



## Department of Energy

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MAR 29 2000

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

DOE-0556-00

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

Dear Mr. Saric and Mr. Schneider:

### **TRANSMITTAL OF REVISED ADDENDUM 2 AND ADDENDUM 3 TO THE IMPACTED MATERIAL PLACEMENT PLAN FOR THE ON-SITE DISPOSAL FACILITY**

- References:
- 1) Letter, T. Schneider to J. Reising, "IMPP Addenda 2, 3, and 4 RTC, and Addendum 5 Submittal," dated December 28, 1999
  - 2) Letter, T. Schneider to J. Reising, "Approval RTC on Addenda 2, 3, and 4 IMPP and Asbestos Disposal," dated March 8, 2000

Enclosed for your approval are Addendum 2 and Addendum 3 to the Impacted Material Placement Plan (IMPP) for the On-Site Disposal Facility (OSDF) project. This submittal is in response to the above referenced letters from the Ohio Environmental Protection Agency (OEPA) granting approval of the previously submitted addenda contingent on combining Addendum 4 into Addendum 2. Addendum 2 addresses placement of thorium debris and non-bagged materials such as broken transite debris, and friable asbestos mixtures. Addendum 3 addresses alternative placement of Category 2 debris using a trenching method. Also included, is a revised summary page to be replaced in your current version in the IMPP, and a table of specialized placement plan restrictions which should be inserted in Appendix C along with the addenda.

Mr. James A. Saric  
Mr. Tom Schneider

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MAR 29 2000

If you have any questions or require additional information, please contact Jay Jalovec at (513) 648-3122.

Sincerely,



Johnny W. Reising  
Fernald Remedial Action  
Project Manager

FEMP:Jalovec

Enclosures

cc w/enclosures:

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## REVISION SUMMARY

<u>Revision</u>	<u>Dated</u>	<u>Description of Revision</u>
0	1/19/98	Initial issuance of Revision 0, <i>Impacted Material Placement Plan, On-Site Disposal Facility</i> (20100-PL-007)
PCN1	7/7/98	Added Revision Summary page and revised physical waste acceptance criteria for debris (Page 4-1) to reflect that transite panels will not be size reduced before disposal in the On-Site Disposal Facility
OADD1	2/17/99	Addendum 1: Issuance of Revision 0, <i>Specialized Placement Plan for Bagged Impacted Material</i> to discuss placement of bagged material into the On-Site Disposal Facility
1	10/99	Issuance of Revision 1 based on paged changes approved by the U.S. EPA and OEPA. Addendum 1 incorporated into Appendix C
1ADD2	3/00	Addendum 2: Issuance of Revision 1, <i>Specialized Placement Plan for Thorium and Non-Bagged Impacted Material</i> to discuss placement of thorium debris and non-bagged material into the On-Site Disposal Facility.
1ADD3	3/00	Addendum 3: Issuance of Revision 1, <i>Alternative Trenching Method for Placement of Category 2 Impacted Material</i> to discuss placement of Category 2 items by trenching method into the On-Site Disposal Facility
1TBL1	3/00	Added <i>Placement Restrictions for Specialized Placement Plans</i> table to be inserted in front of Addendum 1 of Appendix C.

## PLACEMENT RESTRICTIONS FOR SPECIALIZED PLACEMENT PLANS

PLACEMENT RESTRICTIONS	ADDENDUM 1 (Bagged Impacted Material)	ADDENDUM 2 (Thorium and Non-Bagged Impacted Material)	ADDENDUM 3 (Alternate CAT 2 Placement)
TRENCHES SHALL NOT BE EXCAVATED IN PREVIOUSLY PLACED CATEGORY 2 THROUGH 5 IMPACTED MATERIAL, PROTECTIVE, CONTOURING, OR SELECT IMPACTED MATERIAL LAYERS.	X	X	X
IMPACTED MATERIAL SHALL NOT BE PLACED DIRECTLY ON PREVIOUSLY PLACED CATEGORY 2 THROUGH 5 IMPACTED MATERIAL, PROTECTIVE LAYER, OR SELECT IMPACTED MATERIAL LAYERS.	X	X	X
PLACEMENT GRID SHALL NOT BE LOCATED WITHIN 100 FT Laterally Adjacent to a Category 3 Grid in the same Horizon	X	X	
GRIDS WITH TRANSITE DEBRIS OR THORIUM DEBRIS PLACED BY THE GRID METHOD SHALL NOT BE Laterally Adjacent to Each Other within the same Horizon.		X	
GRIDS WITH TRANSITE DEBRIS OR THORIUM DEBRIS PLACED BY THE TRENCHING METHOD SHALL NOT BE Laterally Adjacent to Each Other within the same Horizon.		X	
GRIDS WITH TRANSITE DEBRIS OR THORIUM DEBRIS PLACED BY THE GRID METHOD AND GRIDS WITH TRANSITE DEBRIS OR THORIUM DEBRIS PLACED BY THE TRENCHING METHOD SHALL NOT BE Adjacent to Each Other in the same Horizon.		X	
IMPACTED MATERIAL SHALL BE PLACED ABOVE AN INTERVENING HORIZON OF CATEGORY 1 IMPACTED MATERIAL		X	X
IMPACTED MATERIAL SHALL NOT BE PLACED WITHIN 6 FEET UNDER THE SELECT IMPACTED MATERIAL FOR THE FINAL COVER SYSTEM		X	X
PLACEMENT OF IMPACTED MATERIAL PER THIS ADDENDUM IS LIMITED TO ONE LIFT PER GRID FOR THE LIFE OF THE CELL		X	

"X" INDICATES THAT PLACEMENT RESTRICTION IS APPLICABLE TO ADDENDUM NOTED.

**Addendum No. 2  
To  
IMPACTED MATERIALS PLACEMENT PLAN  
ON-SITE DISPOSAL FACILITY**

**Specialized Placement Plan  
for Thorium and Non-Bagged Impacted Material**

**20100-PL-007  
Revision 1  
March 2000**

**United States Department of Energy**

**Fernald Environmental Management Project  
Fernald, Ohio**

*Prepared by*

**GeoSyntec Consultants  
1100 Lake Hearn Drive, NE, Suite 200  
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*Under*

**Fluor Fernald  
Subcontract 95PS005028**

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**Addendum No. 2**  
**To**  
**Impacted Material Placement Plan**  
**On-Site Disposal Facility**  
**Specialized Placement Plan for Thorium and Non-bagged Impacted Material**

In accordance with Section 8, Article 8.6.1 of the Impacted Material Placement (IMP) Plan, Revision 0, dated January 1998 for the On-Site Disposal Facility (OSDF), a specialized placement plan is required to be prepared for "materials either nominally larger than the physical criteria for the OSDF..." or "not reasonably anticipated by currently identified categories...". This specialized placement plan provides requirements and two options for placement of Category 2, Category 3, Category 4, and Category 5 thorium and non-bagged impacted material. This impacted material cannot be placed as described in Section 8, Article 8.6.3 of the IMP Plan or as described for bagged material in Addendum No 1, "Specialized Placement Plan for Bagged Impacted Material" because of more restrictive radiological requirements for thorium and more restrictive placement requirements for non-bagged asbestos.

