Department of Energy

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FEB 25 2000

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

DOE-0431-00

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

Dear Mr. Jablonowski and Mr. Schneider:

TRANSMITTAL OF SUPPLEMENTAL INFORMATION FOR THE ACCELERATED WASTE RETRIEVAL PROJECT

Enclosed is additional information you requested at the Silos 1 and 2 Accelerated Waste Retrieval (AWR) briefing on February 8, 2000. The transmittal includes the following: 1) a full length video of the Decant Sump Tank inspection, 2) full size versions of drawings in the Remedial Design Work Plan (RDWP), and 3) preliminary details on enlarging silo penetrations and the recipe for surrogate material planned for the full scale mock up.

Please contact Nina Akgündüz at (513) 648-3110 if you have any questions.

Sincerely,

Johnny Reising

Johnny W. Reising
Fernald Remedial Action
Project Manager

FEMP:Akgündüz

Enclosure

cc w/enclosure:
G. Jablonowski, USEPA-V, SRF-5J
T. Schneider, OEPA-Dayton

cc w/o enclosure:
S. Fauver, EM-31/CLOV
N. Hallein, EM-31/CLOV
A. Tanner, OH/FEMP
J. Saric, USEPA-V, SRF-5J
F. Bell, ATSDR
M. Schupe, HSI GeoTrans
R. Vandegrift, ODH
F. Barker, Tetra Tech
T. Hagen, Fluor Fernald/65-2
J. Harmon, Fluor Fernald/90
S. Hinnefeld, Fluor Fernald/31
D. Paine, Fluor Fernald/52-4
T. Walsh, Fluor Fernald/65-2
AR Coordinator, Fluor Fernald/78
ECDC, Fluor Fernald/52-7

Residue Physical Surrogate

Florida International University (FIU) developed a physical surrogate material formulation that, when combined with water and BentoGrout™ into surrogate slurries, simulates the rheological and physical properties of residue slurries. The proposed formulation of the AWR surrogate solids for the residue material is shown on Table G-1 along with information on the soil and sand constituents. The surrogate slurries were prepared and tested in the clean test loop. Pressure drop measurements made in the cold loop for the surrogate slurries were found to be consistent to the comparable residue slurries over a range of concentrations up to 43 wt% residue and up to 5 wt% Bento Grout™. Surrogate slurry tests are planned for the range of BentoGrout™ between 5 and 10 wt%; this information will be included in the final report prepared by FIU. For AWR systems testing, it is proposed that surrogate slurries would be composed of the solids surrogate from Table G-1 in combination with bentonite and water in proportions that cover the range of slurries that could be used for the system operational design basis.

TABLE G-1

Formulation of the AWR Proposed Residue Physical Surrogate

Materials	Weight % (dry basis)	Description	
Sand	44.5	Fine construction sand	
		Particle sizes	Wt%
		>1mm	10
		< 1mm > Mesh #60	18
		< Mesh #60 > Mesh #80	27
		< Mesh #80	45
Soil	44.5	Vitagreen™ Top Soil[1]	
		Peat plus sand	
		Particle sizes	Wt%
		>1mm	10
		<1mm >Mesh #60	18
		<Mesh #60>Mesh #80	27
		<Mesh #80	45
Diatomaceous Earth	5	Fisher Celite-545	
Al_2O_3	3	60 micron	
Fe_2O_3	3	325 mesh	

1 Vitagreen, Inc.
P.O. Box 739
Polk City, FL 33868-0739
Tel: 1-800-432-2410

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FOSTER WHEELER

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Silo Penetration and Riser Installation Plan

DOCUMENT NO.
624-P622-63, Rev. A

FOR THE
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL (AWR) PROJECT

SUBMITTED TO:

FLUOR DANIEL FERNALD (FDF)

CONTRACT NO. FSC 624

November 30, 1999

Revision	Prepared by	Reviewed by	Approved by	Date
A	Brad Langley			

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[ ] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[X] C - Revise and Resubmit
Sig: KASolomon Date 12/21/99

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ATTACHMENTS:

A. SKFMD002, Anchor Cable Details
B. SKFMD003, Camera Riser Assembly
C. SKFMD004, Typical Equipment Riser Assembly
D. SKFMD005, Typical Base Plate
E. SKFMD006, Penetration Details

1.0 PENETRATION REQUIREMENTS

Prior to removing K-65 material from the silos, new risers must be installed in the domes of each silo. The penetrations will be cut using the bridge as a working platform before the equipment modules are installed. The bridge will also be used to determine the location of the new penetrations. The Radon Control System (RCS) will be operational before any cutting takes place.

The existing protective dome covers on Silos 1 and 2 will be removed before the Easily Manipulated Mechanical Arm™ (EMMA™) riser can be installed. Three new penetrations will also be required in each silo for the cameras to be installed. These penetrations can be made by standing on the silo dome. The same procedures will be used to cut new penetrations and install risers in Silo 1, Silo 2, and Silo 4.

1.1 Penetrations Cut From Bridge

New penetrations in each silo that will be cut from a working platform on the bridge are described below:

1.1.1 Penetration 1

The new penetration required for the EMMA™ module will be located in the center of the silo dome. This penetration is to be a 36-in.-diameter hole. The existing riser on top of the silos will not be used because it is not centered on the dome.

1.1.2 Penetration 2

The penetration for the sluicing module is an enlargement of the penetration for an existing 20-in.-diameter riser. The module opening in the bridge will determine the center of this penetration. The existing riser will be removed and a new 36-in.-diameter riser installed.

1.1.3 Penetration 3

The penetration for the slurry module is an enlargement of the penetration for an existing 20-in.-diameter riser. The module opening in the bridge will determine the center of this penetration. This existing riser will be removed and a new 48-in.-diameter riser installed.

1.2 Penetrations Cut From Dome

New penetrations in each silo that will be cut while standing on the dome are described below:

1.2.1 Camera Penetrations

Three new penetrations are required for the cameras. The camera penetrations are located 120° apart. To avoid blind spots in the silos, cameras will not be located in line with the bridge or the equipment modules.

2.0 BASE PLATE INSTALLATION

2.1 Overview

Base plates will be installed on the silo dome before the penetrations are cut into the silo dome. They will serve several purposes including; securing the riser to the dome, sealing the riser to the dome, leveling and controlling elevation of the riser, distributing the riser load on the dome, and minimizing worker expose after penetration is made. They will be constructed of continuous, ¼-inch aluminum plate to minimize weight. The base plate will have a hole through the center for cutting the penetration after it is installed and for installing the riser. Details of the base plates can be seen on Drawing SKD005.

2.2 Surface Preparation

Aligning with the module opening in the bridge, the center and the perimeter of the new penetration will be marked on the silo dome. The rigid polyurethane foam covering on the domes will be removed where the riser will be located by first scraping it away from the surface of the dome that will contact the base plate except for an area where the base plate will overlap the foam 6-inches. This overlap will allow the existing foam to later be used as a form for applying grout. After the bulk of the foam is removed by scraping, a power brush will be used to remove the remaining foam and etch the existing concrete surface. A bonding agent will be applied to the silo dome prior the bed that will ensure the bed is secured to the silo dome.

2.3 Installation

An annular bed of grout will be applied around the perimeter of the future penetration. This be will have an approximate radial width of 8-inches and be sufficiently thick to allow the base plate to rest entirely on the new bed and not the silo dome when installed. The base plate will next be lowered into position. The plate will be shimmed to a predetermined angle and will rest on the shims while the grout is curing. The plate will have bent steel anchor bolts attached to the bottom side, which will be pressed into the grout. These anchor bolts will secure the base plate to the grout after the grout has cured.

3.0 CUTTING PROCEDURES

3.1 Overview

Because of the deteriorated condition of the silo domes (see Appendix H, TRD-40710-RP-0001), special care will be given to minimize loading. This will be especially true during the cutting process because of the vibrations introduced to the structure by the cutting equipment. To assure that the silo dome loading is not exceeded the workers will be standing on gangways located under the bridge. These gangways will be moved aside to allow the bridge to clear the risers when in motion and then placed in position for cutting silo penetrations and for riser maintenance that may be required such as connecting or disconnecting equipment risers. All equipment used for cutting will be placed on these gangways and not on the dome whenever possible. Calculations have been made to determine the silo's integrity once the penetrations are made (see Calculation CA-FSC24-FS-003).

The concrete and risers being removed will be prevented from falling into the silo once they are severed. After these pieces of concrete are removed, they will be transferred to Fluor Daniel Fernald (FDF) for disposal. The new risers will then be installed and sealed.

3.2 Cutout Retention

Before the cutting process begins, the concrete to be removed must be secured to prevent it from falling into the silo. Because of the poor condition of the concrete, a compression-type concrete anchor cannot be trusted to prevent the cutouts from falling into the silo. An anchor may even cause the cutouts being removed to split apart, risking dropping the fragmented cutouts into the silo. The plan to capture the cutouts will be to anchor to the inside surface of the dome. This will be accomplished by drilling several holes through the dome and lowering anchor cables down through these holes. Details of the anchor cables can be seen on Drawing SKFMD002. The anchor cables are sized so that once they are lowered through the hole, they cannot slip back through the reinforcing mesh even if the concrete disintegrates around them. Using several anchors in each cutout will distribute the load, reducing the risk of the cutout collapsing under its own weight during the removal process. When the anchor cables have been secured to the dome they will then be attached to a rigging eye which will be suspended from the bridge using a jib crane and hoist. After the cuts have been made, the cutouts will be hoisted up onto the bridge and handled for disposal. All of these operations will be conducted using a containment tent to guard against uncontrolled releases of Radon.

3.2.1 Riser 1 Penetration

The EMMA™ module will be positioned over the center of the silo dome when in operation. There is not an existing riser in this location so a new one will be made. The jib crane and hoist will be centered over the EMMA™ module opening in the bridge and used to hoist the cutout once it is severed.

3.2.2 Risers 2 & 3 Penetrations

Risers 2 & 3 will replace existing risers in the silos. An eyebolt will be attached to the existing riser before cutting begins. This eyebolt will then be attached to the same jib crane mentioned above. Once the cutout is severed, it will be hoisted through the module opening in the bridge. Anchor cables will be used to secure the concrete surrounding the riser to the riser to prevent possible separation during cutting.

3.2.3 Camera Penetrations

There will be three camera penetrations per silo located 120° apart. The camera penetrations will be made no further than 32-feet radially outward from the center of the silo dome to prevent cutting any of the structural rebar in the silos domes. A single anchor cable will be attached to the center of the cutout to retain it after it is cut. The camera penetrations are located near a thicker section of the dome with more reinforcement. Workers will be able to work from the surface of the silo dome to make these penetrations. It is more convenient to locate equipment on the surrounding berm rather than on the bridge to make the camera penetrations. The cutouts will be hoisted out by hand since they will only weigh 40 pounds.

NOTE: This method cannot be used on silo 4 since it does not have the earthen berm. Temporary scaffolding or a hydraulic man platform will be used to set up equipment and work

around the edges of the dome for camera riser installation, camera installation, and camera removal.

3.2.4 Contingency Plan

Some of the concrete being removed for riser installation could fall into the silo. If a substantial piece of the cutout does fall into the silo, it must be retrieved before the riser is installed. It will be retrieved using a set of lifting tongs attached to the jib crane to grab it. The tongs would be attached to the jib crane normally used to remove the cutouts and hoisted out of the silo. Once the cutout fragment is hoisted free of the silo, it will be securely netted or captured in a manner to prevent falling back into the silo. Once it is secured it can be hoisted the remaining distance to the bridge and removed from the site for disposal by FDF.

Workers will not be able to look down into the penetration easily. A small camera and light may be necessary to locate the cutout fragments and guide the tongs down to remove the fallen fragments.

3.3 Cutting Method

The new penetrations will be located using the center of the module openings on the bridge. All penetrations will be shaped as close to a circle as possible using the cutting method detailed below. They will also be cut vertically through the silo except for the camera penetrations, which will be cut perpendicular to the silo dome surface.

The penetrations will be made using a water-cooled, hydraulically powered chainsaw with a diamond blade. An ICS, Model 831H has been selected for the cutting work. The saw is lightweight (28 lb.) and compact, making it easier to operate and to reduce dome loading. The saw will be handheld and will not rest directly on the dome. The saw requires a portable hydraulic power pack, which will be located on the bridge. Three, approximately 25-feet-long hoses (two for the hydraulics and one for cooling water), will be run from the power pack and coolant pump to the saw. The cooling water must be supplied at 80 psi and 2 gpm. The cooling water will drain into the silos.

The holes for the anchor cables will be drilled 2-in.-diameter using standard concrete drills and drilling techniques. For anchor cable hole details, see Drawing SKFMD006.

4.0 RISER INSTALLATION

The design of the new risers will be similar to the existing risers. They will consist of round pipe protruding through both surfaces of the silo dome. The upper end of the riser will be flanged for attachment of equipment modules or sealing plates when not in use. For a general arrangement of the riser locations see Drawings 11FMD019 for Silos 1 & 2 and 10FMD017 for Silo 4.

4.1 Riser 1 (For EMMA™)

The riser for the EMMA™ penetration will set perpendicular to the silo surface on the center of the dome. As mentioned earlier, the existing protective dome covers on Silos 1 and 2 will be removed prior to installation of Riser 1. The riser will be constructed of 36-inch I.D. pipe, with an 11-gauge wall thickness. The top of the riser will have a circular flange (constructed of 2 X 2 X ¼ rolled angle) continuously welded to the pipe to ensure a positive seal. The riser will have

another flange (constructed of 1/8"-inch plate) for connecting and sealing the riser to the base plate. This flange will be welded to the riser on an angle that will match the angle of the base plate installed for this riser. Because of the weight of the risers, all handling of the risers will be done with the jib crane and hoist.

Sealant will be applied to the base plate interface flange and the riser will be lowered into position. The riser will be centered under the bridge module opening and secured to the base plate using strap type clamps. For more details of Riser 1, see Drawing SKFMD004.

4.2 Riser 2 (For Sluicer)

Riser 2 will be positioned vertically in the silo to allow for ease of equipment installation and removal. It is made of 36-inch I.D. pipe, with an 11-gauge wall thickness. The top of this riser will also have a circular flange (constructed from 2 X 2 X ¼ rolled angle) continuously welded to the pipe to ensure a positive seal. The riser will have another flange (constructed of 1/8"-inch plate) for connecting and sealing to the base plate. This flange will be welded to the riser on an angle that will match the angle of the base plate installed for this riser. It will be installed in the same manner as Riser 1. For more details of Riser 2, see Drawing SKFMD004.

4.3 Riser 3 (For Slurry)

The riser for the slurry pump will be installed in the same manner as Riser 2. The only difference is that it will be made from 48-inch I.D. pipe with an 11-gauge wall thickness. For details of Riser 3, see Drawing SKFMD004.

4.4 Camera Risers

The three camera risers are the smallest of the risers to be installed. The inside diameter of these risers will be 12-inch with an 11-gauge wall thickness. They will have a circular flange continuously welded on top to positively seal the riser. This flange will mate with the camera flange. The camera risers will be secured and sealed to the silo dome the same way as the other risers except they will be installed perpendicular to the silo dome since the cameras do not have to be mounted or inserted/extracted vertically. The elevation of the top of the risers is not critical because they will not be accessed by equipment on the bridge. Details for the camera risers can be seen on Drawing SKFMD003.

5.0 REFERENCES

Calculation CA-FSC24-FS-003
Drawing SKFMD002
Drawing SKFMD003
Drawing SKFMD004
Drawing SKFMD005
Drawing SKFMD006
Drawing 10FMD017
Drawing 11FMD019

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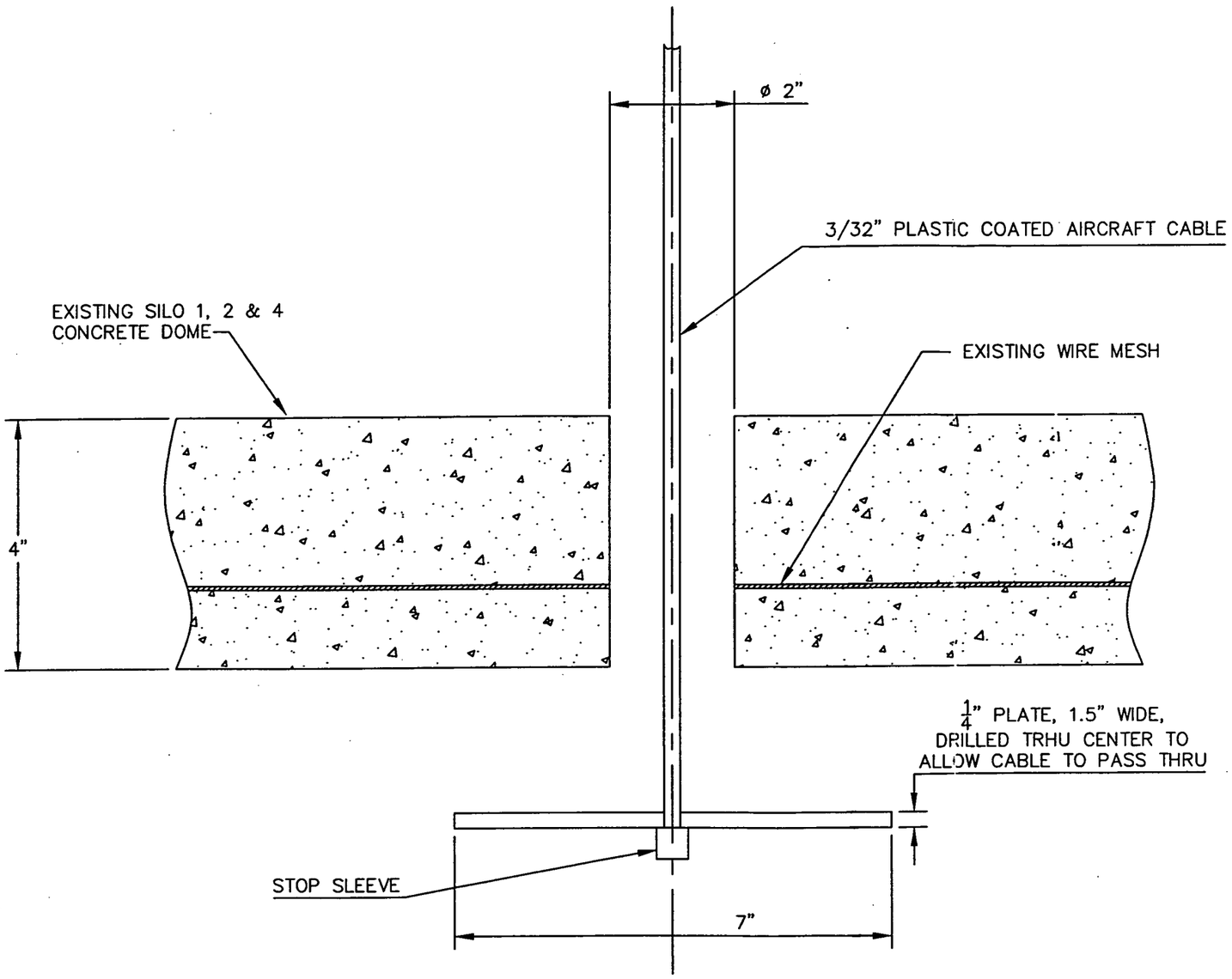

LIFT POINT DETAIL
TYPICAL

LIFT POINT NOTES

1. LOCATE PENETRATIONS PER DRAWINGS 10FMD017 & 11FMD019.
2. MARK CENTER AND SIZE OF PENETRATION USING SILO BRIDGE TO LOCATE.
3. DRILL REQUIRED NUMBER OF 2" DIAMETER HOLES THRU SILO DOME (SEE SKFMD006) OR ATTACH EYEBOLTS IF REPLACING EXISTING RISER.
4. INSTALL REQUIRED NUMBER OF ANCHOR CABLES THRU HOLES AND SECURE TO HOIST.
5. CUT CIRCULAR HOLE THRU SILO DOME USING A HYDRAULIC CHAINSAW
6. HOIST CORE TO SILO BRIDGE OR SURROUNDING BERM.

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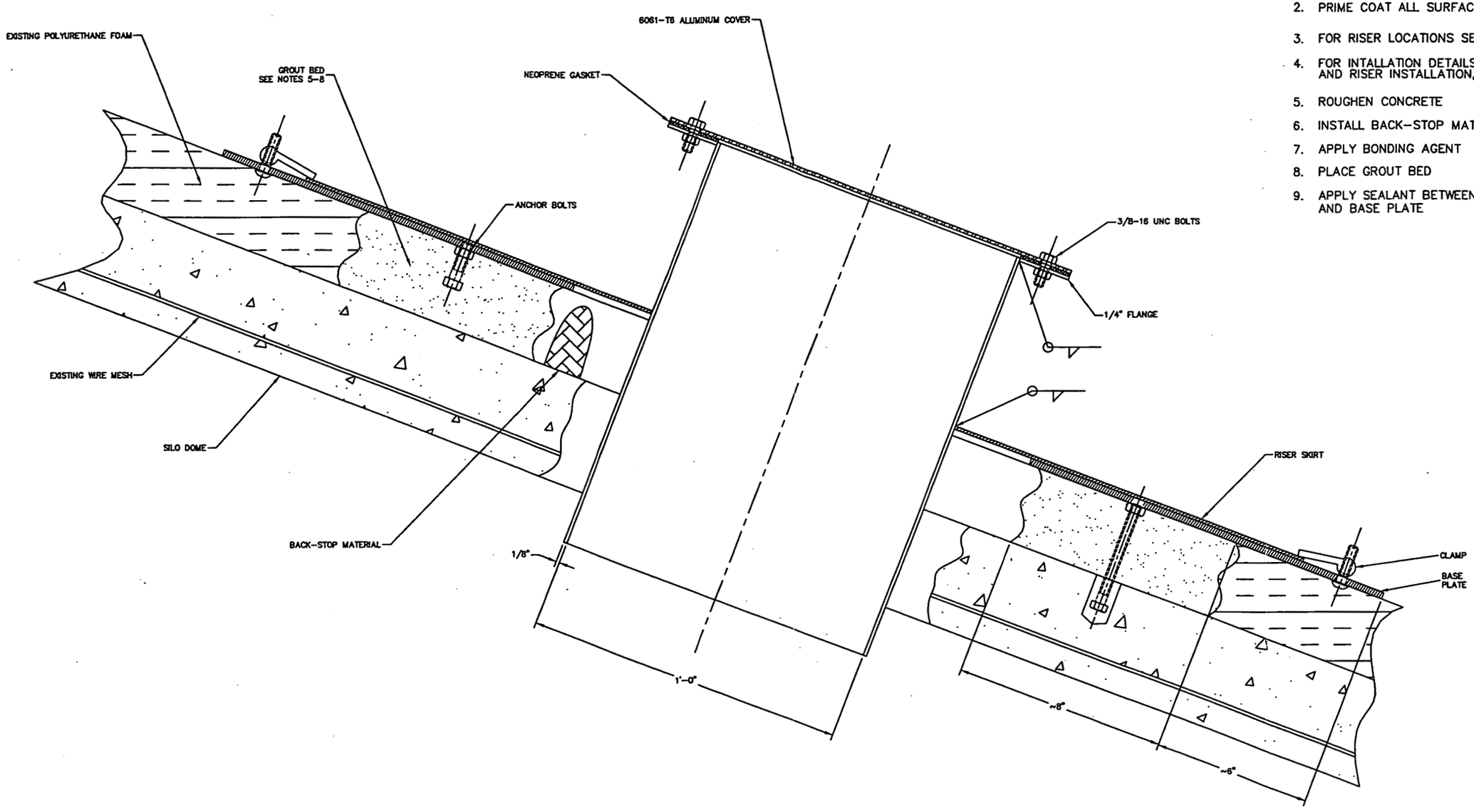
PRELIMINARY
NOT FOR CONSTRUCTION

TITLE		
SILO 1, 2 & 4 ANCHOR CABLE DETAILS		
SIZE D	SCALE: 6"=1'-0"	DWG. NO. SKFMD002



NOTES:

1. ENTIRE ASSEMBLY TO BE SAND BLASTED TO PROVIDE A CLEAN, RUST FREE SURFACE.
2. PRIME COAT ALL SURFACES.
3. FOR RISER LOCATIONS SEE 10FMD017, 11FMD019.
4. FOR INTALLATION DETAILS SEE SILO PENETRATION AND RISER INSTALLATION, 624-P622-63
5. ROUGHEN CONCRETE
6. INSTALL BACK-STOP MATERIAL
7. APPLY BONDING AGENT
8. PLACE GROUT BED
9. APPLY SEALANT BETWEEN RISER SKIRT AND BASE PLATE

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PRELIMINARY
NOT FOR CONSTRUCTION

TITLE		
SILO 1, 2 & 4 CAMERA RISER ASSEMBLY		
SIZE D	SCALE: 6"=1'-0"	DWG. NO. SKFMD003

FILENAME: SKFMD003.DWG

NOTES:

1. ENTIRE ASSEMBLY TO BE SAND BLASTED TO PROVIDE A CLEAN, RUST FREE SURFACE.
2. PRIME COAT ALL SURFACES.
3. FOR RISER LOCATIONS SEE 10FMD017, 11FMD019.
4. FOR INTALLATION DETAILS SEE SILO PENETRATION AND RISER INSTALLATION, 624-P622-63
5. ROUGHEN CONCRETE
6. INSTALL BACK-STOP MATERIAL
7. APPLY BONDING AGENT
8. PLACE GROUT BED
9. APPLY SEALANT BETWEEN RISER SKIRT AND BASE PLATE

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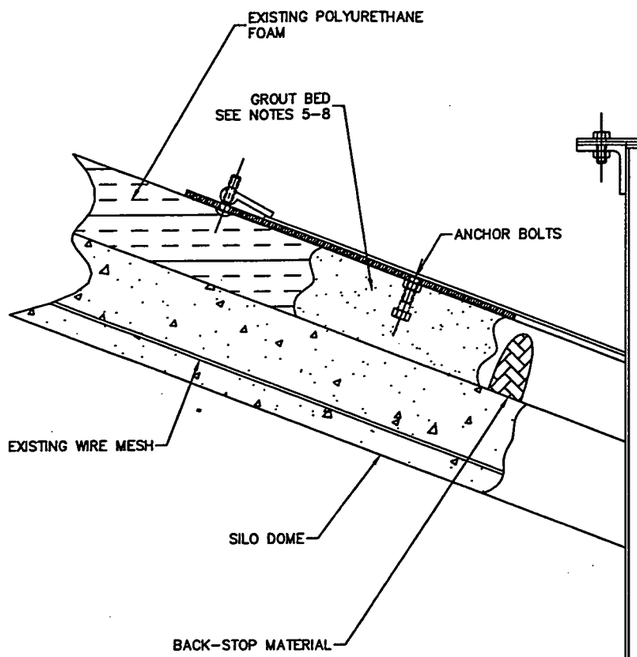

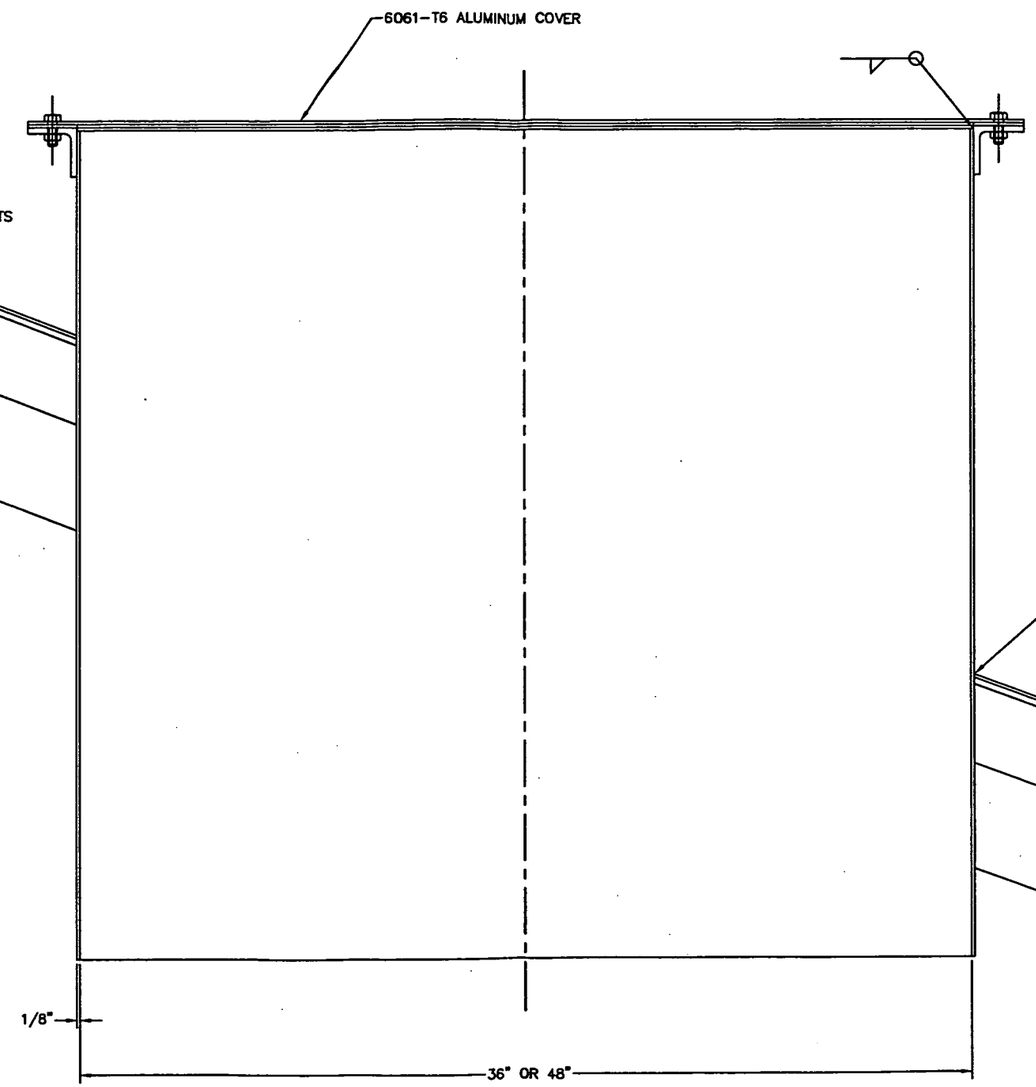

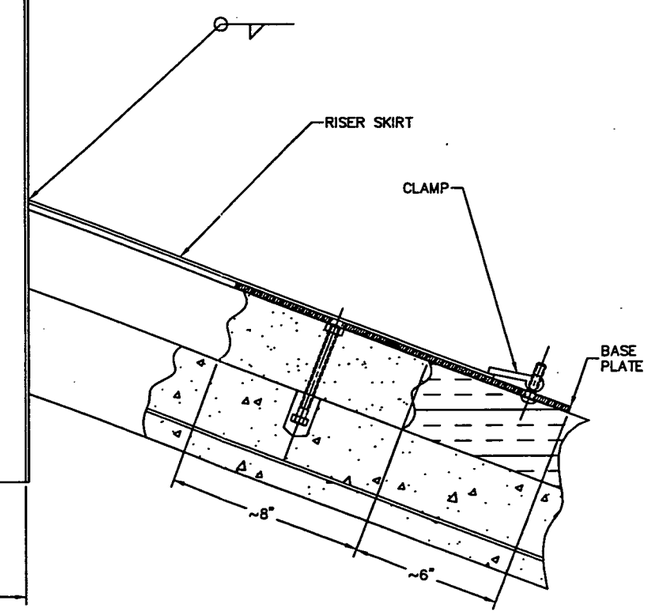

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PRELIMINARY
NOT FOR CONSTRUCTION

TITLE		
SILO 1, 2 & 4 TYPICAL EQUIPMENT RISER ASSEMBLY		
SIZE D	SCALE: 6"=1'-0"	DWG. NO. SKFMD004

FILENAME: SKFMD004.DWG

NOTES:

1. MATERIAL: 6061–T6, ALUMINUM PLATE, 1/4" THICK
2. FOR BASE PLATE INSTALLATIONS, SEE SILO PENETRATION AND RISER INSTALLATION, 624–P622–63
3. FOR BASE PLATE LOCATIONS, SEE DRAWINGS 10FMD017 & 11FMD019

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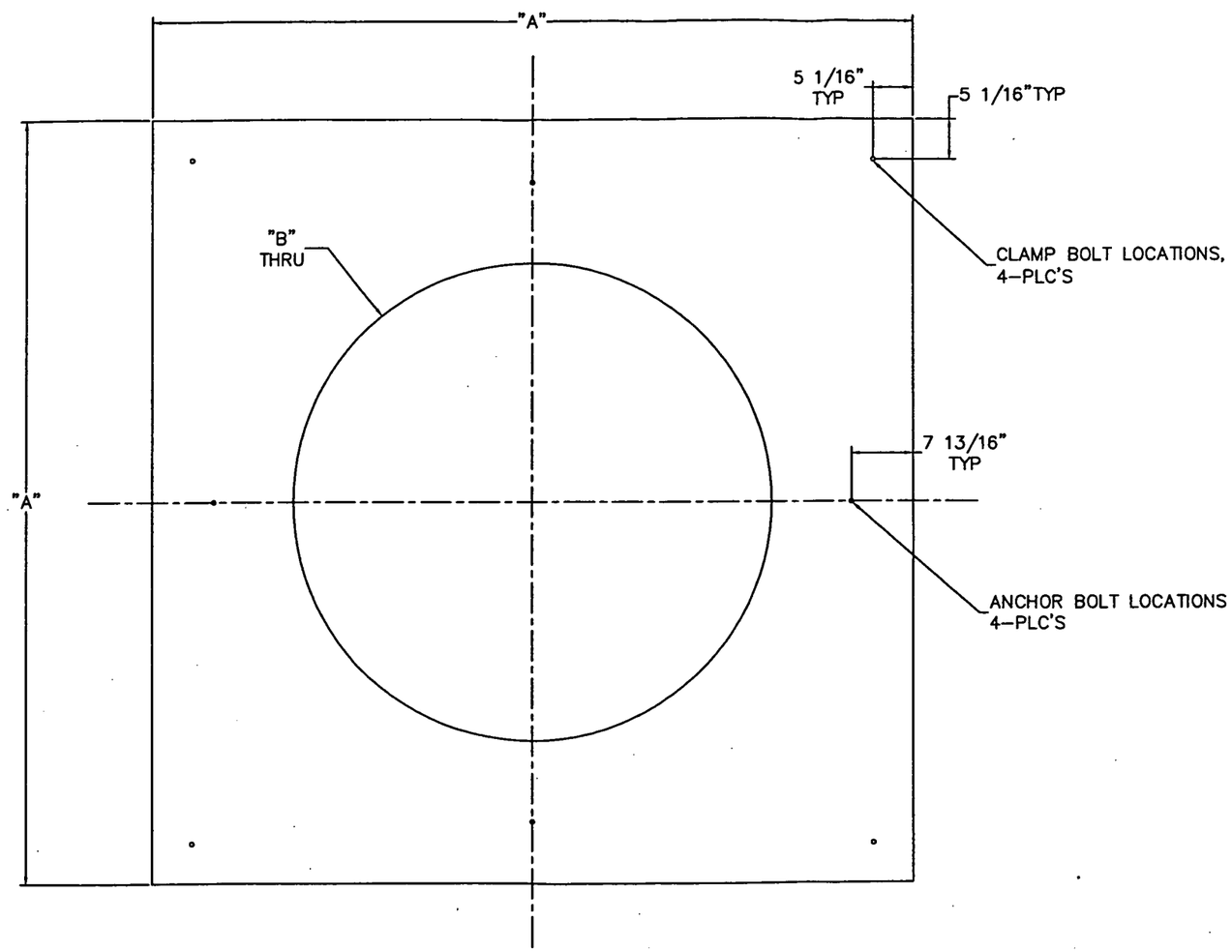

RISER	"A" (INCHES)	"B" (INCHES)
CAMERA	36	14
SLURRY	96	54
SLUICER	80	40
EMMA	80	40

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PRELIMINARY
NOT FOR CONSTRUCTION

TITLE
SILO 1, 2 & 4
TYPICAL BASE PLATE

SIZE	SCALE:	DWG. NO.
D	6"=1'-0"	SKFMD005

FILENAME: SKFMD005.DWG

NOTES:

1. FOR PENETRATION CUTTING DETAILS INSTALLATIONS, SEE SILO PENETRATION AND RISER INSTALLATION, 624-P622-63

2. FOR PENETRATION LOCATIONS, SEE DRAWINGS 10FMD017 & 11FMD019

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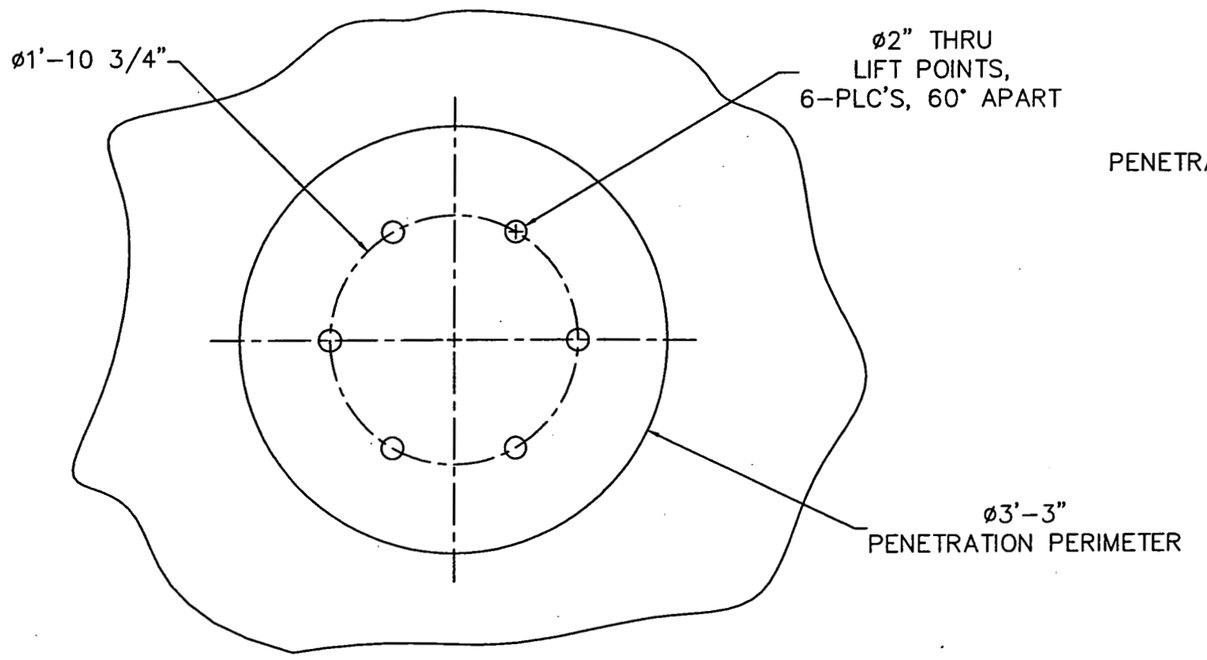
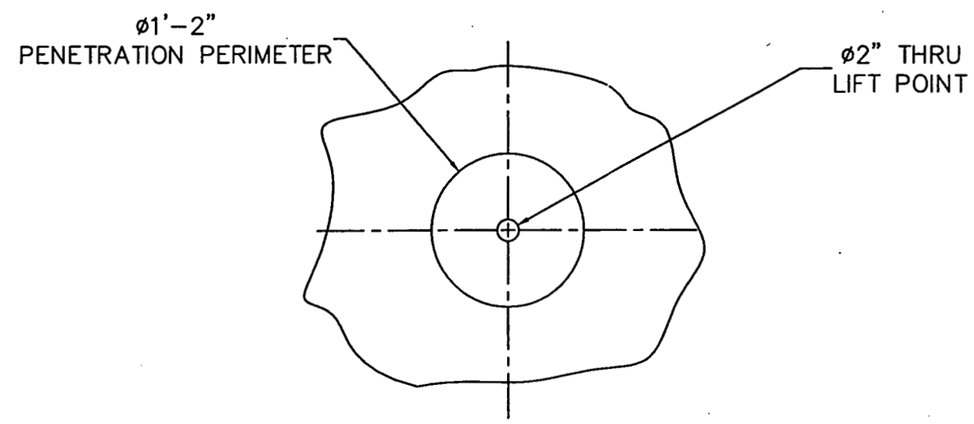


TYPICAL EMMA PENETRATION
CUT VERTICALLY THRU DOME



TYPICAL CAMERA PENETRATION
CUT PERPENDICULAR TO DOME

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PRELIMINARY
NOT FOR CONSTRUCTION

TITLE
SILO 1, 2 & 4
PENETRATION DETAILS

SIZE	SCALE:	DWG. NO.
D	6"=1'-0"	SKFMD006

FILENAME: SKFMD006.DWG

DOCUMENT REVIEW COMMENT SHEET

DOCUMENT NUMBER AND TITLE: : Silo Penetration and Riser Installation Plan, 624-P622-63, Rev. A

ITEM NO.	REVIEWER NAME	PAGE NO. /PARAGRAPH	COMMENT	COMMENT RESPONSE AND RESOLUTION	DATE RECEIVED	DATE RESOLVED
1	Safety	General	This plan is very conceptual in that it lacks detail in many areas; including but not limited to the following areas related to design and safety: - Appropriate detail for contamination control (e.g. handling the concrete cutout) - Process for controlling personnel and equipment loads to ensure dome limits (reference OU4 HAR Technical Safety Requirements) are not exceeded during operations requiring access to the dome surface, such as camera hole cutting or removal of plywood caps. - Hazardous chemicals such as grout (pg. 3), bonding agents (pg. 3), and sealant (pg. 6) are discussed. However, the chemicals are not identified nor is there any precautions or references to other plans permits to control their use. - This plan does not detail (nor cover by reference) the type/design of the work platform to be used. - No mention of required permits/supporting plans/ precaution/ emergency actions. - This plan does not discuss use of fall protection nor tie-off points. There is no mention of a path forward for development of this plan from its current stage to implementation. Nor is there any mention of supporting documents. This plan does not adequately detail the activity and will need to be updated as the design			

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DOCUMENT REVIEW COMMENT SHEET

DOCUMENT NUMBER AND TITLE: : Silo Penetration and Riser Installation Plan, 624-P622-63, Rev. A

ITEM NO.	REVIEWER NAME	PAGE NO. /PARAGRAPH	COMMENT	COMMENT RESPONSE AND RESOLUTION	DATE RECEIVED	DATE RESOLVED
			progresses. This should be discussed as a path forward.			
2	Engineering	General	Consider making the Sluicer riser the same as the Slurry riser "just in case" problems are encountered in mobilizing the K-65 material during operation.			
3	Engineering	Page 2	The plan mentions that the "existing protective dome covers (plywood cap) will be removed before the Easily Manipulated Mechanical Arm (EMMA) riser can be installed. However the plan lacks an explanation of how this task will be accomplished. There are several issues with the removal of this cover, which need to be considered. (For example the radon build up under the cap, and how the foam acts like an adhesive seal between the plywood cap and the silo dome.)			
4	Engineering	Page 2	Given that the plywood cap is to be removed, this plan should provide a high level discussion of how this waste form will be handled.			
5	Engineering & Safety	Page 3 Section 2.2	This section discusses the removal of the rigid polyurethane foam cover by scraping and use of a power brush. This activity needs to be further evaluated and addressed in the safety documentation. Dust from the foam may be a safety issue. Describe any controls to be used for control of air contaminant as a result of the use of power brushes.			
6	Legge	Page 3 Section 2.2 & SKFMD003, SKFMD004	It talks about Silo 1, 2, & 4 being alike. Silo 4 is not like Silo 1 & 2 on top "like rigid polyurethane foam". We need to rephrase the last sentence in the 2nd paragraph of			

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DOCUMENT REVIEW COMMENT SHEET

DOCUMENT NUMBER AND TITLE: : Silo Penetration and Riser Installation Plan, 624-P622-63, Rev. A

ITEM NO.	REVIEWER NAME	PAGE NO. /PARAGRAPH	COMMENT	COMMENT RESPONSE AND RESOLUTION	DATE RECEIVED	DATE RESOLVED
			Section 1.0 penetration requirements. "Silo 4 has not polyurethane foam on top."			
7	Engineering	Page 3 Section 2.2	This section discusses the removal of the rigid polyurethane foam cover. How will this potentially contaminated waste be handled? The plan should acknowledge this waste form and references where the details will be addressed.			
8	Engineering	Section 2.2, 1st paragraph	If a temporary enclosure is used, how will it be ventilated? What PPE and breathing air system will be required for personnel to work in the enclosure?			
9	Engineering	Pages 3 & 4 Section 3	This section defines the use of gangways, containment tents, jib cranes and hoist on the silo superstructure bridge. Information on these additional equipment needs to be developed and evaluated to complete the review of the silo penetration activity.			
10	Engineering	Pages 3 & 4 Section 3	This section discusses supporting the removal concrete and removed risers from a jib crane in the bridge structure. Please evaluate the load impacts to bridge structure. Also evaluate the accident scenario of dropping this material on the dome during removal.			
11	Engineering	Section 3.2.1	Riser 1 Penetration will be in the center of the silo where "there is not an existing riser in this location so a new one will be made". This is true for Silo 1 and Silo 2 but not for the Silo 4 center manway. Need to demonstrate the cutting technique to be used on Silo 1&2 on Silo #4. What is the plan to cut a center manway where there is no existing manway? Per drawing 10FMD018 all 3 cuts on Silo #4 are being made at			

000018

2905

DOCUMENT REVIEW COMMENT SHEET

DOCUMENT NUMBER AND TITLE: : Silo Penetration and Riser Installation Plan, 624-P622-63, Rev. A

ITEM NO.	REVIEWER NAME	PAGE NO. /PARAGRAPH	COMMENT	COMMENT RESPONSE AND RESOLUTION	DATE RECEIVED	DATE RESOLVED
			existing manways.			
12	Engineering	Page 4 Section 3.2	The plan should identify how the contaminated cutout concrete and riser waste will be handled.			
13	Engineering	Section 3.2.3, 1st paragraph	Above the dome, what is the anchor cable attached to for the camera cutouts?			
14	Engineering	Page 4 Section 3.2.3	Please provide information of how the silo dome weight limit will be complied with during the installation of the camera dome penetrations.			
15	Engineering	Page 4 Section 3.2.3 Note on Silo #4	The sequence of dome penetrations on silo #4 needs to be evaluated relative to any safety issues associated with the Silo #4 doorway, ie., dome loads limit change after door installation.			
16	Engineering	Section 3.2.4, 1st paragraph	What is considered to be a substantial piece of concrete?			
17	Engineering	Section 3.2.4, 1st paragraph	Will this same tong technique be used for the camera cutouts? If so explain how?			
18	Engineering & Safety	Page 5 Section 3.2.4	This section discusses the retrieval of concrete cutout material that falls inside the silos. Given the terrain and conditions with in the silos please evaluate the functionally of the lifting tongs and the worker exposure issues. Retrieval of pieces of concrete falling into the silo appears to be unnecessary and not ALARA.			
19	Engineering	Section 3.3	While cutting near the existing manways, the saw will encounter No. 4 steel reinforcement bars in addition to the wire mesh. Have the steel reinforcement bars been considered in the cutting activity?			
20	Safety	Drawing SKFMD003	Drawing SKFMD003 discusses sand blasting. If this is to be performed at the FEMP,			

000019

F-2905

DOCUMENT REVIEW COMMENT SHEET

DOCUMENT NUMBER AND TITLE: : Silo Penetration and Riser Installation Plan, 624-P622-63, Rev. A

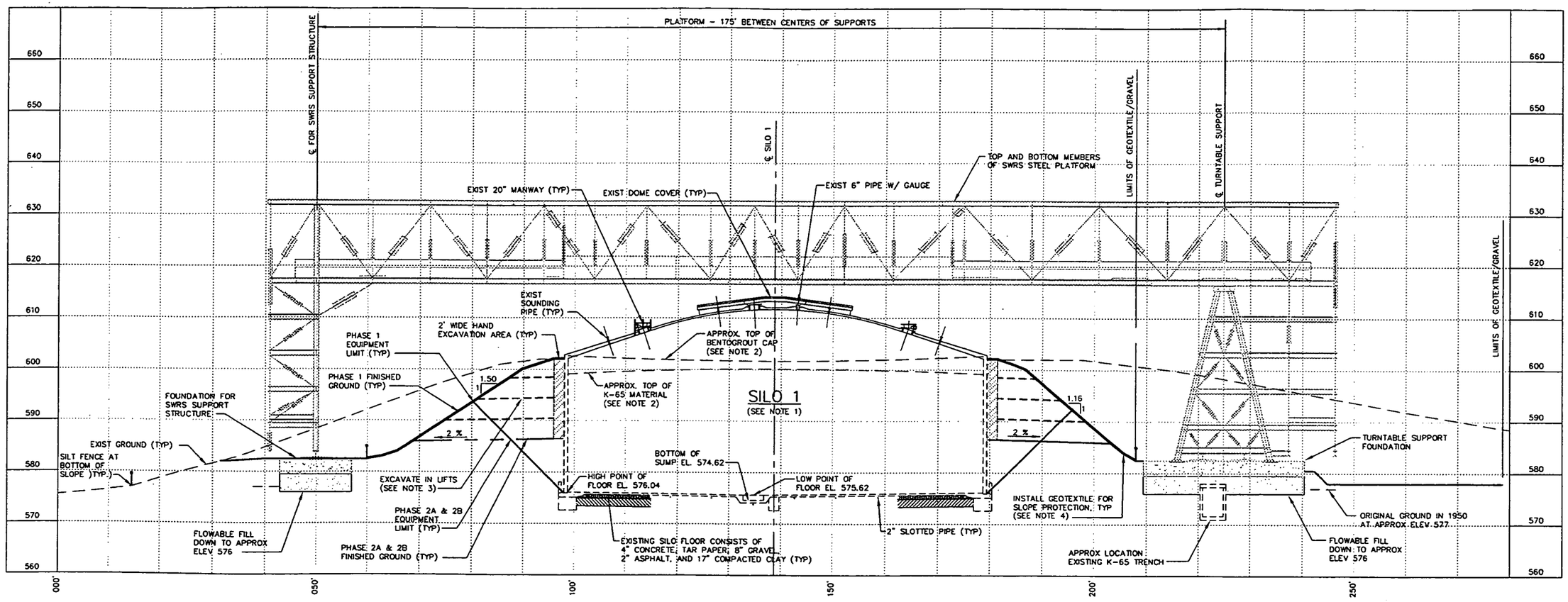
ITEM NO.	REVIEWER NAME	PAGE NO. /PARAGRAPH	COMMENT	COMMENT RESPONSE AND RESOLUTION	DATE RECEIVED	DATE RESOLVED
			FWENC must use a non-silica blasting agent.			
21	Engineering	Drawing SKFMD004 and SKFMD005	At the location of the slurry and sluicer risers, the dome thickens from 4 inches to 8 inches at the current manways (Drawing 34x-1450-P-00090). For the size of the base plates shown, they would not rest on the concrete surface. There will be an additional gap under the plate of up to a 1" for the slurry and 3" for the sluicer. Will the grout bed be adequate to cover this gap?			
22	Engineering	Drawing SKFMD004 and SKFMD005	At the location of the EMMA riser on Silo 1&2 the outer edge will interfere with increased dome concrete slope for the existing manway. There will be an additional gap under the baseplate of up to 2" or more depending on baseplate orientation will grout bed be adequate to cover gap.			
23	Engineering	Section 2, Section 3 and Drawings SKFMD004& SKFMD005	Text defines the use of bent steel anchor bolts to be pressed into the grout, however the drawings indicate a bolt into a predrilled hole in the dome concrete. Please correct this inconsistency.			

000020

2905

DWG. #	REV.
05FMD010	
11FCD003 & 4	B
11FCD006 Thru 8	B
11FCD009 & 10	B
06FCD001	A
51FMD001	1
61FCD001 & 2	A
51FCD001 & 2	A
66FCD001	B
66FCD002, 03, 04	A
66FCD006	A
05FCD014	A
12FCD002	A
12FCD003	A
12FCD005 Thru 7	A
12FSD103	A
10FSD001	A
10FSD002	A
10FCD003	A
12FSD010 & 011	A
12FSD016	A
12FSD102	A
12FSD110	A
20FSD005	A
20FSD050	A
20FSD051	A
20FSD065	A
10FMD001 Thru 3	1
10FMD006 Thru 11	1
10FMD017 & 18	2
11FMD001 Thru 9	1
11FMD019 & 20	2
11FMD025 & 26	1
12FMD001 Thru 8	1
12FMD021 Thru 26	1
13FMD001 Thru 4	1
14FMD001 & 2	1
14FMD006 & 7	2
20FMD001 Thru 11	1
20FMD027 Thru29	1
51FMD001	1
77FMD001 Thru 5	B
77FMD006 Thru 8	A

2905



SECTION

SCALE: 1"=10'

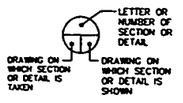
B

11FCD003
11FCD004
11FCD009
11FCD010

11FCD006

NOTES:

1. SILO 1 CONTAINS APPROXIMATELY 115,900 CUBIC FEET OF MATERIAL (INCLUDING RESIDUE AND DISCRETE OBJECTS) AND APPROXIMATELY 12,600 CUBIC FEET OF BENTOGROUT.
2. APPROXIMATE LOCATION OF BENTOGROUT CAP AND K-65 MATERIAL COMES FROM SECTION 2.5.1 OF THE TECHNICAL REQUIREMENTS DOCUMENT.
3. EXCAVATION AROUND SILOS DURING PHASE 2A AND PHASE 2B WILL BE COORDINATED WITH THE HEIGHT OF K-65 MATERIAL WITHIN EACH SILO SUCH THAT THE HEIGHT DIFFERENTIAL ON BOTH SIDES OF SILO WALL DOES NOT EXCEED 10 FEET UNTIL FINISHED GROUND ELEV OF 586 IS REACHED.
4. SEE SPECIFICATION SECTION 02375 FOR GEOTEXTILE. REMOVE PORTIONS OF GEOTEXTILE TO EXCAVATE EACH LIFT AND REATTACH AFTER EXCAVATION WORK IS FINISHED.



SECTION & DETAIL KEY

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
B	1/7/00	WVD			ISSUED FOR OHIO EPA REVIEW
A		WVD			PRELIMINARY DESIGN SUBMITTAL

RPE

DRAWN BY WVD	DATE
DESIGNED BY KEO	DATE
CHECKED BY	DATE
APPROVED BY	DATE
APPROVED BY	DATE

000022

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

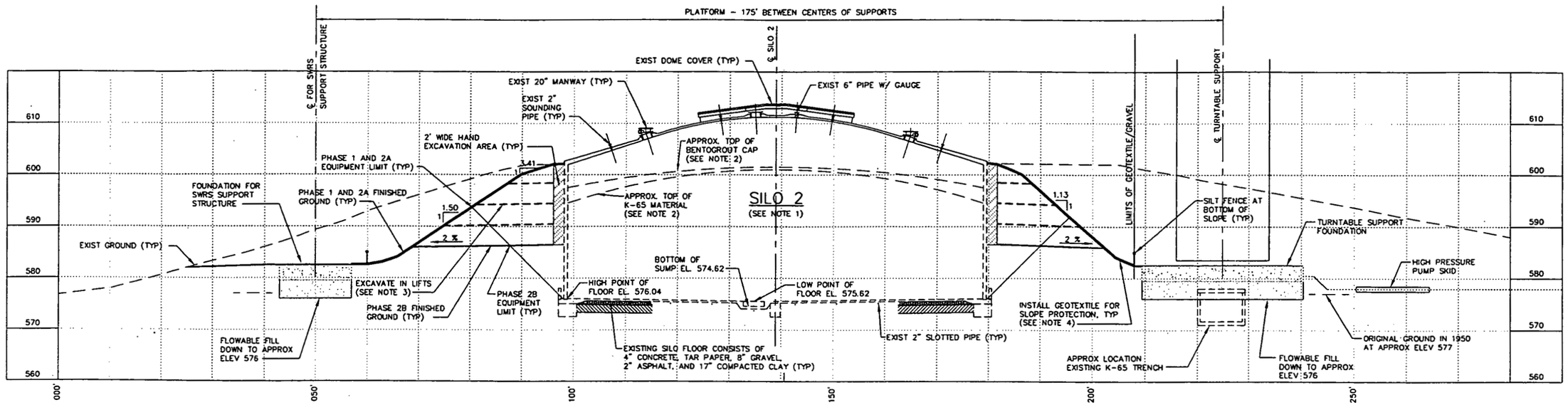
FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
SILO WASTE RETRIEVAL SYSTEM
CROSS SECTIONS
SHEET 2

SIZE	SCALE:	DWG. NO.	REV
D	1"=10'	11FCD006	B

FILENAME: 11FCD006.DWG

2905



SECTION
SCALE: 1"=10'

C
11FCD003
11FCD004
11FCD009
11FCD010
11FCD007

000023

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

SECTION & DETAIL KEY

NOTES:

1. SILO 2 CONTAINS APPROXIMATELY 100,400 CUBIC FEET OF MATERIAL (INCLUDING RESIDUE AND DISCRETE OBJECTS) AND APPROXIMATELY 11,100 CUBIC FEET OF BENTOGROUT.
2. APPROXIMATE LOCATION OF BENTOGROUT CAP AND K-65 MATERIAL COMES FROM SECTION 2.5.1 OF THE TECHNICAL REQUIREMENTS DOCUMENT.
3. EXCAVATION AROUND SILOS DURING PHASE 2A AND PHASE 2B WILL BE COORDINATED WITH THE HEIGHT OF K-65 MATERIAL WITHIN EACH SILO SUCH THAT THE HEIGHT DIFFERENTIAL ON BOTH SIDES OF SILO WALL DOES NOT EXCEED 10 FEET UNTIL FINISHED GROUND ELEV OF 586 IS REACHED.
4. SEE SPECIFICATION SECTION 02375 FOR GEOTEXTILE. REMOVE PORTIONS OF GEOTEXTILE TO EXCAVATE EACH LIFT AND REATTACH AFTER EXCAVATION WORK IS FINISHED.

PRELIMINARY
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APPROVED BY DATE

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

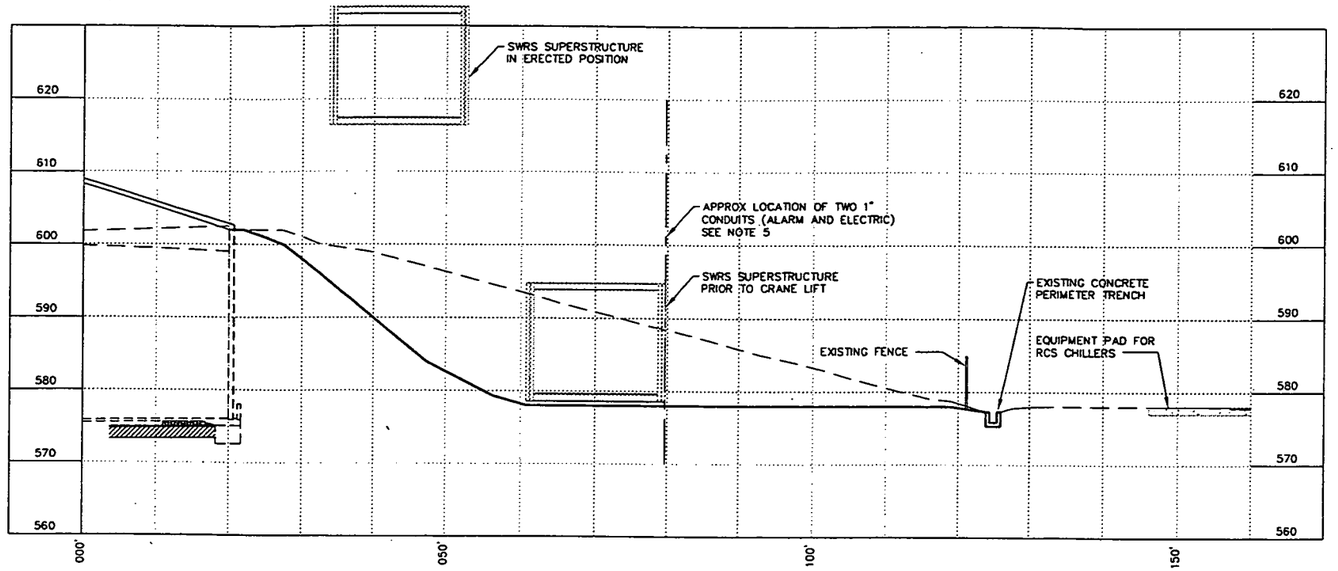
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
SILO WASTE RETRIEVAL SYSTEM
CROSS SECTIONS
SHEET 3

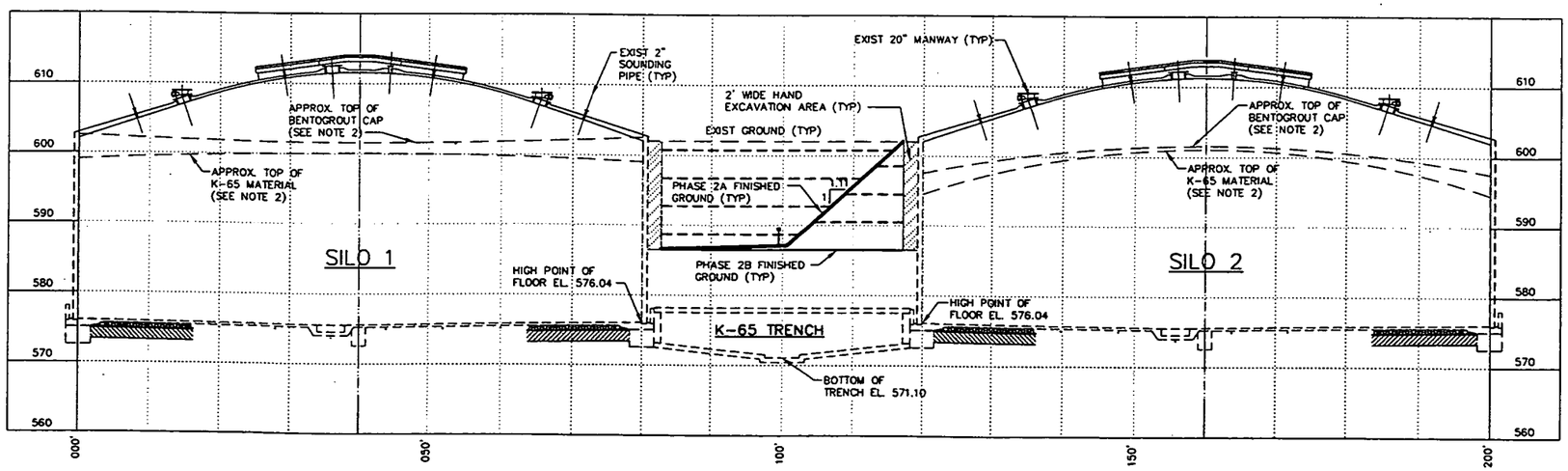
SIZE D | SCALE: 1"=10' | DWG. NO. 11FCD007 | REV B

FILENAME: 11FCD007.DWG

2905



SECTION D
SCALE: 1"=10'
11FCD003
11FCD009
11FCD008



SECTION E
SCALE: 1"=10'
11FCD003
11FCD004
11FCD009
11FCD010
11FCD008

NOTES:

1. SILO 2 CONTAINS APPROXIMATELY 100,400 CUBIC FEET OF MATERIAL (INCLUDING RESIDUE AND DISCRETE OBJECTS) AND APPROXIMATELY 11,100 CUBIC FEET OF BENTOGROUT.
2. APPROXIMATE LOCATION OF BENTOGROUT CAP AND K-65 MATERIAL COMES FROM SECTION 2.5.1 OF THE TECHNICAL REQUIREMENTS DOCUMENT.
3. EXCAVATION AROUND SILOS DURING PHASE 2A AND PHASE 2B WILL BE COORDINATED WITH THE HEIGHT OF K-65 MATERIAL WITHIN EACH SILO SUCH THAT THE HEIGHT DIFFERENTIAL ON BOTH SIDES OF SILO WALL DOES NOT EXCEED 10 FEET UNTIL FINISHED GROUND ELEV OF 586 IS REACHED.
4. SEE SPECIFICATION SECTION 02375 FOR GEOTEXTILE. REMOVE PORTIONS OF GEOTEXTILE TO EXCAVATE EACH LIFT AND REATTACH AFTER EXCAVATION WORK IS FINISHED.
5. TWO 1" CONDUITS, CARRYING ALARM AND ELECTRIC CABLE, ARE SHOWN ON DRAWING 94X-6100-E-02230.

