AREA 7 EXCAVATION AND PRECERTIFICATION STRATEGY, PHASE I

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

APRIL 2002

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

20501-PL-0001
REVISION A
DRAFT

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

AWWT	Advanced Waste Water Treatment (Facility)
D&D	Decontamination and Dismantlement
FEMP	Fernald Environmental Management Project
OSDF	On-Site Disposal Facility
SDFP	Soil and Disposal Facility Project
SP-7	Stockpile 7
WAC	waste acceptance criteria
WPRAP	Waste Pits Remedial Action Project

AREA 7 EXCAVATION AND PRECERTIFICATION STRATEGY, PHASE I

1.0 PURPOSE

The purpose of this document is to describe Soil and Disposal Facility Project (SDFP) strategy to excavate and remediate a portion of Silos area (Area 7) in support of the Silos Project Remediation Facility and support structures at the Fernald Environmental Management Project (FEMP). The goal is to provide a remediated footprint prior to the construction of the Remediation Facility. Scope for the activity involves general excavation and grading, and removal of at- and below-grade structures and utilities following decontamination and dismantlement (D&D) of the area. This plan presents general methodology of activities specific to SDFP. The five key excavation/remediation elements are as follows:

- K-65 Trench
- Remediation Facility Footprint
- High Nitrate Tank (18M) Footprint
- Warehouse Footprint
- Railroad Embankment.

Execution of these elements will be completed in Fiscal Year 2002 and is described in following sections.

2.0 PROJECT BOUNDARY

The excavation zone (see Figure 1) will be inclusive of Soil Remedial Area 7 and will be bounded as follows:

1. On the east by the Lime Sludge Ponds excavation area and the Building 30/45 parking lot
2. On the west by the Transfer Tank Area
3. On the south by the Operable Unit (OU4) Detention Basin
4. On the north by 2nd Street and just to the north of the K-65 Trench.

3.0 EXCAVATION METHODOLOGY

3.1 Remediation Facility Footprint

Preparation of the Remediation Facility footprint involves general excavation of soil and miscellaneous aggregate to a depth of approximately 5 to 8 feet. Pending sampling and analysis in the area, preliminary design grade is based on the Remediation Facility excavation grading plan (see Figure 2). The debris and impacted soil within the remediation area will be excavated and disposed at the On-Site Disposal Facility (OSDF) following completion of sampling activities. The remaining surface will be both

visually inspected for man-made materials and monitored using real-time scanning to determine if additional excavation is required. Excavation in 3 ± 1-foot lifts will be performed with the associated lift scan until all impacted material has been removed. Except for OSDF above-waste acceptance criteria (WAC) material, debris and impacted soil will be disposed in the OSDF. Surface water collected in this excavation will be pumped or drained to the Lime Sludge Pond excavation (see Section 4.0, Surface Water Control).

3.2 High Nitrate Tank

The High Nitrate Tank (18M) is illustrated in Figures 3 and 4. Following removal of the High Nitrate Tank and containment wall by D&D, sampling will be performed on the underlying gravel and fill material through the concrete tank storage pad. A lesson learned during recent Plant 6 sampling showed that drilling to sample through the concrete pad proved easier than sampling through a broken pad. Sampling through the pad will be performed to characterize underlying gravel and fill material to native soil. The concrete tank storage pad and sump will then be broken into manageable pieces that meet the WAC sizing requirements for placement into the OSDF using a hoe ramp or other commonly used construction methods. The concrete will be kept wet during the trench breaking to control dust. The concrete will be excavated and disposed at the OSDF following completion of sampling and analysis activities. The underlying gravel will be scanned with real time instrumentation to check for above-WAC conditions. If OSDF above-WAC material is found, the extent will be determined with real time instrumentation and sent to Stockpile 7 (SP-7) or WPRAP directly. The gravel and underlying fill material that meets OSDF WAC will be excavated in lifts and remain consistent with the excavation controls established in the Area 3A Implementation Plan. Preliminary excavation design grade is considered to be the limit of fill material, 3.5 feet below the concrete pad. The remaining surface will be both visually inspected for man-made materials and monitored using real-time scanning to determine if additional excavation is required. Excavation in 3 ± 1-foot lifts will be performed with the associated lift scan until all impacted material has been removed. Except for OSDF above-WAC material, excavated debris and impacted soil will be disposed in the OSDF. Surface water collected in this excavation will be pumped or drained to the Lime Sludge Pond excavation (see Section 4.0, Surface Water Control).

3.3 K-65 Trench

The K-65 Trench will be removed from just east of the East Silos Access Road to just west of the Former Production Area near the southeast corner of the Lime Sludge Ponds. Prior to excavation, D&D operations will complete the removal of the piping within the trench and metal decking on top of the trench. Based on recent sampling and characterization, the soil like/sediment residues in the bottom of the trench are above-WAC due to elevated levels of technetium-99. Tests are being conducted for this material to confirm Resource Conservation and Recovery Act (RCRA) status. In general, assuming there are no RCRA issues, this residue along with the concrete, and approximately 1 foot of underlying soil will be excavated for disposition at SP-7 or WPRAP directly, using the following construction method. A backhoe using a smooth blade bucket will remove the bulk of the sediment from the trench. The back hoe will transfer the residues into the bucket of a front end loader which will in turn dump the excavated material into an articulated truck for hauling and disposition at SP-7 or WPRAP. Geomembrane will be placed on the ground wherever excavated material is transferred from one vehicle to another to minimize the spread of technetium-99 contamination to adjacent areas. The remaining residues within the trench will be washed from east to west using a power washer. Waste water from this process will be pumped out of the trench near the Silos Transfer Tanks Building using a construction trash pump and be discharged directly or indirectly into the Biodenitrification Surge Lagoon for Advanced Waste Water Treatment Facility (AWWT) Phase II treatment. A concrete plug has been installed in the western portion of the K-65 Trench by the Silos Project near the Transfer Tank Building. The residues in the bottom of the K-65 Trench will be removed from the section of trench extending from the eastern limit of excavation (near the southeast corner of the Lime Sludge Ponds) to the concrete plug near the Transfer Tank Building.