**PLACEMENT REQUIREMENTS**

Placement of Category 2, Category 3, Category 4 and Category 5 thorium and non-bagged impacted material shall be performed in accordance with Fernald Environmental Management Project (FEMP) radiological safety procedures, the IMP Plan, including fugitive dust control and storm water runoff control, and the Contractor's approved Safe Work Plan. The Contractor's Safe Work Plan shall be revised to include requirements for placement of thorium and non-bagged impacted material as described in this Addendum No. 2. In addition to the requirements described in the above said documents, thorium and non-bagged impacted material shall be placed in a manner protective of the health and safety of OSDF personnel and the public, utilizing the As Low As Reasonably Achievable (ALARA) approach and shall meet the OSDF performance criteria stated in the Design Criteria Package for the OSDF.

**PLACEMENT OPTIONS**

Thorium and non-bagged impacted material (e.g. thorium contaminated debris, broken

transite panels, and soil containing friable asbestos) is expected to be generated as buildings are demolished. Additionally, some non-bagged impacted material may be generated in small quantities as other remediation activities are performed. To provide flexibility, two options are specified herein for placement of Category 2, Category 3, Category 4 and Category 5 thorium and non-bagged impacted material. These options are specified to minimize potential radiological exposure to personnel and equipment, limit dust generation, control storm water runoff, and place thorium and non-bagged impacted material in a safe manner. The two placement options are:

- Option 1 - Placement by Grid Method
- Option 2 - Placement by Trenching Method

Selection of the placement option will be made by the Construction Manager based on the quantity of thorium and non-bagged impacted material that is available for placement and availability of a required grid.

#### **Option 1 - Placement by Grid Method**

Non-bagged impacted material shall be placed by grid method when an estimated quantity of debris for placement is equal to or more than that required to fill half a grid (approximately 220 bcy or more) or when a previously placed minimum 3 ft (0.9 m) thick Category 1 grid is not available for placement by Option 2 trenching method. Bagged thorium impacted debris shall be placed by Option 2 only.

A minimum of two (2) working days prior to commencement of non-bagged impacted material placement by grid method, the Construction Manager will select and approve a grid(s). The approved selected grid(s) shall meet the following requirements:

- Grid shall not be located within 100 ft (30m) laterally adjacent to a Category 3 grid in the same horizon
- Grids with non-bagged impacted material placed by the Grid Method shall not be laterally adjacent to each other within the same horizon.
- Grid with non-bagged impacted material placed by the Grid Method and grid with thorium and non-bagged impacted material or bagged thorium impacted material placed by the Trenching Method shall not be adjacent to each other in the same horizon.
- Non-bagged impacted material shall be placed above an intervening horizon of Category

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1 impacted material.

- Non-bagged impacted material shall not be placed directly on previously placed Category 2 through 5 impacted material, protective layer, or select impacted material layer.
- Non-bagged impacted material shall not be placed within 6 ft (1.8 m) under the select impacted material for the final cover system.
- Only one (1) lift of non-bagged impacted material shall be placed in each grid.

Non-bagged impacted material placement in grid(s) shall be in accordance with the following requirements and general procedures and as shown on Figures 1, 2 and 3.

General procedures include:

- Preparation of the grid
- Debris placement
- Initial and additional lifts of Category 1 material

Requirements for each procedure are as follows:

Preparation of the Grid: After a grid is selected and approved, perimeter berms shall be constructed on three sides of the grid, as shown on Figure 1. These berms shall be constructed from Category 1 material; they shall be 24 in (600 mm) high and have a minimum top width of 10 ft (3 m). The berms shall be placed and compacted in 12 inch (300 mm) to 15 inch (375 mm) loose lifts in accordance with the IMP Plan. An additional berm shall be constructed (with the same requirements of the perimeter berms) in the middle of the grid to provide access for a trackhoe (or other equipment) to spread and compact the material. Until non-bagged impacted material placement in the grid is complete, the fourth side shall be left open for truck entrance and exit to and from the grid. The fourth side of the perimeter berm shall be constructed after completion of non-bagged impacted material as shown in Figures 2, and 3. The berms shall be compacted to meet at least 90 percent of the standard Proctor maximum dry density as described in the IMP Plan (Section 7.4.2). Compaction shall be tested in accordance with the IMP Plan. The surface of the Category 1 material on which the non-bagged impacted material will be placed shall be graded at an approximately 1% slope downward away from the truck entrance and exit side of the grid. A temporary diversion berm (approx. 18 inches

[450 mm] high), as needed, shall be constructed approximately 30 ft (9 m) in front of the grid entrance to limit runoff from entering the grid. The grid shall be oriented so that the open side of the grid (fourth perimeter berm) is at the up gradient side of the grid. The required radiological controls for the placement area will be established prior to commencement of non-bagged impacted material placement.

Debris Placement: After the grid has been prepared, trucks transporting non-bagged impacted material shall dump material at the down gradient end of the grid. Non-bagged impacted material shall be spread and tamped by the bucket of a trackhoe to achieve a maximum loose lift thickness of 18 inches (450 mm). The trackhoe shall be of sufficient size and reach and be situated in such a way that only the bucket shall contact the non-bagged impacted material. Compaction, other than tamping from a trackhoe bucket shall not be performed directly on the non-bagged impacted material. In accordance with the ALARA concept, equipment operators and other personnel shall avoid contact with thorium or asbestos impacted material. Also, trucks delivering thorium impacted debris shall not drive on material deposited by the trucks or previously placed thorium impacted debris to minimize the potential for thorium contamination on the outside of the vehicle. A radiological technician or trained asbestos personnel, as appropriate, will monitor the trucks at the exit to the grid as shown on Figure 1. Fugitive dust and storm water runoff controls shall be in accordance with the IMP Plan. Water trucks and/or water hoses shall be available at the location of placement activities. The top of non-bagged impacted material shall be surveyed for location and elevation and information shall be submitted to the Construction Manager.

Initial and Additional Lifts of Category 1 Material: As the material placement progresses, an initial 15 inches (375 mm), minimum, 18 in (450 mm) maximum loose lift of Category 1 material (soil and soil-like material) shall then be placed on top of the non-bagged impacted material by the end of each working day. No non-bagged impacted material shall remain uncovered with Category 1 material by the end of the workday. The entire grid shall be covered with an initial lift by the end of five (5) working days. The initial lift shall be compacted with a minimum of four one-way passes of a self-propelled double drum roller compactor, a smooth drum vibratory roller or other compaction equipment approved by the Construction Manager. No compaction testing will be performed on the initial lift above the non-bagged impacted material. As shown in Figures 2 and 3, the fourth side of the perimeter berm will be constructed after non-bagged impacted material placement is completed. After the fourth side of the perimeter berm has been placed and initial lift is

placed over the non-bagged impacted material, the temporary diversion berm to control storm water runoff, as needed, shall be removed. An additional 12 inches (300 mm)  $\pm$  3 inches (75 mm) loose lift(s) of Category 1 material shall be placed above the initial lift. Total compacted thickness of Category 1 material placed above the non-bagged impacted material, including the initial lift, shall be at least as thick as the intervening horizon described in the IMP Plan. See attached Figure 3. The Category 1 lift(s) above the initial lift shall be compacted to meet at least 90 percent of the standard Proctor maximum dry density. Appropriate compaction equipment, including the Cat-826 landfill compactor or approved equivalent, shall be used on lifts above the initial lift to meet the specified compaction requirements. Compaction of the additional lift(s) shall be tested in accordance with the IMP Plan.

