

OPERABLE UNIT 3

ADVANCED WASTEWATER TREATMENT FACILITY (AWWT) IMPLEMENTATION PLAN FOR ABOVE-GRADE DECONTAMINATION AND DISMANTLEMENT



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**ADVANCED WASTEWATER TREATMENT FACILITY COMPLEX
IMPLEMENTATION PLAN FOR ABOVE-GRADE
DECONTAMINATION AND DISMANTLEMENT**

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NOTATION

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Abbreviations, Acronyms, and Initials

ACM	Asbestos-Containing Material(s)
ADT	Articulating Dump Truck
AWWT	Advanced Waste Water Treatment System
CAWWT	Converted Advanced Wastewater Treatment System
DOE	United States Department of Energy
D&D	Decontamination and Dismantlement
FCP	Fernald Closure Project
HEPA	high-efficiency particulate air [filter]
HVAC	heating, ventilation and air conditioning
IEMP	Integrated Environmental Monitoring Plan
IIMS	Integrated Information Management System
MDCR	Minimal Detectable Count Rate
MEF	Material Evaluation Form
MSCC	Material Segregation and Containerization Criteria
NESHAPs	National Emissions Standards for Hazardous Air Pollutants
NPDES	National Pollutant Discharge Elimination System
OSDF	On-Site Disposal Facility
OU3	Operable Unit 3
PPE	personal protective equipment
PWID	Project Waste Identification and Disposition [form]
RD/RA	remedial design/remedial action
RI/FS	Remedial Investigation and Feasibility Study
ROB	roll-off box
ROD	Record of Decision
SAP	Sampling and Analysis Plan
SWIFTS	Site-Wide Waste Information, Forecasting and Tracking System
U.S. EPA	United States Environmental Protection Agency
WAC	Waste Acceptance Criteria

Units of Measure

sq. cm.	square centimeter(s)
dpm	disintegration(s) per minute
ft.	foot (feet)
mrem	millirem(s)
psi	pounds per square inch
yds ³	cubic yards

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1.0 INTRODUCTION

1.1 Project Statement

This implementation plan represents the sole remedial design deliverable developed for the Advanced Wastewater Treatment (AWWT) Complex decontamination and dismantlement (D&D) project, which has been prepared for regulatory agency approval pursuant to the Operable Unit 3 (OU3) Integrated Remedial Design/Remedial Action (RD/RA) Work Plan (DOE 1997a). This document presents a summary of the remedial design documentation prepared for D&D of the AWWT Complex. This D&D project is being implemented pursuant to the authority stipulated in the OU3 Record of Decision for Final Remedial Action (OU3 Final ROD) (DOE 1996a), which covers D&D, waste treatment, and disposition.

The purpose of this document is to summarize the AWWT Complex D&D design in the format and content stipulated by the OU3 Integrated RD/RA Work Plan and established by previously approved D&D implementation plans. This document elaborates, as applicable, on programmatic strategies developed for the Fluor Fernald self-perform D&D scope of work and project specifications (contained in Appendix C of this document).

1.2 Scope of Work

The AWWT Complex D&D project includes the following major activities:

- preparatory action/facility shutdown
- surface decontamination;
- above-grade building/component dismantlement;
- environmental monitoring; and
- material management.

Preparatory action: Inventory Removal and Safe Shutdown are not in the scope of this D&D project; however, Facility Shutdown shall be performed and pertinent information has been summarized in Sections 2 and 3. The following components are included in the AWWT Complex D&D project:

- Component 51A – Advanced Wastewater Treatment Facility
- Component 51B – Slurry Dewatering Facility
- Component 51C – AWWT Laboratory Expansion Building
- Component G-008 – AWWT Pipe Bridges

Requirements for above-grade D&D of the AWWT were developed using the performance specifications that were originally included in Appendix B of the OU3 Integrated RD/RA Work Plan. Appendix C of this Implementation Plan contains project-specific applications of these performance specifications that incorporate process improvements and lessons-learned from previous D&D projects at the Fernald Closure Project (FCP).

Excavation and removal of the underlying contaminated soil within the AWWT Complex footprint will be addressed in the Fernald Closure Project Area 7 Support Areas Integrated Remedial Design Package that will be submitted in May 2005. Excavation of contaminated soil will start after all the D&D activities are completed in the AWWT Complex footprint.

Department of Energy (DOE) will provide notification to the regulatory agencies of any significant changes to the design prior to implementation. Should the regulatory agencies have any concerns regarding any significant design change, DOE will properly address those concerns as soon as practicable and, if necessary, perform one or more of the following: amend the implementation plan, amend the OU3 Integrated RD/RA Work Plan, present an explanation of significant difference to the OU3 ROD, and/or amend the RODs. Significant changes to the design are those that require formal design modification that would impact the implementation strategies presented in this document. If necessary, affected activities may be suspended until the revision has been completed and approved. This course of action adheres to the commitments made in Section 4.2.2 of the OU3 Integrated RD/RA Work Plan for design changes.

Unlike all previous site complex D&D activities at the FCP, a portion of the existing the AWWT Complex will remain intact for operation after the AWWT D&D activities are completed. The portion of Component 51A that will remain after AWWT D&D is known as the Converted Advanced Wastewater Treatment Facility (CAWWT). The floor plan (Drawing #51D-5500-M-01326 Rev. 0) for the CAWWT facility can be found in Appendix D.

1.3 Plan Organization

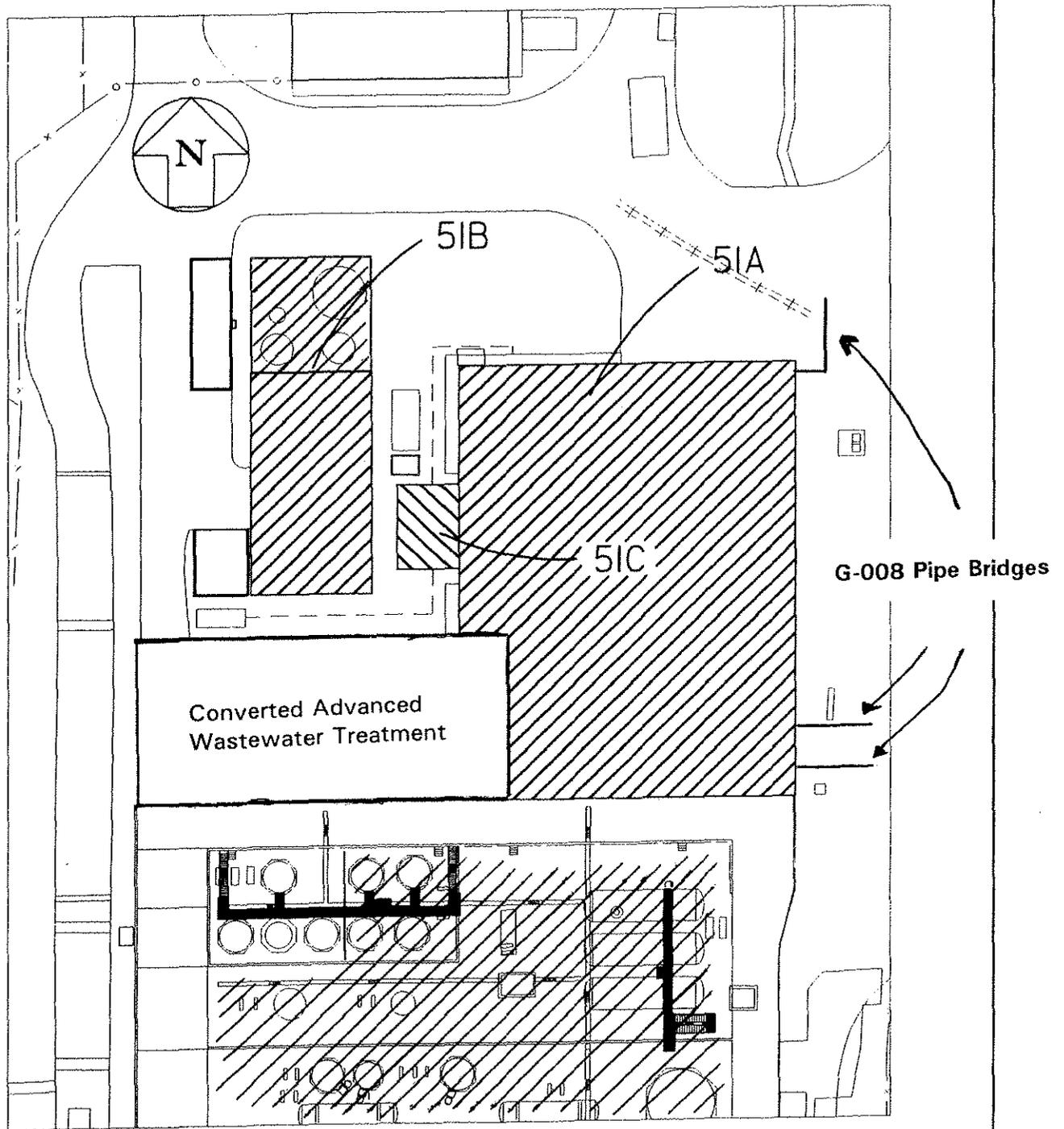
This implementation plan is comprised of five sections and five appendices. Section 1 contains the remedial action project statement, scope of work, an overview of this implementation plan, and a brief description of the AWWT Complex. Section 2 describes the overall approach to implementing this above-grade D&D project, as applied from the OU3 Integrated RD/RA Work Plan. That approach includes the projected sequence for remediation of structures, a plan for materials management, environmental monitoring activities, and the project-specific applications of implementation strategies for above-grade remediation. Section 3 presents pertinent component history and applicable component-specific details of the applicable remedial tasks. Section 4 presents the schedule for remediation and project reporting. Section 5 describes the Fluor Fernald self-perform D&D strategy and FCP project management approach.

Appendix A contains a discussion of potential environmental and occupational sampling for this project, based on the assumptions in the Sampling and Analysis Plan (SAP) contained in Appendix D of the OU3 Integrated RD/RA Work Plan, and on the remediation requirements presented in this plan. Appendix B provides a summary of the evaluation of material disposition alternatives for accessible metals and a tabulation of the cost comparison between the disposition alternatives. Appendix C provides the project performance specifications. Appendix D provides copies of available drawings and sketches that show floor plans and

elevations of buildings/components. Appendix E contains selected photographs of notable features of the AWWT Complex.

1.4 Location of the AWWT Complex

The AWWT Complex project area is located at the U.S. Department of Energy (DOE) Fernald Closure Project (FCP) in Fernald, Ohio. The AWWT Complex is located in the southwest corner of the former Production Area just southwest of the former Pilot Plant Complex location. The AWWT project area is illustrated in Figure 1-1.



Hatched areas indicate demolition.

FIGURE 1-1 Advanced Wastewater Treatment Complex PCN1

2.0 GENERAL PROJECT REMEDIATION APPROACH

The overall approach to the above-grade D&D of the AWWT Complex is based on the project-specific applications of the programmatic elements and tasks that were described in Section 3 of the OU3 Integrated RD/RA Work Plan. Section 2 of the implementation plan summarizes the project-specific applications of those elements.

2.1 Sequencing of Remediation

The remediation sequence for the components in the AWWT Complex D&D project covers the period of: 1) premobilization, which includes the preparation, review and approval of the Fluor Fernald self-perform work control documents, health and safety documents, etc; 2) mobilization, which includes establishing project support facilities and controls; 3) actual D&D field activities for each building/component; and 4) demobilization, which includes securing the area and decontaminating/removing Fluor Fernald self-perform equipment. The actual sequence of building/component D&D will be determined by the Fluor Fernald self-perform project schedule which includes the operational sequence for shut-down of facilities. It is anticipated that the sequence for dismantlement may be the following:

1. Component G-008 – AWWT Pipe Bridges
2. Component 51B – Slurry Dewatering Facility
3. Component 51C – AWWT Laboratory Expansion Building
4. Component 51A – Advanced Wastewater Treatment Facility

2.2 Characterization of the AWWT Complex

A recent radiological survey was obtained to substantiate the information summarized in Table 2-1.

TABLE 2-1 Summary of Radiological Survey Data

Comp. No.	Alpha Removable (dpm/100 sq. cm.)			Beta-Gamma Removable (dpm/100 sq. cm.)			Beta-Gamma Total (dpm/100 sq. cm.)		
	Avg Value	Max Value	Sample Size	Avg Value	Max Value	Sample Size	Avg Value	Max Value	Sample Size
51A & Pipe Bridges	<MDCR	<MDCR	47	<MDCR	<MDCR	47	.38k	18k	47
51B	<MDCR	<MDCR	31	<MDCR	<MDCR	31	8.7k	75k	31
51C	<MDCR	<MDCR	14	<MDCR	<MDCR	14	<MDCR	<MDCR	14

MDCR – Minimal Detectable Count Rate

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Materials to be generated from components in the AWWT Complex D&D project are considered low-level radiological waste, which may be disposed in the On-Site Disposal Facility (OSDF) provided that other physical OSDF Waste Acceptance Criteria (WAC) is met.

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The most significant radiological concerns are the health and safety of the workers during dismantlement of equipment/systems and other miscellaneous materials. The presence of radiological contamination justifies at least best available technology to prevent or minimize generation of airborne dusts. The isotope of concern for the AWWT Complex D&D project is uranium-238. All activities in this complex shall be performed under radiological controls for uranium-238. All waste and debris from this area shall be treated as uranium-contaminated. Standard technology will be used to prevent or minimize generation of airborne contamination.

Specific uses of the radiological survey data summarized in Table 2-1 will support the following efforts:

- Developing the safety assessment documentation to support the proposed activities.
- Enhancing the project-specific health and safety requirements and determining potential concerns for worker protection based on the suggested D&D techniques.
- Documenting expected contamination levels for self-performing the work.
- Determining personnel monitoring requirements.
- Identifying specific systems or equipment that will require radiological engineered controls prior to dismantlement.
- Air modeling for and assessment of potential radiological air emissions.
- Identifying potential gross radiological contamination that will need to be removed/fixed prior to exposing affected material surfaces to the environment.

Due to the recent construction of the AWWT Complex, it is anticipated that there will be no friable asbestos containing materials (ACM) present. ACM floor tile may exist in the AWWT Complex. The AWWT Complex will be evaluated by a State of Ohio-Certified Asbestos Hazard Evaluation Specialist for asbestos containing materials (ACM) prior to demolition activities. Results of the evaluation will be used to determine asbestos abatement requirements for the AWWT Complex D&D activity. The results of this evaluation will be forthcoming and therefore are not available to be presented in this implementation plan. If required, sampling criteria for asbestos abatement activities will be established just prior to the AWWT Complex D&D Project activities.

2.3 Materials Management

Project-specific material management strategies for the AWWT Complex D&D project are based on the overall material management strategies that were presented in Section 3.3 of the OU3 Integrated RD/RA Work Plan and the project-specific requirements presented in Specification Section 01120. Management of primary and secondary waste materials estimated to be generated during the AWWT Complex D&D project is discussed in this section.

Waste minimization will be accomplished, in part, by ensuring that equipment and material are unpacked prior to entering the FCP controlled area whenever possible. This administrative

control will limit the amount of trash that could become contaminated and limit quantities of any hazardous material brought into the project area.

2.3.1 Primary Materials Management

Primary materials refer to the debris that will be generated by the dismantlement of the components and structures associated with the AWWT Complex. During the remedial design, a Project Waste Identification and Disposition form (PWID — see Section 3.3.1 of the OU3 Integrated RD/RA Work Plan for description) was developed which identifies all debris to be generated along with quantities, characterization, container requirements, and disposition location. In support of the PWID, each waste stream has been characterized and documented in a Material Evaluation Form (MEF) or an OSDF profile. In order to provide the sizing, segregation, and containerization requirements outlined in the OU3 Integrated RD/RA Work Plan, a Material Segregation and Containerization Criteria form (MSCC — see Section 3.3.1 and Appendix A of the work plan for description and example, respectively) was developed.

Pursuant to DOE's commitment to evaluating potential opportunities for recycle/reuse, as described in Section 3.3.6.1 of the OU3 Integrated RD/RA Work Plan, an evaluation of material disposition alternatives for accessible metals was performed and a summary of the results is presented in Appendix B.

Specification Section 01120 identifies debris/waste handling requirements. Debris handling requirements are defined by the following classifications: 1) non-process debris; 2) process debris and 3) suspect process debris. Details regarding the handling of each of these types of debris are described in Article 3.2 of Specification Section 01120. All debris is required to be sized, segregated, and containerized in accordance with MSCC. To ensure debris that is destined for disposal in the OSDF meets the OSDF waste acceptance criteria (WAC), the MSCC identifies specific materials from the project that are known to either meet or not meet the OSDF WAC. When debris is generated, a representative from the OSDF Waste Acceptance Organization will be present to ensure that debris is segregated according to the proper categories identified on the MSCC.

2.3.2 Secondary Waste Management

Management of secondary wastes includes handling, sampling, storage and disposition of secondary waste materials generated during remediation. Secondary waste includes vacuumed particulate, filters, personal protective equipment (PPE), spent consumables and washwaters.

Depending on the DOE-approved methods for equipment/systems dismantlement, it is possible that up to 25,000 gallons of decontamination washwaters may be generated during the D&D of the AWWT Complex and the Fluor Fernald self-perform equipment. Since decontamination methods include non-water wash techniques (e.g., encapsulation), the projected volume of washwater is only a liberal estimate based on previous OU3 D&D projects that used high pressure, low volume water spray. Wastewater will be managed in accordance with the

strategies laid out in the OU3 Integrated RD/RA Work Plan. The wastewater collection system will include polyethylene-lined containment structure(s) over which equipment is washed, and filtered (20- micron prefilter and 5-micron filter) to remove entrained particulate during transfer into a holding tank. Wastewater handling includes sampling and analysis of water and sludges for constituents of concern (see Section 2.4 for wastewater monitoring), discharge of approved effluent into the FCP wastewater treatment system (Converted Advanced Wastewater Treatment Facility (CAWWT)) and sludge removal. The need for washwater sampling is determined by the CAWWT Manager if significant levels of constituents of concern are present, based on an assessment of relevant OU3 Remedial Investigation and Feasibility Study (RI/FS) (DOE 1993) analytical data and process history. Section 2.4 further discusses wastewater monitoring strategies. The ultimate disposition of wastewater into the CAWWT is managed in accordance with existing site procedure EP-005 "Controlling Aqueous Wastewater Discharges into Wastewater Treatment Systems".

2.3.3 Estimates of Material Volumes

Materials to be generated during this project have been categorized using the same classification system that was developed for and described in the OU3 RI/FS and OU3 Integrated RD/RA Work Plan, and are estimated in Tables 2-2, 2-3, and 2-4.

2.3.4 Material Handling, Storage, Treatment, and Disposition

Materials generated from the D&D of the AWWT Complex will be reduced in size, segregated, and containerized in accordance with the requirements identified in the MSCC form. Quantities and disposition of specific material categories were documented in the PWID form for internal use. Tables 2-2, 2-3, and 2-4 summarize the MSCC and PWID by identifying quantities, containerization, staging/interim storage, and disposal requirements for each category of material. Debris size requirements are described in Sections 3.3.2.1 and 3.3.6.2 of the OU3 Integrated RD/RA Work Plan.

As stated in Section 3.3.2.2 of the OU3 Integrated RD/RA Work Plan, materials will be identified according to the OU3 debris categories identified in the MSCC. The MSCC for the AWWT Complex allows for commingling of OU3 debris categories A, B, D and incidental E into the same Roll-Off Boxes (ROBs) or Articulating Dump Truck (ADT) since each of these material types conform to OSDF Impacted Material Category 2. The majority of Debris Category E (concrete), however, will be placed in separate ROBs or ADTs. Commingling of OU3 debris categories A, B, D and incidental E is being done to conform to the OSDF impacted material categories in order to facilitate placement. By allowing the commingling of these types of debris into the same ROB or ADT, there will be more efficient use of a limited number of available ROBs or ADTs at the FCP. Materials will be containerized inside the project boundaries adjacent to structures being dismantled. It is currently planned that filled containers will be covered/sealed, screened for exterior radiological contamination, inspected, tagged, and transported directly to the OSDF Transfer Area. Should any materials be encountered that do not meet the OSDF waste acceptance criteria (e.g., materials with "visible

process residues") as defined in Specification Section 01120, they will be segregated from OSDF-bound materials. This debris that exceeds the OSDF Waste Acceptance Criteria will be evaluated for the appropriate offsite disposal destination.

TABLE 2-2 AWWT Complex Bulked Material Volume Estimates (yd³)

Component Number	OU3 Debris Categories								Totals
	Cat. A	Cat. B	Cat. C	Cat. D	Cat. E	Cat. F/G/H	Cat. I-2	Cat. 1-4	
51A	172	3697	0	963	1033	0	60	30	5955
51B	564	1247	0	162	0	0	20	10	2003
51C	130	955	0	63	0	0	9	0	1157
Pipe Bridges	217	31	0	60	0	0	0	0	308
Complex Total	1083	5930	0	1248	1033	0	89	40	9423
Container/Quantity	ROB or ADT 37	ROB or ADT 198	N/A	ROB or ADT 42	ROB or ADT 92	N/A	ROB 3	ROB 2	
Interim Storage	AWWT Pad	AWWT Pad	N/A	AWWT Pad	AWWT Pad	N/A	ROB	ROB	
Disposition	OSDF	OSDF	N/A	OSDF	OSDF	N/A	OSDF	OSDF	

General Notes:

OU3 Debris Categories: Cat. A – Accessible Metals; Cat. B – Inaccessible Metals; Cat. C – Process-Related Metals; Cat. D – Painted Light Gauge Metals; Cat. E – Concrete; Cat. F – Acid Brick; Cat. G – Non-Regulated ACM; Cat. H – Regulated ACM; Cat. I – Miscellaneous Materials; Cat. J – Special Handling.

ROB: Roll-Off Box holds 30 cubic yards (810 cubic feet) and/or 16.95 tons of material; ADT: Articulating Dump Truck, holds up to 18 cubic yards of material.

If necessary, Category A, B, D, and E debris may be temporarily stockpiled on the AWWT Complex Pad at project completion.

TABLE 2-3 AWWT Complex Unbulked Material Volume Estimates (yd³)

Component Number	OU3 Debris Categories								Totals
	Cat. A	Cat. B	Cat. C	Cat. D	Cat. E	Cat. F, G & H	Cat. I-2	Cat. I-4	
51A	49	1056	0	275	689	0	30	15	2114
51B	161	356	0	46	0	0	10	5	578
51C	37	273	0	18	0	0	4	0	332
Pipe Bridges	62	9	0	18	0	0	0	0	89
Complex Total	309	1694	0	357	689	0	44	20	3113

General Note:

Refer to Table 2-2 for OU3 Debris Category descriptions.

TABLE 2-4 AWWT Complex Material Weight Estimates (Tons)

Component Number	OU3 Debris Categories								Totals
	Cat. A	Cat. B	Cat. C	Cat. D	Cat. E	Cat. F, G & H	Cat. I-2	Cat. 1-4	
51A	96	1349	0	96	1550	0	12	1	3104
51B	314	455	0	16	0	0	4	1	790
51C	73	348	0	7	0	0	2	0	430
Pipe Bridges	119	12	0	6	0	0	0	0	137
Complex Total	602	2164	0	125	1550	0	18	2	4461

General Note:

Refer to Table 2-2 for OU3 Debris Category descriptions.

The current project strategy for managing debris is to deliver containerized debris directly to the OSDF Transfer Area; however, stockpiling of Category A, B, D and E debris for interim storage is a possibility due to the limited number of ROBs and ADTs or availability of area in the OSDF at the FCP. Stockpiling of debris, if utilized, will follow the strategies provided under Section 3.3.2.3 of the OU3 Integrated RD/RA Work Plan, which requires best available storage configuration for OU3 Debris Categories A, B, D and E. The strategy for stockpiling also requires removing or encapsulation of contaminants. Specification Section 01517 debris release criteria requires that gross contamination be removed or encapsulated on debris surfaces prior to their removal from a building enclosure or local containment. To the

maximum extent practicable, debris will be containerized following sizing when sufficient containers are available. Should the best available storage configuration (i.e., containers with lids or tarps) be temporarily unavailable, stockpiling of debris that meet the release criteria on pads with run-off controls would be performed. At this time, there are no plans to stockpile the AWWT Complex debris. In the event stockpiling becomes necessary, all site requirements will be met.

Material tracking is performed using the Site-Wide Waste Information, Forecasting and Tracking System/Integrated Information Management System (SWIFTS/IIMS) through the FCP waste acceptance organization. Project-specific reporting on material disposition will be provided by a SWIFTS/IIMS summary in the Project Completion Report. Section 3.3.2.2 (Segregation, Containerization, Tracking) of the OU3 Integrated RD/RA Work Plan describes material tracking and reporting using SWIFTS. OU3 Debris Categories A, B, D and E debris are classified as OSDF Category 2 material. Therefore, commingled Debris Categories A, B, D and E quantities will be tracked in SWIFTS/IIMS under a discreet Material Evaluation Form that corresponds to Impacted OSDF Category 2 debris in interim storage. Debris Category G (Transite) and Debris Category H (Regulated ACM) are regarded as OSDF Categories 3 and 5, respectively, and will also be handled separately. Since the volume of commingled debris will represent a combination of waste streams, proportions of OU3 debris categories within that total volume will be derived based on original estimates to identify and track waste volumes by OU3 debris category. These derived quantities will be documented in the Project Completion Report for the AWWT Complex. Other than tracking debris specifically for the purpose of OSDF placement, project-specific material tracking and reporting strategies for the AWWT Complex D&D project do not differ from the strategies laid out in the OU3 Integrated RD/RA Work Plan and therefore no additional details were developed during the remedial design process.

The disposition strategy for the AWWT Complex material is consistent with the requirements stated in the OU3 Final ROD and strategies presented in the OU3 Integrated RD/RA Work Plan. Table 2-2 identifies that debris generated from this project will be placed in the OSDF. No treatment will be necessary for those materials destined for on-site disposal since all chemical-based waste acceptance criteria are met based on OU3 RI/FS data.

Any material failing to Meet OSDF WAC will be size reduced as required to meet Envirocare WAC and transported to Soil Pile 7 for staging pending shipment to Envirocare.

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2.3.5 Material Recycling/Reuse

Accessible metals (Category A) from the AWWT Complex have been evaluated for potential recycling options and a detailed summary of that evaluation is available in Appendix B. Using the Decision Methodology for Fernald Material Disposition Alternatives (the "Decision Methodology"), 602 tons of potentially recyclable accessible metals (OU3 Debris Category A) from the AWWT Complex were evaluated by comparing the three leading alternatives to on-site disposal. Of the three phases of the Decision Methodology (Threshold Phase, Life Cycle

Analysis Phase, and Decision Phase), only the first phase was applied since the comparative evaluation of project costs for each alternative showed that the total costs for each of the recycling options greatly exceed the 25 percent total cost criteria compared to OSDF.

2.4 Environmental Monitoring

Environmental monitoring for the AWWT Complex D&D project will include supplemental radiological environmental air monitoring and wastewater monitoring. Groundwater monitoring is not needed to support this project but would be employed if necessary, as described in Section 3.6.2.3 of the OU3 Integrated RD/RA Work Plan.

Project-specific stormwater management is governed by the FCP Stormwater Pollution Prevention Plan (DOE 1996b) and any monitoring associated with that program is managed by OU5/Aquifer Restoration Project. Project-specific stormwater management includes the diversion of stormwater to appropriate site collection drains surrounding the project.

Surface Water (Wastewater) Monitoring

Section 2.3.2 of this Implementation Plan describes the wastewater management strategies that have been developed for the D&D of the AWWT Complex. The OU3 Integrated RD/RA Work Plan describes the overall strategies to be implemented for project monitoring of wastewater. Listed below are the specific references in the Work Plan:

- Section 3.2.5, Surface Decontamination: Wastewater collection and management strategies.
- Section 3.3.3, Management of Secondary Waste: The overall strategy for managing wastewater, as one of the primary aspects of secondary waste, through the site wastewater treatment system.
- Section 3.5.2, Management of Contaminated Water: References site procedure to be used for the evaluation and management of contaminated wastewater.
- Sampling and Analysis Plan (SAP)/Section 2, General Sampling and Data Collection Approach: Focuses on wastewater sampling, among other aspects of sampling.
- SAP/Section 3, Specific Sampling Programs: Sampling for disposition of wastes, including wastewater. Determination of hazardous, radiological, and other waste characteristics.

Potential elevated levels of contaminants of concern may be present within the AWWT Complex. Based on an estimated 25,000 gallons of potential washwater, it is anticipated that up to twelve samples will be taken to determine isotopic radiological and heavy metals concentrations prior to discharge into the CAWWT Facility. Of those twelve samples, one will be a duplicate for quality assurance/quality control purposes. The purpose of the sampling is to ensure the adequacy of treatment capacity so that National Pollutant Discharge Elimination System (NPDES) permit requirements are met.

Project-specific reporting for wastewater will be provided in the project completion report. The report will include a summary of the data generated during the project. The report will include a summary of the results from sampling and analysis prior to its discharge into the CAWWT.

Radiological Air Monitoring

Occupational monitoring will be performed using personal and workplace air samplers in the work areas to ensure worker protection and will also serve as an indication of the effectiveness of engineering controls. Any potential emissions that could affect the outside environment would be detected first by environmental and occupational monitoring. Section 8.1 of the OU3 RD/RA Health and Safety Plan (Appendix E of the OU3 Integrated RD/RA Work Plan) describes the occupational air-monitoring program.

Environmental radiological air monitoring during the D&D of the AWWT Complex will consist of the Fernald Site Environmental Monitoring Program described in the site-wide IEMP, and discussed in Sections 3.5.1 and 3.6.2.1 of the OU3 Integrated RD/RA Work Plan. FCP boundary monitors are shown in Figure 2-1.

The need for a supplemental environmental radiological air-monitoring program for this D&D project was evaluated by modeling the potential release of radiological (uranium) contaminants from the components during D&D. The result of that modeling effort reveals that uranium emissions would be negligible and therefore, supplemental radiological monitoring is not warranted.

Radiological survey data summarized in Table 2-1 were used for the air emissions modeling input. Computer modeling of potential uranium emissions from the AWWT Complex was performed using the CAP88PC method to measure potential dose impacts from the project. CAP88PC is the personal computer version of the United States Environmental Protection Agency (U.S. EPA) model CAP88 that is the approved method for predicting dose impacts to offsite personnel from emissions of radionuclides under the National Emissions Standards for Hazardous Air Pollutants (NESHAPs) regulations. It is emphasized that the CAP88PC model is being used as a tool to assess potential dose to offsite personnel from radionuclide emissions from a project in order to identify potential mitigative controls and supplemental monitoring measures; it is not being used as a means to demonstrate compliance with NESHAPs Subpart H. The method to be used for demonstrating NESHAPs Subpart H compliance is presented in the IEMP as a collective sitewide strategy.

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The CAP88PC modeling methodology is prescribed by the U.S. EPA reference manual: U.S. EPA User's Guide for CAP88, Version 1.0, 402-B-92-001. Computer modeling of potential radiological emissions from the AWWT Complex used radiological smear data to provide a more realistic measure of removable alpha, beta and gamma contamination rather than fixed contamination (identified through intrusive sampling results from the OU3 RI/FS database and direct surface contamination surveys) for estimating contaminant release. The removable contamination data obtained through smear sampling represents a model input that depicts worst-case emissions since it represents removable contamination present prior to the

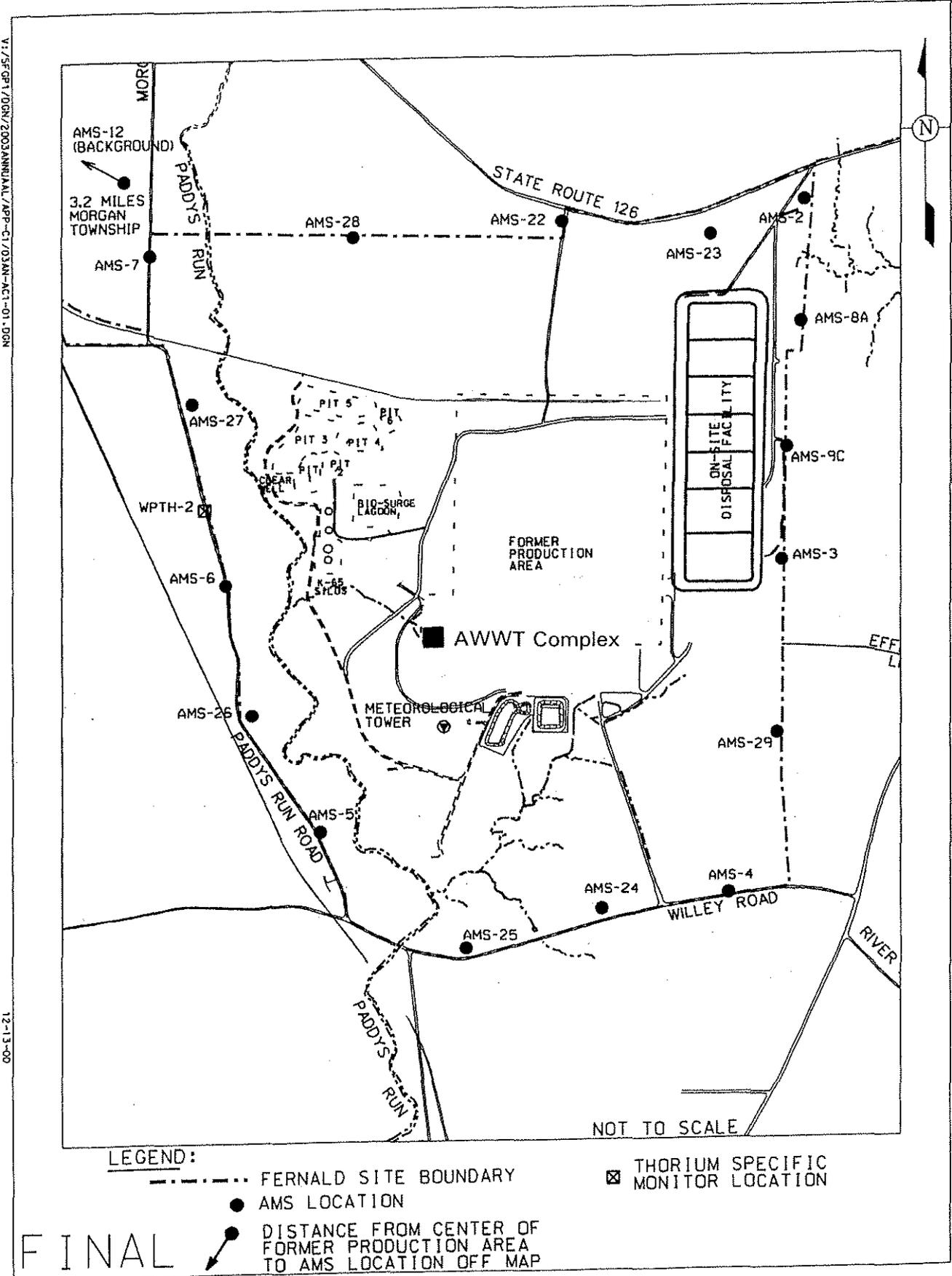
decontamination activities.

The modeling methodology assumed no controls on emissions release, such as high-efficiency particulate air (HEPA) filters on containment ventilation systems and a percentage (of removable contamination) that would become airborne during D&D activities. Potential emissions sources were treated as being in readily dispersible forms. The results of the computer modeling indicate that the maximally exposed individual would theoretically be located approximately 698 meters west-southwest of the project area and would potentially receive a maximum Total Effective Dose Equivalent of 6.0×10^{-2} mrem/year from the D&D activities which is less than the 0.1 mrem/year monitoring criteria and does not justify additional air monitoring for this project. Based on a review of the results of the computer modeling, no supplemental environmental air monitoring will be required for the AWWT Complex D&D activities.

PCN1

PCN1

Further justification for not providing project specific air monitors comes from analysis of data from the Plant 7 Dismantling – Removal Action No. 19 Final Report (DOE 1995), the Project Completion Report for Building 4A (DOE 1997b), the Plant 1 Complex – Phase I Project Completion Report (DOE 1997c) and the Thorium/Plant 9 Complex Project Completion Report (DOE 1999), which have shown that dismantlement activities resulted in negligible airborne radiological contaminant emissions. Results for airborne uranium contamination during those projects have been approximately 5 percent of the DOE maximum off-site guidelines of 0.1 pCi/m³. The relationship between pCi/m³ and mrem/year may be understood by the conversion factor used to equate the two terms at the FCP. If inhaled continuously (24 hours/day, 365 days/year), 0.1 pCi/m³ of uranium in air will result in a dose of 100 mrem/year. It should be noted that various assumptions have been incorporated into the conversion factor. Mitigative measures that might be employed in the event the set criterion are exceeded would include an increase in engineering and administrative controls during a particular task that has been identified as the cause or possible cause of elevated radiological levels. Such controls could include negative pressure within an enclosed work area using additional HEPA filtration units or additional surface cleaning (wash) steps before removing material from the containment area.



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FIGURE 2-1 Air Monitoring Locations PCN1

2.5 Remediation Activities

A general approach to the D&D of the AWWT Complex is described in the following subsections. Section 3 elaborates on this discussion by identifying component specific interests concerning the remedial tasks listed below, as applicable. The remedial tasks that apply to the AWWT Complex include the following:

- Preparatory Action: Facility Shutdown;
- Surface Decontamination; and
- Above-Grade Dismantlement.

As required by Specification 01515 (Mobilization), the Fluor Fernald self-perform project team will mobilize in preparation for the D&D activities by establishing the construction zone boundary and material handling and containerization area(s), providing portable support facilities as needed, extending water and electrical utilities from designated tie-ins, and establishing stormwater controls. Site preparation by the FCP workforce will complete the relocation of radiological control point/break trailers to the designated area prior to mobilization. If needed, the Fluor Fernald self-perform project team will supply an asbestos hygiene trailer/facility.