After removal of sediment, two additional clay plugs will then be installed within the portions of the trench not to be excavated (the eastern portion located near the southeast corner of the Lime Sludge Pond and the western portion located near the East Silos Access Road). The concrete foundation and walls will be inspected for soundness before placing the clay plug. The plug will have a minimum 5-foot length where it is continuous from bottom to top of trench and will be compacted to at least 95 percent standard proctor density. The portion of the trench to remain located between the East Silos Access Road and the Transfer Tank Building will then be filled with gravel or stone. Water collected in this section of the trench will be removed through the existing sump system located near the Transfer Tank Building.

The trench concrete will then be broken, excavated, and disposed at SP-7 or WPRAP. The concrete will be kept wet during the trench breaking to control dust and will be sized reduced to meet WAC for WPRAP. Approximately 1 foot of underlying soil will be excavated and disposed at SP-7 or WPRAP.

Soil underlying the approximate 1-foot scrape will be tested for technetium-99 and scanned with real time instrumentation to check for OSDF above-WAC conditions. If OSDF above-WAC material is found, the extent will be determined with real-time instrumentation and/or physical samples and disposed similarly to the initial soil scrape. The material that meets OSDF WAC will be excavated in lifts and remain consistent with the excavation controls established in the Area 3A/4A Implementation Plan (DOE 2001). Excavation in 3 $\pm$ 1-foot lifts will be performed with the associated lift scan until all impacted material has been removed. The depth of excavation will be approximated based on characterization results obtained from analysis of samples previously taken up to 10 feet north and south of the K-65 Trench. These samples were collected at 5 and 10-foot depths. The remaining surface will be both visually inspected for man-made materials and monitored using real-time scanning to determine if additional excavation is required. Except for OSDF above-WAC material, debris and impacted soils will be disposed in the OSDF.

After the removal of the OSDF above-WAC material associated with the K-65 Trench, surface water collected in this excavation will be drained to the Lime Sludge Pond excavation (see Section 4.0, Surface Water Control). The K-65 Trench will generally be excavated to drain eastward towards the discharge location.

Care will be taken to assure that the clay plugs installed in the trench will not be damaged. After all excavations governed by this strategy have been completed, the trench excavation will be filled with non-impacted gravel or stone according to the Silos Project needs.

3.4 Warehouse

The open area west of the Lime Sludge Ponds south of 2nd Street and north of the K-65 Trench will be excavated to support the construction of the planned K-65 Stabilization Warehouse. The soil in this area contains significant loose fill in some locations that may have to be removed for structural reasons related to the construction of the warehouse. The initial depth of excavation will be approximated based on analysis completed on samples previously taken in the warehouse area. The remaining surface will be

both visually inspected for man-made materials and monitored using real-time scanning to determine if additional excavation is required. Excavation in 3 ± 1-foot lifts will be performed with the associated lift scan until all debris and impacted soil has been removed. If the excavation must proceed past removal of impacted material based on the Silos Project needs (see Figure 5), then any additional soil generated will be treated as non-impacted soil. Soil determined during the excavation to be structurally deficient for constructing the new warehouse will also be removed. Excavation of non-impacted soil may be performed under the guidance of the Silos Project. Except for OSDF above-WAC material, debris and impacted soil will be disposed in the OSDF. Surface water collected in this excavation will be pumped or drained to the Lime Sludge Pond excavation (see Section 4.0, Surface Water Control).

3.5 Railroad Embankment

The Track No. 12 railroad embankment located from 2nd Street southward to the portion of track east of the northern portion of the OU4 Detention Basin will be excavated to bring the grade down near the design elevations for the new railroad spurs supporting Silos Remediation Facility. The existing track will be removed prior to the start of this excavation. The railroad ties will be removed and hauled to the bulk debris storage area for later disposition into the OSDF. The gravel and soil within the embankment will be excavated approximately to surrounding grade. The exposed surface will be both visually inspected for man-made materials and monitored using real-time scanning to determine if additional excavation is required.

Any portion of the K-65 Trench that is located underneath the embankment will be removed in accordance with the aforementioned methodology.

As the embankment is excavated, a berm will be created on the eastern boundary of the excavation south of the Lime Sludge Ponds to prevent excavation area surface water from draining onto the Building 30/45 parking lot. This berm will be constructed just inside of the silt fence surrounding the excavation area. Excavation in 3 ± 1-foot lifts will be performed with the associated lift scan until all impacted material has been removed. Except for OSDF above-WAC material, debris and impacted soil will be disposed in the OSDF. Surface water collected in this excavation will be pumped or drained to the Lime Sludge Pond excavation (see Section 4.0, Surface Water Control).

4.0 SURFACE WATER CONTROL

Due to the lack of a storm sewer system that drains to the Surface Water Retention Basin in or near the immediate excavation area, the following strategy will be used to control surface water. The existing storm sewer system within the excavation area drains to the OU4 Detention Basin (and subsequently to Paddys Run) and will be isolated from the excavation area by placing a HDPE liner over the catch basin grating and mounding at least 1 foot of soil over each catch basin. Construction fencing will be placed immediately around each catch basin to indicate location and prevent damage to the catch basin during excavation.