After compacting the final lift of Category 1 material over the non-bagged impacted material the Category 1 material shall be proof-rolled. Soft spots indicated by tire ruts more than 3 inches (76 mm) in depth or visible deflection under the moving proof rolling equipment shall be stabilized through additional passes of the compactor. The proof rolling equipment shall have a minimum gross vehicle weight of 20 tons (180kN) and exert a ground pressure of at least 65 psi (450 kPa). Any soft spot that cannot be stabilized with further compactive effort shall be cause for additional treatment to the satisfaction of the Construction Manager.

#### Option 2 – Placement by Trenching Method

Bagged thorium or non-bagged impacted material shall be placed by trenching method when the material estimated quantity of debris will be less than the quantity required to fill a half grid (less than approximately 220 bcy) and a previously placed minimum 3 ft (0.9 m) thick Category 1 grid is available for placement of the bagged thorium or non-bagged impacted material as shown in Figure 4.

A minimum of two (2) working days prior to commencement of impacted material placement by the trenching method, the Construction Manager will select and approve a grid previously placed with a minimum 3 ft (0.9 m) thick Category 1 layer overlying an intervening horizon of Category 1 material. The trench for placement of bagged thorium or non-bagged impacted material by this method shall meet the following requirements:

- Grid shall not be located within 100 ft (30 m) laterally adjacent to a Category 3 grid in

the same horizon.

- Grids with bagged thorium or non-bagged impacted material trenches shall not be laterally adjacent to each other within the same horizon.
- Grid with non-bagged impacted material placed by the Grid Method and grid with bagged thorium or non-bagged impacted material placed by the Trenching Method shall not be adjacent to each other in the same horizon.
- A trench for bagged thorium or non-bagged impacted material shall not be excavated in previously placed Category 2 through 5 impacted material, protective layer, or select impacted material layer.
- A trench for bagged thorium or non-bagged impacted material shall not be excavated within 6 ft (1.8 m) under the select impacted material for the final cover system
- Only one (1) lift of bagged thorium or non-bagged impacted material shall be placed in each grid.
- Minimum thickness of Category 1 material under bagged thorium or non-bagged impacted material trench excavation shall be the thickness of the intervening horizon of Category 1 impacted material as described in the IMP Plan.

Bagged thorium or non-bagged impacted material placement in a trench shall be in accordance with the following requirements and general procedures and as shown on Figure 4.

General procedures include:

- Trench Excavation
- Debris Placement
- Initial and Additional Lifts of Category 1 Material

Requirements for each procedure are as follows:

Trench Excavation: After a grid(s) is selected and approved, a trench (or trenches) shall be excavated as shown on Figure 4. Each trench shall be a minimum of 3 ft (0.9 m) deep and a maximum of 4 ft (1.2 m) deep and between 8 ft (2.4 m) and 12 ft (3.6 m) wide. A minimum 6 ft (1.8 m) distance shall be maintained between top of the side slopes of the adjacent trench. One end of the trench shall be graded to a minimum 5H:1V ramp (subject to approval by FDF Safety Engineer) for truck access into the trench. The trench bottom

shall be graded at an approximately 1% slope downward away from the truck access ramp. The maximum trench length shall be approximately 70 ft (21 m) and shall be limited by the maximum length that can be excavated in one grid and still provide adequate access to enter and exit the trench. The Category 1 material excavated from the trench shall be stockpiled a minimum of 6 ft (1.8 m) from the top of the side slopes of the trench and shall be used later for initial and additional lifts over the bagged thorium or non-bagged impacted material. The necessary radiological controls or trained asbestos personnel, as appropriate, will be established prior to commencement of bagged thorium or non-bagged impacted material placement.

Debris Placement: After the trench is excavated, trucks transporting bagged thorium or non-bagged impacted material shall back down the ramp and begin dumping material at the furthest end of the trench. Bagged thorium or non-bagged impacted material shall be spread and tamped by the bucket of a trackhoe to achieve a maximum loose lift thickness of 18 inches (450 mm). The trackhoe shall be situated in such a way that only the bucket shall contact the bagged thorium or non-bagged impacted material. Compaction, other than tamping from a trackhoe bucket shall not be performed directly on the bagged thorium or non-bagged impacted material. Equipment operators and other personnel shall avoid contact with thorium or asbestos impacted material in accordance with the ALARA concept. Trucks delivering thorium impacted debris shall not drive on material deposited by the trucks or previously placed thorium impacted material to minimize the potential for thorium contamination on the outside of the vehicle. A radiological technician or trained asbestos personnel, as appropriate, will monitor the trucks at the exit to the trench as shown on Figure 4. Fugitive dust and storm water runoff controls shall be in accordance with the IMP Plan. Water trucks and/or water hoses will be available at the location of placement activities. The bottom of the trench and the top of the bagged thorium or non-bagged impacted material shall be surveyed for location and elevation and information shall be submitted to the Construction Manager.

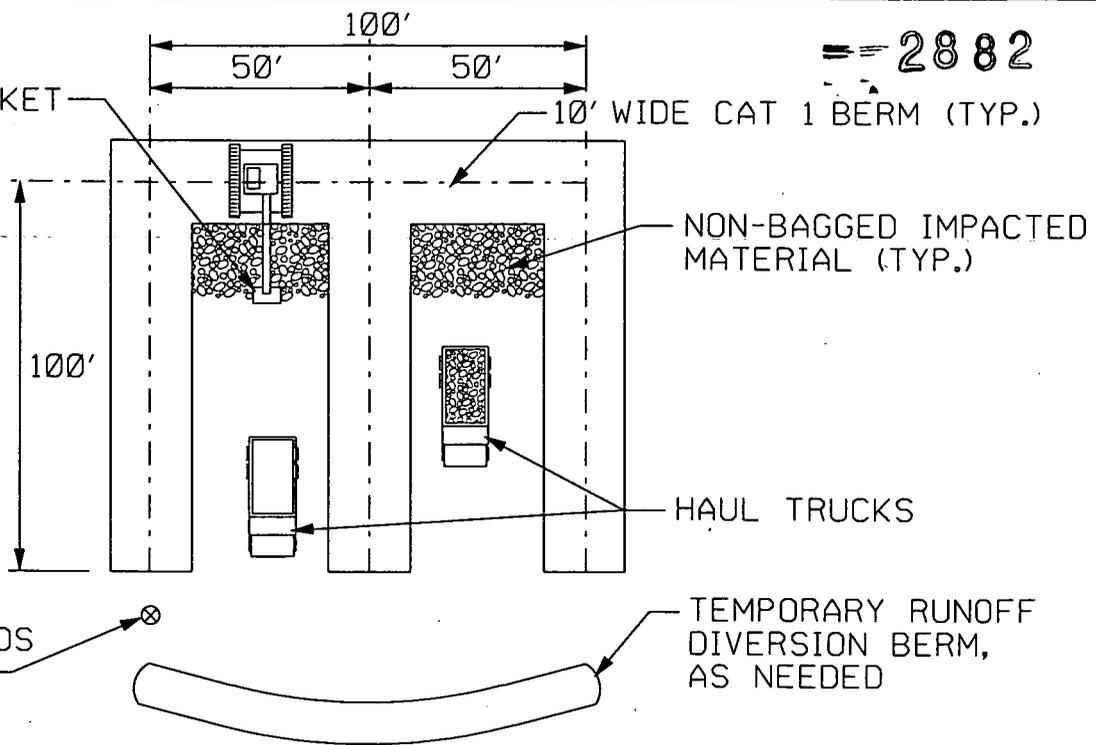
Initial and Additional Lifts of Category 1 Material: After bagged thorium or non-bagged impacted material is placed in the trench and compacted, it shall be covered with an initial 15 inches (375 mm) minimum, 18 in (450 mm) maximum loose lift of Category 1 material by the end of each working day. The initial lift shall be compacted with a minimum of four one-way passes of a self-propelled double drum roller compactor, a smooth drum vibratory roller or other compaction equipment approved by the Construction Manager. No compaction testing will be performed on the initial lift above bagged thorium or non-