Equipment that is potentially contaminated due to a history of use at another FCP radiological location will be inspected by FCP Project Management and surveyed by radiological control technicians to ensure that no contamination items are brought into the AWWT Complex D&D job site. An access control point will be established at the entrance to the AWWT Complex D&D job site for posting of permits and health and safety plans. Additional radiological control boundaries will be established in various areas as necessary prior to starting remediation activities in those areas. These boundaries will be established prior to starting in order to locate contaminated material staging areas as well as access and egress points to and from contaminated areas.

The project team, with oversight by FCP management, prepares work control documents that include the requirements stipulated by the performance specifications for detailing work activities. Examples of such work control documents include details relative to where the Fluor Fernald self-perform project team will erect barriers and fences for radiological control (Specification Section 01515), controlling fugitive emissions (Specification Section 15067), stormwater run-off protection (Specification 01515), and controlling erosion (Specification Section 01515). Throughout the remediation activities, the Fluor Fernald self-perform project team will notify management of conditions in the field (e.g., chemical spills, leaking containers) that require environmental response. All conditions that necessitate a response will be dealt with immediately.

2.5.1 Preparatory Action: Facility Shutdown

The Facility Shutdown scope will be performed by the AWWT Operations personnel and may consist of the following activities (not to include the CAWWT facility):

- removal of process liquids, solids and remaining chemicals;
- removal of all salvageable equipment;
- general clean-up; and
- disconnection of all utilities.

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All steam, potable water, electrical power, fire protection alarms and systems, compressed air, and communication systems have been disconnected at the equipment or at the building exterior to establish the known condition of each energy source within the remediation area. Section 3.2.2 of the OU3 Integrated RD/RA Work Plan further discusses the scope of this preparatory action.

2.5.2 Surface Decontamination

Surface decontamination refers to the removal of loose surface contamination and/or potentially the encapsulation of remaining contaminants in order to minimize the potential for release of contaminants during handling and disposal. Specification Section 01517 addresses the removal and/or fixing of radiological contamination and generally covers the following activities:

- cleaning low-level uranium contaminated materials and/or building surfaces by contaminant removal or encapsulation to meet debris and/or structure release criteria;
- cleaning equipment and materials to remove visible residues, if practicable; and
- controlling and moving effluent produced during the removal and/or encapsulation of contamination.

To identify materials/surfaces that may require surface cleaning, radiological surveys will be reviewed. These surveys will provide Radiological Engineers with an indication of the extent of alpha removable, and beta-gamma removable, and total beta-gamma radiological contamination.

Prior to removing debris from a building enclosure or local containment, all external surfaces will be cleaned per Specification Sections 01517 and 01120. Specification Section 01517 identifies the requirements for removing/fixing of contamination, including DOE-approved methods, while Specification Section 01120 identifies the level of decontamination needed to meet material handling criteria. Among other requirements, these specifications require removal of gross removable surface contamination and sealing of all openings of equipment and debris that are potentially contaminated internally with removable contamination. For large items such as ductwork, the Fluor Fernald self-perform project team may apply a surface

PCN1

encapsulant (Childers Chill Lock or equal – used previously in FCP D&D activities) using pressure spraying equipment to the internal surfaces in lieu of sealing. Acceptable methods for removing surface contamination include, but are not limited to: low volume hydro-blasting with a minimum of 1,000 psi, steam-cleaning, sponge blasting, CO₂ blasting, etc. FCP Project Management will be notified prior to encapsulation of debris to allow for inspection for visible process residues. Acceptable methods for encapsulating contamination, which is not readily removed by the above-identified methods include, but are not limited to, encapsulating coatings, non-strippable coatings as referenced in Article 2.2 of Specification Section 01517, and reinforced polyethylene sheeting which is sealed prior to movement to prevent migration of potential contaminants.

Prior to opening the structures that require decontamination to the environment, either by removal of exterior siding or by dismantlement, the Fluor Fernald self-perform project team is required to remove and/or fix radiological contamination on all surfaces in the facility until the detected radioactivity levels are below the facility release criteria identified in the Engineering Specifications, Section 01517 (Appendix C). FCP Project Management will perform a radiological release survey to ensure the radioactivity criteria are met.

2.5.3 Above-Grade Dismantlement

All above-grade dismantlement activities to be performed during the AWWT Complex D&D project are described in Section 3.2.6 of the OU3 Integrated RD/RA Work Plan. The specification sections listed below describe various project applications of structural building/component dismantlement:

- Bulk Removal: includes removal of electrical components, piping, construction debris, and heating, ventilation and air conditioning (HVAC) systems: (Specification Section 15065);
- Equipment/System Dismantlement: Specification Section 15065;
- Structural Steel Dismantlement: Specification Section 05126; and
- Concrete/Masonry Removal: Specification Section 03315.

The project team, with oversight by FCP Project management, prepares work control documents that include the requirements stipulated by the above referenced specifications. Based on these and other supporting specifications, a general description of above-grade dismantlement tasks is described below, while building-specific above-grade dismantlement tasks are discussed in Section 3.

Bulk Removal

Prior to breaching any system, the Fluor Fernald self-perform project team and Project Management will verify that all the systems are de-energized. Air-gapping between AWWT and CAWWT will be completed prior to any equipment/system and structural dismantlement activities.

All piping, valves, electrical components, conduit, wire, cable trays, construction debris, and HVAC systems will be removed and reduced in size. During removal of HVAC ductwork, internal surfaces will be visually inspected to ensure the absence of free liquids or solid materials. If free liquids or solid materials are found, an evaluation will be initiated by the FCP Project Manager to determine the requirements for material handling and removal. The evaluation will identify the contents and requirements for containerization, storage, and disposal. If the item fails visual inspection, it will be labeled as "process debris" (designated by red paint) unless the item is decontaminated free of such residues and thereby rendering it as "non-process" debris. Specification Section 01120 (Part III) describes the decision process used to evaluate whether debris is to be labeled as "non-process", "process", or "suspect process" and the action to be taken for each.

Methods such as reciprocating saws, portable band saws, and shears are the preferred methods for bulk removal. Surface wiping or HEPA filtered vacuuming may be required for contaminated surfaces where cuts are planned in order to minimize transferable contamination. Methods that minimize volatilization and release of paint constituents and other contamination are preferred; however, alternative methods may be proposed provided that HEPA-filtered local ventilation and adequate respiratory protection are used. Continuous workplace air monitoring for radioactivity will be performed to ensure that engineering controls employed by Fluor Fernald self-perform are adequate.

Equipment/System Dismantlement

As equipment/systems are removed, the previously inaccessible surfaces will be visually inspected to ensure the absence of free liquids or debris. If these materials are found, an evaluation will be initiated by FCP Project Management to determine the appropriate removal and handling requirements for the material (Specification Section 15065).

The project team will detail in its work control documents the sequence, methods of removal and dismantlement, equipment required, catalog cut sheets, drawings and methods and materials to control generation of airborne contaminants from cutting operations, etc. Staging of removed equipment and size reduction will be performed by the Fluor Fernald self-perform project team.

Structural Steel Dismantlement

Specification Section 05126 addresses structural steel dismantlement requirements. Exterior metal panels will be left in place on the structural steel members. All remaining items, such as non-load bearing steel members, windows and frames, doors, gutters and down spouts, will be removed using mechanical means. As these items are removed, the exposed component surfaces have the potential of holding debris and contamination. These areas will be visually inspected to determine if these surfaces meet the decontamination requirements of Specification Section 01517.

For the AWWT Complex, hydraulic shears or oxy-acetylene torches will be used to dismantle and size reduce the structural steel frame. Prior to and during structural dismantlement, the

area surrounding the structure will be sprayed with water as necessary to reduce fugitive dust emissions.

Pursuant to Specification Section 05126, the project team, with oversight by FCP Project Management, prepares work control documents that specify the methods for structural steel removal that contain the following information:

- Detailed sequence of dismantlement and method of cutting, including equipment to be used;
- Methods for contaminant control, including fugitive emissions during cutting;
- Detailed plan for controlling airborne radiological emissions; and
- If structural steel is removed in sections, verify the structural adequacy of the remaining structure. Calculations and drawings to verify the structural integrity of the partially dismantled structure must bear the stamp of a Registered Professional Engineer.

Furthermore, Specification Section 05126 requires that the Fluor Fernald self-perform project team apply mechanical means of cutting to remove the structural steel to the largest extent possible while also avoiding damage to adjacent structures, components, equipment, and utilities.

Concrete Removal

Pursuant to Specification Section 03315, the project team, with oversight by FCP Project Management, prepares work control documents that specify the methods for concrete removal that contains the following information:

- Detailed method and sequence of dismantlement, including equipment to be used;
- Methods for control of contaminants, including control of fugitive emissions;
- Materials, such as non-woven geotextile fabrics and surfactants, to be used;
- Methods of cutting, including equipment to be used;
- Calculations to verify structural adequacy of partially dismantled structure, as applicable; and
- If dismantlement method requires personnel on the roof, Fluor Fernald Engineering shall provide calculations verifying the structural adequacy of the roof to support personnel and equipment. These calculations shall be stamped by a Registered Professional Engineer.

The concrete walls will be radiologically surveyed prior to removal to determine the need for engineering controls, such as an enclosure with ventilation or water sprays to minimize fugitive dust, during removal operations. When controls are necessary, best available control technologies will be applied to concrete removal operations.

Specification Section 01515 addresses requirements relative to the preparation of the base slab during demobilization. Specifically, openings in the slab will be filled with granular material or soils and grout to provide a flat uniform surface to minimize the chance for water

accumulation & migration and to mitigate potential safety hazards. Wire and cable will be cut away to grade from the conduit embedded in the concrete.

2.6 Use of New Technologies

The performance specifications provide an avenue for FCP Project Management to use new and/or innovative technologies. The use of any new and/or innovative technologies will be identified in the work control documents prepared by the project team with oversight by FCP Project Management to provide safer, quicker, and/or less expensive remediation. Information relating to any new or innovative technologies incorporated during the decontamination and demolition activities will be issued with a submittal letter to the regulatory agencies.

3.0 COMPONENT-SPECIFIC REMEDIATION

This section presents component-specific remediation tasks identified for the AWWT Complex D&D project. Structural (floor plan, elevation and section view) drawings have been compiled for the AWWT Complex and are shown in Appendix D (see Appendix D list of drawings for component identification). Photographs illustrating components throughout the AWWT Complex are provided in Appendix E (see listing of photograph numbers and accompanying drawing in Appendix E for photograph identification). Information regarding the remediation approach was obtained from the performance specifications and the OU3 Integrated RD/RA Work Plan.

3.1 Component 51A – Advanced Wastewater Treatment Facility

Background

Component 51A (Advanced Wastewater Treatment Facility) is a structural steel frame building with metal panel outside walls and sloped roof. From the exterior, the facility has the appearance of being two separate buildings set next to one another. The southern-most area of Component 51A measures 244 ft. from east to west, 64 ft. north to south and is a single story extending 40 ft. high. The northern-most area of Component 51A measures 124 ft. east to west, 166 ft. north to south and is five stories tall, extending 85 ft. high. Additionally, there is an exterior tank farm that measures 156 ft. by 194 ft. and is referred to as the "South Containment Area". The South Containment Area consists of numerous horizontal and vertical tanks along with a network of piping and pipe bridges.

Process Area Description

Component 51A housed the AWWT groundwater, stormwater and remediation wastewater treatment processes. Sodium hydroxide, aluminum sulfate and polymers were used in the treatment process. Water was treated through multimedia filters, carbon filters and ion exchange vessels. Component 51A contains pumps, tanks, pipes and other equipment for wastewater treatment.

Remedial Tasks

Three remedial tasks apply to Component 51A.

Preparatory Action: Facility Shutdown

Facility shutdown activities for Component 51A will include removal of chemicals, salvageable equipment, general clean-up and disconnection of all utilities.

Surface Decontamination

Surface decontamination will be performed to reduce potential airborne contamination resulting from the D&D activities. Surface decontamination of Component 51A does not include any particular strategies beyond those already presented in Section 2.5.2.

Above-Grade Dismantlement

Component 51A will be dismantled using a track-hoe mounted, hydraulic shear. The portion of Component 51A to remain as CAWWT will be protected during shearing operations. Material take-off estimates identify that the majority of debris from structural dismantlement will consist of equipment, piping & conduit/wire and structural and miscellaneous steel.

3.2 Component 51B – Slurry Dewatering Facility

Background

Component 51B (Slurry Dewatering Facility) is a structural steel frame building with metal panel outside walls and sloped roof. Component 51B measures 45 ft. wide by 85 ft. long and 31 ft. high. Additionally, there is an exterior tank farm located on the north side of Component 51B that measures 45 ft. by 45 ft and a drum storage area located on the west side that measures 20 ft. by 26 ft.

Process Area Description

The Component 51B operations included the dewatering of sludges generated by AWWT, the New Sewage Treatment Plant and other site operations. Sodium hydroxide, lime, ferric chloride and polymers were used in the dewatering process. Component 51B contains pumps, tanks, pipes, a plate & frame filter press and other associated equipment for the dewatering process.

Remedial Tasks

Three remedial tasks are applicable to Component 51B.

Preparatory Action: Facility Shutdown

Facility shutdown activities for Component 51B will include removal of chemicals, salvageable equipment, general clean-up and disconnection of all utilities.

Surface Decontamination

Surface decontamination will be performed to reduce potential airborne contamination resulting from the D&D activities. Surface decontamination of Component 51B does not include any particular strategies beyond those already presented in Section 2.5.2.

Above-Grade Dismantlement

Component 51B will be dismantled using a track-hoe mounted, hydraulic shear. The portion of Component 51A to remain as CAWWT will be protected during shearing operations. Material take-off estimates identify that the majority of debris from structural dismantlement will consist of equipment, piping & conduit/wire and structural and miscellaneous steel.

3.3 Component 51C – AWWT Laboratory Expansion Building

Background

Component 51C (AWWT Laboratory Expansion Building) is a structural steel frame building with metal panel outside walls and a flat roof. Component 51C measures 20 ft. wide by 30 ft. long and 17 ft. high.

Process Area Description

Component 51C housed the analytical and chemical process laboratories associated with AWWT operations.

Remedial Tasks

Three remedial tasks are applicable to Component 51C.

Preparatory Action: Facility Shutdown

Facility shutdown activities for Component 51C will include removal of chemicals, salvageable equipment, general clean-up and disconnection of all utilities.

Surface Decontamination

Surface decontamination will be performed to reduce potential airborne contamination resulting from the D&D activities. Surface decontamination of Component 51C does not include any particular strategies beyond those already presented in Section 2.5.2.

Above-Grade Dismantlement

Component 51C will be dismantled using a track-hoe mounted, hydraulic shear. Material take-off estimates identify that the majority of debris from structural dismantlement will consist of equipment, piping & conduit/wire and structural and miscellaneous steel.

3.4 Component G-008 – AWWT Pipe Bridges

Background

The pipe bridges are steel structures that supported the steam lines and other lines required for process support activities. The pipe bridges included in the AWWT Complex are the three remaining sections of bridge located on the east side of Component 51A. Two of the sections run in parallel from Component 51A to the former Component 19B area. Each of these sections cover a distance of approximately 80 ft. One of the sections runs from the northeast end of Component 51A a distance of approximately 30 ft. eastward then turns north and extends for a distance of approximately 80 ft.

Remedial Tasks

Three remedial tasks are applicable to Component G-008.

Preparatory Action: Facility Shutdown

Facility shutdown activities for Component G-008 will include disconnection of all utilities.

Surface Decontamination

Surface decontamination will be performed to reduce potential airborne contamination resulting from the D&D activities. Surface decontamination of Component G-008 does not include any particular strategies beyond those already presented in Section 2.5.2.

Above-Grade Dismantlement

Component G-008 will be dismantled using a track-hoe mounted, hydraulic shear. Material take-off estimates identify that the majority of debris from structural dismantlement will consist of piping & conduit/wire and bridge steel.

4.0 SCHEDULE

This section presents the planning and implementation schedule for the AWWT Complex D&D project. Figure 4-1 presents the schedule for implementation of field activities beginning with the Project Start and ending with the submittal of the Project Completion Report. The primary milestones of the project include the following: 1) Project Start; 2) Completion of Field Activities; and 3) submittal of the Project Completion Report to the U.S.EPA and Ohio Environmental Protection Agency. The content for the Project Completion Report is outlined in Section 4.5 of the OU3 Integrated RD/RA Work Plan.

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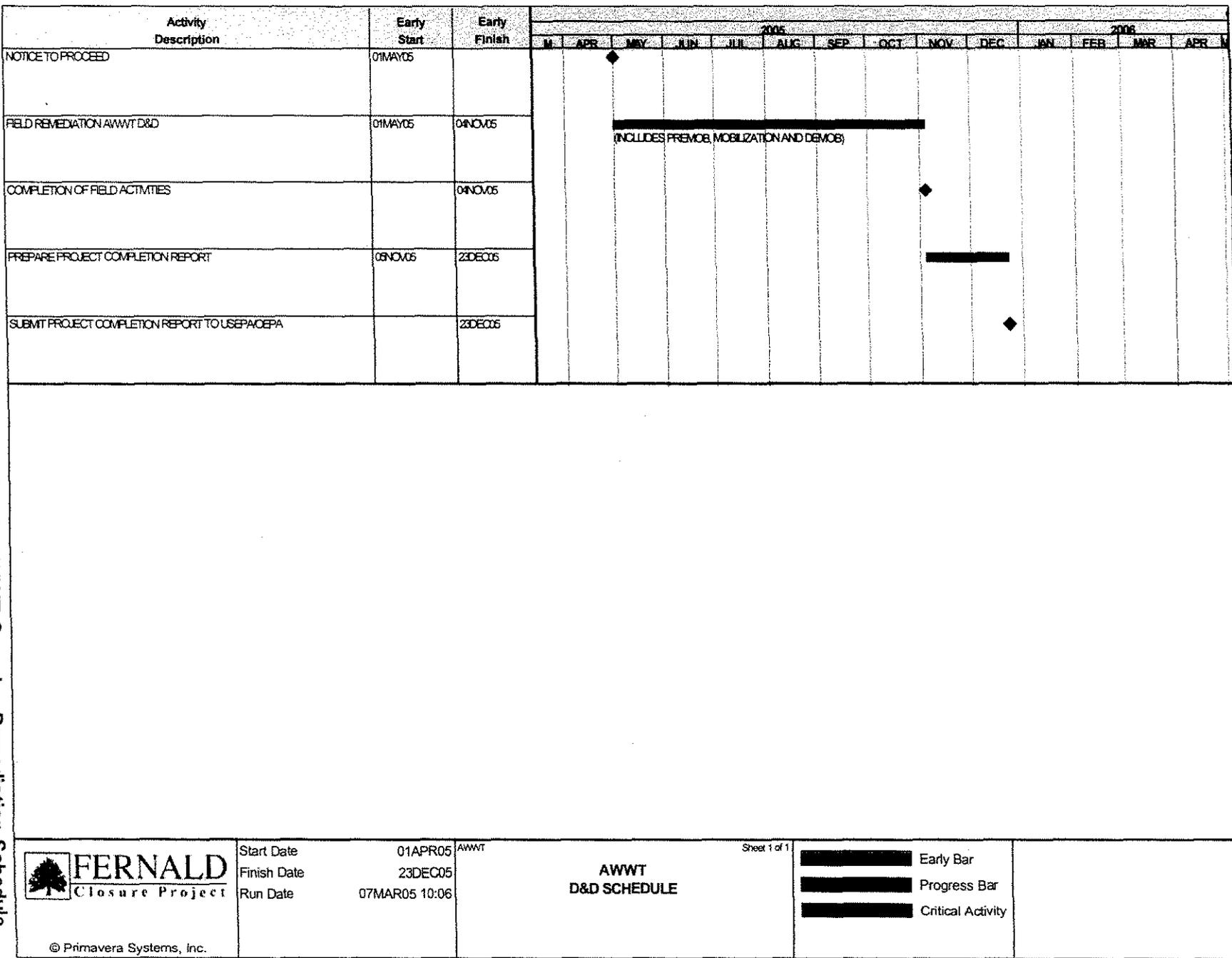


FIGURE 4-1 AAWT Complex Remediation Schedule

5.0 MANAGEMENT

The implementation of the Advanced Wastewater Treatment Complex D&D project will be performed through a coordinated effort by the Fluor Fernald self-perform project team, Fluor Fernald Project Management, support organizations and DOE Project Management. Section 7 of the OU3 Integrated RD/RA Work Plan provides the overall management structure applied to this remediation project. A description of project-specific management responsibilities has been highlighted for the Advanced Wastewater Treatment Complex in this section.

DOE will provide direct project oversight in two ways, both of which become a concerted effort to ensure that remedial activities are performed according to project specifications and requirements. The DOE Office of Operations Assurance has assigned a Facility Representative from the Fernald Field Office whose responsibilities will be to perform independent field oversight of all remedial activities performed under this project. This individual will be responsible for weekly coverage of all field activities and necessary reporting to the DOE-FCP Site Manager. The Facilities Representative will have the authority to stop work if conditions warrant such action. DOE-FCP will also conduct field oversight in the areas of construction, engineering, quality assurance, and health and safety. The DOE Facilities Representative and others will immediately notify the DOE Project Manager of any issues or problems that arise in an effort to seek prompt resolution.

The DOE Project Manager and the environmental management contractor, Fluor Fernald, will oversee the remedial action through its project team review and approval process and by performing the following functions:

- ensuring that the Fluor Fernald self-perform project team is provided with the proper direction and support necessary to meet the remedial action objectives for this project;
- detailing all work conditions and scope requirements;
- conducting a kick-off meeting where all project personnel will be instructed on the work control documents, pre-construction meetings, daily pre-work scope and safety briefings, and weekly project team meetings to address all concerns, schedule status, planning, progress, and deviations;
- performing quality assurance and quality audits of all remediation tasks to determine adherence to project specifications;
- verifying work is performed in compliance with approved health and safety plans and work control documents; and
- performing pre-final and final inspections.

The Fluor Fernald self-perform project team will perform D&D of the buildings & components, material sizing, segregation, and loading into containers and/or stockpiling. FCP Waste Generator Services personnel will perform transport of containers to and from the project area.

REFERENCES

U.S. Department of Energy, 1993, *Operable Unit 3 Remedial Investigation and Feasibility Study Work Plan Addendum*, Final, prepared by Fluor Environmental Restoration Management Corporation, Cincinnati, Ohio

U.S. Department of Energy, 1995, *Plant 7 Dismantling – Removal Action No. 19*, Final Report, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

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U.S. Department of Energy, 1997b, *Building 4A Project Completion Report*, Rev. 1, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

U.S. Department of Energy, 1997c, *Plant 1 Complex – Phase I Project Completion Report*, Rev. 1, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

U.S. Department of Energy, 1999, *Thorium/Plant 9 Complex Project Completion Report*, Rev. 0, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

APPENDIX A

PROPOSED SAMPLING

Several types of sampling were identified early in the design process to support both the design itself and to support logistical planning for field remediation. The scope and requirements for potential D&D sampling were outlined in the Sampling and Analysis Plan, included as Appendix D to the OU3 Integrated RD/RA Work Plan. A project-specific summary of the sampling types are included below.

Characterization Screening

Just prior to D&D activities, radiological surveying will be conducted for fixed and removable radioactive contamination using both Geiger-Mueller radiological contamination meters and scintillation counters (to monitor alpha) as well as low background counting systems. Radiological surveying will continue to be used throughout D&D activities to verify that radiological facility release criteria (i.e., release from containment) are met on equipment and materials being removed from the project containment.

Asbestos

Due to the recent construction, it is anticipated that there will be no friable asbestos containing materials (ACM) present in the AWWT Complex D&D Project. ACM floor tile may exist in the AWWT Complex. Prior to demolition activities, the AWWT Complex D&D Project will be evaluated for asbestos containing materials (ACM) by a State of Ohio-Certified Asbestos Hazard Evaluation Specialist. Results of the evaluation will be used to determine asbestos abatement requirements for the AWWT Complex D&D Project activity. The results of this evaluation will be forthcoming and therefore are not available to be presented in this implementation plan. If required, sampling criteria for asbestos abatement activities will be established prior to the AWWT Complex D&D Project asbestos activities.

Upon evaluation of the AWWT Complex D&D Project for the presence of ACM, if the evaluation reveals that ACM is present, this plan will be revised to discuss the location and volume of ACM that will require abatement and the associated impact, if any, on the decontamination and dismantlement schedule.

Secondary Waste (Decontamination Water)

Based on worst-case wash-down calculations, up to 25,000 gallons of decontamination washwater could be generated during equipment cleaning. Samples will be used to determine pre-treatment requirements prior to discharge into the AWWT. Based on this worst-case washwater volume estimate, twelve samples would be needed to characterize washwater for isotopic radionuclides & heavy metals, up to twelve samples would be needed to evaluate enrichment (i.e., levels of uranium).

A project-specific sampling plan for the decontamination washwater will be developed after decontamination washwater is generated but prior to actual sampling. An example of a typical wastewater sampling plan is attached to Appendix D of the OU3 Integrated RD/RA Work Plan.

Nevada Test Site (NTS) Confirmatory

At this time, it is anticipated that NTS will not be a disposal facility for any AWWT Complex debris. No sampling of any material/waste stream will be performed.

Asbestos Air Monitoring

If friable and non-friable ACM is discovered, asbestos air sampling will be necessary for ACM removal prior to dismantlement under controlled abatement methods per Specification Section 01516 and 07415. If required, occupational air sampling for asbestos will be performed as required by OSHA standards.

Radiological Air Monitoring

Data from the IEMP site-wide routine environmental air monitoring program will be used to complement the occupational air monitoring program. Per the Fluor Fernald Radiological Control Requirements Manual, occupational air (i.e., breathing zone) samplers will be worn as necessary by workers to evaluate the potential for intake when performing airborne radioactivity generating activities in a contamination area, high contamination area or an airborne radioactivity area.

Fluor Fernald reviews work control documents to ensure that they include the appropriate engineering and administrative controls to mitigate the spread of radiological contamination and limit airborne radioactivity concentrations to levels at or below those specified in the IFB/RFP. Fluor Fernald performs an occupational ALARA review or evaluation (as appropriate) for each component undergoing D&D.

APPENDIX B

EVALUATION OF MATERIAL DISPOSITION ALTERNATIVES FOR THE AWWT COMPLEX

Per the OU3 Record of Decision for Final Remedial Action, the selected disposition route for the majority of OU3 radiologically contaminated material, including accessible metals, is placement in the On-Site Disposal Facility (OSDF). However, in support of DOE's commitment to evaluate recycling on a case-by-case basis during each above-grade D&D project design (per Section 3.3.6.1 of the OU3 Integrated Remedial Design/Remedial Action Work Plan under the subheading of Unrestrictive Release Recycling/Reuse), an evaluation of disposition alternatives was performed for potentially recyclable/reusable materials estimated to be generated from the AWWT Complex D&D Project. Using the Decision Methodology for Fernald Material Disposition Alternatives (the "Decision Methodology"), which was finalized in July 1997 following extensive stakeholder involvement and subsequent reevaluation of unit costs using 1998 recycling data from the Recycling Supplemental Environmental Project, 602 tons of potentially recyclable accessible metals (OU3 Debris Category A) from the AWWT Complex D&D Project was evaluated by comparing the three leading alternatives to on-site disposal.

The Decision Methodology consists of three phases: 1) Threshold Phase; 2) Life Cycle Analysis Phase; and 3) Decision Phase. The first phase, the Threshold Phase, includes a comparative evaluation of project costs for each alternative. The cost estimates which were established under the Plant 4 Case Study (presented during July 8, 1997 public meeting; cost data dated from September 27, 1996) were utilized for the 602 tons of structural steel from the AWWT Complex D&D Project. Since total cost estimates for each recycling alternative are current, and other factors such as vendor and market information have not significantly changed since the Plant 4 evaluation was performed, unit rates for each of the recycling alternatives shown in the Plant 4 Case Study are considered valid for the OU4 Complex alternative disposition alternative evaluation. The total cost comparison of the disposition alternatives is shown in Table B-1.

TABLE B-1 Total Cost Comparison for Disposition Alternatives

Disposition Alternative	Cost Per Pound	Total Cost	Percent Above Lowest Cost
On-Site Disposal Facility	\$ 0.04	\$48,160	--
Vendor Material Release Facility	\$ 0.41	\$493,640	1,025%
"Recycle 2000"	\$ 1.20	\$1,444,800	3,000 %
Privatized FEMP Material Release Facility	\$ 0.56	\$674,240	1,400%

The comparison of total costs between disposal in the OSDF and the three recycling alternatives indicates that each of the recycling alternatives greatly exceeds the 25 percent total cost criteria established for the Threshold Phase. As a result, only the lowest cost alternative (i.e., on-site disposal) meets the minimum criterion defined for the Threshold Phase. Therefore, as identified in the Decision Methodology, no further consideration of these decision alternatives is warranted and the disposition decision the estimated, 602 tons of accessible metals is disposal in the OSDF. Should vendor or market conditions change significantly prior to OSDF disposal of the structural steel, whereby the total costs of any of the recycling alternatives approach the cost threshold for further evaluation, then an re-evaluation of the disposition alternatives would be considered.

APPENDIX C

PERFORMANCE SPECIFICATIONS

The project specification included in this appendix represent a modified version of the original set of performance specifications contained in the May 1997 final version of the OU3 Integrated RD/RA Work Plan. These project-specific specifications incorporate lessons-learned from previous D&D projects at the FCP and identify new and innovative technologies and methods that are applicable to the AWWT Complex D&D project.

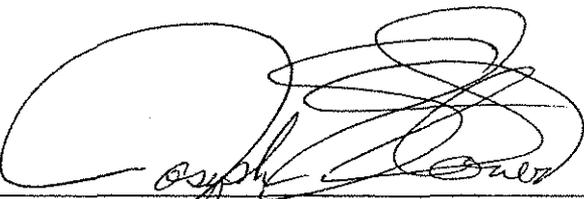
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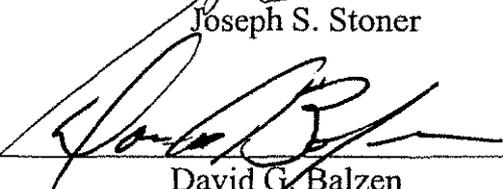
FLUOR FERNALD

DEMOLITION CLOSURE PROJECT

SPECIFICATIONS

PROJECT: 01789
SPEC 01789-TS-0001
FLUOR FERNALD ENGINEERING SUPPORT
REVISION 10

PREPARED BY:  9/22/03
Joseph S. Stoner Date

APPROVED BY:  9/22/03
David G. Balzen Date

U. S. DEPARTMENT OF ENERGY
FERNALD CLOSURE PROJECT

Fluor Fernald, Inc.
P.O. Box 538704
Cincinnati, Ohio 45253-8704

Title: Demolition Closure Project	Specification No: 01789-TS-0001		
	Date: 9/22/03	Table of Contents	Rev 10

ISSUE AND REVISION SUMMARY

<u>Revision</u>	<u>Date</u>	<u>Description of Issue or Revision</u>
0	09/04/01	Issued CFC Verbiage formats and conflicts with the IFB corrected. Initiated by Joyce Leslie. HEPA Vacuum and /Air Filtration Device specifications updated. Initiated by Joe Stoner.
1	12/10/01	Implemented comment resolutions made on HEPA Vacuum/Air Filtration Device specifications. Initiated by Joe Stoner. Update of Technical References, codes and standards. Initiated by Joyce Leslie and Joe Stoner.
2	1/28/02	Added changes per DCN 1789-001. Initiated by Jerry Fry and Joe Stoner.
3	04/11/02	Added exception to Section 01120 per DCN 1789-002. Initiated by Jerry Fry and Joe Stoner.
4	04/25/02	Added condition to 3.2.D.2 of Section 01515 per DCN 1789-003. Initiated by Jerry Fry and Joe Stoner.
5	6/27/02	Added condition to 3.1.B.3.c of Section 01517 per DCN 1789-005. Initiated by Jerry Fry and Joyce Leslie.
6	7/27/02	Added condition to 3.2.B.1 of Section 01515 per DCN 1789-007. Initiated by Jerry Fry and Joyce Leslie.
7	8/21/02	Revised words in 3.2.B.1 of Section 01515 per DCN 1789-008. Initiated by Jerry Fry and Joyce Leslie.
8	2/19/03	Changed "Note" to "Note 1" and added Note 2 to 3.3.A.4 of Section 01120 per DCN 1789-009. Initiated by Jerry Fry and Joe Stoner.
9	03/17/03	Added "Note 3" to Paragraph 3.3.A.4 of Section 01120 per DCN 1789-010.. Initiated by Jerry Fry and Joe Stoner.
10	9/22/03	Deleted "in one piece" from Paragraph 3.3.A.1a of Section 05126 per DCN 1789-011

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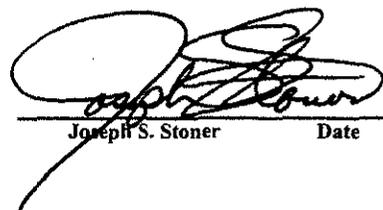
<u>Revision</u>	<u>Section</u>	<u>Description of Issue or Revision</u>
1	01010	General Requirements
4	01120	Debris/Waste Handling Criteria
4	01515	Mobilization, Demobilization and General Site Requirements
1	01516	Asbestos Abatement
2	01517	Removing/Fixing Radiological Contamination
1	01519	Decontamination of Contractor Provided Tools, Equipment and Material
1	03315	Concrete/Masonry Removal
1	03920	Concrete Surface Removal
1	05125	New Structural Steel/Metals
3	05126	Structural Steel Dismantlement
2	07415	Transite Removal
0	11010	HEPA Vacuum Cleaner Requirements
1	15065	Equipment/System Dismantlement
1	15067	Ventilation and Containment
0	15860	HEPA Air Filtration Device Requirements

END OF SECTION

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	Date: 12/10/01	Section 01010	Rev 1

Approved:



 Joseph S. Stoner Date 12/10/01

SECTION 01010

GENERAL REQUIREMENTS

PART I GENERAL

1.1 SUMMARY

- A. The intent of these Specifications is to establish technical requirements necessary to support the above-grade decontamination and dismantlement (D&D) of the structures and components at the Fernald Environmental Management Project (FEMP).
- B. In all cases where the terms "Vendor", "Seller", "Manufacturer", or similar terms appear in these Specifications, they shall be understood to refer to an individual or firm(s) providing materials, equipment or services, as noted, under a contract to Fluor Fernald, Inc.
- C. In all cases where the term "Contractor" appears in these Specifications, it shall be understood to refer to the Contractor and their subtier contractors who are performing the D&D services at the FEMP.
- D. General: The Technical Specifications are of the abbreviated, simplified, or streamlined type and include incomplete sentences. Omissions of words or phrases such as "the contractor shall," "in conformity therewith," "shall be," "as noted on the drawings," "according to the plans," "a," "the," and "all" are intentional. Omitted words or phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the drawings.

For convenience of reference and to facilitate the letting of contracts, the Specifications may be separated into titled Divisions. The following defines the separations referred to in the Specifications:

- 1. Section: Separate numbered section of a Specification (e.g., Section 16020)
- 2. Article: Separate numbered article of a Subsection (e.g., Article 2.1)
- F. Definitions: Certain terms and words as used throughout the Specifications shall be defined as follows, unless otherwise particularly specified:
 - 1. "Provide": Furnish and install, complete, in place.
 - 2. "Indicated": As shown on the drawings and/or specified.
 - 3. "Directed," Shall be as directed, authorized, or permitted by Fluor Fernald.
 - "Authorized,"
 - "Permitted":

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4. "Selected": Shall be as selected by the Contractor or Fluor Fernald.
5. "Satisfactory,"
"Acceptable": Satisfactory or acceptable to Fluor Fernald.
6. "Necessary,"
"Required,"
"Suitable": As necessary, required, or suitable for the intended purpose as determined by Fluor Fernald.
7. "Submit": Submit to Fluor Fernald unless otherwise specified.
8. "Above-grade": Refers to first, second, third, etc., stories of a facility, and accessible materials/equipment in basements, sumps, pits, and trenches of a facility.
9. At- and Below-grade: Slab, and/or basement, foundation, loading docks, etc.
10. In all cases where the words "or equal" appear in these specifications, they shall be understood to mean "or approved as equal by Fluor Fernald."
11. Where the Sections refer to Parts 6, 7, 8 or 9, the reference will be the Information for Bid/Request for Proposal (IFB/RFP) or the Contract, whichever is applicable.

1.2 REFERENCES, CODES, AND STANDARDS All work shall be accomplished in accordance with the code requirements listed below. References to specific codes, regulations, standards, or other criteria documents in these Sections are indicated as the latest edition or revision of each document, as of the date when these Sections were prepared. Invoking all or any part of these standards is to be accomplished in accordance with normal industry practices. Standards listed in these Sections can be used in their entirety or applicable Sections depending on their application to the services being rendered by the Contractor.

A. Building Officials Code Administrators (BOCA)

1. Ohio Basic Building Code (OBBC) 1998

B. National Fire Protections Assosiation

1. NFPA 101 Life Safety Code 2000 Edition
2. Other applicable National Fire Protection Association (NFPA) Codes in the National Fire Code Library

C. Code of Federal Regulations (CFR)

1. 10 CFR 835 - Energy - Occupational Radiation Protection
2. 29 CFR 1910 - Department of Labor, Occupational Safety and Health Standards
3. 29 CFR 1926 - Department of Labor, Safety and Health Regulations for Construction
4. 10 CFR 830.120 Quality Assurance Program (as applicable)

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D. The United States Department of Energy (DOE)

1. DOE G 440.1 - 1 - Worker Protection Management for DOE Federal and Contractor Employees Guide
2. DOE N 441.1 - Radiological Protection for DOE Activities
3. DOE Order 5400.5 CHG2- Radiation Protection of the Public and the Environment

1.3 SUBMITTALS

A. An Installation, Operation, and Maintenance (IOM) Manual shall be prepared that provides optimum operation and maintenance of any equipment and systems required.

