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Environmental Restoration Program

OPERABLE UNIT 5 DRAINAGE CONTROL INTERIM RESPONSE ACTION WORK PLAN

MOUND PLANT
MIAMISBURG, OHIO

July 1995

Final
(Revision 0)

U.S. Department of Energy
Ohio Field Office

EG&G Mound Applied Technologies

ENVIRONMENTAL RESTORATION PROGRAM

OPERABLE UNIT 5
DRAINAGE CONTROL INTERIM RESPONSE ACTION
WORK PLAN

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B Construction Drawings
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LIST OF ACRONYMS

AM	Action Memorandum
D&D	decontamination and decommissioning
DOE	U.S. Department of Energy
HASP	Health and Safety Plan
NCP	National Oil and Hazardous Substances Contingency Plan
OSC	On-Scene Coordinator
OSHA	U.S. Occupational Safety and Health Administration
OU	Operable Unit
pCi/g	picocuries per gram
RSE	Removal Site Evaluation
RSE/AM	Removal Site Evaluation/Action Memorandum

ACKNOWLEDGEMENTS

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1.0 INTRODUCTION

1.1 PURPOSE

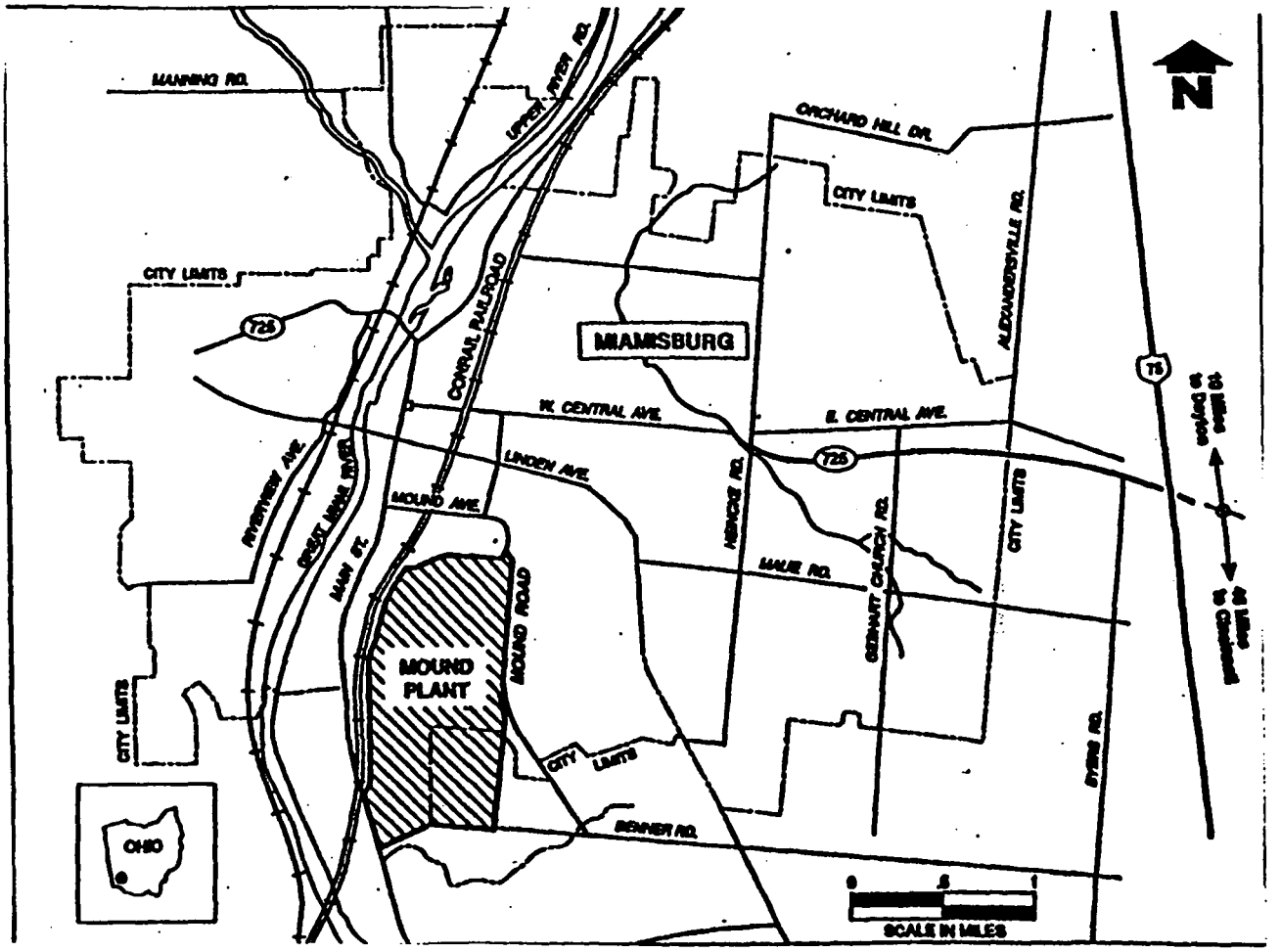
This work plan is the primary document to be used for the implementation of the Operable Unit (OU) 5 Drainage Control Interim Response Action. This action was proposed in a Removal Site Evaluation/Action Memorandum (RSE/AM) for Operable Unit 5, U.S. Department of Energy (DOE) Mound Plant, Miamisburg, Ohio (DOE 1994) (Figure 1.1). The RSE/AM concluded that a threat of potential exposure to the general public exists due to the presence on site of surface soils exhibiting elevated activity concentrations of plutonium and thorium. These soils are located in two general areas: upgradient of the plant boundary between the Operational Property and New Property, and upgradient of the plant boundary adjacent to Building 19. During the storm events, the existing site stormwater collection system cannot prevent the migration of contaminated soils from these upgradient areas to the New Property or to off site locations near Building 19. The proposed interim response action incorporates construction of two separate engineered drainage control systems, one along each of the property boundaries identified above. Each of these systems would contain and control stormwater on site by diverting it into the existing on-site stormwater collection system. Figure 1.2 shows the locations of the proposed drainage control systems.

1.2 BACKGROUND INFORMATION

The Mound Plant is a 306-acre research and development facility located along the southern border of the city of Miamisburg, Ohio. The facility is approximately 10 miles south-southwest of Dayton, Ohio, and 45 miles north of Cincinnati, Ohio. As a result of operational incidents at the Mound Plant, soils within several areas at the plant exhibit elevated activity concentrations of plutonium and thorium. Two specific areas affected by these incidents include the area within the immediate vicinity of Building 19 and the area upgradient of the South Property Boundary. These areas are currently being assessed by the Mound Plant Environmental Restoration Program with regard to future remedial action.

Elevated activity concentrations of plutonium in soils within the vicinity of Building 19 may have resulted from runoff caused by the rupture of the Waste Transfer System line between the Waste Disposal Building and the Special Metallurgical/Plutonium Processing Area in 1969, or through subsequent cleanup operations following the rupture. Elevated activity concentrations of thorium may have resulted from thorium redrumming and storage operations in nearby areas. Elevated plutonium and thorium

Figure 1.1 Location of the Mound Plant



activity concentrations in soils upgradient of the South Property Boundary, particularly in the vicinity of Building 21, may have resulted from thorium redrumming and storage operations.

1.2.1. Nature, Source, and Extent of Contamination

During the years 1982 through 1985, Mound Plant performed a systematic radiological survey of Mound Plant soils (DOE 1991). The survey, which became known as the Mound Site Survey Project, was conducted to document radionuclide activity levels in exposed land areas within the Mound Plant boundaries and to characterize environmental radioactive contaminants on a site-wide basis. This provided the DOE with the basis for estimating the cost required for stabilizing or removing radioactively contaminated soils. Collected samples were primarily analyzed for plutonium-238 and thorium (all isotopes).

During this survey, surface and subsurface soil samples were collected within each of the areas identified for drainage control improvements. Maximum plutonium-238 and thorium activity concentrations of 34,000 picocuries per gram (pCi/g) and 54.3 pCi/g, respectively, were observed within the area along the South Property Boundary. This stated activity concentration for plutonium-238 is much higher than all other activity concentrations for plutonium-238 observed within this area. Soils samples collected during a 1989 reconnaissance investigation (DOE 1989) reflected maximum plutonium-238 and thorium-232 activity concentrations of 40 pCi/g and 185 pCi/g, respectively. During the Mound Site Survey Project, the maximum activity concentrations for plutonium-238 and thorium within the area around Building 19 were 50.60 pCi/g and 5.30 pCi/g, respectively.

1.2.2. Removal Site Evaluation/Action Memorandum

A Removal Site Evaluation (RSE) was performed in accordance with the National Oil and Hazardous Substances Contingency Plan (NCP), 40 CFR Part 300, and incorporated into an Action Memorandum (AM). The RSE concluded that a threat of potential exposure to the general population exists due to the presence of surface soils exhibiting elevated activity concentration of plutonium and thorium. These soils are located upgradient of the plant boundary between the Operable Unit 5 old South Property and New Property, and upgradient of the plant boundary adjacent to Building 19. During storm events, the existing site stormwater collection system cannot prevent the migration of contaminated soils from upgradient areas to the New Property and to off site locations near Building 19.

Three remedial alternatives were identified and evaluated in the RSE/AM: construction of two separate intercept drainage control systems with the ability to effectively control stormwater on site, removal of soils exhibiting elevated activity concentrations of plutonium and thorium, and implementation of administrative controls. Each of these alternatives was evaluated based on cost, implementability, and effectiveness. Construction of two separate intercept drainage control systems was selected as the alternative that best complied with the evaluation criteria.

2.0. SCOPE OF WORK

This Work Plan, developed in support of an interim response action, describes the design criteria for the construction of two separate drainage control systems: the Building 19 and the South Property Boundary drainage control systems. The Building 19 drainage control system consists of a lined trench, catch basins, and piping. It will redirect stormwater to the main drainage channel upstream of the overflow pond. The South Property Boundary drainage control system consists of a lined trench and piping, and will direct stormwater into an existing concrete channel for subsequent discharge into the overflow pond. Figure 1.2 shows the location of these systems.

Before initiation of construction activities, surface and subsurface soils in the areas identified for construction of the drainage control systems will be characterized for the presence or absence of plutonium and thorium. Soils exhibiting activity concentrations of plutonium and thorium in excess of Mound Plant Decontamination and Decommissioning (D&D) Program cleanup standards will be excavated by the Mound Plant D&D Program prior to construction activities. The work package describing proposed Mound Plant D&D pre-excavation characterization and soil removal activities is provided in Appendix A. Excavations created by the Mound Plant D&D Program will be backfilled during construction operations.

Following Mound Plant D&D Program soil removal operations, base lines and bench marks will be established along the construction line for each of the drainage control systems. The location of buried utilities within the line of construction will be identified. Barricades and warning signs will be installed around all work areas to prevent unauthorized access.

Construction of the drainage control system elements will be in accordance with the design drawings and specifications accompanying this work plan (Appendices B and C, respectively). These design documents were developed in accordance with current industry standards and practices, and Mound Plant construction requirements. Construction activities will also be conducted in accordance with the project specific health and safety plan (HASP) (Appendix D), and will include continuous monitoring of the work environment and the use of protective equipment, as needed. Standard construction equipment will be employed during all construction operations. Construction equipment will be selected on the basis of conditions present at the site. Good engineering practices will be applied to minimize dust generation and control erosion during construction activities.

Both drainage control systems consist of precast and cast-in-place concrete elements. Precast elements include manholes and piping. Cast-in-place elements include intercept trenches and collection basins. These elements will be constructed to the lines, grades, and elevations provided on the construction drawings. Handling and installation of all precast elements will be in accordance with the construction specifications provided in Appendix C and/or the manufacturer's recommendations. Bedding and fill materials will meet the requirements of the construction drawing and specifications.

Excavations will be completed to the depths and widths indicated on the construction drawings and necessary for installation of precast and cast-in-place concrete elements. Appropriate precautions to protect all identified utilities will be taken during excavation operations. Open excavations will be protected in accordance with U.S. Occupational Safety and Health Administration (OSHA) regulations. Boring or jacking may be required beneath the railroad spur intersected by the Building 19 drainage control system. Excavated rock not suitable for backfill will be transported off site for disposal. Excavated soil not suitable for backfill will be placed in the Mound Plant Construction Spoils Area. Excavated soil and rock suitable for backfill, but in excess of these needed for this purpose, will be placed in the Mound Plant Construction Spoils Area. Construction runoff control will be performed to prevent surface water from flowing into open excavations. Any water that accumulates within open excavations will be removed and discharged into the existing site stormwater collection systems. Groundwater is not anticipated to be encountered during excavation operations.

Temporary staging facilities may need to be constructed to support equipment storage and provide for stockpiling of materials. These staging facilities will be removed at the end of the interim response action.

Disturbed areas will be backfilled with appropriate material(s), regraded to original contours, and revegetated. Upon completion of construction operations, all equipment, unused materials, and debris will be removed from the work site.

Upon completion of remedial activities, an On-Scene Coordinator's (OSC) Report will be prepared in accordance with the requirements specified in 40 CFR 300.

3.0. DESIGN CRITERIA

The proposed drainage control systems are designed to effectively control stormwater and to prevent the spread of radiological contaminants. The systems, as designed, will accommodate a minimum of a 25-year, 24-hour storm event as required by DOE Order 6430.1A. Design information for each of the drainage control systems is presented in the construction drawings and specifications provided in Appendices B and C, respectively.

3.1. PERMITS

An excavation/digging permit will be obtained from the EG&G Mound Construction Safety Inspector prior to the start of any activity which will disturb the surface of the earth. This includes any excavation or drilling operation. Excavation/digging permits are to be maintained at the site until the completion of work.

3.2. SITE PREPARATION

Site preparation activities will be conducted prior to excavation and will include a horizontal and vertical construction survey, installation of erosion and sedimentation control facilities, and demolition of existing structures. Baselines and benchmarks will be established along the construction line for each of the drainage control structures. Control points will reference established benchmarks established within the Mound Plant boundary. The horizontal and vertical position of all utilities within the construction line will be identified by a Mound Plant Construction Inspector. Erosion and sediment control measures will be in accordance with the construction drawings and specifications. Demolition work will be as indicated on the construction drawings. Demolition operations will be performed in a manner that will ensure minimal interference with plant operations. Prior to commencement of demolition work, areas in which work will be performed and objects designated to be removed will be inspected. Where pavement or concrete is to be removed to make room for new construction, it will be saw cut first around the limits of removal. Materials generated during demolition operations will be disposed of off site in a permitted solid waste disposal facility.

3.2.1. <u>Erosion and Sedimentation Control</u>

During construction operations, sediment barriers and temporary vegetative cover for soil stabilization will be installed and maintained until final seeding occurs. Hay bales will be placed in the area where runoff discharge may occur.

3.2.2. Safety Equipment

Good excavation practices address three concerns: the need for sloping, shoring, or sheet piling within the excavation; the need for traffic control within the immediate vicinity of excavations: and the need for protection of excavations to mitigate hazards associated with open excavations.

All excavations will be adequately protected from slides or collapse in accordance with OSHA standards. Shoring will not place any stress on the completed work. The roadway along the South Property Boundary drainage control system will be marked and barricaded as needed to narrow the traffic pattern to only one lane. Traffic will be limited to the lane furthest from the excavation to avoid excess loading on the shoring walls. Signs indicating a one-lane road will be placed on either side of the excavation portion of the roadway. Barricades with flashing orange warning lights will be placed as needed for traffic control during the night.

All excavations will be safety fenced or barricaded to minimize tripping and falling hazards associated with an open excavation. The safety fencing will have warning signs attached and flashing orange warning lights will be activated at night. The safety fencing will remain in place until the excavation has been backfilled and completed.

3.2.3. Material Staging Area

Prior to initiation of construction operations, area may be identified for staging equipment and construction materials. The location of these areas would meet with the approval of Mound Plant construction inspection personnel. Materials and equipment would be removed from the work site as soon as they are no longer needed.

3.2.4. Utilities

The construction drawings provide in Appendix B illustrate the approximate locations of all currently known buried utilities crossing the line of construction for the drainage control systems. Before initiation of construction operations, the location of these utilities will be verified in the field by a Mound Plant

Construction Inspector. Appropriate precautions will be taken to protect all identified utilities during construction operations.

3.3.EXCAVATION

All excavations will be completed to the lines and grades specified on the construction drawings provided in Appendix B. Excavation operations will be performed using standard construction equipment. Excavation operations will also conform to Mound Plant construction requirements.

3.3.1. Excavation of Soil/Rock

All excavations will be made by open cut methods. Boring or jacking operations may be required beneath the railroad spur intersected by the Building 19 drainage control system. Excavations will be completed to the depths and widths will be as indicated on the construction drawings and necessary for installation of precast and cast-in-place concrete elements. Care will be taken to avoid excavation below the established grade plus the required overdepth. If rock is encountered, it will be overexcavated and backfilled with compacted granular bedding material. If bedrock is encountered, removal of the bedrock through blasting will not be permitted. Sidewalls of the excavation will be adequately protected from slides or collapse in accordance with OSHA standards. During excavation, material unsuitable for backfill will be removed from the site. Material suitable for backfilling operations will be staged alongside the excavation. This material will be placed sufficiently back from the edge of the excavation to prevent caving of trench walls and to permit safe access along the trench. Excavated soils will be periodically screened by a Mound Plant Health Physics Technician for radioactivity. Soils exhibiting elevated activity levels of plutonium and thorium are not anticipated to be encountered during excavation operations.

3.3.2. Material Disposition

Unless otherwise specified, material generated during excavation operations will be suitable for use as fill, provided that all organic material, rubbish, debris, and other objectionable material contained therein is first removed. Rock, concrete, and asphaltic pavement will not be considered as suitable fill material. Excess fill material will be transferred to the Mound Plant Construction Spoils Area following construction operations. Materials generated during demolition operations, rubbish, unused materials, concrete forms, and other like material will be removed from the jobsite and disposed off site.

3.4. DRAINAGE SYSTEM CONSTRUCTION

Construction of the drainage control system elements will be in accordance with the design drawings and specification accompanying this work plan, and current industry standards and practices. Standard construction equipment will be employed during all construction operations.

Figure 1.2 shows the approximate location of both drainage control systems. Specific locations and dimensions of the drainage control systems are provided on the construction drawings provided in Appendix B. The Building 19 drainage control system will consist of a lined trench, catch basins, and piping that will redirect stormwater to the main drainage channel upstream of the overflow pond. The South Property Boundary drainage control system will consist of a lined trench and piping that will direct stormwater to the overflow pond.

Construction of the drainage control system elements will be in accordance with the design drawings and specification accompanying this work plan, and current industry practices and standards. Construction will involve the installation of both precast and cast-in-place concrete elements. Precast concrete elements will include collection basins and manholes. Cast-in-place concrete elements will include collection basins and intercept trenches. Precast concrete elements will be laid on a firm foundation true to line and grade, with socket ends upgrade. Adjustments to line and grade will be made by removing or adding bedding material under the pipe, not by using wedges, blocks, or beating on the pipe. Care should be taken when joining the pipe sections to ensure that joints are free of any foreign material. Walking on the pipe sections or otherwise disturbing any section after joining will not be permitted.

Forms for all cast-in-place concrete structures will conform to the shapes, lines, and dimensions of the respective structures shown on the design drawings. Form work will be in accordance with the construction specifications and/or building codes. Forms will not be disturbed until concrete has hardened sufficiently to permit their removal with safety. The removal of forms will be carried out in such a manner as to insure the safety of the structure.

Concrete will be of such consistency and composition that it can be conveyed and worked readily into the corners and angles of the forms and around the reinforcement without permitting material segregation. All unformed surfaces will be screeded and wood float-finished, followed by light brooming. Freshly placed concrete will be protected from premature drying and excessive cold or hot temperatures. After the form work is removed, voids in all formed surfaces will be filled with patching mortar, and form ties will be cut back and dry packed if necessary.

Location and sizing or reinforcement will be as dictated by the construction drawings and specifications. Bends in bars will be made cold. Reinforcement will be cleaned of heavy flaky rust, loose scale, dirt, grease, or other foreign substances.

3.5. SITE RESTORATION

Subsequent to the completion of construction activities, disturbed areas will be stabilized in an expedient manner. This will include proper backfilling of all excavations, grading in accordance with existing drainage patterns, and seeding or paving of disturbed areas to prevent further erosion. Rubbish, unused materials, concrete forms, and other like material will be removed from the jobsite and disposed off site. Excess soils will be placed in the Mound Plant Construction Spoils Area, and the jobsite will be left in a state of order and cleanliness.

4.0 WORK PLAN SCHEDULE

Activity	Performance Period
Contract Award	April 1995
Perconstruction Meeting at Mound	April 1995
Mobilize and Site Preparation	May-June 1995
Perconstruction Survey	June 1995
Construction	June-August 1995
Final Punch List	September 1995
On-Scene Coordinator Report	October 1995

5.0 REFERENCES

DOE 1989. *Reconnaissance Sampling Plan; Mound Plant, Decontamination and Decommissioning Program Sites Operable Unit (AL-MD-4)* [DRAFT]. U.S. Department of Energy, Albuquerque Operations Office, Albuquerque, New Mexico. September 1989.

DOE 1991. *Operable Unit 9 Site Scoping Report: Volume 3 - Radiological Site Survey* [DRAFT]. U.S. Department of Energy, Albuquerque Operations Office, Albuquerque, New Mexico. April 1991.

DOE 1994. *Action Memorandum/Removal Site Evaluation, Drainage Control Interim Response Action, Environmental Restoration Program, Operable Unit 5* [FINAL]. U.S. Department of Energy, Ohio Field Office, Miamisburg, Ohio. December 1994.

APPENDIX A

MOUND PLANT DECONTAMINATION AND DECOMMISSIONING PROGRAM PRE-EXCAVATION CHARACTERIZATION

SOIL REMOVAL

BUILDING 19 AREA (THORIUM AND PLUTONIUM)

In Support of
Intercept Drainage Control Project

Project No. WBS 105.52
O.U.5

ASSEMBLED FOR D&D ENGINEERING

by

DEAN A. BUCKNER

03/23/95

D&D WORK PACKAGE SIGN-OFF SHEET
(SIGNATURE AND DATE REQUIRED)

Project Name: Soil Removal (Bldg. 19 Area)

Project Number: B02383

Current Date: March 30, 1995

Project Engineer: Dean A. Buckner

DECONTAMINATION AND DECOMMISSIONING

		DATE	SIGNATURE
D. A. Buckner	PROJECT ENGINEERING	3/30/95	D A Buckner
J. E. Thompson	D&D SUPERVISION	03/30/95	John W. Nichols (Acting)
G. L. Coons	CERCLA MANAGER	5/8/95	Gary L. Coons
R. P. Martin	DECONTAMINATION	4/4/95	Raymond P. Martin
R. N. Rogers	QUALITY ASSURANCE	4/3/95	R N Rogers
M. R. O'Donoghue	HEALTH PHYSICS	4-11-95	M R O'Donoghue
S. A. Collas	HEALTH PHYSICS OPERATIONS	4-3-95	Steve Collas
R. L. Lynch	INDUSTRIAL HYGIENE	4/4/95	Mark W. Cole for Rod Lynch
D. Garrison	INDUSTRIAL SAFETY	8 May 95	Daniel L. Garrison
M. L. Alexander	WASTE MANAGEMENT	4-3-95	M L Alexander
J. V. Adams	MAINTENANCE	4.3.95	J. V. Adams
S. A. Cloud	ENVIRONMENTAL, TECHNOLOGY & MONITORING	4/26/95	Sue Cloud

THORIUM AND PLUTONIUM REMOVAL (Intercept Drainage Control)

AES WORK PACKAGE TRANSMITTAL SHEET

AES NO: B02383 ENGINEER: Dean A. Buckner DATE: 3/30/95

Q.A. LEVEL: [ ]1 [X]2 [ ]3

PACKAGE: COMPLETE: PHASE NO: 1 OF 1

CONTENT REQUIREMENTS	CHECK CONTENTS ATTACHED	NO. OF COPIES
MSR (always required)	✓	MSR
JOB SCOPE	✓	1
DESCRIPTION	✓	In Job Scope
SPECIAL INSTRUCTIONS/SPECS.	✓	In Job Scope
SPECIAL SCHEDULING INSTRUCTIONS	✓	In Job Scope
COST ESTIMATE SUMMARY (REQUIRED)	✓	1
MATERIALS LIST (1 Copy to Material Control Clerk)	✓	1
FORMAL DRAWINGS/APPROVED SYSTEM DRAWINGS	N/A	N/A
SKETCHES	✓	1
VENDOR DATA FOR EQUIPMENT	N/A	N/A
PROJECT SCHEDULE	N/A	N/A

DO YOU WANT A PRE-CONSTRUCTION MEETING? [X]YES [ ]NO

REMARKS:

SUPERVISOR'S APPROVAL: John W. Nichols 03/30/95

NOTE: FOR: _____ SEND TO: _____

D-0105

I. INTRODUCTION

Summary

This project is in support of the CERCLA effort to affect a "Drainage Control Interim Response Action." All work is to be charged to B02383.

This work will be performed parallel to the site boundary fence west of Buildings 19 and 72, and west of Buildings 94 and 112. This project will identify and remove contaminated soil exceeding the guidelines contained in "D&D's" Digging Guidelines (appended). Radionuclides of concern are Pu-238 and Th-232. The areas in question encompass approximately 4,800 sq. ft. (12′ x 300′ and 12′ x 100′).

Scope

No contaminated soil is planned to be removed beyond those 12′ x 300′ and 12′ x 100′ strips, which are a portion of the land designated for installation of the "Drainage Control" ditch. The volume of soil to be removed is estimated to be 1′ x 12′ x 400′ = 4,800 cubic feet (178 yards).

All work that is to be performed by Mound Personnel [Decon (D), Health Physics (HP) and/or Heavy Duty (HD)] and is to be done according to instructions and procedures provided by the Field Coordinator or Project Engineer, as per this work package.

The following tasks are associated with the project:

1. Remove contaminated soil.

2. Package all waste for disposal.

3. Verify decontamination, via RAD survey, and release site to follow-on operations.

References

1. Figure 2, Plan of Intercept Drainage, Building 19 Area.

2. Operable Unit 5, Operational Area, Phase I investigation, Area 3 Field Report.

3. Soil screen sampling for Drainage Control Interim Response Action (appended).

Assumptions

It is assumed that only Pu-238 and Th-232 are the contaminates of concern. Field sampling (see references 2 and 3 above) disclosed no other radionuclides, and no history indicates, nor any other known sampling has disclosed, other hazardous chemicals in excess of concern limits.

II. SITE INFORMATION

Description of Site

Area 3 has been identified as an area of concern within the Operational Area of Operable Unit (OU) 5 (see Figure 1). Area 3, approximately 340 ft. by 450 ft. (153,000 sq. ft.), is in the lower valley, southwest of the Main Hill (see Figure 1). It includes Buildings 19, 42, 55, 57, 72, and 94. These buildings serve a variety of purposes including salvage operations, effluent monitoring, and sewage treatment. The area not covered by buildings is approximately 40,000 sq. ft. (DOE 1993a). A railroad spur runs through the middle of Area 3. Previous investigations (DOE 1992a) show that bedrock is greater than 25 ft. below ground surface.

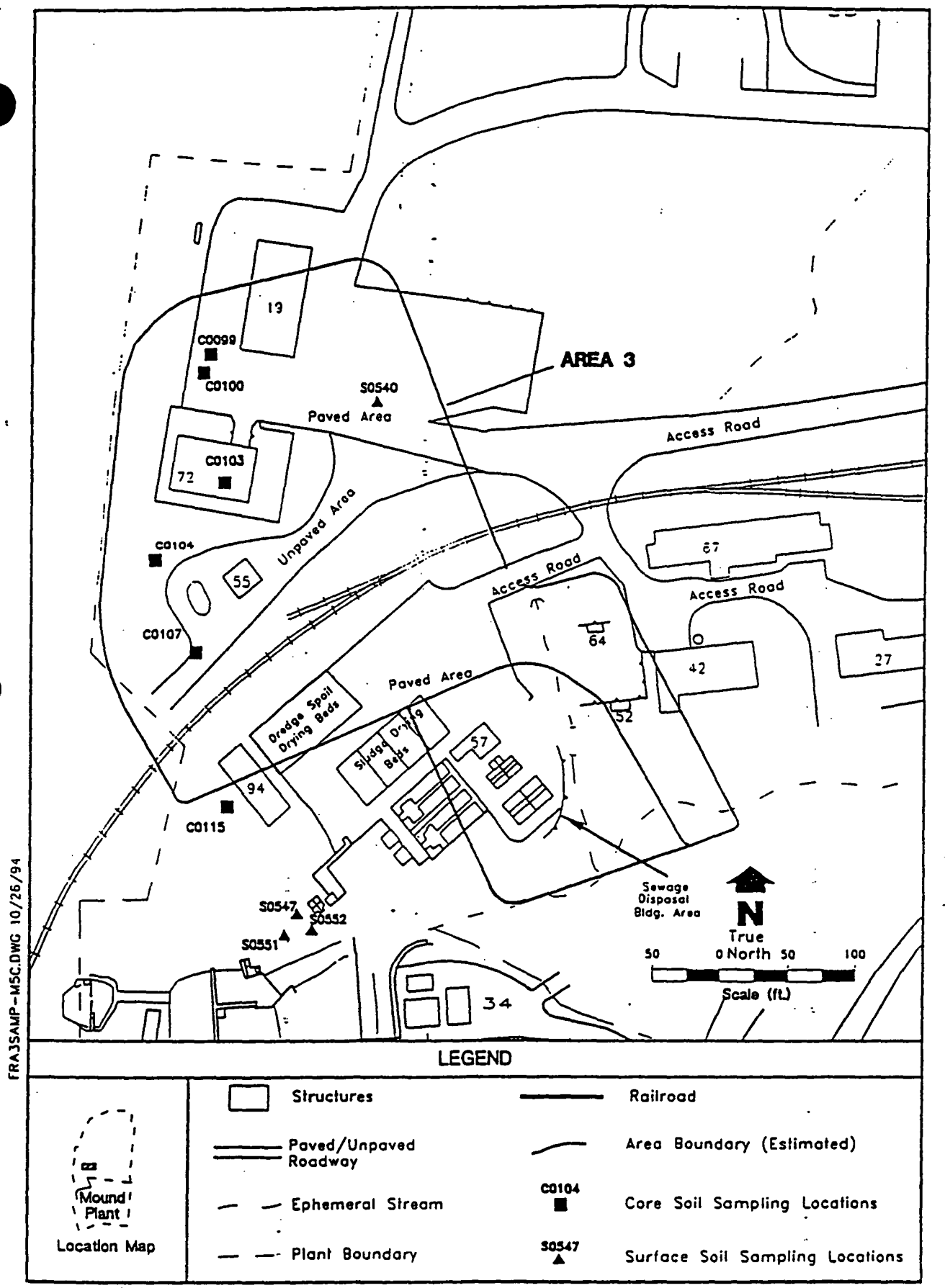


Figure 2.4. Sampling Locations for Historical Radiological Data Collected in Area 3 (Mound Site Survey Project, 1983-1985)

Site History

Area 3 was used for the storage and redrumming of 55-gallon drums containing thorium and plutonium in the late 1950s and early 1960s (MRC 1973). In 1954 and 1955, approximately 6,000 55-gallon drums containing thorium sludge were delivered by rail to the Mound Plant (MRC 1973; Meyer 1979). Some of these drums were stored in Area 3 for prolonged periods of time. Weathering and internal corrosion made it necessary to frequently redrum the thorium sludge (MRC 1973). Thorium was released into the soil due to leakage during storage and the redrumming operation. In 1965, the thorium-contaminated soil was reportedly excavated and the area backfilled with clean soil (MRC 1985; Stought et al., 1988). It is not known how much fill was placed in this area.

Soil samples collected from the areas of concern adjacent to Building 19 show elevated levels of Pu-238 and unspecified isotopes of thorium (see DOE 1993a for sampling locations and detailed results). The plutonium contamination may have resulted from runoff caused by the rupture of the waste transfer system (WTS) line between the Waste Disposal (WP) Building and the SM/PP area in 1969 or by the clean-up operations that followed the rupture. This event resulted in contamination of the off-site area, known as the Runoff Hollow, west of the property fence line near Building 19.

Hazardous Material

Soil samples were cored on 50′ centers for the full length of the proposed ditch. Soil screens for Pu-238 and Th-232 were made for each point at near-surface (6") and at depth (4′ - 5′). No readings for Th-232 were above the action levels. Two near-surface readings for Pu-238 behind Building 19 and one near-surface reading behind Building 94 were above the action level (although below 100 pCi/gm). (See soil screening analysis data appended.) No other radionuclides were indicated.

Initial Conditions

The areas of concern are not restricted. References 2 and 3 show random hot spots, marginally above the "cold" level and thus, may remain undisturbed. Nevertheless, once disturbed, they fall within the LSA classification. Seven field drain pipes lay across the ditch line behind Buildings 19 and 72, and must be removed. The contents of these pipes is an unknown -- to be evaluated by Health Physics personnel prior to removal.

III. ES&H

These guidelines are to be used for any construction job that discovers contaminated soils.

Mound Standards and Procedures

According to MD-81010, Mound Plant Application, all waste packaged and shipped must comply with NVO 325 in order to send to the Nevada Test Site, and comply

with MD-81020, Mound Plant Waste Certification Program for Waste Stream AMDM-000000012 (low level radioactive contaminated soil).

Work that is done by Decontamination personnel is to be done according to the D&D Decontamination Procedures Manual MD-10332. Work that is done by D&D or ER personnel is to be performed according to the D&D Operations Procedure Manual MD-10167 and Waste Accountability Shipping and Packaging (WASP) MD-10173. Work that is done by the Health Physics Radiation Technicians (HP) is to be done according to the Health Physics Procedures Manual MD-80036 and Mound Radiological Protection Manual MD-10019. All waste packaged and shipped must comply with NVO 325.

Mound Maintenance and Utilities Safety Handbook MLM-89-70-0001, Safety and Hygiene Manual MD-10286, and Mound Radiological Protection Manual MD-10019, will be used as guidelines for all general safety and health requirements.

All personnel working within this controlled area must have 40 hours of HAZWOPER Training. It is the responsibility of the personnel's supervision to ensure proper training has been administered, also that personnel are qualified per current Bioassay surveillance.

Field Coordination

A pre-job meeting will be held by the Field Coordinator and the Project Engineer prior to work commencing. All applicable permits are to be completed and signed by the responsible parties before work is initiated. Safety and Industrial Hygiene, H.P., Decon, and Waste Management personnel should be in attendance at this initial meeting. The most appropriate soil removal equipment should be designated. Subsequent meetings should be held when job conditions change, personnel changes, or updates to employees are required. These meetings will be held at the discretion of the Field Coordinator and/or the Project Engineer.

The Field Coordinator will monitor all work to ensure that all procedures are followed from project start to completion. The Field Coordinator will assure that a copy of the latest issue of the work package is posted at the work site, that a copy of the "Employee/Employer Responsibilities" notice is visibly displayed, and that a copy of the Site Specific Health and Safety Plan is posted.

During the operational phase, the Field Coordinator will:

- Designate the Decon change room facilities.
- *Select the appropriate wind velocity reading location.
- *Make wind/rain stop-work decisions.
- *Determine whether loosened soil may be boxed or whether it shall be staged for drying.
- *Direct that water mist will be sprayed on loosened soil and/or whether it shall be covered with a tarpaulin at the end of the work period.

- See Appendix II "General Digging Guidelines."

Health Physics Requirements

Health Physics personnel coverage is required for any D&D soil removal work. The Health Physics personnel will install and maintain radiation control signs, and dictate the appropriate protective clothing and monitoring. Anyone working in a hazardous and/or radioactive control area may request upgraded protective equipment.

Local area will be monitored by personal lapel air monitors, or high volume sampling and controlled by Health Physics personnel. Data collected from monitors shall be copied to the appropriate supervisor, Environmental Monitoring Group, and the Project Engineer.

Continuous air monitors (CAM) are to be set up to monitor the operations as directed by Health Physics. At any time, these locations can be changed as directed by Health Physics personnel because of changing weather or job conditions. In the event that a CAM alarm goes off, all operations will stop, and Health Physics personnel will check their monitoring equipment to assess the situation. Health Physics, along with the Project Engineer and Field Coordinator, will notify the ET&M or designee of the possibility of a release of contamination at the work site. The ET&M Manager will make the decision of course of action and notify the D&D Project Engineer whether to proceed or hold operations.

The contaminated area will be identified with radiation control barriers and postings. All personnel within that area must wear safety equipment listed under the safety section (documented on the D&D Work Permit), plus the radiation protective equipment and clothing specified by Health Physics (documented on the Radiation Work Permit).

Safety

A pre-entry briefing will be held prior to initiating any site activity, and at such other times as necessary to ensure that all employees are appraised of the Site Safety and Health Plan. A pre-job meeting will be held at the start of each work day to define the day's work, as well as to stress all of the pertinent safety aspects.

The work area will be identified with construction barriers. All personnel within that area must wear hard hats, safety glasses (with permanent side shields), safety shoes, and appropriate protective gloves.

Hazards

Noise
Hearing protection, available as PPE, will be worn as needed while heavy-duty equipment is operating.

Excavations
All excavations must be sloped, shored or shielded per OSHA Standard 29 CFR part 1926. This applies to both excavations and trenching. Excavating below 4'-0" deep

must be initially monitored for combustibles and oxygen, unless the trench is sloped back to the angle of repose. Contact Industrial Hygiene for monitoring.

Slips and Falls
Special care should be exercised when working on slopes or near excavations to avoid slipping and falling. Special overshoes with rubber spikes shall be provided to improve footing under those conditions.

Heat Stress/Stroke
Heat stress guidelines will be posted at the job site. If anyone should show signs of heat stress or stroke, the Fire Department is to be called at extension 911.

Electrical
There should be no extraordinary electrical hazards associated with this project. GFI (Ground Fault Interrupter) circuits shall be used for all electrical-powered equipment.

General
MSDS's are maintained by employee supervisors. A master copy is available in the Industrial Hygiene office.

Good housekeeping practices will be utilized to minimize slipping, falling, or other related safety hazards.

Common sense and good judgement will be expected of all workers, supervision, or visitors at all times.

Remain clear of all heavy-duty equipment while it is in operation, and remain clear of the backhoes' counterbalance swings. Remain clear of all loads that are being moved or lifted, either directly or by chains/cables or straps, by the heavy-duty equipment.

Equipment Utilized

Hand tools may be used to manually dig soils. Several units of heavy-duty equipment are available and applicable to this project. The choice of equipment used will be left to the discretion of the Supervisor of the heavy-duty operation, in concert with the Field Coordinator.

Waste Management Procedures

The waste generated by this project will be packaged and sealed according to applicable procedures in the current issues of MD-81010, Mound Plant Application to Ship Waste to the Nevada Test Site, MD-81020 Mound Plant Waste Certification Program Plan, MD-10332, D&D Decontamination Procedures and MD-10167, D&D Operations Procedures for Waste Stream AMDM-000000012 (low level radioactive contaminated soil).

Radiation/Release

It is expected that some soils will be sufficiently contaminated to fall within the LSA category as disturbed (see "Removal of Pu-238 and/or Th-232 Contaminated Soil" Table 2, Item 2, appended). Since "release" in this case is for further excavation, the

"cold" level (ibid) must obtain, (i.e. Pu-238 ≤ 25 pCi/g and Th-232 ≤ 5 pCi/g. Health Physics will sample the work area per MD-80036 to verify that the above levels have been met. Accordingly, the area will be released for the contractor to construct the "Drainage Intercept" project.

Permitting

The following permits are required to the start of work:

1. Radiation Work Permit
2. D&D Work Permit
3. Excavation/Digging Permit

IV. QUALITY ASSURANCE

1. DESCRIPTION AND SCOPE OF PROJECT

This project involves the removal of soil contaminated with Thorium and Plutonium found west of Buildings 19 and 72 along the site boundary fence, and west of Building 94.

2. PURPOSE OF QA PLAN

The purpose of this Quality Assurance Plan (QA Plan) is to assure that the objectives of the United States Department of Energy (DOE) and EG&G Mound Applied Technologies (Mound) are met for this Decontamination and Decommissioning (D&D) project relative to Health and Safety, radiological and environmental protection, reliability and continuity of operations, and documentation or quality efforts. This QA Plan identifies the activities and responsibilities which are necessary in the design, procurement, fabrication, installation, and start-up of this project in order to meet these objectives.

3. APPLICABLE DOCUMENTS

The DOE requirements for Quality Assurance for D&D projects such as this one are stated in 10 CFR 830.120. DOE order 5700.6C directs EG&G Mound Applied Technologies to develop non-weapons Quality Assurance Programs.

Based on the DOE Order 5700.6C, EG&G Mound Applied Technologies has established a Quality Assurance Program as described in the Mound Technical Manual MD-10334, "Mound Quality Policy and Responsibilities." MD-81020, Mound Plant Waste Certification Program Plan is used for waste management. This covers 5700.6c and NQA-1 requirements.

The D&D Engineering portion of the QA program is described in the Mound Technical Manual MD-10403, titled "Quality Assurance Plan For The D&D Project Engineering Group." This manual describes the management structure used for organizing the program, management responsibilities in QA operations and activities, program requirements, quality plans for ongoing services and functions provided by the section, and the requirements to develop project

specific quality plans for projects designed, constructed, and decontaminated and decommissioned for our customers. Section 1.3 of this manual, entitled "Source Requirement Documents," specifically describes the quality assurance activities and plans that are established, implemented, and maintained to achieve a high degree of confidence in the D&D program's operational success, and to protect the public health and environment from radioactive contamination, and from hazardous materials contained within the inactive contaminated facilities and areas.

The "Mound Project Management Manual 804" provides information on procedures within the engineering department. The "Plant Engineering Guide," issue of February 1988, provides general operational guidelines for work within the plant engineering section.

MD-10423 Work Package Development Manual, Decontamination and Decommissioning, contains step-by-step procedures describing how routine D&D activities are performed. The D&D activities which affect quality shall be planned by the Project Engineer and accomplished under controlled conditions specified in the work packages according to procedures specified in MD-10423.

The Mound Technical Manual MD-10403 requires a written QA Plan for any D&D project and/or work package assessed as Quality Assurance Level 1 or Level 2. Form ML-8047 "Project Quality Assurance Review" also is written for any D&D work package assessed as Level 3.

This QA Plan requires the use of "Engineering Review Transmittal Sheet," Mound form ML-7588, for documentation of content review and comment. If applicable, this QA Plan also requires the use of "Deficiency Evaluation Correction Action Report" (DECAR).

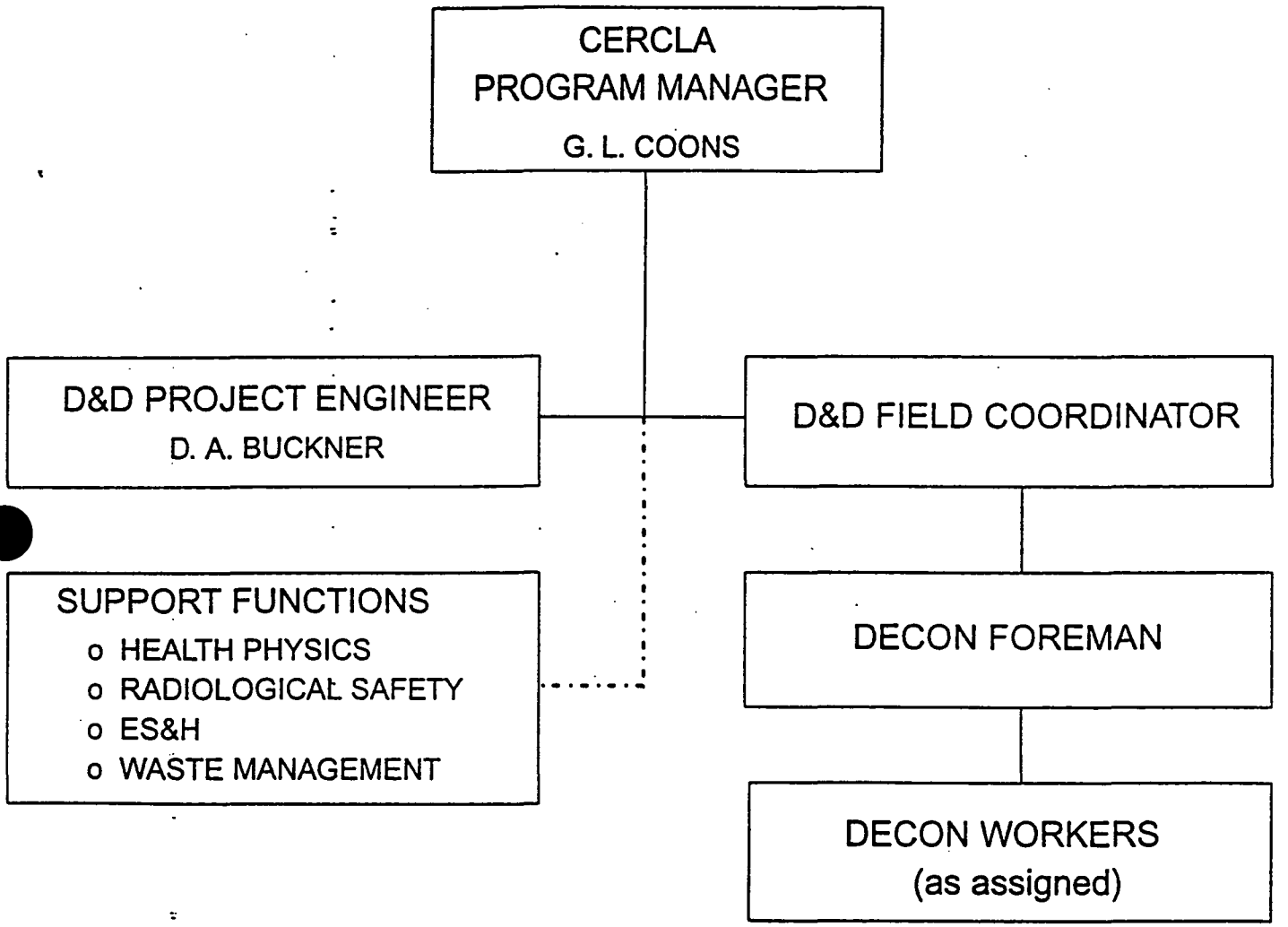
V. SECURITY

Do not leave equipment unattended within 10 ft. of the site boundary fence. If such should become necessary, report the occurrence immediately to Security. Since soil is to be removed adjacent to the boundary fence, do not dig within 2 ft. of any fence post, so as not to weaken the structure. Do not dig so as to create an opening or man-way underneath the fence.

VI. PROJECT ORGANIZATION

This project is in support of the CERCLA program "Drainage Control Interim Response Action." D&D personnel will report directly to the CERCLA source (Program Manager), per the Organization Chart VI-1. The responsibilities of D&D personnel are specified in the Mound Systems Manual 820, Issue 4, Section 2.3.

PROJECT ORGANIZATION CHART



VII. TECHNICAL

Preliminary Actions

1. Order any materials and equipment not available at Mound.

2. Obtain permits:

   a. Radiation Work Permit
   b. D&D Work Permit
   c. Excavation Permit

3. Hold a pre-job meeting at the direction of the Field Coordinator and the Project Engineer. Health Physics, Environmental Technology and Monitoring, Waste Management, Industrial Hygiene, and Decon personnel should be in attendance at this initial meeting.

4. Establish Health Physics Monitoring Plan.

5. Field Coordinator and Decon personnel select the most appropriate equipment for the work.

6. Create a work schedule (HP coverage/maintenance/decon).

7. Notify Environmental Technology and Monitoring of planned work start, in order that up-to-date environmental control and monitoring details can be provided.

Sequence of Work

1. The work area should be roped off and warning signs posted on the perimeter to minimize the chance of visitors entering the area.

2. Obtain and deliver required equipment available at Mound.

   a. Hand tools (for hand-digging soil)
   b. Backhoe and/or bulldozer (for excavating dirt)
   c. Radiation monitors (as required by Mound HP)
   d. High-volume monitors (as required by Mound Environmental)

3. Deliver required waste shipping containers, as needed, and packaging materials.

4. Review the Site Specific Health & Safety Plan with all workers assigned to the project.

5. Stress the immediate hazards/precautions (per D&D, H.P., I.H. and Industrial Safety) that are foreseen for the work day, with all personnel, at the daily pre-job conference.

6. In order to prevent rain run-off from carrying contamination from disturbed soil to lower areas, excavate per the following sequence:

   a. Starting at a high end of the work strip, scoop dirt one foot deep and twelve feet wide downward for a distance of thirty feet.

   b. Place straw bales across the low width of this strip to trap any run-off suspension.

   c. Health Physics grid and sample the exposed soil. If still contaminated, repeat the excavation procedure to a depth of an additional foot.

