of Tests**

1. Frequency of in-place density testing shall be derived from the following list, utilizing whichever of the following results in the greatest number of tests:
  - a. Once each day of work filling;
  - b. Once every layer of filling;
  - c. Once every 100 cubic yards of fill;
  - d. Every 2,000 square feet under paving, slab on grade; and
  - e. Under each foundation at subgrade.

**D. Minimum Compaction Requirements**

Location	Required Compaction
Under Slabs and Buildings (Fill Type A3)	100 percent Standard Proctor (ASTM D698)
Trenches	95 percent Standard Proctor (ASTM D698)
All other fill (Fill Type S1 or S2)	95 percent Standard Proctor (ASTM D698)

**3.3 ADJUSTING**

- A. Grading and filling shall be performed in accordance with the following table:

Structural Subgrade	± 1 inch
Pavement Repair	± ½ inch
General Site	± 3 inches*

- Graded to drain

- B. Tip of Topsoil
- Plus or minus 3 inches of required elevation or plane.

**3.4 CLEANING**

- A. Leave the area in a clean and neat condition. Grade and stabilize site surface to prevent freestanding surface water.

**3.5 PROTECTION**

- A. Grade excavation top perimeter to prevent surface water runoff from entering into excavation or to adjacent properties.

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- B. Protect finished work and existing features, and landscaping which will remain.
- C. Reshape and recompact fills subjected to vehicular traffic to final grade and to the compaction requirements in Article 3.2.
- D. Protect excavations by methods required to prevent cave-in or loose soil from falling into excavation.
- E. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.
- F. Provide erosion and sediment control ~~in accordance with Section 02270~~

**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. Permanent seeding;
- D. Summer seeding;
- E. Application of fertilizer; and
- F. Application of mulch and mulch binder.
- G. Application of crusting agent.

**1.2 RELATED SECTIONS AND PLANS**

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

**1.3 REFERENCES**

- A. State of Ohio, Department of Natural Resources (ODNR): Rainwater and Land Development, Ohio's Standard for Storm Water Management, Land Development, and Urban Stream Protection - 1996.
- B. Title 40, Code of Federal Regulations (CFR), Part 161, Identification and Listing of Hazardous Waste.
- C. Sitewide Excavation Plan, current revision.
- D. Land Use Authority, Master Plot, Overall Plan, current plan.

## 1.4

### SUBMITTALS

- A. Provide submittals as required in *Part 6, Section 10.0.* 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. Proposed seed mixes and application rates for seed, mulch, mulch binder, and fertilizers.
  - 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. Provide a plan showing seeding type by area (interim or permanent) and a written statement of proposed changes to seed mix and application rate of seed mix and/or associated materials (i.e., fertilizer, mulch, and mulch binder) a minimum of ten (10) calendar days before seeding. Choice of seeding type shall follow the Land Use Authority, Master Plan, Overall Plan and other pertinent project information according to when areas will be redisturbed.
- D. Submit certificate of compliance for the following within fifteen (15) calendar days before the seeding. 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.

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1.6 HEALTH AND SAFETY REQUIREMENTS

- A. Environmental Health and Safety/Training Requirements shall be as specified in *Part 8*.

PART 2 PRODUCTS

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 at least:

- 1. Annual Rye - 60 pounds pure live seed (pls)/acre
- 2. Perennial Rye - 60 pounds pls/acre

Interim seeding may be applied from October through May.

- C. For permanent seeding, the seed mixture shall be at least (all measures are pounds pls/acre):

	<u>April 15 - May 31</u>	<u>October 1 - April 4</u>
1. Canada Wild Rye	2	3
2. Little Bluestem	2	3
3. Big Bluestem	3	4
4. Indian Grass	2	3
5. Switch Grass	½	1
6. Side Oats Gramma	½	1
7. Live Oats	20	25

- D. For summer (June - September) seeding, the seeding mixture shall be at least:

- Buckwheat - 60 pounds pls/acre.

The planting of buckwheat during the summer season will be followed by either interim or permanent seeding during the next seeding window.

- E. Obtain water from the on-site sources shown on the construction drawings or specified in *Part 6, Section 6.0*, unless otherwise approved by the Construction Manager.

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**F. 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 interim seeding shall be VCOTE 34-4-14 as manufactured by George W. Hill or equal.
3. Fertilizer for permanent seeding shall be 0-12-12.

**G. 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.
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:

Item	Specification Limit
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)

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- H. Mulch binder agent shall be as approved by the FDF Construction Manager and shall meet the following requirements:
1. The mulch binder shall be a pine sap emulsion or equal comprised of a 100% organic emulsion produced from naturally occurring resins (pine sap) and be nontoxic to plants. The mulch binder shall not be comprised of chloride, lignosulfonate, 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 261, Subpart C, for a hazardous waste in either its pre-applied or cured state.
  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.
- I. 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.
- 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. Permanent seeding is required for disturbed areas and soil piles which will not be disturbed for more than two (2) years.
- D. Disturbed areas and soil piles which are scheduled to be significantly disturbed within two (2) years, are destined for the On-Site Disposal Facility (OSDF), and/or need effective erosion control immediately, are to be stabilized with use of a crusting agent as specified in *Section 02270*.

- E. Stabilization of permanent slopes exceeding 2H:1V shall utilize an erosion control blanket as specified in *Section 02270* after application of seed mixture.
- F. 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.
- G. Repeat cultivation in areas where equipment used for hauling and spreading has compacted subgrade.

### 3.2 APPLICATION

- A. Seeding seasons are as follow:
  - 1. For interim seeding, October through ~~May~~.
  - 2. For permanent seeding, April 15 through May 31, and October 1 through ~~April 4~~, each with a corresponding application rate.
  - 3. Seeding that must be done outside of the above seeding seasons shall be completed with the summer seeding mixture specified in this section. Application of summer seeding shall be followed during the next seeding season by the application of either interim or permanent seeding, as appropriate, in accordance with the general execution requirements specified in this section.
- 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.
- 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 that 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 an approximately 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 - Exhibit 6.4*.
- 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.
- G. Maintain mulching material in place with a pine sap emulsion binder or equal. Apply mulch binder according to manufacturer's directions. When using pine sap emulsion 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. Areas that become bare during June through September shall be reseeded with the summer seeding mix 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 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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SECTION 03001  
CONCRETE

## PART 1 GENERAL

## 1.1 SECTION INCLUDES

- A. Concrete work for foundations, slabs, equipment supports, and other miscellaneous concrete.
- B. Formwork and accessories.
- C. Reinforcement and accessories.
- D. Cast-in-place concrete, grout, and accessories.
- E. Finishing and curing.
- F. Sampling and testing of concrete work by an independent testing laboratory.

## 1.2 RELATED SECTIONS

- A. *Section 01010 - General Requirements.*
- B. *Section 02200 - Earthwork.*
- C. *Section 02831 - Chain Link Fence.*
- D. *Section 16170 - Grounding and Bonding.*

## 1.3 REFERENCE DRAWINGS

- A. Reference *Section 01012* for the Schedule of Drawings.

## 1.4 REFERENCES

- A. American Concrete Institute (ACI):
  - 1. ACI 301-96 Standard Specifications for Structural Concrete.
  - 2. ACI 305R-91 Hot Weather Concreting.
  - 3. ACI 306R-88 Cold Weather Concreting.
  - 4. ACI 318/318R Rev. 95 Building code Requirements for Structural Concrete.
  - 5. ACI SP-66-94 ACI Detailing Manual.

6. ACI 117-90/  
117R90 Standard Tolerances for Concrete Construction  
and Materials and Commentary.

**B. American Society for Testing and Materials (ASTM)**

1. ASTM A615/A615M  
Rev. A-96 Deformed and Plain Billet-Steel Bars for Concrete  
Reinforcement.
2. ASTM C31/  
C31M-96 Standard Practice for Making and Curing  
Concrete Test Specimens in the Field.
3. ASTM C33-93 Concrete Aggregates.
4. ASTM C39-96 Standard Test Method for Compressive Strength  
of Cylindrical Concrete Specimens.
5. ASTM C94-96 Ready Mixed Concrete.
6. ASTM C109/  
C109M-95 Standard Test Method for Compressive Strength  
of Hydraulic Cement Mortars.
7. ASTM C143  
Rev. A-90 Standard Test Method for Slump of Hydraulic  
Cement Concrete.
8. ASTM C150-96 Portland Cement.
9. ASTM C157-93 Standard Test Method for Length Change of  
Hardened Hydraulic Cement Mortar and  
Concrete.
10. ASTM C231  
Rev. B-91 Standard Test Method for Air Concrete by the  
Pressure Method.
11. ASTM C260-95 Air-Entraining Admixtures for Concrete.
12. ASTM C309-95 Liquid Membrane-Forming Compounds for Curing  
Concrete.
13. ASTM C311  
Rev. B-96 Standard Test Methods for Sampling and Testing  
Fly Ash or Natural Pozzolans for Use as a Mineral  
Admixture in Portland Cement Concrete.
14. ASTM C494-92 Chemical Admixtures for Concrete.

- 15. ASTM C618  
Rev. A-96 Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
- 16. ASTM C827  
Rev. A-95 Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens form Cementitious Mixtures.
- 17. ASTM C882-91 Standard Test for Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear.
- 18. ASTM C920-95 Elastomeric Joint Sealants.

C. U. S. Department of Commerce, Voluntary Products Standards (PS):

- PS 1-83 Plywood

1.5 SUBMITTALS

- A. Reference *Part 6, Section 10.0* for submittals and *ACR-001* for procedures.
- B. Shop Drawings
  - Indicate reinforcing bar sizes, spacings, locations, quantities, bending and cutting schedules, placing drawings, and supporting and spacing devices.
- C. Product Data
  - Concrete mix designs, including documentation of aggregate sources and most recent sieve analysis. Sieve analyses must not be older than 1 year.
- D. Concrete Supplier
  - Name and address of the transit-mix concrete supplier. Supply typical batch ticket and history per ASTM C94.
  - Submit concrete test reports per 3.3.
- E. Test Reports
  - Submit test reports to FDF for all tests required under field quality assurance.

1.6 QUALITY ASSURANCE PROGRAM

- A. ACI 301 Change to Read
- Architect/Engineer FDF
- Owner FDF

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- B. Formwork shall be in accordance with Section 2 of ACI 301, unless specified otherwise in this section.
- C. Perform concrete reinforcing work in accordance with Section 3 of ACI 301, unless specified otherwise in this specification.
- D. Perform cast-in-place concrete work in accordance with Sections 4 and 5 of ACI 301, unless specified otherwise in this section.

## 1.7

### DELIVERY, STORAGE, AND HANDLING

- A. Reference *Part 6, Section 5.1* for all delivery, storage, and handling requirements and procedures.
- B. Reinforcing bars shall be delivered to meet the construction schedule and stored as directed by the Construction Manager.
- C. Reinforcing bar tags shall be made of durable material and marked in a legible manner with waterproof markings; not less than one tag per bundle, attached by wire. Identification tags shall show the grade, number of pieces, size, and mark or length of bars.

## PART 2

### PRODUCTS

## 2.1

### MATERIALS

- A. Plywood Forms
  - Not less than 5/8 inch-thick, 5-ply Douglas fir plywood conforming to PS1, and as manufactured by a member of the American Plywood Association; B-B Plyform, Class I, Exterior-APA, with plyform faces sanded and oiled.
- B. Prefabricated Type Forms
  - Matched, tight fitting, stiffened to support weight of concrete.
- C. Form Release Agent
  - Colorless mineral oil which will not stain concrete nor impair natural bonding characteristics of subsequent coatings.
- D. Reinforcing Steel
  - ASTM A615, 60 ksi yield grade; deformed billet steel bars; plain finish.
- E. Tie Wire
  - Minimum 16-gage annealed type wire.
- F. Chairs, Bolsters, Bar Supports, Spacers
  - Sized and shaped for strength and support of reinforcement during concrete placement conditions.

- G. Fabrication
  - Fabricate concrete reinforcing in accordance with ACI SP-66 and Chapters 7 and 12 of ACI 318.
- H. Cement
  - Normal, Portland cement, conforming to requirements of ASTM C150, Type I.
- I. Fly Ash
  - Class F, conforming to requirements of ASTM C618 and ASTM C311.
- J. Admixtures
  1. Air Entrainment - conforming to ASTM C260; and
  2. Water Reducing and Retarding - Conforming to requirements of ASTM C494.
- K. Aggregates
  1. Normal Weight Concrete - Conforming to requirements of ASTM C33; and
  2. Maximum aggregate size - 1 inch.

## 2.2 ACCESSORIES

- A. Chamfer Strips
  - Chamfered, wood strip type; 3/4 by 3/4 inch size.
- B. Nails, Spikes, and Anchorages
  - Sized as required and of sufficient strength and character to maintain formwork in place while placing concrete.
- C. Form Ties
  - Removable or snap-off type; designed to prevent form deflection; of adjustable length, cone type, with waterproofing washer; and free of defects that could leave holes larger than 1 inch in concrete surface.
- D. Joint Sealer - Elastomeric joint sealant conforming to ASTM C920; Type S or Type M, Grade P, Class 25.
  1. Acceptable products and suppliers (or equal)
    - a. Sikadur 51 SL, by Sika Corp.; and
    - b. Sonolastic SI-1, by Sonneborn Building Products.
- E. Nonshrink Grout Under Equipment - Premixed compound consisting of nonmetallic aggregate, cement, water reducing and plasticizing agent; capable of developing minimum compressive strength of 7,000 psi in 28 days; conforming to ASTM C109 and ASTM C827.
  1. Acceptable products and suppliers (or equal)
    - a. Masterflow 713, by Master Builders;
    - b. SikaGrout 212, by Sika Corp.; and

- c. **Sealtight 588, by W.R. Meadows.**
- F. **Patching Grout - Premixed, nonshrink epoxy grout, capable of developing minimum compressive strength of 3,000 psi in 24 hours, conforming to ASTM C109. The grout must not shrink or expand more than 5 percent when tested in accordance with ASTM C157 and achieve a minimum bond strength of 1,200 psi in 24 hours when tested in accordance with ASTM C882.**
- G. **Bonding Agent**
  - **Polyvinyl acetate polymer or acrylic polymer, water resistant when cured.**
- H. **Curing Compound**
  - **Conforming to the requirements of ASTM C309, clear; must not impair natural bonding characteristics of subsequent coatings.**

## **2.3 FABRICATION**

### **A. General**

- **All concrete used in the work shall be composed of Portland cement, fine and coarse aggregate, and the specified admixtures. Design mixes shall be submitted to FDF for approval before any concrete is placed. Concrete for every part of the work shall be of homogeneous structure which, when hardened, will have the required strength and resistance to weathering. The proportions for all concrete shall be such as to produce a mixture which will work readily into the forms and around reinforcement with the method of placing employed on the work, but with out permitting the materials to segregate.**

### **B. Mix Proportions**

1. **The following mix designs shall be used for cast-in-place concrete.**

#### **a. Slabs**

**Specified Strength (28 days) 4,000 psi  
Total Air Content: 5 ± 1-1/2 percent  
Specified Slump: 4 inches ± 1 inch  
Maximum Aggregate Size: 1 inch  
Maximum Water/Cement Ratio: 0.35  
Water Reducing and retarding admixtures as required per  
ASTM C494.**

#### **b. Foundations**

**Specified Strength (28 days) 3,000 psi  
Total Air Content: 5 ± 1-1/2 percent  
Specified Slump: 4 inches ± 1 inch**

Maximum Aggregate Size: 1 inch  
 Maximum Water/Cement Ratio: 0.46  
 Water Reducing and retarding admixtures as required per  
 ASTM C494.

2. The work has been designed for concrete having minimum compressive strength at 28 days as determined by ASTM C39. The water/cement ratio shall be determined by consideration of the specified strength, the water reducing admixtures, the slump required for proper placement, air entraining requirements, the maximum allowable fineness modulus of the fine aggregate and its specific gravity, and the amount of water carried on the aggregates. The mix designs shall be on the aggregates. The mix designs shall be proportioned in accordance with ACI 318, Section 5.3 or Section 5.4.
3. The proportions of all materials in the concrete shall be subject to review by FDF. The Contractor shall provide all plant and equipment necessary to determine and control the actual proportions of materials entering the batch. Slumps shall be recorded for each trial batch.

**C. Water Content**

- In calculating the total water content in any mix, the amount of water carried on the aggregate shall be included. The water on the aggregate shall be determined periodically by test, and the amount of free water on the aggregate shall be subtracted from the water allowed in the mix. In all cases, the amount of water to be used shall be the minimum amount required to produce a plastic mixture of the specified strength and slump.

**D. Mixing and Delivery**

- Mixing and delivery of concrete shall be scheduled so that all concrete placing operations can be completed within 1-1/2 hours or before the drum has revolved 300 revolutions, whichever comes first, after introduction of mixing water to cement and aggregates, in accordance with Section 11 of ASTM C94. When air temperature has fallen to or is expected to fall below 40 degrees F, the recommendations for cold weather concreting contained in ACI 306R shall be followed. When the air temperature exceeds 90 degrees F, the recommendations for hot weather concreting contained in ACI 305R shall be followed.

**PART 3 EXECUTION**

**3.1 PREPARATION**

- A. Erect formwork and bracing to achieve design requirements in accordance with requirements of Section 2 of ACI 301.
  1. Provide bracing to ensure stability of formwork;
  2. Align joints and make watertight. Keep number of form joints to a minimum;

3. Provide chamfer strips on external corners of permanently exposed edges; and
  4. Shore or strengthen formwork subject to over stressing by construction loads.
- B. Application - Form Release Agent: Apply form release agent on formwork in accordance with manufacturer's instructions.
1. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items; and
  2. Keep surfaces coated prior to placement of concrete.
- C. Form cleaning: Clean and remove foreign matter within forms as erection proceeds.
1. Clean formed cavities of debris prior to placing concrete;
  2. Flush with water or use compressed air to remove remaining foreign matter;
  3. Ensure that water and debris drain to exterior; and
  4. During cold weather, remove ice and snow from within forms. Do not use de-icing salts or water to clean out forms.
- D. Tolerances: Construct formwork to maintain tolerances required by Section 2.3.
- E. Form Removal: Forms or bracing shall not be removed until concrete has gained sufficient strength to carry its own weight and imposed loads.
1. Loosen forms carefully; and
  2. Do not sedge with pry bars, hammers, or tools against finished concrete surfaces.
- F. Preparation for Grouting:
1. To ensure proper bond to concrete, all grease, oil, dirt, and other deleterious materials shall be completely removed;
  2. Roughen the surfaces by chipping, sandblasting, or another mechanical means to ensure bond of the grout to the existing concrete;
  3. After concrete surfaces have been washed clean, they shall then be saturated with water for 24 hours prior to placement of cement-based grout; and
  4. Upon completion of saturation period, excess water shall be removed prior to grouting.

### 3.2

#### ERECTION/INSTALLATION/APPLICATION

- A. Place, support, and secure reinforcement against displacement. Do not deviate from required position. Make electrical ground system connection where required by *Section 16170*.

- B. Maintain concrete cover around reinforcing according to the requirements of Section 3.3.2.3 of ACI 301 and Section 7.7 of ACI 318, and as shown on construction drawings.
- C. Provide formed openings where required for work to be embedded in concrete members.
- D. Coordinate work of other sections in forming and setting openings, slots, recesses, sleeves, bolts, anchors, and other inserts.
- E. Install concrete accessories straight, level, and plumb or as called out on the construction drawings.
- F. Place concrete continuously between forms or other limits indicated on the construction drawings.
  - 1. Place concrete in accordance with Section 5 of ACI 301 and Chapter 5 of ACI 318;
  - 2. Notify FDF a minimum of 24 hours prior to commencement of operations; and
  - 3. Ensure that reinforcement and forms are not disturbed during concrete placement.
- G. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- H. Installation of Grout:
  - 1. Follow the manufacturer's instruction for mixing, placing, and curing grout.

### 3.3

#### QUALITY CONTROL

- A. Testing: The Contractor shall pay and provide for services of an independent testing agency. The Contractor shall deliver test specimens to the testing agency. The agency shall perform field tests (take slumps, air, and cylinders) and shall perform laboratory test on the specimens. Concrete testing shall be performed in accordance with Section 1 of ACI 301 for each 50 cubic yards, or fraction thereof, of each mix design placed in any 1 day.
  - 1. Slump Tests: ASTM C143. One sample for each strength test;
  - 2. Air Content Tests: ASTM C231. One sample for each strength test;
  - 3. Test Cylinders: ASTM C31. One set of three cylinders for above quantities; and
  - 4. Compressive Strength: ASTM C39. One specimen tested at 7 days and two specimens tested at 28 days.

**3.4****PROTECTION**

- A. Provide concrete curing and protection in accordance with Section 5 of ACI 301.
  - Apply floor slab curing compound, where used, in accordance with the approved manufacturer's recommendations.
- B. Provide finishes for formed concrete surfaces as defined in Section 5 of ACI 301.
- C. Provide finishes and tolerances for slabs in accordance with Section 5 of ACI 301 and ACI 117.
  - Provide troweled finish with Class A tolerance on all exposed slabs.

**END OF SECTION**

SECTION 02910  
SODDING AND WETLAND HERBACEOUS VEGETATION

**PART 1 GENERAL**

**1.1 SCOPE**

This section includes but is not limited to:

- A. Soil preparation;
- B. Application of soil amendments;
- C. Installation;
- D. Application of mulch; and
- E. Maintenance.

**1.2 RELATED SECTIONS AND PLANS**

- A. *Section 02270 - Erosion and Sediment Control;*
- A. *Section 02900 - Seeding;*
- B. *Part 6 - Statement of Work;* and
- C. *Part 8 - Environmental Health and Safety/Training Requirements.*

**1.3 REFERENCES**

- A. State of Ohio, Department of Natural Resources (ODNR): Rainwater and Land Development, Ohio's Standard for Storm Water Management, Land Development, and Urban Stream Protection - 1996.
- B. Title 40, Code of Federal Regulations (CFR), Part 161, Identification and Listing of Hazardous Waste.
- C. Sitewide Excavation Plan, current revision.
- D. Land Use Authority, Master Plot, Overall Plan, current plan.

**1.4 SUBMITTALS**

- A. Provide submittals as required in *Part 6, Section 10.0.* 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. Proposed sod and wetland herbaceous vegetation. Application rates for mulch, mulch binder, and fertilizers.
  2. Manufacturer's product data and recommended methods of installation for sod, wetland herbaceous vegetation, and application for 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. Provide a plan showing sod and wetland herbaceous vegetation type and a written statement of proposed changes to sod, wetland herbaceous vegetation and application and/or associated materials (i.e., fertilizer, mulch, and mulch binder) a minimum of ten (10) calendar days before planting.
- D. Submit certificate of compliance for the following within fifteen (15) calendar days before installation of the sod and wetland herbaceous vegetation. Do not install until the Construction Manager has reviewed and approved the certificates.
1. Certificate stating the name of the producer, amount of sod shipped in square meters (square yards), number of wetland herbaceous plants shipped, location of sod field, location of plant nursery, date sod was cut, thickness the sod was cut, 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. Sod shall be harvested, delivered within 24 hours after being cut and shall be installed within a period of 48 hours after being cut. Sod not transplanted within this period shall be inspected and approved by FDF prior to installation.
- C. Sod shall be kept moist and covered during hauling and preparation for placement. Wetland herbaceous vegetation shall be kept moist in tray flats

~~and protected during hauling and preparation for placement.~~

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- D. Store materials in a dry ~~shaded and cool~~ area in a manner to prevent physical damage from the elements.

## 1.6 HEALTH AND SAFETY REQUIREMENTS

- A. Environmental Health and Safety/Training Requirements shall be as specified in *Part 8*.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. ~~Sod; see Section 2900, Item 2.1 Materials for acceptable grass mixtures.~~

- Sod shall be well-rooted containing a growth of not more than 30 percent of other grasses and clovers, and free from all noxious weeds such as wild mustard, thistles, quack grass, and Johnson grass, and reasonably free from dandelions and crab grass.
- B. Sod shall be recently machine cut to a uniform soil thickness of 0.75 in., plus or minus 0.25 in., at the time of cutting. Measurement thickness excludes top growth and thatch but includes the fibrous root system. It shall be cut into strips of not less than 3 feet and not over 6 feet with a uniform width of not over 24 inches.
- C. Wetland herbaceous vegetation shall ~~contain~~ only plant species native to Hamilton and Bulter County, Ohio and adjacent counties will be planted.
1. To the extent possible planting stock will be purchased from sources as close to the project site as possible.
  2. All plant stock material is to be procured from the chart below on the basis of scientific name. At least five species must be selected in equal quantities (as available). Any substitutions not listed below must be approved by the project ecologist.