B. The cover of the IOM Manual shall include the following information:

1. Project Title - _____,
2. Contractor,
3. Construction Manager - Fluor Fernald, and
4. Subtier Contractor (name, if any).

C. The IOM Manuals shall be bound into one or more volumes for ease of handling and shall have an index. The manual shall include descriptive literature, drawings, performance curves and rating data, test reports, and spare parts lists. The maintenance section shall divide maintenance procedures into two categories, "Preventive Maintenance" and "Corrective Maintenance," and a subsection for "Safety Precaution." Preventive maintenance shall include cleaning and adjustment instructions. Corrective maintenance shall include instructions and data arranged in the normal sequence of corrective maintenance (i.e., troubleshooting, logical effect to cause, etc.), repair and replacement of parts, then the parts list. Safety Precautions shall comprise a list of safety precautions and instructions to be followed before, during, and after making repairs, adjustments, or routine maintenance.

1.4 QUALITY REQUIREMENTS

A. The Contractor shall provide written procedures for Fluor Fernald's review and approval of all tests to be performed as identified in the specifications and in other sections of the contract. These procedures shall provide the detailed step-by-step operations with sign-off columns and date columns and shall be submitted and approved prior to testing.

B. The Contractor shall not deviate from construction acceptance tests as reviewed and approved by Fluor Fernald.

C. All test instruments shall be calibrated within 12 months prior to use on this contract or at intervals as recommended by the vendor, by a calibration laboratory whose calibration equipment and instruments are fully traceable to National Institute of Standards and Technology (NIST) standards. The Contractor shall provide individual certification of calibration and NIST standards traceability for all test instruments used on this contract.

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1.5 ABBREVIATIONS FOR REFERENCED STANDARDS AND SPECIFICATIONS

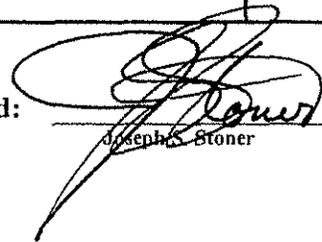
The following list denotes abbreviations used in the technical portions of these Sections:

<u>Abbreviation</u>	<u>Authority or Title</u>
AASHTO	American Association of State Highway Transportation Officials
AGA	American Gas Association
AGC	Associated General Contractors of America
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
CFR	Code for Federal Regulations
ERDA	Energy Research and Development Administration
IFB	Invitation for Bid
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
RFP	Request for Proposal
UL	Underwriters Laboratories, Inc.

END OF SECTION

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	Date: 03/17/2003	Section 01120	Rev 4

Approved:


 Joseph S. Stoner
 Date: 3/17/03

SECTION 01120

DEBRIS/WASTE HANDLING CRITERIA

PART I GENERAL

1.1 SUMMARY

This Section provides the requirements for handling, containerization and stockpiling of debris/waste generated during the dismantlement of FEMP processing and support facilities. Debris/waste shall be segregated into established categories and containerized as directed in this Section. This includes, but is not limited to, the following:

- A. Classification of materials by segregation category,
- B. Segregation of materials,
- C. Containerization/loading,
- D. Movement of containers within the construction zone,
- E. Tagging containers,
- F. Debris stockpiling, and
- G. Collection and containerization of controlled area office trash from Contractor-owned office trailers.

1.2 RELATED SECTIONS

- A. Section 01515 - Mobilization, Demobilization, and General Site Requirements
- B. Section 01516 - Asbestos Abatement
- C. Section 01517 - Removing/Fixing Radiological Contamination
- D. Section 01519 - Decontamination of Contractor Provided Tools, Equipment, and Material
- E. Section 03315 - Concrete/Masonry Removal
- F. Section 05126 - Structural Steel Dismantlement
- G. Section 07415 - Transite Removal
- H. Section 15065 - Equipment/System Dismantlement
- I. Section 15067 - Ventilation and Containment

1.3 REFERENCE MATERIALS

See Parts 6 and 7 for the following:

- A. Index of Drawings,
- B. Contractor Safe Work Plan Format Requirements, and
- C. The Material Segregation and Containerization Criteria (MSCC) form identifies anticipated waste streams to be generated and their respective waste categories. In addition, the MSCC identifies containers (where applicable) for the waste streams, size criteria, and special waste handling criteria. Debris is defined as dismantled piping, equipment, systems, components, asbestos-containing materials (ACM), etc., which is contained within the project boundaries.

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1.4 REFERENCES, CODES AND STANDARDS

All work shall be accomplished in accordance with the following code and standards:

- A. United States Department of Energy
 - 1. DOE Order 460.1A Packaging and Transportation Safety
- B. Code of Federal Regulations (CFR)
 - 1. 10 CFR 835 Energy - Occupational Radiation Protection.

1.5 SUBMITTALS

The Contractor shall submit the following for approval by Fluor Fernald:

- A. Debris/Waste Handling Safe Work Plan

Prior to mobilization, the Contractor shall submit a detailed debris/waste handling Safe Work Plan for approval by Fluor Fernald, in accordance with the Contractor Safe Work Plan Format Requirements contained in Part 7 - ACR-002. The Safe Work Plan shall include the Contractor's:

- 1. Method of cutting to meet debris size requirements (if different from methods used for dismantlement),
- 2. Proposed equipment for loading and handling containers,
- 3. Method to verify that the weight capacity of each container is not exceeded,
- 4. Method for loading containers,
- 5. Method for segregating waste categories,
- 6. Method for moving debris in and around project area (debris flow),
- 7. Proposed container staging areas, as required by this Section, and
- 8. Material inspection area.

- B. Monthly Container Report

A report shall be submitted identifying the current waste container stock listing of drums and all metal boxes delivered to and staged at the project site. This report shall be by inventory number; shall be issued on a monthly basis; and shall describe the usage and/or contents of the waste containers under control by the Contractor.

1.6 PROJECT CONDITIONS

- A. Generation of additional debris/waste shall be minimized. Waste minimization shall include, but not be limited to, unpacking equipment and material prior to entering the Controlled Area. The Contractor shall not bring any hazardous material to the construction zone unless prior approval is received from Fluor Fernald. Alternatives to hazardous materials shall be used whenever possible.
- B. The Contractor shall notify Fluor Fernald immediately when hazardous or mixed wastes are found or, whenever possible, before they are generated. Further management of these wastes shall be coordinated with Fluor Fernald.

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- C. All waste and debris designated for placement in the OSDF from thorium-contaminated areas shall be free of visible material. The Contractor shall high-pressure rinse and lock down these items. The *exterior* surfaces of roll-off boxes used to transport these items to the OSDF shall be decontaminated as necessary and released from thorium controls prior to their pick-up for movement to the OSDF.
- D. Requests for containers shall be made to Fluor Fernald in writing at least 4 calendar days in advance of need.

PART II PRODUCTS

2.1 EQUIPMENT

- A. The Contractor shall supply all equipment required for:
 - 1. Sizing debris and moving containers within the construction zones [except End Loading Container Sea Land Boxes International Standards Organization (ISO) containers], and
 - 2. Loading containers.
- B. Fluor Fernald will move Roll-off Boxes (ROBs) and ISO containers.

2.2 MATERIALS - FURNISHED BY OWNER (FLUOR FERNALD)

- A. Fluor Fernald will provide appropriate containers for debris/waste categories as identified on the MSCC* (except liquid storage tanks, as noted in Section 01517) and as otherwise specified. These containers include, but are not limited to, the following:

Container Designation	Nominal Exterior Dimensions (H x W x L)	Maximum Gross Weight (lbs.)
Large metal boxes (LMB) (top load)	8' x 8' x 20'	42,000
ISO containers (top load)	8' x 8' x 20'	42,000
ISO containers (end load)	8' x 8' x 20'	42,000
Small metal boxes	Various	8,000
55-gallon drums with lid	---	882
Roll-off boxes (ROB)	6' x 8' x 22'	42,000

- B. Fluor Fernald will deliver empty ("prepped", if required) containers, pallets (possibly radiologically contaminated), dunnage, and miscellaneous materials, as required, to the container staging (also referred to as "queuing") area.

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* NOTE: The MSCC can be found in Part 6, Exhibit E

2.3 MATERIALS - FURNISHED BY CONTRACTOR

- A. The Contractor shall supply fiber-reinforced polyethylene or polyester sheeting approved for outdoor storage: color, yellow; minimum thickness of 6-mils; ultraviolet resistant; as manufactured by Griffolyn, Herculite or equal.
- B. The Contractor shall furnish 8" x 11" weatherproof removable tags.
- C. The Contractor shall furnish 3.5'- 4' high woven metal fencing consisting of 14 gauge 2 inch x 4 inch galvanized welded mesh with 7 foot painted steel "T" posts embedded to a depth of 2 feet and placed at 10 foot intervals.

PART III EXECUTION

3.1 PREPARATION

A. Roll-Off Box Staging Area:

The Contractor shall establish and maintain a ROB staging area(s), as needed, which shall be proposed by the Contractor unless otherwise specified by Fluor Fernald on reference site drawings. To define and control access to this area, woven metal fencing will be erected around the perimeter of the staging area. One section of the fence will be open for access and egress. The fencing must be maintained in good condition. This area shall be used for temporary staging of empty and full ROB containers. If the staging area is a non-concrete surface, the Contractor shall be responsible for stabilizing and maintaining the areas and routes of access to accommodate container handling requirements.

B. Other Container Staging Areas:

The Contractor shall prepare other container staging areas as needed. Areas will either be used to store empty drums and metal boxes (includes ISO Containers), or will be used for full drums and metal boxes which shall be proposed by the Contractor (unless otherwise specified by Fluor Fernald on reference site drawings). Woven metal fencing will be erected around the perimeter of each staging area. One section of the fence for each area will be open for access and egress. The fencing must be maintained in good condition.

C. Material Inspection Area:

The Contractor shall establish a material inspection area for each contamination area, for access of Fluor Fernald personnel to inspect debris and/or perform radiological surveying. Each material inspection area shall be proposed by the Contractor and approved by Fluor Fernald. The inspection area shall be arranged such that routine access will be prevented by means of fencing and/or barrier tape, with appropriate posting to identify that the items contained are being held for visual inspection or radiological survey. The inspection area will be off-limits to individuals other than Fluor Fernald/Contractor waste technicians and radiological survey personnel.

3.2 APPLICATION

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A. Debris handling requirements are defined by the following Fluor Fernald classifications: 1) non-process debris and 2) process debris. All debris shall be sized, segregated, rinsed with high-pressure water, and containerized in accordance with the MSCC.

1. Non-Process Debris:

Non-process debris will be exempt from the inspection requirement for *visible process residues* as described in Article 3.2.A.3 of this Section. Non-process debris would include, but are not limited to, piping for utility systems (i.e., steam, condensate, drinking water, air, and others), electrical systems (i.e., conduit, motors, electrical panels, and others), and obvious non-process items such as structural steel (Debris Category A), concrete (Debris Category E), transite (Debris Category G), and most miscellaneous materials categorized as Debris Category I.

2. Process Debris:

Process debris is defined as debris that fails the inspection for *visible process residues* per Article 3.2.A.3, and debris listed in the MSCC as Debris Category C.

3. Visible Process Residue Inspection Requirements:

The definition of *visible process residues*, (green salt, yellow cake, black oxide, etc.) including films and precipitates, is "hold-up/materials on the interior or exterior surfaces of debris that is obvious". Dirt, oil, grease, stains, rust, corrosion, and flaking do NOT qualify as visible process residues; however, dirt, oil, grease, stains, rust, corrosion, and flaking require decontamination for radiological control purposes prior to removing the debris from the enclosure or prior to opening a building to the environment, per Technical Specification Section 01517. Regardless of whether or not visible process residues are present, all debris are still considered to be radiologically contaminated unless otherwise specifically identified.

Fluor Fernald visual inspection will take place following dismantlement, sizing, and surface decontamination in accordance with Section 01517 Article 3.1, and relocation to the Fluor Fernald-approved Material Inspection Area referenced in Article 3.1.C of this Section.

a. Debris That Fails Inspection for Visible Process Residues:

Debris that fails the inspection criteria for visible process residues will be identified with yellow paint by Fluor Fernald, and the Contractor shall attempt to remove the visible process residues at least one time in accordance with Section 01517 prior to Fluor Fernald re-inspection. If the debris fails the second inspection for visible process residues, it shall be deemed as "Process Debris" (Debris Category C) and will be identified with red paint by Fluor Fernald.

b. Debris That Passes Inspection for Visible Process Residues:

Debris that passes the Fluor Fernald inspection for visible process residues shall be rinsed with high-pressure water, and containerized or staged according to Article 3.3 of this Section.

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- B. The Contractor shall be responsible for retrieving empty containers from the container staging areas (except for ISO containers), segregating debris/waste, loading, securing containers, tagging for on-site movement, and scheduling the movement of containers back to the designated container staging area. The Contractor shall use the MSCC as the basis of all containerizing activities, and shall be responsible for minimizing debris/waste generation by limiting the amount of material brought on site.

- C. Equipment, material or debris requiring movement outside the enclosed building to be sized, containerized or palletized, must meet the requirements for removal/fixing of radiological contamination per Section 01517. If the removal/fixing requirements cannot be met, the material may be encapsulated or wrapped in fiber-reinforced sheeting and sealed prior to movement to prevent the migration of radioactive contamination as follows:
 - 1. Place fiber-reinforced sheeting over pallet, position material on pallet, and wrap the sheeting over material,
 - 2. Secure fiber-reinforced sheeting over material to prevent migration of contamination, and
 - 3. Secure material to pallet with vinyl or metal banding material as needed.

3.3 PERFORMANCE

- A. For containerization, the Contractor shall:
 - 1. Ensure that Fluor Fernald personnel are present during the loading and securing of containers identified in the MSCC, and provide notice to Fluor Fernald within 24 hours prior to containerization.
 - 2. Provide a debris/waste-handling supervisor to supervise operations.
 - 3. Segregate and containerize all debris/waste according to the categories defined in the MSCC. Should a debris/waste stream be discovered that is not on the MSCC, work on the handling of this debris/waste shall stop, and Fluor Fernald shall be contacted for further direction.
 - 4. Commingle Debris Categories A, B, D (except for lead), and incidentally generated E in the designated container or stockpile, as directed by the MSCC. Debris Category I shall be segregated and containerized according to two subcategories: I2 - Non-compressible and/or Non-organic Misc. Debris, and I4 - Compressible and/or Organic Misc. Debris.

NOTE 1: An exception shall be taken for the Administration Complex D&D activity that allows commingling Debris Categories A, B, D (except for lead), E and I (during the OSDF's seasonal operating period) in the designated container and disposed of as directed by the MSCC.

NOTE 2: An exception shall be taken for the Lab Complex D&D activity that allows for commingling Debris Categories A, B, D (except for lead), E and I. Lab Complex D&D commingled debris will be staged at the Lab footprint and loaded out in roll-off boxes or dump trucks for direct placement into the OSDF based on availability of the OSDF to accept it. Whenever capacity for placement of non-Thorium above grade debris becomes available, priority will be given to the staged Lab commingled debris over any other debris located at the OMTA for OSDF placement.

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NOTE 3: An exception shall be taken for Buildings 45A and 80 (Multi-complex) D&D activity that allows for commingling Debris Categories A, B, D (except for lead), E and I. Buildings 45A and 80 D&D commingled debris will be staged at the footprint of their respective locations and loaded out in roll-off boxes or dump trucks for direct placement into the OSDF based on availability of the OSDF to accept it. Whenever capacity for placement of non-Thorium above grade debris becomes available, priority will be given to the staged Buildings 45A and 80 commingled debris over any other debris located at the OMTA for OSDF placement.

5. Upon receipt of containers, the Contractor shall perform a visual inspection to ensure that the containers do not contain any of the prohibited items identified in Section 01120.3.3.A.8 Fluor Fernald will remove any free liquids upon removal from the work zone, as necessary.
6. Fill containers, boxes, and drums such that the interior volume is as efficiently and compactly loaded as practical up to the maximum gross weight limit of the container. Fill void space in large piping, equipment, containers, etc., with smaller debris. Any container exceeding maximum allowable gross weight shall have contents removed, as required, to lower the weight to an acceptable range. Contents shall be prepared for containerization in order to minimize load shifting or damage to container during movement.
7. Ensure that empty metal boxes and drums must remain in the established empty container staging area, except during loading activities.
8. Ensure that the following "Prohibited Materials List" is displayed in the containerization area or on each container. Notify Fluor Fernald if any of the prohibited materials are identified for specific material handling directions.

PROHIBITED MATERIALS LIST

- a. Gas cylinders that are able to be pressurized
- b. Explosives
- c. Materials containing free liquids. The intent of the exclusion of free liquids is to prevent contaminated liquid waste (e.g., a drum of solvent) from being directly disposed of in the On-Site Disposal Facility (OSDF). Materials that contain rainwater or that have inherent moisture content (e.g., sludge) are not excluded.
- d. Fine particulates (respirable fines)
- e. Hazardous waste (Characteristic or Listed)
- f. Corrosive materials
- g. Etiologic agents
- h. Flammable liquids or combustible solids
- i. Whole or shredded scrap tires
- j. Material from any off -site source, including any other DOE site
- k. Product, residues, and other special materials (Category J materials)
- l. Process-related metals (Category C)
- m. Intact containers (i.e., containers must be empty and crushed)
- n. Acid brick (Category F material)
- o. Transformers, which have not either been crushed or had their void spaces filled with grout
- p. HEPA filters

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- q. Used oils
- r. Materials not accompanied by a manifest
- s. Solvent saturated soils
- t. Material not meeting physical WAC

9. Install weatherproof removable tags on each debris/waste container prior to loading. Tags shall identify container contents, using indelible ink, by debris/waste category specified in the MSCC and the debris/waste's building of origin. For Category J Debris, an exact description of the contents is required.

10. Containerize Thorium contaminated debris/waste separately from non-Thorium contaminated debris/waste.

B. Security and Movement of Containers:

To ensure security and movement of containers, the Contractor shall:

1. Schedule the movement of containers to the specific task location from the container staging area.
2. Ensure that the lid, doors, or tarps on debris/waste containers are secured when no containerization is in progress to prevent unauthorized containerization of materials or release of container contents. Containers must be weather protected when lid is not secured, to prevent entry of snow and rain or release of container contents.
3. Inspect all containers, double bagged materials, drums, boxes, or double wrapped components for exterior contamination and damage before removing them from the work area. Damaged containers shall be reported to Fluor Fernald. Any container damage beyond normal wear and tear that is Contractor-caused shall be the Contractor's responsibility to repair or to provide compensation for such repairs.
4. Secure full containers.
 - a. End-loading ISO containers shall be secured by closing and latching doors, ensuring that all latching mechanisms are engaged.
 - b. Drums shall be secured as follows:
 1. Place lid on drum, ensuring that gasket is seated to maintain a tight seal,
 2. Install bolt-type lock ring on lid and torque to 45 ± 5 foot-pounds, and
 3. Drums shall be securely strapped together on pallets, using at least one strap.
 - c. Top-Loading Metal boxes (large and small) shall be secured as follows:
 1. Inspect gasket for damage and repair, if required, and
 2. Place gasket and lid on the box and secure with clamping device or pins.
 - d. Roll-Off Boxes (ROBs) shall be secured as follows:
 1. Cover ROB with tarp or steel lid,

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2. Secure tarp (with straps) or steel lid (with clamping device or pins),
 3. Secure all gate chains, and
 4. Ensure that containers have not been damaged during loading.
- e. Prior to securing lid or doors on containers holding asbestos-containing materials (ACM), fold fiber-reinforced sheeting over ACM and seal with tape.
 - f. Return full, secured containers to the staging area (except for ISOs, which will be removed by Fluor Fernald).
 - g. Filled ROBs must remain inside the established staging area until they can be removed by Fluor Fernald.
 - h. Filled drums and metal boxes must remain inside the established full container staging area until they can be removed by Fluor Fernald.
 - i. The Contractor shall decontaminate waste containers, equipment, tools, etc., prior to exiting the construction zone or staging area as necessary in accordance with Section 01519.

C. Stockpiling of Materials:

1. The Contractor shall establish/construct and manage debris stockpile area(s) on concrete or asphalt surfaces with run-off controls (as required by Section 01515), and fencing. The Contractor shall ensure that run-off controls are constructed and used in accordance with Section 01515. Stockpiled materials shall be sized and segregated in accordance with the MSCC. A five foot buffer area shall be maintained between the footprint of the stockpile(s) and the perimeter of the pad(s) and the stockpile area fencing. The Contractor shall inspect the stockpile area(s) and report any deficiencies to Fluor Fernald. Inspections shall be documented in the Contractor's Daily Work Activities Report and shall include at least the following:
 - a. Daily and after storm events with heavy rains and/or strong winds to ensure that piles remain in a safe and controlled configuration,
 - b. Covers of catch basins to ensure that they remain unclogged and free of obstructions,
 - c. Diking to ensure that controls are in good condition, permitting easy flow of runoff, and
 - d. Perimeter fencing, gates, and other materials required for maintaining project control of the stockpile area(s).
2. Fluor Fernald will perform routine radiological contamination surveys and airborne radioactivity monitoring, as deemed to be appropriate. If deemed necessary by Fluor Fernald, the Contractor shall take measures to mitigate the spread of contamination to areas outside of the staging area and to maintain airborne radiological levels within allowable limits. These measures may include area decontamination, application of fixatives, or other measures proposed by the Contractor and accepted by Fluor Fernald.
3. Floor Load Capacity:

If the Contractor chooses to stage any debris on a floor other than a slab-on-grade, a

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structural engineering analysis shall be required. It shall be the Contractor's responsibility to perform the analysis to verify the loading capacity of said floor and submit the analysis to Fluor Fernald, signed and stamped by a Professional Engineer (PE) registered in the State of Ohio, to ensure that the load capacity is not exceeded.

D. Collection and Containerization of Controlled Area Office Trash from Contractor-Owned Office Trailers

Office trash from Contractor-owned office trailers shall be collected and managed in accordance with the following requirements:

1. Collect office trash from Contractor-owned office areas for participation in the controlled area Office Trash Program.
2. Prohibited items, items that are suspected to be contaminated, or items not normally discarded into office area trash containers shall be segregated from typical office trash. Prohibited items include, but are not limited to: tools, equipment, mop heads, hose clamps, floor sweepings, aerosol cans, high density material, protective clothing (Anti-C's, gloves, booties, coveralls), yellow maslin, yellow tape/RadCon tape, yellow herculite, yellow shoe covers, radiological smears, radiological safety signs, plastic sample bottles, and instrument survey cords.
3. If any prohibited or suspect materials are found (with the exception of tools and equipment), they shall be disposed of as contaminated material in accordance with the MSCC.
4. If tools or equipment are found in office area trash containers, contact the Fluor Fernald Construction Manager for radiological evaluation and the procedure for decontamination or disposition.
5. Package office trash in green tinted translucent plastic bags provided by Fluor Fernald. Green tinted translucent plastic bags are mutually exclusive to the Controlled Area Office Trash Disposal Program.
6. Seal each clear trash bag and green trash bag with tape (not yellow in color) and indicate the building or area where the trash was generated directly on each trash bag with a paint stick or permanent marker.
7. Place office trash in a designated area agreed upon by Fluor Fernald and the Contractor. Fluor Fernald will collect office trash daily, unless stated otherwise by the Demolition Closure Project Contract.

3.4 QUALITY ASSURANCE

The Contractor and Fluor Fernald shall inspect filled containers upon their return to the container staging area to verify that no damage has occurred during the filling of the container.

END OF SECTION

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Approved:  8/21/02
Fred Jebens Date

SECTION 01515

**MOBILIZATION, DEMOBILIZATION AND
GENERAL SITE REQUIREMENTS**

PART I GENERAL

1.1 SUMMARY

This Section consists of the work related to Contractor mobilization, demobilization, and general site requirements. The principal items included in this Section are:

- A. Site access,
- B. Slab Repair,
- C. Construction utilities,
- D. Signs and barriers,
- E. Potential use of existing overhead bridge cranes,
- F. Gravel pads for access and queuing areas,
- G. Protecting adjacent facilities and components,
- H. Stormwater control,
- I. Debris chutes,
- J. Remediation equipment, and
- K. Ventilation and containment.

1.2 RELATED SECTIONS

- A. Section 01120 - Debris/Waste Handling Criteria
- B. Section 01519 - Decontamination of Contractor Provided Tools, Equipment and Materials
- C. Section 03315 - Concrete/Masonry Removal
- D. Section 05126 - Structural Steel Dismantlement
- E. Section 07415 - Transite Removal
- F. Section 15065 - Equipment/System Dismantlement
- G. Section 15067 - Ventilation and Containment

1.3 REFERENCE MATERIALS

Fluor Fernald will provide access to existing site drawings at the Fluor Fernald office located at:

175 Tri-County Parkway
Cincinnati, OH 45246-3222

Drawings will be provided on an information only basis.

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1.4 REFERENCES, CODES AND STANDARDS

The entire work under this Section shall be in compliance with the provisions of the following:

A. American Society of Testing and Materials (ASTM):

1. ASTM A36/A36M Rev A Standard Specification for Carbon Structural Steel
2. ASTM C109/C109M Standard Test Method for Compressive Strength of Hydraulic Cement Mortars ((Using 2 - in. or (50 - mm) Cube Specimens))
3. ASTM C136 2000 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
4. ASTM A475 1998 Standard Specification for Zinc-Coated Steel Wire Strand
4. ASTM D698 Rev A Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort ((12,400 ft-lbs/ft. (600kN-m³))
5. ASTM C827 2001 Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures
6. ASTM C1042 Standard Test Method for Bond Strength of Latex Systems Used with Concrete by Slant Shear

B. National Fire Protection Association (NFPA):

1. NFPA 70 National Electrical Code, 1996 Edition
2. NFPA 101 ® Life Safety Code ® 2000 Edition, NFPA 101A Guide on Alternative Approaches to Life Safety 2001 Edition, and NFPA 101B Code for Means of Egress for Buildings and Structures 1999 Edition

C. American National Standards Institute (ANSI):

1. ANSI/IEEE C2 2000 National Electrical Safety Code
2. ANSI C135.1 1979 Galvanized Steel Bolts and Nuts for Overhead Line Construction
3. ANSI 05.1 1992 Wood Poles Specifications and Dimensions

D. American Wood-Preservers Association (AWPA):

1. AWPA C4 1999 Poles - Preservative Treatment by Pressure Processes

E. National Electrical Manufacturers Association (NEMA):

1. NEMA LA 1 1992 (R1999) Surge Arresters
2. NEMA WC 70 1999/ICEA S-95-658-1999 Nonshielded Power Cables Rated 2000 Volts or less for the Distribution of Electrical Energy
3. NEMA WC 71 1999/ICEA S 96-659-1999 Standard for Nonshielded Cables Rated 2001-5000 Volts for use in the Distribution of Electrical Energy
4. NEMA WC 72 1999 Continuity of Coating Testing for Electrical Conductors

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F. Underwriters Laboratories (UL):

1. UL 96 2000 Lightning Protection Components 4th Edition
2. UL Electrical Directories, Construction Materials, Latest Edition

G. United States Department of Agriculture:

1. Soil Conservation Service: Water Management and Sediment Control in Urbanizing Areas.

H. Code of Federal Regulations (CFR):

1. 29 CFR 1926 Occupational Safety and Health Administration, Dept. of Labor, Safety and Health Regulations for Construction
2. 29 CFR 1910 Occupational Safety and Health Administration, Dept. of Labor, Occupational Safety and Health Standards

I. American Water Works Association (AWWA):

1. C510 1997 Double Check Valve Backflow Prevention Assembly
2. C511 1997 Reduced-Pressure Principle Backflow Prevention Assembly

J. BOCA:

1. 4104:26:105 Backflow Ohio State Plumbing Code

1.5 SUBMITTALS

The Contractor shall submit a Mobilization Safe Work Plan for approval by Fluor Fernald that shall include the following:

A. Drawings and Data:

1. Detail and layout drawings showing locations of any barriers and/or fencing the Contractor will use for construction zones, radiological control boundaries, container staging areas, debris stockpiling areas, and barriers to be used for protection of adjacent structures.
2. Detail and layout drawings showing temporary structures, access and roadways required during mobilization of major equipment components (e.g., cranes, field offices, tool and equipment storage, chutes within the stated limits of the construction zone). This shall include personnel and flow patterns into and within the construction zone.
3. Drawings showing layout, details and applicable equipment, or plans the Contractor will employ to control fugitive emissions, storm water runoff, erosion, and migration of liquids.
4. Detail and layout drawings showing lay down areas, building vestibule sizes and locations, cutting areas and, as required by Section 01120, container staging areas, material inspection area, and debris stockpiling area(s).

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5. Shop drawings for all debris chutes to be used.
 - a. Provide manufacturer's data or calculations to verify that the chute, its support system and the existing structure (if the debris chute is attached) can withstand all dynamic impact loads they will be subjected to during dismantlement operations.
 - b. Debris chute drawings and calculations submitted must bear the stamp of a Professional Engineer registered in the State of Ohio.

- B. Temporary utilities (such as water, steam, electric power) from the point source location to end use locations, as identified on the reference site drawing.

- C. Portable heating systems.

- D. Verification that the patching grout compressive and bond strengths are in accordance with ASTM C109/C109M and ASTM C1042, respectively.

- E. Results of the Engineering Survey per 29 CFR 1926.850: (If any building or if part of a building to be dismantled is identified in the Contractor's engineering survey as being structurally deficient, the Contractor shall include in the Safe Work Plan proposed methods to shore the structure so that safety of the workers is maintained).

- F. Written statement that the Contractor accepts that all electric, gas, water, steam, sewer, and/or other service lines to the structures have been disconnected and/or capped.

PART II PRODUCTS

2.1 MATERIALS

- A. Patching Grout: Non-shrink type, premixed compound consisting of non-metallic aggregate; cement; water reducing and plasticizing agent; capable of developing minimum compressive strength of 5,000 psi in 28 days; capable of developing a bond strength of 1,200 psi in 28 days; conforming to ASTM C 109/C109M and ASTM C827.
 1. Acceptable products and suppliers:
 - a. Masterflow 713, by Masters Builders
 - b. SikaGrout 212, by Sika Corp
 - c. Sealtight 588, by W. R. Meadows
 - d. Approved equal

 2. The "approved equal" products shall be approved by Fluor Fernald prior to use at the FEMP.

- B. Construction Zone fencing shall meet the requirements for permanent fencing in Article 2.1.C., Gates, shall be plastic yellow chain fixed to stanchions. Stanchions shall be located on grade.

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- C. Permanent Fencing: Permanent fencing shall be a distance of 10 feet outside of the areas to be protected and shall consist of 14 gauge 2"x4" galvanized welded wire mesh 48" high with 7 foot high painted steel "T" posts embedded to a depth of 2 feet and placed at 10 foot intervals.
- D. If filling of slab openings is required per Article 3.2.B of this Section, clean granular fill is used to fill large openings in the base slab, including pits, large sumps, etc. The Contractor will supply this material. Use of fine aggregate shall be natural river sand, bank sand or sand manufactured from stone or air-cooled blast furnace slag; washed; free of silt, clay, loam, friable or soluble materials, and organic matter; within the following limits:

Sieve Size	Percent Passing
No. 4	100
No. 50	10 - 40
No. 200	0 - 5

E. Gravel Pads for Access and Container Staging Areas

The aggregate shall be 6 - 8 inches of crushed limestone or gravel and compacted to form a 12 inch base.

F. Wood Utility Poles:

1. ANSI 05.1; treated southern pine poles.
2. Select poles for straightness, minimum sweeps and short crooks. Fluor Fernald shall be notified of any sweeps or crooks prior to installation for determination of acceptance.
3. Preservative: ANSI 05.1 and AWPA C4, Pentachlorophenol.
4. Apply preservative to AWPA C4 with minimum net retention of 12 lbs/ft³ (285 kg/m³). Obtain complete sapwood penetration.

G. Pole Hardware:

1. Miscellaneous Pole Hardware: Hot-dipped galvanized after fabrication
2. Bolts and Nuts: ANSI C135.1
3. Butt Plate: Copper
4. Guy Strand: High strength, seven strand steel cable galvanized to ASTM A475, Class A or B
5. Guy Termination: Preformed dead-end grip clamp type
6. Guy Guards: 8 foot (2 m) long plastic, colored yellow
7. Ground Wire: Soft drawn copper conductors, 6 AWG minimum size
8. Air Terminal: UL 96; 18 inch copper air terminal
9. Guy Adapter: Twin or Triple Eye

H. Line Conductors:

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Secondary Conductors: Aluminum or copper, triplex (three) cable with 600 volt cross-linked polyethylene insulation for phase conductors. Use bare messenger for grounding conductor.

I. Arresters:

1. Surge Arresters: NEMA LA 1; valve type, arranged for pole mounting, and rated 3 kv.
2. Mechanical Connectors: Bronze
3. Wire: Stranded copper
4. Grounding Conductor: Size to meet NFPA 70 requirements

J. Pole Anchors: Helical screw anchor type sized for load; galvanized steel; ASTM A36/36M

K. Backflow Prevention for Temporary Water Conditions (Reduced Pressure Type):

1. The backflow preventor shall meet Ohio State Plumbing Code 4101:26:105 Backflow and the American Water Works Association (AWWA) Standard (AWWA C510 and C511) for Backflow Prevention Devices.
2. Acceptable products and suppliers:
 - a. WATTS 909 Backflow Preventor (Fluor Fernald recommended product)
 - b. Approved equal

L. Portable Heating Systems: All portable heaters shall be Underwriters Laboratories (UL) listed or American Gas Association (AGA) certified for their intended use, and are not modified for other applications.

M. Materials Supplied by Owner:

Fluor Fernald shall supply signs, barriers, yellow snow fencing, and tape indicating radiological control zones for Contractor installation.

N. Materials Supplied by Contractor:

The Contractor shall supply all materials (other than those listed in M. above) required for mobilization, demobilization, and other site requirements identified herein.

2.2 EQUIPMENT

The Contractor shall supply all equipment necessary for mobilization, demobilization, and other site requirements.

2.3 UTILITIES

Fluor Fernald will provide electrical power and water according to Part 6, Section 7.

PART III EXECUTION

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3.1 EXAMINATION

The Contractor shall perform an Engineering Survey in accordance with the requirements of OSHA 29 CFR 1926.850 and obtain approval from Fluor Fernald prior to mobilization.

3.2 PREPARATION

A. Site Access:

1. Vehicle, equipment and pedestrian access/egress shall be directed through the designated radiological control points.
2. Provide for emergency vehicles to enter the construction zone at all times.

B. Slab Repair:

1. Except for areas noted, on the Work Area Site Layout Drawing (which is found in the Contractor's Mobilization/Demobilization Work Plan), permanent fencing is required to prevent access to particular subsurface voids (e.g., basements, pits, and trenches). The Contractor shall fill large openings (e.g., pits, sumps, etc.) with granular fill material to within 2 inches of grade. Contaminated fill from the site should be used in lieu of clean material, if available. Contaminated granular material or crushed concrete are both acceptable. If concrete rubble is used and the top layer needs to be graded smooth, it is acceptable to top the rubble with clean gravel. Alternatively, the Contractor may propose to use engineered covers that are capable of supporting anticipated loads during D&D. Fluor Fernald shall approve alternatives.
2. Portions of the building slab, which are not identified on the Work Area Site Layout Drawing (which is found in the Contractor's Mobilization/Demobilization Work Plan) as areas to be protected with permanent fencing are potential locations for interim storage, stockpiling of contaminated debris, or for staging of contaminated equipment. In those areas, the slab openings (i.e., conduit, piping, drain openings, etc.) shall be filled and covered with patching grout. Additional requirements for potential stockpiling areas include the following:
 - a. Drain water and remove loose debris from large openings in the base slab including pits, sumps, trenches, etc., prior to filling.
 - b. All grease, oil, dirt and other deleterious materials shall be completely removed from slab openings and handled in accordance with Section 01120.
 - c. Follow the manufacturer's recommendations for the application of patching grout.
 - d. Fill in damaged areas of base slab and small openings including drains, chases, small sumps, etc., with a patching grout to create a surface level with surrounding slab. Maximum allowable depression not requiring repair is 1 inch in depth.
 - e. Concrete reinforcements, such as rebar, shall be cut flush with the slab.

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C. Construction Utilities:

1. Prior to mobilization, the Contractor shall conduct a physical survey to verify that all utilities are capped and/or controlled to the Contractor's satisfaction.
2. The Contractor shall determine if the capacities that can be provided by Fluor Fernald are adequate for their needs; if not, the Contractor shall notify Fluor Fernald in writing of needs for evaluation.
3. All electrical appurtenances required for temporary power shall be in accordance with the National Electric Code.
4. Temporary heating or cooling, if needed, shall be provided by the Contractor. Ventilation for fuel-fired heaters and adequate clearance to combustible materials, surfaces, and furnishings shall be provided according to manufacturer's recommendations. Use of LPG gas-fired heaters shall be approved by Fluor Fernald. All portable continuous running of gas fired heating systems require 24 hour coverage by the Contractor.
5. The Contractor shall extend construction water from the point source location to support operations or provide portable facilities. Tie-in to water point source shall require a backflow preventor in accordance with the Ohio State Plumbing Code, as referenced in Article 1.4. Installation, maintenance, and inspection of the backflow preventor shall be by a licensed plumber. The licensed plumber shall be certified in the State of Ohio as a Backflow Preventor Tester.

The individual who provides only the hook-up of a backflow preventor need not be a certified and licensed plumber provided that the hook-up is inspected by a certified and licensed plumber prior to system operation.

- a. The Contractor shall supply, install, and maintain all backflow prevention devices (in accordance with Article 2.1 of this Section), fittings, and valves for point source connections.
 1. The contractor shall provide Fluor Fernald with the backflow prevention device at least two weeks prior to installation for inspection.
 2. Fluor Fernald will test and approve the backflow preventor for contractor installation.
- b. Every 12 months after installation, Fluor Fernald will inspect the assemblies. The Contractor shall coordinate water hook-up with Fluor Fernald. Fluor Fernald will activate hydrants.
- c. At project completion, the Contractor shall turn all backflow prevention devices, fittings, and valves over to Fluor Fernald in good working order at no additional costs.
- d. Backflow devices shall have freeze protection and be accessible for inspection.