      If clean, consider the soil as being decontaminated.

   d. Repeat the excavation for an additional thirty feet, as per a, b, and c above.

   e. Continue this strip-wise maneuver of excavation, straw baling of lower end, and HP soil screening along the length of the work area.

   f. At the discretion of the Field Coordinator, cover unboxed disturbed soil with a tarp to protect against rain or wind at any time, including overnight. For periods longer than overnight, this soil shall be covered with tarp(s).

      Straw bales will be placed along the outflow border until HP sampling has demonstrated that the decontaminated soil has been removed.

      HP will sample any standing water. Disposition of the water will be at the direction of the ET&M Senior Manager (or his designee). If not contaminated, dumping of the water will be approved via use of a sump pump and flexible hose to discharge the water into the nearest storm sewer. If contaminated, direction will be given to pump the water into 55-gallon drums and delivered to WD Building for disposal.

      Straw bales used to block the flow of water which is found to be contaminated will be boxed with the soil.

7. Remove soil approximately one foot in depth over the work area, as directed by the Field Coordinator. Stop if Fidler readings on Channel 2 exceed 10K dpm above back ground. At this point, soil samples will be taken to determine the extent and depth of the contamination. Isolate the area until the sample data are evaluated, where upon a decision will be made as to the next appropriate steps to be taken.

8. Dirt will be surveyed and may be boxed immediately upon excavation. If the soil is too wet for boxing, as determined by the Field Coordinator, it may be staged aside until dry enough for boxing. Permission to stage soil must be received from Environmental Technology and Monitoring section.

9. Upon encountering drain tile (seven places behind Buildings 19 and 72), cease excavation until HP has determined the extent of internal contamination. If water is found in the tile, HP will sample the water and if found to be contaminated, it will be removed via the most appropriate means and drummed for waste disposal.

10. HP, Project Engineer, Field Coordinator, and Decon personnel are to formulate a field plan for tile removal and boxing.

11. *Remove, segregate the tile, and continue excavating to conclusion.

12. During the course of digging, HP may detect hot spots, each of which is to be excavated an additional 1 ft. in depth.

13. HP will survey the excavated area(s), per the H.P. Procedure MD-80036-7 OP-1005 "Final or Release Survey" sampling plan to verify a suitable level of decontamination.

14. Once the area is "released" by D&D and CERCLA Management, the contractor will continue the procedures set forth in his work package to finish the Intercept Drainage Control ditch. Note that further excavation will be under the oversight of Health Physics.

- The amount of the tile expected should not be placed in the same LSA box(es) as soil, therefore, to be classified and sampled as a Soil Waste Stream. Place the tile into a separate LSA box, to be marked as to its identify in the Debris Waste Stream, per Waste Compliance.

APPENDIX I

SOIL SCREENING ANALYSIS

DRAINAGE CONTROL PROJECT

1/26/95

TEST RESULTS - SODIUM IODIDE SOIL SCREEN
(MD-80030, OP. 1355)
400 SECOND COUNT
PREPARED BY BETTY PETERS - EXT. 4408

SAMPLE NO.	DATE COLLECTED	DATE SCREENED	SAMPLER	SAMPLE TYPE	88KEV WINDOW	17 KEV WINDOW	MORE ISO-TOPES	GRID LOCATION	WELL
9501236	01/25/95	01/26/95	[redacted] 5983	CONT	1.2	13	N	WESTON DRAINAGE CTRL MSN1701 AT 0-6"	C
9501237	01/25/95	01/26/95	[redacted] 5983	CONT	1.8	14	N	WESTON DRAINAGE CTRL MSN1702 AT 4-5'	A
9501238	01/25/95	01/26/95	[redacted] 5983	CONT	0.3	0	N	WESTON DRAINAGE CTRL MSN1801 AT 0-6"	B
9501239	01/25/95	01/26/95	[redacted] 5983	CONT	1.4	16	N	WESTON DRAINAGE CTRL MSN1802 AT 4-5'	C
9501240	01/25/95	01/26/95	[redacted] 5983	CONT	0.9	3	N	WESTON DRAINAGE CTRL MSN1901 AT 0-6"	B
9501241	01/25/95	01/26/95	[redacted] 5983	CONT	0.9	3	N	WESTON DRAINAGE CTRL MSN1902 AT 4-5'	C
9501212	01/24/95	01/25/95	[redacted] 5983	CONT	0.7	0	N	WESTON DRAINAGE CTRL MSN2001 0-6"	B
9501208	01/24/95	01/25/95	[redacted] 5983	CONT	0.9	2	N	WESTON DRAINAGE CTRL MSN2002 4-5'	B
9501254	01/26/95	01/26/95	[redacted] 5983	CONT	0.9	18	N	WESTON DRAINAGE CTRL MSN2101 AT 0-6"	A
9501255	01/26/95	01/26/95	[redacted] 5983	CONT	0.8	5	N	WESTON DRAINAGE CTRL MSN2102 AT 4-5'	B
9501256	01/26/95	01/26/95	[redacted] 5983	CONT	0.5	3	N	WESTON DRAINAGE CTRL MSN2201 AT 0-6"	C
9501257	01/26/95	01/26/95	[redacted] 5983	CONT	1.0	9	N	WESTON DRAINAGE CTRL MSN2202 AT 4-5'	A
9501258	01/26/95	01/26/95	[redacted] 5983	CONT	0.8	15	N	WESTON DRAINAGE CTRL MSN2301 AT 0-6"	B
9501259	01/26/95	01/26/95	[redacted] 5983	CONT	0.8	0	N	WESTON DRAINAGE CTRL MSN2302 AT 4-5'	C
9501260	01/26/95	01/26/95	[redacted] 5983	CONT	0.4	5	N	WESTON DRAINAGE CTRL MSN2401 AT 0-6"	C
9501261	01/26/95	01/26/95	[redacted] 5983	CONT	1.4	20	N	WESTON DRAINAGE CTRL MSN2402 AT 4-5'	A
9501262	01/26/95	01/26/95	[redacted] 5983	CONT	0.6	64	N	WESTON DRAINAGE CTRL MSN2501 AT 0-6"	B
9501263	01/26/95	01/26/95	[redacted] 5983	CONT	0.9	1	N	WESTON DRAINAGE CTRL MSN2502 AT 4-5'	C

SAMPLE NO.	DATE COLLECTED	DATE SCREENED	SAMPLER		SAMPLE TYPE	88KEV WINDOW	17 KEV WINDOW	MORE ISO-TOPES	GRID LOCATION	WELL
9501264	01/26/95	01/26/95	[redacted]	5983	CONT	0.8	48	N	WESTON DRAINAGE CTRL MSN2601 AT 0-6"	C
5901265	01/26/95	01/26/95	[redacted]	5983	CONT	0.9	0	N	WESTON DRAINAGE CTRL MSN2602 AT 4-5'	C
5901266	01/26/95	01/26/95	[redacted]	5983	CONT	0.6	9	N	WESTON DRAINAGE CTRL MSN2701 AT 0-6"	B
9501267	01/26/95	01/26/95	[redacted]	5983	CONT	0.8	9	N	WESTON DRAINAGE CTRL MSN2702 AT 4-5'	A
9501268	01/26/95	01/26/95	[redacted]	5983	CONT	1.0	4	N	WESTON DRAINAGE CTRL MSN2801 AT 0-6"	C
9501269	01/26/95	01/26/95	[redacted]	5983	CONT	1.0	20	N	WESTON DRAINAGE CTRL MSN2802 AT 4-5'	A
9501270	01/26/95	01/26/95	[redacted]	5983	CONT	0.7	0	N	WESTON DRAINAGE CTRL MSN2901 AT 0-6"	B
9501251	01/26/95	01/26/95	[redacted]	5983	CONT	0.7	0	N	WESTON DRAINAGE CTRL MSN2901 AT 0-6" (EPA)	B
9501271	01/26/95	01/26/95	[redacted]	5983	CONT	1.3	15	N	WESTON DRAINAGE CTRL MSN2902 AT 4-5'	A
[illegible]04	01/24/95	01/25/95	[redacted]	5983	CONT	1.4	2	N	WESTON DRAINAGE CTRL MSN3001 AT 0-6"	B
9501203	01/24/95	01/25/95	[redacted]	5983	CONT	0.7	0	N	WESTON DRAINAGE CTRL MSN3002 AT 1-1.5'	C
9501285	01/26/95	01/30/95	[redacted]	5983	CONT	0.4	0	N	WESTON DRAINAGE CTRL MSN3101 AT 0-6"	C
9501297	01/26/95	01/30/95	[redacted]	5983	CONT	0.0	17	N	WESTON DRAINAGE CTRL MSN3102 AT 4-5'	C
9501287	01/26/95	01/30/95	[redacted]	5983	CONT	0.5	0	N	WESTON DRAINAGE CTRL MSN3201 AT 0-6"	B
9501288	01/26/95	01/30/95	[redacted]	5983	CONT	1.3	3	N	WESTON DRAINAGE CTRL MSN3202 AT 4-5'	C
9501294	01/26/95	01/30/95	[redacted]	5983	CONT	1.1	32	N	WESTON DRAINAGE CTRL MSN3301 AT 0-6"	C
9501290	01/26/95	01/30/95	[redacted]	5983	CONT	1.6	15	N	WESTON DRAINAGE CTRL MSN3302 AT 4-5'	C
9501298	01/26/95	01/30/95	[redacted]	5983	CONT	1.0	3	N	WESTON DRAINAGE CTRL MSN3401 AT 0-6"	B
9501292	01/26/95	01/30/95	[redacted]	5983	CONT	1.3	22	N	WESTON DRAINAGE CTRL MSN3402 AT 4-5'	B

APPENDIX II

REMOVAL OF CONTAMINATED SOIL

(GENERAL DIGGING GUIDELINES)

REMOVAL OF CONTAMINATED SOIL

SOIL CONTAMINATION CRITERIA

DETERMINATION OF COLD, LSA, AND TRU SOIL

1.* All non-excavated/undisturbed soil with sample results for Pu-238 alpha contamination ≥100 pCi/g to 100 nCi/g and/or Th-232 contamination ≥5 pCi/g will be removed and packaged as LSA waste.

2.* All unexcavated/undisturbed soil with Pu-238 alpha contamination ≤100 pCi/g and/or thorium contamination ≤5 pCi/g may be left in place.

3. Excavated soil with Pu-238 alpha contamination ≥25 pCi/g to 100 nCi/g and/or Th-232 contamination ≥5 pCi/g will be packaged as LSA waste.

4. All soil with Pu-238 alpha contamination ≥100 nCi/g will be removed and packaged as TRU waste.

***Note:** In the special case that contamination is found at a depth greater than 15 cm below the surface, the action limits for undisturbed soils in #1 and #2 above are 15 pCi/g -- in the case of Th-232 only.

Field measurements will be used to characterize soil using the Fidler instrument, according to Table 1 below:

Table 1. Field Measurements

	Pu (Net cpm) Bicron Ch. 1	Th (Net cpm) Bicron Ch. 2
Cold	Determined by H Building Counting & EPA Sampling	≤ 1000 cpm
LSA	> Background - 50K cpm	≥ 1000 cpm
TRU	≥50K cpm	

The H Building screening results will categorize the soil according to the following table:

Table 2. H Building Screening

Cat.	Pu-238	Th-232	Notes
Cold	≤25 pCi/g	≤5 pCi/g	No action required
LSA	≥25 pCi/g to 100 nCi/g	≥5 pCi/g	Excavated/Disturbed soil will be packaged as LSA. (See #3 above)

Cat.	Pu-238	Th-232	Notes
Cold/LSA	≤100 pCi/g	≤5 pCi/g	May be left in place undisturbed (See #2 above), or LAS if disturbed (See #3 above).
LSA	≥100 pCi/g to 100 nCi/g	≥5 pCi/g	Unexcavated/Undisturbed soil will be packaged as LSA. (See #1 above)
TRU	≥100 nCi/g		Will be packaged as TRU. (See #4 above)

RELEASE CRITERIA

1. Five (5) soil samples in a 10′ x 10′ grid must average less than 100 pCi/g, with no one of the samples reading over 300 pCi/g for Pu-238. Each of the (5) soil samples must be ≤5 pCi/g for Th-232.

2. If the grid square does not meet the above requirements, continue excavating the hot spots in one (1) ft. increments of depth, and resample until the requirement is met.

3. If the grid square meets the above requirements, it will be considered decontaminated, and the areas will be reviewed for release by D&D Management.

Note: No backfilling will be permitted until the H Building analysis demonstrates that decontamination is complete and a written release for backfilling is given by the D&D Project Engineer.

CONTAMINATED SOIL REMOVAL

GENERAL CONDITIONS

An evaluation of the weather must be made by the Project Engineer or the Field Coordinator, and a decision to work or not must be made prior to 6:00 a.m., and again prior to 11:45 a.m. Work will proceed in mist or light rain. Light rain is defined as, "scattered drops that do not completely wet an area or when individual drops can be identified." Work will stop temporarily if rain exceeds this and resume after the rain. The Field Coordinator or the Project Engineer will make the rain decision. Note that the HP Technician may stop work if he determines that moisture adversely affects instrumentation.

Removal of dirt will proceed if wind velocity does not exceed an average of 20 mph, with gusts to 25 mph. Wind velocity shall be measured and recorded each hour (on the hour) by the Field Coordinator or his delegate. The wind monitoring station to be used will be designated by the Field Coordinator.

Radiation Technician coverage is required any time soil is disturbed, excavated, and/or boxed. The Radiation Technician will install and maintain radiation control barriers, High-

Volume Air Samplers, and the Continuous Air Monitoring (CAM) System. They will also obtain soil samples and and mark the contaminated areas.

Water mist will be sprayed on all freshly exposed soil and rubble, as necessary, to eliminate dust. The exposed soil may be sprayed with water and/or covered with a tarp before securing for the day, as necessary. This is at the Field Coordinator's discretion.

Florco must be used in all waste containers containing LSA and TRU soils. For wood and metal LSA boxes, two bags of Florco is the minimum required and should be placed in the bottom of the box. However, in full metal LSA boxes, should the soil look very wet, up to three additional bags (for a maximum total of five) can be added to the LSA box. In this case, two of the bags should be placed in the bottom of the box, two in the middle, and one on top of the soil. (MD-10332, Operation 720, LLW Waste-Metal Box Loading Guidelines). If excavated soil is too wet to box (as determined by the Field Coordinator), it is to be staged on a tarp to air dry before packaging.

OPERATIONAL GUIDELINES

1. All applicable permits must be completed, signed, and in place prior to starting and excavating.

2. Work will be performed in designated areas in proper protective clothing designated by HP following the guidelines stated in MD-10167, MD-10332, and MD-80036. The change area for radiation control clothing for personnel involved will be designated by the Field Coordinator.

3. LSA contaminated dirt (AMDM-000000012) will be excavated, removed, and placed in metal LSA boxes then sealed using the appropriate specifications found in Manual MD-10332, depending upon the box type. See also MD-10167. Weigh boxes and record weights.

4. Cover the box exchange area with an appropriate sized plastic tarp to protect it from any material that would spill from the excavator bucket.

5. Place the TRU or LSA box on the plastic tarp close to the excavation area.

6. Contaminated dirt will be excavated by hand shovel or heavy-duty equipment, as determined by the Field Coordinator. Note that only hand tools may be used to dig within 5' of any underground utility.

7. LSA boxes will be sealed (per the appropriate operation No. 745 or No. 750 in MD-10332), surveyed, and the paperwork completed, per procedure in MD-10167, prior to removal from the control area.

8. High Volume air samples are to be taken during digging operations and sent to Building 33 (HP Procedure Manual, Operation 1.2.1.1). Environmental Monitoring picks up these samples for analysis and recording to ensure that the project remains within allowable limits and airborne releases are within established limits.

SAFETY GUIDELINES

1. Safety glasses, safety shoes, and hard hats are required in the work area.

2. Radiation protective - clothing and respiratory requirements are provided in accordance with HP Operations direction.

3. Appropriate protective gloves are required.

4. Remain clear of all heavy-duty equipment while it is in operation. Remain clear of all loads that are being moved or lifted, either directly or by chains/straps, by the heavy-duty equipment.

5. Care should be exercised under wet/damp conditions to avoid slips and electrical hazards.

6. Care should be exercised to guard against heat stress/stroke conditions. Guidelines will be posted at the job site.

   Stop work and call the Fire Department at Ext. 911 if anyone shows signs of heat stress or stroke for transportation to Medical.

7. Follow all applicable safety and housekeeping practices and guidelines.

8. GFI (Ground Fault Interrupter) circuits shall be used for all power equipment, standard AC, or generators over 5,000 watts.

9. Copies of the Material Safety Data Sheets (MSDS), if applicable, must be at the job site at all times. Master copies of all Material Safety Data Sheets (MSDS) are available in the Safety Office.

SPECIAL NOTICES

SECURITY

Soil removal near a Security structure may violate a Security concern. Examples are: 1) Do not leave heavy equipment unattended within 10 ft. of a boundary configuration (fence or wall), lest that be an aid to intrusion; 2) Do not remove soil such that a man-way is created beneath a Security configuration or that the structure is weakened (i.e., within 2 ft. of a fence post).

Consult with Security before work is scheduled to ensure compliance with their responsibilities and/or to include Security oversight in the work plan.

In case of an inadvertent breech of Security principles (e.g. equipment break down near a fence), notify Security immediately.

INDUSTRIAL SAFETY

When excavating near a buried utility line, hand dig only any time the excavation is within 5 ft. of a line that is shown on a drawing or is located by scanning procedures.

WASTE MANAGEMENT

LSA and TRU boxes will be used for soil transportation off-site. The contents of each box must be completely and accurately identified. They will be properly sampled to determine the level of RCRA hazardous and RAD waste(s) and will go into the Soil Waste Stream. Accordingly, a preponderance of soil should be placed in such a box, since the sampling procedures are based upon soil only. Incidental fragments of e.g. tile or brick may be included. However, sizeable volumes of e.g. concrete, pipe, etc. should be separated from the boxed soil. These items may be placed in a separate box and appropriately identified for sampling and disposal in the Debris Waste Stream.

In order to exhibit proper control of our waste, do not allow stray trash to enter these boxes. Minimize even those acceptable materials listed below.

Acceptable Materials List

The following is the ACCEPTABLE MATERIALS LIST specific to WASTE STREAM AMDM-000000012. Items not on this list shall not be LOADED in box containing soil.

Soil and Rock Debris:

- Asphalt
- Ceramic tile
- Clay absorbent (e.g., Florco)
- Clay tile
- Cloth/leather (e.g., gloves)
- Concrete
- Dried vegetation
- Glass
- Paper/cardboard (e.g., empty absorbent bags, suits, head covers)
- Plastic (e.g., shoe covers, bags, radiation rope/signs, tarps)
- PVC pipe
- Rubber (e.g., gloves, gasket material)
- Scrap metal, **EXCLUDING LEAD** (e.g., steel strapping material, steel reinforcement rods {rebar}, sheet metal)
- Styrofoam
- Tape (e.g., masking, clear decon)
- Wood/lumber

ENVIRONMENTAL

It may be appropriate to stage excavated soils, e.g. for drying prior to boxing. Written permission to do so must be obtained from the Environmental Technology and Monitoring Organization. It is recommended that this eventuality be settled prior to the start of work.

SOIL REMOVAL

BUILDING 21 AREA (THORIUM AND PLUTONIUM)

In Support of
Intercept Drainage Control Project

Project No. WBS 105.52
O.U.5

ASSEMBLED FOR D&D ENGINEERING

by

DEAN A. BUCKNER

03/23/95

D&D WORK PACKAGE SIGN-OFF SHEET
(SIGNATURE AND DATE REQUIRED)

Project Name: Soil Removal (Bldg. 21 Area)

Project Number: B02383

Current Date: March 30, 1995

Project Engineer: Dean A. Buckner

DECONTAMINATION AND DECOMMISSIONING

		DATE	SIGNATURE
D. A. Buckner	PROJECT ENGINEERING	3/30/95	D A Buckner
J. E. Thompson	D&D SUPERVISION	03/30/95	John W. Thompson
G. L. Coons	CERCLA MANAGER	5/8/95	(Acting) Gary L. Coons
R. P. Martin	DECONTAMINATION	4/4/95	Raymond P. Martin
R. N. Rogers	QUALITY ASSURANCE	4/3/95	R N Rogers
M. R. O'Donoghue	HEALTH PHYSICS	4-11-95	Mike O'Donoghue
S. A. Collas	HEALTH PHYSICS OPERATIONS	4-3-95	Stan Collas
R. L. Lynch	INDUSTRIAL HYGIENE	4/4/95	Walter L. Cash for Rod Lynch
D. Garrison	INDUSTRIAL SAFETY	8 May 95	Daniel Garrison
M. L. Alexander	WASTE MANAGEMENT	4-3-95	M L Alexander
J. V. Adams	MAINTENANCE	4/3/95	J V Adams
S. A. Cloud	ENVIRONMENTAL, TECHNOLOGY & MONITORING	4/24/95	S A Cloud

THORIUM AND PLUTONIUM REMOVAL (Intercept Drainage Control)

AES WORK PACKAGE TRANSMITTAL SHEET

AES NO: B02383 ENGINEER: Dean A. Buckner DATE: 3/30/95

Q.A. LEVEL: [ ]1 [X]2 [ ]3

PACKAGE: COMPLETE: PHASE NO: 1 OF 1

CONTENT REQUIREMENTS	CHECK CONTENTS ATTACHED	NO. OF COPIES
MSR (always required)	✓	MSR
JOB SCOPE	✓	1
DESCRIPTION	✓	In Job Scope
SPECIAL INSTRUCTIONS/SPECS.	✓	In Job Scope
SPECIAL SCHEDULING INSTRUCTIONS	✓	In Job Scope
COST ESTIMATE SUMMARY (REQUIRED)	✓	1
MATERIALS LIST (1 Copy to Material Control Clerk)	✓	1
FORMAL DRAWINGS/APPROVED SYSTEM DRAWINGS	N/A	N/A
SKETCHES	✓	1
VENDOR DATA FOR EQUIPMENT	N/A	N/A
PROJECT SCHEDULE	N/A	N/A

DO YOU WANT A PRE-CONSTRUCTION MEETING? [X]YES [ ]NO

REMARKS:

SUPERVISOR'S APPROVAL: John W. Nichols March 30, 1995

NOTE: FOR: _____ SEND TO: _____

I. INTRODUCTION

Summary

This project is in support of the CERCLA effort to affect a "Drainage Control Interim Response Action." All work is to be charged to B02383.

This work will be performed on the drainage channel south of Building 21. This project will identify and remove all contaminated shale/dirt exceeding the guidelines contained in the D&D Digging Guidelines (appended). The total area encompasses approximately 9,600 sq. ft. (12' x 800'). However, only contaminated areas will be removed.

Scope

No contaminated soil is planned to be removed beyond the 12' x 800' strip, which is the land designated for installation of the "Drainage Control" ditch. The volume of soil to be removed will be determined solely by hot spots located by Health Physics during construction.

All work that is to be performed by Mound Personnel [Decon (D), Health Physics (HP) and/or Heavy Duty (HD)] and is to be done according to instructions and procedures provided by the Field Coordinator or Project Engineer, as per this work package.

The following tasks are associated with the project:

1. Remove contaminated soil.

2. Package all waste for disposal.

3. Verify decontamination, via RAD survey, and release site to follow-on operations.

References

1. Figure 2, Plan of Intercept Drainage, Building 21 Area.

2. Soil screen sampling for Drainage Control Interim Response Action (appended).

Assumptions

It is assumed that only Pu-238 and Th-232 are the contaminates of concern. Field sampling (see reference 2 above) disclosed no other radionuclides, and no history indicates, nor any other known sampling has disclosed, other hazardous chemicals in excess of concern limits.

II. SITE INFORMATION

Description of Site

A Mound site survey project analyzed soil samples collected from the areas of concern upgradient of the fenced boundary separating the old property from the new. The primary area of concern, designated as Area 1, is located near Building 21 and the contaminated soil boxed storage area. Area 1 was used for storage of plutonium-238 waste packages in the mid-1960s and for storage and repackaging of thorium sludge from 1966 to 1974. Several soil samples showed elevated levels of plutonium-238 and thorium (see DOE, 1993a for sampling locations and detailed results). The maximum plutonium-238 and thorium concentrations in the surface soil samples near Building 21 were 34,000 pCi/g and 54.3 pCi/g, respectively.

Site History

Area 1 was used for the storage and redrumming of 55-gallon drums containing thorium and plutonium in the late 1950s and early 1960s (MRC 1973). In 1954 and 1955, approximately 6,000 55-gallon drums containing thorium sludge were delivered by rail to the Mound Plant (MRC 1973; Meyer 1979). Some of these drums were stored in Area 1 for prolonged periods of time. Weathering and internal corrosion made it necessary to frequently redrum the thorium sludge (MRC 1973). Thorium was released into the soil due to leakage during storage and the redrumming operation.

Soil samples collected from the areas of concern adjacent to Building 21 show elevated levels of Pu-238. The plutonium contamination may have resulted from drums stored adjacent to Building 21 and the attendant redrumming operations.

Hazardous Material

Soil samples were cored on 50′ centers for the full length of the proposed ditch. Soil screens for Pu-238 and Th-232 were made for each point at near-surface (6") and at depth (4′ - 5′). No readings for Th-232 or Pu-238 were above the action levels. No other radionuclides were indicated.

Initial Conditions

The area of concern is not restricted. Random hot spots may well be detected along the route of the drainage ditch during the construction phase.

III. ES&H

These guidelines are to be used for any construction job that discovers contaminated soils.

Mound Standards and Procedures

According to MD-81010, Mound Plant Application, all waste packaged and shipped must comply with NVO 325 in order to send to the Nevada Test Site, and comply with MD-81020, Mound Plant Waste Certification Program for Waste Stream AMDM-000000012 (low level radioactive contaminated soil).

Work that is done by Decontamination personnel is to be done according to the D&D Decontamination Procedures Manual MD-10332. Work that is done by D&D or ER personnel is to be performed according to the D&D Operations Procedure Manual MD-10167 and Waste Accountability Shipping and Packaging (WASP) MD-10173. Work that is done by the Health Physics Radiation Technicians (HP) is to be done according to the Health Physics Procedures Manual MD-80036 and Mound Radiological Protection Manual MD-10019.

Mound Maintenance and Utilities Safety Handbook MLM-89-70-0001, Safety and Hygiene Manual MD-10286, and Mound Radiological Protection Manual MD-10019, will be used as guidelines for all general safety and health requirements.

All personnel working within this controlled area must have 40 hours of HAZWOPER Training. It is the responsibility of the personnel's supervision to ensure proper training has been administered, also that personnel are qualified per current Bioassay surveillance.

Field Coordination

A pre-job meeting will be held by the Field Coordinator and the Project Engineer prior to work commencing. All applicable permits are to be completed and signed by the responsible parties before work is initiated. Safety and Industrial Hygiene, H.P., Decon, and Waste Management personnel should be in attendance at this initial meeting. The most appropriate soil removal equipment should be designated. Subsequent meetings should be held when job conditions change, personnel changes, or updates to employees are required. These meetings will be held at the discretion of the Field Coordinator and/or the Project Engineer.

The Field Coordinator will monitor all work to ensure that all procedures are followed from project start to completion. The Field Coordinator will assure that a copy of the latest issue of the work package is posted at the work site, that a copy of the "Employee/Employer Responsibilities" notice is visibly displayed, and that a copy of the Site Specific Health and Safety Plan is posted.

During the operational phase, the Field Coordinator will:

- Designate the Decon change room facilities.
- *Select the appropriate wind velocity reading location.
- *Make wind/rain stop-work decisions.
- *Determine whether loosened soil may be boxed or whether it shall be staged for drying.
- *Direct that water mist will be sprayed on loosened soil and/or whether it shall be covered with a tarpaulin at the end of the work period.
- See Appendix II "General Digging Guidelines."

Health Physics Requirements

Health Physics personnel coverage is required for any D&D soil removal work. The Health Physics personnel will install and maintain radiation control signs, and dictate the appropriate protective clothing and monitoring. Anyone working in a hazardous and/or radioactive control area may request upgraded protective equipment.

Local area will be monitored by personal lapel air monitors, or high volume sampling and controlled by Health Physics personnel. Data collected from monitors shall be copied to the appropriate supervisor, Environmental Monitoring Group, and the Project Engineer.

Continuous air monitors (CAM) are to be set up to monitor the operations as directed by Health Physics. At any time, these locations can be changed as directed by Health Physics personnel because of changing weather or job conditions. In the event that a CAM alarm goes off, all operations will stop, and Health Physics personnel will check their monitoring equipment to assess the situation. Health Physics, along with the Project Engineer and Field Coordinator, will notify the ET&M or designee of the possibility of a release of contamination at the work site. The EM&T Manager will make the decision of course of action and notify the D&D Project Engineer whether to proceed or hold operations.

The contaminated area will be identified with radiation control barriers and postings. All personnel within that area must wear safety equipment listed under the safety section (documented on the D&D Work Permit), plus the radiation protective equipment and clothing specified by Health Physics (documented on the Radiation Work Permit).

Safety

A pre-entry briefing will be held prior to initiating any site activity, and at such other times as necessary to ensure that all employees are appraised of the Site Safety and Health Plan. A pre-job meeting will be held at the start of each work day to define the day's work, as well as to stress all of the pertinent safety aspects.

The work area will be identified with construction barriers. All personnel within that area must wear hard hats, safety glasses (with permanent side shields), safety shoes, and appropriate protective gloves.

Hazards

Noise

Hearing protection, available as PPE, will be worn as needed while heavy-duty equipment is operating.

Excavations

All excavations must be sloped, shored or shielded per OSHA Standard 29 CFR part 1926. This applies to both excavations and trenching. Excavating below 4'-0" deep must be initially monitored for combustibles and oxygen, unless the trench is sloped back to the angle of repose. Contact Industrial Hygiene for monitoring.

Slips and Falls

Special care should be exercised when working on slopes or near excavations to avoid slipping and falling. Special overshoes with rubber spikes shall be provided to improve footing under those conditions.

Heat Stress/Stroke

Heat stress guidelines will be posted at the job site. If anyone should show signs of heat stress or stroke, the Fire Department is to be called at extension 911.

Electrical

There should be no extraordinary electrical hazards associated with this project. GFI (Ground Fault Interrupter) circuits shall be used for all electrical-powered equipment.

General

MSDS's are maintained by employee supervisors. A master copy is available in the Industrial Hygiene office.

Good housekeeping practices will be utilized to minimize slipping, falling, or other related safety hazards.

Common sense and good judgement will be expected of all workers, supervision, or visitors at all times.

Remain clear of all heavy-duty equipment while it is in operation, and remain clear of the backhoes' counterbalance swings. Remain clear of all loads that are being moved or lifted, either directly or by chains/cables or straps, by the heavy-duty equipment.

Equipment Utilized

Hand tools may be used to manually dig soils. Several units of heavy-duty equipment are available and applicable to this project. The choice of equipment used will be left to the discretion of the Supervisor of the heavy-duty operation, in concert with the Field Coordinator.

Waste Management Procedures

The waste generated by this project will be packaged and sealed according to applicable procedures in the current issues of MD-81010, Mound Plant Application to Ship Waste to the Nevada Test Site, MD-81020 Mound Plant Waste Certification Program Plan, MD-10332, D&D Decontamination Procedures and MD-10167, D&D Operations Procedures for Waste Stream AMDM-000000012 (low level radioactive contaminated soil).

Radiation/Release

It is expected that some soils will be sufficiently contaminated to fall within the LSA category as disturbed (see "Removal of Pu-238 and/or Th-232 Contaminated Soil" Table 2, Item 2, appended). Since "release" in this case is for further excavation, the "cold" level (ibid) must obtain, (i.e. Pu-238 $\leq$ 25 pCi/g and Th-232 $\leq$ 5 pCi/g. Health Physics will sample the work area per MD-80036 to verify that the above levels have been met. Accordingly, the area will be released for the contractor to construct the "Drainage Intercept" project.

Permitting

The following permits are required to the start of work:

1. Radiation Work Permit
2. D&D Work Permit
3. Excavation/Digging Permit

IV. QUALITY ASSURANCE

1. DESCRIPTION AND SCOPE OF PROJECT

This project involves the removal of soil contaminated with Thorium and Plutonium found along the drainage channel south of Building 21 and parallel with the paved road.

2. PURPOSE OF QA PLAN

The purpose of this Quality Assurance Plan (QA Plan) is to assure that the objectives of the United States Department of Energy (DOE) and EG&G Mound Applied Technologies (Mound) are met for this Decontamination and Decommissioning (D&D) project relative to Health and Safety, radiological and environmental protection, reliability and continuity of operations, and documentation or quality efforts. This QA Plan identifies the activities and responsibilities which are necessary in the design, procurement, fabrication, installation, and start-up of this project in order to meet these objectives.

3. APPLICABLE DOCUMENTS

The DOE requirements for Quality Assurance for D&D projects such as this one are stated in 10 CFR 830.120. DOE order 5700.6C directs EG&G Mound Applied Technologies to develop non-weapons Quality Assurance Programs.

Based on the DOE Order 5700.6C, EG&G Mound Applied Technologies has established a Quality Assurance Program as described in the Mound Technical Manual MD-10334, "Mound Quality Policy and Responsibilities." MD-81020, Mound Plant Waste Certification Program Plan is used for waste management. This covers 5700.6c and NQA-1 requirements.

The D&D Engineering portion of the QA program is described in the Mound Technical Manual MD-10403, titled "Quality Assurance Plan For The D&D Project Engineering Group." This manual describes the management structure used for organizing the program, management responsibilities in QA operations and activities, program requirements, quality plans for ongoing services and functions provided by the section, and the requirements to develop project specific quality plans for projects designed, constructed, and decontaminated and decommissioned for our customers. Section 1.3 of this manual, entitled "Source Requirement Documents," specifically describes the quality assurance activities and plans that are established, implemented, and maintained to achieve a high degree of confidence in the D&D program's operational success, and to protect the public health and environment from radioactive contamination, and from hazardous materials contained within the inactive contaminated facilities and areas.

The "Mound Project Management Manual 804" provides information on procedures within the engineering department. The "Plant Engineering Guide," issue of February 1988, provides general operational guidelines for work within the plant engineering section.

MD-10423 Work Package Development Manual, Decontamination and Decommissioning, contains step-by-step procedures describing how routine D&D activities are performed. The D&D activities which affect quality shall be planned by the Project Engineer and accomplished under controlled conditions specified in the work packages according to procedures specified in MD-10423.

The Mound Technical Manual MD-10403 requires a written QA Plan for any D&D project and/or work package assessed as Quality Assurance Level 1 or Level 2. Form ML-8047 "Project Quality Assurance Review" also is written for any D&D work package assessed as Level 3.

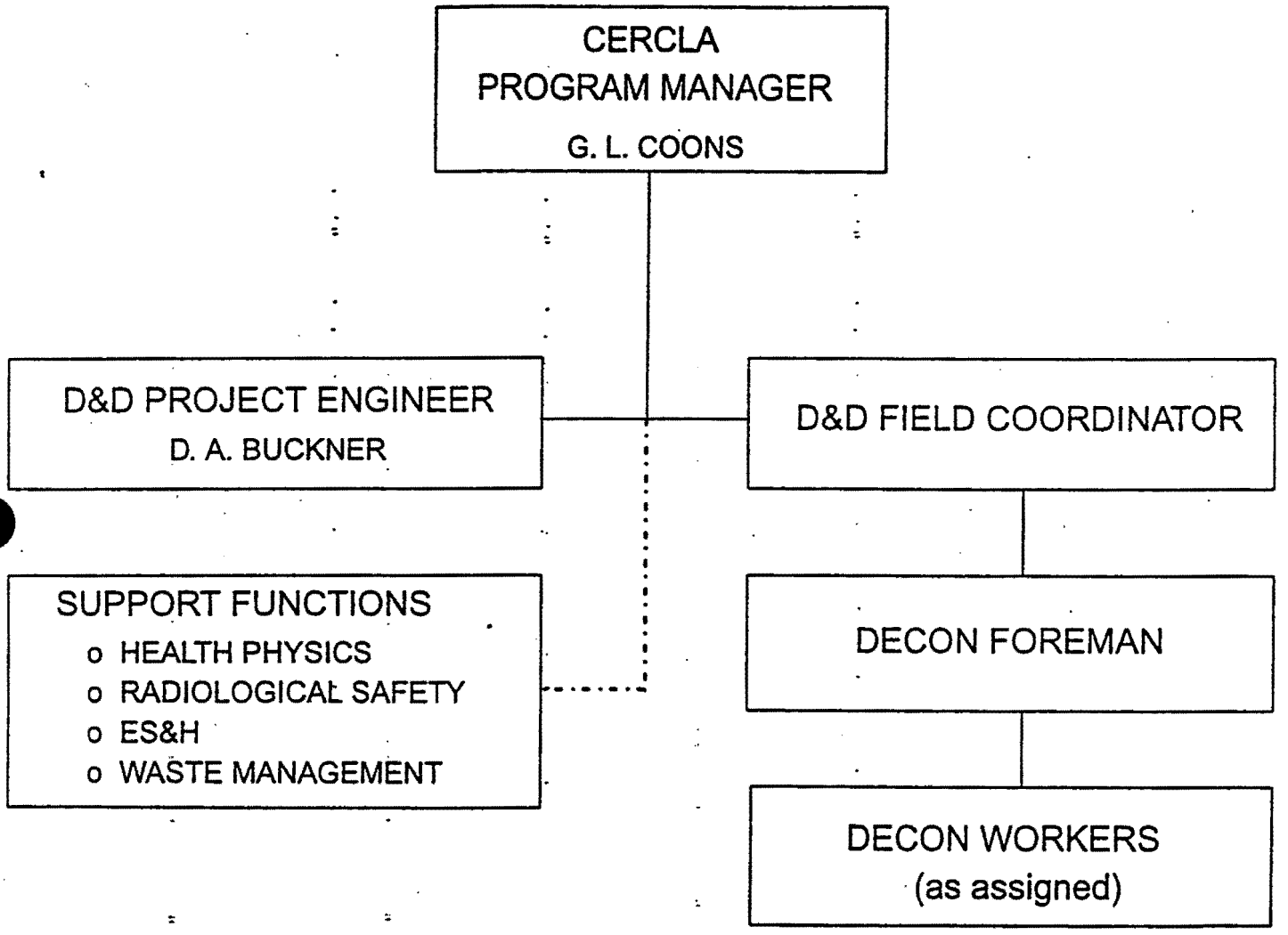
This QA Plan requires the use of "Engineering Review Transmittal Sheet," Mound form ML-7588, for documentation of content review and comment. If applicable, this QA Plan also requires the use of "Deficiency Evaluation Correction Action Report" (DECAR).

V. SECURITY N/A

VI. PROJECT ORGANIZATION

This project is in support of the CERCLA program "Drainage Control Interim Response Action." D&D personnel will report directly to the CERCLA source (Program Manager), per the Organization Chart VI-1. The responsibilities of D&D personnel are specified in the Mound Systems Manual 820, Issue 4, Section 2.3.

PROJECT ORGANIZATION CHART



VII. TECHNICAL

Preliminary Actions

1. Order any materials and equipment not available at Mound.

2. Obtain permits:

   a. Radiation Work Permit
   b. D&D Work Permit
   c. Excavation Permit

3. Hold a pre-job meeting at the direction of the Field Coordinator and the Project Engineer. Health Physics, Environmental Technology and Monitoring, Waste Management, Industrial Hygiene, and Decon personnel should be in attendance at this initial meeting.

4. Establish Health Physics Monitoring Plan.

5. Field Coordinator and Decon personnel select the most appropriate equipment for the work.

6. Create a work schedule (HP coverage/maintenance/decon).

Sequence of Work

1. The work area should be roped off and warning signs posted on the perimeter to minimize the chance of visitors entering the area.

2. Obtain and deliver required equipment available at Mound.

   a. Hand tools (for hand-digging soil)
   b. Backhoe and/or bulldozer (for excavating dirt)
   c. Radiation monitors (as required by Mound HP)
   d. High-volume monitors (as required by Mound Environmental)

3. Deliver required waste shipping containers, as needed, and packaging materials.

4. Review the Site Specific Health & Safety Plan with all workers assigned to the project.

5. Stress the immediate hazards/precautions (per D&D, H.P., I.H. and Industrial Safety) that are foreseen for the work day, with all personnel, at the daily pre-job conference.

6. In order to prevent rain run-off from carrying contamination from disturbed soil to lower areas, excavate per the following sequence:

   a. Starting at a high end of the work strip, scoop dirt one foot deep and twelve feet wide downward for a distance of thirty feet.

b. Place straw bales across the low width of this strip to trap any run-off suspension.

c. Health Physics grid and sample the exposed soil. If still contaminated, repeat the excavation procedure to a depth of an additional foot.

If clean, consider the soil as being decontaminated.

d. Repeat the excavation for an additional thirty feet, as per a, b, and c above.

e. Continue this strip-wise maneuver of excavation, straw baling of lower end, and HP soil screening along the length of the work area.

f. At the discretion of the Field Coordinator, cover unboxed disturbed soil with a tarp to protect against rain or wind at any time, including overnight. For periods longer than overnight, this soil shall be covered with tarp(s).

Straw bales will be placed along the outflow border until HP sampling has demonstrated that the decontaminated soil has been removed.

HP will sample any standing water and survey used straw bales. Contaminated bales may be boxed with the soi. Contaminated water will be pumped into drums for waste disposal.

7. Remove soil approximately one foot in depth over the work area, as directed by the Field Coordinator. Stop if Fidler readings on Channel 2 exceed 10K dpm above back ground. At this point, soil samples will be taken to determine the extent and depth of the contamination. Isolate the area until the sample data are evaluated, where upon a decision will be made as to the next appropriate steps to be taken.

8. Dirt will be surveyed and may be boxed immediately upon excavation. If the soil is too wet for boxing, as determined by the Field Coordinator, it may be staged aside until dry enough for boxing. Permission to stage soil must be received from Environmental Technology and Monitoring section.

9. During the course of digging, HP may detect hot spots, each of which is to be excavated an additional 1 ft. in depth.

10. HP, will survey the excavated area(s), per the H.P. Procedure MD-80036-7 OP-1005 "Final or Release Survey" sampling plan to verify a suitable level of decontamination.

11. Once the area is "released" by D&D and CERCLA Management, the contractor will continue the procedures set forth in his work package to finish the Intercept Drainage Control ditch. Note that further excavation will be under the oversight of Health Physics.

APPENDIX I

SOIL SCREENING ANALYSIS

DRAINAGE CONTROL PROJECT

1/26/95

TEST RESULTS - SODIUM IODIDE SOIL SCREEN
(MD-80030, OP. 1355)
400 SECOND COUNT
PREPARED BY BETTY PETERS - EXT. 4408

SAMPLE NO.	DATE COLLECTED	DATE SCREENED	SAMPLER	SAMPLE TYPE	88KEV WINDOW	17 KEV WINDOW	MORE ISO-TOPES	GRID LOCATION	WELL
9501236	01/25/95	01/26/95	[redacted] 5983	CONT	1.2	13	N	WESTON DRAINAGE CTRL MSN1701 AT 0-6"	C
9501237	01/25/95	01/26/95	[redacted] 5983	CONT	1.8	14	N	WESTON DRAINAGE CTRL MSN1702 AT 4-5'	A
9501238	01/25/95	01/26/95	[redacted] 5983	CONT	0.3	0	N	WESTON DRAINAGE CTRL MSN1801 AT 0-6"	B
9501239	01/25/95	01/26/95	[redacted] 5983	CONT	1.4	16	N	WESTON DRAINAGE CTRL MSN1802 AT 4-5'	C
9501240	01/25/95	01/26/95	[redacted] 5983	CONT	0.9	3	N	WESTON DRAINAGE CTRL MSN1901 AT 0-6"	B
9501241	01/25/95	01/26/95	[redacted] 5983	CONT	0.9	3	N	WESTON DRAINAGE CTRL MSN1902 AT 4-5'	C
9501212	01/24/95	01/25/95	[redacted] 5983	CONT	0.7	0	N	WESTON DRAINAGE CTRL MSN2001 0-6"	B
9501208	01/24/95	01/25/95	[redacted] 5983	CONT	0.9	2	N	WESTON DRAINAGE CTRL MSN2002 4-5'	B
9501254	01/26/95	01/26/95	[redacted] 5983	CONT	0.9	18	N	WESTON DRAINAGE CTRL MSN2101 AT 0-6"	A
9501255	01/26/95	01/26/95	[redacted] 5983	CONT	0.8	5	N	WESTON DRAINAGE CTRL MSN2102 AT 4-5'	B
9501256	01/26/95	01/26/95	[redacted] 5983	CONT	0.5	3	N	WESTON DRAINAGE CTRL MSN2201 AT 0-6"	C
9501257	01/26/95	01/26/95	[redacted] 5983	CONT	1.0	9	N	WESTON DRAINAGE CTRL MSN2202 AT 4-5'	A
9501258	01/26/95	01/26/95	[redacted] 5983	CONT	0.8	15	N	WESTON DRAINAGE CTRL MSN2301 AT 0-6"	B
9501259	01/26/95	01/26/95	[redacted] 5983	CONT	0.8	0	N	WESTON DRAINAGE CTRL MSN2302 AT 4-5'	C
9501260	01/26/95	01/26/95	[redacted] 5983	CONT	0.4	5	N	WESTON DRAINAGE CTRL MSN2401 AT 0-6"	C
9501261	01/26/95	01/26/95	[redacted] 5983	CONT	1.4	20	N	WESTON DRAINAGE CTRL MSN2402 AT 4-5'	A
9501262	01/26/95	01/26/95	[redacted] 5983	CONT	0.6	64	N	WESTON DRAINAGE CTRL MSN2501 AT 0-6"	B
9501263	01/26/95	01/26/95	[redacted] 5983	CONT	0.9	1	N	WESTON DRAINAGE CTRL MSN2502 AT 4-5'	C

MPLE NO.	DATE COLLECTED	DATE SCREENED	SAMPLER	SAMPLE TYPE	88KEV WINDOW	17 KEV WINDOW	MORE ISO-TOPES	GRID LOCATION	WELL
9501264	01/26/95	01/26/95	[redacted] 5983	CONT	0.8	48	N	WESTON DRAINAGE CTRL MSN2601 AT 0-6"	C
5901265	01/26/95	01/26/95	[redacted] 5983	CONT	0.9	0	N	WESTON DRAINAGE CTRL MSN2602 AT 4-5'	C
5901266	01/26/95	01/26/95	[redacted] 5983	CONT	0.6	9	N	WESTON DRAINAGE CTRL MSN2701 AT 0-6"	B
9501267	01/26/95	01/26/95	[redacted] 5983	CONT	0.8	9	N	WESTON DRAINAGE CTRL MSN2702 AT 4-5'	A
9501268	01/26/95	01/26/95	[redacted] 5983	CONT	1.0	4	N	WESTON DRAINAGE CTRL MSN2801 AT 0-6"	C
9501269	01/26/95	01/26/95	[redacted] 5983	CONT	1.0	20	N	WESTON DRAINAGE CTRL MSN2802 AT 4-5'	A
9501270	01/26/95	01/26/95	[redacted] 5983	CONT	0.7	0	N	WESTON DRAINAGE CTRL MSN2901 AT 0-6"	B
9501251	01/26/95	01/26/95	[redacted] 5983	CONT	0.7	0	N	WESTON DRAINAGE CTRL MSN2901 AT 0-6" (EPA)	B
9501271	01/26/95	01/26/95	[redacted] 5983	CONT	1.3	15	N	WESTON DRAINAGE CTRL MSN2902 AT 4-5'	A
01204	01/24/95	01/25/95	[redacted] 5983	CONT	1.4	2	N	WESTON DRAINAGE CTRL MSN3001 AT 0-6"	B
9501203	01/24/95	01/25/95	[redacted] 5983	CONT	0.7	0	N	WESTON DRAINAGE CTRL MSN3002 AT 1-1.5'	C
9501285	01/26/95	01/30/95	[redacted] 5983	CONT	0.4	0	N	WESTON DRAINAGE CTRL MSN3101 AT 0-6"	C
9501297	01/26/95	01/30/95	[redacted] 5983	CONT	0.0	17	N	WESTON DRAINAGE CTRL MSN3102 AT 4-5'	C
9501287	01/26/95	01/30/95	[redacted] 5983	CONT	0.5	0	N	WESTON DRAINAGE CTRL MSN3201 AT 0-6"	B
9501288	01/26/95	01/30/95	[redacted] 5983	CONT	1.3	3	N	WESTON DRAINAGE CTRL MSN3202 AT 4-5'	C
9501294	01/26/95	01/30/95	[redacted] 5983	CONT	1.1	32	N	WESTON DRAINAGE CTRL MSN3301 AT 0-6"	C
9501290	01/26/95	01/30/95	[redacted] 5983	CONT	1.6	15	N	WESTON DRAINAGE CTRL MSN3302 AT 4-5'	C
9501298	01/26/95	01/30/95	[redacted] 5983	CONT	1.0	3	N	WESTON DRAINAGE CTRL MSN3401 AT 0-6"	B
9501292	01/26/95	01/30/95	[redacted] 5983	CONT	1.3	22	N	WESTON DRAINAGE CTRL MSN3402 AT 4-5'	B

APPENDIX II

REMOVAL OF CONTAMINATED SOIL

(GENERAL DIGGING GUIDELINES)

REMOVAL OF CONTAMINATED SOIL

SOIL CONTAMINATION CRITERIA

DETERMINATION OF COLD, LSA, AND TRU SOIL

1.* All non-excavated/undisturbed soil with sample results for Pu-238 alpha contamination ≥100 pCi/g to 100 nCi/g and/or Th-232 contamination ≥5 pCi/g will be removed and packaged as LSA waste.