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
B	1/7/00	WVD			ISSUED FOR OHIO EPA REVIEW
A		WVD			PRELIMINARY DESIGN SUBMITTAL

RPE

DRAWN BY WVD DATE
DESIGNED BY KEO DATE
CHECKED BY DATE
APPROVED BY DATE
APPROVED BY DATE

000024

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

SECTION & DETAIL KEY

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

POSTER WHEELER
POSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
SILO WASTE RETRIEVAL SYSTEM
CROSS SECTIONS
SHEET 4

SIZE D | SCALE: 1"=10' | DWG. NO. 11FCD008 | REV B

FILENAME: 11FCD008.DWG

NOTES:

1. SEE DRAWING 05FCD011 FOR GENERAL NOTES AND LEGEND.

2905

000025

SILO 3
SILO 2
SILO 1
PERIMETER ROAD
T-12
UNDERGROUND ELECTRICAL DUCTBANK
PHASE 1 EQUIPMENT PAD
ELEC GEN
ELEC PANEL
FHY
EMH
4" DW
2ND STREET
12" ST
FSMS SURROGATE MATERIAL DEWATERING BIN
STORAGE T-411
STORAGE T-412
CONTROL T-410
94G ELECTRICAL EQUIPMENT BUILDING
EMERGENCY BACKUP GENERATOR
AIR COMPRESSOR
PUMP
MAKEUP WATER STORAGE TANK
VITPP FACILITY
VITPP CONTROL ROOM
30" CONC
TURNTABLE SUPPORT FOUNDATION
HIGH PRESSURE PUMP SKID
PUMP SKID
K-65 TRENCH
PIPE SUPPORT (TYP.)
PIPE RACK
LIMITS OF GEOTEXTILE AND GRAVEL
PIV
EXIST. MH TOP 576.1 INV. 566.6
CHILLERS
SAMPLE PREP & STORAGE BUILDING 94F
EXIST. MH
STAIRWAY
STACK
EXISTING GATE
APPROX. LOCATION OF EXIST. GRATE
94E AIR HANDLING BUILDING (RCS)
94C TRANSFER TANK AREA BUILDING FFE 576.0
94D CARBON BED BUILDING (RCS)
ASSEMBLY LAYDOWN/ STAGING AREA
LIMITS OF GEOTEXTILE AND GRAVEL FOR SWRS SUPPORT STRUCTURE ERECTION (AFTER IRES IS FUNCTIONAL)
APPROX. LOCATION OF EXIST. ROAD
FOUNDATION FOR SWRS SUPPORT STRUCTURE (TYP.)
EXIST 21" CONC PIPE
EXIST CB INLET
CB
CB-04
CB-03
CB-02
MH-01
11FCD001
11FCD002
11FCD003
11FCD004
11FCD005
11FCD006
11FCD008
11FCD009
N 480600
N 480400
N 480200
E 1346800
E 1347000
E 1347200
E 1347400
APPROX. LOCATION OF EXIST. GRATE
FOUNDATION FOR SWRS SUPPORT STRUCTURE ERECTION
LIMITS OF GEOTEXTILE AND GRAVEL
PROPOSED LOCATION OF NEW GRATE
EXIST. ST
LOADING PLATFORM WITH STAIRWAY
30" CONC DRAIN
LIMITS OF GEOTEXTILE AND GRAVEL
SS MODULE ASSEMBLY AREA/ SECONDARY WASTE STAGING AREA
12" ST
PERIMETER ROAD
CM-101R
570
575

STATE OF OHIO NORTH (NAD 83)

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

30 0 30 60
SCALE IN FEET

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
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A		WVD			PRELIMINARY DESIGN SUBMITTAL

RPE

DRAWN BY WVD	DATE
DESIGNED BY KEO	DATE
CHECKED BY	DATE
APPROVED BY	DATE
APPROVED BY	DATE

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

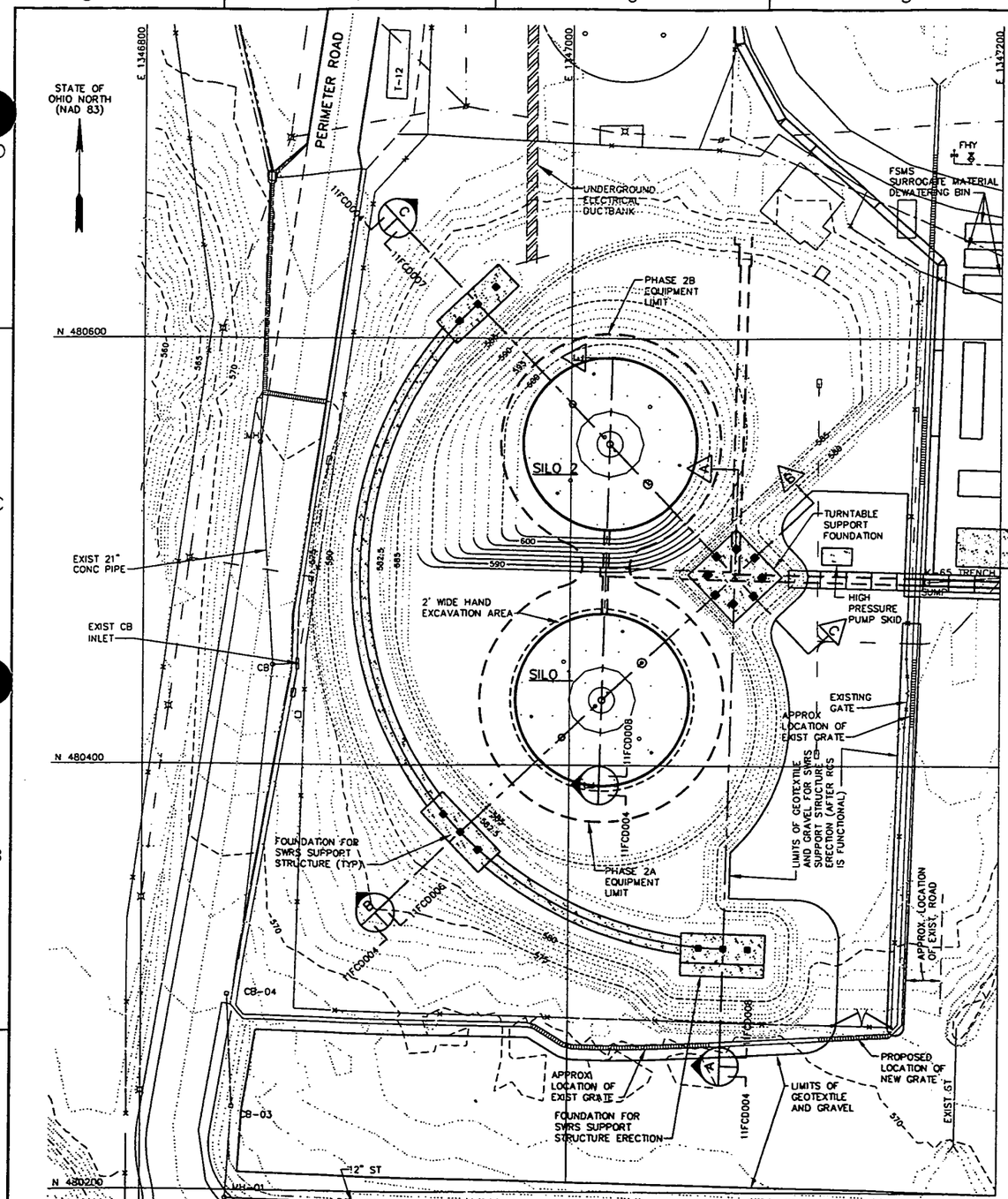
FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

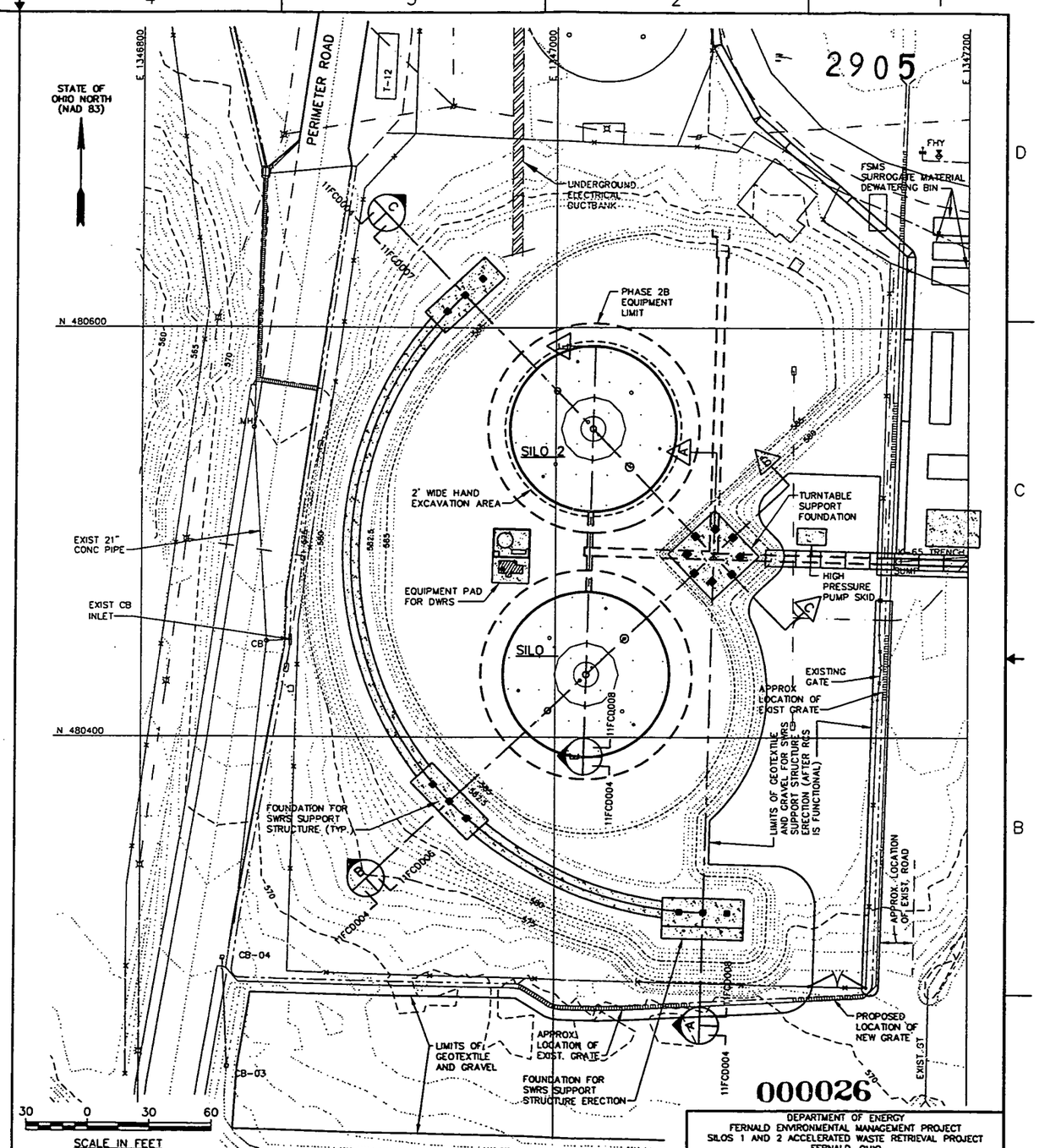
TITLE
SILO WASTE RETRIEVAL SYSTEM
EXCAVATION PLAN
PHASE 1

SIZE	SCALE:	DWG. NO.	REV
D	1"=30'	11FCD003	B

XREF DRAWINGS: 30-EXIST.DWG

FILENAME: 11FCD003.DWG





000026

NOTES:
1. SEE DRAWING 05FCD011 FOR GENERAL NOTES AND LEGEND.

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
B	1/7/00	WVD			ISSUED FOR OHIO EPA REVIEW
A		WVD			PRELIMINARY DESIGN SUBMITTAL

RPE

DRAWN BY WVD	DATE
DESIGNED BY KEO	DATE
CHECKED BY	DATE
APPROVED BY	DATE
APPROVED BY	DATE

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

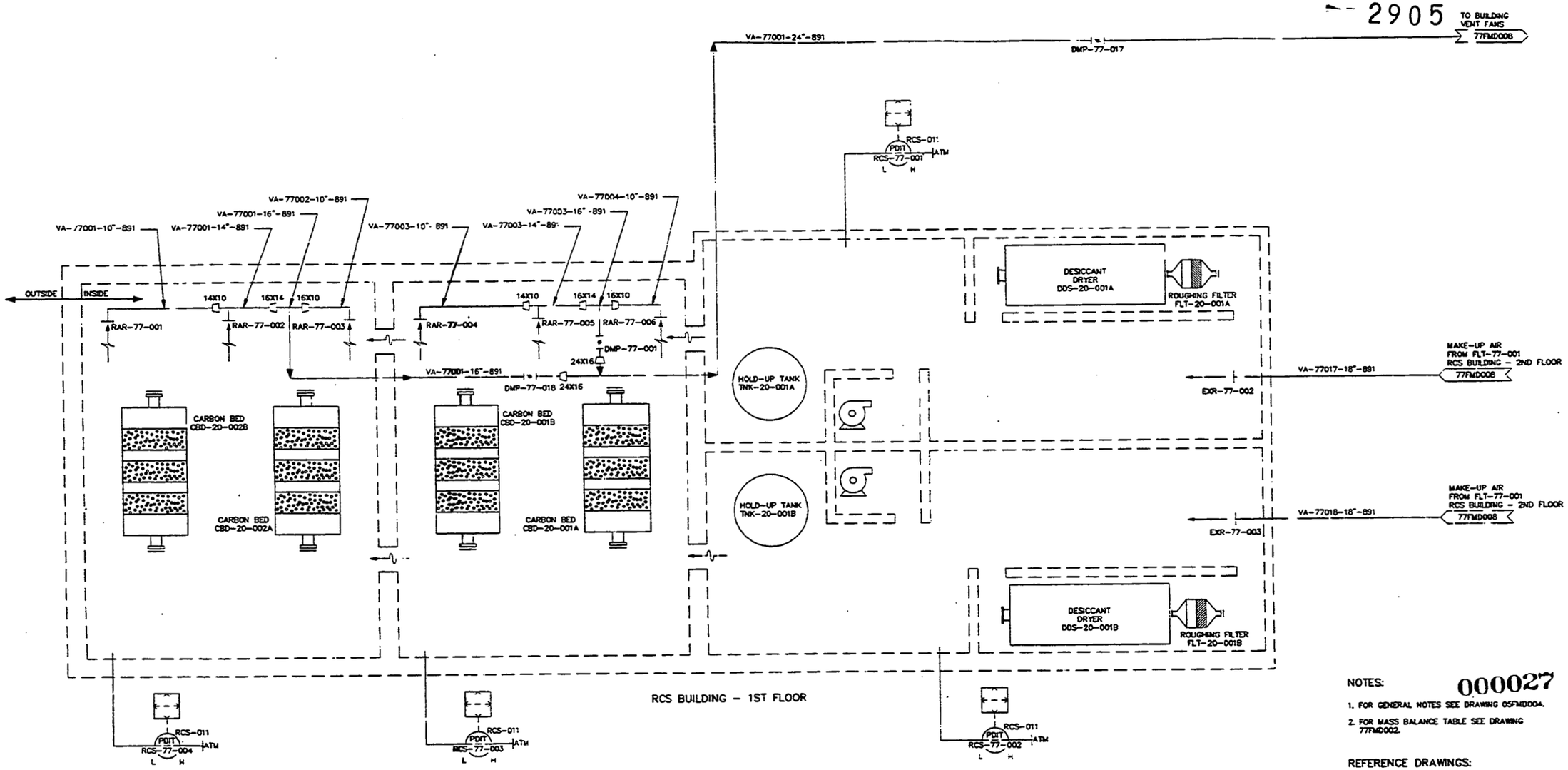
FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
SILO WASTE RETRIEVAL SYSTEM
EXCAVATION PLAN
PHASES 2A AND 2B

SIZE	SCALE:	DWG. NO.	REV
D	1"=30'	11FCD004	B

FILENAME: 11FCD004.DWG

2905



NOTES:

000027

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLE SEE DRAWING 77FMD002.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM - INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM - CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM - PIPING & EQUIPMENT IDENTIFICATION

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
MISC FACILITIES HVAC SYSTEM
HVAC CONTROL DIAGRAM
RCS BLDG VENTILATION-1ST FL

SIZE	SCALE:	DWG. NO.	REV
D	NONE	77FMD006	A

REV	DATE	BY	CHK'D	APRV'D	DESCRIPTION/ISSUE
A					PRELIMINARY DESIGN SUBMITTAL

DRAWN BY BJD
DESIGNED BY BF
CHECKED BY
APPROVED BY
APPROVED BY

PRELIMINARY
NOT FOR CONSTRUCTION

FILENAME: 77FMD006

\CHUBZ\FOFSILOS\WS\ 77fmd006.dwg Tue Oct 26 12:42:11 1999

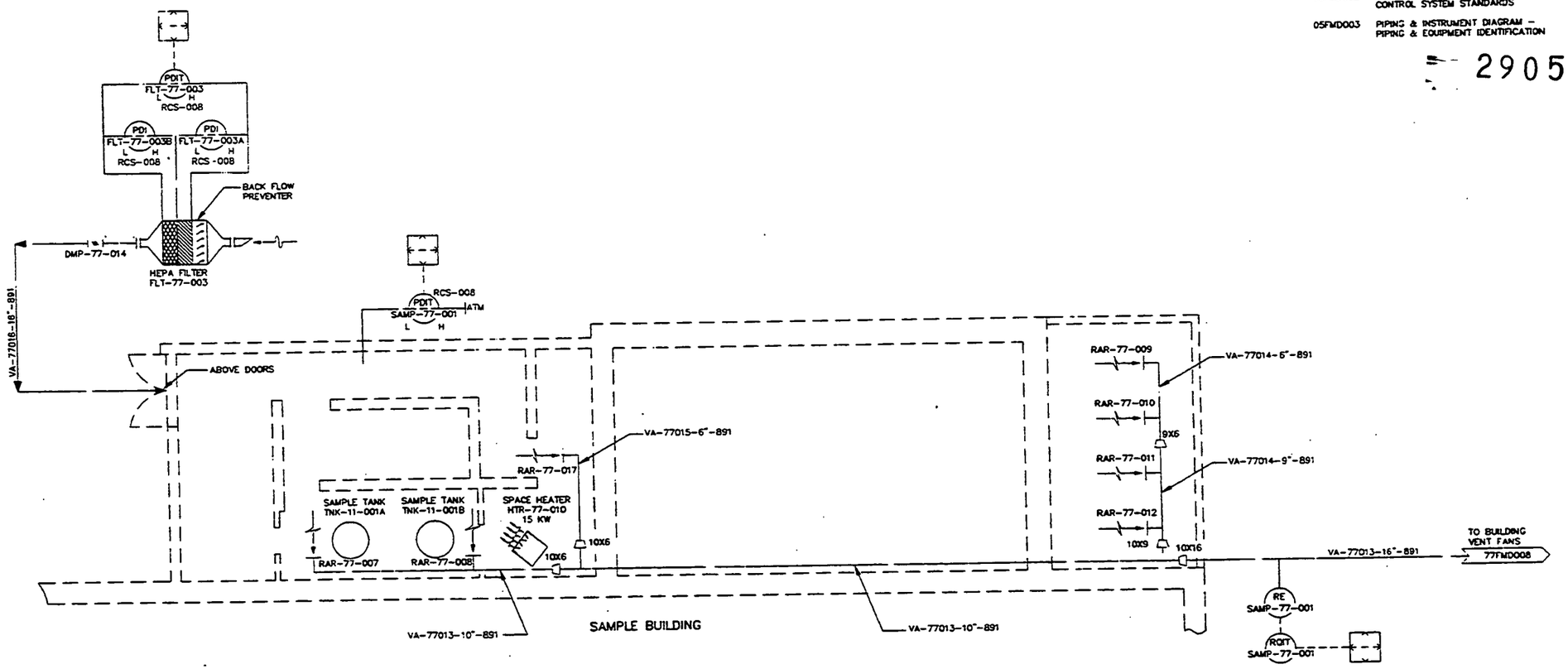
NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLE SEE DRAWING 77FMD002.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

2905



000028

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APPR'VD	DESCRIPTION/ISSUE
A					PRELIMINARY DESIGN SUBMITTAL

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
MISC FACILITIES HVAC SYSTEM
HVAC CONTROL DIAGRAM
SAMPLE BUILDING VENTILATION

DRAWN BY: BJD
DESIGNED BY: BF
CHECKED BY
APPROVED BY
APPROVED BY

SIZE: D | SCALE: NONE | DWG. NO. 77FMD007 | REV A

FILENAME: 77FMD0C

\CHUBEV\FSILCSV\77fmd007.dwg Wed Oct 27 14:26:39 1999

2905

OUTSIDE | INSIDE

RAR-77-013
VA-77011-6"-891
10X6
RAR-77-014
RCS BUILDING 2ND FLOOR VENTILATION DUCTS
VA-77011-10"-891
14X10
14X10
VA-77012-10"-891
VA-77011-14"-891
RAR-77-015
VA-77012-6"-891
10X6
RAR-77-016

EXHAUST REGISTER INTO RCS BUILDING - 2ND FLOOR
EXR-77-001
DMP-77-012
VA-77016-14"-891
VA-77016-28"-891
28X14
28X18
DMP-77-015
28X18
DMP-77-016
DUCT HEATER HTR-77-012 100 KW
VA-77017-18"-891
VA-77018-18"-891
TO RCS-1ST FLOOR 77FMD006
TO RCS-1ST FLOOR 77FMD006

RCS-011
PDIT FLT-77-001 L H
RCS-011 PDI FLT-77-001 L H
RCS-011 PDI FLT-77-001 L H
BACK FLOW PREVENTER
HEPA FILTER FLT-77-001

PDIT FLT-77-002A H L RCS-002
PDI FLT-77-002A/A H L RCS-002
PDI FLT-77-002A/B H L RCS-002
TEST TEST
HEPA FILTER FLT-77-002A
VA-77001-30"-891
DMP-77-002
DMP-77-003
VA-77006-30"-891
30X10
VA-77008-10"-891
DMP-77-007
EXPANSION JOINT EXP-77-001
HOA FAN-77-001A
M
BLDG VENT FAN FAN-77-001A 15 HP
HOA DMP-77-008
M
ZS DMP-77-002
DMP-77-008
EXPANSION JOINT EXP-77-002
VA-77009-30"-891
FIT FAN-77-001A/B RCS-019
FE FAN-77-001A/B
DMP-77-011
TO STACK STK-20-001 20FMD019
BACK FLOW PREVENTER

AIR FROM RCS BUILDING 1ST FLOOR 77FMD006
24X14
VA-77001-24"-891
30X24
16X12
RE RCS-77-001
RQIT RCS-77-001
AIR FROM SAMPLE BUILDING 77FMD007
VA-77013-16"-891
DMP-77-013

PDIT FLT-77-002B H L RCS-002
PDI FLT-77-002B/A H L RCS-002
PDI FLT-77-002B/B H L RCS-002
TEST TEST
HEPA FILTER FLT-77-002B
VA-77005-30"-891
DMP-77-004
DMP-77-005
VA-77007-30"-891
DMP-77-006
VA-77008-10"-891
30X10
DMP-77-009
EXPANSION JOINT EXP-77-003
HOA FAN-77-001B
M
BLDG VENT FAN FAN-77-001B 15 HP
HOA DMP-77-010
M
ZS DMP-77-010
DMP-77-010
EXPANSION JOINT EXP-77-004
VA-77010-30"-891

RCS BUILDING - 2ND FLOOR

NOTES: 000029

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLE SEE DRAWING 77FMD002.

REFERENCE DRAWINGS:

05FMD001 PIPING & INSTRUMENT DIAGRAM - INSTRUMENT IDENTIFICATION
05FMD002 PIPING & INSTRUMENT DIAGRAM - CONTROL SYSTEM STANDARDS
05FMD003 PIPING & INSTRUMENT DIAGRAM - PIPING & EQUIPMENT IDENTIFICATION

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APRV'D	DESCRIPTION/ISSUE
A					PRELIMINARY DESIGN SUBMITTAL

DRAWN BY BJD
DESIGNED BY BF
CHECKED BY
APPROVED BY
APPROVED BY

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

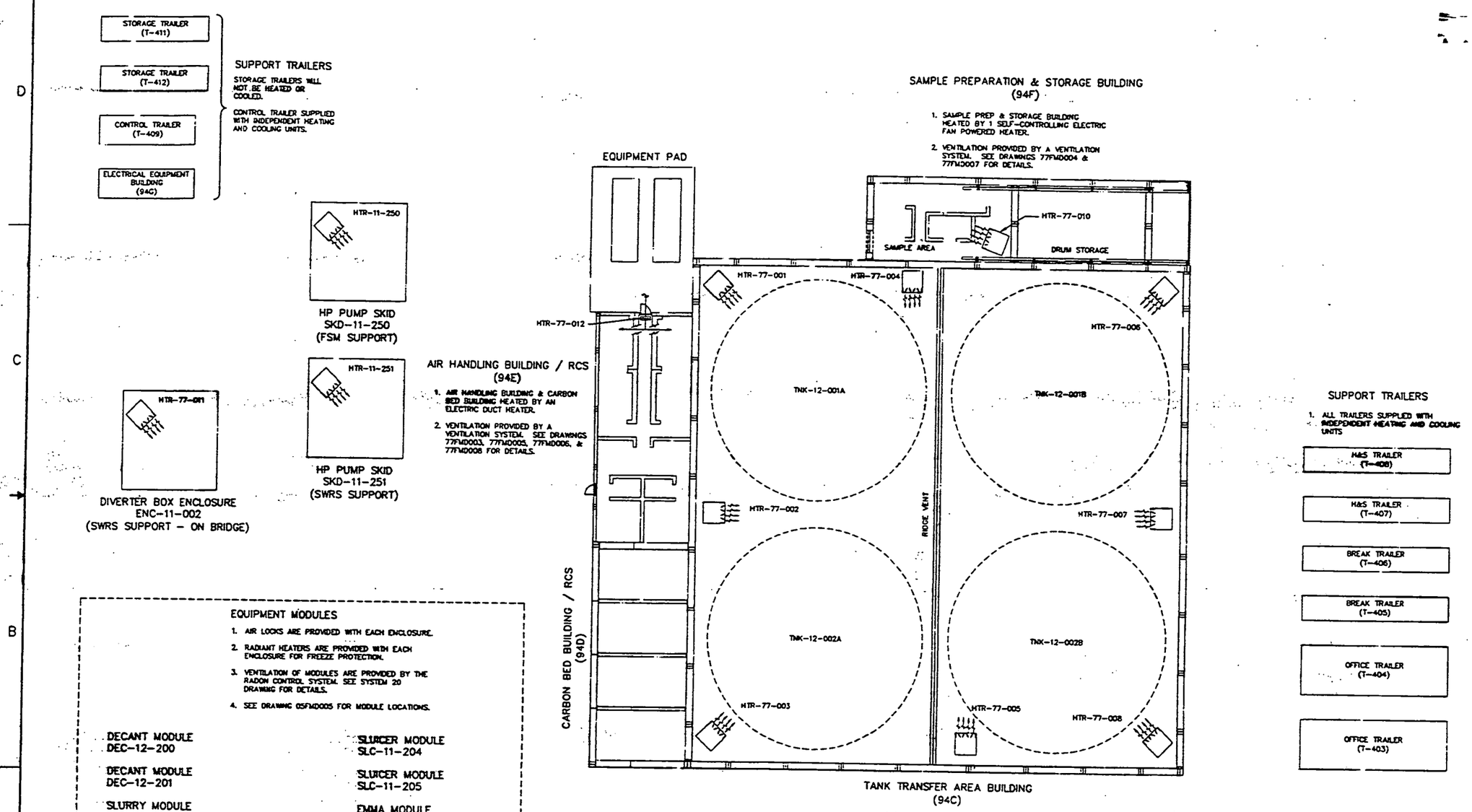
TITLE
MISC FACILITIES HVAC SYSTEM
HVAC CONTROL DIAGRAM
RCS BLDG VENTILATION-2ND FL

SIZE D | SCALE: NONE | DWG. NO. 77FMD008 | REV A

FILENAME: 77FMD008.D

S:\DARGE\DPS11 \SYS71\77fmd008.dwg Wed Oct 27 14:26:00 1999

2905



EQUIPMENT MODULES

1. AIR LOCKS ARE PROVIDED WITH EACH ENCLOSURE.
2. RADIANT HEATERS ARE PROVIDED WITH EACH ENCLOSURE FOR FREEZE PROTECTION.
3. VENTILATION OF MODULES ARE PROVIDED BY THE RADON CONTROL SYSTEM. SEE SYSTEM 20 DRAWING FOR DETAILS.
4. SEE DRAWING 05FMD005 FOR MODULE LOCATIONS.

DECANT MODULE DEC-12-200	SLURCER MODULE SLC-11-204
DECANT MODULE DEC-12-201	SLURCER MODULE SLC-11-205
SLURRY MODULE SLR-11-200	EMMA MODULE EMA-14-400
SLURRY MODULE SLR-11-201	EMMA MODULE EMA-14-401
SLURRY MODULE SLR-11-202	DEBRIS REMOVAL MODULE DRM-11-600
SLUICER MODULE SLC-11-203	DEBRIS REMOVAL MODULE DRM-11-601

000030

REV	DATE	BY	CHK'D	APRV'D	DESCRIPTION/ISSUE
B	9/10/98	BJD			ISSUED FOR OHIO EPA REVIEW
A		BJD			PRELIMINARY DESIGN SUBMITTAL

DRAWN BY BJD DATE
DESIGNED BY BJD DATE
CHECKED BY DATE
APPROVED BY DATE
APPROVED BY DATE

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
MISC FACILITIES HVAC SYSTEM
HVAC FLOW DIAGRAM
LOCATION AND CONTROL

SIZE D | SCALE: NONE | DWG. NO. 77FMD001 | REV B

FILENAME: 77FMD001.DWG

G:\DATA\EV\FSILOS\WE\SYS\77\77FMD001.DWG Fri Jan 07 12:12:37 2000

2905

RCS BUILDING VENTILATION

STREAM NUMBER	1	2	3	4	5	6	7	13
COMPONENT	TOTAL HVAC MAKE-UP	RCS BUILDING 1ST FLOOR	RCS BUILDING 2ND FLOOR SUPPLY	RCS BUILDING 2ND FLOOR RETURN	RCS BUILDING 1ST FLOOR COMBINED RETURN	SAMPLE BUILDING RETURN	SAMPLE BUILDING SUPPLY	BUILDING VENT TO STACK
AIR (LBS/HR)	30,060	24,030	6,021	6,628	26,434	6,355	5,777	39,422
WATER (LBS/HR)	562	450	112	124	496	118	107	737
TOTAL (LBS/HR)	30,622	24,480	6,134	6,752	26,930	6,473	5,884	40,159
FLOW (CFM)	6,939	5,547	1,390	1,530	6,102	1,467	1,333	9,100
FLOW (GPM)	--	--	--	--	--	--	--	--
RADON (PICOCURIES/L)	0	0	0	0	0	0	0	0
RADON (CURIES/HR)	0	0	0	0	0	0	0	0
TEMPERATURE (DEG F)	75	75	75	75	75	75	75	75
PRESSURE (INCHES WC)	--	--	--	--	--	--	--	--
NOTES	RELATIVE HUMIDITY = 100%					RELATIVE HUMIDITY = 100%		NOTE 2

NOTES:

1. FOR FLOW DIAGRAMS SEE DRAWINGS 77FMD003, 77FMD004, & 77FMD005.
2. STREAM 13 ALSO APPEARS ON 20FMD002.
3. SAMPLE BUILDING & RCS BUILDING WILL BE VENTILATED TO MAINTAIN A SLIGHTLY NEGATIVE PRESSURE WITHIN EACH BUILDING. DISCHARGE WILL BE APPROXIMATELY 10% GREATER THAN SUPPLY TO MAINTAIN NEGATIVE PRESSURE BOUNDARY.

000031

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
B	01/07/00	BJD			ISSUED FOR OHIO EPA REVIEW
A		BJD			PRELIMINARY DESIGN SUBMITTAL

RFC

DRAWN BY BJD DATE
DESIGNED BY BF DATE
CHECKED BY DATE
APPROVED BY DATE
APPROVED BY DATE

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

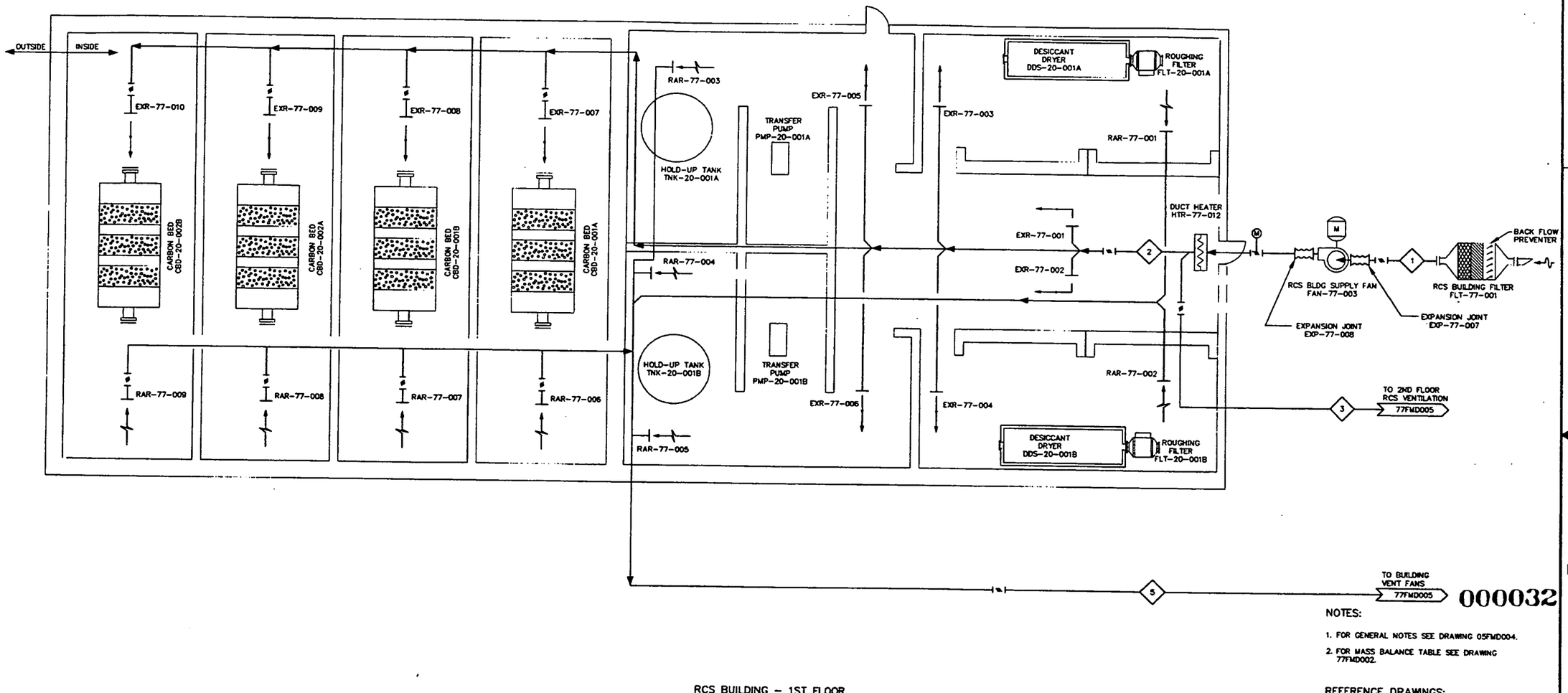
TITLE
MISC FACILITIES HVAC SYSTEM
HVAC FLOW DIAGRAM
MASS BALANCE TABLE

SIZE D | SCALE: NONE | DWG. NO. 77FMD002 | REV B

FILENAME: 77FMD002.DWG

Q:\DARPE\F0931\03\WEC\3593\77\fmd002.dwg Fri Jan 07 12:52:49 2000

2905



000032

RCS BUILDING – 1ST FLOOR

NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLE SEE DRAWING 77FMD002.

REFERENCE DRAWINGS:

05FMD001 PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION

05FMD002 PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS

PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
B	01/07/00	BJD			ISSUED FOR OHIO EPA REVIEW
A		BJD			PRELIMINARY DESIGN SUBMITTAL

RFE

DRAWN BY BJD DATE
DESIGNED BY BF DATE
CHECKED BY DATE
APPROVED BY DATE
APPROVED BY DATE

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
MISC FACILITIES HVAC SYSTEM
HVAC FLOW DIAGRAM
RCS BLDG VENTILATION–1ST FL

SIZE D | SCALE: NONE | DWG. NO. 77FMD003 | REV B

FILENAME: 77FMD003.DWG

I:\DURFE\SILOS\SILOS1\77fmd003.dwg Thu Jan 06 21:36:29 2000

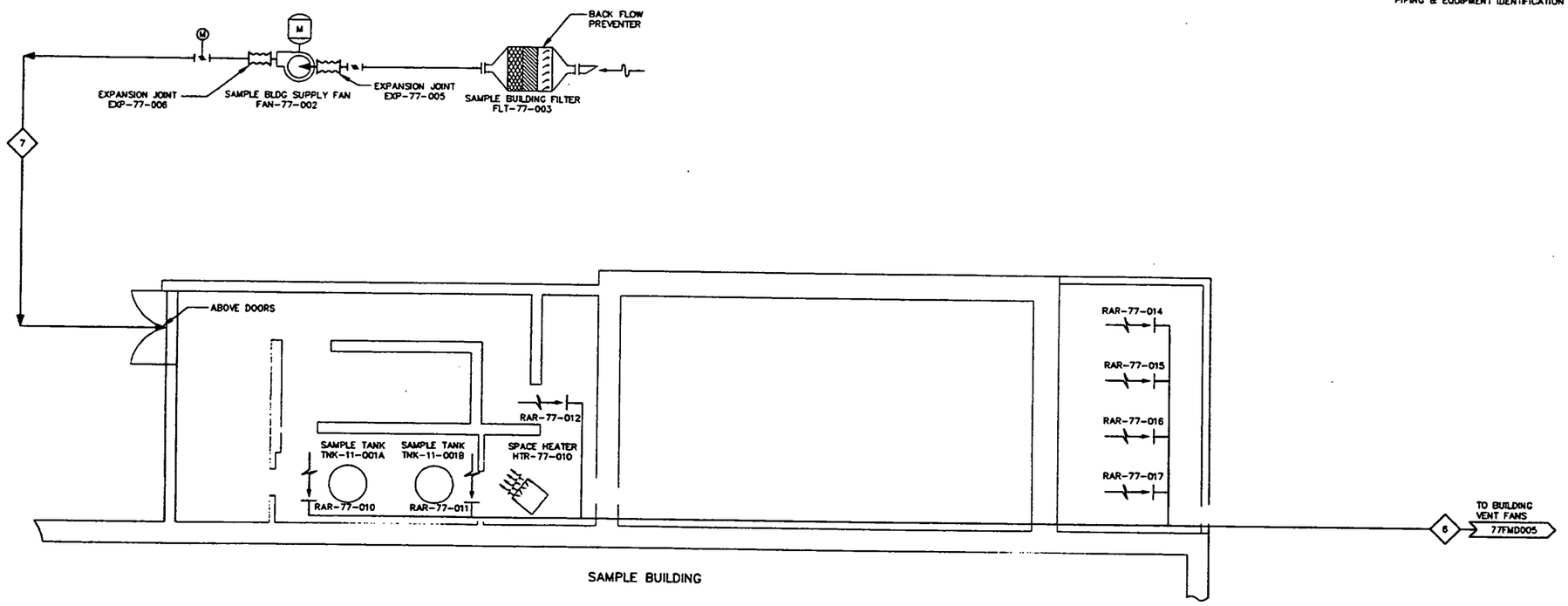
2905

NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLE SEE DRAWING 77FMD002.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION



000033

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
B	01/07/00	BJD			ISSUED FOR OHIO EPA REVIEW
A		BJD			PRELIMINARY DESIGN SUBMITTAL

RFE

DRAWN BY BJD DATE
DESIGNED BY BF DATE
CHECKED BY DATE
APPROVED BY DATE
APPROVED BY DATE

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
MISC FACILITIES HVAC SYSTEM
HVAC FLOW DIAGRAM
SAMPLE BUILDING VENTILATION

SIZE D | SCALE: NONE | DWG. NO. 77FMD004 | REV B

FILENAME: 77FMD004.DWG

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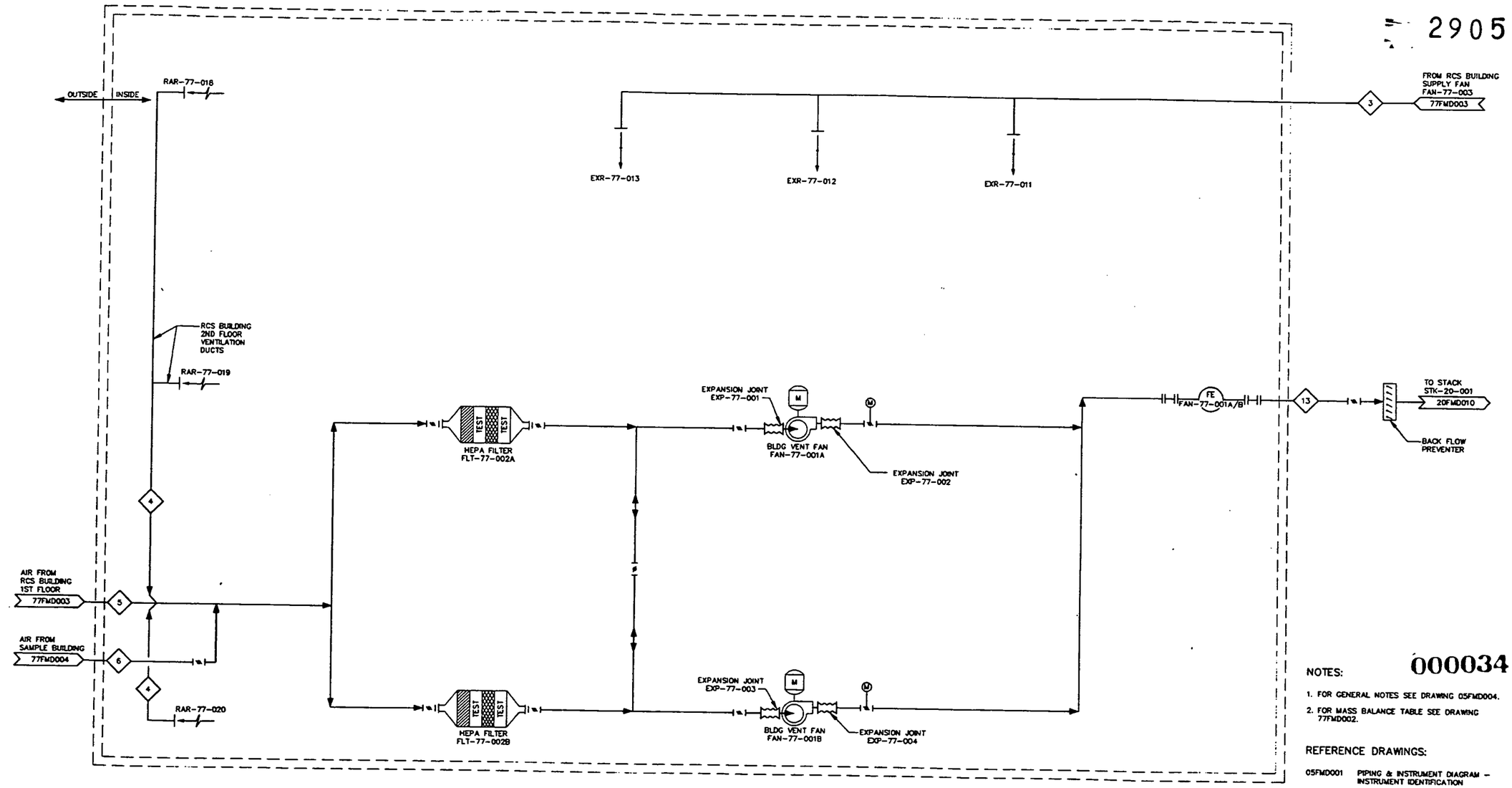
2905



NOTES:

000034

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLE SEE DRAWING 77FMD002.

REFERENCE DRAWINGS:

05FMD001 PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION

05FMD002 PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS

05FMD003 PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
B	01/07/00	BJD			ISSUED FOR OHIO EPA REVIEW
A		BJD			PRELIMINARY DESIGN SUBMITTAL

RPC

DRAWN BY BJD DATE
DESIGNED BY BF DATE
CHECKED BY DATE
APPROVED BY DATE
APPROVED BY DATE

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
MISC FACILITIES HVAC SYSTEM
HVAC FLOW DIAGRAM
RCS BLDG VENTILATION–2ND FL

SIZE D | SCALE: NONE | DWG. NO. 77FMD005 | REV B

FILENAME: 77FMD005.DWG

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2905

STATE OF OHIO NORTH (NAD 83)

181'-3 1/4" (REF)

69'-0" | 68'-8" | 43'-7 1/4"

19'-0" | 16'-0" | 16'-0" | 16'-0" | 12'-6" | 7'-11 3/4" | 10'-0" | 5'-0" | 32'-2 1/4"

2'-0"

N 480275.18
E 1347174.45

2'-0"

30'-10 1/4"

A — 20FMD027 — 20FMD029

B — 20FMD027 — 20FMD029

SHIELDING ABOVE (2 PL'CS)

FAN-77-002

TOP OF PLATFORM EL 585'-0"

RCS BUILDING FILTER FLT-77-001

CONCRETE SLAB

DOWN

UP

HOLD-UP TANK TNK-20-002A

TRANSFER PUMP PMP-20-001A

SUMP PUMP

DESICCANT DRYING SYSTEM DDS-20-001A

FLT-20-001A

CHILLER UNIT CHR-20-001A

CHILLER UNIT CHR-20-001B

CARBON BED CBD-20-002B

CARBON BED CBD-20-002A

CARBON BED CBD-20-001B

CARBON BED CBD-20-001A

HOLD-UP TANK TNK-20-002B

TRANSFER PUMP PMP-20-001B

DESICCANT DRYING SYSTEM DDS-20-001B

FLT-20-001B

EXHAUST STACK STK-20-001

30'-10 1/4"

2'-0"

TTA BUILDING

PROTECTIVE DIKE 1'-4" HIGH (TYP. 2 PL'CS)

27'-3 1/4"

2'-0"

TRANSFER STORAGE TANK TNK-12-002A

TRANSFER STORAGE TANK TNK-12-001A

CARBON BUILDING (94D)
AIR HANDLING BUILDING (94E)
FIRST FLOOR PLAN (@EL 576'-0")
SCALE: 1/8"=1'-0"

000035

NOTES:
1. FOR CLARITY SYSTEM 20 RCS AND SYSTEM 77 MISCELLANEOUS HVAC FACILITIES HVAC SYSTEM ARE PRESENTED ON SYSTEM 20 DRAWINGS.

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

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	1/6/00	WCB	MBF		CERTIFIED FOR CONSTRUCTION
0	11/01/99	WCB	MBF		PRELIMINARY DESIGN SUBMITTAL

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

KENNETH D. PRICKETT — REGISTERED PROFESSIONAL ENGINEER — REG. 103742 — STATE OF TENNESSEE — 01/07/00

DRAWN BY — DATE 01/07/00
DESIGNED BY — DATE 01/07/00
CHECKED BY — DATE 01/07/00
APPROVED BY — DATE 01/07/00
APPROVED BY — DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

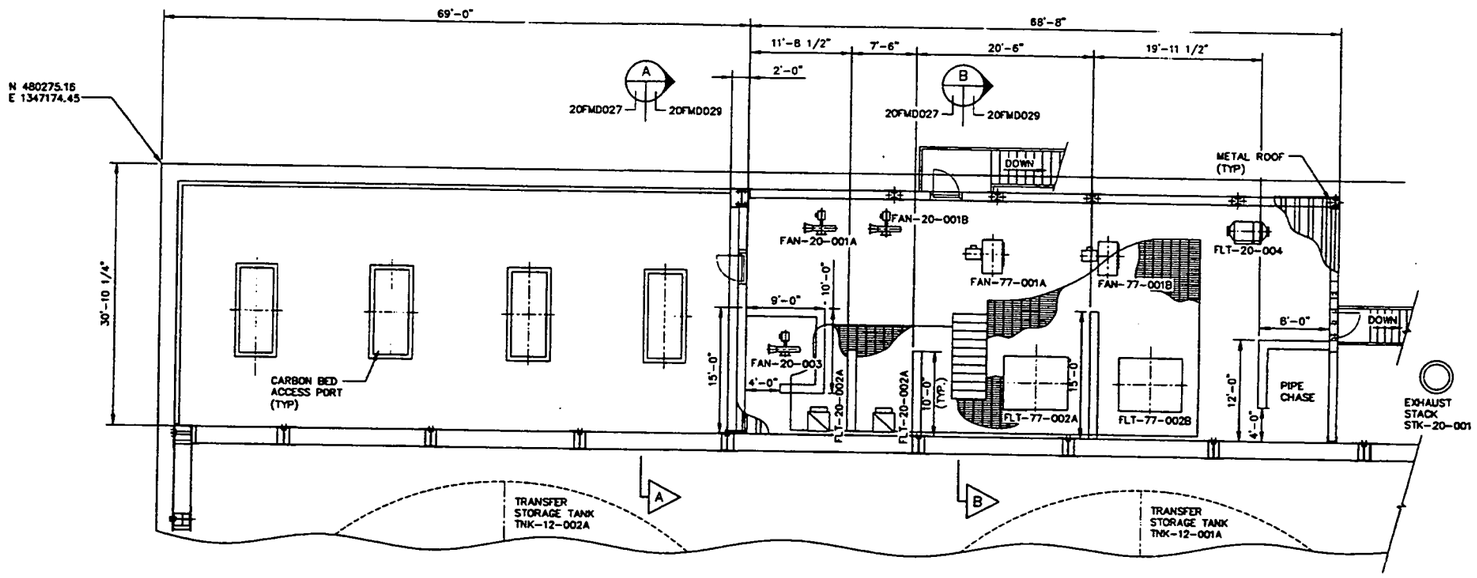
TITLE
RADON CONTROL SYSTEM
GENERAL ARRANGEMENT
1ST FLOOR

SIZE D | SCALE: 1/8"=1'-0" | DWG. NO. 20FMD027 | REV 1

FILENAME: 20FMD027.DWG

G:\CHARGE\FDF81L0S\MECH\TSSR\20fmd027.dwg Fri Jan 07 17:06:54 2000

2905



CARBON BED BUILDING (94D)
AIR HANDLING BUILDING (94E)
SECOND FLOOR PLAN (℄EL 593'-1")
SCALE: 1/8"=1'-0"

000036

NOTES:
1. FOR CLARITY SYSTEM 20 RCS AND SYSTEM 77 MISCELLANEOUS HVAC FACILITIES HVAC SYSTEM ARE PRESENTED ON SYSTEM 20 DRAWINGS.

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 8, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

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

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/06/00	WCB	JLP	MBF	CERTIFIED FOR CONSTRUCTION
0	11/03/99	WCB	MBF		PRELIMINARY DESIGN SUBMITTAL

KENNETH B. HUCKETTS, PROFESSIONAL ENGINEER, NO. 109728, STATE OF TENNESSEE

DRAWN BY	WCB	DATE 01/07/00
DESIGNED BY	WCB	DATE 01/07/00
CHECKED BY	JLP	DATE 01/07/00
APPROVED BY	MBF	DATE 01/07/00
APPROVED BY	JLP	DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
RADON CONTROL SYSTEM
GENERAL ARRANGEMENT
2ND FLOOR

SIZE	SCALE	DWG. NO.	REV
D	1/8"=1'-0"	20FMD028	1

FILENAME: 20FMD028.DWG

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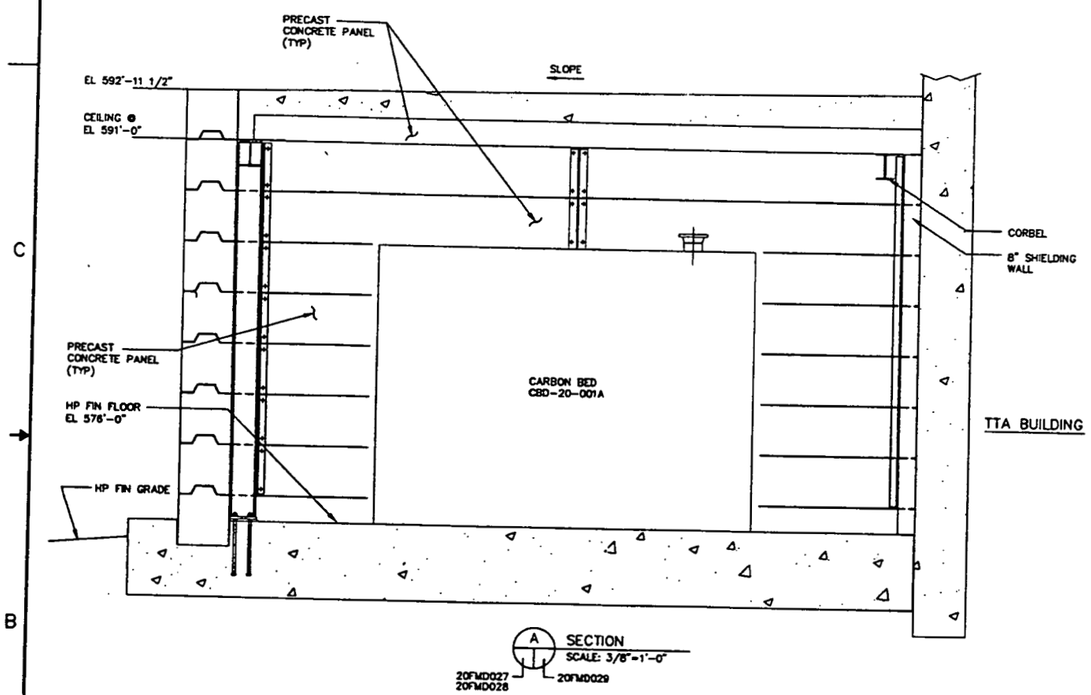
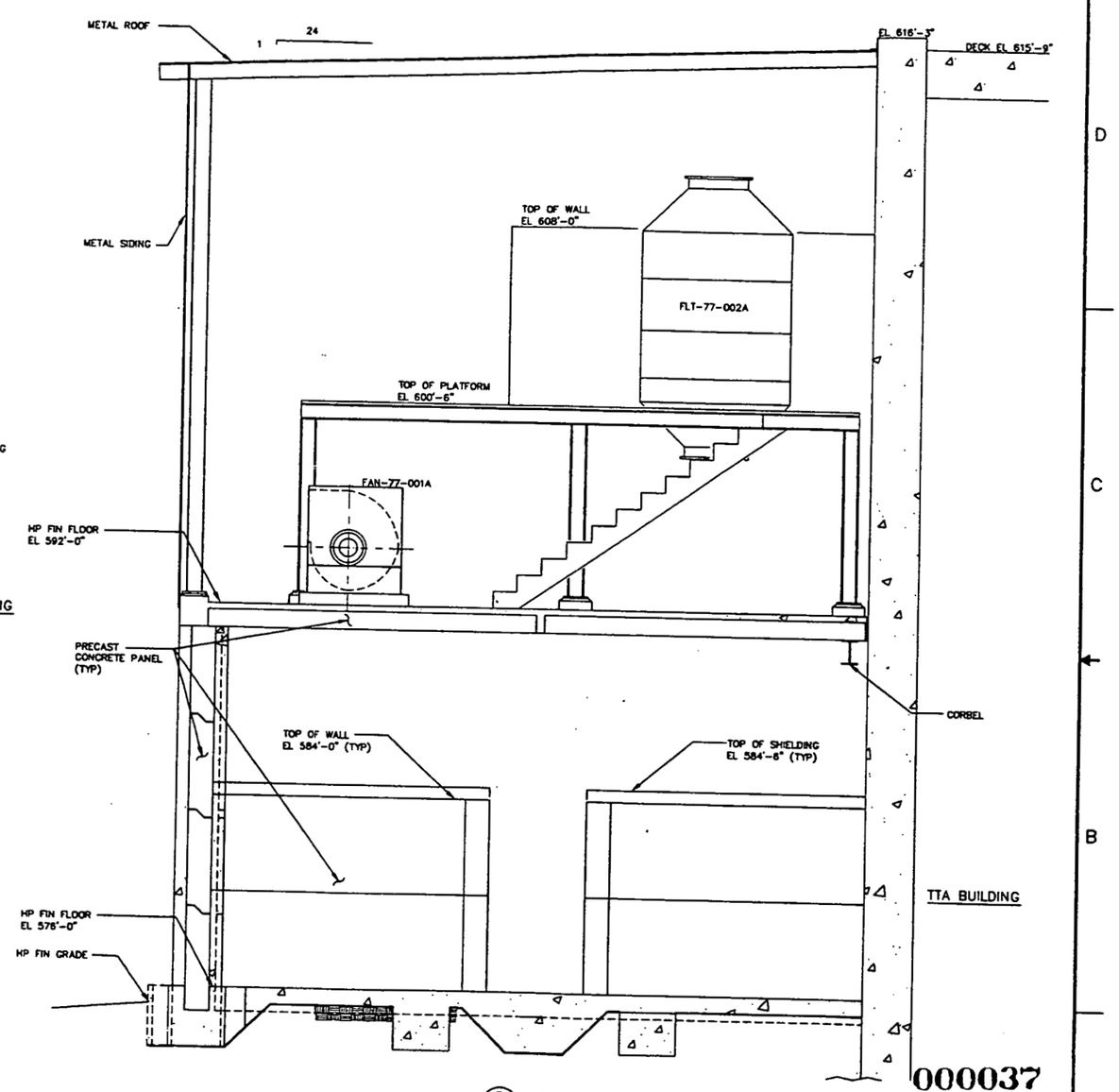
2905





000037

NOTES:

1. FOR CLARITY SYSTEM 20 RCS AND SYSTEM 77 MISCELLANEOUS HVAC FACILITIES HVAC SYSTEM ARE PRESENTED ON SYSTEM 20 DRAWINGS.

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

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	[illegible]	[illegible]	[illegible]	[illegible]	CERTIFIED FOR CONSTRUCTION
0	11/01/99	WCB	MBF		PRELIMINARY DESIGN SUBMITTAL

RPE KENNETH D. BRICKETT NO. 105742 STATE OF TENNESSEE

		DATE
DRAWN BY	[illegible]	01/01/00
DESIGNED BY	[illegible]	01/01/00
CHECKED BY	[illegible]	01/01/00
APPROVED BY	[illegible]	01/01/00
APPROVED BY	[illegible]	01/01/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
RADON CONTROL SYSTEM
GENERAL ARRANGEMENT
SECTIONS & DETAILS

SIZE D | SCALE: 3/8"=1'-0" | DWG. NO. 20FMD029 | REV 1

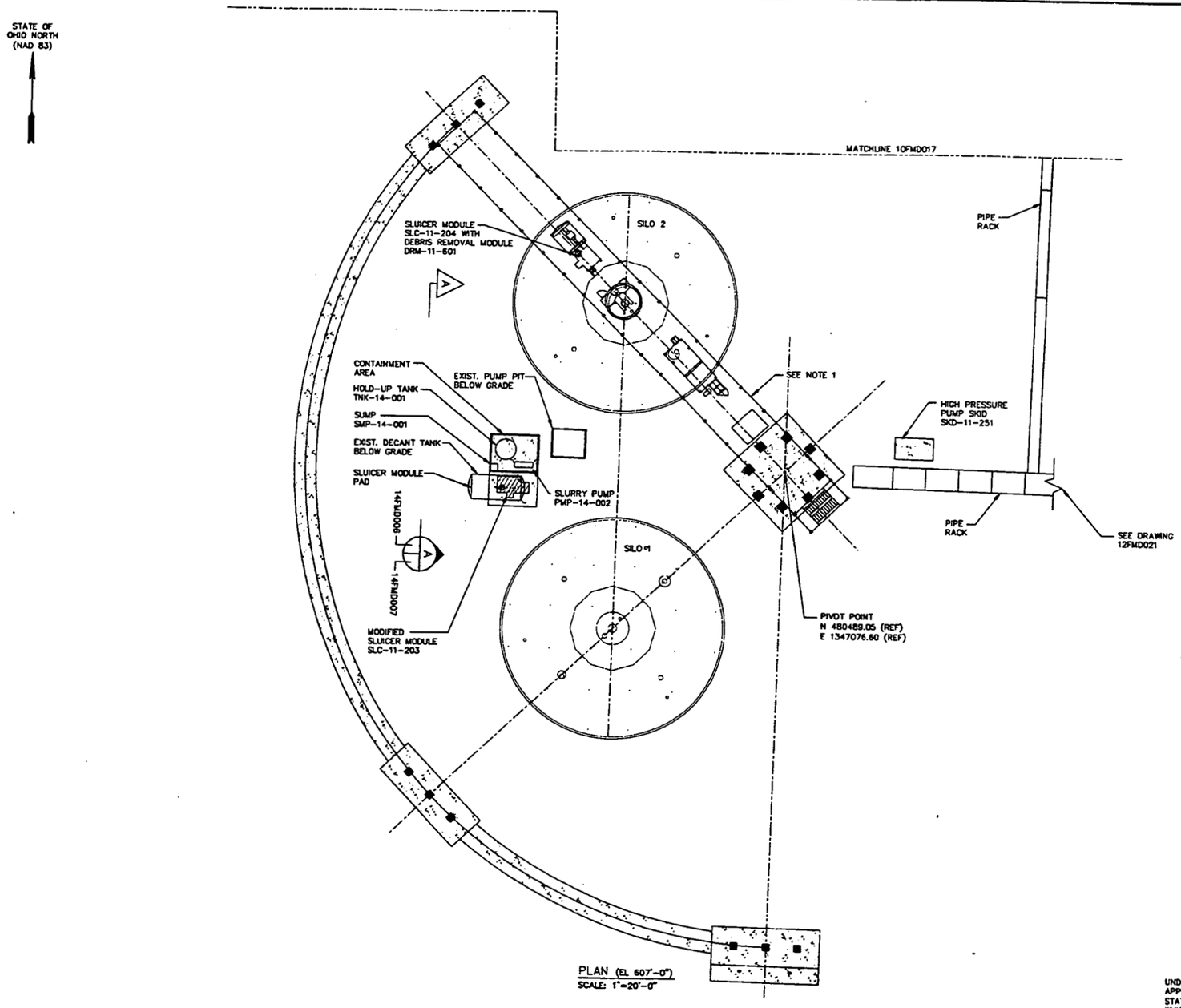
FILENAME: 20FMD029.DWG

G:\SAVE\FDF51L05\NEW\SYS20\20fm029.dwg Fri Jan 07 10:07:34 2000

NOTES:

1. BRIDGE CRANE SHOWN IN SILO 2 OPERATION POSITION, SILO 1 IS SIMILAR.

2905



PLAN (EL 607'-0")
SCALE: 1"=20'-0"

REFERENCE DRAWINGS:

05FMD010 GENERAL ARRANGEMENT KEY PLAN

000038

LETTER OR NUMBER OF SECTION OR DETAIL

DRAWING ON WHICH SECTION OR DETAIL IS TAKEN

DRAWING ON WHICH SECTION OR DETAIL IS SHOWN

SECTION & DETAIL KEY

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
2	01/07/00	WCB	MH	KDB	CERTIFIED FOR CONSTRUCTION
1	12/01/99	WCB	SWH		REVISED FOR NOZZLE LOCATIONS
0	11/99	WCB	SWH		PRELIMINARY DESIGN SUBMITTAL

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

KENNETH D. BURKETT PROFESSIONAL ENGINEER NO. 105744 STATE OF TENNESSEE 01/07/00

DRAWN BY: DATE 01/07/00
DESIGNED BY: DATE 01/07/00
CHECKED BY: DATE 01/07/00
APPROVED BY: DATE 01/07/00
APPROVED BY: DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
DECANT WASTE RETRIEVAL SYSTEM
GENERAL ARRANGEMENT
SHEET 1 OF 2

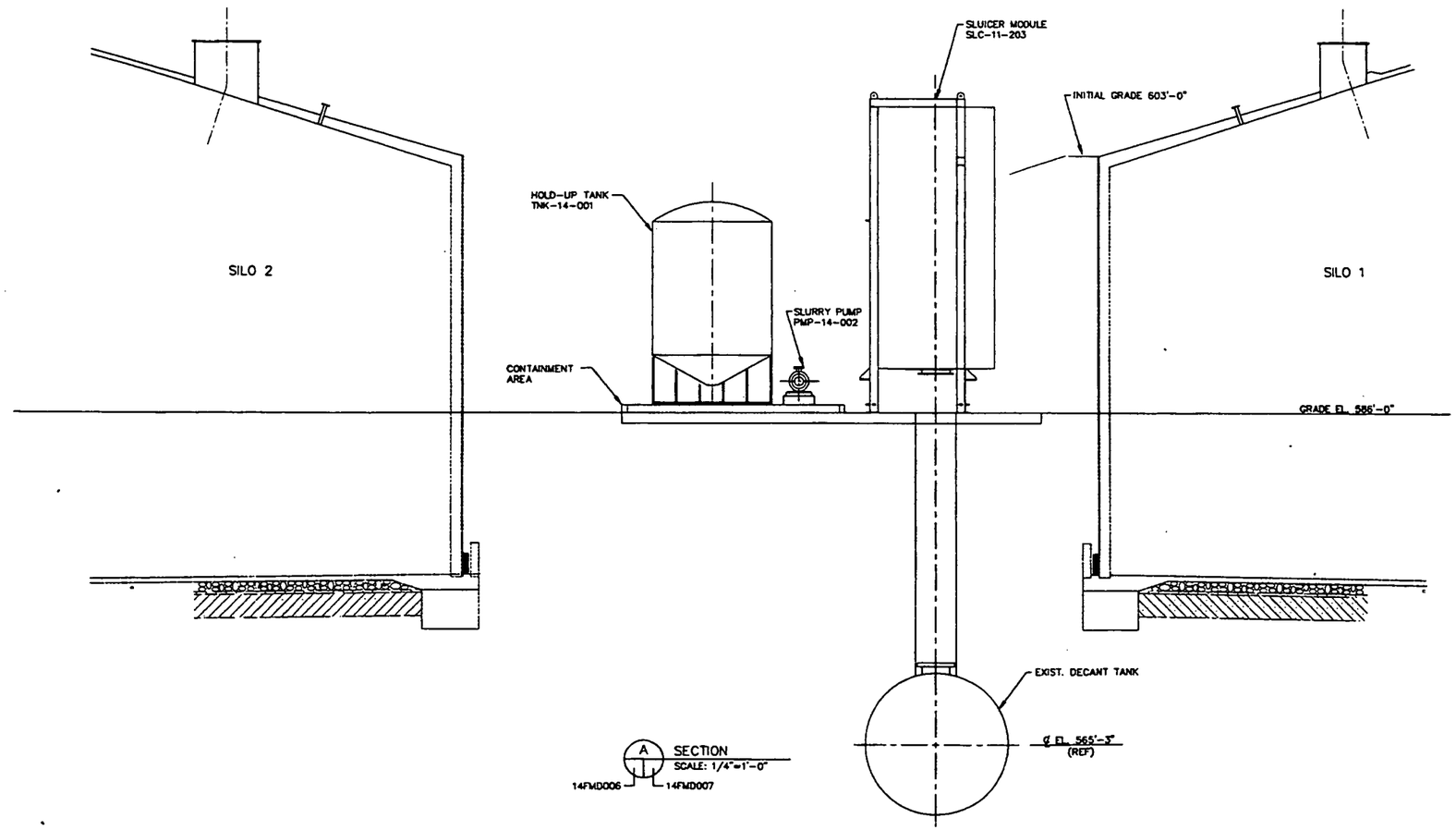
SIZE	SCALE:	DWG. NO.	REV
D	1"=20'-0"	14FMD006	2

FILENAME: 14FMD006.DWG

P:\CHARGE\FDF\SILOS\MEC\SYS\14\14FMD006.dwg Fri Jan 07 09:19:29 2000

XREF DRAWINGS: 10FMD010.DWG 05FMD010.DWG

2905



000039

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

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

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
2	01/07/00	WCB	SWH	KDN	CERTIFIED FOR CONSTRUCTION
1	12/01/99	WCB	SWH		REVISED FOR NOZZLE LOCATIONS
0	11/99	WCB	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. NUNNETT — REGISTERED PROFESSIONAL ENGINEER — No. 102742 — STATE OF TENNESSEE

DRAWN BY: 01/07/00
DESIGNED BY: 01/07/00
CHECKED BY: 01/07/00
APPROVED BY: 01/07/00
APPROVED BY: 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
DECANT WASTE RETRIEVAL SYSTEM
GENERAL ARRANGEMENT
SHEET 2 OF 2

SIZE: D | SCALE: 1/4" = 1'-0" | DWG. NO. 14FMD007 | REV 2

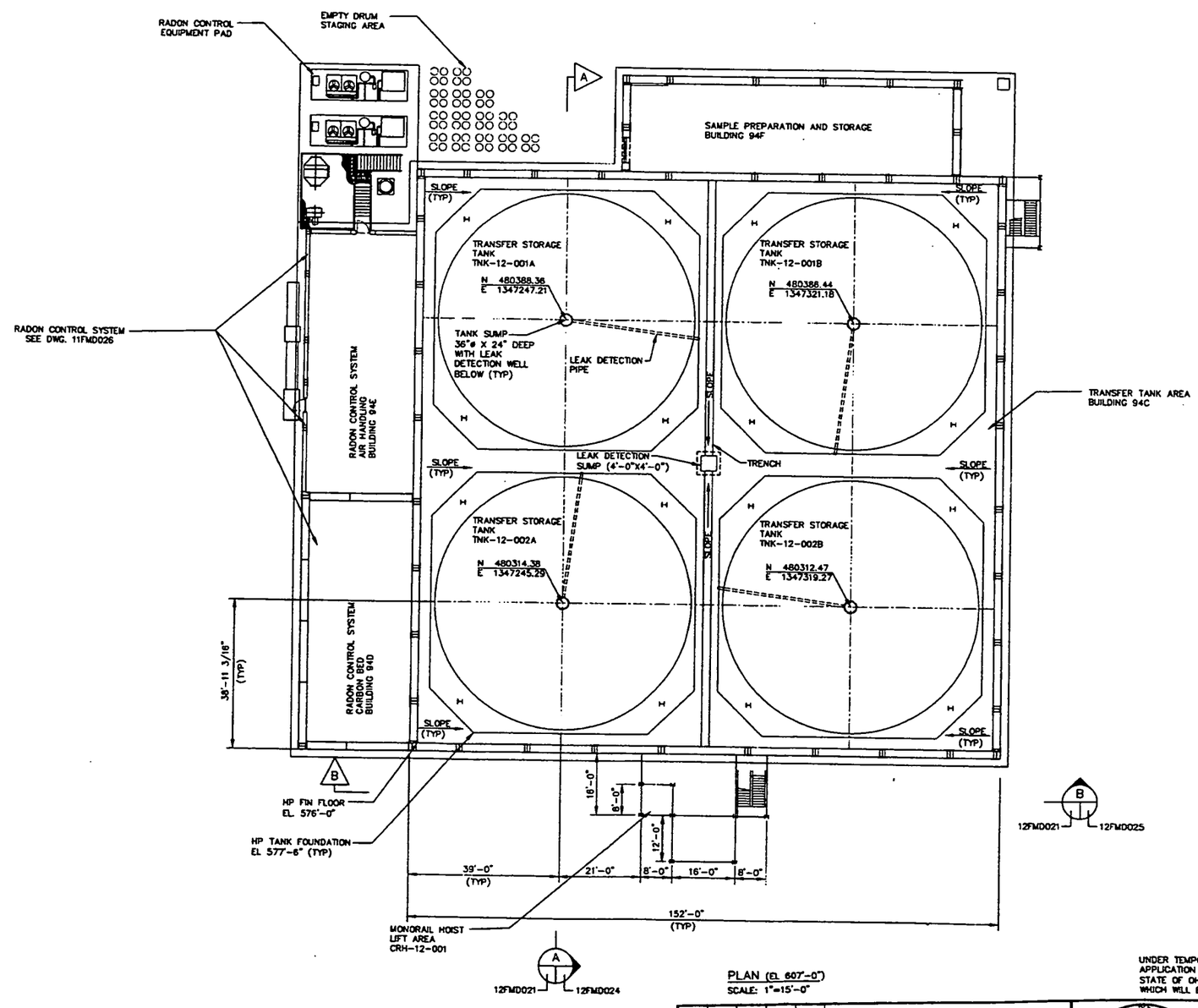
FILENAME: 14fmd007.DWG

H:\DWGS\FSF51105\MEC\SYS\14\14fmd007.dwg Fri Jan 07 09:20:50 2000

NOTES:

1. RATE OF FLOOR SLOPE IS 1"/8'-0" UNLESS NOTED OTHERWISE.

2905



PLAN (EL 607'-0")
SCALE: 1"=15'-0"

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

REFERENCE DRAWINGS:
05FMD010 GENERAL ARRANGEMENT KEYPLAN

000040

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	[illegible]	[illegible]	[illegible]	[illegible]	CERTIFIED FOR CONSTRUCTION
0	01/01/99	WCB	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RUCKER REGISTERED ENGINEER TENNESSEE STATE OF TENNESSEE

		DATE
DRAWN BY	[illegible]	01/07/00
DESIGNED BY	[illegible]	01/07/00
CHECKED BY	[illegible]	01/07/00
APPROVED BY	[illegible]	01/07/00
APPROVED BY	[illegible]	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

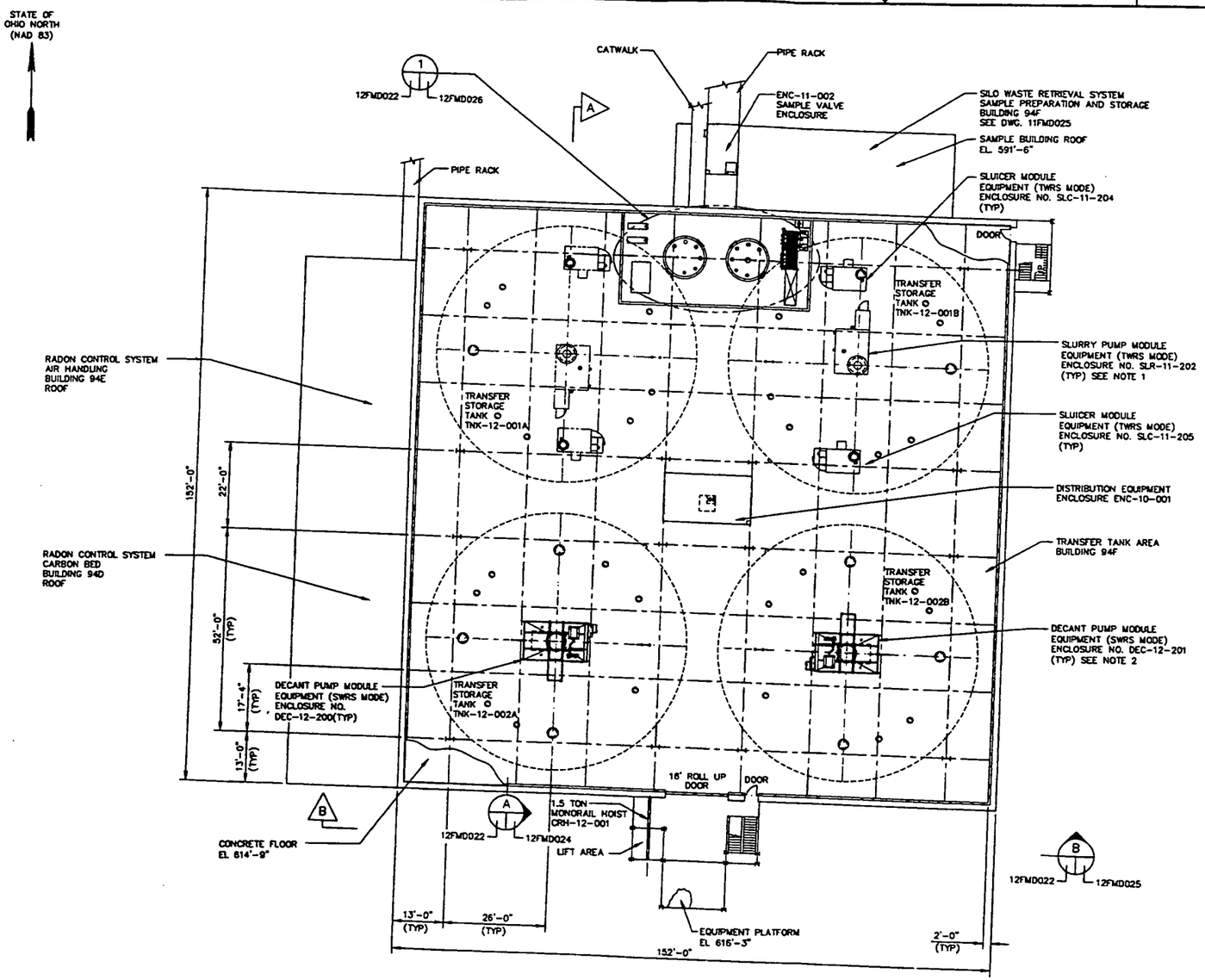
TITLE
TRANSFER TANK SYSTEM
GENERAL ARRANGEMENT
SHEET 1 OF 6

SIZE	SCALE:	DWG. NO.	REV
D	1"=15'-0"	12FMD021	1

FILENAME: 12FMD021.DWG

XREF DRAWINGS: 10FMD010.DWG

JOBREV:F:\FS1LOS\MEC\STS\12\MD021.dwg Fri Jan 07 12:27:31 2000



PLAN (EL 638'-0")
SCALE: 1"=15'-0"

NOTES:

1. TANK TNK-12-001B IS SHOWN WITH TWRS MODE EQUIPMENT IN PLACE. THIS SAME EQUIPMENT WILL MOVE FROM TANK TO TANK. THE EQUIPMENT SHOWN ON TANK TNK-12-001A IS FOR ORIENTATION PURPOSES ONLY.
2. TANK TNK-12-002A & 002B REFLECTS EQUIPMENT REQUIRED FOR SWRS MODE. THE DECANT MODULES WILL BE MOVED AS REQUIRED.