Common Name	Scientific Name
Soft Rush	<i>Juncus effusus</i>
Softstem Bulrush	<i>Scirpus validus</i>
Green Bulrush	<i>Scirpus atrovirens</i>
Lurid Sedge	<i>Carex lurida</i>
Tussock Sedge	<i>Carex stricta</i>
Woolgrass	<i>Scirpus cyperinus</i>

Common Name	Scientific Name
Franks Sedge	<i>Carex frankii</i>
Swamp Milkweed	<i>Asclepias incarnata</i>
Blunt Spikerush	<i>Eleocharis obtusa</i>
Fowl Mannagrass	<i>Glyceria striata</i>

3. Wetland herbaceous plugs are to be nursery grown stock with 2 inch diameter.
- D. Obtain water from the on-site sources shown on the construction drawings or specified in **Part 6, Section 6.0**, unless otherwise approved by the Construction Manager.
- E. Soil Amendments:
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. Agricultural ground limestone shall be applied to acid soil as recommended by soil test. Lime shall be applied at the rate of 100 lbs./1,000 sq. ft.
  3. Fertilizer shall be applied at rate of 12 lbs/1,000 sq. ft. of 12-12-12 analysis.
  4. Fertilizer and liming materials when required shall be applied separately but can be incorporated into the soil in the same operation.

## 2.2 EQUIPMENT

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

## PART 3 EXECUTION

### 3.1 GENERAL

- A. No sod or vegetation shall be placed when the temperature is below 0° C (32° F). No frozen sod or vegetation shall be placed nor shall any sod or vegetation be placed upon frozen soil. When sod is placed between the dates of June 1<sup>st</sup> and October 15<sup>th</sup>, it shall be covered immediately by a straw mulch 1 inch thick, loosely measured.
- B. During wet weather the sod shall be allowed to dry sufficiently to prevent tearing during handling and placing, and during dry weather it shall be watered before lifting to insure its vitality and to prevent the dropping off of the soil in handling.

- C. Area(s) to be laid with sod or vegetation shall be generally free of debris, rock, root material, and other objects which may impede soil preparation and sod placing or planting activities.
- D. As required, commercial fertilizer and agricultural liming material shall be applied and incorporated in the areas to be sodded at the rate of specified in this Section to a depth of not less than 1 inch, and not more than 48 hours before the sod is placed.
- E. Repeat cultivation in areas where equipment used for hauling and spreading has compacted subgrade.

### 3.2 APPLICATION

- A. Before laying sod or planting vegetation, the surface shall be uniformly graded and cleared of all debris, stones and clods larger than 3 inch diameter. 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.
- C. Application of Soil Amendments:
  - 1. Apply fertilizer at a uniform rate.
  - 2. Apply agricultural ground limestone (as required) at a uniform rate.
  - 3. Disc soil amendments thoroughly into upper 2 inches.
  - 4. Lightly water to aid the distribution of soil amendments.
- D. Placing Sod:
  - 1. If dry, the sod bed shall be thoroughly watered previous to placing of the sod.
  - 2. Sod shall be lifted from trucks or storage piles and placed by hand with close joints and on overlapping. All gaps between sections of sod and openings at angles and the like, shall be plugged with sod.
  - 3. Sod shall be laid in a straight line with subsequent rows placed parallel to and tightly wedged against each other. Transverse joints shall be staggered.
  - 4. Sod placed in ditches shall be laid transversely in the ditch with successive strips neatly matched and lateral joints staggered. The sod shall be held in place securely with staples.
  - 5. Sod placed on slopes of 2H:1 and steeper shall be laid with the long edges of the strip parallel to the contour starting at the bottom of the slope. Successive strips shall be neatly matched and all joints

staggered or broken. Sod shall be secured with staples.

6. Thoroughly water sod prior to rolling or tamping.
7. Roll or tamp sod with approved sod tampers sufficiently to bring the sod roots into close contact with the sod-bed and insure tight joints between the section or strips.
8. Spread straw mulch in a uniformly thick layer over sod.
9. Apply mulch within 24 hours of placing sod.
10. Do not sod areas in excess of that which can be mulched within 24 hours.
11. Apply water with a fine spray immediately after each area has been straw mulched. Wet soil at an approximately a rate of 120 gallons per 1,000 square feet.

**F. Planting Wetland Herbaceous Plugs**

1. Plugs will be planted at an approximate diagonal spatial distribution of 20 plugs per 10 lineal feet.
2. Plugs will be placed into the coir fabric to be level with the surrounding soil surface and in firm contact with soil on all sides. When placing plugs into coir fabric, a small slot (2-4 inches) may need to be cut in the direction paralleling the stream to provide an adequate, but tight opening for plug placement.
3. Thoroughly saturate plugs with water within the same day as planting.

**3.3 MAINTENANCE**

- A. Maintain the sodded and planted areas in satisfactory condition until acceptance of the area by the Construction Manager. Maintenance of the sodded and planted areas includes repairing eroded areas, revegetating when necessary; watering and mowing (if applicable).
- B. Watering
  1. Thoroughly moisten sodded and planted areas, including the subgrade for 30 days after sodding. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary during the first week. It shall be done in sufficient quantities to maintain moist soil to a depth of 4 inches.
  2. After the first week, the sod and vegetated area shall be watered as necessary to maintain adequate moisture and ensure establishment.

- C. A satisfactory condition of the sodded and planted area is defined as follows:
- The area shall have a predominant stand of healthy sod or plant vegetation.
- D. Areas that fail to meet these requirements shall be repaired or resodded as necessary to produce an acceptable stand of vegetation, as specified in this section.

### 3.4 WARRANTY

- A. Sodded and planted areas shall be in place for at least 30 days before final acceptance.
- B. At the end of the period, the Construction Manager will perform an inspection upon written request by the Contractor. Areas not demonstrating satisfactory condition of vegetation as specified herein, shall be repaired, resodded and maintained to meet all requirements as specified herein at the Contractor's expense.

### 3.5 ACCEPTANCE

- A. The sodded and/or planted 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 sodded and/or planted areas.

**END OF SECTION**

SECTION 02512  
HOT-LAID ASPHALTIC CONCRETE PAVING

**PART 1 GENERAL**

**1.1 REFERENCES**

A. The following documents and others referenced therein form part of this Contract to the extent designated in this section:

1. Ohio Department of Transportation (ODOT)
  - Ohio Manual of Uniform Traffic Control Devices (OMUTCD)
2. Ohio Department of Transportation (ODOT)
  - Construction and Material Specification (1997)

**1.2 SUBMITTALS**

A. Reference *Part 6, Section 10.0* for submittals and *ACR-001* for procedures.

B. Approval Required

Laboratory Test Reports

- Before delivery, submit test reports demonstrating that asphalt and mix meet requirements. Contractor shall provide mix design and quality control in accordance with ODOT Item 441. Reference to the "Department" or the "Engineer" shall be interpreted as FDF.

C. Approval Not Required

None

**PART 2 PRODUCTS**

**2.1 MATERIALS**

A. Asphalt

1. Asphalt cement for use in asphaltic concrete surfacing shall conform to ODOT 702.01;
2. Prime coat shall conform to ODOT Item 408.02; and
3. Tac coat shall conform to ODOT Item 407.02.

- B. Aggregate for asphalt concrete shall conform to the applicable portions of ODOT Item 703.

**2.2 MIXES**

- A. Proportioning of Asphalt Concrete Materials: ODOT Item 404 ASPHALT CONCRETE. Gradation shall conform to ODOT Item 441, Type 1 Surface Course, Medium Traffic (Reference ODOT 441, Table A).

**PART 3 EXECUTION**

**3.1 APPLICATION**

- A. Perform work in accordance with the applicable portions of ODOT Item 400 FLEXIBLE PAVEMENT.
- B. Permanent signage and pavement striping shall be in accordance with OMUTCD.

**3.2 FIELD QUALITY CONTROL**

- A. The Contractor is required to sample, test, and document results of testing in accordance with ODOT Section 401.

**3.3 PROTECTION**

- A. Traffic Control: TBD

**END OF SECTION**

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SECTION 02720  
STORM SEWERAGE

**PART 1 GENERAL**

**1.1 REFERENCES**

- A. The following documents and others referenced therein form part of this Contract to the extent designated in this section:

1. Ohio Department of Transportation (ODOT)  
 • Construction and Material Specifications, ~~January 1, 1997~~

**1.2 SUBMITTAL**

Not Used

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- A. Storm Sewer Pipe  
 • ODOT, Item 707.33, corrugated polyethylene smooth lined pipe.
- B. Culvert Pipe  
 • ODOT, Item 707.01 OR 707.02, corrugated steel conduit.
- C. Trace Wire  
 • Magnetic detectable conductor, brightly colored plastic covering, imprinted with "water service" in large letters.
- D. Drainage Structures
1. Precast Concrete Manholes  
 • ODOT Item 604 shall conform to precast reinforced concrete manhole riser sections in ODOT 706 and ASTM C478. High density polyethylene (HDPE) manholes can be substituted for precast concrete. HDPE manholes shall be in accordance with ASTM D3350. Pipe resin is cell classification 3454-34C and a plastic pipe Institute Rating of PE 3408. The cylinder and outlet shall be fabricated from HDPE pipe with SDR, same as pipe, as indicated on drawings. All components shall be joined by butt fusion, saddle fusion, socket fusion, or extrusion welding. Hot air welding is not acceptable. The manhole shall have lifting lugs capable of supporting manhole during placement and shipping. HDPE molded pipe stubs and ductile iron flanged backup rings in manholes shall be installed in manhole by shop fabrication.

2. Precast Concrete Catch Basins

- ODOT Item 604 shall conform to precast reinforced concrete catch basins in ODOT 706 and ASTM C478. HDPE catch basins can be substituted for precast concrete with approval by FDF. The outlet shall be fabricated from HDPE pipe with SDR, same as pipe, as indicated on drawings. All components shall be joined by butt fusion, saddle fusion, socket fusion, or extrusion welding. Hot air welding is not acceptable. HDPE molded pipe stubs and ductile iron flanged backup rings in catch basins shall be installed in catch basin by shop fabrication.

3. Manhole and catch basin frames and lids shall be heavy-duty (H-20 load) cast iron as noted on the drawings.

**PART 3 EXECUTION**

**3.1 INSTALLATION**

- A. Storm sewers and culverts shall be installed in accordance with ODOT Item 603.

1. Excavations shall be constructed in accordance with ~~ODOT 603.03~~;
2. Bedding shall conform to ~~ODOT 603.04~~ Class B unless otherwise approved by FDF;
3. Pipe shall be laid in accordance with ~~ODOT 603.05~~. Pipe shall be joined in accordance with ~~ODOT 603.06~~;
4. Backfill shall in accordance with ~~ODOT 603.08~~. Compact backfill in accordance with ~~ODOT 603.081~~; and
5. Work site shall be cleaned/restored in accordance with ~~ODOT 603.09~~.

- B. Drainage Structures

1. Construct manholes, inlets, and catch basins in accordance with ~~ODOT 604.03~~. Concrete for drainage structures shall conform to ~~ODOT 604.06~~ and ~~ODOT 604.08~~ as applicable; and
2. Excavation and backfill shall be performed in accordance with ~~ODOT 604.04~~.

END OF SECTION

SECTION 02831  
CHAIN LINK FENCE

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Fence framework, fabric, and accessories.
- B. Excavation for post bases; concrete foundation for posts and center drop for gates.
- C. Manual gates and related hardware.
- D. Specification applies to fence repair needed as a result of relocation or of Contractor's construction or site clearing activities.

**1.2 RELATED SECTIONS**

- A. *Section 01010 - General Requirements.*
- B. *Section 02110 - Site Clearing.*
- C. *Section 02200 - Earthwork.*
- D. *Section 16170 - Grounding and Bonding*

**1.3 REFERENCE DRAWINGS**

- A. Reference *Section 01012* for the Schedule of Drawings.

**1.4 REFERENCES**

- A. American Society for Testing and Materials (ASTM):
  - 1. ASTM A121 Rev. A-92 Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.
  - 2. ASTM A123 Rev. A-89 Standard Specification for Zinc (Hot Dip Galvanized) coatings on Iron and Steel Products.
  - 3. ASTM A153  
A153M-95 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
  - 4. ASTM A392-96 Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric.

- |    |                       |  |
|----|-----------------------|--|
| 5. | ASTM A570<br>A570M-95 | Standard Specification for Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality.                 |
| 6. | ASTM C94-96           | Standard Specification for Ready-mixed Concrete.   |
| 7. | ASTM F567-93          | Standard Practice for Installation of Chain Link Fence.  |
| 8. | ASTM F669-92          | Standard Specification for Strength Requirements of Metal Posts and Rails for Industrial Chain Link Fence. |

## 1.5 SYSTEM DESCRIPTION

- A. Fence Height
  - 6 feet nominal (with three strands of barbed wire 1 foot high on extension arms, if applicable) as indicated on drawings.
- B. Line Post Spacing
  - At intervals not exceeding 10 feet.
- C. Fence Post and Rail Strength
  - Conform to ASTM F669.
- D. Gate Sizes
  - As shown on drawings.

## 1.6 SUBMITTALS

- A. Reference *Part 6, Section 10.0*, and *ACR-001* for all submittal requirements and procedures.
- B. Shop Drawings
  - Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, and schedule of components.
- C. As-Built Drawings
  - Indicate plan layout, size, type, and swing of gates.

## Part 2 PRODUCTS

### 2.1 MATERIALS

- A. Posts (Steel)
  - ASTM A570; hot rolled steel strip, cold formed to pipe configuration, longitudinally welded construction, minimum yield strength of 50 ksi.
- B. Fabric Wire (Steel)

- ASTM A392 zinc-coated, 9-gage wire fabric. Fabric wire on-site can be re-used if approved by FDF.
- C. Barbed Wire
- ASTM A121 galvanized steel; 12-gage wire, three strands, four points at 5 inches on center.
- D. Concrete
- FDF mix FMPC #2, ASTM C94; normal Portland cement, 3,000 psi strength at 28 days, 4 inch slump,  $\pm 1$  inch.
- E. Gates
- Swing gates internally braced to prevent sag. Fabric equivalent to that of fence; secure to frame with tension bars and hook bolts. Extend top frame of gates vertically to provide three rows of barbed wire, if applicable. Fence fabric and rails may be re-used if in sound condition. Posts and fence accessories shall be new materials.
- F. Components
1. Corner and Terminal Posts - 2-7/8 inch, outside diameter.
  2. Top and Brace Rail - 1-5/8 inch, outside diameter, plain end, sleeve coupled.
  3. Tension Wire - 6-gage galvanized steel, single strand.
  4. Tie Wire - 6-gage galvanized steel wire.
  5. Line Posts - 2-3/8 inch outside diameter.
  6. Gate Posts - 2-3/8 inch outside diameter
  7. Gate Frame - 1-7/8 inch diameter for welded fabrication.

## 2.2 ACCESSORIES

- A. Caps
- Cast steel galvanized; sized to post diameter, screw retainer.
- B. Fittings
- Sleeves, bands, clips, rail ends, tension bars, fasteners and fittings; galvanized steel.
- C. Extension Arms
- Cast steel galvanized, to accommodate three strands of barbed wire, single arm, sloped to 45 degrees up from horizontal.
- D. Gate Hardware
- Hinges shall be galvanized, malleable iron hinges. Ball and socket bottom hinge to sustain device and padlocking capabilities and double gates with center lunger rod catches. Secure gates in open position with semiautomatic outer catches to secure gates in open position.
- E. Drive Anchor
- Two angles, 36 inch length, 1-1/4 inches by 1-1/4 inches by 1/4 inch.

## 2.3

### FINISHES

- A. Components and Fabric
  - Galvanized to ASTM A123; 2.0 ounces/square feet coating.
- B. Hardware
  - Galvanized to ASTM A153; 2.0 ounces/square feet coating.
- C. Accessories
  - Same finish as framing.

## PART 3

### EXECUTION

## 3.1

### ERECTION/INSTALLATION/APPLICATION

- A. Remove existing fence as shown on the drawings and as otherwise required to perform the work. Stockpile fence fabric in tied rolls and stack posts in a neat pile. Stockpile location shall be on site as designated by FDF.
- B. Install framework, fabric, accessories, and gates in accordance with the manufacturer's instructions and ASTM F567.
- C. Set all posts plumb in accordance with drawing details. Where concrete footings are used, top of footing shall be 2 inches above finish grade. Slope top of concrete for water runoff. Concrete used for fence posts does not require concrete tests. Allow posts to be driven when not corner of gate posts.
- D. Brace gate and corner post to adjacent line post with horizontal center brace rail and diagonal truss rods. Install brace rail, one bay from end.
- E. Provide top rail through line post tops and splice with 6 inch long rail sleeves.
- F. Stretch fabric between terminal posts or at intervals of 100 feet maximum, whichever is less, per manufacturer's recommendations.
- G. Position bottom of fabric 1 inch above finished grade.
- H. Fasten fabric to top rail, line posts, braces, and bottom tension wire with tie wire at maximum 15 inches on centers.
- I. Attach fabric to end and corner posts with tension bars and tension bar clips.
- J. Install bottom tension wire stretched taut between terminal posts, as per manufacturer's recommendations.
- K. Install support arms sloped outward and attach barbed wire; tension and secure.

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- L. Install gates plumb, level, and secure for full opening without interference. Adjust and lubricate hardware for smooth operation.
- M. Coat areas where the galvanized finish has been damaged, using zinc-enriched paint.
- N. Install grounding as noted on drawing details, in accordance with *Section 16170*.

**3.2 ADJUSTING**

- A. Erection Tolerances
  - 1. Maximum Variation from Plumb - 1/4 inch.
  - 2. Maximum Offset from True Position - 1 inch.
- B. Patch, repair, or replace any material damaged by the Contractor to match undamaged material.

**END OF SECTION**

Project No. 40315-TS-0001

Project Title: Silos Infrastructure Project

Specification Section: 16400

APPROVAL DATA LIST  
("X" Indicates Required Data)

1 EPN Identification	2 Description	3 Reference Drawing	4 Specification Paragraph	5 Data					Instructions - Operations - Maintenance	Spare Parts List	Data Shts	Illust Cuts
				Dimen Drwgs	Equip. Wghts	Spec	Cert Test Data	Circuit or Control Digrms				
	Switchgear Outdoor 480 V	94X-6100-E- 02238	2.3, A						ALL		X	
	Automatic Transfer Switch	94X-6100-E- 02242	2.3, B						ALL		X	
	Transformer (Reference Section)	94X-6100-E- 02238	2.3, E 16320	X		X			• MNT • Spare Parts	X		

Remarks:

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END OF SECTION

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IFB NO. F98B157563

CONTRACT NO. FSC 631

SILOS INFRASTRUCTURE PROJECT

## WASTE MANAGEMENT REQUIREMENTS

January 1999

Rev.1

000126

IFB NO. F98B157563

CONTRACT NO. FSC 631

SILOS INFRASTRUCTURE PROJECT

WASTE MANAGEMENT REQUIREMENTS

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2.	At- and Below-Grade Debris .....	3

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CONTRACT NO. FSC 631  
WASTE MANAGEMENT REQUIREMENTS  
SILOS INFRASTRUCTURE PROJECT

Management of all secondary wastes generated as a result of the Infrastructure development shall be consistent with all FDF site procedures and applicable regulatory drivers. It is expected that the Contractor will generate free-releasable construction debris, contaminated construction debris and chemical waste and will encounter debris from the excavation of soil. In addition to these waste streams, the Contractor shall manage all soil excavated per FDF Waste Management guidance as stated herein. FDF has characterized the soil in the area of the proposed road. The data resulting from the sampling efforts indicate that all soil will meet the Waste Acceptance Criteria (WAC) for the On Site Disposal Facility (OSDF).

**1. Construction Debris**

The Contractor shall set aside all construction debris generated in a predetermined construction laydown area. FDF radiological control shall survey all debris to ensure that it meets the free-release criteria for the site. FDF will arrange for the delivery and pickup of commercial disposal facility (CDF) containers for the disposition of all waste deemed free-releasable. FDF personnel will be responsible for tracking the volume of debris sent to any CDF. The contractor shall notify Waste Management one day in advance of needing additional commercial roll-offs.

Construction debris which cannot be free-released to a CDF must be segregated by waste stream and size-reduced as identified in Attachment 1 and in the Material Segregation and Containerization Criteria Report (Attachment 2), or the latest version of these documents when work begins. The Contractor and FDF project personnel will be briefed on waste segregation and size-reduction criteria. FDF will arrange for pickup and delivery of all containers of contaminated construction debris. FDF personnel will track all volumes of contaminated waste. FDF Waste Acceptance Organization (WAO) personnel must be present prior to loading of all contaminated debris bound for the OSDF. Any debris loaded without WAO present, or any debris not correctly segregated and size-reduced must be removed from the containers, properly size-reduced, and reloaded at the contractor's expense. Further guidance on size reduction and segregation can be found in the WAC Attainment Plan, Rev. 0, or the OSDF Implementation Plan.

FDF must be notified in writing of all chemicals brought on site by the contractor. FDF Waste Management personnel will be responsible for the appropriate disposition of unused chemicals and empty containers. FDF will provide the Contractor direction on temporary storage of these materials.

**2. At- and Below-Grade Debris**

During excavation, the Contractor may encounter debris previously buried underground. In the event that debris is unearthed, the Contractor must notify FDF personnel immediately. FDF will arrange for container delivery, characterization and sampling as required, and transportation of the container to the appropriate facility. FDF will track all volumes of such debris should it be encountered. WAO personnel will be present in the field during excavation and while any other below-grade debris is inspected, size-reduced, and containerized. FDF will transport all

CONTRACT NO. FSC 631  
WASTE MANAGEMENT REQUIREMENTS  
SILOS INFRASTRUCTURE PROJECT

containers.

The recent characterization of the soil indicates that all soil will meet the OSDF WAC. Therefore, all excess soil, following cut and fill, will be placed by the contractor in the location identified on Sketch No. 94X-5500-X-SK-1035. The soil from MTL-HIS-005 shall also be placed by the contractor in this area following the contractor's installation of geotextile and silt fence. The contractor must maintain this pile throughout the duration of the project. This includes, but may not be limited to, grading the pile daily, maintaining the silt fence to prevent runoff, installing and maintaining construction fence around the pile, and applying a crusting agent to the pile following project completion. The Contractor must report the volume of excess soil generated to FDF Waste Management on a daily basis.

In the event that real-time readings conducted by FDF Radiological Control during excavation indicate that the soil may exceed the OSDF WAC, the contractor must establish a separate soil pile. It is again the contractor's responsibility to install geotextile, silt and construction fence, maintain the fence and pile by grading, etc., apply crusting agent following project completion, and to report all volumes of soil deposited in this area. Volumes must be reported by soil pile.

FDF is responsible for final movement and disposition of all soils and containerized debris.