2.* All unexcavated/undisturbed soil with Pu-238 alpha contamination ≤100 pCi/g and/or thorium contamination ≤5 pCi/g may be left in place.

3. Excavated soil with Pu-238 alpha contamination ≥25 pCi/g to 100 nCi/g and/or Th-232 contamination ≥5 pCi/g will be packaged as LSA waste.

4. All soil with Pu-238 alpha contamination ≥100 nCi/g will be removed and packaged as TRU waste.

***Note:** In the special case that contamination is found at a depth greater than 15 cm below the surface, the action limits for undisturbed soils in #1 and #2 above are 15 pCi/g -- in the case of Th-232 only.

Field measurements will be used to characterize soil using the Fidler instrument, according to Table 1 below:

Table 1. Field Measurements

	Pu (Net cpm) Bicron Ch. 1	Th (Net cpm) Bicron Ch. 2
Cold	Determined by H Building Counting & EPA Sampling	≤ 1000 cpm
LSA	> Background - 50K cpm	≥ 1000 cpm
TRU	≥50K cpm	

The H Building screening results will categorize the soil according to the following table:

Table 2. H Building Screening

Cat.	Pu-238	Th-232	Notes
Cold	≤25 pCi/g	≤5 pCi/g	No action required
LSA	≥25 pCi/g to 100 nCi/g	≥5 pCi/g	Excavated/Disturbed soil will be packaged as LSA. (See #3 above)

Cat.	Pu-238	Th-232	Notes
Cold/LSA	≤100 pCi/g	≤5 pCi/g	May be left in place undisturbed (See #2 above), or LAS if disturbed (See #3 above).
LSA	≥100 pCi/g to 100 nCi/g	≥5 pCi/g	Unexcavated/Undisturbed soil will be packaged as LSA. (See #1 above)
TRU	≥100 nCi/g		Will be packaged as TRU. (See #4 above)

RELEASE CRITERIA

1. Five (5) soil samples in a 10′ x 10′ grid must average less than 100 pCi/g, with no one of the samples reading over 300 pCi/g for Pu-238. Each of the (5) soil samples must be ≤5 pCi/g for Th-232.

2. If the grid square does not meet the above requirements, continue excavating the hot spots in one (1) ft. increments of depth, and resample until the requirement is met.

3. If the grid square meets the above requirements, it will be considered decontaminated, and the areas will be reviewed for release by D&D Management.

Note: No backfilling will be permitted until the H Building analysis demonstrates that decontamination is complete and a written release for backfilling is given by the D&D Project Engineer.

CONTAMINATED SOIL REMOVAL

GENERAL CONDITIONS

An evaluation of the weather must be made by the Project Engineer or the Field Coordinator, and a decision to work or not must be made prior to 6:00 a.m., and again prior to 11:45 a.m. Work will proceed in mist or light rain. Light rain is defined as, "scattered drops that do not completely wet an area or when individual drops can be identified." Work will stop temporarily if rain exceeds this and resume after the rain. The Field Coordinator or the Project Engineer will make the rain decision. Note that the HP Technician may stop work if he determines that moisture adversely affects instrumentation.

Removal of dirt will proceed if wind velocity does not exceed an average of 20 mph, with gusts to 25 mph. Wind velocity shall be measured and recorded each hour (on the hour) by the Field Coordinator or his delegate. The wind monitoring station to be used will be designated by the Field Coordinator.

Radiation Technician coverage is required any time soil is disturbed, excavated, and/or boxed. The Radiation Technician will install and maintain radiation control barriers, High-

Volume Air Samplers, and the Continuous Air Monitoring (CAM) System. They will also obtain soil samples and and mark the contaminated areas.

Water mist will be sprayed on all freshly exposed soil and rubble, as necessary, to eliminate dust. The exposed soil may be sprayed with water and/or covered with a tarp before securing for the day, as necessary. This is at the Field Coordinator's discretion.

Florco must be used in all waste containers containing LSA and TRU soils. For wood and metal LSA boxes, two bags of Florco is the minimum required and should be placed in the bottom of the box. However, in full metal LSA boxes, should the soil look very wet, up to three additional bags (for a maximum total of five) can be added to the LSA box. In this case, two of the bags should be placed in the bottom of the box, two in the middle, and one on top of the soil. (MD-10332, Operation 720, LLW Waste-Metal Box Loading Guidelines). If excavated soil is too wet to box (as determined by the Field Coordinator), it is to be staged on a tarp to air dry before packaging.

OPERATIONAL GUIDELINES

1. All applicable permits must be completed, signed, and in place prior to starting and excavating.

2. Work will be performed in designated areas in proper protective clothing designated by HP following the guidelines stated in MD-10167, MD-10332, and MD-80036. The change area for radiation control clothing for personnel involved will be designated by the Field Coordinator.

3. LSA contaminated dirt (AMDM-000000012) will be excavated, removed, and placed in metal LSA boxes then sealed using the appropriate specifications found in Manual MD-10332, depending upon the box type. See also MD-10167. Weigh boxes and record weights.

4. Cover the box exchange area with an appropriate sized plastic tarp to protect it from any material that would spill from the excavator bucket.

5. Place the TRU or LSA box on the plastic tarp close to the excavation area.

6. Contaminated dirt will be excavated by hand shovel or heavy-duty equipment, as determined by the Field Coordinator. Note that only hand tools may be used to dig within 5' of any underground utility.

7. LSA boxes will be sealed (per the appropriate operation No. 745 or No. 750 in MD-10332), surveyed, and the paperwork completed, per procedure in MD-10167, prior to removal from the control area.

8. High Volume air samples are to be taken during digging operations and sent to Building 33 (HP Procedure Manual, Operation 1.2.1.1). Environmental Monitoring picks up these samples for analysis and recording to ensure that the project remains within allowable limits and airborne releases are within established limits.

SAFETY GUIDELINES

1. Safety glasses, safety shoes, and hard hats are required in the work area.

2. Radiation protective clothing and respiratory requirements are provided in accordance with HP Operations direction.

3. Appropriate protective gloves are required.

4. Remain clear of all heavy-duty equipment while it is in operation. Remain clear of all loads that are being moved or lifted, either directly or by chains/straps, by the heavy-duty equipment.

5. Care should be exercised under wet/damp conditions to avoid slips and electrical hazards.

6. Care should be exercised to guard against heat stress/stroke conditions. Guidelines will be posted at the job site.

   Stop work and call the Fire Department at Ext. 911 if anyone shows signs of heat stress or stroke for transportation to Medical.

7. Follow all applicable safety and housekeeping practices and guidelines.

8. GFI (Ground Fault Interrupter) circuits shall be used for all power equipment, standard AC, or generators over 5,000 watts.

9. Copies of the Material Safety Data Sheets (MSDS), if applicable, must be at the job site at all times. Master copies of all Material Safety Data Sheets (MSDS) are available in the Safety Office.

SPECIAL NOTICES

SECURITY

Soil removal near a Security structure may violate a Security concern. Examples are: 1) Do not leave heavy equipment unattended within 10 ft. of a boundary configuration (fence or wall), lest that be an aid to intrusion; 2) Do not remove soil such that a man-way is created beneath a Security configuration or that the structure is weakened (i.e., within 2 ft. of a fence post).

Consult with Security before work is scheduled to ensure compliance with their responsibilities and/or to include Security oversight in the work plan.

In case of an inadvertent breech of Security principles (e.g. equipment break down near a fence), notify Security immediately.

INDUSTRIAL SAFETY

When excavating near a buried utility line, hand dig only any time the excavation is within 5 ft. of a line that is shown on a drawing or is located by scanning procedures.

WASTE MANAGEMENT

LSA and TRU boxes will be used for soil transportation off-site. The contents of each box must be completely and accurately identified. They will be properly sampled to determine the level of RCRA hazardous and RAD waste(s) and will go into the Soil Waste Stream. Accordingly, a preponderance of soil should be placed in such a box, since the sampling procedures are based upon soil only. Incidental fragments of e.g. tile or brick may be included. However, sizeable volumes of e.g. concrete, pipe, etc. should be separated from the boxed soil. These items may be placed in a separate box and appropriately identified for sampling and disposal in the Debris Waste Stream.

In order to exhibit proper control of our waste, do not allow stray trash to enter these boxes. Minimize even those acceptable materials listed below.

Acceptable Materials List

The following is the ACCEPTABLE MATERIALS LIST specific to WASTE STREAM AMDM-000000012. Items not on this list shall not be LOADED in box containing soil.

Soil and Rock Debris:

- Asphalt
- Ceramic tile
- Clay absorbent (e.g., Florco)
- Clay tile
- Cloth/leather (e.g., gloves)
- Concrete
- Dried vegetation
- Glass
- Paper/cardboard (e.g., empty absorbent bags, suits, head covers)
- Plastic (e.g., shoe covers, bags, radiation rope/signs, tarps)
- PVC pipe
- Rubber (e.g., gloves, gasket material)
- Scrap metal, **EXCLUDING LEAD** (e.g., steel strapping material, steel reinforcement rods {rebar}, sheet metal)
- Styrofoam
- Tape (e.g., masking, clear decon)
- Wood/lumber

ENVIRONMENTAL

It may be appropriate to stage excavated soils, e.g. for drying prior to boxing. Written permission to do so must be obtained from the Environmental Technology and Monitoring Organization. It is recommended that this eventuality be settled prior to the start of work.

Appendix C

Construction Specifications

SPECIFICATIONS

INTERCEPT DRAINAGE CONTROL

ER PROGRAM - INTERIM RESPONSE ACTION

- Building 19 Offsite Intercept Drainage Control

- Old South Property Intercept Drainage Control

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SECTION 01000

SCOPE OF WORK AND PROJECT COORDINATION

01001 SCOPE OF WORK

This contract covers the furnishing of all supervision, labor, equipment, supplies and materials and performing all work in strict accordance with the terms of the contract drawings and specifications.

01041 IDENTIFICATION OF ARCHITECT-ENGINEER

Architect-Engineering services for this project are being provided to the Government by:

Name: EG&G Mound Applied Technologies
Address: P.O. Box 3000
Miamisburg, OH 45343

Telephone No.: (513) 865-3859
Contact: Alan Spesard

01042 CONTRACT DRAWINGS AND SPECIFICATIONS

The Seller will be furnished, without charge, up to 10 sets of drawings and specifications. The drawings which constitute a part of the contract documents are as indexed on the title sheet of the drawings.

01043 PRIORITIES, ALLOCATIONS AND ALLOTMENTS (952.212-71)

A. The Seller shall follow the provisions of Defense Material System Regulation 1 or Defense Priorities System Regulation 1 (see 15 CFR Parts 330-354) and all other applicable regulations and orders of the DMS/DPS in obtaining controlled materials and other products and materials needed to fill this contract.

B. The Seller further agrees to require the inclusion of Paragraph A. of this clause in all subcontracts issued hereunder.

C. Except as specifically modified in these specifications, Priority DO-E1 certified for National Defense under DMS

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number;

(ii) drawing title; (iii) original issue date; (iv) revisions and date of issues and, (v) distribution of drawings and revisions.

E. Baselines and Grades

The Seller shall take all elevations and coordinates from established permanent bench marks and shall be responsible for insuring that all elevations and connections to existing structures, utilities and other existing construction are correct. Initial layout shall be verified by a licensed professional land surveyor and properly recorded and submitted to the Buyer.

F. As-Built Drawings

1. The Seller shall, at all times, maintain, on the site, a complete master set of drawings and specifications current to the last issued revision. Record keeping for all drawings and specifications shall be in accordance with the General Provisions Clause entitled "Specifications and Drawings for Construction".

2. The Seller shall be responsible for ensuring that As-Built data including actual location of all installed construction, if different from contract drawings and specifications as approved by the Buyer, is properly included in "red" on the master set of project plans and specifications. The Seller shall be responsible for maintaining this as-built data for all subcontractors, suppliers or others performing work on the job.

3. Within thirty (30) days of completion of the Work all master drawings and specification sets including the current master drawing "stick file", obsolete drawing specifications, plus all other information and data relating to actual as-built conditions of the work shall be submitted to the Buyer. Final payment and retainage will be withheld until such time that the Buyer has received such submittal.

SECTION 01100

SPECIAL CONTRACT REQUIREMENTS

01130 SPECIAL ASBESTOS REQUIREMENTS

Not Used

01140 SPECIAL SECURITY OR ACCESS REQUIREMENTS

Not Used

01150 CONSTRUCTION COORDINATION FOR CONTAMINATED SOILS AREAS

The seller shall coordinate all activities to allow the EG&G Mound D&D group to remove identified contaminated soil. The areas associated with this project have been assessed for contamination and all applicable soils are scheduled to be removed prior to the seller's mobilation date.

SECTION 01200

PROJECT MEETINGS

01201 PROGRESS MEETINGS

Progress meetings will be held at the Mound site as directed by the Prime contractor.

SECTION 01300

SUBMITTALS

01301 GENERAL

A. Shop drawings, catalog data, equipment and material lists, elementary diagrams, wiring diagrams, installation instructions, maintenance manuals and instructions, and operation brochures, shall be submitted for the items of equipment and materials in accordance with the coded legend herein within the time specified unless otherwise directed by the Buyer. If materials or equipment are required and are not specifically listed therein, the most closely related item listed will govern the type of submittal required. The submittal shall include a typewritten list showing each item and manufacturer for approval and shall be submitted concurrently with all equipment which forms a system or subsystem that must be reviewed simultaneously because of coordination requirements. These submittals shall be corrected to "as-built" conditions prior to the completion of the project and turned over to the Buyer. Catalogs for submittal shall have unrelated pages removed with capacities and specified parameters relating to the item or items clearly marked. The maintenance manuals and instructions shall indicate routine-type work defined by step-by-step instructions, that should be performed to insure long life and proper operations; the recommended frequency of performance is also to be included. Instructions should include possible trouble spots with diagnosis and correction of each. These manuals shall be turned over to the Buyer at the completion of the project. The theory of operation brochures shall describe the function of each component or subassembly in

block-diagram-type presentation to a degree that a mechanic will understand the product well enough to operate and maintain it. These brochures will be submitted to the Buyer at the completion of the project.

The submittal shall include project identification (project name), contract number and specification section. Address and submit all submittals to:

Shelia K. Willis, MAIL ZONE: Bldg. 22
EG&G Mound Applied Technologies
P.O. Box 3000
Miamisburg, Ohio 45343-3000

B. The Seller shall review, sign, and stamp submittals and shall submit to the Buyer, for his review, six (6) copies as required by the Buyer, as described in paragraph A, above) for all items he proposes to use in the project, complete, containing all required detailed information. After review has been indicated on each copy by appropriate signature, stamp and date, three (3) copies will be returned to the Seller and the balance retained by the Buyer. If the Seller requires the return of more than three (3) approved copies, he must submit an equal number of additional copies or a reproducible copy.

C. All descriptive materials submitted shall bear the approval stamp and signature of the Seller submitting the same as evidence that they have been reviewed and approved by him. Each submittal shall also be marked with the project specification Reference Number and the specific types of submittal data (shop drawings, material lists, performance curves, catalog data, etc.) included. Correction of dimensions, location of various items, encroachment of work of other Sellers or subcontractors and variations from the requirements of the Contract Documents shall be made or corrected by the Seller. Materials submitted without the Seller's approval stamp and signature, without the Specification Reference Number and type of submittal noted or submitted with an insufficient number of copies shall be returned for resubmission. If the submittals indicate variations from the requirements of the Contract Documents because of standard shop practice or for any other reason the Seller shall make specific mention of such variation in his letter of transmittal.

D. Submittals which include manufacturers catalog data shall include full identification of the equipment or fixture, capacities, current characteristics, dimensions and identification of replacement parts.

E. Review of descriptive submittals will not relieve the Seller of the responsibility for correcting any errors which may exist or for meeting requirements of the specifications. Partial submittals will be accepted only with prior approval of the Buyer.

F. If required, samples and descriptive data shall be submitted within the time specified in these

specifications or, if no time is specified, within a reasonable time before use to permit inspection and testing; and shall be shipped prepaid and delivered as specified in these specifications and shall be properly marked to show the name of the material, trade name of manufacturer, place of origin, name and location of work where the material represented by the sample is to be used, and name of Seller submitting the sample. Samples not subject to destructive tests may be retained until completion of the work but thereafter will be returned to the Seller, if he so requested in writing, at his own expense. Failure of any samples to pass the specified requirements will be sufficient cause for refusal to consider further any samples from the same manufacturer whose materials failed to pass the tests.

G. Substitutions: Written authorization of the work or items proposed to be substituted in lieu of those specified or referenced. (See the Clause of the General Provisions entitled "Materials and Workmanship.") The opinion of the Buyer relating to the equality of items shall be final. Any changes required in the details and dimensions indicated on the drawings as a result of approved substitution shall be properly made, as approved by the Buyer and at the expense of the Seller. If the Seller fails to submit for approval the required data within the specified time in accordance with the preceding paragraph, the Buyer will select a complete line of materials and/or equipment. If the Seller submits for inclusion in the work materials and/or equipment not in accordance with the specifications, the Buyer will have the right to reject them and select a full line of materials and/or equipment. The selection made by the Buyer will be final and binding and the items shall be furnished and installed by the Seller without change in the contract price.

H. Notwithstanding the Conflict Provisions - Interpretations clause of the Special Conditions, this provision shall be deemed superseded to the extent of conflict, if any, between this provision and any provision in the technical sections of the specifications.

I. At completion of the construction, and prior to final payment, Seller shall deliver to the Buyer five (5) bound sets of all approved submittal corrected to as-built condition. These bound sets shall include all applicable shop drawings, manufacturers catalog data, diagrams, maintenance manuals, operating instructions, etc. as noted on the "Listing of Seller Submittals", Technical specifications and drawings. Copies of manufacturers' catalog data covering all fixtures and equipment installed shall include full identification of the equipment or fixtures, capacities, current characteristics, dimensions and identification of replacement parts.

J. A minimum of one approved set of shop drawings shall be available at the Seller's construction field office at all times during construction.

01302 SPECIFIC REQUIREMENTS

A. The Seller shall submit all forms, data, information, certificates, schedules, etc., as required in other sections of the specifications. Omission of an item from the following tabulation does not relieve the Seller from the responsibility for submitting the item required.

B. Descriptive submittals shall be made for the items of equipment and materials set forth below, in accordance with the coded legend set forth below, within ten (10) days after receipt of Notice to Proceed. (Submittals marked with an asterisk must be in reproducible form, the same size and scale as the contract drawings, or as directed.)

LEGEND

a. Shop Drawings
b. Certifications
c. Equipment List
d. Material lists
e. Elementary Diagrams and Wiring Diagrams
f. Installation Instructions
g. Maintenance Instructions
h. Operating Instructions
i. Samples, Colors
j. Welders' Certifications
k. Performance Curves
l. Catalog Data
m. Recommended Spare Parts Lists
n. Computations
o. Logical Bar Chart Schedule
p. Laboratory and Field Test Reports
q. Warranties and Guarantees
r. Material Safety Data Sheets (MSDS)
s. Detailed lifting and erection plans
t. Other

* Sepia reproducible required ** Mylar reproducible required

Listing of Seller Submittals

Section	Description	Required Remarks
02072	Sequencing and Scheduling	a, o
02938	Sodding	b,p,i
02720	Intercept Storm Sewer	a
03300	Concrete Mix Design	p
03300	Reinforcing Bars	a
03300	Concrete Aggregates	p
03300	Curing and Sealing Compounds	l,r
03300	Waterstops	l
03300	Testing Agency Field Records & Reports	p
Drawings	Grates & Frames	l,a

01303 OPERATING AND MAINTENANCE INSTRUCTIONS

A. Not Used

B. Not Used

01304 CONTROL DIAGRAMS

A. Not Used

01305 OPERATING AND MAINTENANCE MANUALS

Not Used

01310 SCHEDULES, BREAKDOWNS, REPORTS, AND SUBCONTRACTS

(NOTE: This section 01310 shall govern in the event of inconsistencies.

A. Progress Schedule. Within ten (10) days after receipt of Notice to Proceed, the Seller shall submit a construction progress schedule to the Buyer for approval. During the process of schedule development, the Seller shall be required to submit, at the Buyer's request, intermediate copies of the schedule to demonstrate acceptable progress toward the final schedule. In no case will any progress payments be approved until such time as a final project schedule is submitted and approved by the Buyer.

B. Schedule Requirements: The schedule will be in the form, detail and number as prescribed by the Contracting Representative and as indicated in paragraph C.

Division I, Paragraph 01310 C shall apply unless otherwise noted.

C. LOGICAL BAR CHART SCHEDULE REQUIREMENTS:

1. A "LOGICAL BAR" type schedule as described below shall be required and shall clearly identify all activities, relationships, milestones, and critical paths necessary to achieve scheduled project completion in accordance with the contract performance duration.

2. Specifically a "LOGICAL BAR" type schedule identifies along a time scale drawing all tasks and logical precedences between the tasks. Each task is clearly identified by an activity number, which is tied to the bid breakdown structure; by an activity description; and by an activity duration. Each task should have tie-ins to the preceding activities and to the succeeding activities. The tie-ins should be shown as lines with arrows pointing to the specific predecessors and/or successors. The length of the activity, which includes the above items, directly corresponds to the time scale of the drawing. The logical precedence between the tasks should tie-in all activities so as to have only one project start activity and one project finish activity.

3. The "LOGICAL BAR" chart should highlight the critical path and denote the amount of total float for non-critical activities.
4. The selection and number of activities shall be sufficient to fully describe and monitor the progress on a weekly basis. In no case shall activities with durations greater than twenty working days be aggregated together. The schedule shall show the date of commencement of work for each work activity, the duration for each work activity, and manpower loading for each work activity. The total activity float and free float values should be indicated.

5. Major milestones such as utility shutdowns, ordering and delivery of major equipment items, checkout and start-up will be included. In cases of critical plant operations requiring close coordination, the Seller will be required to prepare a more detailed daily plan and schedule for approval prior to authorization to proceed.

6. The schedule shall also include the anticipated number of days to be lost due to adverse weather conditions. Both the number of days lost with and with out weather protection shall be provided. The requirements for weather protection are covered under Division I Section entitled "Temporary Field Facilities, Weather Protection:"

7. The Seller shall participate in a review and evaluation of the proposed Progress Schedule with the Buyer. The Progress Schedule including revisions shall be resubmitted for approval of the Buyer within ten (10) calendar days after the conference. Upon final approval by the Buyer, the Progress Schedule shall be designated as the <u>Baseline Schedule</u>. The approved Baseline Schedule shall be used by the Seller for planning, organizing and directing the work, reporting progress, and for submission of payment requests for work accomplished.

8. Upon approval of the progress schedule by the Buyer, the contract amount shall be broken down by activity as a basis for progress payment. (See Breakdown of Bids.)

9. The Seller shall furnish sufficient forces, construction plant, and equipment, and shall work such hours, including night shifts, overtime operations and Sunday and holiday work as may be necessary to ensure the prosecution of the work in accordance with the approved progress schedule. If, in the opinion of the Buyer, the Seller falls behind the progress schedule, the Seller shall take such steps as may be necessary to improve his progress and the Buyer may require him to increase the number of shifts and/or overtime operations, days of work and/or amount of construction plant, all without additional cost to the Buyer or the Government under this contract.

10. Failure of the Seller to comply with the requirements of the Buyer under this provision shall be grounds for determination by the Buyer that the Seller is not prosecuting the work with such diligence as will ensure completion within the time specified. Upon such determination, the Buyer may terminate the Seller's right to proceed with the work or any separable part thereof, in accordance with the General Provision article entitled "Termination for Default - Damages for Delay - Time Extension".

11. The Seller shall, in conjunction with the progress of work, maintain and display a copy of the current master approved "Logical Bar" chart project schedule. This schedule shall be annotated and highlighted to reflect completed construction activities and shall be updated at least once weekly prior to the project coordination meeting held at the construction site.

12. The progress schedule shall be completely revised on a quarterly basis to reflect all changes in contract work including adjustments in time, cost or both which have been approved by the Buyer. If at any time between quarterly revisions, the progress against the approved schedule falls more than ten (10) working days behind the current Progress Schedule as determined by the Buyer, the Seller shall submit within ten (10) working days, a completely revised schedule demonstrating a plan for regaining the progress. This revised schedule shall be subject to the review and approval of the Buyer.

13. If the Seller fails to revise the Progress Schedule due to changes, within the time periods herein prescribed, The Buyer may withhold approval of progress payment estimates until such time as the Seller submits an acceptable revised schedule.

14. On a weekly basis and in conjunction with the progress schedule, the Seller shall be required to prepare and submit a "two week forecast" of all activities scheduled to be accomplished and the manpower necessary to support the activities. This forecast shall be presented and analyzed at the weekly project coordination meeting held at the site and attended by representatives of the Buyer, Seller and all major Subcontractors.

D. <u>Breakdown of Bid:</u> In conjunction with submission of the project progress schedule, within ten (10) days from Notice to Proceed, the Seller shall submit a bid breakdown by schedule activity and totalling the entire contract price. This breakdown is subject to approval of the Buyer concurrent with the progress schedule.

1. The bid breakdown shall be itemized on AIA Document G702, "Application and Certificate for Payment" and G703, "Continuation Sheet." These forms should be submitted with each progress payment showing the percentage of work completed for each item.

2. Seller costs such as mobilization, schedule preparation, and cost of bonds as invoiced are subject to delineation as separate payment and progress activities. General overheads, profit, and other costs associated with the prosecution of work shall be included in the applicable direct work activities and not stated as separate items.

3. The breakdown shall correspond directly to activities in the progress schedule and show separate amounts for labor, material and equipment necessary to complete the activity.

4. The Buyer shall have the right to revise the breakdown submitted, prior to his approval, if, in his opinion, the items indicated do not conform to their true value. Careful attention will be exercised in both preparation and review to avoid "front end loading of activities.

5. The cost of approved changes to the contract shall be added to the progress schedule and cost breakdown in a manner so as to retain their change order number identifier. If the change is a new work activity, payment will be made in accordance with the approved completion percentage. If the change is integral to and accomplished in conjunction with another work activity, payment will be based on the completion percentage of the base activity.

E. <u>Subcontracts:</u>

1. Unless otherwise directed by the Buyer, the Seller shall submit in writing within ten (10) days after receipt of Notice to Proceed, the names of all direct subcontractors and lower tier subcontractors involving on-site labor, together with a summary of the extent, character, and dollar amount of the work to be accomplished by each. The Seller shall, upon the request of the Buyer, furnish copies of all subcontracts
for performance of the Work under this contract. If, for sufficient reasons at any time during the progress of the work the Buyer determines that any subcontractor or lower tier subcontractor is incompetent or undesirable, he will be taken for cancellation of such subcontract. Nothing contained in this contract shall create any contractual relationship between any subcontractor and the Buyer.

2. Immediately after issuance of the Notice to Proceed, and any time thereafter, the Buyer may request submittal of purchase orders or subcontracts for materials or equipment (including those issued by subcontractors) with priority ratings extended where applicable. The submittal to the Buyer shall be made immediately after the Seller receives confirmation of the various items. The promised date(s) of shipment, point(s) of delivery, quantity and name of items to be furnished and unit prices will be clearly

indicated. The date each purchase order or subcontract is placed will be furnished to the Buyer.

SECTION 01400

CONSTRUCTION QUALITY CONTROL

01401 GENERAL

A. DESCRIPTION OF REQUIREMENTS

1. General Required inspection and testing services are intended to assist in the determination of probable compliance of the the work with requirements specified or indicated. These required services do not relieve the Seller of responsibility for compliance with these requirements or for compliance with requirements of the contract documents.

2. Definitions The requirements of this section relate primarily to customized fabrication and installation procedures, not to the production of standard products. Quality control services include inspections and test and related actions including reports performed by independent agencies and governing authorities, as well as directly by the Seller. These services do not include contract enforcement activities performed by the Buyer or A-E.

   a. Specific quality control requirements for individual units of work are specified in the sections of these specifications that specify the individual elements of the work. These requirements, including inspections and tests, cover both production of standard products, and fabrication of customized work. These requirements also cover quality control of installation procedures.

   b. Inspection, tests and related actions specified in this section and elsewhere in the contract documents are not intended to limit the Seller's own quality control procedures which facilitate overall compliance with requirements of the contract documents.

   c. Requirements for the Seller to provide quality control services as required by the A-E, the Buyer, governing authorities or other authorized entities are not limited by the provisions of this section.

B. RESPONSIBILITIES

1. Seller Responsibilities Except where they are specifically indicated as being the Buyer's responsibility, or where they are to be provided by another identified entity, inspections, tests and similar quality control services are the Seller's responsibility; these services also include those

specified to be performed by an independent agency and not directly by the Seller. Cost for these services shall be included in the Contract Sum. The Seller shall employ and pay an independent agency, testing laboratory or other qualified firm to perform quality control test services specified.

2. Buyer's Responsibility The Buyer will engage and pay for the services of an independent agency to perform inspection and tests that are specified as the Buyer's responsibility.

3. Retest Responsibility Where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance of related work with the requirements of the contract documents, then retests are the responsibility of the Seller, regardless of whether the original test was the Seller's responsibility. Retesting of work revised or replaced by the Seller is the Seller's responsibility, where required tests were performed on original work.

4. Responsibility for Associated Services The Seller is required to cooperate with the independent agencies performing required inspections, tests, and similar services. Provide such auxiliary services as reasonably requested. Notify the testing agency sufficiently in advance of operations to permit assignment of personnel. These auxiliary services include but are not necessarily limited to the following:

   - Providing access to the work.
   - Taking samples or assistance with taking samples.
   - Delivery of samples to test laboratories.
   - Security and protection of samples and test equipment at the project site.

C. QUALITY ASSURANCE

Qualification for Service Agencies: Except as otherwise indicated, engage inspection and test service agencies, including independent testing laboratories, whicha re prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and which are recognized in the industry as specialized in the types of inspections and tests to be preformed.

D. SUBMITTALS

1. General Refer to Division-I section entitled "Submittals" for general requirements on submittals. Submit a certified written report for each inspection, test or similar service, directly to the Buyer, induplicate, unless the Seller is responsible for the service. If the Seller is responsible for

the service, submit a certified written report of each inspection, test or similar service through the Seller, in duplicate. Submit additional copies of each written report directly to the governing authority, when the authority so directs.

2. Report Data Written reports of each inspection, test or similar service shall include, but not be limited to the following:

- Name of testing agency or test laboratory.
- Dates and locations of samples and tests or inspections.
- Names of individuals making the inspection or test.
- Designation of the work and test method.
- Complete inspection or test data.
- Test results.
- Interpretation of test results.
- Notation of significant ambient conditions at the time of sample taking and testing.
- Comments or professional opinion as to whether inspected or tested work complies with requirements of the contract documents.
- Recommendations on retesting, if applicable.

01402 PRODUCTS (Not Applicable)

01403 EXECUTION

A. REPAIR AND PROTECTION

General Upon completion of inspection, testing, sample-taking and similar services performed on the work, repair damaged work and restore substrates and finishes to eliminate deficiencies, including deficiencies in the visual qualities of exposed finished. Comply with the contract document requirements for "Cutting and Patching". Protect work exposed by or for quality control service activities, and protect repaired work. Repair and protection is the Seller's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

SECTION 1500

TEMPORARY FACILITIES AND GOVERNMENT PROPERTY

01501 TEMPORARY FIELD FACILITIES

A. Not Required

B. Toilet Facilities: The Seller will provide sufficient temporary facilities (change trailers, toilets, etc.) in accordance with OSHA Standards to support the workforce. In no case will Seller personnel utilize Mound facilities.

C. Weather Protection: The Seller shall make provisions to

protect the construction during adverse weather conditions and insure continuation of construction during winter months without stoppage of construction and at no additional expense to the government. On any project where any adverse weather conditions are anticipated, the Seller shall prior to start of construction submit to the Buyer his plan for providing of weather protection. This plan must be submitted and approve before any payments will be processed.

01502 GOVERNMENT PROPERTY

Not Used

01503 SALVAGE AND DISPOSAL OF WASTE MATERIALS

A. LIST OF ITEMS TO BE SALVAGED AND DISPOSITION:

Excess Parking Bumpers - Locate to salvage yard as designated by buyer.

B. The Seller shall be responsible for the removal and disposal of all scrap and waste materials at no additional cost to the Buyer. The Buyer, subject to availability thereof, may provide a dumping ground for scrap and waste materials. Burning of waste material is not permitted.

C. All soils and excavated excess materials shall be disposed of on the Mound Plant Site at the engineered fill area as shown on the Mound Site Plan. Rocks larger than 3" and concrete shall be hauled off site for disposition.

SECTION 1700

PROJECT DRAWINGS

01701 LIST OF DRAWINGS

The following drawings accompany these specifications and form a part of the contract documents.

Title
Cover Sheet
Contractor's (Seller) Route Sheet
Demolition Plan
Interecpt Drainage South Boundary (2 sheets)
Intercept Drainage Bldg. 19 (2 sheets)

1800 OCCUPATIONAL SAFETY AND HEALTH

A. GENERAL

1. All aspects of the project shall be designed in accordance with the requirements of 29 CFR 1910; National Fire Protection Association(NFPA) and MD 10286.

2. Unless otherwise supplemented below 29 CFR 1910 and 29 CFR 1926 shall apply. It is recognized that 29 CFR 1910 and 29 CFR 1926 sometimes both treat the same specific health or safety concern; in such cases, the requirements of 29 CFR 1926 shall govern unless the issue affects the safety of the buyers employees, then the requirements of 29 CFR 1910 shall apply.

3. All personnel of the Seller that enter the Mound Plant site to perform any type of construction work shall attend a Safety & Security Orientation covering Mound's operational requirements prior to proceeding with the died work. To arrange the orientation Seller shall contact Mound's Construction Inspection Group at (513) 865-4770.

4. The Seller shall immediately notify the Buyer or his representative of any personal injury resulting in lost work days and any loss or damage to government property, including injury to or damage by all subcontractors and material suppliers under control of The Seller.

B. SAFETY:

1. Submittal of Safety Information

   All bidders shall be required to supply the following safety related information as part of the bid. Failure to supply this information may result in the bid being declared non-responsive. A bid may also be ruled non-responsive if the Safety Program or Hazards Communication Program do not meet minimum standards. The successful bidder (Seller) will be required to fully implement these programs.

   a. Workman's Compensation Experience Modification Rating (Interstate Experience Modification Rate, Intrastate Experience Modification Rating, or Monopolistic State Fund) for the past three years.

   b. OSHA Recordable Injury Incidence Rates (per 200,000 hours-per-year worked) for past three years.

   c. OSHA Lost Workday Case Incidence Rates (per 200,000 hours-per-year worked) for past three years.

d. Occupational Injuries and Illnesses Annual Survey Form No. 200 for year.

e. A formal, written safety program.

f. A formal, written hazard communication program.

2. Safety Program

Absolutely NO site work shall proceed until the Safety Plan has been approved by the Buyer. The following are minimum guidelines, and are not intended to be restrictive. A Safety Program should consist of:

a. A statement of company safety policy signed by a corporate executive.

b. An outline of the Accident Prevention Program including:

1) Responsibilities of the Seller and any second tier contractors or subcontractors.

2) Responsibilities of jobsite supervisors and corporate management.

3) Responsibilities of site Safety Supervisor.

4) Responsibilities of company employees, including craft employees.

c. Safety Program should also include policy and procedures on the following.

1) Sellers and sub-contractor orientation program.

2) Safety training program including Tool Box meeting requirements and craft skill training.

3) Accident investigation procedures; first aid and medical care.

4) Fire prevention and protection guidelines and procedures.

5) Emergency procedures for injury, fire, severe weather, and bomb threats.

6) Daily jobsite safety inspection procedures and documentation requirements.

7) Equipment inspection procedures, including ladders, electrical equipment tools.

8) Lock-out procedures.

9) Disciplinary action program.

10) Protection of employees from physical hazards caused by the work.

3. Hazards Communication Program

Absolutely NO site work shall proceed until the Hazards Communication program has been approved by the Buyer. Following are minimum guidelines, and are not intended to be restrictive. A Hazards Communication Program should consist of:

a. A statement of company hazards communication policy signed by a corporate representative.

b. An outline of the Hazards Communication Program including:

   1) Responsibilities of the Seller and any second tier contractors or subcontractors.

   2) Responsibilities of jobsite supervisors and corporate management.

   3) Responsibilities of company employees, including craft employees.

c. Hazards Communication Program should also include policy and procedures on the following.

   1) Sellers and sub-contractor employee orientation and training program.

   2) Availability of Material Safety Data Sheets (MSDS's) to employees.

   3) Proper labeling of all containers, identifying the substance and showing the hazard warning.

Documentation of all contractor and subcontractor orientation and training programs including attendance at those sessions shall be forwarded to the Buyer within one (1) week following the session.

MSDS's shall be submitted to the Buyer as part of the.submittal process and as outlined in Technical Provisions, Division I, Section entitles "Submittals". In absolutely NO cases will the material be used on site until the MSDS's have been submitted to and approved by the Buyer.

A copy of the complete Hazards Communication program and copies of all Material Safety Data Sheets shall be maintained on the job site at all times.
Once on the job site, the complete Hazard Communication program of the contractor and subcontractors will be subject to inspection as part of the on-going OSHA inspection process being conducted by the Buyer's construction Inspectors, Buyer's safety representatives and DOE auditors.

4. Safety Reporting

The Seller shall maintain the following safety records and shall submit them to the Buyer on a monthly basis or as recordable accidents occur.

a. The Injury/Illness Register must be completed and turned in to the Buyer's representative within two working days after the end of the month.

1) The purpose of this form is to provide a uniform means of recording and classifying injuries and illnesses. It is intended to be used as a general dispensary log.

2) Each injury, illness and first aid visit shall be entered on this form as soon as possible after the occurrence.

3) A new register shall be started at the beginning of each month. Entries should be in chronological order taking as many sheets as are necessary to complete the month. At the end of each month, copies of all the register sheets for that month shall be transmitted to the Buyer by the fifth working day of the succeeding month. The original register sheets shall be retained at the site for the length of the construction period.

4) The columns of the Injury/Illness Register form are generally self-explanatory. The Nature and Cause of Injury/Illness column shall contain a brief statement of the injury and what caused it.

5) The Treatment/Medication Given by Job Personnel column shall state whether the treatment was given at the jobsite, at the plant dispensary or at a doctor's office. It shall also be noted in this column when the treatment was a return visit for a previously recorded injury. Applicable boxes in the Legend column shall be checked.

b. <u>The Accident Summary Report</u> is combined with the "Injury/Illness register" and will be turned in within two working days after the end of the month.

1) The purpose of this form is to provide a uniform means for preparing a summary of the information that has been entered on the Register during past month.

2) An Accident Summary Report shall be transmitted to the Buyer each month in time to be receive by the fifth working day of the succeeding month.

3) Fatalities, or incidents involving injuries or illnesses which are likely to receive an abnormal amount of public attention shall be reported immediately in accordance with the terms of the Article entitled "Safety and Health".

c. <u>Recordable Injury or Illness</u> - Any death injury, or illness suffered by an employee which arises out of and in the course of his employment whether on or off the company premises is recordable. This would include all cases which transfer to another job or medical treatment other than first aid.

d. <u>First Aid</u>

1) First aid is limited to one time treatment and any follow-up visits for the purpose of observation, of minor scratches, cuts, burns, splinters and so forth, which do not require medical treatment. Follow-up visits may include the changing of dressing or bandage, and additional cleaning and application of antiseptic. First aid can be provided by a physician, nurse or other professional medical personnel. It is the nature of the injury or illness and the treatment required, not who provides treatment that distinguishes between medical treatment and first aid. Surveillance or observation, including hospital observation, which reveals no injury or illness and requires no medical treatment shall be considered first aid if the employee reports to his next regularly scheduled shift and performs all of the duties of his regularly assigned job.

2) The Seller is responsible for maintaining, on the job site, first aid kit(s) in accordance with OSHA Standards.

5. Plant Safety Rules and Regulations

This section supplements the requirements of OSHA Regulations. In the event of inconsistencies, the more stringent safety requirement will govern.

a. Individual Conduct and Safety:

1) Alcoholic beverages and illegal drugs are not permitted on the Buyer's site. Employees entering the plant under the influence of alcohol or drugs shall be subject to removal from the site.

2) Fighting gambling stealing soliciting, and horseplay will not be tolerated and shall subject the individual to removal from the site.

3) The Seller shall make all employees aware of the plant alarm system code signals and appropriate responses. The requirements for actions to be taken in the event of a plant alarm signal for a fire or an evacuation will be followed. The Seller shall be required to establish an evacuation plan for the site and post evacuation routes and shelter locations in appropriate locations. New employee orientation shall include the signal code system, evacuation routes and staging areas and shelter locations.

4) Access to safety equipment and fire fighting equipment will be kept clear at all times.

5) Plant roadways and walkways shall not be blocked without prior approval of the Buyers representative.

6) Riding construction equipment as a passenger is

prohibited, unless a seat with a seat belt is provided.

7) Material and tools shall not be dropped or thrown from platform, structures, or scaffolds.

8) All excavations or trenches that will be below four feet must submit shoring plans prior to the start of the project. The four feet level is set because if an excavation or trench is below four feet there is a high possibility of going beneath the five foot, where shoring or sloping is required.

9) The Seller and all subcontractors shall preform safety inspections of the jobsite on a daily basis. These shall be documented by the Seller.

b. Protective Equipment and Clothing:

1) All construction sites shall be barricaded. If the construction site is an excavation it shall be barricaded with substantial barricades such as temporary plastic fences and saw horses. Flashing lights are required if the excavation will be left open overnight. Yellow caution may be are to be used to barricade a site only in temporary situations(2-3 days). If a job is long term more substantial and permanent barricades such as sawhorses, expanded plastic fencing, etc. Caution tape may only be used to supplement more substantial barricades on long term jobs. When the construction site is exposed to roadways barrel, sawhorses or traffic cones shall be used to mark off the roadway exposure. If the roadway will be exposed overnight the barricades shall be equipped with flashing lights.

2) The Seller shall provide the appropriate personal protective equipment, for hazardous conditions which may be encountered and shall provide training in the Proper use and maintenance of the equipment.

3) Hard hats shall be worn at all times on the construction site. The helmet must conform to ANSI Z89.1 class b or better.

4) Safety glasses shall be worn at all times on the construction sites. Safety glasses shall comply with ANSI Z87 Additional eye protection may be necessary when grinding, welding, or handling, hazardous materials.

5) Hearing, protection shall be provided whenever conditions warrant.

6) Seller employees must wear substantial leather shoes. Cloth shoes, tennis shoes and sandals are

prohibited. Safety shoes or boots shall be worn when conditions require.

7) Seller employees shall wear full length trousers and shirts that cover the shoulders. Half length and "muscle man" shirts are not permitted. Shirts must not be removed on the site.

8) Respiratory protection for hazards created as part of the construction will be Provided by the Seller. The seller shall provide certification that there employees have been fit test and have received a medical exam certifying that they are able to wear a respirator. Work in radiation areas will require that Seller's employees be fitted and provided respiratory protection by the Buyer.

c. Equipment:

1) The Seller shall be responsible for maintaining all,Seller owned, leased or rented tools and equipment in safe mechanical working conditions and assume all risks for the use of same.

2) When mobile equipment is not in use, it shall be secured to prevent movement or operation.

3) Equipment not in use shall be positioned where it will not obstruct railroad tracks, walkways, electrical lines and access to safety or fire equipment.

4) Cylinder caps must be in place when cylinders are being, moved and whenever regulators are removed. Regulators shall be removed and cylinders capped when not in use and at the end of each workday.

5) Oxygen and Acetylene cylinders will always be kept in an upright position and secured to a welding, cart or other stationary object. No more than four cylinders will be "chained" together. Cylinders will not be lifted with slings.

6) Tools and equipment will be operated only by authorized personnel. Machinery and moving equipment will be shutoff when being lubricated or refueled. Only a qualified mechanic will be permitted to adjust any piece of equipment while it is running.

7) Electrical tools and Power cords must have the third wire ground in place. Double insulated tools must be clearly marked by the manufacturer. The Seller will provide ground fault circuit interrupters (GFCI) for all temporary power and will be required to perform and document monthly testing and inspection of the ground system for continuity.

8) All scaffolding must be properly erected on good foundations with cross braces installed and proper planking placed on the decks. Planking shall be cleated and tied down. Proper guardrail (42 inches), toeboards and midrails shall be installed on all scaffolds over 6 feet in height.

9) All floor and wall openings excavations or areas where persons may fall are to be guarded with standard guardrail or covered at all times. If they are covered, the covering shall be secured in a manner that will prevent its accidental misplacement and the cover shall be capable of withstanding the weight of a 200 pound person.

10) All ladders are to be of the proper length for the job and will be secured at the top as soon as erected. Unsafe ladders that cannot be repaired will be taken out of service immediately and removed from site. No metal ladders will be permitted on site. The Seller shall perform and document monthly ladder inspections and tags shall be affixed to each ladder on the project indicating the inspection date and person performing the inspection.

11) Employees working near an opening, up on steel or in any area where full guardrail protection is not possible must be provided and wear a safety belt and be tied off to structural steel or an object capable of withstanding a 5,400 drop test.

12) Machinery or equipment shall not be operated in a position where any part of the machine, suspended loads or lines can be brought closer than ten (10) feet from exposed high voltage (440 volts and over) lines unless the current has been cut off and positive means have been taken to prevent the lines from being energized. A signalman will be assigned to each piece of equipment working under these conditions. All cranes and crane-type equipment will be equipped with boom stops and load blocks with operable safety latches on the hook.

NOTE: Any cutoff of utilities must be requested and approved at least 48 hours in advance of the required outage.

13) Review of Lifting Plans - Where any installation requires lifts with cranes, hoists or other lifting device, the Buyer may require the Seller to develop and submit to the Buyer, a detailed lifting plan at least ten (10) days prior to the scheduled lift. This plan will NOT be reviewed by the Buyer other than to ensure that the Seller has developed a plan for the lift and to ensure that this plan is followed ring the actual lift placement, equipment capacity, rigging configuration, etc.). The responsibility for the actual lift and installation shall remain

completely the responsibility of the Seller.

14) Seller will conform to the plant tag and lockout procedure which requires that the Buyer lockout any existing active equipment which is shutdown for the Seller to work on the equipment and then for the Seller to place their locks on the equipment.

15) Motorized, lift-type work platforms must be approved by a registered engineer or meet ANSI standards. Fork-lift type trucks with makeshift Platforms will not be used on site.

16) Temporary construction trailers will be tied down and the electrical service to the trailer will be properly grounded.

d. Housekeeping

A high standard of housekeeping shall be maintained on the construction site at all times. The purpose of this requirement is to ensure the safety of all personnel entering the construction area and to maintain a condition of housekeeping that is consistent with the appearance of the Buyer's facility. It is also recognized that the fire hazard caused by poor housekeeping in a construction area can endanger nearby buildings and personnel outside the construction area. The following requirements apply to all construction areas and to all construction projects and represent the minimum acceptable standard and level of effort By the Seller. Enforcement of these requirements is the responsibility of the Seller and inspections will be conducted by representatives of the Buyer on a periodic basis. At such time that inspections identify conditions which are not in compliance with these requirements, the Seller will be notified in writing by the Buyer and corrective action will be taken immediately. In the event that the Seller fails to adequately correct the discrepancy, the Buyer may, without prejudice to any other legal or contractual rights of the Government, issue an order stopping all or any part of the work; thereafter, a start order for resumption of the work may be issued at the discretion of the Buyer. The Seller shall make no claim for an extension of time or for compensation or damages by reason of, or in connection with, such work stoppage.