2905

000041

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

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	WCB	J.H.	K.D.R.	CERTIFIED FOR CONSTRUCTION
0	11/01/99	WCB	SWH		PRELIMINARY DESIGN SUBMITTAL

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

KENNETH D. RICKETT REGISTERED PROFESSIONAL ENGINEER NO. 107742 STATE OF TENNESSEE 01/07/00

		DATE
DRAWN BY	W.C. Bell	01/07/00
DESIGNED BY	W.C. Bell	01/07/00
CHECKED BY	J.N. Hewitt	01/07/00
APPROVED BY	Kenneth Rickett	01/07/00
APPROVED BY	Chris Duncan	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 824

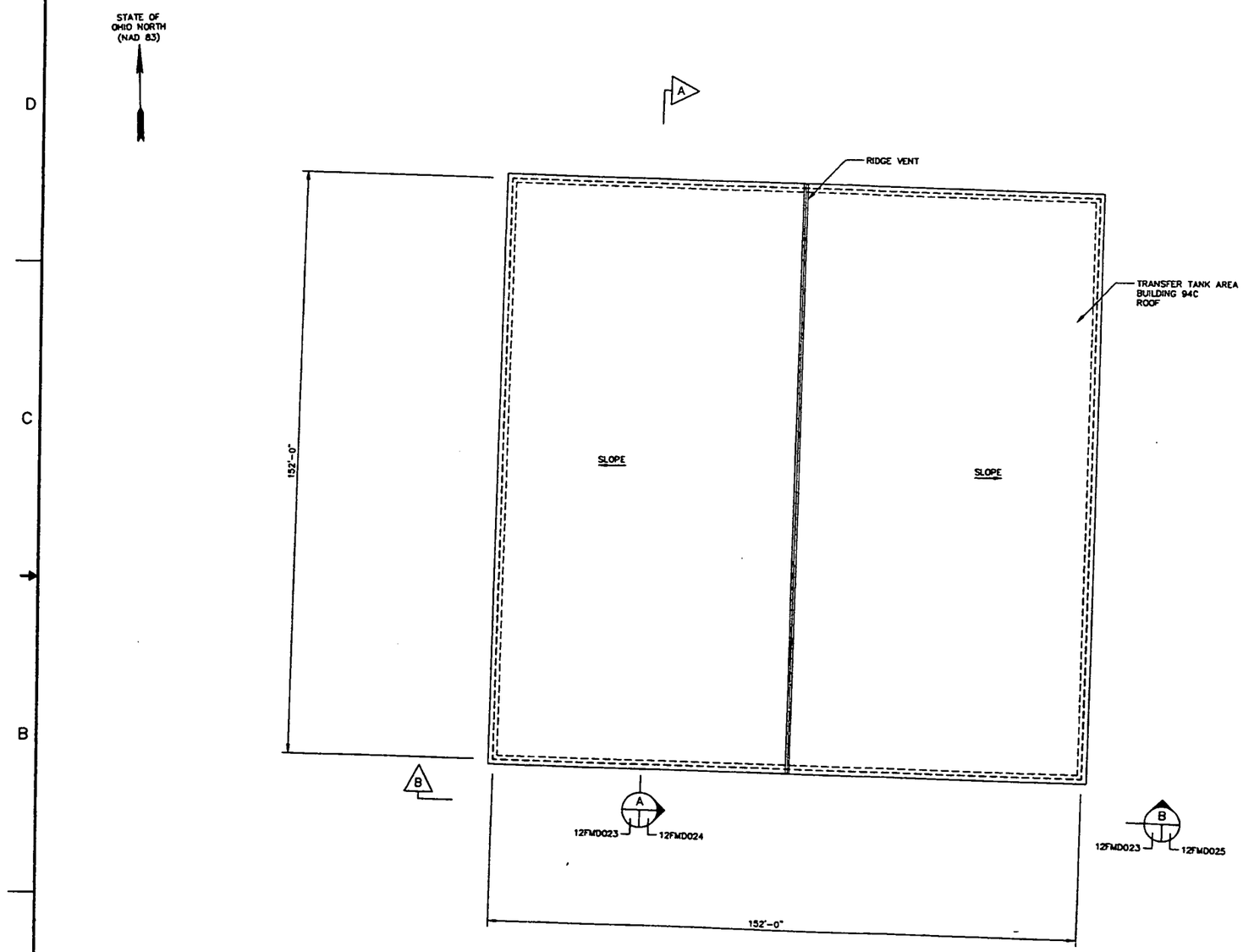
FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
TRANSFER TANK SYSTEM
GENERAL ARRANGEMENT
SHEET 2 OF 6

SIZE	SCALE	DWG. NO.	REV
D	1"=15'-0"	12FMD022	1

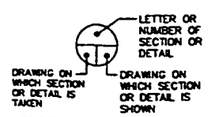
FILENAME: 12FMD022.DWG

2905



PLAN (EL 650'-0")
SCALE: 1"=15'-0"

000042



SECTION & DETAIL KEY

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	WCB	JHA	KDR	CERTIFIED FOR CONSTRUCTION
0	11/01/99	WCB	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICKETT — REGISTERED PROFESSIONAL ENGINEER — No. 105748 — STATE OF TENNESSEE

		DATE
DRAWN BY	W.C. Blair	01/07/00
DESIGNED BY	W.C. Blair	01/07/00
CHECKED BY	J.H. Wright	01/07/00
APPROVED BY	Kenneth Rickett	01/07/00
APPROVED BY	[illegible]	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
TRANSFER TANK SYSTEM
GENERAL ARRANGEMENT
SHEET 3 OF 6

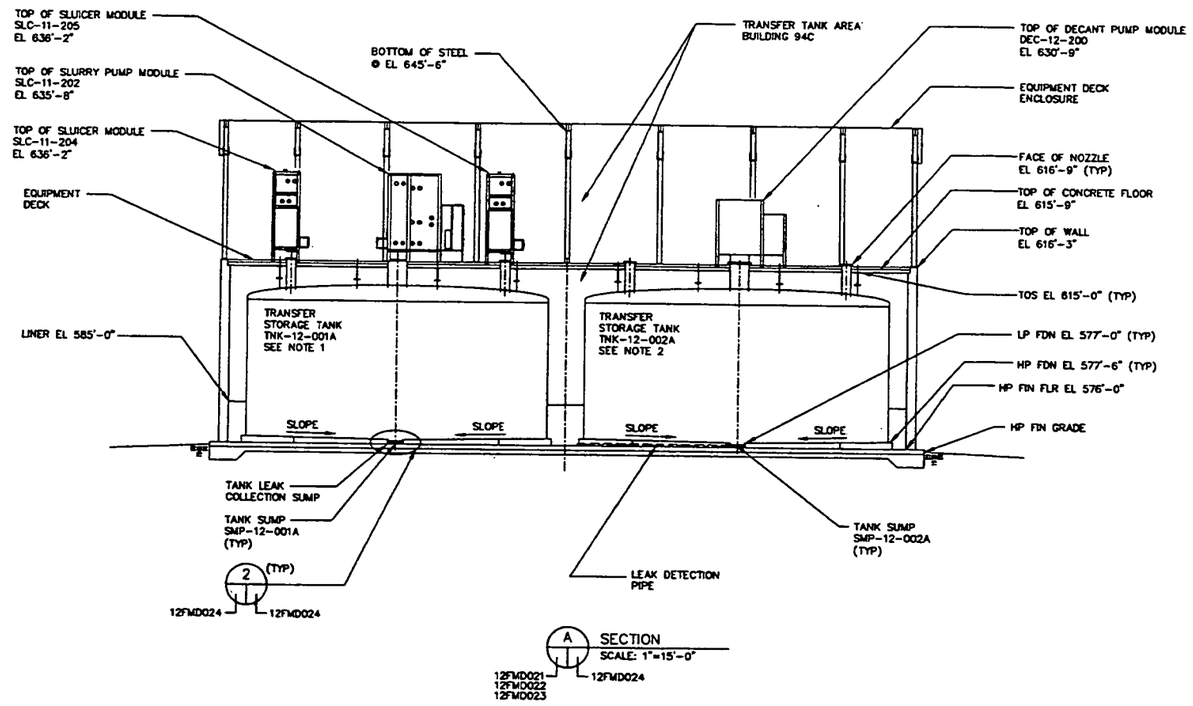
SIZE	SCALE	DWG. NO.	REV
D	1"=15'-0"	12FMD023	1

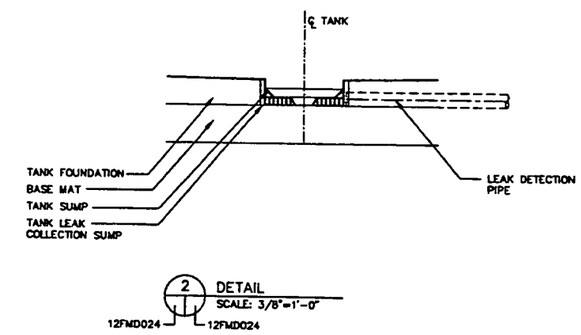
FILENAME: 12FMD023.DWG

NOTES:

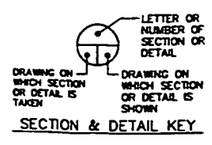
1. TNK-12-001A IS SHOWN IN TWRS MODE.
2. TNK-12-002A IS SHOWN IN SWRS MODE.

2905





000043



SECTION & DETAIL KEY

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	WCB	JLL	KDR	CERTIFIED FOR CONSTRUCTION
0	11/01/99	WCB	SWH		PRELIMINARY DESIGN SUBMITTAL

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

KENNETH D. RIGGS PROFESSIONAL ENGINEER REGISTERED No. 103763 STATE OF TENNESSEE

		DATE
DRAWN BY	R.C. Ref	01/07/00
DESIGNED BY	R.C. Ref	01/07/00
CHECKED BY	J.N. Hargrove	01/07/00
APPROVED BY	Kenneth Riggs	01/07/00
APPROVED BY	Carl Sawyer	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

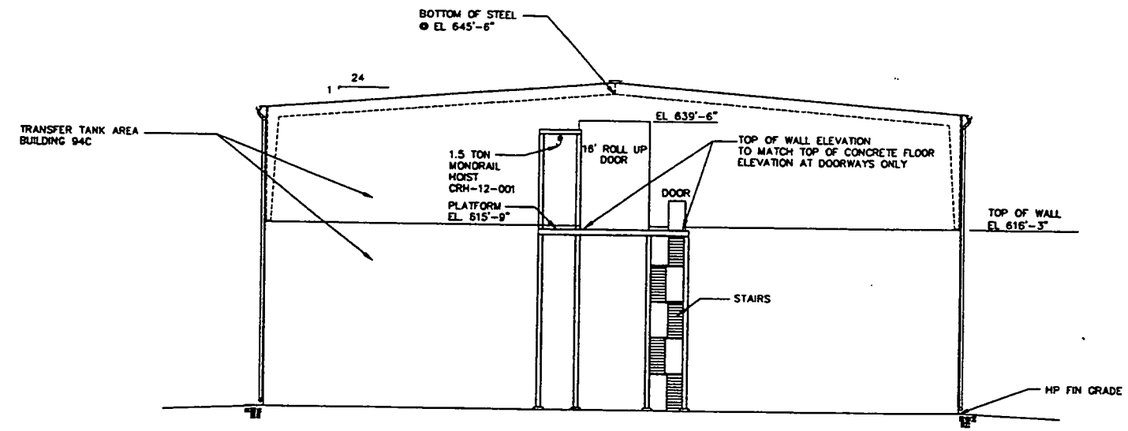
FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
TRANSFER TANK SYSTEM
GENERAL ARRANGEMENT
SHEET 4 OF 6

SIZE	SCALE:	DWG. NO.	REV
D	1"=15'-0"	12FMD024	1

FILENAME: 12FMD024.DWG

2905



B SECTION
SCALE: 1"=15'-0"
12FMD021
12FMD022
12FMD023
12FMD025

000044

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

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

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	[illegible]	[illegible]	JLW	KDS	CERTIFIED FOR CONSTRUCTION
0	11/01/99	WCB	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. PRIDEMORE
REGISTERED PROFESSIONAL ENGINEER
STATE OF TENNESSEE
No. 103743

		DATE
DRAWN BY	[illegible]	01/07/00
DESIGNED BY	[illegible]	01/07/00
CHECKED BY	J.H. Hough	01/07/00
APPROVED BY	[illegible]	01/07/00
APPROVED BY	[illegible]	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

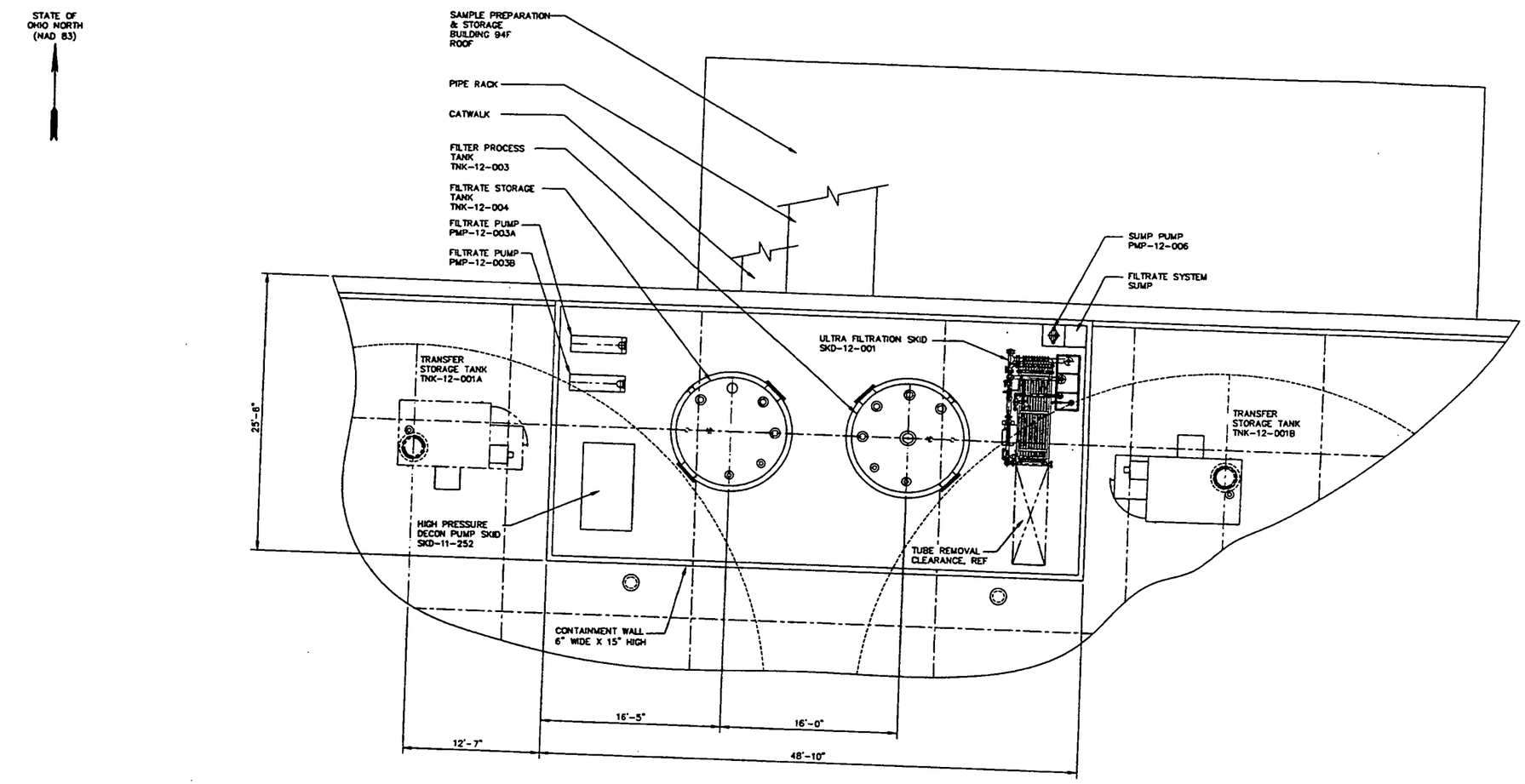
TITLE
TRANSFER TANK SYSTEM
GENERAL ARRANGEMENT
SHEET 5 OF 6

SIZE	SCALE:	DWG. NO.	REV
D	1"=15'-0"	12FMD025	1

FILENAME: 12FMD025.DWG

H:\LHARRE\FDF\SILOS\MEC\SYS12\12fmd025.dwg Fri Jan 07 09:15:14 2000

2905



PARTIAL PLAN VIEW-EQUIPMENT DECK

ULTRA FILTRATION SYSTEM AND FILTRATE STORAGE AREA

1 DETAIL
SCALE: 3/16"=1'-0"
12FMD022 — 12FMD026

000045

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

SECTION & DETAIL KEY

REV	DATE	BY	CHK'D	APRV'D	DESCRIPTION/ISSUE
1	01/07/00	WCB	JJR	KDR	CERTIFIED FOR CONSTRUCTION
0	11/01/99	WCB	SWH		PRELIMINARY DESIGN SUBMITTAL

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

RPE: KENNETH D. RAMSEY, REGISTERED PROFESSIONAL ENGINEER, NO. 103734, STATE OF TENNESSEE, 01/07/00

		DATE
DRAWN BY		01/07/00
DESIGNED BY		01/07/00
CHECKED BY		01/07/00
APPROVED BY		01/07/00
APPROVED BY		01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
TRANSFER TANK SYSTEM
GENERAL ARRANGEMENT
SHEET 6 OF 6

SIZE	SCALE:	DWG. NO.	REV
D	3/16" = 1'-0"	12FMD026	1

FILENAME: 12FMD026.DWG

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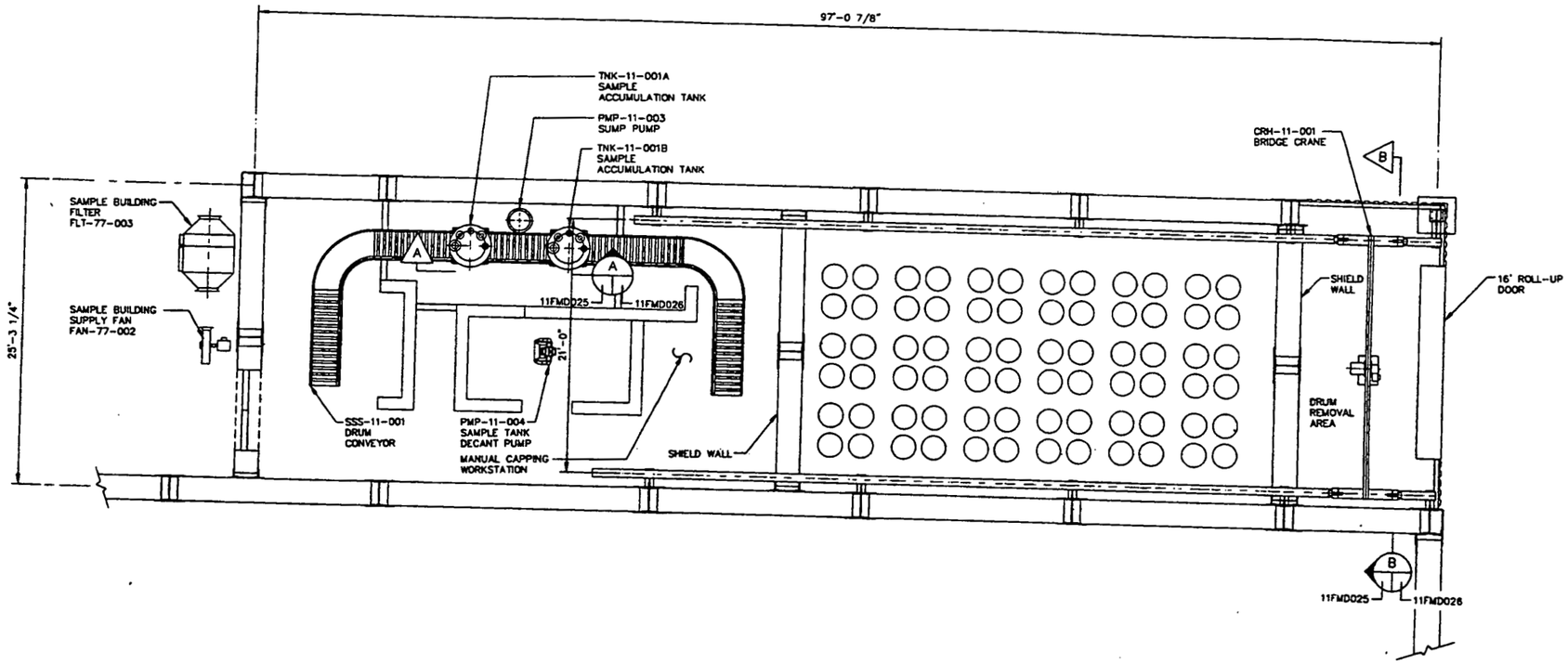
2905

STATE OF OHIO NORTH (NAD 83)



PLAN VIEW
SCALE: 3/16"=1'-0"

REFERENCE DRAWINGS:

05FMD010 GENERAL ARRANGEMENT KEY PLAN

000046

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

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

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	WCB	SWH	KDR	CERTIFIED FOR CONSTRUCTION
0	11/03/99	WCB	SWH		PRELIMINARY DESIGN SUBMITTAL

RPE KENNETH D. RICHARDS PROFESSIONAL ENGINEER REGISTERED No. 103715 STATE OF TENNESSEE 01/10/00

		DATE
DRAWN BY	D.C. Clay	01/07/00
DESIGNED BY	D.C. Clay	01/07/00
CHECKED BY	S.W. Hirsch	01/07/00
APPROVED BY	Kenneth D. Richards	01/07/00
APPROVED BY	J.R. Gerson	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

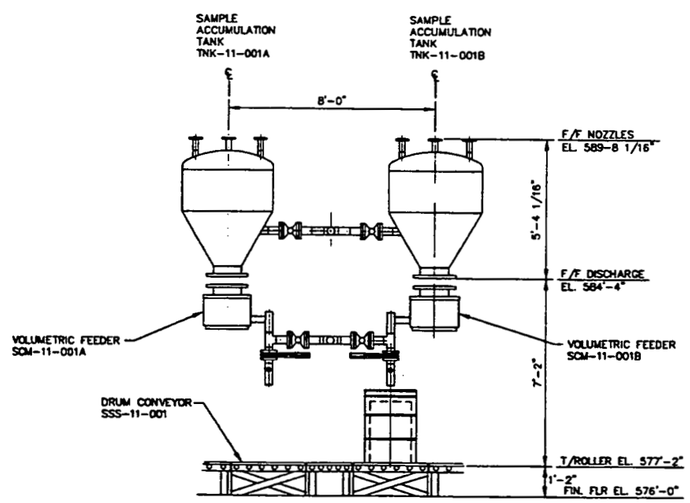
TITLE
SILO WASTE RETRIEVAL SYSTEM
GENERAL ARRANGEMENT
SAMPLE BUILDING

SIZE	SCALE:	DWG. NO.	REV
D	3/16" = 1'-0"	11FMD025	1

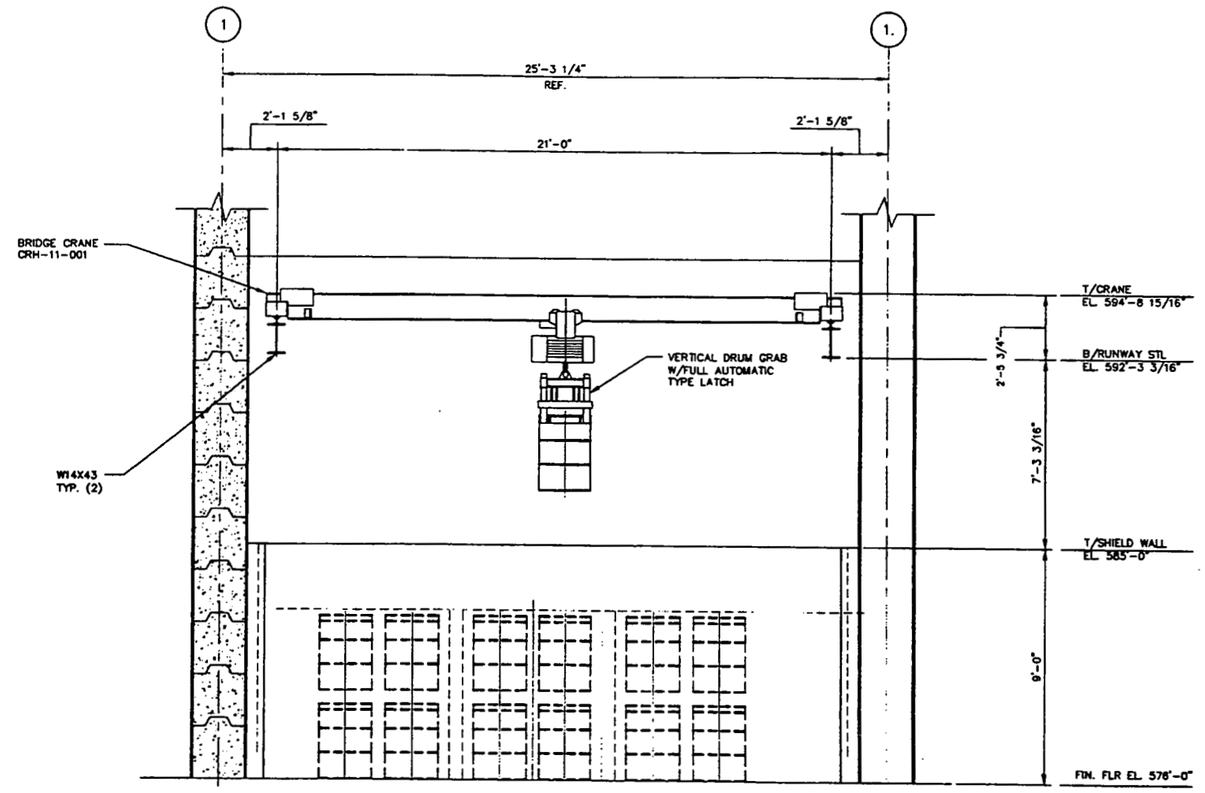
FILENAME: 11FMD025

K:\DRAWS\DGN\SECSIS\11FMD025.dwg Fri Jan 07 10:07:47 2000

2905



A SECTION
SCALE: 3/8" = 1'-0"
11FMD025 11FMD026



B SECTION
SCALE: 3/8" = 1'-0"
11FMD025 11FMD026

000047

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

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	WCB	JAL	KDR	CERTIFIED FOR CONSTRUCTION
0	01/01/99	WCB	SWH		PRELIMINARY DESIGN SUBMITTAL

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

KENNETH D. RICHARDS REGISTERED PROFESSIONAL ENGINEER NO. 103742 STATE OF TENNESSEE

DRAWN BY 01/07/00
DESIGNED BY 01/07/00
CHECKED BY 01/07/00
APPROVED BY 01/07/00
APPROVED BY 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
SILO WASTE RETRIEVAL SYSTEM
SECTIONS & DETAILS
SAMPLE BUILDING

SIZE D | SCALE: 3/8" = 1'-0" | DWG. NO. 11FMD026 | REV 1

FILENAME: 11FMD026

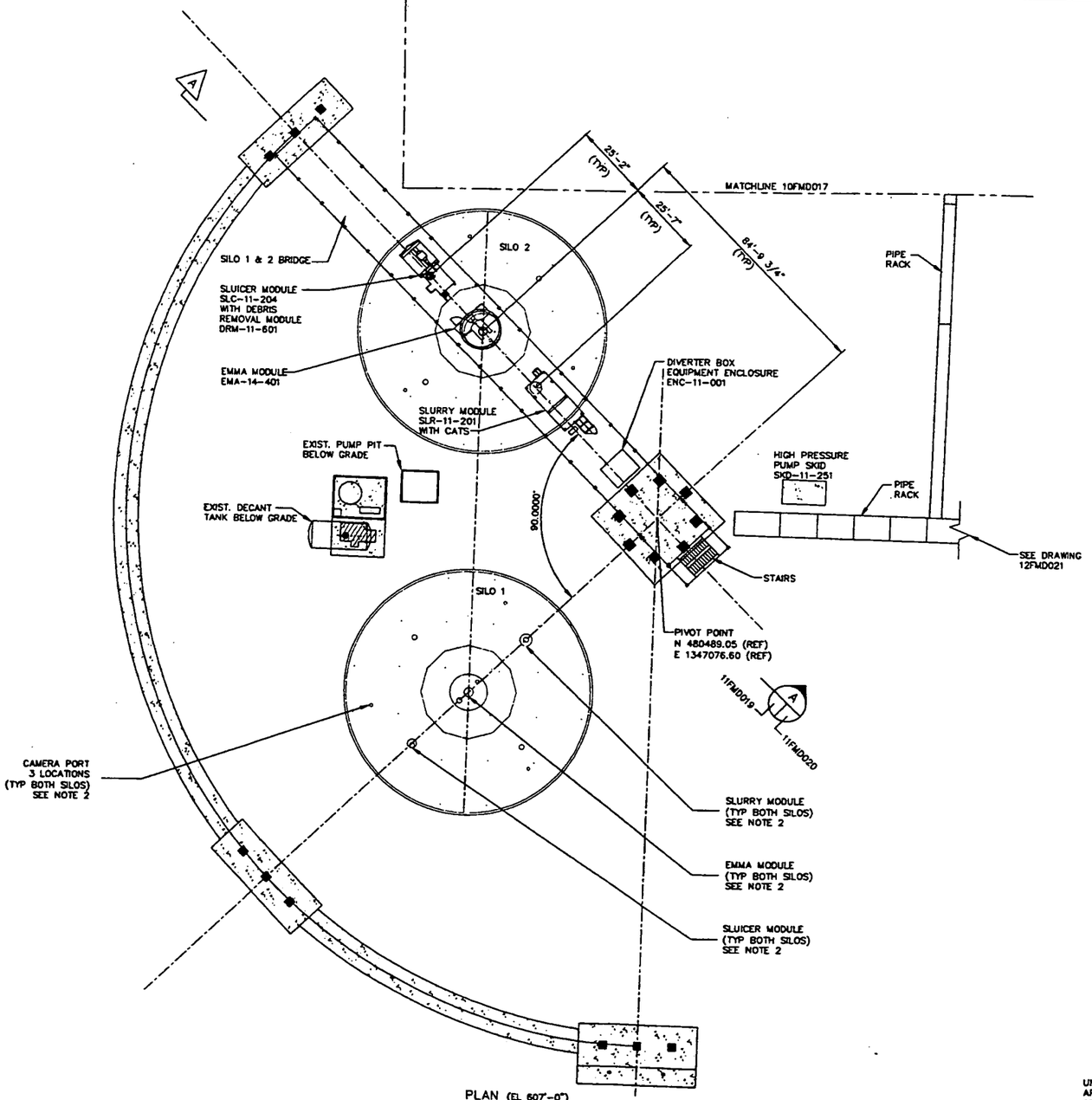
G:\CHARGE\FD\[illegible]\11FMD026.dwg Fri Jan 07 11:42:37 2000

STATE OF OHIO NORTH (NAD 83)

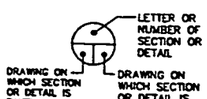
NOTES:

1. BRIDGE CRANE SHOWN IN SILO 2 OPERATION POSITION, SILO 1 IS SIMILAR.
2. FOR RISER DETAILS, SEE SILO PENETRATION AND RISER INSTALLATION PLAN, DOCUMENT NO. 624-P622-63

2905



PLAN (EL 607'-0")
SCALE: 1"=20'-0"



SECTION & DETAIL KEY

REFERENCE DRAWINGS:

05FMD010 GENERAL ARRANGEMENT KEY PLAN

000048

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
2	01/07/00	WCB	SWH		CERTIFIED FOR CONSTRUCTION
1	12/01/99	WCB	SWH		REVISED FOR NOZZLE LOCATIONS
0	11/99	WCB	SWH		PRELIMINARY DESIGN SUBMITTAL

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMPTY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

KENNETH R. FIELD REGISTERED PROFESSIONAL ENGINEER No. 103752 STATE OF TENNESSEE 01/07/00

DRAWN BY: DATE 01/07/00
DESIGNED BY: DATE 01/07/00
CHECKED BY: DATE 01/01/00
APPROVED BY: DATE 01/07/00
APPROVED BY: DATE 01/01/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
SILO WASTE RETRIEVAL SYSTEM
GENERAL ARRANGEMENT
SILO 1 & 2 BRIDGE

SIZE D | SCALE: 1"=20'-0" | DWG. NO. 11FMD019 | REV 2

FILENAME: 11FMD019.DWG

XREF DRAWINGS: 10FMD010.DWG 60-P606.DWG 60-C051.DWG

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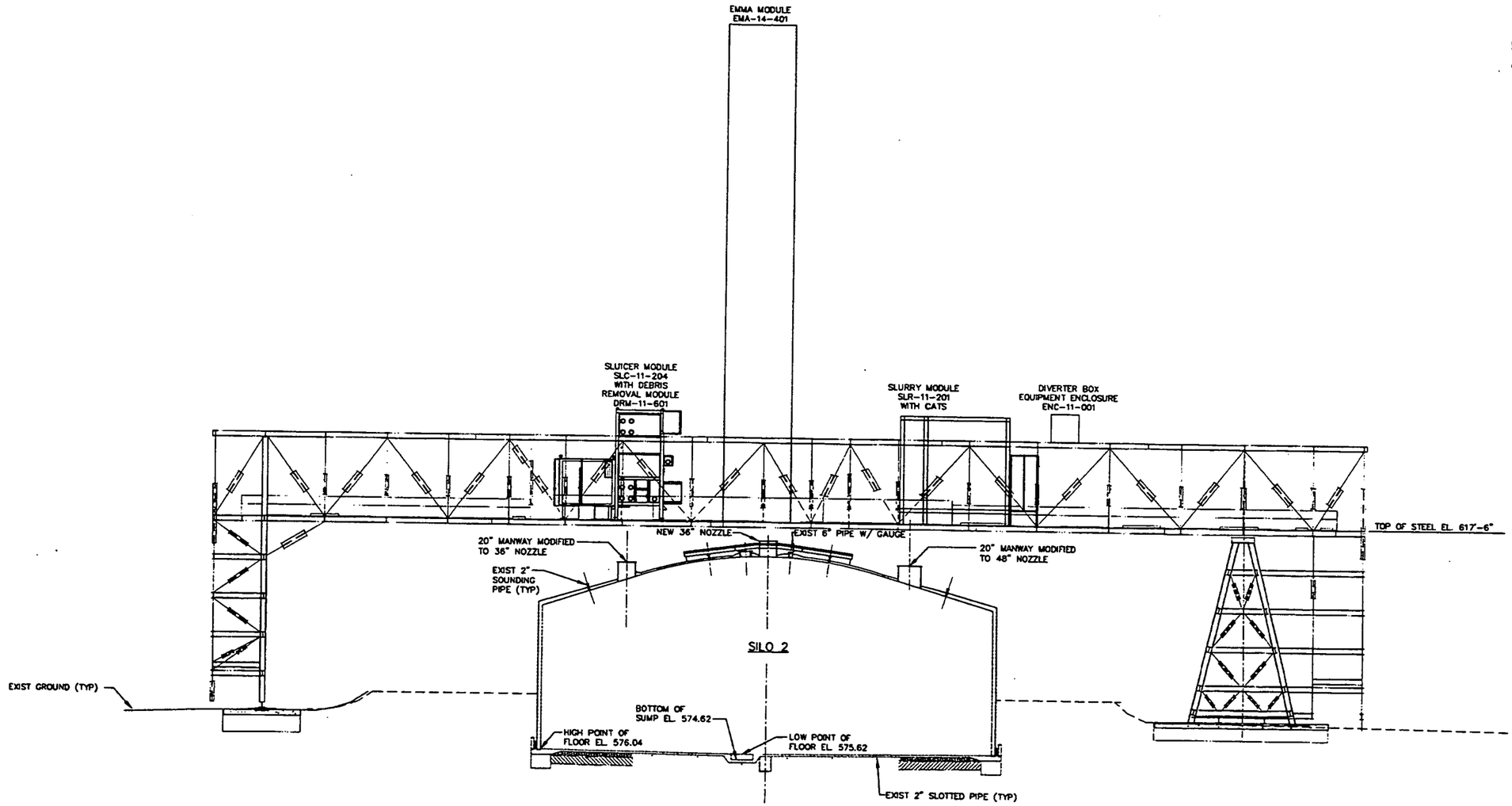
2905



A SECTION
SCALE: 1"=10'-0"
11FMD019 — 11FMD020

000049

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

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

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
2	01/07/00	WCB	JJN	KSR	CERTIFIED FOR CONSTRUCTION
1	12/01/99	WCB	SWH		REVISED FOR NOZZLE LOCATIONS
0	11/99	WCB	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RUSSELL, REGISTERED PROFESSIONAL ENGINEER, NO. 100743, STATE OF TENNESSEE

		DATE
DRAWN BY	WCB	01/07/00
DESIGNED BY	WCB	01/07/00
CHECKED BY	JJN	01/07/00
APPROVED BY	KSR	01/07/00
APPROVED BY	[illegible]	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

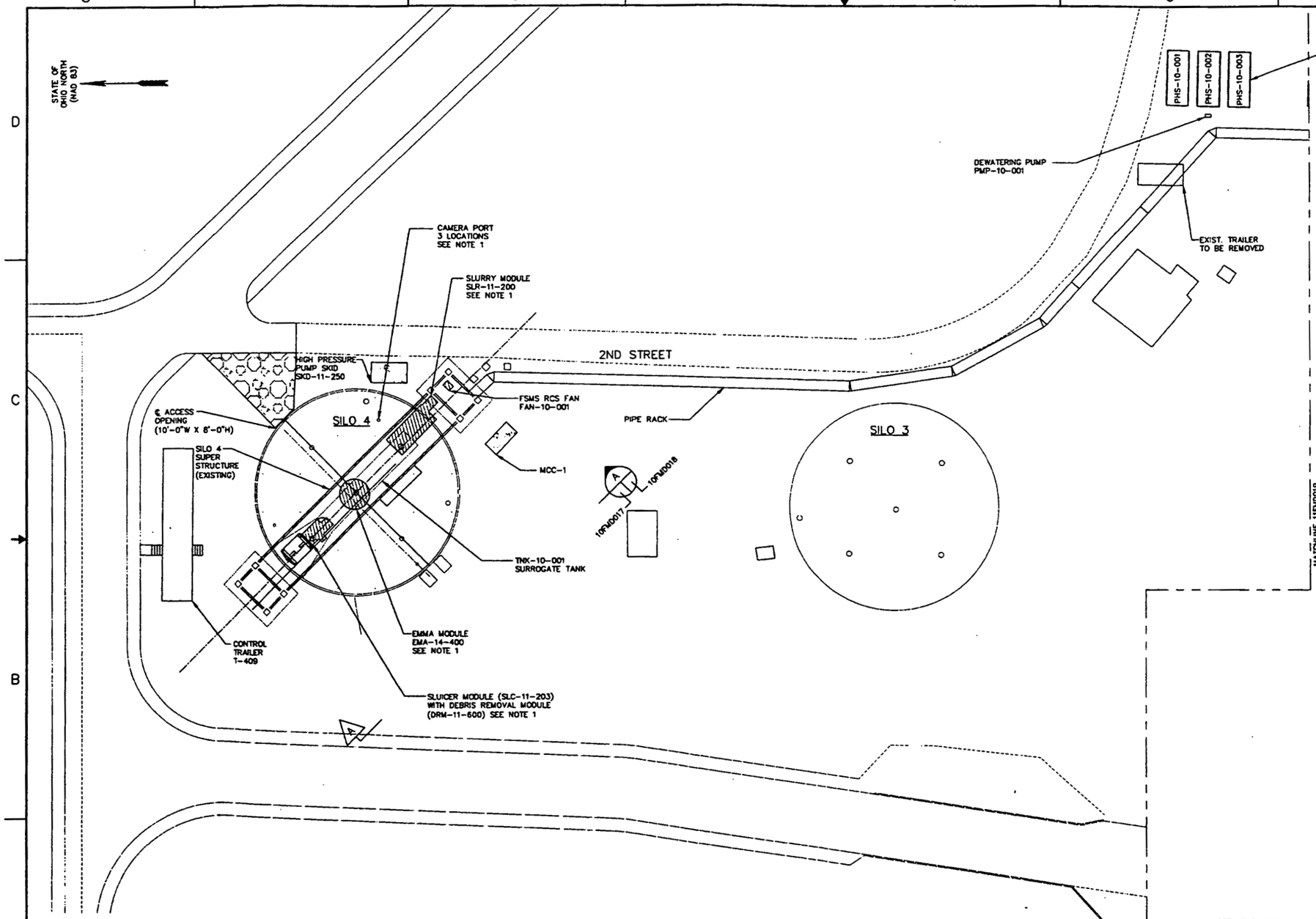
TITLE
SILO WASTE RETRIEVAL SYSTEM
GENERAL ARRANGEMENT
SILO 1 & 2 BRIDGE

SIZE	SCALE:	DWG. NO.	REV
D	1"=10'-0"	11FMD020	2

FILENAME: 11FMD020.DWG

G:\DWG\...\11FMD020.dwg Fri Jan 07 11:14:42 2000

2905



NOTES:

1. FOR RISER DETAILS, SEE SILO PENETRATION AND RISER INSTALLATION PLAN, DOCUMENT NO. 624-P622-63

REFERENCE DRAWINGS:

05FMD010 GENERAL ARRANGEMENT KEY PLAN

000050

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

LETTER OR NUMBER OF SECTION OR DETAIL

DRAWING ON WHICH SECTION OR DETAIL IS TAKEN

DRAWING ON WHICH SECTION OR DETAIL IS SHOWN

SECTION & DETAIL KEY

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
2	01/07/00				CERTIFIED FOR CONSTRUCTION
1	12/01/99	WCB	SWH		REVISED FOR NOZZLE LOCATIONS
0	11/99	WCB	RAR		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICHARDS, REGISTERED PROFESSIONAL ENGINEER, MECHANICAL, LICENSE NO. 105748, STATE OF TENNESSEE

DRAWN BY — DATE 01/07/00
DESIGNED BY — DATE 01/07/00
CHECKED BY — DATE 01/07/00
APPROVED BY — DATE 01/07/00
APPROVED BY — DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. PSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
FULL-SCALE MOCKUP SYSTEM
GENERAL ARRANGEMENT
SHEET 1 OF 2

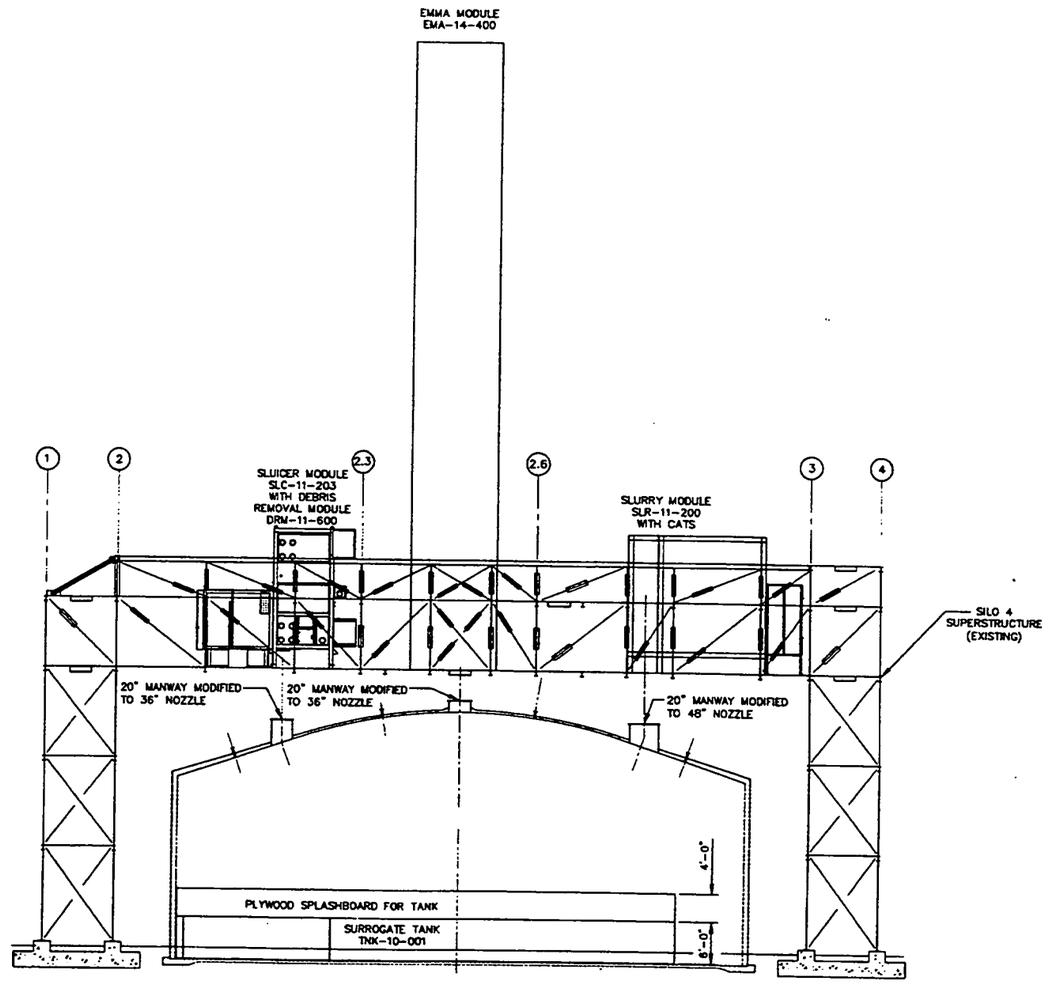
SIZE D | SCALE 1"=20'-0" | DWG. NO. 10FMD017 | REV 2

FILENAME: 10FMD017.DWG

G:\CHARGE\TD\SILOS\MECS\TS10\10fmd017.dwg Fri Jan 07 14:05:53 2000

XREF DWG NAME: 05FMD010.DWG
05-FMD-P.DWG
05-FMD-T.DWG

2905



A SECTION
SCALE: 1"=10'-0"
10FMD017 — 10FMD018

000051

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

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

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
2	01/07/00	WCB	SWH	JWR	CERTIFIED FOR CONSTRUCTION
1	12/01/99	WCB	SWH		REVISED FOR NOZZLE LOCATIONS
0	11/99	WCB	RAR		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICKETT, PROFESSIONAL ENGINEER, No. 103742, STATE OF TENNESSEE

DRAWN BY / DATE 01/07/00
DESIGNED BY / DATE 01/07/00
CHECKED BY / DATE 01/07/00
APPROVED BY / DATE 01/07/00
APPROVED BY / DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
FULL-SCALE MOCKUP SYSTEM
SECTION
SHEET 2 OF 2

SIZE D | SCALE: 1"=10'-0" | DWG. NO. 10FMD018 | REV 2

FILENAME: 10FMD018.DWG

G:\CADD\FDF\SILOS\SILO1\STS101\10FMD018.dwg Fri Jan 07 11:32:50 2000

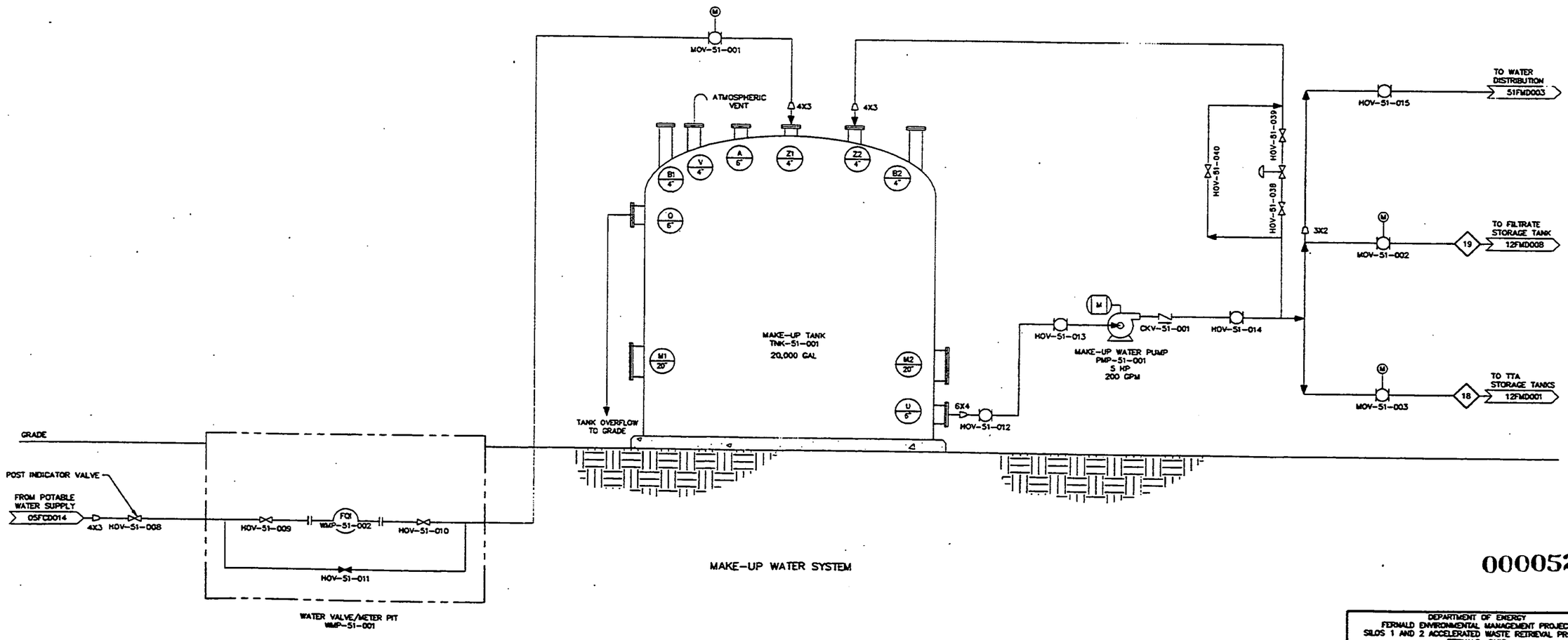
NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 11FMD001 & 11FMD002.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM - INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM - CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM - PIPING & EQUIPMENT IDENTIFICATION

2905



MAKE-UP WATER SYSTEM

000052

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
0	11/1/99	BLD			PRELIMINARY DESIGN PACKAGE

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DRAWN BY BLD DATE 11/01/99
DESIGNED BY BLD DATE 11/01/99
CHECKED BY DATE 11/1/99
APPROVED BY DATE
APPROVED BY DATE

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
POTABLE/DOMESTIC WATER SYS
PROCESS FLOW DIAGRAM
MAKE-UP WATER

SIZE	SCALE:	DWG. NO.	REV
D	NONE	51FMD001	0

FILENAME: 51FMD001.DWG

G:\CADAC\FDF311\dwg=C:\SYS311\51fmd001.dwg Tue Oct 26 22:30:23 1999

2905

PHASE 1 – SILO 1 AND SILO 2 HEADSPACE REDUCTION

STREAM NUMBER	1	2	3	4	5	6	6A	7	8	9	9A
COMPONENT	AIR FLOW FROM SILO 1	AIR FLOW FROM SILO 2	AIR FLOW FROM TTA	AIR TO CHILLER	AIR TO CARBON BED	AIR FROM CARBON BED	FAN INLET (TREATED GAS + FAN RECYCLE + MAKEUP)	AIR TO SILO 1	AIR TO SILO 2	MAKEUP AIR TO TTA	RECYCLE AIR TO TTA
AIR (LBS/HR)	1080.37	1080.37	--	2160.73	2160.73	2160.73	3152.55	1010.72	1010.72	--	--
WATER (LBS/HR)	20.34	20.34	--	40.68	1.66	1.66	7.88	2.48	2.48	--	--
TOTAL (LBS/HR)	1100.71	1100.71	--	2201.41	2162.39	2162.39	3160.43	1013.20	1013.20	--	--
FLOW (CFM)	250.00	250.00	--	500.00	454.00	454.00	678.00	227.00	227.00	--	--
FLOW (GPM)	--	--	--	--	--	--	--	--	--	--	--
RADON (PICOCURIES/L)	252195	249620	--	250907	276250	27	24	24	24	--	--
RADON (CURIES/HR)	1.07E-01	1.06E-01	--	2.13E-01	2.13E-01	2.08E-05	2.78E-05	9.29E-06	9.29E-06	--	--
TEMPERATURE (DEG F)	75	75	--	75	40	40	51	73	73	--	--
PRESSURE (INCHES WC)	--	--	--	--	--	--	--	--	--	--	--
NOTES	RELATIVE HUMIDITY= 100% RADON CONCENTRATION STEADY STATE	RELATIVE HUMIDITY= 100% RADON CONCENTRATION STEADY STATE	TTA NOT FUNCTIONAL IN PHASE 1	FLOW REPRESENTS SILOS 1 AND 2	CHILLER CONDITIONS AIR TO 40F AND 15% RELATIVE HUMIDITY	RADON REMOVAL BASED ON K=13 AND 4 CARBON BEDS	FLOW IS CARBON BED EXHAUST PLUS FAN RECYCLE FLOW + MAKEUP AIR. INCL. FAN HEAT			TTA NOT FUNCTIONAL IN PHASE 1	TTA NOT FUNCTIONAL IN PHASE 1

STREAM NUMBER	10	11	12	13	14	15	16	17	18	19	20
COMPONENT	CONDENSATE TO HOLD-UP TANKS	AIR FROM FUTURE WASTE TREATMENT AREA	RCS TO STACK	BUILDING VENT TO STACK	AIR TO STACK	FAN RECYCLE FLOW	MAKE-UP AIR	CONDENSATE TO FILTRATE TANKS	EQUIPMENT ENCLOSURE AIR INFLOW	EQUIPMENT ENCLOSURE AIR INFLOW	EQUIPMENT ENCLOSURE AIR INFLOW
AIR (LBS/HR)	--	--	222.56	39422	39644.56	760.61	231.21	--	--	--	--
WATER (LBS/HR)	39.02	--	0.55	737	737.55	1.87	4.35	25037.46	--	--	--
TOTAL (LBS/HR)	39.02	--	223.11	40159	40382.11	762.47	235.56	25037.46	--	--	--
FLOW (CFM)	--	--	50.00	9100.00	9150.00	171.00	54.00	--	--	--	--
FLOW (GPM)	0.08	--	--	--	--	--	--	50.00	--	--	--
RADON (PICOCURIES/L)	138043	--	24	0	0	24	0	2443	--	--	--
RADON (CURIES/HR)	2.44E-06	--	2.05E-06	0.00E+00	2.05E-06	6.99E-06	0.00E+00	2.08E-05	--	--	--
TEMPERATURE (DEG F)	40	--	73	75	75	73	75	--	--	--	--
PRESSURE (INCHES WC)	--	--	--	--	--	--	--	--	--	--	--
NOTES		FUTURE WASTE TREATMENT AREA NOT FUNCTIONAL IN PHASE 1	RELATIVE HUMIDITY= 14.2%	NOTE 2	RELATIVE HUMIDITY= 99.5%	FLOW ENTERS FAN SUCTION AFTER CARBON BEDS		INTERMITTENT FLOW; DECAYED BY STORAGE	EQUIPMENT ENCLOSURES NOT INSTALLED IN PHASE 1	EQUIPMENT ENCLOSURES NOT INSTALLED IN PHASE 1	EQUIPMENT ENCLOSURES NOT INSTALLED IN PHASE 1

PHASE 2A – SILO 2 RETRIEVAL, SILO 1 HEADSPACE REDUCTION, TTA VENTILATION

STREAM NUMBER	1	2	3	4	5	6	6A	7	8	9	9A
COMPONENT	AIR FLOW FROM SILO 1	AIR FLOW FROM SILO 2	AIR FLOW FROM TTA	AIR TO CHILLER	AIR TO CARBON BED	AIR FROM CARBON BED	FAN INLET (TREATED GAS + FAN RECYCLE + MAKEUP)	AIR TO SILO 1	AIR TO SILO 2	MAKEUP AIR TO TTA	RECYCLE AIR TO TTA
AIR (LBS/HR)	1080.37	1080.37	1080.37	3241.10	3241.10	3241.10	4666.95	--	1015.52	1080.37	--
WATER (LBS/HR)	20.34	20.34	20.34	61.03	2.49	2.49	3.44	--	0.68	20.34	--
TOTAL (LBS/HR)	1100.71	1100.71	1100.71	3302.12	3243.59	3243.59	4670.40	--	1016.20	1100.71	--
FLOW (CFM)	250.00	250.00	250.00	750.00	681.00	681.00	1000.00	--	227.00	250.00	--
FLOW (GPM)	--	--	--	--	--	--	--	--	--	--	--
RADON (PICOCURIES/L)	1665166	251837	272500	729768	803478	1701	1701	--	1701	0	--
RADON (CURIES/HR)	0.707	0.107	0.116	9.30E-01	9.30E-01	1.97E-03	2.89E-03	--	6.56E-04	0.00E+00	--
TEMPERATURE (DEG F)	75	75	75	75	40	40	51	--	73	75	--
PRESSURE (INCHES WC)	--	--	--	--	--	--	--	--	--	--	--
NOTES	RELATIVE HUMIDITY=100 % RADON CONCENTRATION STEADY STATE	RELATIVE HUMIDITY=100 % RADON CONCENTRATION STEADY STATE	RELATIVE HUMIDITY=100 % RADON CONCENTRATION STEADY STATE	FLOW REPRESENTS SILOS 1 AND 2 PLUS TTA	CHILLER CONDITIONS AIR TO 40F AND 15% RELATIVE HUMIDITY	RADON REMOVAL BASED ON K=13 AND 4 CARBON BEDS	FLOW IS CARBON BED EXHAUST PLUS FAN RECYCLE FLOW + MAKEUP AIR. INCL. FAN HEAT	NO RECYCLE FLOW TO SILO1 IN PHASE 2A		NO FLOW IN STREAM 9 DURING RECIRC OF TTA	9A FLOW EQUAL TO STREAM 8 DURING RECIRC OF TTA

STREAM NUMBER	10	11	12	13	14	15	16	17	18	19	20
COMPONENT	CONDENSATE TO HOLD-UP TANKS	AIR FROM FUTURE WASTE TREATMENT AREA	RCS TO STACK	BUILDING VENT TO STACK	AIR TO STACK	FAN RECYCLE FLOW	MAKE-UP AIR	CONDENSATE TO FILTRATE TANKS	EQUIPMENT ENCLOSURE AIR INFLOW	EQUIPMENT ENCLOSURE AIR INFLOW	EQUIPMENT ENCLOSURE AIR INFLOW
AIR (LBS/HR)	--	--	2031.06	39422	41453.06	1425.84	0.00	--	360.12	360.12	360.12
WATER (LBS/HR)	58.54	--	1.36	737	738.36	0.95	0.00	25037.46	6.78	6.78	6.78
TOTAL (LBS/HR)	58.54	--	2032.41	40159	42191.11	1426.79	0.00	25037.46	366.90	366.90	366.90
FLOW (CFM)	--	--	454.00	9100.00	9554.00	319.00	0.00	--	83.00	83.00	83.00
FLOW (GPM)	0.12	--	--	--	--	--	--	50.00	--	--	--
RADON (PICOCURIES/L)	401500	--	1701	0	90	1701	0	7106	0	.0	0
RADON (CURIES/HR)	1.07E-05	--	1.31E-03	0.00E+00	1.31E-03	9.21E-04	0.00E+00	8.07E-05	0.00E+00	0.00E+00	0.00E+00
TEMPERATURE (DEG F)	40	--	73	75	75	73	75	--	75	75	75
PRESSURE (INCHES WC)	--	--	--	--	--	--	--	--	--	--	--
NOTES		FUTURE WASTE TREATMENT AREA NOT FUNCTIONAL IN PHASE 2	RELATIVE HUMIDITY=4.4%	NOTE 2	RELATIVE HUMIDITY= 95.1%			INTERMITTENT FLOW; DECAYED BY STORAGE	SILO 1	SILO 1	SILO 1

PHASE 2B – SILO 1 RETRIEVAL, TTA VENTILATION

STREAM NUMBER	1	2	3	4	5	6	6A	7	8	9	9A
COMPONENT	AIR FLOW FROM SILO 1	AIR FLOW FROM SILO 2	AIR FLOW FROM TTA	AIR TO CHILLER	AIR TO CARBON BED	AIR FROM CARBON BED	FAN INLET (TREATED GAS + FAN RECYCLE + MAKEUP)	AIR TO SILO 1	AIR TO SILO 2	MAKEUP AIR TO TTA	RECYCLE AIR TO TTA
AIR (LBS/HR)	--	1080.37	2160.73	3241.10	3241.10	3241.10	4666.95	--	--	2160.73	--
WATER (LBS/HR)	--	20.34	40.68	61.03	2.49	2.49	3.44	--	--	40.68	--
TOTAL (LBS/HR)	--	1100.71	2201.41	3302.12	3243.59	3243.59	4670.40	--	--	2201.41	--
FLOW (CFM)	--	250.00	500.00	750.00	681.00	681.00	1000.00	--	--	500.00	--
FLOW (GPM)	--	--	--	--	--	--	--	--	--	--	--
RADON (PICOCURIES/L)	--	912497	211373	445081	490036	1038	1038	--	--	0	--
RADON (CURIES/HR)	--	3.88E-01	1.80E-01	5.67E-01	5.67E-01	1.20E-03	1.76E-03	--	--	0.00E+00	--
TEMPERATURE (DEG F)	--	75	75	75	40	40	51	--	--	75	--
PRESSURE (INCHES WC)	--	--	--	--	--	--	--	--	--	--	--
NOTES	NO FLOW FROM SILO 1 IN PHASE 2B	RELATIVE HUMIDITY=100% RADON CONCENTRATION STEADY STATE	RELATIVE HUMIDITY=100% RADON CONCENTRATION STEADY STATE	FLOW REPRESENTS SILOS 1 AND 2 PLUS TTA	CHILLER CONDITIONS AIR TO 40F AND 15% RELATIVE HUMIDITY	RADON REMOVAL BASED ON K=13 AND 4 CARBON BEDS	FLOW IS CARBON BED EXHAUST + FAN RECYCLE FLOW + MAKEUP AIR. INCL. FAN HEAT	NO RECYCLE FLOW TO SILOS IN PHASE 2B	NO RECYCLE FLOW TO SILOS IN PHASE 2B	NO FLOW IN STREAM 9 DURING RECIRC OF TTA	9A FLOW EQUALS 2X STREAM 8 IN PHASE 2A DURING RECIRC OF TTA

STREAM NUMBER	10	11	12	13	14	15	16	17	18	19	20
COMPONENT	CONDENSATE TO HOLD-UP TANKS	AIR FROM FUTURE WASTE TREATMENT AREA	RCS TO STACK	BUILDING VENT TO STACK	AIR TO STACK	FAN RECYCLE FLOW	MAKE-UP AIR	CONDENSATE TO FILTRATE TANKS	EQUIPMENT ENCLOSURE AIR INFLOW	EQUIPMENT ENCLOSURE AIR INFLOW	EQUIPMENT ENCLOSURE AIR INFLOW
AIR (LBS/HR)	--	--	3046.56	39422	42469.56	1425.85	0.00	--	360.12	360.12	360.12
WATER (LBS/HR)	58.54	--	2.04	737	739.04	0.95	0.00	25037.46	6.78	6.78	6.78
TOTAL (LBS/HR)	58.54	--	3048.60	40159	43207.60	1426.80	0.00	25037.46	366.90	366.90	366.90
FLOW (CFM)	--	--	681.00	9100	9781.00	319.00	0.00	--	83.00	83.00	83.00
FLOW (GPM)	0.12	--	--	--	--	--	--	50.00	--	--	--
RADON (PICOCURIES/L)	244872	--	1038	0	81	1038	0	4334	0	0	0
RADON (CURIES/HR)	6.50E-06	--	1.20E-03	0.00E+00	1.20E-03	5.62E-04	0.00E+00	4.92E-05	0.00E+00	0.00E+00	0.00E+00
TEMPERATURE (DEG F)	40	--	73	75	75	73	75	--	75	75	75
PRESSURE (INCHES WC)	--	--	--	--	--	--	--	--	--	--	--
NOTES		FUTURE WASTE TREATMENT AREA NOT FUNCTIONAL IN PHASE 2B	RELATIVE HUMIDITY=4.4%	NOTE 2	RELATIVE HUMIDITY= 92.8%			INTERMITTENT FLOW; DECAYED BY STORAGE	SILO 2	SILO 2	SILO 2

000053

NOTES:

1. FOR FLOW DIAGRAMS SEE DRAWINGS 20FMD003, 20FMD004, & 20FMD005.
2. STREAM 13 FLOW FROM 77FMD002.

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	[illegible]	[illegible]	[illegible]	[illegible]	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	KR		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICKETT — STATE OF TENNESSEE — No. 103742

DRAWN BY [signature] DATE 01/01/00
DESIGNED BY [signature] DATE 01/01/00
CHECKED BY [signature] DATE 01/01/00
APPROVED BY Kenneth Rickett DATE 01/07/00
APPROVED BY [signature] DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE: RADON CONTROL SYSTEM PROCESS FLOW DIAGRAM MASS BALANCE TABLES – SHT 1

SIZE: D | SCALE: NONE | DWG. NO. 20FMD001 | REV 1

FILENAME: 20FMD001.DWG

2905

PHASE 2C – TTA VENTILATION

STREAM NUMBER	1	2	3	4	5	6	6A	7	8	9	9A	10	11	12	13	14	15	16	17	18	19	20	21
COMPONENT	AIR FLOW FROM SILO 1	AIR FLOW FROM SILO 2	AIR FLOW FROM TTA	AIR TO CHILLER	AIR TO CARBON BED	AIR FROM CARBON BED	FAN INLET (TREATED GAS + FAN RECYCLE + MAKEUP)	AIR TO SILO 1	AIR TO SILO 2	MAKEUP AIR TO TTA	RECYCLE AIR TO TTA	CONDENSATE TO HOLD-UP TANKS	AIR FROM FUTURE WASTE TREATMENT AREA	RCS TO STACK	BUILDING VENT TO STACK	AIR TO STACK	FAN RECYCLE FLOW	MAKE-UP AIR	CONDENSATE TO FILTRATE TANKS	EQUIPMENT ENCLOSURE AIR INFLOW	EQUIPMENT ENCLOSURE AIR INFLOW	EQUIPMENT ENCLOSURE AIR INFLOW	AIR FLOW FROM DECANT SUMP
AIR (LBS/HR)	--	--	2160.73	2160.73	2160.73	2160.73	3146.67	--	--	2160.73	--	--	--	2027.15	39422	41449.15	985.92	0.00	--	--	--	--	360.12
WATER (LBS/HR)	--	--	40.68	40.68	1.66	1.66	2.35	--	--	40.68	--	39.02	--	1.41	737	738.41	0.69	0.00	25037.46	--	--	--	6.78
TOTAL, (LBS/HR)	--	--	2201.41	2201.41	2162.39	2162.39	3149.02	--	--	2201.41	--	39.02	--	2028.56	40159	42187	986.61	0.00	25037.46	--	--	--	366.90
FLOW (CFM)	--	--	500.00	500.00	454.00	454.00	675.00	--	--	500.00	--	--	--	454.00	9100.00	9554.00	221.00	0.00	--	--	--	--	83.00
FLOW (GPM)	--	--	--	--	--	--	--	--	--	--	--	0.08	--	--	--	--	--	--	50.00	--	--	--	--
RADON (PICOCURIES/L)	--	--	211373	211373	232723	23	23	--	--	0	--	116292	--	23	0	1	23	0	2058	--	--	--	--
RADON (CURIES/HR)	--	--	1.80E-01	1.80E-01	1.80E-01	1.75E-05	2.60E-05	--	--	0.00E+00	--	2.06E-06	--	1.75E-05	0.00E+00	1.75E-05	8.51E-06	0.00E+00	1.75E-05	--	--	--	--
TEMPERATURE (DEG F)	--	--	75	75	40	40	51	--	--	75	--	40	--	73	75	75	73	75	--	--	--	--	75
PRESSURE (INCHES WC)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NOTES	NO FLOW FROM SILO IN PHASE 2C	NO FLOW FROM SILO IN PHASE 2C		FLOW REPRESENTS WTA PLUS TTA	CHILLER CONDITIONS AIR TO 40F AND 15% RELATIVE HUMIDITY	RADON REMOVAL BASED ON K=13 AND 4 CARBON BEDS	FLOW IS CARBON BED EXHAUST PLUS FAN RECYCLE FLOW + MAKEUP AIR. INCL. FAN HEAT	NO FLOW TO SILOS IN PHASE 2C	NO FLOW TO SILOS IN PHASE 2C	NO FLOW IN STREAM 9 DURING RECIRC OF TTA	9A FLOW EQUALS 2X STREAM 8 IN PHASE 2A DURING RECIRC OF TTA		FUTURE WASTE TREATMENT NOT FUNCTIONAL IN PHASE 2C	RELATIVE HUMIDITY=4.4%	NOTE 2	RELATIVE HUMIDITY= 95.1%			INTERMITTENT FLOW: DECAYED BY STORAGE	EQUIPMENT ENCLOSURES NOT INSTALLED IN PHASE 2C	EQUIPMENT ENCLOSURES NOT INSTALLED IN PHASE 2C	EQUIPMENT ENCLOSURES NOT INSTALLED IN PHASE 2C	DECANT SUMP NOTE 3

PHASE 3 – TTA VENTILATION, FUTURE WASTE TREATMENT

STREAM NUMBER	1	2	3	4	5	6	6A	7	8	9	9A	10	11	12	13	14	15	16	17	18	19	20
COMPONENT	AIR FLOW FROM SILO 1	AIR FLOW FROM SILO 2	AIR FLOW FROM TTA	AIR TO CHILLER	AIR TO CARBON BED	AIR FROM CARBON BED	FAN INLET (TREATED GAS + FAN RECYCLE + MAKEUP)	AIR TO SILO 1	AIR TO SILO 2	MAKEUP AIR TO TTA	RECYCLE AIR TO TTA	CONDENSATE TO HOLD-UP TANKS	AIR FROM FUTURE WASTE TREATMENT AREA	RCS TO STACK	BUILDING VENT TO STACK	AIR TO STACK	FAN RECYCLE FLOW	MAKE-UP AIR	CONDENSATE TO FILTRATE TANKS	EQUIPMENT ENCLOSURE AIR INFLOW	EQUIPMENT ENCLOSURE AIR INFLOW	EQUIPMENT ENCLOSURE AIR INFLOW
AIR (LBS/HR)	--	--	2160.73	4321.46	4321.46	4321.46	4321.46	--	--	2160.73	--	--	2160.73	4139.64	39422	43561.64	0.00	0.00	--	--	--	--
WATER (LBS/HR)	--	--	40.68	81.37	3.32	3.32	3.32	--	--	40.68	--	78.05	40.68	2.95	737	739.95	0.00	0.00	25037.46	--	--	--
TOTAL, (LBS/HR)	--	--	2201.41	4402.83	4324.78	4324.78	4324.78	--	--	2201.41	--	78.05	2201.41	4142.58	40159	44301.58	0.00	0.00	25037.46	--	--	--
FLOW (CFM)	--	--	500.00	1000.00	908.00	908.00	908.00	--	--	500.00	--	--	500.00	908.00	9100.00	10008.00	0.00	0.00	--	--	--	--
FLOW (GPM)	--	--	--	--	--	--	--	--	--	--	--	0.16	--	--	--	--	--	--	50.00	--	--	--
RADON (PICOCURIES/L)	--	--	710019	565009	622078	6140	6140	--	--	0	--	310854	420000	6140	0	619	0	0	5501	--	--	--
RADON (CURIES/HR)	--	--	6.03E-01	9.60E-01	9.60E-01	9.47E-03	9.47E-03	--	--	0.00E+00	--	1.10E-05	3.57E-01	9.47E-03	0.00E+00	9.47E-03	0.00E+00	0.00E+00	6.25E-05	--	--	--
TEMPERATURE (DEG F)	--	--	75	75	40	40	40	--	--	75	--	40	75	62	75	75	62	75	--	--	--	--
PRESSURE (INCHES WC)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NOTES	NO FLOW FROM SILO IN PHASE 3	NO FLOW FROM SILO IN PHASE 3		FLOW REPRESENTS WTA PLUS TTA	CHILLER CONDITIONS AIR TO 40F AND 15% RELATIVE HUMIDITY	RADON REMOVAL BASED ON K=13 AND 4 CARBON BEDS	FLOW IS CARBON BED EXHAUST PLUS FAN RECYCLE FLOW + MAKEUP AIR. INCL. FAN HEAT	NO FLOW TO OR FROM SILOS IN PHASE 3	NO FLOW TO OR FROM SILOS IN PHASE 3	NO FLOW IN STREAM 9 DURING RECIRULCLATION OF TTA	9A FLOW EQUALS 2X STREAM 8 IN PHASE 2A DURING RECIRC OF TTA			RELATIVE HUMIDITY=6.4%	NOTE 2	RELATIVE HUMIDITY= 93.9%	NO FAN RECYCLE IN PHASE 3			EQUIPMENT ENCLOSURES NOT INSTALLED IN PHASE 3	EQUIPMENT ENCLOSURES NOT INSTALLED IN PHASE 3	EQUIPMENT ENCLOSURES NOT INSTALLED IN PHASE 3

NOTES:

1. FOR FLOW DIAGRAMS SEE DRAWINGS 50FMD003, 50FMD004, & 50FMD005.
2. STREAM 13 ORIGINATES ON 77FMD002.
3. STREAM 21 IN PHASE 2C – FOR INFORMATION ONLY – NOT INCLUDED IN OVERALL MASS BALANCE DUE TO DURATION OF DECANT SUMP ACTIVITIES BEING LESS THAN ONE WEEK WITH LIMITED KNOWLEDGE OF RADON CONCENTRATIONS IN TANK.