Early in the excavation process, a section of the Track No. 12 railroad embankment will be removed to allow surface water to flow eastward from the general excavation area towards the Lime Sludge Pond excavation. The Lime Sludge Pond excavation will be used as a construction sump where all excavation waters will be directed. Surface water collected in the Lime Sludge Pond excavation will be pumped to a nearby hose connector located above the surface at the southeast corner of the Lime Sludge Ponds. This hose connector directs water underground to manhole MH168 through a 6-inch storm sewer line for subsequent AWWT Phase I treatment via the Storm Water Retention Basin. Water collected in the High Nitrate Tank, Warehouse, or Remediation Facility excavations will be pumped as required to either the K-65 Trench excavation or directly to the Lime Sludge Pond excavation. The K-65 Trench will be excavated to drain eastward.

Prior to excavation activities, silt fence will be installed around the perimeter of the excavation area except the areas that will drain into the Lime Sludge Pond excavation.

This surface water control strategy is dependent on the completion of the excavation at the Lime Sludge Ponds before significant excavation occurs. In the event that the K-65 remedial excavation begins prior to the completion of Lime Sludge Pond excavation, then water will be collected at the eastern end of the K-65 Trench excavation and pumped to the hose connector located near the southeast corner of the Lime Sludge Ponds.

The Lime Sludge Pond excavation will not be certified upon completion. The remaining surface underneath the Lime Sludge Ponds will be certified along with later remediation efforts within Soil Remediation Area 7.

5.0 DUST CONTROL

Dust will be controlled using standard methods deployed in other on-site remedial excavation projects (e.g., keeping concrete wet when breaking or size reducing, and using water trucks in excavation areas and along haul routes to keep ground surface damp).

6.0 EXCAVATION SEQUENCING

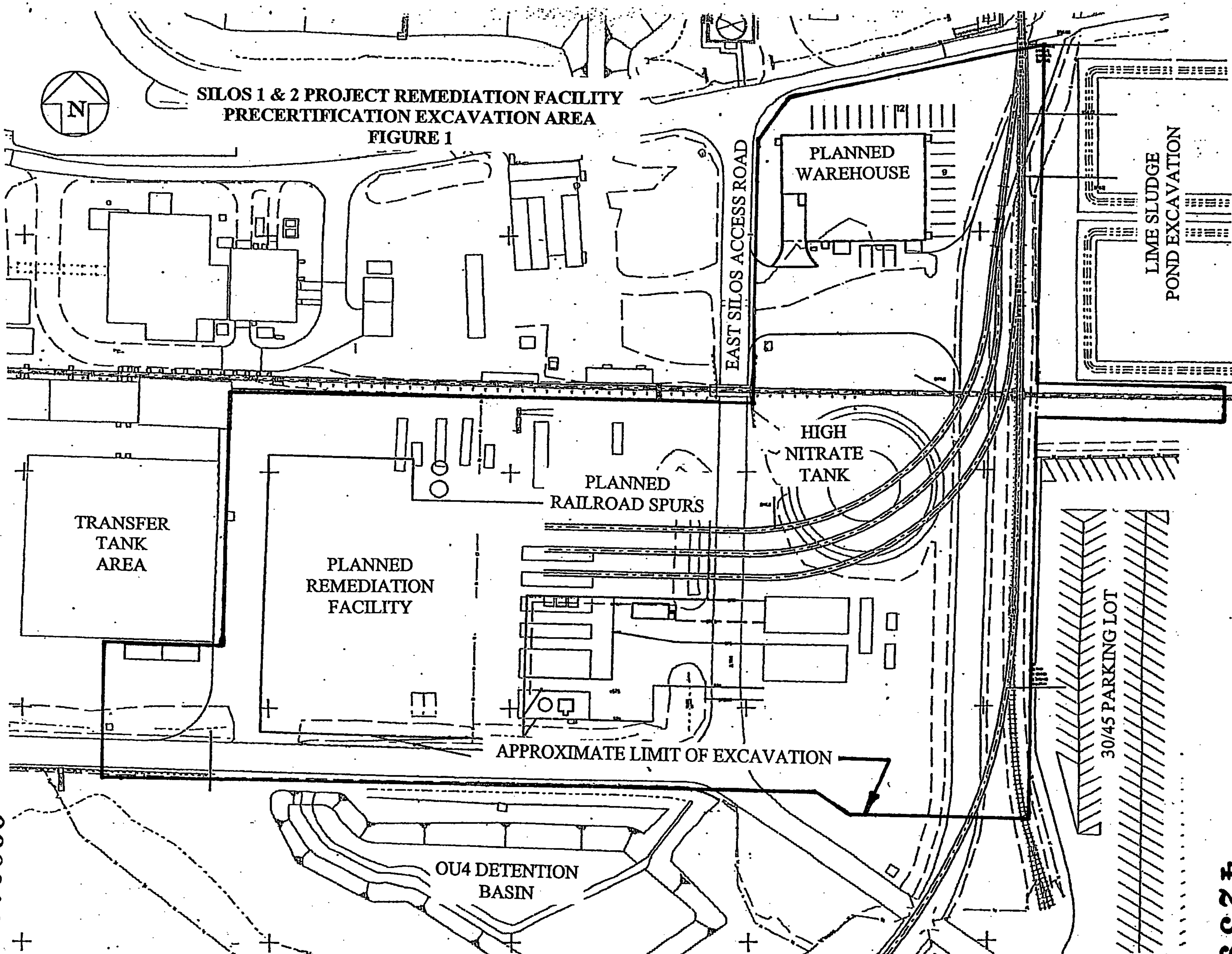
The surface water controls will be installed before any excavation will begin within the general remediation area. The isolated cut through the railroad embankment will also be excavated first to promote drainage towards the hose connector pumping station. The K-65 Trench will be excavated next, since this area contains the highest concentrations of contamination within the remediation area, and is required to establish drainage eastward towards the hose connector discharge location. Concrete breaking of the High Nitrate Tank foundation may occur before excavation begins provided silt fence has been installed to control runoff from the work zone. The remaining excavation areas will be sequenced as needed.