1) All inside work areas shall be swept at the end of each work shift. Outside work areas shall be raked, weather permitting, at least once Per week

2) All equipment and construction materials shall be stored in an orderly manner in designated storage areas. The storage areas shall be kept in such a condition to permit grass cutting if necessary. The Seller will perform grass and weed control within the bounds of the entire construction site.

3) Electrical cords, hoses and other lines shall be neatly stored when not in use. When in use, these items will be routed, secured and protected so as not to cause injury. Lines will not be placed across access ways, walkways or in a place where they create tripping hazards.

4) Wire and cable being removed or installed shall not be left hanging or lying on the floor or ground when work is completed or at the end of a workday. If the work is incomplete, the wire and cable shall be neatly coiled and laid or hung out of walkways to avoid safety hazards and to prevent damage to the cable itself.

5) All scrap construction materials and waste shall be picked up and disposed of at least daily. Debris is to be placed into waste containers provided by the Seller

6) All excavations for underground structures and utility lines will be backfilled and graded promptly. Those excavations required to remain open beyond the work day will be properly marked and lighted for night time visibility. All openings and excavations will be properly barricaded at all times to prevent persons from falling. Barricades must be substantial such as temporary plastic fencing, sawhorses, construction barrels, etc. Warning tape does not constitute a barricade and shall only be used to supplement more substantial barricades.

7) Loose materials on roofs or other overhead structures must be removed or secured so that they cannot be blown or bumped off.

8) Forms, wood and other lumber shall be neatly stored when not in use. All nails shall be removed or bent over to prevent puncture wounds.

9) All flammable liquids, including: cleaning fluids, oils, paints and paint thinner must be stored in U.L. or FM approved containers and in a storage area which provides proper separation from other structures and proper ventilation.

10) All liquid wastes, including: cleaning fluids,oils, paints, and paint thinner etc., must be removed off the site by the Seller for proper disposal. Dumping of these materials into floor drains, toilets, storm sewers, drainage ditches, or other open ground (on the Buyer's plant site) is forbidden. Oil spills must be reported and proper cleanup is the responsibility of the Seller.

11) Before completing the work, the Seller shall remove from the work and premise any rubbish, tools, scaffolding, equipment and materials that are not the property of the Government. Upon

competing the work, the Seller shall leave the work area in a clean, neat, and orderly condition satisfactory to the Buyer.

6. Medical Facilities

The Buyer's medical and emergency services are not available to the Seller except under extreme circumstances. All accidents, fires, and the like that result out of and involve the construction work are the responsibility of the Seller. Reporting of all incidents will be made in accordance with the requirements stated herein.

7. Smoking Regulations

Smoking is not permitted in any building. No smoking is allowed on roofs and in penthouses. Smoking is permitted only outside of buildings.

8. Hazardous Work Permits

The Seller shall comply with all applicable plant procedures for performing hazardous work including but not limited to the following:

a. Welding/burning Permit Required for any open flame or spark-producing: welding, gases, metal cut off or chop saw, kerosene or gas heater, as an example.

b. Excavating/Digging Permit - Required before any digging takes place on site. A pre-job conference may be required before excavation or trenching takes place. Drilling operation for any reason require an Excavating/Digging permit.

c. Penetration Permit - Required before drilling or cutting a hole in any wall, floor, or ceiling.

d. Confined Space Entry Permit Required before entering any confined space where quality or quantity of air is in question the Buyers Industrial Hygiene group will make checks in the area before permitting Seller's entry. Confined Spaces include electrical substations, electrical and utility manholes, electrical vaults, process vessels, etc.

e. Cartridge-Fired Fastening Tool Permit - This is a powdered actuated device used to-attach fasteners-to concrete or steel. The operator must be certified in the use of the tool and a on-site inspection must be made before this permit will be issued.

The Buyer's representative usually the Construction Inspection, will issue permits as needed. The Seller shall keep the con-construction Inspector fully advised of any work requiring a permit and must allow reasonable time for the permit to be issued. The approved permit shall be displayed in the vicinity of the work being performed in a manner which is clearly visible.

In the event that the emergency alarm is sounded all hazardous work will be terminated, the work may not be restarted until the permit is re-initiated by the approving authority.

No open fires are permitted on the construction site. Burning of trash or open fires for heat are examples of "open fires".

9. Emergency Plans

a. The Seller is responsible for the complete indoctrination of all employees on emergency procedures at the time the employee receives his project orientation. In addition, the Seller shall post all emergency procedures on the project bulletin board and at other conspicuous points on the project site.

b. For emergency dial 865-7111 (or 7111 on the Buyer's plant phone) and give the Security duty Officer the following information.

- Name
- Telephone Number
- Location
- Nature of Emergency

NEXT: DO NOT HANG UP. MAINTAIN CONTACT WITH THE DUTY OFFICER UNTIL INSTRUCTED OTHERWISE.

c. A rising "whoop" on the public address system indicates an important emergency message. Listen and follow Instructions.

SIREN

d. A steady blast or tone for three to five minutes - seek shelter and information will follow over the public address system. In such cases, all permits will be automatically voided. The Seller will insure that all equipment is shut down prior to leaving the area or work site.

e. System checks are conducted at NOON on the first Monday of every month. At any other time, it will be an attention signal and may constitute a "SEVERE WEATHER" or "TORNADO" warning.

f. The Seller shall be responsible for establishing and maintaining a current excavation assembly and shelter plan and insure that all employees are indoctrinate in the route of evacuation and location of assembly points and shelters.

CLAXON HORN

g. This sound indicates a nuclear criticality incident. Immediate evacuation to the closest exit is required. Follow building personnel to the assigned assembly area and listen for a public address announcement to follow.

SINGLE STROKE BELLS

h. Building Evacuation - Single stroke bells will ring in a continuous pattern, for 30 seconds. This alarm will be followed by a public address announcement with instructions.

10. Use of Explosives

The use of explosives is not permitted unless conditions for their use and Seller liability therefore are expressly stated in the Technical Provisions, or unless such use is authorized in writing by the Buyer with express conditions concerning their use and liability.

11. Fire Protection and Automatic Sprinkler Systems

Installation of fire protection equipment shall be accomplished by individuals certified the State of Ohio.

a. The Seller shall insure that the installation of all sprinkler piping and sprinkler heads are coordinated with the installation of ceiling and roof materials, overhead lighting, duct work, piping and suspended equipment to provide an installation in complete compliance with appropriate NFPA Codes particularly NFPA Std. 13 and 14).
b. Fire Protection systems shall be activated by the Seller as soon as possible.

SECTION 2000

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. The Work included in Division 2 shall consist of furnishing all supervision, labor, materials, tools, equipment, transportation, storage facilities, demolition, earthwork, drainage, and utilities all as shown on the Contract Drawings and as specified herein.

B. Related Sections
All sections herein are related to this section.

1.02 REFERENCES

A. State Of Ohio, Department of Transportation, Construction and Material Specifications, latest issue.

B. American Association of State Highway Transportation Officials (AASHTO).

C. American National Standards Institute (ANSI).

D. American Society of Testing and Materials (ASTM).

E. Federal Specifications (FS).

1.03 PROJECT/SITE CONDITIONS

A. Construction Debris

1. Unusable material (except soil) and construction debris not designated as of salvageable value to the government, shall become the property of the Seller and shall be disposed of off Mound property.

2. Prior to leaving the Mound site, Mound Health Physics personnel will monitor the material and issue a health physics release form. If the material is found to be contaminated, the Seller will be directed by the Buyer as to the location for on-site disposal.

B. Soil

1. Mound has a spoils area for dumping of clean soil. Soils from the construction area will be disposed of on-site at the direction of the Buyer.

2. Prior to leaving the job site, Mound Health Physics personnel will monitor the soil and issue a health physics release form so that soil may be dumped at the spoils area.

3. No soil shall leave the Mound site.

4. Contaminated soil is the responsibility of the Buyer - A site investigation was performed prior to the scoping requirements of this project to help determine if contaminated soil is present. The removal of that soil is to be performed by the buyer. All contaminated soil is scheduled to be complete by the seller prior to the construction activities of this project. Health and

Safety measures complying to 29 CFR 1910.120 applies to excavation and construction activities.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

3.02 FIELD QUALITY CONTROL

A. Employ a qualified, experienced, and independent testing laboratory to provide quality control for all operations specified in Division 2. Submit three copies of all tests, to the Buyer.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Removal of designated items indicated on the project drawings and listed herein.

2. Removal of designated construction.

3. Identification of utilities.

4. Removal of site items.

B. Related Sections

1. Section 02000: SUMMARY OF WORK for disposal requirements

1.02 SUBMITTALS

NOT USED

A. Comply with applicable requirements of Division 1.

1.03 QUALITY ASSURANCE

A. Project Record Documents

1. Submit under provisions of Division 1.

2. Accurately record actual locations of capped utilities and subsurface obstructions.

B. Regulatory Requirements

Safety requirements shall follow OSHA and 29 CFR 1910.120 as applicable.

1. Obtain required permits from Mound.

2. Notify Buyer before starting work and comply with their requirements.

3. Do not close or obstruct egress width to exits.

4. Do not disable or disrupt building fire or life safety systems without written approval from the Buyer.

5. Conform to procedures applicable when discovering hazardous or contaminated materials. See Division 1.

1.03 SEQUENCING AND SCHEDULING

A. Describe demolition removal procedures and schedule and submit to Buyer for approval prior to starting work.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 PREPARATION

A. Provide, erect, and maintain temporary barriers at locations to direct trafiic and personnel around construction.

c. Protect existing materials and utilities which are not to be demolished.

D. Prevent movement of structure; provide required bracing and shoring.

E. Mark location of utilities.

F. Conduct demolition to minimize interference with adjacent and occupied building areas.

G. Cease operations immediately if structure or utilities appears to be in danger. Notify Buyer. Do not resume operations until directed.

H. Maintain protected egress and access to the work.

I. The use of explosives will not be permitted.

J. Conduct demolition operations and the removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

K. Ensure the safe passage of persons around the areas of demolition. Conduct operations to prevent injury to adjacent buildings, structures, other facilities, and persons.

L. Provide interior and exterior shoring, bracing, or support to prevent the movement, settlement, or collapse of both structures to be demolished and adjacent facilities that are to remain.

M. Promptly repair damages caused to adjacent facilities by demolition operations at no cost to the Buyer.

N. Maintain existing utilities that are to remain, keep them in service, and protect them against damage during demolition operations.

O. Do not interrupt existing utilities serving occupied or used facilities except when authorized in writing by Buyer. Provide temporary services during interruptions to existing utilities, as acceptable to the Buyer.

3.02 APPLICATION

A. Methods

1. Coordinate the Disconnection and identification of utilities within demolition areas.

2. Demolish in an orderly and careful manner. Protect existing supporting structural members.

3. Remove temporary work.

4. Use water sprinkling, temporary enclosures, and other suitable methods to limit the amount of dust and dirt

rising and scattering in the air to the lowest practical level. Comply with governing regulations pertaining to environmental protection.

5. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

6. Do not use water in areas containing radiological contamination.

7. Clean adjacent structures and improvements of dust, dirt and debris caused by demolition operations as directed by the Buyer. Return adjacent areas to the condition existing prior to the start of the work.

8. Demolish concrete and masonry in small sections.

9. Use erosion control devices during demolition as indicated on the drawings.

B. Disposal of Demolished Materials

1. See Section 02000: SUMMARY OF WORK, for requirements for disposal.

2. Remove debris, rubbish, and other materials resulting from demolition from the site.

3. Burning of removed materials from demolished structures will not be permitted on Mound Property.

4. Transport materials removed from demolished structures, and dispose of off the site.

3.03 PROTECTION

A. Whenever an existing system or part of an existing system is to be replaced by a new system, then provisions shall be made by the Seller for keeping the existing system in operation at all times during the construction.

B. Storm Drainage

1. Work includes rerouting of storm water with provisions for prevention of any damage to existing facilities from a 25-year storm. Bypasses around construction sites shall be arranged so that storm water exceeding bypass capability shall not damage existing facilities. Site shall be arranged at all times to handle 25-year storms (especially at night, holidays and weekends.)

C. Drinking Water Systems

1. Demolition of sections of the drinking water systems shall be arranged for protection of all personnel from contaminated water and continuous operation of remaining system.

CAUTION

The Drinking Water System at Mound is also used for Process Water. Even short interruptions of service may damage expensive operations. All interruptions must be approved in writing by Buyer.

D. Fire-Protection Water System

1. Demolition of sections of the Fire Protection System shall be arranged to provide continuous operation of the remaining Fire Protection Water System.

CAUTION

Even short interruptions of operation of the Fire Protection System requires written approval and presence during interruption of the Buyer who will have approval of the Chief Fire Protection Officer.

E. Structures

1. All provisions shall be made for disconnection or rerouting of all utilities to a structure prior to start of <u>and</u> structure demolition.

END OF SECTION

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PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Cutting, grading, formation of embankment and rough contouring the site.

B. Related Sections

1. Soil investigation report; and findings of subsurface materials.
2. Not used.
3. Section 02222: EXCAVATION for general excavation around structures.
4. Section 02223: BACKFILLING for general structural and building area backfilling.
5. Section 02225: TRENCHING for trenching and backfilling for utilities.
6. Section 02921: LANDSCAPE GRADING for fine grading with topsoil.

1.02 REFERENCES

A. ANSI/ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil Aggregate Mixtures Using 10 lb. Rammer and 18 inch Drop (Modified Proctor) for optimum density.

B. ASTM D-1556 - Sand Cone

C. ASTM D-2922 - Nuclear Density

D. ASTM D-3017 - Nuclear Moisture Content for Determination of Field Density.

1.03 DEFINITIONS

A. Embankment - A structure consisting of soil, granular material, shale, rock, or random material, constructed in layers to a predetermined elevation and cross section.

B. Base Stone - Selected material of planned thickness placed on the subgrade as a foundation for other courses. Base stone is a part of the pavement structure.

C. Soil - All earth materials, organic or inorganic which have resulted from natural processes such as weathering, decay, and chemical action in which more than 35 percent by weight of the grains or particles will pass a No. 200 sieve.

D. Granular Materials - Natural or synthetic mineral aggregate such as broken or crushed rock, gravel, slag, sand or cinders which can be readily incorporated in an 8-inch layer, and in which at least 65 percent by weight of the grains or particles are retained on a No. 200 sieve.

E. Shale - Laminated material, formed by the consolidation in nature of soil, having a finely stratified structure.

F. Rock - Sandstone, limestone, glacial boulders, brick and old concrete which can readily be incorporated in an 8-inch layer.

G. Random Material - A mixture of previously defined materials suitable for use in embankment which can be readily incorporated in an 8-inch layer.

H. Optimum Moisture - The water content at which the maximum density is produced in a soil by a given compactive effort (AASHTO Designation: T 99). The appropriate curve from Ohio's typical moisture-density curves, Set C, may be used to establish optimum moisture.

I. Field Testing - Testing of embankment and subgrade compaction shall be in accordance with the tests referenced in this section.

J. Finished Subgrade Elevation - Elevation obtained by subtracting the thickness of base, intermediate, and surface treatment courses from the finished grade elevation as shown on the contract drawings.

K. Laboratory Dry Weight - The maximum laboratory dry weight shall be the weight provided by the laboratory when the sample is tested in accordance with AASHTO T 99. The appropriate curve from Ohio's typical moisture-density curves, Set C, may be used to establish maximum laboratory dry weight.

L. Excavating - The excavation and disposal or incorporation of all materials of whatever character encountered in the work.

1.04 SUBMITTALS

A. Comply with applicable requirements of Division 1.

1.05 QUALITY ASSURANCE

A. Project Record Documents

1. Submit under provisions of Division 1.

2. Accurately record location of utilities remaining, rerouted utilities, new utilities by horizontal dimensions, elevations or inverts, and slope gradients.

PART 2 PRODUCTS

2.01 MATERIALS

A. Topsoil: Excavated material, graded free of roots, rocks larger than one inch, subsoil, debris, and large weeds.

B. Subsoil: Excavated material, graded free of lumps larger

than 6 inches, rocks larger than 3 inches, and debris.

C. Use only acceptable materials in embankment formation. Place no frozen material, stumps, logs, roots, or other perishable materials in any embankment. Place no stone or masonry fragment greater than four inches in any dimension within 12 inches of the finished subgrade elevation.

D. Requirements for Suitable Material

1. Granular Materials - Granular materials, shale, rock, and random material as defined herein are suitable for use in embankments.

2. Soil - Soil is suitable for use in embankments provided it has the following characteristics:

a. Maximum laboratory dry weight shall not be less than 90 pounds per cubic foot, except that soils having maximum dry weights of less than 100 pounds per cubic foot shall not be used in the top 12 inches of embankment subgrade.

b. Soil, in addition to the above requirements, shall have a liquid limit of not to exceed 65, and the minimum plasticity index number of soil with liquid between 40 and 65 shall not be less than that determined by the formula liquid limit minus 30.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that site has been cleared prior to beginning grading operations.

B. Verify that survey benchmark and intended elevations for the work are as indicated.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Identify known underground, above ground and aerial utilities. Stake and flag locations.

C. Notify Buyer prior to removing utilities.

D. Protect above and below grade utilities which are to remain.

E. Protect plant life, lawns, and other features remaining as a portion of final landscaping.

F. Protect bench marks, existing structures, fences, sidewalks, paving, and curbs from excavation equipment and vehicular traffic.

3.03 APPLICATION

A. Topsoil Excavation

1. Excavate topsoil from areas to be further excavated, relandscaped, or regraded.
2. Place excess topsoil not being reused in Mound Spoils area. See section 2000 and HP requirements.

B. Subsoil Excavation

1. Excavate subsoil from areas to be relandscaped or regraded.

2. Place excess subsoil not being reused in Mound Spoils area.

3. Do not excavate wet subsoil.

4. When excavation through roots is necessary, perform work by hand and cut roots with a sharp axe.

C. Embankment
1. Not Used.

2. Conduct all embankment operations in accordance with the requirements of the erosion control plan approved by the Buyer.

3. Not Used.

4. See Section 02223: BACKFILLING for backfill next to structures.

5. Embankment for the project, shall be finished to conform to the plan cross sections and finished grade elevations within the tolerances set forth herein. Prior to beginning grading and embankment operations in an area, any necessary clearing and grubbing in that area shall have been performed. Limitations of areas of clearing and grubbing and of earthwork operations shall be in accordance with limits of construction shown on Contract Drawings.

6. During the process of excavation, the project area shall be maintained in such condition that it will be well drained at all times.

7. Not Used.

8. Soil, granular material, shale and random material shall be spread in successive loose layers, not to exceed 8 inches specified in this section. Compaction of the outer 5 feet of each layer measured horizontally from the face of the slope shall be obtained with a roller capable of covering the layer to the outer edge.

a. <u>Soil</u> - All soil used in embankment shall be placed as specified herein.

b. Granular Material - Granular material shall be compacted to the density established as satisfactory by the Buyer based on field density test. The moisture content shall be as determined by the Buyer to obtain the desired compaction.

c. Random Material- For random materials moisture content and compaction shall be as required by the Buyer. When random material is of such size that it cannot be readily incorporated into 8-inch layer it shall be reduced in size until it can be so incorporated.

9. Construction of Embankment - All embankments shall be constructed using moisture and density control.

10. Moisture Control - Embankment and subgrade material which does not contain sufficient moisture to be compacted in accordance with the requirements of this subsection shall be sprinkled with water as directed by the Buyer. Water shall be applied by means of tank trucks equipped with suitable sprinkling devices and shall be thoroughly incorporated into the material which is to be compacted by means of discs or other approved equipment.

11. Embankment Compaction

Soil embankment shall be placed and compacted in layers until the density is not less than the percentage of maximum dry density indicated in the following table determined by ASTM D1557 or other approved method.

1. Turfed areas - 85%
2. Under pavements - 95%

12. Subgrade

a. All soil subgrade shall be prepared in accordance with this subsection. Soils with a maximum dry weight of less than 100 pounds per cubic foot are considered unsuitable for use where subgrade compaction for a depth of 12 inches is required and when encountered in the upper 12 inches of subgrade shall be replaced with suitable soil or granular material.

(1) Compaction Requirements - All soil subgrade shall be compacted to not less than 95 percent of maximum dry density as determined by ASTM D 1557 or other approved method. Qualification of subgrade may be required.

Subgrade under new pavement and paved shoulders shall be compacted to a depth of 12 inches below the surface of the subgrade and to a width of 18 inches beyond the edge of the surface of the pavement, paved median or paved shoulder or to the back of the adjacent curb and gutter.

Subgrade under pavement widening, driveway and stabilized shoulders, shall be compacted to a depth

of 6 inches below the surface of the subgrade and to the width of the pavement or base, or to the back of adjacent curb and gutter; and shall not be paid for as a separate item.

(2) Drainage - The surface of the subgrade shall be maintained in a smooth condition to prevent ponding of water after rains, and ditches shall be constructed and maintained to insure the thorough drainage of the subgrade surface at all times.

(3) Soft Subgrade - Where soft subgrade is encountered in cuts, due to no fault or neglect of the Seller, in which satisfactory stability cannot be obtained by moisture control and compaction as specified herein, the unstable material shall be excavated to the depth required by the Buyer. If the depth is in excess of 1 foot, excavation shall be measured and the cost will be negotiated.

Where soft subgrade is due to the failure of the Seller to maintain adequate surface drainage as required in Drainage, or is due to any other fault or neglect of the Seller, the unstable condition shall be corrected as outlined above at no expense to the Buyer.

(4) Full Width New Pavement Construction - After the surface of the subgrade has been shaped to approximate cross section grade, and before any pavement, or base stone material is placed thereon, the subgrade and a portion of the berm for a distance of at least 18 inches outside the limits of the surface of the planned pavement, shall be compacted. When the rolling is completed, the surface of the subgrade shall be shaped as necessary to conform to the grade and cross section shown on the Contract Drawings within the tolerance set forth herein and shall be so maintained until the overlying course is in place.

13. Proof Rolling

a. Proof rolling shall be performed on areas described on the Contract Drawings or as directed by the Buyer.

D. Tolerances

1. Top Surface of Subgrade: Plus or minus 1/2 inch.
2. For cut slopes back of the ditch line and for fill slopes beyond the shoulder, deviations of one foot measured in a horizontal plane will be permitted. For ditches the horizontal measurements from the centerline shall not be less than the plan dimension and the elevations thereof shall not be higher than specified, but may vary not more than 1/2 inch below the

established grades. For subgrade, the surface shall at no place vary more than 1/2 inch from the ten-foot straight edge applied to the surface parallel to the centerline of the pavement nor more than 1/2 inch from subgrade elevation established by construction layout stakes.

3.04 FIELD QUALITY CONTROL

A. Laboratory tests and analysis of fill material will be performed in accordance with ASTM D-1557.

B. Field density testing shall be in accordance with ASTM D-1556 Sand Cone or ASTM D-2922 Nuclear Density.

C. If tests indicate work does not meet specified requirements, remove work, replace and retest at no cost to Buyer.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Not used.

2. Compacted bedding under utilities, culverts, distribution piping and intercept trench..

3. Backfilling and compaction for utilities, culverts, distribution piping, and intercept trench.

B. Related Sections

1. Section 02211: ROUGH GRADING for topsoil and subsoil removal from site surface.
2. Section 02720: Distribution Piping, Collection Basins, Manholes.
3. Not Used.
4. Not Used.
5. Section 02921: LANDSCAPE GRADING for filling of topsoil over backfilled trenches to finish grade elevation.
6. Section 03300: CAST-IN-PLACE CONCRETE for concrete materials.

1.02 REFERENCES

A. ANSI/ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.

B. ANSI/ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb Rammer and 18 inch Drop.

1.03 SUBMITTALS

A. Comply with applicable requirements of Division 1.

1.04 PROJECT/SITE CONDITIONS

A. FIELD MEASUREMENTS

1. Verify that survey benchmark and intended elevations for the Work are as shown on Contract Drawings.

PART 2 PRODUCTS

2.01 MATERIALS

A. Backfill Materials

1. Material shall be full depth crushed stone ODOT No. 57

under paved areas.

B. Bedding Materials

1. Class A bedding shall consist of a continuous concrete cradle conforming to the plan details. Concrete shall conform to ODOT 499.03 for Class F (3000 psi).

2. Class B bedding shall consist of ODOT No. 57 Stone.

2.02 ACCESSORIES

Not Used.

PART 3 EXECUTION

3.01 PREPARATION

A. Location of Existing Lines

1. Prior to start of trenching excavation, Seller shall accurately locate and mark (stakes) all intersections of trench and existing buried lines shown on Project Drawings. Seller shall notify Buyer on completion of marking and receive written approval prior to proceeding with trenching.

2. Whenever a buried line is encountered at Mound Facility (whether shown or not shown on Project Drawings) -- all work shall stop until Buyer positively identifies line. All of Seller's personnel shall be made aware of use of plastic Terratape buried above some lines at Mound as precautionary warning of lines presence. All excavation within five (5) feet of a line shall be by hand shovel. Radioactive underground lines do exist at Mound Facility and Seller shall ensure that all Seller's personnel are informed of correct safety procedures around these lines.

3. Practice of intentional breaking of lines (either cheaper of faster for Seller) shall not be allowed. Seller shall be responsible for disruption of services to MRC operations of the line is shown on Project Drawings within + or - five feet of actual location (lateral distance).

B. Identify required lines, levels, contours, and datum.

C. Not Used

D. Not Used.

E. Protect bench marks,[existing structures, fences, sidewalks, paving, and curbs from excavation equipment and vehicular traffic.

F. Protect above and below grade utilities which are to remain.

G. Cut out soft areas of subgrade not capable of in situ compaction. Backfill with crushed stone and compact to density equal to or greater than requirements for subsequent backfill material. Wherever muck, quicksand, soft clay, swampy ground, or other material unsuitable for foundations, subgrade, or backfilling is encountered, remove it and continue excavation until suitable material is encountered. The material removed shall be disposed of in the manner

described below. Then refill the areas excavated for this reason with 1 inch to 2 inches crushed stone up to the level of the lines, grades, and/or cross sections shown on the drawings. The top 6 inches of this refill shall be crushed stone for bedding.

3.02 APPLICATION

A. Excavation

1. Before starting construction, remove from the work site all vegetable growth (except as hereinafter excluded), debris, and/or other objectionable matter as well as any buildings and/or other structures that the drawings and/or the Buyer specifically indicate are to be removed. Dispose of this refuse material in a manner acceptable to the Buyer.

2. Not Used.

3. Excavation shall not interfere with normal 45 degree bearing splay of foundations.

4. Hand trim excavation. Remove loose matter.

5. Remove lumped subsoil, boulders, and rock.

6. Correct unauthorized excavation at no cost to Buyer.

7. Correct areas over-excavated by error by placing either crushed stone or concrete at the direction of the Buyer.

8. Stockpile excavated material in area designated on site and remove excess material not being used.

9. The Seller may, if he chooses, use a motor powered trenching machine. If he does, however, he shall be fully responsible for the preservation or repair of existing utility service connections.

10. Not Used.

11. Not Used.

13. Not Used.

14. In all cases where materials are deposited along open trenches, place them so that in the event of rain or surcharge loading from such deposits no damage will result to the work and/or to adjacent property.

15. Provide and keep in operation enough suitable pumping equipment whenever necessary or whenever directed to do so by the Buyer. Give special attention to excavations for those structures that, prior to proper backfilling, are subject to flotation from hydrostatic uplift.

B. Bedding

1. Bed Sub-Grade - The foundation for the conduit bed shall be firm for its full length. Where unstable material is encountered below the plan foundation it shall be removed to the depth directed by the Buyer under the conduit and

for a width on each side equal to the diameter or span of the conduit and replaced with granular material. Rock or boulders encountered at the conduit bed shall be removed at least six inches below at the bottom of the conduit and replaced with granular material. In case the flow line is changed not to exceed one foot, or it becomes necessary to remove unsuitable material at the direction of the Buyer in an amount not to exceed one foot, the same shall be done for no additional compensation. When the flow line is lowered more than 1 foot or if it becomes necessary to remove more than 1 foot of unsuitable material below the bottom of the trench, work will be considered as a Contract Change Notice.

2. Bedding Material

   a. Class A bedding shall consist of a continuous concrete cradle conforming to the plan details.

   b. Class B bedding shall consist of a bed of crushed stone at least 6" deep below the bottom of the conduit. Once pipe has been laid, backfill pipe to one foot above the top of the pipe to complete the bedding and backfill requirements for the first one foot. Above this point, see backfill requirements.

C. Backfilling

1. Backfill trenches to contours and elevations with unfrozen materials.

2. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.

3. Place geotextile fabric over Type A fill prior to placing next lift of fill.

4. Granular Fill: Place and compact materials in continuous layers not exceeding 6 inches compacted depth.

5. Soil Fill: Place and compact material in continuous layers not exceeding 8 inches compacted depth.

6. Not Used.

7. Maintain optimum moisture content of backfill materials to attain required compaction density.

8. Leave fill material stockpile areas completely free of excess fill materials.

9. Do not begin backfilling until the line has been inspected and approved by the Buyer.

10. Backfill shall consist of full depth crushed stone underneath areas to receive pavement.

11. Backfill underneath turfed areas shall consist of crushed stone up to one foot above the top of pipe. The remainder of backfill shall consist of suitable soil which may contain some broken stone (3/4 of total volume.

12. Wherever trenches have been cut across or along existing pavement, temporarily pave the backfill of

such trenches by placing ODOT 304 crushed stone as the top 12 inches of the backfill. Maintain this temporary pavement either until the permanent pavement is installed.

13. Conduct backfilling around manholes, inlets, outfalls, and/or structures in the same manner as specified above for pipelines except that even greater care is necessary to prevent damage to the utility structure.

14. Wherever pipes have diameters of 15 inches or less, do not use power operated tampers to tamp that portion of the backfill around the pipe within one foot above the pipe.

15. Perform backfilling so as not to disturb or injure any pipe and/or structure against which the backfill is being placed. If any pipe or structure is damaged and/or displaced during backfilling, open up the backfill and make whatever repairs are necessary, whenever directed to do so by the Buyer.

16. Backfilling and clean-up operations shall closely follow pipe laying, failure to comply with this provision will result in the Buyer's requiring that the Seller's other activities be suspended until backfilling and clean-up operations catch up with pipe laying.

3.03 FIELD QUALITY CONTROL

A. Field testing will be performed under provisions of Division 1.

B. Laboratory tests and analysis of fill material will be performed in accordance with ANSI/ASTM D1557.

C. Field compaction testing will be performed in accordance with ANSI/ASTM D1556 Sand Cone or ASTM D-2992 Nuclear Density.

D. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Buyer.

3.04 PROTECTION

A. Finished Work

1. Protect finished Work under provisions of Division 1.

2. Recompact fills subjected to vehicular traffic.

3. Seed and maintain in good condition all excavated areas, trenches, fills, embankments, and channels until final acceptance by the Owner.

4. Maintain trench backfill at the approximate level of the original ground surface by periodically adding backfill material wherever necessary and whenever directed to do so by the Buyer. Continue such maintenance until final acceptance of the project, or until the Buyer issues a written release.

5. Clearing Site and Restoring Damaged Surfaces - After the backfilling has been completed, the Seller shall immediately remove and dispose of all surplus material including rubbish. Unless otherwise called of on the plans, the Seller shall replace all pavement, sidewalks, sod, or other surface disturbed, to a condition equal to that existing before the work was started.

6. Construction Equipment Overburden - Lightweight dozers and graders may be operated over culverts having two feet or compacted cover, but heavy earth moving and compaction equipment shall not be operated closer than one pipe until a cover of four feet has been placed and properly compacted over the top of the conduit.

B. Sheeting, Shoring, and Bracing

1. Take special care to avoid damage wherever excavation is being done. Sufficiently sheet, shore, and brace the sides of all excavations to prevent slides, cave-ins, settlement, or movement of the banks and to maintain the specified trench widths. Use solid sheets in wet, saturated, or flowing ground. All sheeting, shoring, and bracing shall have enough strength and rigidity to withstand the pressures exerted, to keep the walls of the excavation properly in place, and to protect all persons and property from injury or damage. Separate payment will not be made for sheeting, shoring, and bracing, which are considered an incidental part of the excavation work.

2. Wherever employees may be exposed to moving ground or cave-ins, shore and lay back exposed earth excavation surfaces more than five feet high to a stable slope, or else provide some equivalent means of protection. Effectively protect trenches less than five feet deep when examination of the ground indicates hazardous ground movement may be expected. Guard the walls and faces of all excavations in which employees are exposed to danger from moving ground by a shoring system, sloping of the ground, or some equivalent protection.

3. Comply with all OSHA standards in determining where and in what manner sheeting, shoring, and bracing are to be done. The sheeting, shoring, and bracing system shall be designed by a professional engineer licensed in the State of Ohio and shall be subject to approval by the Buyer. However, such approval does not relieve the Seller of the sole responsibility for the safety of all employees, the effectiveness of the system, and any damages or injuries resulting from the lack or inadequacy of sheeting, shoring, and bracing.

4. Where excavations are made adjacent to existing buildings or structures or in paved streets or alleys, take particular care to sheet, shore, and brace the sides of the excavation so as to prevent any undermining of or settlement beneath such structures or pavement. Underpin adjacent structures wherever necessary, with the approval of the Buyer.

5. Do not leave sheeting, shoring, or bracing materials in place unless this is called for by the drawings, ordered by the Buyer, or deemed necessary or advisable for the safety or protection of the new or existing work or features. Remove these materials in such a manner that

the new structure or any existing structures or property, whether public or private, will not be endangered or damaged and that cave-ins and slides are avoided.

6. Fill and compact all holes and voids left in the work by the removal of sheeting, shoring, or bracing as specified herein.

7. The Seller may use a trench box, which is a prefabricated movable trench shield composed of steel plates welded to a heavy steel frame. The trench box shall be designed to provide protection equal to or greater than that of an appropriate shoring system.

3.05 SCHEDULE

A. Distribution Piping, Intercept Trench, Collection Basin:

1. Bedding Fill: Type B, 6 inches thick, compacted to 95 percent.

2. Remaining fill as indicated on drawings.

END OF SECTION

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PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Asphaltic concrete paving.

B. Related Sections

1. Section 02211: ROUGH GRADING for preparation of site for paving including sub-grade preparation of areas in cut as well as embankment.
2. Not Used.
3. Not Used.
4. Section 02225: TRENCHING for trench backfill underneath paved areas.

1.02 REFERENCES

A. State of Ohio Department of Transportation Construction and Material Specifications. (ODOT)

B. American Association of State Highway and Transportation Officials. (AASHTO)

1.03 SUBMITTALS

A. Comply with applicable requirements of Division 1.

B. Material Lists

1. Submit for each type mix, the following information; asphalt content, aggregate gradation, chemical and physical properties of bituminous material, etc.

C. Laboratory and Field Test Reports

1. For each mix, submit the Marshall method data as prepared by the O.D.O.T. representative or plant personnel.

1.04 QUALITY ASSURANCE

A. Qualifications

1. Perform work in accordance with [State of Ohio Highway Standards] [City of Miamisburg].

2. Mixing Plant: Conform to State of Ohio Standards.

3. Obtain materials from same source throughout.

B. Regulatory Requirements

1. Conform to [applicable][_____] code for paving work on [public][right-of-way] property.

C. Temperature Requirements

1. The weather limitations shall be as shown in ODOT Section 401.05.

PART 2 PRODUCTS

2.01 MATERIALS

A. Asphalt Cement: AASHTO M226, Table 2.

B. Bitumious Aggregate Base - ODOT 301.

C. Asphalt Concrete Binder - ODOT 402.

D. Asphalt Concrete Levelling Binder - ODOT 403.

E. Asphalt Concrete Surface - ODOT 404.

2.02 ACCESSORIES

A. Prime Coat: ODOT 408.
B. Tack Coat: ODOT 407.

2.03 MIXES

A. Use dry material to avoid foaming. Mix uniformly.

B. Mix preparation shall be as shown in ODOT Specifications.

2.04 SOURCE QUALITY CONTROL

A. Not Used.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that base conditions are acceptable.
B. Verify that compacted subgrade is dry and ready to support paving and imposed loads.
C. Verify gradients and elevations of base are correct.

3.02 PREPARATION

A. Prime Coat

1. Apply prime coat on aggregate base course surface at uniform rate of 0.3-0.5 gal/sq. yd.

2. Wait a minimum of 48 hours for the prime coat to cure before placing any equipment on the surface.

3. Not Used.

4. Use clean sand to blot excess prime coat.

B. Tack Coat

1. Apply tack coat on asphalt surfaces at uniform rate of 0.1-0.3 gal/sq. yd.

2. Also apply to contact surfaces of curbs, gutters.

3. Coat surfaces of manhole frames with oil to prevent bond with asphalt pavement. Do not tack coat these surfaces.

3.03 APPLICATION

A. Placing Asphalt Pavement

1. Place asphalt in accordance with ODOT Section 401.

2. Place each mix to thicknesses identified as shown on the drawings.

3. Not Used.

4. Compact pavement by rolling. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

5. Develop rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.04 Not Used.

3.05 PROTECTION

A. Immediately after placement, protect pavement from mechanical injury until project closeout.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. The Work shall consist of temporary control measures as detailed in the Contract Drawings to control soil erosion and sedimentation through use of straw bales.

2. The permanent control provisions specified elsewhere shall be coordinated with the temporary erosion control features to the extent practical to assure economical, effective, and continuous erosion control throughout the construction and post-construction period.

3. Temporary control may be required for construction Work outside the limits of construction such as borrow pit operations, haul roads, equipment and material storage sites, waste areas, and temporary set-up areas.

B. Related Sections

1. Not Used.
2. Section 02211: ROUGH GRADING.
3. Section 02222: EXCAVATION.
4. Not Used.
5. Section 02225: TRENCHING.
6. Not Used.
7. Not Used.
8. Section 02938: SODDING

1.02 REFERENCES

A. O.D.O.T. CONSTRUCTION AND MATERIALS SPECIFICATIONS Item 207.

1.03 QUALITY ASSURANCE

A. Seller shall keep permanent record of all erosion/silt control measures including dates, photographs, rainfalls/snow dates and amounts, and other pertinent data.

1.04 PROJECT/SITE CONDITIONS

A. Emergency Procedures

1. Seller shall be responsible for maintaining in-place the controls. This shall include nights, weekends, holidays, and all other times. Seller shall maintain readily available tools, equipment, and materials to repair or replace controls damaged in any way.

1.05 SEQUENCING AND SCHEDULING

A. Submit schedule of Work versus erosion/silt controls showing controls in place at time of start of other Work in area. (This schedule is subject to approval by Buyer.)

PART 2 PRODUCTS

2.01 MATERIALS

A. General

1. Commercial fertilizer shall be 12-12-12.

2. Temporary seeding and mulching shall consist of annual rye-grass (Lolium multifolium). Seed and mulching material shall be applied in accordance with Section 02936: SEEDING.

3. Temporary ditch checks shall consist of straw bales or coarse aggregate.

4. Temporary inlet filters shall consist of straw bales or filter fabric adequately supported on fence.

5. Temporary dikes shall consist of suitable embankment material (Section 02211: Rough Grading).

6. Temporary slope drains shall consist of pipe, coarse aggregate, riprap, rock channel protection, mats, plastic sheets, or other materials. Such materials shall be approved by the Buyer before being incorporated into the work. Sediment pits may be included as part of the slope drain construction.

B. Construction Requirements

1. The Seller shall limit the surface area of erodible earth material exposed by clearing and grubbing; the surface area of erodible earth material exposed by excavation, borrow, and fill operations; and provide immediate permanent or temporary control measures to prevent contamination of drainage system. Such Work will involve the construction of temporary filters, or other control devices, or methods necessary to control erosion and sedimentation.

C. Permanent Erosion Control

1. The Seller shall incorporate all permanent erosion control features into the project at the earliest practicable time. Temporary control measures will be used when and as directed by the Buyer to correct conditions that develop during construction that were not foreseen during the design stage; that are needed prior to installation of permanent control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

PART 3 EXECUTION

3.01 PREPARATION

A. Where erosion is likely to be a problem, clearing and grubbing operations should be so scheduled and performed so

that grading operations and permanent erosion control features can follow immediately thereafter if the project conditions permit; otherwise, temporary erosion control measures shall be required between successive construction stages.

1. The Buyer may limit the area of excavation, borrow, and embankment operations in progress commensurate with the Seller's capability and progress in keeping the finished grading, mulching, seeding, and other such permanent control measures current in accordance with the accepted schedule. Mulching, seeding, and other such permanent control measures shall be applied after completions of eight feet (vertical) of embankment or cut, unless otherwise directed by the Buyer. Should seasonal limitations or embankment make such coordination unrealistic, temporary erosion control measures shall be taken immediately.

2. In the event of conflict between these requirements and pollution control laws, rules, or regulations of other Federal, State or local agencies, the more restrictive laws, rules, or regulations shall apply.

3.02 APPLICATION

A. Performance

1. If, in the opinion of the Buyer, proper control of soil erosion and sedimentation is not being provided by the Seller, the Buyer may take the necessary steps to provide corrective measures and the cost of such services will be deducted from any money which may be due or become due the Seller.

END OF SECTION

PART 1 GENERAL

1.02 SUMMARY

A. Section Includes

1. Intercept and distribution Storm drainage piping, fittings, and accessories.

2. Not Used.

3. manholes, site surface drainage, collection basins.

B. Related Sections

1. Section 02225: TRENCHING for excavating subsoil for sewerage system piping and backfilling.
2. Not Used.
3. Not Used.
4. Section 03300: CAST-IN-PLACE CONCRETE for collection basin, manhole base pad construction.

1.02 REFERENCES

A. ANSI/ASTM C14 - Concrete sewer Storm Drain, and Culvert Pipe.

B. ANSI/ASTM C76 - Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.

C. ANSI/ASTM C443 - Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.

1.03 DELIVERY, STORAGE AND HANDLING

A. Products shall be lifted by lifting devices (slings, cradles, forks, etc.) designed for lifting concrete structures. Any device which crushes edges, cracks, or otherwise damages the material, leaving a permanent mark on the product shall not be used.

B. Products showing signs of physical abuse such as cracks, crushed edges, chipped concrete, abraded surfaces shall be removed from site immediately.

C. Products shall be stored off the ground away from traffic areas and other possible damage.

2.01 MATERIALS

A. Concrete Pipe

1. Not Used.

2. Reinforced Concrete Pipe: ANSI/ASTM C76.

3. Reinforced Concrete Pipe Joint Device: ANSI/ASTM C443, rubber compression gasket joint.

4. Not Used.

5. Not Used.

6. All concrete pipe larger than 15 inches in internal diameter shall have tongue and groove joints.

B. Not Used.

C. Structures

1. Precast Manhole Components: Meeting the requirements of ASTM C478 with the following exceptions and additions. The manhole sidewall shall be of a length such that a minimum of one course and a maximum of four courses of brick shall be placed on top of the unit to bring the casting to grade.

a. Not Used.

b. Applicable Documents - Replace ASTM C497 Testing Concrete Pipe or Tile with AASHTO T33,

c. Not Used.

d. Cement - cement shall be Portland Cement.

e. Aggregate - Aggregate shall meet the quality requirements of Item 703.02 of the ODOT Specification.

f. Steel Reinforcement - Steel shall be Item 709.01, 709.08, 709.10, 709.12 of ODOT Specification. Precast catch basin and inlet tops shall also permit Items 709.03 and 709.05 of the ODOT Specification.

g. Lift Holes - Not more than two holes may be cast, drilled or otherwise neatly made in the shell of each piece of each riser section for the purpose of handling or laying. The holes shall be tapered unless drilled, and before backfilling the tapered holes shall be filled with portland cement mortar or with concrete plugs which shall be secured with portland cement mortar. Drilled holes shall be filled with portland cement mortar.

h. Not Usd..

i. Absorption Test - Requirements for Concrete - Does not Apply.

j. Retests - Does not apply.

k. Inspection - Inspection shall be done at the project site. Random samples shall be obtained from material delivered to the project site or at other locations designated by the Buyer.

1. Marking - In addition, the plant location shall be marked on each manhole or top section.

2. Not Used.

3. Manholes

a. Shaft Construction and Concentric or Eccentric Cone Top Section: Reinforced concrete pipe sections, lipped male/female joints; cast steel ladder rungs into shaft sections at 12 inches; nominal shaft diameter of 48 inches; per ODOT spec.s.

b. Base Pad: Cast-in-Place concrete of type specified in Section 03300levelled top surface to receive concrete shaft sections, sleeved to receive sewer pipe sections.

2.02 ACCESSORIES

A. Clay Brick (For Casting Adjustment): Clay brick shall be medium hard or better quality Grade SM sewer brick conforming to the requirements of ASTM C32. Brick shall be solid and not cored or frogged.

B. Mortar: Composed of one part portland cement and two parts sand (volumetric measure) thoroughly mixed in a tight box, with water added gradually and mixed continually until mortar has attained the proper consistency for use in brick masonry; prepared only in such quantities as needed for immediate use; mortar mixed for more than 30 minutes, retempered, or previously set will not be allowed.

C. Gray Iron Castings: Cast iron conforming to the requirements of Class 30, ASTM A48; made accurately to the required dimensions; sound, smooth, clean, and free from blisters and other defects; not plugged or otherwise treated to remedy defects; machined so that covers rest securely in the frames with no rocking and are in contact with frame flanges for the entire perimeter of the contact surfaces; thoroughly cleaned subsequent to machining and, before rusting begins, painted with a bituminous coating so as to present a smooth finish; tough and tenacious when cold, but not tacky and with no tendency to scale; and with the actual weight in pounds stenciled or printed by the manufacturer on each casting in white paint.

D. Rubber Gaskets: Rubber or neoprene joints shall be Tylox Type CR, Type C., O-ring, or approved equal; the bell and spigot and the tongue and groove of the pipe shall be specially manufactured and prepared for the use of the type of joint selected. The rubber gaskets shall meet the requirements of ASTM C443. Submit the shape and design to the Buyer for his approval.

E. Corrugated Steel Pipe Couplings: Shall conform to AASHTO M36 except that coupling bands shall not be more than two nominal sheet thicknesses thinner than the thickness of the pipe to be connected. Bands shall be a minimum of 16 gauge and have at least one annular corrugation that indexes into the

inboard corrugation of each pipe section joined.

F. Ladder Bars: An Aluminum alloy weighing 2.2 pounds or 3/8 inch steel reinforced rod encapsulated in polypropylene plastic.

2.03 SOURCE QUALITY CONTROL

A. Material Testing: All precast reinforced concrete manhole risers and tops specified herein shall be tested and inspected by a commercial testing laboratory approved by the Buyer prior to delivery to the site, and all materials that fail to conform to these specifications shall be rejected. After delivery to the site, any materials that have been damaged in transit or are otherwise unsuitable for use in the work shall be rejected and removed from the site. Supply certified copies in duplicate of the inspection and acceptance reports of the testing laboratory to the Buyer before using the materials. (Each joint and each special shall be stenciled or otherwise marked with the laboratory's mark of acceptance. Furnish the Buyer with two certified copies of the laboratory's report of inspection, test, and acceptance on all pipe and specials prior to its incorporation in the work.) The commercial testing laboratory shall be engaged and paid for by the Seller. Submit a certificate from the manufacturer of the castings indicating that they meet all applicable requirements of these specifications.

B. Additional Testing: If products or installation does not seem satisfactory to the Buyer, the Buyer may order tests of products, seals, compaction, fill materials, and items supplied. If products and installation meet the leakage requirements specified, then the Government will pay for testing. If products or installation do not meet the requirements specified, then work will be removed and replaced as required at the expense of the Seller (including cost of testing).

C. The Seller shall require that his supplier furnish a certification that all materials furnished meet the above standards and specifications.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that trench cut and excavation base is ready to receive work, and excavations, dimensions, and elevations are as indicated on Contract Drawings.

B. Beginning of installation means acceptance of existing conditions.

3.02 PREPARATION

A. Hand trim excavations to required elevations. Correct over excavation with fill material.

B. Remove large stones or other hard matter which could damage

drainage tile or impede consistent backfilling or compaction.

C. Lay no pipe except in the presence of an inspector representing the Buyer.

D. Before constructing or placing joints, demonstrate to the Buyer, by completing at least one sample joint, that the methods employed conform to the specifications and will provide a watertight joint, and further that the workmen intended for use on this phase of the work are thoroughly familiar and experienced with the type of joint proposed.

E. Before placing sewer pipe in position in the trench, carefully prepare the bottom and sides of the trench, and install any necessary bracing and sheeting a provided in Section 02225: TRENCHING.

F. Excavate for inlets in accordance with the applicable provisions of Section 02225: TRENCHING.

G. Where inlets are to be constructed in existing pavements and/or curbs and gutters, cut such pavements and/or curbs and gutters to a neat line with an air hammer or other suitable equipment, removing no more pavement and/or curb and gutter than is essential.