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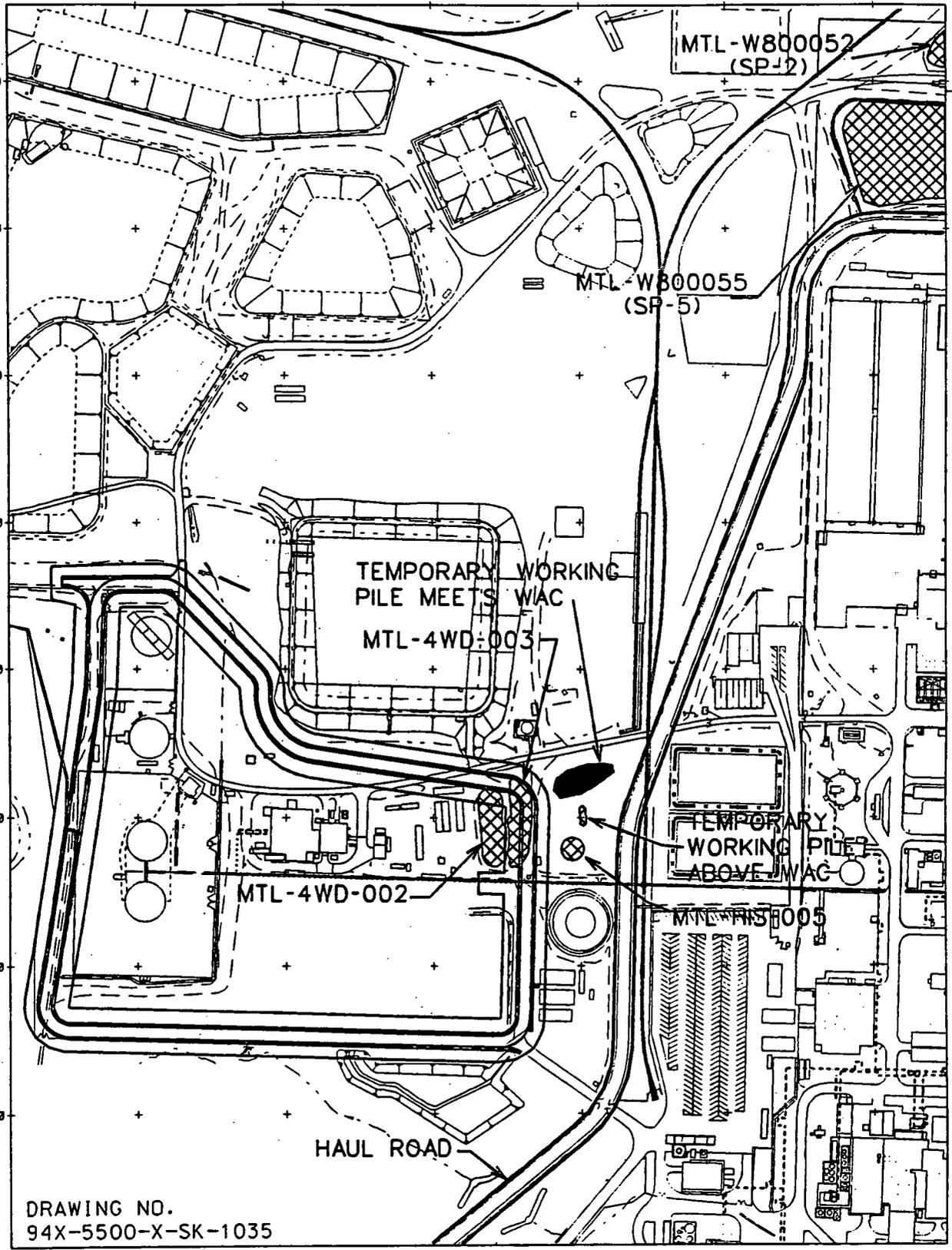
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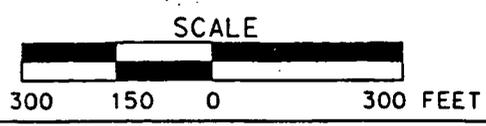
STATE PLANNING COORDINATE SYSTEM 1927

19-JAN-1999



DRAWING NO.  
94X-5500-X-SK-1035

LEGEND:



INFRASTRUCTURE SOIL PLAN

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

Profile No. <sup>(1)</sup>	OSDF Category No.	Category Description	Physical Requirements	Examples	Decision Process <sup>(2)</sup>
91000	Category 1	Soil and soil-like	<ul style="list-style-type: none"> <li>o Any hard agglomerations ≤12"</li> <li>o Other than till or ash, at least 80% of particles finer than 1" • (3)</li> <li>o Compaction using standard construction equipment •</li> </ul>	<ul style="list-style-type: none"> <li>o Fly ash</li> <li>o Majority of OU2 and OUS soils</li> </ul>	<p>[1] Evaluate impacted soil and soil-like material for Category 1. If it fails, proceed to Category 2.</p>
92000	Category 2	Materials that can be transported, placed, spread and compacted in masses, and meet the size criteria	<ul style="list-style-type: none"> <li>o Irregularly shaped metals &amp; finish/superstructure components ≤10' long and 18" 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) - ≤10' long and 18" thick</li> <li>o Equipment - drained of all oils and liquids</li> <li>o Piping ≥12" diameter - split in half</li> <li>o Lines drums must be empty and crushed (P)<sup>(4)</sup></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)<sup>(5)</sup></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 3.</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 ≤4'</li> <li>o Rectangular shaped</li> <li>o Concrete protrusions ≤18"</li> <li>o Void spaces ≥1' 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>	<p>[3] Evaluate impacted debris for Category 3. If it fails, proceed to Category 5.</p>
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>(5)</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 unmixtd 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 unmixtd 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,...86,888) 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.
- (5) 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	Acrosol 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  
Regardless of WAC Status**

**Part 2 - Materials that Require Special Handling**

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 3 (requires a RFD). Containerize and move to interim storage if field operations do not allow timely completion of OSDF 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 3 (requires a RFD). Containerize and move to interim storage if field operations do not allow timely completion of OSDF 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>41</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 derbites, 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 OUI, including any debris found within the waste pits	Categorically excluded by ROD.
Waste pit covers and liners from OUI	Categorically excluded by ROD.
Solvent saturated soils	Categorically excluded by ROD.
RCRA toxicity characteristic soil from the six geographic areas designated in the OU3 ROD, as well as any other material types excavated from these areas <sup>42</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.

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

POTENTIALLY RCRA CHARACTERISTIC AREAS IDENTIFIED IN OUS 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)





SECTION 16400  
SERVICE AND DISTRIBUTION

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**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

A. This section provides a description of required materials and installation practices for low voltage (1000v and less) installation. Scope of this work includes removal and installation of aerial cable, modifications to existing outdoor electrical racks, installation of roadway lighting system, modifications to generator starting circuitry and installation of underground duct bank.

B. General

Work is performed at the Fernald site, a DOE site containing radionuclides.

**1.2 RELATED SECTIONS**

A. Section 01010 - General Requirements

B. Section 16170 - Grounding and Bonding

C. Section 16320 - Pad Mounted Transformer

D. Section 16370 - Electric Power Transmission

**1.3 REFERENCES**

A. The following documents and others referenced therein form part of this Contract to the extent designated in this section.

1. American National Standards Institute (ANSI)

- C80.1 (1993) Rigid Steel Conduit--Zinc Coated

2. Code of Federal Regulations (CFR)

- a. Title 29 Labor
- b. Part 1910 Occupational Safety and Health Standards

3. Factory Mutual System (FM)

- Approval Guide 1995 Edition

4. Federal Specifications (FS)

- TT-S-00230 Sealing Compound: Elastomeric Type, Single Component (For Calking, Sealing, And Glazing In Buildings And Other

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5. National Electrical Manufacturer's Association (NEMA)
  - a. AB 1 (1993) Molded Case Circuit Breakers and Molded Case Switches
  - b. FB 1 (1993) Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies
  - c. FU 1 (1986) Low Voltage Cartridge Fuses
  - d. ICS 2 (1993) Industrial Control and Systems Controllers, Contractors, and Overload Relays Rated Not More Than 2000 Volts AC or 750 Volts DC
  - e. ICS 4 (1993) Industrial Control and Systems Terminal Blocks
  - f. ICS 6 (1993) Industrial Control and Systems Enclosures
  - g. KS 1 (1990) Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum)
  - h. TC 2 (1990) Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80)
  - i. WD 1 (1989) General Requirements for Wiring Devices
6. National Fire Protection Association (NFPA)
  - 70 (1996) National Electrical Code
7. Underwriters Laboratories (UL)
  - a. Electrical Appliance 1995 and Utilization Equipment Directory
  - b. Electrical Construction 1995 Materials Directory
  - c. 6 (1993) Rigid Metal Conduit
  - d. 50 (1994) Enclosures for Electrical Equipment
  - e. 83 (1994) Thermoplastic-Insulated Wires and Cables
  - f. 198E (1988) Glass R Fuses
  - g. 467 (1994) Grounding and Bonding Equipment
  - h. 486A (1992) Wire Connectors and Soldering Lugs for Use with Copper Conductors

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- i. 486C (1992) Splicing Wire Connectors
- j. 489 (1994) Molded-Case Circuit Breakers and Circuit Breaker Enclosures
- k. 498 (1994) Attachment Plugs and Receptacles
- l. 510 (1994) Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape
- m. 514A (1993) Metallic Outlet Boxes
- n. 514B (1993) Fittings for Conduit and Outlet Boxes
- o. 651 (1995) Schedule 40 and 80 Rigid PVC Conduit
- p. 651A (1996) Type EB and A Rigid PVC Conduit and HDPE Conduit
- q. 1059 (1993) Terminal Blocks

**1.4 SUBMITTAL**

- A. Reference **Part 6, Section 10.0** for submittals and **ACR-001** for procedures.
- B. Approval Required
  - 1. Approval data: Before delivery, submit information listed in **Approval Data List** in this section.
  - 2. Constructure Acceptance Test (CAT) Plan: Before starting construction acceptance test, submit CAT plan described in Part 6 - Section 3.1.3.
- C. Approval Not Required
  - 1. Electrical contractor's license: Before installation, submit a copy of license required by local authority.
  - 2. Vendor information: Before installation, submit information listed in Vendor Information List in this section.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Reference **Part 6, Section 5.1** for delivery, storage, and handling requirements and procedures.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- A. Box, outlet: UL 514A or NEMA OS 1 and the following. **000141**

1. For exterior lighting fixture: Cast metal with threaded hubs; and
  2. For exterior receptacle: Cast metal, Type FD.
- B. Conductor: UL 83, copper with Type THWN/THHN or XHHW insulation, 600 volt, of type and AWG size specified on the drawings. Sizes No. 8 AWG and larger shall be stranded.
- C. Conduit and Tubing
1. Rigid metal conduit: UL 6 or ANSI C80.1; and
  2. Rigid plastic conduit: UL 651, UL 651A, or NEMA TC 2.
- D. Connector, Wire: UL 486A or UL 486C and the following.
1. Terminal lugs: Crimp type with ring or spade lug with turned up tips, nylon or vinyl insulated; and
  2. Twist-on wire joints: Nylon insulated with tapered spring grip.
- E. Fittings, Conduit
1. For rigid steel conduit: UL 514B or NEMA FB 1. Use compression-type, threadless fittings with EMT;
  2. For flexible metal conduit: UL 514B;
  3. For rigid plastic conduit: UL 514B;
  4. For entries into sides and tops of UL 50 or NEMA ICS 6, Type 3 or 3R enclosures: Myers-type watertight fittings or sealing-type locknuts; and
  5. Couplings: Erickson type.
- F. Identification Materials and Plates
1. Equipment nameplates: Laminated plastic, 2 mm (1/16 inch) thick with white surface and black core, sized to meet legend requirements.
- G. Insulating Putty: 3M Company "Scotchfil," General Electric Company No. 8389, or Kearney Company "Airseal."
- H. Lubricant and Sealant for Conduit Thread: Conductive compound providing anti-seize and corrosion protection. Thomas & Betts "KOPR-SHIELD" or approved substitute.
- I. Marker for Buried Cable and Conduit: Reference *Section 02220*.
- J. Penetration Sealant
1. Nonfirestopping: FS TT-S-00230, Type II, Class A, 1-component polyurethane, nonsag type, light-colored.
- K. Sealing Compound for Conduit: Porcelain Products Company "Sealex" or Gardner-Bender "Duct Seal."
- L. Supports

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1. Individual conduit hangers: Factory-made, spring able, wrought-steel clamps, or malleable-iron split and hinged rings. For suspended conduit, clamps or rings shall bolt to, or interlock with, threaded suspension rod.
2. Conduit supports: 1-hole clamps with clamp backs, or Unistrut with clamps.
3. Expansion anchors: HILTI anchors, suitable application per manufacturer's recommendation.

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M. Tape

1. Plastic insulating tape: UL 510;
2. Conduit protection tape: UL 510; and
3. Electrical color-coding tape: UL 510.

N. Wire Pulling Compound: Electro Compound Company "Y-er Eas," American Polywater Corporation "Polywater," or Ideal Co. "Yellow 77."

O. Wireway: Steel, UL 50 or NEMA ICS 6, Type 3R surface lay-in wireway with hinged covers, sized as shown on the drawings, provided with fittings, adapters, and end plates necessary for a complete installation.

## 2.2

### EQUIPMENT

A. Switchgear: Free standing, bottom fed, NEMA 3R distribution panel rated 1200 amperes at 480Y/277 V, 3 phase, 4 wire rated 35 KAIC with cable pull section for incoming cables. Unit shall be equipped with a 1200 ampere, 3 pole main circuit breaker with integral ground fault protection. The unit shall be provided with 1 each 600 A, 3 pole circuit breaker. There shall be space for 2 additional 400 A, 3 pole circuit breakers. There shall be kwh/demand metering on the 1200 ampere circuit breakers.

B. Automatic Transfer Switch: Consisting of an enclosure, contacts, control transfer hardware and logic.

1. Contacts: 3 pole, double-throw, single-coil electrically operated, mechanically held, with break before make ungrounded and neutral switching. A manual operator shall be provided for maintenance purposes that will allow the contacts to be manually operated to any point in their travel.
2. Rating: 600 amperes, 600 volt, short circuit withstand 65 kA symmetrical.
3. Enclosure: NEMA Std. 250 Type 1.
4. Control: Microprocessor based with the following functions; three phase voltage sensing of normal source and single phase sensing of emergency source both with adjustable pickup and drop out. Provide time delay on transferring, time delay after transfer to normal power to allow for diesel generator cool down before stopping, adjustable from 1-60 minutes. A 10 ampere pilot contact to initiate generator

starting controls. Switch to select manual or automatic transfer and retransfer. Momentary test switch to simulate loss of normal power. Terminals for remote connections. Pilot light and auxiliary contacts to indicate switch position, and normal and emergency source availability.

5. **Manufacture:** Automatic Transfer Switch shall be ASCO brand Model 940 as manufactured by Automatic Switch Co. or equal.
6. **Nameplate:** Engraved plastic nameplates with black characters on white background shall be provided. Character height shall be 5/16 inch minimum. Information depicted shall include normal and emergency source identifiers, load identifier at a minimum.
7. **Programming/Configuration:** Transfer switch shall be configured for operation as shown on contract drawings.

**C. Plates**

- **For receptacle:** Cast metal weatherproof.

**D. Receptacle:** UL 498 or NEMA WD 1 Designation 5-15R, duplex, brown, specification grade, rated 15 A, 120 V, 3-wire, grounding type, with screw terminals arranged for side wiring. Self-grounding receptacles may be used instead of ground requirements specified.

**E. Transformer:** in accordance with specification 16320.

**PART 3 EXECUTION**

**3.1 PREPARATION**

**A. Field Measurements:** Scale dimensions on the drawings show desired and approximate locations of equipment. Actual locations, distances, and levels shall be governed by field conditions.

**3.2 INSTALLATION**

**A. General**

1. Perform work in accordance with NFPA 70, the specifications, and the drawings.
2. Fasten equipment to structural members of building or metal supports attached to structure, or to concrete surfaces.
  - a. Use clamping devices for attachments to structural steel. When clamping is impractical, obtain approval from FDF Construction Engineer before drilling, punching, cutting, or welding to building structural steel members for support attachments;
  - b. Fasten equipment to concrete or masonry with expansion anchors; and
  - c. Fasten equipment to drywall with screws driven into studs,

and to metal wall panels with weld studs, bolts or self-tapping metal screws.

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3. Locate equipment, boxes, and conduit approximately where shown on the drawings in relation to equipment served.
4. Do not install conduit, raceways, and boxes in positions that interfere with work done by other trades.
5. Identify components with nameplates bearing legends shown on the drawings.
6. Attach nameplate on or near equipment, with clear RTV silicone sealant.
7. For excavation and backfill of soil, reference *Section 02220*.

#### B. Grounding Systems

1. Underground conductors, electrodes, and connections: Install in accordance with NFPA 70 and the drawings. Make joints connecting copper and galvanized steel conductors above grade and in dry locations.
2. System grounding: Solidly connect neutral conductor of each separately derived system to ground in accordance with NFPA 70 and the drawings.
3. Equipment grounding: Connect metal equipment to ground in accordance with NFPA 70 and the drawings.

#### C. Conduit

1. Use rigid steel where subject to mechanical damage or when located 1.2 m (4 feet) or less above floors.
2. Install 3-mm (1/8-inch) polyethylene rope in spare conduits.
3. Install concealed conduits as directly as possible, with bend radii as long as possible. Install exposed conduit parallel with or at right angles to building lines. Where conditions permit, maintain continuous exposed horizontal runs along walls at 2.7 m (9 feet) minimum above floor level or grade.
4. Make elbows, offsets, and bends uniform and symmetrical. Bend conduit with approved bending devices.
5. Cut ends square, ream, and remove burrs. Conduit shall be clean, dry, and free of debris. Immediately after installation, plug or cap exposed ends with standard accessories until wires are installed.
6. Use specified fittings for conduit except that threaded hubs and sealing type locknuts shall be used outdoors and in locations where

moisture is present. Use couplings where required. Do not use running threads.

7. Install without moisture traps wherever possible. Where practicable, provide drain holes in pullboxes or fittings at low points in raceway systems and remove burrs from drilled holes.
8. Set up joints in conduit installed in concrete, underground, or exposed to weather, with high-temperature, antiseize, conductive thread lubricant and sealant.
9. Verify stub-up locations with final equipment arrangements. Install exposed conduit stubbing up through floor slab straight and plumb, lined up, and uniformly spaced. Install at sufficient depth below slab to eliminate part of bend above top of slab. Cap or plug stub-up before placing concrete.
10. Wrap conduit passing from concrete to air or to direct earth burial with conduit protection tape from 76 mm (3 inches) in concrete to 305 mm (12 inches) minimum in earth, or 76 mm (3 inches) in air, unless conduit is PVC or PVC coated.
11. Seal openings around conduit at concrete or block fire walls and floor penetrations. Use fire barrier sealing compound for openings to 6 mm (1/4 inch) maximum, and grout for larger openings. Make seals water-proof, and finish sealant flush with surrounding wall surfaces.
12. Seal openings around conduit at exterior wall penetrations and penetrations of walls which form boundaries between adjoining ventilation zones, using specified sealant. Make seals waterproof, and finish sealant flush with surrounding wall surfaces.
13. Use hangers with 9.5-mm (3/8-inch) rods for 53-mm (2-inch) and smaller conduit, and hangers with 13-mm (1/2-inch) rods for 63-mm (2-1/2-inch) and larger conduit. If conduit is suspended on rods more than 0.6 m (2 feet) long, rigidly brace to prevent horizontal motion or swaying.
14. Apply sealing compound after installation of conductors, at boxes, in conduits that penetrate walls or floors.
15. Where routing is parallel with hot water or steam pipes, maintain 152-mm (6-inches) minimum clearance from pipe covering. Where not run parallel with pipe, it is acceptable to run closer than 152 mm (6 inches), providing conduit does not touch pipe covering.
16. Secure conduit using specified conduit supports.

#### D. Underground Duct Banks

1. All installation shall be in accordance with the drawings.
2. Install ductbank 15 inches (minimum) to top of ductbank below finished grade.

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3. Install duct with minimum slope of 4 inches per 100 feet. Slope duct to handholes.
4. Cut duct square using saw or pipe cutter; de-burr cut ends.
5. Insert duct to shoulder of fittings; fasten securely.
6. Join nonmetallic duct using adhesive as recommended by manufacturer.
7. Wipe nonmetallic duct dry and clean before joining. Apply full even coat of adhesive to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.
8. Provide suitable fittings to accommodate expansion and deflection where required.
9. Terminate duct at handhole entries using end bell.
10. Stagger duct joints vertically in concrete encasement 6 inches minimum.
11. Use suitable separators and chairs installed not greater than 4 feet on centers.
12. Band ducts together before placing concrete.
13. Securely anchor duct to prevent movement during concrete placement.
14. Place concrete under provisions of *Section 03001*. Use mineral pigment to color concrete red.
15. Provide minimum 3-inch concrete cover at bottom, top, and sides of ductbank.
16. Provide pull rope in each duct except sleeves and nipples. Minimum  $\frac{1}{2}$  inch, 4,000 psi tensile strength polypropylene.
17. Swab duct. Use suitable caps to protect installed duct against entrance of dirt and moisture.
18. Perform excavations and backfill trenches under provisions of *Section 02200* of this specification package.
19. Interface installation of underground warning tape with backfilling. Install tape below finished surface. Refer to *Section 02220*.

E. Boxes, Enclosures, and Wiring Devices

1. Install boxes firmly in position and plumb.

F. Conductors

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1. Do not bend cables installed in raceways to less than manufacturer's recommended minimum bending radii.
2. Use lubricant recommended by wire or cable manufacturer, or wire pulling compound specified, when pulling wire and cable through conduit.
3. Do not install or handle wires with thermoplastic insulation or jacket when ambient temperature is -9 °C (15 °F) or lower.
4. Coding: Paint or pressure-sensitive electrical color-coding tape may be used for coding conductors instead of colored insulation on No. 8 AWG and larger wire for phase (ungrounded) conductors, and No. 4 AWG and larger wire for neutral (grounded) conductors and equipment grounding conductors only. Maintain phase color coding, in accordance with the following table, for branch and feeder circuits up to and including equipment connections.

Conductor Origin	Conductor	Insulation Color
480Y/277 V, 3-phase systems, transformers, panels, switchboards, etc.	Phase A Phase B Phase C Neutral (grounded) Ground	Yellow Orange Brown Gray Green
208Y/120 V, 3-phase systems, transformers, panels, switchboards, etc.	Phase A Phase B Phase C Neutral (grounded) Ground	Black Red Blue White Green
Low Voltage Honeywell Protection System	Plant Fire Alarm System	Red and Yellow Brown & Yellow
120 V, Single Phase	Hot Neutral	Black White

**G. Conductor/Cable Connections and Terminations**

1. Connect conductors to terminal blocks, binder-screw, or stud-type terminals with terminal lug-type connectors.
2. Use plastic insulating tape for uninsulated splices and taps. Apply tape to thickness at least equal to conductor insulation. Where bolted splice or connection presents irregular surface, apply insulating putty to joints before taping.
3. Use twist-on wire joints for connections of conductors in lighting and receptacle circuits only.

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## H. Generator Changes

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- a. Add wiring from transfer switch to existing generator as shown on drawings.
- b. In addition to CAT Test requirements given in section 3.3A, contractor shall test diesel generator / transfer switch operation for auto start capability operation as described on drawings. Coordinate test with FDF.

### 3.3 FIELD QUALITY CONTROL

- A. Before attempting to operate equipment, perform the following tests and verifications, and record results. Notify FDF Construction Engineer before starting tests.
  1. Test equipment and wiring for continuity and unintentional grounds;
  2. Verify proper phase sequence and voltage at equipment served; and
  3. Check motors for correct rotation.
- B. Furnish equipment and instruments for above tests and verifications which bear calibration stamps showing calibration and expiration dates. Calibration and accuracy of equipment and instruments shall have been certified by an independent testing laboratory having standards traceable to National Institute of Standards and Technology.
- C. Acceptance Test
  1. Contractor will provide approved (by FDF) CAT Test.
  2. Before starting acceptance test, verify operability of circuits, equipment, and system. Notify FDF upon completion of verification.
  3. Acceptance test will be directed by Test Director named in the CAT. Participate in acceptance test as directed by Test Director.

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Project No. 40315-TS-0001

Project Title: Silos Infrastructure Project

Specification Section: 16400

VENDOR INFORMATION LIST  
("X" Indicates Required Data)

1 EPN Identification	2 Description	3 Reference Drawing	4					5 Data						
			Specification Paragraph	Dimen Drwgs	Equip. Wghts	Spec.	Material Dscrpt.	Perf Data	Circuit or Control Digrms	Data Sheets	Illust. Cuts	Install. Instruc.		
	Switchgear Outdoor 480 V	94X-6100-E-02238	2.3, A	X	X		X					X	X	X
	Automatic Transfer Switch	94X-6100-E-02242	2.3, B		X		X				X		X	X
	Transformer (Reference Section 16320)	94X-6100-E-02238	2.3, E 16320	X	X		X				X			X
Remarks:														

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SECTION 16320  
PAD MOUNTED TRANSFORMER

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

**A. Scope of Specification**

This specification describes the general requirements for pad mounted transformers. The specific requirements for each transformer shall be given on individual transformer datasheets. Requirements left blank on the datasheets are to be determined by the supplier. The supplier shall submit completed datasheet with submittals for FDF concurrence.