000054

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD	KR		CERTIFIED FOR CONSTRUCTION
0	11/03/99	BJD	KR		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. ROBERTS, REGISTERED ENGINEER, STATE OF TENNESSEE, NO. 105748

DRAWN BY / DATE 01/07/00
DESIGNED BY / DATE 01/07/00
CHECKED BY / DATE 01/07/00
APPROVED BY / DATE 01/07/00
APPROVED BY / DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 824

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
RADON CONTROL SYSTEM
PROCESS FLOW DIAGRAM
MASS BALANCE TABLES – SHT 2

SIZE D | SCALE: NONE | DWG. NO. 20FMD002 | REV 1

FILENAME: 20FMD002.DWG

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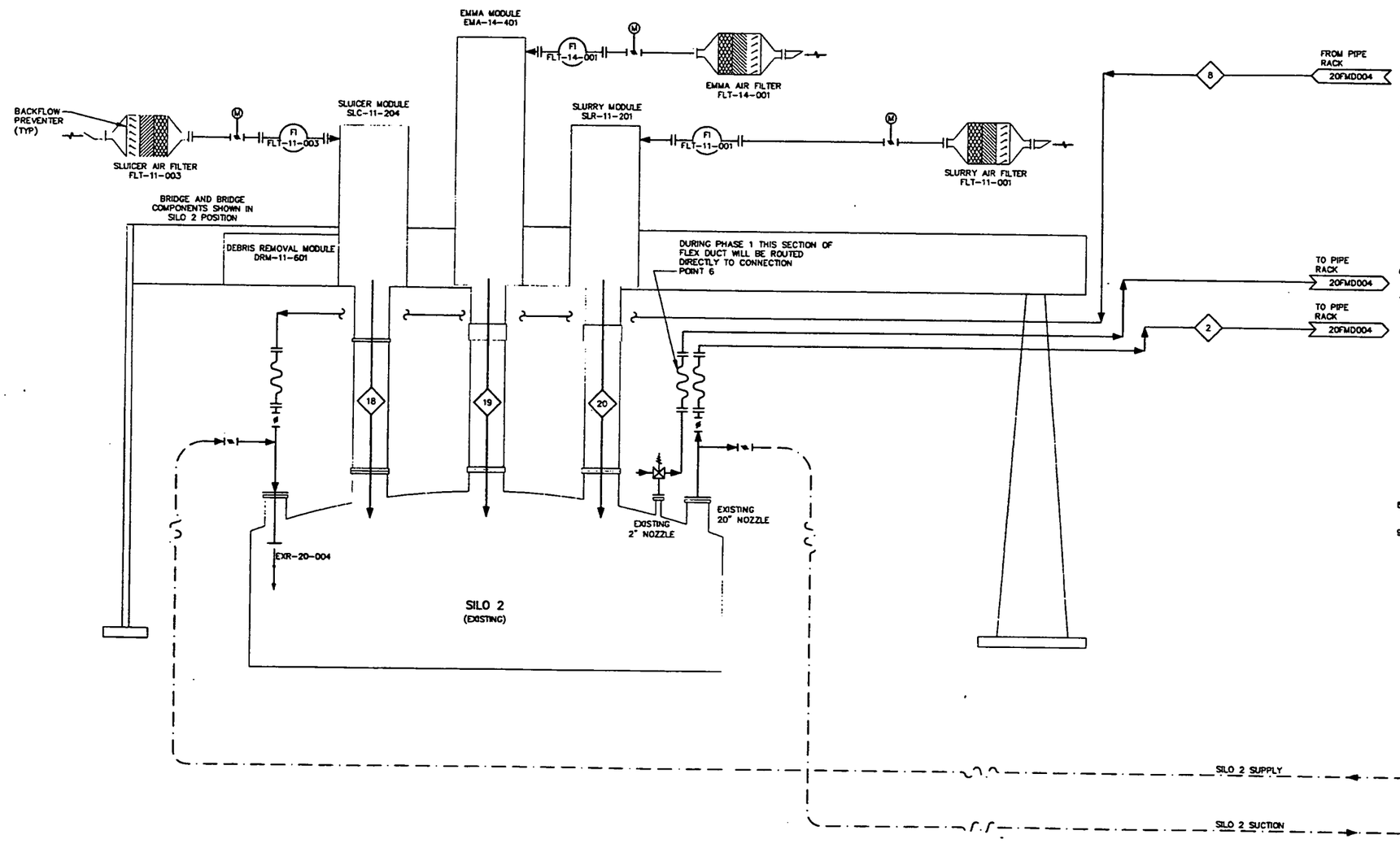

NOTES:

2905

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWINGS 20FMD001 & 20FMD002.
3. THE SEQUENCE OF OPERATION OF SILOS IS DIVIDED INTO PHASE 1, PHASE 2A, & PHASE 2B.
4. DURING PHASE 1, THE RCS SUCTION LINES FROM SILO 1 & 2 WILL BE FLEXIBLE DUCTING ROUTED OVER BERM TO A LOW-POINT CONDENSATE TRAP AND THEN CONNECTED TO THE RIGID RCS DUCTING ON PIPE RACK (SEE CONNECTION POINTS 1 & 4 ON DRAWINGS 20FMD004 AND 20FMD013). THE RCS SUPPLY DUCTING WILL BE FLEXIBLE DUCTING ROUTED OVER BERM THEN CONNECTED TO THE RIGID RCS DUCTING ON A PIPE RACK (SEE CONNECTION POINTS 2 & 3 ON DRAWINGS 20FMD004 AND 20FMD013). THE PRESSURE RELIEF DUCTING WILL BE FLEX ROUTED OVER BERM THEN CONNECTED TO THE RIGID RCS DUCTING ON PIPE RACK (SEE CONNECTION POINTS 7 & 6 ON DRAWINGS 20FMD004 AND 20FMD013).
5. DURING PHASE 2A, THE BRIDGE WILL BE POSITIONED OVER SILO 1. BOTH THE RCS SUPPLY AND SUCTION DUCTS FROM SILO 1 WILL BE CONNECTED TO RIGID DUCTING, MOUNTED ON THE BRIDGE, BY MEANS OF A SHORT PIECE OF FLEXIBLE DUCTING. THE SUPPLY AND SUCTION DUCTING WILL BE ROUTED ON THE NEW BRIDGE AND CONNECTED TO THE RCS DUCTING ON THE PIPE RACK (SEE CONNECTION POINTS 2 & 1). THE PRESSURE RELIEF DUCTING FROM SILO 1 WILL BE CONNECTED TO RIGID DUCTING, MOUNTED ON THE BRIDGE BY MEANS OF A SHORT PIECE OF FLEXIBLE DUCTING. THE SUPPLY, SUCTION, AND PRESSURE RELIEF DUCTING WILL BE ROUTED ON THE NEW BRIDGE AND CONNECTED TO THE RCS DUCTING ON THE PIPE RACK (SEE CONNECTION POINTS 2, 1 & 7 ON DRAWINGS 20FMD004 AND 20FMD013).
6. DURING PHASE 2A SILO 2 WILL BE CONNECTED THE SAME WAY AS EXPLAINED IN PHASE 1 ABOVE (SEE NOTE 4).
7. DURING PHASE 2B THE BRIDGE WILL BE POSITIONED OVER SILO 2. BOTH THE RCS SUPPLY AND SUCTION DUCTS FROM SILO 2 WILL BE CONNECTED TO RIGID DUCTING, MOUNTED ON THE BRIDGE, BY MEANS OF A SHORT PIECE OF FLEXIBLE DUCTING. THE SUPPLY AND SUCTION DUCTING WILL BE ROUTED ON THE NEW BRIDGE AND CONNECTED TO THE RCS DUCTING ON THE PIPE RACK WITH A PIECE OF FLEXIBLE DUCTING. THE PRESSURE RELIEF DUCTING FROM SILO 2 WILL BE CONNECTED TO RIGID DUCTING, MOUNTED ON THE BRIDGE, BY MEANS OF A SHORT PIECE OF FLEXIBLE DUCTING.

   APPROPRIATE DAMPERS USED FOR SILO 1 VENTILATION DURING PHASE 2A WILL BE SHUT AND LOCKED CLOSED. EACH UNUSED DUCT WILL BE BLIND FLANGED TO PROVIDE ADDITIONAL SEALING.

   THE SUPPLY, SUCTION, AND PRESSURE RELIEF DUCTING WILL BE ROUTED ON THE NEW BRIDGE AND CONNECTED TO THE RCS DUCTING ON THE PIPE RACK (SEE CONECTION POINTS 3, 4, & 6 ON DRAWINGS 20FMD004 AND 20FMD013).
8. ALL RCS DUCTING DURING PHASES 2A & 2B WILL BE SLOPED TO THE TTA BUILDING.
9. SILO RCS SYSTEM WILL BE DISCONNECTED AND DWRS SYSTEM WILL BE CONNECTED (SEE CONNECTION POINT 5 ON DRAWINGS 20FMD004 AND 20FMD013). FLEX DUCT WILL BE REUSED FROM PREVIOUS OPERATIONS. EXISTING VALVES AND DAMPERS WILL BE USED TO ISOLATE ANY UNUSED CONNECTIONS TO THE RCS. BLIND FLANGES WILL COVER UNUSED CONNECTIONS.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

000055

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APRV'D	DESCRIPTION/ISSUE
1	01/07/00	BJD	JLA	KDF	CERTIFIED FOR CONSTRUCTION
0	01/01/00	BJD	KR		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. FUCKETT REGISTERED PROFESSIONAL ENGINEER NO. 100748 STATE OF TENNESSEE 01/07/00

DRAWN BY B.J. Davis DATE 01/07/00
DESIGNED BY B.J. Davis DATE 01/07/00
CHECKED BY J.L. Hunnicutt DATE 01/07/00
APPROVED BY Kenneth Fuckett DATE 01/07/00
APPROVED BY John Duncan DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC'624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
RADON CONTROL SYSTEM
PROCESS FLOW DIAGRAM
SILO 2

SIZE D | SCALE: NONE | DWG. NO. 20FMD003 | REV 1

FILENAME: 20FMD003.DWG

G:\DARE\FSILOS\RCS\SYS20\20fmd003.dwg Thu Jan 06 19:42:10 2000

2905

REMOVABLE SPOOL PIECES TO ALLOW BRIDGE ROTATION (TYP)

FROM RECIRCULATION FANS 20FMD010

TO SILO 2 20FMD003

EMMA MODULE EMA-14-401

FI FLT-14-001

EMMA AIR FILTER FLT-14-001

SLUICER MODULE SLC-11-204

SLURRY MODULE SLR-11-201

FI FLT-11-003

FI FLT-11-001

SLUICER AIR FILTER FLT-11-003

SLURRY AIR FILTER FLT-11-001

BACKFLOW PREVENTER (TYP)

BRIDGE AND BRIDGE COMPONENTS SHOWN IN SILO 1 POSITION

DEBRIS REMOVAL MODULE DRM-11-601

DURING PHASE 1 THIS SECTION OF FLEX DUCT WILL BE ROUTED DIRECTLY TO CONNECTION POINT 6

FROM SILO 2 20FMD003

FE SILO-20-001

FE SILO-20-002

TO TREATMENT SYSTEM 20FMD006

PIPE RACK TO TTA BUILDING

EXISTING 20" NOZZLE

EXR-20-005

EXISTING 2" NOZZLE

EXISTING 20" NOZZLE

SILO 1 (EXISTING)

SILO 1 SUCTION

SILO 1 SUPPLY

SILO 2 SUPPLY

SILO 2 SUCTION

CONDENSATE TRAP INSULATED, HEAT TRACED, AND SHIELDED

TO SILO 2 20FMD003

FROM SILO 2 20FMD003

CONDENSATE TRAP INSULATED, HEAT TRACED, AND SHIELDED

FROM DWRS SYSTEM 20FMD011

SEE NOTE 9

NOTES:

1. FOR NOTES SEE DRAWINGS 20FMD003, & 20FMD012.

LEGEND:

(1) = INDICATES CONNECTION POINTS FOR PIPING.

REFERENCE DRAWINGS:

05FMD001 PIPING & INSTRUMENT DIAGRAM - INSTRUMENT IDENTIFICATION

05FMD002 PIPING & INSTRUMENT DIAGRAM - CONTROL SYSTEM STANDARDS

05FMD003 PIPING & INSTRUMENT DIAGRAM - PIPING & EQUIPMENT IDENTIFICATION

000056

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD	JKH	KSR	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	KR		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICHARDS REGISTERED PROFESSIONAL ENGINEER NO. 103722 STATE OF TENNESSEE 01/07/00

		DATE
DRAWN BY	BJD	01/07/00
DESIGNED BY	BJD	01/07/00
CHECKED BY	JKH	01/07/00
APPROVED BY	Kenneth Richards	01/07/00
APPROVED BY	John Lawson	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
RADON CONTROL SYSTEM
PROCESS FLOW DIAGRAM
SILO 1

SIZE	SCALE:	DWG. NO.	REV
D	NONE	20FMD004	1

FILENAME: 20FMD004.DWG

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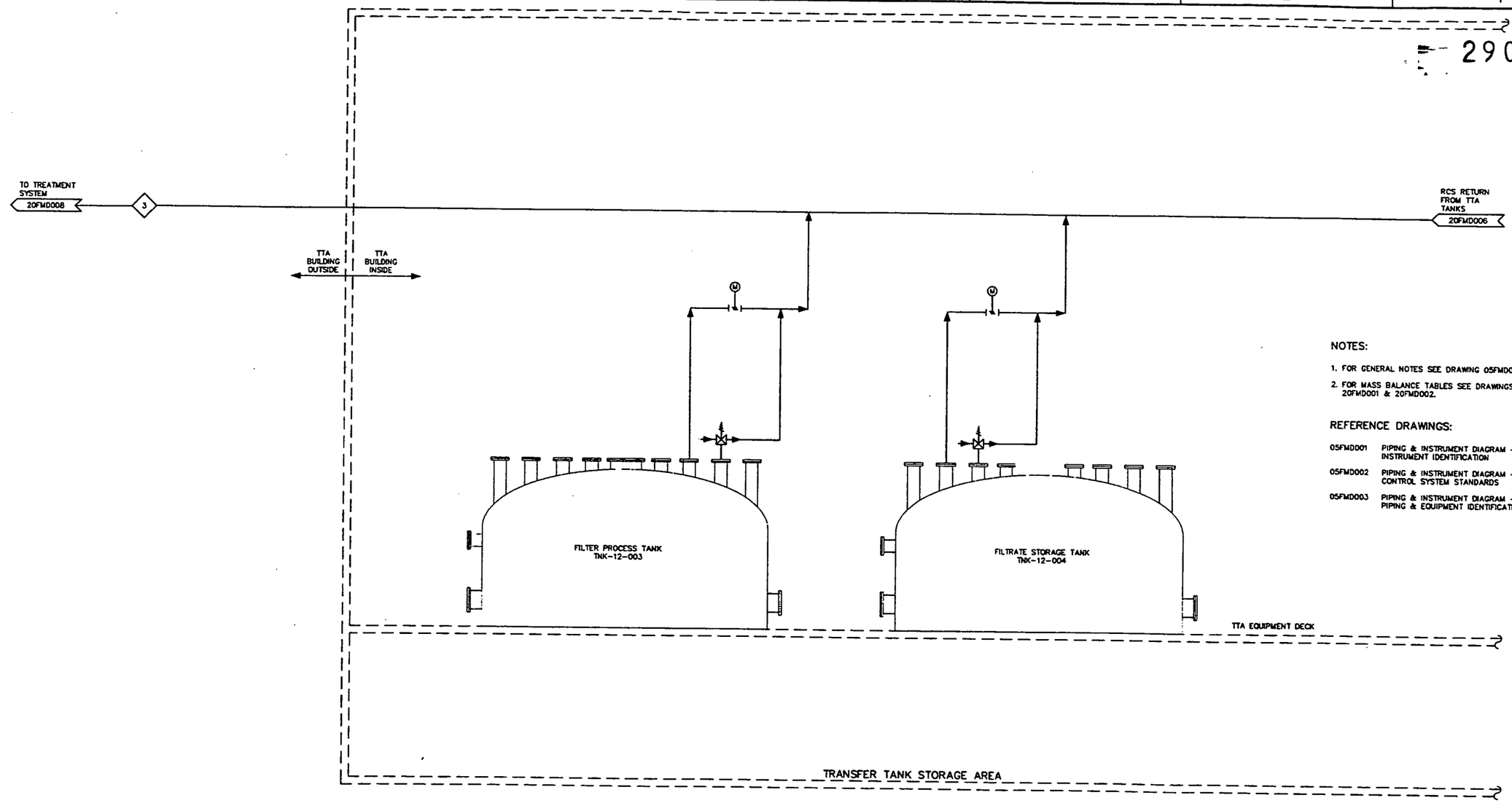
2905



NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWINGS 20FMD001 & 20FMD002.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

000057

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	MJD	JLH	KSA	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	KR		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICHARDS — PROFESSIONAL ENGINEER — No. 103740 — STATE OF TENNESSEE

DRAWN BY: B.J. Davis — DATE: 01/07/00
DESIGNED BY: B.J. Davis — DATE: 01/07/00
CHECKED BY: J.N. Hamilton — DATE: 01/07/00
APPROVED BY: Kenneth Richards — DATE: 01/07/00
APPROVED BY: John Jackson — DATE: 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE: RADON CONTROL SYSTEM PROCESS FLOW DIAGRAM FILTER & FILTRATE STORAGE TNKS

SIZE: D | SCALE: NONE | DWG. NO.: 20FMD005 | REV: 1

FILENAME: 20FMD005.DWG

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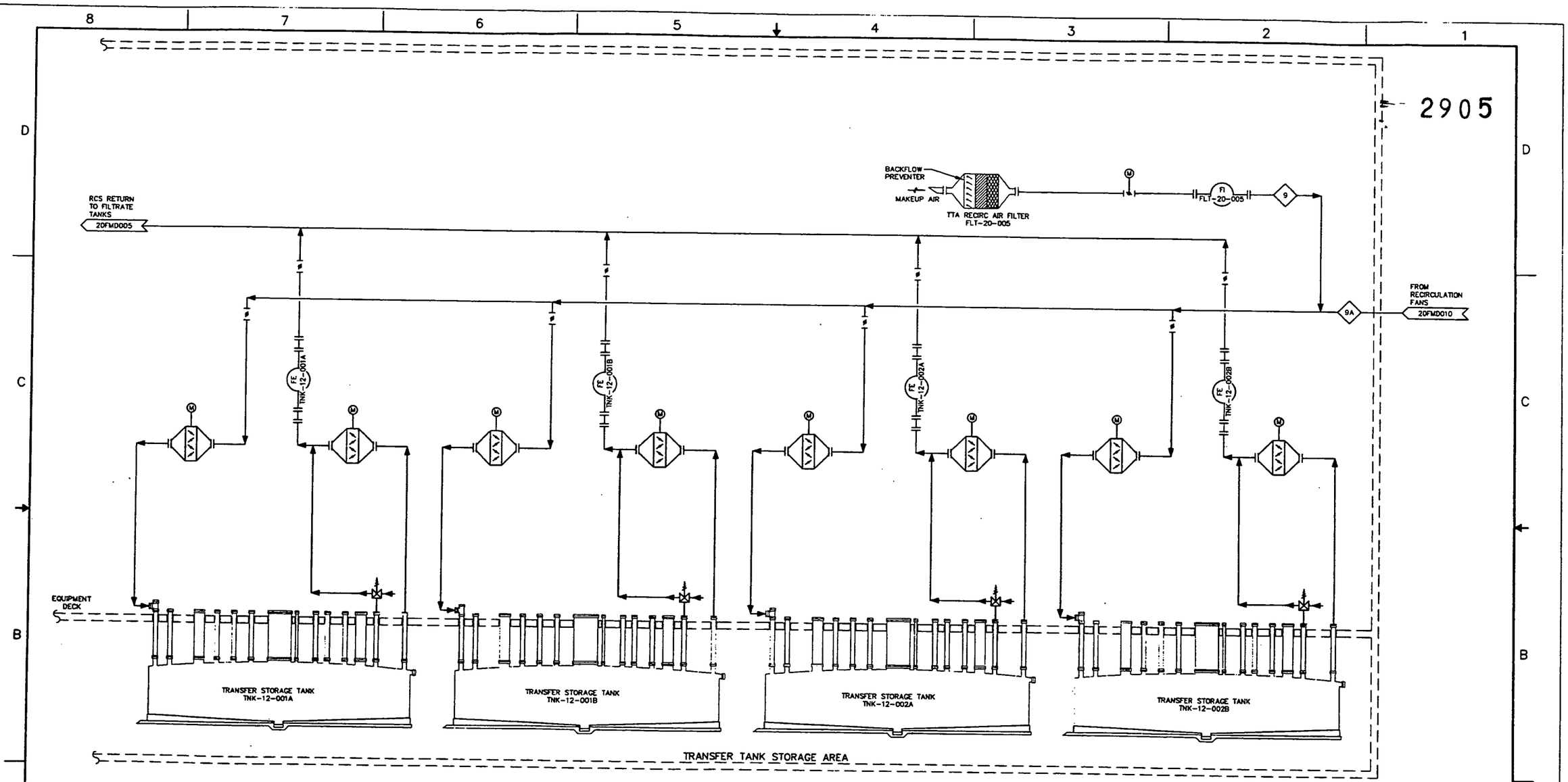

NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWINGS 20FMD001 & 20FMD002.

REFERENCE DRAWINGS:

05FMD001 PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION

05FMD002 PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS

05FMD003 PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

000058

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	[illegible]	[illegible]	[illegible]	[illegible]	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	KR		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICKETT PROFESSIONAL ENGINEER REGISTERED NO. 103749 STATE OF TENNESSEE

		DATE
DRAWN BY	B.J. Davis	01/07/00
DESIGNED BY	B.J. Davis	01/07/00
CHECKED BY	[illegible]	01/07/00
APPROVED BY	Kenneth D. Rickett	01/07/00
APPROVED BY	[illegible]	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
RADON CONTROL SYSTEM
PROCESS FLOW DIAGRAM
TTA STORAGE TANKS

SIZE D | SCALE: NONE | DWG. NO. 20FMD006 | REV 1

FILENAME: 20FMD006.DWG

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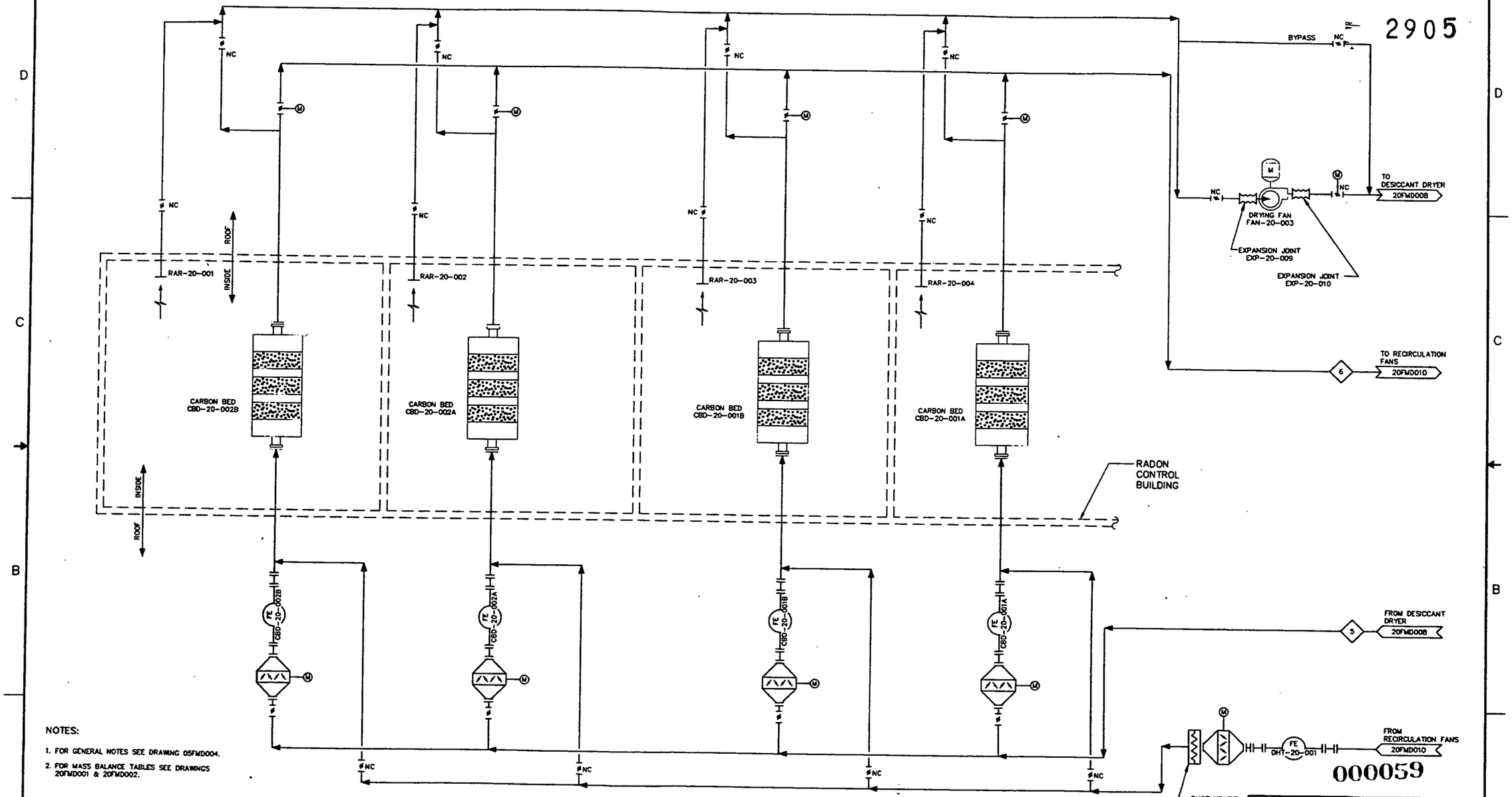

NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWINGS 20FMD001 & 20FMD002.

REFERENCE DRAWINGS:

05FMD001 PIPING & INSTRUMENT DIAGRAM - INSTRUMENT IDENTIFICATION

05FMD002 PIPING & INSTRUMENT DIAGRAM - CONTROL SYSTEM STANDARDS

05FMD003 PIPING & INSTRUMENT DIAGRAM - PIPING & EQUIPMENT IDENTIFICATION

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD	JLH	KDR	CERTIFIED FOR CONSTRUCTION
0	11/03/99	BJD	KR		PRELIMINARY DESIGN SUBMITTAL

REG. NO. 103742 KENNETH D. RICHARDS PROFESSIONAL ENGINEER STATE OF TENNESSEE

		DATE
DRAWN BY		01/07/00
DESIGNED BY		01/07/00
CHECKED BY		01/07/00
APPROVED BY	Kenneth D. Richards	01/07/00
APPROVED BY	John Larson	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
RADON CONTROL SYSTEM
PROCESS FLOW DIAGRAM
CARBON BEDS

SIZE: D | SCALE: NONE | DWG. NO. 20FMD007 | REV 1

FILENAME: 20FMD007.DWG

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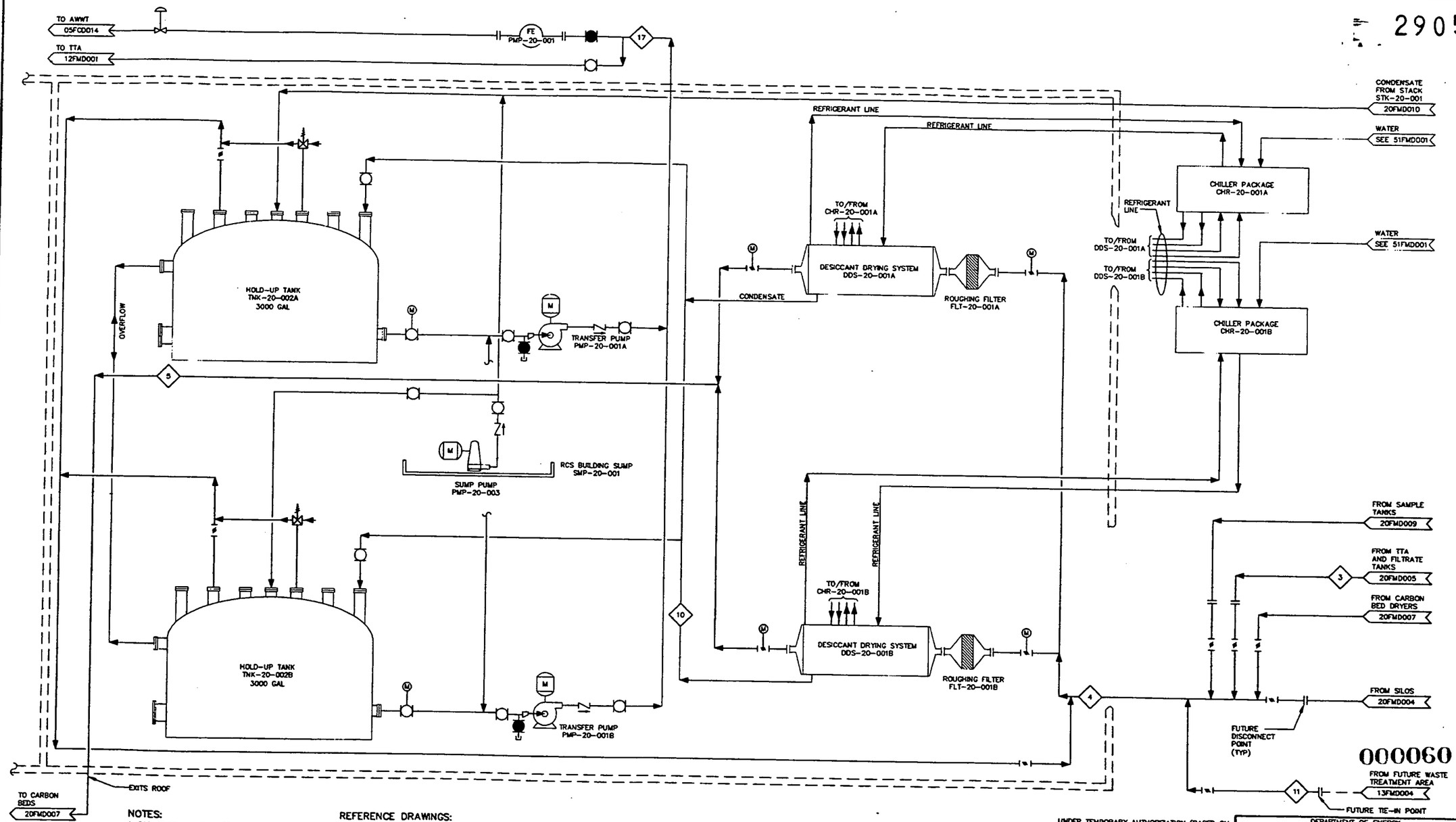
2905



NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWINGS 20FMD001 & 20FMD002.
3. DESICCANT DRYING SYSTEM INCLUDES PRECOOLING COIL, DESICCANT WHEEL, POST-COOLING COIL, CLOSED LOOP - REACTIVATION SYSTEM, CONDENSATE COLLECTION TRANSFER SYSTEM, AND INSTRUMENTATION.

REFERENCE DRAWINGS:

05FMD001 PIPING & INSTRUMENT DIAGRAM - INSTRUMENT IDENTIFICATION

05FMD002 PIPING & INSTRUMENT DIAGRAM - CONTROL SYSTEM STANDARDS

05FMD003 PIPING & INSTRUMENT DIAGRAM - PIPING & EQUIPMENT IDENTIFICATION

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	NJP	DJH	KDR	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	KR		PRELIMINARY DESIGN SUBMITTAL

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

KENNETH D. RIGGS PROFESSIONAL ENGINEER No. 105745 STATE OF TENNESSEE

		DATE
DRAWN BY		01/07/00
DESIGNED BY		01/07/00
CHECKED BY		01/07/00
APPROVED BY		01/07/00
APPROVED BY		01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
RADON CONTROL SYSTEM
PROCESS FLOW DIAGRAM
AIR HANDLING & CONDENSATE

SIZE D | SCALE: NONE | DWG. NO. 20FMD008 | REV 1

FILENAME: 20FMD008.DWG

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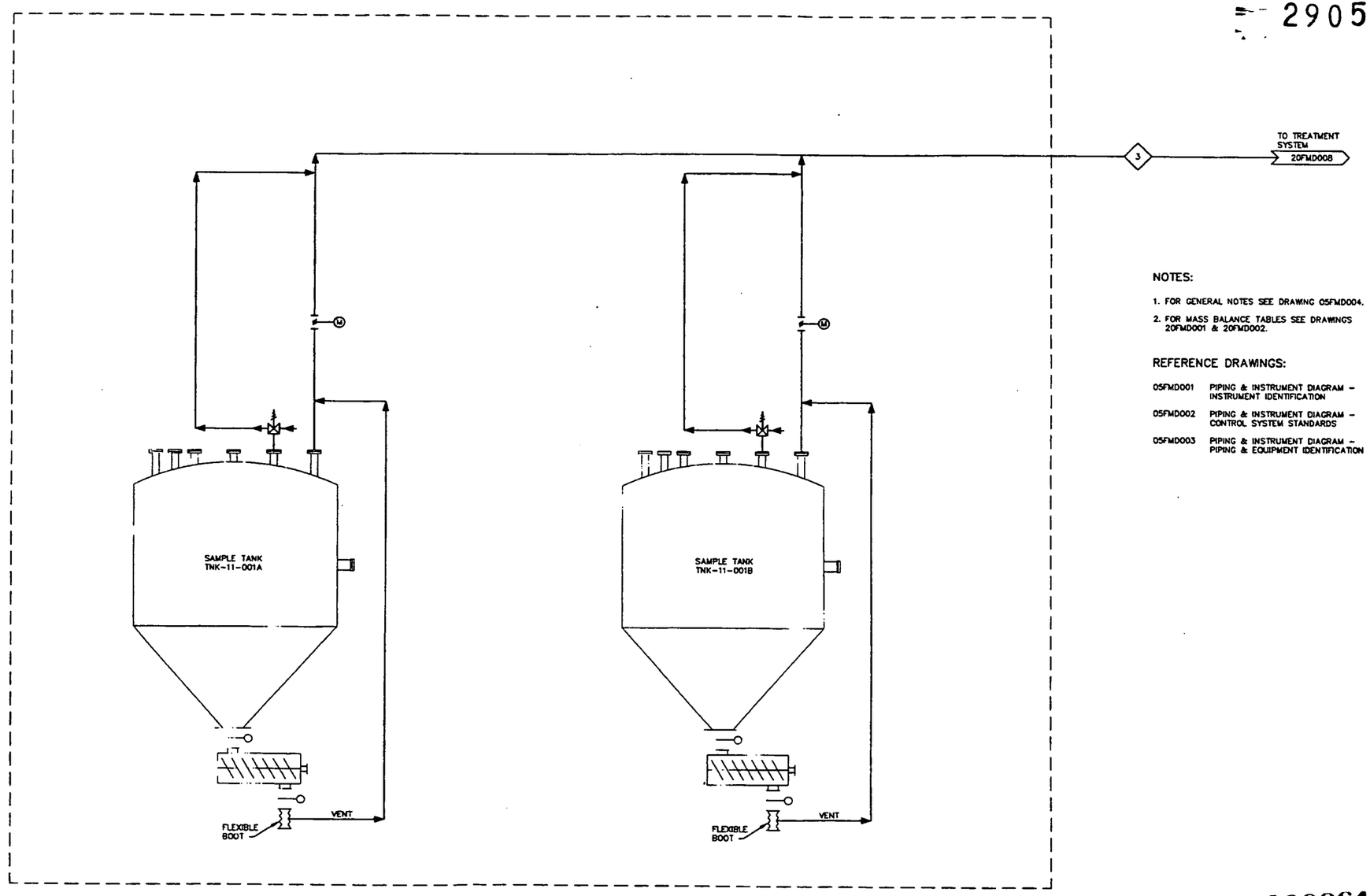
2905



SAMPLE PREPARATION & STORAGE AREA

NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWINGS 20FMD001 & 20FMD002.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

000061

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH: WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APRV'D	DESCRIPTION/ISSUE
1	01/07/00	MD	MM	KR	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	KR		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RIEKER PROFESSIONAL ENGINEER REGISTRATION NO. 10371-E STATE OF TENNESSEE

		DATE
DRAWN BY	B.J. Davis	01/07/00
DESIGNED BY	B.J. Davis	01/07/00
CHECKED BY	M. Hamel	01/07/00
APPROVED BY	Kenneth Rieker	01/07/00
APPROVED BY	John Lawson	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
RADON CONTROL SYSTEM
PROCESS FLOW DIAGRAM
SAMPLE TANKS

SIZE	SCALE:	DWG. NO.	REV
D	NONE	20FMD009	1

FILENAME: 20FMD009.DWG

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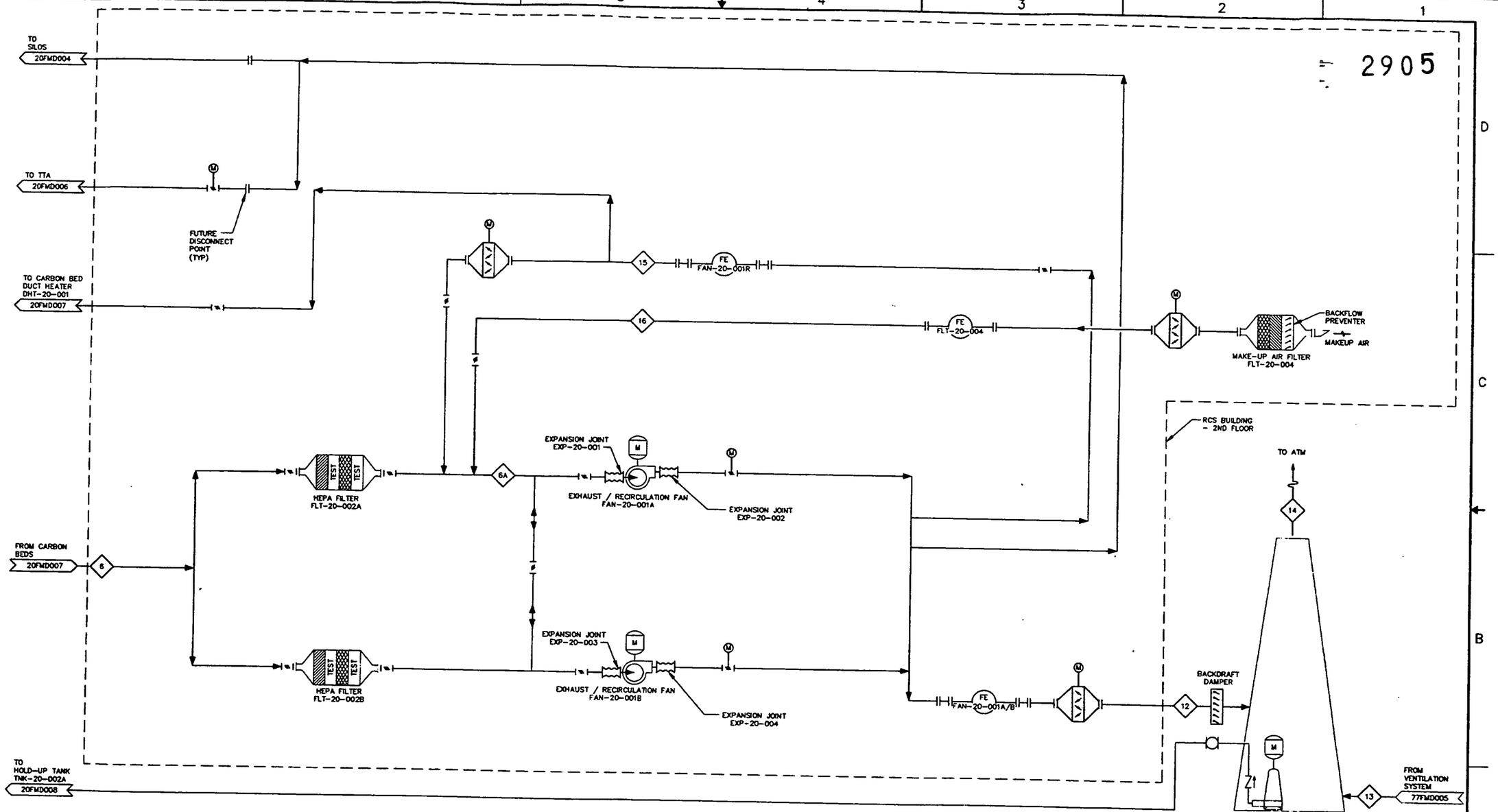


NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWINGS 20FMD001 & 20FMD002.

REFERENCE DRAWINGS:

05FMD001 PIPING & INSTRUMENT DIAGRAM - INSTRUMENT IDENTIFICATION

05FMD002 PIPING & INSTRUMENT DIAGRAM - CONTROL SYSTEM STANDARDS

05FMD003 PIPING & INSTRUMENT DIAGRAM - PIPING & EQUIPMENT IDENTIFICATION

RCS BUILDING - 2ND FLOOR

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD	KR		CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	KR		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. FRANKLIN REGISTERED PROFESSIONAL ENGINEER No. 105745 STATE OF TENNESSEE

DRAWN BY DATE 01/07/00
DESIGNED BY DATE 01/07/00
CHECKED BY DATE 01/07/00
APPROVED BY DATE 01/07/00
APPROVED BY DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 524

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

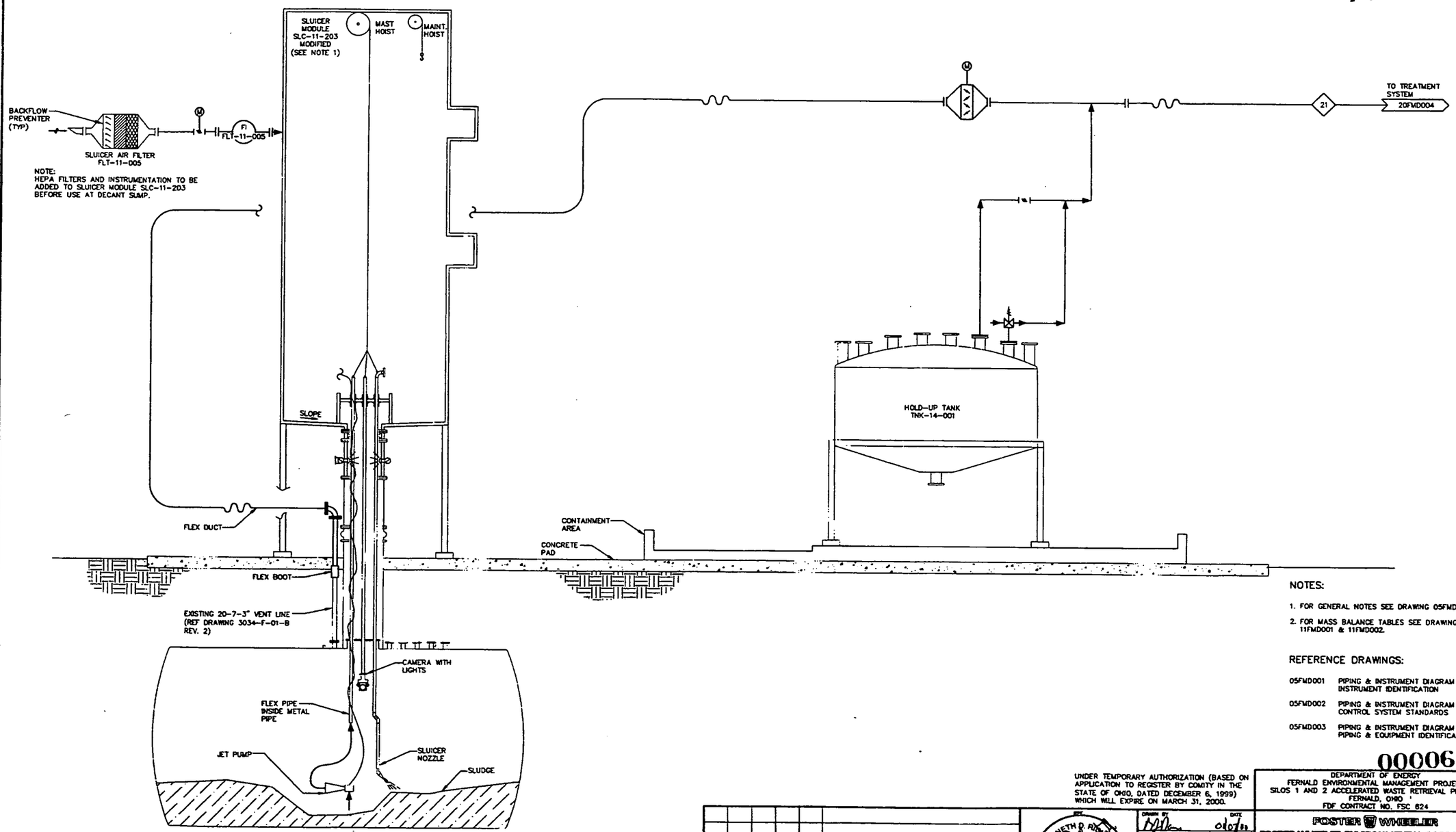
TITLE
RADON CONTROL SYSTEM
PROCESS FLOW DIAGRAM
EXHAUST & RECIRC FANS

SIZE D | SCALE: NONE | DWG. NO. 20FMD010 | REV 1

FILENAME: 20FMD010.DWG

Thu Jan 06 21:06:01 2000

2905



NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 11FMD001 & 11FMD002.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

000063

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APRV'D	DESCRIPTION/ISSUE
1	01/07/00	BJD	JAH	KDR	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	KR		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RIGGETT REGISTERED PROFESSIONAL ENGINEER NO. 103748 STATE OF TENNESSEE

DRAWN BY	DATE 01/07/00
DESIGNED BY	DATE 01/07/00
CHECKED BY	DATE 01/07/00
APPROVED BY	DATE 01/07/00
APPROVED BY	DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
RADON CONTROL SYSTEM
PROCESS FLOW DIAGRAM
DECANT WASTE RETRIEVAL

SIZE	SCALE:	DWG. NO.	REV
D	NONE	20FMD011	1

FILENAME: 20FMD011.DWG

G:\DWG\CAD\F3515\03\MECS\TSC\20FMD011.Dwg Wed Jan 05 21:14:40 2000

2905

DECANT SUMP RETRIEVAL – AWRS MASS BALANCE TABLE

INVENTORY		STREAM NUMBER	37	1	33	4	30	5	6	34	34	35	35	22	8	28	29	9	32
		STREAM DESCRIPTION	DECANT FROM TTA TO UF MAKE-UP CONNECTION	DECANT FROM UF CONNECTION TO HOLD-UP TANK	DECANT INTO HOLD-UP TANK	DECANT WATER TO BE FILTERED	DECANT MAKE-UP TO FILTER PROCESS TANK	SAMPLE ACCUMULATION TANK DECANT	SAMPLE ACCUMULATION TANK FLUSH	SLURRY DISCHARGE FROM HOLD-UP TANK (LIQUID RECOVERY)	SLURRY DISCHARGE FROM HOLD-UP TANK (SOLIDS RECOVERY)	SLURRY DISCHARGE TO HOLD-UP TANK (LIQUID RECOVERY)	SLURRY DISCHARGE TO HOLD-UP TANK (SOLIDS RECOVERY)	SAMPLE STORAGE	SLURRY LINE FROM UF SYSTEM	UF DECANT SUPPLY FROM PROCESS TANK	UF DECANT RETURN TO PROCESS TANK	SLURRY SAMPLE LINE	HP DECON WATER FOR SLUICE WATER
		FLOW (GPM)	320	300	300	320	20	10	10	358	353	58	52.55	9	300	300	280	0.38	40
K-65 (LB)	11,995	% SOLIDS (WT)	2.0	2.0	2.0	2.0	2.0	1.5	0	1.94	2.78	1.65	7.15	10.0	4.0	2.0	2.14	2.8	0
LIQUID (LB)	44,135	SOLIDS PER GAL (LB)	0.167	0.167	0.167	0.167	0.167	0.121	0	0.162	0.233	0.138	0.607	0.858	0.336	0.167	0.179	0.233	0
TOTAL MASS (LB)	56,130	SOLIDS PER DAY (LB)	25,654	24,050	24,050	1,256	1,253	18	0	27,864	39,351	3,833	15,302	23	2,519	18,789	18,770	42	0
K-65 (GALLONS) IN-SITU	1,008	MINUTES PER DAY OPERATION (MIN)	480	480	480	24	375	15	15	480	480	480	480	3	25	375	375	480	120
LIQUID (GALLONS) IN-SITU	5,292	TOTAL VOLUME PER DAY (GALLONS)	153,600	144,000	144,000	7,520	7,500	153	150	171,840	169,224	27,840	25,224	27	7,500	112,500	105,000	180	4,800
TOTAL VOLUME (GALLONS)	6,300	DAYS OF OPERATION	2.03	2.03	2.03	2.03	2.03	1.57	1.57	0.46	1.57	0.46	1.57	1.57	2.03	2.03	2.03	1.57	1.57
CURIES	94	TOTAL VOLUME (GALLONS)	311,387	291,906	291,906	15,244	15,203	240	253	78,939	265,301	12,789	39,545	42	15,203	228,052	212,848	282	7,525
		TOTAL MASS SOLIDS (LB)	52,003	48,753	48,753	2,546	2,539	29	0	12,800	61,692	1,761	23,990	36	5,107	38,088	38,048	66	0
		SOLIDS PER HOUR (LB/HR)	3,207	3,006	3,006	3,207	200	73	0	3,483	4,919	479	1,913	463	6,047	3,006	3,003	5	0
		CURIES	409.40	383.81	383.81	20.04	19.99	0.23	0.00	100.77	485.68	13.86	188.87	0.29	40.21	299.85	299.54	0.52	0

DECANT SUMP RETRIEVAL – AWRS MASS BALANCE TABLE – CONT.

INVENTORY		STREAM NUMBER	31	12	15
		STREAM DESCRIPTION	JET PUMP WATER	FILTRATE RECIRCULATION LOOP (FILTERED WATER)	FROM UF TO FW TANK (FILTERED WATER)
		FLOW (GPM)	10	180	20
K-65 (LB)	11,995	% SOLIDS (WT)	0	0	0
LIQUID (LB)	44,135	SOLIDS PER GAL (LB)	0	0	0
TOTAL MASS (LB)	56,130	SOLIDS PER DAY (LB)	0	0	0
K-65 (GALLONS) IN-SITU	1,008	MINUTES PER DAY OPERATION (MIN)	480	480	375
LIQUID (GALLONS) IN-SITU	5,292	TOTAL VOLUME PER DAY (GALLONS)	4,800	86,400	7,500
TOTAL VOLUME (GALLONS)	6,300	DAYS OF OPERATION	2.03	2.03	2.03
CURIES	94	TOTAL VOLUME (GALLONS)	9,730	175,144	15,203
		TOTAL MASS SOLIDS (LB)	0	0	0
		SOLIDS PER HOUR (LB/HR)	0	0	0
		CURIES	0	0	0

NOTES:

1. MASS BALANCE TABLE TO BE USED IN CONJUNCTION WITH DRAWING 14FMD002.

000064

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD	JLH	KDR	CERTIFIED FOR CONSTRUCTION
0	11/22/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICKETT REGISTERED PROFESSIONAL ENGINEER REG. 103742 STATE OF TENNESSEE

	DATE
DRAWN BY	01/07/00
DESIGNED BY	01/07/00
CHECKED BY	01/07/00
APPROVED BY	01/07/00
APPROVED BY	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

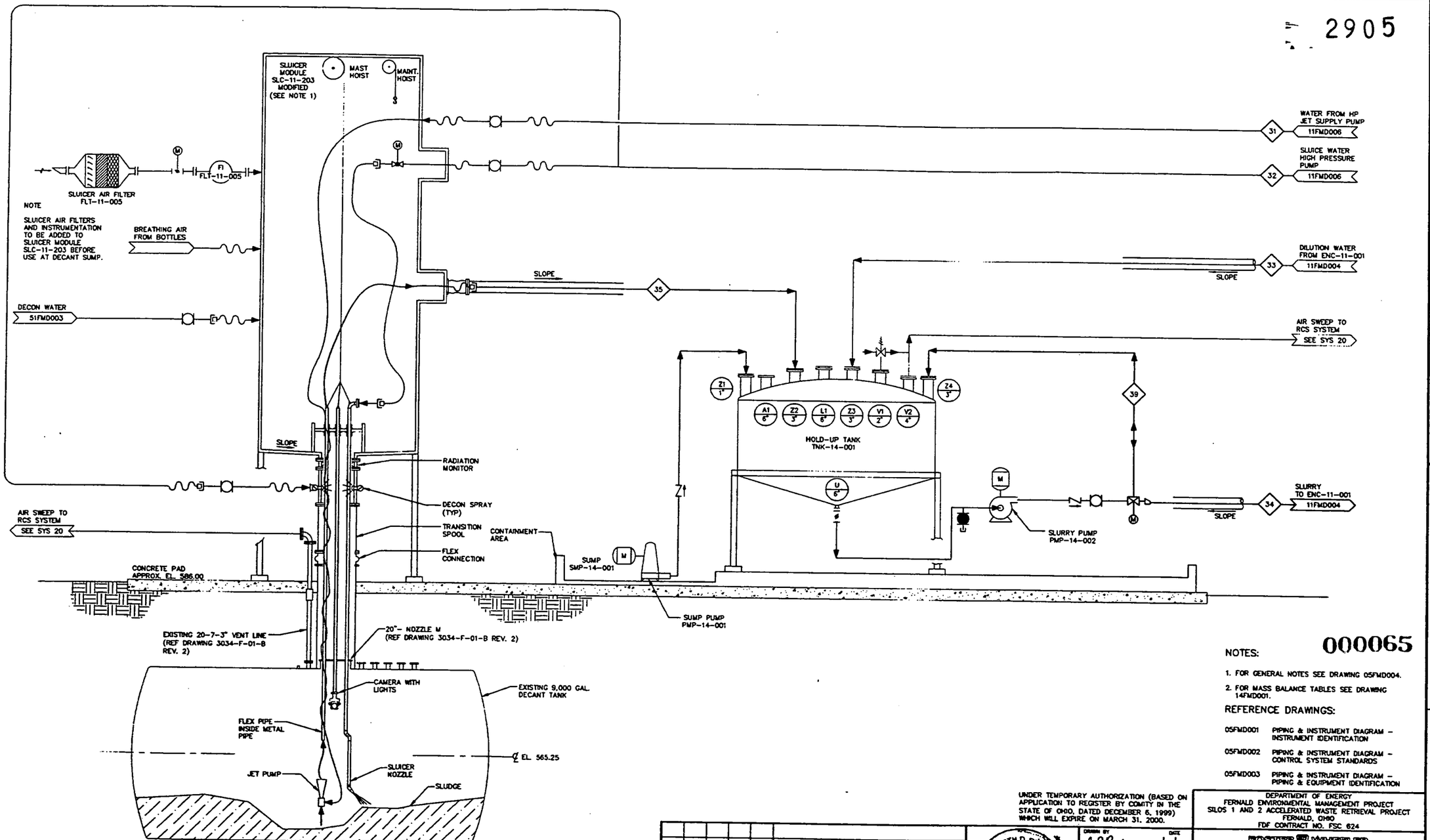
TITLE
DECANT SUMP RETRIEVAL SYSTEM
PROCESS FLOW DIAGRAM
MASS BALANCE TABLE

SIZE	SCALE:	DWG. NO.	REV
D	NONE	14FMD001	1

FILENAME: 14FMD001.DWG

Q:\DARGE\VTF31L02\WES\SYS14\14fmd001.dwg Wed Jan 05 21:54:19 2000

2905



NOTES:

000065

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 14FMD001.

REFERENCE DRAWINGS:

05FMD001 PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION

05FMD002 PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS

05FMD003 PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	[illegible]	[illegible]	[illegible]	KDH	CERTIFIED FOR CONSTRUCTION
0	11/09/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RUCKER PROFESSIONAL ENGINEER NO. 109743 STATE OF TENNESSEE

DRAWN BY	B.J. Davis 01/07/00
DESIGNED BY	B.J. Davis 01/07/00
CHECKED BY	S.W. Hughes 01/07/00
APPROVED BY	Kenneth D. Rucker 01/07/00
APPROVED BY	[illegible] 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
DECANT SUMP RETRIEVAL SYSTEM
PROCESS FLOW DIAGRAM
DECANT SUMP RETRIEVAL

SIZE	SCALE	DWG. NO.	REV
D	NONE	14FMD002	1

FILENAME: 14FMD002.DWG

G:\DWGBES\FS\SILOS\MECS\TS14\14fmd002.dwg Thu Jan 06 20:33:19 2000

NOTES:

1. MASS BALANCE TABLE TO BE USED IN CONJUNCTION WITH DRAWINGS 13FMD002, 13FMD003, & 13FMD004.
2. STREAM OF APPROXIMATE WASTE RETRIEVED (SLURRY SOILDS 15% – DECANT SOILDS 2%).
3. TTA TANK FOUNDATION DRAIN.