bagged impacted material. An additional 12 inches (300 mm)  $\pm$  3 inches (75 mm) loose lift(s) of Category 1 material shall be placed above the initial lift. Total compacted thickness of Category 1 material placed above the bagged thorium or non-bagged impacted material, including the initial lift, shall be a minimum 15 inches (375 mm) as shown on attached Figure 4. The Category 1 lift(s) above the initial lift shall be compacted to meet at least 90 percent of the standard Proctor maximum dry density. Appropriate compaction equipment, shall be used on lifts above the initial lift to meet the specified compaction requirements. Compaction of the additional lift(s) shall be tested in accordance with the IMP Plan.

After compacting the final lift of Category 1 material over the bagged thorium or non-bagged impacted material, the Category 1 material shall be proof-rolled. Soft spots indicated by tire ruts more than 3 inches (76 mm) in depth or visible deflection under the moving proof rolling equipment shall be stabilized through additional passes of the compactor. The proof rolling equipment shall have a minimum gross vehicle weight of 20 tons (180 kN) and exert a ground pressure of at least 65 psi (450 kPa). Any soft spot that cannot be stabilized with further compactive effort shall be cause for additional treatment to the satisfaction of the Construction Manager. As shown on Figure 4, the trench will subsequently be covered with an intervening horizon of Category 1 material.

SPREAD AND TAMP DEBRIS WITH TRACKHOE BUCKET

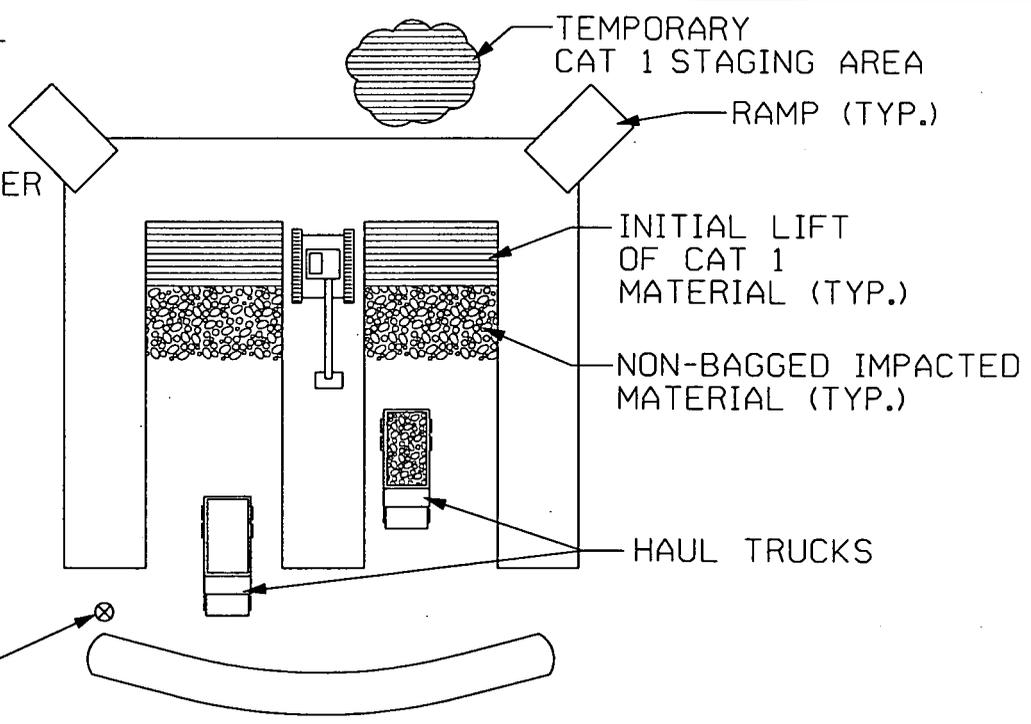
LOCATION OF RADIOLOGICAL CONTROL OR TRAINED ASBESTOS PERSONNEL



PLACING NON-BAGGED IMPACTED MATERIAL IN GRID  
NTS

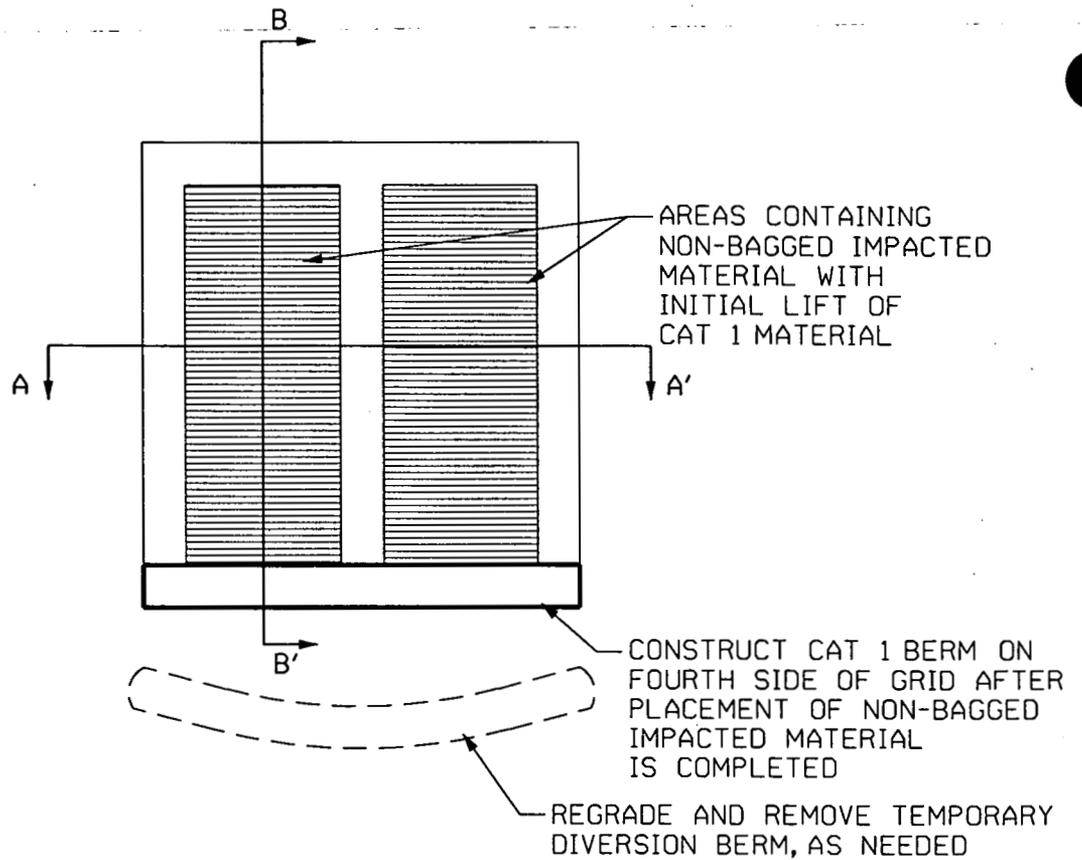
PLACE INITIAL CAT 1 LIFT WITH TRACKHOE OR PUSH INITIAL CAT 1 LIFT ONTO MATERIAL WITH DOZER