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D. Signs and Barriers:

1. The Contractor shall protect manholes, catch basins, valve pits, underground utilities, post indicator valves, power poles and drains, adjacent structures, groundwater monitoring wells, existing exterior benchmarks, and survey monuments from damage. If any are displaced or lost, the Contractor shall replace or repair at no additional cost to Fluor Fernald.
2. The Contractor shall post construction safety signs at 50 feet intervals around the defined construction area, unless otherwise approved by the Fluor Fernald Project Team or Health and Safety personnel. Fencing must be supported by posts driven into the ground. The Contractor shall regularly inspect all fences and barriers for integrity in a prompt manner throughout the D&D project and repair as necessary.
3. The fencing described in 2.1.B., 2.1.C, and 3.2.D.2 may serve as both a construction work zone boundary fence and the radiological control fence in outdoor areas. However, the Contractor shall install additional radiological control fencing as required to delineate areas discussed below. The preferred fencing is as per 2.1.C; however, yellow snow fence may be used.
 - a. The yellow fencing shall be used to designate the following boundaries:
 - 1). Contamination Area/Controlled Area;
 - 2). High Contamination Area/Contamination Area;
 - 3). Adjacent Contamination Areas controlled for different radionuclides; and/or
 - 4). Any other boundaries between different levels of radiological control.
 - b. Existing physical barriers, such as permanent fences or building walls, may serve as part of the radiological boundary where appropriate.
4. Fencing for short-term work, i.e., work within the project construction zone boundary, may be supported with portable stanchions placed at no more than six feet apart. Entry points shall be established such that they may be easily opened and can be held closed. These points shall be large enough to support traffic and/or movement of waste containers. For situations where personnel access is the only need, the Contractor may utilize building doors or overlapping yellow fence that can be tied back and supported by the remaining fence while open (i.e., will not lie on the ground).
5. Permanent Fencing: Upon completion of D&D activities, the Contractor shall install permanent fencing around specific areas as identified on the Work Area Site Layout Drawing (which is found in the Contractor's Mobilization/Demobilization Work Plan). Article 2.1.C of this Section defines the material and placement specifications. An access gate, using the same fence material, shall be installed at one location along the perimeter fencing, this allows subsequent access by Fluor Fernald. The gate shall have a latch that can be locked.

E. Potential Use of Existing Overhead Bridge Cranes:

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Use of Existing Overhead Bridge Cranes shall be in accordance with the requirements specified in Part 8, Section B.6.0 of the IFB. Existing Overhead Bridge Cranes or other existing hoisting devices shall not be allowed without prior approval from the Fluor Fernald Construction Manager.

F. Gravel Pads for Access and Queuing Areas:

Grading of site shall prevent ponding of water. Use a minimum slope of 1 percent. All grading will direct water toward the site's storm drainage system.

G. Stormwater Control:

Storm water control will be required for activities that could disturb soils or otherwise allow for release of contaminants from stockpiled debris. Storm drainage systems within the construction zone shall be maintained free and clear of debris and sediments by use of control devices, such as staked silt fences, and be maintained throughout the project. Hay/straw bales are not acceptable control devices.

H. Debris Chutes:

1. The Contractor shall ensure that catch platforms, chutes and other means of handling debris are properly isolated by gates or barriers designed and constructed to eliminate impact hazards and to control the flow of material to its final destination.
2. Debris chutes shall meet the requirements of 29 CFR 1926.852.
3. Debris chutes shall be fully enclosed, dust-tight and ventilated.
4. Fluor Fernald may prohibit the use of a debris chute if the radiological contamination levels could result in the uncontrolled generation of airborne radioactivity.

I. Remediation Equipment:

1. Identify any special requirements for storing material or equipment.
2. To minimize the generation of waste products by the Contractor, all equipment requiring periodic oil and filter changes shall have this maintenance performed just prior to arrival on site.
3. Additional requirements for mobilization and demobilization of remediation equipment are listed in Part 8, Section B.12.

J. Ventilation and Containment:

1. If release cleaning for structures is required, as specified in the Radiological Requirements Plan contained in Part 8, Section C 2.0, a vestibule on the entry/exit of the building access prior to the beginning of work shall be installed. The vestibule shall be constructed so as to prevent the escape of airborne contamination. Material used for the construction of vestibules shall be in compliance with Section 15067.

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2. Enclose structure and ensure that all holes, gaps, openings in exterior building structure walls and roofs are sealed with duct tape, fiber-reinforced sheeting, plywood or foam material (including where doors or windows are missing) in accordance with Section 15067. Enclosed structures shall allow for emergency exits.

3.3 DEMOBILIZATION AND FINAL PROJECT SITE ACCEPTANCE

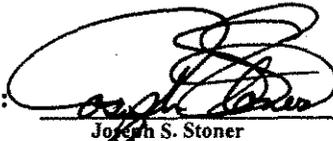
- A. Demobilization includes the decontamination and removal of all contractor tools, equipment, facilities, materials, and construction zone perimeter fencing.
- B. Final project site acceptance shall be conducted by Fluor Fernald, and will consist of verification of completion of all work activities relating to the work scope.

END OF SECTION

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Approved:



Joseph S. Stoner
Date 12/10/01

SECTION 01516

ASBESTOS ABATEMENT

PART I GENERAL

1.1 SUMMARY

This Section specifies the requirements for an asbestos abatement program; methods to be used for removal, movement, and disposition of friable asbestos-containing material (ACM); and other materials contaminated with asbestos. This Section does not cover transite unless panels exhibit significantly deteriorated surfaces where surfaces become friable.

1.2 RELATED SECTIONS

- A. Section 01120 - Debris/Waste Handling Criteria
- B. Section 01517 - Removing/Fixing Radiological Contamination
- C. Section 07415 - Transite Removal
- D. Section 11010 - HEPA Vacuum Cleaner Requirement
- E. Section 15067 - Ventilation and Containment
- F. Section 15860 - HEPA Air Filtration Device Requirement

1.3 REFERENCE MATERIALS

- A. See Part 7 for the following:
 - 1. Index of Drawings
 - 2. Contractor Safe Work Plan Format Requirements
- B. ACM summary information on the project is provided in Part 6, Exhibit F; however, the contractor is responsible for estimating quantities for bid/proposal and regulatory purposes.

1.4 REFERENCES, CODE AND STANDARDS

- A. Code of Federal Regulations (CFR):
 - 1. 29 CFR 1926 Occupational Safety and Health Administration, Dept. of Labor, Safety and Health Regulations for Construction
 - 2. 29 CFR 1910 Occupational Safety and Health Administration, Dept. of Labor, Occupational Safety and Health Standards
 - 3. 40 CFR 61 Protection of Environment, National Emissions Standards for Hazardous Air Pollutants (NESHAPS)

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B. Ohio Department of Health:

1. Asbestos Hazards Abatement Rules, Ohio Administrative Code, Chapter 3701 - 34

C. Ohio Environmental Protection Agency:

Air Pollution Regulations, Ohio Administrative Code, Chapter 3745-20 Asbestos Waste

E. United States Environmental Protection Agency (U.S. EPA) 40 CFR 61, Subpart M, (NESHAPS)

1.5 SUBMITTALS

The Contractor shall submit to Fluor Fernald the following for approval:

- A. An Asbestos Abatement Safe Work Plan, prepared by an Ohio Certified Asbestos Abatement Project Designer, in accordance with Part 7, ACR-002, Contractor Safe Work Plan Format Requirements, and Part 8, Section B.3.3 - Asbestos Abatement Safe Work Plan Requirements and Safety and Health and Training Requirements. Included are the procedures proposed for use in complying with the requirements of this Section.
- B. Prior to initiation of ACM work, the Contractor shall submit the following items to Fluor Fernald:
 1. Ohio Department of Health/OSHA-required documentation for Asbestos Removal Contractors:
 - a. Documentation of training
 - b. Medical surveillances
 - c. Respirator fit-test
 - d. Employee exposure assessments
 2. State of Ohio certificates and licenses for the Contractor
 3. State of Ohio certification for all personnel as required by law
- C. Two (2) weeks or ten (10) working days (minimum) prior to submittal of notification to government agencies, the Contractor shall provide a copy of the notification to Fluor Fernald for concurrence.
- D. Product Data: The Contractor shall submit manufacturer's technical information including application instructions for each material proposed for use.

1.6 PROJECT CONDITIONS

1. Transite that has deteriorated to a friable condition shall be considered friable ACM and therefore be removed in accordance with this Section.
2. ACM-containing materials such as floor tile, mastic, woven cloth-covered electric wire, and gaskets may become friable during handling; therefore, such materials shall be removed pursuant

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to the requirements of this Section.

PART II PRODUCTS

2.1 MATERIAL

- A. Polyethylene sheeting: Fire retardant, clear, and have a minimum of 6 mils thickness as manufactured by Blueridge Films, Inc. or equal.
- B. Polyethylene bags: clear and have a minimum of 6 mils thickness.
- C. Outside containments: Clear, reinforced and have a minimum of 6 mils thickness as manufactured by Blueridge Films, Inc. or equal.
- D. Surfactants (wetting agents), encapsulates, and lockdowns shall be mixed in a proportion specified by the manufacturer, applied according to manufacturer's specifications (including temperature), and contain a colorant to make coverage areas readily apparent. Products that have been acceptable to Fluor Fernald include those listed below. Equivalent or better products may be acceptable and shall be approved by Fluor Fernald.
 - 1. Surfactants:
 - a. CP-225 CHIL-SORB by Childers
 - b. Approved equal
 - 2. Encapsulates/Lockdowns:
 - a. Control – Grayling Ind.
 - b. Foster 32-60 – Foster Products Corp.
 - c. Fiberset PM – Fiberlock Technologies
 - d. ACC 22-P – American Coatings Corp.
 - e. Serpiloc
 - f. Approved equal
 - 3. Bridging Encapsulates:
 - a. Asbestos Binding Compound – Fiberlock Technologies
 - b. Leadlock – Global Encasement Systems
 - c. Foster 32-80, Foster Products Corp.
 - d. Approved equal
- E. Materials shall be in original, new, and unopened containers bearing manufacturer's name, label, and the following information:
 - 1. Name or title of material
 - 2. Manufacturer's stock number and date of manufacture
 - 3. Manufacturer's name
 - 4. Thinning instructions
 - 5. Application instructions

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2.2 EQUIPMENT

- A. Negative pressure Air Filtration Device (AFD) equipped with HEPA filtration and operated in accordance with the requirements of 29 CFR 1926.1101.
- B. All containments used for asbestos abatement operations shall be capable of maintaining a minimum of 0.02 inches water gauge (w.g.) of negative pressure, as recorded by manometric measurements. The ventilation system for this type of operation shall provide a minimum of four air changes per hour.
- C. For mini-enclosures and glovebags, a HEPA filtered vacuum system may be substituted to provide negative air pressure. Ensure that the HEPA filtered vacuum system meets the four air changes per hour capacity required for mini-containments.
- D. HEPA filtered vacuum.
- E. The Contractor shall supply a Portable Asbestos Hygiene Facility (see Figure 1). The size of this facility shall be large enough to handle the asbestos workers during peak manpower periods. The facility shall meet the requirements for a hygiene facility specified by OSHA 29 CFR 1926.1101, DOE and site radiological control requirements. It shall be constructed using fire retardant material. When exiting a radiological contaminated area, whole body monitoring is required prior to showering.

The requirements for hygiene facility compliance with radiological controls are as follows:

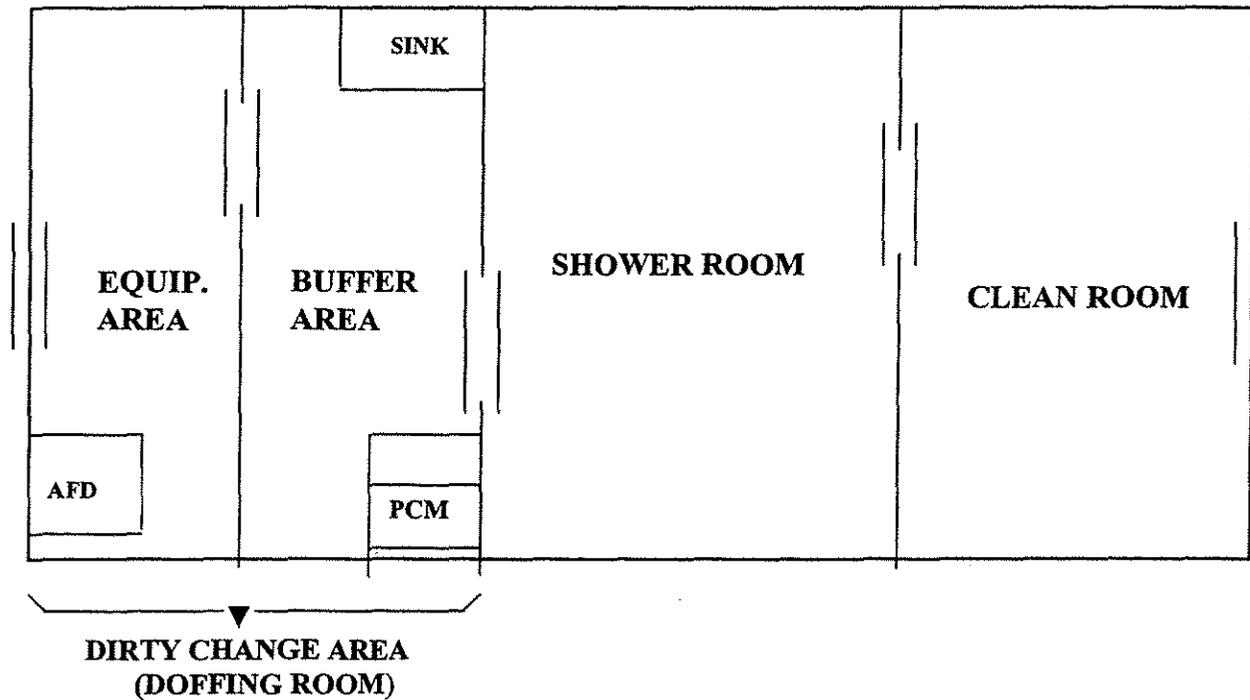
1. The asbestos hygiene facility shall be located adjacent to the radiological contamination area. The size of this facility is based on the number of employees that will be using the facility; this determines the number of showers required. The minimum number of showers required (based on number of workers) is located in 29 CFR 1910.141, Sanitation. It is recommended that the Contractor provide more showers than are legally required so the workers can exit the work area in a timely manner.
2. The doffing room shall be divided into two areas, the Equipment Area and the Buffer Area, and the equipment area shall be maintained under negative pressure relative to the rest of the asbestos hygiene facility.
3. The Equipment Area will be considered a radiological contaminated area. The air in the dirty change area shall be exhausted through a HEPA filtered air filtration device to assist in cleaning the air in the change area. The air change requirement in the dirty change area is 4 air changes per hour at a minimum of -0.02 inches of water pressure differential, relative to outside pressure. The dirty change area shall be large enough to accommodate four containers for segregation of asbestos contaminated waste and personal protective equipment, and an Air Filtering Device. The dirty change area shall have hooks or shelves for storage of hardhats and toolbelts.
4. A step-off pad will be established in the airlock/doorway separating the radiological contaminated area from the radiological controlled area creating a boundary for control of asbestos contaminated items and radiological contamination. The second area in the doffing room (Buffer Area) will be a radiologically controlled area, which should be

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maintained free of any asbestos or radiological contamination. The Contractor shall ensure that an electrical outlet exists for the Personnel Contamination Monitor (PCM). The minimum power requirements for the PCM are 120 volts AC and 1 amp. The PCM minimally requires an area of 5.5 feet by 4 feet by 8 feet in height. The buffer area shall also contain a sink with a spray attachment for the rinsing of respirators prior to doffing.

5. Water shall be collected from the shower room and the buffer area sink, and be filtered down to 5 microns for asbestos fibers prior to discharge to the site wastewater treatment facility.
6. The clean room shall contain benches, lockers for storage of workers' personal clothing, and shelves for storage of personal protective equipment.

FIGURE 1 ASBESTOS HYGIENE FACILITY (EXAMPLE)



PART III EXECUTION

3.1 PREPARATION

A. Regulatory:

The Contractor shall:

1. Notify the Ohio Department of Health (ODOH) ten (10) working days or two (2) weeks prior to start of ACM removal; coordinate with Fluor Fernald prior to submitting ODOH notification (Note: Fluor Fernald will be responsible for notifying the EPAs and all other applicable governmental agencies before start of work).

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2. Comply with work practices and procedures set forth in all applicable Federal, State, and local codes, regulations, and standards.
3. Obtain certifications and licenses.
4. Take precautions to prevent creation of friable ACM during handling.

B. Work Area (for containment work):

1. Isolate the work area
2. Establish hygiene facility/equipment room
3. Install primary containment barriers
4. Cover the floor with two layers of 6 mil polyethylene sheeting
5. Size plastic to minimize seams
6. Cover walls and any contained work area with 6 mil polyethylene sheeting
7. Provide load out facility and emergency exits
8. Post the required asbestos hazard warning signs

C. Work Area (for glove-bag/wrap and cut removal):

1. Isolate work area
2. Establish hygiene facility/equipment room
3. Install work area barriers
4. Cover the floor with one layer of 6 mil polyethylene sheeting
5. Post the required asbestos hazard warning signs

D. Work Area (floor tile removal)

1. Isolate work area
2. Establish hygiene facility/equipment room
3. Install critical barriers
4. Post the required asbestos hazard warning signs

3.2 APPLICATION

A. Wet methods and engineering controls/containment shall be utilized throughout abatement activities to prevent employee exposure as well as the release of visible asbestos emissions to the environment.

B. Removal procedures:

1. Wet all ACM to be removed with amended water solution.
2. Saturated ACM shall be removed in manageable sections and maintained wet until placed into disposal containers or sealed in 2 layers of clear 6-mil plastic.
3. Material removed from building structures or components shall not be dropped or thrown to the floor or into disposal containers.
4. Large components removed intact may be wrapped in two layers of clear 6-mil polyethylene sheeting, secured with tape and properly labeled. All piping (less than 12

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inches in diameter) insulated with ACM may be removed with ACM in place. Wrap the piping with two layers of clear 6-mil polyethylene sheeting. Remove ACM from area of cut utilizing glovebags as containment. Exposed ACM ends shall be capped and the pipe shall be wrapped in clear 6-mil polyethylene sheeting. Containerize according to the MSCC, located in Part 6, Exhibit E.

5. Asbestos-containing material with sharp-edged components (e.g., nails, screws, metal lath, tin sheeting) which will tear the polyethylene bags and sheeting shall be placed into Contractor-supplied, properly labeled containers, and subsequently bagged for disposal. These containers are required to be "see-through", so Fluor Fernald personnel can visually inspect contents. When bagging floor tile, ensure that waste bags are not overloaded such that the weight makes them difficult to handle.
6. After completion of all stripping work, surfaces from which ACM has been removed shall be wet-brushed and sponged or cleaned by some equivalent method to remove all visible ACM residue.

C. Cleanup procedures:

1. Remove and containerize all visible accumulations of ACM and asbestos-contaminated material.
2. HEPA vacuum and wet clean all surfaces in the work area.
3. For containment work, after cleaning the work area, wait at least 24 hours to allow fibers to settle, and HEPA vacuum and wet clean objects and surfaces in the work area again.
4. Inspect the work area for visible residue.
5. The work area shall be cleaned until visual inspection reveals no evidence of any ACM as determined by Fluor Fernald.
6. Apply lockdown to all surfaces in the work area.
7. For containment work, aggressive clearance testing shall be performed by Fluor Fernald and the acceptable limit shall be <0.01 f/cc by Phase Contrast Microscopy.
8. Upon successful completion of aggressive clearance testing by Fluor Fernald, the Contractor shall remove containment and dispose of it as ACM waste per Part 6, Exhibit E. If clearance sampling is unacceptable, repeat Section 3.2.C.
9. Wastewater associated with asbestos abatement shall be handled in accordance with Article 3.1.E of Section 01517.

- D.** Floor tile, mastic, woven cloth-covered electric wire, built-up roofing, and gaskets may become friable during removal; therefore, the Contractor shall remove such material in a manner that does not allow it to become friable while also adhering to all applicable government, state, and local asbestos abatement regulations.

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- E. All ACM material shall be dispositioned in accordance with the MSCC located in Part 6, Exhibit E.

3.3 QUALITY ASSURANCE

The Contractor and Fluor Fernald shall inspect removal methods and filled containers to ensure compliance with the requirements of this Section.

END OF SECTION

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Approved:  6/27/02
 Fred Lehman Date

SECTION 01517

REMOVING/FIXING RADIOLOGICAL CONTAMINATION

PART I GENERAL

1.1 SUMMARY

- A. The scope of this Section is decontamination of dismantled equipment or the structure to a level that permits removal of the debris from a local containment enclosure, or permits opening the building to the environment. This Section includes, but is not limited to:
1. Decontaminating low-level uranium and thorium contaminated equipment, materials, structural members, and/or buildings,
 2. Decontaminating enriched uranium contaminated equipment and materials,
 3. Decontaminating RCRA contaminated equipment and materials,
 4. Controlling and moving effluent produced during the removal and/or fixing of contamination, and
 5. Fixing contamination.
- B. Project Conditions
1. Process material (i.e., green salt, yellow cake, black oxide) in excess of films and precipitates has been removed from process equipment to the maximum extent practical by Fluor Fernald prior to D&D activities. If process material in excess of films and precipitates is found during D&D activities, Fluor Fernald shall be notified prior to disturbing the condition.
 2. See Section 01120 for requirements to establish an inspection area.
 3. Removing/fixing radiological contamination on multiple layers of transite roof panels is addressed in this Section; handling of transite panels is addressed in Section 07415.
 4. Hazardous Waste Management Units (HWMUs) shall be decontaminated pursuant to the specific conditions included in Part 6, Section 3.5 .
- C. Fluor Fernald will perform all effluent sampling, analysis, and transportation.

1.2 RELATED SECTIONS

- A. Section 01120 - Debris/Waste Handling Criteria
- B. Section 03315 - Concrete/Masonry Removal
- C. Section 05126 - Structural Steel Dismantlement
- D. Section 07415 - Transite Removal
- E. Section 15065 - Equipment/System Dismantlement

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F. Section 15067 - Ventilation and Containment

1.3 REFERENCE MATERIALS

See Part 7 for the following:

- A. Index of Drawings
- B. Safe Work Plan Requirements

1.4 REFERENCES, CODES, AND STANDARDS

- A. United States Department of Energy (DOE):
 - 1. DOE Order 5400.5 CHG2 Radiation Protection of the Public and the Environment
 - 2. DOE N 441.1 Radiological Protection for DOE Activities
 - 3. DOE G 430.1-4 DOE Decommissioning Implementation Guide
- B. Code of Federal Regulations (CFR):
 - 1. 10 CFR 835 Department of Energy, Occupation Radiation Protection

1.5 SUBMITTALS

- A. Before start of decontamination work, the Contractor shall submit for approval a Safe Work Plan in accordance with Part 7, ACR-002, Contractor Safe Work Plan Format Requirements, describing the system design for removing and/or fixing contamination. This includes the methods and equipment for: removing contamination; fixing contamination; and controlling, and filtering effluent produced during removal and/or fixing activities.
- B. Product Data: The Contractor shall submit manufacturer's technical information including the material to be used, its intended use, and its application instructions.

1.6 DELIVERY, STORAGE, AND HANDLING

The Contractor shall deliver materials in original, new and unopened containers bearing the manufacturer's name, label, and the following information:

- A. Name or title of material
- B. Manufacturer's stock number and date of manufacture
- C. Manufacturer's Name
- D. Application instructions
- E. Material Safety Data Sheets

PART II PRODUCTS

2.1 CONTRACTOR'S EQUIPMENT

- A. The Contractor shall supply all equipment required to remove and/or fix contamination.

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- B. The Contractor shall supply all equipment required to control, filter, and move effluent produced during removal and/or encapsulation of contaminants.
1. The filter system shall consist of a 20 micron pre-filter and a 5 micron filter to remove entrained particulate prior to effluent discharge to tankage.
 2. The Contractor shall construct all holding tank systems and secondary containment systems as specified in Articles 3.1.D and 3.1.E of this section.

2.2 MATERIALS

- A. Encapsulating coatings: If encapsulating coatings are employed, they shall be Carboline D3358 or approved equal. Manufacturers may include, but are not limited to: Tnemec Series 6 - Tnemec-Cryl, and products by Sherwin-Williams and International Protective Coatings.
- B. If non-strippable coatings are employed, they shall include Polymeric Barrier System (Bartlett), or a Fluor Fernald-approved equal.
- C. Plastic sheeting: Where encapsulation by clear plastic sheet wrapping is allowed, the wrapping shall be a minimum of 6-mil reinforced fire-retardant polyethylene sheeting.

PART III EXECUTION

3.1 APPLICATION

- A. Requirements for managing non-process debris and process debris are described in Section 01120, Articles 3.2.A.1 and 3.2.A.2.
- B. Requirements specific to debris decontamination and their removal from a building enclosure or local containment:
1. Prior to removing debris from a building enclosure or local containment, all internal and external surfaces shall be free of gross removable surface contamination, films and precipitates. Acceptable methods for removing surface contamination, films, and precipitates include but are not limited to: hydro-blasting with a minimum of 1,000 psi, steam-cleaning, sponge blasting, CO₂ blasting, or other methods approved by Fluor Fernald.
 2. Debris and equipment/systems shall be managed in accordance with Section 01120, Article 3.2.
 3. Thorium-contaminated items or debris cannot be released from the building enclosure or local containment areas unless they meet thorium-specific release limits (as referenced in Part 8, Section C 2.4.3). If items do not meet release limits, then they shall be either:
 - a. decontaminated, wrapped and brought directly to containers labeled as containing thorium-contaminated items (not for re-packaging),
 - b. containerized prior to removal from the enclosure as determined by Fluor Fernald, or
 - c. ~~encapsulated and brought directly to containers labeled as containing thorium contaminated items (not for re-packaging).~~

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In all cases where a thorium-contaminated area is separated from a uranium-contaminated area by a wall, the Contractor shall anticipate that the interstitial spaces in the wall will be thorium-contaminated.

4. Equipment/systems identified by Fluor Fernald as being contaminated with uranium with an enrichment over 2 percent will be removed, wrapped, and containerized by the Contractor for disposition as contaminated material without decontamination (such items shall be identified in the MSCC, Part 6, Exhibit E). These items shall not be allowed to get wet.

C. Requirements Specific to Decontamination of Structures and Outdoor Process Tanks/Pipes:

1. Structures:

Prior to opening contaminated structures to the environment (by removing the exterior siding or structural dismantlement), the Contractor shall remove and/or fix radiological contamination on all surfaces within the facility until the detected radioactivity levels are below release criteria identified in Part 8, Section C 2.4.3. Fluor Fernald will perform a radiological release survey to ensure the radioactivity criteria are met.

2. Transite Roof and Wall Panels:

Exterior panels shall be removed in a manner that minimizes the possibility of loose contamination becoming airborne (visible) when the panel is removed. A HEPA vacuum shall be used to remove any loose contamination which may be exposed when the exterior panel is removed (e.g., the under side of the outer panel and the upper surface of the lower roof panel). After the roof or wall panels have been vacuumed, all newly exposed surfaces shall be encapsulated to fix any contamination that remains. Vacuumed residues shall be handled as Debris Category J, in accordance with Part 6, Exhibit E (Debris Category J).

3. Outdoor Process Tanks and Pipe:

- a. Prior to demolition of outdoor process (or suspect process) tanks, all surfaces (interior and exterior) shall be decontaminated to meet the radiological release criteria for outdoor process tanks contained in Part 7. If outdoor tanks do not meet the release criteria in Section 01519, they shall be demolished within a containment, either constructed or existing, in accordance with Section 15067 unless one of the following methods are implemented:

1. Encapsulate and mechanically cut (e.g., shear, saw, etc.):

Prior to tank demolition, the interior of the tank shall be empty and fully encapsulated. During tank demolition, the work area shall be misted with water to minimize release of airborne contamination.

2. Torch or other "hot cutting" methods:

The Contractor shall propose methods that minimize "hot cutting" (e.g., oxy/gas and oxy/acetylene torch cutting). If approved by Fluor Fernald, "hot cutting" of

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surfaces that exceed 25,000 dpm/100cm² beta-gamma total contamination or are thorium contaminated shall be performed within containment per Section 15067.

Hot cutting of tank surfaces may be considered by Fluor Fernald as a proposed method of dismantlement for tanks and pipe located outside of containment, provided that:

- a). HEPA filtered ventilation is maintained, and/or
- b). point-of-cut ventilation can be provided such that fugitive emissions captured and project boundary airborne radioactivity levels are maintained according to limits specified in Part 8, Section C 2.4.2.

The ventilation/containment requirements of Section 15067 apply.

3. Hot cutting may be performed on contaminated surfaces less than 25,000 dpm/100cm² beta-gamma total contamination with local HEPA ventilation. (Note: this clause applies only to uranium-contaminated outdoor process tanks and pipe.)
 - b. Internal surfaces of process piping are assumed to exceed both the removable and total contamination limits for uncontained demolition. However, removal and transport to the debris decontamination area of process piping that is located outside of the building structures may be performed outside of containment if the methods of cutting inherently minimize fugitive emissions.
4. Acceptable methods for removing surface contamination on structures and outdoor tanks/pipes include, but are not limited to: hydro-blasting with a minimum of 1,000 psi, steam-cleaning, sponge blasting, CO₂ blasting, or other Fluor Fernald-approved method.
5. Encapsulation of surfaces is required if the release criteria specified in Part 8, Section C 2.4.3 have not been met and decontamination has been attempted at least once. Fluor Fernald shall be notified prior to encapsulation to allow for inspection for visible process residues. Acceptable methods for encapsulating contamination, which is not readily removed by the above-identified methods include, but are not limited to, encapsulating coatings, non-strippable coatings as referenced in Article 2.2, and wrapping in reinforced sheeting and sealed prior to movement to prevent migration of potential contaminants. The Contractor shall take precautions to prevent the breaching of encapsulating coatings applied to equipment or structure. If an encapsulating coating is breached after application, during activities leading up to but not including structural demolition, the Contractor must take action to reseal the breached areas.
6. If stabilizer or non-strippable coatings are used as fixatives, they will meet the requirements of this specification (see Article 2.2).
7. Down posting of thorium contaminated areas requires that contamination levels meet the thorium-specific release limits of Section 01519, Table 1.
8. If hydro-blasting or steam cleaning is employed, the Contractor shall:

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- a. Seal floor cracks/seams, openings, and building cracks using sealants to protect the environment from migration of contaminants.
 - b. Contain effluents to the building interior/outdoor tank containment system and subsequently to collection systems.
9. The Contractor may utilize any existing building floor sumps for effluent collection, as long as system capacity for sludge and/or liquid does not exceed limitations determined from enriched levels as stated in Article 3.1.D.
 10. The Contractor shall take precautions to prevent the spread of contamination from other more-contaminated areas of the facility to less contaminated areas.
 11. Acceptable methods for decontamination of Hazardous Waste Management Units (HWMUs) to meet RCRA/CERCLA closure Ohio Environmental Protection Agency guidance are hydro-blasting or steam cleaning with a minimum of 1,000 psi, unless otherwise stated in Part 6, Section 3.5 for that particular component.
- D. Rinseate/Effluent Handling:
1. The Contractor shall collect all waste and effluent generated while removing and/or fixing contamination. Effluent and sludge shall be containerized in accordance with the requirements listed in Articles 3.1.D and 3.1.E.
 2. For rinseate/effluent generated from decontamination of a structure containing uranium and/or thorium contamination, or from decontamination washwater generated from contact with outdoor pads with process tanks and pipes:
 - a. The Contractor shall supply all effluent collection equipment (e.g., pumps, secondary containment, tanks).
 - b. Effluent tanks require secondary containment with a minimum of 10 percent of the combined capacity of the effluent tanks housed and not less than the volume of one full tank, whichever is greater.
 3. Enriched Equipment/Material (if listed in Part 6, Section 3.0): In addition to effluent tanks, the washing of enriched equipment/material requires the use of smaller tanks to permit safe quantities to be maintained (for nuclear criticality safety purposes). There are no mass restrictions for rinseates or sludges with a U-235 enrichment less than 1 percent.
 - a. For enrichments greater than 1 percent and less than or equal to 1.25 percent, the Contractor shall supply effluent storage tanks of no greater than 175 - gallon capacity, in numbers sufficient to permit 15 calendar days storage without impact to Contractor operations.
 - b. For enrichments greater than 1.25 percent and less than or equal to 2 percent, no equipment/material over 2 percent enrichment is to be decontaminated. See Article 3.1.B.3. The Contractor shall supply effluent storage tanks no greater than 30 - gallon capacity and in numbers sufficient to permit 15 calendar days storage, without impact to Contractor operations.

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- c. The Contractor shall store sludge, resulting from enriched equipment/material cleaning, in 55-gallon drums. Filled drums may be stored no closer than 2 feet apart.
- d. Should equipment be discovered with uranium enrichment greater than 1 percent then equipment/material washing operations and effluents shall be maintained separate, based on enrichment and type, by the following: 1) uranium less than or equal to 1 percent enrichment; 2) uranium greater to 1 percent enrichment but less than or equal to 1.25 percent enrichment; 3) uranium greater than 1.25 percent enrichment but less than or equal to 2 percent enrichment; and 4) thorium. Wash systems can be maintained separate by campaign or by physically separate systems.
- 4. The Contractor shall devise a system that uniquely identifies each tank of generated wastewater. Prior to filling, a unique number shall be determined for the tank contents and this number shall be identified in the field, on the sampling plan, and on the wastewater discharge request.
- 5. Approval to commingle the effluents and sludges is required from Fluor Fernald. Approval to transfer effluents to large effluent tanks is required from Fluor Fernald.
- 6. The Contractor shall notify Fluor Fernald when the effluent tanks are filled. Fluor Fernald will sample, empty the tanks, and transport the effluent to the FEMP Advanced Wastewater Treatment Facility. Upon testing and approval of laboratory analysis from Fluor Fernald, Fluor Fernald shall empty the contents of the effluent storage tanks and transport the effluent to the FEMP AWWT. The Contractor shall keep additional tanks in reserve, as the tank(s) will be out of commission until the sample results are received and water is dispositioned. The Contractor shall allow six weeks for this process.
- 7. Effluent generated from the decontamination and/or rinsing of HWMUs shall be collected and temporarily stored separately from general, non-HWMU effluent. Fluor Fernald will notify the Contractor when commingling of HWMU and non-HWMU effluent may occur.
- 8. The Contractor shall supply storage tanks and secondary containment with a minimum liquid effluent storage capacity to allow 20 days storage without impacting the Contractor operations.
- 9. The Advanced Wastewater Treatment Facility (AWWT) of the Fernald Environmental Management Project (FEMP) is not designed to process heavy oils, greases, or other stratified organic layers. Should such contaminants exist, Fluor Fernald shall be responsible for their removal from the wastewater prior to delivery to the AWWT. The contaminants shall be containerized and delivered to Fluor Fernald personnel, who will be responsible for disposal.

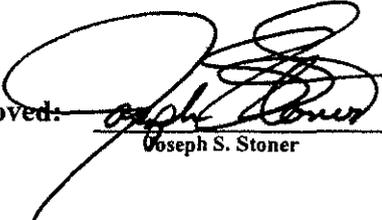
E. Sludge Drumming

Sludge limits for individual drums from enriched cleaning operations are restricted to 104 grams of U-235 per 55-gallon drum. (Note: The weight is limited due to Department of Transportation and/or the maximum allowable weight of the drum.)

END OF SECTION

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Approved:  12/10/01
Joseph S. Stoner Date

SECTION 01519

DECONTAMINATION OF CONTRACTOR PROVIDED TOOLS, EQUIPMENT AND MATERIAL

PART I GENERAL

1.1 SUMMARY

- A. Preventative measures for and decontamination of Contractor provided tools, equipment (including vehicles), and material to a level that permits removal from an enclosure/work zone, restricted reuse, or unrestricted release. This Section includes, but is not limited to:
1. Preventative measures/waste minimization,
 2. Decontamination area requirements,
 3. Methods of decontamination activities,
 4. Control of effluent and waste management activities, and
 5. Relocation, reuse, and release activities for tools, equipment, and material.
- B. Project Conditions and Requirements:
1. All facilities, unless expressly noted in Part 6 Section 3.0, shall be considered contaminated with radioactive material.
 2. All items are considered potentially contaminated if they have been used or stored in Controlled Areas that could contain unconfined radioactive material.
 3. The Contractor shall establish a holding/inspection area to allow Fluor Fernald to perform tool and equipment radiological surveying.
 - a. The holding/inspection area shall be arranged such that routine access is prevented by means of fencing and/or barrier tape with appropriate posting to identify that the items contained are being held for survey, and such that the area is off limits to individuals other than Fluor Fernald/Contractor radiological survey personnel.
 - b. Only those items which meet the requirements (as described in this Section) for leaving the work zone should enter the inspection area.
 4. The Contractor should assume that extensive dismantlement and an aggressive decontamination effort will be required to achieve unrestricted release of items that have come in contact with radioactive material or were used in contamination areas. Based on past experience using the best available technologies, decontamination and survey access requirements to meet the release criteria may be difficult to achieve.

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5. Hand and portable tools used in controlled areas for performance of the subcontract are to be considered expendable as specified in Part 4 - Special Terms and Conditions, DISPOSITION OF CONTRACTOR PROVIDED EQUIPMENT, TOOLS, AND MATERIALS THAT HAVE BECOME CONTAMINATED (SC-33).

1.2 RELATED SECTIONS

Work related to this Section shall also be accomplished in accordance with the following Sections:

- A. Section 01120 - Debris/Waste Handling Criteria,
- B. Section 01517 - Removing/Fixing Radiological Contamination, and
- C. Section 15067 - Ventilation and Containment.