2905

TYPICAL TTA TANK – MASS BALANCE

TYPICAL TTA TANK INVENTORY		STREAM NUMBER	1	2	3	7	7	16	23	24	25	26	27
		STREAM DESCRIPTION	SLUICING WATER	DILUTION WATER	FLUSH WATER	SLURRY DISCHARGE	RETRIEVED WASTE	TTA HP DECON (FILTERED WATER)	STORAGE TANK 2B SUMP DRAIN	STORAGE TANK 2A SUMP DRAIN	STORAGE TANK 1B SUMP DRAIN	STORAGE TANK 1A SUMP DRAIN	FROM TTA SUMP PUMP TO SLURRY LINE
TOTAL SOLIDS (LB)	5,270,000						NOTE 2		NOTE 3	NOTE 3	NOTE 3	NOTE 3	NOTE 3
BENTOGROUT (LB)	107,000	FLOW (GPM)	300	50	300	338	338	40	0	0	0	0	50
K-65 (LB)	5,160,000	% SOLIDS (WT)	2.0	2.0	2.0	15.0	13.0	0	20.0	20.0	20.0	20.0	20.0
WATER (LB)	3,870,000	SOLIDS PER GAL (LB)	0.167	0.167	0.167	1.315	1.129	0	1.798	1.798	1.798	1.798	1.798
TOTAL MASS (LB)	9,140,000	SOLIDS PER DAY (LB)	24,050	501	3,006	213,218	183,097	0	0	0	0	0	0
VOLUME WATER (GALLONS)	464,000	MINUTES PER DAY OPERATION (MIN)	480	60	60	480	480	20	0	0	0	0	0
TOTAL VOLUME (GALLONS)	675,000	TOTAL VOLUME PER DAY (GALLONS)	144,000	3,000	18,000	162,166	162,166	800	0	0	0	0	0
TOTAL SOLIDS (GALLONS)	211,000	DAYS OF OPERATION	29	0	0	29	29	5	0	0	0	0	0
CURIES	8,680	TOTAL VOLUME (GALLONS)	4,140,000	0	0	4,670,000	4,670,000	4,000	0	0	0	0	0
		TOTAL MASS SOLIDS (LB)	629,000	0	0	6,140,000	5,270,000	0	0	0	0	0	0
		SOLIDS PER HOUR (LB/HR)	3,010	501	3,010	26,700	22,900	0	0	0	0	0	0
		CURIES	1,140	0	0	10,100	8,680	--	--	--	--	--	--

000066

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	MJD	AB	KDR	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICKETT REGISTERED PROFESSIONAL ENGINEER NO. 1037 STATE OF TENNESSEE 01/07/00

DRAWN BY: A. Davis DATE 01/07/00
DESIGNED BY: BJD DATE 01/07/00
CHECKED BY: S.W. Hewitt DATE 01/07/00
APPROVED BY: Kenneth Rickett DATE 01/07/00
APPROVED BY: John Jackson DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC-624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

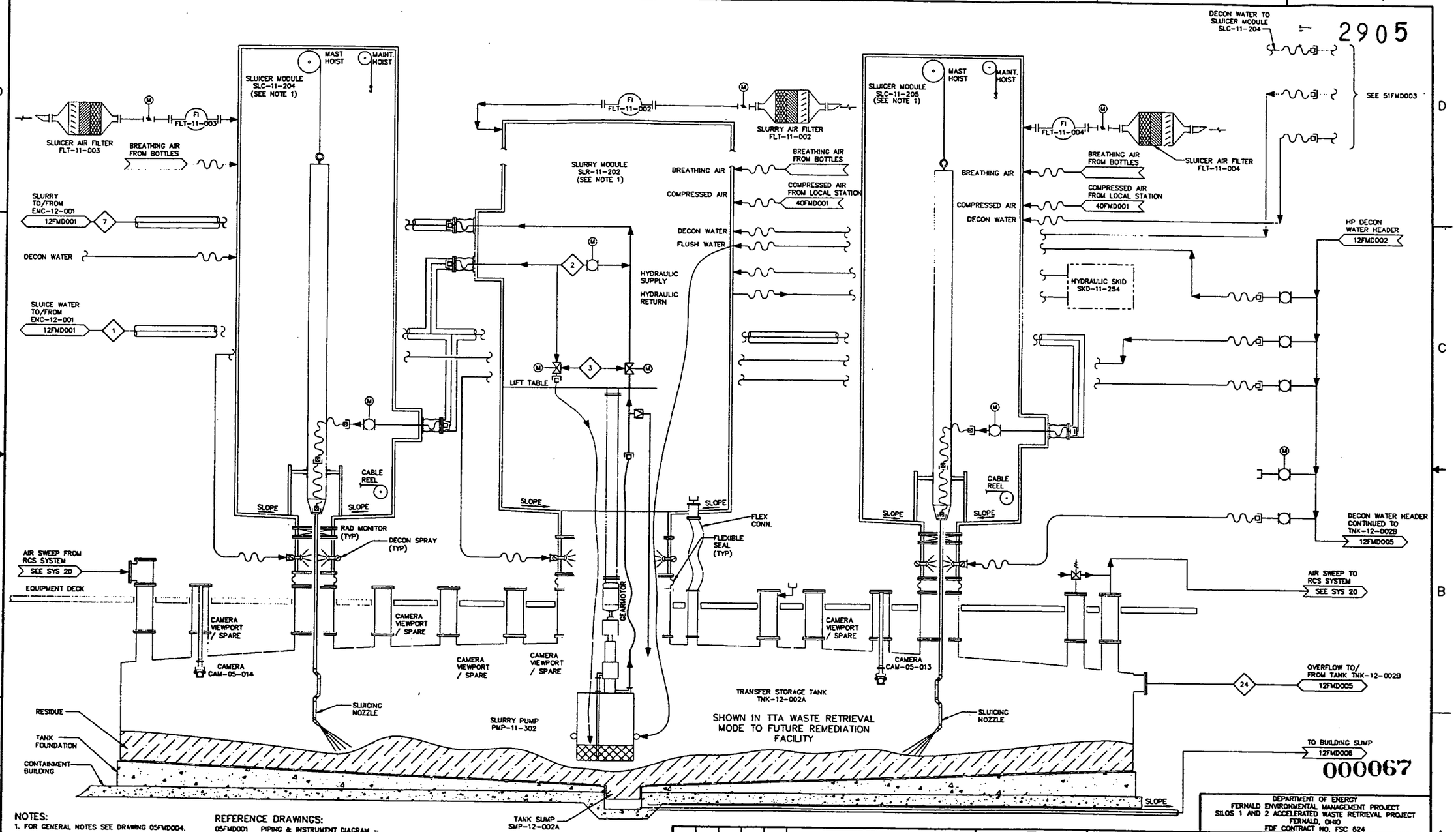
TITLE: TRANSFER TANK WASTE RETRIEVAL PROCESS FLOW DIAGRAM MASS BALANCE TABLE

SIZE: D | SCALE: NONE | DWG. NO. 13FMD001 | REV 1

FILENAME: 13FMD001.DWG

G:\DWGS\FDF3LOS\VE\CTS13\13FMD001.dwg Wed Jan 05 20:49:51 2000

2905



NOTES:
1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 13FMD001.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD	SWH	KRR	CERTIFIED FOR CONSTRUCTION
0	11/03/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH R. RICKETT REGISTERED PROFESSIONAL ENGINEER NO. 103747 STATE OF TENNESSEE 01/07/00

		DATE
DRAWN BY	B.J. Davis	01/07/00
DESIGNED BY	B.J. Davis	01/07/00
CHECKED BY	S.H. Hampton	01/07/00
APPROVED BY	Kenneth Rickett	01/07/00
APPROVED BY	John Lawson	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 824

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

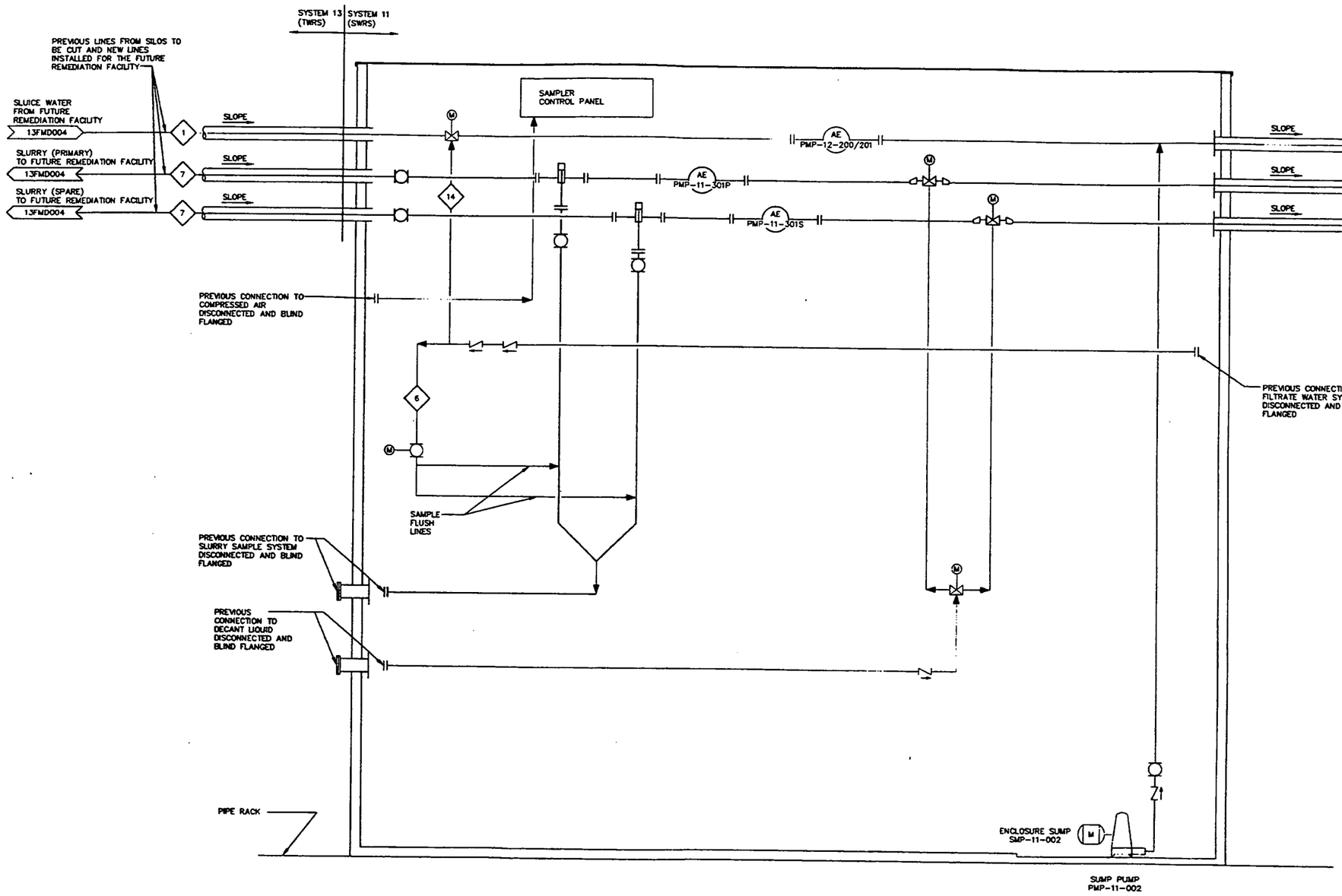
TITLE
TRANSFER TANK WASTE RETRIEVAL PROCESS FLOW DIAGRAM STORAGE TANK TNK-12-002A

SIZE D | SCALE: NONE | DWG. NO. 13FMD002 | REV 1

FILENAME: 13FMD002.DWG

G:\DHARGE\DF&SILOS\WEDS\SILS\13\13fmd002.dwg Thu Jan 06 20:56:46 2000

2905



NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 13FMD001.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

000068

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APRV'D	DESCRIPTION/ISSUE
1	01/07/00	BJD	SWH	KDR	CERTIFIED FOR CONSTRUCTION
0	01/03/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICHARDS, REGISTERED PROFESSIONAL ENGINEER, No. 103743, STATE OF TENNESSEE, 01/07/00

DRAWN BY	B.J. Davis	DATE 01/07/00
DESIGNED BY	B.J. Davis	DATE 01/07/00
CHECKED BY	S.W. Hunt	DATE 01/07/00
APPROVED BY	Kenneth D. Richards	DATE 01/07/00
APPROVED BY	John Swanson	DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
TRANSFER TANK WASTE RETRIEVAL
PROCESS FLOW DIAGRAM
SAMPLE VALVE ENCLOSURE

SIZE	SCALE:	DWG. NO.	REV
D	NONE	13FMD003	1

FILENAME: 13FMD003.DWG

G:\CHARGE\FSFS\LOS\WCS\STS\13\13fd003.dwg Thu Jan 06 20:19:12 2000

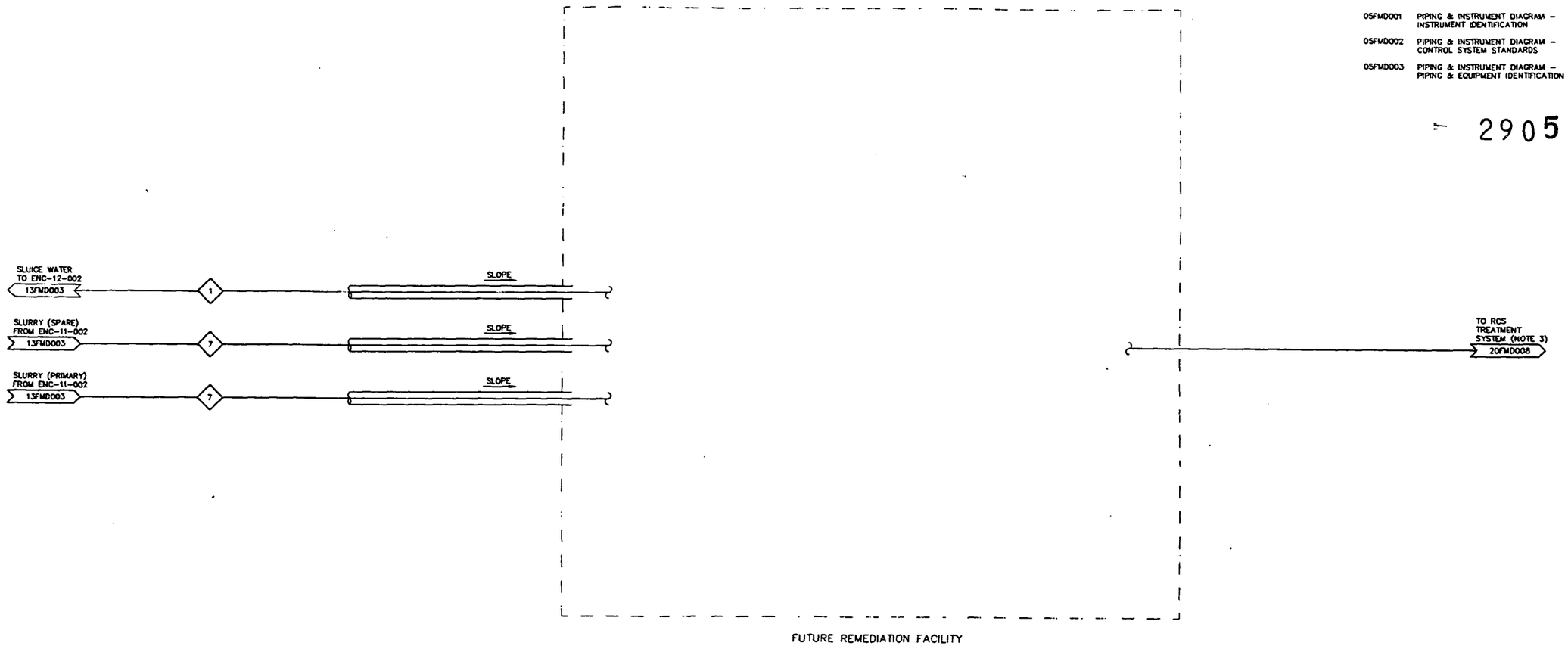
NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 13FMD001.
3. CORRESPONDS TO STREAM 11 OF RCS - SYSTEM 20.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM - INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM - CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM - PIPING & EQUIPMENT IDENTIFICATION

2905



000069

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	[illegible]	[illegible]	[illegible]	[illegible]	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH R. RICKETT REGISTERED PROFESSIONAL ENGINEER No. 103742 STATE OF TENNESSEE

DRAWN BY	DATE 01/07/00
DESIGNED BY	DATE 01/07/00
CHECKED BY	DATE 01/07/00
APPROVED BY	DATE 01/07/00
APPROVED BY	DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
TRANSFER TANK WASTE RETRIEVAL
PROCESS FLOW DIAGRAM
FUTURE REMEDIATION FACILITY

SIZE	SCALE:	DWG. NO.	REV
D	NONE	13FMD004	1

FILENAME: 13FMD004.DWG

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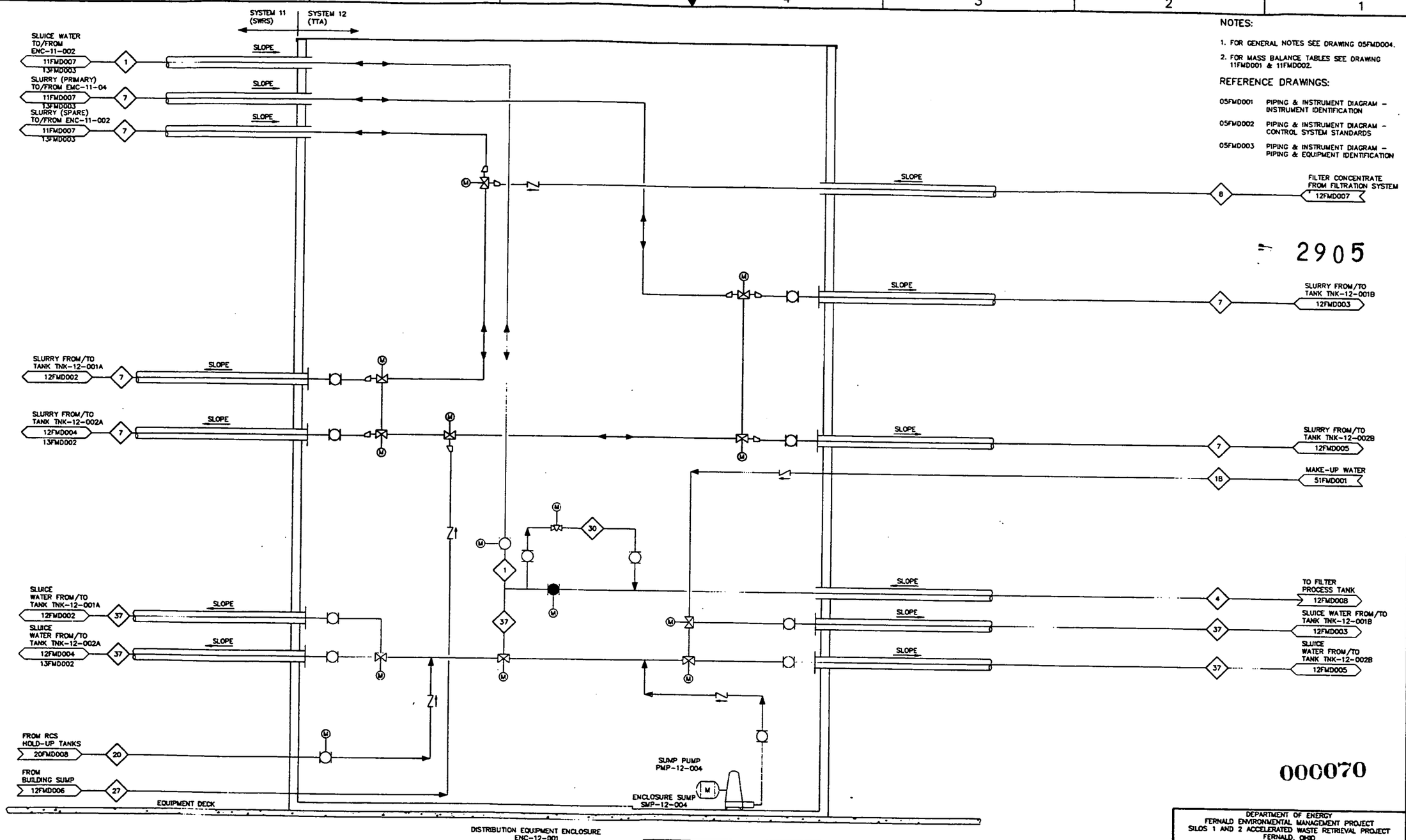


NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 11FMD001 & 11FMD002.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

2905

000070

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD	SWH	DR	CERTIFIED FOR CONSTRUCTION
D	01/01/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICKETT PROFESSIONAL ENGINEER REGISTRATION NO. 105725 STATE OF TENNESSEE

		DATE
DRAWN BY	BJ Davis	01/07/00
DESIGNED BY	BJ Davis	01/07/00
CHECKED BY	S.N. Hewitt	01/07/00
APPROVED BY	Kenneth D. Rickett	01/07/00
APPROVED BY	Don Lawson	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

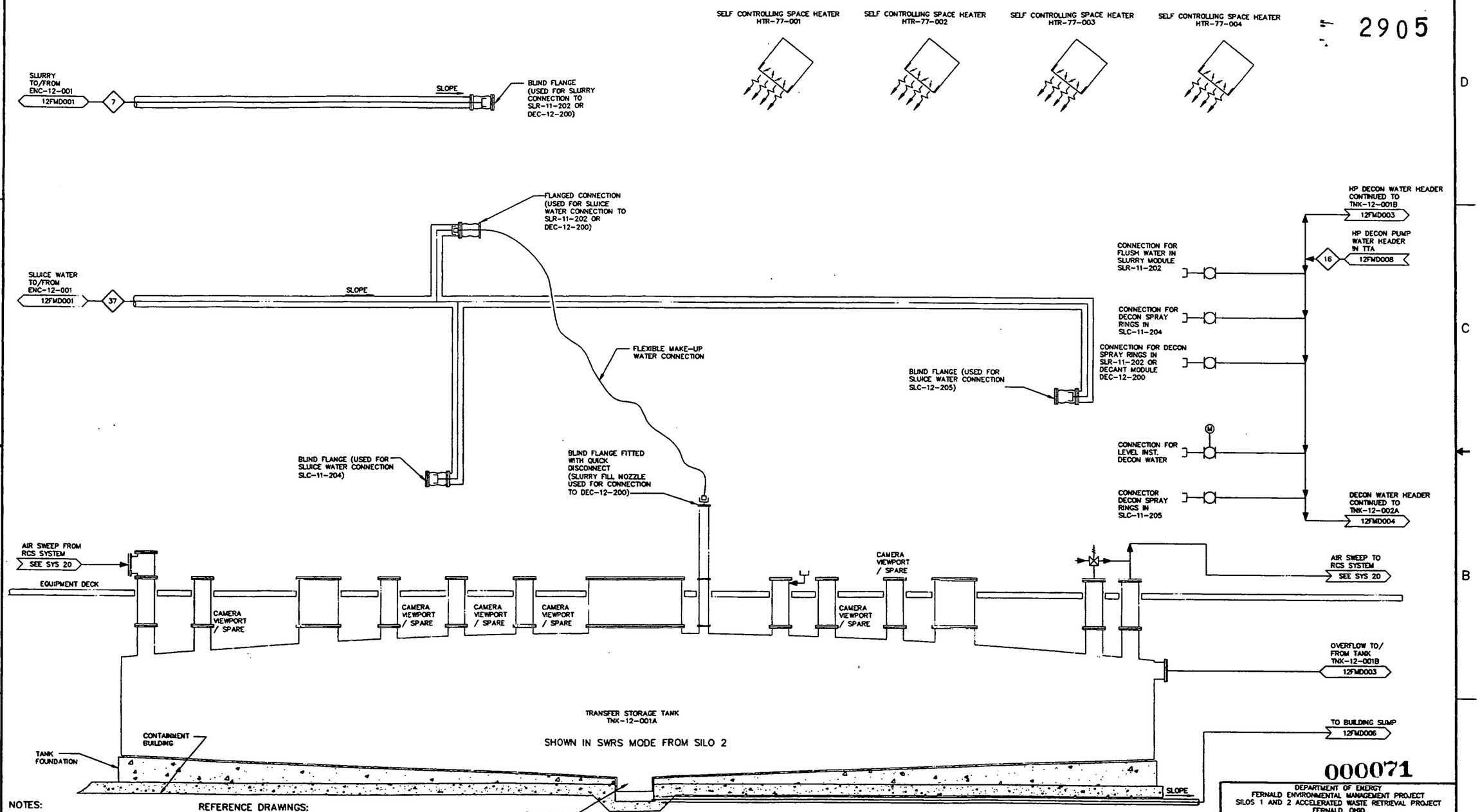
TITLE
TRANSFER TANK SYSTEM
PROCESS FLOW DIAGRAM
DISTRIBUTION ENC-12-001

SIZE	SCALE:	DWG. NO.	REV
D	NONE	12FMD001	1

FILENAME: 12FMD001.DWG

G:\DWGREV\C\SYS12\12fmd001.dwg Thu Jan 06 20:22:39 2000

2905



000071

NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 11FMD001 & 11FMD002.

REFERENCE DRAWINGS:

05FMD001 PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION

05FMD002 PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS

05FMD003 PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD	SWH	KDR	CERTIFIED FOR CONSTRUCTION
0	11/01/98	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICKETT — PROFESSIONAL ENGINEER — REGISTERED — No. 105742 — STATE OF TENNESSEE

DRAWN BY: 01/07/00
DESIGNED BY: 01/07/00
CHECKED BY: 01/07/00
APPROVED BY: 01/07/00
APPROVED BY: 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
TRANSFER TANK SYSTEM
PROCESS FLOW DIAGRAM
STORAGE TANK TNK-12-001A

SIZE: D | SCALE: NONE | DWG. NO. 12FMD002 | REV 1

FILENAME: 12FMD002.DWG

G:\DWARE\FSILOS\WEC\STS12\12FMD002.dwg Thu Jan 06 15:42:31 2000

2905

SELF CONTROLLING SPACE HEATER HTR-77-005

SELF CONTROLLING SPACE HEATER HTR-77-006

SELF CONTROLLING SPACE HEATER HTR-77-007

SELF CONTROLLING SPACE HEATER HTR-77-008

SLURRY TO/FROM ENC-12-001 12FMD001 7

SLOPE

BLIND FLANGE (USED FOR SLURRY CONNECTION TO SLR-11-202 OR DEC-12-201)

FLANGED CONNECTION (USED FOR SLUICE WATER CONNECTION TO SLR-11-202 OR DEC-12-201)

SLUICE WATER TO/FROM ENC-12-001 12FMD001 37

SLOPE

FLEXIBLE MAKE-UP WATER CONNECTION

BLIND FLANGE (USED FOR SLUICE WATER CONNECTION SLC-12-205)

BLIND FLANGE (USED FOR SLUICE WATER CONNECTION SLC-11-204)

HP DECON WATER HEADER 12FMD002 16

CONNECTION FOR FLUSH WATER IN SLURRY MODULE SLR-11-202

CONNECTION FOR DECON SPRAY RINGS IN SLC-11-204

CONNECTION FOR DECON SPRAY RINGS IN SLR-11-202 OR DECANT MODULE DEC-12-201

CONNECTION FOR LEVEL INST. DECON WATER

CONNECTOR DECON SPRAY RINGS IN SLC-11-205

AIR SWEEP FROM RCS SYSTEM SEE SYS 20

EQUIPMENT DECK

CAMERA VIEWPORT / SPARE

CAMERA VIEWPORT / SPARE

CAMERA VIEWPORT / SPARE

CAMERA VIEWPORT / SPARE

CAMERA VIEWPORT / SPARE

CAMERA VIEWPORT / SPARE

AIR SWEEP TO RCS SYSTEM SEE SYS 20

OVERFLOW TO/ FROM TANK TNK-12-001A 12FMD002

CONTAINMENT BUILDING

TANK FOUNDATION

TRANSFER STORAGE TANK TNK-12-001B

SHOWN IN SWRS MODE FROM SILO 2

TO BUILDING SUMP 12FMD008

000072

TANK SUMP SMP-12-001B

SLOPE

NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 11FMD001 & 11FMD002.

REFERENCE DRAWINGS:

05FMD001 PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION

05FMD002 PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS

PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD	SWH	KDR	CERTIFIED FOR CONSTRUCTION
0	01/01/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICHARDS REGISTERED PROFESSIONAL ENGINEER NO. 102742 STATE OF TENNESSEE 01/07/00

DRAWN BY B.J. Davis DATE 01/07/00
DESIGNED BY B.J. Davis DATE 01/07/00
CHECKED BY J. Nutt DATE 01/07/00
APPROVED BY Kenneth Richards DATE 01/07/00
APPROVED BY John Sawyer DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

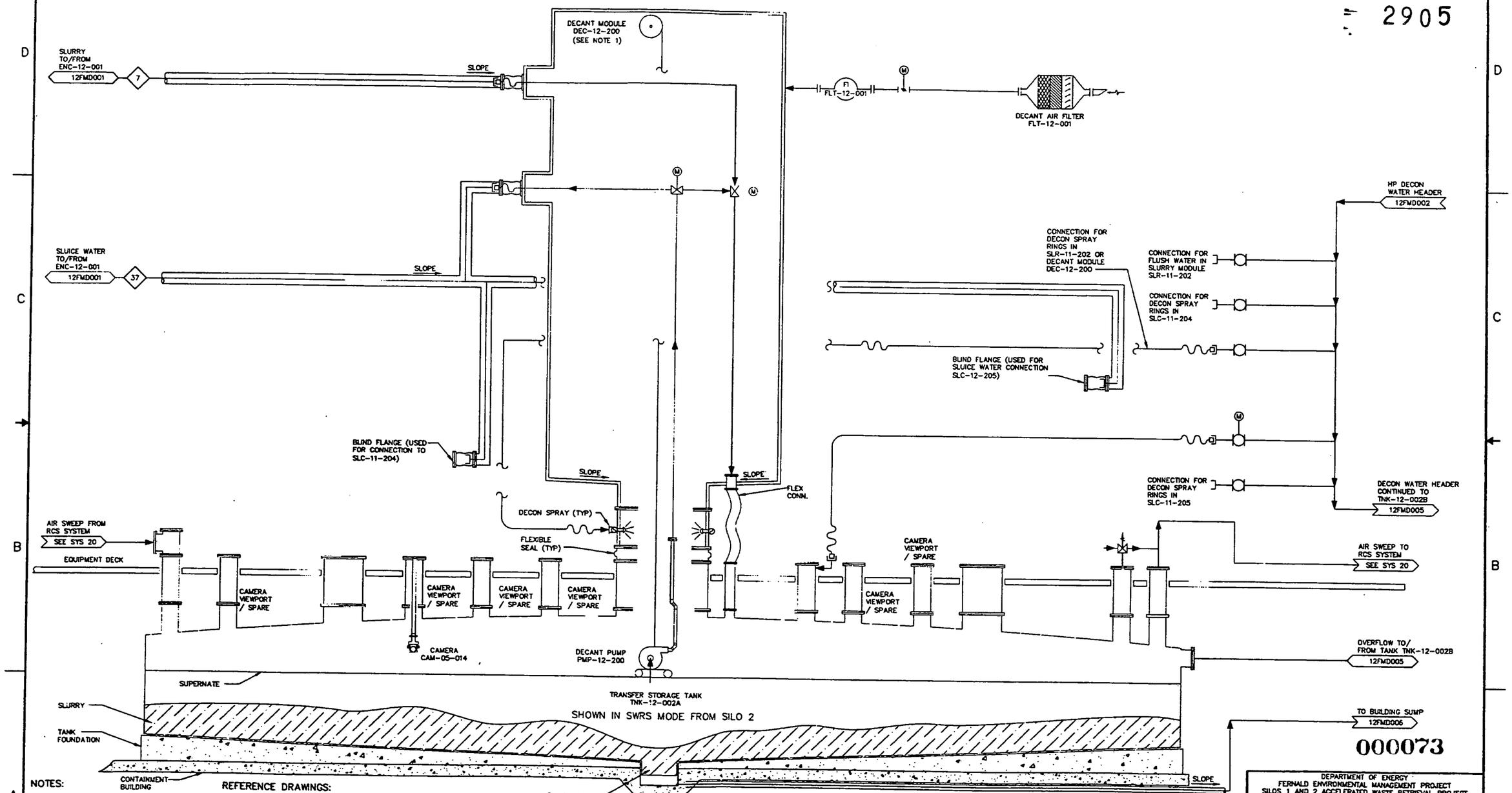
TITLE
TRANSFER TANK SYSTEM
PROCESS FLOW DIAGRAM
STORAGE TANK TNK-12-001B

SIZE D | SCALE: NONE | DWG. NO. 12FMD003 | REV 1

FILENAME: 12FMD003.DWG

G:\DWREF\FS\SILOS\WCS\SRS1\12fmd003.dwg Thu Jan 06 18:43:21 2000

2905



000073

NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 11FMD001 & 11FMD002.

REFERENCE DRAWINGS:

05FMD001 PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002 PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003 PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	[illegible]	[illegible]	[illegible]	[illegible]	CERTIFIED FOR CONSTRUCTION
0	01/03/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

REG. KENNETH D. RICKETT NO. 103748 STATE OF TENNESSEE

		DATE
DRAWN BY	[illegible]	01/07/00
DESIGNED BY	[illegible]	01/07/00
CHECKED BY	[illegible]	01/07/00
APPROVED BY	Kenneth D. Rickett	01/07/00
APPROVED BY	[illegible]	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

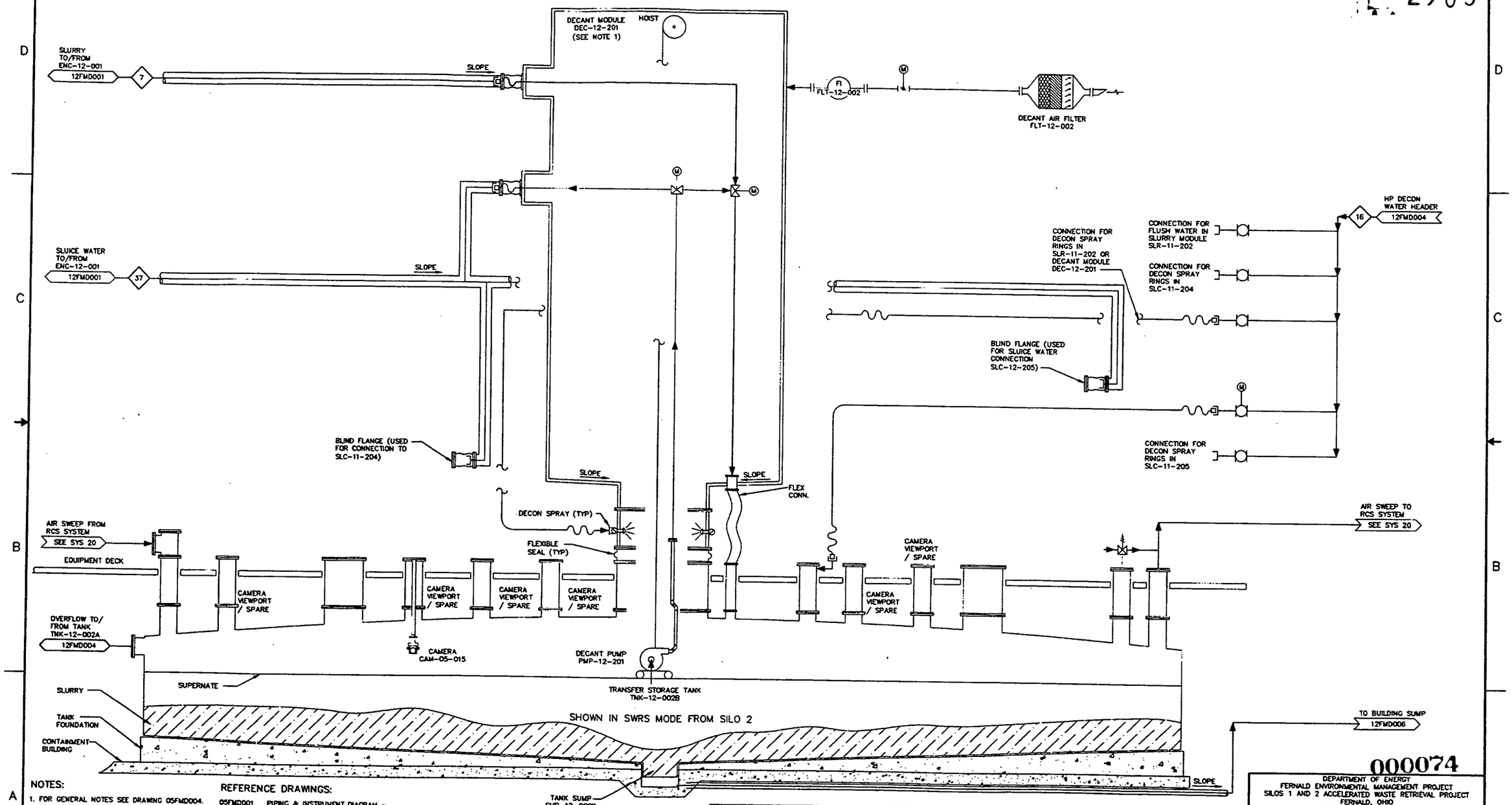
TITLE
TRANSFER TANK SYSTEM
PROCESS FLOW DIAGRAM
STORAGE TANK TNK-12-002A

SIZE	SCALE:	DWG. NO.	REV
D	NONE	12FMD004	1

FILENAME: 12FMD004.DWG

G:\DGNFILES\12fmd004.dwg Thu Jan 06 21:44:20 2000

2905



NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 11FMD001 & 11FMD002.

REFERENCE DRAWINGS:

05FMD001 PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION

05FMD002 PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS

PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD	SWH	KDR	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICHARDS REGISTERED PROFESSIONAL ENGINEER No. 103744 STATE OF TENNESSEE 01/07/00

		DATE
DRAWN BY	B.J. Davis	01/07/00
DESIGNED BY	B.J. Davis	01/07/00
CHECKED BY	S.W. Hampton	01/07/00
REVIEWED BY	Kenneth Richards	01/07/00
APPROVED BY	John Lawson	01/07/00

000074

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
TRANSFER TANK SYSTEM
PROCESS FLOW DIAGRAM
STORAGE TANK TNK-12-002B

SIZE	SCALE:	DWG. NO.	REV
D	NONE	12FMD005	1

FILENAME: 12FMD005.DWG

G:\DWARE\FSILOS\WEC\SYS12\12fmd005.dwg Thu Jan 06 12:44:46 2000

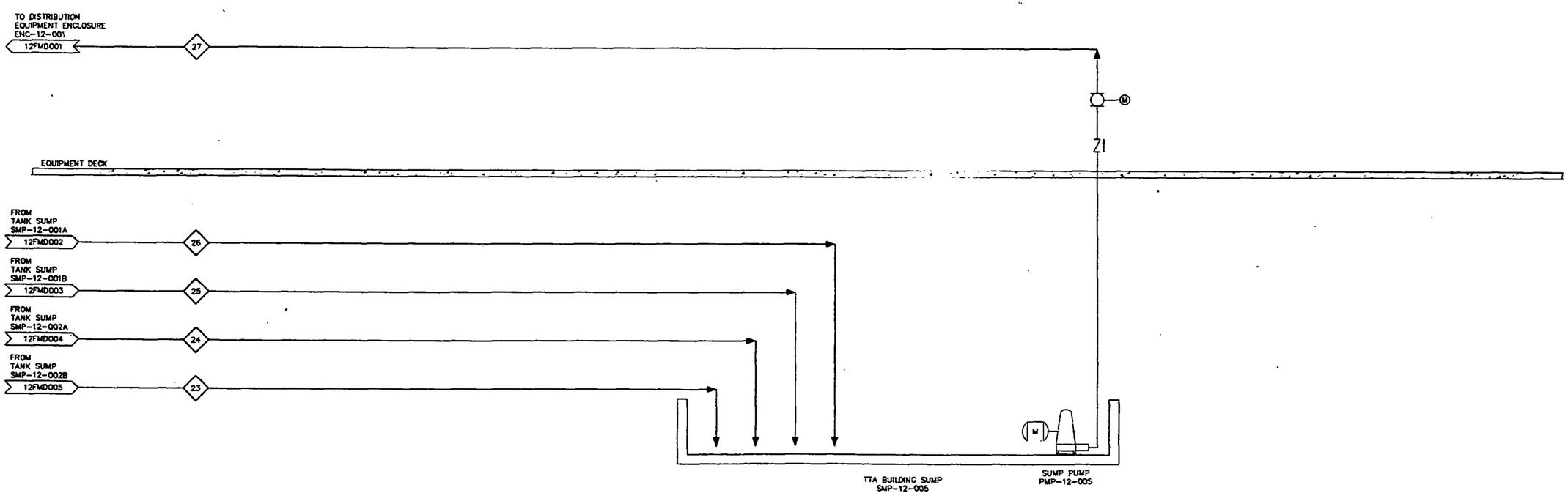
NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 11FMD001 & 11FMD002.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

2905



000075

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD	SWH	KDR	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RIGGS — REGISTERED PROFESSIONAL ENGINEER — STATE OF TENNESSEE — No. 107742 — 01/07/00

		DATE
DRAWN BY	B.J. Davis	01/07/00
DESIGNED BY	B.J. Davis	01/07/00
CHECKED BY	S.W. Hunt	01/07/00
APPROVED BY	Kenneth D. Riggs	01/07/00
APPROVED BY	John Rawson	01/09/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

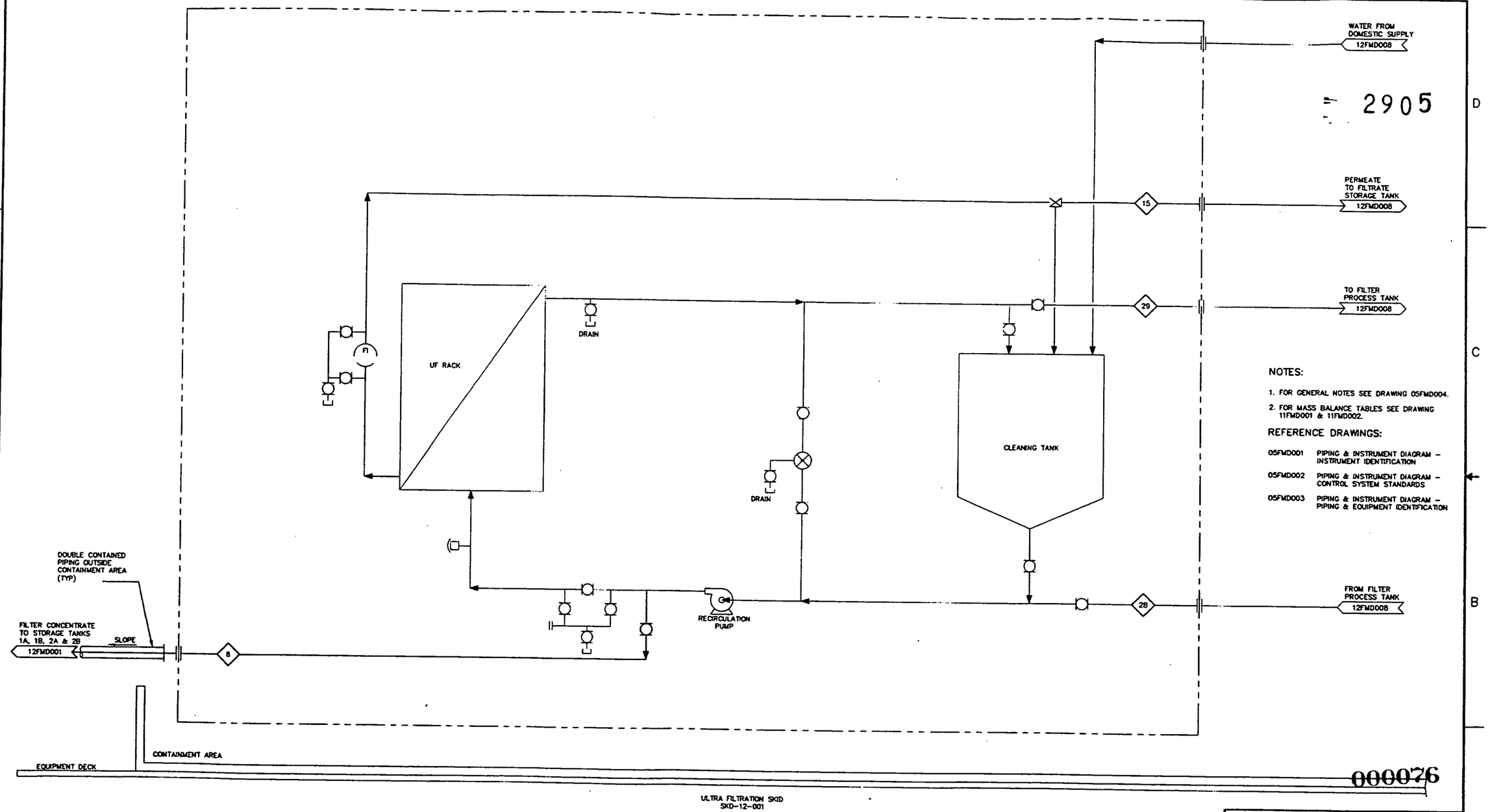
FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
TRANSFER TANK SYSTEM
PROCESS FLOW DIAGRAM
BUILDING SUMP SMP-12-005

SIZE	SCALE:	DWG. NO.	REV
D	NONE	12FMD006	1

FILENAME: 12FMD006.DWG

G:\CAD\DEV\C15\S12\12fd006.dwg Wed Jan 05 20:23:40 2000



NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 11FMD001 & 11FMD002.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

000076

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	1/6/00	BJD	SWH	KDR	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICKETT, REGISTERED PROFESSIONAL ENGINEER, NO. 105742, STATE OF TENNESSEE, 01/07/00

DRAWN BY	B.J. Davis 01/07/00
DESIGNED BY	B.J. Davis 01/07/00
CHECKED BY	S.W. Hunter 01/07/00
APPROVED BY	Kenneth Rickett 01/07/00
APPROVED BY	John Simon 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

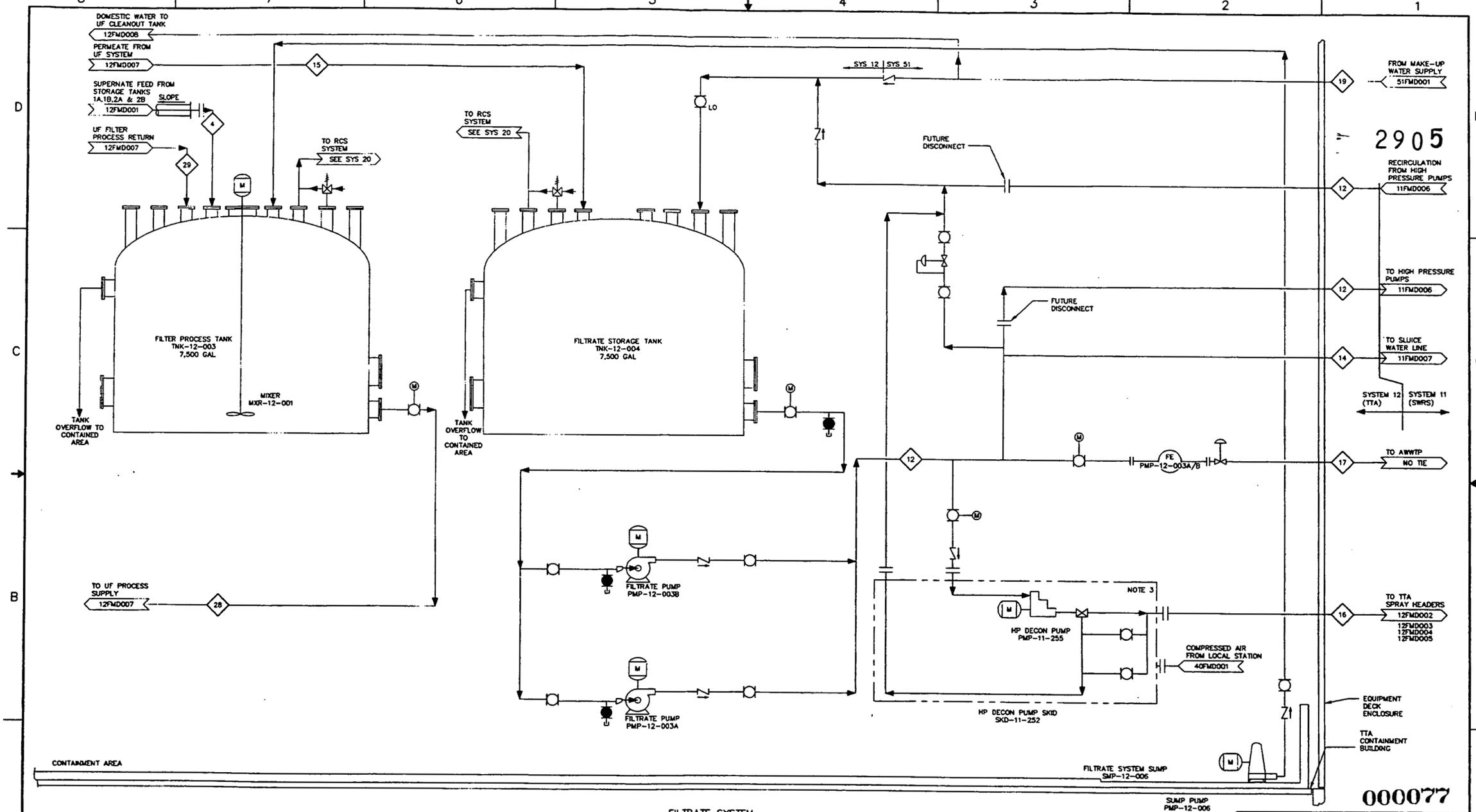
FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
TRANSFER TANK SYSTEM
PROCESS FLOW DIAGRAM
ULTRA FILTRATION SKD-12-001

SIZE	SCALE	DWG. NO.	REV
D	NONE	12FMD007	1

FILENAME: 12FMD007.DWG

C:\MARSTEM\SYS\12FMD007.dwg Thu Jan 06 20:00:32 2000



FILTRATE SYSTEM

NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 11FMD001 & 11FMD002.
3. SEE DRAWING 11PMD403 FOR DETAILS OF HIGH PRESSURE PUMP SKID SKD-11-252.

REFERENCE DRAWINGS:

05FMD001 PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION

05FMD002 PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS

PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD	SWH	LDL	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RIOKEN — PROFESSIONAL ENGINEER — STATE OF TENNESSEE

		DATE
DRAWN BY	B.J. Davis	01/07/00
DESIGNED BY	B.J. Davis	01/07/00
CHECKED BY	S.N. Hewitt	01/07/00
APPROVED BY	Kenneth K. Kubik	01/07/00
APPROVED BY	John Swanson	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
TRANSFER TANK SYSTEM
PROCESS FLOW DIAGRAM
FILTRATE SYSTEM

SIZE	SCALE:	DWG. NO.	REV
D	NONE	12FMD008	1

FILENAME: 12FMD008.DWG

G:\CHARGE\VDF SILOS\MEC\SYS12\12FMD008.dwg Thu Jan 06 20:05:51 2000

2905

SILO 2 – AWRS MASS BALANCE TABLE

INVENTORY		STREAM NUMBER	37	1	1	2	3	4	30	5	6	7	7	7	21	22	8	28	29
		STREAM DESCRIPTION	DECANT FROM TTA TO UF MAKE-UP CONNECTION	DECANT FROM UF MAKE-UP CONNECTION (BULK RETRIEVAL)	DECANT FROM UF MAKE-UP CONNECTION (CATS)	DECANT DILUTION WATER	DECANT FLUSH WATER	DECANT WATER TO BE FILTERED	DECANT MAKE-UP TO FILTER PROCESS TANK	SAMPLE ACCUMULATION TANK DECANT	SAMPLE ACCUMULATION TANK FLUSH	SLURRY DISCHARGE (BULK RETRIEVAL)	SLURRY DISCHARGE RETRIEVED WASTE (BULK RETRIEVAL)	SLURRY DISCHARGE (CATS WITH DILUTION WATER)	SLURRY DISCHARGE (FROM SREE TO SLURRY PUMP)	SAMPLE TO STORAGE DRUM	SLURRY LINE FROM UF SYSTEM	UF SUPPLY FROM PROCESS TANK	UF RETURN TO PROCESS TANK
													NOTE 2						
TOTAL SOLIDS (LB)	9,130,965	FLOW (GPM)	320	300	300	50	300	320	20	10	10	330.8	330.8	321	21	9	300	300	280
BENTOGROUT (LB)	187,369	% SOLIDS (WT)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	4.0	0	15.0	13.38	4.18	31.0	58.0	4.0	2.0	2.14
K-65 (LB)	8,943,596	SOLIDS PER GAL (LB)	0.167	0.167	0.167	0.167	0.167	0.167	0.167	0.336	0	1.315	1.164	0.351	2.983	6.926	0.336	0.167	0.179
VOLUME BENTOGROUT (GALLONS) IN-SITU	83,011	SOLIDS PER DAY (LB)	25,654	24,050	24,050	501	3,006	1,256	1,253	51	0	208,762	184,751	54,118	30,071	187	2,519	18,789	18,770
VOLUME K-65 (GALLONS) IN-SITU	751,141	MINUTES PER DAY OPERATION (MIN)	480	480	480	60	60	24	375	15.3	15	480	480	480	480	3	25	375	375
WATER (LB)	3,911,803	TOTAL VOLUME PER DAY (GALLONS)	153,600	144,000	144,000	3,000	18,000	7,520	7,500	153	150	158,777	158,777	154,080	10,080	27	7,500	112,500	105,000
TOTAL MASS (LB)	13,042,768	DAYS OF OPERATION	62.13	46.95	15.18	0.00	0.00	64.63	64.63	50.75	50.75	46.95	46.95	15.18	15.18	50.75	64.63	64.63	64.63
VOLUME WATER (GALLONS)	468,749	TOTAL VOLUME (GALLONS)	9,543,792	6,761,069	2,186,236	0	0	486,048	484,755	7,764	7,612	7,454,874	7,454,874	2,339,272	153,037	1,370	484,755	7,271,332	6,786,577
TOTAL VOLUME (GALLONS)	834,152	TOTAL MASS SOLIDS (LB)	1,593,969	1,129,209	365,137	0	0	81,178	80,962	2,608	0	9,801,761	8,674,417	821,626	456,548	9,490	162,841	1,214,431	1,213,150
CURIES	9,682	SOLIDS PER HOUR (LB/HR)	3,207	3,006	3,006	501	3,006	3,207	200	202	0	26,095	23,094	6,765	3,759	3,740	6,047	3,006	3,003
		CURIES	1,690	1,197	387	0	0	86	86	3	0	10,393	9,198	871	484	10	173	1,288	1,286

SILO 2 – AWRS MASS BALANCE TABLE – CONT.

INVENTORY		STREAM NUMBER	9	10	11	12	13	14	15	16	17	18	19	20	23	24	25	26	27
		STREAM DESCRIPTION	SLURRY SAMPLE LINE	SREE SPRAYERS (FILTERED WATER)	EMMA, SPRAY WAND, AND DECON SPRAY RINGS (FILTERED WATER)	FILTRATE RECIRCULATION LOOP (FILTERED WATER)	HP JET PUMP SUPPLY (FILTERED WATER)	RINSE WATER (FILTERED WATER)	FROM UF TO FW TANK (FILTERED WATER)	TTA HP DECON (FILTERED WATER)	AWWTP SUPPLY	MAKE-UP WATER TO TTA	MAKE-UP WATER TO FILTRATE TANK	RCS CONDENSATE RETURN	STORAGE TANK 2B SUMP DRAIN	STORAGE TANK 1B SUMP DRAIN	STORAGE TANK 2A SUMP DRAIN	STORAGE TANK 1A SUMP DRAIN	FROM TTA SUMP PUMP LINE
															NOTE 3	NOTE 3	NOTE 3	NOTE 3	NOTE 3
TOTAL SOLIDS (LB)	9,130,965	FLOW (GPM)	0.375	6	40	150	10	150	20	40	5	200	200	50	0	0	0	0	50
BENTOGROUT (LB)	187,369	% SOLIDS (WT)	15.0	0	0	0	0	0	0	0	0	0	0	0	20	20	20	20	20
K-65 (LB)	8,943,596	SOLIDS PER GAL (LB)	1.315	0	0	0	0	0	0	0	0	0	0	0	1.80	1.80	1.80	1.80	1.80
VOLUME BENTOGROUT (GALLONS) IN-SITU	83,011	SOLIDS PER DAY (LB)	237	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUME K-65 (GALLONS) IN-SITU	751,141	MINUTES PER DAY OPERATION (MIN)	480	480	60	480	480	2	375	20	0	90	30	60	0	0	0	0	0
WATER (LB)	3,911,803	TOTAL VOLUME PER DAY (GALLONS)	180	2,880	2,400	72,000	4,800	300	7,500	800	0	18,000	6,000	3,000	0	0	0	0	0
TOTAL MASS (LB)	13,042,768	DAYS OF OPERATION	62.13	15.18	5.00	15.18	15.18	62.13	64.63	0.00	0.00	21.00	21.00	4.00	0	0	0	0	0
VOLUME WATER (GALLONS)	468,749	TOTAL VOLUME (GALLONS)	11,184	43,725	12,000	1,093,118	72,875	18,640	484,755	0	0	378,000	126,000	12,000	0	0	0	0	0
TOTAL VOLUME (GALLONS)	834,152	TOTAL MASS SOLIDS (LB)	14,705	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CURIES	9,682	SOLIDS PER HOUR (LB/HR)	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		CURIES	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTES:

1. MASS BALANCE TABLES TO BE USED IN CONJUNCTION WITH DRAWINGS 11FMD003 THRU 11FMD009, & 12FMD001 THRU 12FMD008.
2. STREAM OF APPROXIMATE WASTE RETRIEVED (SLURRY SOILDS 15% – DECANT SOLIDS 2%).
3. TTA TANK FOUNDATION DRAIN.

000078

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	1/07/00	BJD	SWH	RJK	CERTIFIED FOR CONSTRUCTION
0	01/05/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICKS PROFESSIONAL ENGINEER NO. 107748 STATE OF TENNESSEE 01/07/00

		DATE
DRAWN BY	BJD	01/07/00
DESIGNED BY	BJD	01/07/00
CHECKED BY	SWH	01/07/00
REVIEWED BY	RJK	01/07/00
APPROVED BY		01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
SILO WASTE RETRIEVAL SYSTEM
PROCESS FLOW DIAGRAM
MASS BALANCE TABLE – SHT 1

SIZE	SCALE:	DWG. NO.	REV
D	NONE	11FMD001	1

FILENAME: 11FMD001.DWG

G:\DWGS\CVS\11\11fmd001.dwg Wed Jan 05 12:52:15 2000

2905

SILO 1 – AWRS MASS BALANCE TABLE

INVENTORY		STREAM NUMBER	37	1	1	2	3	4	30	5	6	7	7	7	21	22	8	28	29
		STREAM DESCRIPTION	DECANT FROM TTA TO UF MAKE-UP CONNECTION	DECANT FROM UF MAKE-UP CONNECTION (BULK RETRIEVAL)	DECANT FROM UF MAKE-UP CONNECTION (CATS)	DECANT DILUTION WATER	DECANT FLUSH WATER	DECANT WATER TO BE FILTERED	DECANT MAKE-UP TO FILTER PROCESS TANK	SAMPLE ACCUMULATION TANK DECANT	SAMPLE ACCUMULATION TANK FLUSH	SLURRY DISCHARGE (BULK RETRIEVAL)	SLURRY DISCHARGE RETRIEVED WASTE (BULK RETRIEVAL)	SLURRY DISCHARGE (CATS WITH DILUTION WATER)	SLURRY DISCHARGE (FROM SREE TO SLURRY PUMP)	SAMPLE TO STORAGE DRUM	SLURRY LINE FROM UF SYSTEM	UF SUPPLY FROM PROCESS TANK	UF RETURN TO PROCESS TANK
TOTAL SOLIDS (LB)	10,539,229	FLOW (GPM)	320	300	300	50	300	320	20	10	10	330.8	NOTE 2						
BENTOGROUT (LB)	214,613	% SOLIDS (WT)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	4.0	0	15.0	330.8	321	21	9	300	300	280
K-65 (LB)	10,324,616	SOLIDS PER GAL (LB)	0.167	0.167	0.167	0.167	0.167	0.167	0.167	0.336	0	1.315	13.38	4.18	31.0	58.0	4.0	2.0	2.14
VOLUME BENTOGROUT (GALLONS) IN-SITU	95,130	SOLIDS PER DAY (LB)	25,654	24,050	24,050	501	3,006	1,256	1,253	51	0	208,762	1.164	0.351	2.983	6.926	0.336	0.167	0.179
VOLUME K-65 (GALLONS) IN-SITU	867,074	MINUTES PER DAY OPERATION (MIN)	480	480	480	60	60	24	375	15.3	15	480	184,751	54,118	30,071	187	2,519	18,789	18,770
WATER (LB)	4,510,370	TOTAL VOLUME PER DAY (GALLONS)	153,600	144,000	144,000	3,000	18,000	7,520	7,500	153	150	158,777	480	480	480	3	25	375	375
TOTAL MASS (LB)	15,049,599	DAYS OF OPERATION	69.78	54.57	15.21	0.00	0.00	72.28	72.28	58.37	58.37	54.57	158,777	154,080	10,080	27	7,500	112,500	105,000
VOLUME WATER (GALLONS)	540,475	TOTAL VOLUME (GALLONS)	10,718,260	7,858,042	2,190,327	0	0	543,548	542,103	8,931	8,756	8,664,415	54.57	15.21	15.21	58.37	72.28	72.28	72.28
TOTAL VOLUME (GALLONS)	962,204	TOTAL MASS SOLIDS (LB)	1,790,124	1,312,421	365,820	0	0	90,781	90,540	3,000	0	11,392,080	8,664,415	2,343,650	153,323	1,576	542,103	8,131,538	7,589,435
CURIES	17,363	SOLIDS PER HOUR (LB/HR)	3,207	3,006	3,006	501	3,006	3,207	200	202	0	26,095	10,081,826	823,163	457,403	10,916	182,106	1,358,099	1,356,667
		CURIES	2,949	2,162	603	0	0	150	149	5	0	18,768	23,094	6,765	3,759	3,740	6,047	3,006	3,003
													16,609	1,356	754	18	300	2,237	2,235

SILO 1 – AWRS MASS BALANCE TABLE – CONT.

INVENTORY		STREAM NUMBER	9	10	11	12	13	14	15	16	17	18	19	20	23	24	25	26	27
		STREAM DESCRIPTION	SLURRY SAMPLE LINE	SREE SPRAYERS (FILTERED WATER)	EMMA, SPRAY WAND, AND DECON SPRAY RINGS (FILTERED WATER)	FILTRATE RECIRCULATION LOOP (FILTERED WATER)	HP JET PUMP SUPPLY (FILTERED WATER)	RINSE WATER (FILTERED WATER)	FROM UF TO FW TANK (FILTERED WATER)	TTA HP DECON (FILTERED WATER)	AWWTP SUPPLY	MAKE-UP WATER TO TTA	MAKE-UP WATER TO FILTRATE TANK	RCS CONDENSATE RETURN	STORAGE TANK 2B SUMP DRAIN	STORAGE TANK 1B SUMP DRAIN	STORAGE TANK 2A SUMP DRAIN	STORAGE TANK 1A SUMP DRAIN	FROM TTA SUMP PUMP LINE
TOTAL SOLIDS (LB)	10,539,229	FLOW (GPM)	0.375	6	40	150	10	150	20	40	5	200	200	50	NOTE 3	NOTE 3	NOTE 3	NOTE 3	NOTE 3
BENTOGROUT (LB)	214,613	% SOLIDS (WT)	15.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
K-65 (LB)	10,324,616	SOLIDS PER GAL (LB)	1.315	0	0	0	0	0	0	0	0	0	0	0	20	20	20	20	20
VOLUME BENTOGROUT (GALLONS) IN-SITU	95,130	SOLIDS PER DAY (LB)	237	0	0	0	0	0	0	0	0	0	0	0	1.80	1.80	1.80	1.80	1.80
VOLUME K-65 (GALLONS) IN-SITU	867,074	MINUTES PER DAY OPERATION (MIN)	480	480	60	480	480	2	375	20	480	90	30	60	0	0	0	0	0
WATER (LB)	4,510,370	TOTAL VOLUME PER DAY (GALLONS)	180	2,880	2,400	72,000	4,800	300	7,500	800	2,400	18,000	6,000	3,000	0	0	0	0	0
TOTAL MASS (LB)	15,049,599	DAYS OF OPERATION	69.78	15.21	5.00	15.21	15.21	69.78	72.28	0.00	0.00	22.10	20.70	5.00	0	0	0	0	0
VOLUME WATER (GALLONS)	540,475	TOTAL VOLUME (GALLONS)	12,560	43,807	12,000	1,095,163	73,011	20,934	542,103	0	0	397,800	124,200	15,000	0	0	0	0	0
TOTAL VOLUME (GALLONS)	962,204	TOTAL MASS SOLIDS (LB)	16,515	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CURIES	17,363	SOLIDS PER HOUR (LB/HR)	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		CURIES	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTES:

1. MASS BALANCE TABLES TO BE USED IN CONJUNCTION WITH DRAWINGS 11FMD003 THRU 11FMD009, 12FMD001 THRU 12FMD008, & 51FMD001.
2. STREAM OF APPROXIMATE WASTE RETRIEVED (SLURRY SOILDS 15% – DECANT SOLIDS 2%).
3. TTA TANK FOUNDATION DRAIN.

000079

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD	JKF	KDR	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICKETT PROFESSIONAL ENGINEER NO. 107742 STATE OF TENNESSEE

DRAWN BY BJD DATE 01/07/00
DESIGNED BY BJD DATE 01/07/00
CHECKED BY SWH DATE 01/07/00
APPROVED BY Kenneth Rickett DATE 01/07/00
APPROVED BY John Jason DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

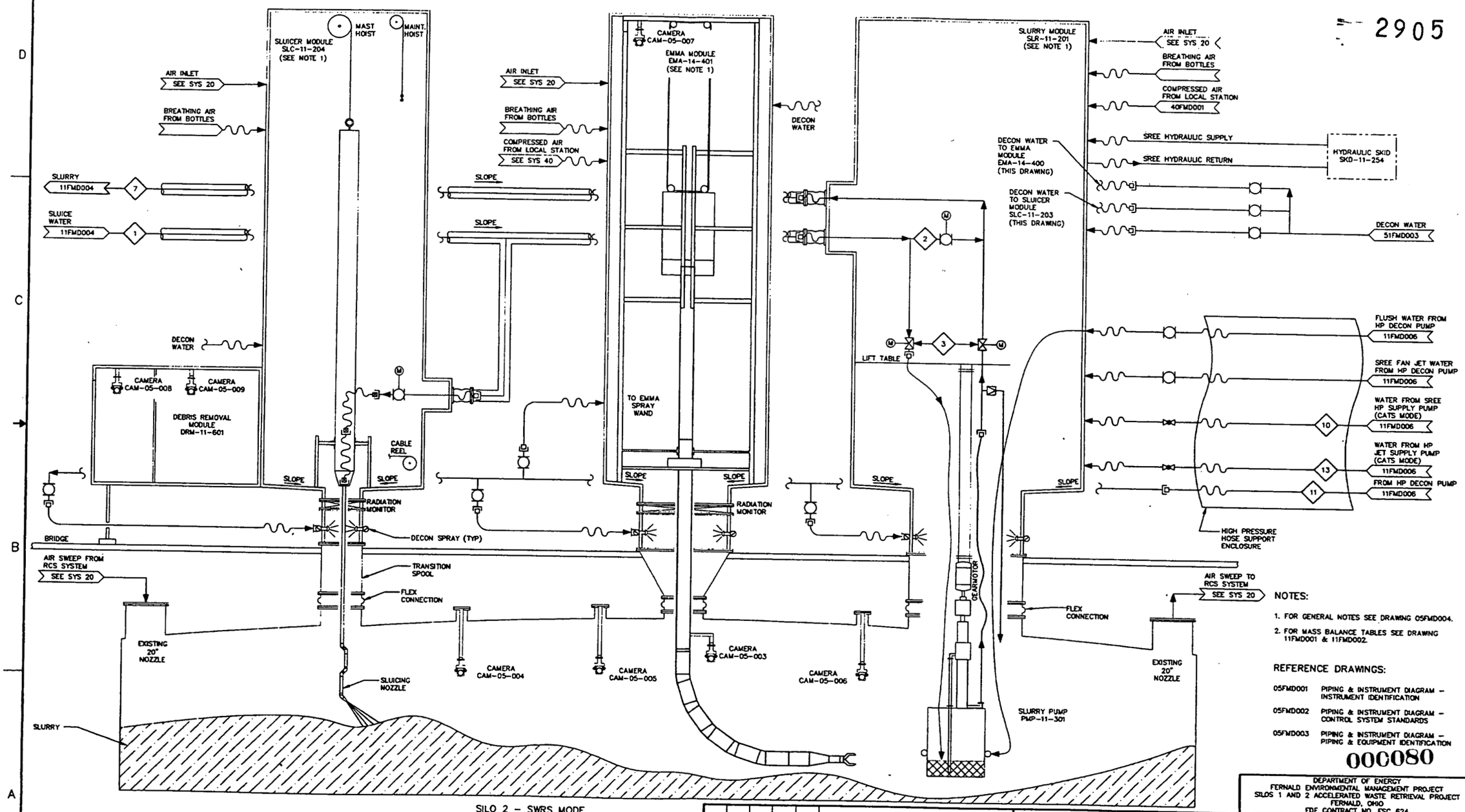
FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
SILO WASTE RETRIEVAL SYSTEM
PROCESS FLOW DIAGRAM
MASS BALANCE TABLE – SHT 2

SIZE D | SCALE: NONE | DWG. NO. 11FMD002 | REV 1

FILENAME: 11FMD002.DWG

2905



SILO 2 – SWRS MODE

NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 11FMD001 & 11FMD002.