LOCATION OF RADIOLOGICAL CONTROL OR TRAINED ASBESTOS PERSONNEL



COVERING NON-BAGGED IMPACTED MATERIAL  
NTS

FIGURE 1  
CORIUM AND NON-BAGGED IMPACTED MATERIAL PLACEMENT  
OPTION 1 - GRID METHOD  
PLAN VIEW  
SHEET 1 OF 3

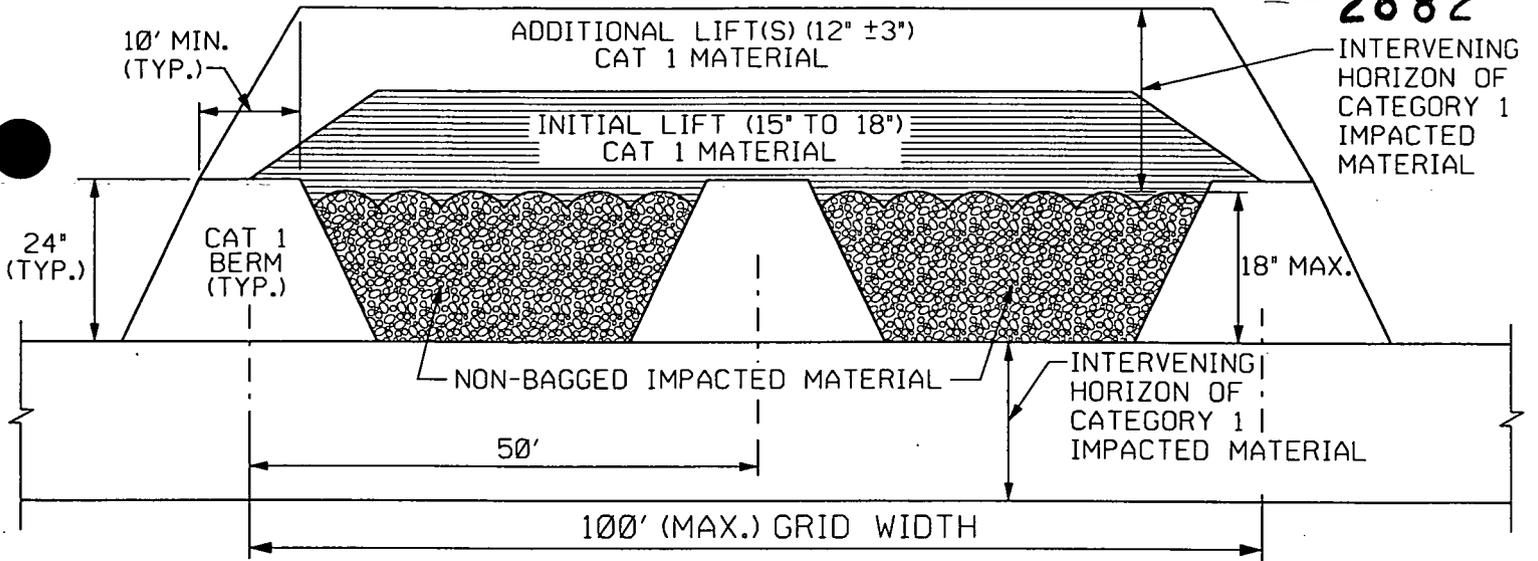


COMPLETION OF NON-BAGGED IMPACTED MATERIAL GRID  
NTS

NOTES: SEE FIGURE 3 (SHEET 3 OF 3) FOR AA' AND BB' CROSS SECTIONS.

FIGURE 2  
THORIUM AND NON-BAGGED IMPACTED MATERIAL PLACEMENT  
OPTION 1 - GRID METHOD  
PLAN VIEW  
SHEET 2 OF 3

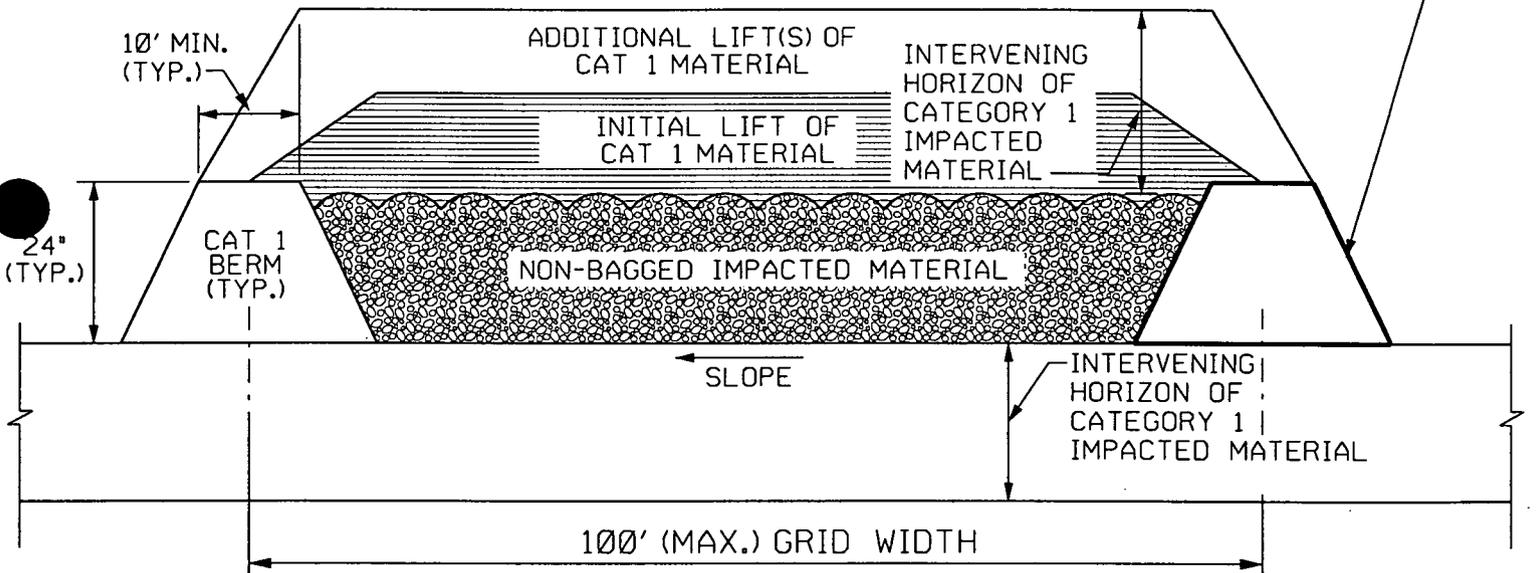
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SECTION A-A'