**1.2 RELATED SECTIONS**

- A. Section 16170 - Grounding and Bonding
- B. Section 01010 - General Requirements
- C. Section 16370 - Electrical Power Transmission
- D. Section 16400 - Service and Distribution

**1.3 REFERENCES**

The publications listed below form part of this specification. Each publication shall be the latest revision and addendum in effect on the date this specification is issued for construction unless noted otherwise. Except as modified by the requirements specified herein or the drawing details, work included in this specification shall conform to the applicable provisions of these publications.

**A. ANSI (American National Standards Institute)**

- |    |                   |   |
|----|-------------------|---|
| 1. | ASTM C57.92-91    | Guide for Loading Mineral Oil - Immersed Power Transformers Up to & Including 100 MVA with 55° C or 65° Ave Winding Rise.   |
| 2. | ASTM C57.12.26-87 | A Standard for Transformers - Pad - Mounted Compartmental - Type, Self-Cooled, 3- Phase Distribution Transformers for use with Separable Insulated High-Voltage Connectors, High-Voltage, 34,500 GRD Wye/19200 Volts & Below: 2500 KVA & Smaller. |

B. NEMA (National Electrical Manufacturers Association)

- NEMA LA-1 1992 Surge Arrestors.

C. NFPA (National Fire Protection Association)

- NFPA 70 1996 National Electrical Code.

D. UL (Underwriters Laboratories, Inc.)

- 1997 Electrical Materials & Construction Directory.

**1.4 SYSTEM DESCRIPTION**

- A. Liquid filled pad mounted distribution transformer shall have nominal primary voltage of 34.5 kV, and secondary voltage 480 V and capacity rating of 1000 KVA.
- B. The transformer shall be for use in a 3 phase, 60 Hertz system. Ratings, voltages, winding connections, and impedances shall be as indicated on the datasheets.
- C. The equipment shall consist of the transformer with all auxiliary equipment and accessories described in this specification and the datasheets.

**1.5 SUBMITTALS**

The manufacturer shall furnish all data and other documentation as indicated on the Vendor Data Requirements Sheets. A drawing of the transformer shall be submitted to FDF showing overall dimensions, center of gravity, lifting lugs, jacking pad locations, and cable entry locations. Cable termination locations (bushings) shall be shown on the drawing. Manufacturer shall furnish completed data sheet with documentation for the transformer.

**1.6 SERVICE CONDITIONS**

Unusual service conditions such as the following are possible for this transformer:

1. Load involving abnormal harmonic or DC current such as those which may result where appreciable load currents are controlled by solid state or similar devices (such as rectifiers or adjustable speed drives).
2. Unusual frequency of impact loading such as may occur when supplying welding apparatus, electric arc furnaces, or motors with cyclical loads.

**PART 2 PRODUCTS****2.1 GENERAL**

The pad mounted transformer shall consist of the following:

- A. Transformer Tank
- B. High Voltage Cable Terminating Compartment
- C. Low Voltage Cable Terminating Compartment
- D. Primary Disconnect (if specified on the datasheet)
- E. Primary Fuses (if specified on the datasheet)
- F. Secondary Circuit Breaker (if specified on the datasheet)
- G. Accessories (as specified on the datasheet)

**2.2 DESIGN SUMMARY****A. General**

1. The transformer shall be compartment type, self-cooled, tamper proof, and weatherproof for mounting on a pad. Color shall be outdoor green, Munsell No. 7GY3.29/1.5
2. The average temperature rise of the windings, measured by the resistance method, shall be as indicated on the datasheet when the transformer is operated at rated kVA output in a 40 degree Celsius maximum (30 degree Celsius average) ambient temperature in any 24 hour period.
3. Coolant and insulating fluid shall be as indicated on the datasheet. The fluid shall contain less than 1 ppm of PCB. A Material Safety Data Sheet (MSDS) shall be submitted for the coolant.
4. The high and low voltage compartments shall be located side by side, separated by a steel barrier. If you face the transformer, the low voltage compartment shall be on the right. Terminal compartments shall be full height, air-filled, with individual doors. The high voltage door fastenings shall not be accessible until the low voltage door has been opened. The low voltage door shall have a three-point latching mechanism with provisions for a single padlock. The doors shall be equipped with lift-off stainless steel hinges to allow removal of the doors and door stops to hold the doors in the open position.

5. The following accessories shall be provided as standard on all transformers:
  - a. One-inch filling provision;
  - b. One-inch drain provision; and
  - c. Tap changer, for de-energized operation only, which is externally operable and padlockable.
6. The front of both high voltage and low voltage compartments shall be removable to permit rolling or skidding of unit into place over conduit stubs in foundation.
7. ANSI tank grounding provisions shall be furnished in both compartments.

**B. Ratings**

1. Transformer ratings of the following parameters shall be as indicated on the datasheet:
  - a. kVA;
  - b. Primary voltage (Delta);
  - c. Secondary voltage (Wye);
  - d. Impedance; and
  - e. Basic impulse level.
2. Transformer shall have two 2½ percent full capacity above normal and two 2½ percent below normal taps.

**2.3 DESIGN REQUIREMENTS**

**A. Tank**

1. The transformer shall be of sealed-tank construction of sufficient strength to withstand a pressure of 7 psi without permanent distortion. The cover shall be welded and the fastenings tamper proof.
2. The transformer shall remain effectively sealed for a top oil temperature range of minus 30 to 105 degrees Celsius.
3. If required, cooling panels will be provided on the back and sides. Lifting and packing pads will be provided.

**B. Coils**

Coils shall be wound with copper or aluminum conductor; copper is preferred.

**C. Core**

1. Core/coil assembly shall be the 5 legged wound core type, using high grade, grain oriented silicon steel laminations carefully annealed after fabrication to restore high magnetic permeability.
2. Magnetic flux is to be kept well below the saturation point.

**D. HIGH VOLTAGE COMPARTMENT**

1. The high voltage terminations and equipment shall be dead front and conform to ANSI C57.12.26 requirements.
2. Dead front bushings shall be universal wells or one-piece integrated type for use with separable connectors. Bushings shall be externally clamped and front removable.
3. Provide 3 distribution class Metal Oxide Varistor Elbow (MOVE) lightning arresters for surge protection.
4. A ground pad shall be provided.

**E. LOW VOLTAGE COMPARTMENT**

1. The low voltage bushings shall be molded epoxy, and provided with blade-type spade terminals with NEMA standard hole spacing arranged for vertical take-off.
2. The low voltage neutral shall be an insulated bushing, grounded to the tank by a removable strap.
3. Wye-wye transformers shall have the high and low voltage neutrals internally tied, with a removable strap.
4. A ground pad shall be provided.
5. Barrier type terminal blocks shall be provided in the cabinet for all external control and alarm wiring. Current transformer wiring shall terminate in shorting type terminal blocks. Terminal blocks shall be rated 600 V AC 30 amps minimum and shall be capable of accepting a minimum of 2 Number 12 AWG field wires.
6. All devices mounted on transformer, including current transformers, shall be wired to terminal blocks.

## **2.4 INSPECTION AND TESTS**

- A. Transformer shall be tested in accordance with applicable ANSI, IEEE, and NEMA standards.
- B. Requirements for additional testing shall be identified on the datasheet.
- C. Certified test report for all transformer tests shall be submitted for each transformer.

## **2.5 IDENTIFICATION AND TAGGING**

- A. Each transformer shall be furnished with a permanent stainless steel nameplate in low voltage compartment.
- B. The nameplate shall contain the equipment tag number, as well as all connection, rating and weight information as required per ANSI and NEMA standards.

## **PART 3 EXECUTION**

Not applicable.

## **PART 4 ATTACHMENTS**

FDF Datasheet - Power Transformer

FDF DATASHEET - POWER TRANSFORMER

DATE: 4/8/98

REV.: A

CONTRACT NO.: 40315

PO NO.:

BY: jd

REVIEWED: JT

ITEM NO.:

QUANTITY: 1

Type

[ ] Power [ ] Distribution [ ] Pole Mounted [ ] Substation  
[x] Pad

Mounted [ ] \_\_\_\_\_

Characteristics

1000 kVA 3 Phase 60 Hertz

34.5KV PRI 3 Wire

[ ] Grd Wye

2 FC Taps 2 1/2 % ARV PRI BIL 150 kV

2 FC Taps 2 1/2 % BRV

[x] No Load Changer [ ] Load Changer [ ] Manual [ ] Auto  
[ ] Remote

SEC 480 Volts 4 Wire

[ ] Wye [x] Grd Wye [ ] Delta

30 % Impedance SEC BIL 30 kV

[ ] Aluminum Winding

Connection Data

Primary:

[ ] From Above [x] From Below

Cable 1/0 MCM/AWG 1 Per Phase

Type EPR [x] Cable Lug Required

[ ] Conduit: Size 4" No. 1 [ ] Bus Du 000157

**Connection Data continued**

Secondary:

From Above  From Below

Cable 600 to 750 MCM/AWG 3 Per Phase

Type THWN  Cable Lug Required

Conduit: Size 4" No. 3  Bus Duct

Secondary Connection is to be "loop feed."

Neutral:  On Cover  In Throat

Cable 600 to 750 MCM/AWG

Type THWN  Cable Lug Required

**Cooling**

Oil Type Ambient Cooling (OA) 65° C Rise above 40° C ambient

ANV  ANV/FA  150° F  115° C

Provisions for Future Cooling Only

55° C  65° F  Ventilated Dry Type

AA  AA/FA  AFA  150° C  115° C

80° C Rise Abv 30° C Average, 40° C Max Ambient

Weather Resistant Ventilated Dry Type

AA  AA/FA  150° C  115° C

80° C Rise Abv 30° C Average, 40° C Max Ambient

Sealed Dry Type  Freon  GA  Nitrogen

150° C  120° C Rise Abv 30° C Average, 40° C Max Ambient



Rating and Diagram Nameplate

**Grounding Resistor**

Neutral Ratings: \_\_\_\_\_ A \_\_\_\_\_ V (Line to Neutral) \_\_\_\_\_ sec / min

Material:  Stainless steel  Cast Iron  \_\_\_\_\_

Enclosure:  Screened  \_\_\_\_\_

Current Transformer: Qty \_\_\_\_\_ Ratio \_\_\_\_\_ Accuracy \_\_\_\_\_

Mounting:

On Transformer  Ground Level  On Elevated Structure (By Others)

**Oil Type**

Mineral Oil

**Installation Conditions**

Service:  Outdoor  Indoor  Damaging Fumes or Vapors  
 Steam or Excessive Moisture  Salt Air or Spray  
 Excessively Conductive, Thermally Insulating, or Abrasive Dust or Sand  
 Oil Vapor  Hot and Humid  Nuclear Radiation  
 Other \_\_\_\_\_

**Installation Conditions (continued)**

Elevation \_\_\_\_\_ <1000'

Temperature: \_\_\_\_\_ -20 ° F Min / \_\_\_\_\_ 120 ° F Max / \_\_\_\_\_ ° F Ave

Seismic Requirements: \_\_\_\_\_

Area Classification: \_\_\_\_\_ Non class \_\_\_\_\_

Auto Ignition Temp: \_\_\_\_\_ ° F

**Paint Finish**

- Manufacturer's Standard \_\_\_\_\_
- \_\_\_\_\_
- ANSI 61             A quart of touch-up paint shall be furnished

**Loss Evaluation Data**

- Not to be considered.                     \$ \_\_\_\_\_ per kW.

Percent of full load at which the transformer will be evaluated: \_\_\_\_\_ %

**Parallel Operation**

- Yes                     No

Other Transformer: KNA \_\_\_\_\_ IMP \_\_\_\_\_ %

Voltage: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

Serial No.: \_\_\_\_\_

**Other Requirements**

1. Compartment doors & hood shall be removable to facilitate cable pulling.
2. A permanent & conspicuous warning sign shall be mounted to outside of high voltage door in accordance with NFPA 70, NEC.
3. Estimated efficiency (losses) shall be submitted.

END OF SECTION

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SECTION 16370  
ELECTRIC POWER TRANSMISSION

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. This section provides a description of required materials and installation practices for medium voltage (15kv-50kv) installation. Scope of this work includes pole procurement and installation, installation of aerial conductors and associated hardware, and installation of 34.5kv per transformer primary cable installation through duct bank.

**1.2 RELATED SECTIONS**

- A. Section 01010 - General Requirements  
 B. Section 16170 - Grounding and Bonding  
 C. Section 16320 - Pad Mounted Transformer  
 D. Section 16400 - Service and Distribution

**1.3 REFERENCES**

- A. The following documents and others referenced therein form part of this Contract to the extent designated in this section:

1. American National Standards Institute (ANSI)

- |    |           |   |
|----|-----------|---|
| a. | C2-1997   | National Electrical Safety Code             |
| b. | 05.1-1992 | Wood Poles -- Specifications and Dimensions |

2. American Wood Preservers Association (AWPA)

- |    |             |  |
|----|-------------|--|
| a. | AWPA C4-89  | Poles - Pressure Process   |
| b. | AWPA C25-89 | Preservative Treatment of Crossarms by the Pressure Process.   |
| c. | C7-1992     | Western Red Cedar, Northern White Cedar and Alaska Yellow Cedar Poles, Southern Pine - Preservative Treatment of Incised Pole Butts by the Thermal Process |
| d. | P1-1992     | Coal Tar Creosote for Land, Fresh Water and Marine (Coastal Water Use)   |
| e. | P8-1992     | Oil-Borne Preservatives  |
| f. | P9-1992     | Solvents and Formulations for Organic Preservative Systems   |

3. Institute of Electrical and Electronics Engineers (IEEE)

- |   |            |                                       |
|---|------------|---------------------------------------|
| • | C62.1-1989 | Surge Arresters for AC Power Circuits |
|---|------------|---------------------------------------|

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4. National Electrical Manufacturers Association (NEMA)
  - WC 8-1988 Ethylene-Propylene-Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy
5. National Fire Protection Association (NFPA)
  - 70-1996 National Electrical Code

**1.4 SUBMITTAL**

A. Reference *Part 6, Section 10.0* for submittals and *ACR-001* for procedures.

B. Approval Required

Approval Data

- Before delivery, submit the information listed in the *Vendor Information Submittals* in this section.

C. Approval Not Required

Vendor Information

- Before installation, submit the information listed in the Vendor Information List in this section.

**1.5 QUALITY ASSURANCE**

A. Contractor's Quality Assurance Program

B. Electrical/Electronic Product Acceptability

- Reference *ACR-001* for required use of products listed and labeled by national testing and evaluation agencies.

C. Misrepresented Products

- Reference *ACR-001* for the required measures to prevent use of misrepresented products.

D. Deliverable Documentation

The following document and record, required by this section, shall be delivered to FDF:

<u>Document</u>	<u>Paragraph</u>
Electrical Test Results	3.3.1

**000163**

- A. Reference *Part 6, Section 5.1* for all delivery, storage, and handling requirements and procedures.
- B. Cable Inspection - Upon delivery to worksite, inspect cable and reels for shipping damage such as:
1. Marks caused by improper lifting equipment or techniques;
  2. Breaks or cuts in outer covering;
  3. Damaged jacket or insulation; and
  4. Reel damage from mishandling.
- C. Cable Testing - Upon delivery to worksite, Operating Contractor will perform dc over potential tests on new cable. Acceptance criteria are given in 3.3, B of this section.
- D. Cable Reel Storage
1. Store reels with flanges resting on hard surface or pallet to prevent sinking into ground;
  2. Do not allow reel flanges to touch cable on other reels;
  3. Do not store reels on sides. Store with reel axis horizontal; and
  4. Cap or tape cable ends to prevent entrance of moisture.
- E. Pole Line Material Storage
1. Stack poles that will be stored longer than 2 weeks on supports at least 1 foot above ground. Strength and spacing of supports, and manner of stacking shall produce no noticeable distortion in poles; and
  2. Locate material stored at worksite to prevent damage from weather and adjacent construction operations.
- F. Cable Reel Handling
1. Slings and forklifts shall not contact cable or protective covering;
  2. Use spreader bar when lifting reel with bar and sling; and
  3. Do not drop reels.
- G. Pole Line Material Handling

The Contractor shall comply with the following Hoisting and Rigging requirements, and the requirements of FDF Hoisting and Rigging Manual Section 15, which meets the requirements of the DOE Hoisting and Rigging Manual and will be issued to the Contractor after award.

1. Handle poles, fittings, insulators, and miscellaneous hardware with care to prevent damage. Unload carefully from truck and do not drop. Do not drag poles; and
2. Do not use construction hooks, tongs, or other sharp tools on treated portion of poles.

000164

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- A. Solder less Terminals for Insulated Aerial Conductors
- Circumferential compression type; Burndy Corp HYLUG Type YA for copper conductors and Type YA-A for aluminum conductors.
- B. Cable - 35 kV Type MV-105 shielded power cable, single conductor No. #1/0 AWG cable in accordance with NEMA WC 8 for both wet and dry conditions at normal operating temperature of 90 °C maximum, sunlight rated.
1. Conductor - Copper, annealed, Class B compact stranding.
  2. Conductor shield - Extruded semi-conducting thermosetting compound, 15 mils thick, minimum.
  3. Insulation- Ethylene-propylene-rubber, 420 mils thick, minimum.
  4. Insulation shield - Extruded nonmetallic covering over insulation, with nonmagnetic metal component directly over or embedded in covering.
  5. Jacket - Black polyethylene or polyvinyl chloride.
  6. Cable shall have continuous permanent printing on jacket showing manufacturer's name, trade name, type, size, rated voltage, and footage markings. Cable reels shall be marked to show above information and length of each cable. Ends of cable shall have weatherproof seals and both ends exposed on reel, accessible for testing.
  7. Manufacture's recommended stress cones and load break elbows shall be utilized to match the cable.
- C. The 600 Volt power communication and signal cable shall be as specified on the drawings.
- D. Tape
1. Plastic insulating tape: 3M Company "Scotch No. 33+"; and
  2. Silicon rubber termination tape: 3M Company "Scotch No. 70."
- E. Insulating Putty
- 3M Company "Scotchfil," General Electric Company No. 8389, or Kearney Company "Airseal."
- F. Wood Poles
- ANSI O5.1, southern pine, class 2, cut from live timber. Poles shall be butt-treated by manufacturer in accordance with AWPA C7, using AWPA P8 and P9 or P1 preservatives, confirm approval by local authorities. Each pole shall be given single top cut at 30 degree angle with normal to axis of pole and at right angles to sweep. Roofs shall be brush-treated by manufacturer with ANSI O5.1 and AWPA C4, Pentachlorophenol preservative. Bolt holes shall not be more than 1/16-inch oversize.

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**G. Armor Rods**

- Aluminum alloy, preformed type, similar to ones made by Preformed Line Products Company, for pin insulator supports. Rod diameter and length shall meet recommendations of aerial line conductor manufacturer.

**2.2 EQUIPMENT****A. Street Lighting Fixtures**

- Fixture shall be 400 watt High pressure sodium with lamp, cut off optics, flat glass lens and ANSI type II distribution provide complete with a 4 foot roadway bracket. Ballast shall be a lag type regulating unit for 480 Volt line and shall be capable of reliably starting the lamp in ambient temperatures down to -40°F. Each fixture shall be equipped with a photoelectric control.

**B. Lightning Arresters**

- IEEE C62.1, distribution valve type, rated 35 kV, 150 BIL, for use on 34.5 kV delta system. Porcelain bodies shall be wet porcelain, with uniform color glaze. Galvanized cap and base hardware shall have bolted clamps for both line and ground connections. Mounting bolts shall be galvanized. Reuse existing units on pole WP# 129, if field inspection shows them to be in serviceable condition and FDF agrees.

**C. Fused Cutouts**

- Reuse existing units on Pole WP# 129, if field inspection shows them to be in serviceable condition and FDF agrees. If they are replaced, then match existing units. Replace fuse links as noted on the drawing.

**PART 3 EXECUTION****3.1 PREPARATION****A. Field Measurements**

- Scale dimensions on the Drawings show desired and approximate location of equipment, actual locations, distances, and levels shall be governed by field conditions.

**3.2 INSTALLATION****A. General**

1. Perform work in accordance with NFPA 70 and ANSI C2; and
2. Install products as shown on the Drawings and specified.

**B. Splices, Taps, and Cable Terminations**

1. Make splices and taps with Solder less connectors specified in 2.2, A. Use connectors in accordance with manufacturer's instructions.
2. Use plastic insulating tape for uninsulated splices and taps to thickness at least equal to conductor insulation. Where bolted splice or connection presents irregular surface, apply insulating putty to joints before taping.

000166

3. Follow manufacturer's instructions and directions for splices, stress cones and cable terminations.
4. Wrap terminations for stranded insulated conductors on aerial equipment with 2 half-lapped layers of plastic insulating tape from 2 inches back on cable insulation to cover barrel of terminal. Taping shall effect moisture barrier so moisture cannot penetrate between conductor and insulation or interstices of stranded conductor. Overlay 1 half-lapped layer of silicon rubber termination tape over plastic insulating taping.
5. Use heat or termination kits for 34-5KV terminations.

#### C. Setting Poles

1. Excavate holes large enough to admit tamping bar around pole at butt. Do not use explosives to excavate holes.
2. Use backfill materials which can be solidly compacted by power tamping in 6-inch lifts. Compact surplus earth around pole in cone 1 foot high above grade. Add additional backfill where backfill has settled, and tamp before completion of work.
3. Set 30-foot poles 6'-0" in earth and 50-foot poles 7'-0" in earth. Measure depth from lowest side, on moderately sloping ground and from point 2'-6" from center of pole toward low side on steep slopes, cuts, embankments, or where soil is likely to be washed away from pole.
4. Set poles plumb and in line, except that corners and other strain points which are guyed shall have butts displaced to keep tops in line where feasible. At such locations, rake against strain shall be approximately 3 inches for each 10 feet of height.
5. Backfill holes created by removal of poles and other underground structures to finish grade and solidly compact by power tamping. Where backfill has settled, place additional backfill and tamp before completion of work.
6. Identify each pole using aluminum marker stamped with characters 2-½" (60 mm) high, minimum. Obtain identifying numbers from FDF.

#### D. Guys and Anchors

1. Install anchors to bear against undisturbed earth. Tamp backfill around anchors entire depth of hole. Provide temporary guying required during stringing of conductors. Remove at completion of work.
2. Set guy rods in earth in line with strand and install at least 6 inches above grade.

000167

**E. Aerial Conductors**

**1952**

1. Clearances shall be maintained for cables and conductors in accordance with the drawings and ANSI C2.
2. String conductors from rotating reels and do not drag along ground nor permit conductors to lie where they may be run over by vehicles. Pull conductors through stringing sheaves or stringing blocks hung on messenger cable, but do not pull around sharp corners. Inspect conductors as they leave reels and cut out weak or damaged sections and splice ends. Do not make splices in adjacent spans, dead end spans, or within 4 feet of support. Install conductors to proper stringing tensions in accordance with manufacturer's recommendations.
3. Make splices under tension mechanically and electrically secure by compression fittings. Do not use self-gripping or automatic tension splicing sleeves. Make taps between primary wires, jumpers, etc., with mechanical connector.
4. Install hot line stirrups on existing conductors where new feeder taps are made.
5. Sag conductors in accordance with ANSI C2 for medium loading districts and manufacturer's specification.

- F. Aerial Equipment Grounding:** Ground fused switches and lightning arresters in accordance with the drawings. Bond together pole line hardware separated by less than 2 inches. Ground messenger cable of each aerial cable. Connect grounding conductor to messenger with split-bolt connector.

**3.3 FIELD QUALITY CONTROL**

**A. Testing**

1. Use instruments which bear valid calibration stamps showing dates of calibration and expiration dates of stamps. Calibration and accuracy of test instruments shall be certified by an independent testing laboratory, having standards traceable to National Institute of Standards and Technology.
2. Test equipment and wiring for continuity and unintentional grounds, and verify proper phase sequence and voltage at equipment served before attempt is made to operate equipment. Notify Quality Control Inspector before start of tests. Correct items found, during testing or examination by Quality Control Inspector, to be at variance with the Drawings and Specifications. Record results.