REFERENCE DRAWINGS:

05FMD001 PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION

05FMD002 PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS

05FMD003 PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

000080

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD	[illegible]	KMR	CERTIFIED FOR CONSTRUCTION
0	12/01/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICKETT PROFESSIONAL ENGINEER REGISTERED 103742 STATE OF TENNESSEE 01/07/00

DRAWN BY B.J. Davis DATE 01/07/00
DESIGNED BY B.J. Davis DATE 01/07/00
CHECKED BY J.N. Hamm DATE 01/07/00
APPROVED BY Kenneth Rickett DATE 01/07/00
APPROVED BY John Lawson DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
SILO WASTE RETRIEVAL SYSTEM
PROCESS FLOW DIAGRAM
SILO 2 – SWRS MODE

SIZE D | SCALE: NONE | DWG. NO. 11FMD003 | REV 1

FILENAME: 11FMD003.DWG

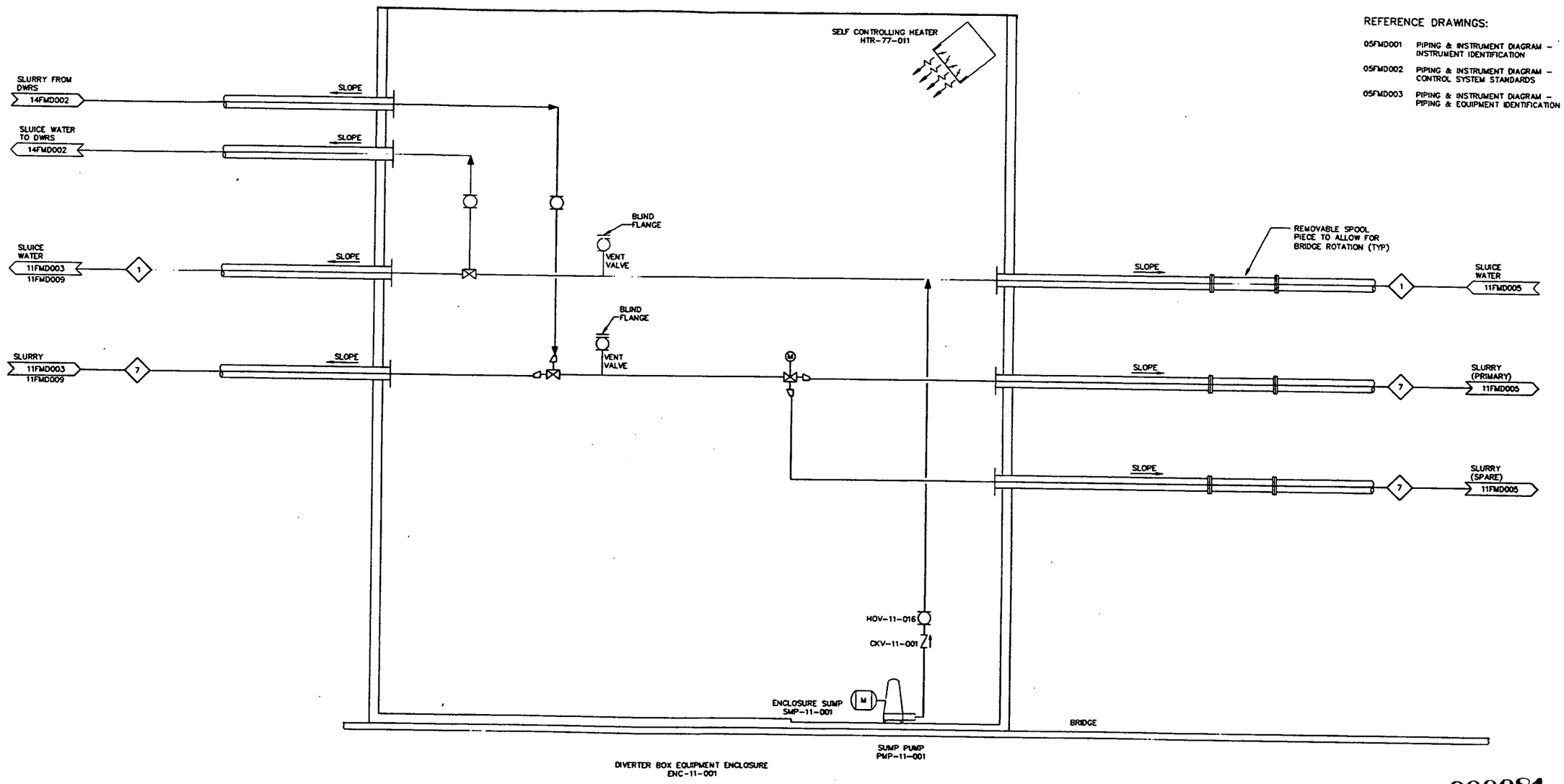
E:\DHARDEL\FSILOS\DECUS\FSILS11111fmd003.dwg Thu Jan 06 18:39:38 2000

NOTES: 2905

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 11FMD001 & 11FMD002.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION



000081

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	[illegible]	[illegible]	[illegible]	[illegible]	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICKETT PROFESSIONAL ENGINEER REGISTRATION NO. 103742 STATE OF TENNESSEE

DRAWN BY	DATE 01/07/00
DESIGNED BY	DATE 01/07/00
CHECKED BY	DATE 01/07/00
APPROVED BY	DATE 01/07/00
APPROVED BY	DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
SILO WASTE RETRIEVAL SYSTEM
PROCESS FLOW DIAGRAM
DIVERTER BOX ENC-11-001

SIZE	SCALE:	DWG. NO.	REV
D	NONE	11FMD004	1

FILENAME: 11FMD004.DWG

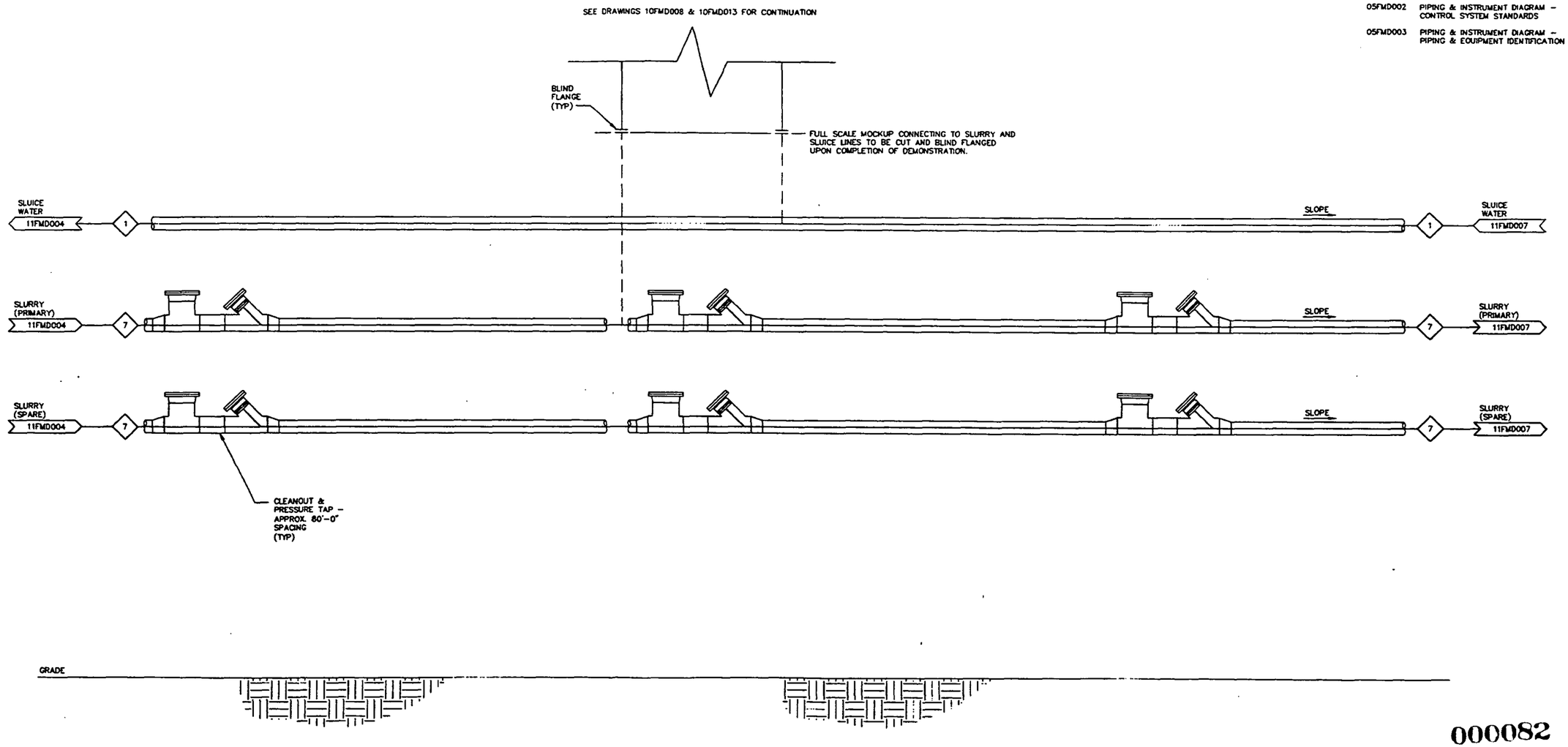
O:\DHARBE\FDF SILOS\WAC\SYS11\11fmd004.dwg Thu Jan 06 12:12:25 2000

NOTES: 2905

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 11FMD001 & 11FMD002.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION



000082

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	[illegible]	[illegible]	[illegible]	[illegible]	CERTIFIED FOR CONSTRUCTION
0	11/18/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICKETT REGISTERED PROFESSIONAL ENGINEER NO. 103745 STATE OF TENNESSEE

DRAWN BY	B.J. Davis 01/07/00
DESIGNED BY	B.J. Davis 01/07/00
CHECKED BY	[illegible] 01/07/00
APPROVED BY	Kenneth Rickett 01/07/00
APPROVED BY	John Lawson 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
SILO WASTE RETRIEVAL SYSTEM
PROCESS FLOW DIAGRAM
SLURRY LINE CLEANOUTS

SIZE	SCALE:	DWG. NO.	REV
D	NONE	11FMD005	1

FILENAME: 11FMD005.DWG

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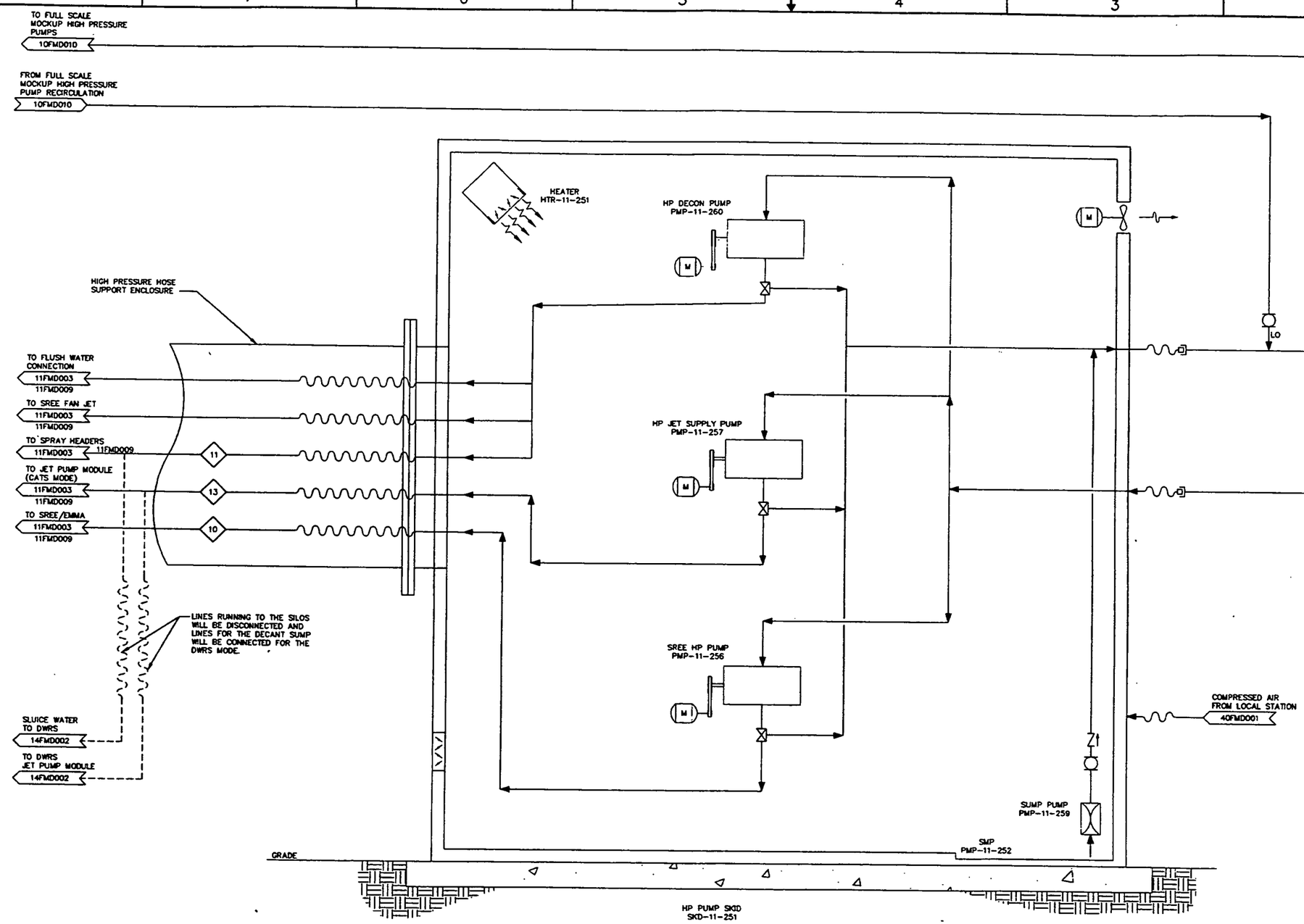
2905



NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 11FMD001 & 11FMD002.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM - INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM - CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM - PIPING & EQUIPMENT IDENTIFICATION

000083

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD	SWH	KDR	CERTIFIED FOR CONSTRUCTION
0	01/03/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICKETT PE, PROFESSIONAL ENGINEER, REGISTRATION NO. 10031142, STATE OF TENNESSEE

		DATE
DRAWN BY	B.J. Davis	01/07/00
DESIGNED BY	B.J. Davis	01/07/00
CHECKED BY	J.V. Hunzeker	01/07/00
APPROVED BY	Kenneth D. Rickett	01/07/00
APPROVED BY	John Simmons	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
SILO WASTE RETRIEVAL SYSTEM
PROCESS FLOW DIAGRAM
HP PUMP SKID SKD-11-251

SIZE	SCALE:	DWG. NO.	REV
D	NONE	11FMD006	1

FILENAME: 11FMD006.DWG

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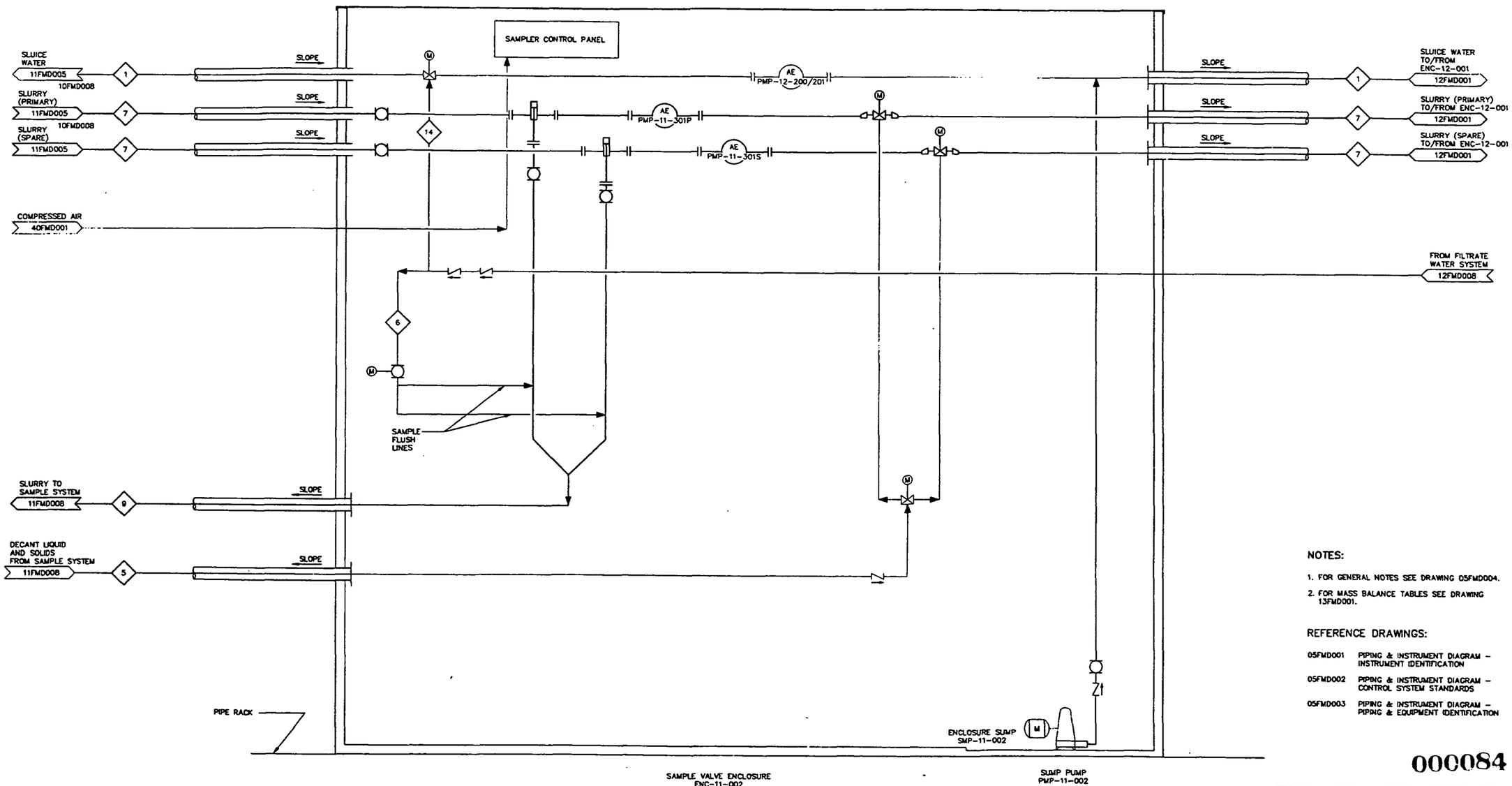
2905



NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 13FMD001.

REFERENCE DRAWINGS:

05FMD001 PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION

05FMD002 PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS

05FMD003 PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

000084

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD	ALH	KDR	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

PE KENNETH D. RICHARDS No. 10574 STATE OF TENNESSEE

DRAWN BY B.J. Davis DATE 01/07/00
DESIGNED BY B.J. Davis DATE 01/07/00
CHECKED BY S.W. Hampton DATE 01/07/00
APPROVED BY Kenneth Richards DATE 01/07/00
APPROVED BY John Lawson DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
SILO WASTE RETRIEVAL SYSTEM
PROCESS FLOW DIAGRAM
SAMPLE VALVE ENCLOSURE

SIZE D | SCALE: NONE | DWG. NO. 11FMD007 | REV 1

FILENAME: 11FMD007.DWG

G:\CAMRCE\DATA\SYS11\11FMD007.DWG Wed Jan 05 12:24:58 2000

2905

SLURRY FROM SAMPLE VALVES
11FMD007

SLOPE

CAMERA
CAM-05-011

COMPRESSED AIR
40FMD001

COMPRESSED AIR
40FMD001

SELF CONTROLLING SPACE HEATER
HTR-77-010

SAMPLE BUILDING

DECANT PUMP
PMP-11-004

SLOPE

DECANT LIQUID AND SOLIDS TO TTA
11FMD007

VENT TO RCS
SEE SYS 20

SAMPLE TANK
TNK-11-001A
185 GAL

SAMPLE TANK
TNK-11-001B
185 GAL

2 TON BRIDGE CRANE
CRH-11-001

SLIDE GATE
SLG-11-001

CAMERA
CAM-05-010

VOLUMETRIC FEEDER
SCM-11-001A

SLIDE GATE
SLG-11-003

VOLUMETRIC FEEDER
SCM-11-001B

SLIDE GATE
SLG-11-002

FLEXIBLE BOOT
FLX-11-004

SLIDE GATE
SLG-11-004

FLEXIBLE BOOT
FLX-11-005

EMPTY 30 GALLON DRUM INSIDE 55 GALLON OVERPACK

LIFT TABLE

SUMP PUMP
PMP-11-003

CONTAINMENT CURB (TYP)

STORAGE AREA

DRUM CAPPING / BUNGING WORK STATION

DRUM FILLING STATION

CONVEYOR
SSS-11-001

DRUM FILLING STATION

SAMPLE BUILDING SUMP
SMP-11-003

NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 11FMD001 & 11FMD002.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

000085

SAMPLE SYSTEM

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	RDD	BJD	SWH	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICHARDS, REGISTERED PROFESSIONAL ENGINEER, NO. 103745, STATE OF TENNESSEE, 01/07/00

	DATE
DRAWN BY: B.D. Davis	01/07/00
DESIGNED BY: B.D. Davis	01/07/00
CHECKED BY: S.W. Hewitt	01/07/00
APPROVED BY: Kenneth D. Richards	01/07/00
APPROVED BY: [illegible]	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

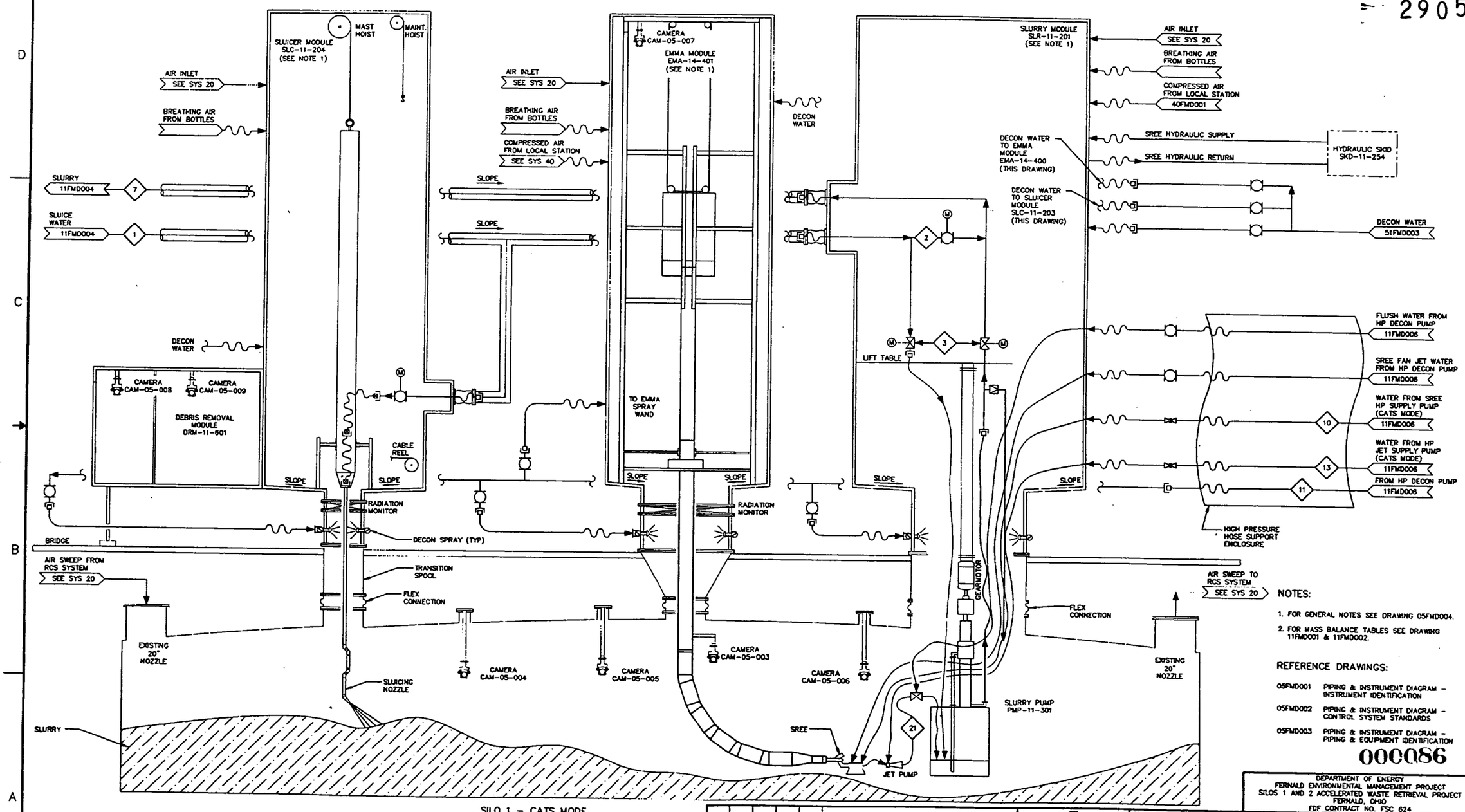
TITLE
SILO WASTE RETRIEVAL SYSTEM
PROCESS FLOW DIAGRAM
SAMPLE SYSTEM

SIZE: D | SCALE: NONE | DWG. NO. 11FMD008 | REV 1

FILENAME: 11FMD008.DWG

G:\DRAFTING\C\SYS11\11fmd008.dwg Thu Jan 06 20:52:06 2000

2905



SILO 1 – CATS MODE

NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 11FMD001 & 11FMD002.

REFERENCE DRAWINGS:

05FMD001 PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION

05FMD002 PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS

05FMD003 PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

000086

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD	DLH	KDR	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICHARDS REGISTERED ENGINEER No. 16024 STATE OF TENNESSEE 01/07/00

DRAWN BY B.J.Davis DATE 01/07/00
DESIGNED BY B.J.Davis DATE 01/07/00
CHECKED BY D.N.Hunt DATE 01/07/00
APPROVED BY Kenneth Richards DATE 01/07/00
APPROVED BY John Sawyer DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
SILO WASTE RETRIEVAL SYSTEM
PROCESS FLOW DIAGRAM
SILO 1 – CATS MODE

SIZE	SCALE	DWG. NO.	REV
D	NONE	11FMD009	1

FILENAME: 11FMD009.DWG

Z:\DWGES\FWFS11DS\VECLS\009.dwg Thu Jan 06 18:55:25 2000

2905

FULL-SCALE MOCKUP MASS BALANCE TABLE

FSMS INVENTORY		STREAM NUMBER	37	1	1	2	3	4	30	5	6	7	7	7	21	22	8	28	29	9
		STREAM DESCRIPTION	DECANT FROM TTA TO UF MAKE-UP CONNECTION	DECANT FROM UF MAKE-UP CONNECTION (BULK RETRIEVAL)	DECANT FROM UF MAKE-UP CONNECTION (CATS)	DECANT DILUTION WATER	DECANT FLUSH WATER	DECANT WATER TO BE FILTERED	DECANT MAKE-UP TO FILTER PROCESS TANK	SAMPLE TANK DECANT	SAMPLE TANK FLUSH	SLURRY DISCHARGE (BULK RETRIEVAL)	SLURRY DISCHARGE RETRIEVED WASTE (BULK RETRIEVAL)	SLURRY DISCHARGE (CATS WITH DILUTION WATER)	SLURRY DISCHARGE (FROM SREE TO SLURRY PUMP)	SAMPLE STORAGE	SLURRY LINE FROM UF SYSTEM	UF SUPPLY FROM PROCESS TANK	UF RETURN TO PROCESS TANK	SLURRY SAMPLE LINE
TOTAL SOLIDS (LB)	184,751		NOTE 3					NOTE 3	NOTE 3	NOTE 3	NOTE 3		NOTE 2			NOTE 3	NOTE 3	NOTE 3	NOTE 3	NOTE 3
BENTOGROUT (LB)	3,791	FLOW (GPM)	320	300	300	50	300	320	20	10	10	355	355	325	25	9	300	300	100	0.355
FIU SIMULANT (LB)	180,960	% SOLIDS (WT)	0	0	0	0	0	0	0	4.5	0	15.0	15.0	3.0	32	55.0	0	0	0	15.0
VOLUME BENTOGROUT (GAL) IN-SITU	1,575	SOLIDS PER GAL (LB)	0	0	0	0	0	0	0	0.378	0	1.334	1.334	0.247	3.183	6.387	0	0	0	1.334
VOLUME FIU (GAL) IN-SITU	20,886	SOLIDS PER DAY (LB)	0	0	0	0	0	0	0	54	0	227,424	227,424	38,603	38,811	172	0	0	0	227
WATER (LB)	94,886	MINUTES PER DAY OPERATION (MIN)	480	480	480	60	60	24	375	14.3	15	480	480	480	480	3	25	375	375	480
TOTAL MASS (LB)	279,637	TOTAL VOLUME PER DAY (GALLONS)	153,600	144,000	144,000	3,000	18,000	7,520	7,500	143	150	170,487	170,487	156,192	12,192	27	7,500	112,500	37,500	170
VOLUME WATER (GALLONS)	11,861	DAYS OF OPERATION	1.01	0.76	0.25	0	0	1.01	1.01	1.01	1.01	0.76	0.76	0.25	0.25	1.01	1.01	1.01	1.01	1.01
TOTAL VOLUME (GALLONS)	22,461	TOTAL VOLUME (GALLONS)	155,136	109,440	36,000	0	0	7,595	7,575	144	152	129,570	129,570	39,048	3,048	27	7,575	113,625	37,875	172
		TOTAL MASS SOLIDS (LB)	0	0	0	0	0	0	0	55	0	172,842	172,842	9,651	9,703	174	0	0	0	230
		SOLIDS PER HOUR (LB/HR)	0	0	0	0	0	0	0	227	0	28,428	28,428	4,825	4,851	3,449	0	0	0	28

FULL-SCALE MOCKUP MASS BALANCE TABLE – CONT.

FSMS INVENTORY		STREAM NUMBER	10	11	12	13	14	15	18	19
		STREAM DESCRIPTION	SREE SPRAYERS (FILTERED WATER)	EMMA, SPRAY WAND, AND DECON SPRAY RINGS (FILTERED WATER)	FILTRATE RECIRCULATION LOOP (FILTERED WATER)	HP JET PUMP SUPPLY (FILTERED WATER)	RINSE WATER (FILTERED WATER)	FROM UF TO FW TANK (FILTERED WATER)	MAKE-UP WATER	MAKE-UP WATER TO FILTRATE TANK
TOTAL SOLIDS (LB)	184,751						NOTE 3	NOTE 3	NOTE 3	NOTE 3
BENTOGROUT (LB)	3,791	FLOW (GPM)	6	40	180	10	150	20	200	200
FIU SIMULANT (LB)	180,960	% SOLIDS (WT)	0	0	0	0	0	0	0	0
VOLUME BENTOGROUT (GAL) IN-SITU	1,575	SOLIDS PER GAL (LB)	0	0	0	0	0	0	0	0
VOLUME FIU (GAL) IN-SITU	20,886	SOLIDS PER DAY (LB)	0	0	0	0	0	0	0	0
WATER (LB)	94,886	MINUTES PER DAY OPERATION (MIN)	240	60	30	480	2	375	90	30
TOTAL MASS (LB)	279,637	TOTAL VOLUME PER DAY (GALLONS)	1,440	2,400	5,400	4,800	300	7,500	18,000	6,000
VOLUME WATER (GALLONS)	11,861	DAYS OF OPERATION	0.25	5	0.25	0.25	1.01	1.01	7.50	1.00
TOTAL VOLUME (GALLONS)	22,461	TOTAL VOLUME (GALLONS)	360	12,000	1,350	1,200	303	7,575	135,000	6,000
		TOTAL MASS SOLIDS (LB)	0	0	0	0	0	0	0	0
		SOLIDS PER HOUR (LB/HR)	0	0	0	0	0	0	0	0

NOTES:

1. MASS BALANCE TABLES TO BE USED IN CONJUNCTION WITH 10FMD007, 10FMD008, 10FMD009, 10FMD010 & 10FMD011.
2. STREAM OF APPROXIMATE WASTE RETRIEVED (SLURRY SOLIDS 15% – DECANT SOLIDS 2 %).
3. DURING ICAT & SOT OPERATION OF THE FULL-SCALE MOCKUP (FSM), COMPONENTS AND FLOW STREAMS OF THE PERMANENT FACILITY WILL BE USED. CERTAIN FLOW STREAM IDENTIFIERS HAVE BEEN DUPLICATED ON THIS MASS BALANCE WHEN COMPARED TO OTHER SYSTEM MASS BALANCES. THE STREAMS ARE DUPLICATED BECAUSE THE MASS BALANCE VALUES ARE DIFFERENT DURING FSM OPERATION AS OPPOSED TO NORMAL SYSTEM OPERATION. ALL OF THE DUPLICATE STREAM NUMBERS DO NOT APPEAR ON THE FULL-SCALE MOCKUP SYSTEM (FSMS) PROCESS FLOW DIAGRAMS. THE LIST BELOW SHOWS THE LOCATION OF THE DUPLICATE STREAMS NOT SHOWN ON THE FSMS PROCESS FLOW DIAGRAMS. THE VALUES PRESENTED ON THIS DRAWING SHOULD ONLY BE USED FOR FSM OPERATION. STREAM NUMBERS ARE PRESENTED IN THE ORDER THEY APPEAR ON THE MASS BALANCE.

STREAM NUMBER	DRAWING
37	12FMD001 12FMD002 12FMD003 12FMD004 12FMD005
4	12FMD001 12FMD008
30	12FMD001
5	11FMD007 11FMD008
6	11FMD007
22	11FMD008
8	12FMD001 12FMD007
28	12FMD007 12FMD008
29	12FMD007 12FMD008
9	12FMD007 12FMD008
14	11FMD007
15	12FMD007 12FMD008
18	12FMD001
19	12FMD008

000087

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMTY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APRV'D	DESCRIPTION/ISSUE
1	01/07/00	BJD	BJD	KDR	CERTIFIED FOR CONSTRUCTION
0	01/31/98	BJD	SWH		PRELIMINARY DESIGN SUBMITTAL

RPE KENNETH D. RICKETT PROFESSIONAL ENGINEER NO. 103742 STATE OF TENNESSEE 01/07/00

		DATE
DRAWN BY	BJ Davis	01/07/00
DESIGNED BY	BJ Davis	01/07/00
CHECKED BY	D.N. Hunter	01/07/00
APPROVED BY	Kenneth Rickett	01/07/00
APPROVED BY	John Emerson	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
FULL-SCALE MOCKUP SYSTEM
PROCESS FLOW DIAGRAM
MASS BALANCE TABLE

SIZE	SCALE:	DWG. NO.	REV
D	NONE	10FMD006	1

FILENAME: 10FMD006.DWG

G:\CADDEV\0\STS10\10fmd006.dwg Wed Jan 05 18:32:19 2000

2905

SLUICER AIR FILTER FLT-11-005

FI FLT-11-005

BREATHING AIR FROM BOTTLES

SLURRY 10FMD008

SLUICE WATER 10FMD008

DECON WATER

SLUICER MODULE SLC-11-203 (SEE NOTE 1)

MAST HOIST

MAINT. HOIST

CAMERA

CAMERA

DEBRIS REMOVAL MODULE DRM-11-600

CABLE REEL

SLOPE

SLOPE

EXISTING SILO 4 BRIDGE

DECON SPRAY (TYP)

AIR SWEEP FROM FSMS RCS SYSTEM 10FMD002

TRANSITION SPOOL

FLEX CONNECTION

EXISTING 20" NOZZLE

SURROGATE TANK TNK-10-001

SLURCING NOZZLE

SURROGATE

EMMA AIR FILTER FLT-14-002

FI FLT-14-002

BREATHING AIR FROM BOTTLES

COMPRESSED AIR FROM LOCAL STATION SEE SYS 40

SLOPE

SLOPE

CAMERA

EMMA MODULE EMA-14-400 (SEE NOTE 1)

TO EMMA SPRAY WAND

SLOPE

SLOPE

CAMERA

CAMERA

CAMERA

CAMERA

DECON WATER

SLURRY MODULE SLR-11-200 (SEE NOTE 1)

DECON WATER TO EMMA MODULE EMA-14-400 (THIS DRAWING)

DECON WATER TO SLUICER MODULE SLC-11-203 (THIS DRAWING)

LIFT TABLE

GEARMOTOR

SLOPE

SLOPE

SLURRY PUMP PMP-11-300

FI FLT-11-006

SLURRY AIR FILTER FLT-11-006

BREATHING AIR FROM BOTTLES

COMPRESSED AIR FROM LOCAL STATION 40FMD001

SREE HYDRAULIC SUPPLY

SREE HYDRAULIC RETURN

HYDRAULIC SKID SKD-11-253

DECON WATER 51FMD003

FLUSH WATER FROM HP DECON PUMP 10FMD010

SREE FAN JET WATER FROM HP DECON PUMP 10FMD010

WATER FROM SREE HP SUPPLY PUMP (CATS MODE) 10FMD010

WATER FROM HP JET SUPPLY PUMP (CATS MODE) 10FMD010

FROM HP DECON PUMP 10FMD010

AIR SWEEP TO FSMS RCS SYSTEM 10FMD002

FLEX CONNECTION

EXISTING 20" NOZZLE

SILO 4 – SWRS MODE

NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 10FMD006.

000088

REFERENCE DRAWINGS:

05FMD001 PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION

05FMD002 PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS

05FMD003 PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APRV'D	DESCRIPTION/ISSUE
1	01/07/00	BJD	DLW	RAR	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD		RAR	PRELIMINARY DESIGN SUBMITTAL

REG. KENNETH D. RICKER PROFESSIONAL ENGINEER NO. 103742 STATE OF TENNESSEE

DRAWN BY B.J. Davis DATE 01/07/00
DESIGNED BY B.J. Davis DATE 01/07/00
CHECKED BY DATE
APPROVED BY DATE 01/07/00
APPROVED BY DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
FULL-SCALE MOCKUP SYSTEM
PROCESS FLOW DIAGRAM
SILO 4 – SWRS MODE

SIZE	SCALE:	DWG. NO.	REV
D	NONE	10FMD007	1

FILENAME: 10FMD007.DWG

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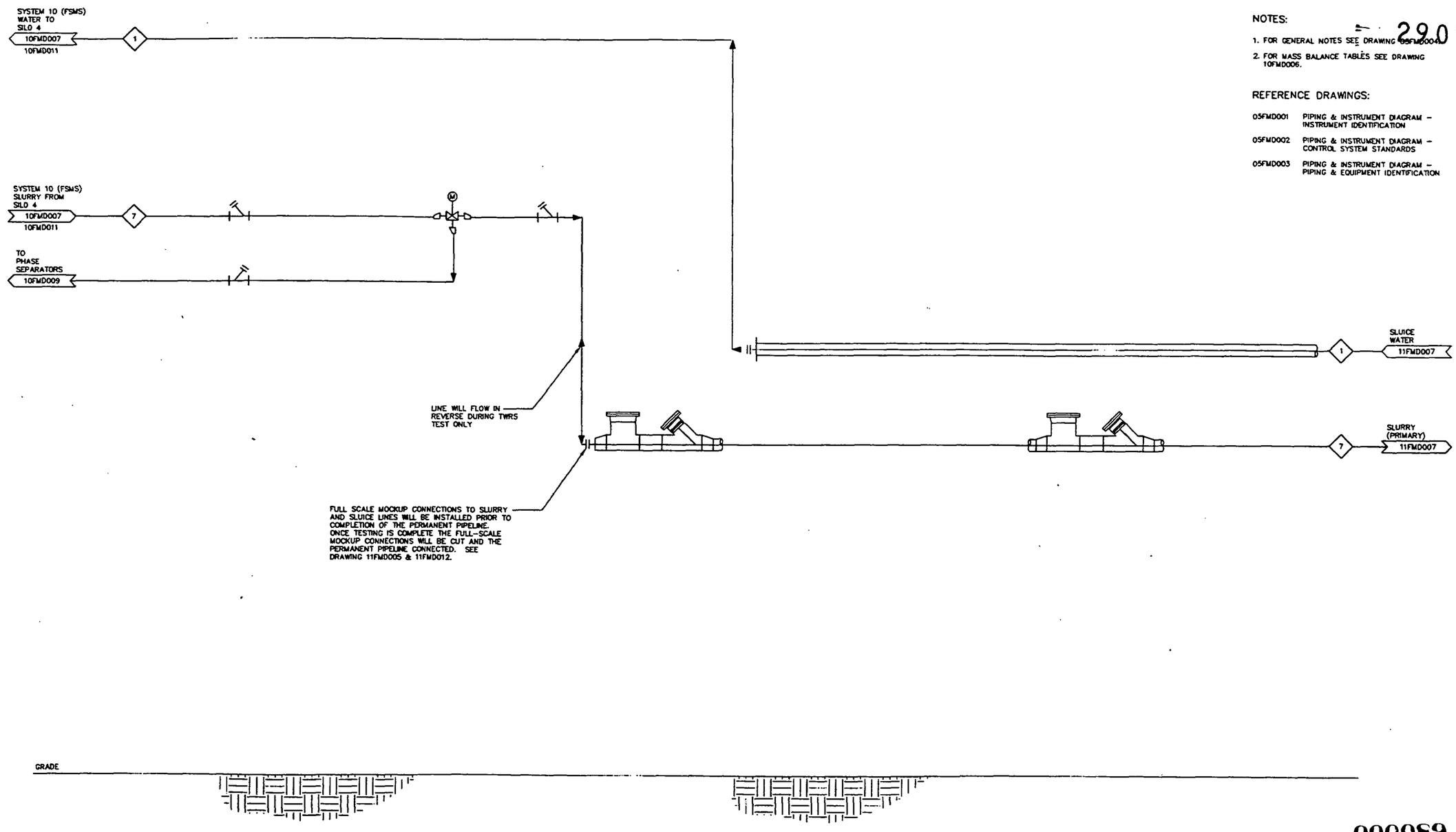


NOTES:

1. FOR GENERAL NOTES SEE DRAWING ~~05FMD004~~ 2905
2. FOR MASS BALANCE TABLES SEE DRAWING 10FMD006.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	2/6/00	BJD	J.E.	RAR	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	RAR		PRELIMINARY DESIGN SUBMITTAL

REV KENNETH D. RICKETTS PROFESSIONAL ENGINEER No. 102743 STATE OF TENNESSEE 01/02/00

		DATE
DRAWN BY	B.J. Davis	01/07/00
DESIGNED BY	B.J. Davis	01/07/00
CHECKED BY	J.E. Hunt	01/07/00
APPROVED BY	Kenneth Ricketts	01/10/00
APPROVED BY	John Lemon	01/10/00

000089

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
FULL-SCALE MOCKUP SYSTEM
PROCESS FLOW DIAGRAM
SLURRY & WATER PIPING TIE-IN

SIZE	SCALE:	DWG. NO.	REV
D	NONE	10FMD008	1

FILENAME: 10FMD008.DWG

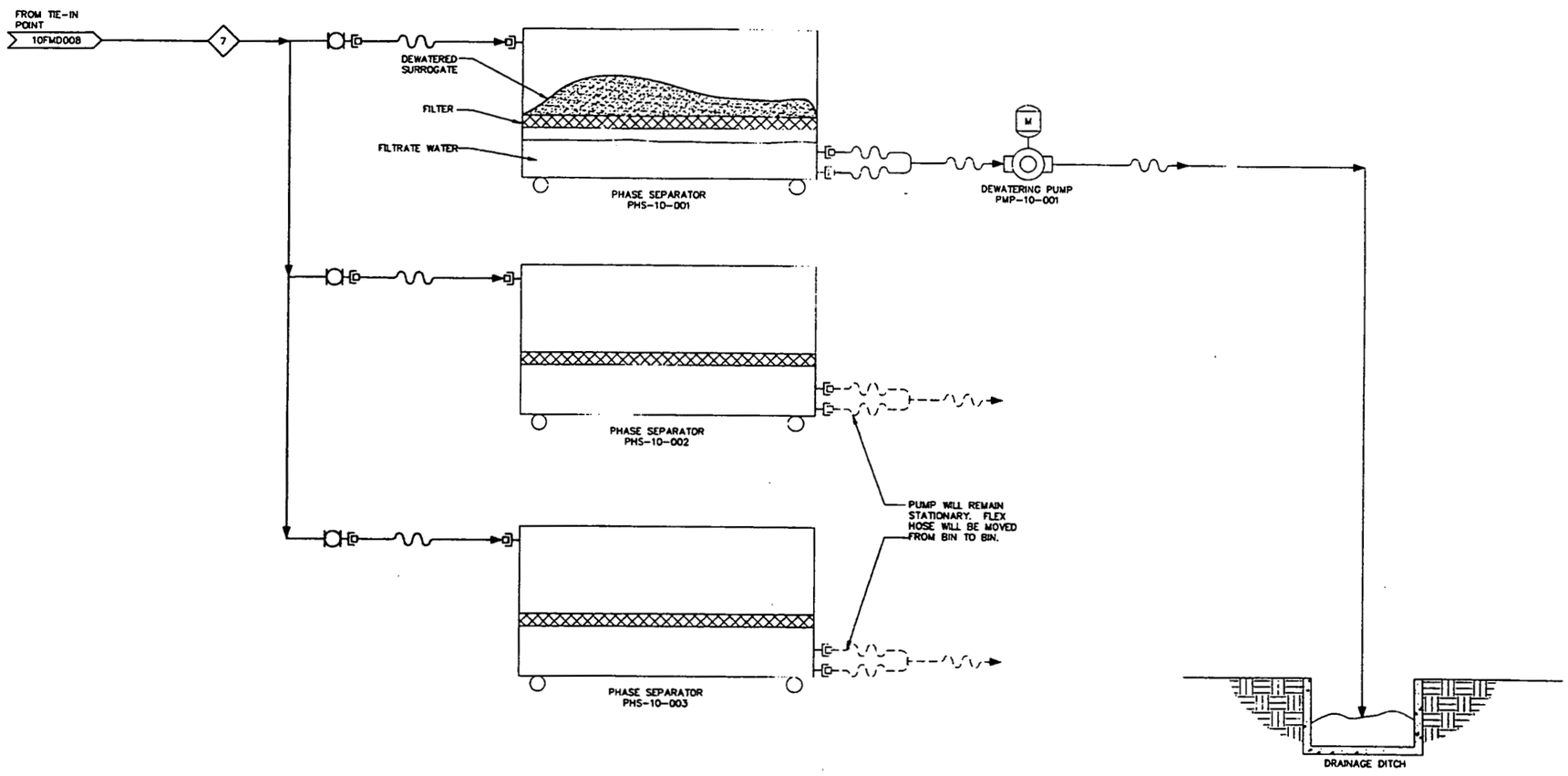
G:\DWGS\FDFSILOS\MECH\SYS10\10FMD008.dwg Thu Jan 06 18:27:40 2000

NOTES: 2905

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 10FMD006.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION



000090

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD	KAH	KDR	CERTIFIED FOR CONSTRUCTION
0	11/03/99	BJD	RAR		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICKETTS PROFESSIONAL ENGINEER NO. 103712 STATE OF TENNESSEE

DRAWN BY	B.J. Davis	DATE 01/07/00
DESIGNED BY	B.J. Davis	DATE 01/07/00
CHECKED BY	K.H. Hunt	DATE 01/07/00
APPROVED BY	Kenneth Ricketts	DATE 01/07/00
APPROVED BY	John Lawson	DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
FULL-SCALE MOCKUP SYSTEM
PROCESS FLOW DIAGRAM
PHASE SEPARATORS

SIZE	SCALE	DWG. NO.	REV
D	NONE	10FMD009	1

FILENAME: 10FMD009.DWG

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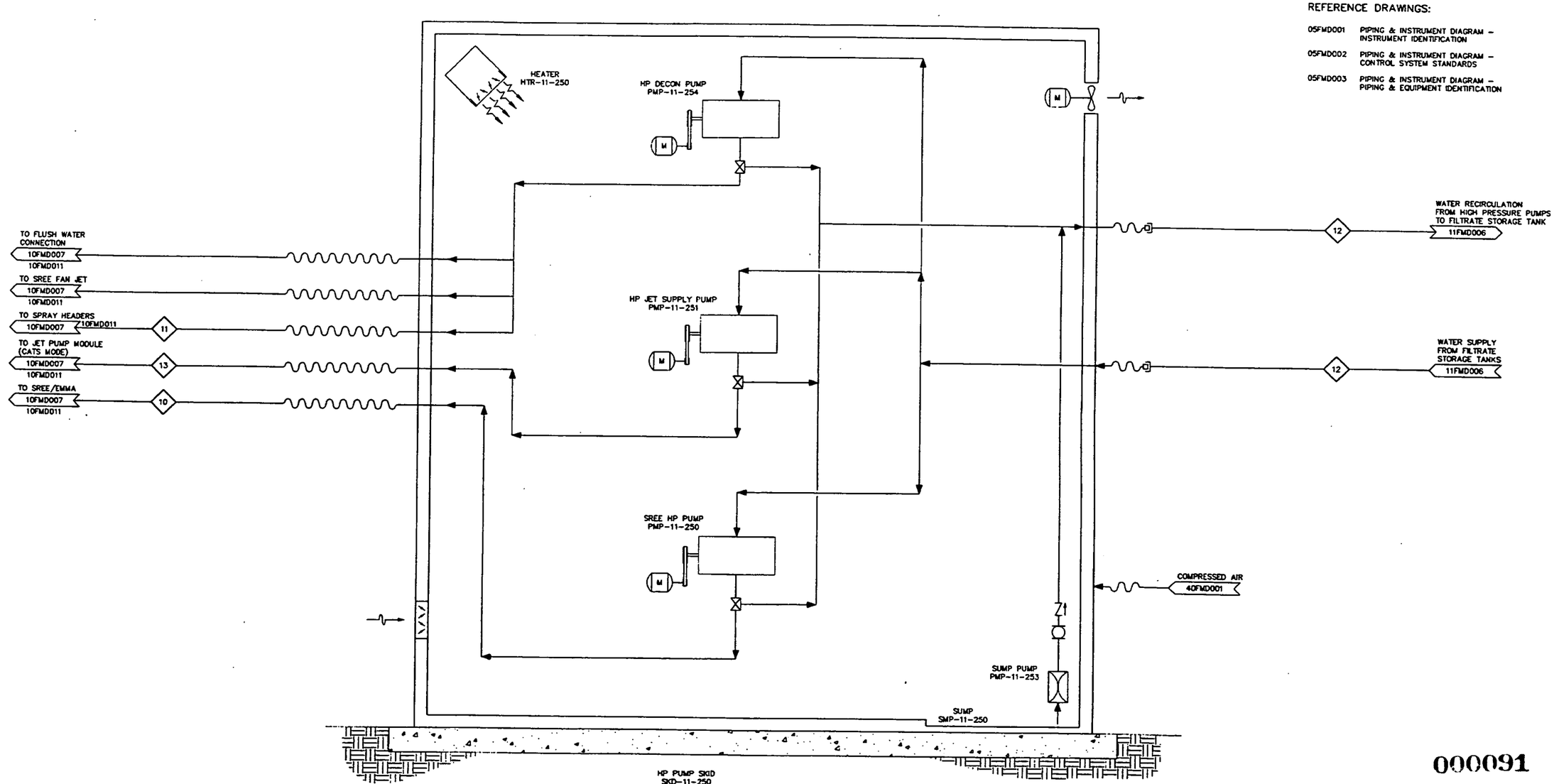
NOTES: 2905

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 10FMD006.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION



000091

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD	RAR		CERTIFIED FOR CONSTRUCTION
0	01/07/99	BJD	RAR		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICKETT PROFESSIONAL ENGINEER NO. 103741 STATE OF TENNESSEE

DRAWN BY	DATE 01/07/00
DESIGNED BY	DATE 01/07/00
CHECKED BY	DATE 01/07/00
APPROVED BY	DATE 01/07/00
APPROVED BY	DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
FULL-SCALE MOCKUP SYSTEM
PROCESS FLOW DIAGRAM
HP PUMP SKID SKD-11-250

SIZE	SCALE:	DWG. NO.	REV
D	NONE	10FMD010	1

FILENAME: 10FMD010.DWG

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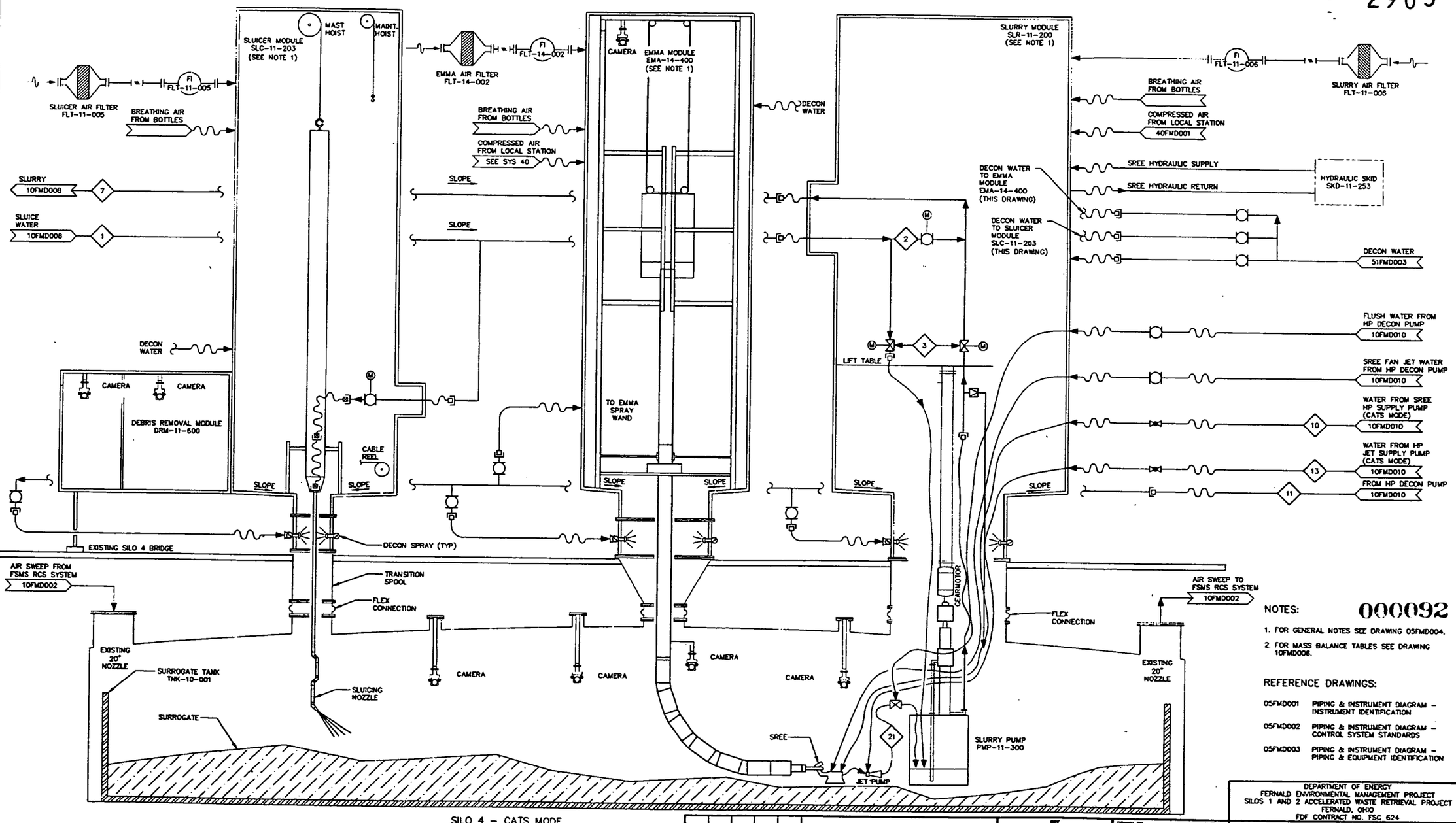
2905



SILO 4 – CATS MODE

NOTES: 000092

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 10FMD006.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD	JHH	MRL	CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	RAR		PRELIMINARY DESIGN SUBMITTAL

RPE KENNETH D. RICKETT — STATE OF TENNESSEE

		DATE
DRAWN BY	BJ Davis	01/07/00
DESIGNED BY	BJ Davis	01/07/00
CHECKED BY	J.H. Hennessy	01/07/00
PROVED BY	Kenneth Rickett	01/07/00
APPROVED BY	John Lawson	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
FULL-SCALE MOCKUP SYSTEM PROCESS FLOW DIAGRAM SILO 4 – CATS MODE

SIZE	SCALE	DWG. NO.	REV
D	NONE	10FMD011	1

FILENAME: 10FMD011.DWG

G:\DRAWINGS\FSCS\10\10FMD011.dwg Fri Jan 07 19:05:26 2000

2905

PHASE 1 (SEE NOTE 2)

STREAM NUMBER	1	2	3	4	5	6	7	8	9
COMPONENT	AIR FROM SILO 4	AIR TO SILO 4	AIR TO STACK	FAN RECYCLE FLOW	AIR TO FAN	MAKE-UP AIR	EQUIPMENT ENCLOSURE AIR INFLOW	EQUIPMENT ENCLOUSRE AIR INFLOW	EQUIPMENT ENCLOSURE AIR INLFLOW
AIR (LBS/HR)	2,166	2,166	216.6	1,949.4	4,332	--	--	--	--
WATER (LBS/HR)	40.6	40.6	4.1	36.5	81.2	--	--	--	--
TOTAL (LBS/HR)	2,206.6	2,206.6	220.7	1,985.9	4,413.2	--	--	--	--
FLOW (CFM)	500	500	50	450	1,000	50	--	--	--
FLOW (GPM)	--	--	--	--	--	--	--	--	--
RADON (PICOCURIES/L)	--	--	--	--	--	--	--	--	--
RADON (CURIES/HR)	--	--	--	--	--	--	--	--	--
TEMPERATURE (DEG F)	75	75	75	75	75	--	--	--	--
PRESSURE (INCHES WC)	--	--	--	--	--	--	--	--	--
NOTES									

PHASE 2 (SEE NOTE 3)

STREAM NUMBER	1	2	3	4	5	6	7	8	9
COMPONENT	AIR FROM SILO 4	AIR TO SILO 4	AIR TO STACK	FAN RECYCLE FLOW	AIR TO FAN	MAKE-UP AIR	EQUIPMENT ENCLOSURE AIR INFLOW	EQUIPMENT ENCLOSURE AIR INFLOW	EQUIPMENT ENCLOSURE AIR INFLOW
AIR (LBS/HR)	1,083	--	3,249	1,083	4,332	2,166	361	361	361
WATER (LBS/HR)	20.3	--	60.9	20.3	81.2	40.6	6.8	6.8	6.8
TOTAL (LBS/HR)	1,103.3	--	3,309.9	1,103.3	4,413.2	2,206.6	367.8	367.8	367.8
FLOW (CFM)	250	--	750	250	1,000	500	83	83	83
FLOW (GPM)	--	--	--	--	--	--	--	--	--
RADON (PICOCURIES/L)	--	--	--	--	--	--	--	--	--
RADON (CURIES/HR)	--	--	--	--	--	--	--	--	--
TEMPERATURE (DEG F)	75	--	75	75	75	75	75	75	75
PRESSURE (INCHES WC)	--	--	--	--	--	--	--	--	--
NOTES									

NOTES:

1. MASS BALANCE TABLES TO BE USED IN CONJUNCTION WITH 10FMD002, & 10FMD003.
2. PHASE 1 MASS BALANCE REPRESENTS RCS RECYCLE WITH 100% OF AIR PULLED FROM SILO 4 RECYCLED BACK TO SILO 4.
3. PHASE 2 MASS BALANCE REPRESENTS RCS OPERATION DURING RETRIEVAL MODE FROM SILOS AND AIRFLOW THROUGH EQUIPMENT MODULES.

000093

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMDTY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	BJD			CERTIFIED FOR CONSTRUCTION
0	01/01/99	BJD	RAR		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICKETT PROFESSIONAL ENGINEER REGISTRATION NO. 10371 STATE OF TENNESSEE

DRAWN BY BJD DATE 01/07/00
DESIGNED BY BJD DATE 01/07/00
CHECKED BY DATE 01/07/00
APPROVED BY DATE 01/07/00
APPROVED BY DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
FULL-SCALE MOCKUP SYSTEM
PROCESS FLOW DIAGRAM
MASS BALANCE-RADON CONTROL

SIZE D | SCALE: NONE | DWG. NO. 10FMD001 | REV 1

FILENAME: 10FMD001.DWG

G:\CAD\REV\DFS1.05\VEC\SYS\10\10fmd001.dwg Fri Jan 07 15:52:15 2000

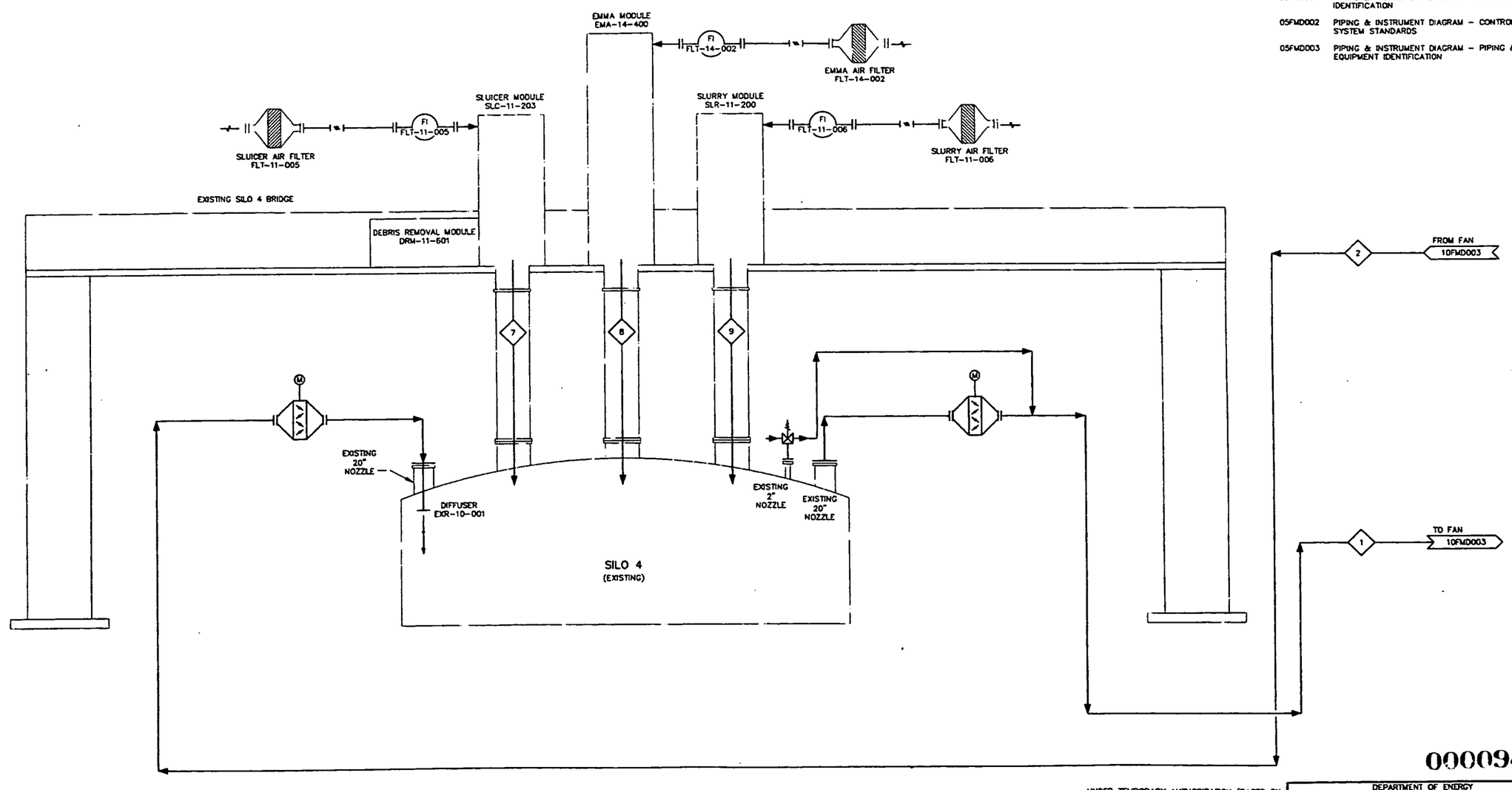
2905

NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 10FMD001.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION



000094

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	DGP	JLR	KDR	CERTIFIED FOR CONSTRUCTION
0	11/03/99	BJD	RAR		PRELIMINARY DESIGN SUBMITTAL

RPE KENNETH D. RICKETT PROFESSIONAL ENGINEER REGISTRATION NO. 103743 STATE OF TENNESSEE 01/07/00

		DATE
DRAWN BY	B. J. Davis	01/07/00
DESIGNED BY	B. J. Davis	01/07/00
CHECKED BY	J. V. Hunt	01/07/00
APPROVED BY	Kenneth Rickett	01/07/00
APPROVED BY	John Swanson	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
FULL-SCALE MOCKUP SYSTEM
PROCESS FLOW DIAGRAM
RADON CONTROL SYSTEM

SIZE	SCALE:	DWG. NO.	REV
D	NONE	10FMD002	1

FILENAME: 10FMD002.DWG

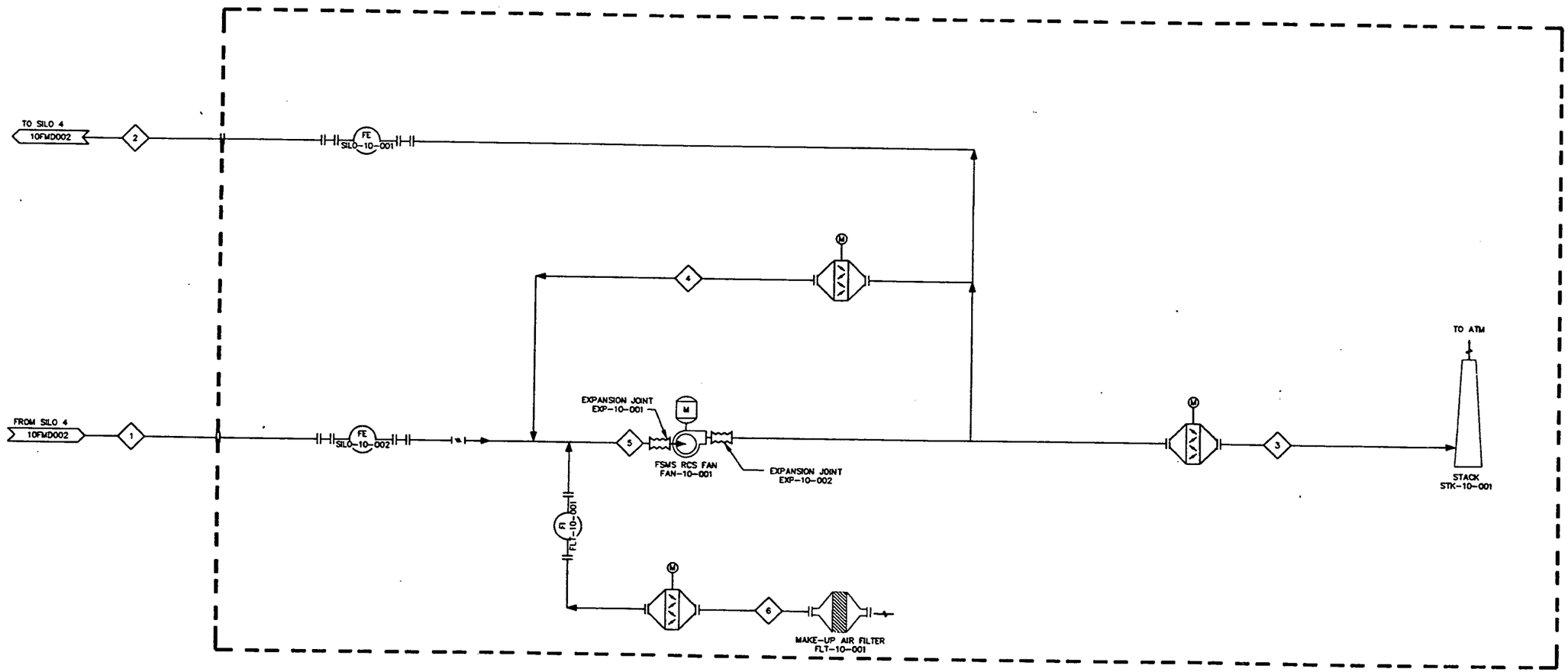
Z:\DAVES\FDFSILOS\10FMD002.DWG Wed Jan 05 17:22:54 2000

NOTES: 2905

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 10FMD001.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION



000095

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	01/07/00	RAR	BJD	RDK	CERTIFIED FOR CONSTRUCTION
0	01/07/99	BJD	RAR		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICKETT — PROFESSIONAL ENGINEER — NO. 15748 — STATE OF TENNESSEE

		DATE
DRAWN BY	B J Davis	01/07/01
DESIGNED BY	B J Davis	01/07/01
CHECKED BY	J N Hunt	01/07/00
APPROVED BY	Kenneth D Rickett	01/07/00
APPROVED BY	John Swan	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

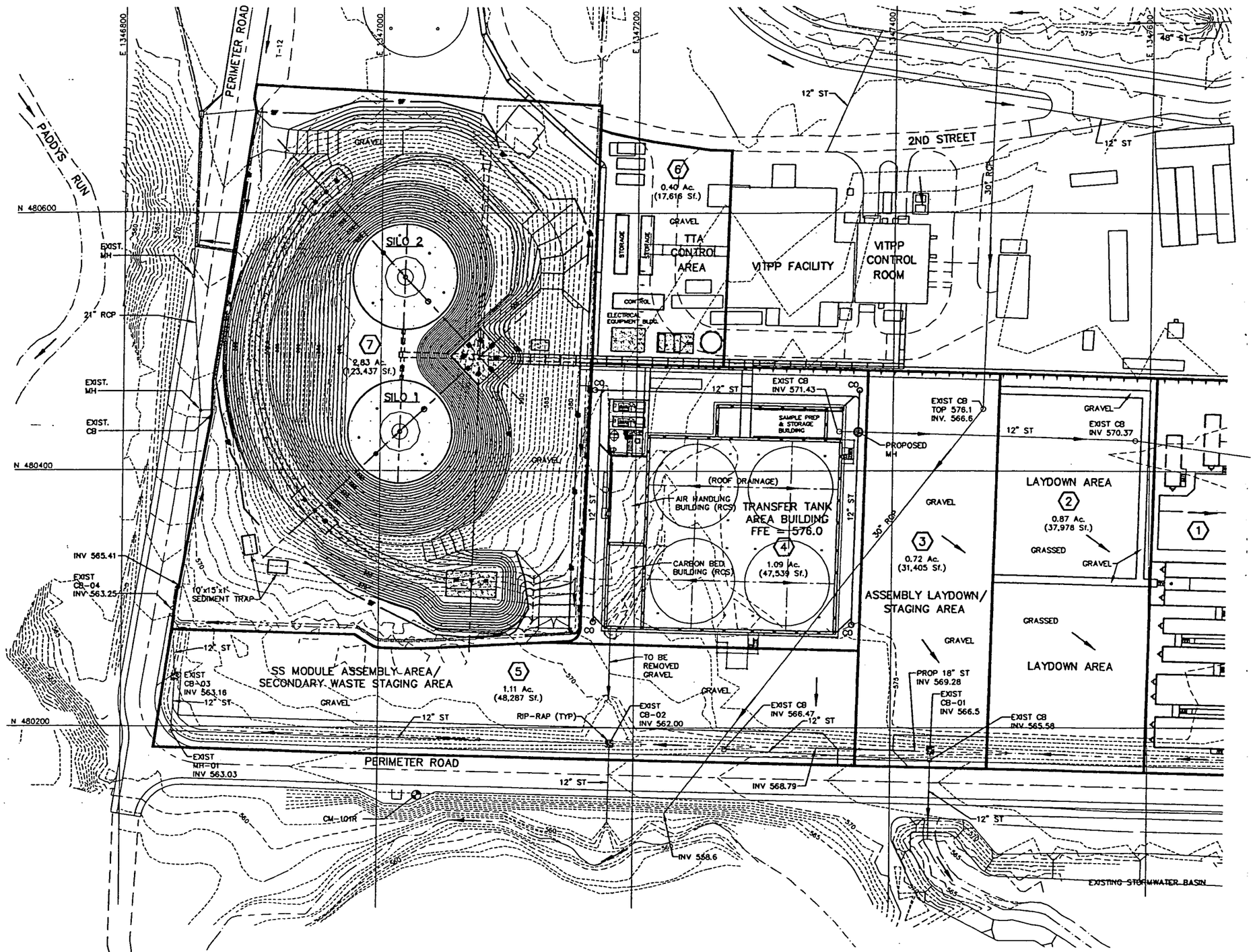
FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
FULL-SCALE MOCKUP SYSTEM
PROCESS FLOW DIAGRAM
RADON CONTROL SYSTEM

SIZE	SCALE:	DWG. NO.	REV
D	NONE	10FMD003	1

FILENAME: 10FMD003.DWG

C:\CHARGE\FDF5\ILOS\MECS\STS10\10fmd003.dwg Thu Jan 06 16:22:35 2000



NOTES: 2905

1. SEE DRAWING 05FCD011 FOR GENERAL NOTES AND LEGEND.
2. SILT FENCE TO BE INSTALLED AT THE BOTTOM OF ALL DISTURBED SLOPES.
3. CULVERT ENTRANCES AND EXITS TO BE PROTECTED BY RIP-RAP AND GEO FABRIC.
4. AREAS DISTURBED BY EXCAVATION ACTIVITIES ARE TO BE SEEDED AND MULCHED AS SOON AS PRACTICAL.
5. OVERSEEDING AND RESEEDING ARE TO BE PERFORMED AS NECESSARY UNTIL VEGETATION IS ESTABLISHED.
6. SILT IS TO BE REMOVED FROM DIVERSION DITCHES AND SILT FENCE INSTALLED AS REQUIRED BY THE SPECIFICATIONS AND AT THE END OF CONSTRUCTION.
7. EROSION CONTROL MEASURES ARE TO BE INSPECTED WEEKLY AND WITHIN 24 HOURS OF A 0.5 INCH RAINFALL.
8. REMEDIATION OF PROBLEMS IDENTIFIED IN THE INSPECTION ARE TO BE COMPLETED IN A TIMELY MANNER.
9. AWR PROJECT ACTIVITIES DO NOT SIGNIFICANTLY ALTER EXISTING DRAINAGE PATTERNS.
10. THE TTA PROCESS AREA ROOF DRAINAGE WILL BE DIRECTED TO THE EXISTING 12" STORM DRAIN SYSTEM AT THE NORTHEAST SECTION OF THE BUILDING.
11. EROSION AND SILTATION INTO THE CONCRETE CHANNEL IS TO BE PREVENTED.