7.0 RESTORATION

No restoration seeding will take place within the work zone as this area will be turned over almost immediately to the Silos Project to begin the construction of the K-65 Remediation Facility, warehouse, rail spurs, and other associated support structures. This document does not address surface water, erosion, or dust controls associated with the construction of the K-65 Remediation Facility and associated support structures.

8.0 REFERENCES

U.S. Department of Energy, 2001, "Implementation Plan for Area 3A/4A," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.



SILOS 1 & 2 PROJECT REMEDIATION FACILITY PRECERTIFICATION EXCAVATION AREA
FIGURE 1

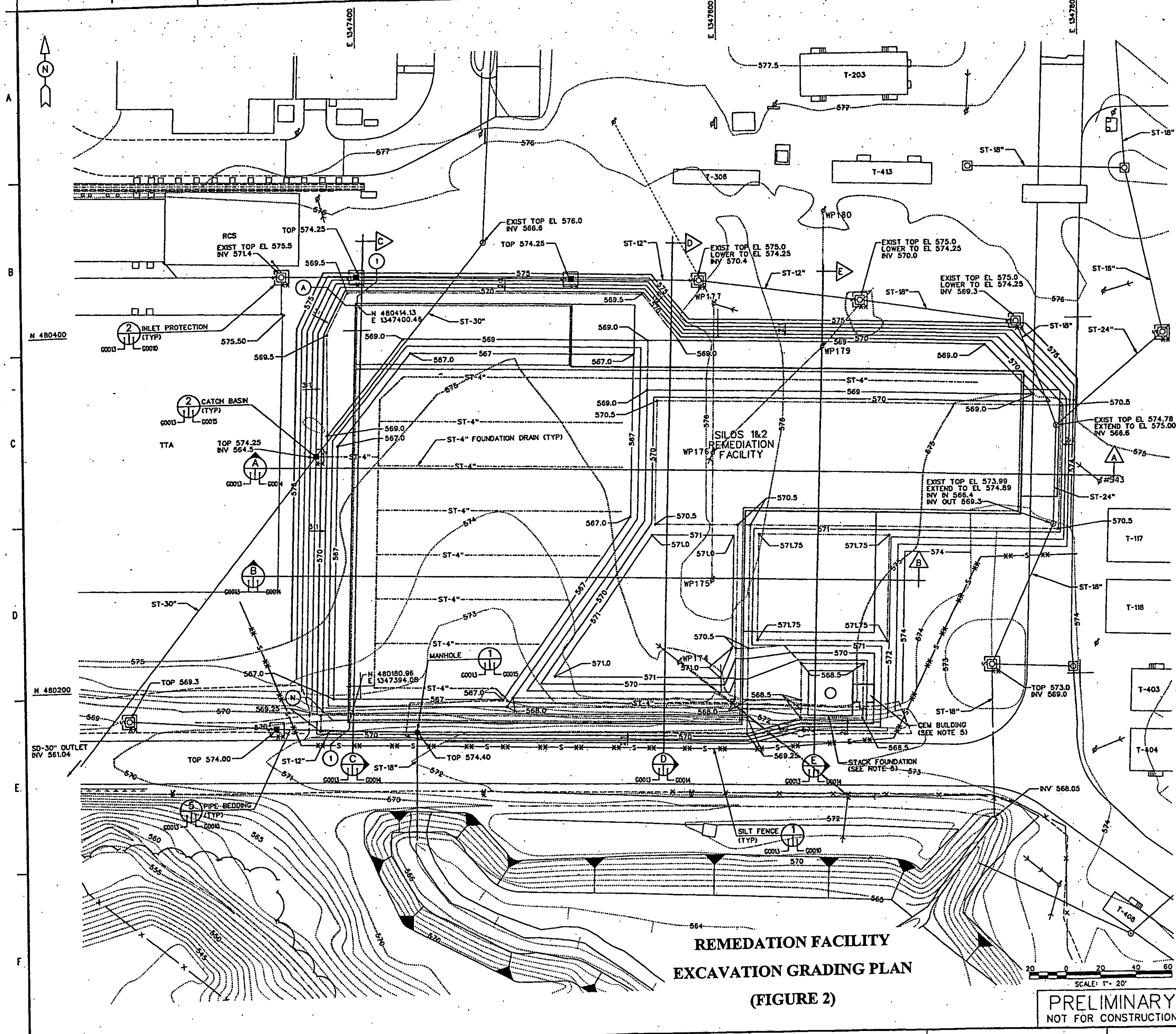
000011

4239

NOTES:

1. FOR GENERAL NOTES, LEGEND, UTILITY DESIGNATIONS AND EXCAVATION NOTES, SEE SHEET G0012.
2. SILT FENCE LOCATIONS SHOWN ARE APPROXIMATE. ADD ADDITIONAL SILT FENCE AND/OR ADJUST LOCATIONS AS NECESSARY TO MEET FIELD CONDITIONS.
3. PROTECT ALL EXISTING UTILITIES TO REMAIN FROM DAMAGE DURING EXCAVATION ACTIVITIES.
4. ALL SIDE SLOPES SHALL BE 4:1 UNLESS NOTED OTHERWISE.
5. STACK FOUNDATION AND CEM BUILDING LOCATION ARE ON HOLD.