H. Obtain an adequate foundation for all manhole structures by removing and replacing unsuitable material with well graded granular material, by tightening with coarse rock, or by such other means as provided for foundation preparation of the connected sewers or as directed by the Buyer. Wherever water is encountered at the site, place all cast-in-place bases or monolithic structures on a one-piece waterproof membrane to prevent any movement of water into the fresh concrete.

3.03 INSTALLATION

A. Pipe

1. General - Except where otherwise directed by the Buyer for special conditions, the conduit shall be laid starting at the outlet end with the bell or groove end laid upgrade. The lower segment of the conduit shall be in contact with the shaped bedding throughout its full length. Metal conduits shall be placed with longitudinal laps or seams at the side and by lapping the circumferential seams on the inside in the direction of flow.

2. All conduits shall begin and end with pipe ends as normally fabricated by the manufacturer. If field cutting is found to be necessary, the cut end shall be located at an interior joint and cradle, collar, or band shall be provided to assure a stable joint.

3. Carefully inspect each piece of pipe and special fitting before it is placed, and lay no defective pipe in the trench. Pipe laying shall proceed upgrade, starting at the lower end of the grade and with the bells upgrade.

4. Bell holes shall be large enough to allow ample room for the pipe joints to be properly made. Cut bell holes out not more than ten joints ahead of the pipe laying. Carefully grade the bottom of the trench between bell holes so that each pipe barrel will rest on a solid foundation for its entire length. Lay each pipe joint so as to form a close concentric joint with adjoining pipe and to avoid sudden offsets or inequalities in the flow line.

5. Place pipe on minimum 6 inch deep bed of bedding material.

6. Lay pipe to slope gradients noted on Contract drawings.

7. Backfill for pipe trenches, shall be in accordance with Section 02225: Trenching.

8. Not Used.

9. Jointing operations shall follow pipe laying very closely; failure to comply with this provision will result in the Buyer's stopping all pipe laying operations until jointing operation catch up.

10. Rubber gaskets and the method of joint construction shall be in strict accordance with the manufacturer's directions and requirements. Adequately lubricate the gaskets with special cement provided for this purpose, and pipe joints shall be adequately and thoroughly driven home or seated.

11. The method of joining conduit sections shall be such that the ends are fully entered and the inner surfaces are reasonably flush and even. Sealed, banded or bolted joints shall be provided for all conduits. Corrugated conduits shall be jointed with coupling bands which match and mesh with the corrugations of the pipes (bands with projections, i.e. dimple bands, shall not be used). Conduits shall have open joints only if shown on Contract Drawings.

B. Structures

1. Not Used.

2. For precast manholes, carefully block the base section above the prepared surface so that it is fully and uniformly supported in true alignment; make sure that all entering pipe can be inserted at proper grade. Then place the concrete foundation and invert under and upon this base section as shown in the standard drawings. A base section with monolithic foundation (bottom) may be used when approved by the Buyer.

3. Form bottom of excavation clean and smooth to correct elevation.

4. Form and place cast-in-place concrete base pad, with provision for storm sewer pipe end sections.

5. Establish elevations and pipe inverts for inlets and outlets as indicated.

6. Manhole inverts shall be constructed of concrete. Make any necessary changes in cross sections gradually from side to side of the manhole; make changes in direction of flow of the sewers to a true curve of as large a radius as is permitted by the size of the manhole.

7. Not Used.

8. Thoroughly wet and then completely fill all lift holes and all joints between precast elements with mortar. Smooth and paint them both inside and outside to ensure watertightness.

9. All connections for lateral sewers including drops and leads, will be considered a part of all manholes, inlets, junction chambers and catch basins.

10. Mount lid and frame level in grout, secured to top cone section to elevation indicated.

C. Castings

1. Set all castings accurately to line and grade in full cement mortar beds on the brick masonry. Unless otherwise shown on the drawings and/or directed by the Buyer, set all grate frames no less than one inch below the normal grade of surrounding pavement and no less than three inches below the normal surface of unpaved areas; then slope the surrounding area to the grates on a slope of 1:12.

2. Carefully set the cast iron frame for the cover at the required elevation, and properly bond it to the masonry with cement grout and/or anchor bolts. Wherever manholes are constructed in paved areas, tilt the top surface of the frame and cover so as to conform to the exact slope, crown, and grade of existing adjacent pavement.

3. Not Used.

D. Backfilling

1. Place backfill by hand around the manhole and to a distance of at lest one pipe length into each trench, and tamp with selected material up to an elevation of 12 inches above the crown of all entering pipes. Continue backfilling in accordance with the requirements for trench backfilling in Section 02225: TRENCHING.

3.04 FIELD QUALITY CONTROL

A. General - The testing of joints shall be performed by the Seller in accordance with approved methods, Should any section of conduit fail to meet the test requirements, corrections shall be made until the test requirements for the section are met. The costs of all materials, equipment,

labor, and incidentals necessary for performing the tests and making any necessary corrections and replacements shall be included.

B. Gaskets - When resilient and flexible gasket joints are specified, they shall sustain a maximum limit of 0.6 gallon per inch of internal diameter over 100 feet per hour when field tested for infiltration. As an alternate, they may be field tested for exfiltration, in which case the joints shall perform equally well except that an allowance of an additional 10 percent of gallonage will be permitted for each additional two-foot head over a basic two-foot minimum internal head.

C. After the joints have been completed, they shall be inspected, tested, and accepted by the Buyer before they can be covered. The pipe shall meet test requirements for watertightness; immediately repair any leaks or defects discovered at any time after completion of the work. Take up any pipe that has been disturbed after joints were formed; clean and remake the joints; and relay the pipe at the Seller's expense. Carefully protect all pipe in place from damage until backfill operations are completed.

D. Do not begin the backfilling of trenches until the pipe in place has been inspected and approved by the Buyer. Backfilling shall be performed in the manner provided in Section 02225: TRENCHING.

E. Accurately record location of pipe runs, connection, collection basins, manholes, and invert elevations.

F. Identify and describe unexpected variations to subsoils conditions or discovery of uncharted utilities.

3.04 ADJUSTING

A. Construction Methods - General

1. The construction for the item specified shall conform to the Contract Drawings and be placed at the locations and elevations, shown or ordered except that the height of any unit may be changed. The height changed shall not exceed one foot.

B. When adjustment to grade is specified, the work shall be accomplished by one of the following methods:

1. Carefully remove and clean the existing frame; adjust the height of supporting walls as necessary; and rest the existing frame in a bed of mortar or concrete.

2. Carefully remove the existing cover or grate and furnish and install an approved adjusting ring or casting.

3.06 PROTECTION

A. Protect finished installation under provisions of Division 1.

B. Protect pipe and filter aggregate cover from damage or

displacement until backfilling operation is in progress.

C. Adequate precautions shall be taken to prevent concrete and/or mortar from freezing. Brick, concrete block, precast concrete, etc. having a temperature of 40 degrees F. or less shall not be set with mortar until heated for a period sufficient to insure a temperature of 50 degrees F. to 80 degrees F. throughout the entire mass of the material.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Furnishing, hauling, preparing the bed, and placing sod on areas as shown on Contract Drawings or disturbed areas.

B. Related Sections

1. Not Used.
2. Section 02225: TRENCHING for rough grading over cut.
3. Section 02275: EROSION CONTROL.
4. Section 02921: LANDSCAPE GRADING for preparation of subsoil and placement of topsoil in preparation for the work of this Section.

1.02 REFERENCES

A. American Sod Producers Association (ASPA) - Guideline Specifications to Sodding.

B. Federal Specifications (FS) - FS O-F-241 - Fertilizers, Mixed, Commercial.

1.03 SUBMITTALS

A. Comply with applicable requirements of Division 1.

B. Certifications

1. Submit sod certification for grass species and location of sod source.

1.04 QUALITY ASSURANCE

A. Qualifications

1. Sod Producer: Company specializing in sod production and harvesting.
2. Installer: Company approved by the sod producer.

B. Regulatory Requirements

1. Comply with regulatory agencies for fertilizer and herbicide composition.

C. General

1. Sod: Minimum age of 18 months, with root development that will support its own weight, without tearing, when suspended vertically by holding the upper two corners.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Division 1.

B. Store and protect products under provisions of Division 1.

C. Protect exposed roots from dehydration.

D. Do not deliver more sod than can be laid within 24 hours.

E. Temporary storage of sod is permitted; however, take care to maintain the sod in a live, growing condition. Sod shall be rejected if it is permitted to decay or dry out to the extent that, in the judgement of the Buyer, its survival is doubtful. Dispose of rejected sod as directed by the Buyer at no expense.

F. During wet weather sod shall be allowed to dry sufficiently to prevent tearing during handling and placing, and during dry weather it shall be watered before lifting to insure its vitality and to prevent the dropping off of the soil in handling.

1.06 MAINTENANCE

A. Maintain installed sod for three months from Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MATERIALS

A. Sod

1. Sod shall be well-rooted Kentucky Blue Grass (Poa pratensis) or Canadian Blue Grass (Poa compressa) containing a growth of not more than 30 percent of other grasses and covers, and free from all noxious weeds such as wild mustard, thistles, quack grass, etc., and reasonably free from dandelions, crab grass, etc. The sod shall be recently mowed to a length of not more than three inches.

2. It shall be cut into strips of not less than 3 feet and not over 6 feet with a uniform width of not over 18 inches. Sod shall be delivered to the job within 24 hours after being cut and shall be installed within 48 hours after being cut.

2.02 Not Used.

2.03 ACCESSORIES

Not Used.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared soil base is ready to receive the work of this Section.

B. Beginning of installation means acceptance of existing site conditions.

3.02 PREPARATION

A. Before beginning sodding operations, the placing of topsoil and final grading shall be completed and approved by the Buyer (as specified in Section 02921: LANDSCAPE GRADING.)

B. Before the sod is placed, the sod bed shall be excavated to such a depth that when the sod is in place the top of the sod will be flush with the surrounding grade and in accordance with the typical cross section. Commercial fertilizer and agricultural liming material shall be applied and incorporated in the areas to be sodded at the rate specified to a depth of not less than one inch, and not more than 48 hours before the sod is placed. Immediately prior to the placing of the sod, the area shall be raked, or otherwise brought to an even surface forming a proper sod bed, and if dry, the sod bed shall be thoroughly watered previous to placing of the sod.

3.03 INSTALLATION

A. Laying Sod

1. No sod shall be placed when the temperature is below 32 degrees F. No frozen sod shall be placed nor shall any sod be placed upon frozen soil. When sod is placed between the dates of June 1st and October 15th, it shall be covered immediately with straw mulch one inch thick, loose measurement.

   Sod shall be lifted from trucks or storage piles and placed by hand with close joints and no overlapping. All gaps between sections of sod and openings at angles and the like, shall be plugged with sod. After laying, the sod shall be sprinkled thoroughly and then tamped with approved sod tampers sufficiently to bring the sod into close contact with the sod-bed and insure tight joints between the sections or strips. Upon the completion of the above work, the surface of the sodded areas shall coincide with the finished grade.

2. No equipment, material, storage, construction traffic, etc. will be permitted on newly sodded ground.

3. On slopes 3 to 1 and steeper, sod shall be laid with the long edges of the strip parallel to the contour starting at the bottom of the slope. Successive strips shall be neatly matched and all joints staggered or broken.

   Each strip or section of sod placed on slopes 3 to 1 and steeper which are 6 feet or more in height, measured on the slope, shall be staked or pinned securely with at least two stakes or pins not more than two feet apart with the flat side against the slope. Stakes may be wood at least 1/2 x 3/4 x 12 inches, driven so that the last one inch remains above the top of the

sod, or T-shaped pins, machine bent from 15 inch pieces of 8 gage low carbon bright steel with an 8 inch leg, a 4 inch head and a one inch secondary drive. Wire pins shall be driven flush with the top of the sod.

Sod laid on slopes shall be sprinkled thoroughly, and then tamped or pressed to bring the sod into close contact with the sod-bed and insure tight joints between the sections or strips.

4. Sod shall be placed in ditches with successive strips neatly matched and transverse joints staggered. The sod shall be held in place securely with wooden stakes or wire pins placed at a maximum distance of two feet and staggered in adjacent rows.

3.04 FIELD QUALITY CONTROL

A. Inspection

1. The Buyer shall inspect the sod after planting and determine if it is satisfactory.

B. Guarantees

1. Establish an acceptable growth of the specified sod on all areas indicated on the drawings or as directed by the Buyer. An area is considered acceptable if the majority of each piece of sod is alive and healthy and generally free from weeds, insects, and disease.END OR SECTION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Preparation of subsoil.
2. Placing, leveling, and compacting topsoil material prior to final landscaping work.

B. Related Sections

1. Section 02000: SUMMARY OF WORK for disposal requirements.
2. Not Used.
3. Not Used.
4. Section 02225: TRENCHING for backfilling trenches.
5. Section 02275: EROSION CONTROL.
6. Not Used.
7. Section 02938: SODDING.

1.03 SUBMITTALS

A. Comply with applicable requirements of Division 1.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements

1. See Section 02000: SUMMARY OF WORK for requirements of disposal.

2. Remove debris, rubbish, and other materials resulting from grading of site.

3. Any debris removed from site without Buyer's specific written approval shall be returned at Seller's expense for monitoring.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver material to the site and store on site in such a manner as not to disturb storm drainage.

B. Storage of material to be located as shown on Contract Drawings.

PART 2 PRODUCTS

2.01 MATERIALS

A. Topsoil: Excavated from site and free of weeds.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify fill material to be reused is acceptable.

B. Verify trench backfilling has been inspected.

C. Verify subsoil base has been contoured and compacted.

3.02 PREPARATION

A. Eliminate uneven areas and low spots in subsoil.

B. Remove debris, roots, branches and stones in excess of 1/2 inch in size. Refer to Section 02000: SUMMARY OF WORK for removal of unusable material.

C. Scarify subgrade to depth of four inches where topsoil is scheduled. Scarify in areas where equipment is used for hauling and spreading topsoil and has compacted subsoil.

3.03 APPLICATION

A. Place topsoil in areas where sodding is required to thickness 4 inch.

B. Use topsoil in relatively dry state. Place during dry weather.

C. Fine grade topsoil eliminating rough or low areas. Maintain profiles, and contour of subgrade, and ensure positive drainage.

D. Remove roots, weeds and foreign material while spreading.

E. Not Used.

F. Lightly compact placed topsoil.

G. Remove surplus subsoil and topsoil from site.

H. Leave stockpile area and site clean and raked, ready to receive landscaping.

3.04 PROTECTION

A. Protect landscaping and other features remaining as final work.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Concrete reinforcement and accessories.

2. Cast-In-Place normal weight concrete.

3. The extent of concrete work is shown on the Contract Drawings.

B. Products Installed but not Furnished Under this Section

Not Used.

C. Related Sections

1. Section 02222: EXCAVATION.
2. Section 03100: CONCRETE FORMWORK.
3. Section 03400: STRUCTURAL PRECAST CONCRETE.
4. Section 03550: CONCRETE TOPPING.
5. Section 03600: GROUT.
6. Section 04200: UNIT MASONRY.

1.02 REFERENCES

A. ACI 301, Specifications for Structural Concrete for Buildings.

B. Not Used.

C. ACI 304, Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete.

D. ACI 305, Hot Weather Concreting

E. ACI 306, Cold Weather Concreting

F. ACI 311, Recommended Practice for Concrete Inspection.

G. ACI 315, Detailing Manual.

H. ACI 318, Building Code Requirements for Reinforced Concrete.

I. ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.

J. ANSI/AWS D12.1 - Reinforcing Steel Welding Code.

K. ASTM A615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.

L. Not Used.

M. ASTM A617 - Axle Steel Deformed and Plain Bars for Concrete Reinforcement.

N. ASTM C33 - Concrete Aggregates

O. ASTM C94 - Ready-Mixed Concrete.

P. ASTM C150 - Portland Cement.

Q. ASTM C171 - Moisture Retaining Coverings.

R. ASTM C260 - Air Entraining Admixtures for Concrete.

S. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.

T. NOt Used.

U. ASTM C494 - Chemical Admixtures for Concrete.

V. ASTM C618 - Fly Ash and Raw or Calcinated Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.

W. ASTM D2103 - Polyethylene Film and Sheeting.

X. ANSI/ASTM D994 - Preformed Expansion Joint Filler for Concrete (Bituminous Type).

Y. ANSI/ASTM D1190 - Concrete Joint Sealer, Hot-Poured Elastic Type.

Z. ANSI/ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

AA. ANSI/ASTM D1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

AB. CRSI - Concrete Reinforcing Steel Institute Manual of Practice.

AC. CRSI 63 - Recommended Practice for Placing Reinforcing Bars.

AD. CRSI 65 - Recommended Practice For Placing Bar Supports, Specifications and Nomenclature.

1.03 SUBMITTALS

A. Comply with applicable requirements of Division 1.

B. Shop Drawings

1. Submit shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with the ACI 315, Detailing Manual, showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement Show on the shop drawings special reinforcement required and openings through concrete structures.

C. Certifications

1. For each material sampled and tested, submit written reports to the Buyer prior to the start of work. Provide the project identification name and number, date of

report, name of Seller, name of concrete testing service, source of concrete aggregates, materials manufacturer and brand name for manufactured materials, values specified in the referenced specification for each material, and test results. Indicate whether or not material is acceptable for the intended use, and compliance with ASTM governing each material.

D. Material Lists

1. Prepare design mixes for each type and strength of concrete in accordance with applicable provisions of ASTM C94. Use an independent testing facility acceptable to the buyer for preparing and reporting proposed mix designs. The testing facility shall not be the same one used for field quality control testing unless this is acceptable eo the buyer. Submit to the buyer written reports of each proposed mix for each class of concrete at least 15 days before the start of work. Do not begin concrete production until the buyer reviews the mixes.

E. Catalog Data

1. Submit manufacturer's product data with application and installation instruction for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing and sealing compounds, and others requested by the buyer.

F. Laboratory and Field Test Reports

1. Submit two copies of laboratory test reports with standard deviation analysis or trial batch data. All concrete materials shall be listed.

1.04 DELIVERY, STORAGE AND HANDLING

A. Reinforcing bars and wire fabric shall be delivered and stored flat. Use wood blocking as required to prop up so as to avoid contact with the ground.

B. Store cement, grout and other moisture sensitive materials on elevated pads and wrap them with waterproof covering as required to protect them from inclement weather.

C. Delivery record log shall be maintained for all deliveries of ready-mixed concrete.

1. Record log shall include supplier name, truck number, date, time of water introduction, time of arrival at job site, ambient temperature, concrete temperature, slump, entrained air content, unit weight [for lightweight concrete], time of completion of deposition of concrete, installation position of load, and test cylinder serial numbers, plus a remarks column.

2. Delivery log shall be kept on hand at the job site for review by buyer at all times.

3. At completion of the contract, the complete concrete delivery log shall be given to the Buyer.

4. Each load of concrete arriving at the job shall be accompanied by a delivery ticket that shall be collected by the Seller and submitted to the Buyer and shall contain the following information:

   a. The design mix and strength of mix concrete being delivered.

   b. The exact time the cement, aggregate, and water were discharged into the delivery truck.1.05
      PROJECT/SITE CONDITIONS

A. Seller shall take all precautions to minimize combustible refuse. Stacks of flammable used forms, curing paper, cement sacks, and other refuse shall not be permitted, but shall be removed from site. Flammable or toxic oils, hardeners, curing compounds, and other substances used in Concrete Work shall be handled, stored, and used in strict conformance with Mound Safety requirements.

PART 2 PRODUCTS

2.01 MATERIALS

A. Portland Cement: ASTM C150, Type I.

B. Normal Weight Aggregates: ASTM C33, and as specified below:

1. Local aggregates that do not comply with ASTM C33 but that have been shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to the buyer.

2. Fine aggregate is to be clean, sharp, river sand or crushed gravel when used for vehicular wearing surfaces. Manufactured sand may be used elsewhere provided the percentage passing a No. 200 sieve is less than 3 percent.

3. Coarse Aggregate: Coarse aggregate shall be stone that is clean, uncoated, and processed from natural rock or stone and that contains no clay, mud, loam, or foreign matter. Its maximum size shall be no larger than 3/4 inches.

C. Not Used.

D. Water: Clean, fresh, drinkable.

E. Admixtures

1. Water Reducing Admixture: Eucon WR-75 by the Euclid Chemical Company, Pozzolith 200N by Master Builders, or Plastocrete 160 by Sika Chemical Corporation. The admixture shall conform to ASTM C494, Type A, and not contain more chloride ions than are present in municipal drinking water.

2. Water Reducing, Retarding Admixture: Eucon Retarder-75 by the Euclid Chemical Company, Pozzolith 100 XR by Master Builders, or Plastiment by Sika Chemical Corporation. The admixture shall conform to ASTM C494, Type D, and not contain more chloride ions than are present in municipal drinking water.

3. High Range Water Reducing Admixture Superplasticizer: Eucon 37 by the Euclid Chemical Company or Sikament 320 by Sika Chemical Corporation, Rhiobuild, by Masterbuilders Corporation. The admixture shall conform to ASTM C494, Type F or G, and not contain more chloride ions than are present in municipal drinking water.

4. Master Builders: Accelguard 80 by the Euclid Chemical Company or Darex Set Accelerator by W.R. Grace. The admixture shall conform to ASTM C494, Type C or E, and not contain more chloride ions than are present in municipal drinking water.

5. Air Entraining Admixture: ASTM C260.

6. Calcium Chloride: Calcium chloride or admixtures containing more than 0.1 percent chloride ions are not permitted.

7. Pozzolanic Admixtures: ASTM C618.

8. Certification: Written conformance to the abovementioned requirements and the chloride ion content will be required from the admixture manufacturer prior to mix design review by the Buyer.

F. Reinforcing Materials

1. Reinforcing Bars: ASTM A615, Grade 60

2. Welded Wire Fabric: ASTM A185 (Sheet form only. Roll form is not allowed.)

3. Supports for Reinforcement: Provide supports for reinforcement, including bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Unless otherwise indicated on the Contract Drawings, use wire type bar supports complying with CRSI recommendations. Wood, brick, and oher devices will not be acceptable. Comply with the following:

   a. For slabs on grade, where wetted base material will not support chair legs, use supports with sand plates or horizontal runners.

   b. For concrete surfaces exposed to view, where leg supports are in contact with forms, provide supports with legs that are hot dip alvanized or protected by either plastic or stainless steel.

2.02 ACCESSORIES

A. Crushed Stone Beneath Floor Slabs: free draining limestone or river gravel meeting ASTM C33 size number 67.

B. Waterstops: Provide waterstops of either rubber or PVC. Rubber units shall comply with Corps of Engineers CRD-C513; PVC units, with CRD-C572. Locate waterstops at joints as shown on the Contract Drawings. Where waterstops are located between walls and foundations, use steel plate unless otherwise detailed on the Contract Drawings.

C. Preformed Expansion Joint Fillers: Sponge rubber, ASTM D1752, Type I.

D. Joint Sealing Compound: Two component polysulfide rubber complying with FS TT-S-227e, Type 2.

E. Slab Control/Construction Joint Filler: MM-80, a semirigid epoxy manufactured by Metzger/McGuire Company, Contoocook, New Hampshire 03229, 603/746-4963 or EUCO 700 as manufactured by the Euclid Chemical Company, Cleveland, Ohio. Material shall have a cured Shore A hardness of approximately 80, tensile strength of approximately 400 to 500 psi, and adhesion to concrete of approximately 180 to 230 psi. It shall be 100 percent solid epoxy, require no primer under normal circumstances, and be a two component pour grade, gray color.

F. Moisture Retaining Covering: One of the following, complying with ASTM C171.

1. Waterproof paper.
2. Polyethylene film.
3. Polyethylene coated burlap.

G. Curing and Sealing Compound: Super Floor Coat or Super Pliocure by the Euclid Chemical Company or Masterseal 66 by Master Builders. The compound shall conform to FS TT-C-800A, 30 percent solids content minimum, and have test data from an independent laboratory indicating a maximum moisture loss of 0.030 gram per square centimeter when applied at a coverage rate of 300 square feet per gallon. Manufacturer's certification is required.

H. Bonding Compound: Euco Weld by Euclid Chemical Company, Everweld, by L&M Construction Chemicals, Inc. or Weldcrete by the Larsen Company. The compound shall be a polyvinyl acetate, rewettable type.

I. Epoxy Adhesive: Euco Epoxy No. 452 or No. 620 by Euclid Chemical Company or Sikadur Hi-mod by Sika Chemical Corporation. The compound shall be a two component, 100 percent reactive compound suitable for use on dry or damp surfaces.

J. Moisture Barrier: Provide moisture barrier cover over prepared base material where shown on the drawings. This barrier shall consist of polyethylene sheet that is not less than 6 mils thick, is resistant to decay when tested in accordance with ASTM E154, and has a certified water transmission rate of no more than 0.005 perms. Lap and tape

all joints. Repair any tears. Note areas on the Contract Drawings where 3 inches of damp sand is required prior to concrete placement.

2.03 MIX DESIGN

A. Ready-Mixed Concrete supplier shall submit mix designs for each strength concrete required by the Contract Drawings.

1. Mix design shall be in accordance with ACI 301.

2. Design based upon historical concrete production records of thirty consecutive batches or 2 sets of fifteen consecutive batches and a statistical analysis indicating standard deviation.

3. For design(s) based upon historical records, provide a mix design that is greater than that specified by the following amounts.

a. Deviation less than 300 psi, add 400 psi.

b. Deviation between 300 and 400 psi, add 550 psi.

c. Deviation between 400 and 500 psi, add 700 psi.

d. Deviation between 500 and 600 psi, add 900 psi.

e. Deviation above 600 psi or unknown, add 1200 psi.

B. Adjustment to Concrete Mixes: The Seller may request adjustments to the mix design when warranted by the characteristics of the materials, job conditions, weather, test results, or similar circumstances. Such adjustments shall be made only if approved by the Buyer and at no additional cost to the Buyer. Laboratory test data for revised mix design and strength results must be submitted to and accepted by the Buyer before the revised mix design is used in the work.

C. Admixtures

1. All concrete shall contain the specified water reducing admixture and/or high range water reducing admixture (superplasticizer). All concrete slabs placed at air temperatures below 50 degrees F shall contain the specified nonchloride accelerator. All concrete required to be air entrained shall contain an approved air entraining admixture. All pumped concrete, architectural concrete, concrete for industrial slabs and parking decks, and concrete with a water/cement ratio below 0.50 shall contain the specified high range water reducing admixture (superplasticizer).

a. Use an air entraining admixture in all concrete structures and slabs exposed to freezing and thawing or subjected to hydraulic pressure:

Between 4.5 percent and 7.5 percent for maximum 3/4 inch aggregate.

2. Water/Cement Ration: All concrete exposed to freezing and thawing shall have a maximum water/cement ration of 0.45.

3. Use the amounts of admixtures recommended by the manufacturer for climatic conditions prevailing at the time of placing. Adjust quantities and types of admixtures as required to maintain quality control.

D. Slump Limits

All concrete shall have a maximum slump of 3 inches for slabs and 4 inches for other members.

E. Job Site Mixing

1. Design mix for small batches to be prepared on site shall be submitted for approval by buyer, per para 1.03D.

2. Mix materials for concrete in an acceptable drum type batch machine mixer. For mixers with a capacity of one cubic yard or less, continue mixing at least 1-1/2 minutes but not more than 5 minutes after all ingredients are in the mixer before any part of the batch is released. For mixers with a capacity of more than one cubic yard, increase the minimum mixing time of 1-1/2 minutes by 15 seconds for each additional cubic yard of capacity or fraction thereof.

3. For each batch discharged and used in the work, provide a batch ticket indicating the project identification name and number, date, mix type, mix time, quantity, and amount of water introduced. This batch ticket shall be kept with ready mix delivery tickets. See paragraph 1.04C. Maintain a log of these batches in the same manner and form as for ready-mixed concrete.

PART 3 EXECUTION

3.01 EXAMINATION

A. Subgrade for foundations and slabs on grade shall be inspected by the buyer prior to commencement of concrete work.

B. Prior to placing concrete, the seller shall inspect the completed formwork installation, reinforcing steel placement, attachment and securing or embedded items. Items such as anchor bolts shall be securely tied to insure that they will remain in their proper position during concrete placement. Dowels, anchor bolts or other embedded items shall not be inserted into concrete after placing. Dowel bars shall be in position as shown on design Contract Drawings. Twisting or bending or dowel bars after form removal shall not be permitted. Items or other trades encased in concrete shall be verified by representatives of their respective trades.

3.02 INSTALLATION

A. Reinforcing Steel Placement

1. For details and methods of placing reinforcement and supports, comply with the specified codes and standards, the recommended practice of the CRSI as outlined in "Placing Reinforcing Bars," and these specifications.

2. Clean reinforcement to remove loose rust and mill scale, earth, ice, and other materials that reduce or destroy the bond with concrete.

3. Accurately position, support, and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcement with metal chairs, runners, bolsters, spacers, and hangers as required for security for security. Wood or brick will not be acceptable.
4. Place reinforcement to obtain at least the minimum coverages for concrete protection as required by ACI 318. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so that ends are directed into the concrete, not toward exposed concrete surfaces.

5. Do not place reinforcing bars more than 2 inches beyond the last leg of continuous bar support. Do not use supports as bases for runways for concrete conveying equipment or similar construction loads.

6. Install welded wire fabric in lengths that are as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

7. The use of heat to bend or straighten reinforcing bars shall not be used without written approval of the Buyer for each case for the entire project. Written requests for approval shall include heating method, bending, straightening, positioning, and cooling procedures.

8. Welding or flame cutting or reinforcing steel shall not be permitted.

9. Reinforcement shall be accurately placed and securely tied at all intersections and splices with 18 gauge black annealed wire, and shall be securely held in position during the placing of concrete by spacers, chairs, squares, or other approved supports. Wire tie ends shall point away from the form. Unless otherwise indicated, the number, type and spacing of supports shall conform to ACI Manual 315.

10. Slab reinforcing may be supported with concrete support blocks squares shall be approximately 2 inches square and of a thickness adequate to provide the cover for the reinforcing steel as called for on the plans. The squares shall be made using a mixture of one part Portland cement to 3 parts sand (fine aggregate) and tie wires shall be cast integrally with each square.

11. For concrete surfaces exposed to view, where leg supports are in contact with forms, provide supports with legs that are hot dip galvanized or protected by either plastic or stainless steel.

B. Concrete Placement

1. Deposit concrete either continuously or in layers thick enough to prevent its being placed on concrete that has hardened enough to cause the formation of seams or planes of weakness within the section. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as close to its final location as practicable in order to avoid segregation due to rehandling or flowing.

2. Deposit concrete in forms in horizontal layers no deeper than 24 inches and in a manner that avoids inclined construction joints. Where placement consists of several layers, avoid cold joints by placing each layer while the preceding one is still plastic. Free drop shall not exceed 5 feet. Use hopper and elephant trunk to deposit concrete into forms close to its final position.

3. Use mechanical vibrating equipment supplemented by hand spading, rodding, or tamping to consolidate placed concrete. The equipment and procedures used to consolidate the concrete shall comply with the recommended practices of ACI 309 and suit both the type of concrete and project conditions. Do not tamp or vibrate the forms or reinforcement.

4. Do not use vibrators to transport concrete once it is inside the forms. Insert and withdraw vibrators vertically at uniformly spaced locations no further apart than the visible horizontal effectiveness of the machine. Limit layer heights so that the vibrator is effective into 6 inches of the preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit the duration of vibration to the time necessary to consolidate the concrete, and complete embedment of reinforcement and other embedded items without causing segregation of the mix. Lower frequency vibrators may be used with "flowing" concrete.

5. Until the placing of a panel or section is completed, deposit and consolidate concrete slabs in a continuous operation within construction joints.

6. Consolidate concrete during placing operations so that it is thoroughly worked around reinforcement and other embedded items and into corners.

7. Bring slab surfaces to the correct level with a straightedge and strike off. Use bull floats or darbies to smooth the surface, leaving it free from humps and hollows. Do not sprinkle water on the plastic surface. Do not disturb the slab surfaces before starting finishing operations.

8. Maintain reinforcement in the proper position during

placement operations.

9. Cold Weather Placement

   a. Comply with ACI 306 and the requirements herein specified to protect concrete work from physical damage or reduced strength due to frost, freezing, or low temperatures.

   b. When the air temperature has fallen or is expected to fall below 40 degrees F, heat all water and aggregates uniformly before mixing so that the concrete, at point of placement, will have a temperature of not less than 50 degrees nor more than 80 degrees F.

   c. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

   d. Use only the specified nonchloride accelerator. Do not use calcium chloride or admixtures containing more than 0.1 percent chloride ions.

10. Hot Weather Placement

   a. When the weather is hot enough to impair seriously the concrete's quality and strength, place the concrete as specified herein and in ACI 305 and ASTM C94.

   b. Cool ingredients before mixing so that when the concrete is placed, its temperature is below 90 degrees F. Mixing water may be chilled, or else a portion of the water may be in the form of chopped ice.

   c. If reinforcing steel becomes hotter than the ambient air temperature, cool it with water soaked burlap so that its temperature will not exceed the ambient air temperature.

   d. When high temperatures and/or placing or humidity conditions dictate, the mix may be initially retarded by use of the water reducing, retarding formulation (Type D) or the specified water reducing admixture (Type A).

   e. During hot weather or under conditions that contribute to rapid setting of concrete, a shorter mixing time than that specified in ASTM C94 may be required. When the air temperature is between 85 degrees and 90 degrees F, reduce the mixing and delivery time from 1-1/2 hours to 75 minutes; when the air temperature is above 90 degrees F, reduce the mixing time to 60 minutes.

C. Joints - Provide control joints as indicated on the Contract Drawings. The size of pour shall not exceed 30 feet in any horizontal direction; and floor panel surface area shall not exceed 625 square feet; unless approved in writing by the

Buyer. The surface of the placed concrete shall be cleaned and all laitance removed by wet sandblasting or wire brushing. All construction joints shall be thoroughly wetted and slushed with a coat of neat cement grout immediately before placing the new concrete.

1. Not Used.

2. Wall Joints - Special provision shall be made for jointing successive pours as indicated or required. A strip of dressed lumber shall be tacked on the inside of the forms at the construction joint. The concrete shall be poured to a point one inch above the underside of the strip. The strip shall be removed one hour after the concrete has been placed, and any irregularities in the joint line leveled off with a wood float and all laitance removed.

3. Waterproof Joints - Install water stops in concrete joints where indicated on Contract Drawings or at any additional construction joints not shown on Contract Drawings but requested by Seller. Make the water stops continuous along the concrete joint; solvent weld or heat weld end joints to make water tight; and support and secure during pour.

4. Construct contraction (control) joints in slabs on ground to form panels of patterns as shown. On design Contract Drawings use saw cuts or approved inserts creating a plane of 1/4 slab thickness.

5. Make saw cuts as soon as possible after final finishing without dislodging the aggregate.

6. Install slab joint filler and sealant materials as specified by the manufacturer.

D. Finishing

1. Slab Finishes - The dusting of surfaces with cement will not be permitted. Where drains occur, the concrete shall be sloped to drains as indicated or directed. Grade and screed the surfaces to the elevation or slope required. Make proper allowance for setting beds of ceramic tile or brick terrazo or concrete topping. Slabs shall be given one of the following finishes.

   a. Float Finish - Soon after screeding and while the concrete is still plastic, the surface is floated with wood or metal floats or by a finishing machine. The surface is brought to true grade, any high spots are cut down and low spots filled in and sufficient mortar is brought to the surface to produce the desired finish.

      Where floating is done to provide a coarse texture at the final finish it may be necessary to float the surface the second time after it has partially hardened so that the desired finish can be produced.

Buyer shall be notified (with sufficient time allowed), for determination as to desirability of second floating.

b. Trowel Finish - Troweling should not start until the moisture film or sheen disappears from the floated surface, and when the concrete has hardened enough to prevent fine materials and water from being worked to the surface. Troweling should leave the surface smooth, even, and free of marks and ripples. Wet spots must be avoided if possible; when they do occur, finishing operations should not be resumed until the water has been absorbed, evaporated, or has been mopped up.

   The first steel troweling should be only sufficient to produce a smooth surface free of defects. This may be followed by a second troweling after the concrete has become hard enough so that no mortar adheres to the edge of the trowel as it passes over the surface. During the final troweling the trowel should be tilted slightly and heavy pressure should be exerted to compact the surface thoroughly.

c. Nonslip Finish - Surfaces indicated shall have a nonslip finish obtained by sprinkling not less than 1/4 pound of abrasive aggregate over each square foot of the screeded and floated concrete, and finishing immediately with a steel trowel. The abrasive aggregate shall be ceramically bonded together to form a homogeneous material that will be sufficiently porous to provide a good bond with Portland cement.

d. Rough Slab Finish - Screed and float the slab only. Use this finish when no finish is indicated on the Contract Drawings.

e. Nonslip Broom Finish - Apply nonslip broom finish to exterior concrete platforms, steps, and ramps and elsewhere as indicated by the Contract Drawings or schedules. Immediately after float finishing, roughen the concrete surface slightly by brooming perpendicular to the main traffic route with a fiber bristle broom.

2. Concrete Finish Other Than Floors and Slabs - Cut out minor honeycombs and pockets, voids over 1/2 inch diameter and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1 inch. Patch with cement mortar made with one part cement and two parts fine aggregate. Commercial patching compound may be used if approved by the Buyer. Exposed surfaces shall be give one of the following finishes as indicated:

   a. Rough Finish - Fins and rough edges shall be removed. Use this finish where no finish is specified.

3. Related Uniform Finishes: At the tops of walls,

horizontal offsets, and similar unformed surfaces that are next to formed surfaces, strike off smooth and finish with a texture that matches the adjacent formed surfaces. Unless otherwise shown on the Contract Drawings, continue the final surface treatment of formed surfaces uniformly across adjacent unformed finishes.

4. Surfaces to be Grouted - Piers, pedestals, foundations or other surfaces which are to be grouted shall be scratched and left with a rough surface.

E. Curing and Protection Sealing

1. Protect concrete from injurious action by the sun, cold weather, rain, or mechanical injury. Prevent drying out between time of placing and minimum curing periods required or specified. Permit no live loads on slabs within 7 days after placing ASTM C150, Types I and II; nor within 3 days after placing ASTM C150, Type III (High Early Strength).

2. Immediately after placing or finishing, concrete surfaces not covered by forms shall be protected against moisture loss for not less than seven days (three days for high-early strength concrete). Begin curing as soon as the curing materials can be applied without damage to the finished surfaces. Curing shall be accomplished by one of the following methods or combination thereof, as approved. Protect the concrete from temperatures falling below 35 degrees F.

3. It shall be the Seller's responsibility to ensure constant curing means. Rains, storms, winds, holidays, weekends, and other normal occurrences shall not excuse continuity of curing. When areas of concrete are permitted by Seller to improperly cure in the opinion of the Buyer, then at the option of the Buyer, Seller shall remove concrete and replace with new concrete at no cost to the Buyer or shall otherwise satisfy the requirements of this Specification to the satisfaction of the Buyer.

4. Cure concrete by moist curing, moisture retaining cover curing, membrane curing, or combinations of these methods, as specified herein.

5. Provide moisture curing by one of the following methods:

   a. Keep concrete surface continuously wet by covering with water.

   b. Spray it continuously with a water fog.

   c. Cover the concrete surface with the specified absorptive cover, thoroughly saturating the cover with water and keeping it wet; position the absorptive cover so that it covers the concrete surface and edges and laps adjacent absorptive covers by 4 inches.

6. Provide moisture cover curing by covering concrete

surfaces with a moisture retaining cover designed for curing concrete. Place the cover in the widest practicable width of material with sides and ends of the material lapped at least 4 inches and sealed by waterproof tape or adhesive. Repair immediately any holes or tears that occur during the curing period with identical cover material and waterproof tape. Tape shall be not less than 1-1/2 inches wide.

7. Membrane Curing - Curing compound conforming to ASTM C309 shall be applied in a two-coat, continuous spraying operation using not less than 1 gallon for 200 square feet of surface for each coat. The second coat shall be applied in a direction approximately at right angle sot the direction of the first coat. Surfaces subjected to heavy rainfall within 3 hours after compound has been applied shall be resprayed at the rate specified above. Permanently exposed surfaces shall be cured by use of a clear-type membrane-forming curing compound containing fugitive dye. Where clear-type curing compounds are used, the concrete surfaces shall be shaded from the direct rays of the sun for the curing period. Surfaces shall be kept free of foot and vehicular traffic during the curing period.

8. Not Used.

9. Not Used.

F. Not Used.

H. Miscellaneous Concrete Items

1. Filling In: Unless the Contract Drawings shown otherwise or the Buyer directs, fill in holes and openings left in concrete structures for the work of other trades once that work is in place. Mix, place, and cure concrete as specified herein to blend with in-place construction. Provide other miscellaneous concrete filling shown on the Contract Drawings or necessary to complete the work.

2. Not Used.

3.03 FIELD QUALITY CONTROL

A. Test During The Work

1. The Seller shall employ an independent testing laboratory approved by the Buyer to conduct the testing program. The Testing Laboratory shall take samples as specified below. The Seller shall be responsible for their testing, and shall submit test reports for review by the Buyer. The Testing Laboratory shall use one set of the samples taken from each 50 cu yd or fraction thereof for each day's pour, whichever is less. Samples shall be taken from each type of mix design of concrete placed. Samples shall be taken in accordance with ASTM C172 by not from the same truck and shall be tested as follows:

2. Sampling Fresh Concrete: ASTM C172, but modified for

slump to comply with ASTM C94.

3. Slump: ASTM C143; one test for each concrete load at point of discharge and one test of each set of compressive strength test specimens.

4. Air Content:ASTM C231 pressure method for normal weight concrete; one test for each set of compressive strength test specimens.

5. Concrete Temperature: Test hourly when air temperature is 40 degrees F and below or when 80 degrees F and above and each time a set of compression test specimens is made.

6. Compression Test Specimen: ASTM C31; one set of four standard cylinders for each compressive strength test, unless otherwise directed by the Buyer. Mold and store cylinders of laboratory cured test specimens except when the Buyer requires field cured test specimens.

7. Compressive Strength Tests: ASTM C39; one set for each 25 cubic yards or fraction thereof of each concrete class placed in any one day; one specimens tested at seven, two specimens tested at 28 days, and one specimen retained in reserve for later testing, if needed.

8. Not Used.

9. The strength level shall be considered satisfactory as long as the averages of all sets of three consecutive strength test results equal or exceed the specified compressive strength (f'c), and no individual test result falls below the specified compressive strength by more than 500 psi.

10. When the strength of field cured cylinders is less than 85 percent of companion laboratory cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.

B. Laboratory Test Results

1. Test results will be reported to the Buyer and Seller in writing on the same day that the test is made. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in the structure, design compressive strength at 28 days, concrete mix proportions and materials, and compressive breaking strength and type of break for both seven day tests and 28 day tests.

2. The testing service will make additional tests of in-place concrete when the test results indicate that the required strength level has not been achieved and other characteristics have not been attained in the structure, as directed by Buyer. The testing service may conduct tests to determine the adequacy of concrete by cored

cylinders that comply with ASTM C42 or by such other methods as are directed by the Buyer. The Seller shall pay for such tests and any additional testing that may be required when concrete is verified to be unacceptable.

C. Correction of Defective Work

1. Where questions exist as to the quality of the concrete placed, the Buyer may require tests per ASTM C42 or order a Load Test of Structures as outlined in Chapter 2 of ACI 318, Building Code Requirements for Reinforced Concrete.

2. Repair and patch defective areas with cement mortar immediately after removing forms, when acceptable to the Buyer.

3. Cut out honeycomb, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts down to solid concrete, but in no case to a depth of less than one inch. Make edges of cuts perpendicular to the concrete surface. Before placing cement mortar, thoroughly clean, dampen with water, and apply the specified bonding compound. The cement mortar shall be placed after the bonding compound has dried.

4. Remove and replace concrete with defective surfaces if these effects cannot be repaired to the satisfaction of the buyer. Such surface defects include irregularities of color and texture, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, and fill with dry pack mortar or with precast cement cone plugs secured in place with bonding agent.

5. Where possible, repair concealed formed surfaces that contain defects which adversely affect the durability of the concrete. If such defects cannot be repaired, remove and replace the concrete.

6. Not Used.

7. Repair finished unformed surfaces that contain defects which adversely affect durability of the concrete. Such surface defects include crazing, spalling, pop-outs, honeycomb, rock pockets, cracks that are more than 0.01 inch wide or that, regardless of width, penetrate either to reinforcement or completely through unreinforced sections, and other objectionable conditions.

8. After the concrete has cured at least 14 days, correct high areas in unformed surfaces by grinding.

9. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting them out and refilling with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to the Buyer.

10. Repair defective areas (except for random cracks and single holes not more than one inch in diameter) by cutting out and replacing with fresh concrete. Remove defective areas to clean, square cuts, and expose reinforcing steel with at least 3/4 inch clearance all around. Dampen concrete surfaces in contact with patching concrete after the bonding compound has dried. Mix patching concrete of the same materials to provide concrete of the same type or class as the original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in the same manner as adjacent concrete.

11. Repair isolated random cracks and single holes not over one inch in diameter by the dry pack method. Groove top of crack, cut out holes until sound concrete is reached, and clean to remove dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply the specified bonding compound. Place dry pack after the bonding compound has dried. Dry pack shall consist of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve. Mix with no more water than is necessary for handling and placing. Compact dry pack mixture in place, and finish to match adjacent concrete. Keep patched area continuously moist for no less than 72 hours.

12. All repairs shall be made, with prior approval of the Buyer as to the method and procedure, using the specified epoxy adhesive and/or epoxy mortar.

13. Repair methods not specified above may be used, subject to acceptance by the Buyer.

END OF SECTION

APPENDIX D

CONSTRUCTION HEALTH AND SAFETY PLAN

SITE HEALTH AND SAFETY PLAN (HASP)

Prepared by: Phillip McAtee, Engineer

W.O. Number: 05376-055-001-0600-00 **Date:** 06 March 1995

Project Identification:
Division: MWR
Department/Office: Cincinnati/000713
Site Name: Mound Plant
Client: EG&G Mound
Work Location Address: 1 Mound Road, Miamisburg, OH 45342

Site History: (describe briefly) Government-owned (DOE), Contractor-operated R&D Production Facility supporting DOE weapons and energy programs with emphasis on explosive and nuclear technology. This project is being conducted as part of the Environmental Restoration (ER) Program. The purpose of this action is to prevent the migration off site of possible radiologically contaminated surface soils by installing drainage control run-off diversion systems.

Scope of Work: (describe briefly) Build two separate drainage control systems. The Building 19 drainage control system will consist of a lined trench, catch basins, and piping to direct stormwater to the main drainage channel. The South Property Boundary (Bldg. 21) drainage control system will consist of a lined trench and piping to direct stormwater to the overflow pond via existing cement channels.

☐ Site visit only; site HASP not necessary. List personnel here and sign off below:

Regulatory Status:

Site regulatory status:

CERCLA/SARA	RCRA	Other Federal Agency
☑ US EPA	☑ US EPA	☑ DOE
☑ State	☐ State	☐ USACE
☑ NPL Site	NRC	☐ Air Force
OSHA	☐ 10 CFR 20	☐ _____
☑ Hazard Communication (Req'd See Attachment "D")		
☐ 1910	☑ 1926	☐ State

☑ Safety Officer Manual (Required to be On Site)
Based on the Hazard Assessment and Regulatory Status, determine the Standard HASP(s) applicable to this project. Indicate below which Standard HASP will be used and append the appropriate pages of this form along with the Standard Plan.

☐ Stack Test	☐ _____
☐ Air Emissions	☐ _____
☐ Asbestos	☐ _____
☐ Industrial Hygiene	☐ _____
☐ _____	☐ _____

Review and Approval Documentation:

Reviewed by:
a. P.M. _____ Date: 4/3/95
b. P.D. _____ Date: _____
c. DSO/RSO _____ Date: 4-3-95

Approved by: Robert P. Schoenfelder for GMC Date: 4/14/95

☒ Corporate Health and Safety Director (CHSD)
☐ DSO/RSO (Only with specific delegation by CHSD)

Hazard Assessment and Equipment Selection

In accordance with WESTON's Personal Protective Equipment Program and 29 CFR 1910.132 at the site prior to personnel beginning work the SHCS and/or the Site Manager have evaluated conditions and verified that the personal protective equipment selection outlined within this HASP is appropriate for the hazards known or expected to exist. (Refer to Safety Officer Manual Section 2 Personal Protection Program for Guidance)

☐ SHSC ☐ Site Manager Signature: _____ Date: _____

Project start date: 17 April 1995 End date: 30 September 1995	This site HASP must be reissued/reapproved for any activities conducted after: Date: 30 September 1995	Amendment date(s): By: 1. 2. 3. 4. 5.