NTS

CONSTRUCT CAT 1 BERM ON FOURTH SIDE OF GRID AFTER PLACEMENT OF NON-BAGGED IMPACTED MATERIAL IS COMPLETED



NOTE: FOR PLAN VIEW SEE FIGURE 2 (SHEET 2 OF 3)

SECTION B-B'

NTS

THORIUM AND NON-BAGGED IMPACTED MATERIAL PLACEMENT  
 OPTION 1 - GRID METHOD  
 CROSS SECTIONS  
 SHEET 3 OF 3

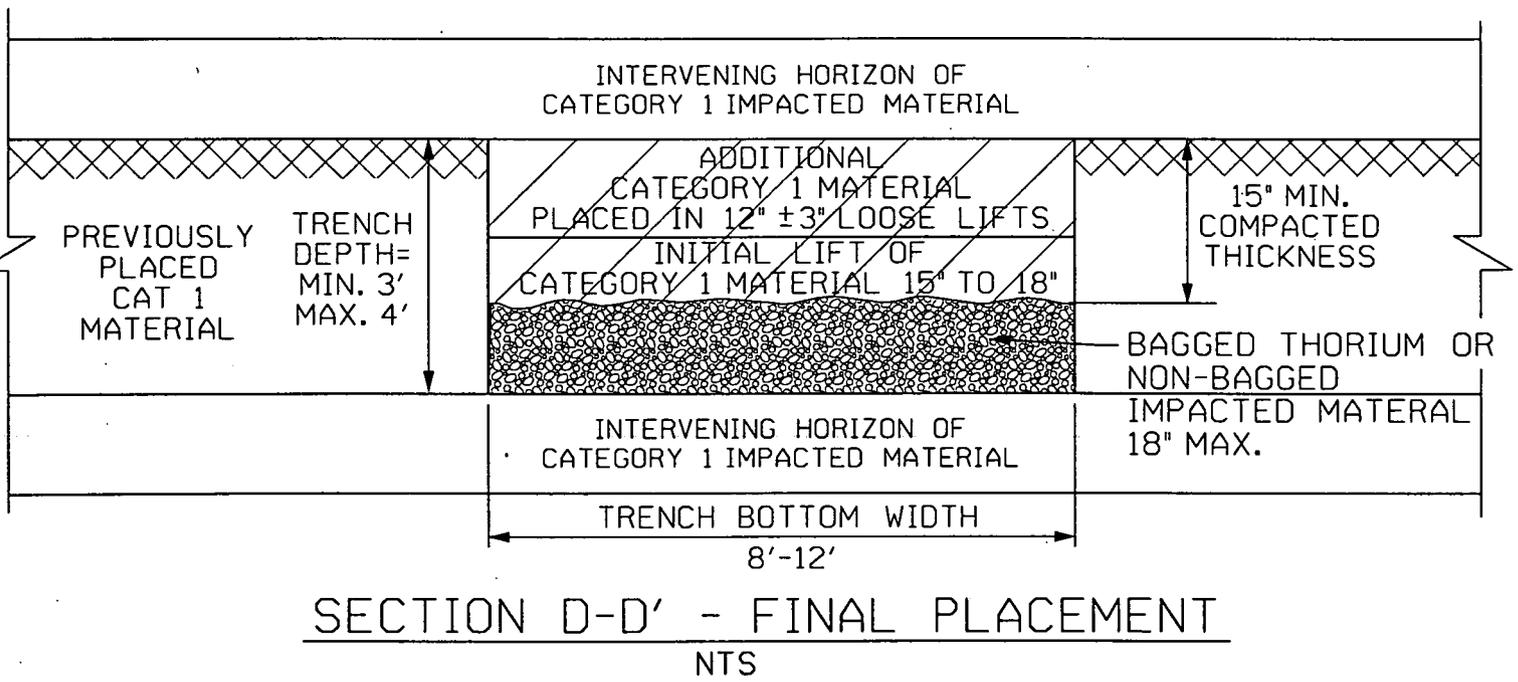
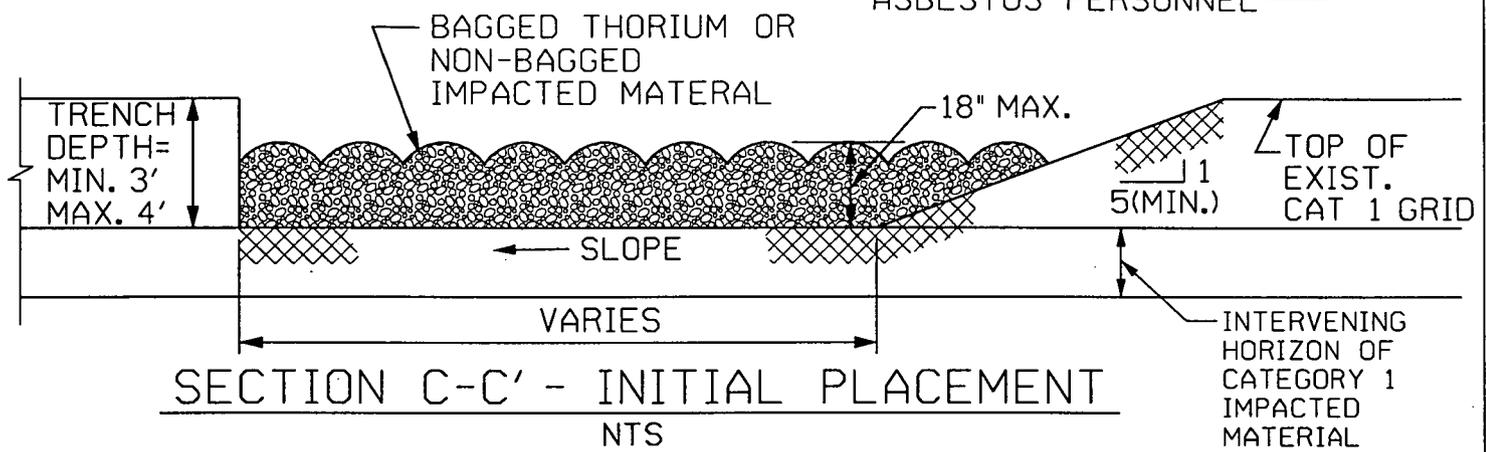
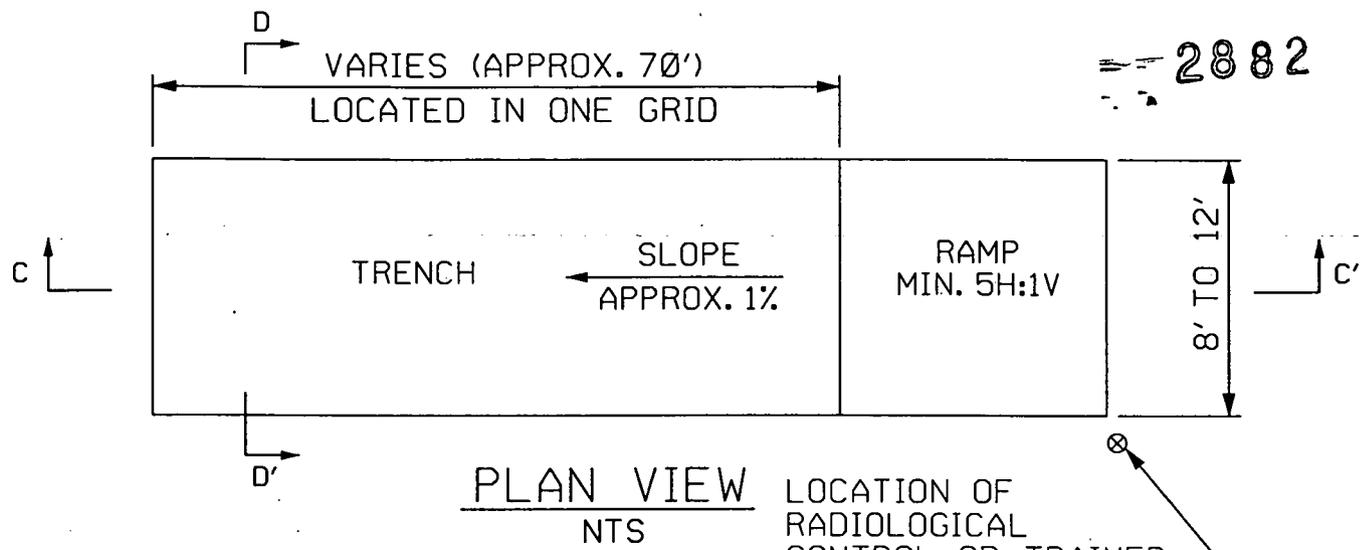