**B. Acceptance Testing**

1. Upon receipt of new cable, Contractor will perform the following tests:

**000168**

- a. Visual inspection of cables to insure there is no visible signs of damage;
- b. Megger between the conductor and shield with a 1000 volt unit. Ensure the test value exceeds 36 megohm after 1 minute of test; and
- c. Continuity test of the conductor and cable shield, test measurements shall be less than 1 ohm.

000169

APPROVAL DATA LIST ("X" Indicates Required Data)												
Project No. 40315-TS-0001												
Project Title: Silos Infrastructure Project												
Specification Section: 16400												
B DATA												
1 EPN Identification	2 Description	3 Reference Drawing	4 Specification Paragraph	5 Dimen Drawgs.	6 Equip. Wghts.	7 Specs.	8 Material Descript.	9 Perf. Data	10 Circuit or Control Diagrams.	11 Data Sheets	12 illus. Cuts	13 Install. Instruct.
	Cable 35 kV	94X-6100-E-02241	2.3, A			X				X	X	X
Remarks:												

000170

VENDOR INFORMATION LIST ("X" Indicates Required Data)																		
Project No. 40315-TS-0001			Vendor Information															
Project Title: Silos Infrastructure Project			1	2	3	4	5	6	7	8								
Specification Section: 16400			EPN Identification	Description	Reference Drawing	Spec. Paragraph	Dimen. Drwgs.	Equip. Wghts.	Specs.	Cert. Test Data	Circuit or Control Dgrms.	Install. Instruct.	Ops. Instruct.	Mnt. Instruct.	Spare Parts List	Data Shts.	Illus. Cuts	
				Street Light Fixtures	94X-6100-E-02241	2.3, A							X	X				X
				Cable 35 kV	94X-6100-E-02238	2.2, B							X	X				
Remarks:																		

000171

END OF SECTION

SECTION 16170  
GROUNDING AND BONDING

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

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

**1.2 RELATED SECTIONS**

- A. *Section 01010 - General Requirements.*
- B. *Section 02831 - Chain Link Fence.*
- C. *Section 16400 - Service and Distribution.*

**1.3 REFERENCE DRAWINGS**

- A. Reference *Section 01012* for the Schedule of Drawings.

**1.4 REFERENCES**

- A. InterNational Electrical Testing Association (NETA)
  - NETA ATS-95 Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- B. National Fire Protection Association (NFPA)
  - NFPA 70. National Electrical code, 1996 Edition.
- C. Underwriters Laboratories, Inc. (UL)
  - 1. UL 467-93 UL Standard for Safety Grounding and Bonding.
  - 1. Electrical Construction Materials Directory-96.

**1.5 SYSTEM DESCRIPTION**

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

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**1.6**

**SUBMITTALS**

- A. Reference *Part 6, Section 10.0* for submittals and *ACR-001* for procedures.
- B. Provide certification or record of calibration of ground testing instrumentation.
- C. Provide record of as-built locations of grounding electrodes, if grounding electrodes are required.

**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.

**PART 2**

**PRODUCTS**

**2.1**

**MANUFACTURES**

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

**2.2**

**MATERIALS**

- A. Rod Electrode
  - Copper-clad steel, 3/4 inch diameter, 10 foot length.
- B. Mechanical Connectors
  - 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.

**000173**

**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.

**3.2 ERECTION/INSTALLATION/APPLICATION**

- A. Install products in accordance with manufacturer's instruction.
- 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 all 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 drawings.
- G. Fence Grounding - Fences shall be grounded with a ground rod at each fixed gate post and at each corner post:
  - 1. Drive ground rods until the top is 12 inches below grade;
  - 2. Attach a No. 4 AWG copper conductor, by fusion weld process, to the ground rods and extend it underground to the immediate vicinity of the fence post; and
  - 3. Lace the conductor vertically into 12 inches of fence mesh and fasten it by two approved bronze compression fittings, one to bond the wire to the post and the other to bond the wire to the fence. Each gate section shall be bonded to its gatepost by a 1/8 inch by 1 inch flexible braided copper strap and ground post clamps. Clamps shall be of the anti-electrolysis type.

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### **3.3**

#### **QUALITY CONTROL**

- A. Inspect grounding and bonding system conductors and connections for tightness and proper installation as defined by contract documents and manufacturer's instructions. Accurately record as-built locations of grounding electrodes if required, and submit to FDF. Test instrumentation shall conform to NEA ATS. Provide certification for instrumentation.**
  
- B. Measure the system's resistance to the ground; perform testing in accordance with instrument manufacturer's recommendation using the fall-of-potential method. Provide written test reports indicating overall resistance to ground and resistance of each electrode to ground.**

**END OF SECTION**

**000175**

SECTION 09900  
PAINTING**PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Surface preparation and field application of paints and coatings.

**1.2 REFERENCES**

- A. ASTM D16 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.
- B. NPCA (National Paint and Coatings Association) - Guide to U.S. Government Paint Specifications.
- C. OSHA (Occupational Safety and Health Administration) - 29 CFR 1910
- D. Ohio Department of Transportation (ODOT)
  - Pavement Markings and Material (1997)

**1.3 SUBMITTALS**

- A. Product Data: Provide data on all finishing products and special coatings.
- B. Manufacturer's Instructions: Indicate special surface preparation procedures, substrate conditions requiring special attention.
- C. Material Safety Data Sheet (MSDS): Submit for primers, finish paints, thinners and solvents.

**1.4 QUALIFICATIONS**

- A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years experience.

**1.5 REGULATORY REQUIREMENTS**

- A. Conform to applicable code for flame and smoke rating requirements for finishes.

**1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, store, protect and handle products to site.

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- B. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- C. Container label to include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- D. Store paint materials at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F in ventilated area, and as required by manufacturer's instructions.

## **1.7 ENVIRONMENTAL REQUIREMENTS**

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- C. Noise, dust, fumes and fire hazard due to painting and sandblasting shall comply with OSHA 29 CFR 1910 regulations.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Manufacturers - Paint
  - a. Carboline
  - b. Coronada
  - c. Devoe
  - d. Glidden
  - e. Porter
  - f. Sherwin-Williams
  - g. Approved equal.

### **2.2 MATERIALS - GENERAL**

- B. Coatings: Ready mixed, except field catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating; good flow and brushing properties; capable of drying or curing free of streaks or sags.
- C. Accessory Materials: Paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.
- D. Materials shall be free of lead and other RCRA metals.

**PART 3 EXECUTION**

**3.1 EXAMINATION**

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Test shop applied primer for compatibility with subsequent cover materials.

**3.2 PREPARATION**

- A. Asphalt, Creosote, or Bituminous Surfaces Scheduled for Paint Finish: Remove foreign particles to permit adhesion of finishing materials. Apply compatible sealer or primer.

**3.3 APPLICATION**

- A. Apply products in accordance with manufacturer's instructions.
- B. Do not apply finishes to surfaces that are not dry.
- C. Apply each coat to uniform finish.
- D. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
- E. Allow applied coat to dry before next coat is applied.

**3.4 CLEANING**

- A. Collect waste material which may constitute a fire hazard, place in closed metal containers and remove from site.

**END OF SECTION**

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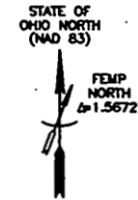
1952

**ENCLOSURE 3**

**SILOS INFRASTRUCTURE PROJECT SITE DRAINAGE AND WETLANDS PLAN**

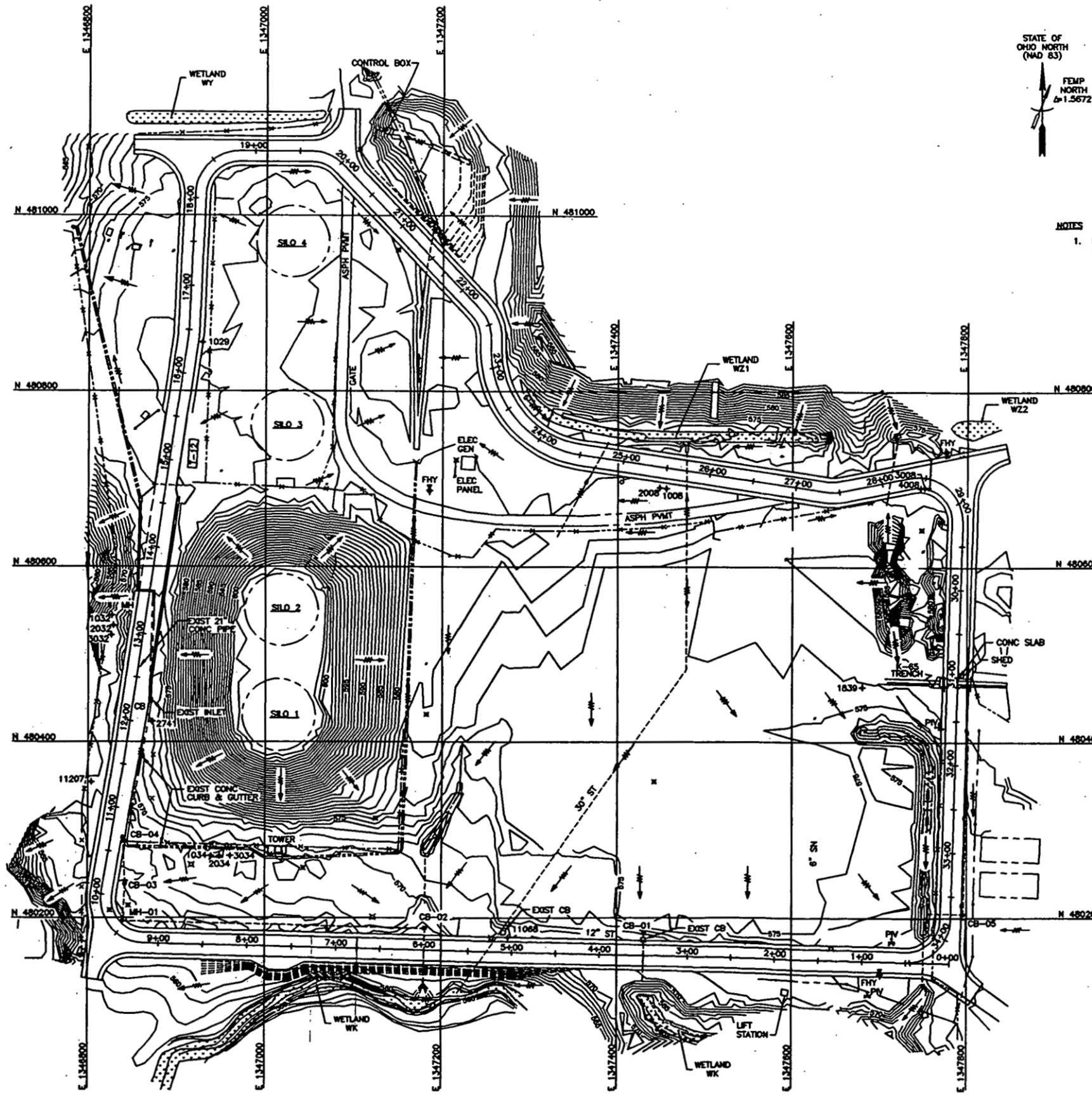
000179

1952



NOTES

- 1. DRAWING 75X-5500-G-00372 USE TO DETERMINE WETLAND LOCATIONS.



SITE DRAINAGE PLAN

SCALE: 1"=50'



SCALE IN FEET

000180

PRELIMINARY DRAWING

UNITED STATES DEPARTMENT OF ENERGY FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

FLUOR DANIEL FERNALD

SILOS PROJECT

SILOS INFRASTRUCTURE PROJECT SITE DRAINAGE AND WETLAND PLAN

Table with project details including drawing number (94X-5500-P-SK-XX), sheet number (A), and date (12/3/96).

ENCLOSURE 4

CALCULATION OF ACRES OF WETLANDS IMPACT

1952

Author: Dana Whitish at FDNW-01  
Date: 12/16/98 4:47 PM  
Priority: Normal  
TO: Jay Thompson at FNST-03  
Subject: Ditch Modification Quantities

----- Message Contents -----  
-----

Jay,

I sampled grade at the modified ditch from sta 6+75 to 7+28, comparing new ditch alignment to existing ditch alignment and arrived at a net cut of 10.51 cu yd's of native ground, all on the south side of the ditch.

Also, required quantities of:

SOD = 425 sq ft (nom)  
MATTING = 700 sq ft (nom)

> 1125 ft<sup>2</sup>

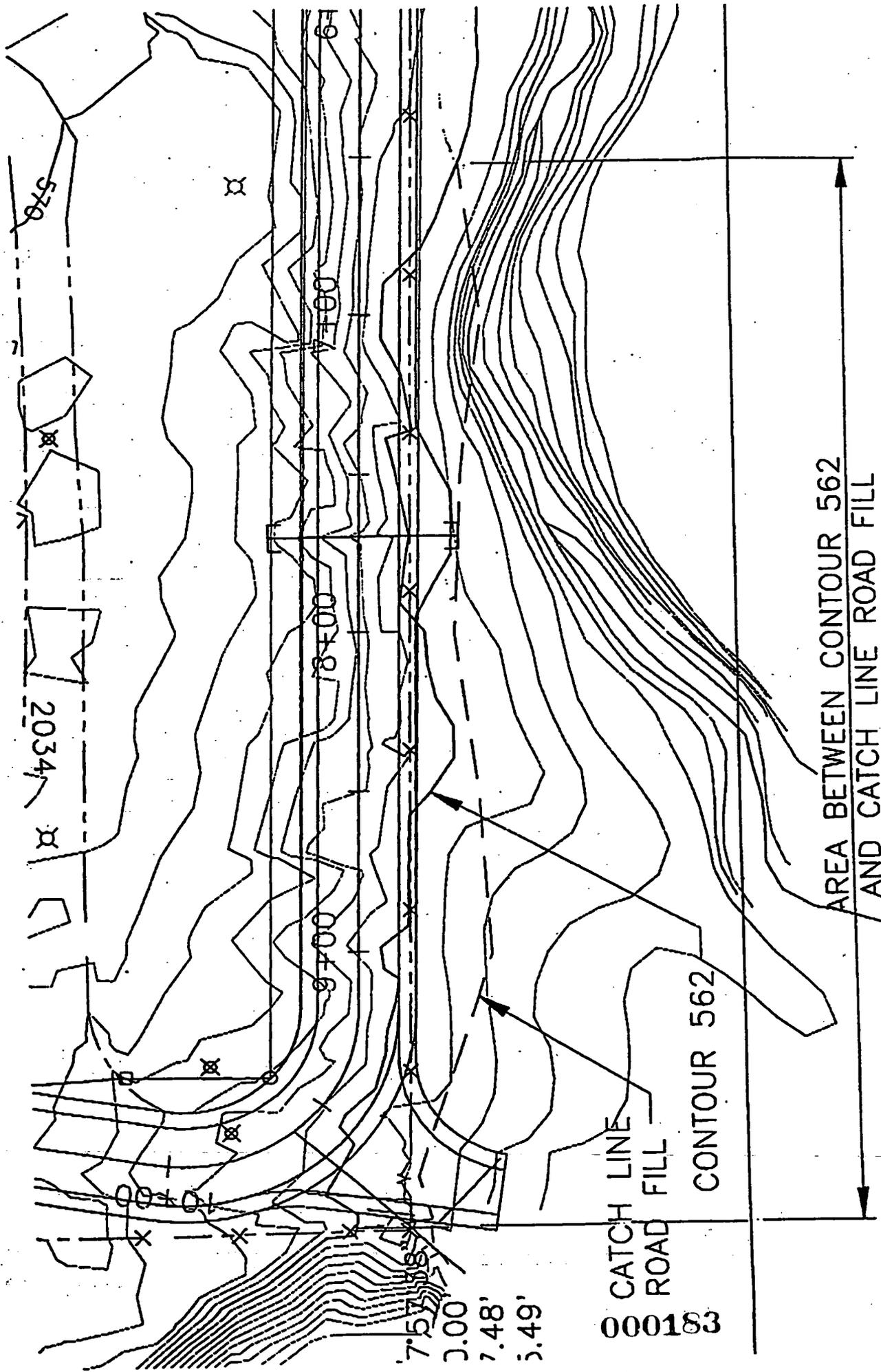
Total on north side

6202 ft<sup>2</sup>

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7327 ft<sup>2</sup> = 0.2 acres

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1952

page 1

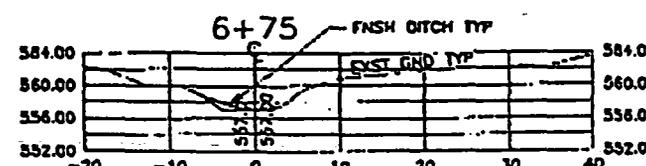
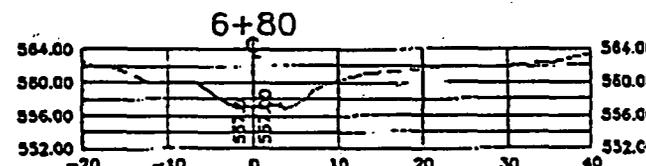
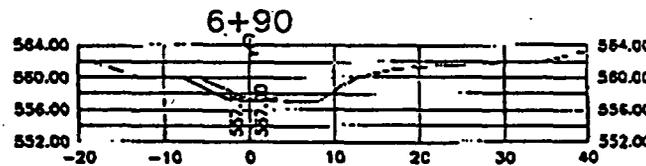
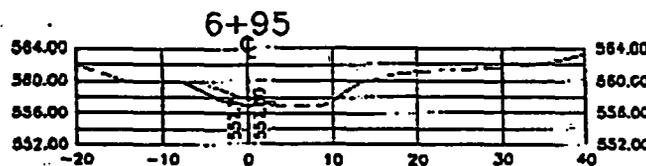
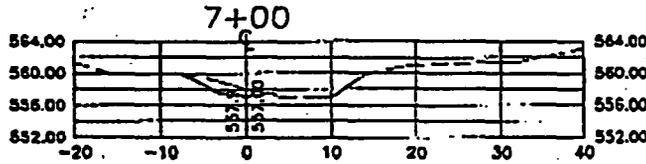
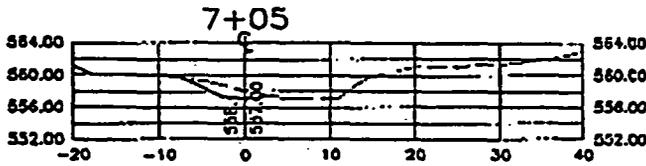
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Wed Dec 16 15:17:26 1998

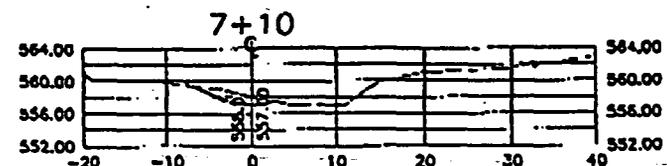
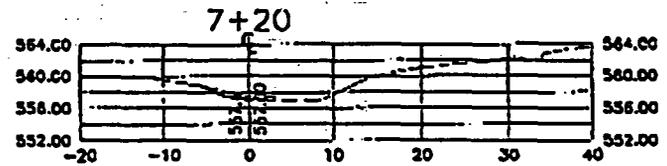
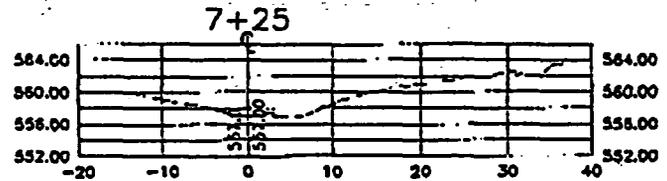
ect: fermco  
nment: crk

Station	Cut Area (sqft)	Fill Area (sqft)	END AREA VOLUME LISTING		Cut 1.0000 Tot Vol (yds)	Fill 1.0000 Tot Vol (yds)	Mass Ordinate
			Cut 1.0000 Volume (yds)	Fill 1.0000 Volume (yds)			
6+75	0.00	1.50	0.00	0.26	0.00	0.26	-0.26
6+80	0.00	1.30	0.41	0.19	0.41	0.45	-0.04
6+85	4.48	0.76	1.02	0.13	1.43	0.58	0.85
6+90	6.53	0.68	1.35	0.10	2.78	0.68	2.10
6+95	8.04	0.40	1.55	0.04	4.33	0.72	3.61
7+00	8.68	0.06	1.61	0.01	5.94	0.73	5.20
7+05	8.68	0.06	1.52	0.01	7.46	0.74	6.72
7+10	7.76	0.01	1.44	0.00	8.89	0.74	8.15
7+15	7.76	0.01	1.02	0.05	9.91	0.80	9.11
7+20	3.24	0.58	0.60	0.11	10.51	0.91	9.61
7+25	3.24	0.58					

000184



STATION	AREAS Square Feet		VOLUMES Cubic Yards		CUMULATIVE VOLUME Cubic Yards	
	CUT	FILL	CUT	FILL	CUT	FILL
6+75	0.00	1.50	0.00	0.26	0.00	0.28
6+80	0.00	1.30	0.41	0.19	0.41	0.45
6+85	4.48	0.78	1.02	0.13	1.43	0.58
6+90	8.53	0.68	1.35	0.10	2.78	0.68
6+95	8.04	0.40	1.55	0.04	4.33	0.72
7+00	8.68	0.06	1.81	0.01	5.94	0.73
7+05	8.68	0.06	1.52	0.01	7.46	0.74
7+10	7.76	0.01	1.44	0.00	8.89	0.74
7+15	7.76	0.01	1.02	0.05	9.81	0.80
7+20	3.24	0.58	0.60	0.11	10.51	0.91
7+25	3.24	0.58	0.00	0.00	10.51	0.91



SECTIONS - FERMO  
CREEK LEFT OF 7+00  
SCALE: 1:10

000185

**ENCLOSURE 5**

**WETLAND PERMITTING CROSSWALK**

**Silos Infrastructure Project  
Substantive Permitting Cross-Walk**

Condition	Substantive Requirement	Compliance Plan
<b>Nationwide Permit 26 - Headwaters and Isolated Waters Discharge<sup>1</sup></b>		
Navigation	No activity may cause more than a minimal effect on navigation.	Portions of the proposed project will result in the placement of fill material (stone, matting and herbaceous plugs) into a jurisdictional wetland (Pilot Plant Drainage Ditch). A maximum of approximately 0.2 acres of jurisdictional wetlands could be impacted. No work will occur within any water bodies used for navigation, either in commerce or recreation. Therefore, the proposed activity will not have an adverse impact on navigation.
Proper Maintenance	Any structure or fill authorized shall be properly maintained, including maintenance to ensure public safety.	Public access to the project area is restricted by the site perimeter fence. Additional personnel access restrictions will be imposed during construction in the form of construction fencing and/or barrier ropes. The project area will be inspected during construction under the site Storm Water Pollution Prevention Plan (SWPPP) construction inspection program to ensure erosion and sedimentation controls are properly maintained.
Erosion and Siltation Controls	Appropriate erosion and siltation controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date.	Heavy equipment will be restricted to the north bank of the PPDD in order to minimize collateral impact due to excavation activities. Silt fence and/or other appropriate methods of sedimentation and erosion control will be used as necessary to minimize potential erosion and sediment transport during construction. The project area will be inspected during construction under the site SWPPP construction inspection program to ensure erosion and sedimentation controls are properly maintained. Matting and herbaceous plugs will be placed as soon as practicable to provide stabilization.

Condition	Substantive Requirement	Compliance Plan
Aquatic Life Movement	No activity may substantially disrupt the movement of those species of aquatic life indigenous to the water body, including those species which normally migrate through the area, unless the activity's primary purpose is to impound water.	Portions of the proposed project will be conducted within a jurisdictional wetland. No disruption in the movement of aquatic species is anticipated as a result of the project.
Equipment	Heavy equipment working within wetlands must be placed on mats, or other measures must be taken to minimize soil disturbance.	Heavy equipment will be restricted to the north bank of the PPDD in order to avoid and minimize collateral impact impacts to wetland areas located outside the project boundary. Should entry into the ditch be required matting or other suitable protection will be implemented.
Regional and Case-by-Case	The Activity must comply with any regional conditions which may have been added by the Division Engineer and with any case specific conditions added by the Corps or by the state or tribe in its section 401 water quality certification.	No regional conditions have been added by the U.S. Army Corp of Engineers. Section 401 water quality certification conditions are addressed below.
Wild and Scenic Rivers	No activity may occur in a component of the National Wild and Scenic River System or in a river officially designated by Congress as a "study river" for possible inclusion in the system.	Not applicable. The project area is not part of the National Wild Scenic River System.
Tribal Rights	No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.	Not applicable. No tribal water, fishing, or hunting treaty rights have been granted for the wetland area in which the project will be conducted.
Water Quality Certification	Section 401 State Water Certification must be obtained or waived.	Ohio EPA issued its current Section 401 State Water Quality Certification for NWP 26 on February 10, 1997 which was modified May 20, 1998. These conditions are addressed below.
Coastal Zone Management	State coastal zone management consistency concurrence must be obtained or waived.	Not applicable. The project area is not regulated under state coastal management regulations or statutes.