1.3 REFERENCE MATERIALS

- A. Part 4 - "Special Terms and Conditions, DISPOSITION OF CONTAMINATED TOOLS, EQUIPMENT, AND MATERIALS" (SC-33).
- B. Part 6 - Section 1.0, "Scope of Work"
- C. Part 7 - ACR-002, "Safe Work Plan Requirements"

1.4 REFERENCES, CODES, AND STANDARDS

- A. United States Department of Energy (DOE):
 1. DOE Order 5400.5 CHG2 Radiation Protection of the Public and the Environment
 2. DOE N 441.1 Radiological Protection for DOE Activities
 3. DOE G 430.1-4 DOE Decommissioning Implementation Guide
- B. Code of Federal Regulations (CFR):
 1. 10 CFR 835 Department of Energy, Occupation Radiation Protection

1.5 SUBMITTALS

- A. The Contractor must provide Fluor Fernald with a list of all tools, vehicles, equipment and material to be brought onsite which have been used in conjunction with radioactivity in the past including such information as:
 1. Previous use of the equipment,
 2. Dates of use,
 3. Levels of contamination, and
 4. Radioisotopes involved.

This list must be submitted as soon as known in advance of bringing the item onsite. Fluor Fernald reserves the right to reject the Contractor's request to bring these items on site. Any tools or equipment contaminated with a radioactive material greater than 1 percent enriched uranium or thorium-232 will be rejected. Thorium contaminated tools and equipment may only be used in a thorium contaminated area.

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- B. The Contractor shall submit the manufacturer's technical information for any decontamination or contamination controlling agents for compliance review prior to use. This information shall include:
1. Material to be used,
 2. Intended use,
 3. Application instructions, and
 4. MSDS Sheets.
- C. Before start of decontamination work, the Contractor shall submit a Safe Work Plan addressing tool and equipment decontamination for compliance review in accordance with Part 7 - ACR-002 ("Contractor Safe Work Plan Format Requirements"), describing the following:
1. Preventative measures to be employed,
 2. The design and construction of the decontamination area,
 3. The methods to be utilized for decontamination (see Article 3.1.C of this Section),
 4. The methods and equipment for controlling and handling effluent and/or secondary waste produced during decontamination activities, and
 5. Plans for relocating, reusing, or releasing tools and equipment.

PART II PRODUCTS

2.1 CONTRACTOR PROVIDED TOOLS AND EQUIPMENT

- A. The Contractor shall furnish all equipment, tools, and material required to perform the work described in the subcontract except where the contract explicitly states that Fluor Fernald will provide the item.
1. The Contractor shall deliver approved decontamination and contamination control materials in original, new and unopened containers bearing the manufacturer's label, and the following information:
 - a. Name or title of material,
 - b. Manufacturer's stock number and date of manufacture,
 - c. Manufacturer's Name, and
 - d. MSDS Sheets.
 2. All possible shipping and packing materials will be removed upon receipt at the site prior to entering the controlled area to minimize contaminated waste generation.
- B. ALARA
1. For the purposes of meeting the "As Low As Reasonably Achievable" (ALARA) goal for tools, equipment, and materials, it is expected that:
 - a. All reasonable efforts are to be used to control residual contamination to the extent that there is no detectable contamination on items that were free of contamination prior to use.
 - b. There is no increase in the level of contamination on items that were previously contaminated.

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2. The ALARA efforts include, but are not limited to, the following:
 - a. Protective measures prior to use of items,
 - b. Preventative measures while items are being used, and
 - c. Decontamination upon completion of work activities.
3. In support of the ALARA initiative, all Contractor furnished tools, vehicles, equipment, and material may be inspected for radioactive contamination by Fluor Fernald personnel prior to initial entry and upon removal from the radiological controlled area.

PART III EXECUTION

3.1 APPLICATION

A. Prevention of or Minimizing Contamination:

1. The Contractor shall plan and coordinate all work to minimize exposure of equipment, tools, and vehicles to potential radioactive contamination. Equipment shall be located in the area with the least potential for contamination. For example, locate equipment outside the facility with leads, hose lines, etc. wrapped and run to the interior of the facility. Typical examples of equipment where this approach should be used include air compressors, high pressure hydroblasters, welders, generators, oxy-acetylene cylinders, and battery chargers.
2. It is the Contractor's responsibility to evaluate materials, tools and equipment for ease of decontamination and disassembly that may be required for decontamination prior to use on-site. Use of unrestricted release items (i.e., those other than expendable as defined in Part 4, Special Terms And Conditions, SC-33 - "DISPOSITION OF CONTRACTOR PROVIDED EQUIPMENT, TOOLS, AND MATERIALS THAT HAVE BECOME CONTAMINATED") should incorporate appropriate precautions to prevent contamination. These precautions should be implemented prior to and during use. Precautionary measures may include the following, which are expected to be implemented as described in the Safe Work Plan:
 - a. Internal combustion equipment subject to contamination should make use of pre-filters or have a separate source of outside air on the intake.
 - b. High volume air handling equipment such as blowers, compressors, etc., shall have a filtered inlet to minimize the potential for internal contamination due to build up of low level radioactivity.
 - c. The Contractor is prohibited from bringing electrical driven mobile equipment to the FEMP (e.g., fork-lifts) except where only electric driven equipment is available.
 - d. Protective sheathing/covers, strippable coatings, or protective caps should be used to minimize the potential for contamination (e.g., coating the buckets of man lifts or other walking/standing surfaces). In addition, all openings on equipment, tools, or vehicles that may permit contamination of inaccessible or difficult to clean areas shall be covered and protected.
3. If encapsulants, sealants and/or coatings are utilized during the project, the Contractor shall be responsible for protecting their tools and equipment from over spray. In addition, the Contractor shall ensure that the encapsulant, sealant and/or coating can be readily removed during decontamination activities, if necessary.

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B. Decontamination Area Requirements:

1. Tools and equipment utilized inside an enclosure/building may be decontaminated at an existing indoor debris cleaning location.
2. The following are examples of options for establishing outdoor decontamination areas:
 - a. Utilize an existing concrete pad with run-on and run-off controls.
 - b. Construct a temporary containment area. Containment must have a bermed perimeter to ensure run-off control. An example of acceptable containment is Herculite with sandbag underlayment perimeters on grade without penetrations. Containment used must be adequate to maintain its integrity.

C. Methods of Decontamination Activities:

1. Where decontamination is needed, the Contractor shall at a minimum use the following as applicable:
 - a. Dry cleaning.
 - b. Steam cleaning.
 - c. High pressure, hot water hydroblasting (may be used in conjunction with abrasive techniques and approved decontamination agents) with a minimum of 1,000 psi and HEPA vacuuming.
2. When selecting a decontamination technique other than those identified in C.1 above, consideration should be given to those technologies that minimize radiological airborne emissions, secondary wastes, and tool or equipment damage.
3. As an alternative to decontamination, replacement of contaminated components shall be in accordance with the requirements of Part 4, Special Terms And Conditions, SC-33 - "DISPOSITION OF CONTRACTOR PROVIDED EQUIPMENT, TOOLS, AND MATERIAL THAT HAVE BECOME CONTAMINATED".
 - a. The contaminated components are subject to the cleaning criteria stated in Article 3.2.B.
 - b. The contaminated components will be managed and handled per Section 01120 and Part 6, Exhibit E subsequent to the cleaning as directed by Fluor Fernald.

D. Control of Effluent and Waste Management Activities:

1. The Contractor shall control and collect all waste and effluent generated while removing and/or fixing contamination in accordance with the requirements listed in Sections 01120 and 01517.
2. Management of wastes generated during decontamination activities shall be in accordance with Section 01120 and the Demolition Closure Project MSCC located in Part 6, Exhibit E.

E. Relocation, Reuse, and Release of Tools, Equipment, and Material:

1. The Contractor shall perform all decontamination and surveying activities required to verify that the surface contamination limits identified in Table 1 of this Section are not exceeded. Fluor Fernald shall perform final verification surveying.

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TABLE 1 SURFACE CONTAMINATION LIMITS(a)

NUCLIDE(f)	FIXED PLUS REMOVABLE		REMOVABLE(b),(e)
	AVERAGE(b),(c)	MAXIMUM(b),(d)	
U-nat, U-235, U-238, and associated decay products, alpha emitters.	5,000 dpm /100 cm ²	15,000 dpm /100 cm ²	1,000 dpm/100 cm ²
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm ²	300 dpm/100 cm ²	20 dpm/100 cm ²
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1,000 dpm/100 cm ²	3,000 dpm/100 cm ²	200 dpm/100 cm ²
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5,000 dpm /100 cm ²	15,000 dpm /100 cm ²	1,000 dpm /100 cm ²

- (a) Where surface contamination by both alpha and beta-gamma emitting nuclides exists, the limits established for alpha and beta-gamma emitting nuclides should apply independently.
- (b) As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.
- (c) Measurements of average contaminant should not be averaged over more than one square meter. For objects of less surface area, the average should be derived for each object.
- (d) The maximum contamination level applies to an area of not more than 100 cm².
- (e) The amount of removable radioactive material per 100 cm² of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.
- (f) The limits presented for transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, and Ac-227 may be adjusted on a case by case basis. Consult with Radiological Compliance when required to apply these limits for unrestricted release.

2. The Contractor shall provide notice to Fluor Fernald of intent to remove tools and equipment from the contamination area, in accordance with Part 6, SC-33 - DISPOSITION OF CONTRACTOR PROVIDED EQUIPMENT, TOOLS, AND MATERIALS THAT HAVE BECOME CONTAMINATED.
3. Release of tools, equipment, and material from Contamination Areas to the Controlled Area:

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- a. If removable contamination in excess of the limits of Table 1 is present on the tools, equipment or material, then:
 - 1). The items must remain in the contamination area for decontamination, or
 - 2). The item must be contained such that no contaminated surfaces of the item are accessible without disassembling the equipment or breaching the containment.
 - b. Examples of acceptable containment include plastic wrapping, yellow Herculite wrapping, or a sealable hard container. However, the containment used must be adequate to maintain its integrity considering the weather, conditions of storage, and the methods or conditions of transport.
 - c. If the removable contamination limits are met but the total (fixed plus removable) limit is exceeded, the item may be labeled or identified as radioactive material by Fluor Fernald and released to the Controlled Area.
4. Unrestricted Release Criteria:
- Tools and equipment with detectable radioactivity may be released from the controlled area with the approval of a Fluor Fernald Radiological Control Technician if all of the following have been met:
- a. Both removable and total surface contamination (including contamination on and under any coating) are in compliance with the levels given in Table 1 above and the item has been subjected to the ALARA process described in Article 2.1.B.
 - b. All areas must be readily accessible for survey for residual radioactivity including proper surface counting geometry to allow for accurate quantification. Items with inaccessible areas which are likely to be contaminated but are of such size, construction, or location as to make them inaccessible for survey shall be assumed to exceed the limits for release. The item must either be disassembled to permit an adequate survey to certify that internal contamination is at or below the limits of Table 1 above, or well documented process knowledge can be applied to provide confidence that contamination in inaccessible areas is not probable. In evaluating the potential for contamination in inaccessible areas, consideration will be given to where the item was used on site and preventative measures taken prior to use, such as coverings, wrappings, air intake filters, etc.
 - c. Upon approval from Fluor Fernald, the Contractor shall remove the tools, equipment, and/or materials off -site within eight hours.
5. Release to an Off -Site Licensed Facility:
- a. If the Contractor possesses the appropriate license to receive, possess, use, and transfer the equipment, tools, material, or vehicles with radioactive contamination, the Contractor may elect to remove such items from the site in lieu of decontamination. The responsibility of complying with all state, local and federal regulations during the packaging, shipping, and receipt of the equipment shall be the responsibility of the Contractor. The Contractor shall submit a copy of the license and applicable procedures

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to Fluor Fernald for compliance review prior to removal of the contaminated equipment. A copy of all Bills of Lading shall be submitted to Fluor Fernald prior to shipment.

- b. The Contractor is to provide 24 hours notice to Fluor Fernald prior to shipping radioactive tools, equipment, and/or material.

3.2 UNSUCCESSFUL/IMPRACTICAL CONTRACTOR DECONTAMINATION

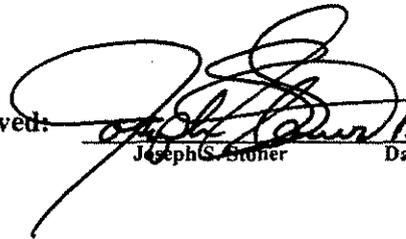
- A. If Fluor Fernald determines that the Contractor has implemented the requirements of this Section and the Safe Work Plan and the Contractor's decontamination efforts are unsuccessful or decontamination is not practical (as identified below), refer to Part 4 - Special Terms And Conditions, DISPOSITION OF CONTRACTOR PROVIDED EQUIPMENT AND TOOLS THAT HAVE BECOME CONTAMINATED (SC-33) for action to be taken.
- B. Decontamination may be considered impractical for non-expendable items that are integral parts of equipment and not readily replaceable such as porous materials (e.g., wood and fiberglass), wire rope, chains, brushes, items with finned surfaces, and similar items where contamination may be embedded within the material configuration matrix. These items may not be released if detectable contamination is identified on the surface.
- C. All tools, material, vehicles, and equipment accepted by Fluor Fernald for disposition must have been cleaned to meet the visual inspection requirements defined in Section 01517 and handled as defined in Section 01120 and the MSCC located in Part 6, Exhibit E.

3.3 QUALITY ASSURANCE

All QA requirements required to be met by the Subcontractor are stated in Part 9.

END OF SECTION

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SECTION 03315

CONCRETE/MASONRY REMOVAL

PART I GENERAL

1.1 SUMMARY

Dismantling of all above-grade concrete and masonry, including:

- A. Elevated floor and roof slabs,
- B. Cast-in-place walls,
- C. Pre-cast concrete components,
- D. Foundations, piers, and selected curbs,
- E. Concrete encasement (e.g., fireproofing),
- F. Interior and exterior masonry,
- G. Control of fugitive emissions, and
- H. Windows, doors, roof louvers and lead.

1.2 RELATED SECTIONS

- A. Section 01120 - Debris/Waste Handling Criteria
- B. Section 01515 - Mobilization, Demobilization, and General Site Requirements
- C. Section 01517 - Removing/Fixing Radiological Contamination
- D. Section 05126 - Structural Steel Dismantlement
- E. Section 15067 - Ventilation and Containment
- F. Section 03920 - Concrete Surface Removal

1.3 REFERENCE MATERIALS

See Part 7 for the following:

- A. Index of Drawings
- B. Contractor Safe Work Plan Format Requirements

REFERENCES, CODES, AND STANDARDS

All work shall be accomplished in accordance with the following reference, code, and standard requirements:

- A. American National Standards Institute (ANSI):
 - 1. ANSI A10.6-90 National Safety Council, Safety Requirements for Demolition Operations

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2. ANSI A10.8-01 National Safety Council, Safety Requirements for Scaffolding
3. ANSI A10.9-97 National Safety Council, Safety Requirements Concrete Construction Masonry Work

B. National Fire Protection Association (NFPA):

1. NFPA 101 ® Life Safety Code ® 2000 Edition, NFPA 101A Guide on Alternative Approaches to Life Safety 2001 Edition, and NFPA 101B Code for Means of Egress for Buildings and Structures 1999 Edition.
2. NFPA 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations 2000 Edition

C. United States Department of Energy:

D. Code of Federal Regulations (CFR):

1. 10 CFR 835 - Energy - Occupational Radiation Protection,
2. 27 CFR 55 Subpart K Storage.

E. Ohio Administrative Code (OAC):

1. 3745-17 Particulate Matter Standards Part 08 Restriction of Emission of Fugitive Dust

1.4 SUBMITTALS

The Contractor shall submit for approval a Concrete/Masonry Removal Safe Work Plan in accordance with Part 7 - ACR-002, Contractor Safe Work Plan Format Requirements, which contains the following information:

- A. Detailed method and sequence of dismantlement, including equipment to be used.
- B. Methods for control of contaminants, including control of fugitive emissions.
- C. Materials, such as non-woven geotextile fabrics and surfactants, to be used.
- D. Methods of cutting, including equipment to be used.
- E. Calculations: Verification of the structural adequacy of partially dismantled structures, as applicable, shall be stamped by a Professional Engineer registered in the State of Ohio.
- F. If dismantlement method requires personnel on the roof, the Contractor shall provide calculations verifying the structural adequacy of the roof to support personnel and equipment. A Professional Engineer registered in the State of Ohio shall stamp these calculations.

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- G. If controlled explosive methods are proposed to be used on building structures that are constructed of precast columns and roof beams, a detailed Safe Work Plan containing the following information shall be prepared:
1. Methods and materials to be used.
 2. Means to protect adjacent structures, equipment, material, and underground utilities from damage, including protection from projectiles.
 3. Methods and materials to control fugitive emissions.
 4. Contingency plan for detonation failure.
 5. Proof of permit, issued by the Bureau of Alcohol, Tobacco and Firearms, to use explosives.
 6. Methods and materials to store explosives according to the requirements of 27 CFR 55 Subpart K.
 7. Evidence of previous work experience using controlled explosives to take down multi-story structures near other structures within the last 5 years. Provide project locations and contacts for verification.
- H. Detailed method and sequence of dismantlement of Technetium-99 contaminated concrete, including equipment to be used, method of removal, equipment/method to control, filter and store waste produced during Tech-99 Concrete removal.

PART II PRODUCTS

2.1 MATERIALS

- A. Non-woven Geotextile Fabric:
1. Trevira Spunbond 1120 by Hoechst Celanese Corp.
 2. Mirafi 160N by Mirafi, Inc.
 3. ADS 600 by Advanced Drainage Systems, Inc.
 4. Equal products manufactured by others will be acceptable. Must be approved by Fluor Fernald.
- B. Encapsulants/Lockdowns:
1. Control – Grayling Ind.
 2. Foster 32-60 – Foster Products Corp.
 3. Fiberset PM – Fiberlock Technologies
 4. ACC 22-P – American Coatings Corp.
 5. Serpiloc
 6. Approved equal
- C. Bridging Encapsulants:
1. Asbestos Binding Compound – Fiberlock Technologies
 2. Leadlock – Global Encasement Systems
 3. Foster 32-80, Foster Products Corp.
 4. Approved equal

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PART III EXECUTIONS

3.1 PREPARATION

- A. The Contractor shall ensure that adequate lay down space has been cleared and barriers have been established.
- B. The Contractor shall take the following precautions to control fugitive emissions. A wet dust suppression system shall be used. This system will utilize the following:
 - 1. Amended water (with surfactant), and
 - 2. Finely atomized water spray.
- C. Concrete and masonry shall have contamination fixed or removed prior to dismantlement and prior to removing local containment or building enclosures, in accordance with Section 01517.

3.2 APPLICATION

- A. The Contractor shall prevent damage to adjacent structures, materials, and equipment including underground utilities, during dismantlement activities. Activities to fell concrete structures outside their own footprint require prior approval. Activities to fell concrete structures shall maintain the integrity of porous surfaces to the extent practical to minimize dispersal of debris. If concrete dust is generated as a result of removal operations (due to crumbling, etc.), dust suppression techniques must be employed during demolition and, if necessary, during transportation.
- B. Removal of Above-Grade Concrete/Masonry:

Any above-grade concrete/masonry remaining intact following structural dismantlement shall be removed down to grade-level except for poured concrete structures that are imbedded in soil (e.g., raised slabs, curbs on slabs, foundations, concrete tank saddles), which shall remain in place.
- C. Removal of At-Grade Concrete/Masonry:
 - 1. Concrete slabs, pedestals, columns, miscellaneous foundation piers, walls, and curbs shall be sealed and may remain intact during and after structural dismantlement.
 - 2. Cut all reinforcing (e.g., rebar) and anchors flush with base slab for areas designed on the Contractor Safe Work Plan for potential debris stockpiling. For all other areas, reinforcements and anchors need only be cut down to within one inch of the base slab.
- D. Cutting:
 - 1. All material shall be reduced in size as required for containerization in accordance with Section 01120 and the MSCC located in Part 6, Exhibit E.
 - 2. Embedded steel reinforcing is considered part of concrete. Reinforcing bar/mesh shall be cut to less than 1 ft. from concrete mass.

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3. Because of contamination levels, some concrete may require local containment for cutting activities in accordance with Section 15067. Any currently known areas requiring local containment are identified in Part 6, Section 3.0; however, new or additional areas may be identified during dismantlement activities.

E. Explosives:

1. Interior non-load bearing masonry walls shall be removed using non-explosive methods prior to opening the shell of the structure. For interior poured concrete walls, the Contractor shall have the option to leave them in place during structural dismantlement provided that facility release criteria are met prior to structural dismantlement and the method of dismantlement in the Concrete/Masonry Removal Safe Work Plan is approved by Fluor Fernald personnel.
2. Any bituminous roofs felled by explosives are to be dropped in a single unit and impact the ground in a horizontal plane.

3.3 SPECIAL INSTRUCTIONS

The following special instructions apply to concrete/masonry removal:

A. Windows and Doors

1. The Contractor shall remove all windows in one piece and place them in appropriate containers.
2. The Contractor shall remove all doors (wood and/or steel) and place them in appropriate containers.

B. Lead Materials

1. The Contractor shall segregate all lead materials (e.g., flashing, vent stacks, etc.) and place them in appropriate containers in accordance with Section 01120 and the WMP located in Part 6.
2. Prior to torch cutting on a surface coated with a lead-based paint, an eight-inch strip of paint shall be removed at the area of the cut (e.g., 4 inches on each side of cut).
3. The Contractor shall (whenever possible) dismantle lead flashing in a manner that will facilitate recycling. This will include minimizing inaccessible surfaces and maximizing straight lengths. This will also include avoiding the use of fixatives on the lead flashing that would require an abrasive method of removal.

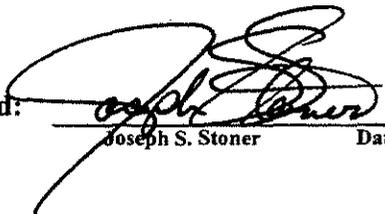
C. Wall and Roof Louvers

The Contractor shall remove louvers and roof vents during exterior concrete/masonry removal and place in appropriate containers.

END OF SECTION

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 Joseph S. Stoner Date

SECTION 03920

CONCRETE SURFACE REMOVAL

PART I GENERAL

1.1 SUMMARY

This Section defines the work related to the removal of a surface layer from the existing concrete pads utilizing surface removal technologies. Principals included in this Section are:

- A. Removing surface layer,
- B. Controlling and transporting waste produced during the removal of concrete,
- C. Controlling the spread of radiological contamination in the operating area, and
- D. Equipment types and usage.

1.2 RELATED SECTIONS

- A. Section 01120 - Debris/Waste Handling Criteria
- B. Section 01517 - Removing/Fixing Radiological Contamination
- C. Section 15067 - Ventilation and Containment
- D. Section 01519 - Decontamination of Contractor Provided Tools, Equipment, and Materials

1.3 REFERENCE MATERIALS

- A. See Part 7 for the following:
 - 1. Index of Drawings
- B. See Part 8 – Section C 2.0 for the Radiological Requirements.

1.4 REFERENCES, CODES, AND STANDARDS

- A. Code of Federal Regulations
 - 1. 10 CFR 835 Occupational Radiation Protection

1.5 SUBMITTALS

- A. Before start of concrete surface removal work, the Contractor shall submit for approval a work plan describing the system design for removing concrete. The work plan shall describe methods and equipment for removing concrete, including equipment used for controlling, filtering, and

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transporting waste generated during removal activities. The work plan shall also describe methods and equipment used to control the generation and spread of contamination.

- B. **Product Data:** The Contractor shall submit manufacturer's technical information on all materials to be used, including their intended use and application instructions.
- C. See Part 6, Section 11.0 for additional submittal requirements.

1.6 QUALITY ASSURANCE

Prior to commencement of work, the Contractor shall demonstrate the methods for removing concrete on a sample area of a concrete floor selected by Fluor Fernald.

1.7 PROJECT CONDITIONS

- A. Radiological contamination has been detected on concrete pads, as identified in Part 6, Section 3.1.6. The Contractor is to remove surface layers of concrete in the locations and to the depth specified. This may require concrete removal adjacent to curbs and foundations.

PART II PRODUCTS

2.1 MANUFACTURERS/EQUIPMENT

- A. The Contractor shall supply a system with all equipment required to remove concrete, including equipment to control, filter, and transport waste produced during concrete removal.
- B. The concrete removal system (equipment) shall include, but not be limited to, the following features:
 1. Integral vacuum system with pre- and HEPA filters.
 2. Controlled, dustless process with personnel exposure below DAC limits as defined in Part 8.
 3. Simultaneous collection of waste in 55-gallon drums.
 4. No use of water where technetium-99 contamination is of concern.
 5. Equipment shall be portable.
 6. Consideration shall be used to select equipment that can be easily decontaminated for free release after use. For details on releasing tools and equipment, refer to Section 01519.
 7. Equipment shall implement waste management technology that minimizes secondary waste.
 8. Vacuum design shall allow operator to fill, seal, remove, and replace the waste drum under negative pressure vacuum conditions/enclosures.
- C. Fluor Fernald will provide standard 55-gallon drums for collection of waste. The Contractor shall provide all replacement filters.
- D. Vendor shall provide method(s) for concrete removal adjacent to areas such as curbs and around foundations.
- E. Erection of any necessary local containment shall be defined by the vendor in accordance with the requirements of Section 15067.

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PART III EXECUTION

3.1 APPLICATION

- A. All concrete removal activities shall be performed in accordance with 10 CFR 835.
- B. All work is to be performed according to Fluor Fernald's health and safety requirements. Personnel in the controlled area shall be required to wear personal protective equipment as detailed in the health and safety matrix.
- C. The Contractor shall control dust and debris generated while removing concrete. Fluor Fernald shall monitor the area for airborne contamination. The Contractor shall be required to make changes to operating methods and equipment if unacceptable levels of airborne contamination are found in the operating area.
- D. The Contractor shall collect all waste generated while removing concrete. Waste and effluent shall be packaged in accordance with the requirements in the MSCC , located in Part 6, Exhibit E.
- E. Once the concrete has been removed, the Contractor shall take precautions to prevent the further spread of radiological contamination to the area.
- F. The Contractor shall not remove more than one-half (1/2) inch.

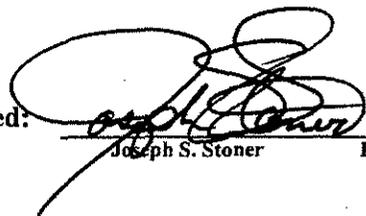
3.2 QUALITY ASSURANCE

The Contractor and Fluor Fernald shall verify that the removal depths indicated in Part 6, Section 3.0 are met. The removal depths are the minimum requirements for concrete removal. Acceptable performance is achieved when the minimum removal has occurred over the work area specified.

END OF SECTION

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SECTION 05125

NEW STRUCTURAL STEEL/METALS

PART I GENERAL

1.1 SUMMARY

Design, fabrication, and installation of miscellaneous metal items for protective barriers, lifting assemblies, rigging, and temporary bracing and supports.

1.2 RELATED SECTIONS

- A. Section 01120 - Debris/Waste Handling Criteria
- B. Section 05126 - Structural Steel Dismantlement

1.3 REFERENCE MATERIALS

See Part 7 for the following:

- A. Index of Drawings

1.4 REFERENCES, CODES, AND STANDARDS

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

- | | | |
|----|--------------------|---|
| 1. | ASTM A36/A36M 2001 | Standard Specification for Carbon Structural Steel |
| 2. | ASTM A307 2000 | Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength. |
| 3. | ASTM A325 2000 | Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength. |
| 4. | ASTM A563 2000 | Standard Specification for Carbon and Alloy Steel Nuts. |
| 5. | ASTM F436 2000 | Standard Specification for Hardened Steel Washers R (2000). |

B. American Welding Society (AWS):

- | | | |
|----|--------------------|--|
| 1. | ANSI/AWS A2.4 1998 | Standard Symbols for Welding, Brazing, and Nondestructive Examination. |
| 2. | ANSI/AWS D1.1 2000 | Structural Welding Code, Steel. |
| 3. | ANSI/AWS D1.2 1997 | Structural Welding Code, Aluminum. |
| 4. | ANSI/AWS D1.3 1998 | Structural Welding Code, Sheet Steel. |

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- C. American Institute of Steel Construction (AISC):
1. Manual of Steel Construction - Allowable Stress Design (ASD), 9th Edition
 2. Manual of Steel Construction - Load and Resistance Factor Design (LRFD), 3rd Edition
- D. American National Standards Institute (ANSI):
- ANSI A10.13 1989 National Safety Council, Construction and Demolition Operations
- Steel Erection - Safety Requirements

1.5 SUBMITTALS

- A. The Contractor shall submit the following for conformance review by Fluor Fernald:
1. Calculations: Indicate design method, assumptions, loads, member forces, allowable stresses, and connection designs.
 2. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 3. Indicate welded connections using standard ANSI/AWS A2.4 welding symbols. Indicate net weld lengths. Submit copies of welder's certifications with shop drawings.
 4. A plan for conducting and documenting field quality testing and inspection including test methods and reports required under Field Quality Assurance.
 5. Provide Material Safety Data Sheets for primer and finish coatings to be applied to new structural steel, and for welding materials.
 6. Contractor's AWS Welding Program for approval.
 7. Mill Test Reports for structural steel
- B. For additional submittal requirements see Part 6, Section 11.0.

1.6 DELIVERY, STORAGE, AND HANDLING

ASTM A325 high strength bolts shall be delivered to the site in the original labeled containers and once onsite shall not be transferred into unlabeled containers. The label information shall include the type of bolt, purchase order number, and the name of the supplier.

PART II PRODUCTS

2.1 MATERIALS

- A. Steel sections and plates: ASTM A36
- B. Structural Fasteners: Bolts shall be hardened and meet ASTM A325; nuts shall be heavy hex type meeting ASTM A563, Grade C; and washers shall be hardened and meet ASTM F436, Grade 1.

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- C. Miscellaneous Fasteners: Shall meet ASTM A307.
- D. Expansion Anchors: Expansion bolts used for securing steel to concrete shall be one of the following:
 - 1. "Parabolt" as manufactured by Molly Fastener Group of Emhard, Temple, PA 19560,
 - 2. "Wedge Anchors" as manufactured by ITT Phillips Drill Division, Michigan City, IN 46360,
 - 3. "Kwik Bolt" as manufactured by Hilti, Inc., Stamford, CT 06405, or
 - 4. Fluor Fernald approved equal.
- E. Welding Materials: ANSI/AWS D1.1 - Structural Welding Code. Use E70XX electrodes.
- F. Abide by requirements of Federal Fastener Act.
- G. Shop Primer: Short-oil alkyd that is VOC compliant.

2.2 FABRICATION

- A. For delivery to site, fit and ship assembled in largest practical sections.
- B. Supply components required for connecting and anchorage of fabricated structural assemblies.
- C. All welding procedures, welder's certification, and visual acceptance criteria must be in accordance with ANSI/AWS D1.1, Chapter 5.
- D. Clean surfaces of rust, scale, grease, and foreign matter prior to applying shop primer. Prepare surface in accordance with paint manufacturer's instructions.
- E. Shop prime with one coat of short-oil alkyd primer per manufacturer's instruction for primer (dry film) coat thickness.
- F. Do not prime surfaces in direct contact with concrete or within three inches of where field welding is required.
- G. All coatings shall be free of lead and chromium.

PART III EXECUTION

3.1 PREPARATION

Prior to fabrication, the Contractor shall verify field dimensions.

3.2 INSTALLATION - GENERAL

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Allow for installation loads and provide temporary bracing to maintain true alignment until completion of installation.
- C. Field weld components as indicated on the approved drawings. Field welding shall be in accordance with ANSI/AWS D1.1, Chapter 3.

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- D. Fasteners shall be tightened to manufacturer's specifications or applicable design requirements.
- E. Field modifications to load bearing structures shall require prior approval from Fluor Fernald.
- F. After installation, prime field welds and abrasions. Any steel embedded in concrete is an exception.
- G. All steel shall be fabricated and installed in accordance with the AISC Manual of Steel Construction.
- H. After use, all steel shall be dismantled and cut for containerization in accordance with Section 01120 and Section 05126.

3.3 QUALITY ASSURANCE

- A. Calculations and shop drawings must bear the stamp of a Professional Engineer registered in the State of Ohio.
- B. The Contractor shall inspect high-strength bolted connections for all shop-fabricated steel, and perform tests and prepare test reports in accordance with the AISC specifications. All test results shall be submitted to Fluor Fernald.
- C. The Contractor shall conduct tests and shall state in each test report whether test specimens comply with requirements, and shall specifically state any deviations. Fluor Fernald must approve deviations in writing.
- D. Shop and Field Welding
 - 1. The Contractor shall: inspect and test, during fabrication and installation of structural steel assemblies in accordance with ANSI/AWS Structural Welding Code and as follows:
 - a. Conduct inspections and tests as required. Record types and locations of all defects found in the work. Record work required and performed to correct deficiencies. All test results to be submitted to Fluor Fernald.
 - b. Perform visual inspection of all welds per AWS D.1.1.
 - c. All welds that fail shall be repaired per approved Contractor AWS Welding Program.
 - d. Reworked areas shall be re-tested using the same method as used to find original indications.
 - 2. Perform nondestructive tests of welds per AWS D.1.1. Full penetration welded connections on structural steel rigging frame utilized for critical lifts, as defined in the FEMP Hoisting and Rigging Manual, shall be 100 percent radiograph tested by an independent certified testing lab. Results shall be submitted to Fluor Fernald for approval.
 - a. All welds that fail testing shall be repaired per approved Contractor AWS Welding Program.
 - b. Reworked areas shall be re-tested using the same method as used to find original indications.

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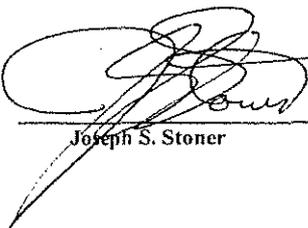
E. Correction of Substandard Work:

The Contractor shall correct deficiencies in structural steel work which inspections and laboratory test reports have indicated to be not in compliance with requirements.

END OF SECTION

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SECTION 05126

STRUCTURAL STEEL DISMANTLEMENT

PART I GENERAL

1.1 SCOPE

This Section includes dismantling and containerization of:

- A. Structural steel,
- B. Bar joists,
- C. Floor plate/decking,
- D. Grating,
- E. Stairs, ladders, and handrail,
- F. Metal siding and roofing, including doors, louvers, and windows,
- G. All other miscellaneous steel, and
- H. Control of fugitive emissions.

1.2 RELATED SECTIONS

- A. Section 01120 - Debris/Waste Handling Criteria
- B. Section 01517 - Removing/Fixing Radiological Contamination
- C. Section 03315 - Concrete/Masonry Removal
- D. Section 07415 - Transite Removal

1.3 REFERENCE MATERIALS

See Part 7 for the following:

- A. Index of Drawings,
- B. Photographs,
- C. Drawings, and
- D. Contractor Safe Work Plan Format Requirements.

1.4 REFERENCES, CODES, AND STANDARDS

All work shall be accomplished in accordance with the following reference, code, and standard requirements:

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- A. American National Standards Institute (ANSI):
 - 1. ANSI A10.6 1990 National Safety Council, Safety Requirements for Demolition Operations
 - 2. ANSI A10.8 2001 National Safety Council, Construction and Demolition Operations - Scaffolding - Safety Requirements
 - 3. ANSI A10.13 1989 Construction and Demolition Operations - Steel Erection
- B. National Fire Protection Association (NFPA):
 - 1. NFPA 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations 2000 Edition
- C. Code of Federal Regulations:
 - 2. 29 CFR 1926.858 Occupational Safety and Health Administration, Department of Labor, Safety and Health Regulations for Construction.

1.5 SUBMITTALS

The Contractor shall submit to Fluor Fernald for conformance review a structural steel removal Safe Work Plan in accordance with Part 7, ACR-002, and the Contractor Safe Work Plan Format Requirements that contains the following information:

- A. Detailed sequence of dismantlement and method of cutting, including equipment to be used.
- B. Methods for contaminant control, including fugitive emissions during cutting.
- C. Detailed plan for protecting lay down and cutting areas from contamination by lead paint chips and for controlling airborne radiological emissions.
- D. Methods and materials used for cutting lead-painted steel.
- E. If structural steel is removed in sections, verify the structural adequacy of the remaining structure. Calculations and drawings to verify the structural integrity of the partially dismantled structure must bear the stamp of a Professional Engineer registered in the State of Ohio.
- F. Plans for personnel tie-offs, use of pick boards and walking on or near roof purlins/girders.
- G. If controlled explosive methods are used for structural steel dismantlement, a detailed Safe Work Plan containing the following information shall be prepared:
 - 1. Methods and materials to be used.
 - 2. Means to protect adjacent structures, equipment, material, and underground utilities from damage, including protection from projectiles.
 - 3. Methods and materials to control fugitive emissions.
 - 4. Contingency plan for detonation failure and safe recovery of all non-detonated charges.

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5. Proof of permit, issued by the Bureau of Alcohol, Tobacco, and Firearms, to use explosives.
6. Evidence of previous work experience using controlled explosives to take down multi-story structures within the last 5 years. This experience may be shown through the sub-tier contract. Provide project locations and contacts for verification.
7. If non-load bearing, interior concrete/masonry walls are to be removed, refer to concrete/masonry removal specifications in Section 03315.
8. Identify locations of all cuts and charges and detonation sequence on composite drawings, which will be provided by Fluor Fernald.
9. Provision of adequate protection of charges to prevent shrapnel from damaging the non-electric detonation system or persons near the exclusion boundary.
10. Predications of rubble/debris piles should be made to ensure that safe exclusion zones are established.