FIGURE 4  
THORIUM AND NON-BAGGED IMPACTED MATERIAL PLACEMENT  
OPTION 2 - TRENCHING METHOD  
SHEET 1 OF 1

**Addendum No. 3  
To  
IMPACTED MATERIALS PLACEMENT PLAN  
ON-SITE DISPOSAL FACILITY**

**Alternative Trenching Method for Placement  
of Category 2 Impacted Material**

**20100-PL-007**

**Revision 1  
MARCH 2000**

**United States Department of Energy  
Fernald Environmental Management Project  
Fernald, Ohio**

*Prepared by*

**GeoSyntec Consultants  
1100 Lake Hearn Drive, NE, Suite 200  
Atlanta, Georgia 30342**

*Under*

**Fluor Daniel Fernald  
Subcontract 95PS005028**

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**Addendum No. 3**  
**To**  
**Impacted Material Placement Plan**  
**On-Site Disposal Facility**  
**Alternative Trenching Method for Placement of Category 2 Impacted Material**

In accordance with Section 8, Article 8.3 of the Impacted Materials Placement (IMP) Plan, Revision 0, dated January 1998 for the On-Site Disposal Facility (OSDF) describes the placement and compaction procedures for Category 2 impacted material. As described in Section 5, Article 5.2 of the IMP Plan, Category 2 impacted materials are materials that can be transported, placed, spread and compacted *en masse*. Examples of Category 2 impacted material include: broken-up concrete foundations, impacted soil mixed with broken-up concrete, general building rubble and debris of irregularly shaped metals or other components of the superstructure or substructure with a maximum length of 10 ft (3 m) and a maximum thickness of 18 in (450 mm).

This specialized placement plan provides an alternative trenching method and related requirements for placement of Category 2 impacted material. This alternative trenching method shall be used for non-routine placement of Category 2 impacted material when:

- Types of Category 2 impacted material require lateral confinement for spreading and placement activities (e.g., structural steel, pipes), or
- Types of Category 2 material require special handling (such as large structural members that meet the Category 2 materials size criteria).

**PLACEMENT REQUIREMENTS**

Placement of Category 2 impacted material using the alternative trenching method shall be performed in accordance with Fernald Environmental Management Project (FEMP) radiological safety procedures, the IMP Plan, including fugitive dust control and storm water runoff control, and the Contractor's approved Safe Work Plan. The Contractor's Safe Work Plan shall be revised to include requirements for the Alternative Trenching

**Method.** In addition to the requirements described in the above said documents, Category 2 impacted material shall be placed in a manner protective of the health and safety of OSDF personnel and the public, utilizing the As Low As Reasonably Achievable (ALARA) approach and shall meet the OSDF performance criteria stated in the Design Criteria Package for the OSDF.

A minimum of two (2) working days prior to commencement of Category 2 impacted material placement by the alternative trenching method, the Construction Manager will select and approve a previously placed minimum 3 ft (0.9 m) thick Category 1 grid overlying an intervening horizon of Category 1 material. The trench for placement of Category 2 material by this method shall meet the following requirements:

- A trench shall not be excavated in previously placed Category 2 through 5 impacted material, protective layer, or select impacted material layer.
- A trench shall not be excavated within 6 ft (1.8 m) under the select material for the final cover system.
- Minimum thickness of Category 1 material under trench excavation shall be as thick as the intervening horizon of Category 1 impacted material as described in the IMP Plan.

Category 2 material placement in a trench shall be in accordance with the requirements and general procedures presented herein and as shown on Figure 1.

General procedures include:

- Trench Excavation
- Category 2 Material Placement
- Lift(s) of Category 1 Material

Requirements for each procedure are as follows:

Trench Excavation: After a grid(s) is selected and approved, a trench (or trenches) shall be excavated as shown on Figure 1. Each trench shall be a minimum of 3 ft (0.9 m) deep and a maximum of 4 ft (1.2 m) deep, and between 15 ft (4.6 m) and 18 ft (5.5 m) wide. A minimum 6 ft (1.8 m) distance shall be maintained between top of the side slopes of the adjacent trenches. One end of the trench shall be graded to a minimum 5H:1V (subject to approval by FDF Safety Engineer) ramp for truck access into the trench. The maximum trench length shall be approximately 70 ft (21 m) and shall be limited by the maximum

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length that can be excavated in one grid and still provide adequate access to enter and exit the trench. The Category 1 material excavated from the trench shall be stockpiled a minimum of 6 ft (1.8 m) from the top of the side slopes of the trench and shall be used later for lift(s) of Category 1 material over the Category 2 impacted material.

Category 2 Material Placement: After the trench is excavated, trucks transporting Category 2 impacted material shall back down the ramp and begin dumping material at the furthest end of the trench. Category 2 material shall be spread by construction equipment, such as a trackhoe or dozer, to achieve a maximum loose lift thickness of 18 in. (450 mm)  $\pm$  3 in. (75 mm). Contractor shall spread and mix Category 1 material as much as practicable with Category 2 material during placement in the trench. The objective of this mixing is to fill voids within the Category 2 material, increase the density, and aid in homogenizing the debris. Initial compaction shall be accomplished using a Cat 826 landfill compactor or equivalent within the trench. Fugitive dust and storm water runoff controls shall be in accordance with the IMP Plan. Water trucks and/or water hoses will be available at the location of placement activities.

Lift(s) of Category 1 Material: The compacted Category 2 impacted material shall be covered with a 12 in. (300 mm) to 15 in. (375 mm) loose lift of Category 1 material. The lift shall be compacted with a minimum of four one-way passes of a self-propelled double drum roller compactor, a smooth drum vibratory roller or other compaction equipment approved by the Construction Manager. Additional 12 in. (300 mm) to 15 in. (375 mm) loose lift(s) of Category 1 material shall be placed, if necessary, to the top of trench elevation. Total compacted thickness of Category 1 material placed above the Category 2 impacted material, shall be a minimum of 15 in. (375 mm) as shown on attached Figure 1. The lift(s) of Category 1 material shall be compacted to at least 90 percent of the standard Proctor maximum dry density. Compaction shall be tested in accordance with the IMP Plan. As shown on Figure 1, the trench will subsequently be covered with an intervening horizon of Category 1 material.