000188

Condition	Substantive Requirement	Compliance Plan
Endangered Species	No activity is authorized under any NWP, which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act, or which is likely to destroy or adversely modify the critical habitat of such species.	No known federally-listed threatened or endangered species or critical habitat will be impacted by the project. No known individuals were encountered in the immediate project area during on-site threatened and endangered species surveys.
Historic Properties	No activity which may affect historic properties listed, eligible of listing, in the National Register of Historic Places in authorized.	No impacts to historic properties are anticipated. The project area has been surveyed prior to disturbance in accordance with the Programmatic Agreement Regarding Archaeological Investigations at the Fernald Environmental Management Project (March 6, 1997). Any unanticipated discoveries encountered during actual field work will be addressed in accordance with that programmatic agreement between DOE, the Ohio Historic Preservation Office, and the Advisory Council on Historic Preservation.
Notification	When required by the terms of a NWP, the permittee must notify the ACOE in accordance these provisions.	Not applicable. ACOE notification is not required for CERCLA remedial actions regulated by USEPA.
Water Supply Intakes	No discharges of dredged or fill material may occur in the proximity of a public water supply intake except where the discharge is for repair of the public water supply intake structure or adjacent bank stabilization.	Not applicable. No public water supply intakes are located in the vicinity of the proposed project.
Shellfish Production	No discharge of dredged or fill material may occur in areas of concentrated shellfish production, unless the discharge is directly related to shellfish harvesting authorized by NWP 4.	Not applicable. The project area is not used for shellfish production.

Condition	Substantive Requirement	Compliance Plan
Suitable Material	No discharge of dredged or fill material may consist of unsuitable material (e.g. trash, debris, car bodies, asphalt, etc.) and material discharged must be free from toxic pollutants in toxic amounts.	Clean stone meeting ODOT Specification 601.07 will be the fill material in question. Stone meeting this specification will not contain trash, debris, toxic pollutants, etc.. Appropriate erosion and sedimentation controls will also be used as necessary to minimize sediment transport from the project area.
Mitigation	Discharges of dredged or fill material into waters of the United States must be minimized and avoided to the maximum extent practicable at the project site.	Work within wetland areas will be limited to the immediate vicinity of the proposed roadway. Approximately 0.2 acres of jurisdictional wetland will be impacted. Appropriate erosion and sedimentation controls will be used as necessary to minimize sediment transport. The 0.2 acre wetland impact associated with the proposed project is already accounted for in the site-wide wetland mitigation strategy outlined in the Natural Resource Restoration Management Plan and will be mitigated at a 1:1.5 acre ratio
Spawning Areas	Discharges in spawning areas during spawning seasons must be avoided to the maximum extent practicable.	No adverse impacts to spawning areas are anticipated. Appropriate erosion and sedimentation controls will also be used as necessary to minimize sediment transport in downstream portions of the watershed.
Obstruction of High Flows	To the maximum extent practicable, discharges must not permanently restrict or impede the passage of normal or expected high flows or cause the relocation of the water (unless the primary purpose of the fill is to impound waters).	No permanent restrictions or impediments to normal or expected high flows are anticipated. A slight diversion of approximately 53 linear feet of the existing water course will be necessary to ensure flows are maintained.
Adverse Effects from Impoundments	If the discharge creates an impoundment of water, adverse effects on the aquatic system caused by the accelerated passage of water and/or the restriction of its flow shall be minimized to the maximum extent practicable.	No temporary or permanent impoundments or structures are planned as part of this project. A slight diversion of approximately 53 linear feet of the existing water course will be necessary to ensure flows are maintained.
Waterfowl Breeding Areas	Discharges into breeding areas for migratory waterfowl must be avoided to the maximum extent practicable.	Not applicable. The project area is not used extensively by water fowl during the breeding season.

000190

Condition	Substantive Requirement	Compliance Plan
Removal of Temporary Fills	Any temporary fills must be removed in their entirety and the affected areas returned to their preexisting elevation.	Not applicable. No temporary fills are anticipated as part of the proposed project. Fill material (stone, matting and herbaceous plugs) placed within the jurisdictional wetland will be semi-permanent. The stone is necessary to stabilize the road surface. All fill materials will be removed as necessary during the remediation of Area 7.
<b>Clean Water Act Section 401 State Water Quality Certification<sup>2</sup></b>		
Bank Stabilization	Steps shall be taken, upon completion of the project, to ensure bank stability. This may include, but is not limited to, the placement of rip-rap or bank seeding.	Disturbed soils associated with construction of the access road will be re-stabilized upon completion of the project using matting and herbaceous plugs.
Restoration	Any damages to the immediate environment of the project by equipment for construction or hauling will be repaired immediately.	The movement of heavy equipment will be limited to the immediate project area. Disturbed soils associated with construction of the roadway will be re-stabilized upon completion of the project.
Adverse Impacts to Water Quality and Aquatic Life	Care must be employed throughout the course of the project to avoid the creation of unnecessary turbidity which may degrade water quality or adversely affect aquatic life outside of the project area.	The movement of heavy equipment will be limited to the immediate project vicinity during construction of the roadway. Appropriate erosion and sedimentation controls will also be used to minimize sediment transport from the project area.
Acreage Restrictions	The discharge does not cause the loss of more than 1 acre of waters of the United States nor cause the loss of waters of the United States for a distance greater than 200 linear feet of the stream bed.	Approximately 0.2 acres of jurisdictional wetlands will be filled as a result of the proposed project. Approximately 53 linear feet will be impacted by diversion but will not be lost. This complies with the 200 foot criteria. These impacts are consistent with the Section 401 Water Quality Certification for NWP 26 (May 1998 Modification).
	For discharges causing the loss of greater than 1/3 acre of waters of the United States, the permittee notifies the District Engineer in accordance with the "notification" general condition in the NWP.	Not applicable. ACOE notification is not required for CERCLA remedial actions regulated by USEPA. Pre-discharge notification to U.S. EPA and Ohio EPA will be conducted by DOE.
	For discharges causing the loss of 1/3 acre or less of waters of the United States, the permittee must submit a report within 30 days of completion of the work with the requisite information.	Not applicable. ACOE notification is not required for CERCLA remedial actions regulated by USEPA. Pre-discharge notification to U.S. EPA and Ohio EPA will be conducted by DOE.

Condition	Substantive Requirement	Compliance Plan
	For discharges in special aquatic sites, including wetlands, the notification must also include a delineation of affected special aquatic sites.	Not applicable. ACOE notification is not required for CERCLA remedial actions regulated by USEPA. Pre-discharge notification to U.S. EPA and Ohio EPA will be conducted by DOE.
	The discharge, including all attendant features, both temporary and permanent, is part of a single and complete project.	The work within the jurisdictional wetland is necessary for the construction of the road. The road is necessary and will be implemented in support of the Silos remediation.
<b>Clean Water Act Section 401 State Water Quality Certification<sup>2</sup> - Special Conditions and Limitations</b>		
Streams designated as Exceptional Warm water Habitat or Coldwater Habitat	NWP 26 shall not authorize impacts to streams designated Exceptional Warm water Habitat or Coldwater Habitat in Ohio's Water Quality Standards (Rule 3745-1 of the OAC).	Neither the Pilot Plant Drainage Ditch or Paddys Run is classified as Exceptional Warm water Habitat or Coldwater Habitat.
Discharge Restrictions within Bogs and Fens	No discharges of dredged or fill material shall occur within bogs or fens.	No work will occur within a bog or fen system.
<b>10 CFR 1022 - Compliance with Floodplain/Wetlands Environmental Review Requirements</b>		
Avoidance and Minimization of Wetland Impacts and Incorporation of Flood Plain Management	Federal agencies undertaking actions within wetlands must take appropriate steps to avoid and minimize potential wetland impacts and incorporate flood plain management into planning decisions. Federal agencies are to provide the opportunity for public involvement.	The proposed project is not located within the 100-yr or 500-yr flood plain of Paddys Run. A Notification of Wetland Involvement is contained in the OUS Feasibility Study.

<sup>1</sup> See 61 FR 65874 and Appendix B of the OUS ROD for additional detail.  
<sup>2</sup> Ohio EPA granted Section 401 State Water Quality Certification for NWP - 26 on February 11, 1997 and modified the conditions pursuant to the NWP 26 Settlement on May 20, 1998. See OAC 3745-32 and Appendix B of the OUS ROD for additional details.

**1952**

**ENCLOSURE 6**

**ADDENDUM TO WAC ATTAINMENT REPORT FOR AREA 7 SOILS - PILOT PLANT  
DRAINAGE DITCH.**

**000193**

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**ADDENDUM TO THE WAC ATTAINMENT REPORT FOR AREA 7  
SOILS (SILOS PROJECT AREA) -**

**WAC CHARACTERIZATION OF A SECTION OF THE PILOT  
PLANT DRAINAGE DITCH**

**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT  
FERNALD, OHIO**



**JANUARY 1999**

**U.S. DEPARTMENT OF ENERGY  
FERNALD AREA OFFICE**

**20500-RP-0001  
REVISION A**

000194

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2.0 Sampling Design ..... 1

3.0 Summary of Analytical Data and Conclusions ..... 2

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Figure 1 Sample Locations A7-B73 through A7-B82 - Pilot Plant Ditch Sample Locations

Table 1 Summary of WAC Analytical Data for the Pilot Plant Ditch Section Planned for Excavation

**LIST OF ATTACHMENTS**

Attachment A Variance No. 20500-PSP-01-7

Attachment B Historical Data Summary for the Pilot Plant Ditch

**000195**

**LIST OF ACRONYMS AND ABBREVIATIONS**

DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
OEPA	Ohio Environmental Protection Agency
OSDF	On-Site Disposal Facility
PSP	Project Specific Plan
WAC	Waste Acceptance Criteria

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## 1.0 BACKGROUND

The design footprint for the southern portion of the planned Silos Project infrastructure road necessitates excavation and rerouting a section of the existing Pilot Plant Ditch. The affected section of ditch is approximately 50 feet by 30 feet and is located south of Silo 1. The toe of the rock rip-rap to be used for road embankment support is designed to extend into the vicinity of the existing ditch line. The initial engineering design plans for the road did not account for re-routing of the Pilot Plant Ditch and therefore was not incorporated into the Project-Specific Plan for WAC Attainment Sampling of Area 7 Soils (DOE 1998).

This report summarizes the sampling design, selection of On-Site Disposal Facility (OSDF) WAC constituents of concern, and the conclusions drawn from this characterization of soils in the Pilot Plant Ditch area.

## 2.0 SAMPLING DESIGN

A sampling design was developed for characterization of the soils planned for excavation in the Pilot Plant Ditch and surrounding bank area which is documented in the Variance Form (No. 20500PSP01-7) included as Attachment A. The sampling design included ten sample locations (Figure 1), each having a target depth which corresponds to the designed excavation depth. At each location, the entire soil core collected down to the target depth was subjected to field radiological screening using a beta-gamma meter (frisker) to apply a biased sampling approach. Two of the ten boring locations were located within the centerline of the ditch during low flow with the remainder locations on the bank of the ditch. No above-background radiological levels were encountered during the sampling therefore all samples were collected from the surface.

The process for selecting the constituents of concern for this Pilot Plant Ditch area entailed reviewing all analytical results for soil and sediment in the site-wide environmental database for which positive detections were reported. The area footprint used for the data query extended from the existing Pilot Plant Ditch sump located west of the Advanced Wastewater Treatment Facility to the fence west of the silos. No positive detections were reported for the WAC constituents or Resource Conservation and Recovery Act (RCRA) list of contaminants near the regulatory limits. In fact, positive detections were near background levels. The historical analytical data from the database query are included as Attachment B. Total

uranium and technetium-99 samples were included in the analytical plan due to their ubiquitous nature, and, in the case of technetium-99, its relatively low WAC limit.

### 3.0 SUMMARY OF ANALYTICAL RESULTS AND CONCLUSIONS

The recent sampling results are summarized in Table 1 below. The highest total uranium and technetium-99 result was 127 mg/kg and 2.1 pCi/g, respectively, which was obtained from a sediment sample collected from the ditch channel (sample ID A7-B75-1-R). The sample results demonstrate that the soils are well below the WAC limit for the two constituents of concern and are near background levels in most cases.

**TABLE 1**

**Summary of WAC Analytical Data for the Pilot Plant Ditch Section Planned For Excavation**

Sample Identifier	General Location	Total Uranium (mg/kg)	Technetium-99 (pCi/g)	Sample Depth Interval	Total Boring Depth
A7-B73-1-R	North bank of ditch	15 mg/kg	0.9 pCi/g	0-0.5 feet	6.4 feet
A7-B74-1-R	North bank of ditch	11 mg/kg	1.3 pCi/g	0-0.5 feet	1.6 feet
A7-B75-1-R	In centerline of ditch	127 mg/kg	2.7 pCi/g	0-0.5 feet	1.5 feet
A7-B76-1-R	North bank of ditch	33 mg/kg	1.8 pCi/g	0-0.5 feet	1.4 feet
A7-B77-1-R	South bank of ditch	25 mg/kg	1.5 pCi/g	0-0.5 feet	3.4 feet
A7-B78-1-R	South bank of ditch	27 mg/kg	1.3 pCi/g	0-0.5 feet	4.5 feet
A7-B79-1-R	In centerline of ditch	119 mg/kg	0.9 pCi/g	0-0.5 feet	1.2 feet
A7-B80-1-R	North bank of ditch	65 mg/kg	2.1 pCi/g	0-0.5 feet	1.4 feet
A7-B81-1-R	South bank of ditch	26 mg/kg	1.6 pCi/g	0-0.5 feet	1.5 feet
A7-B82-1-R	South bank of ditch	30 mg/kg	0.6 pCi/g	0-0.5 feet	5.6 feet

The results obtained from this sampling design, combined with the historical data, demonstrate that there is no above-WAC concern for the soils identified for excavation in the Pilot Plant Ditch vicinity as outlined in the Silos Project infrastructure road engineering design drawings. Therefore, the Silos Project plans to proceed with excavation of this soil and debris to be dispositioned per the Silos Project waste management plan in early Spring of 1999.

000198

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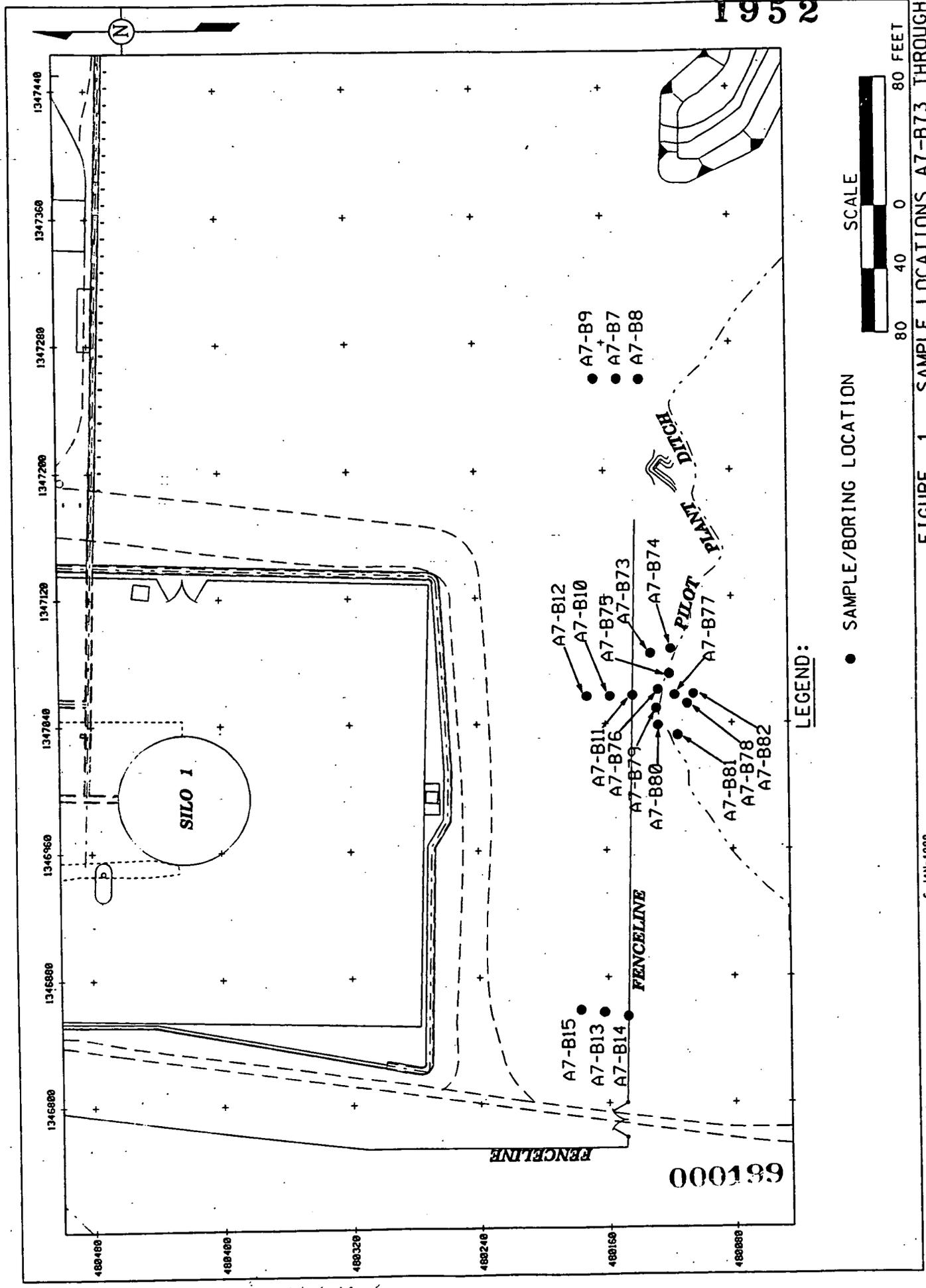


FIGURE 1. SAMPLE LOCATIONS A7-B73 THROUGH A7-B82, PILOT PLANT DITCH AREA

6-JAN-1999

/dglbr/55981/dgnr/611cr-d4.dgn  
STATE PLANAR COORDINATE SYSTEM 1927

## REFERENCES

U.S. Department of Energy, 1998a, "WAC Attainment Report for Area 7 Soils (Silos Project Area)," Draft, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 1998b, "WAC Attainment Plan for the On-Site Disposal Facility," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 1998c, "Project Specific Plan for WAC Attainment Sampling of Area 7 Soils," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

000200

**1952**

**ATTACHMENT A**

**Variance No. 20500PSP01-7**

**000201**

VARIANCE / FIELD CHANGE NOTICE

1952

V/F 20500PSP01-7

WBS NO.: 20500PSP01

Page 1 of 7

PROJECT TITLE: PSP for WAC Attainment Sampling of Area 7 Soils

Date: 12/16/98

VARIANCE / FIELD CHANGE NOTICE (Include justification): 20500-PSP-0001 Rev.0

This variance provides direction on additional sampling to be performed in the vicinity of the Pilot Plant Drainage Ditch in support of planned excavation for the Silos Project infrastructure road. The initial engineering design did not provide for re-routing of the drainage ditch as a result of a planned rock berm to be installed during road construction which would potentially disrupt storm water flow within the ditch. The design drawings were revised to include re-routing of approximately 50 to 75-foot section of channel. The revised drawings are attached along with cross-sectional drawings indicating the approximate depth of excavation and location of the sample points.

The sampling design includes ten sampling points spaced over the planned excavation area which encompasses a 50 to 75-foot section of the ditch and the soil bank to the south of the ditch. The entire area planned for excavation is approximately 75 feet by 25 feet.

<u>Analytes</u>	<u>TAL</u>	<u>Container/Mass</u>	<u>Preservative</u>
Total U / Tc-99	TAL A	250 mL/300 g	None

<u>Sample IDs</u>	<u>Total Depth</u>
A7-B73-x-R	555' Elevation
A7-B74-x-R	555' Elevation
A7-B75-x-R	555' Elevation
A7-B76-x-R	555' Elevation
A7-B77-x-R	555' Elevation
A7-B78-x-R	555' Elevation
A7-B79-x-R	555' Elevation
A7-B80-x-R	555' Elevation
A7-B81-x-R	555' Elevation
A7-B82-x-R	555' Elevation

ECDC CONTROLLED  
COPY NO.  
8591

Note: The "x" will be replaced with the appropriate depth code as specified in the PSP (1 for 0-0.5 feet, 2 for 0.5-1.0 feet, etc.). The total boring depth will be determined based on the marked surface elevation at each sample location (surface elevation - 555 feet elevation = total depth).

All samples will be collected from the interval having the highest radiological field reading (beta-gamma frisker); if all soil intervals are background, then the 0.0-0.5 foot interval will be collected.

The total depth of each boring will extend to 555 feet in elevation. The total depths in feet will be recorded in the Field Activity Log during the sampling event. If an obstruction is encountered, the location should be relocated within the limits of the penetration permit. A minimum of three boring attempts should be made at each location if obstructions are encountered.

The sampling equipment to be utilized shall include a manually driven Macro-core or hand auger. A heavy steel bar with a blunt end may also be used to penetrate through obstructions such as rocks or roots.

For sample locations in the stream bed (B75 and B79), collection of soil is preferable down to the 555 feet elevation. The points may be moved along the stream channel up to ten feet in either direction if necessary to collect soil. However, it may be necessary to collect sediment as the 0.0-0.5 foot interval. If this is the case, attempt to collect only silt and fine-grained materials and avoid gravel to the extent possible.

000202

Justification:

Characterization of the described area of soils is necessary due to excavation planned to install rock to support the planned infrastructure road. This rock will extend into the existing Pilot Plant Drainage Ditch which necessitates the need to re-route the ditch from approximately the 6+75 station to the 7+25 station as illustrated on the attached design drawings.