PART II PRODUCTS

2.1 MATERIALS

- A. Non-woven Geotextile Fabric:
 1. Trevira Spunbond 1120 by Hoechst Celanese Corp.
 2. Mirafi 160N by Mirafi Inc.
 3. ADS 600 by Advanced Drainage Systems, Inc.
 4. Fluor Fernald-approved equal products
- B. Surfactants:
 1. CP-225 CHIL-SORB by Childers.
 2. Fluor Fernald-approved equal products

PART III EXECUTION

3.1 PREPARATION

- A. The Contractor shall ensure that adequate lay down space has been cleared and barriers have been established.
- B. Building contents, steel, and siding shall have contamination removed or fixed prior to exposing interior surfaces including steel and siding to the environment in accordance with Section 01517.
- C. If controlled explosive methods are used, the Contractor shall take precautions to control fugitive emissions by saturating the explosion footprint with water 2 to 4 hours prior to the implosion.

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3.2 APPLICATION

- A. All dismantlement activities shall be performed in accordance with the standards listed in Article 1.4.
- B. The Contractor shall apply mechanical means of cutting and removing the structural steel to the largest extent possible while also avoiding damage to adjacent structures, components, equipment, and utilities.
- C. The roof deck and roofing material, panels and concrete floor decking shall also be demolished with the structure wherever possible. Roofing material containing asbestos containing material (ACM) shall not be demolished with structural steel.
- D. The Contractor shall dismantle, shear, and segregate the structural steel to avoid damage to adjacent structures, component, equipment, and utilities. The Contractor shall minimize bending, twisting, and smashing of the steel during segregation and bulk storage.
- E. Control of fugitive emissions shall be maintained at all times during this removal work to minimize visible dust.
- F. All temporary bracing and rigging frames required shall be designed and stamped by a State of Ohio Professional Engineer, then submitted with calculations to Fluor Fernald for review and approval.
- G. Cut all reinforcing (e.g., rebar) and anchors flush with base slab for areas designated on the Contractor's Safe Work Plan for potential debris stockpiling. For all other areas, reinforcements and anchors need only be cut down to within one inch of the base slab. Fill in damaged areas of base slab with patching grout as described in Section 01515.
- H. Lead-based paint chips and debris, released during structural steel dismantlement, shall be collected and managed in accordance with Section 01120 and the Waste Management Plan located in Part 6, Exhibit E.

3.3 SPECIAL INSTRUCTIONS

- A. The following items are also included (where applicable) in the sequence of structural steel dismantlement:
 - 1. Doors, Windows, and Frames:
 - a. The Contractor shall remove all windows and place them in appropriate containers.
 - b. The Contractor shall remove all doors (wood and/or steel) and place them in appropriate containers.
 - 2. Lead Materials:
 - a. The Contractor shall segregate all lead materials (i.e., flashing, vent stacks, etc.) and place them in appropriate containers in accordance with Section 01120 and the Waste Management Plan located in Part 6, Exhibit E.

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- b. Prior to torch cutting on a surface coated with a lead-based paint, an eight-inch strip of paint shall be removed at the area of the cut (i.e., 4 inches on each side).
 - c. The Contractor shall (whenever possible) dismantle lead flashing in a manner that will facilitate recycling. This will include minimizing inaccessible surfaces and maximizing straight lengths. This will also include avoiding the use of fixatives on the lead flashing that would require an abrasive method of removal.
- B. All material shall be cut to meet sizing criteria and be managed in accordance with the Waste Management Plan located in Part 6, Exhibit E.

3.4 QUALITY ASSURANCE

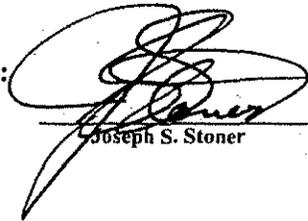
The Contractor shall inspect debris generation, stockpiling, and containerization to ensure that all materials have been cut to meet size criteria and are being managed in accordance with the Waste Management Plan located in Part 6, Exhibit E.

END OF SECTION

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Approved:


 Joseph S. Stoner
 Date 1/28/02

SECTION 07415

TRANSITE REMOVAL

PART I GENERAL

1.1 SUMMARY

The work includes:

- A. Removal of all interior and exterior transite panels.
- B. Use of vacuuming, encapsulates, and/or surfactants on the transite panels to prevent airborne asbestos fibers and airborne radioactivity.

1.2 RELATED SECTIONS

- A. Section 01120 - Debris/Waste Handling Criteria
- B. Section 01515 - Mobilization, Demobilization, and General Site Requirements
- C. Section 01516 - Asbestos Abatement
- D. Section 01517 - Removing/Fixing Radiological Contamination
- E. Section 11010 - HEPA Vacuum Cleaner Requirements
- F. Section 15065 - Equipment/System Dismantlement
- G. Section 15067 - Ventilation and Containment
- H. Section 15860 - HEPA Air Filtration Device Requirements

1.3 REFERENCE MATERIALS

See Part 7 for the following:

- A. Index of Drawings
- B. Contractor's Safe Work Plan Format Requirements

1.4 REFERENCES, CODES AND STANDARDS

A. Code of Federal Regulations:

- | | | |
|----|---------------------|--|
| 1. | 29 CFR 1926.850 | Demolition Preparatory Operations |
| 2. | 29 CFR 1926.1101 | Asbestos (Construction Industry) |
| 3. | 29 CFR 1910.134 | Respiratory Protection |
| 4. | 29 CFR 1910.1001 | Asbestos (General Industry) |
| 5. | 40 CFR 61 Subpart M | United States Environmental Protection Agency (U.S. EPA) (NESHAPS) |

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B. Ohio Department of Health:

1. Asbestos Hazards Abatement Rules, OAC, Chapter 3701-34

C. Ohio Environmental Protection Agency:

1. Air Pollution Regulations, OAC, Chapter 3745-20, Asbestos Waste

1.5 SUBMITTALS

A. The Contractor shall submit to Fluor Fernald a detailed Safe Work Plan (SWP) for approval in accordance with Part 7, ACR-002, "Contractor Safe Work Plan Format Requirements" and "Asbestos Abatement Safe Work Plan Requirements". The submittal shall include the procedures proposed for use in complying with the requirements of this Section. An Ohio Certified Asbestos Abatement Project Designer shall prepare and approve the SWP. The SWP shall include the following information:

1. The location and layout of storage and queuing areas.
2. The method of applying vacuuming, encapsulates, and/or surfactants.
3. The methods and sequencing of interior and exterior panel removal.
4. The interface of trades involved in the performance of work.
5. A detailed description of the methods to be employed to prohibit visible emissions in the work area.
6. A detailed description of the methods for removing transite panels from the structures and moving them to the lay down location for containerization (per the Material Segregation and Containerization Criteria (MSCC)) is located in Part 6, Exhibit E. The description of methods shall include methods to be employed to ensure transite panels are removed without cutting, abrading, or breaking.
7. Description of the portable HEPA ventilation system, the containerization of removed asbestos debris, the method of treating broken and/or damaged panels, and the method of protecting adjacent structures.
8. If dismantlement method requires personnel on the roof, the plan shall include calculations verifying the structural adequacy of the roof and roof penetrations to support personnel and equipment. These calculations shall be stamped by a Professional Engineer registered in the State of Ohio, consistent with Section 01515.
9. Plans for personnel tie-off, use of pick boards and walking on or near roof purlins/girders.

B. Prior to initiation of the work, the Contractor shall submit the following OSHA-required documentation for Asbestos Removal Contractors to Fluor Fernald:

1. Documentation of training,
2. Medical surveillance,
3. Respirator fit-test, and
4. Employee exposure assessments.

C. Five (5) days prior to submittal of notification to government agencies, the Contractor shall provide a copy to Fluor Fernald for concurrence.

D. Product Data: The Contractor shall submit for approval manufacturer's technical information, including application instructions for each material proposed for use.

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1.6 HANDLING AND STORAGE

- A. The Contractor shall manage transite in accordance with Section 01120 and the MSCC , located in Part 6, Exhibit E. Corrugated transite panels shall be stacked separately from flat transite panels.
- B. The Contractor shall take precautions to prevent breakage of transite panels during handling.

1.7 PROJECT CONDITIONS

Multiple layers of transite roof and wall panels require specific methods for removal/fixing of radiological contamination, which is likely to exist between the layers of transite. Section 01517 contains specific instructions for removing/fixing contamination during removal of transite roof or wall panels.

Before performing any D&D activities within the footprint of the building, the contractor will take actions to abate any deteriorated overhead transite hazards that would place their workforce in unsafe surroundings.

As exterior transite panels are removed, the associated structural steel shall be considered to be contaminated with asbestos fibers, and therefore shall require encapsulation with lockdown material.

Refer to Section 01516 for information regarding the handling of deteriorated transite.

PART II PRODUCTS

2.1 MATERIALS

- A. Deliver materials in original, new, and unopened containers bearing manufacturer's name, label, and the following information:
 - 1. Name or title of material,
 - 2. Manufacturer's stock number and date of manufacture,
 - 3. Manufacturer's name, and
 - 4. Thinning and application instructions.
- B. Encapsulates/Lockdowns:
 - 1. Control – Grayling Ind.
 - 2. Foster 32-60 – Foster Products Corp.
 - 3. Fiberset PM – Fiberlock Technologies
 - 4. ACC 22-P – American Coatings Corp.
 - 5. Serpiloc
 - 6. Approved equal

Note: Encapsulates shall have a coloring agent or dye so that, when applied, there is obvious verification that a coating has been applied.

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- C. Surfactants:
 - 1. CP-225 CHIL-SORB by Childers
 - 2. Fluor Fernald-approved equal products
- D. Fiber-reinforced polyethylene or polyester sheeting approved for outdoor storage; color, yellow; minimum thickness of 6 mils; ultraviolet resistant, as manufactured by Griffolyn or Herculite.
- E. Or equal, as approved by Fluor Fernald.

PART III EXECUTION

3.1 PREPARATION

- A. Regulatory:
 - 1. When applicable, the Contractor shall notify the Ohio Department of Health (ODOH) and Fluor Fernald shall notify the EPA and all other applicable governmental agencies before the start of work.
 - 2. The Contractor shall adhere to and comply with work practices and procedures set forth in the most current and applicable Federal, State, and local codes, regulations, and standards.
 - 3. The Contractor shall obtain certifications and licenses if transite becomes friable.
- B. Consistent with Section 01517, prior to opening a building to the environment by removing the exterior siding (e.g., transite, metal siding, roof panels), the Contractor shall remove and/or fix radiological contamination on all surfaces within the facility until the detected radioactivity levels are below the criteria defined in Part 8, Section 8-C 2.4.

3.2 APPLICATION

- A. The Contractor shall apply encapsulates, and/or surfactants according to the product manufacturer's specifications for application conditions (e.g., temperature).
- B. Where transite panels show significant deterioration, which results in potentially friable surfaces, panels shall be removed in accordance with Section 01516.
- C. Apply encapsulate and/or surfactant to areas around fasteners of transite panels before removal of fasteners.
 - 1. Fasteners are required to be removed or cut without damaging the transite panel. A flat, sharp instrument shall be used to cut the fasteners.
 - 2. When encapsulate and/or surfactant is applied, it shall be applied to provide visible coverage. If original application of surfactant becomes dried out before or during removal or handling, apply a second application.
- D. Prior to removal of transite panels, all surfaces of the panels shall be thoroughly encapsulated.
 - 1. Bodily contact with the panels, as practical, shall be avoided.
 - 2. When dust is observed between panels, collect the dust with a HEPA-filtered vacuum.

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3. In the event a transite panel is broken or deteriorated, the Contractor shall apply encapsulant and/or surfactant to the edges of deteriorated areas.
 4. Removed transite panels shall be encapsulated on both sides by the end of the work shift.
- E. Removal of transite roof panels shall be sequenced to minimize exposed underlying surfaces.
- F. Cleanup procedures:
1. Remove and containerize all visible accumulations of asbestos containing material (ACM) and asbestos-contaminated material.
 2. Wet clean all surfaces in the work area.
 3. Inspect the work area for visible residue.
 4. The work area shall be cleaned until visual inspection reveals no evidence of any ACM as determined by Fluor Fernald.

3.3 SPECIAL INSTRUCTIONS

A. Single and Multiple Transite Layers:

Surfaces adjacent or between transite layers shall be considered radiologically contaminated. Refer to the requirements contained in Section 01517 for removing/fixing radiological contamination on transite panels.

B. Gutters:

The Contractor shall collect all ACM from gutters using wet methods, and shall apply an encapsulant and/or surfactant to the gutters before their removal.

C. Insulation:

1. The Contractor shall remove the mineral wool insulation between the transite panels and/or other materials.
2. The Contractor shall use dust control techniques (minimum of applying amended water) to minimize airborne contaminants generated during insulation removal.

D. Windows and Doors:

1. The Contractor shall remove all windows in one piece and place them in appropriate containers.
2. The Contractor shall remove all doors (wood and/or steel) and place them in appropriate containers.

E. Lead Materials:

1. The Contractor shall segregate all lead materials (i.e., flashing, vent stacks, etc.) and place them in appropriate containers in accordance with Section 01120 and the MSCC located in Part 6, Exhibit E.
2. Prior to torch cutting on a surface coated with a lead-based paint, an eight-inch strip of paint shall be removed at the area of the cut.

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3. The Contractor shall (whenever possible) dismantle lead flashing in a manner that will facilitate recycling. This will include minimizing inaccessible surfaces and maximizing straight lengths. This will also include avoiding the use of fixatives on the lead flashing that would require an abrasive method of removal.
- F. All material shall be managed in accordance with the MSCC located in Part 6, Exhibit E.

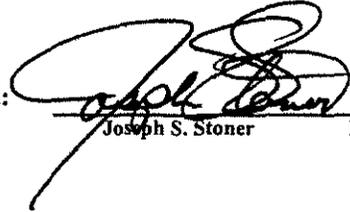
3.4 QUALITY ASSURANCE

Mock-up: Prior to commencement of work, the Contractor shall provide for approval a Fluor Fernald-selected sample area of transite for approval, 10 feet by 10 feet in size, to demonstrate encapsulant and/or surfactant methods. The approved mock-up shall serve as a standard for the balance of the work.

END OF SECTION

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Approved:


 Joseph S. Stoner Date 12/10/01

SECTION 11010

HEPA VACUUM CLEANER REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. The subcontractor shall include but not be limited to performing the following work (not, all inclusive):
1. General cleaning in a contaminated area(s),
 2. Post job cleanup and decontamination in a contaminated area(s),
 3. Cleanup and decontamination following a spill of radioactive or hazardous material except for mercury spills,
 4. Removal of debris from contaminated plant systems following maintenance operations, and
 5. Providing negative pressure for small glove bag or glove box containments.
- B. The subcontractor shall supply the following:
1. EQUIPMENT
 - a. HEPA Vacuum Cleaners;

(NOTE: Only High Efficiency Particulate Air (HEPA) rated vacuums will be permitted at the Fluor Fernald site where the potential for vacuuming hazardous or the spreading of radiological contaminates exists.)
 - b. All consumables (Pre-filters, HEPA Filters, hoses, accessories, etc.)
 2. SERVICES
 - a. The subcontractor shall connect, maintain and operate each vacuum in accordance with vendor supplied/Fluor Fernald approved Operations and Maintenance Manual requirements and checklists.
 - b. Upon completion of each task, the subcontractor shall empty the contents of the

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vacuum in accordance with Fluor Fernald approved Manufacturer Recommended Practices and the Fluor Fernald Radiation Worker Permit. Disposition of all wastes shall be in accordance with the each projects waste disposal requirements.

- c. All suction line openings shall be sealed after use to prevent the spread of contamination or friable asbestos during movement of the equipment.

1.2 RELATED SECTIONS

- A. Section 01516 – Asbestos Abatement.
- B. Section 07415 – Transite Removal.
- C. Section 15067 – Ventilation and Containment.
- D. Section 15065 – Equipment and System Dismantlement.

1.3 REFERENCES, CODES, AND STANDARDS

- A. American National Standards Institute (ANSI)/Underwriters Laboratories (UL)
ANSI/UL 586-1996 - High-Efficiency, Particulate, Air Filter Units.
- B. American Society of Mechanical Engineering (ASME)
ASME AG-1a-00: Code on Nuclear Air and Gas Treatment.

1.4 DELIVER DETAILS

Site Delivery - Upon receipt of any portable HEPA vacuum at the Fluor Fernald site, the vacuum will be delivered to the Maintenance "DOP" Shop for inspection and testing. Failure of any Poly Alpha Olfin (PAO) test performed by Fluor Fernald Maintenance personnel will result in the vacuum being rejected for use. The method of rejection will be evaluated by Fluor Fernald "PAO" trained personnel. If necessary, accessories will be exchanged. Then the equipment will be retested. If the equipment has to be removed from the Fluor Fernald site, all shipping of the equipment back to the subcontractor's or manufacturer's facilities shall be the responsibility of the subcontractor.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. HEPA Vacuum units that are provided shall be one of the following manufacturers and models, or Fluor Fernald approved equal:

<u>MANUFACTURER</u>	<u>UNIT TYPE</u>	<u>MODEL</u>	<u>CFM</u>
Hako	Dry	C82915-09*	110 with wet adapter assembly (P/N 800420) and inlet plug (P/N 390038)
Power Products	Wet/Dry	RAD VAC 2000	

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*HAKO Minuteman Model

HEPA Vacuum units larger than the models listed shall be submitted to Fluor Fernald for approval.

Any additional requirements shall be included with the purchase order for HEPA Vacuum Cleaners:

2.2 LABELING

- A. Any HEPA filters supplied any the subcontractor shall be clearly labeled, certifying:
1. The manufacturer's name,
 2. Manufacturer's unique UL registration number indicating compliance with UL 586,
 3. Filter efficiency based on "PAO" testing,
 4. Resistance at the test airflow rate,
 5. Filter part number and serial number, and
 6. Test airflow direction.
- B. The HEPA filter shall be tested at a flow rate equal to or greater than the flow rate of the vacuum cleaner.

PART 3 EXECUTION

3.1 EXAMINATION

- A. PAO Tests - Prior to use, Fluor Fernald will provide a filter integrity test (PAO test) following installation of a HEPA filter to ensure that the filter is in good working condition and is properly installed. Failure to pass the test will result in the HEPA filter being rejected. The project supporting the work shall assume ownership of all waste generated by these vacuums. The filter integrity test shall be repeated every six (6) months or anytime the vacuum cleaner is opened, if opening breaks the HEPA seal.
- B. Hoses and Extensions - All hoses and extensions used on the vacuum shall employ clamps or locking connectors to prevent hoses from pulling loose while in use. All joints should employ seals, such as rubber O-rings to prevent leakage or be taped.
- C. Segregation of Contaminants - Vacuum cleaners are most commonly used for radioactive or asbestos work and shall be marked with the predominant waste to be cleaned up, such as "For Radioactive Use Only" or "For Asbestos Use Only". Vacuums used for asbestos shall not be used for general non-asbestos work. Radiological and Asbestos Work Permit provisions shall apply for this use (see Sections 01516 and 01517). Other contaminants or hazardous materials, such as mercury, may require the exclusive use of a HEPA vacuum unit with special accessories (e.g. cyclone separator, special treated charcoal filters, etc.) to maintain a segregation of the contaminant or hazardous material and to provide additional protection of personnel using the equipment. All HEPA vacuums shall be stored in a secure area to prevent unauthorized use.
- D. Non-Contaminated Area Use - HEPA Vacuums may be specifically designated and marked for use only in areas in which no contamination is expected. Only these vacuum cleaners shall be used in clean areas. The vacuum cleaners may be surveyed by Fluor Fernald periodically to verify that they have not been contaminated.

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- E. Liquid Use - Vacuuming liquids or wet solids can result in damage to the HEPA filter or motor and can present an electrical safety problem if an electric vacuum cleaner is used. To prevent such problems, only a HEPA vacuum specified for wet/dry use shall be used (for vacuuming liquids refer to Section 01517; Part 3.1.D., and 3.1.E.).

NOTE: The preferred method of collecting liquids is by the use of a catch tank or knockout drum connected to the vacuum cleaner suction line. The catch tank should be removed and emptied when full to minimize liquids entering the vacuum cleaner. Anytime an electric vacuum cleaner is used to collect liquids, it shall be fitted with a float switch to de-energize the motor before it fills up to the point where the motor will become wet. Electric vacuum cleaners shall not be used to collect flammable or combustible liquids.

- F. Vacuum Cleaner Head Removal - Removal of the vacuum cleaner head shall take place in a room, containment, bag, or tent established to control the spread of airborne contamination. The area should include complete physical boundaries to isolate it from surrounding area and should be equipped with a HEPA-filtered ventilation system. The type of containment device should be adequate for the expected radiological or other contaminant conditions. During the dumping process Fluor Fernald may take general area or personal air samples. The Radiation Work Permit (RWP) required to perform the work shall specify protective clothing and respiratory protection equipment (reference Part 8; Sections B.2.5 and C.2.6). If removal of the head breaks the HEPA filter seal or exposes the HEPA filters, then a filter integrity test will have to be performed, before the unit is used.

3.2 ERECTION/INSTALLATION/APPLICATION

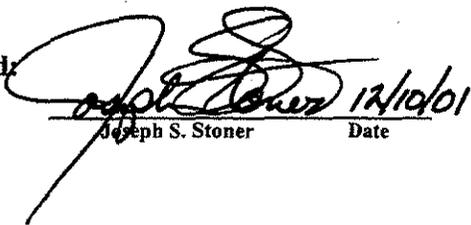
- A. HEPA filter elements are to operate from ambient temperature up to 250°F.

3.3 QUALITY CONTROL

- A. Provide in-service inspection hold and witness points and record the results of test performed.

END OF SECTION

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SECTION 15065

EQUIPMENT/SYSTEM DISMANTLEMENT

PART I GENERAL

1.1 SUMMARY

- A. This Section includes the Contractor's responsibility for removal or dismantlement of equipment and demolition debris from a facility and support systems within or outside a facility.
- B. Segregation of demolition debris into various waste streams and preparation for containerizing shall be completed in accordance with the MSCC.

1.2 RELATED SECTIONS

- A. Section 01120 - Debris/Waste Handling Criteria
- B. Section 01515 - Mobilization, Demobilization, and General Requirements
- C. Section 01516 - Asbestos Abatement
- D. Section 01517 - Removing/Fixing Radiological Contamination
- E. Section 11010 - HEPA Vacuum Cleaner Requirements
- F. Section 15067 - Ventilation and Containment
- G. Section 15860 - HEPA Air Filtration Device Requirements

1.3 REFERENCE MATERIAL

See Part 7 for the following:

- A. Index of Drawings
- B. Contractor's Safe Work Plan Format Requirements

1.4 REFERENCES, CODES, AND STANDARDS

All work shall be accomplished in accordance with the following reference, code, and standard requirements:

- A. Code of Federal Regulations:
 - 1. 29 CFR 1926.301 Hand Tools, and
 - 2. 29 CFR 1926.302 Power Operated Hand Tools.

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1.5 SUBMITTALS

The Contractor shall submit the following for approval:

- A. Detailed removal Safe Work Plan in accordance with Part 7, ACR-002, Contractor Safe Work Plan Format Requirements for dismantlement of equipment/systems.
- B. Proposed location, and method of installation of all hoisting equipment, and specialized construction equipment submitted for approval by Fluor Fernald with the Safe Work Plan.
- C. Safe Work Plan specific to the dismantlement of outdoor process or suspect process tanks and pipes in accordance with Part 7, ACR-002, Subcontractor Safe Work Plan Format Requirements, including:
 - 1. Sequence of work,
 - 2. Methods and materials to control spills and possible generation of fugitive emissions from opening and cutting operations,
 - 3. Method to access tanks and pipes, including health and safety issues,
 - 4. Methods of dismantlement,
 - 5. Method to size reduce and segregate,
 - 6. Locations of cutting and interim storage areas,
 - 7. Equipment required,
 - 8. Methods to seal equipment and pipe openings for each equipment type,
 - 9. Method to be used if piping or equipment contains nitric acid,
 - 10. Location for interim storage,
 - 11. Allowable floor loads,
 - 12. Catalog cut sheets, and
 - 13. Drawings.

1.6 PROJECT CONDITIONS

Process material (i.e., green salt, yellow cake, black oxide) has been removed from process equipment to the maximum extent practical by Fluor Fernald prior to D&D activities. If process material in excess of films and precipitates is found during D&D activities, Fluor Fernald project management shall be notified for evaluation and determination of the existing condition, prior to disturbing the process material.

PART II PRODUCTS

2.1 MATERIALS

- A. The Contractor shall supply all materials required to seal equipment openings, to prevent spillage and/or migration of contaminants, per requirements of this Section.
- B. Fiber-reinforced polyethylene or polyester material approved for outdoor storage: color, yellow; minimum thickness of 6 mils; ultraviolet resistant; as manufactured by Griffolyn, Herculite, or Fluor Fernald-approved equal.

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PART III EXECUTION

3.1 APPLICATION

- A. The Contractor shall supply all tools, materials, and equipment necessary for the performance of the work.
- B. The Contractor shall use mechanical means of cutting whenever possible.
- C. Prior to equipment/system dismantlement, the Contractor shall take the necessary actions to preclude spillage of residual material, if encountered. This shall include the temporary sealing of openings, pipe ends, etc. For liquid processing systems perform the following actions:
 - 1. Piping shall be walked down before dismantlement;
 - 2. Piping shall be nicked at identified low points and at other cut points
 - 3. Piping will be secured to allow pipe to remain level during cut process
 - 4. If liquid residual material is encountered,
 - a. immediately stop
 - b. contain the spillage in a container compatible with the liquid
 - c. avoid making physical contact with liquid/material
 - d. notify RCT and Industrial Hygiene (IH)
- D. Prior to cutting into tanks or piping where the potential for flammable lining exists, it shall be the Contractor's responsibility to verify that no lining exists. Should the Contractor find lined pipes or tanks, the pipes or tanks shall be cut and removed by mechanical means and shall not be torch cut.
- E. In some cases, equipment may be elevated from the ground by the means of a structural platform. In these cases, the equipment should be cut away or disconnected from the platform and lowered to the ground. The dismantlement of this equipment shall be accomplished by shearing and cutting whenever possible. If this is not possible, the equipment shall be dismantled at convenient assembly joints.
- F. Fluor Fernald Radiological Control shall be contacted prior to performing any torch cutting on contaminated surfaces.
- G. Prior to cutting into piping or equipment known or suspected of containing nitric acid or other corrosive, toxic, flammable or combustible material, such systems shall be purged to remove any potentially explosive or otherwise potentially harmful gases.
- H. Equipment that can be removed in one piece during dismantlement of the building will be identified in Part 6, Section 3.1; however, handling of such equipment must still follow all other applicable requirements in Section 01120.
- I. Uncontrolled dropping of equipment and materials is not allowed.
- J. Piping insulated with asbestos may be removed in its entirety per the requirements of Section 01516.

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- K. The Contractor shall take the necessary actions to preclude spillage of residual material, if encountered.
- L. Debris segregation, sizing, and management shall be in accordance with Section 01120 and the MSCC located in Part 6, Exhibit E.
- M. HEPA-filtered local ventilation shall be implemented for disassembly and sizing of process and suspect process pipe and equipment and for all burning (e.g., torch cutting) activities on contaminated surfaces.

3.2 SPECIAL INSTRUCTIONS: REMOVAL OF PERCHLORIC ACID FUME HOOD DUCTING

Perchloric acid hoods are located in the Laboratory (Building 15) in rooms 157, 165, 168, 169, 192, 206, 207, 209, 213, and C-31; and also in room 213 of the Health and Safety Building (Building 53A).

These hoods were designed for the exclusive use of perchloric acid. There is a possibility that other chemicals were used in these hoods, and that the water washdown system was not used during all operations. Therefore, there exists a potential for the formation of explosive perchlorate compounds.

It is because of this potential that a process must be used to minimize the possibility of an explosive decomposition occurring during the demolition process.

Therefore, in addition to those listed in Article 3.1 above, the following specifications apply:

- A. Obtain a Safe Work Permit and Radiation Work Permit.
- B. Ensure that each hood is both electrically and mechanically isolated.
- C. Establish personnel control access; Signs, rope barriers, etc. (both in rooms and on roof).
- D. Set up polyethylene sheets, drain tubes and bottles for water spray control, diking and drainage.
- E. Using an "amended water" supply, spray the exhaust duct stack cover and damper. Continue for a minimum of two hours, keeping all joints, bolts, nuts, etc. wet. Continuously check drainage. Wet surfaces of ductwork until perchlorate crystals have dissolved and/or been rinsed away. Rinseate will be collected in accordance with Specification 01517. Allow surfaces to dry for inspection by Fluor Fernald. If crystals are no longer visible, the material can be disposed in accordance with uranium contaminated metal requirements. If crystals are still visible, the surface shall be cleaned again. If the visual inspection fails a second time, then the metal shall be disposed as process debris.
- F. Set up electrically powered tools with ground fault circuit interrupters.
- G. Cut plastic ducting with an "all type" saw. Keep water spray applied near the kerf of the saw blade. The first cut should be near the duct top, removing the damper and cover.
- H. Repeat steps 5 through 8 for removal/cutting of ducting down to required distance.
- I. Securely wrap/seal ducting with poly sheet/duct tape. Ensure that the duct is wet prior to wrapping.

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J. Dispose of materials in accordance with Section 01120.

3.3 SPECIAL INSTRUCTIONS: REMOVAL OF LABORATORY DRAINS

- A. The Contractor shall contact Fluor Fernald for direction on containerization and disposition of mercury contaminated materials. The waste is treated as RCRA hazardous waste. Before commencing removal operations of laboratory drains, ensure that the drain trap has been filled with water for at least the past two hours
- B. Insert a stick into the drain, withdraw it, and touch it to a strip of litmus paper. Verify that the drain water is not significantly different from neutral pH by comparing the paper with the color chart enclose with the litmus paper. Record the indicated pH for each drain on the work permit.
- C. Fluor Fernald personnel will check each drain to ensure that mercury vapor levels are not elevated.
- D. If mercury is present, the workers shall wear mercury vapor cartridges or combination HEPA/mercury cartridges (if radiological concern). Also, personnel shall wear nitrile gloves. Mercury and radiation contamination monitoring is required at the job's conclusion. All workers in the room must wear safety glasses and face shields when unscrewing drain fittings, drilling, or hacksawing drains. Fluor Fernald personnel shall handle disposal of all recovered mercury.
- E. If mercury is present, try to remove it from the bottom of the drain trap. Unscrewing a drain fitting from the trap is permitted; however, it is NOT permitted if crystals of any kind are evident on the cap threads. To catch the mercury and any water in the drain, a plastic tub should be used. After the drain is removed, inform Fluor Fernald personnel that the waste contains mercury. The waste is treated as RCRA hazardous waste
- F. Outside of drain pipes:
 - 1. Wash off all drain fittings with soapy warm water.
 - 2. If any crystals are evident on drain pipes or fittings (especially around lead or brass drains which may have formed lead peroxide from perchloric acid use), it is imperative that the drain not be disturbed in any way until the crystals are dissolved with warm water.
 - 3. Crystals on the outside of the drain shall be removed by first soaking with a sponge, followed by brushing beneath a water spray.
 - 4. If the crystals on the outside are dissolved, the drain may be removed by cutting it by mechanical means such as with a multi-turn pipe cutter, or hacksaw.
 - 5. For removing drains, leather palm gloves worn over disposable vinyl plastic inner gloves must be worn and face protection is required from a face shield with safety glasses or full-face respirator. If there is a respirator requirement from a radiological safety standpoint, combination HEPA/mercury cartridges should be selected.

3.4 SPECIAL INSTRUCTIONS: REMOVAL OF LEAD MATERIALS

- A. The Contractor shall segregate all lead materials (e.g., flashing, vent stacks) and place them in appropriate containers in accordance with Section 01120 and the MSCC located in Part 6, Exhibit E.

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- B. There is lead shielding in Buildings 30A, 53A, and 53B. There is also cadmium shielding in Building 53B.
- C. Prior to torch cutting on a surface coated with a lead-based paint, an eight inch strip of paint shall be removed at the area of the cut.
- D. The Contractor shall (whenever possible) dismantle lead flashing in a manner that will facilitate recycling. This will include minimizing inaccessible surfaces and maximizing straight lengths. This will also include avoiding the use of fixatives on the lead flashing that would require an abrasive method of removal.

3.5 INTERIM MATERIAL STORAGE

- A. Where removed materials are staged or stored within the facility, they shall be stored in designated floor storage areas as described in Section 01120.
- B. Damaged areas within facilities identified by the Contractor's Engineering Survey shall not be used for interim material storage.

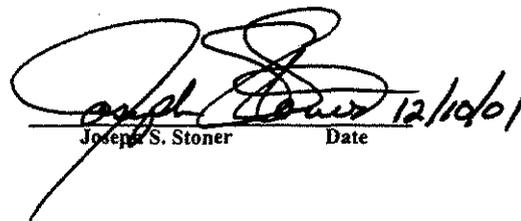
3.6 QUALITY ASSURANCE

Calculations submitted on maximum allowable floor loading must bear the stamp of a Professional Engineer registered in the State of Ohio.

END OF SECTION

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Approved:


 Joseph S. Stoner Date 12/10/01

SECTION 15067

VENTILATION AND CONTAINMENT

PART I GENERAL

1.1 SUMMARY

A. This Section consists of the work related to the Contractor-supplied ventilation and local containment that is required for radiological contamination purposes. The principal items included in this Section are:

1. Local containment and vestibule design requirements,
2. Ventilation requirements,
3. Types of ventilation/local containment design,
4. Guidance on type of ventilation/local containment applicability, and
5. Exterior items; such as dust collectors.

B. Definitions:

1. Local Containment – is an enclosure that is designed to maintain 0.1 inch water gauge negative pressure, or six air changes per hour, within its structure to prevent fugitive emissions from escaping to the outside environment.
2. Vestibule – is an enclosed entrance, a passage, or space that is between the outer door and the interior of the building. The space within the vestibule does not have to be under a negative pressure.
3. Enclosure – is the exterior wall of a building forming the containment.

1.2 RELATED SECTIONS

- A. Section 01120 - Debris/Waste Handling Criteria
- B. Section 01515 – Mobilization, Demobilization, and General Site Requirements
- C. Section 01517 – Removing/Fixing Radiological Contamination
- D. Section 03315 – Concrete/Masonry Removal
- E. Section 05126 – Structural Steel Dismantlement
- F. Section 11010 - HEPA Vacuum Cleaner Requirements
- G. Section 15065 – Equipment/System Dismantlement
- H. Section 15860 - HEPA Air Filtration Device Requirements

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1.3 REFERENCE MATERIALS

See Part 7 for the following:

- A. Index of Drawings

1.4 REFERENCES, CODES, AND STANDARDS

All work shall be accomplished in accordance with the following reference, code, and standard requirements:

- A. United States Department of Energy (DOE):

1. DOE Order 5400.5 CHG2 Radiation Protection of the Public and the Environment
2. DOE N 441.1 Radiological Protection for DOE Activities
3. DOE O 6430.1A Division 11

- B. Code of Federal Regulations:

1. 10 CFR 830.120 Quality Assurance Program
2. 29 CFR 1926.56 Illumination

- C. Building Officials and Code Administration:

Ohio Basic Building Code (OBBC)

1.5 SUBMITTALS

The Contractor shall submit a Safe Work Plan (SWP) in accordance with Part 7, ACR-002, Contractor SWP Format Requirements, with the following information to Fluor Fernald for approval:

- A. Drawings and Data:

1. Indicate materials of construction, sizes, locations, entrances, and egresses that do not allow for breach of the local containment or vestibule, and all other details of local containments and vestibules to be erected.
2. Provide air flow diagrams for local containment and vestibule ventilation.
3. Submit calculations indicating that a minimum negative pressure of 0.1-inch water gauge or six air changes per hour is maintained in all local containments when the ventilation system is in operation.
4. If any part of the above affects or involves asbestos activities, the Ohio Department of Health/OSHA Asbestos Hazard Abatement Project Designer certification shall be part of the documentation submitted with the SWP.

- B. Submit vendor information for performance, operation and maintenance on all ancillary ventilation equipment that will be used.

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- C. Provide building-specific SWPs on the use of portable HEPA units including replacement of HEPA filters and prefilters.

PART II PRODUCTS

2.1 MATERIALS

- A. The Contractor shall provide:
1. Air cleaning devices,
 2. HEPA elements,
 3. Prefilter elements, and
 4. All other ventilation accessory equipment for the completion of this project in accordance with Part 6, Section 4.0.
- B. Polyethylene sheeting shall be clear and have a minimum of 6 mils thickness as manufactured by Blueridge Films, Inc. or Fluor Fernald approved equal.
1. Fire retardant polyethylene shall be used.
 2. All outside containments shall be constructed of reinforced polyethylene.

PART III EXECUTION

3.1 EXAMINATION

- A. All vestibules, equipment, and/or structure containment material shall be fire resistant and corrosion resistant.
- B. Local containment structures shall be designed to be leak-tight and capable of maintaining a negative pressure of at least 0.1 inches water gauge or six air changes per hour. The typical design for various local containments should include the following features, where applicable:
1. Windows and mountings,
 2. Glove ports,
 3. Ease of cleaning,
 4. Interior illumination per 29CFR 1926.56,
 5. Connections for services lines, conduits, instrument leads, and ductwork,
 6. 6 mil polyethylene sheeting,
 7. Pressure differential readouts, and
 8. Attachments for interconnection of local containments.
- C. Where practical, and without penetrating the local containment, all equipment components not functionally required to operate directly in the presence of radioactive materials shall be located outside the local containment.
- D. The local containment or vestibule structure external to the building shall be designed to withstand the effects of normal operating conditions and the following load capacities:
1. Interior: 5 psf lateral load, and

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2. Exterior: per Ohio Basic Building Code (OBBC).

3.2 PREPARATION

- A. The Contractor shall enclose the structure and ensure that all building exterior holes, gaps, or openings are adequately sealed to prevent exhaust of airborne radioactive particulates.
- B. The Contractor shall ensure that all ductwork used is free of dust or dirt before installing it in the ventilation system to prevent premature impingement loading of the prefilters and HEPA filters.
- C. The Contractor shall ensure that all vestibules are large enough to support appropriate storage containers, material handling and dismantling equipment, and debris containerizing operations.