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Prepared by: Phillip McAtee, Engineer

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☑ State	☐ State	☐ USACE
☑ NPL Site	NRC	☐ Air Force
OSHA	☐ 10 CFR 20	☐ _____
Hazard Communication (Req'd See Attachment "D")		
☐ 1910	☑ 1926	☐ State

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Based on the Hazard Assessment and Regulatory Status, determine the Standard HASP(s) applicable to this project. Indicate below which Standard HASP will be used and append the appropriate pages of this form along with the Standard Plan.

☐ Stack Test	☐ _____
☐ Air Emissions	☐ _____
☐ Asbestos	☐ _____
☐ Industrial Hygiene	☐ _____
☐ _____	☐ _____

Review and Approval Documentation:

Reviewed by:
a. P.M. _____ Date: 4/3/95
b. P.D. _____ Date: _____
c. DSO/RSO _____ Date: 4-3-95

Approved by: _____ Date: _____

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WESTON REPRESENTATIVES

Organization/Branch	Name/Title	Address	Telephone
Cincinnati/Midwest Region	Gordon Horn Project Manager	11840 Kempersprings Drive Cincinnati, OH 45240-1640	(513) 825-3440
Norcross/CRD	Terry Lambert Site Field Engineer	1880-H Beaver Ridge Circle Norcorss, GA 30071	(404) 263-5400

Roles and Responsibilities: Supervision and management of construction project.

WESTON SUBCONTRACTORS

Organization/Branch	Name/Title	Address	Telephone
Applied Science and Technologies	Robert Welsh Project Manager	8401 Claude Thomas Rd., Ste. 58, Franklin, OH 45005	(513) 743-0002

Surveyor - To be determined.

Roles and Responsibilities:
AST - All excavation and construction.
Surveyor (TBD) - General construction surveying.

SITE SPECIFIC HEALTH AND SAFETY PERSONNEL

The Site Health and Safety Coordinator (SHSC) for activities to be conducted at this site is: Terry Lambert.

The SHSC has total responsibility for ensuring that the provisions of this Site HASP are adequate and implemented in the field.

Changing field conditions may require decisions to be made concerning adequate protection programs. Therefore, the personnel assigned as SHSCs are experienced and meet the additional training requirements specified by OSHA in 29 CFR 1910.120

Qualifications: B-S, SHSC class. *Current 8-hr OSHA Hazardous Waste Refresher Training; Current First Aid and CPR;* Extensive Field Experience.

Designated alternates include: Michael Szabo, D-S, B-T.

HEALTH AND SAFETY EVALUATION

Hazard Assessment

Background Review: ☑ Complete ☐ Partial If partial why?

Activities Covered Under This Plan:

No.	Task/Subtask	Description	Schedule
1	Surveying	Survey of existing conditions including elevations and coordinate locations.	April 1995 - September 1995
2	Construction along Building 21	Construction of an approximately 780-ft. long trench and piping system.	April 1995 - September 1995
3	Construction along Building 19	Construction of approximately 1120 feet of trenches, catch basins, and piping.	April 1995 - September 1995

Types of Hazards:

☐ Numbers refer to one of the following hazard evaluation forms. Complete hazard evaluation forms for each appropriate hazard class.

Physiochemical [1]

- ☑ Flammable
- ☑ Explosive
- ☐ Corrosive
- ☐ Reactive
- ☐ O_2 Rich
- ☐ O_2 Deficient

Chemically Toxic [1]

- ☑ Inhalation
- ☑ Ingestion
- ☑ Contact
- ☐ Absorbtion
- ☐ Carcinogen
- ☐ Mutagen
- ☐ Teratogen

☐ OSHA 1910.1000 Substance (Air Contaminants)

☐ OSHA Specific Hazard Substance Standard
(Refer to HASP Form 04HASP.894 for Listing.)

Radiation [3]

Ionizing:

- ☑ Internal exposure
- ☑ External exposure

Non-Ionizing:

- ☑ UV
- ☐ IR
- ☐ RF
- ☐ MicroW
- ☐ Laser

Biological [2]

- ☐ Etiological Agent
- ☑ Other (Plant, Insect, animal)

☑ Physical Hazards [4]

- ☑ Construction Activities

Source/Location of Contaminants and Hazardous Substances

Directly Related to Tasks

- ☐ Air
- ☐ Other Surface
- ☑ Groundwater
- ☑ Soil
- ☐ Surface Water
- ☐ Sanitary Wastewater
- ☐ Process Wastewater
- ☐ Other _____

Indirectly Related to Tasks - Nearby Process(es) That Could Affect Team Members:

- ☑ Client Facility
- ☐ Nearby Non-client Facility

Describe: Traffic on Mound roadways, possible heavy equipment movement, Mound employees, noise from nearby buildings.

☑ Client Briefing Arranged
A client pre-construction meeting will be held with Mound Plant personnel and WESTON field team members prior to commencement of field activities.

HEALTH AND SAFETY EVALUATION - 1 CHEMICAL HAZARDS

☑ N/A

Chemical Contaminants of Concern

Provide the data requested for chemical contaminants on HASP Form 33HASP.894 or attach data sheets from an acceptable sources such as NIOSH pocket guide, condensed chemical dictionary, ACGIH TLV booklet, etc. List chemical and concentration below and locate data sheets in Appendix A of this HASP.

☐ N/A

Identify hazardous materials used or on-site and attach Material Safety Data Sheets (MSDS) for all reagent type chemicals, solutions, or other identified materials that in normal use in performing tasks related to this project could produce hazardous substances. Ensure that all subcontractors and other parties working nearby are informed of the presence of these chemicals and the location of MSDS's. Obtain from subcontractors and other parties lists of the hazardous materials they use or have on-site and identify location of MSDS's here. List chemicals and quantities below and locate MSDS in Appendix B of this HASP.

Chemical Name	Concentration (if known)	Chemical Name	Quantity
		Alconox	3 lbs.
		Gasoline (for equipment)	*
		Diesel Fuel (for heavy equipment)	*
		Hexane (for decontamination)	*
		Methanol (for decontamination)	*
			*To be determined by SHSC

OSHA SITE SPECIFIC HAZARDOUS SUBSTANCES

The following substances may require specific medical, training, or monitoring based upon concentration or evaluation of risk. See the appropriate citation listed under 29 CFR 1910 or 1926 for additional information.

- ☐ 1910.1001 Asbestos
- ☐ 1910.1002 Coal tar pitch volatiles
- ☐ 1910.1003 4-Nitrobiphenyl
- ☐ 1910.1004 alpha-Naphthylamine
- ☐ 1910.1005 [Reserved]
- ☐ 1910.1006 Methyl chloromethyl ether
- ☐ 1910.1007 3,3'-Dichlorobenzidine (and its salts).
- ☐ 1910.1008 bis-Chloromethyl ether
- ☐ 1910.1009 beta-Naphthylamine
- ☐ 1910.1010 Benzidine
- ☐ 1910.1011 4-Aminodiphenyl
- ☐ 1910.1012 Ethylenimine
- ☐ 1910.1013 beta-Propiolactone
- ☐ 1910.1014 2-Acetylaminofluorene
- ☐ 1910.1015 4-Dimethylaminoazobenzene
- ☐ 1910.1016 N-Nitrosodimethylamine
- ☐ 1910.1017 Vinyl chloride
- ☐ 1910.1018 Inorganic arsenic
- ☐ 1910.1025 Lead
- ☐ 1910.1027 Cadmium
- ☐ 1910.1028 Benzene
- ☐ 1910.1029 Coke oven emissions
- ☐ 1910.1043 Cotton dust
- ☐ 1910.1044 1,2-dibromo-3-chloropropane
- ☐ 1910.1045 Acrylonitrile
- ☐ 1910.1047 Ethylene oxide
- ☐ 1910.1048 Formaldehyde
- ☐ 1910.1050 Methylenedianiline

HEALTH AND SAFETY EVALUATION - 2 BIOLOGICAL HAZARDS OF CONCERN

☑ **Poisonous Plants** (FLD 43)

Location/Task No(s).: All
Source: ☐ Known ☑ Suspect
Route of Exposure: ☐ Inhalation ☐ Ingestion ☑ Contact ☐ Direct Penetration

Team Member(s) Allergic: ☐ Yes ☐ No *TBD
Immunization required: ☐ Yes ☐ No

☑ **Insects** (FLD 43)

Location/Task No(s).: All
Source: ☐ Known ☑ Suspect
Route of Exposure: ☐ Inhalation ☐ Ingestion ☐ Contact ☑ Direct Penetration

Team Member(s) Allergic: ☐ Yes ☐ No *TBD
Immunization required: ☐ Yes ☐ No

☑ **Snakes, Reptiles** (FLD 43)

Location/Task No(s).: All
Source: ☐ Known ☑ Suspect
Route of Exposure: ☐ Inhalation ☐ Ingestion ☐ Contact ☑ Direct Penetration

Team Member(s) Allergic: ☐ Yes ☐ No *TBD
Immunization required: ☐ Yes ☐ No

☑ **Animals** (FLD 43)

Location/Task No(s).: All
Source: ☐ Known ☑ Suspect
Route of Exposure: ☐ Inhalation ☐ Ingestion ☐ Contact ☑ Direct Penetration

Team Member(s) Allergic: ☐ Yes ☐ No *TBD
Immunization required: ☐ Yes ☐ No

FLD 43 – WESTON Biohazard Field Operating Procedures: Att. OP ☐

☐ **Sewage** N/A

Location/Task No(s).:
Source: ☐ Known ☐ Suspect
Route of Exposure: ☐ Inhalation ☐ Ingestion ☐ Contact ☐ Direct Penetration

Team Member(s) Allergic: ☐ Yes ☐ No
Immunization required: ☐ Yes ☐ No

Tetanus Vaccination within Past 7 yrs: ☐ Yes ☐ No
(see Note #1 below)

☐ **Etiologic Agents (List)** N/A

Location/Task No(s).:
Source: ☐ Known ☐ Suspect
Route of Exposure: ☐ Inhalation ☐ Ingestion ☐ Contact ☐ Direct Penetration

Team Member(s) Allergic: ☐ Yes ☐ No
Immunization required: ☐ Yes ☐ No

FLD 44 – WESTON Bloodborne Pathogens Exposure Control Plan - First Aid Procedures: Att. OP ☑

FLD 45 – WESTON Bloodborne Pathogens Exposure Control Plan – Working with Infectious Waste: Att. OP ☐

Note #1: A tetanus injection is recommended every 10 years for employees with "normal exposure risks." However, if employees have frequent potential for exposure at "higher risk," as working with raw sewage, then a frequency of 7 years is recommended.

*TBD = To be determined by SHSC in the field prior to commencement of work.

HEALTH AND SAFETY EVALUATION — 3 RADIATION HAZARDS OF CONCERN

NONIONIZING RADIATION

Task #	Type of Nonionizing Radiation	Source Onsite	TLV/PEL	Wavelength Range	Control Measures	Monitoring Instrument		
All	Ultraviolet	Sun			Sunscreen			
N/A	Infrared							
N/A	Radio							
N/A	Microwave							
N/A	Laser							

IONIZING RADIATION

				DAC (μCi/mL)				
Task #	Radionuclide	Major Radiations	Radioactive Half-Life (Years)	D	W	Y	Surface Contamination Limits (dpm/100 cm^2)*	Monitoring Instrument
2,3	Thorium-232	Alpha, Gamma	1.41×10^{10}		5×10^{-13}	1×10^{-12}	200/1,000	Alpha Scint.
2,3	Plutonium-238	Alpha, Gamma	86.4		3×10^{-12}		20/500	Alpha Scint.
2,3	Thorium-230	Alpha, Gamma	8.0×10^{4}		3×10^{-12}	6×10^{-12}	20/500	Alpha Scint.
2,3	Radium-226	Alpha, Gamma	1602		3×10^{-10}		20/500	Alpha Scint.
2,3	Tritium	Beta (weak)	12.3	2×10^{-5}			10,000	Not Available
2,3	Polonium-210	Alpha, Gamma	138.40 (days)	3×10^{-10}	3×10^{-10}		1,000/5,000	Alpha Scint.
2,3	Cesium-137	Beta, Gamma	30	6×10^{-8}			1,000/5,000	GM Pancake
2,3	Cobalt-60	Gamma	5.27		7×10^{-8}	1×10^{-8}	5,000	GM Pancake
2,3	Actinium-227	Beta, Gamma, Alpha	6.13 (hours)	2×10^{-13}	7×10^{-13}	2×10^{-12}	20/500	GM Pancake
2,3	Thorium-228	Alpha, Gamma	1.91		4×10^{-12}	7×10^{-12}	20/500	Alpha Scint.

*Surface Contamination Limits: Removable Limit/Total Limit (fixed and removable)

HEALTH AND SAFETY EVALUATION - 4 PHYSICAL HAZARDS OF CONCERN

Phy.Haz.Cond.	Physical Hazard	Att.OP	Weston OP Titles
Loud noise	Hearing loss/disruption of communication	☑	FLD01 - Noise Protection
[illegible]ment weather	Rain/humidity/cold/ice/snow/lightning	☑	FLD02 - Inclement Weather
Steam heat stress	Burns/displaced oxygen/wet working surfaces	☐	FLD03 - Hot Process - Steam
Heat/Stress	Burns/hot surfaces/low pressure steam	☐	FLD04 - Hot Process - LT3
Ambient heat stress	Heat rash/cramps/exhaustion/heat stroke	☑	FLD05 - Heat Stress Prevention/Monitoring
Cold Stress	Hypothermia/frostbite	☑	FLD06 - Cold Stress
Cold/wet	Trench/paddy/immersion foot/edema	☑	FLD07 - Wet Feet
Confined spaces	Falls/burns/drowning/engulfment/electrocution	☐	FLD08 - Confined Space Entry
Explosive vapors	Thermal burns/impaction/dismemberment	☐	FLD09 - Hot Work
Improper lifting	Back strain/abdomen/arm/leg muscle/joint injury	☑	FLD10 - Manual Lifting/Handling Heavy Objects
Uneven Surfaces	Vehicle accidents/slips/trips/falls	☑	FLD11 - Rough Terrain
Poor housekeeping	Slips/trips/falls/punctures/cuts/fires	☑	FLD12 - Housekeeping
Structural integrity	Crushing/overhead hazards/compromised floors	☑	FLD13 - Structural Integrity
Hostile persons	Bodily injury	☐	FLD14 - Site Security
Remote Area	Slips/trips/falls/back strain/communication	☐	FLD15 - Remote Area
Improper Cyl.Handling	Mechanical injury/fire/explosion/suffocation	☐	FLD16 - Pressure Systems - Compressed Gases
Water Hazards	Poor visibility/entanglement/drowning/cold stress	☐	FLD17 - Diving
Water Hazards	Drowning/heat/cold stress/hypothermia/falls	☐	FLD18 - Operation and Use of Boats
Water Hazards	Drowning/frostbite/hypothermia/falls/electrocution	☐	FLD19 - Working Over Water
Vehicle Hazards	Struck by vehicle/collision	☑	FLD20 - Traffic
Explosions	Explosion/fire/thermal burns	☐	FLD21 - Explosives
[illegible]ving mechanical parts	Crushing/pinch points/overhead hazards	☑	FLD22 - Heavy Equipment Operation
Moving mech.parts	Overhead hazard/electrocution	☑	FLD23 - Cranes/Lifting Equipment Operation
Working at elevation	Overhead hazards/falls/electrocution	☐	FLD24 - Aerial Lifts/Manlifts
Working at elevation	Overhead hazard/falls/electrocution	☐	FLD25 - Working at Elevation
Working at elevation	Overhead hazard/falls/electrocution/slips	☐	FLD26 - Ladders
Working at elevation	Slips/trips/falls/overhead hazards	☐	FLD27 - Scaffolding
Trench Cave-in	Crushing/falling/overhead hazards/suffocation	☑	FLD28 - Excavating/Trenching
Improper material handling	Back injury/crushing from load shifts	☑	FLD29 - Materials Handling
Physiochemical	Explosions/fires from oxidizing, flam./corr.material	☐	FLD30 - Hazardous Materials Use/Storage
Physiochemical	Fire and explosion	☐	FLD31 - Fire Prevention/Response Plan Required
Physiochemical	Fire	☑	FLD32 - Fire Extinguishers Required
Structural integrity	Overhead/electrocution/slips/trips/falls/fire	☐	FLD33 - Demolition
Electrical	Electrocution/shock/thermal burns	☑	FLD34 - Utilities
Electrical	Electrocution/shock/thermal burns	☑	FLD35 - Electrical Safety
Burns/Fires	Heat Stress/Fires/Burns	☐	FLD36 - Welding/Cutting/Burning
Impact/thermal	Thermal burn/high pressure impaction/heat stress	☐	FLD37 - High Pressure Washers
Impaction/electrical	Smashing body parts/pinching/cuts/electrocution	☑	FLD38 - Hand and Power Tools
Poor visibility	Slips/trips/falls	☑	FLD39 - Illumination
Fire/Explosion	Burns/impaction	☐	FLD40 - Storage Tank Removal/Decommissioning
Communications	Disruption of Communications	☑	FLD41 - Std. Hand/Emergency Signals
[illegible]ergy/Release	Unexpected release of energy	☐	FLD42 - Lockout/Tagout
Drilling hazards	Electrocution/overhead hazards/pinch points	☑	2.5 - Drilling Safety Guide

TASK-BY-TASK RISK ASSESSMENT
(Complete One Sheet for Each Task)

TASK DESCRIPTION

Task 1: Surveying

General construction surveying prior to and during Tasks 2 and 3. *Surveyors will not be required to be 40-hour trained and will not* enter any areas where contamination has been shown to be present. Construction activites will cease during surveying. Areas will be screened to ensure no contamination is present prior to surveying activities.

EQUIPMENT REQUIRED/USED
(Be specific, e.g., hand tools, heavy equipment, instruments, PPE)

Equipment: General Surveying Equipment, Level D PPE (personal clothing)

Instruments: None required.

POTENTIAL HAZARDS/RISKS

CHEMICAL

☐ Hazard Present Risk Level: ☐ H ☐ M ☐ L

What Justifies Risk Level? No chemical hazards are anticipated. Potentially contaminated soils will not be disturbed, and surface contamination is not present in work area.

PHYSICAL

☑ Hazard Present Risk Level: ☐ H ☐ M ☑ L

What Justifies Risk Level? Physical hazards include slips, trips, and falls associated with surveying activities. Emphasis will be placed on the importance of sure footing during movement.

BIOLOGICAL

☑ Hazard Present Risk Level: ☐ H ☐ M ☑ L

What Justifies Risk Level? There is a small risk of exposure to poisonous plants through external contact. Snakes and reptiles may also be in the area. Other small animals may present a hazard. Care should be taken to note signs of rabies. Winter work: Minimal contact with dormant plant and animal life. Summer work: Recognize and avoid contact with poisonous plants and all animals.

RADIOLOGICAL

☑ Hazard Present Risk Level: ☐ H ☐ M ☑ L

What Justifies Risk Level? Dust levels generated during surveying activities should be minimal, negating the possibility of inhalation of airborne particulates. Pins and stakes, once driven, will not be removed, further limiting any potential for exposure. All areas that surveyors are allowed to enter have been pre-screened by EG&G Mound health physics technicians.

LEVELS OF PROTECTION/JUSTIFICATION

Level D protection will be used including personal clothes, hard hat, safety glasses, steel-toed boots. Note: No upgrade for subcontractors.

SAFETY PROCEDURES REQUIRED AND/OR FIELD OPS UTILIZED

Field OPs utilized are listed on page 7 of 29.

TASK-BY-TASK RISK ASSESSMENT
(Complete One Sheet for Each Task)

TASK DESCRIPTION

Task 2: Construction along Building 21 of approximately 780 feet of trench and piping.

EQUIPMENT REQUIRED/USED
(Be specific, e.g., hand tools, heavy equipment, instruments, PPE)

Heavy Equipment: Backhoe, dump trucks, break hammer, hand tools, bulldozer

Instruments: CGI/O_2 Meter, Miniram, FIDLER (provided by EG&G), alpha scintillometer (provided by EG&G), pancake GM probe (provided by EG&G), micro-R meter

POTENTIAL HAZARDS/RISKS

CHEMICAL

☐ Hazard Present Risk Level: ☐ H ☐ M ☐ L

What Justifies Risk Level? No chemical hazards are anticipated. Potentially contaminated soils will not be disturbed, and surface contamination is not present in work area.

While all construction activities are in progress, CGI/O_2 meters will be used near the work area to monitor vapors in the work zone.

PHYSICAL

☑ Hazard Present Risk Level: ☐ H ☑ M ☐ L

What Justifies Risk Level? Heavy equipment traffic will be a main concern due to a limited work area. Proper barriers will be installed to prevent pedestrian and vehicle traffic into the excavation area. All heavy equipment shall have back-up (reverse) alarms installed. Underground and overhead utilities and buried lines will be cleared by EG&G Mound construction inspectors. Personnel must follow safe working OPs as indicated on page 7 of 29.

BIOLOGICAL

☑ Hazard Present Risk Level: ☐ H ☐ M ☑ L

What Justifies Risk Level? There is a small risk of exposure to poisonous plants through external contact. Snakes and reptiles may also be in the area. Other small animals may present a hazard. Care should be taken to note signs of rabies. Winter work: Minimal contact with dormant plant and animal life. Summer work: Recognize and avoid contact with poisonous plants and all animals.

RADIOLOGICAL

☑ Hazard Present Risk Level: ☐ H ☐ M ☑ L

What Justifies Risk Level? Previous borings from OU-3 Limited Field Investigation and recent Geoprobe field investigation in the source are indicate low levels of radiological components that fall well below action levels. Regardless, initial work will require adherence to previously established action levels. A miniram aerosol monitor will be used to monitor airborne particulates. Mound Health Physics will continuously monitor personnel and disturbed soils during construction operations to verify that safety procedures are adequate. If visible dust is observed, dust suppression techniques will be initiated. Instrument action levels will be followed according to the HASP.

LEVELS OF PROTECTION/JUSTIFICATION

Level D protection will be used including personal clothes, hard hat, safety glasses, steel-toed boots. Level D protection will be required initially and may be upgraded to modified Level D if readings exceed action levels. Level C will be required to continue working in areas of elevated levels of contamination.

SAFETY PROCEDURES REQUIRED AND/OR FIELD OPS UTILIZED

Field OPs utilized are listed on page 7 of 29.

TASK-BY-TASK RISK ASSESSMENT
(Complete One Sheet for Each Task)

TASK DESCRIPTION

Task 3: Construction along Building 19 of approximately 1,120 feet of trenches, catch basing, and piping.

EQUIPMENT REQUIRED/USED
(Be specific, e.g., hand tools, heavy equipment, instruments, PPE)

Heavy Equipment: Backhoe, dump trucks, break hammer, hand tools, bulldozer

Instruments: CGI/O_2 Meter, Miniram, FIDLER (provided by EG&G), alpha scintillometer (provided by EG&G), pancake GM probe (provided by EG&G), micro-R meter

POTENTIAL HAZARDS/RISKS

CHEMICAL

☐ Hazard Present Risk Level: ☐ H ☐ M ☐ L

What Justifies Risk Level? No chemical hazards are anticipated. Potentially contaminated soils will not be disturbed, and surface contamination is not present in work area.

While all construction activities are in progress, CGI/O_2 meters will be used near the work area to monitor vapors in the work zone.

PHYSICAL

☑ Hazard Present Risk Level: ☐ H ☑ M ☐ L

What Justifies Risk Level? Heavy equipment traffic will be a main concern due to a limited work area. Proper barriers will be installed to prevent pedestrian and vehicle traffic into the excavation area. All heavy equipment shall have back-up (reverse) alarms installed. Underground and overhead utilities and buried lines will be cleared by EG&G Mound construction inspectors. Personnel must follow safe working OPs as indicated on page 7 of 29.

BIOLOGICAL

☑ Hazard Present Risk Level: ☐ H ☐ M ☑ L

What Justifies Risk Level? There is a small risk of exposure to poisonous plants through external contact. Snakes and reptiles may also be in the area. Other small animals may present a hazard. Care should be taken to note signs of rabies. Winter work: Minimal contact with dormant plant and animal life. Summer work: Recognize and avoid contact with poisonous plants and all animals.

RADIOLOGICAL

☑ Hazard Present Risk Level: ☐ H ☐ M ☑ L

What Justifies Risk Level? Previous borings from OU-3 Limited Field Investigation and recent Geoprobe field investigation in the source area indicate low levels of radiological components that fall well below action levels. Regardless, initial work will require adherence to previously established action levels. A miniram aerosol monitor will be used to monitor airborne particulates. Mound Health Physics will continuously monitor personnel and disturbed soils during construction operations to verify that safety procedures are adequate. If visible dust is observed, dust suppression techniques will be initiated. Instrument action levels will be followed according to the HASP.

LEVELS OF PROTECTION/JUSTIFICATION

Level D protection will be used including personal clothes, hard hat, safety glasses, steel-toed boots. Level D protection will be required initially and may be upgraded to modified Level D if readings exceed action levels. Level C will be required to continue working in areas of elevated levels of contamination.

SAFETY PROCEDURES REQUIRED AND/OR FIELD OPS UTILIZED

Field OPs utilized are listed on page 7 of 29.

PERSONNEL PROTECTION PLAN

Engineering Controls
Describe Engineering Controls used as part of Personnel Protection Plan:

Task(s)	2,3
	Dust Suppression Techniques

Administrative Controls
Describe Administrative controls used as part of Personnel Protection Plan:

Task(s)	All
	Monitor for cold or heat stress. Standard WESTON protocols will apply. Access to work area will be restricted.

Personnel Protective Equipment
Action Levels for Changing Levels of Protection. Define Action Levels for up or down grade for each task:

Task(s)	2,3
Miniram	(Assume work begins in Level D) • > 2.5 mg/m^3. Upgrade to Level C protection is necessary. Stop work and consult SHSC.
RADIATION	If RAD Instrument Action Levels are reached: Stop Work and initiate decontamination procedure. Ensure use of disposable PPE. Consult a WESTON Health Physicist and RSO to determine if work can continue in Level D protection.

Instrument	Units	Action Level
Alphascint. (provided by EG&G)	CPM	Fixed contamination less than 300 dpm/100 cm^2 above background. If this is exceeded, wet decon will be performed on skin surfaces and/or clothing/equipment. Arrange for clothing/equipment disposal in accordance with Mound Rad. Waste handling procedure.
Pancake G-M (provided by EG&G)	CPM	Fixed contamination less than 50 cpm above background. If this is exceeded, wet decon will be performed on skin surfaces and/or clothing/equipment. Arrange for clothing/equipment disposal in accordance with Mound Rad. Waste handling procedure.
Micro-R Meter	Micro-R/hr	Readings in excess of 3 times background indicate potential contamination. If readings exceed 500 micro-R/hr, stop work and consult a health physicist.
Fidler (provided by EG&G)	CPM	Determine typical background readings in an uncontaminated area. If readings on channel 1 (Pu) are greater than 1,000 cpm above background or if readings on channel 2 (Th) are greater than 5,000 cpm above background, then contamination is potentially present. Stop work and re-evaluate the situation. Mandatory sample screening required by on-site Mound Soil Screening Laboratory. Consult with RSO and WESTON Health Physicist. At a minimum, Mound HP action levels (soil concentrations in pCi/g) for respiratory protection for digging activities will be followed (i.e., 690 pCi/g for Pu-238 and 190 pCi/g for Th-232).

Description of Levels of Protection

Level D		Level D Modified	
Task(s): All		**Task(s): All**	
☑ Head	Hard hat	☑ Head	Hard hat
☑ Eye and Face	Safety glasses	☑ Eye and Face	Safety glasses
☑ Hearing	Ear plugs if needed	☑ Hearing	Ear plugs if needed
☐ Arms and Legs Only		☐ Arms and Legs Only	
☑ Appropriate Work Uniform	Personal clothing	☑ Whole Body	Tyvek or coveralls; saranex when wet or extremely muddy conditions are present
☑ Hand - Gloves	Cloth work gloves if needed	☐ Apron	
☑ Foot - Safety Boots		☑ Hand - Gloves	
☐ Fall Protection		☑ Gloves	Latex
☐ Flotation		☑ Gloves	Cloth work gloves
☐ Other		☑ Foot - Safety Boots	
		☑ Boots	Disposable boot covers
		☐ Boots	

Description of Levels of Protection

Level C		Level B
Task(s):		**Task(s):**
☑ Head	Hard Hat	☐ Head
☐ Eye and Face		☐ Eye and Face
☑ Hearing	Ear plugs	☐ Hearing
☐ Arms and Legs Only		☐ Arms and Legs Only
☑ Whole Body	Tyvek or Saranex	☐ Whole Body
☐ Apron		☐ Apron
☑ Hand - Gloves	Nitrile outer	☐ Hand - Gloves
☑ Gloves	Inner nitrile/latex	☐ Gloves
☐ Gloves		☐ Gloves
☑ Foot - Boots	Steel-toed	☐ Foot - Boots
☑ Boots	Disposable boot covers	☐ Boots
☐ Boots		☐ Boots
☐ Half Face		☐ SAR - Airline
☐ Cart./Canister		☐ SCBA
☑ Full Face		☐ Comb. Airline/SCBA
☑ Cart./Canister	GMC-H	☐ Cascade System
☐ PAPR		☐ Compressor
☐ Cart./Canister		☐ Fall Protection
☐ Type C		☐ Flotation
☐ Fall Protection		☐ Other
☐ Flotation		
☐ Other		

SITE OR PROJECT HAZARD MONITORING PROGRAM

Direct Reading Air Monitoring Instruments

Instrument Selection and Initial Check Record

Reporting Format: ☑ Field Notebook ☐ Field Data Sheets ☐ Air Monitoring Log ☐ Trip Report ☐ Other

Instrument	Task No.(s)	Number Required	Number Received	Checked Upon Receipt	Comment	Initials
☐ CGI				☐		
☐ O_2				☐		
☑ CGI/O_2	All			☐		
☐ CGI/O_2/tox-PPM, H_2S,H_2S/CO				☐		
☑ RAD-GM	All			☐		
☑ NaI	All			☐		
☑ ZnS	All			☐		
☑ Other FIDLER	All			☐		
☑ PID				☐		
☐ HNU 10.2				☐		
☐ HNU 11.7				☐		
☐ Photovac, TMA				☐		
☑ OVM				☐		
☐ Other _____				☐		
☐ FID				☐		
☐ FOX 128				☐		
☐ Heath, AID, Other _____				☐		
☑ RAM, Mini-RAM, Other _____	All			☐		
☐ Monotox				☐		
☐ H_2S				☐		
☐ COCL				☐		
☐ SO_2				☐		
☐ HCN				☐		
☐ Other _____				☐		
☐ Bio-Aerosol Monitor				☐		
☐ Detector Tubes				☐		
☐ Pump - MSA, Dräeger, Sensidyne				☐		
☐ Tubes/type: _____				☐		
☐ Tubes/type: _____				☐		
☐ Other _____				☐		

SITE OR PROJECT HAZARD MONITORING PROGRAM

Direct Reading Air Monitoring Instruments Calibration Record

Instrument, Mfg., Model, Equip. ID No.	Date	Time	Calib. Material	Calib. Method Mfg.'s	Other	Initial Setting and Reading	Final Setting and Reading	Calibrator's Initials

SITE AIR MONITORING PROGRAM

Direct Reading Air Monitoring Instruments

Air Monitoring Instrument: CGI/O_2	
Air Monitoring Frequency:	**Tasks:**
☐ Periodically:	
☐ Periodically:	
☑ Continuously: During Construction	2,3
☐ Other:	
Monitoring Locations	
☐ Upwind/downwind of site activities	
☐ Near residents, etc.	
☑ Key site activity locations:	2,3
☐ Decon area	
☑ Staging area	2,3
☑ Excavation area	2,3
☐ Field lab area	
☐ Storage tanks	
☐ Lagoons	
☐ Drums	
☐ Fixed stations	
☐ Other:	

Air Monitoring Instrument: Miniram	
Air Monitoring Frequency:	
☐ Periodically:	
☐ Periodically:	
☑ Continuously: During construction	2,3
☐ Other:	
Monitoring Locations	
☐ Upwind/downwind of site activities	
☐ Near residents, etc.	
☑ Key site activity locations:	2,3
☐ Decon area	
☐ Staging area	
☑ Excavation area	2,3
☐ Field lab area	
☐ Storage tanks	
☐ Lagoons	
☐ Drums	
☐ Fixed stations	
☐ Other:	

SITE AIR MONITORING PROGRAM

Action Levels

These Action Levels, if not defined by regulation, are some percent (usually 50%) of the applicable PEL/REL/TLV. That number must also be adjusted to account for instrument response factors.

	Tasks	Action Level		Action
☑ **Explosive atmosphere**	2,3	Ambient Air Concentration	Confined Space Concentration	
		<10% LEL	0 to 1% LEL	Work may continue. Consider toxicity potential.
		10 to 25% LEL	1 to 10% LEL	Work may continue. Increase monitoring frequency.
		>25% LEL	>10% LEL	Work must stop. Ventilate area before returning.
☑ **Oxygen**	2,3	Ambient Air Concentration	Confined Space Concentration	
		<19.5% O_2	<19.5% O_2	Leave Area. Re-enter only with self-contained breathing apparatus.
		19.5% to 25% O2	19.5% to 23.5% O_2	Work may continue. Investigate changes from 21%.
		>25% O_2	>23.5% O_2	Work must stop. Ventilate area before returning.
☑ **Radiation**	2,3	< 3 times background		Continue Work
		3 Times Background to < 500 microR/hour		Radiation above background levels (normally 0.01-0.02 microR/hr)g signifies possible source(s) radiation present. Continue investigation with caution. Perform thorough monitoring. Consult with a Health Physicist. See pg. 11 of 33 for procedures.
		> 500 microR/hour		Potential radiation hazard. Evacuate site. Continue investigation only upon the advice of Health Physicist.
☐ **Organic gases and vapors**	Not anticipated to be present			
☐ **Inorganic gases, vapors and particulates**	Not anticipated to be present			

SITE AIR MONITORING PROGRAM

Ambient Air Sampling

Check situations which will require or action levels which will apply to deciding to institute or increase scope of planned air sampling.

☑ No air sampling is required on this site.

☐ An air sampling plan is incorporated in this HASP.

Meteorological Conditions

☐ Dry weather for ____ days

☐ Ambient temperature above ____ °F

☐ Wind increasing potential of more contaminant dispersion in or migration out of controlled area.

Activities which will require instituting or increasing scope of air sampling:

☐ Major spills

☐ New site activity resulting in potential presence of new chemical hazards.

☐ Site activity increases airborne contaminants possibilities.

☐ Air sampling documentation required for:

- ☐ Downgrading from stipulated level of protection
- ☐ Documenting no migration of contaminants offsite through air

Applicable Action Levels for Instituting Air Sampling:

☐ Visible vapor/gas clouds or vapor levels, or

☐ Visible dust or particulate levels measured with Direct Reading Instrument, two-three times background or above action level, sustained over 10-15 minute period.

The following requirements apply to air sampling:

Sampling Matrix/Air Interface - Monitor matrix/air interface and breathing zone periodically with DRI. If vapor levels > 2-3 times background, monitor continuously. Follow No. 4.

Container Opening - Monitor opening and breathing zone periodically with DRI. If vapor levels > 2-3 times background, monitor opening and breathing zone continuously. Follow No. 4.

Excavation/Drilling/Intrusive Work - Monitor at ground level and breathing zone periodically with DRI. If vapor levels > 2-3 times background, monitor opening and breathing zone continuously. Follow No. 4.

Breathing Zone - Ensure level of protection specified in HASP is being used. Consult HASP or Corporate Health and Safety relative to instituting personnel, area, or perimeter sampling.

☐ Other

SITE AIR MONITORING PROGRAM

Work Location Instrument Readings

Location:

% LEL	% O_2	PID (units)	FID (units)	Aerosol Monitor (mg/m³)	GM: Shield Probe/ Thin Window		NaI (uR/hr)	ZnS (cpm)
					mR/hr	cpm		
Monitox (ppm)				Detector Tube(s)				
Sound Levels (dBA)		Illumination	pH	Other	Other	Other	Other	Other

Location:

% LEL	% O_2	PID (units)	FID (units)	Aerosol Monitor (mg/m³)	GM: Shield Probe/ Thin Window		NaI (uR/hr)	ZnS (cpm)
					mR/hr	cpm		
Monitox (ppm)				Detector Tube(s)				
Sound Levels (dBA)		Illumination	pH	Other	Other	Other	Other	Other

CONTINGENCIES

Emergency Contacts and Phone Numbers

Agency	Contact	Phone Number
Local Medical Emergency Facility (LMF)	Sycamore Hospital	513-296-7026
WESTON Medical Emergency Contact	EMR - Dr. Barnes	1-800-229-3674
WESTON Health and Safety	Kevin Bate	513-825-3440
Fire Department	Fire Chief - Dave Heitz	911 or 513-865-3125
Police Department	Security - Duty Officer	911 or 513-865-3400
Onsite Coordinator	Gary Coons	513-865-3867
Site Telephone	Bldg. 19	513-865-4196
Nearest Telephone	To Be Determined	To Be Determined

Local Medical Emergency Facility(s)

Name of Hospital: Sycamore Hospital

Address: 2150 Leiter, Miamisburg, Ohio — **Phone No.:** 513-865-8797

Name of Contact: — **Phone No.:**

Type of Service:

- ☐ Physical trauma only
- ☐ Chemical exposure only
- ☑ Physical trauma and chemical exposure
- ☑ Available 24 hours

Route to Hospital (written detail): (Figure 1) Exit Mound Facility at construction gate on Benner Rd., travel east to Gebhart Church Rd., and turn left. Take Gebhart Church Rd. to Leiter Rd. and turn right. Hospital on right 0.5 mile.

Travel time from site: 5 - 6 minutes

Distance to hospital: < 5 miles

Name/No. of 24-hr Ambulance Service: Mound Plant Fire Department Medical Response, ext. 911

Secondary or Specialty Service Provider

Name of Hospital: Mound Plant Fire Department Medical Response

Address: — **Phone No.:** Ext. 911

Name of Contact: Ray Hensley — **Phone No.:**

Type of Service:

- ☐ Physical trauma only
- ☐ Chemical exposure only
- ☑ Physical trauma and chemical exposure
- ☑ Available 24 hours

Route to Hospital (written detail):

Travel time from site: _____

Distance to hospital: _____

Name/No. of 24-hr Ambulance Service:

Figure 1. Route to Hospital
(Draw map to hospital here if space permits or attach on next sheet.)

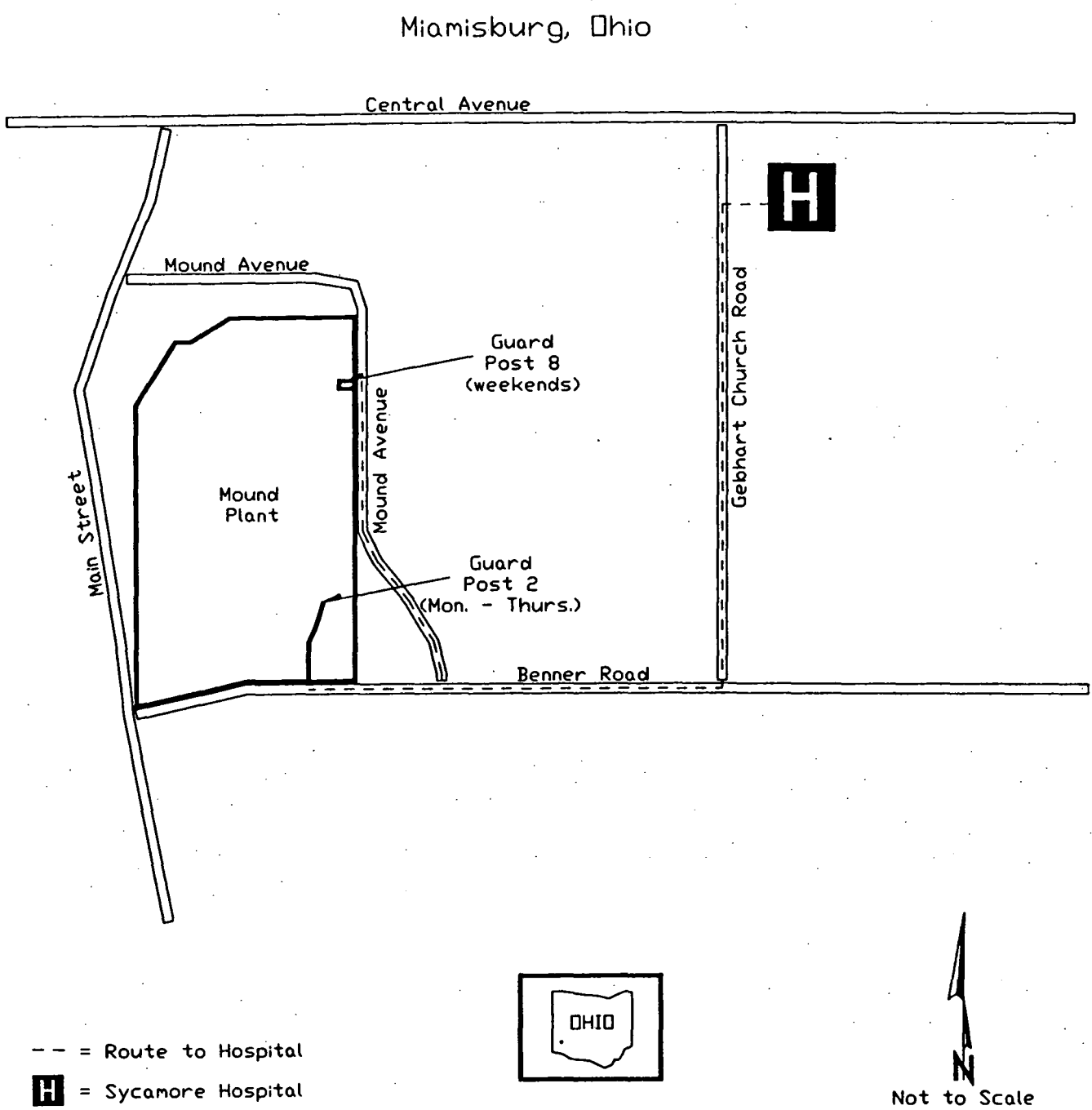

Figure 1 - Route to Hospital (Map)

CONTINGENCIES

Response Plans

Medical - General	First Aid Kit:	Type	Location	Special First Aid Procedures:
Provide First Aid as trained, assess and determine need for further medical assistance, Transport or arrange for transport after appropriate decontamination	Field Kit	OSHA approved first responder	Field vehicle office trailer	Cyanides on site ☐ Yes ☑ No. If yes, contact LMF. Do they have antidote kit? ☐ Yes ☐ No
	Eyewash required ☑ Yes ☐ No	Type 15-minute eyewash	Location Field vehicle office trailer	HF on site ☐ Yes ☑ No. If yes, need neutralizing ointment for First Aid kit. Contact LMF.
	Shower required ☑ Yes ☐ No	Type Bottle sterile solution	Location Field first aid kit	

Plan for Response to Spill/Release		Plan for Response to Fire/Explosion		Fire Extinguishers
In the event of a spill or release, ensure safety, assess situation and perform containment and control measures as appropriate:	a. Clean up per MSDS if small or; Sound Alarm, call for assistance, Notify Emergency Coordinator b. Evacuate to pre-determined safe place c. Account for personnel d. Determine if Team can respond safely e. Mobilize per Site Spill Response Plan	In the event of a fire or explosion, ensure personal safety, assess situation and perform containment and control measures as appropriate:	a. Sound Alarm and call assistance, Notify Emergency Coordinator b. Evacuate to predeter-mined safe place c. Account for personnel d. Use fire extinguisher, <u>only if safe and trained</u> e. Standby to inform Emergency responders of materials and conditions	Type/Location Dry Chem 20 BC-Field trailer, office trailer
Description of Spill Response Gear	Location	Description (Other Fire Response Equipment)		Location

Plan to Response to Security Problems

Call security - Duty officer (513) 865-3400.

DECONTAMINATION PLAN

Personnel Decontamination

Consistent with the levels of protection required, step-by-step procedures for personnel decontamination for each Level of Protection are attached.

Levels of Protection Required for Decontamination Personnel

The levels of protection required for personnel assisting with decontamination will be:

☐ Level B ☐ Level C ☑ Level D

Modifications include: Hands and face will be washed before leaving site. Nose wipes may be taken and screened by Mound Health Physics. If upgrades in levels of protection are needed, this plan will be revised.

Disposition of Decontamination Wastes

Provide a description of waste disposition including identification of storage area, hauler, and final disposal site, if applicable:

Follow SOP 1.15, Guide to Waste Management.

Place disposable PPE and decontamination fluids in separate plastic-lined drums. Mound will store and dispose of these wastes.

Equipment Decontamination

A procedure for decontamination steps required for non-sampling equipment and heavy machinery follows:

Equipment will be decontaminated through the use of a high pressure cleaner. When the equipment is dry, Health Physics will then take wipe samples to verify that radiological contamination does not exist.

Sampling Equipment Decontamination

Sampling equipment will be decontaminated in accordance with the following procedure:

For samples collected for chemical analyses other than metals:

- Equipment will be rinsed/scrubbed in alconox/potable water solution
- Potable water rinse
- Methanol spray
- Hexane spray
- Distilled water rinse
- Air dry

For samples collected for radiological and metals analyses:

- Equipment will be rinsed/scrubbed in alconox/potable water solution
- Potable water rinse
- Distilled water rinse
- Air dry

LEVEL D/MODIFIED LEVEL D DECONTAMINATION PLAN

Check indicated functions or add steps as necessary:

Function	Description of Process, Solution, and Container
☐ Segregated equipment drop	
☐ Boot cover and glove wash	
☐ Boot cover and glove rinse	
☐ Tape removal - outer glove and boot	
☑ Boot cover removal	Remove, place in bag and then in drum.
☑ Outer glove removal	Remove, place in bag and then in drum.
HOTLINE	
☐ Suit/safety boot wash	
☐ Suit/boot/glove rinse	
☐ Safety boot removal	
☑ Suit removal	Remove, place in bag and then in drum.
☐ Inner glove wash	
☐ Inner glove rinse	
☑ Inner glove removal	Remove, place in bag and then in drum.
☐ Inner clothing removal	
CRC/SAFE ZONE BOUNDARY	
☑ Field wash	Soap and water with water rinse (before leaving Mound)
☐ Redress	

Disposal Plan, End of Day:

According to SOP 1.15

Disposal Plan, End of Week:

According to SOP 1.15

Disposal Plan, End of Project:

According to SOP 1.15

LEVEL C DECONTAMINATION PLAN

Check indicated functions or add steps as necessary:

Function	Description of Process, Solution, and Container
☑ Segregated equipment drop	Place equipment on plastic.
☐ Boot cover and glove wash	
☐ Boot cover and glove rinse	
☑ Tape removal - outer glove and boot	Remove, place in bag and then in drum.
☑ Boot cover removal	Remove, place in bag and then in drum.
☑ Outer glove removal	Remove, place in bag and then in drum.
HOTLINE	
☐ Suit/safety boot wash	
☐ Suit/boot/glove rinse	
☐ Safety boot removal	
☑ Suit removal	Remove, place in bag and then in drum.
☑ Inner glove wash	Soap and water (bucket)
☑ Inner glove rinse	Water rinse (bucket)
☑ Face piece removal	Remove, place in bag and then in drum.
☑ Inner glove removal	Remove, place in bag and then in drum.
☐ Inner clothing removal	
CRC/SAFE ZONE BOUNDARY	
☑ Field wash	Soap and water with water rinse (before leaving Mound)
☐ Redress	

Disposal Plan, End of Day:

According to SOP 1.15

Disposal Plan, End of Week:

According to SOP 1.15

Disposal Plan, End of Project:

According to SOP 1.15

SITE PERSONNEL AND CERTIFICATION STATUS

WESTON

Name: Terry Lambert **Title:** Site Field Engineer **Task(s):** All **Certification Level or Description:** B-S ☑ Medical Current ☑ Training Current ☑ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** Mike Szabo **Title:** Project Engineer **Task(s):** All **Certification Level or Description:** D-S, B-T ☑ Medical Current ☑ Training Current ☑ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)
Name: **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)
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TRAINING CURRENT - Training: All personnel, including visitors, entering the exclusion or contamination reduction zones must have certifications of completion of training in accordance with OSHA 29 CFR 1910, 29 CFR 1926 or 29 CFR 1910.120.