REQUESTED BY: Mike Frank

Date: 12/16/98

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE <i>T. J. Moore</i>	12-16-98	X	CHARACTERIZATION LEAD <i>Mike Frank</i>	12-16-
	DATA QUALITY MANAGEMENT		X	FIELD MANAGER <i>Mike Frank</i>	12-16-
	ANALYTICAL CUSTOMER SUPPORT		X	Site Project Incharge <i>[Signature]</i>	12-16-
	OTHER		X	AREA 7 PROJECT MGR. <i>[Signature]</i>	12-16-
VARIANCE/FCN APPROVED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			REVISION REQUIRED: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
<b>DISTRIBUTION</b>					
PROJECT MANAGER:		DOCUMENT CONTROL: <i>Jeanie Roseer</i>		OTHER:	
QUALITY ASSURANCE:		OTHER:		OTHER:	
FIELD MANAGER:		OTHER:		OTHER:	

000203

Variance #7  
Page 2 of 7

HORIZONTAL: 1" = 10'

VERTICAL: 1" = 10'

1952

J. CRALFORD 12-11-98

920-5042

+5819

REVISION A - 12-16-98 E

CORRECTED STATION 6+75 TO 7+12.5

RAISED STA 700 CROSS SECTION TO LUXURIA

OWA DCU-40315-A-RWD INFO

REMOVED 12-16-98

MOVED STATION 700 SAMPLE PTS

FROM -42' TO -38'

FROM -50' TO -46'

ADDED -54'

ALL PER EPA DISCUSSIONS 12-16-98

PLACE SAMPLE PT. & PILOT PLANT E FOR STA 6+75 & 7+12.5 OR REMOVE DN FROM SOIL IN E

ADDED SAMPLE NO. TO TABLE

SUMMARY

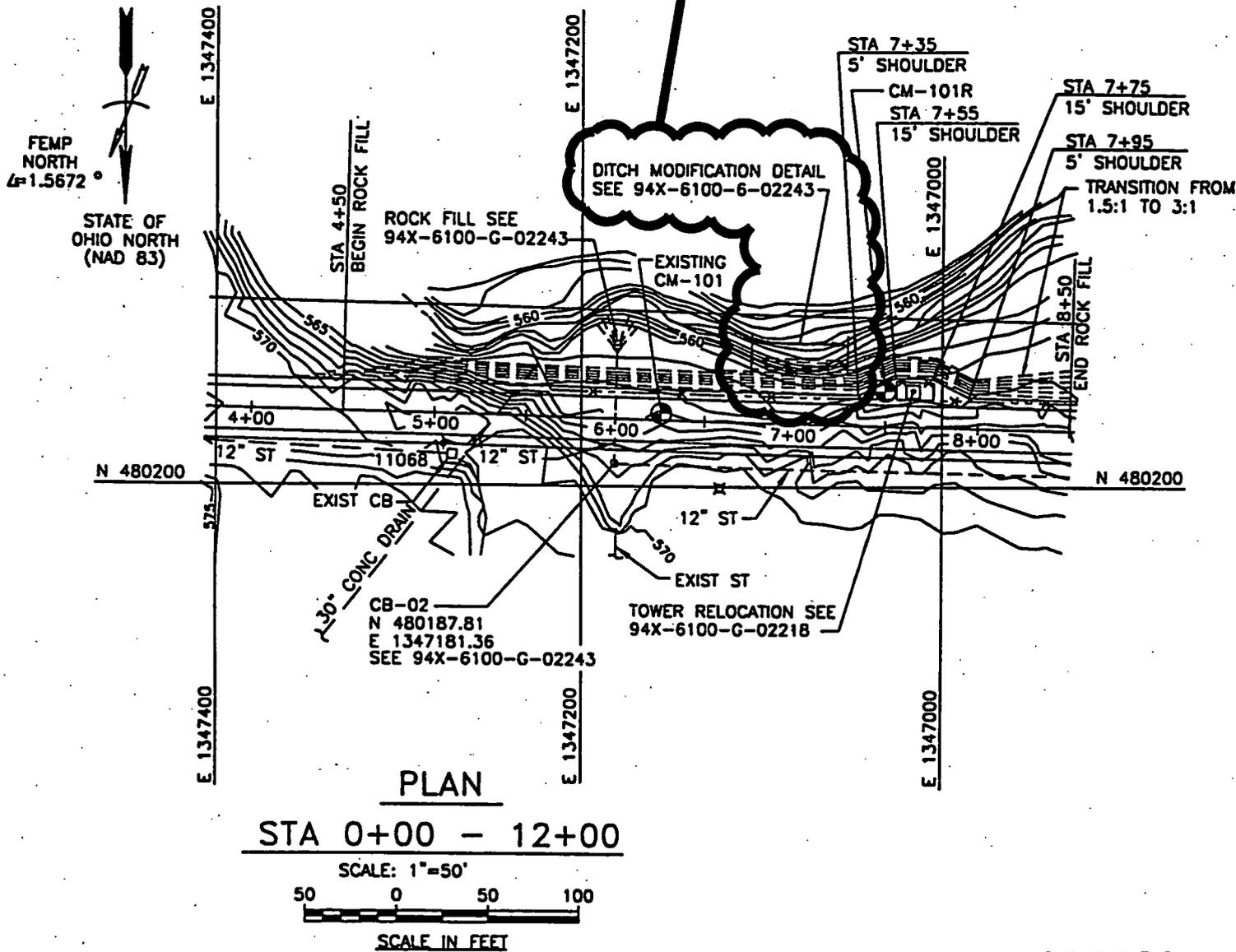
SAMPLE LOCATIONS

STATION	DISTANCE FROM R.O. E	DESCRIPTION	△ SAMPLE NO.
6+75	32' LEFT OR -32'	-	A7-B73
	-37'	-	A7-B74
△ 6+87.5	-35' ±	Pilot Plant Plant E	A7-B75
7+100	-32'	-	A7-B76
	-38' △	-	A7-B77
	-46' △	-	A7-B78
	-54' △	-	A7-B82
△ 7+12.5	-30' E	Pilot Plant Plant E	A7-B79
7+25	-35'	-	A7-B80
	-41'	-	A7-B81

Variance 21



1952



PLAN

STA 0+00 - 12+00

SCALE: 1"=50'



SCALE IN FEET

000206

PSP  
Variance #7  
Page 5 of 7

 FLUOR DANIEL NORTHWEST, INC.

DESIGN CHANGE NOTICE

DESCRIPTION CHANGE:

MODIFY PLAN VIEW TO REFERENCE DITCH MODIFICATION

BASE DOC. NO.

94X-6100-G-02210

SHT/PG. 1

REV. 0

PREPARED BY: RS CHRISTENSEN

DATE: 12/9/98

CADCODE: WIN95:ACD2:14.0:SS

DISCIPLINE ENGINEER: D MESSINGER

DATE: 12/9/98

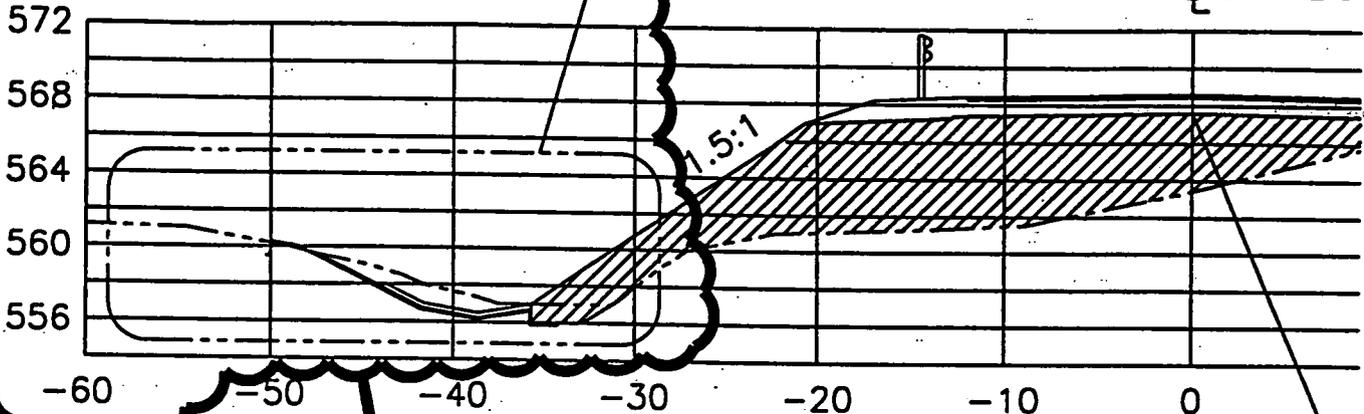
DISCIPLINE: CIVIL

CADFILE: DCN14.DWG

DCN-40315-014

PAGE	REV.
3	0

DITCH MODIFICATION DETAIL  
SEE 94X-6100-6-02243



7+00

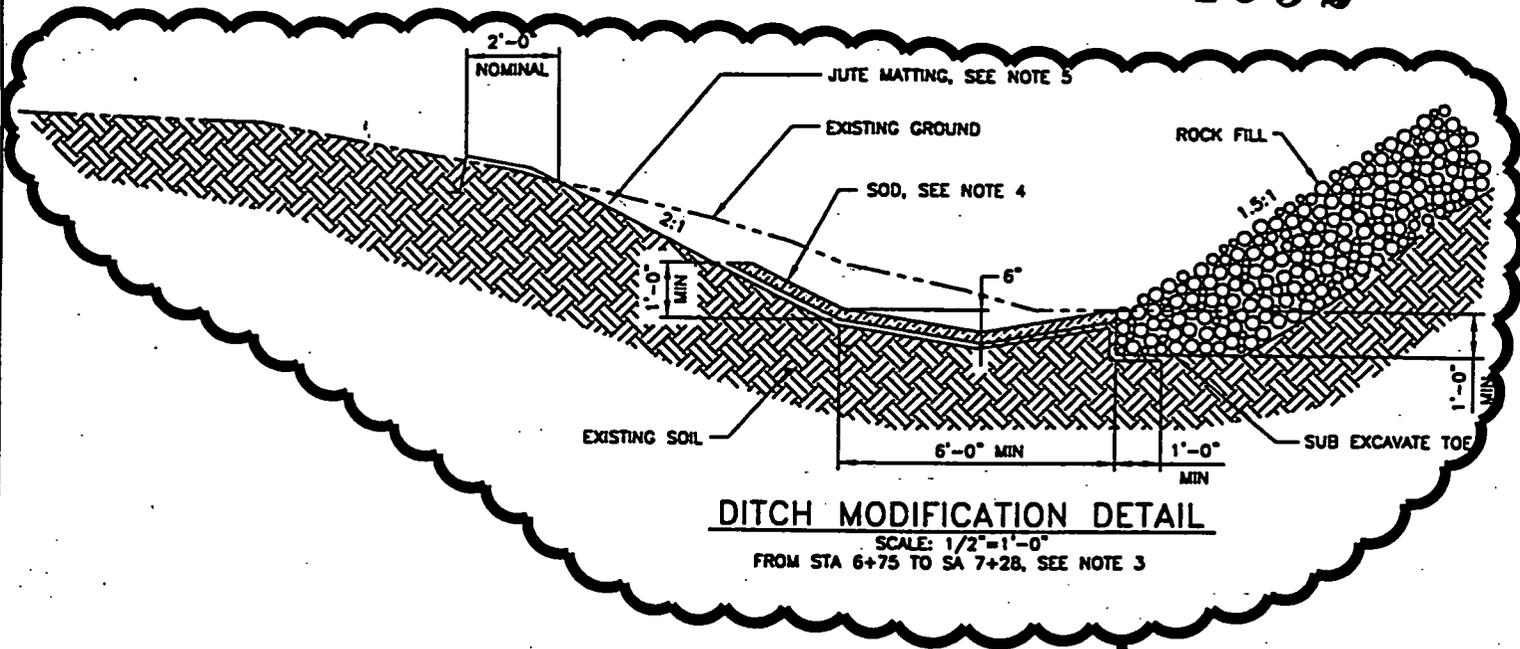
MODIFY

000207

PSP Variation  
#7  
Page 6 of

 <b>FLUOR DANIEL NORTHWEST, INC.</b>		<b>DESIGN CHANGE NOTICE</b>	
<b>DESCRIPTION CHANGE:</b> MODIFY CROSS SECTION AT STATION 7+00 TO SHOW MODIFICATION IN CHANNEL		<b>BASE DOC. NO.</b> <b>94X-6100-G-02213</b>	
		<b>SHT/PG. 1</b>	<b>REV. 0</b>
<b>PREPARED BY: RS CHRISTENSEN</b>	<b>DATE: 12/9/98</b>	<b>CADCODE: WIN95:ACD2:14.0:SS</b>	
<b>DISCIPLINE ENGINEER: D MESSINGER</b>	<b>DATE: 12/9/98</b>	<b>DCN-40315-014</b>	
<b>DISCIPLINE: CIVIL</b>	<b>CADFILE: DCN14.DWG</b>	<b>PAGE 4</b>	<b>R</b>

1952



ADD

3. MODIFY EXISTING DRAINAGE DITCH WHERE ROCK SLOPE ENCROCHES FROM APPROXIMATELY STA 6+75 TO STA 7+28. THE FINAL CHANNEL GRADE SHALL MATCH THE EXISTING CHANNEL GRADE.

*NEW SPEC.*

4. SOD SPECIFICATION NOTE ( ENTER SECTION NO.)

5. SEE SPECIFICATION SECTION 02270, EROSION CONTROL BLANKETS.

000208 PSP Variance

Page 7 of 7



FLUOR DANIEL NORTHWEST, INC.

DESIGN CHANGE NOTICE

DESCRIPTION CHANGE:

ADD DITCH MODIFICATION DETAIL.  
 ADD NOTES 3,4, & 5.

BASE DOC. NO.

94X-6100-G-02243

SHT/PG. 1

REV. 0

PREPARED BY: RS CHRISTENSEN

DATE: 12/9/98

CADCODE: WIN95:ACD2:14.0:SS

DISCIPLINE ENGINEER: D MESSINGER

DATE: 12/9/98

DISCIPLINE: CIVIL

CADFILE: DCN14.DWG

DCN-40315-014

PAGE	REV.
5	028

1952

**ATTACHMENT B**

**Historical Data for the Pilot Plant Ditch**

000209

Historical Data Summary for the Pilot Plant Ditch Vicinity South of the Silos Area (Detections Above the Minimum Detectable Concentration)

Sample ID	Location ID	Date Collected		Top Depth (ft.)	Bottom Depth (ft.)	Northings	Eastings	Analyte	Result	Units	Sample Type
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Aluminum	17400.0	mg/kg		NORMAL
121098	500318/SS-33	09-Jul-93	0	0.5	479975.5	1346903.2	Aluminum	8650.0	mg/kg		NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Aluminum	269.0	mg/L	J	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Aluminum	22500.0	mg/kg	J	NORMAL
061150	WPA22	21-Apr-91	0	0.5	480068.5	1346835.6	Aluminum	5450.0	mg/kg		NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Aluminum	345.0	mg/L	J	NORMAL
009050	ASIT-010	28-Jun-88	0	0.5	480010.2	1346819.0	Ammonia	93.6	mg/kg		NORMAL
061150	WPA22	21-Apr-91	0	0.5	480068.5	1346835.6	Antimony	22.6	mg/kg	J	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Arsenic	20.3	mg/kg		NORMAL
061150	WPA22	21-Apr-91	0	0.5	480068.5	1346835.6	Arsenic	6.8	mg/kg		NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Arsenic	39.6	mg/kg	J	NORMAL
121098	500318/SS-33	09-Jul-93	0	0.5	479975.5	1346903.2	Arsenic	26.0	mg/kg	J	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Barium	72.3	mg/kg	J	NORMAL
061150	WPA22	21-Apr-91	0	0.5	480068.5	1346835.6	Barium	49.8	mg/kg	J	NORMAL
121098	500318/SS-33	09-Jul-93	0	0.5	479975.5	1346903.2	Barium	53.0	mg/kg		NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Barium	381.0	mg/L		NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Barium	118.0	mg/kg		NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Barium	204.0	mg/L		NORMAL
061156	WPA22	21-Apr-91	1.5	2	480068.5	1346835.6	Benzole acid	59.0	ug/kg	J	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Beryllium	0.5	mg/kg	J	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Beryllium	0.3	mg/kg		NORMAL
061150	WPA22	21-Apr-91	0	0.5	480068.5	1346835.6	Beryllium	0.7	mg/kg		NORMAL
061156	WPA22	21-Apr-91	1.5	2	480068.5	1346835.6	bis(2-Ethylhexyl)phthalate	1600.0	ug/kg		NORMAL
061150	WPA22	21-Apr-91	0	0.5	480068.5	1346835.6	Cadmium	5.8	mg/kg		NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Calcium	43800.0	mg/L		NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Calcium	25900.0	mg/L		NORMAL
061150	WPA22	21-Apr-91	0	0.5	480068.5	1346835.6	Calcium	73700.0	mg/kg		NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Calcium	1920.0	mg/kg	J	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Calcium	1060.0	mg/kg	J	NORMAL
121098	500318/SS-33	09-Jul-93	0	0.5	479975.5	1346903.2	Calcium	2590.0	mg/kg	J	NORMAL
005149	ZONE 3-149	14-Nov-87	0	0.1866667	480009.4	1347516.0	Cesium-137	1.0	pCi/g	J	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Cesium-137	0.5	pCi/g		NORMAL
005511	ZONE 3-152	28-Sep-88	0	0.5	480009.4	1347766.0	Cesium-137	0.8	pCi/g	J	NORMAL
121100	500318/SS-33	09-Jul-93	0	0.5	479975.5	1346903.2	Cesium-137	0.8	pCi/g	J	NORMAL
005517	ZONE 3-117	28-Sep-88	0	0.5	479759.4	1347766.0	Cesium-137	0.5	pCi/g		NORMAL

000210

Historical Data Summary for the Pilot Plant Ditch Vicinity South of the Silos Area (Detections Above the Minimum Detectable Concentration)

Sample ID	Location ID	Date Collected	Top Depth (ft)	Bottom Depth (ft)	Moisture	Residue	Analyte	Result	Units	Sample Desc
SS-23-083	CIS_SYSGEN_151						Cesium-137	0.3	NV	NORMAL
009050	ASIT-010	28-Jun-88	0	0.5	480121.2	1347722.4	Chloride	40.0	-	NORMAL
121098	500318/SS-33	09-Jul-93	0	0.5	480010.2	1346819.0	Chromium	11.0	-	NORMAL
061150	WPA22	21-Apr-91	0	0.5	479975.5	1346903.2	Chromium	14.5	-	NORMAL
200030	11369	11-Jul-94	2	2.5	480068.5	1346835.6	Chromium	22.3	J	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Chromium	17.3	J	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Cobalt	11.5	J	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Cobalt	12.4	J	NORMAL
121098	500318/SS-33	09-Jul-93	0	0.5	479975.5	1346903.2	Cobalt	8.3	-	NORMAL
061150	WPA22	21-Apr-91	0	0.5	480068.5	1346835.6	Cobalt	8.7	-	NORMAL
121098	500318/SS-33	09-Jul-93	0	0.5	479975.5	1346903.2	Copper	9.1	-	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Copper	21.4	J	NORMAL
061150	WPA22	21-Apr-91	0	0.5	480068.5	1346835.6	Copper	17.6	-	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Copper	13.3	-	NORMAL
009050	ASIT-010	28-Jun-88	0	0.5	480010.2	1346819.0	Fluoride	5.7	-	NORMAL
121100	500318/SS-33	09-Jul-93	0	0.5	479975.5	1346903.2	Gross Alpha	24.5	NV	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Gross Alpha	15.0	NV	NORMAL
009050	ASIT-010	28-Jun-88	0	0.5	480010.2	1346819.0	Gross Alpha	28.0	NV	NORMAL
009050	ASIT-010	28-Jun-88	0	0.5	480010.2	1346819.0	Gross Beta	28.0	NV	NORMAL
121100	500318/SS-33	09-Jul-93	0	0.5	479975.5	1346903.2	Gross Beta	32.4	NV	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Gross Beta	17.0	NV	NORMAL
121098	500318/SS-33	09-Jul-93	0	0.5	479975.5	1346903.2	Iron	13900.0	-	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Iron	22800.0	-	NORMAL
061150	WPA22	21-Apr-91	0	0.5	480068.5	1346835.6	Iron	16200.0	-	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Iron	36000.0	-	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Lead	1.8	-	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Lead	15.5	-	NORMAL
121098	500318/SS-33	09-Jul-93	0	0.5	479975.5	1346903.2	Lead	16.9	J	NORMAL
061150	WPA22	21-Apr-91	0	0.5	480068.5	1346835.6	Lead	12.0	-	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Lead	19.9	J	NORMAL
009050	ASIT-010	28-Jun-88	0	0.5	480010.2	1346819.0	Lead	18.4	J	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Magnesium	2910.0	J	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Magnesium	2080.0	J	NORMAL
121098	500318/SS-33	09-Jul-93	0	0.5	479975.5	1346903.2	Magnesium	1740.0	J	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Magnesium	6940.0	-	NORMAL
061150	WPA22	21-Apr-91	0	0.5	480068.5	1346835.6	Magnesium	25000.0	-	NORMAL

000211

Historical Data Summary for the Pilot Plant Ditch Vicinity South of the Silos Area (Detections Above the Minimum Detectable Concentration)

Sample ID	Location ID	Date Collected	Top Depth (ft.)	Bottom Depth (ft.)	Northings	Eastings	Analysis	Result	Units	Sample Type
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Magnesium	8170.0	mg/L	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Manganese	168.0	mg/L	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Manganese	1750.0	mg/kg	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Manganese	2790.0	mg/L	NORMAL
121098	500318/SS-33	09-Jul-93	0	0.5	479975.5	1346903.2	Manganese	402.0	mg/kg	NORMAL
061150	WPA22	21-Apr-91	0	0.5	480068.5	1346835.6	Manganese	457.0	mg/kg	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Manganese	1050.0	mg/kg	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Molybdenum	2.4	mg/kg	NORMAL
061150	WPA22	21-Apr-91	0	0.5	480068.5	1346835.6	Molybdenum	4.6	mg/kg	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Molybdenum	2.2	mg/kg	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Neptunium-237	0.1	pCi/g	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Nickel	16.4	mg/kg	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Nickel	22.8	mg/kg	NORMAL
061150	WPA22	21-Apr-91	0	0.5	480068.5	1346835.6	Nickel	28.8	mg/kg	NORMAL
121098	500318/SS-33	09-Jul-93	0	0.5	479975.5	1346903.2	Nickel	10.7	mg/kg	NORMAL
009050	ASIT-010	28-Jun-88	0	0.5	480010.2	1346819.0	Nitrate	2.6	mg/kg	NORMAL
061156	WPA22	21-Apr-91	1.5	2	480068.5	1346835.6	Phenol	230.0	ug/kg	NORMAL
009050	ASIT-010	28-Jun-88	0	0.5	480010.2	1346819.0	Phosphorus	38.9	mg/kg	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Plutonium-239/240	0.8	pCi/g	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Plutonium-239/240	0.6	pCi/g	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Plutonium-241	0.2	pCi/g	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Potassium	2090.0	mg/kg	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Potassium	2580.0	mg/kg	NORMAL
009050	ASIT-010	28-Jun-88	0	0.5	480010.2	1346819.0	Potassium	659.0	mg/kg	NORMAL
121098	500318/SS-33	09-Jul-93	0	0.5	479975.5	1346903.2	Potassium	876.0	mg/kg	NORMAL
061150	WPA22	21-Apr-91	0	0.5	480068.5	1346835.6	Potassium	530.0	mg/kg	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Potassium	1670.0	mg/L	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Potassium	7210.0	mg/L	NORMAL
121100	500318/SS-33	09-Jul-93	0	0.5	479975.5	1346903.2	Radium-226	0.3	pCi/g	NORMAL
005149	ZONE 3-149	14-Nov-87	0	0.1668667	480009.4	1347516.0	Radium-226	1.0	pCi/g	NORMAL
005511	ZONE 3-152	26-Sep-88	0	0.5	480009.4	1347766.0	Radium-226	1.1	pCi/g	NORMAL
SD-40-013	CIS_SYSGEN_146		0	0.42	480108.4	1347052.0	Radium-226	0.7	pCi/g	NORMAL
SD-40-011	CIS_SYSGEN_144		0	0.5	480090.4	1347220.0	Radium-226	0.8	pCi/g	NORMAL
SS-23-083	CIS_SYSGEN_151		0	0.5	480121.2	1347722.4	Radium-226	0.5	pCi/g	NORMAL
SS-23-076	CIS_SYSGEN_152		0	0.5	480123.9	1347622.5	Radium-226	1.1	pCi/g	NORMAL
SD-40-010	CIS_SYSGEN_142		0	0.33	480068.4	1347301.0	Radium-226	0.7	pCi/g	NORMAL

000212

Historical Data Summary for the Pilot Plant Ditch Vicinity South of the Silos Area (Detections Above the Minimum Detectable Concentration)