4239



REMEDATION FACILITY

EXCAVATION GRADING PLAN

(FIGURE 2)

PRELIMINARY
NOT FOR CONSTRUCTION

REF DWG NO.	DRAWING TITLE

REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	DATE	REV. BY	APPR.
A	ISSUED FOR REVIEW	04/15/02		

UNITED STATES
DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

THIS DRAWING PREPARED BY
JACOBS

PROJECT NAME
SILOS 1 AND 2

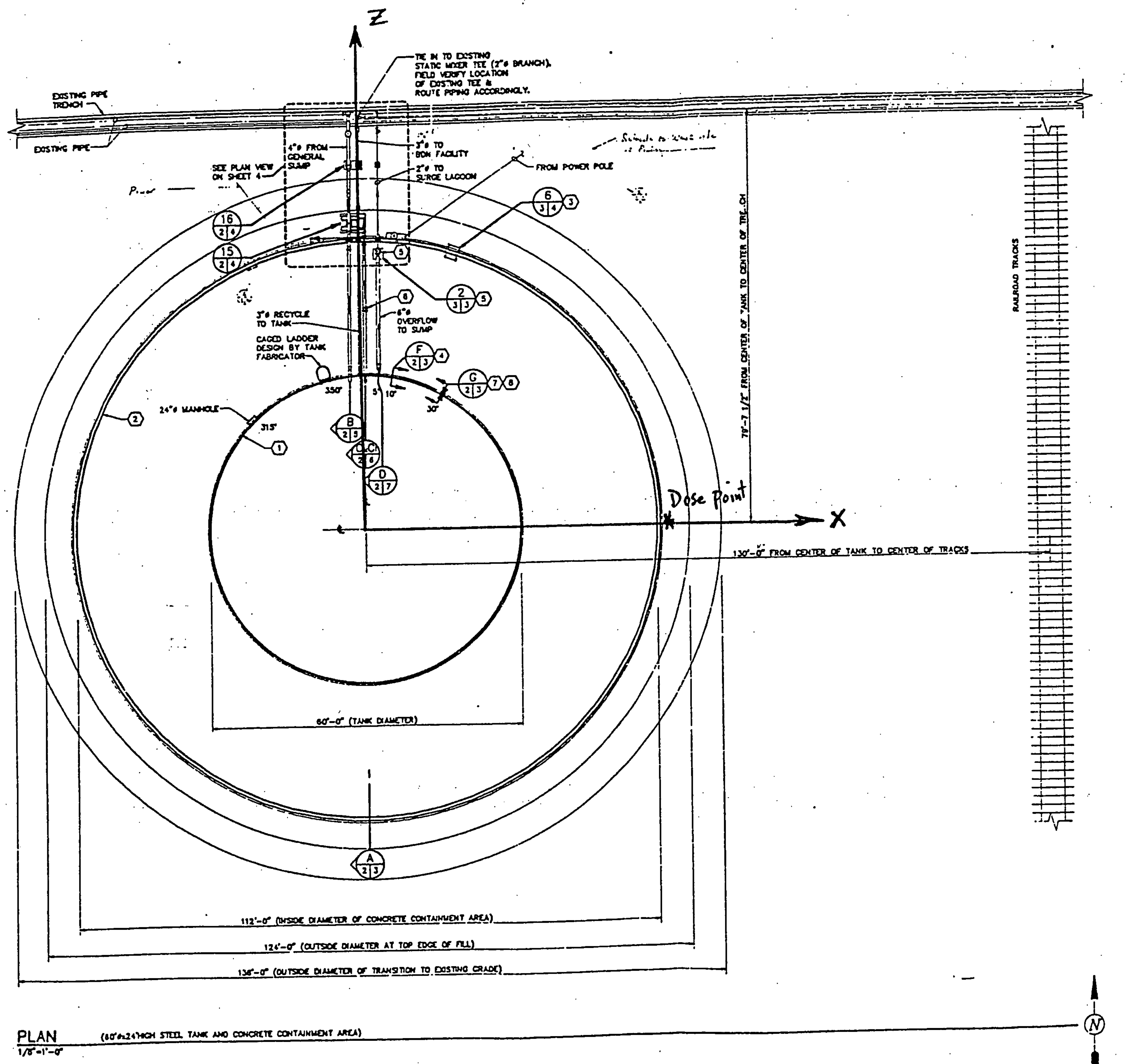
DRAWING TITLE
CIVIL
REMEDIATION FACILITY FOUNDATION EXCAVATION
GRADING, DRAINAGE AND EROSION CONTROL PLAN

SCALE 1"=20'

T.O. NUMBER	PROJECT NO.	DRAWING INDEX CODE NO.	SHEET NO.	REV. NO.
N/A	40750	94X-3900-G-01376	G0013	A

JEC PROJECT NO. 35H19603 — FILENAME 94XG1376.DGN

DATE: 04/15/02 TIME: 03:36:47 PM USER: KAKing DESIGN FILE: L:\Civil\Drawings\94XG1376.dgn



PLAN (60'ø×24'HIGH STEEL TANK AND CONCRETE CONTAINMENT AREA)
1/8"=1'-0"

DO NOT SCALE REDUCED DRAWING

DRAWING NOTES:

1. 60'-0" DIAMETER x 24'-0" HIGH ABOVE GROUND, OPEN-TOP, 500,000 GALLON STEEL TANK TO RECEIVE HIGH NITRATE CONCENTRATION WASTEWATER FROM THE FMPC GENERAL SUMP.
2. 112'-0" I.D. x 8'-0" HIGH ABOVE GROUND REINFORCED LEAK-TIGHT CONCRETE CONTAINMENT STRUCTURE.
3. ACCESS LADDER INTO CONTAINMENT AREA. FOR DETAIL OF LADDER SEE SHEET 4, DETAIL 6.
4. 1" DIA. COUPLING WITH PLUG USED AS A DRAIN FOR EASE OF CLEANING TANK. SEE SHEET 3, DETAIL 19.
5. CONTAINMENT AREA SUMP PUMP. ZOELLER PUMP MODEL 198, 2 H.P.
6. 4" DIA. EXPANSION JOINT. GENERAL RUBBER CORP. STYLE 1015 MAXI-JOINT (OR APPROVED EQUAL).
7. 10" DIA. OUTSIDE FLANGED NOZZLE.
8. 8" DIA. INSIDE AND OUTSIDE FLANGED NOZZLE.