STORMWATER LEGEND:

- (1) DRAINAGE AREA
- DRAINAGE AREA BOUNDARY
- FLOW DIRECTION
- CO PROPOSED CLEANOUT
- PROPOSED MANHOLE

STATE OF OHIO NORTH (NAD 83)

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

SECTION & DETAIL KEY

000096

40 0 40 80

SCALE IN FEET

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
A		WVD			ISSUED FOR OHIO EPA REVIEW

RPE

DRAWN BY WVD	DATE	
DESIGNED BY MSH	DATE	
CHECKED BY	DATE	
APPROVED BY	DATE	
APPROVED BY	DATE	

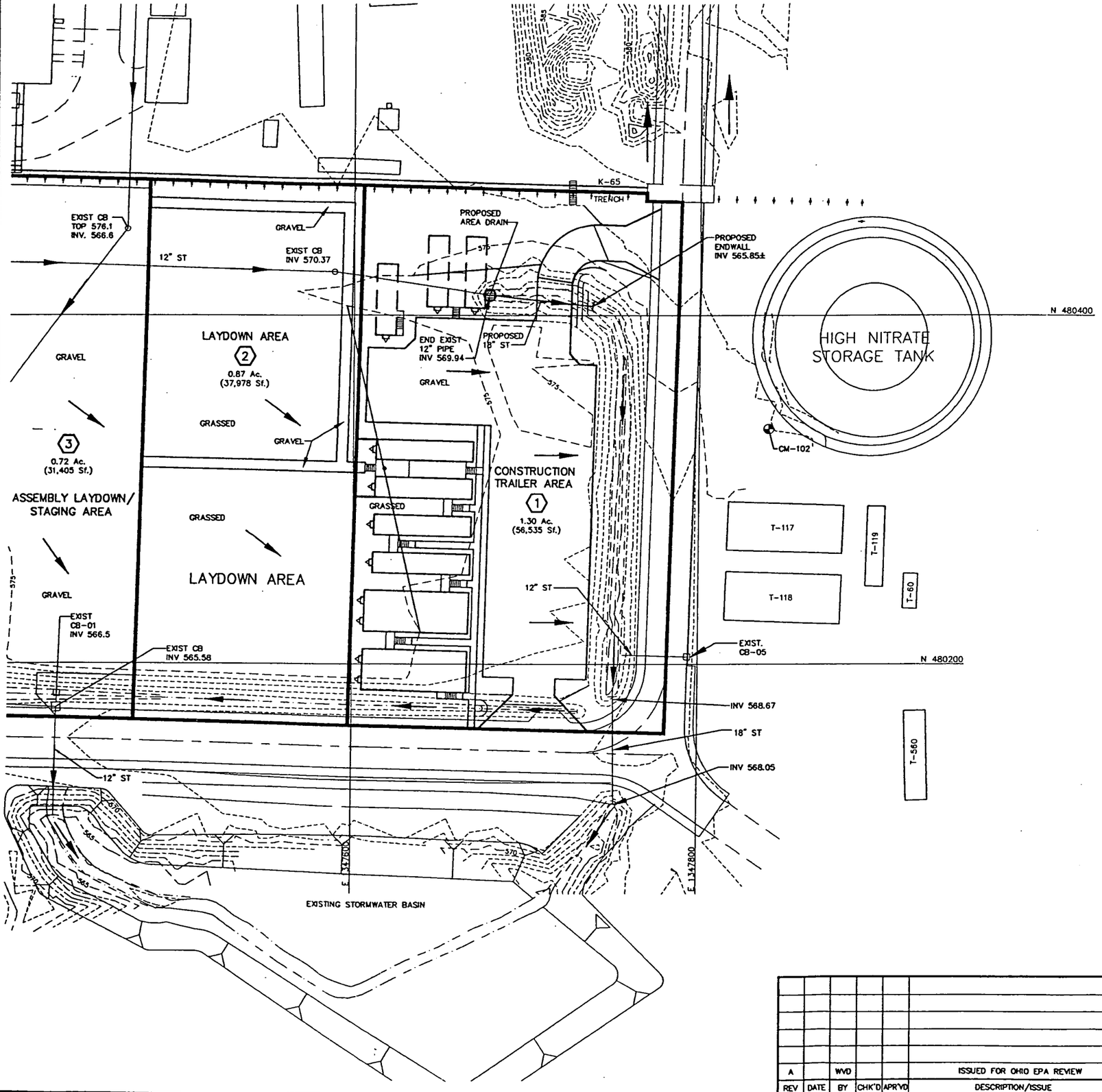
DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
STORM WATER SYSTEM
SWRS – DRAINAGE PLAN
PHASE 1

SIZE	SCALE:	DWG. NO.	REV
D	1"=30'	66FCD002	A

FILENAME: 66FCD002.



NOTES: 2905

1. SEE DRAWING 05FCD011 FOR GENERAL NOTES AND LEGEND.
2. SILT FENCE TO BE INSTALLED AT THE BOTTOM OF ALL DISTURBED SLOPES.
3. CULVERT ENTRANCES AND EXITS TO BE PROTECTED BY RIP-RAP AND GEO FABRIC.
4. AREAS DISTURBED BY EXCAVATION ACTIVITIES ARE TO BE SEEDED AND MULCHED AS SOON AS PRACTICAL.
5. OVERSEEDING AND RESEEDING ARE TO BE PERFORMED AS NECESSARY UNTIL VEGETATION IS ESTABLISHED.
6. SILT IS TO BE REMOVED FROM DIVERSION DITCHES AND SILT FENCE INSTALLED AS REQUIRED BY THE SPECIFICATIONS AND AT THE END OF CONSTRUCTION.
7. EROSION CONTROL MEASURES ARE TO BE INSPECTED WEEKLY AND WITHIN 24 HOURS OF A 0.5 INCH RAINFALL.
8. REMEDIATION OF PROBLEMS IDENTIFIED IN THE INSPECTION ARE TO BE COMPLETED IN A TIMELY MANNER.
9. AWR PROJECT ACTIVITIES DO NOT SIGNIFICANTLY ALTER EXISTING DRAINAGE PATTERNS.

STORMWATER LEGEND:

- (1) DRAINAGE AREA
- DRAINAGE AREA BOUNDARY
- FLOW DIRECTION
- PROPOSED MANHOLE
- PROPOSED ENDWALL

STATE OF OHIO NORTH (NAD 83)

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

SECTION & DETAIL KEY

000097

30 0 30 60

SCALE IN FEET

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
A		WVD			ISSUED FOR OHIO EPA REVIEW

RPE

DRAWN BY WVD DATE
DESIGNED BY MSH DATE
CHECKED BY DATE
APPROVED BY DATE
APPROVED BY DATE

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

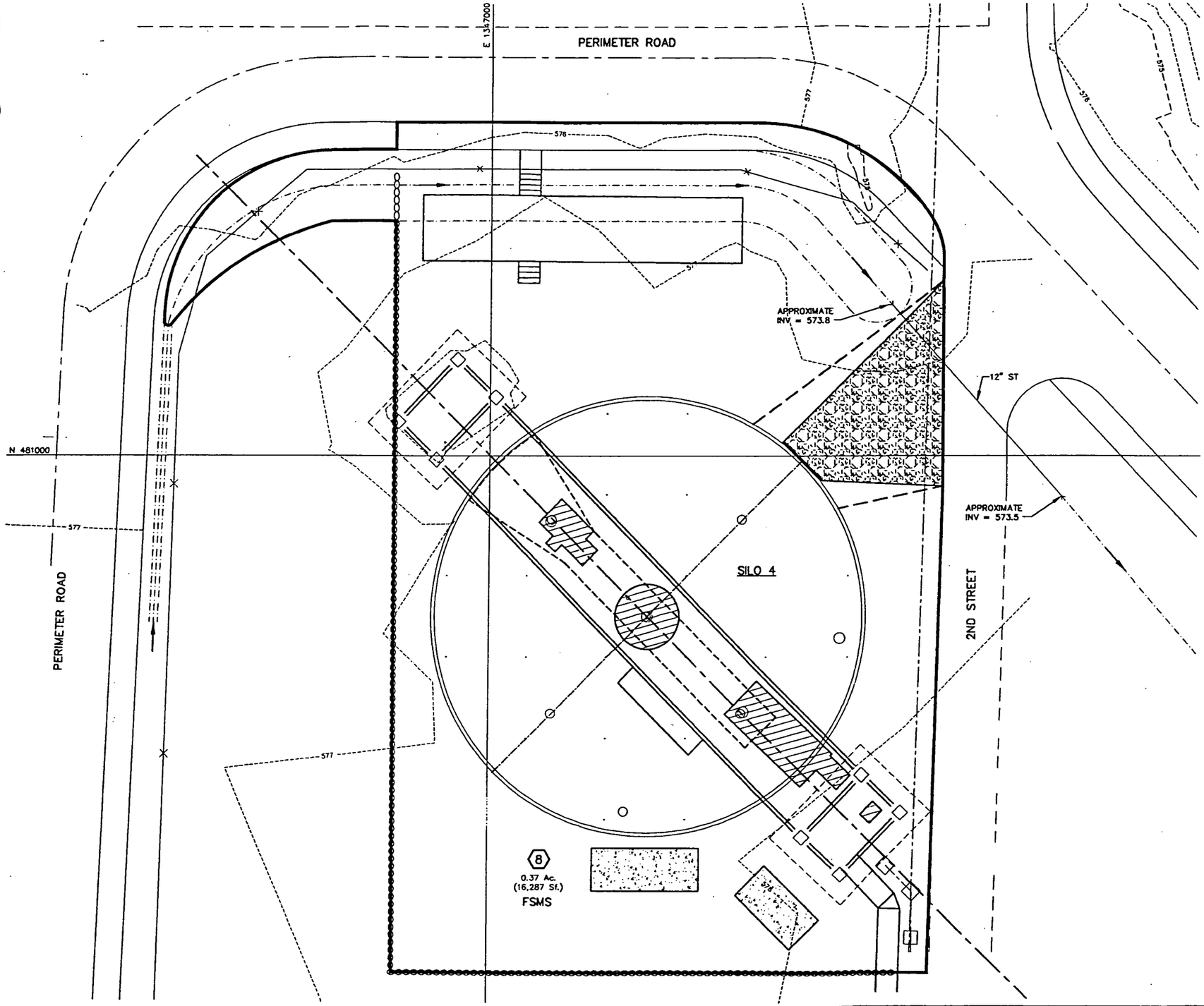
FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
STORM WATER SYSTEM
TRAILER AREA – DRAINAGE PLAN

SIZE D | SCALE: 1"=30' | DWG. NO. 66FCD003 | REV A

FILENAME: 66FCD00

XREF DRAWINGS: 30A-EXTWG



NOTES:

2905

1. SEE DRAWING 05FCD011 FOR GENERAL NOTES AND LEGEND.
2. CONTROL TRAILER WILL BE INSTALLED AFTER MODIFICATIONS TO SILO 4 SUPERSTRUCTURE HAVE BEEN MADE AND THE EMMA UNIT HAS BEEN INSTALLED.
3. GRAVEL ENTRANCE WILL BE INSTALLED AFTER MODIFICATIONS TO SILO 4 SUPERSTRUCTURE HAVE BEEN MADE AND THE EMMA UNIT HAS BEEN INSTALLED.
4. SEE DRAWINGS 10FSD001 THROUGH 10FSD005 FOR SUPERSTRUCTURE DEMOLITION AND MODIFICATIONS.
5. SILT FENCE TO BE INSTALLED AT THE BOTTOM OF ALL DISTURBED SLOPES.
6. CULVERT ENTRANCES AND EXITS TO BE PROTECTED BY RIP-RAP AND GEO FABRIC.
7. AREAS DISTURBED BY EXCAVATION ACTIVITIES ARE TO BE SEEDED AND MULCHED AS SOON AS PRACTICAL.
8. OVERSEEDING AND RESEEDING ARE TO BE PERFORMED AS NECESSARY UNTIL VEGETATION IS ESTABLISHED.
9. SILT IS TO BE REMOVED FROM DIVERSION DITCHES AND SILT FENCE INSTALLED AS REQUIRED BY THE SPECIFICATIONS AND AT THE END OF CONSTRUCTION.
10. EROSION CONTROL MEASURES ARE TO BE INSPECTED WEEKLY AND WITHIN 24 HOURS OF A 0.5 INCH RAINFALL.
11. REMEDIATION OF PROBLEMS IDENTIFIED IN THE INSPECTION ARE TO BE COMPLETED IN A TIMELY MANNER.
12. AWR PROJECT ACTIVITIES DO NOT SIGNIFICANTLY ALTER EXISTING DRAINAGE PATTERNS.
14. THE TTA PROCESS AREA ROOF DRAINAGE WILL BE DIRECTED TO THE EXISTING 12" STORM DRAIN SYSTEM AT THE NORTHEAST SECTION OF THE BUILDING.
15. EROSION AND SILTATION INTO THE CONCRETE CHANNEL IS TO BE PREVENTED.

STORMWATER LEGEND:

- (1) DRAINAGE AREA BOUNDARY
- DRAINAGE DIVIDE
- FLOW DIRECTION

STATE OF OHIO NORTH (NAD 83)

090098

10 0 10 20

SCALE IN FEET

LETTER OR NUMBER OF SECTION OR DETAIL

DRAWING ON WHICH SECTION OR DETAIL IS TAKEN

DRAWING ON WHICH SECTION OR DETAIL IS SHOWN

SECTION & DETAIL KEY

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
A		WVD			ISSUED FOR OHIO EPA REVIEW

RPE

DRAWN BY WVD	DATE
DESIGNED BY MSH	DATE
CHECKED BY	DATE
APPROVED BY	DATE
APPROVED BY	DATE

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
STORM WATER SYSTEM
FSMS – DRAINAGE PLAN

SIZE	SCALE:	DWG. NO.	REV
D	1"=10'	66FCD004	A

FILENAME: 66FCD004.D

2905

STATE OF OHIO NORTH (NAD 83)

E 1345900
E 1347200
E 1347200
E 1347400
E 1347600
E 1347800
E 1346890
E 1347000
E 1347200
E 1347400

N 481000
N 480800
N 480600
N 480400
N 480200
N 480800
N 480500
N 480400
N 480200

SEE DRAWING 10FMD017 FULL-SCALE MOCKUP SYSTEM GENERAL ARRANGEMENT

PIPE RACK

2ND STREET

SEE DRAWING 10FMD017 FULL-SCALE MOCKUP SYSTEM GENERAL ARRANGEMENT

2ND STREET

ELECTRICAL EQUIPMENT BUILDING 94G

SEE DRAWING 11FMD019 SILO WASTE RETRIEVAL SYSTEM GENERAL ARRANGEMENT

PIPE RACK

STORAGE TRAILER T-412

STORAGE TRAILER T-411

CONTROL TRAILER T-410

AIR COMPRESSOR

MAKEUP WATER STORAGE TANK & PUMP

EXIST. PUMP PIT

SEE DRAWING 14FMD006 DECANT WASTE RETRIEVAL SYSTEM GENERAL ARRANGEMENT

PIPE RACK

EXIST. DECANT TANK

EMPTY DRUM STAGING AREA SEE DRAWING 12FMD021 TRANSFER TANK AREA SYSTEM GENERAL ARRANGEMENT

SAMPLE PREP & STORAGE BUILDING 94F SEE DRAWING 11FMD025 SILO WASTE RETRIEVAL SYSTEM GENERAL ARRANGEMENT

RADON CONTROL SYSTEM AIR HANDLING BUILDING 94E SEE DRAWING 20FMD027 RADON CONTROL SYSTEM GENERAL ARRANGEMENT

TRANSFER TANK AREA BUILDING 94C SEE DRAWING 12FMD021 TRANSFER TANK AREA SYSTEM GENERAL ARRANGEMENT

RADON CONTROL SYSTEM CARBON BED BUILDING 94D SEE DRAWING 20FMD027 RADON CONTROL SYSTEM GENERAL ARRANGEMENT

000099

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
2	01/07/00	DLB	SWH		CERTIFIED FOR CONSTRUCTION
1	12/11/99	WCB	SWH		REVISED FOR NOZZLE LOCATIONS
0	11/99	WCB	SWH		PRELIMINARY DESIGN SUBMITTAL

KENNETH D. RICKETT PROFESSIONAL ENGINEER NO. 103745 STATE OF TENNESSEE 01/07/00

DRAWN BY: D.C. Bland DATE 01/07/00
DESIGNED BY: D.C. Bland DATE 01/07/00
CHECKED BY: S.V. Hewitt DATE 01/07/00
APPROVED BY: Kenneth Rickett DATE 01/07/00
APPROVED BY: John Swanson DATE 01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO,
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
MISC FACILITIES
GENERAL ARRANGEMENT
KEY PLAN

SIZE D | SCALE: 1"=60'-0" | DWG. NO. 05FMD010 | REV 2

FILENAME: 05FMD010.DWG

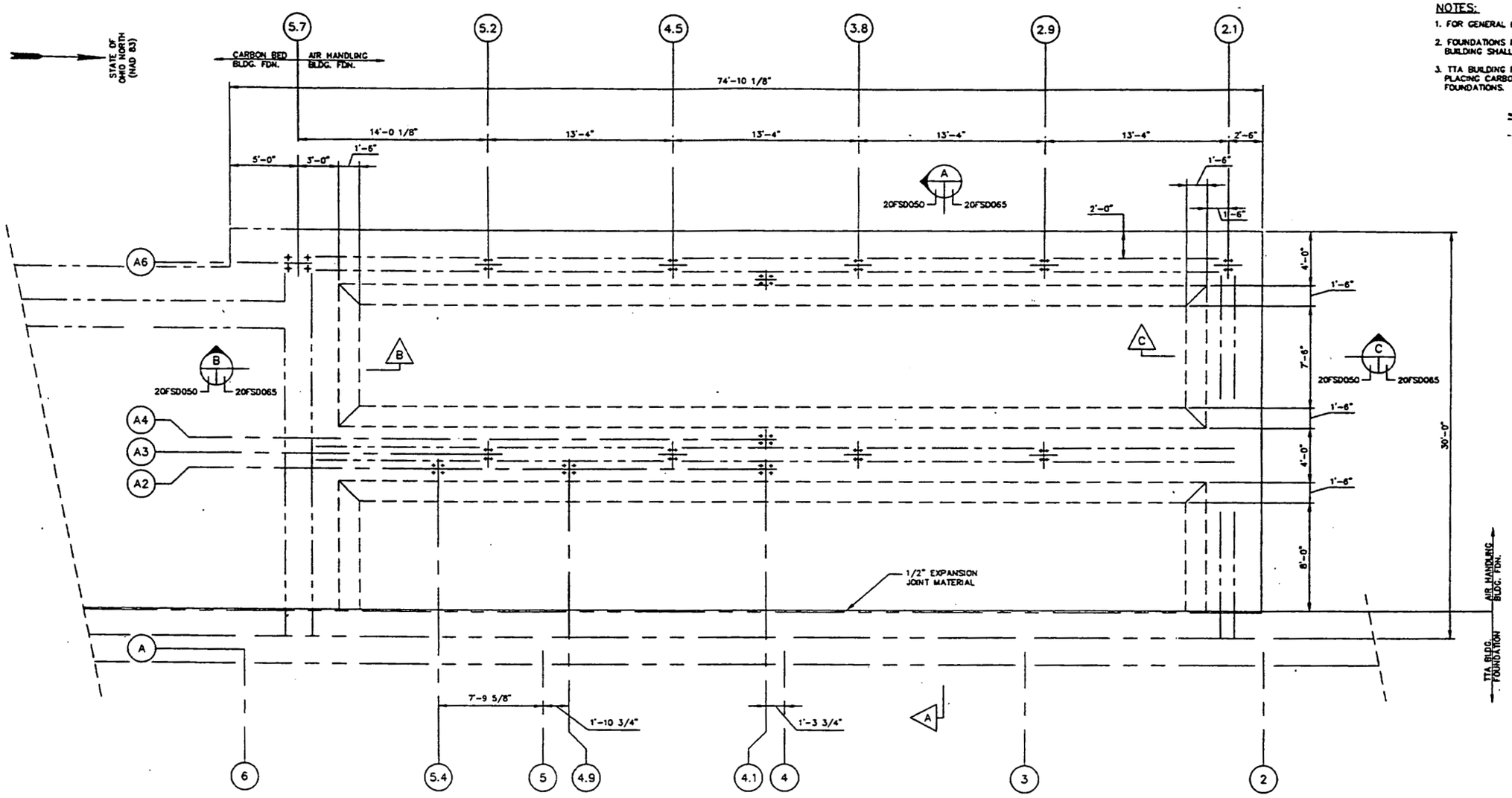
XREF DRAWINGS: 00-PROP.DWG 00-CASE1.DWG

G:\CAD\EVD\FSC-624\SYSCA\05FMD010.dwg Fri Jan 07 15:22:13 2000

NOTES:

1. FOR GENERAL NOTES SEE DRAWING 20FSD001.
2. FOUNDATIONS FOR AIR HANDLING AND CARBON BED BUILDING SHALL BE PLACED AT THE SAME TIME.
3. TTA BUILDING FOUNDATION SHALL BE PLACED PRIOR PLACING CARBON BED AND AIR HANDLING BUILDING FOUNDATIONS.

2905



FOUNDATION PLAN
(T.O. CONCRETE EL. 576'-0")
SCALE: 1/4" = 1'-0"

000100

PRELIMINARY
NOT FOR CONSTRUCTION

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

REV	DATE	BY	CHK'D	APRV'D	DESCRIPTION/ISSUE
A					PRELIMINARY DESIGN SUBMITTAL

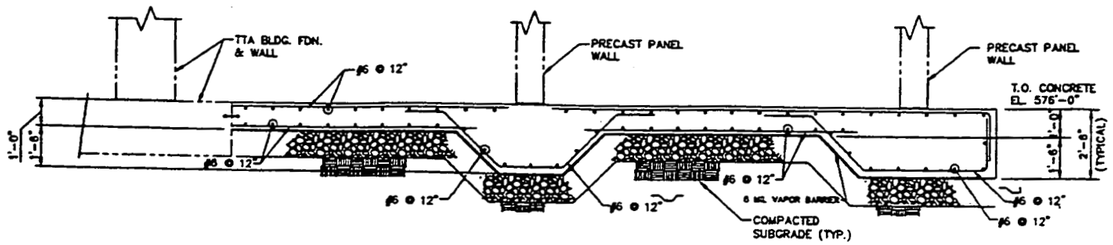
DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

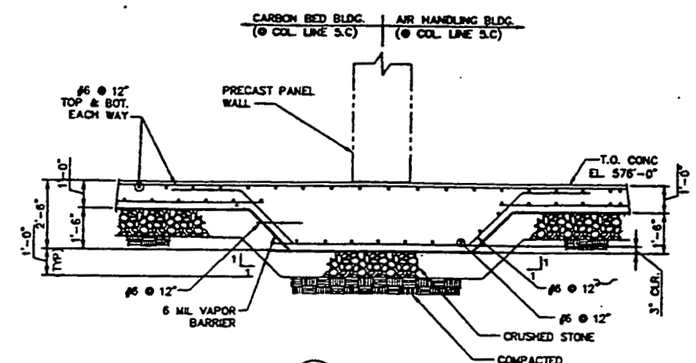
DRAWN BY: RS
DESIGNED BY: RS / WIC
CHECKED BY
APPROVED BY
APPROVED BY

TITLE: RADON CONTROL SYSTEM AIR HANDLING BUILDING FOUNDATION PLAN

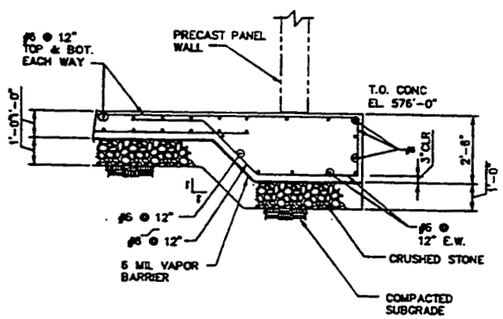
SIZE: D | SCALE: 1/4"=1'-0" | DWG. NO. 20FSD050 | REV A



A SECTION
SCALE: 3/8"=1'-0"
20FSD050 — 20FSD065



B SECTION
SCALE: 3/8"=1'-0"
20FSD050 — 20FSD065



C SECTION
SCALE: 3/8"=1'-0"
20FSD050 — 20FSD065

NOTES:

1. FOR GENERAL CONSTRUCTION NOTES SEE DRAWING 20FSD001.

2905

000101

PRELIMINARY
NOT FOR CONSTRUCTION

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

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
A					PRELIMINARY DESIGN SUBMITTAL

DRAWN BY RS DATE
DESIGNED BY RS DATE
CHECKED BY DATE
APPROVED BY DATE
APPROVED BY DATE

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

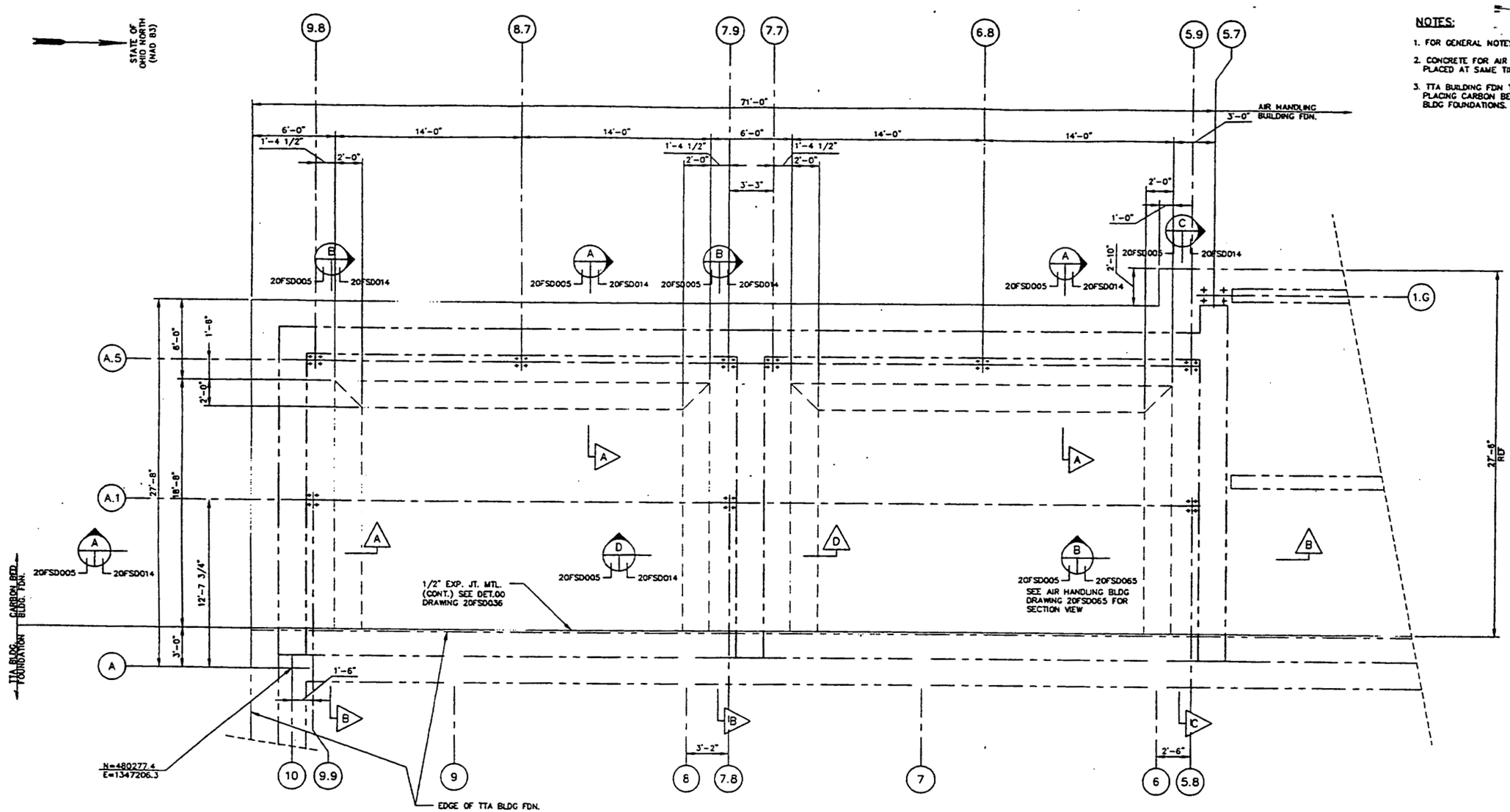
TITLE
RADON CONTROL SYSTEM
AIR HANDLING BUILDING
FOUNDATION SECTION VIEW

SIZE D | SCALE 3/8"=1'-0" | DWG. NO. 20FSD065 | REV A

2905

NOTES:

1. FOR GENERAL NOTES SEE DRAWING 20FSD001.
2. CONCRETE FOR AIR HANDLING BUILDING TO BE PLACED AT SAME TIME AS CARBON BED BLDG FDN.
3. TTA BUILDING FDN TO BE PLACED PRIOR TO PLACING CARBON BED BLDG & AIR HANDLING BLDG FOUNDATIONS.



FOUNDATION PLAN
(T.O. CONCRETE EL. 576'-0")
SCALE: 1/4" = 1'-0"

000102

PRELIMINARY
NOT FOR CONSTRUCTION

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

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
A					PRELIMINARY DESIGN SUBMITTAL

DRAWN BY RS
DESIGNED BY RS
CHECKED BY
APPROVED BY
APPROVED BY

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

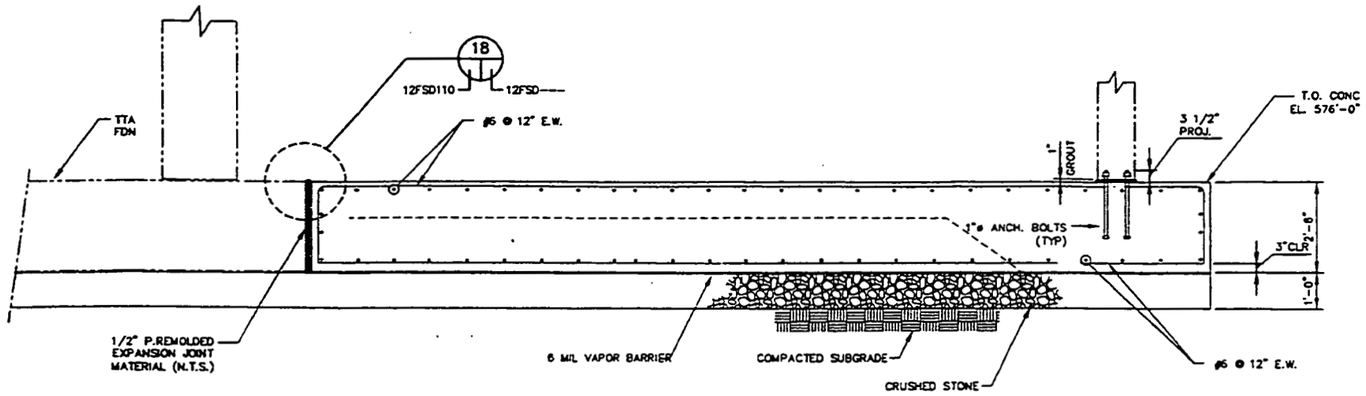
FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
RADON CONTROL SYSTEM
CARBON BED BUILDING
FOUNDATION PLAN

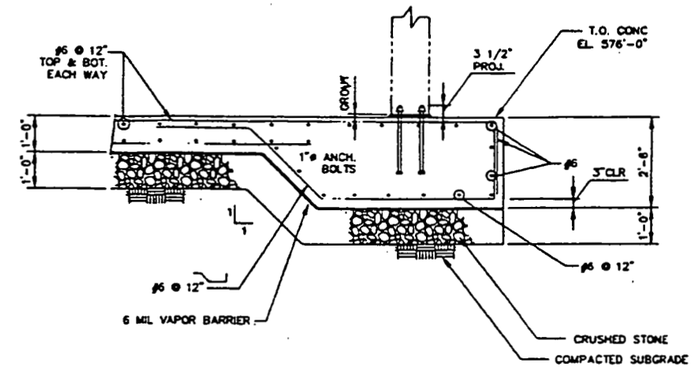
SIZE D | SCALE 1/4"=1'-0" | DWG. NO. 20FSD005 | REV A

NOTES
1. FOR GENERAL NOTES SSE DRAWING #FSD0001.

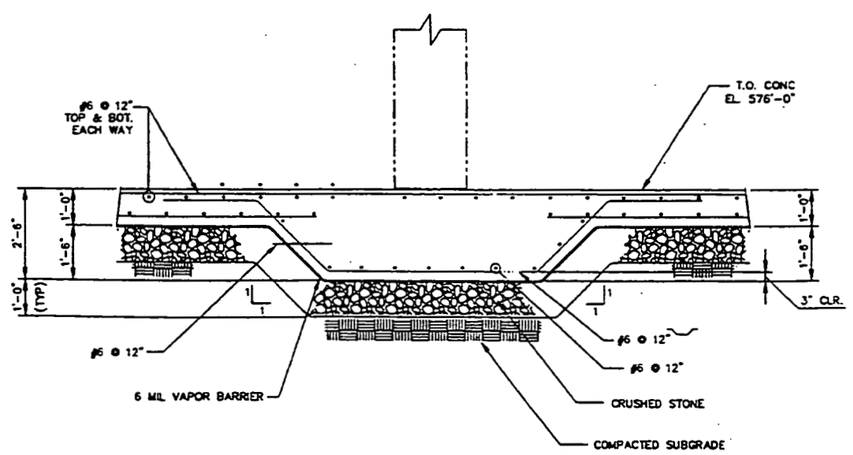
2905



A SECTION
SCALE: 1/2"=1'-0"
12FSD102
12FSD103
12FSD110



B SECTION
SCALE: 1/2"=1'-0"
12FSD102
12FSD103
12FSD110



C SECTION
SCALE: 1/2"=1'-0"
12FSD102
12FSD103
12FSD110

000103

PRELIMINARY
NOT FOR CONSTRUCTION

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

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
A					PRELIMINARY DESIGN SUBMITTAL

SPEC

DRAWN BY RS	DATE
DESIGNED BY RS	DATE
CHECKED BY	DATE
APPROVED BY	DATE
APPROVED BY	DATE

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

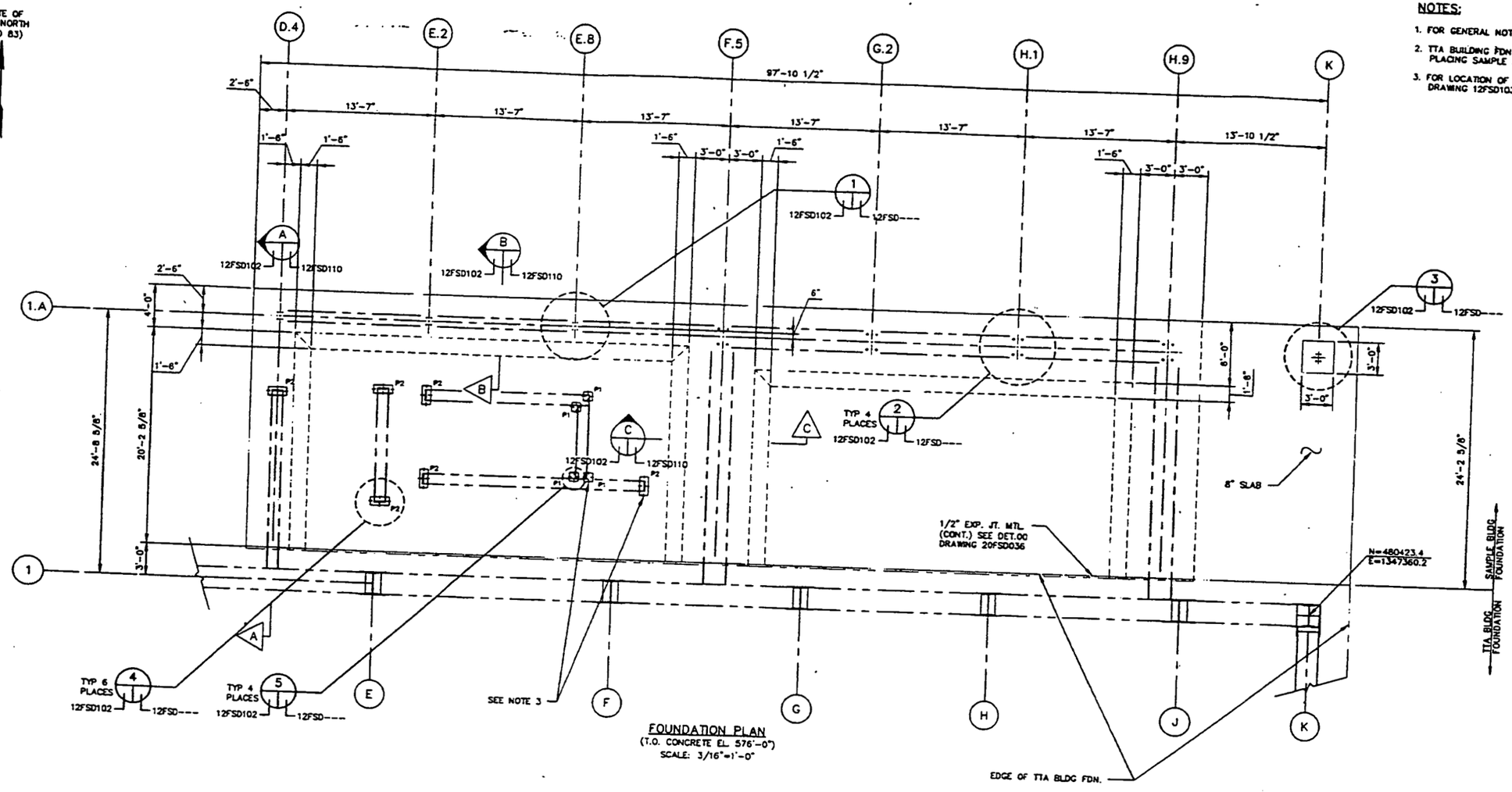
TITLE
TRANSFER TANK SYSTEM
SAMPLE BUILDING
FOUNDATION SECTION VIEW

SIZE	SCALE	DWG. NO.	REV
D	1/2"=1'-0"	12FSD110	A

NOTES:

1. FOR GENERAL NOTES SEE DRAWING 12FSD100.
2. TTA BUILDING FDN TO BE PLACED PRIOR TO PLACING SAMPLE BLDG FOUNDATIONS.
3. FOR LOCATION OF EMBEDDED PLATES SEE DRAWING 12FSD103.

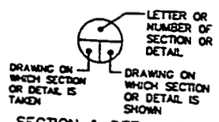
2905



FOUNDATION PLAN
(T.O. CONCRETE EL. 576'-0")
SCALE: 3/16"=1'-0"

000104

PRELIMINARY
NOT FOR CONSTRUCTION



SECTION & DETAIL KEY

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
A					PRELIMINARY DESIGN SUBMITTAL

DRAWN BY RS	DATE
DESIGNED BY RS	DATE
CHECKED BY	DATE
APPROVED BY	DATE
APPROVED BY	DATE

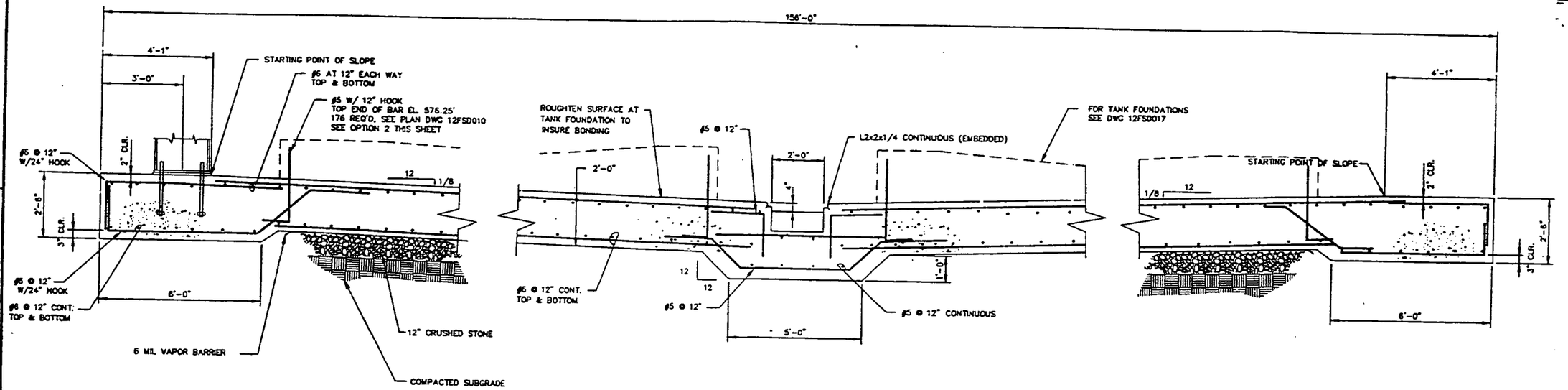
DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

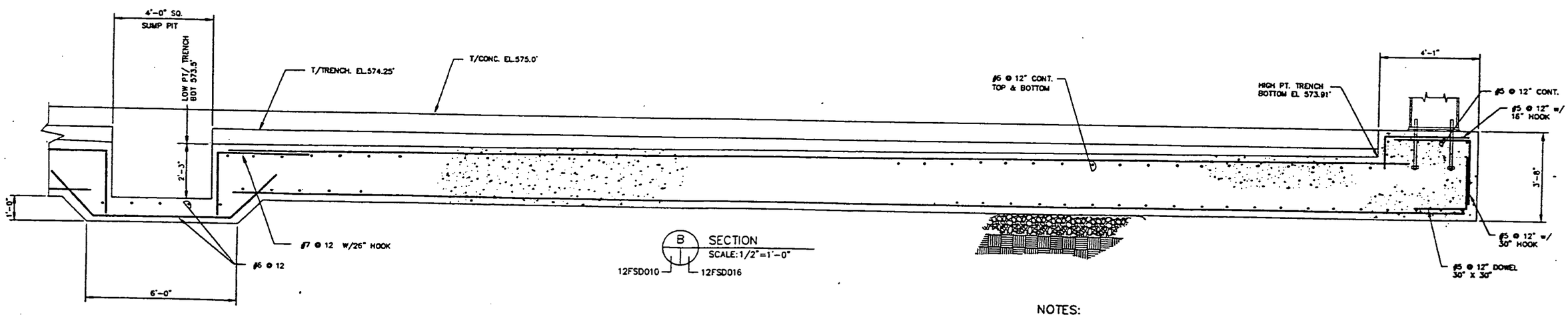
TITLE
TRANSFER TANK SYSTEM
SAMPLE BUILDING
FOUNDATION PLAN

SIZE D | SCALE 3/16" = 1'-0" | DWG. NO. 12FSD102 | REV A

2905



A SECTION
SCALE: 1/2"=1'-0"
12FSD010 — 12FSD016



B SECTION
SCALE: 1/2"=1'-0"
12FSD010 — 12FSD016

NOTES:

1. FOR GENERAL NOTES SEE DWG 20FSD001
2. NORTH ARROW APPLIES ONLY TO THE ERECTION POSITION OF SILO BRIDGE BEFORE IT IS MOVED TO THE SILO NO.1 OR SILO NO. 2 POSITIONS.

000105

12FSD016

PRELIMINARY
NOT FOR CONSTRUCTION

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

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION
A					PRELIMINARY DESIGN SUBMITTAL

DRAWN BY CG	DATE 10/20/99
DESIGNED BY CRG	DATE 10/20/99
CHECKED BY	DATE
APPROVED BY	DATE
APPROVED BY	DATE

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 824.

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

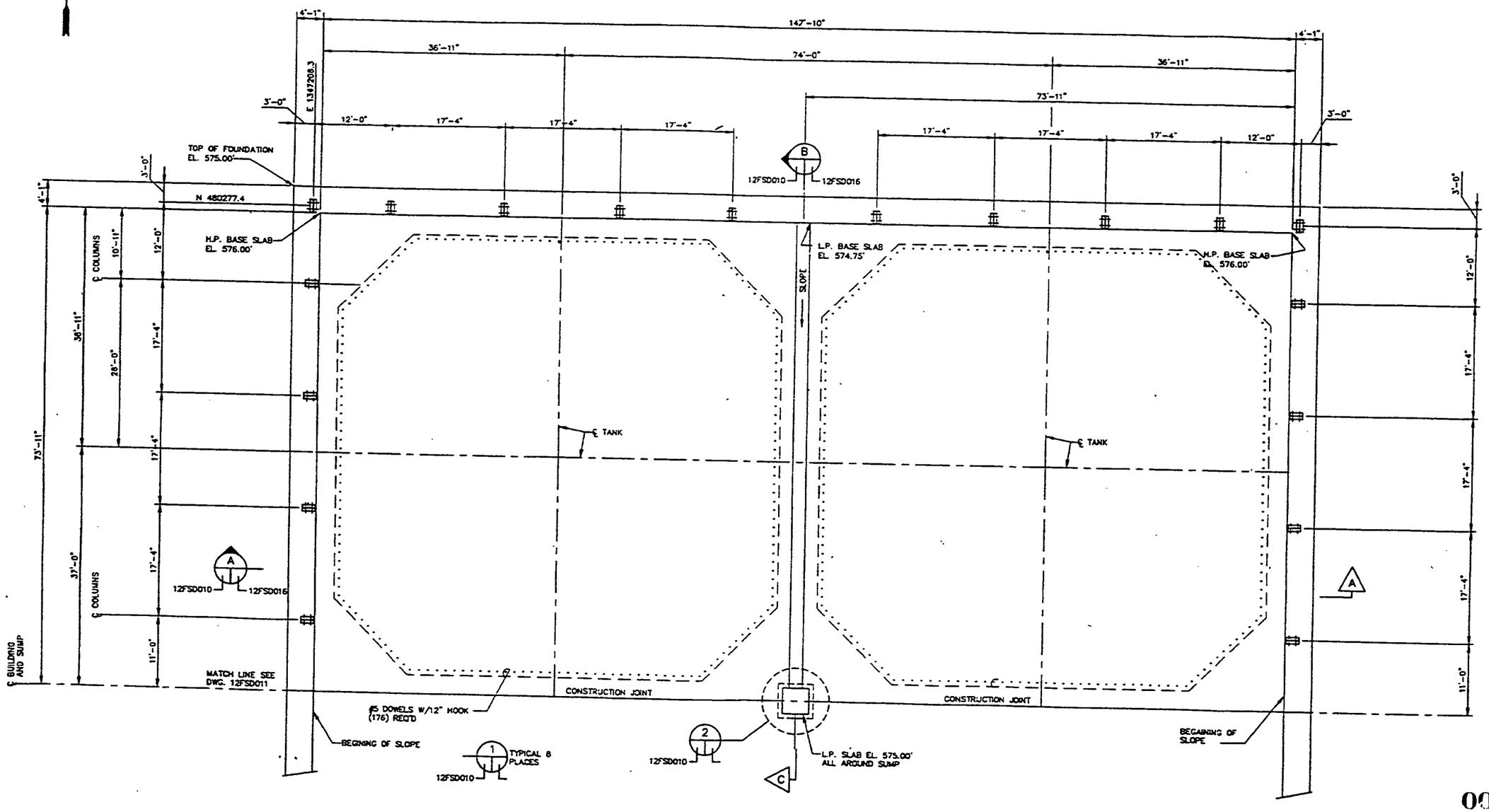
TRANSFER TANK AREA SYSTEM
BASE SLAB AND FOUNDATIONS
SECTIONS AND DETAILS

SIZE | SCALE: | FINAL INT.

\DWGNEW\FDF\SILOS\STRCTRS\12\12
Tue Oct 26 08:58:44 1999

NOTES:
FOR GENERAL NOTES SEE DWG 20FSD001

2905



000106

12FSD010

FOUNDATION PLAN
TRANSFER TANK BUILDING
SCALE: 1/8" = 1'-0"

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

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
A					PRELIMINARY DESIGN SUBMITTAL

PRELIMINARY
NOT FOR CONSTRUCTION

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

DRAWN BY RLB
DESIGNED BY VB
CHECKED BY
APPROVED BY
APPROVED BY

TRANSFER TANK SYSTEM
CONCRETE SLAB – SH. 1

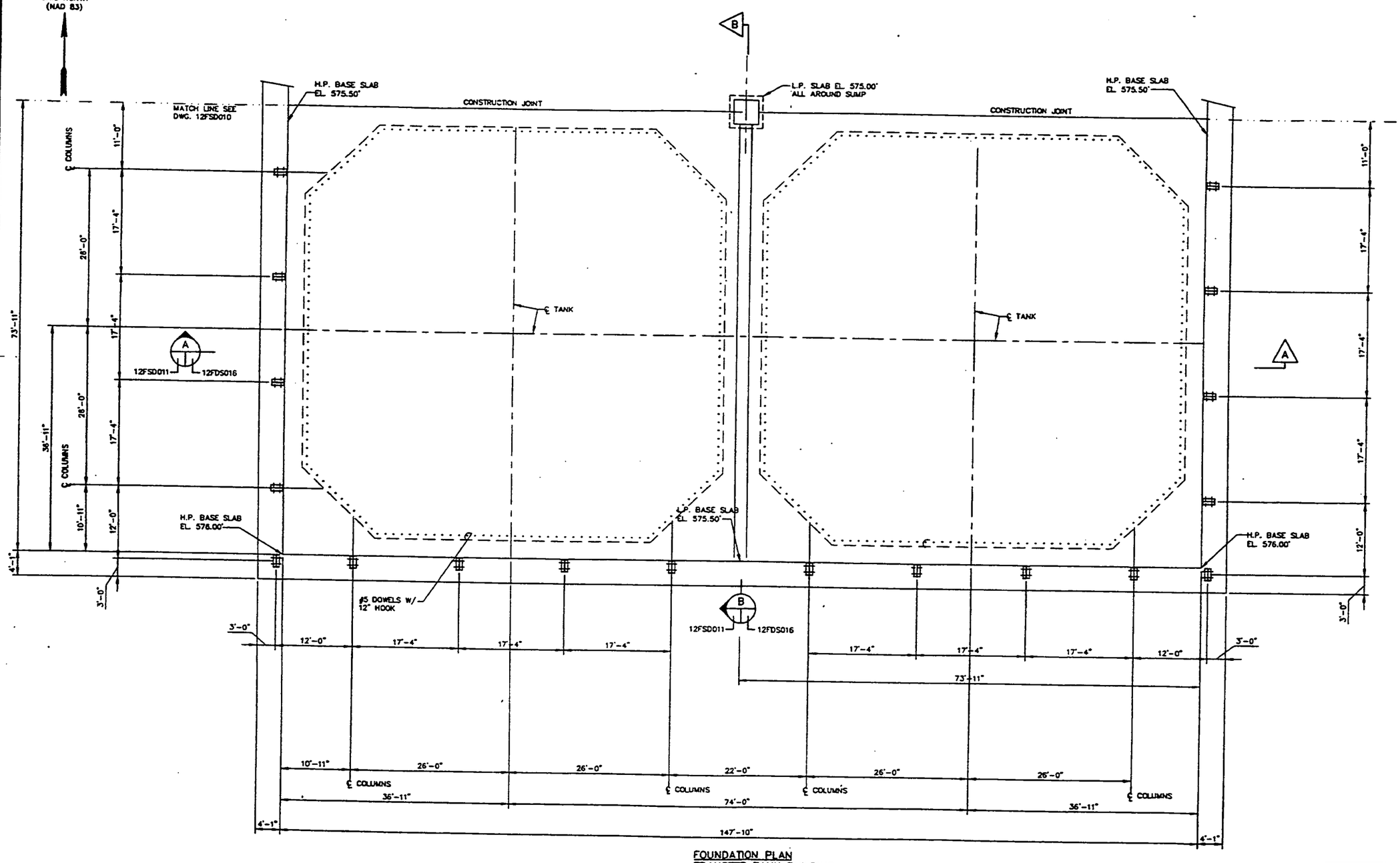
SIZE D SCALE: 1/8" = 1'-0" DWG. NO. REV

6:\DARGE\FDF\S1DS\S1FD\12FSD010.dwg Sun Oct 24 14:06:29 1999

NOTES:

FOR GENERAL NOTES SEE DWG 20FSD001

2905



FOUNDATION PLAN
TRANSFER TANK BUILDING
SCALE: 1/8" = 1'-0"

000107

PRELIMINARY
NOT FOR CONSTRUCTION

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

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
A					PRELIMINARY DESIGN SUBMITTAL

DRAWN BY: RLB
DESIGNED BY: VB
CHECKED BY
APPROVED BY
APPROVED BY

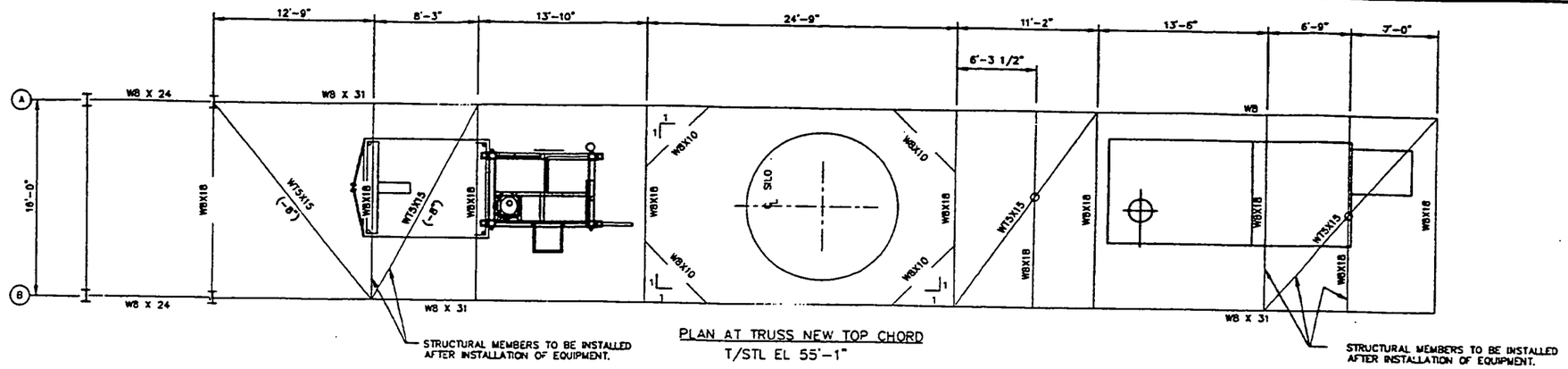
DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

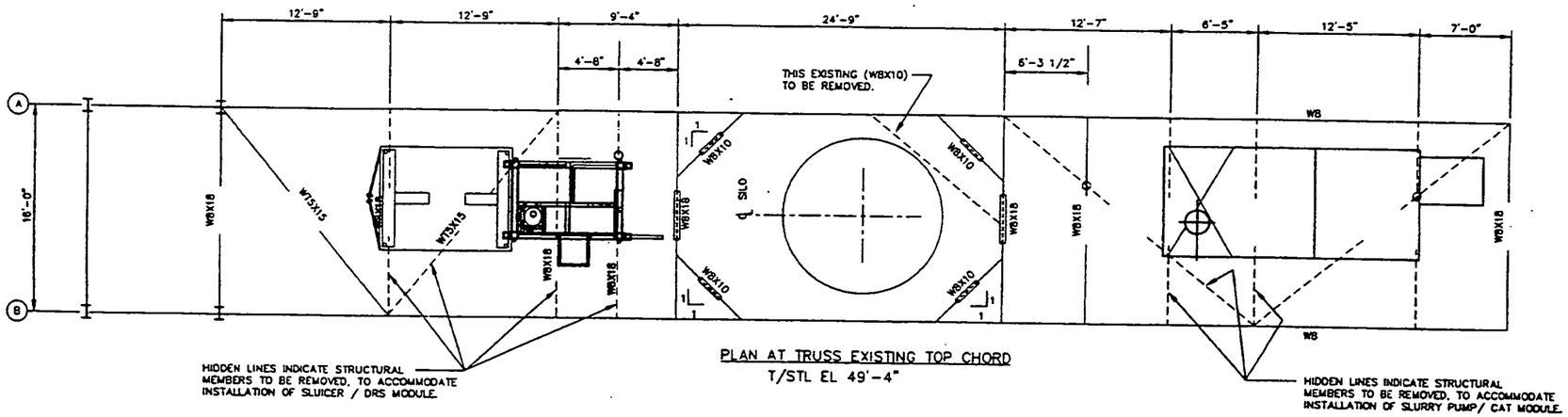
TITLE
TRANSFER TANK SYSTEM
CONCRETE SLAB – SH. 2

SIZE: D | SCALE: 1/8" = 1'-0" | DWG. NO. 12FSD011 | REV A

2905



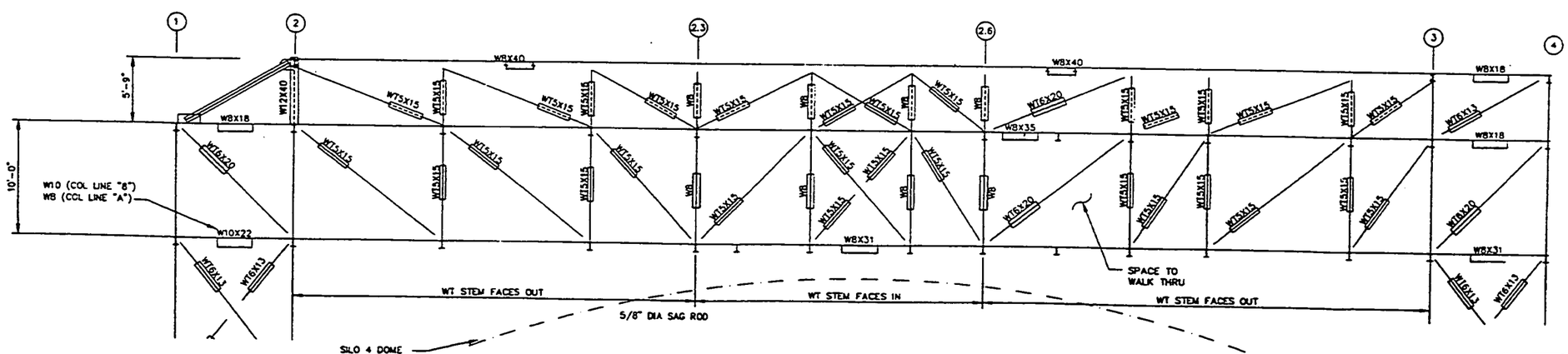
PLAN AT TRUSS NEW TOP CHORD
T/STL EL 55'-1"



PLAN AT TRUSS EXISTING TOP CHORD
T/STL EL 49'-4"

NOTES:

1. FOR NOTES SEE DWG. 10FSD001
2. FOR LEGEND SEE DWG 10FSD001



SOUTHWEST ELEVATION
LOOKING NORTHEAST ALONG COL LINE "B"

000108

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
A					PRELIMINARY DESIGN SUBMITTAL

DRAWN BY CC
DESIGNED BY RRG
CHECKED BY
APPROVED BY
APPROVED BY

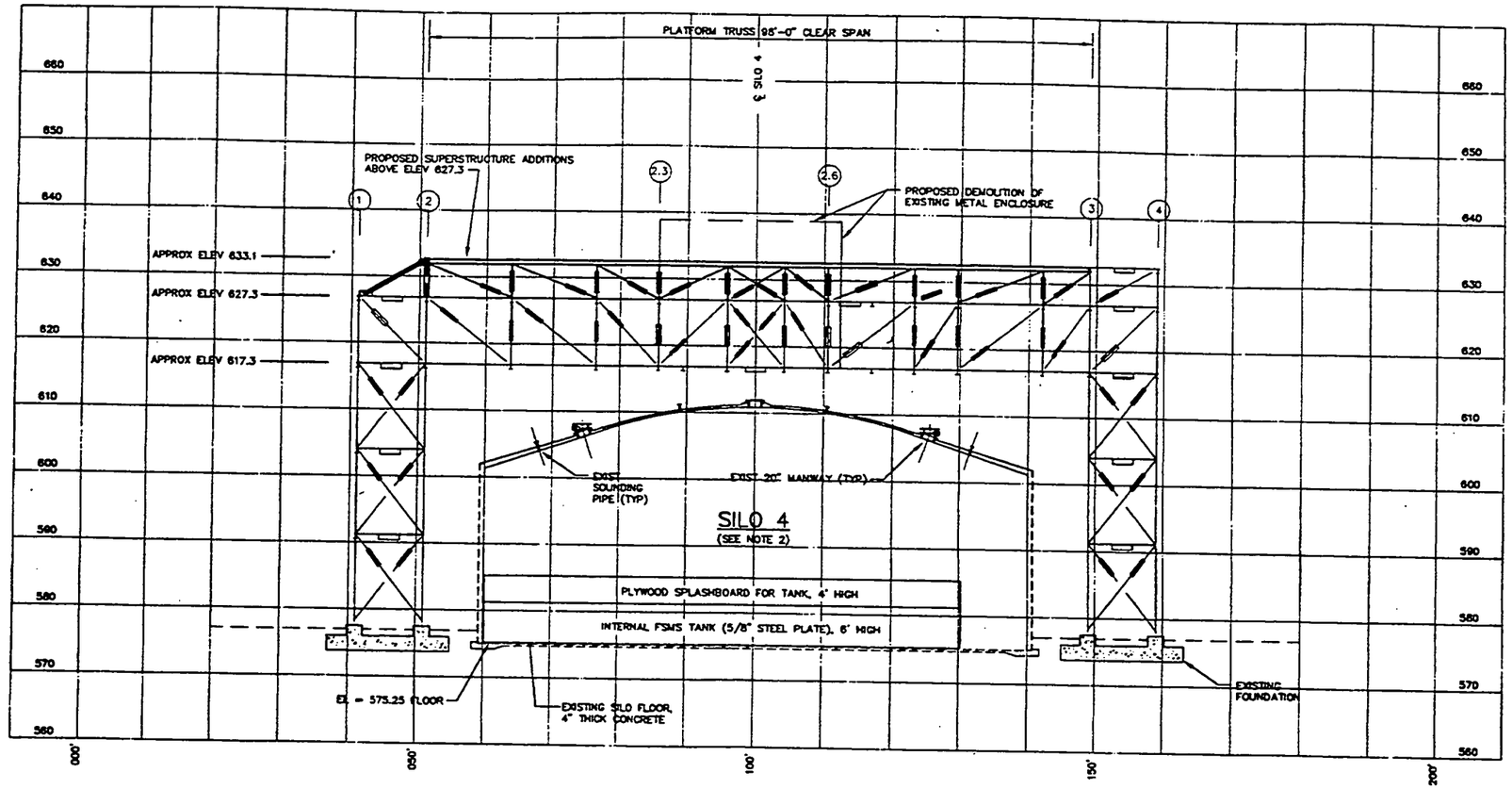
DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
FULL-SCALE MOCKUP SYSTEM
SILO 4 BRIDGE STRUCTURE
STEEL MODIFICATIONS

SIZE D | SCALE: 3/16" = 1'-0" | DWG. NO. 10FSD002 | REV A

2905



SECTION

SCALE: 1"=10'

A
10FCD002 — 10FCD003

NOTES:

1. CROSS SECTION IS BASED UPON PARSONS DRAWINGS (DECEMBER 1993) ENTITLED, "SILO 4 WASTE REMOVAL AND TRANSPORTING SYSTEM, CRUM", DWG 94X-5900-A-00485.
2. SILO 4 WAS NEVER USED FOR THE STORAGE OF HAZARDOUS MATERIALS. IT IS CURRENTLY EMPTY. SILO 4 CONSTRUCTION IS VERY SIMILAR TO SILOS 1 AND 2.

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

SECTION & DETAIL KEY

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
A		WVD			PRELIMINARY DESIGN SUBMITTAL

DRAWN BY WVD
DESIGNED BY KEO
CHECKED BY
APPROVED BY
APPROVED BY

000109

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

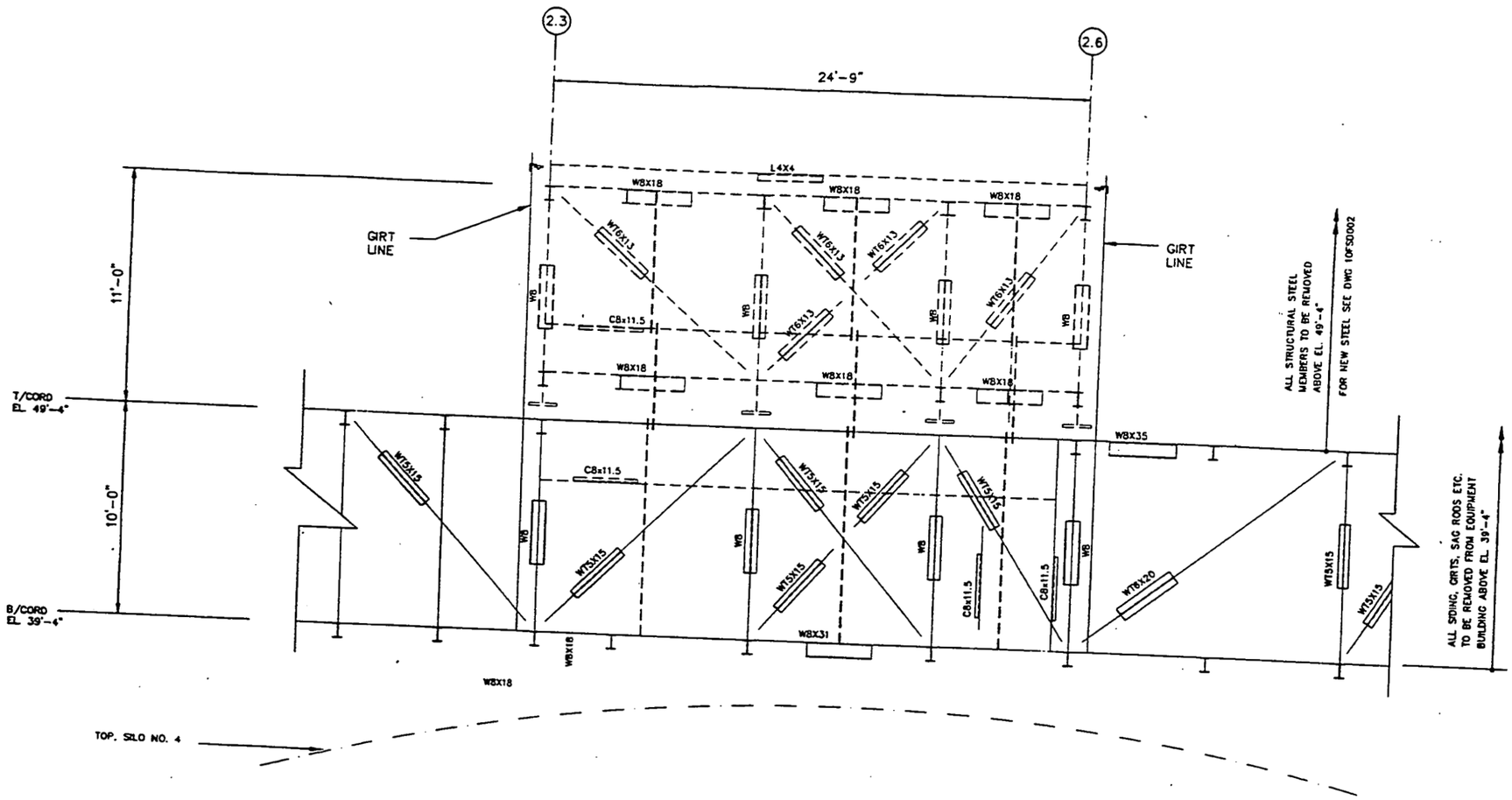
FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
FULL-SCALE MOCKUP SYSTEM
SILO 4
CROSS SECTION

SIZE D | SCALE 1"=10' | DWG NO. 10FCD003 | REV A

FB FNAME: 10FCD003.DWG

2905



SOUTHWEST ELEVATION

NOTES:

1. FOR GENERAL NOTES SEE DWG 20FSD001.
2. THE SILO 4 BRIDGE IS ON EXISTING STRUCTURE SEE (SEE DWG 10FSD005) PREVIOUSLY CONSTRUCTED FOR SILO WASTE REMOVAL DEMONSTRATION.
3. STRUCTURAL MODIFICATIONS THAT ENTAIL REMOVAL, STRENGTHENING, OR ADDITION OF STEEL MEMBERS ARE REQUIRED TO ACCOMMODATE THE CURRENT PROJECT FULL SCALE MOCKUP SYSTEM.