FIT TEST CURRENT - Respirator Fit Testing: All persons, including visitors, entering any area requiring the use or potential use of any negative pressure respirator must have had as a minimum, a qualitative fit test, administered in accordance with OSHA 29 CFR 1910.134 or ANSI within the last 12 months. If site conditions require the use of a full face negative pressure, air purifying respirator for protection from Asbestos or Lead, employees must have had a quantitative fit test, administered according to OSHA 29 CFR 1910.1001 or 1025 within the last 6 months.

MEDICAL CURRENT - Medical Monitoring Requirements: All personnel, including visitors, entering the exclusion or contamination reduction zones must be certified as medically fit to work, and to wear a respirator, if appropriate, in accordance with 29 CFR 1910, 29 CFR 1926/1910 or 29 CFR 1910.120.

The Site Health and Safety Coordinator is responsible for verifying all certifications and fit tests.

SITE PERSONNEL AND CERTIFICATION STATUS

Subcontractor's Health and Safety Program Evaluation

Name of Subcontractor: Applied Science and Technologies (AST)
Address: 8401 Claude Thomas Rd., Suite 58, Franklin, OH 45005

Activities to Be Conducted by Subcontractor: Tasks 2 and 3 - Construction

Evaluation Criteria

Medical program meets OSHA/WESTON criteria ☑ Acceptable ☐ Unacceptable Comments:	Personal protective equipment available ☑ Acceptable ☐ Unacceptable Comments:	Onsite monitoring equipment available, calibrated and operated properly ☑ Acceptable ☐ Unacceptable Comments:
Safe working procedures clearly specified ☑ Acceptable ☐ Unacceptable Comments:	Training meets OSHA/WESTON criteria ☑ Acceptable ☐ Unacceptable Comments:	Emergency procedures ☑ Acceptable ☐ Unacceptable Comments:
Decontamination procedures ☑ Acceptable ☐ Unacceptable Comments:	General health and safety program evaluation ☑ Acceptable ☐ Unacceptable Comments:	Additional comments: ☑ Subcontractor has agreed to and will conform with the WESTON HASP for this Project. ☐ Subcontractor will work under his own HASP which has been accepted by Corporate Health and Safety.

Evaluation Conducted by: Gordon Ho[illegible] **Date:** 23 February 1995

Subcontractor

Name: To be determined **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)
Name: **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)
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SITE PERSONNEL AND CERTIFICATION STATUS

Subcontractor's Health and Safety Program Evaluation

Name of Subcontractor: Surveyor - To be determined. Surveyor is not required to be 40-hour trained.
Address:

Activities to Be Conducted by Subcontractor: Task 1 - Surveying

Evaluation Criteria

Medical program meets OSHA/WESTON criteria ☐ Acceptable ☐ Unacceptable Comments: N/A	Personal protective equipment available ☐ Acceptable ☐ Unacceptable Comments: N/A	Onsite monitoring equipment available, calibrated and operated properly ☐ Acceptable ☐ Unacceptable Comments: N/A
Safe working procedures clearly specified ☐ Acceptable ☐ Unacceptable Comments: N/A	Training meets OSHA/WESTON criteria ☐ Acceptable ☐ Unacceptable Comments: N/A	Emergency procedures ☐ Acceptable ☐ Unacceptable Comments: N/A
Decontamination procedures ☐ Acceptable ☐ Unacceptable Comments: N/A	General health and safety program evaluation ☐ Acceptable ☐ Unacceptable Comments: N/A	Additional comments: ☐ Subcontractor has agreed to and will conform with the WESTON HASP for this Project. ☐ Subcontractor will work under his own HASP which has been accepted by Corporate Health and Safety.

Evaluation Conducted by: **Date:**

Subcontractor

Name: To be determined **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)
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HEALTH AND SAFETY PLAN APPROVAL/SIGNOFF FORM

Site Name: EG&G Mound **WO#** 05376-055-001-0600-00

Address: One Mound Road, Miamisburg, OH

I understand, agree to and will conform with the information set forth in this Health and Safety Plan (and attachments) and discussed in the Personnel Health and Safety briefing(s).

Name	Signature	Date

TRAINING AND BRIEFING TOPICS

The following items will be covered at the site specific training meeting, daily or periodically.

☑ Site characterization and analysis, Sec. 3.0, 29 CFR 1910.120 l	☐ Level A
☑ Physical hazards, Table 3.2	☐ Level B
☑ Chemical hazards, Table 3.1	☑ Level C
☑ Animal bites, stings, and poisonous plants	☑ Level D
☐ Etiologic (infectious) agents	☑ Monitoring, Sec. 7.0; 29 CFR 1910.120 h
☑ Site control, Sec. 8.0; 29 CFR 1910.120 d	☑ Decontamination, Sec. 9.0; 29 CFR 1910.120 k
☑ Engineering controls and work practices, Sec. 8.5; 25 CFR 1910.120 g	☑ Emergency response, Sec. 10.0; 29 CFR 1910.120 l
☑ Heavy machinery	☑ Elements of an emergency response, Sec. 100; 29 CFR 1910.120 l
☐ Forklift	☑ Procedures for handling site emergency incidents, Sec. 10.0; 29 CFR 1910.120 l
☑ Backhoe	☐ Offsite emergency response, 29 CFR 1910.120 l
☑ Equipment	☑ Handling drums and containers, 29 CFR 1910.120 j
☑ Tools	☑ Opening drums and containers
☑ Ladder 29 CFR 1910.27 d	☑ Electrical material handling equipment
☑ Overhead and underground utilities	☑ Radioactive waste
☐ Scaffolds	☐ Shock sensitive waste
☑ Structural integrity	☐ Laboratory waste packs
☐ Unguarded openings - wall, floor, ceilings	☐ Sampling drums and containers
☑ Pressurized air cylinders	☑ Shipping and transport, 49 CFR 172.101
☑ Personnel protective equipment, Sec. 5.0; 25 CFR 1910.120 g; 29 CFR 1910.134	☑ Tank and vault procedures
☑ Respiratory protection, Sec. 5.8; 29 CFR 1910.120 g; Z88.2-1980	☑ Illumination, 29 CFR 1910.120 m
	☑ Sanitation, 29 CFR 1910.120 n

SITE-SPECIFIC HEALTH AND SAFETY PLAN

(An Addendum to the EG&G Mound General Health and Safety Plan MD-10286,G1)
(March 1995)
FOR

Site Name: Soil Removal, Bldg. 19 Area

Prepared by: _____ 3/30/95
(Signature) (Date)

Reviewed by: _____ 4-3-95
Health Physics (Signature) (Date)

Reviewed by: _____ 4/4/95
Industrial Hygiene (Signature) (Date)

Reviewed by: _____ 8 May 95
Industrial Safety (Signature) (Date)

t by: _____ May 9 1995
Occupational Medicine (Signature) (Date)

_____ 10 May 95
ZWOPER Coordinator (Signature) (Date)

1.0 SITE DESCRIPTION

The Site is located at Bldg. 19, 94 (See Site Map).

The Site is near the (streams, roads, other landmarks) parallel to the site boundary fence west of Bldgs. 19 and 72, and west of Bldgs. 94 and 112. This is Area 3 of OU-5, in the valley SW of the main hill. A railroad spur runs through the middle of Area 3.

The Site is (brief description of terrain, vegetation, land use) in the grassy, low-lying run-off hollow west of Bldgs. 19 and 72. Another portion of the site lies west of Bldgs. 94 and 112, on the graded fill above the plant drainage ditch.

2.0 SITE HISTORY

(Brief description of site history and use. Include all site activities that may contribute to current site conditions). Area 3 includes Bldgs. 19, 42, 55, 57, 72, 94, and 112, which have served a variety of purposes, such as: salvage operations, effluent monitoring, sewage treatment, hazardous chemical storage, storage and redrumming of Th-232 sludge and Pu-238. Recently, soil samples were cored on 50' centers for the full length of the proposed ditch. Soil screens for Pu-238 and Th-232 were made for each point at near-surface (6") and at depth (4'-5'). No readings for Th-232 were above the action levels. Two near-surface readings for Pu-238 behind Bldg. 19 and one near-surface reading behind Bldg. 94 were above the action level (although below 100 pCi/gm. No other radionuclides were indicated.

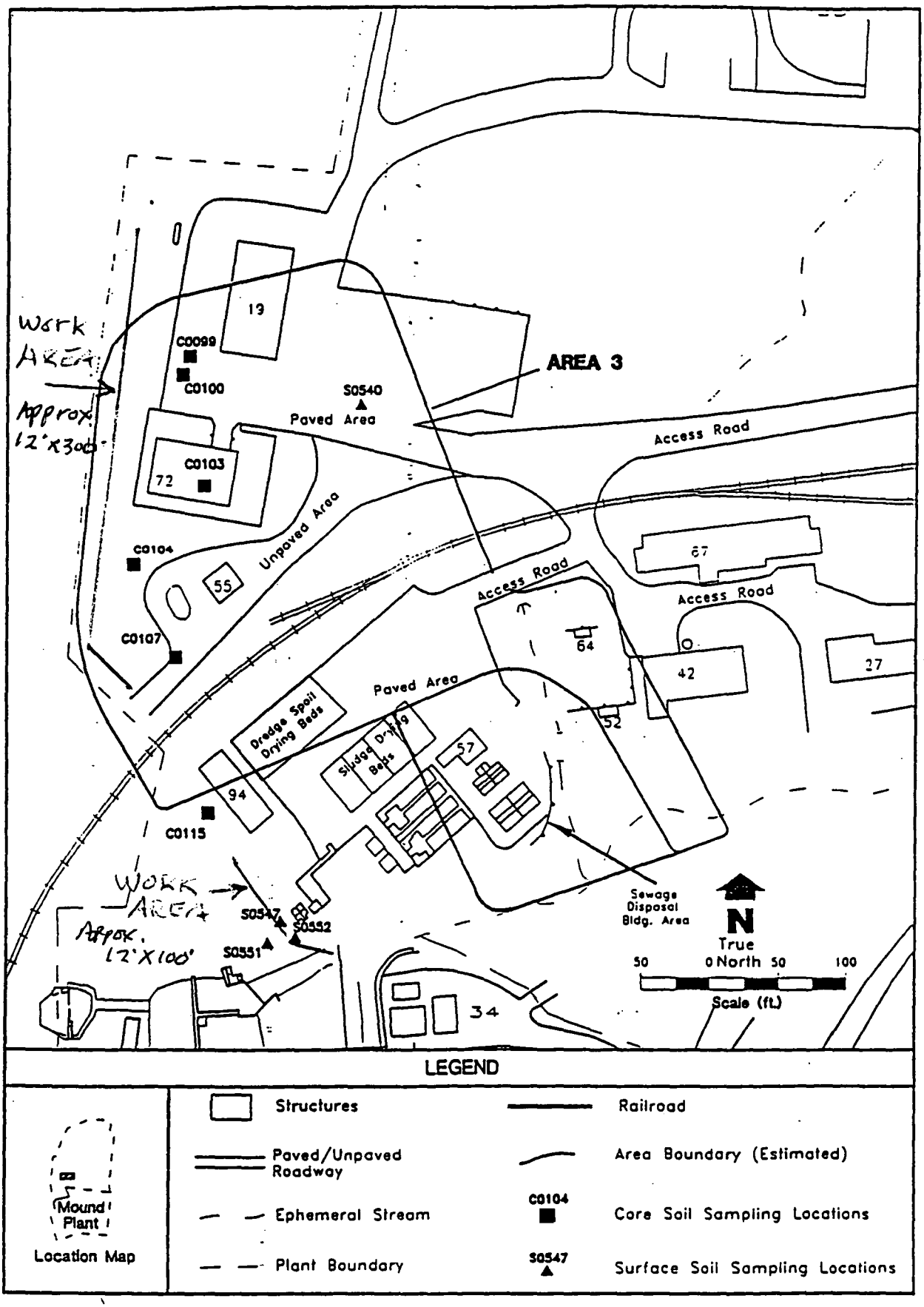


Figure 2.4. Sampling Locations for Historical Radiological Data Collected in Area 3 (Mound Site Survey Project, 1983-1985)

3.0 HEALTH AND SAFETY HAZARD EVALUATION

[Place an X in each ( ) to indicate presence of hazard]

3.1 Physical Hazards

☐ Heat Stress	☐ Cold Stress	■ Noise
☐ Confined Space	☐ Enclosed Space	☐ Heavy Lifting
■ Tripping/Falling	☐ High Voltage	☐ High Pressure Water
☐ Oxygen Deficient	☐ Explosive/Flammable	☐ Vibration

3.2 Construction Hazards

☐ Trenching	■ Excavating	■ Heavy Equipment Op.
☐ Demolition	☐ High Work	☐ Welding/Cutting
☐ Ladders	☐ _____	☐ _____

3.3 Chemical Hazards None Known

☐ Organic Chemical	☐ Inorganic Chemical	☐ Carcinogen
☐ Corrosive	☐ Reactive	☐ OSHA Specific Substances
☐ Mutagen	☐ Teratogen	

3.4 Ionizing Radiological Hazards

■ Internal Exposure	■ External Exposure

3.5 Non-Ionizing Radiological Hazards N/A

☐ UV	☐ RF	☐ Microwave
☐ Laser		

3.6 Biological Hazards N/A

☐ Wildlife	☐ Plants	☐ Medical Waste
☐ Bacterial	☐ Parasites	

4.0 PREVIOUS SAMPLING RESULTS

Contaminant	Source (Water. Sediment, Sludge. Soil. Air. etc.)	Quantity or Concentration
Pu-238	Soil	64 pCi/g
Th-232	Soil	1.6 pCi/g

5.0 CONTAMINANTS Attach MSDS's if available No Known Contaminates

5.1 Chemical: **IDLH:**

PEL/TLV*: LEL:
STEL:
Action Level:
Route of Exposure:
Monitoring Equipment:
Symptoms/Effects of Exposure:
Special Medical Monitoring:

5.2 Chemical: **IDLH:**

PEL/TLV*: LEL:
STEL:
Action Level:
Route of Exposure:
Monitoring Equipment:
Symptoms/Effects of Exposure:
Special Medical Monitoring:

5.3 Chemical: **IDLH:**

PEL/TLV*: LEL:
STEL:
Action Level:
Route of Exposure:
Monitoring Equipment:
Symptoms/Effects of Exposure:
Special Medical Monitoring:

5.4 Chemical: **IDLH:**

PEL/TLV*: LEL:
STEL:
Action Level:
Route of Exposure:
Monitoring Equipment:
Symptoms/Effects of Exposure:
Special Medical Monitoring:

6.0 TASK BREAKDOWN

(Provide detailed description, controls, and requirements, for each task to be performed, i.e., drilling, sampling, etc.)

6.1 Description: TASK 1 - Remove contaminated soil and drain conduits. Heavy-Duty operators using track or backhoe will dig a soil strip approximately 1' x 12' x 400', and load debris into LSA Boxes for disposal.

Level of Personal Protective Equipment: Primary D Contingency C

Type of Work: Digging ■ Non-Digging ☐

Engineering Controls: Use straw bales to prevent run-off. Suppress dust with water mist. Use two high-volume air samplers, one continuous air monitors, and lapel monitors for each worker. HP and/or Industrial Hygiene will provide 100% monitoring using appropriate equipment.

Administrative Controls: (required permits, training, etc.)
D&D Excavating/Digging, RWP
Excavation Work Permits
RAD Worker II Training
Approved training for heavy-duty equipment operations.

Personal Protective Equipment: HAZWOPER

		Primary		Contingency	
		(Write Type Here:)			
a)	Respiratory Protection:	Y ☐	N ■	Y ■	N ☐
b)	Protective Clothing:	Y ■	N ☐	Y ■	N ☐
c)	Head Protection:	Y ■	N ☐	Y ■	N ☐
d)	Eye Protection:	Y ■	N ☐	Y ■	N ☐
e)	Foot Protection:	Y ■	N ☐	Y ■	N ☐
f)	Hand Protection:	Y ■	N ☐	Y ■	N ☐
g)	Hearing Protection:	Y ■	N ☐	Y ■	N ☐
h)	Tape-up Required:	Y ☐	N ■	Y ☐	N ■

6.2 Description: TASK 2 Project Support, Monitoring/Sampling - Health Physics and Industrial Hygiene will monitor the work for the duration of TASK 1. Health Physics to perform radiological Verification/Certification prior to release as decontaminated zone.

Level of Personal Protective Equipment: Primary D Contingency C

Type of Work: Digging ■ Non-Digging

Engineering Controls: Use two high-volume air samplers, one continuous air monitor, and a lapel monitor for each person working within the controlled area.

Administrative Controls: (required permits, required. Industrial Hygiene and HP will conduct the monitoring/sampling using PID/FID, RAM, etc. as D&D Work Permit, RWP, and RAD Worker II Training.

Personal Protective Equipment: HAZWOPER

		Primary		Contingency	
		(Write Type Here:)			
a)	Respiratory Protection:	Y ☐	N ■	Y ■	N ☐
b)	Protective Clothing:	Y ■	N ☐	Y ■	N ☐
c)	Head Protection:	Y ■	N ☐	Y ■	N ☐
d)	Eye Protection:	Y ■	N ☐	Y ■	N ☐
e)	Foot Protection:	Y ■	N ☐	Y ■	N ☐
f)	Hand Protection:	Y ■	N ☐	Y ■	N ☐
g)	Hearing Protection:	Y ■	N ☐	Y ■	N ☐
h)	Tape-up Required:	Y ☐	N ☐	Y ☐	N ■

6.3 Description:

Level of Personal Protective Equipment: Primary _____ Contingency _____

Type of Work: Digging ☐ Non-Digging ☐

Engineering Controls: _____

Administrative Controls: (required permits, training, etc.) _____

7.0 WORKER TRAINING

All personnel assigned to work in a Radiation Control Area must have completed the forty-hour HAZWOPER course, as well as RAD Worker II training. The accompanying verification sheet signifies that those named are thus authorized to enter the controlled area. It must be posted at the job site.

A pre-entry briefing will be held with all employees assigned to the work site, prior to any site activity, in order to completely review the Site Specific Health and Safety Plan. A daily pre-job meeting will be held with all personnel to describe the planned day's work, and will stress each of the anticipated safety hazards. The accompanying "Briefing Log" will be completed for each case and retained in the job file.

VERIFIED TRAINING DATES					
Name	**HP #**	**40-Hour**	**24-Hour**	**8-Hour Site Supervisor**	**8-Hour Refresher**
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					

PRE-JOB SAFETY BRIEFING LOG

PROJECT: _____

DATE: _____

TOPICS

NAME (Print)	H.P.#	SIGNATURE

8.0 HAZARD ANALYSIS

8.1 Chemicals N/A

TASKS 1 and 2 None Known

Specific labeling requirements of site-generated waste: _____

Chemical-specific disposal requirements: _____

8.2 Fire/Explosion N/A

TASKS 1 and 2

Are flammable liquids present? Yes ☐ No ■

Description: _____
Location: _____
Quantity: _____
Containment/Storage method: _____

For welding, cutting, or brazing is a Welding Permit required? Yes ☐ No ☐

8.3 Confined/Enclosed Spaces N/A

(see Confined Space Entry Procedures, MD-10286, Operation # M-11)

TASKS 1 and 2

Confined/enclosed space entry required? Yes ☐ No ■

Confined Space Entry Permit issued? Yes ☐ No ■

Hazard Class A ____ B ____ C ____

Reason for Hazard Class selection: _____

8.4 Ionizing Radiation

TASKS 1 and 2

Applicable detailed checklist? Yes ☐ No ■ NA ☐

Primary contaminating isotope(s): Pu-238 Th-232

Location on site: Soils

Containment/storage method: LSA Boxes

Radiation type: Alpha ■ Beta ■ Gamma ■ Neutron ☐

Dose rate (maximum): <0.1 mR/h @ 0.3 meter(s)
(average) <0.1 mR/h

Worker dose limit: 1000 mR/yr

Contamination level (fixed): _____ dpm/100 cm^2
(removable) _____ dpm/100 cm^2

Airborne contamination conc.: $<3 \times 10^{-19}$ Ci/ml
(<0.1 DAC) (Pu-238 DAC = 3×10^{-12} mCi/ml)

Water contamination potential? Yes ■ No ☐

Unrestricted airborne contamination release potential?: Yes ■ No ☐

Radiation work permit required? Yes ■ No ☐

Health Physics coverage: Continuous ■ Intermittent ☐ Conditional ☐

Special task operation requirements:
- ☐ Welding/cutting/brazing
- ☐ Grinding/chipping
- ☐ Hydraulic/air hammer operation
- ■ Dusty conditions (sweeping, vacuuming, etc.)
- ■ Equipment decontamination/free release

8.5 Non-Ionizing Radiation

TASKS 1 and 2

High-Voltage (>100 Kv) electrical transmission lines nearby? Yes ☐ No ■

Location, distance, and voltage: _____

Radiofrequency radiation sources (AM and/or FM broadcast towers, r-f sealers) nearby? Yes ☐ No ■
Location and distance: _____

Microwave sources in use on site? Yes ☐ No ■
Location and description: _____

Lasers in use nearby? Yes ☐ No ■
Location and laser class: _____

Are ultrasound sources in use on site? Yes ☐ No ■
Location: _____

Are workers potentially exposed to ultraviolet radiation (welder's arc or prolonged sunlight)? Yes ■ No ☐
Precautions to take: PPE to protect from sun.

8.6 Electrical Hazards

TASKS 1 and 2

Electrical shock hazard? Yes ☐ No ■
Answer YES if any of the below are checked:

- ☐ Over head power lines within 10 feet.
- ☐ Potential for underground electrical lines.
- ☐ Potential for concealed lines in walls, conduits, ceilings, etc.
- ☐ Electrically powered tools being used outdoors or near standing water.
- ☐ Power tools being used near recognized grounding surfaces, such as metal tanks, pipelines, or grounded floors.
- ■ Portable generators being used.

Location of hazard: _____

220 Voltage

Abatement:

- ■ Have appropriate scans been performed?
- ■ Are Ground Fault Circuit Interrupters (GFCI) in use with work involving portable hand tools, outdoor work, or with portable generators?
- ■ Have portable generators been properly grounded?
- ☐ Have procedures been implemented to assure that equipment of materials do not come within 10 feet of overhead power lines?

8.7 Temperature Extremes

TASKS 1 and 2

Temperature extremes (Hot ☐ Cold ☐?) Yes ☐ No ☐

90° Average daily high temperature (during work shift) °F ■ °C ☐
25° Average daily low temperature (during work shift) °F ■ °C ☐
20° Average wind speed MPH
_____ Temperature WBGT °C cloudy ☐ sunny ☐

Work load:	Work/Rest regimen:
☐ Light	80 % work
■ Moderate	20 % rest
☐ Heavy	

Threshold Limit Value: 90°F upper, 25°F lower limits
Precautions (specify): Use of PPE etc., clothing. Call emergency in case of sunstroke.

Cooling/heating equipment needed: _____

8.8 Noise

TASKS 1 and 2

Noise extremes? Yes ☐ No ☐
Sound level: ca 90 dB(A)
Noise source(s): Heavy-Duty Equipment

Noise above 85 dB(A) (hearing protection required): Yes ■ No ☐

Precautions (specify): Hearing protection required while heavy-duty equipment is in operation.

8.9 Vibration

TASKS 1 and 2

Vibration extremes? Yes ☐ No ☐

Vibration frequency: _____

Precautions (specify): _____

8.10 Sanitation

TASKS 1 and 2

Potable water required? Yes ■ No ☐

Non-potable water used? Yes ☐ No ■

Eating, drinking, and smoking permitted? Yes ■ No ☐

Where? Outside of barricaded work area.

Toilet facilities required? Yes ■ No ☐
Location and number: Project Site

Washing facilities required? Yes ■ No ☐
Location and number: WD Building

Change rooms required? Yes ■ No ☐
Specify: Leachfield Trailer

8.11 Illumination N/A

TASKS Soil Removal

Additional illumination needed? Yes ☐ No ■ NA ☐

What types and where located? Daylight outside work.

8.12 Safety Hazards

Site posted information/notification required? Yes ■ No ☐ NA ☐

Site posting required? Yes ■ No ☐

Site guard required? Yes ☐ No ■ NA ☐

Access control required? Yes ■ No ☐

Entry logs required? Yes ■ No ☐

Escape routing/posting required (include site map)?

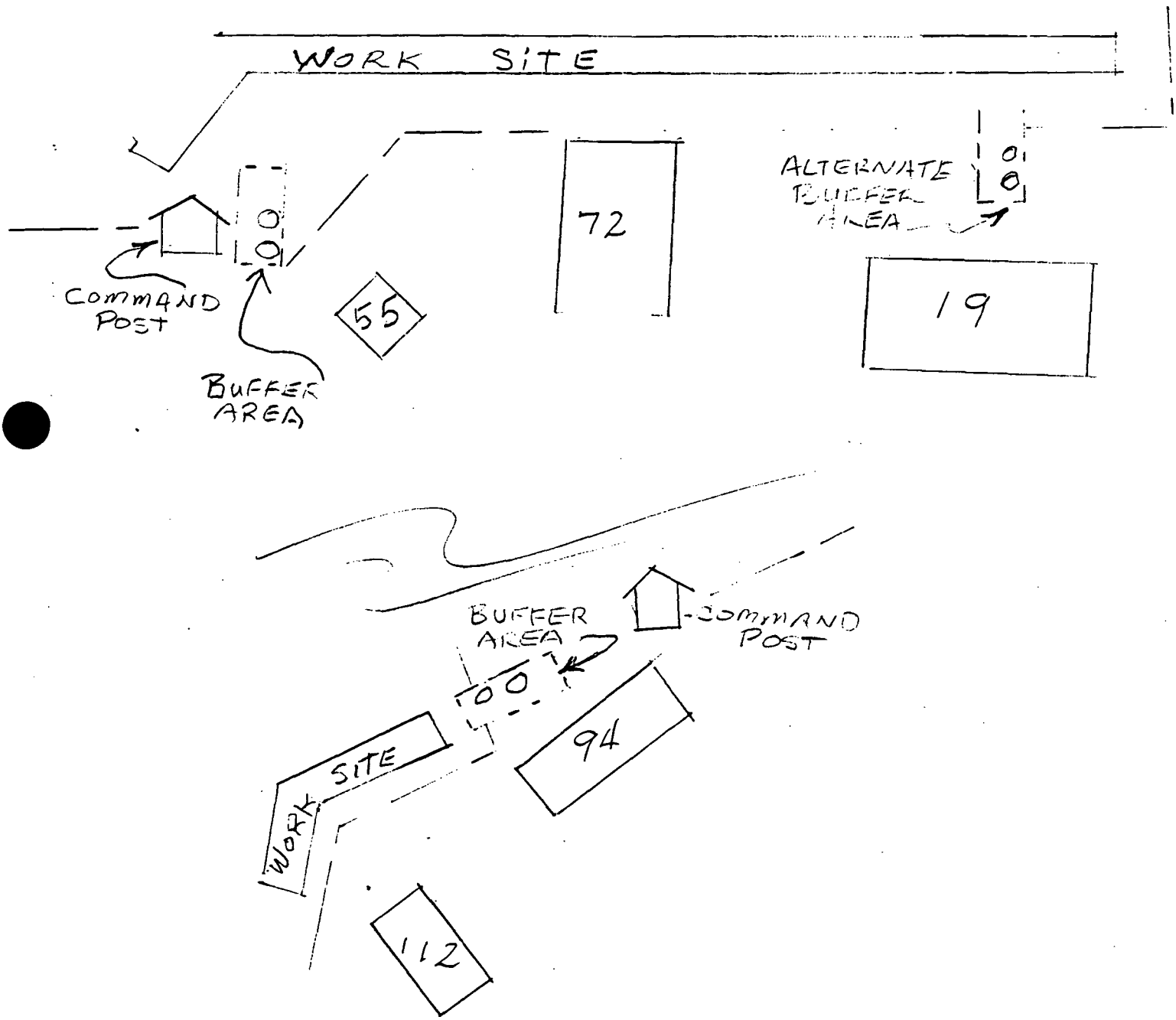
Compressed gas cylinders? Yes ☐ No ■

Location: _____

Storage: _____

9.0 Decontamination

9.1 Decontamination Diagram



9.2 Decontamination Description

Station #	Purpose	Procedures

10.0 EMERGENCY PREPAREDNESS

Attach Map with clear markings to indicate:
- Evacuation route
- Assembly Area
- Areas of Refuge (if applicable)

EMERGENCY CONTACTS: All emergency services at the Site are to be contacted by first calling the Fire Department at 911. Other emergency services may be reached at the telephone numbers shown below.

Facility Personnel	Name	Phone
Project Engineer	Dean Buckner	3407
Program Heath & Safety Coordinator	Dan Garrison	5281
Industrial Hygiene	Rod Lynch	4473
Industrial Safety	Dan Garrison	5281
Health Physics	Steve Collas	3178
Waste Management	Mary Alexander	3428
HAZWOPER Coordinator	Dan Garrison	(847)-5281

Emergency Assistance Services	Name	Phone
Security Police	Mound Security Police	3100
Ambulance	Mound Paramedics	911
Medical Clinic	Mound Medical	3414
Doctor	Mound Doctor On-Call	3414

11.0 RECORD KEEPING REQUIREMENTS

(Mark with an X as appropriate)

Required	
Hazardous Chemicals	
Area monitoring	____
Personnel monitoring	____
Oxygen Level Measurements	____
Flammability Measurements	____
Ionizing Radiation	
Worker dose	____
Contamination levels	____
Airborne contamination level	____
Radiation work permit	X
Non-Ionizing Radiation	
UV level measurements	____
Microwave level measurements	____
Laser power level measurements	____
Biological	
Personnel exposure monitoring	____
Electrical	
Tag-out records	____
Temperature extremes	
WBGT measurements	____
Daily temperature/wind speed	____
Noise	
Area monitoring	____
Personnel monitoring	____
Confined Space Permits	____
Welding Permits	____
Excavation Permits	X
Illumination	
Area foot-candle measurements	____
Personnel Medical Monitoring	____
Safety Incidents	
OSHA accident records	X
Accident/incident reports	X
Personal Protection Equipment	
Inspection of: Clothing	____
Respirators	____
Gloves	____
Boots	____
Waste Disposal Manifests	____
Spill Incident Reports	____
Training of Employees	____
Emergency Response Training	
Emergency Response Drills	____
Medical Emergency Drills	____
Pre-Job Safety Briefing Log	X

MAXIMUM MEASURES FOR LEVEL C DECONTAMINATION

Station 1: **Segregated Equipment**
Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, a cool-down station may be set up within this area.

Station 2 **Boot Cover and Glove Wash**
Scrub outer boot covers and gloves with decon solution or detergent and water.

Station 3: **Boot Cover and Glove Rinse**
Rinse off decon solution from Station 2 using copious amounts of water.

Station 4: **Tape Removal**
Remove tape around boots and gloves and deposit in container with plastic liner.

Station 5: **Boot Cover Removal**
Remove boot covers and deposit in containers with plastic liner.

Station 6: **Outer Glove Removal**
Remove outer gloves and deposit in container with plastic liner.

Station 7: **Suit and Boot Wash**
Wash splash suit, gloves, and safety boots. Scrub with long-handle scrub brush and decon solution.

Station 8: **Suit, Boot, and Glove Rinse**
Rinse off decon solution using water. Repeat as many times as necessary.

Station 9: **Canister or Mask Change**
If worker leaves exclusion zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot covers are donned, and joints are taped. Worker returns to duty.

Station 10: **Safety Boot Removal**
Remove safety boots and deposit in container with plastic liner.

Station 11: **Splash Suit Removal**
With assistance of helper, remove splash suit. Deposit in container with plastic liner.

Station 12: **Inner Glove Removal**
Wash inner gloves with decon solution.

Station 13: **Inner Glove Wash**
Rinse inner gloves with water.

Station 14: **Face Piece Removal**
Remove face piece. Deposit in container with plastic liner. Avoid touching face with fingers.

Station 15: **Inner Glove Removal**
Remove inner gloves and deposit in lined container.

Station 16: **Inner Clothing Removal**
Remove clothing soaked with perspiration and place in lined container. Do not wear inner clothing off-site since there is a probability that small amounts of contaminate might have been transferred in removing the fully-encapsulating suit.

Station 17: **Field Wash**
Shower if highly toxic, skin-corrosive, or skin-absorbable materials are known or suspected to be present. Wash hands and face if shower is not available

Station 18: **Redress**
Put on clean clothes.

MINIMUM MEASURES FOR LEVEL C DECONTAMINATION

Station 1: **Equipment Drop**
Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, a cool-down station may be set up within this area.

Station 2: **Outer Garment, Boots, and Gloves Wash and Rinse**
Scrub outer boots, outer gloves, and splash suit with decon solution or detergent water. Rinse off using copious amounts of water.

Station 3: **Outer Boot and Glove Removal**
Remove outer boots and gloves. Deposit in container with plastic liner.

Station 4: **Canister or Mask Change**
If worker leaves exclusive zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot covers are donned, joints are taped, and worker returns to duty.

Station 5: **Boot, Gloves and Outer Garment Removal**
Boots, chemical-resistant splash suit, and inner gloves are removed and deposited in separate containers lined with plastic.

Station 6: **Face Piece Removal**
Face piece is removed. Avoid touching face with fingers. Face piece is deposited on plastic sheet.

Station 7: **Field Wash**
Hands and face are thoroughly washed. Shower as soon as possible.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

(An Addendum to the EG&G Mound General Health and Safety Plan MD-10286,G1)

(March 1995)

FOR

Site Name: Soil Removal, Bldg. 21 Area

Prepared by: _____ 3/30/95
(Signature) (Date)

Reviewed by: _____ 4-3-95
Health Physics (Signature) (Date)

Reviewed by: _____ 4/4/95
Industrial Hygiene (Signature) (Date)

Reviewed by: _____ 8 May 95
Industrial Safety (Signature) (Date)

Reviewed by: _____ May 9 1995
Occupational Medicine (Signature) (Date)

Approved by: _____ 10 May 95
HAZWOPER Coordinator (Signature) (Date)

1.0 SITE DESCRIPTION

The Site is located at DOE, Mound Plant (See Site Map).

The Site is near the (streams, roads, other landmarks) in the drainage channel south of Bldg. 21 and parallel with the paved road.

The Site is (brief description of terrain, vegetation, land use) mostly grass in the drainage depression, and gravel where two roads cross the ditch.

2.0 SITE HISTORY

(Brief description of site history and use. Include all site activities that may contribute to current site conditions). A Mound site survey project analyzed soil samples collected from the areas of concern upgradient of the fenced boundary separating the old property from the new. The primary area of concern, designated as Area 1, is located near Bldg. 21 and the contaminated soil boxed storage area. Area 1 was used for storage of plutonium-238 waste packages in the mid-1960s and for storage and repackaging of thorium sludge from 1966 to 1974. Several soil samples showed elevated levels of plutonium-238 and thorium (see DOE, 1993a for sampling locations and detailed results). The maximum plutonium-238 and thorium concentrations in the surface soil samples near Bldg. 21 were 34,000 pCi/g and 54.3 pCi/g, respectively. Recently, soil samples were cored on 50' centers for the full length of the proposed ditch. Soil screens for Pu-238 and Th-232 were made for each point at near-surface (6") and at depth (4'-5'). No readings for Th-232 or Pu-238 were above the actions levels. No other radionuclides were indicated.

3.0 HEALTH AND SAFETY HAZARD EVALUATION

[Place an X in each ( ) to indicate presence of hazard]

3.1 Physical Hazards

☐ Heat Stress	☐ Cold Stress	■ Noise
☐ Confined Space	☐ Enclosed Space	☐ Heavy Lifting
■ Tripping/Falling	☐ High Voltage	☐ High Pressure Water
☐ Oxygen Deficient	☐ Explosive/Flammable	☐ Vibration

3.2 Construction Hazards

☐ Trenching	■ Excavating	■ Heavy Equipment Op.
☐ Demolition	☐ High Work	☐ Welding/Cutting
☐ Ladders	☐ _____	☐ _____

3.3 Chemical Hazards

☐ Organic Chemical	☐ Inorganic Chemical	☐ Carcinogen
☐ Corrosive	☐ Reactive	☐ OSHA Specific Substances
☐ Mutagen	☐ Teratogen	

3.4 Ionizing Radiological Hazards

■ Internal Exposure	■ External Exposure

3.5 Non-Ionizing Radiological Hazards N/A

☐ UV	☐ RF	☐ Microwave
☐ Laser		

3.6 Biological Hazards N/A

☐ Wildlife	☐ Plants	☐ Medical Waste
☐ Bacterial	☐ Parasites	

4.0 PREVIOUS SAMPLING RESULTS

Contaminant	Source (Water. Sediment, Sludge. Soil. Air. etc.)	Quantity or Concentration

5.0 CONTAMINANTS Attach MSDS's if available

5.1 Chemical: None Known **IDLH:**

PEL/TLV*: LEL:
STEL:
Action Level:
Route of Exposure:
Monitoring Equipment:
Symptoms/Effects of Exposure:
Special Medical Monitoring:

5.2 Chemical: **IDLH:**

PEL/TLV*: LEL:
STEL:
Action Level:
Route of Exposure:
Monitoring Equipment:
Symptoms/Effects of Exposure:
Special Medical Monitoring:

5.3 Chemical: **IDLH:**

PEL/TLV*: LEL:
STEL:
Action Level:
Route of Exposure:
Monitoring Equipment:
Symptoms/Effects of Exposure:
Special Medical Monitoring:

5.4 Chemical: **IDLH:**

PEL/TLV*: LEL:
STEL:
Action Level:
Route of Exposure:
Monitoring Equipment:
Symptoms/Effects of Exposure:
Special Medical Monitoring:

* OSHA, NOISH, or ACGIH Standard, whichever is most restrictive

5.5 Chemical: **IDLH:**

PEL/TLV*: LEL:
STEL:
Action Level:
Route of Exposure:
Monitoring Equipment:
Symptoms/Effects of Exposure:
Special Medical Monitoring:

5.6 Chemical: **IDLH:**

PEL/TLV*: LEL:
STEL:
Action Level:
Route of Exposure:
Monitoring Equipment:
Symptoms/Effects of Exposure:
Special Medical Monitoring:

5.7 Chemical: **IDLH:**

PEL/TLV*: LEL:
STEL:
Action Level:
Route of Exposure:
Monitoring Equipment:
Symptoms/Effects of Exposure:
Special Medical Monitoring:

* OSHA, NOISH, or ACGIH Standard, whichever is most restrictive

6.0 TASK BREAKDOWN

(Provide detailed description, controls, and requirements, for each task to be performed, i.e., drilling, sampling, etc.)

6.1 Description: TASK 1 - Remove contaminated soil. Heavy-Duty operators using track or backhoe will dig soil strips approximately 1' x 12' x 30', and load debris into LSA Boxes for disposal.

Level of Personal Protective Equipment: Primary D Contingency C

Type of Work: Digging ■ Non-Digging ☐

Engineering Controls: Use straw bales to prevent run-off. Suppress dust with water mist. Use two high-volume air samplers, one continuous air monitors, and lapel monitors for each worker. HP and/or Industrial Hygiene will provide 100% monitoring using appropriate equipment.

Administrative Controls: (required permits, training, etc.)
D&D Excavating/Digging, RWP
Excavation Work Permits
RAD Worker II Training
Approved training for heavy-duty equipment operations.

Personal Protective Equipment: HAZWOPER

		Primary		Contingency	
		(Write Type Here:)			
a)	Respiratory Protection:	Y ☐	N ■	Y ■	N ☐
b)	Protective Clothing:	Y ■	N ☐	Y ■	N ☐
c)	Head Protection:	Y ■	N ☐	Y ■	N ☐
d)	Eye Protection:	Y ■	N ☐	Y ■	N ☐
e)	Foot Protection:	Y ■	N ☐	Y ■	N ☐
f)	Hand Protection:	Y ■	N ☐	Y ■	N ☐
g)	Hearing Protection:	Y ■	N ☐	Y ■	N ☐
h)	Tape-up Required:	Y ☐	N ■	Y ☐	N ■

6.2 Description: TASK 2 Project Support. Monitoring/Sampling - Health Physics and Industrial Hygiene will monitor the work for the duration of TASK 1. Health Physics to perform radiological Verification/Certification prior to release as decontaminated zone.

Level of Personal Protective Equipment: Primary D Contingency C

Type of Work: Digging ■ Non-Digging

Engineering Controls: Use two high-volume air samplers, one continuous air monitor, and a lapel monitor for each person working within the controlled area.

Administrative Controls: Industrial Hygiene and HP will conduct the monitoring/sampling using PID/FID, RAM, etc. as D&D Work Permit, RWP, and RAD Worker II Training.

(required permits, required.

Personal Protective Equipment:

		Primary		Contingency	
		(Write Type Here:)			
a)	Respiratory Protection:	Y ☐	N ■	Y ■	N ☐
b)	Protective Clothing:	Y ■	N ☐	Y ■	N ☐
c)	Head Protection:	Y ■	N ☐	Y ■	N ☐
d)	Eye Protection:	Y ■	N ☐	Y ■	N ☐
e)	Foot Protection:	Y ■	N ☐	Y ■	N ☐
f)	Hand Protection:	Y ■	N ☐	Y ■	N ☐
g)	Hearing Protection:	Y ■	N ☐	Y ■	N ☐
h)	Tape-up Required:	Y ☐	N ■	Y ☐	N ■

Personal Protective Equipment:

		Primary		Contingency	
		(Write Type Here:)			
a)	Respiratory Protection:	Y ☐	N ☐	Y ☐	N ☐
b)	Protective Clothing:	Y ☐	N ☐	Y ☐	N ☐
c)	Head Protection:	Y ☐	N ☐	Y ☐	N ☐
d)	Eye Protection:	Y ☐	N ☐	Y ☐	N ☐
e)	Foot Protection:	Y ☐	N ☐	Y ☐	N ☐
f)	Hand Protection:	Y ☐	N ☐	Y ☐	N ☐
g)	Hearing Protection:	Y ☐	N ☐	Y ☐	N ☐
h)	Tape-up Required:	Y ☐	N ☐	Y ☐	N ☐

6.4 Description:

Level of Personal Protective Equipment: Primary _____ Contingency _____

Type of Work: Digging ☐ Non-Digging ☐

Engineering Controls: _____

Administrative Controls: (required permits, training, etc.) _____

Personal Protective Equipment:

		Primary		Contingency	
		(Write Type Here:)			
a)	Respiratory Protection:	Y ☐	N ☐	Y ☐	N ☐
b)	Protective Clothing:	Y ☐	N ☐	Y ☐	N ☐
c)	Head Protection:	Y ☐	N ☐	Y ☐	N ☐
d)	Eye Protection:	Y ☐	N ☐	Y ☐	N ☐
e)	Foot Protection:	Y ☐	N ☐	Y ☐	N ☐
f)	Hand Protection:	Y ☐	N ☐	Y ☐	N ☐
g)	Hearing Protection:	Y ☐	N ☐	Y ☐	N ☐
h)	Tape-up Required:	Y ☐	N ☐	Y ☐	N ☐

7.0 WORKER TRAINING

All personnel assigned to work in a Radiation Control Area must have completed the forty-hour HAZWOPER course, as well as RAD Worker II training. The accompanying verification sheet signifies that those named are thus authorized to enter the controlled area. It must be posted at the job site.

A pre-entry briefing will be held with all employees assigned to the work site, prior to any site activity, in order to completely review the Site Specific Health and Safety Plan. A daily pre-job meeting will be held with all personnel to describe the planned day's work, and will stress each of the anticipated safety hazards. The accompanying "Briefing Log" will be completed for each case and retained in the job file.

VERIFIED TRAINING DATES					
Name	**HP #**	**40-Hour**	**24-Hour**	**8-Hour Site Supervisor**	**8-Hour Refresher**
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					

PRE-JOB SAFETY BRIEFING LOG

PROJECT: _____

DATE: _____

TOPICS

NAME (Print)	H.P.#	SIGNATURE

8.0 HAZARD ANALYSIS

8.1 Chemicals N/A

TASKS 1 and 2

Specific labeling requirements of site-generated waste: _____

Chemical-specific disposal requirements: _____

8.2 Fire/Explosion

TASKS 1 and 2

Are flammable liquids present? Yes ☐ No ■

Description: _____
Location: _____
Quantity: _____
Containment/Storage method: _____

For welding, cutting, or brazing is a Welding Permit required? Yes ☐ No ☐

8.3 Confined/Enclosed Spaces

(see Confined Space Entry Procedures, MD-10286, Operation # M-11)

TASKS 1 and 2

Confined/enclosed space entry required? Yes ☐ No ■

Confined Space Entry Permit issued? Yes ☐ No ■

Hazard Class A ____ B ____ C ____

Reason for Hazard Class selection: _____

8.4 Ionizing Radiation

TASKS 1 and 2

Applicable detailed checklist? Yes ☐ No ■ NA ☐

Primary contaminating isotope(s): Pu-238 Th-232

Location on site: Soil

Containment/storage method: LSA Boxes

Radiation type: Alpha ■ Beta ■ Gamma ■ Neutron ☐

Dose rate (maximum): <0.1 mR/h @ 0.3 meter(s)
(average) 0.1 mR/h

Worker dose limit: 1000 mR/yr

Contamination level (fixed): _____ dpm/100 cm^2
(removable) _____ dpm/100 cm^2

Airborne contamination conc.: $<3 \times 10^{-19}$ Ci/ml
(<0.1 DAC) (Pu-238 DAC = 3×10^{-12} mCi/ml)

Water contamination potential? Yes ■ No ☐

Unrestricted airborne contamination release potential?: Yes ■ No ☐

Radiation work permit required? Yes ■ No ☐

Health Physics coverage: Continuous ■ Intermittent ☐ Conditional ☐

Special task operation requirements:
- ☐ Welding/cutting/brazing
- ☐ Grinding/chipping
- ☐ Hydraulic/air hammer operation
- ■ Dusty conditions (sweeping, vacuuming, etc.)
- ■ Equipment decontamination/free release

8.5 Non-Ionizing Radiation

TASKS 1 and 2

High-Voltage (>100 Kv) electrical transmission lines nearby? Yes ☐ No ■

Location, distance, and voltage: _____

Radiofrequency radiation sources (AM and/or FM broadcast towers, r-f sealers) nearby? Yes ☐ No ■
Location and distance: _____

Microwave sources in use on site? Yes ☐ No ■
Location and description: _____

Lasers in use nearby? Yes ☐ No ■
Location and laser class: _____

Are ultrasound sources in use on site? Yes ☐ No ■
Location: _____

Are workers potentially exposed to ultraviolet radiation (welder's arc or prolonged sunlight)? Yes ■ No ☐
Precautions to take: PPE to guard against sun exposure.

8.6 Electrical Hazards

TASKS 1 and 2

Electrical shock hazard? Yes ■ No ☐
Answer YES if any of the below are checked:

- ☐ Over head power lines within 10 feet.
- ☐ Potential for underground electrical lines.
- ☐ Potential for concealed lines in walls, conduits, ceilings, etc.
- ☐ Electrically powered tools being used outdoors or near standing water.
- ☐ Power tools being used near recognized grounding surfaces, such as metal tanks, pipelines, or grounded floors.
- ■ Portable generators being used.

Location of hazard: _____

220 Voltage

Abatement:

- ■ Have appropriate scans been performed?
- ■ Are Ground Fault Circuit Interrupters (GFCI) in use with work involving portable hand tools, outdoor work, or with portable generators?
- ■ Have portable generators been properly grounded?
- ☐ Have procedures been implemented to assure that equipment of materials do not come within 10 feet of overhead power lines?

8.7 Temperature Extremes

TASKS 1 and 2

Temperature extremes (Hot ☐ Cold ☐?) Yes ☐ No ☐

_____ Average daily high temperature (during work shift) °F ■ °C ☐
_____ Average daily low temperature (during work shift) °F ■ °C ☐
_____ Average wind speed MPH
_____ Temperature WBGT °C cloudy ☐ sunny ☐

Work load:

- ☐ Light
- ☐ Moderate
- ☐ Heavy

Work/Rest regimen:

____ % work
____ % rest

Threshold Limit Value: _____
Precautions (specify): _____

Cooling/heating equipment needed: _____

8.8 Noise

TASKS 1 and 2

Noise extremes? Yes ■ No ☐
Sound level: _____ dB(A)
Noise source(s): Heavy-Duty Equipment

Noise above 85 dB(A) (hearing protection required): Yes ■ No ☐

Precautions (specify): Workers wear ear protection while heavy-duty equipment is operating.

8.9 Vibration

TASKS 1 and 2

Vibration extremes? Yes ☐ No ■

Vibration frequency: _____

Precautions (specify): _____

8.10 Sanitation

TASKS 1 and 2

Potable water required? Yes ■ No ☐

Non-potable water used? Yes ☐ No ■

Eating, drinking, and smoking permitted? Yes ■ No ☐

Where? Outside of control area.