3.3 INSTALLATION/APPLICATION

- A. The Contractor shall block, tie-down, or wheel lock all portable HEPA units.
- B. The following guidelines for localized ventilation and in-place cutting control measures shall be adhered to by the Contractor:
 - 1. The Contractor shall ensure that ventilation air is provided in the quantities required to maintain OSHA air quality limits, all Permissible Exposure Limits (PELs), and all ACGIH Threshold Limit Values (TLVs) and to maintain exposures As Low As Reasonably Achievable (ALARA).
 - 2. For activities outside of enclosures, nuclear grade HEPA filters with a flexible ventilation duct shall be used as follows:
 - a. Exhaust rate of the HEPA filters with a flexible ventilation duct shall maintain sufficient airflow capture velocity to prevent entry of fumes into the room. A minimum face velocity of 150 fpm is required.
 - b. Each HEPA filter with a flexible ventilation duct in the cutting area should be capable of being isolated by means of control dampers to prevent backflow through a hood when it is not in service.
 - c. The Contractor shall ensure that all local containments can maintain negative pressures. The exhaust volume rate shall be as required to attain 0.1 inch negative pressure within the containment. The exhaust air stream must be HEPA filtered. When containments are out-of-doors or border the outdoors, or are to be used for torch-cutting in the size reduction area, containments must have an airlock for the passage of equipment, personnel, and materials, so the main body of the containment is never directly open to the atmosphere. Other containments must be maintained such that there are no undesigned holes in the containment and the entrance/exit-way closes sufficiently to meet the air exchange/negative pressure requirements.

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3.4 QUALITY ASSURANCE

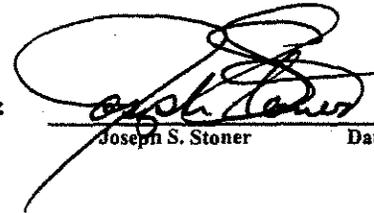
Final acceptance of local containments, building enclosures, and vestibule structures shall be obtained from Fluor Fernald.

END OF SECTION

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Approved:

 12/10/01
 Joseph S. Stoner Date

SECTION 15860

HEPA AIR FILTRATION DEVICE REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. The subcontractor shall provide:

1. Portable 1,000/2,000 cfm air filtration devices,
2. All services and consumables, pre-filters, exhaust ducts, differential pressure gauges and accessories needed to operate. Poly Alpha Olefin (PAO) testing is an exception to this requirement.

Note: Air filtration devices purchased, leased and/or used at the FEMP will meet the minimum requirements of this specification.

1.2 RELATED SECTIONS

- A. Section 01516 – Asbestos Abatement.
- B. Section 07415 – Transite Removal.
- C. Section 11010 – HEPA Vacuum Cleaner Requirements.
- D. Section 15067 – Ventilation and Containment.
- E. Section 15065 – Equipment and System Dismantlement.

1.3 REFERENCES, CODES, AND STANDARDS

- A. Department of Energy (DOE)
DOE O6430.1A-89 General Design Criteria
- B. Code of Federal Regulations (CFR)
10CFR830.120 Quality Assurance Program
- C. Air Movement and Control Association (AMCA)
AMCA 210-99 Laboratory Method for Testing Fans for Aerodynamic
Performance Rating
- D. American Society of Mechanical Engineering
ASME AG-1a-00 Code on Nuclear Air and Gas Treatment

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- E. National Fire Protection Association (NFPA)
NFPA 70-99 National Electric Code

- F. Underwriters Laboratories (UL)
UL 586 Standard for Safety/HEPA Filter Units
UL 900 Standard for Safety/Test Performance of Air Filter

- G. American National Standards Institute/American Society of Heating, Refrigeration and Air-Conditioning Engineering (ANSI/ASHRAE)
ANSI/ASHRAE 52.1-92 Gravimetric and Dust Spot Procedures for Testing Air Cleaning Devices Used in General Ventilation for Removing Particulate Matter

1.4 SUBMITTALS

- A. Submit for Compliance Review
 - 1. Shop Drawings: Shop Drawings shall include assembly drawings,
 - 2. Fan airflow performance curves,
 - 3. Motor ratings for one hundred percent (100%) continuous operation duty cycle,
 - 4. Unit power requirements including voltage and current requirements,
 - 5. Electrical components and controls used by operator, and
 - 6. Warranty.

- B. The Subcontractor shall submit:
 - 1. For each air filtration device provided a certification of compliance with this specification.
 - 2. Documentation that the filters are designed, manufactured, and tested under a Quality Assurance program meeting all requirements of 10CFR830.120.
 - 3. The manufacturer's warranty on the HEPA filter, including the maximum allowable shelf life.

- C. Submit with the Delivery:
 - 1. Manufacturer shall provide with the shipment:
 - a. Complete installation instructions.
 - b. An operations and maintenance manual, including instructions for changing the filters, periodic cleaning, lubrication, and motor and drive assembly replacement.
 - c. A complete spare parts list.
 - d. Electrical wiring diagrams.

1.5 QUALITY ASSURANCE

- A. Certificate(s) of Conformance: The Manufacturer shall certify that the supplied product meets or exceeds the requirements of this Fluor Fernald specification. Unit(s) submitted for purchase shall pass the site PAO test with a minimum in-place efficiency of 99.97%. Failure to pass this site test shall be cause for rejection of the unit. The unit shall be shipped back to the manufacturer or supplier at no cost to Fluor Fernald.

- B. The 1,000/2,000 cfm. HEPA filter element(s) shall be nuclear grade, UL 586 approved and certified, and manufactured in accordance with ASME AG-1a. HEPA filters shall be PAO

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smoke efficiency tested and certified by the filter manufacturer at one hundred percent (100%) and twenty percent (20%) of the rated flow.

- C. Fan Performance Ratings: All fans shall conform to AMCA 210 and bear the AMCA Certified Rating Seal with a certificate of compliance.
- D. All operation and testing of filter materials shall be in compliance with NFPA 70, UL 900, and UL 586, as referenced.
- E. Both interior and exterior surfaces of the HEPA filter housing and fan assembly must be cleaned of weld flux, oil, grease, shop soil, and visible rust.
- F. Each air filtration device shall be fully warranted for a period of one year.
- G. Fluor Fernald shall reserve the right to inspect these units at the point of manufacture.
- H. The filter bulkhead inside the air-handling equipment shall be flat, clean, smooth and free of defects. Gaskets and/or caulking shall not be an acceptable fix of defects with the bulkhead.

PART 2 PRODUCTS

2.1 SUGGESTED MANUFACTURERS (OR APPROVED EQUAL)

A. Local

- | | |
|---|--|
| <p>Abatement Cooperatives
Cincinnati, OH
(513) 860-3444</p> <p>American Air Filter, Inc.
Cincinnati, Ohio
(513) 825-6565</p> <p>Control Resource Systems, Inc.
Michigan City, IN
(800) 272-3786</p> | <p>Aerospace America, Inc.
Bay City, Michigan
(517) 884-2121</p> <p>Charcoal Services Inc.
Cincinnati, Ohio
(513) 771-2820</p> <p>Flanders Filters, Inc.
Washington, N.C.
(919) 946-8081</p> |
|---|--|

B. Other's

- | | |
|---|---|
| <p>Elgin, IL
Local: CSE 769-3400
(708) 695-5822</p> <p>NFS/RFS
Connecticut
(203) 434-0660</p> <p>ADVEX Corp.
Hampton, Virginia
(804) 865-0920</p> | <p>IONEX Research Corp.
Colorado
(303) 666-4400</p> <p>Power Products and Services Co. Inc.
Forest, VA
(804) 525-8120</p> |
|---|---|

C. Recommended Air-Handling Equipment

The following equipment has been purchased in the past for use at the Fluor Fernald site and has consistently met the requirements:

Note: Do not order a ventilation device by model number only. The requirements must be stated in order to ensure that the specifications are met.

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1. AIRHOG Model HV-2000-BI/BO
Power Products and Services Co. Inc.

Remarks: Reliable, high flow rates at moderate pressures, can be supplied weatherproof.

2. NFS-RPS Model PFB-1600
NFS-RPS

Remarks: Reliable can be supplied weatherproof.

3. CSC Model 1H1W-012-1NB-3S
Charcoal Service Corporation

Remarks: Reliable can be supplied weatherproof.

4. Aero-Clean 2000/1000 - Model # 9103
Aerospace America, Inc

Remarks: Weather proofing or bag-in/bag-out technology cannot be supplied. This equipment can not be used outdoors. A differential pressure alarm must be specified or it will not be provided.

2.2 PRODUCTS/EQUIPMENT

A. Disposable Pleated Prefilter:

1. Media:
 - a. Shall be UL 900 Class I or II, with an effective open area of not less than ninety percent (90%).
 - b. The media filtering surface shall be a minimum of seventeen square feet (17 ft²).
 - c. A six-inch to twelve-inch (6" to 12") pre-filter to protect the HEPA Filter with an efficiency rating of eighty-five percent (85%) shall also be provided.
2. Frame:
 - a. A housing that accommodates two stages: a Prefilter; and, a High Efficiency Particulate Air (HEPA) filter.
 - b. Heavy duty, rigid construction, fire retardant, moisture resistant, with diagonal support members bonded to the air entering and exit sides of each pleat. The inside periphery of the enclosing frame shall be bonded to the air filter pack.
 - c. The actual frame size shall be twenty-four inches high by twenty-four inches wide by two inches deep (24" high x 24" wide x 2" deep; tolerance +0, -0.125" (610 mm high x 610 mm wide x 50 mm deep; +0, -3mm)).
3. Rating, ASHRAE 52.1-92:
 - a. The dust spot efficiency shall have a rated average efficiency of not less than thirty percent (30%) for two-inch or four inch (2" or 4") filters and eighty-five percent (85%) for six inch or twelve inch (6" or 12") filters.

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- b. The initial resistance shall not exceed three-tenths inch (0.3") water gauge at one-thousand cubic feet per minute (1,000 cfm), nominal.

2.3 MATERIALS

A. HEPA Filters:

1. Filter Construction:

- a. The 1,000-2,000 cfm HEPA filter element shall be a "nuclear grade", and the media shall meet the requirements of UL 586 and ASME AG-1a.
- b. The holding frame shall be stainless steel.
- c. The construction of the filter and media to frame side bond shall meet the UL 586 and ASME AG-1a standards.
- d. The face gasket shall be Neoprene expanded rubber with dovetail or butterfly joints. The gasket can be on both sides but, at least, located on the sealing face of the filter.
- e. The actual size shall be twenty-four inches high by twenty-four inches long by eleven and one-half inches deep plus zero inches, minus one-eighth inches (24" x 24" x 11.5", +0", - 1/8" (610 mm high x 610 mm wide x 292 mm deep; +0, -3 mm)). Squareness of the filter shall be plus or minus one-eighth ($\pm 1/8$ ") and a depth of plus and minus one-sixteenth ($\pm 1/16$ ").
- f. Filters shall have face guards on both open faces of the filter in accordance with ASME AG-1a.
- g. The HEPA filter frame shall be labeled, certifying:
 - The manufacturer's name,
 - Manufacturer's unique code Underwriter's Laboratory (UL) registration number indicating compliance with UL 586,
 - Filter efficiency based on PAO testing,
 - Resistance at the test airflow rate,
 - Filter part number and serial number,
 - Test airflow direction, and
 - Filter Grade, i.e., "Nuclear Grade".

B. Performance Rating:

1. The minimum certified efficiency should be ninety-nine and ninety-seven one hundredths percent (99.97%), when PAO tested with three-tenths micron particles (0.3 μ) at one-hundred percent (100%) and twenty percent (20%) of the rated flows.
2. The rated clean resistance shall not exceed one-inch (1.0") water gauge at one thousand cubic feet per minute (1,000 cfm) and two and two tenths inch (2.2") water gauge at two thousand cubic feet per minute (2,000 cfm).
3. The HEPA filter shall withstand a ten-inches (10") water gauge pressure drop.
4. The HEPA filter shall be capable of continuous twenty-four hour-per-day (24-hr/day) use

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at two hundred degrees Fahrenheit (200°F).

C. Air Filter Housing Construction:

1. The cabinet housing shall be:
 - a. Reinforced and capable of handling two thousand cubic feet per minute (2,000 cfm) at ten-inches (10") water gauge negative pressure air flow.
 - b. Ruggedly constructed and made of durable materials, such as sixteen gauge (16 Ga.) aircraft aluminum, sixteen gauge (16 Ga.) stainless or cold rolled steel. All cold rolled steel shall be coated with manufacturer's standard rust inhibiting paint.

NOTE: Chromium or Cadmium plated metals shall not be used.
 - c. Designed and constructed in a manner that does not require the airflow to change direction through the housing as it enters or exits the housing.
 - d. A standard size to provide for interchange ability of the prefilter and HEPA filter media from other manufacturers. All filter media shall meet the dimensions of this specification. Prefilter media shall be mounted upstream from HEPA filter media.
2. The cabinet housing shall:
 - a. Have a steel filter-mounting frame to allow the filters to be self-supporting and easily installed and serviced from a front or side servicing arrangement.
 - b. Have all joints and seams welded air tight and free from all burrs and sharp edges.
3. The exhaust ports shall provide for flexible ductwork connections. An attachable hood shall be provided for each inlet flexible duct connection to allow for localized ventilation applications.
4. The air filtration unit shall be able to pass through a thirty-four inch (34") wide opening.
5. Each assembly unit shall be a portable type with two fixed and two locking swivel casters to secure the unit when in operation.
6. The Fan shall be installed downstream from the HEPA filter.
7. The unit shall be a bag-in/bag-out type for the pre-filters and HEPA filters for outdoor use.

D. Centrifugal Fan:

1. Minimum Performance:
 - a. The actual airflow shall be eighteen hundred cubic feet per minute (1800 cfm) at one and one-half inch (1.5") water gauge minimum with all filters installed.
 - b. The fan motor shall be a one and one-half horsepower (1.5 hp); one hundred twenty Volts Alternating Current (120VAC), fifteen amperes (15A), single phase, sixty-hertz (60 Hz), multi-speed, high efficiency, standard "plug-in" (grounded plug) unit.
 - c. The fan motor shall have a one hundred percent (100%) continuous duty cycle rating with thermal overload protection.

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E. Control Panel:

1. A direct reading dial type magnahelic or photohelic differential pressure gauge with a range of zero inch to five inches (0" to 5") water gauge, in a weatherproof housing. The Differential Pressure Gauge shall be piped to read the pressure drop across the HEPA and prefilters. The Differential Pressure Gauge shall be factory mounted and located on the control panel. The Differential Pressure Gauge shall have an easy access front to rear calibration adjustment.
2. Each air filtration device will be equipped with a "power on" indicator light, high and low differential pressure alarm indicator light and audible alarms for all alarm conditions.
3. The unit shall have a running time meter with a range of ten thousand hours (10,000 hrs.) to monitor service use.

F. Safety Controls

1. The unit shall have an automatic shutdown system that detects an adjustable low or high differential pressure condition.
2. An electrical or mechanical lockout shall prevent the fan from operating when the HEPA filter is not in place.

G. Any air filtration device used for local ventilation shall have the appropriately sized flexible duct for the required transport velocity, attachable hood, spark arrestor, and hood positioning device as manufactured for the unit.

H. The air filtration device shall be the bag-in/bag-out style.

2.4 LABELING

- A.** Each air filtration device shall be permanently labeled with the manufacturer's name and serial/model number on the housing.
- B.** The HEPA filter frame shall be labeled as described in Section 2.3.A.1.g of this specification.

PART 3 EXECUTION

3.1 ERECTION/INSTALLATION/APPLICATION

A. Subcontractor's Responsibility

1. When there is no longer a need for the air filtration device at the Fluor Fernald site, the subcontractor shall turn-over the unit to Fluor Fernald Project Manager in good operating condition, except for normal wear and tear including painting, cleaning, and lubrication.
2. The subcontractor shall inspect and document air filtration devices operations per requirements of the Manufacturer's Operating and Maintenance instructions and subcontract provisions.
3. Air filtration devices are required in all work areas at the Fluor Fernald site. This equipment shall be used only for ventilation tasks approved by Radiological Protection and/or Industrial Hygiene for which a Radiation Work Permit, Asbestos Permit or Chemical Hazardous Material Work Permit has been prepared. These permits will specify any precautions or limitations required on the use of this equipment.

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4. The subcontractor shall be responsible for the efficiency and effectiveness of the ventilation equipment during operation. A minimum cross sectional face velocity of one-hundred twenty-five feet per minute plus or minus twenty-five feet per minute (125 ft/min \pm 25 ft/min) shall be maintained at all times through all openings as identified in DOE O 6430.1A; Division 11.

B. Fluor Fernald Responsibilities

1. Fluor Fernald shall provide a PAO test(s) following installation of a HEPA filter to ensure that the filter is in good condition and is properly installed. The PAO test shall be repeated anytime the air filtration device is opened or dropped, when the HEPA seal is broken, and at least every six (6) months. A tag or label showing the date that a PAO test has been performed and the date the test expires shall be affixed to the filter housing and shall not be removed by the subcontractor. Any air filtration device found with seals broken or other evidence of tampering shall be removed from service until it has been inspected and PAO tested by Fluor Fernald to ensure proper installation of the pre-filter and HEPA filter. The subcontractor shall provide forty-eight hours (48-hr.) notice for a new HEPA filter and PAO test services.
2. Fluor Fernald will provide any subsequent HEPA filters and PAO testing, not pre-filters, that the subcontractor may need on a cost recovery basis for the filter.

END OF SECTION

APPENDIX D

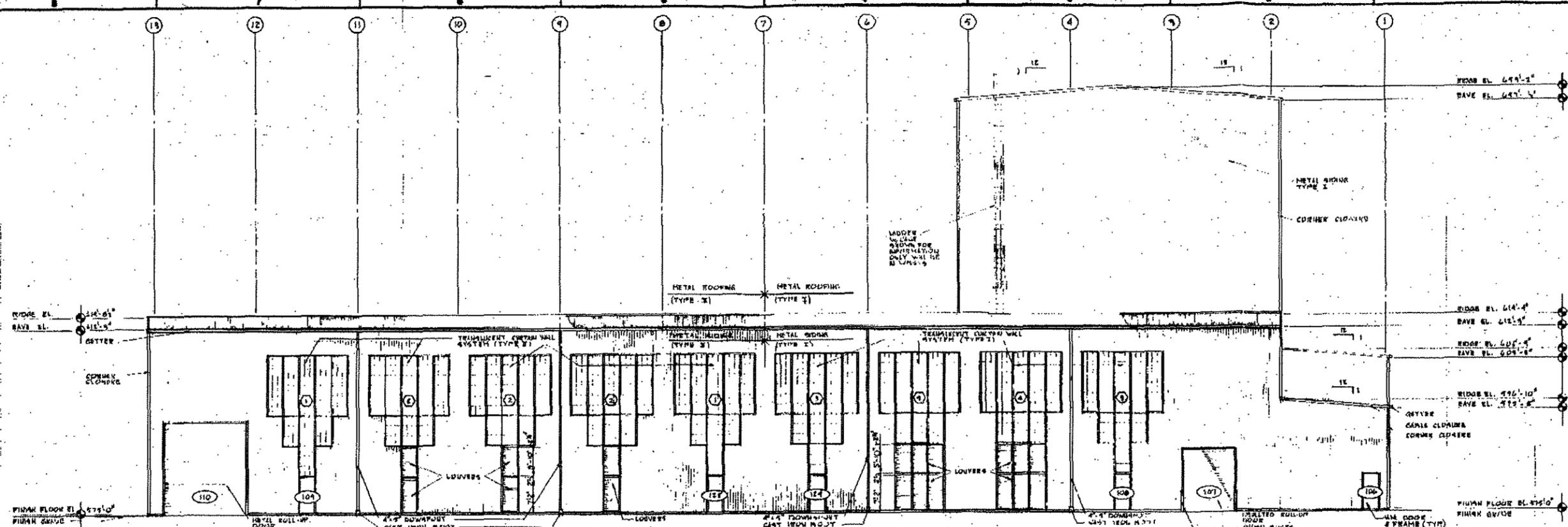
DESIGN DRAWINGS

Representative architectural and D&D design drawings were copied, compiled and are presented in this appendix. Table D-1 lists the drawings included in this appendix. Descriptions of the buildings, systems and process areas illustrated in these drawings may be found in Section 3.0.

TABLE D-1 AWWT Complex Drawings

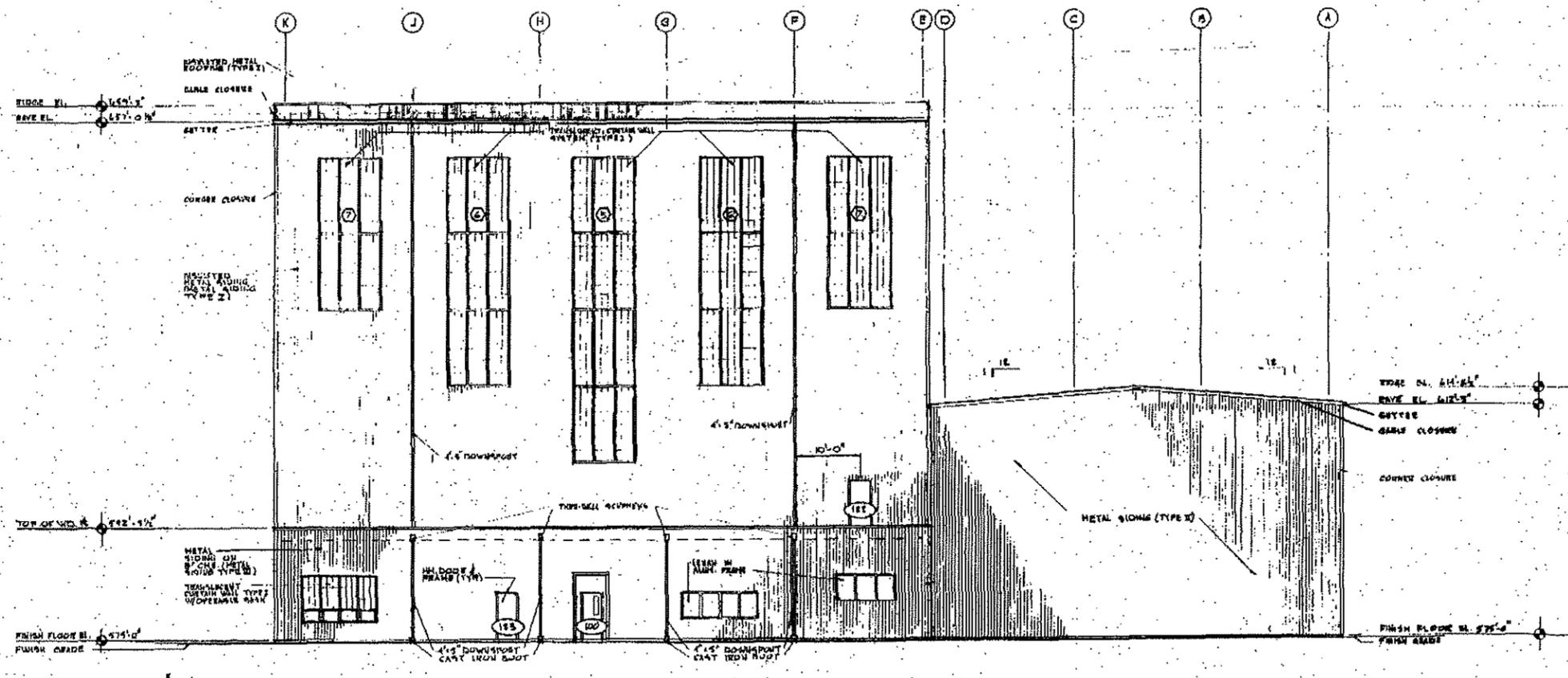
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51X-1910-A-00014	0	Component 51A, Building Elevations
51X-1910-A-00015	1	Component 51A, Building Elevations
51X-1910-A-00016	0	Component 51A Building Elevations
51X-5500-A-00412	2	Component 51A & 51C Ground Floor Plan
51X-5500-A-01091	0	Component 51B Ground Floor Plan
51D-5500-A-01326	0	Converted AWWT (CAWWT) General Equipment Layout

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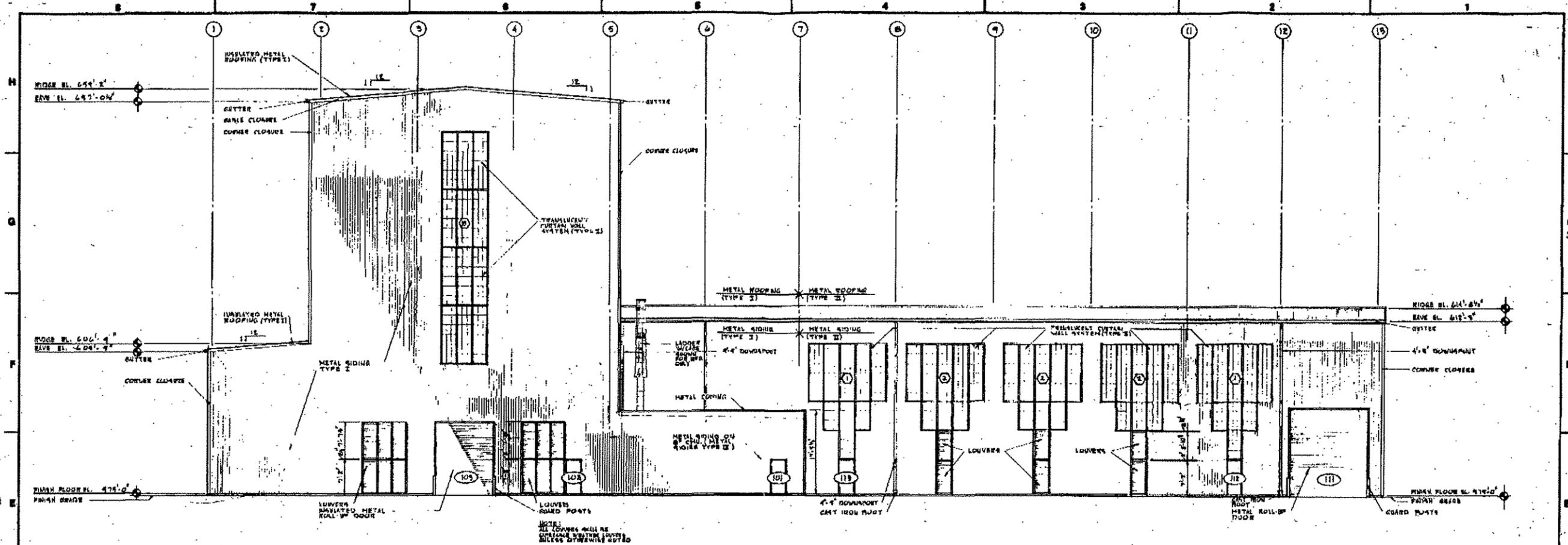
SOUTH ELEVATION
SCALE: 1/8" = 1'-0"

DRAWING NOTES
① REFER TO PANEL NUMBER SEE DRAWING FOR DIMENSIONS & DETAILS

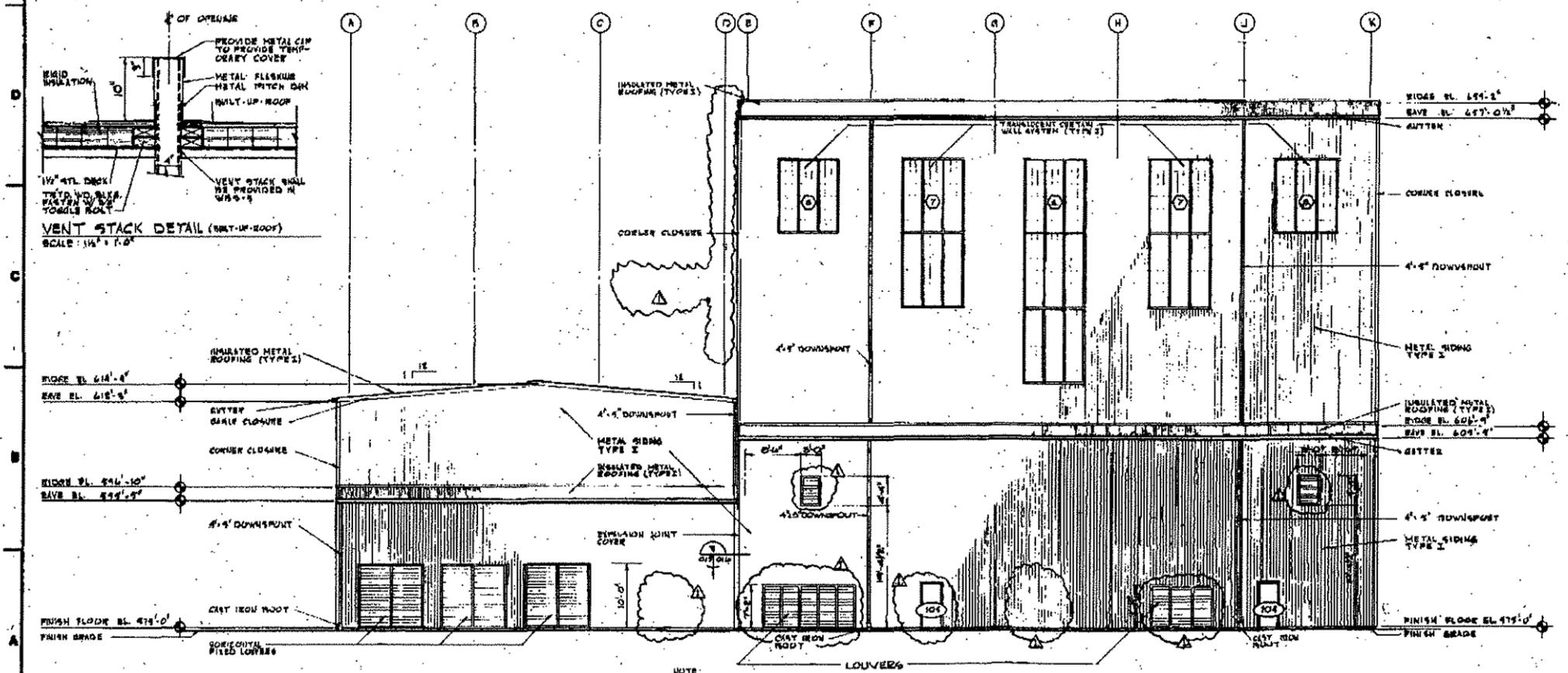


WEST ELEVATION
SCALE: 1/8" = 1'-0"

<input checked="" type="checkbox"/> CERTIFIED FOR CONSTRUCTION		<input type="checkbox"/> NOT FOR CONSTRUCTION
UNITED STATES DEPARTMENT OF ENERGY		
SANDERS & THOMAS, INC. ARCHITECTS PROFESSIONAL FIRM POTTSTOWN, PA 19464		
PROJECT NAME: UF - UF₂ FACILITIES EXPANSION		
ARCHITECTURAL BUILDING ELEVATIONS		
DRAWN BY: M. WALSH	DATE: 10-21-85	DESIGNED BY: M. WALSH
CHECKED BY: J. BECHTEL	DATE: 11-2-85	PROJECT NO.: CP-83-39
APPROVAL FOR APPROVAL: CRAIG OLSON	DATE: 10-28-85	DRAWING NUMBER: 50X-1910-A-0004
OPER. CONTRACTOR: DATE: 12-12-84	DATE: 12-12-84	SHEET NO.: 0

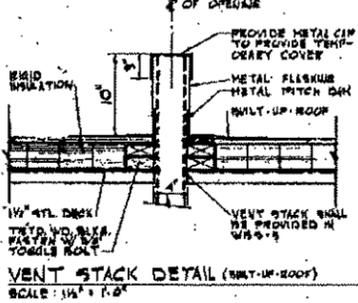


NORTH ELEVATION
SCALE: 1/8" = 1'-0"



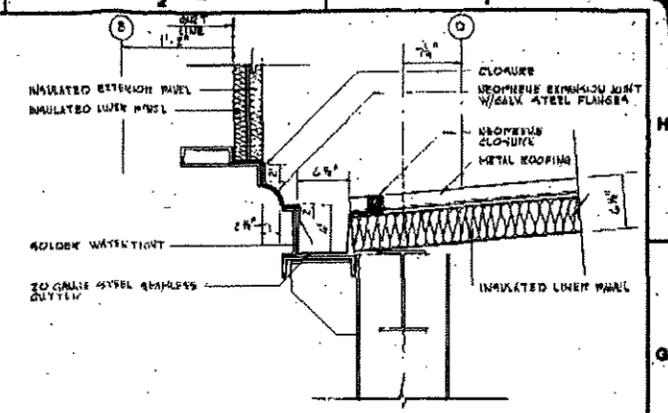
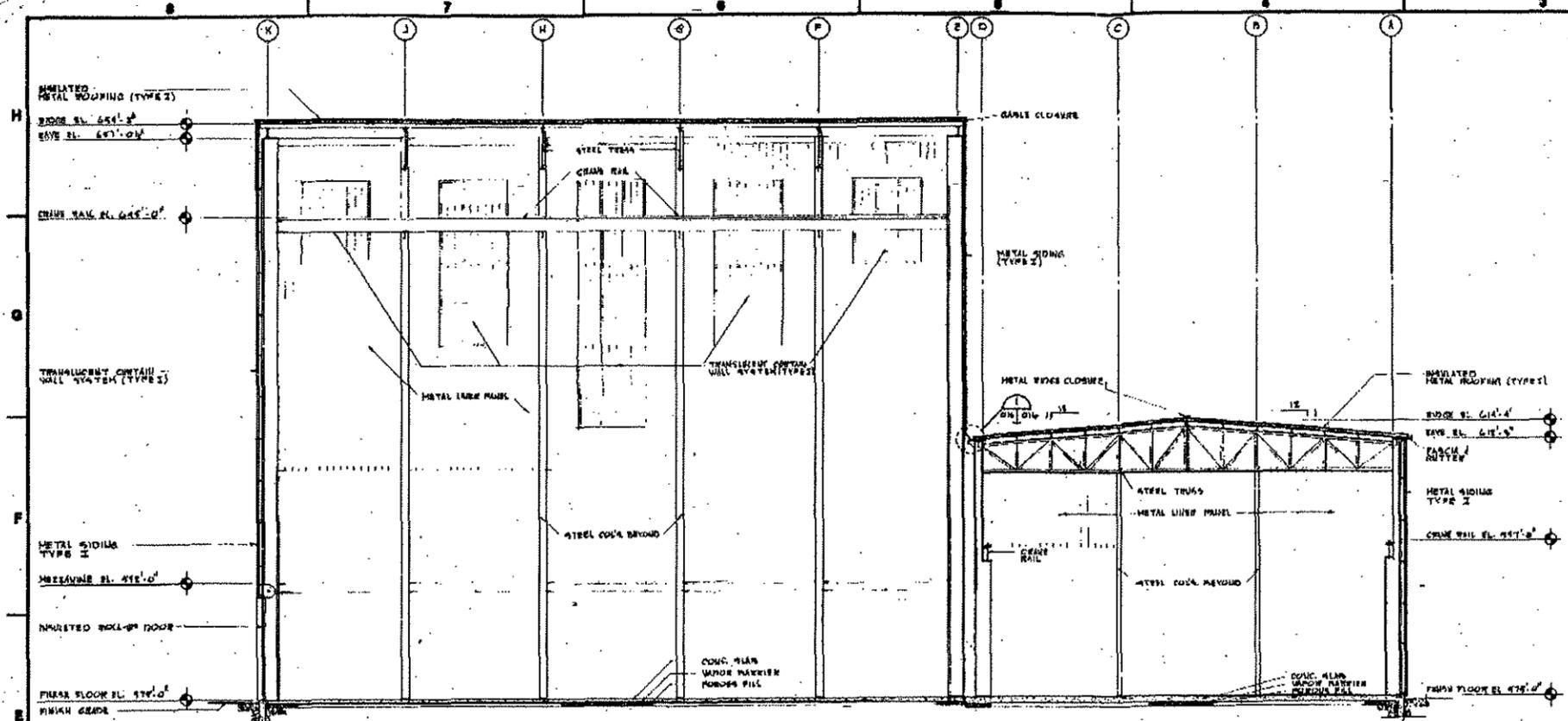
EAST ELEVATION
SCALE: 1/8" = 1'-0"

DRAWING NOTES
① REFERS TO PANEL NUMBER, SEE DWG NO. 09 FOR DIMENSIONS & DETAILS.