LEGEND:

- - - - - EXISTING MEMBERS TO BE REMOVED
——— EXISTING MEMBERS TO REMAIN IN PLACE
——— NEW MEMBERS TO BE ADDED

PRELIMINARY
NOT FOR CONSTRUCTION

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

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
A					PRELIMINARY DESIGN SUBMITTAL

RPC

DRAWN BY CRG	DATE
DESIGNED BY RRG	DATE
CHECKED BY	DATE
APPROVED BY	DATE
APPROVED BY	DATE

000110

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
FULL-SCALE MOCKUP SYSTEM
SILO 4 BRIDGE STRUCTURE
EQUIPMENT ROOM DEMOLITION

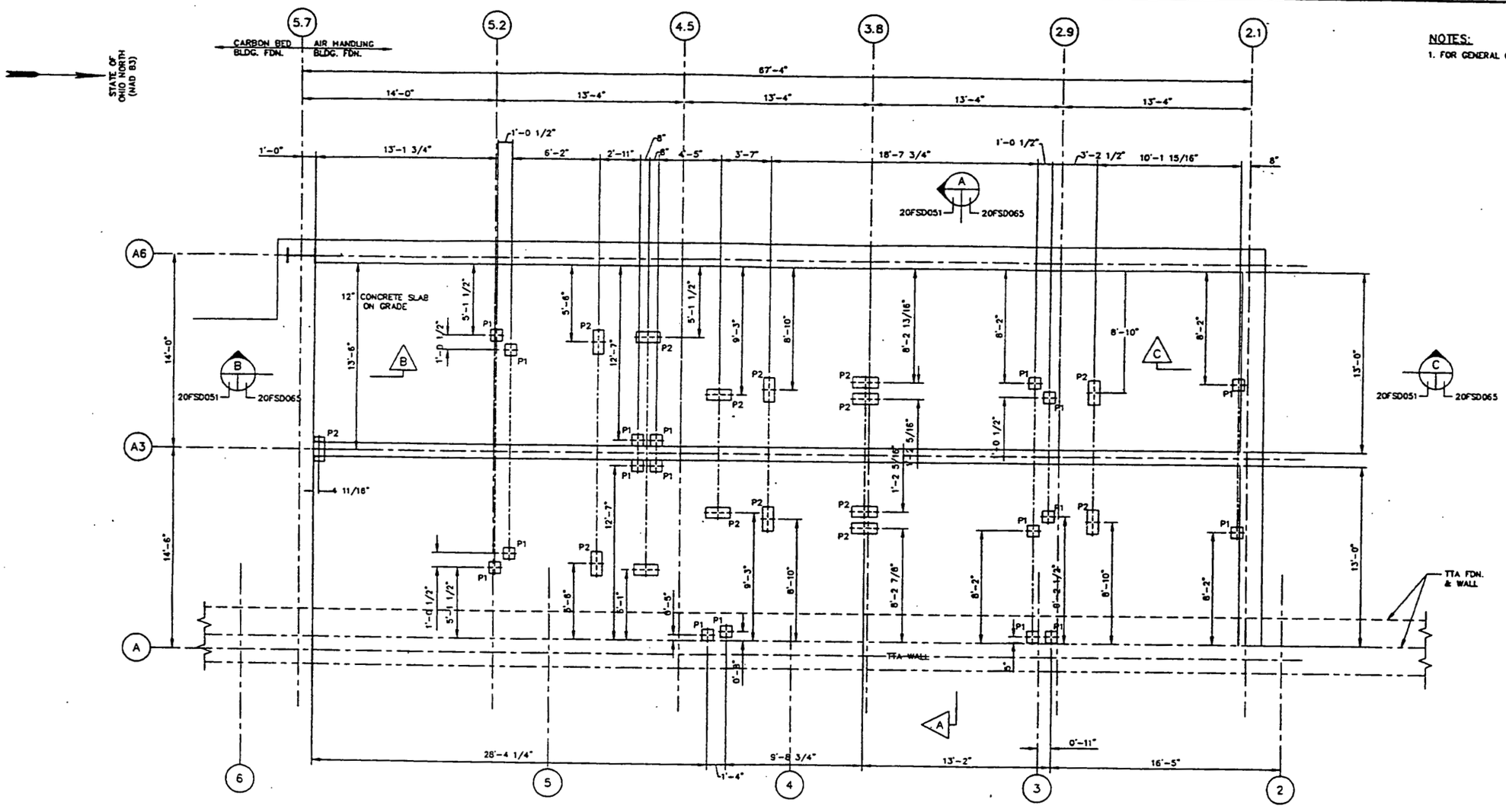
SIZE D | SCALE: 1/4" = 1'-0" | DWG. NO. 10FSD001 | REV A

G:\DRAWINGS\SILOS\STRUCTS\10FSD001.dwg Thu Oct 28 10:48:28 1999

NOTES:

1. FOR GENERAL CONSTRUCTION NOTES SEE DRAWING 20FSD001.

2905

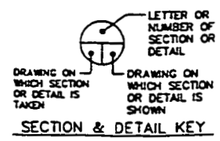


FOUNDATION SLAB EMBEDDED PLATES

SCALE: 1/4" = 1'-0"

000111

PRELIMINARY
NOT FOR CONSTRUCTION



SECTION & DETAIL KEY

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
A					PRELIMINARY DESIGN SUBMITTAL

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

DRAWN BY: RS
DESIGNED BY: RS / WIC
CHECKED BY:
APPROVED BY:
APPROVED BY:

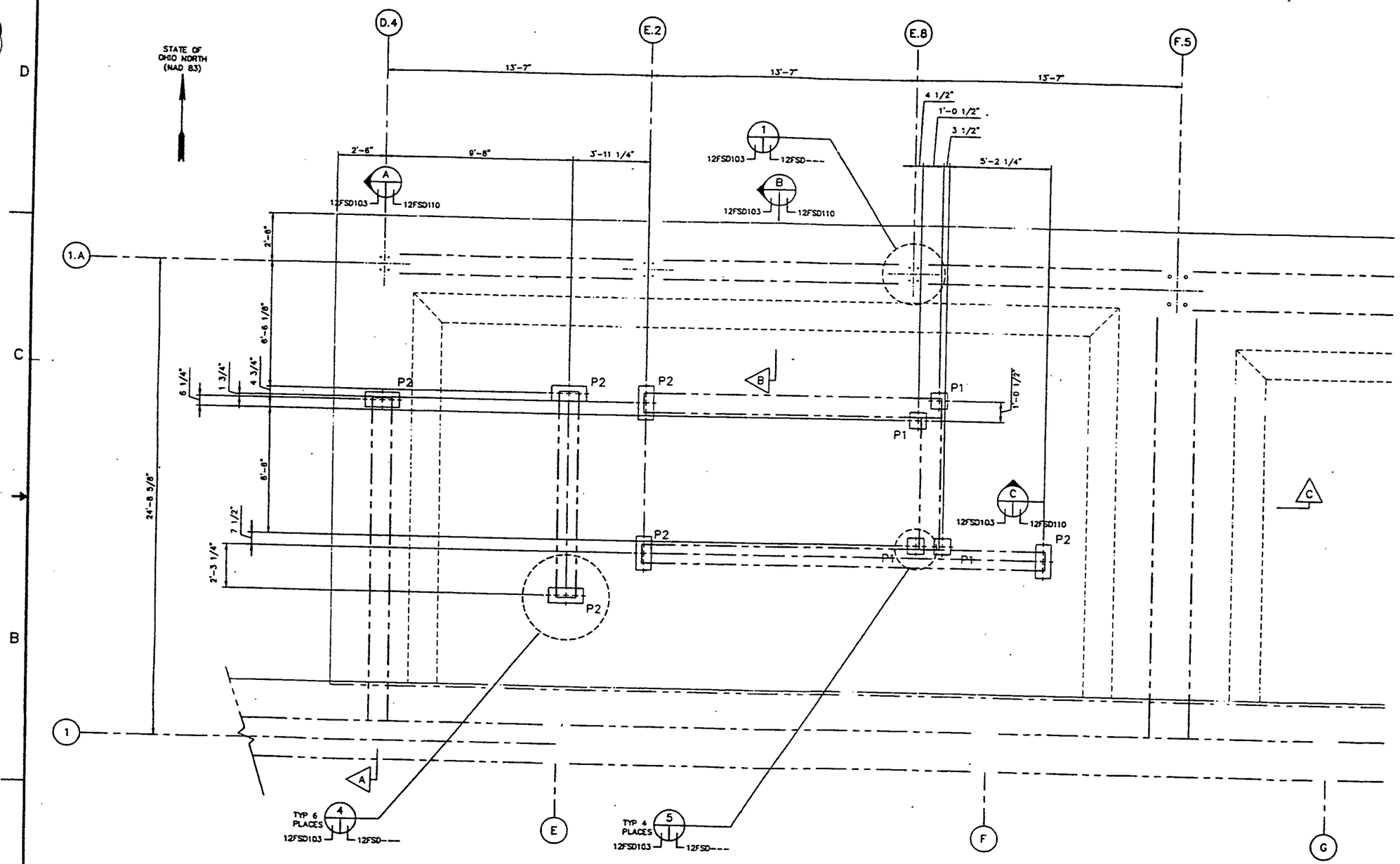
TITLE: RADON CONTROL SYSTEM AIR HANDLING BUILDING BASE SLAB EMBEDDED PLATES

SIZE: D | SCALE: 1/4"=1'-0" | DWG. NO. 20FSD051 | REV A

NOTES:

1. FOR GENERAL NOTES SEE DRAWING 12FSD100.
2. TTA BUILDING FDN TO BE PLACED PRIOR TO PLACING SAMPLE BLDG FOUNDATIONS.

2905



FDN EMBEDDED PLATES PLAN
(T.O. CONCRETE EL. 576'-0")
SCALE: 3/8"=1'-0"

000112

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

SECTION & DETAIL KEY

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APRV'D	DESCRIPTION/ISSUE
A					PRELIMINARY DESIGN SUBMITTAL

DRAWN BY RS DATE
DESIGNED BY RS DATE
CHECKED BY DATE
APPROVED BY DATE
APPROVED BY DATE

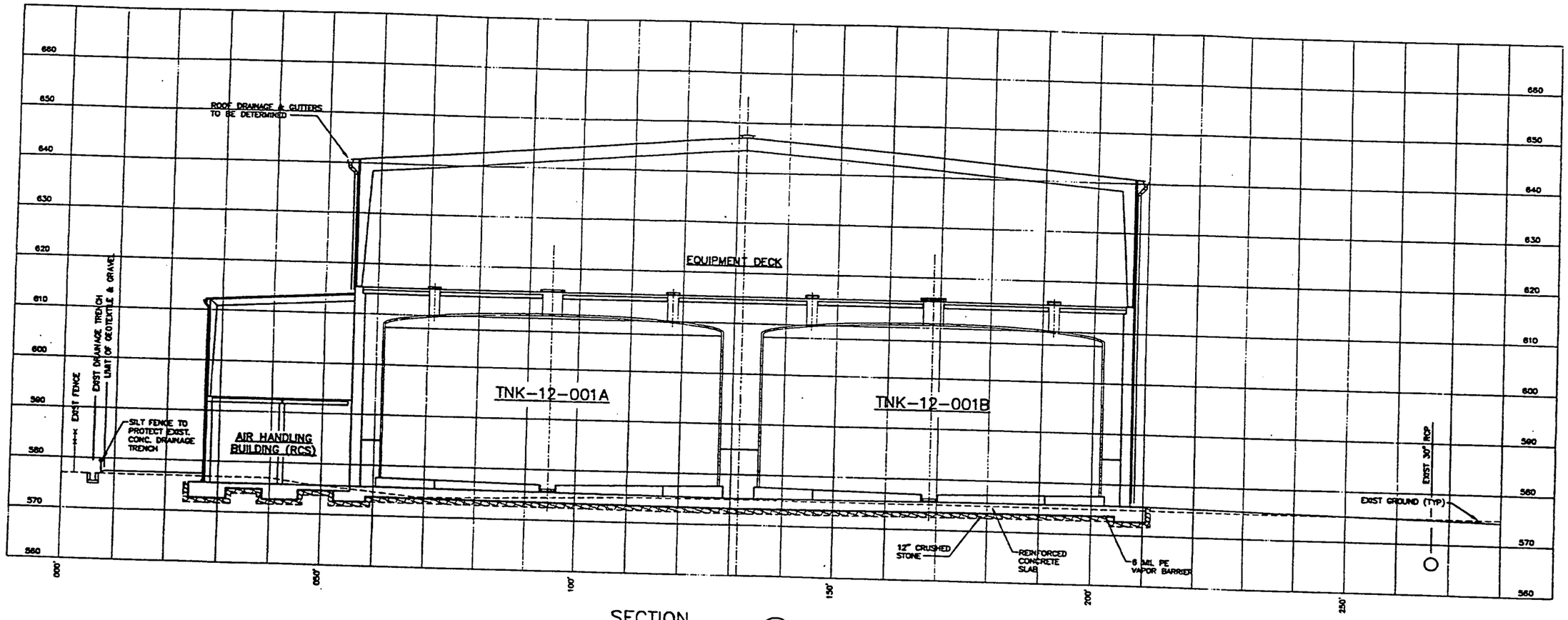
DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 824

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TRANSFER TANK SYSTEM
SAMPLE BUILDING
FDN EMBEDDED PLATES

SIZE D | SCALE: 3/8"=1'-0" | DWG. NO. 12FSD103 | REV A

2905



SECTION

SCALE: 1"=10'

A

12FCD002
12FCD003

12FCD005

000113

LETTER OR NUMBER OF SECTION OR DETAIL

DRAWING ON WHICH SECTION OR DETAIL IS TAKEN

DRAWING ON WHICH SECTION OR DETAIL IS SHOWN

SECTION & DETAIL KEY

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
A		WVD			PRELIMINARY DESIGN SUBMITTAL

SPEC

DRAWN BY WVD	DATE
DESIGNED BY KEO	DATE
CHECKED BY	DATE
APPROVED BY	DATE
APPROVED BY	DATE

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

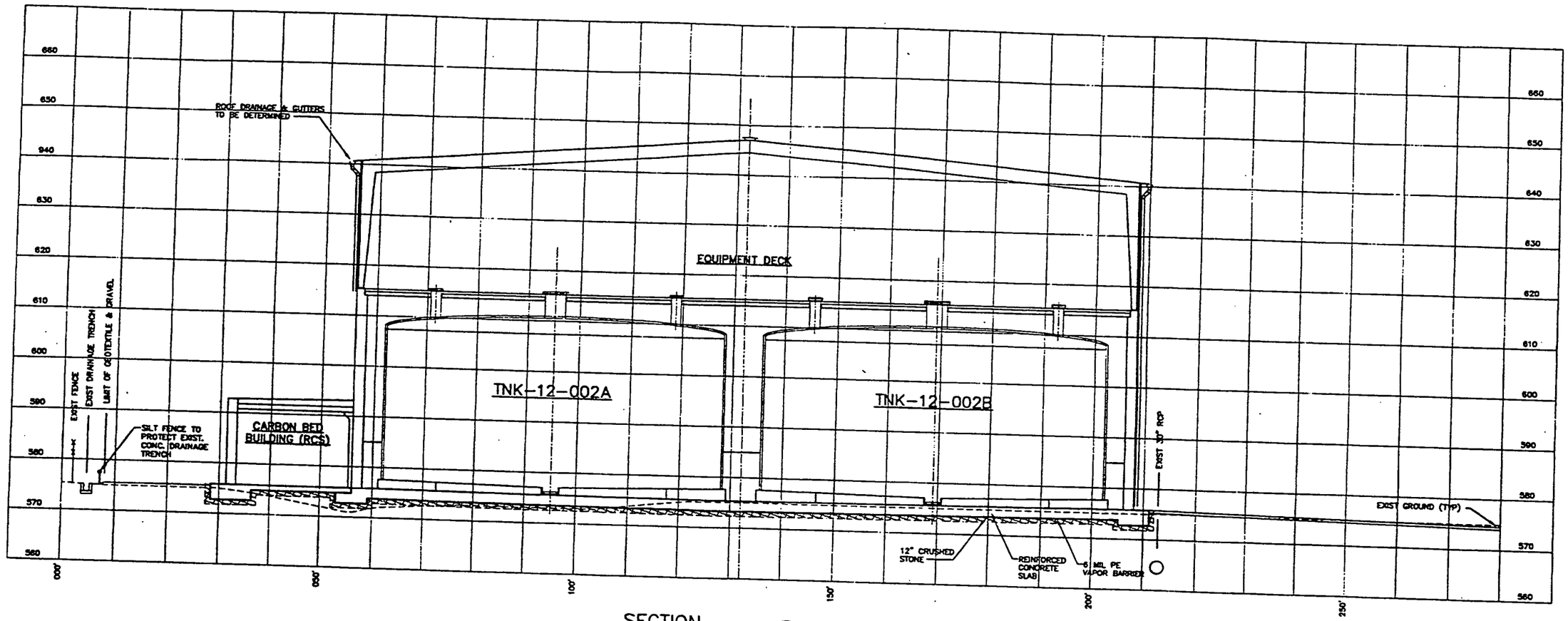
FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
TRANSFER TANK SYSTEM
CROSS SECTIONS
SHEET 1

SIZE	SCALE	DWG. NO.	REV
D	1"=10'	12FCD005	A

FILENAME: 12FCD005.DWG

2905



SECTION

SCALE: 1"=10'

B

12FCD002
12FCD003

12FCD006

000114

LETTER OR NUMBER OF SECTION OR DETAIL

DRAWING ON WHICH SECTION OR DETAIL IS TAKEN

DRAWING ON WHICH SECTION OR DETAIL IS SHOWN

SECTION & DETAIL KEY

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
A		WVD			PRELIMINARY DESIGN SUBMITTAL

DRAWN BY WVD DATE
DESIGNED BY KEO DATE
CHECKED BY DATE
APPROVED BY DATE
APPROVED BY DATE

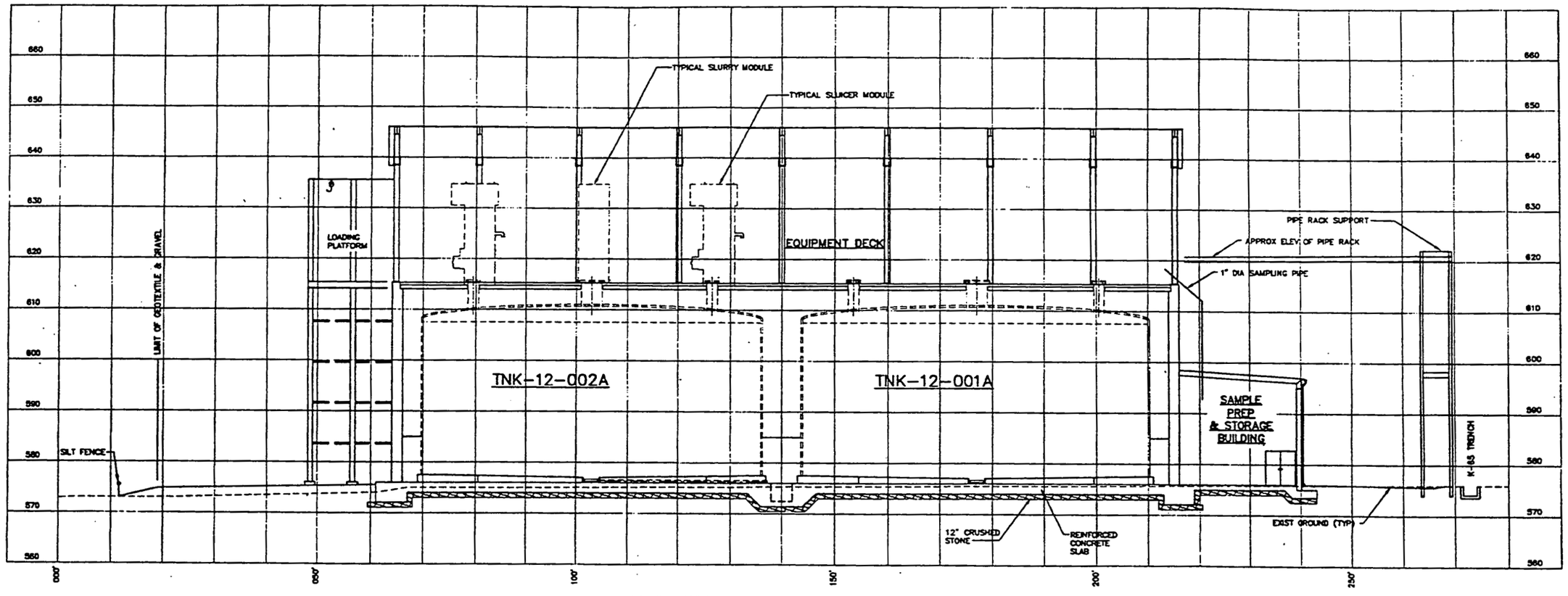
DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
TRANSFER TANK SYSTEM
CROSS SECTIONS
SHEET 2

SIZE D | SCALE 1"=10' | DWG. NO. 12FCD006 | REV A

2905



SECTION

SCALE: 1"=10'

C

12FCD002
12FCD003

12FCD007

000115

LETTER OR NUMBER OF SECTION OR DETAIL

DRAWING ON WHICH SECTION OR DETAIL IS TAKEN

DRAWING ON WHICH SECTION OR DETAIL IS SHOWN

SECTION & DETAIL KEY

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
A		WVD			PRELIMINARY DESIGN SUBMITTAL

DRAWN BY WVD DATE
REVIEWED BY KEC DATE
CHECKED BY DATE
APPROVED BY DATE
APPROVED BY DATE

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TRANSFER TANK SYSTEM
CROSS SECTIONS
SHEET 3

SIZE D | SCALE 1"=10' | DWG. NO. 12FCD007 | REV A

NOTES:

1. SEE DRAWING 05FCD011 FOR GENERAL NOTES AND LEGEND.

2905

CONTROL TRAILER
E 1347200
EMERGENCY SHOWER
MTPP FACILITY
FOUNDATION FOR 480V SWITCHGEAR
E 1347400
E 1347600
DOMESTIC WATER
K-65 TRENCH
BUMP
PIPE SUPPORT (TYP.)
CHILLERS
MCC-3
MCC-2
PUMP
MAKEUP WATER STORAGE TANK
APPROX. SIZE PIPE RACK
LIMITS OF GEOTEXTILE AND GRAVEL
3" WATERLINE
PIV
VALVE BOX 3' x 2'
FIRE WATER
EXIST. MH TOP 576.1 INV. 566.6
4" DW
8" FO
EXISTING GATE
APPROX. LOCATION OF EXIST GRATE
SAMPLE PREP & STORAGE BUILDING
ABANDON EXISTING MH
EXIST. MH
INSTALL NEW CATCH BASIN TO RECEIVE ROOF DRAINAGE
STAIRWAY
EXIST. MH
STACK
AIR COMPRESSOR
EMERGENCY BACKUP GENERATOR
N 480400
TRANSFER TANK TNK-12-001A
TRANSFER TANK TNK-12-001B
TRANSFER TANK BUILDING FFE = 576.0
LAYDOWN AREA
12FCD003
12FCD006
APPROX LOCATION OF EXIST ROAD
AIR HANDLING BUILDING (RCS)
ASSEMBLY LAYDOWN/ STAGING AREA
GRAVEL PATH TO TRAILERS
TRANSFER TANK 2A TNK-12-002A
TRANSFER TANK 2B TNK-12-002B
RIDGE LINE
1.5%
120'
PROPOSED LOCATION OF NEW GRATE
EXIST ST
LOADING PLATFORM WITH STAIRWAY
EXIST. 30" CONC DRAIN
570
575
12FCD007
LIMITS OF GEOTEXTILE AND GRAVEL
N 480200
CB-02 INV. 562.0
EXIST CB INV. 565.6
11068
12" ST
CB-01 INV. 566.5
EXIST CB INV. 565.5
567.4
570.0
PERIMETER ROAD
560

STATE OF OHIO NORTH (NAD 83)

000116

20 0 20 40
SCALE IN FEET

LETTER OR NUMBER OF SECTION OR DETAIL
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN
SECTION & DETAIL KEY

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
A		WVD			PRELIMINARY DESIGN SUBMITTAL

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TRANSFER TANK SYSTEM
SITE LAYOUT PLAN

DRAWN BY WVD
DESIGNED BY KED
CHECKED BY
APPROVED BY
APPROVED BY

SIZE D | SCALE 1"=20' | DWG. NO. 12FCD003 | REV A

NOTES:

1. SEE DRAWING 05FCD011 FOR GENERAL NOTES AND LEGEND.

2905

K-65 TRENCH

SUMP

E 1347200

E 1347400

E 1347600

UNITS OF GEOTEXTILE AND GRAVEL

EXISTING GATE

APPROX LOCATION OF EXIST GRATE

N 480400

N 480200

12FCD002

12FCD005

12FCD007

APPROX LOCATION OF EXIST ROAD

PROPOSED LOCATION OF NEW GRATE

TRANSFER TANK AREA
FFE = 576.0

ASSEMBLY LAYDOWN/ STAGING AREA

LAYDOWN AREA

LAYDOWN AREA

EXIST. MH
TOP 576.1
INV. 566.6

EXIST. MH

EXIST. MH

4" DW

8" FO

EXIST 30" CONC DRAIN

EXIST ST

12" ST

CB-02
INV. 562.0

EXIST CB
INV. 565.6

CB-01
INV. 566.5

EXIST CB
INV. 565.5

PERIMETER ROAD

575

572

570

567.4

570.0

120'

1.5%

STATE OF OHIO NORTH (NAD 83)

000117

20 0 20 40

SCALE IN FEET

LETTER OR NUMBER OF SECTION OR DETAIL

DRAWING ON WHICH SECTION OR DETAIL IS TAKEN

DRAWING ON WHICH SECTION OR DETAIL IS SHOWN

SECTION & DETAIL KEY

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
A		WVD			PRELIMINARY DESIGN SUBMITTAL

DPC

DRAWN BY WVD DATE

DESIGNED BY KED DATE

CHECKED BY DATE

APPROVED BY DATE

APPROVED BY DATE

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER

FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE

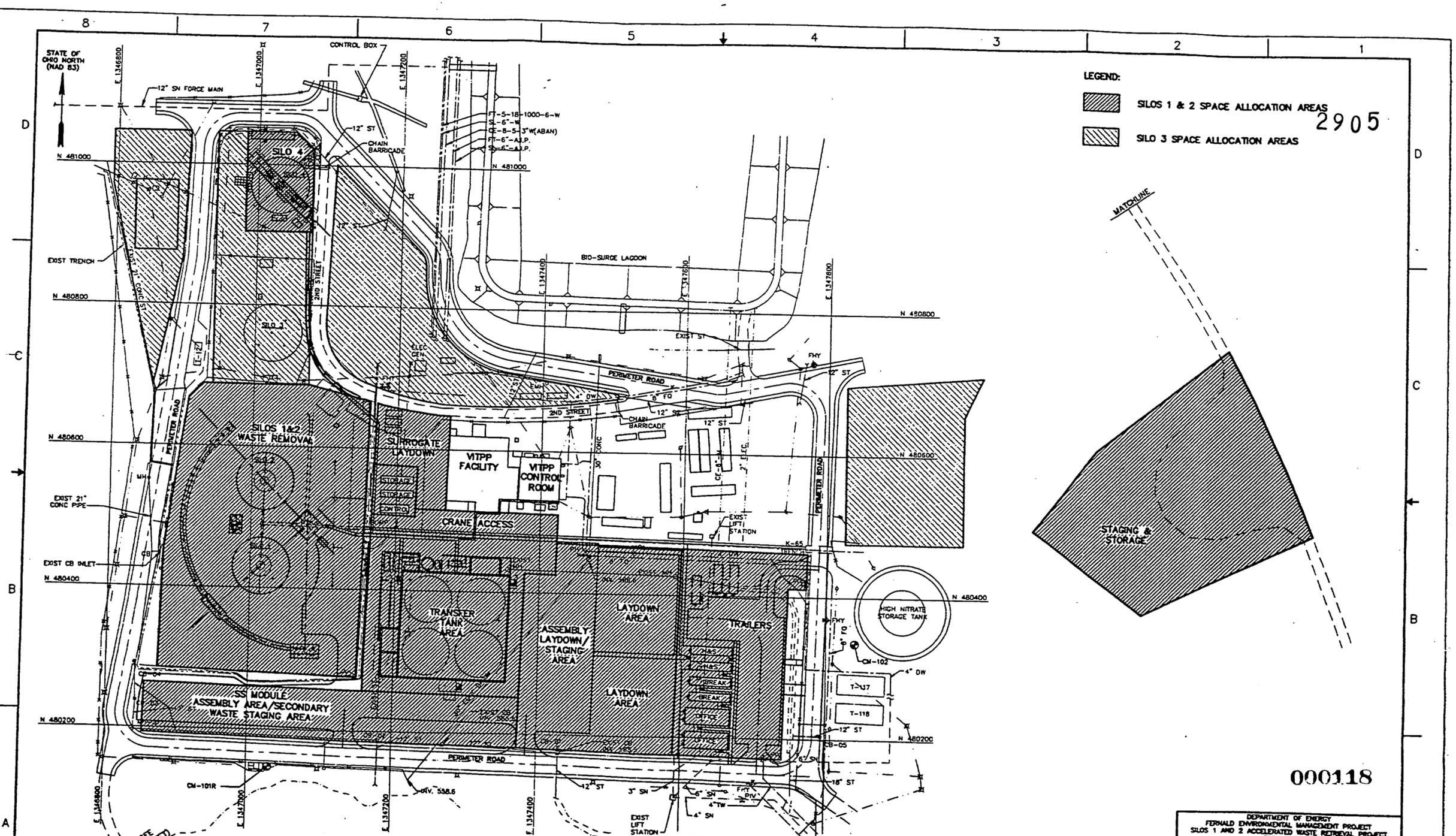
TRANSFER TANK SYSTEM EXCAVATION PLAN

SIZE D | SCALE 1"=20' | DWG NO. 12FCD002 | REV A

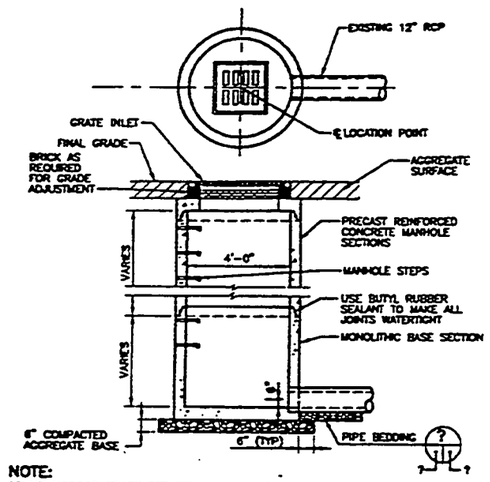
FILENAME: 12FCD002.DWG

560

000117

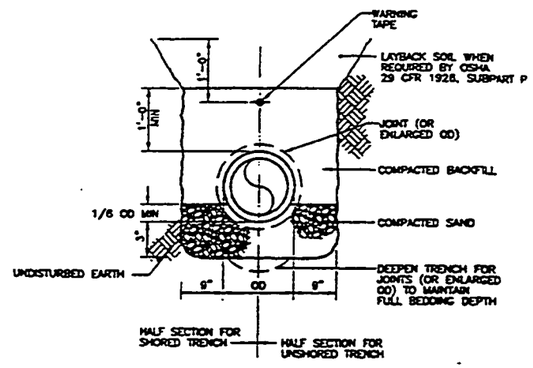

STATE OF OHIO NORTH (NAD 83)
LEGEND:
SILOS 1 & 2 SPACE ALLOCATION AREAS
SILO 3 SPACE ALLOCATION AREAS
2905
MATCHLINE
STAGING & STORAGE
12" SN FORCE MAIN
CONTROL BOX
12" ST
CHAIN BARRICADE
SILO 4
SILO 3
EXIST TRENCH
EXIST 21" CONC ST
2ND STREET
BIO-SURGE LAGOON
EXIST ST
PERIMETER ROAD
ELEC GEN
SILOS 1&2 WASTE REMOVAL
SURROGATE LAYDOWN
VITPP FACILITY
VITPP CONTROL ROOM
STORAGE
CONTROL
CRANE ACCESS
EXIST 21" CONC PIPE
EXIST CB INLET
EXIST LIFT STATION
TRANSFER TANK AREA
ASSEMBLY LAYDOWN/ STAGING AREA
LAYDOWN AREA
TRAILERS
HIGH NITRATE STORAGE TANK
SS MODULE ASSEMBLY AREA/SECONDARY WASTE STAGING AREA
CM-101R
CM-102
T-117
T-118
OFFICE
BREAK
N 481000
N 480800
N 480600
N 480400
N 480200
E 1346800
E 1347000
E 1347200
E 1347400
E 1347600
E 1347800
SCALE IN FEET
60 0 60 120
PRELIMINARY
NOT FOR CONSTRUCTION
000118
DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624
FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION
MISC FACILITIES
SITE SPACE ALLOCATION
D
1"=60'
05FCD014
A
A | WVD | PRELIMINARY DESIGN SUBMITTAL
REV | DATE | BY | CHK'D | APR'VD | DESCRIPTION/ISSUE
DRAWN BY WVD
DESIGNED BY KED
CHECKED BY
APPROVED BY
APPROVED BY

2905



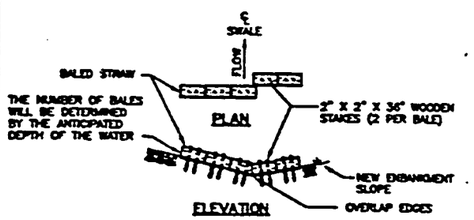
NOTE:
GROUT ANNULAR SPACE BETWEEN WALL AND PIPE WITH NON-SHRINK MORTAR TO ENSURE A WATERTIGHT SEAL OR USE NEOPRENE BOOT WITH COMPRESSION RING; CLAMP BOOT TO PIPE WITH STAINLESS STEEL CLAMP.

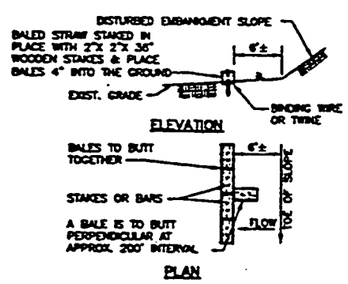
PRECAST CONCRETE CATCH BASIN
NOT TO SCALE



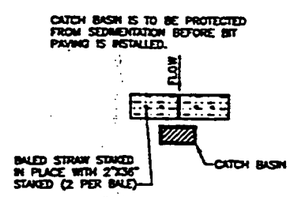
NOTE:
WARNING TAPE SHALL CONSIST OF A SOLID ALUMINUM CORE, A COATED IMPRINT, AND A REINFORCED PROTECTIVE PLASTIC JACKET BONDED TO THE FOIL CORE.

PIPE BEDDING DETAIL
NOT TO SCALE

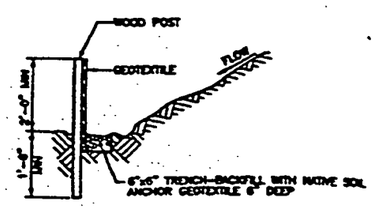




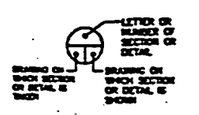
BALED STRAW EROSION CHECKS
NOT TO SCALE



CATCH BASIN PROTECTION
NOT TO SCALE



SILT FENCE DETAIL
NOT TO SCALE



SECTION & DETAIL KEY

PRELIMINARY
NOT FOR CONSTRUCTION

000119

REV	DATE	BY	CHK'D	APP'D	DESCRIPTION/ISSUE
A		WVO			PRELIMINARY DESIGN SUBMITTAL

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APPROVED BY DATE
APPROVED BY DATE

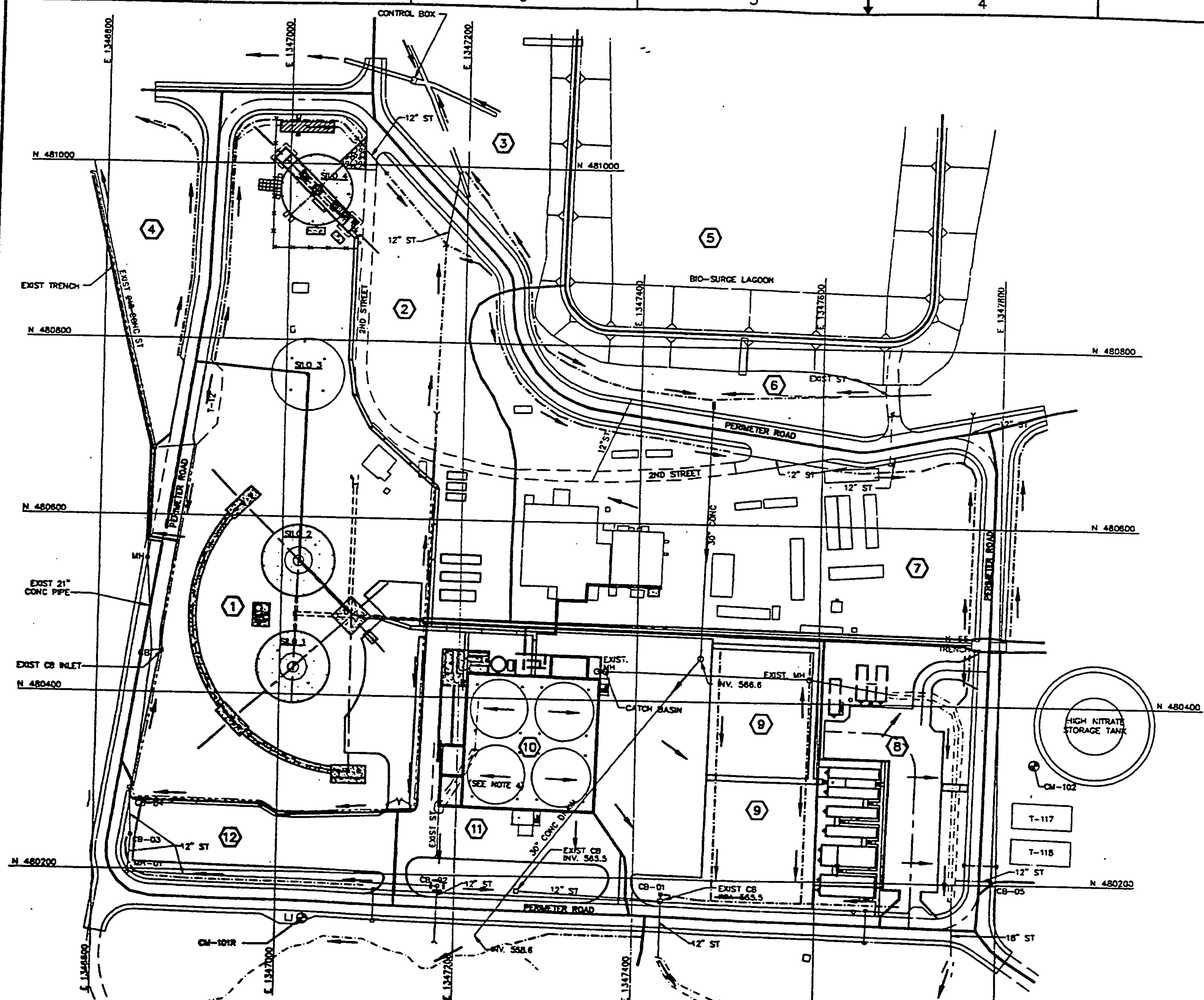
DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 824

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
STORM WATER SYSTEM
MISC DETAILS
SHEET 1

SIZE D | SCALE AS SHOWN | DWG. NO. 66FCD006 | REV A

2905



NOTES:

1. SEE DRAWING 05FCD011 FOR GENERAL NOTES AND LEGEND.
2. DRAINAGE AREAS 1 THROUGH 4 DRAIN TO THE WEST TO AN EXISTING CONCRETE SUMP WITH APPROXIMATE CAPACITY OF 390,000 GALLONS. THE CONCRETE SUMP CONTAINS A 12" DIA FORCE MAIN TO THE BIO-SURGE LAGOON.
3.

DRAINAGE AREA	DESCRIPTION OF DRAINAGE AREA	OUTLET
1	SILOS 1 & 2 – PERIMETER TRENCH	CONCRETE SUMP TO BIO-SURGE LAGOON
2	SILOS 3 & 4 – PERIMETER TRENCH	CONCRETE SUMP TO BIO-SURGE LAGOON
3	GRASS STORM BASIN	CONCRETE SUMP TO BIO-SURGE LAGOON
4	WEST OF SILOS 3 & 4	CONCRETE SUMP TO BIO-SURGE LAGOON
5	BIO-SURGE LAGOON	BIO-SURGE LAGOON
6	OU1 DRAINAGE SOUTH TO 30 IN. RCP	30 IN. RCP
7	DRAINS NORTH TO 30 IN. RCP	30 IN. RCP
8	GRASS FIELD	EXISTING STORMWATER BASIN
9	GRASS FIELD AND LAYDOWN AREA	EXISTING STORMWATER BASIN
10	TTA AND RCS BUILDINGS – GUTTERS	PROPOSED ROOF DRAINAGE
11	EXTERIOR AREAS OF TTA AND RCS BUILDINGS	EXISTING STORMWATER BASIN
12	SOUTH OF SILO 1	12 IN. OUTLET FROM CB-02

4. ROOF DRAINAGE FROM TRANSFER TANK AREA BUILDING AND RCS BUILDING WILL BE ROUTED SOUTH AND ALSO TO THE EAST THROUGH EXISTING 12" RCP.

STORMWATER LEGEND:

- (1) DRAINAGE AREA
- DRAINAGE DIVIDE
- FLOW DIRECTION

STATE OF OHIO NORTH (NAD 83)

000120

60 0 60 120
SCALE IN FEET

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
A		WVD			PRELIMINARY DESIGN SUBMITTAL

DRAWN BY: WVD
REVIEWED BY: KED
CHECKED BY:
APPROVED BY:
APPROVED BY:

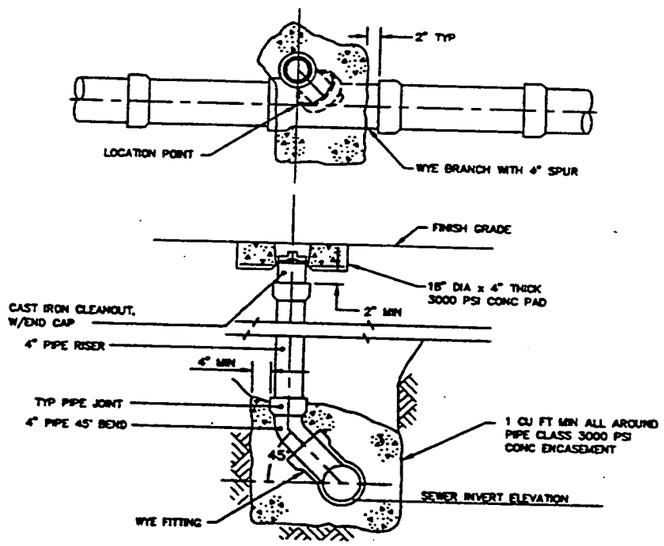
DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

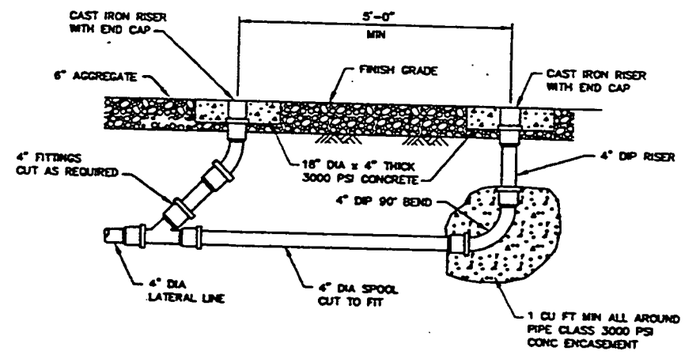
TITLE: STORM WATER SYSTEM OVERALL DRAINAGE PLAN

SIZE	SCALE	DWG. NO.	REV
D	1"=60'	66FCD001	A

2905



SEWER CLEANOUT
NOT TO SCALE



TRAILER CONNECTION
NOT TO SCALE

000121

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

SECTION & DETAIL KEY

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
A		WVD			PRELIMINARY DESIGN SUBMITTAL

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DRAWN BY WVD DATE
DESIGNED BY KED DATE
CHECKED BY DATE
APPROVED BY DATE
APPROVED BY DATE

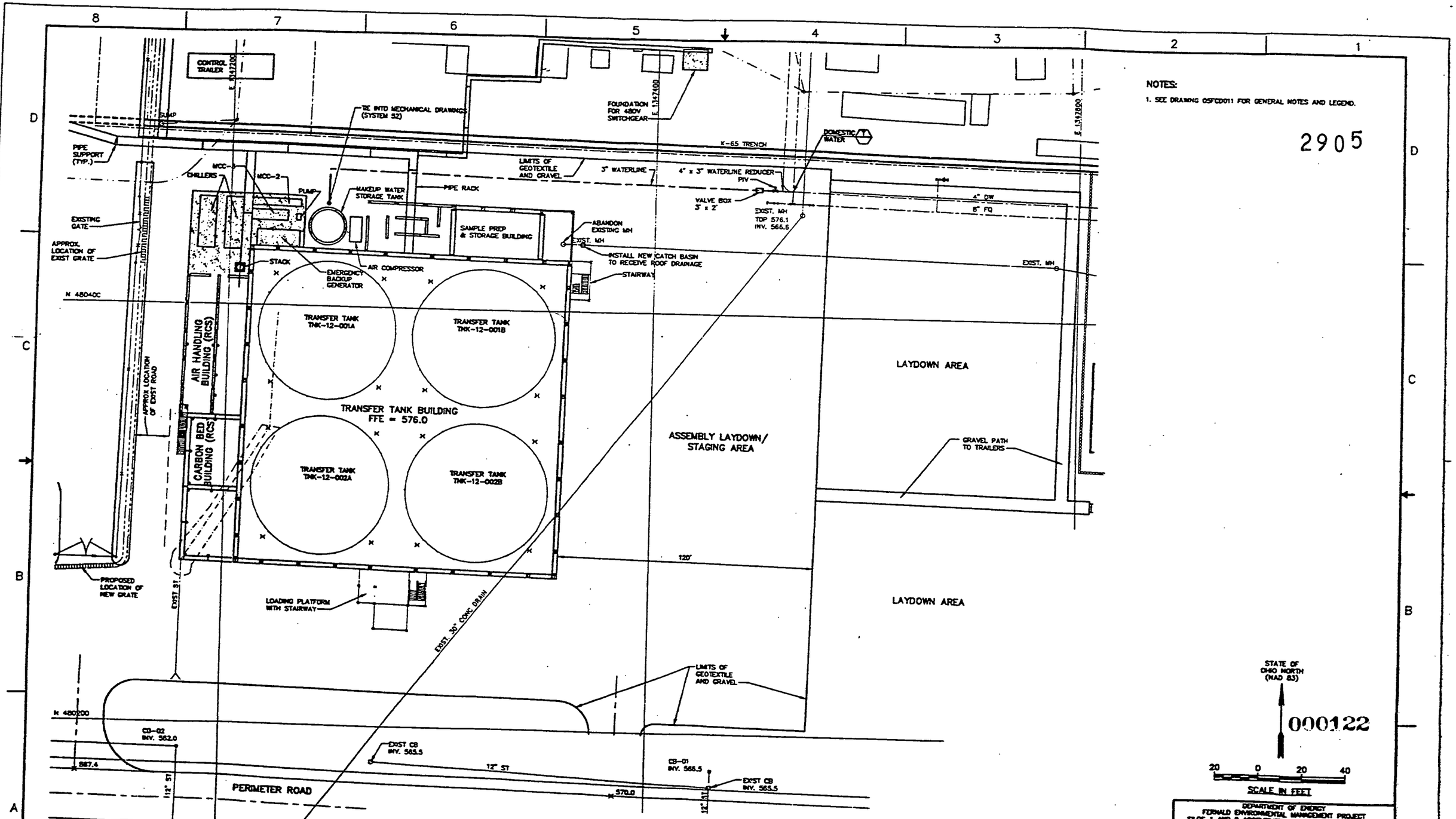
DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 824

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
SANITARY SEWER SYSTEM
DETAILS

SIZE D | SCALE AS SHOWN | DWG. NO. 61FCD002 | REV A

FILENAME: 61FCD002.DWG



NOTES:

1. SEE DRAWING 05FCD011 FOR GENERAL NOTES AND LEGEND.

2905

NOTES:

1. SEE DRAWING 05FCD011 FOR GENERAL NOTES AND LEGEND.

2905

EXIST LIFT STATION
DOMESTIC WATER
4" DW
8" FD
4" x 2" WATERLINE REDUCER
PIV
VALVE BOX 3" x 2"
3" SN
EXIST. MH
30' CONC DRAIN
INV. 568.6
K-65 TRENCH
SUBCONTRACTOR TRAILER
SUBCONTRACTOR TRAILER
SUBCONTRACTOR TRAILER
LAYDOWN AREA
GRAVEL PATH TO CONSTRUCTION AREA
2" WATER LINE
2" X 1" WATER LINE TEE
RADIOLOGICAL CONTROL POINT
GRAVEL PATH TO CONSTRUCTION AREA
H & S TRAILER
2" X 2" WATER LINE TEE
2" X 1" WATER LINE REDUCER
H & S TRAILER
BREAK TRAILER
BREAK TRAILER
LAYDOWN AREA
1" X 1" WATER LINE TEE
OFFICE TRAILER
LIMITS OF GEOTEXTILE AND GRAVEL
1" WATER LINE ELBOW
OFFICE TRAILER
PERIMETER ROAD
N 480400
HIGH NITRATE STORAGE TANK
FHY
8" FD
CM-102
4" DW
T-117
T-118
12" ST
CB-05
N 480200
PIV
6" SN
18" ST
E 1347800
PERIMETER ROAD
6" SN
3" SN
FHY
4" TV
4" SN
EXIST LIFT STATION
E 1347600

STATE OF OHIO NORTH (NAD 83)

20 0 20 40
SCALE IN FEET

000123

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APP'VD	DESCRIPTION/ISSUE
A		WVD			PRELIMINARY DESIGN SUBMITTAL

SIZE D

DRAWN BY WVD DATE
DESIGNED BY KED DATE
CHECKED BY DATE
APPROVED BY DATE
APPROVED BY DATE

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. F3C 824

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
DOMESTIC WATER SYSTEM UNDERGROUND LAYOUT PLAN SHEET 2

SIZE D | SCALE 1"=20' | DWG. NO. 51FCD002 | REV A

NOTES:

1. SEE DRAWING OSFCD011 FOR GENERAL NOTES AND LEGEND.

2905

EXIST LIFT STATION
K-65
TRENCH
4" DW
8" FO
INV 566.6
EXIST. MH
3" SN
SUBCONTRACTOR TRAILER
SUBCONTRACTOR TRAILER
SUBCONTRACTOR TRAILER
MH
PIV
4"
N 480400
GRAVEL PATH TO CONSTRUCTION AREA
LAYDOWN AREA
PERIMETER ROAD
HIGH NITRATE STORAGE TANK
FHY
8" FO
CM-102
GRAVEL PATH TO CONSTRUCTION AREA
RADIOLOGICAL CONTROL POINT
H & S TRAILER
SS MANHOLE
H & S TRAILER
BREAK TRAILER
BREAK TRAILER
OFFICE TRAILER
OFFICE TRAILER
LAYDOWN AREA
4" DW
T-117
T-118
LIMITS OF GEOTEXTILE AND GRAVEL
12" ST
CM-05
SANITARY SEWER HOLDING TANK 5,000 GAL
N 480200
STATE OF OHIO NORTH (NAD 83)
PIV
MH
6" SN
PERIMETER ROAD
6" SN
18" ST
E 1347600
3" SN
FHY
4"TW
EXIST LIFT STATION
4" SN
E 1347600

000124

20 0 20 40

SCALE IN FEET

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APRV'D	DESCRIPTION/ISSUE
A		WVD			PRELIMINARY DESIGN SUBMITTAL

DRAWN BY WVD
DESIGNED BY KED
CHECKED BY
APPROVED BY
APPROVED BY

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
SANITARY SEWER SYSTEM
LAYOUT PLAN

SIZE D | SCALE 1"=20' | DWG. NO. 61FCD001 | REV A

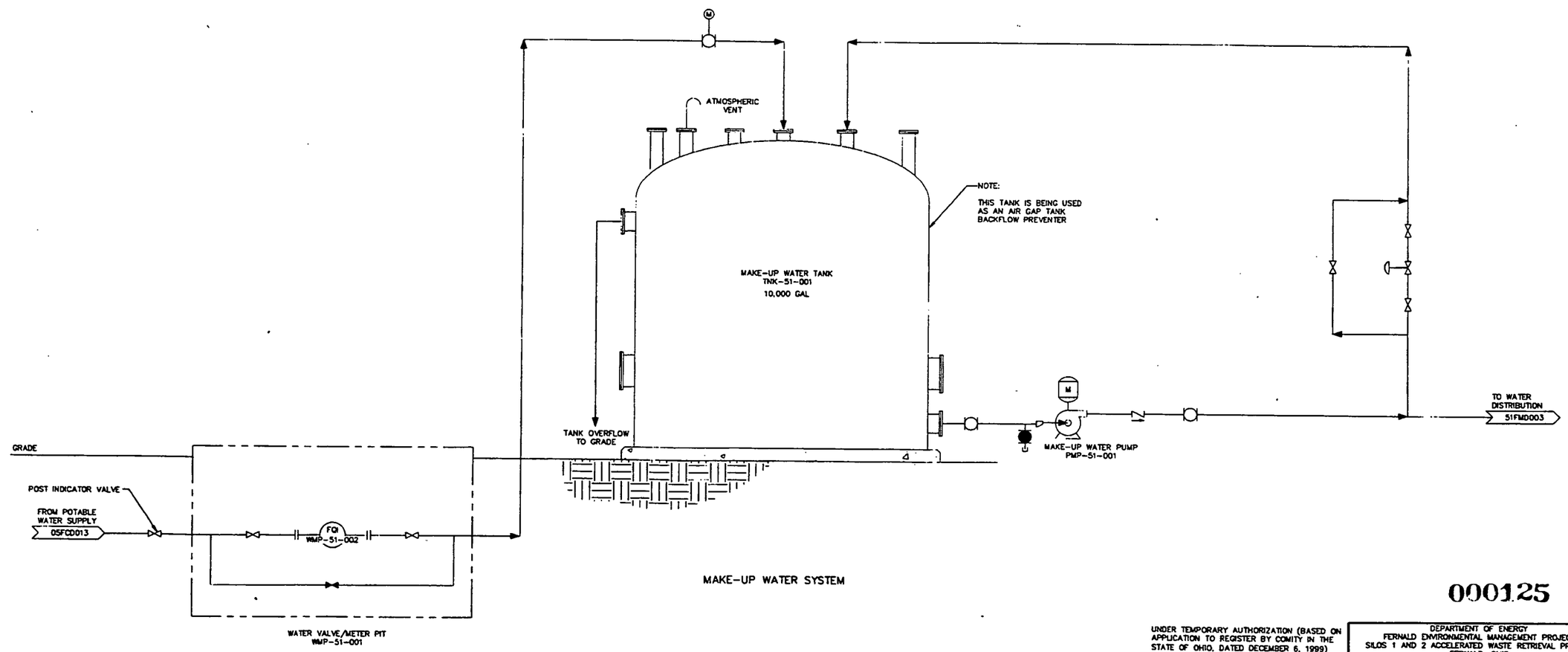
NOTES:

1. FOR GENERAL NOTES SEE DRAWING 05FMD004.
2. FOR MASS BALANCE TABLES SEE DRAWING 11FMD001 & 11FMD002.

REFERENCE DRAWINGS:

05FMD001	PIPING & INSTRUMENT DIAGRAM – INSTRUMENT IDENTIFICATION
05FMD002	PIPING & INSTRUMENT DIAGRAM – CONTROL SYSTEM STANDARDS
05FMD003	PIPING & INSTRUMENT DIAGRAM – PIPING & EQUIPMENT IDENTIFICATION

2905



MAKE-UP WATER SYSTEM

000125

UNDER TEMPORARY AUTHORIZATION (BASED ON APPLICATION TO REGISTER BY COMITY IN THE STATE OF OHIO, DATED DECEMBER 6, 1999) WHICH WILL EXPIRE ON MARCH 31, 2000.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
1	[illegible]	[illegible]	[illegible]		CERTIFIED FOR CONSTRUCTION
0	11/01/99	BJD	SWH		PRELIMINARY DESIGN PACKAGE

KENNETH D. RICHARDS — PROFESSIONAL ENGINEER — LICENSE NO. 103742 — STATE OF TENNESSEE

		DATE
DRAWN BY	[illegible]	01/07/00
DESIGNED BY	[illegible]	01/07/00
CHECKED BY	[illegible]	01/07/00
APPROVED BY	[illegible]	01/07/00
APPROVED BY	[illegible]	01/07/00

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
POTABLE/DOMESTIC WATER SYS
PROCESS FLOW DIAGRAM
MAKE-UP WATER

SIZE	SCALE	DWG. NO.	REV
D	NONE	51FMD001	1

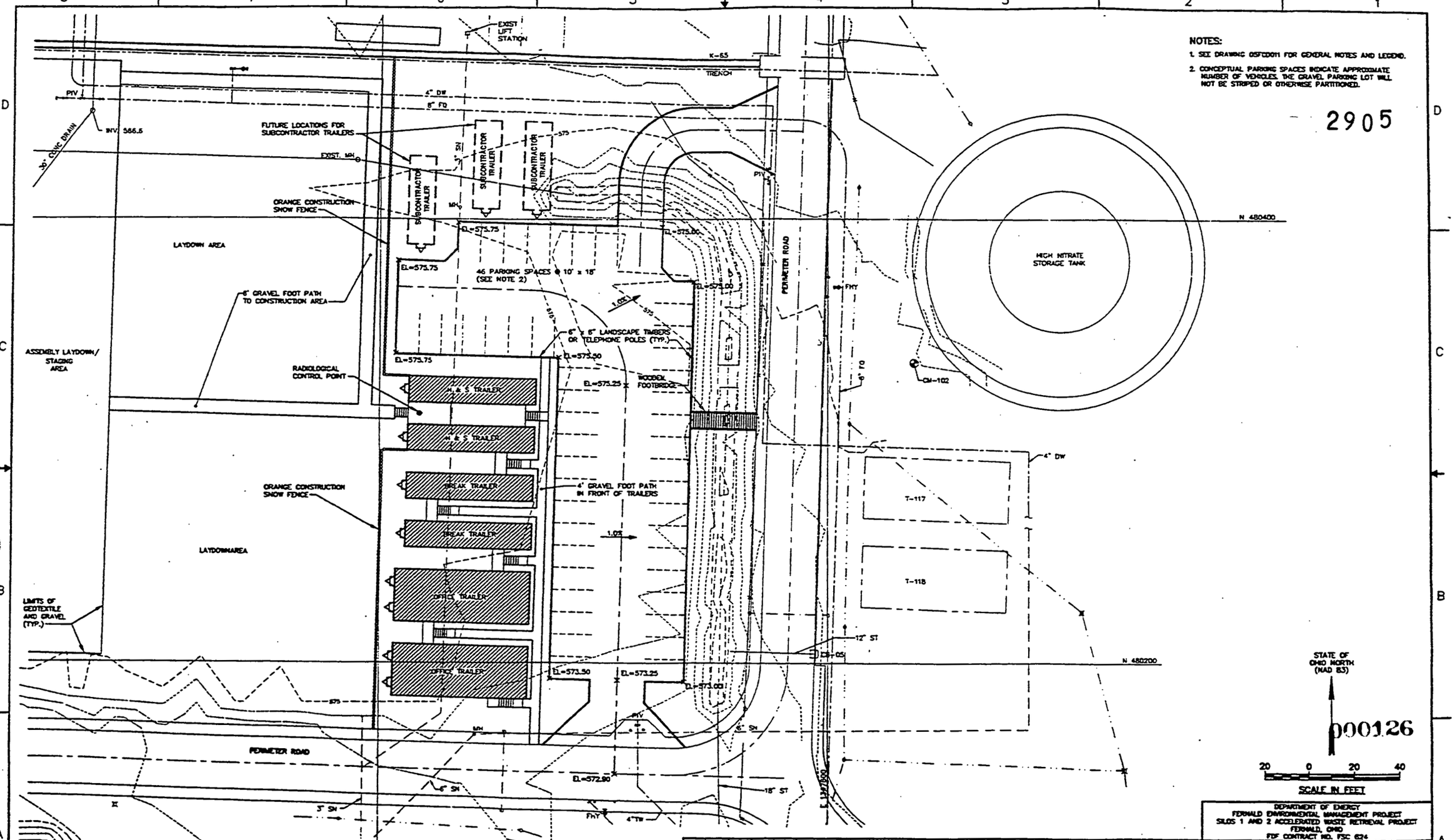
FILENAME: 51FMD001.DWG

G:\CIVIL\FDF\51LIQS\MECS\PS51\51fmd001.dwg Wed Jan 05 21:56:42 2000

NOTES:

1. SEE DRAWING 05FCD011 FOR GENERAL NOTES AND LEGEND.
2. CONCEPTUAL PARKING SPACES INDICATE APPROXIMATE NUMBER OF VEHICLES. THE GRAVEL PARKING LOT WILL NOT BE STRIPED OR OTHERWISE PARTITIONED.

2905



000126

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APP'D	DESCRIPTION/ISSUE
A		WVD			PRELIMINARY DESIGN SUBMITTAL

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DESIGNED BY KED
CHECKED BY
APPROVED BY
APPROVED BY

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

TITLE
SUPPORT FACILITIES
GRADING PLAN
TRAILER LAYOUT

SIZE D | SCALE 1"=20' | DWG NO. 06FCD001 | REV A

FILENAME: 06FCD001.DWG

NOTES:

1. SEE DRAWING 05FCD011 FOR GENERAL NOTES AND LEGEND.

2905

PERIMETER ROAD
UNDERGROUND ELECTRICAL DUCTBANK
CHASE EQUIPMENT UNIT
SILO 2
SILO 1
EXIST 21" CONC PIPE
EXIST CB INLET
EXISTING GATE
APPROX LOCATION OF EXIST GRATE
FOUNDATION FOR SWRS SUPPORT STRUCTURE (TYP.)
LIMITS OF GEOTEXTILE FOR SLOPE PROTECTION (TYP.)
SS MODULE ASSEMBLY AREA/ SECONDARY WASTE STAGING AREA
APPROX LOCATION OF EXIST. GRATE
FOUNDATION FOR SWRS SUPPORT STRUCTURE ERECTION
LIMITS OF GEOTEXTILE AND GRAVEL
PROPOSED LOCATION OF NEW GRATE
LIMITS OF GEOTEXTILE AND GRAVEL FOR SWRS SUPPORT STRUCTURE ERECTION (AFTER RCS IS FUNCTIONAL)
APPROX LOCATION OF EXIST ROAD
PERIMETER ROAD
TURNTABLE SUPPORT FOUNDATION
HIGH PRESSURE PUMP SKID
FSWS SURROGATE MATERIAL DEWATERING BIN
STORAGE T-411
STORAGE T-412
CONTROL T-410
ELECTRICAL EQUIPMENT BUILDING
EMERGENCY BACKUP GENERATOR
AIR COMPRESSOR
PUMP
MAKEUP WATER STORAGE TANK
VITPP FACILITY
VITPP CONTROL ROOM
FOUNDATION FOR 480V SWITCHGEAR
PIPE SUPPORT (TYP.)
PIPE RACK
LIMITS OF GEOTEXTILE AND GRAVEL
CHILLERS
STACK
SAMPLE PREP & STORAGE BUILDING 94F
EXIST. MH
STAIRWAY
94E AIR HANDLING BUILDING (RCS)
94C TRANSFER TANK AREA BUILDING FFE = 576.0
94D CARBON BED BUILDING (RCS)
LOADING PLATFORM WITH STAIRWAY
ASSEMBLY LAYDOWN/ STAGING AREA
LIMITS OF GEOTEXTILE AND GRAVEL
30" CONC DRAIN
EXIST. MH TOP 576.1 INV. 566.6
PIV
ELEC GEN
ELEC PANEL
12" ST
4" DW
N 480600
N 480400
N 480200
E 1346800
E 1347000
E 1347200
E 1347400

STATE OF OHIO NORTH (NAD 83)

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

30 0 30 60
SCALE IN FEET

000127

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REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
B	1/7/00	WVD			ISSUED FOR OHIO EPA REVIEW
A		WVD			PRELIMINARY DESIGN SUBMITTAL

DRAWN BY WVD DATE
DESIGNED BY KEO DATE
CHECKED BY DATE
APPROVED BY DATE
APPROVED BY DATE

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FLUOR FERNALD ENVIRONMENTAL RESTORATION CORPORATION

TITLE
SILO WASTE RETRIEVAL SYSTEM
EROSION CONTROL PLAN
PHASE 1

SIZE D | SCALE: 1"=30' | DWG. NO. 11FCD009 | REV B

FILENAME: 11FCD009.DWG

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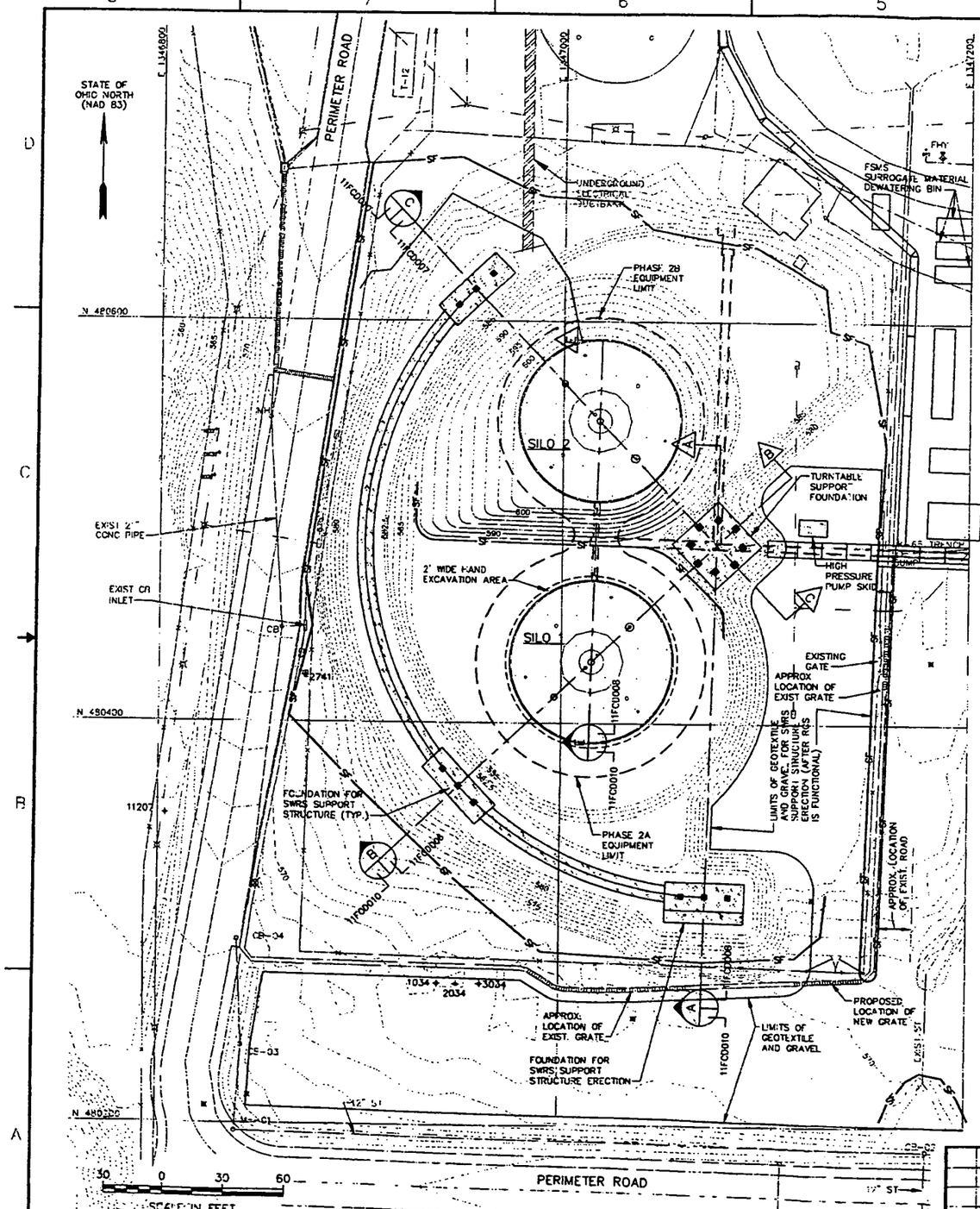

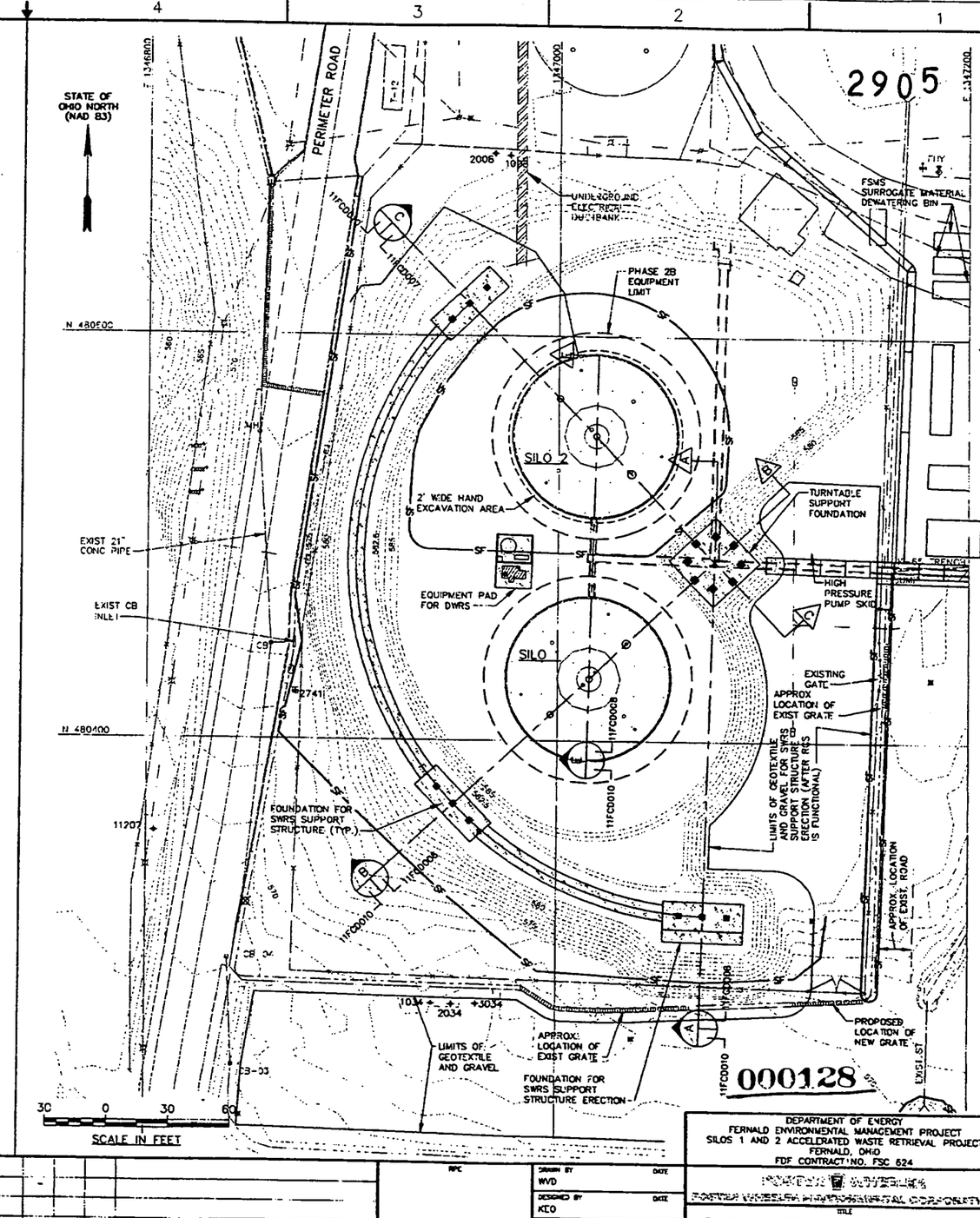

NOTES:

1. SEE DRAWING 05FCD011 FOR GENERAL NOTES AND LEGEND.

PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE
B	1/7/00	WVD			ISSUED FOR OHIO EPA REVIEW
A		WVD			PRELIMINARY DESIGN SUBMITTAL

RFC

DRAWN BY WVD DATE
DESIGNED BY KEO DATE
CHECKED BY DATE
APPROVED BY DATE
APPROVED BY DATE

DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SILOS 1 AND 2 ACCELERATED WASTE RETRIEVAL PROJECT
FERNALD, OHIO
FDF CONTRACT NO. FSC 624

FLUOR FERNALD
FLUOR FERNALD ENVIRONMENTAL CORPORATION

TITLE
SILO WASTE RETRIEVAL SYSTEM
EROSION CONTROL PLAN
PHASES 2A AND 2B

SIZE	SCALE	DWG. NO.	REV
D	1"=30'	11FCD010	B

FILENAME: 11FCD010.DWG

S:\CADDE\FDF\SILOS\CIVIL\11FCD010.dwg Fri Jan 07 11:18:16 2000