HIGH NITRATE TANK

PLAN VIEW

(FIGURE 3)

NO.	REVISIONS	DATE
0	CFC	
B	FINAL APPROVAL	5/89
A	100% DESIGN REVIEW	4/89

SHEET TITLE: PARTIAL SITE PLAN

DANIS

QSOURCE ENGINEERING, INC.

HIGH NITRATE STORAGE TANK FOR BIODENITRIFICATION PROCESS

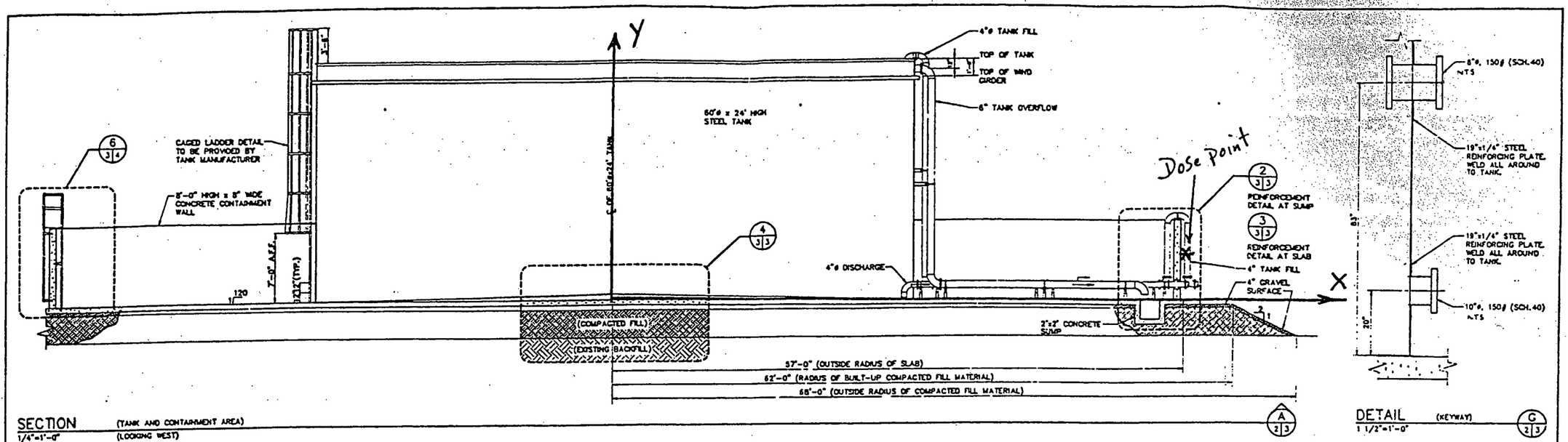
DRN: D.R.H.	DATE 3/89	NO. 2
DSGN: K.M.K.	PROJ. NO.: 88318	OF 10
CAD: K.M.K.		

UNITED STATES DEPARTMENT OF ENERGY
FEED MATERIALS PRODUCTION CENTER

IRA-5500-00097G

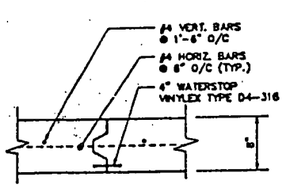
ATTACHMENT 1 of 1
CALCULATION 4146-56-01

4239

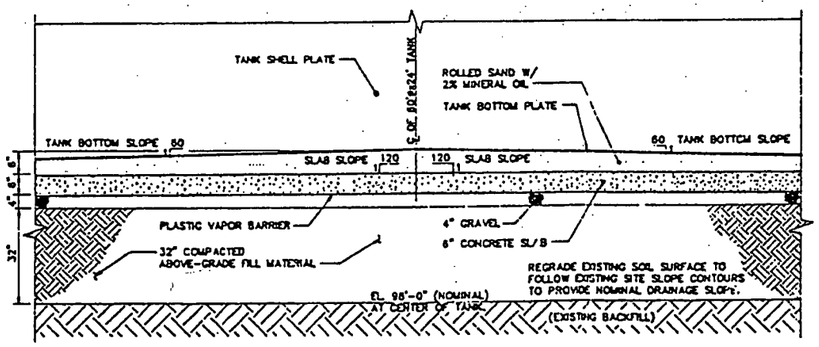


SECTION (TANK AND CONTAINMENT AREA) (LOOKING WEST) — 1/4"=1'-0" — A 2|3

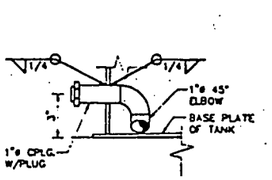
DETAIL (KEYWAY) — 1 1/2"=1'-0" — G 2|3



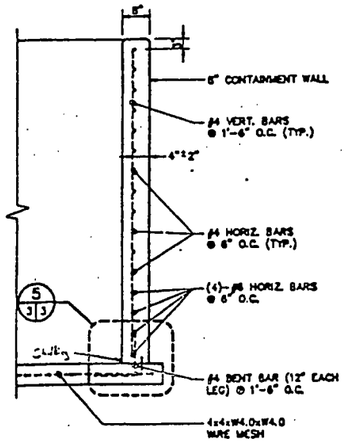
DETAIL (VERTICLE WALL JOINT) — 1 1/2"=1'-0" — E 3|3