Toilet facilities required? Yes ■ No ☐
Location and number: 1 at work site

Washing facilities required? Yes ■ No ☐
Location and number: PP Building

Change rooms required? Yes ■ No ☐
Specify: PP Building

8.11 Illumination

TASKS 1 and 2

Additional illumination needed? Yes ☐ No ■ NA ☐

What types and where located? _____

8.12 Safety Hazards

Site posted information/notification required? Yes ■ No ☐ NA ☐

Site posting required? Yes ■ No ☐

Site guard required? Yes ☐ No ■ NA ☐

Access control required? Yes ■ No ☐

Entry logs required? Yes ■ No ☐

Escape routing/posting required (include site map)? Yes ■ No ☐

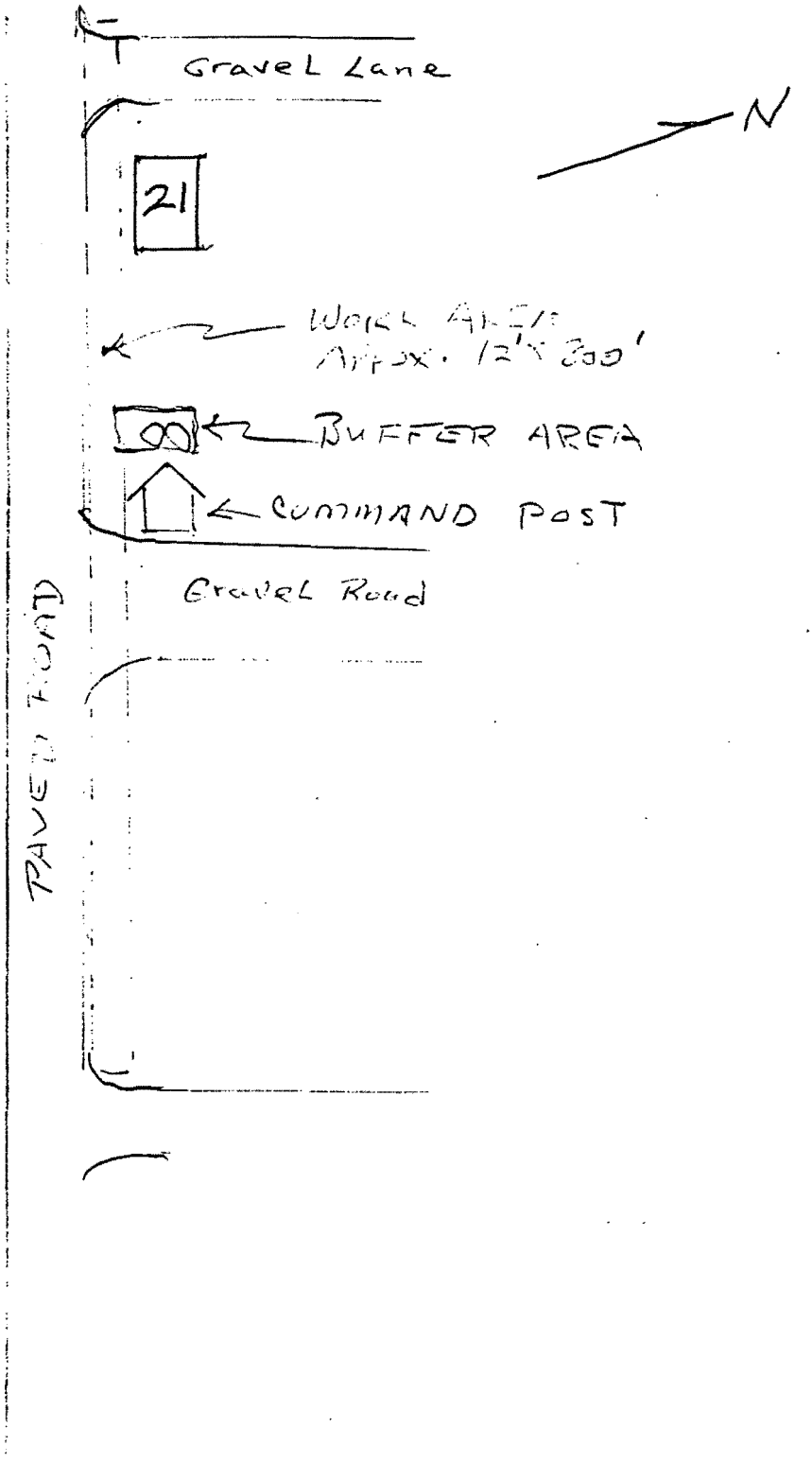
Compressed gas cylinders? Yes ☐ No ■

Location: _____

Storage: _____

9.0 Decontamination

9.1 Decontamination Diagram



9.2 Decontamination Description

Station #	Purpose	Procedures

10.0 EMERGENCY PREPAREDNESS

Attach Map with clear markings to indicate:
- Evacuation route
- Assembly Area
- Areas of Refuge (if applicable)

EMERGENCY CONTACTS: All emergency services at the Site are to be contacted by first calling the Fire Department at 911. Other emergency services may be reached at the telephone numbers shown below.

Facility Personnel	Name	Phone
Project Engineer	Dean Buckner	3407
Program Heath & Safety Coordinator	Dan Garrison	5281
Industrial Hygiene	Rod Lynch	4473
Industrial Safety	Dan Garrison	5281
Health Physics	Steve Collas	3178
Waste Management	Mary Alexander	3428
HAZWOPER Coordinator	Dan Garrison	(847)-5281

Emergency Assistance Services	Name	Phone
Security Police	Mound Security Police	3100
Ambulance	Mound Paramedics	911
Medical Clinic	Mound Medical	3414
Doctor	Mound Doctor On-Call	3414

11.0 RECORD KEEPING REQUIREMENTS

(Mark with an X as appropriate)

Required	
Hazardous Chemicals	
Area monitoring	____
Personnel monitoring	____
Oxygen Level Measurements	____
Flammability Measurements	____
Ionizing Radiation	
Worker dose	X
Contamination levels	X
Airborne contamination level	X
Radiation work permit	X
Non-Ionizing Radiation	
UV level measurements	____
Microwave level measurements	____
Laser power level measurements	____
Biological	
Personnel exposure monitoring	____
Electrical	
Tag-out records	____
Temperature extremes	
WBGT measurements	____
Daily temperature/wind speed	____
Noise	
Area monitoring	____
Personnel monitoring	____
Confined Space Permits	____
Welding Permits	____
Excavation Permits	X
Illumination	
Area foot-candle measurements	____
Personnel Medical Monitoring	____
Safety Incidents	
OSHA accident records	X
Accident/incident reports	X
Personal Protection Equipment	
Inspection of: Clothing	____
Respirators	____
Gloves	____
Boots	____
Waste Disposal Manifests	____
Spill Incident Reports	____
Training of Employees	X
Emergency Response Training	
Emergency Response Drills	____
Medical Emergency Drills	____
Pre-Job Safety Briefing Log	X

MAXIMUM MEASURES FOR LEVEL C DECONTAMINATION

Station 1: **Segregated Equipment**
Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, a cool-down station may be set up within this area.

Station 2 **Boot Cover and Glove Wash**
Scrub outer boot covers and gloves with decon solution or detergent and water.

Station 3: **Boot Cover and Glove Rinse**
Rinse off decon solution from Station 2 using copious amounts of water.

Station 4: **Tape Removal**
Remove tape around boots and gloves and deposit in container with plastic liner.

Station 5: **Boot Cover Removal**
Remove boot covers and deposit in containers with plastic liner.

Station 6: **Outer Glove Removal**
Remove outer gloves and deposit in container with plastic liner.

Station 7: **Suit and Boot Wash**
Wash splash suit, gloves, and safety boots. Scrub with long-handle scrub brush and decon solution.

Station 8: **Suit, Boot, and Glove Rinse**
Rinse off decon solution using water. Repeat as many times as necessary.

Station 9: **Canister or Mask Change**
If worker leaves exclusion zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot covers are donned, and joints are taped. Worker returns to duty.

Station 10: **Safety Boot Removal**
Remove safety boots and deposit in container with plastic liner.

Station 11: **Splash Suit Removal**
With assistance of helper, remove splash suit. Deposit in container with plastic liner.

Station 12: **Inner Glove Removal**
Wash inner gloves with decon solution.

Station 13: **Inner Glove Wash**
Rinse inner gloves with water.

Station 14: **Face Piece Removal**
Remove face piece. Deposit in container with plastic liner. Avoid touching face with fingers.

Station 15: **Inner Glove Removal**
Remove inner gloves and deposit in lined container.

Station 16: **Inner Clothing Removal**
Remove clothing soaked with perspiration and place in lined container. Do not wear inner clothing off-site since there is a probability that small amounts of contaminate might have been transferred in removing the fully-encapsulating suit.

Station 17: **Field Wash**
Shower if highly toxic, skin-corrosive, or skin-absorbable materials are known or suspected to be present. Wash hands and face if shower is not available

Station 18: **Redress**
Put on clean clothes.

MINIMUM MEASURES FOR LEVEL C DECONTAMINATION

Station 1: **Equipment Drop**
Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, a cool-down station may be set up within this area.

Station 2: **Outer Garment, Boots, and Gloves Wash and Rinse**
Scrub outer boots, outer gloves, and splash suit with decon solution or detergent water. Rinse off using copious amounts of water.

Station 3: **Outer Boot and Glove Removal**
Remove outer boots and gloves. Deposit in container with plastic liner.

Station 4: **Canister or Mask Change**
If worker leaves exclusive zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot covers are donned, joints are taped, and worker returns to duty.

Station 5: **Boot, Gloves and Outer Garment Removal**
Boots, chemical-resistant splash suit, and inner gloves are removed and deposited in separate containers lined with plastic.

Station 6: **Face Piece Removal**
Face piece is removed. Avoid touching face with fingers. Face piece is deposited on plastic sheet.

Station 7: **Field Wash**
Hands and face are thoroughly washed. Shower as soon as possible.

ATTACHMENT "A"

CHEMICAL CONTAMINANTS

DATA SHEETS

(Use HASP Form 28HASP.894
or attach appropriate data sheets.)

(NOT APPLICABLE)

ATTACHMENT "B"

MATERIAL SAFETY AND DATA SHEETS (MSDS)

ATTACHMENT "C"

SAFETY PROCEDURES/FIELD OPS (FLDOPS)

(A full set of WESTON Field OPs are on file with the Field Team Leader and SHSCs at each job site or rig.)

ATTACHMENT "D"

SITE SPECIFIC HAZARD COMMUNICATION PROGRAM

Location Specific Hazard Communications Program/Checklist

In order to ensure an understanding of and compliance with the Hazard Communication Standard, WESTON will utilize this checklist/document (or similiar document) in conjunction with the WESTON Written Hazard Communications Program as a means of meeting site or location specific requirements.

While responsibility for activities within this document reference the WESTON Safety Officer, it is the responsibiltiy of all personnel to effect compliance. Responsiblities under various conditions can be found within the WESTON Written Hazard Communication Program.

To ensure that information about the dangers of all hazardous chemicals used by WESTON are known by all affected employees, the following hazardous information program has been established. All affected personnel will participate in the hazard communication program. This written program as well as WESTON's Corporate Hazard Communication Program will be available for review by any employee, employee representative, representative of OSHA, NIOSH or any affected employer/employee on a multi-employer site.

___ Site or other location name/address:

_____

___ Site/Project/Location Manager:_____

___ Site/Location Safety Officer:_____

___ List of chemicals complied, format: HASP:____ Other:____

___ Location of MSDS Files:

_____

___ Training Conducted by (name and date):_____

___ Indicate format of training documentation: Field Log:____ Other:____

___ Client briefing conducted regarding hazard communication:

___ If multi-employer site, indicate name of affected companies:

_____

___ Other employer(s) notified of chemicals, labelling and MSDS information:

___ WESTON notified of other employer's or clients hazard communication program as necessary.

List of Hazardous Chemicals

A list of known hazardous chemicals used by WESTON personnel must be prepared and attached to this document or in a centrally identified location with the MSDS's. Further information on each chemical may be obtained by reviewing the appropriate MSDS's. The list will be arranged to enable cross reference with the MSDS file and the label on the container. The SO or location manager is responsible for ensuring the chemical listing remains up-to-date.

Container Labeling

The WESTON Safety Officer (SO) will verify that all containers received from the chemical manufacturer, importer or distributor for use on site will be clearly labeled.

The SO is responsible for assuring labels are placed where required and for comparing MSDS's and other information with label information to ensure correctness.

Material Safety Data Sheets (MSDS)

The SO is responsible for establishing and monitoring WESTON's MSDS program for the location. The SO will make sure procedures are developed to obtain the necessary MSDS's and will review incoming MSDS's for new or significant health and safety information. He/she will see that any new information is passed on to the affected employees. If an MSDS is not received at the time of initial shipment, the SO will call the manufacturer and have a MSDS delivered for that product in accordance with the requirements of WESTON's Written Hazard Communication Program.

A log for, and copies of, MSDS's for all hazardous chemicals in use will be kept in the MSDS folder at a location known to all site workers. MSDS's will be readily available to all employees during each work shift. If an MSDS is not available, immediately contact the WESTON SO or designated alternate. When revised MSDS's are received the SO will immediately replace the old MSDS's.

Employee Training and Information

The SO is responsible for the WESTON site-specific personnel training program. The SO will ensure that all program elements specified below are supplied to all affected employees.

At the time of initial assignment for employees to the work site or whenever a new hazard is introduced into the work area employees will attend a health and safety meeting or briefing that includes the information indicated below.

- Hazardous chemicals present at the worksite
- Physical and health risks of the hazardous chemicals
- The signs and symptoms of overexposure
- Procedures to follow if employees are overexposed to hazardous chemicals
- Location of the MSDS file and written hazard communication program
- How to determine the presence or release of hazardous chemicals in the employees work area
- How to read labels and review MSDS's to obtain hazard information
- Steps WESTON has taken to reduce or prevent exposure to hazardous chemicals
- How to reduce or prevent exposure to hazardous chemicals through use of controls procedures, work practices and personal protective equipment
- Hazardous, non-routine tasks to be performed (if any)
- Chemicals within unlabled piping (if any)

Hazardous Non-Routine Tasks

When employees are required to perform hazardous non-routine tasks the affected employee(s) will be given information by the SO about the hazardous chemicals he or she may utilize during such activity. This information will include specific chemical hazards, protective and safety measures the employee can use and steps WESTON is using to reduce the hazards. These steps include, but are not limited to, ventilation, respirators, presence of another employee and emergency procedures.

Chemicals in Unlabeled Pipes

Work activities may be performed by employees in areas where chemicals are transferred through unlabeled pipes. Prior to starting work in these areas, the employee shall contact the SO at which time information as to; the chemical(s) in the pipes, potential hazards of the chemicals or the process involved, and safety precautions which should be taken will be determined and presented.

Multi-Employer Worksites

It is the responsibility of the SO to provide other employers with information about hazardous chemicals imported by WESTON to which their employees may be exposed, along with suggested safety precautions. It is also the responsibility of SO and the site manager to obtain information about hazardous chemicals used by other employers to which WESTON employees may be exposed. WESTON's chemical listing will be made available to other employers as requested. MSDS's will be available for viewing as necessary.

The location, format and/or procedures for accessing MSDS information must be relayed to affected employees.

Roy F. Weston, Inc.
11840-D Kempersprings Drive
Cincinnati, Ohio 45240-1640
® 513-825-3440 • Fax 513-825-3336

14 July 1995

EG&G Mound Applied Technologies
Attn: Mr. Gary Coons, COS-4
1 Mound Road
P.O. Box 3000
Miamisburg, Ohio 45343-3000

Re: ER Program, Mound Plant
BOA No. 24251, Task Order No. 52364
Drainage Control Interim Response Action
Health and Safety Plan Addendum I

RFW WO #: 05376-055-001

Dear Mr. Coons:

Roy F. Weston, Inc. (WESTON®) is submitting Addendum I (Attachment I) to the existing Safety Plan (HASP) for Task Order No. 52364, Drainage Control Interim Response Action. This addendum modifies the original HASP to reflect changes made in health and safety operations during the initial phase of the field effort.

If you have any questions, please contact me at (513) 825-3440.

Very truly yours,

ROY F. WESTON, INC.

Gordon S. Horn, P.E.
Alternate Project Manager

Attachment

pc: Rick Christopher, EG&G

Attachment I

Drainage Control Interim Response Action
Health and Safety Plan
Addendum I

Inter-Office Memorandum

TO:	Kevin Bate	**cc:**	Gordon Horn Barry Franz
FROM:	Michael G. Szabo Andrew R. Sperry	**DATE:**	14 July 1995
PROJECT:	EG&G Mound Drainage Control	**W.O. NO.:**	05376-055-001
SUBJECT:	Health and Safety Plan Addendum I		

ACTION:

This memo serves to amend the Drainage Control Interim Response Action Health and Safety Plan (HASP). Please review the following changes and sign this memo as approval of these changes.

1. Page 2 of 26: New Site Manager: Michael G. Szabo to replace Terry Lambert.

2. Page 2 of 26: New SHSC: Michael G. Szabo to replace Terry Lambert. Designated alternates to include: Windle McDonald, Michael May.

3. Page 2 of 26: New Project Manager: Barry Franz to replace Gordon Horn.

4. Page 4 of 26: Modify Chemical Hazards by removing Alconox, Hexane and Methanol from the list of chemicals. No sampling equipment will be used on this project therefore decontamination is not required.

5. Page 8-2 of 26: Task 2: Remove the use of the micro-R meter since Mound Health Physics is providing continuous coverage.

6. Page 8-3 of 26: Task 3: Remove the use of the micro-R meter since Mound Health Physics is providing continuous coverage.

7. Page 8-3 of 26: Modify Task 3 to include confined space entry to conform with WESTON OP FLD08.

8. Page 11 of 26: Modify requirements for direct Reading Air Monitoring Instruments:

- CGI/O_2 Meter - Per Mound Industrial Hygiene the combustible gas monitor/O_2 monitor is not required. This is an outside job with no large quantities of combustible gases or asphixyants. Trenching along the south drainage will be less than 4 feet in depth which is not considered a confined space. During construction, Mound Industrial Hygiene will periodically monitor with a PID/FID. Excavation behind Building 19, which exceeds 4 feet in depth, will follow confined space entry procedures where a CGI/O_2 monitor will be required per WESTON OP FLD08. Therefore, it will be required for only confined space entry under Task 3.

- Micro-R meter - Mound will provide continuous Health Physics coverage for the entire project therefore the mirco-R meter is not necessary.

- PID/OVM - These instruments are not applicable and should not have been indicated.

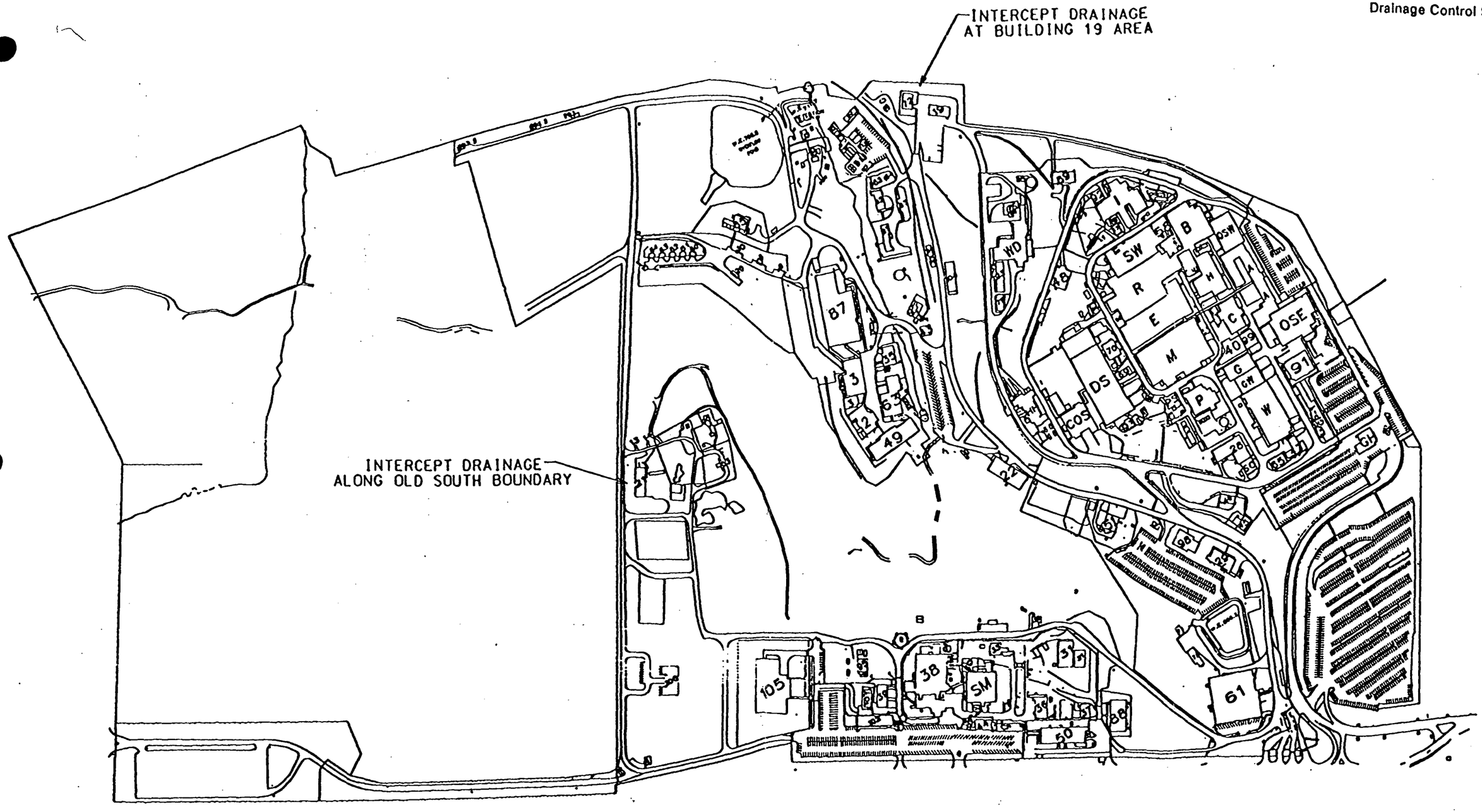
9. Page 19 of 26: Remove shower requirement from contingencies/ response plan. It is not applicable and should not have been indicated.

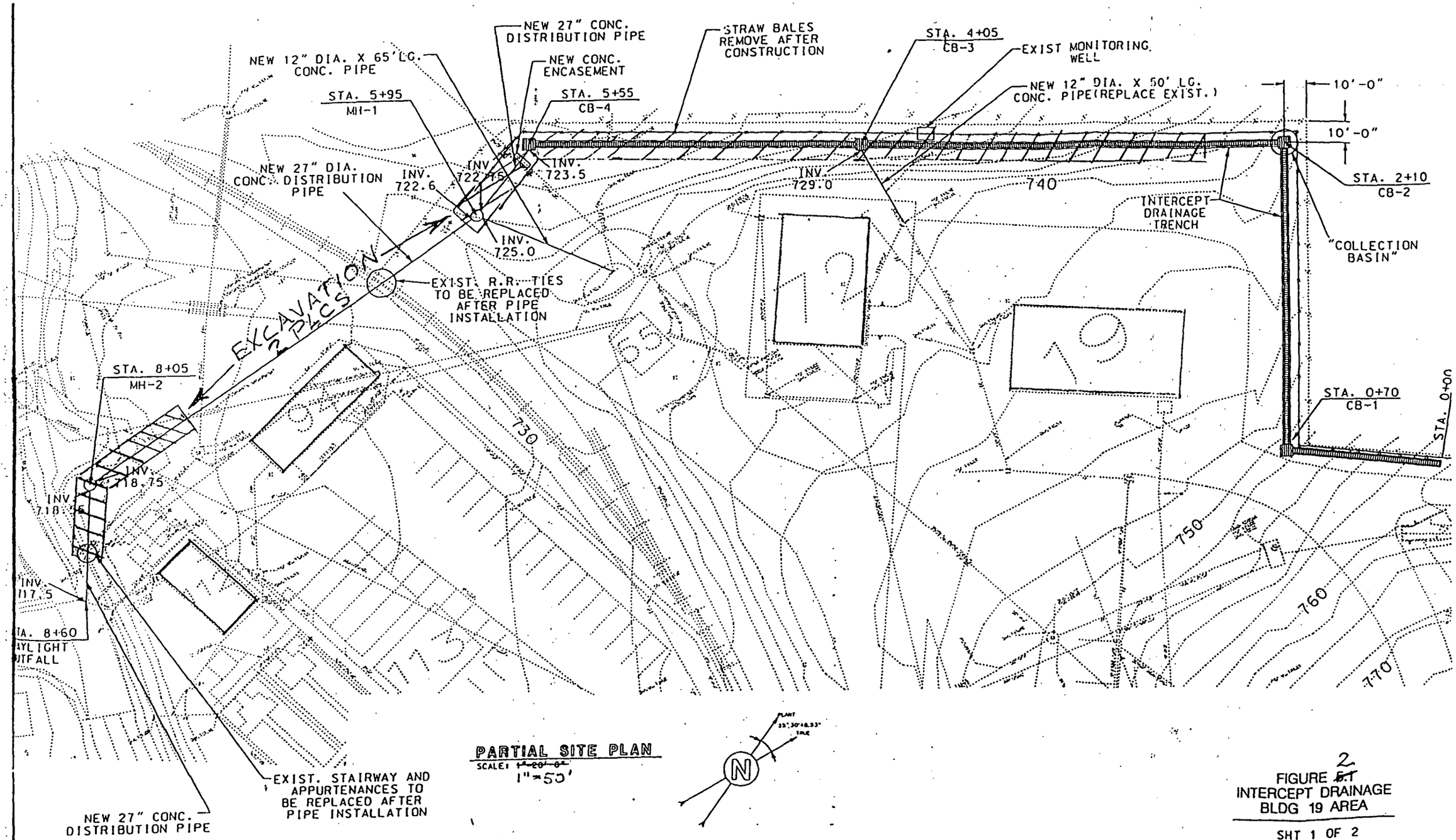
10. Page 20 of 26: Remove Sampling Equipment Decontamination from Decontamination Plan since there will be no sampling conducted other than by Mound Health Physics.

By signature below you authorize and approve the changes to the Drainage Control Interim Response Action HASP as stated above.

Gordon Horn, Alt. P.M.	7/14/95 Date
Barry Franz, P.I.	07/14/95 Date
Kevin Bate, RSO	7-14-95 Date
Michael Szabo, SHSC	7/14/95 Date

Figure 1.2 Location of Proposed Drainage Control Systems



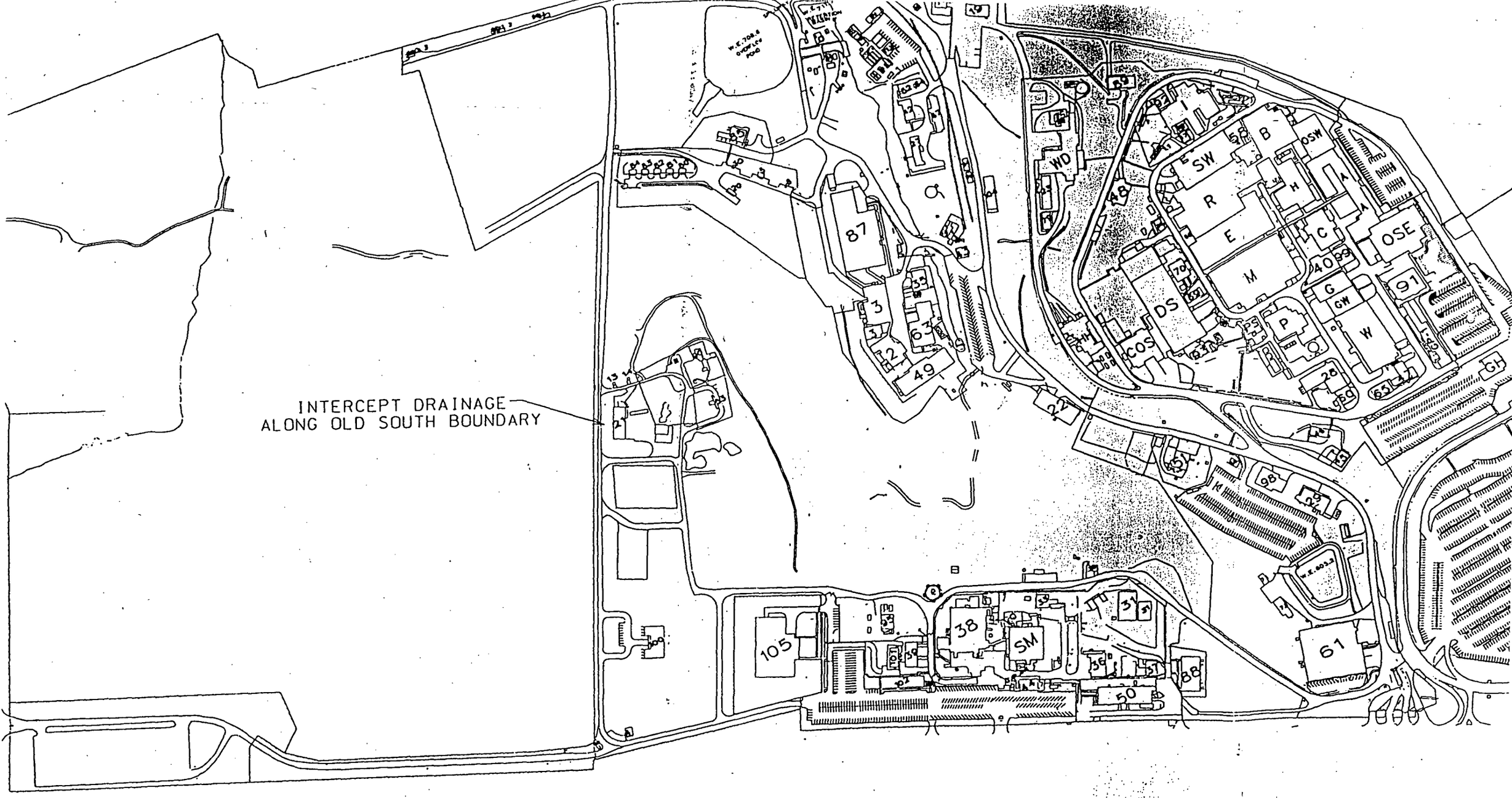


PARTIAL SITE PLAN
SCALE: ~~1"=20'-0"~~ 1"=50'

FIGURE ~~5.1~~ 2
INTERCEPT DRAINAGE
BLDG 19 AREA

SHT 1 OF 2

PG 4


INTERCEPT DRAINAGE
ALONG OLD SOUTH BOUNDARY
87
3
63
62
49
WD
SW
B
OSW
R
E
M
H
C
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OSE
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Pg 3

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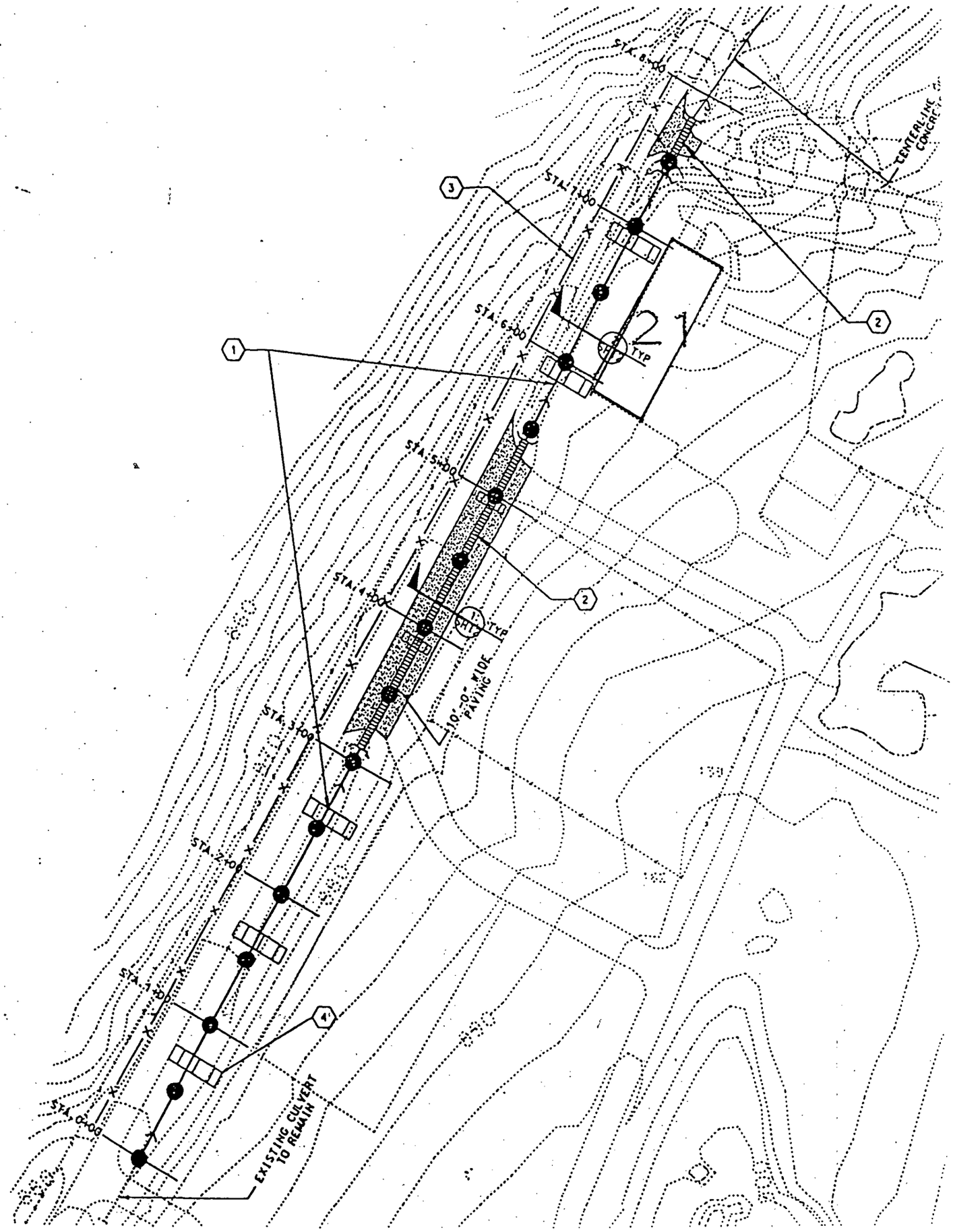
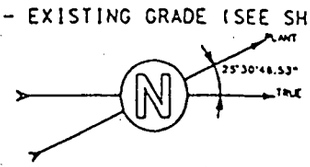


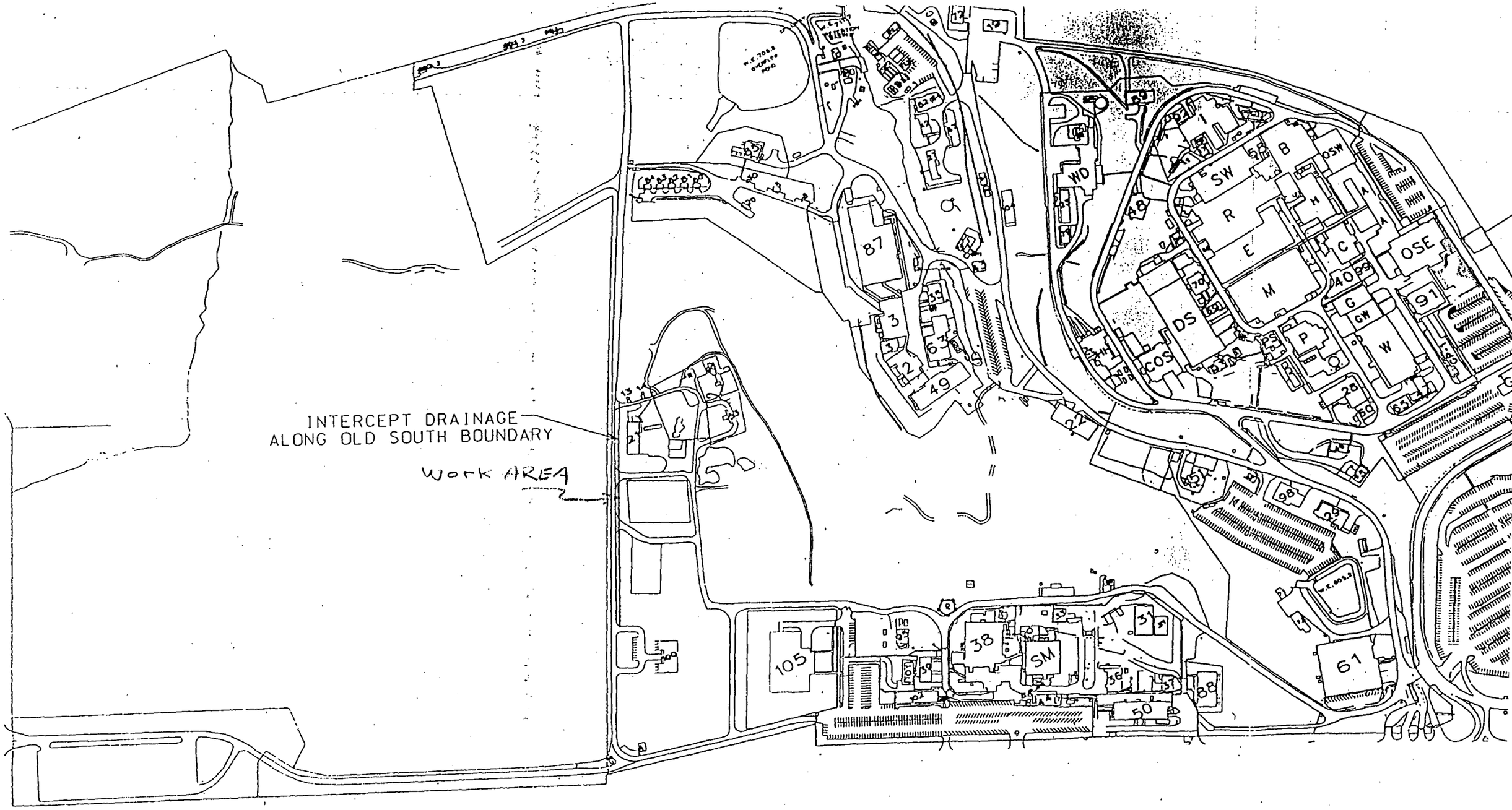
EXISTING GRADE (SEE SHT. 3 OF 3)



PLANVIEW

Figure 2.

INTERCEPT DRAINAGE ALONG OLD SOUTH BOUNDARY


INTERCEPT DRAINAGE
ALONG OLD SOUTH BOUNDARY
WORK AREA
87
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Pg 3

FIGU

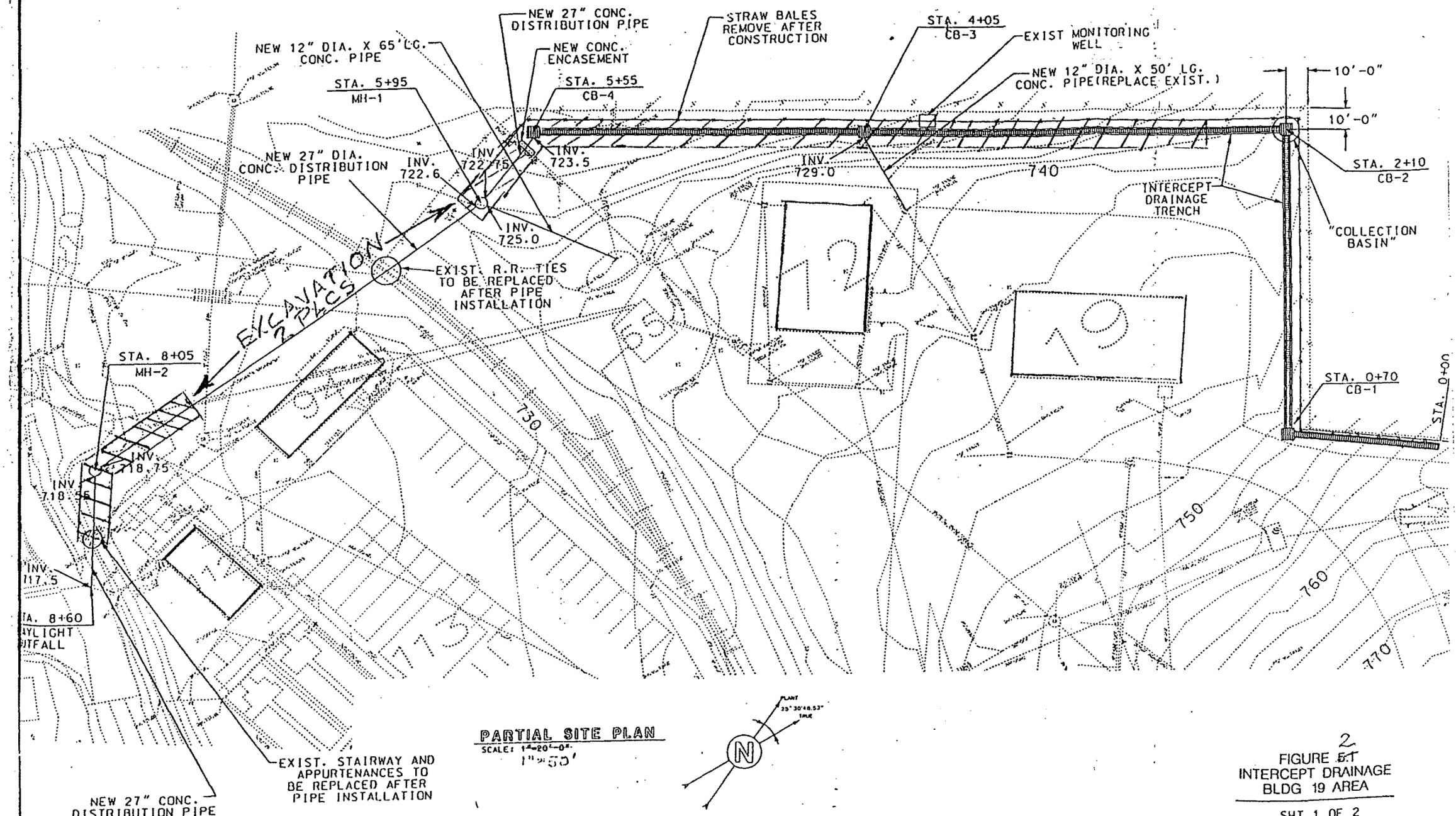
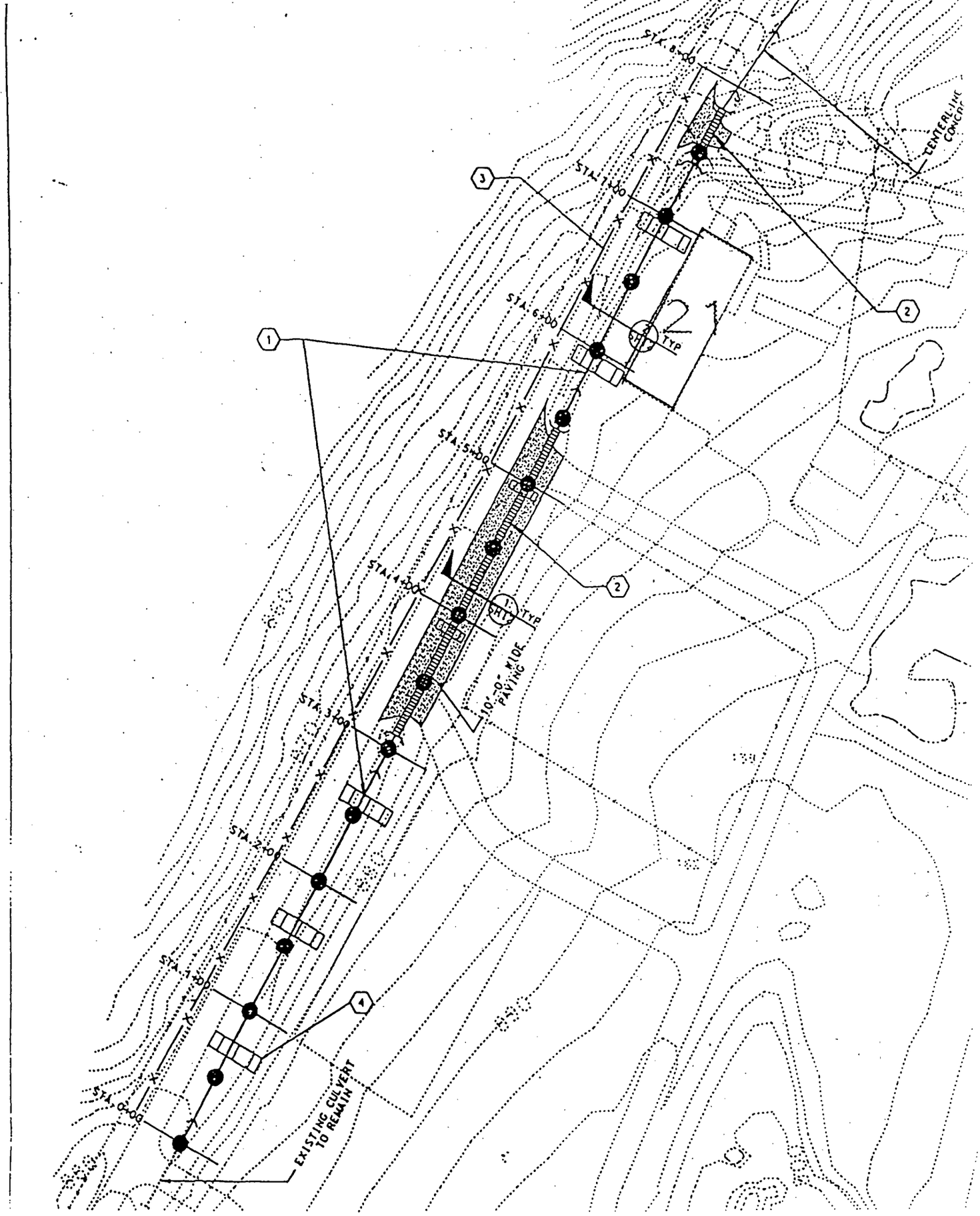
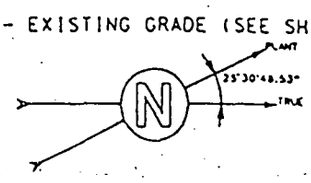


FIGURE ~~5.1~~ 2
INTERCEPT DRAINAGE
BLDG 19 AREA

SHT 1 OF 2



EXISTING GRADE (SEE SHT. 3 OF 3)



PLANVIEW

Figure 2.

INTERCEPT DRAINAGE ALONG OLD SOUTH BOUNDARY

ISS	DATE	REVISION	BY	CHKR	ENG	LP&EC	APVD	M
A	12/08/94	ISSUE FOR CONSTRUCTION	KRW		SAS		*	*

UNITED STATES

DEPARTMENT of ENERGY

MOUND

OPERATED BY

EG&G MOUND APPLIED TECHNOLOGIES

EG&G MOUND APPLIED TECHNOLOGIES INC. P.O.BOX 3000 MIAMISBURG, OHIO 45343-3000 * TEL (513)865-4020

INDEX OF DRAWINGS

DRAWING NO.	TITLE
FSD940449	COVER SHEET
FSD940450	CONTRACTOR'S (SELLER'S) ROUTE
FSD940415	DEMOLITION
FSD940416	INTERCEPT DRAINAGE ALONG OLD SOUTH BOUNDRY
FSD940447	INTERCEPT DRAINAGE BLDG. 19 AREA
FSD940448	GENERAL DETAILS

APPROVALS:	DATES:
SAFETY COMMITTEE REQUIRED: ___NONE ___TRUESOC ___TESOC ___EMSOC	
TECH.RESP.	
SR. MGR.	
TRUESOC	
TESOC	
EMSOC	

DESIGN ENG P.E.	PROJ MGR P.E.
S.A.SPESARD	S.A.SPESARD
SPONS	ENG SUPV
LP & EC	PEER REV
ENG MGR	
APVD	DATE

NO REQD	DESCRIPTION/MATERIAL	ITEM

SHEET	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
ISSUE																					

SHEET	1	2	3	4	5	6
ISSUE	A					

PART CLASSIFICATION

TITLE (U) TITLE CLASSIFICATION

COVER SHEET
DRAINAGE CONTROL INTERIM
RESPONSE ACTION

DRAWING CLASSIFICATION	SIZE	DRAWING NUMBER	JOB NUMBER
UNCLASSIFIED	D	FSD940449	012487

DWG TYPE	PRMG	CAGEC	SCALE	SHEET
ARX	SITE	14065	NONE	1 OF 1

STATUS	ORIGIN
MD-REL-12/08/94	MSTATION 4.0