Sample ID	Location ID	Date Collected	Top Depth (ft)	Bottom Depth (ft)	Northing	Easting	Analyte	Result	Valid	Units	Sample Date
SD-40-014	CIS_SYSGEN_141		0	0.17	480068.4	1346962.0	Radium-226	0.8	NV	pCi/g	NORMAL
005517	ZONE 3-117	28-Sep-88	0	0.5	478759.4	1347766.0	Radium-226	1.2	-	pCi/g	NORMAL
SD-40-008	CIS_SYSGEN_135		0	0.5	478957.4	1347456.0	Radium-226	0.7	NV	pCi/g	NORMAL
200029	11369	11-Jul-94	0	0.17	478915.5	1347209.2	Radium-226	1.1	-	pCi/g	NORMAL
009050	ASIT-010	28-Jun-88	0	0.5	480010.2	1346819.0	Radium-226	0.7	J	pCi/g	NORMAL
SS-23-070	CIS_SYSGEN_153		0	0.5	480126.7	1347522.5	Radium-226	0.9	NV	pCi/g	NORMAL
SD-40-005	CIS_SYSGEN_132		0	0.5	478808.4	1347713.0	Radium-226	0.8	NV	pCi/g	NORMAL
SD-40-007	CIS_SYSGEN_134		0	0.5	478913.4	1347543.0	Radium-226	0.8	NV	pCi/g	NORMAL
200030	11369	11-Jul-94	2	2.5	478915.5	1347209.2	Radium-226	1.2	-	pCi/g	NORMAL
200030	11369	11-Jul-94	2	2.5	478915.5	1347209.2	Radium-228	1.1	-	pCi/g	NORMAL
005511	ZONE 3-152	28-Sep-88	0	0.5	480009.4	1347766.0	Radium-228	0.9	J	pCi/g	NORMAL
005517	ZONE 3-117	28-Sep-88	0	0.5	478759.4	1347766.0	Radium-228	0.9	-	pCi/g	NORMAL
009050	ASIT-010	28-Jun-88	0	0.5	480010.2	1346819.0	Radium-228	0.9	J	pCi/g	NORMAL
200029	11369	11-Jul-94	0	0.17	478915.5	1347209.2	Radium-228	1.0	-	pCi/g	NORMAL
200030	11369	11-Jul-94	2	2.5	478915.5	1347209.2	Selenium	0.4	-	mg/kg	NORMAL
200030	11369	11-Jul-94	2	2.5	478915.5	1347209.2	Silicon	54.3	J	mg/kg	NORMAL
121098	500318/SS-33	09-Jul-93	0	0.5	478975.5	1346903.2	Silicon	88.5	J	mg/kg	NORMAL
200029	11369	11-Jul-94	0	0.17	478915.5	1347209.2	Silicon	119.0	J	mg/kg	NORMAL
200029	11369	11-Jul-94	0	0.17	478915.5	1347209.2	Silicon	2380.0	J	mg/L	NORMAL
081150	WPA22	21-Apr-91	0	0.5	480068.5	1346835.6	Silver	9.0	-	mg/kg	NORMAL
200029	11369	11-Jul-94	0	0.17	478915.5	1347209.2	Sodium	45.2	-	mg/kg	NORMAL
200030	11369	11-Jul-94	2	2.5	478915.5	1347209.2	Sodium	67.1	-	mg/kg	NORMAL
005149	ZONE 3-149	14-Nov-87	0	0.1688887	480009.4	1347516.0	Strontium-90	1.1	-	pCi/g	NORMAL
005511	ZONE 3-152	28-Sep-88	0	0.5	480009.4	1347766.0	Strontium-90	0.5	-	pCi/g	NORMAL
009050	ASIT-010	28-Jun-88	0	0.5	480010.2	1346819.0	Sulfate	418.0	-	mg/kg	NORMAL
200029	11369	11-Jul-94	0	0.17	478915.5	1347209.2	Technetium-99	0.2	J	pCi/g	NORMAL
200030	11369	11-Jul-94	2	2.5	478915.5	1347209.2	Thallium	0.3	-	mg/kg	NORMAL
200029	11369	11-Jul-94	0	0.17	478915.5	1347209.2	Thallium	0.4	-	mg/kg	NORMAL
005517	ZONE 3-117	28-Sep-88	0	0.5	478759.4	1347766.0	Thorium-228	1.1	-	pCi/g	NORMAL
200030	11369	11-Jul-94	2	2.5	478915.5	1347209.2	Thorium-228	1.3	J	pCi/g	NORMAL
121100	500318/SS-33	09-Jul-93	0	0.5	478975.5	1346903.2	Thorium-228	0.3	J	pCi/g	NORMAL
005149	ZONE 3-149	14-Nov-87	0	0.1688887	480009.4	1347516.0	Thorium-228	1.4	-	pCi/g	NORMAL
200029	11369	11-Jul-94	0	0.17	478915.5	1347209.2	Thorium-228	1.1	J	pCi/g	NORMAL
005511	ZONE 3-152	28-Sep-88	0	0.5	480009.4	1347766.0	Thorium-228	0.9	-	pCi/g	NORMAL
121100	500318/SS-33	09-Jul-93	0	0.5	478975.5	1346903.2	Thorium-230	0.4	J	pCi/g	NORMAL
200029	11369	11-Jul-94	0	0.17	478915.5	1347209.2	Thorium-230	2.0	-	pCi/g	NORMAL

000213

Historical Data Summary for the Pilot Plant Ditch Vicinity South of the Silos Area (Detections Above the Minimum Detectable Concentration)

1952

Sample ID	Location ID	Date Collected	Top Depth (ft.)	Bottom Depth (ft.)	Neutrons	Easting	Analysis	Result	Units	Remarks/Type
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Thorium-230	1.4	pCi/g	NORMAL
005517	ZONE 3-117	26-Sep-88	0	0.5	479759.4	1347766.0	Thorium-230	2.2	pCi/g	NORMAL
005149	ZONE 3-149	14-Nov-87	0	0.1666667	480009.4	1347516.0	Thorium-230	8.4	pCi/g	NORMAL
005511	ZONE 3-152	26-Sep-88	0	0.5	480009.4	1347766.0	Thorium-230	3.2	pCi/g	NORMAL
SD-40-005 CIS_SYSGEN_132	ZONE 3-152	26-Sep-88	0	0.5	479808.4	1347713.0	Thorium-232	1.2	pCi/g	NORMAL
005149	ZONE 3-149	14-Nov-87	0	0.1666667	480009.4	1347516.0	Thorium-232	5.2	pCi/g	NORMAL
005517	ZONE 3-117	26-Sep-88	0	0.5	479759.4	1347766.0	Thorium-232	1.0	pCi/g	NORMAL
SS-23-070 CIS_SYSGEN_153	ZONE 3-117	26-Sep-88	0	0.5	480126.7	1347522.5	Thorium-232	1.0	pCi/g	NORMAL
SS-23-076 CIS_SYSGEN_152	ZONE 3-117	26-Sep-88	0	0.5	480123.9	1347622.5	Thorium-232	1.1	pCi/g	NORMAL
SS-23-083 CIS_SYSGEN_151	ZONE 3-117	26-Sep-88	0	0.5	480121.2	1347722.4	Thorium-232	0.7	pCi/g	NORMAL
SD-40-006 CIS_SYSGEN_133	ZONE 3-152	26-Sep-88	0	0.5	479861.4	1347629.0	Thorium-232	1.2	pCi/g	NORMAL
005511	ZONE 3-152	26-Sep-88	0	0.5	480009.4	1347766.0	Thorium-232	0.9	pCi/g	NORMAL
SD-40-013 CIS_SYSGEN_146	ZONE 3-152	26-Sep-88	0	0.42	480108.4	1347052.0	Thorium-232	0.6	pCi/g	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Thorium-232	0.9	pCi/g	NORMAL
SD-40-009 CIS_SYSGEN_138	ZONE 3-117	26-Sep-88	0	0.42	479998.4	1347370.0	Thorium-232	0.5	pCi/g	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Thorium-232	1.1	pCi/g	NORMAL
SD-40-008 CIS_SYSGEN_135	ZONE 3-117	26-Sep-88	0	0.5	479957.4	1347456.0	Thorium-232	0.8	pCi/g	NORMAL
005517	ZONE 3-117	26-Sep-88	0	0.5	479759.4	1347766.0	Thorium, Total	9.1	pCi/g	NORMAL
005149	ZONE 3-149	14-Nov-87	0	0.1666667	480009.4	1347516.0	Thorium, Total	47.4	pCi/g	NORMAL
005511	ZONE 3-152	26-Sep-88	0	0.5	480009.4	1347766.0	Thorium, Total	8.2	pCi/g	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Total Organic Carbon	1410.0	mg/kg	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Total Organic Carbon	15200.0	mg/kg	NORMAL
200097335	11369	22-Sep-94	2	2.5	479915.5	1347209.2	Total Organic Carbon	2460.0	mg/kg	NORMAL
200097334	11369	22-Sep-94	0	0.17	479915.5	1347209.2	Total Organic Carbon	421000.0	mg/kg	NORMAL
009050	ASIT-010	28-Jun-88	0	0.5	480010.2	1346819.0	Total Organic Nitrogen	794.0	mg/kg	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Uranium-234	2.1	pCi/g	NORMAL
200028	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Uranium-234	7.1	pCi/g	NORMAL
005149	ZONE 3-149	14-Nov-87	0	0.1666667	480009.4	1347516.0	Uranium-234	21.0	pCi/g	NORMAL
4S-14	11369	19-Sep-94	2	2.5	479915.5	1347209.2	Uranium-234	1.1	pCi/g	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Uranium-234	10.0	pCi/g	NORMAL
200031	11369	11-Jul-94	0	0.5	479915.5	1347209.2	Uranium-234	8.6	pCi/g	ARCHIVE
91S-14	11369	19-Sep-94	0	0.17	479915.5	1347209.2	Uranium-234	6.1	pCi/g	NORMAL
200029D	11369	28-Jul-94	0	0.17	479915.5	1347209.2	Uranium-234	4.9	pCi/g	DUPLICATE
005511	ZONE 3-152	26-Sep-88	0	0.5	480009.4	1347766.0	Uranium-234	13.0	pCi/g	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Uranium-234	0.9	pCi/g	NORMAL
005517	ZONE 3-117	26-Sep-88	0	0.5	479759.4	1347766.0	Uranium-234	9.9	pCi/g	NORMAL

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000214

Historical Data Summary for the Pilot Plant Ditch Vicinity South of the Silos Area (Detections Above the Minimum Detectable Concentration)

Sample ID	Location ID	Date Collected	Top Depth (ft)	Bottom Depth (ft)	Northing	Easting	Analysis	Result	Units	Sample Type
4S-14	11369	19-Sep-94	2	2.5	478915.5	1347209.2	Uranium-234	1.6	NV	NORMAL
121100	500318/SS-33	09-Jul-93	0	0.5	478975.5	1346903.2	Uranium-234	3.9	J	NORMAL
200034	11369	11-Jul-94	0.5	1	478915.5	1347209.2	Uranium-234	3.1	NV	ARCHIVE
91S-14	11369	19-Sep-94	0	0.17	478915.5	1347209.2	Uranium-234	8.4	J	NORMAL
200034	11369	11-Jul-94	0.5	1	478915.5	1347209.2	Uranium-235	0.2	NV	ARCHIVE
200031	11369	11-Jul-94	0	0.5	478915.5	1347209.2	Uranium-235	0.4	NV	ARCHIVE
200029D	11369	28-Jul-94	0	0.17	478915.5	1347209.2	Uranium-235	0.2	NV	DUPLICATE
200038	11369	11-Jul-94	1.5	2	478915.5	1347209.2	Uranium-235	0.2	NV	ARCHIVE
4S-14	11369	19-Sep-94	2	2.5	478915.5	1347209.2	Uranium-235	0.1	NV	NORMAL
200030D	11369	28-Jul-94	2	2.5	478915.5	1347209.2	Uranium-235	0.2	NV	DUPLICATE
91S-14	11369	19-Sep-94	0	0.17	478915.5	1347209.2	Uranium-235	0.3	NV	NORMAL
200030	11369	11-Jul-94	2	2.5	478915.5	1347209.2	Uranium-235	0.1	NV	NORMAL
200029	11369	11-Jul-94	0	0.17	478915.5	1347209.2	Uranium-235	0.4	NV	NORMAL
200036	11369	11-Jul-94	1	1.5	478915.5	1347209.2	Uranium-235	0.2	NV	ARCHIVE
91S-14	11369	19-Sep-94	0	0.17	478915.5	1347209.2	Uranium-235	0.4	J	NORMAL
005149	ZONE 3-149	14-Nov-87	0	0.1686867	480009.4	1347516.0	Uranium-235/238	1.4	J	NORMAL
4S-14	11369	19-Sep-94	2	2.5	478915.5	1347209.2	Uranium-235/238	0.1	-	NORMAL
005511	ZONE 3-152	28-Sep-88	0	0.5	480009.4	1347788.0	Uranium-235/238	0.9	-	NORMAL
200028	11369	11-Jul-94	0	0.17	478915.5	1347209.2	Uranium-235/238	0.9	-	NORMAL
4S-14	11369	19-Sep-94	2	2.5	478915.5	1347209.2	Uranium-235/238	0.1	J	NORMAL
200030	11369	11-Jul-94	0	0.17	478915.5	1347209.2	Uranium-238	0.0	NV	NORMAL
200029	11369	11-Jul-94	0	0.17	478915.5	1347209.2	Uranium-238	0.1	NV	NORMAL
200029D	11369	28-Jul-94	0	0.17	478915.5	1347209.2	Uranium-238	0.1	NV	DUPLICATE
91S-14	11369	19-Sep-94	0	0.17	478915.5	1347209.2	Uranium-238	0.1	NV	NORMAL
4S-14	11369	19-Sep-94	2	2.5	478915.5	1347209.2	Uranium-238	0.0	NV	NORMAL
200031	11369	11-Jul-94	0	0.5	478915.5	1347209.2	Uranium-238	0.1	NV	ARCHIVE
200030	11369	11-Jul-94	2	2.5	478915.5	1347209.2	Uranium-238	1.2	J	NORMAL
SD-40-013	CIS_SYSGEN_146	N/A	0	0.42	480108.4	1347052.0	Uranium-238	3.3	NV	NORMAL
SD-40-012	CIS_SYSGEN_143	N/A	0	0.5	480090.4	1347130.0	Uranium-238	6.8	NV	NORMAL
SD-40-011	CIS_SYSGEN_144	N/A	0	0.5	480090.4	1347220.0	Uranium-238	4.7	NV	NORMAL
4S-14	11369	19-Sep-94	2	2.5	478915.5	1347209.2	Uranium-238	1.6	NV	NORMAL
SD-40-013	CIS_SYSGEN_146	N/A	0	0.42	480108.4	1347052.0	Uranium-238	7.6	NV	NORMAL
SD-40-014	CIS_SYSGEN_141	N/A	0	0.17	480088.4	1346982.0	Uranium-238	7.4	NV	NORMAL
SS-23-083	CIS_SYSGEN_151	N/A	0	0.5	480121.2	1347722.4	Uranium-238	6.4	NV	NORMAL
SD-40-010	CIS_SYSGEN_142	N/A	0	0.33	480088.4	1347301.0	Uranium-238	4.8	NV	NORMAL
SD-40-015	CIS_SYSGEN_139	N/A	0	0.42	480032.4	1346885.1	Uranium-238	8.1	NV	NORMAL

000215

Historical Data Summary for the Pilot Plant Ditch Vicinity South of the Silos Area (Detections Above the Minimum Detectable Concentration)

Sample ID	Location ID	Date Collected	Top Depth (ft.)	Bottom Depth (ft.)	Horchings	Basings	Analyte	Result	Units	Sample Type
005511	ZONE 3-152	28-Sep-88	0	0.5	480009.4	1347766.0	Uranium-238	13.8	pCi/g	NORMAL
91S-14	11369	19-Sep-94	0	0.17	479915.5	1347209.2	Uranium-238	7.3	NV	NORMAL
SD-40-009	CIS_SYSGEN_138	N/A	0	0.42	479998.4	1347370.0	Uranium-238	2.9	NV	NORMAL
SD-40-016	CIS_SYSGEN_137	N/A	0	0.5	479993.4	1346814.1	Uranium-238	5.6	NV	NORMAL
SD-40-008	CIS_SYSGEN_135	N/A	0	0.5	479957.4	1347456.0	Uranium-238	5.2	NV	NORMAL
SD-40-007	CIS_SYSGEN_134	N/A	0	0.5	479913.4	1347543.0	Uranium-238	16.3	NV	NORMAL
SD-40-006	CIS_SYSGEN_133	N/A	0	0.5	479881.4	1347628.0	Uranium-238	10.5	NV	NORMAL
SD-40-005	CIS_SYSGEN_132	N/A	0	0.5	479808.4	1347713.0	Uranium-238	11.5	NV	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Uranium-238	8.0	J	NORMAL
121100	500318/SS-33	09-Jul-93	0	0.5	479975.5	1346903.2	Uranium-238	5.0	J	NORMAL
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Uranium-238	2.1	NV	NORMAL
4S-14	11369	19-Sep-94	2	2.5	479915.5	1347209.2	Uranium-238	1.2	J	NORMAL
005149	ZONE 3-149	14-Nov-87	0	0.1688667	480009.4	1347516.0	Uranium-238	21.1	J	NORMAL
005517	ZONE 3-117	26-Sep-88	0	0.5	479759.4	1347766.0	Uranium-238	10.2	-	NORMAL
91S-14	11369	19-Sep-94	0	0.17	479915.5	1347209.2	Uranium-238	8.6	J	NORMAL
200029	11369	11-Jul-94	0	0.17	479915.5	1347209.2	Uranium-238	9.5	NV	NORMAL
200038	11369	11-Jul-94	1.5	2	479915.5	1347209.2	Uranium-238	3.9	NV	ARCHIVE
200031	11369	11-Jul-94	0	0.5	479915.5	1347209.2	Uranium-238	7.4	NV	ARCHIVE
200036	11369	11-Jul-94	1	1.5	479915.5	1347209.2	Uranium-238	3.7	NV	ARCHIVE
200029D	11369	28-Jul-94	0	0.17	479915.5	1347209.2	Uranium-238	4.3	NV	DUPLICATE
200034	11369	11-Jul-94	0.5	1	479915.5	1347209.2	Uranium-238	3.9	NV	ARCHIVE
200030D	11369	28-Jul-94	2	2.5	479915.5	1347209.2	Uranium-238	5.0	NV	DUPLICATE
200029D	11369	28-Jul-94	0	0.17	479915.5	1347209.2	Uranium, Total	17.2	NV	DUPLICATE
200038	11369	11-Jul-94	1	1.5	479915.5	1347209.2	Uranium, Total	11.1	NV	ARCHIVE
SD-40-010	CIS_SYSGEN_142	N/A	0	0.33	480068.4	1347301.0	Uranium, Total	14.3	NV	NORMAL
200038	11369	11-Jul-94	1.5	2	479915.5	1347209.2	Uranium, Total	11.5	NV	ARCHIVE
91S-14	11369	19-Sep-94	0	0.17	479915.5	1347209.2	Uranium, Total	11.5	-	NORMAL
SD-40-011	CIS_SYSGEN_144	N/A	0	0.5	480090.4	1347209.2	Uranium, Total	14.0	NV	NORMAL
SD-40-012	CIS_SYSGEN_143	N/A	0	0.5	480090.4	1347130.0	Uranium, Total	20.3	NV	NORMAL
SD-40-013	CIS_SYSGEN_146	N/A	0	0.42	480108.4	1347052.0	Uranium, Total	22.7	NV	NORMAL
4S-14	11369	19-Sep-94	2	2.5	479915.5	1347209.2	Uranium, Total	2.2	-	NORMAL
005511	ZONE 3-152	26-Sep-88	0	0.5	480009.4	1347766.0	Uranium, Total	40.0	J	NORMAL
200029D	11369	28-Jul-94	0	0.17	479915.5	1347209.2	Uranium, Total	19.4	NV	DUPLICATE
200034	11369	11-Jul-94	0.5	1	479915.5	1347209.2	Uranium, Total	11.7	NV	ARCHIVE
200031	11369	11-Jul-94	0	0.5	479915.5	1347209.2	Uranium, Total	21.9	NV	ARCHIVE
200030	11369	11-Jul-94	2	2.5	479915.5	1347209.2	Uranium, Total	1.0	-	NORMAL

000216

1952

Historical Data Summary for the Pilot Plant Ditch Vicinity South of the Silos Area (Detections Above the Minimum Detectable Concentration)

Sample ID	Location ID	Date Collected	Top Depth (ft)	Bottom Depth (ft)	Northing	Easting	Analyte	Result	Units	Sample Type
009050	ASIT-010	28-Jul-88	0	0.5	480010.2	1346819.0	Uranium, Total	30.3	J	NORMAL
200029	11369	11-Jul-94	0	0.17	479815.5	1347209.2	Uranium, Total	16.9	-	NORMAL
005149	ZONE 3-149	14-Nov-87	0	0.1868667	480009.4	1347516.0	Uranium, Total	63.5	NV	NORMAL
005517	ZONE 3-117	28-Sep-88	0	0.5	479759.4	1347766.0	Uranium, Total	43.0	-	NORMAL
121100	500318/SS-33	09-Jul-93	0	0.5	479875.5	1346903.2	Uranium, Total	18.3	-	NORMAL
SD-40-014 CIS_SYSGEN_141	N/A	N/A	0	0.17	480068.4	1346962.0	Uranium, Total	22.1	NV	NORMAL
200030D	11369	28-Jul-94	2	2.5	479815.5	1347209.2	Uranium, Total	15.0	NV	DUPLICATE
4S-14	11369	19-Sep-94	2	2.5	479815.5	1347209.2	Uranium, Total	4.7	NV	NORMAL
SS-23-070 CIS_SYSGEN_153	N/A	N/A	0	0.5	480126.7	1347522.5	Uranium, Total	43.5	NV	NORMAL
SD-40-005 CIS_SYSGEN_132	N/A	N/A	0	0.5	479808.4	1347713.0	Uranium, Total	34.3	NV	NORMAL
SS-23-076 CIS_SYSGEN_152	N/A	N/A	0	0.5	480123.9	1347622.5	Uranium, Total	32.2	NV	NORMAL
SS-23-083 CIS_SYSGEN_151	N/A	N/A	0	0.5	480121.2	1347722.4	Uranium, Total	19.1	NV	NORMAL
SD-40-006 CIS_SYSGEN_133	N/A	N/A	0	0.5	479861.4	1347629.0	Uranium, Total	31.3	NV	NORMAL
91S-14	11369	19-Sep-94	0	0.17	479815.5	1347209.2	Uranium, Total	21.9	NV	NORMAL
SD-40-007 CIS_SYSGEN_134	N/A	N/A	0	0.5	479813.4	1347543.0	Uranium, Total	48.6	NV	NORMAL
200030D	11369	28-Jul-94	2	2.5	479815.5	1347209.2	Uranium, Total	5.1	NV	DUPLICATE
200030	11369	11-Jul-94	2	2.5	479815.5	1347209.2	Uranium, Total	6.3	NV	NORMAL
200030	11369	11-Jul-94	2	2.5	479815.5	1347209.2	Uranium, Total	4.1	NV	NORMAL
SD-40-009 CIS_SYSGEN_138	N/A	N/A	0	0.42	479898.4	1347370.0	Uranium, Total	8.6	NV	NORMAL
SD-40-015 CIS_SYSGEN_139	N/A	N/A	0	0.42	480032.4	1346885.1	Uranium, Total	24.1	NV	NORMAL
SD-40-016 CIS_SYSGEN_137	N/A	N/A	0	0.5	479893.4	1346814.1	Uranium, Total	16.7	NV	NORMAL
200030D	11369	28-Jul-94	2	2.5	479815.5	1347209.2	Uranium, Total	9.2	NV	DUPLICATE
200029	11369	11-Jul-94	0	0.17	479815.5	1347209.2	Uranium, Total	28.6	NV	NORMAL
SD-40-008 CIS_SYSGEN_135	N/A	N/A	0	0.5	479857.4	1347458.0	Uranium, Total	15.5	NV	NORMAL
200029	11369	11-Jul-94	0	0.17	479815.5	1347209.2	Uranium, Total	17.9	NV	NORMAL
200030	11369	11-Jul-94	2	2.5	479815.5	1347209.2	Vanadium	37.5	J	NORMAL
061150	WPA22	21-Apr-91	0	0.5	480068.5	1346835.6	Vanadium	20.6	-	NORMAL
200029	11369	11-Jul-94	0	0.17	479815.5	1347209.2	Vanadium	34.4	J	NORMAL
121098	500318/SS-33	09-Jul-93	0	0.5	479875.5	1346903.2	Vanadium	15.5	J	NORMAL
200030	11369	11-Jul-94	2	2.5	479815.5	1347209.2	Zinc	55.0	J	NORMAL
061150	WPA22	21-Apr-91	0	0.5	480068.5	1346835.6	Zinc	37.4	-	NORMAL
121098	500318/SS-33	09-Jul-93	0	0.5	479875.5	1346903.2	Zinc	50.2	J	NORMAL
200029	11369	11-Jul-94	0	0.17	479815.5	1347209.2	Zinc	53.1	J	NORMAL

000217