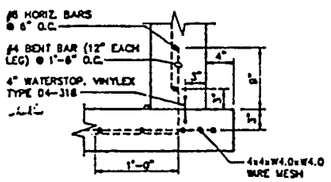
DETAIL (FOUNDATION SECTION VIEW AT CENTER OF TANK) — 3/4"=1'-0" — 4 3|3



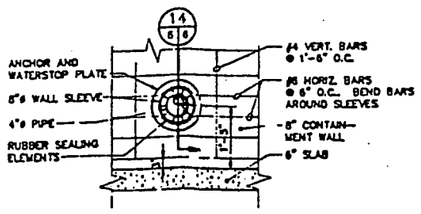
DETAIL — 1 1/2"=1'-0" — F 2|3



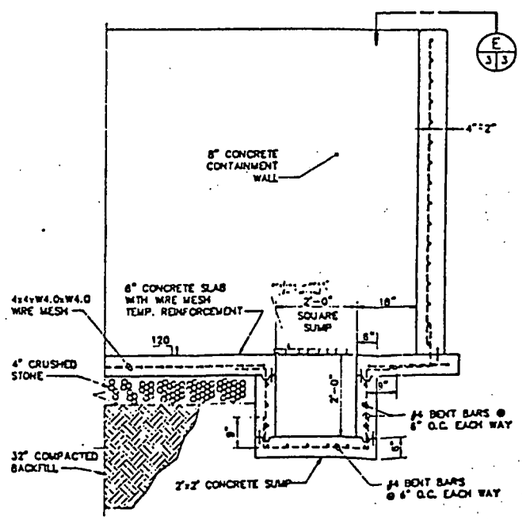
DETAIL (CONCRETE REINFORCEMENT DETAIL AT SLAB) — 3/4"=1'-0" — 3 3|3



DETAIL (WATERSTOP DETAIL) — 1 1/2"=1'-0" — 5 3|3



DETAIL (PIPE SLEEVE THRU WALL) — 3/4"=1'-0" — 8 6|3



DETAIL (CONCRETE REINFORCEMENT DETAIL AT SUMP) — 3/4"=1'-0" — 2 3|3

DO NOT SCALE REDUCED DRAWING

HIGH NITRATE TANK PROFILE (FIGURE 4)

NO.	REVISIONS	DATE
1	CFC	11-4
B	FINAL APPROVAL	9-13-88
A	90% DESIGN REVIEW	6-6-88
0	CFC-TANK FOUNDATION SUBGRADE ONLY	4-6-88

SHEET TITLE: SECTION & DETAILS

DANIS

HIGH NITRATE STORAGE TANK FOR BIODENITRIFICATION PROCESS

QSOURCE — DWN: D.R.H. DATE: 3/88 NO. 3; DESIGN: K.M.K. PROJ. NO.: 88316; CHK: K.M.K. PLOT S/C NO.: 359 OF. 10

UNITED STATES DEPARTMENT OF ENERGY FEED MATERIALS PRODUCTION CENTER

ISSUED FOR CONSTRUCTION

WORK PROJECT NO. 18 88316 1.88.AM; MCC CONTRACT NO. 12A-55005-00977

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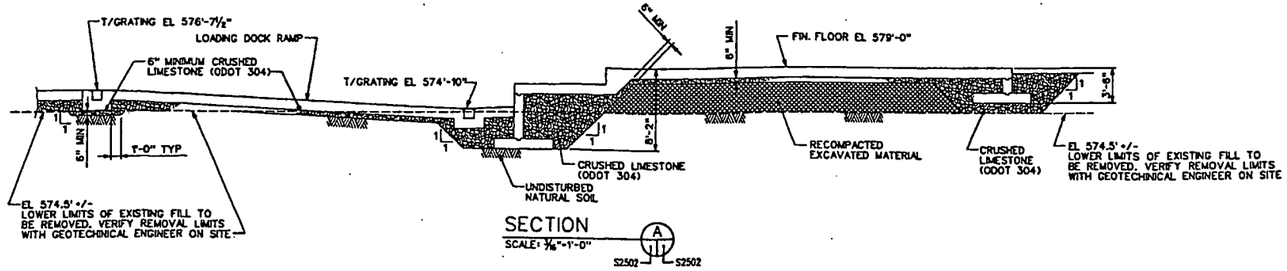
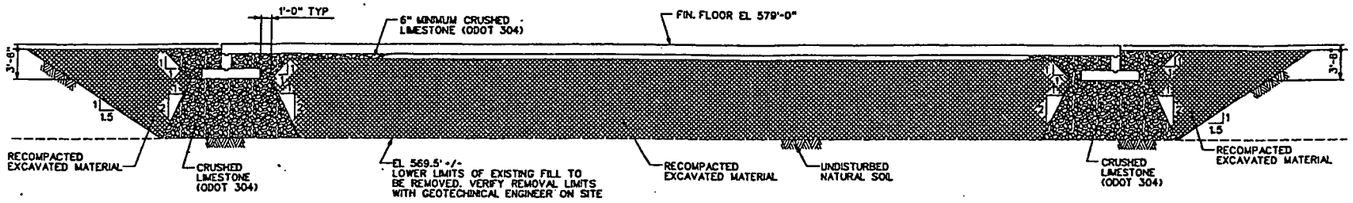
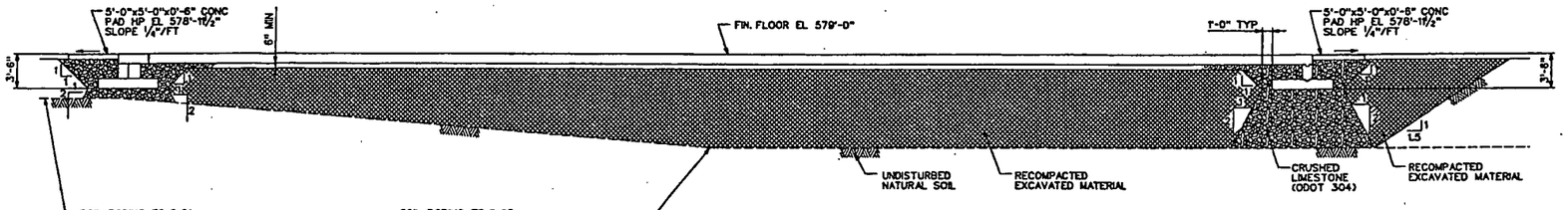