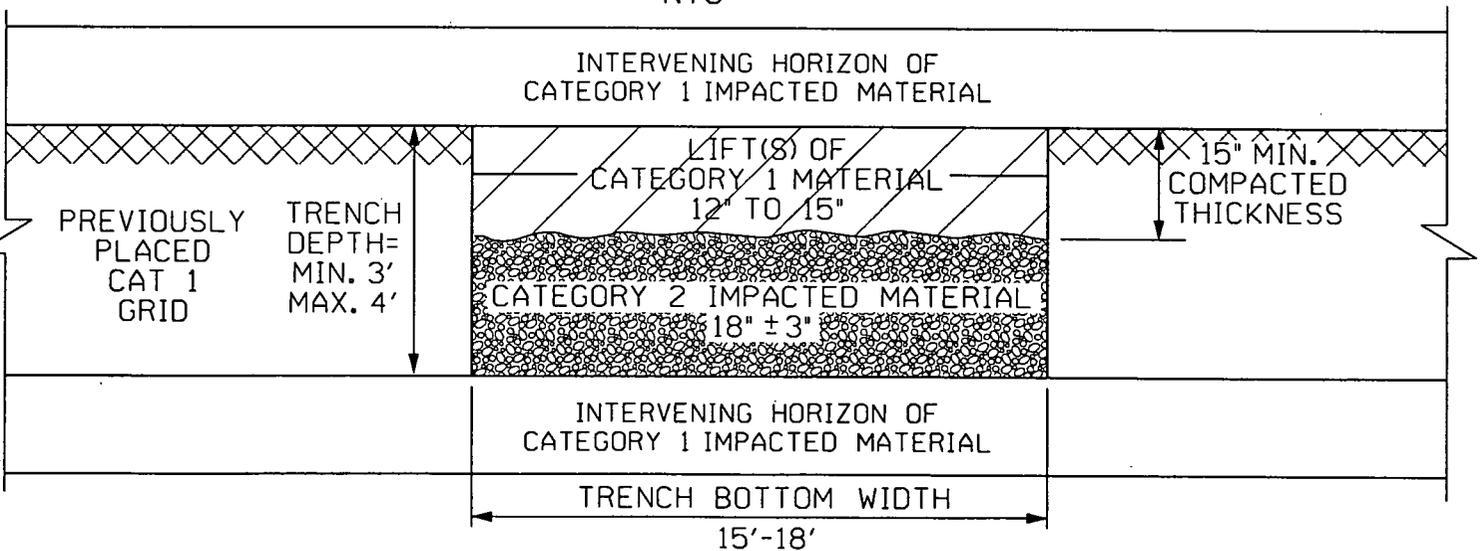
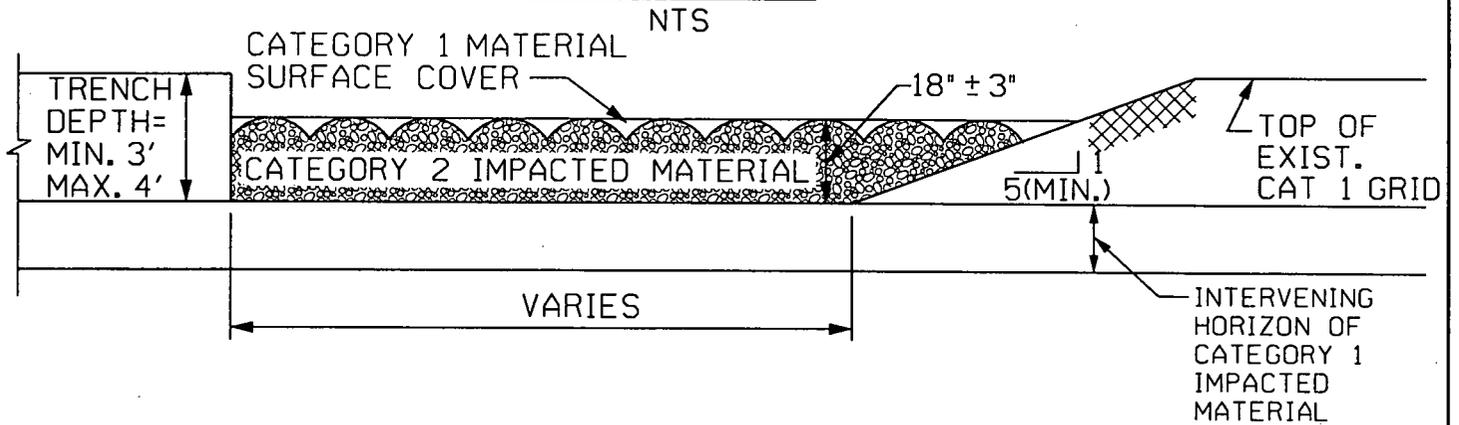
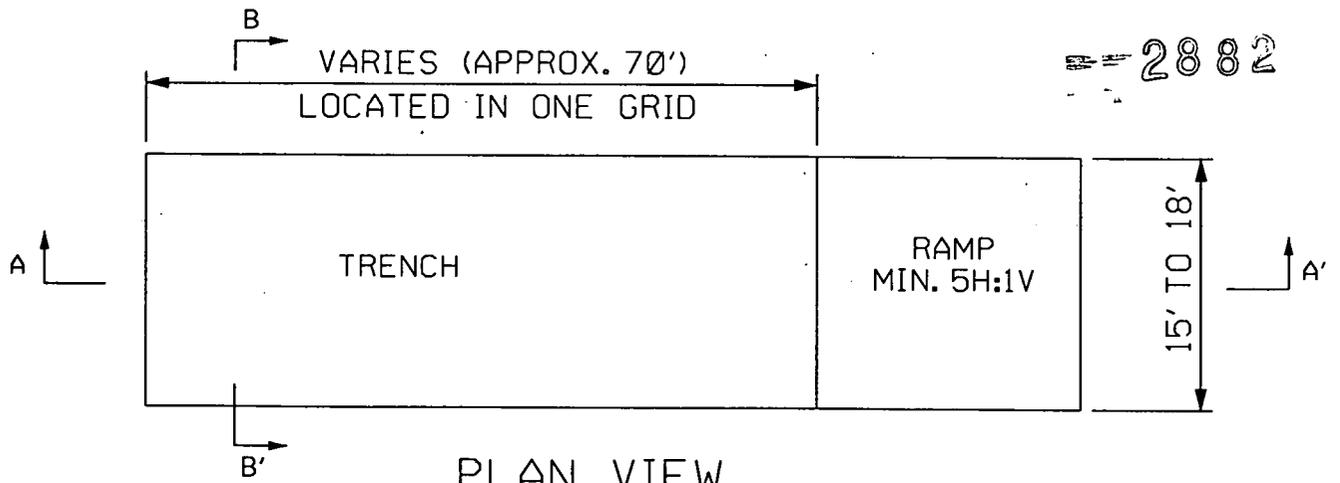


FIGURE 1  
CATEGORY 2 IMPACTED MATERIAL PLACEMENT  
ALTERNATIVE TRENCHING METHOD  
SHEET 1 OF 1