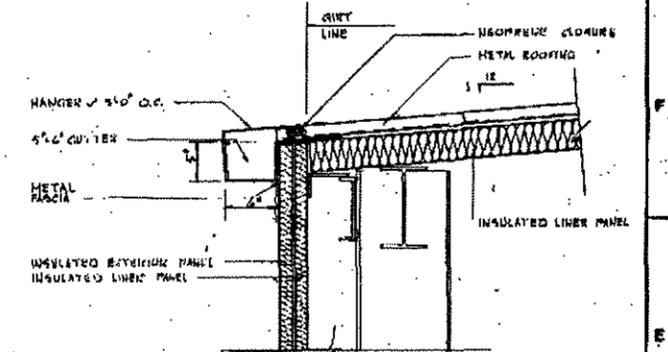


VENT STACK DETAIL (RMT-UP-ROOF)
SCALE: 1/4" = 1'-0"

MHC HVAC REVISIONS		DATE	BY	REVISION
CERTIFIED FOR CONSTRUCTION		DATE	BY	REVISION
<p align="center">UNITED STATES DEPARTMENT OF ENERGY</p> <p align="center">SANDERS & THOMAS, INC. AN EIT ENGINEERS PROFESSIONAL FIRM POTTSVILLE, PA. 19464 SEE CONTRACT NO. DE-AC05-80OR21404 AS NO. 15-014</p> <p align="center">UF₂-UF₃ FACILITIES EXPANSION</p> <p align="center">DRAWING TITLE ARCHITECTURAL BUILDING ELEVATIONS</p>				
DATE	BY	DESIGNED BY	CHECKED BY	DATE
11-2-84	H.W.	F.W.	H.J.	11-2-84
PROJECT NO.	DRAWING NUMBER	DATE	SCALE	SCALE
CP-83-39	SIX-190-A-00015	11-2-84	1/8" = 1'-0"	1/8" = 1'-0"

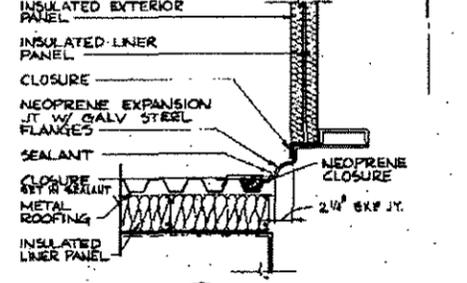
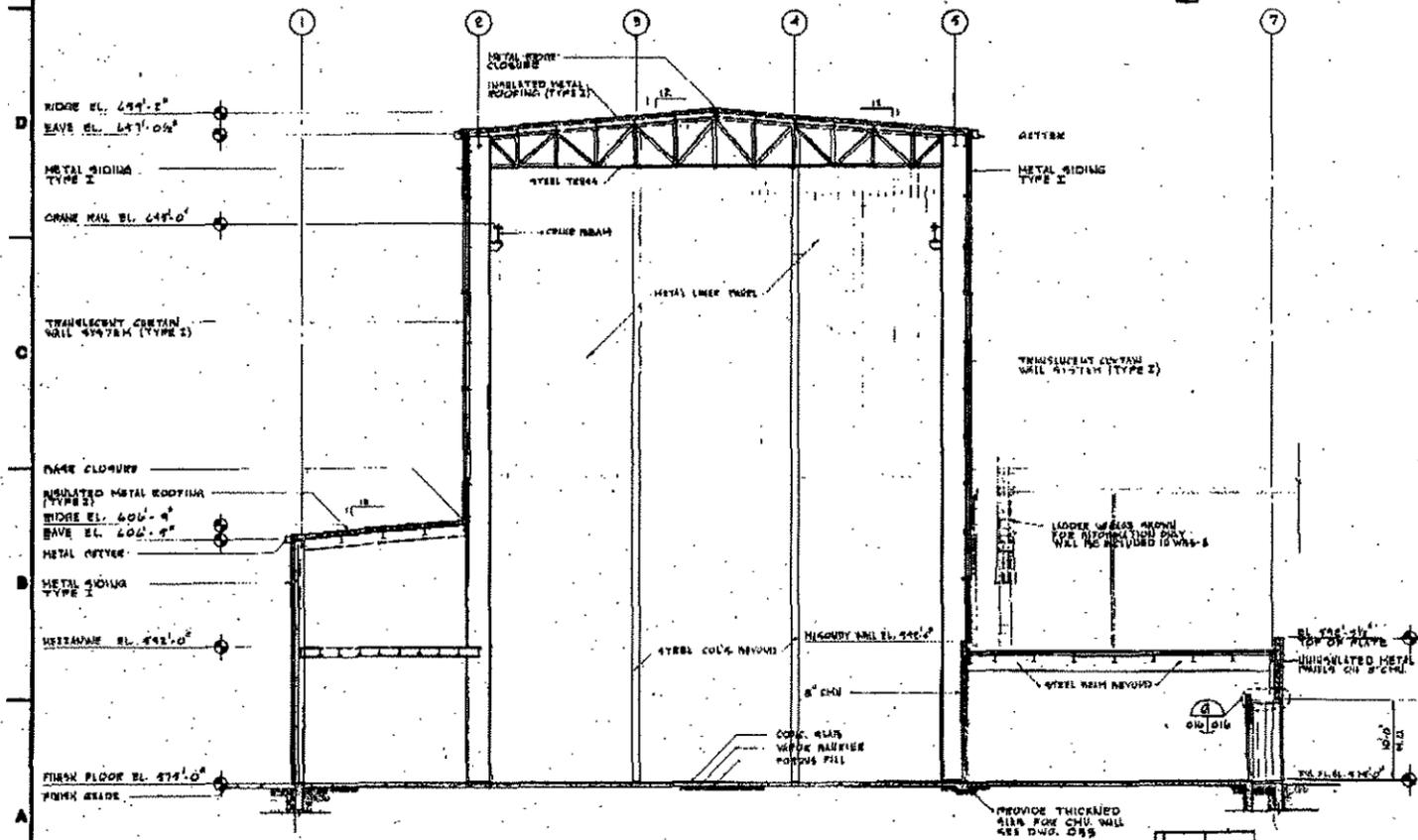


DETAIL
SCALE: 1/4" = 1'-0" 016/016

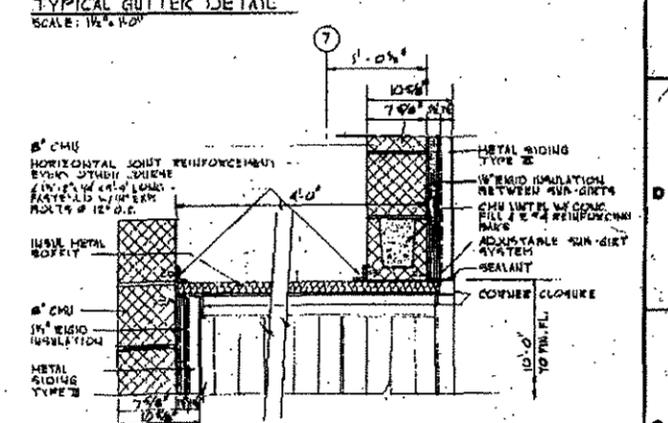


TYPICAL GUTTER DETAIL
SCALE: 1/4" = 1'-0"

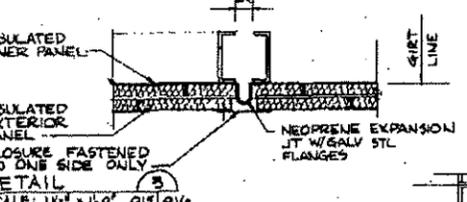
SECTION
SCALE: 1/8" = 1'-0" 016/016



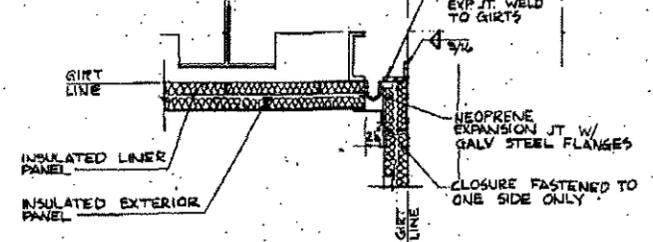
DETAIL
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SECTION
SCALE: 1/8" = 1'-0" 016/016

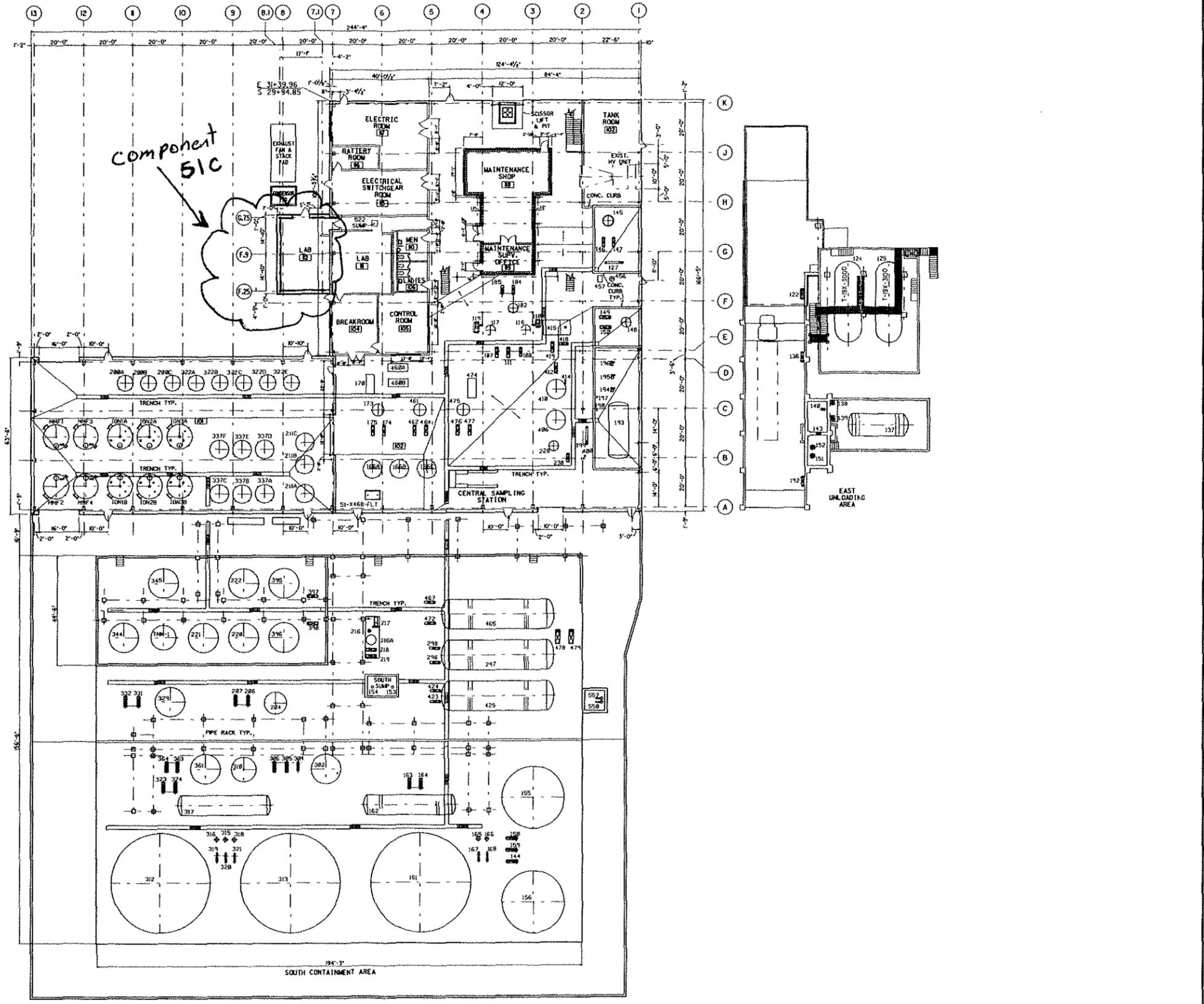


DETAIL
SCALE: 1/4" = 1'-0" 016/016



DETAIL 4 SHOWS 5 SIMILAR
SCALE: 1/4" = 1'-0" 016/016

CERTIFIED FOR CONSTRUCTION		DATE	DESIGNED BY	CHECKED BY	DATE
PROJECT TITLE		DATE	PROJECT NO.	DATE	DATE
UNITED STATES DEPARTMENT OF ENERGY					
SANDERS & THOMAS, INC. AN ARCHITECTURAL FIRM POTTSVILLE, PA. 19464					
PROJECT TITLE UF-UF FACILITIES EXPANSION					
DRAWING TITLE ARCHITECTURAL BUILDING SECTIONS & DETAILS					
DRAWN BY	DATE	DESIGNED BY	CHECKED BY	DATE	DATE
PLANNED BY	DATE	PROJECT NO.	DATE	DATE	DATE
REVISIONS FOR APPROVAL	APPROVAL RECOMMENDED	DATE	DATE	DATE	DATE
DATE	DATE	DATE	DATE	DATE	DATE
PROJECT NO.	DATE	DATE	DATE	DATE	DATE
CP-83-39	DATE	DATE	DATE	DATE	DATE



NO.	REVISIONS	DATE	OWN.	BY	APPD.	NO.	REVISIONS	DATE	OWN.	BY	APPD.	REF. DWG. NO.
2	ADDED AWWT LABORATORY EXPANSION	3/7/96	WPD	GEP			51F-1900-A-0146					
1	REDRAWN & UPDATED	1/15/96	SJS/WMD	GEP			51D-4445-A-00449					

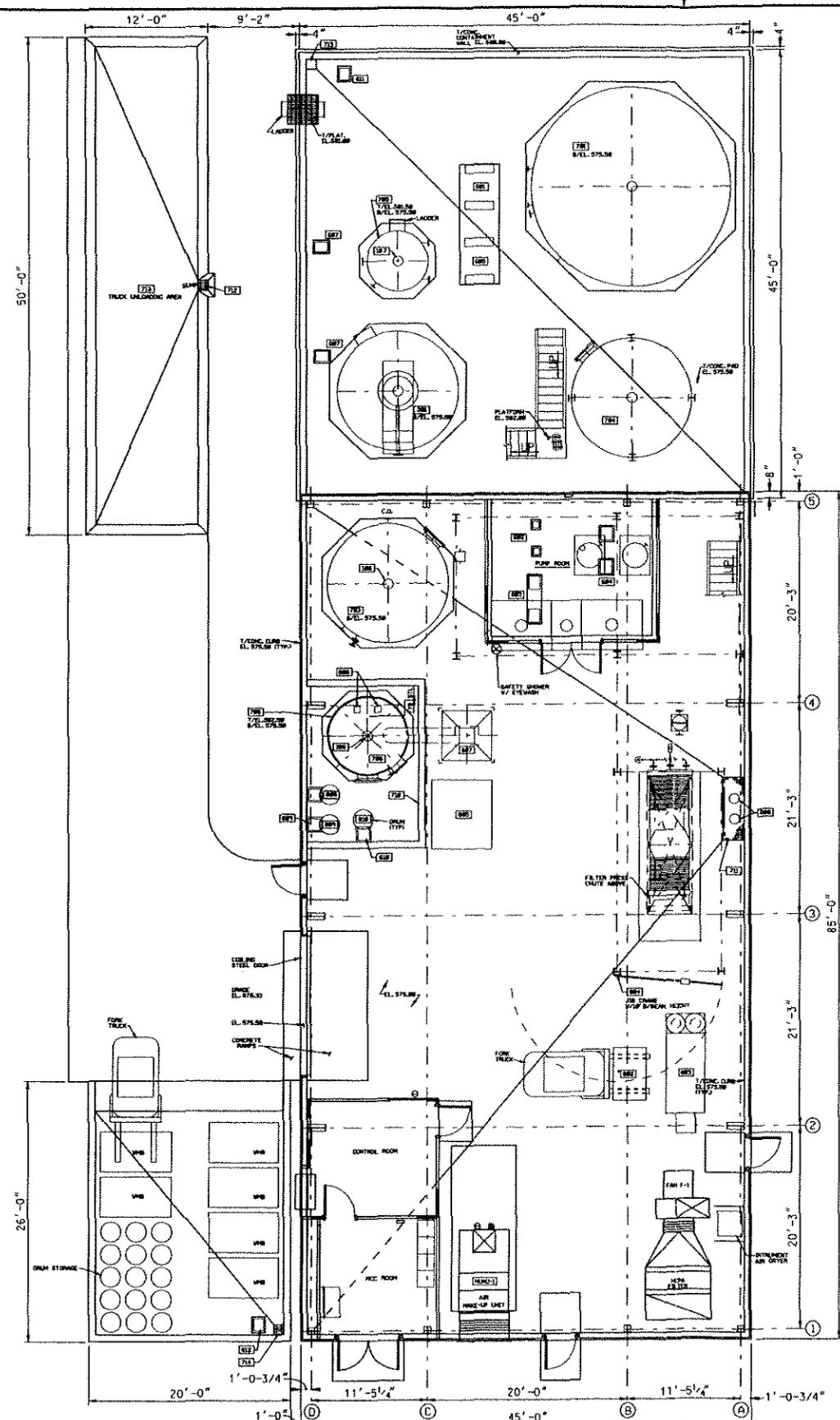
NOTE: FERMCO C.A.D. DRAWING NOT TO BE REVISED MANUALLY

CONFIGURATION MANAGEMENT CONTROL SHEET
 CONTROL NUMBER: 51C-001
 CONTROL POINT: 51C-001
 CONTROL POINT: 51C-001

APPROVALS		APPROVALS	
CIVIL & STR.		SAFETY ENG.	
ELECTRICAL		MAINTENANCE	
ENGINEER		G.A.	
INSTRUMENT		FIRE PROTECT.	
MECHANICAL		WASTE MGMT.	
		SECURITY	
		CRU	

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
 Fernald
 Environmental Management Project
U.S. DEPARTMENT OF ENERGY

FIN. FL. EL. 575'-0"
 BLDG. SIA 51C
 ADVANCED WASTEWATER TREATMENT FACILITY (AWWTF)
 FLOOR PLAN
 1/16" = 1'-0"
 DATE: 3/20/96
 DRAWN: S.J. SMOCK
 SIX-5500-A-00412 2



BLDG. 51B EQUIPMENT LIST (SLURRY DEWATERING FACILITY)

- 100 - AGITATORS**
 - 101 - SURGE TANK AGITATOR
 - 102 - PH ADJUST AGITATOR
 - 103 - DIATOMACEOUS EARTH FLASH MIX AGITATOR
 - 104 - FLOCCULATION TANK AGITATOR
 - 105 - MISCELLANEOUS SLURRY TANK AGITATOR
 - 106 - FILTER FEED TANK AGITATOR
 - 107 - DISCHARGE TANK AGITATOR
 - 108 - BODY FEED AGITATOR
 - 109 - CAUSTIC DAY TANK AGITATOR
- 300 - THICKENERS**
 - 301 - SLUDGE THICKENER
- 400 - FILTERS**
 - 401 - FILTER PRESS
- 600 - PUMPS**
 - 601 - SURGE TANK PUMPS
 - 602 - THICKENER PUMPS
 - 603 - FILTER FEED PUMPS
 - 604 - MISC. SLURRY TANK PUMPS
 - 605 - DISCHARGE TANK PUMPS
 - 606 - DIATOMACEOUS EARTH FEED PUMPS
 - 607 - MISCELLANEOUS SLURRY FILL PUMPS
 - 608 - BUILDING SUMP PUMPS
 - 609 - FERRIC CHLORIDE METERING PUMPS
 - 610 - ALUM METERING PUMPS
 - 611 - OUTSIDE TANK CONTAINMENT SUMP PUMP
 - 612 - WMB STORAGE CONTAINMENT SUMP PUMP
- 700 - TANKS**
 - 701 - SURGE TANK
 - 702 - SLUDGE CONDITIONING TANK
 - 703 - FILTER FEED TANK
 - 704 - MISCELLANEOUS SLURRY TANK
 - 705 - DISCHARGE TANK
 - 706 - BODY FEED TANK
 - 707 - CAUSTIC DAY TANK
 - 708 - SULFURIC ACID DAY TANK
 - 709 - SAMPLE SINK
 - 710 - CONTAINMENT BASIN
 - 711 - BUILDING SUMP
 - 712 - TRUCK UNLOADING CATCH BASIN
 - 713 - OUTSIDE TANK CONTAINMENT SUMP
 - 714 - OUTSIDE/MATERIAL STORAGE/CONTAINMENT SUMP
- 800 - MISCELLANEOUS**
 - 801 - FILTER PRESS HOIST
 - 802 - TILTABLE CAKE HOPPER
 - 803 - DRUM LOADING HOPPER
 - 804 - JIB CRANE
 - 805 - WEIGH SCALE
 - 806 - POLYMER FEEDER
 - 807 - DIATOMACEOUS EARTH FEED SYSTEM
 - 808 - DRUM ROLLER
 - 809 - FERRIC CHLORIDE FEED STOCK
 - 810 - ALUM FEED STOCK
- OTHERS**
 - MJAU-1 - AIR MAKE-UP UNIT

**PRELIMINARY
INFORMATION ONLY**
CADD SERVICES

NO.	REVISIONS	DATE	OWN.	BY	APPD.	NO.	REVISIONS	DATE	OWN.	BY	APPD.	NO.	REF. DWG. NO.

NOTE:
FLUOR DANIEL
FERNALD CADD
DRAWING.
DO NOT REVISE
MANUALLY.

CONFIDENTIAL
MANAGEMENT
DRAWING

COORDINATOR ENGINEER DATE

APPROVALS	
CHEV & STR.	SAFETY ENG.
ELECTRICAL	FIRE PROTECT.
ENGINEER	WASTE MANAGE.
INSTRUMENT	SECURITY
MECHANICAL	PROJECTS
CHECKED	
APPROVED	

Fernald Environmental
Management Project

**FLUOR DANIEL
FERNALD**

U.S. DEPARTMENT OF ENERGY

BLDG. 51B SLURRY DEWATERING FACILITY GROUND FLOOR FLOOR PLAN SCALE: 3/16" = 1'-0"	FIN. FLOOR ELEV. 575'-0"
DATE: 02-19-98 DRAWN: W. BROWN	51X-5500-A-01091 0

FILE NAME: k:\floor\51b.dgn

51b CADD10 pau17461 02/10/2005 07:57:49 AM

APPENDIX E

PHOTOGRAPHS

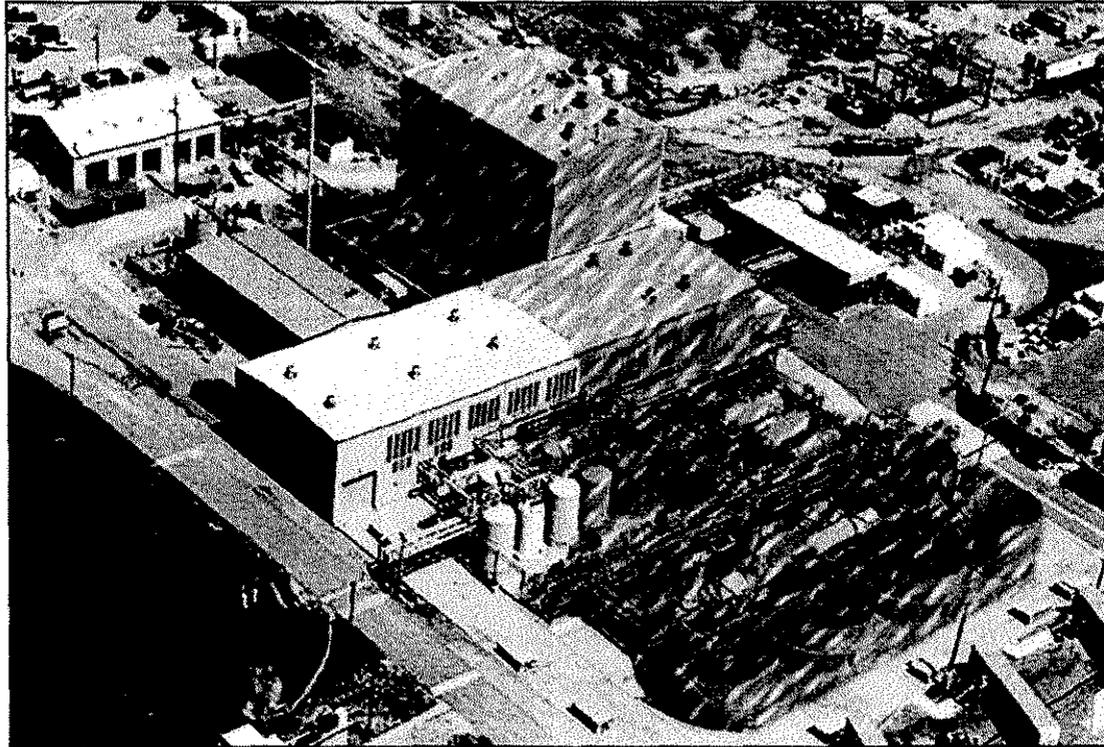
Photographs were compiled for the AWWT Complex D&D Project. The Component location for each photograph is identified below:

TABLE E-1 Photographs

FCP NEGATIVE NUMBER	BUILDING/COMPONENT	LOCATION
8070D-158 Highlight AWWT	Component 51A – The gray, hatched area will be demolished. Note: The single-story gray warehouse is Component 51B and will be demolished.	Exterior – Aerial
8027D-154 Highlight AWWT	Component 51A – The gray, hatched area will be demolished. Note: The single-story warehouse is Component 51B and will be demolished.	Exterior – Aerial
8070D-153 Highlight Slurry	Component 51B – The gray, hatched area will be demolished.	Exterior – Aerial
5531aD-1145	Component 51B – Slurry Dewatering Facility	Interior
8070D-153 Highlight Lab	Component 51C – The gray, hatched area will be demolished.	Exterior – Aerial
7120D-58	Component 51C – Lab Expansion	Interior

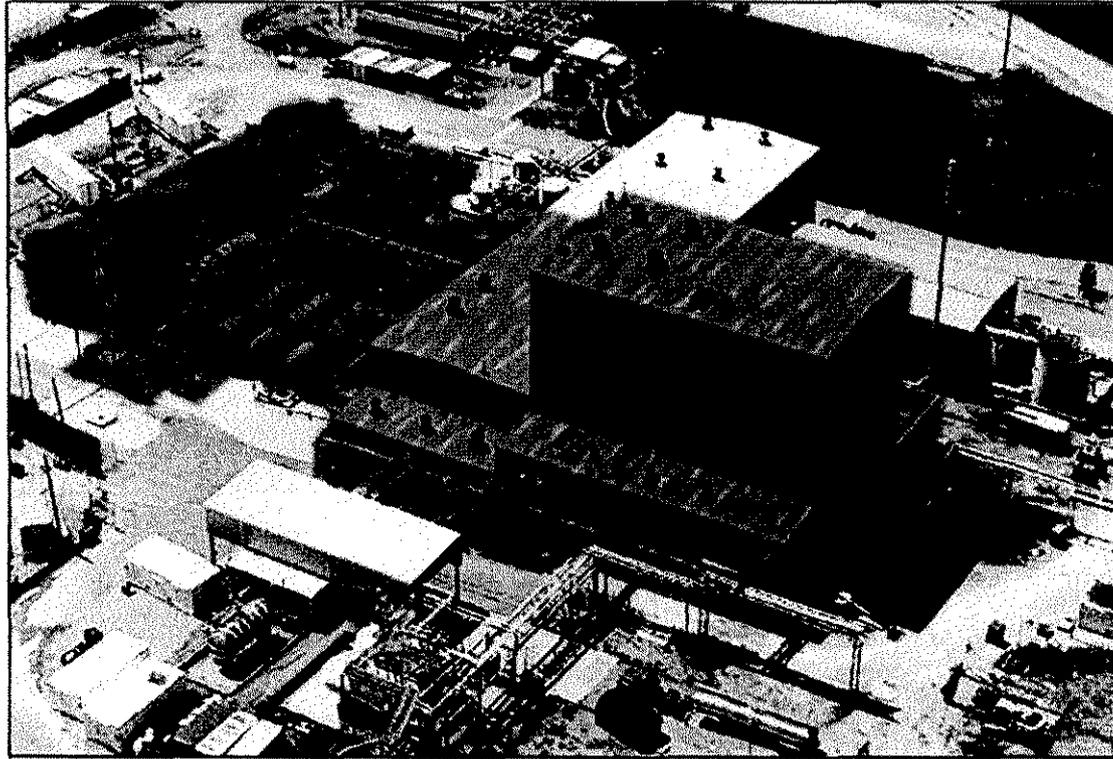
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51A - AWWT



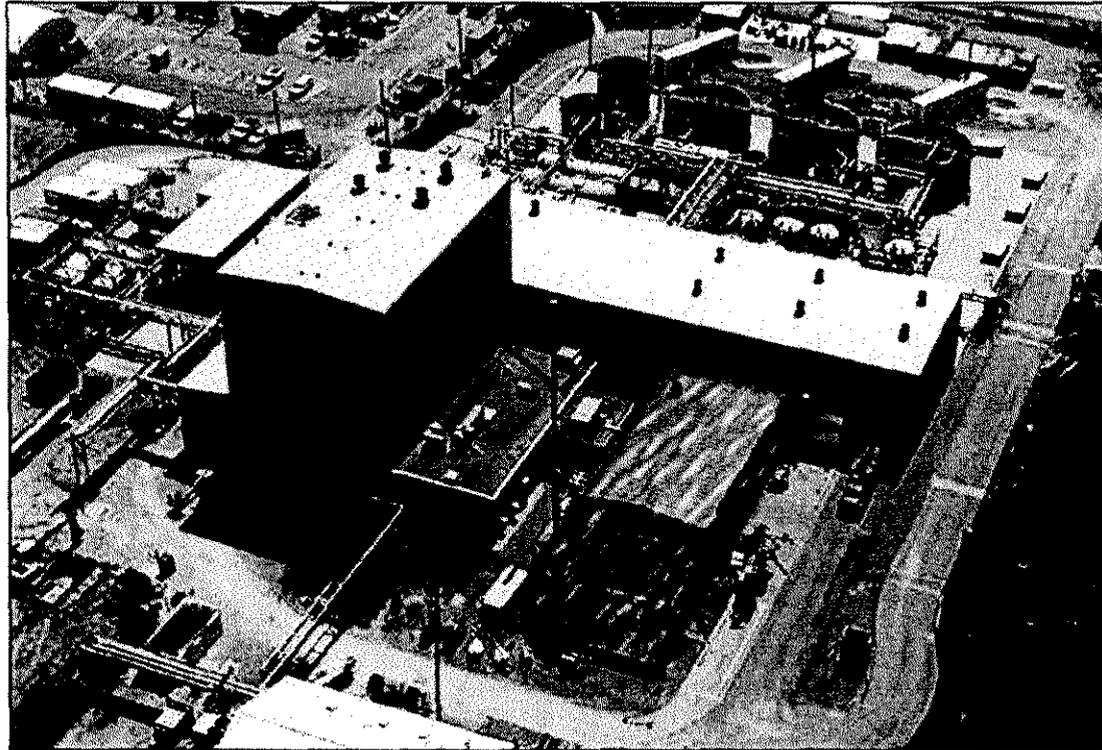
8070D-158 Highlight AWWT

51A - AWWT



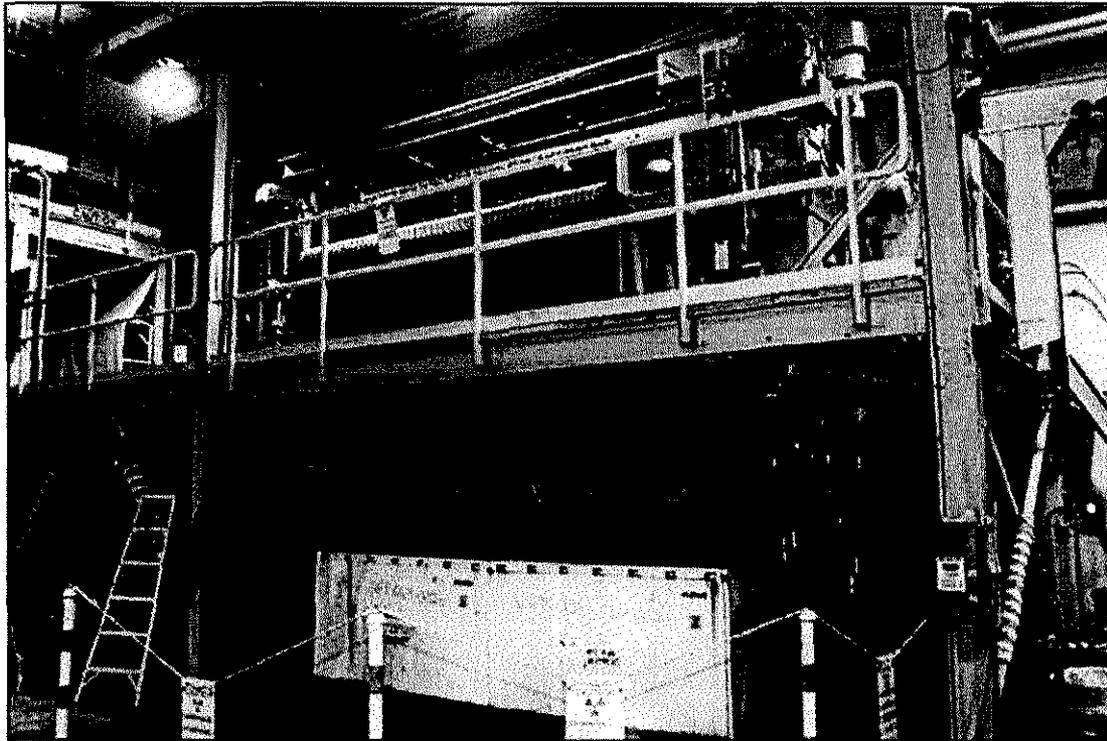
8070D-154 Highlight AWWT

51B – SLURRY DEWATERING FACILITY



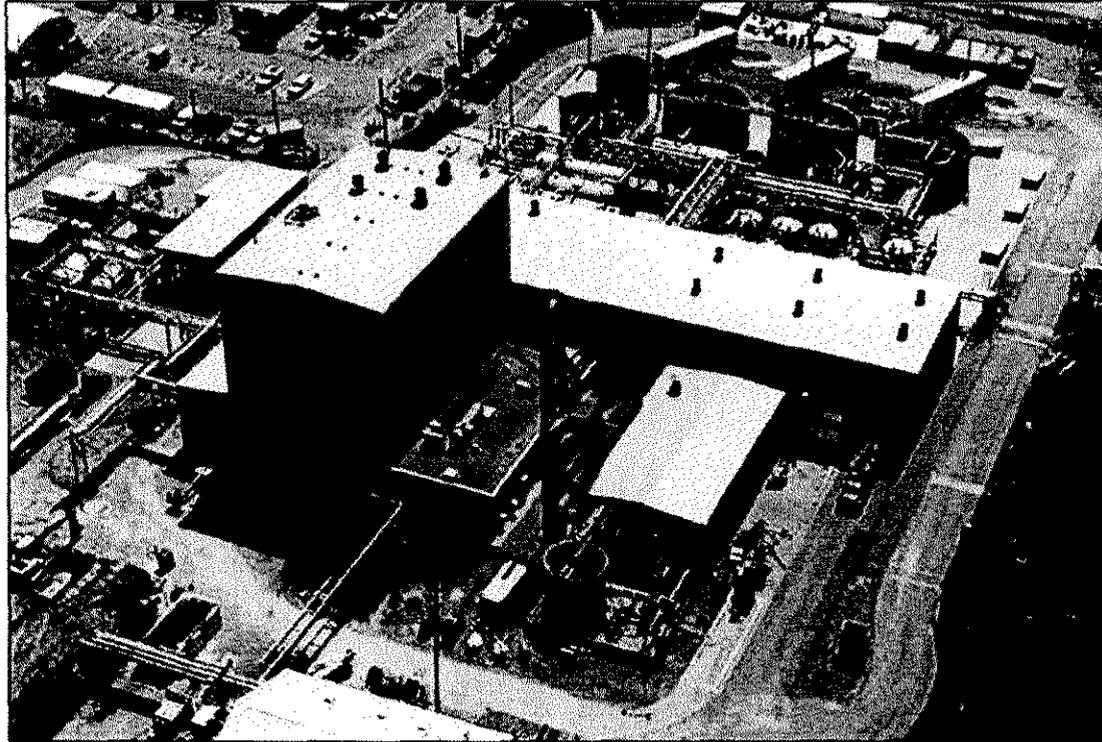
8070D-153 Highlight Slurry

51B – SLURRY DEWATERING FACILITY



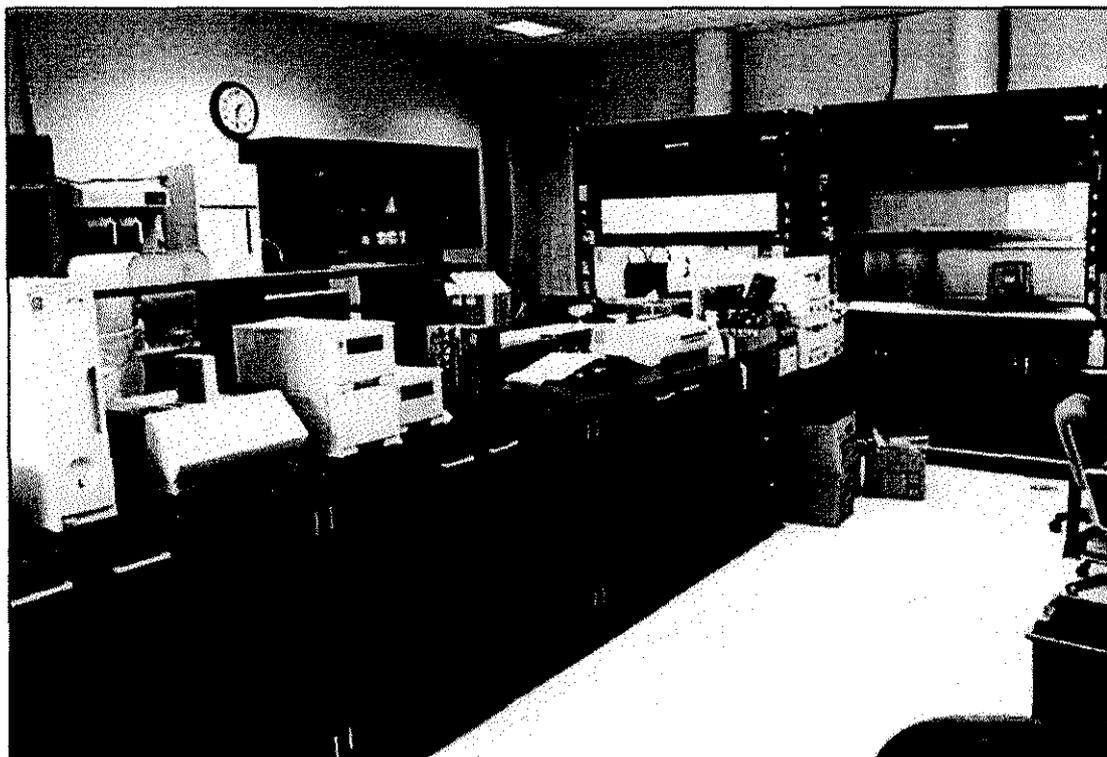
5531aD-1145

51C – LAB EXPANSION



8070D-153 Highlight Lab

51C – LAB EXPANSION



7120D-58

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