SECTION A
SCALE: 3/16"=1'-0"
S2502 — S2502



SECTION B
SCALE: 3/16"=1'-0"
S2502 — S2502



SECTION C
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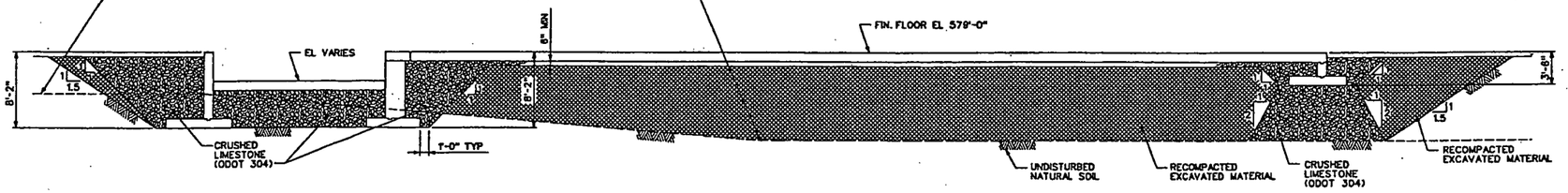
S2502 — S2502



SECTION D
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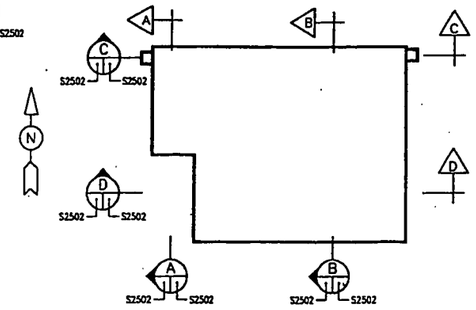

BUILDING PLAN (SECTION KEY)

4 0 4 8 12 FT
SCALE: 3/16"= 1'-0"

NUMBER OF DETAIL OR LETTER OF SECTION
DRAWING ON WHICH SECTION OR DETAIL IS TAKEN
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN

SECTION AND DETAIL KEY

NOTES:

1. SEE SHEET S2500 FOR FOUNDATION PLAN AND GENERAL NOTES.
2. EXCAVATION AND BACKFILL INFORMATION SHOWN ON THIS DRAWING IS INTENDED TO CLARIFY RECOMMENDATIONS IN THE FOLLOWING REPORT:

   GEOTECHNICAL ENGINEERING INVESTIGATION
   PROPOSED WAREHOUSE - SILOS 1 AND 2
   FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
   HAMILTON COUNTY, OHIO
   ATC PROJECT NO. 72.58679.0022 (SITE 2)

   NOTIFY GEOTECHNICAL ENGINEER IMMEDIATELY FOR ANY CLARIFICATIONS OR DISCREPANCIES BETWEEN INFORMATION ON THIS DRAWING AND THE GEOTECHNICAL ENGINEERING INVESTIGATION.
3. EXCAVATED MATERIAL APPROVED FOR REUSE AS RECOMPACTED EXCAVATED MATERIAL BENEATH THE FLOOR SLAB MUST BE STOCKPILED AT AN APPROVED LOCATION ON SITE. ONLY MATERIAL APPROVED BY THE GEOTECHNICAL ENGINEER ON SITE SHALL BE USED AS RECOMPACTED EXCAVATED MATERIAL. ALL PLACEMENT AND COMPACTION PROCEDURES SHALL BE IN CONFORMANCE WITH DIRECTION PROVIDED BY GEOTECHNICAL ENGINEER AND UNDER THE SUPERVISION OF THE GEOTECHNICAL ENGINEER.
4. ENGINEERED FILL CONSISTING OF ODOT 304 CRUSHED LIMESTONE MAY BE USED AS BACKFILL IN LIEU OF RECOMPACTED EXCAVATED MATERIAL.
5. RECOMPACTED EXCAVATED MATERIAL MAY BE USED IN LIEU OF ODOT 304 CRUSHED LIMESTONE WHEN APPROVED BY THE GEOTECHNICAL ENGINEER.

REF DWG NO.	DRAWING TITLE
S2500	FOUNDATION PLAN

REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	DATE	REV. BY	APPR. INITIALS AND DATE
0	ISSUED FOR BID	02/15/02	[illegible]	[illegible]

UNITED STATES
DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

THIS DRAWING PREPARED BY
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PROJECT NAME
SILOS 1 AND 2

WAREHOUSE DESIGN
FIGURE 5

PLANT/BLDG. NO.	FLOOR	SCALE: 3/16"=1'-0"	CLASS U
SUBMITTED FOR 30% ISSUE	SUBMITTED FOR 60% ISSUE	SUBMITTED FOR 90% ISSUE	
TECH LEAD	TECH LEAD	TECH LEAD	
DATE	DATE	DATE	

L.O. NUMBER	PROJECT NO.	DRAWING INDEX CODE NO.	SHEET NO.	REV. NO.
N/A	40750	94X-3900-S-01475	S2502	0
E.C. PROJECT NO. 35H19503	FILENAME 94X51475.DGN			

DATE: 02/20/02
TIME: 07:58:18 AM
USER: SSchoefe
DESIGN FILE: k:\str\drawings\94x51475.dgn