

# 324 Stabilization - Draft REC Cell Fixative and Fogging Test Plan

Prepared for the U.S. Department of Energy  
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy  
under Contract 89303320DEM000030



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# 324 Stabilization - Draft REC Cell Fixative and Fogging Test Plan

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**APPROVED**  
*By Lynn M Ayers at 5:15 pm, Mar 19, 2025*

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Release Approval

Date

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## 1 Background

### 1.1 Building 324, Hot Cell Fixation

The A, B, C, D and Airlock cells in building 324 at DOE's Hanford Site is a group of hot cells that are in the process of deactivation, decommissioning, decontamination and demolition. The exhaust air ducts, pipe trench and the internal walls of the cells must be coated with a fixative compound to shut down building ventilation and mitigate airborne contamination during demolition. The tools tested in the plan below are meant to affix the internal surfaces of the pipe trench, ducts and the inside surfaces of the cells.

### 1.2 Definitions

**Foam Dam:** Expanding foam applied to the interior of the roughing filters in A-Cell to prevent grout introduced into A-Cell from migrating into the ductwork.

**Fixative:** The generic term used to describe a compound that is used to bind radioactive particles to a surface as to prevent the particles from becoming free or air born.

**FireDam:** FireDam Spray 200 manufactured by 3M is a flexible joint sealing compound that is not flammable. This compound has been approved for use as a fixative in building 324.

### 1.3 Assumptions

- Tests can be performed in any order as long all tests are completed.
- Fixative effectiveness can be evaluated by visual verification.
- Foam dam effectiveness will be confirmed by adding grout lifts to verify no in leakage past foam dam.
- Pooling of fixative on the floor is acceptable during testing.

### 1.4 Materials Required for Test

- Pipe Trench fixative application tool
- D-Cell wall fixative application tool
- A-Cell foam dam application tool including camera
- Associated fixative pumps, hoses, etc.
- FireDam Spray 200 fixative
- Hydro Active (HA) Cut foam dam material
- Associated foam dam mixing and delivery equipment
- Grout for A-Cell foam dam testing
- Equipment to validate fixative flow rates and total volume
- Video recorder
- Materials to build a full-size replica of D-Cell cell
- Materials to build a replica of the pipe trench (actual height, actual depth and half the length) including spray fixture access port(s)
- Materials to replicate a pass through the East A-Cell wall including HVAC filter frame and roughing filter. Include a 10' x 10' x 4' basin in front of the roughing filter for the introduction of grout in 12" lifts to determine if the foam dam will prevent grout from entering the duct work.
- Devices for lifting fabricated equipment
- Monitor

- Compressor (100 SCFM @ 100psi)
- Digital camera (pictures)

## 2 D-Cell Interior Wall Fixative Application

Test Instructions.

### 2.1 Mock-Up Assembly

Assemble a full-scale mockup of D-Cell using appropriate materials. Figure 1 shows D-Cell dimensions.

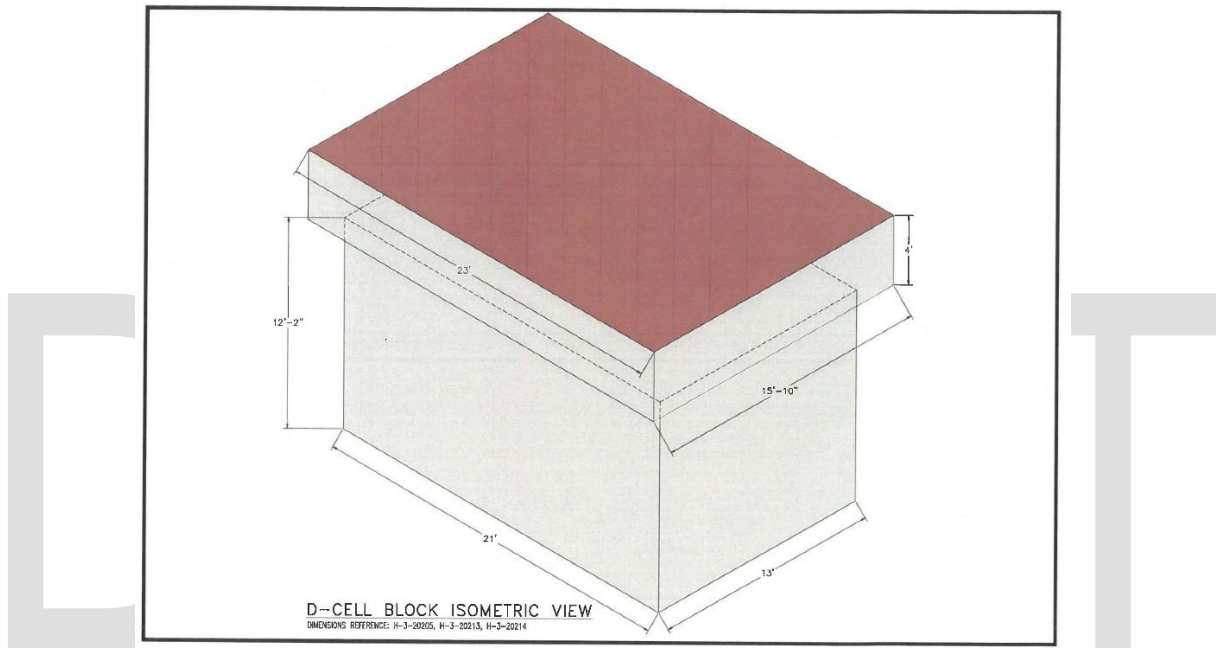


Figure 1: D-Cell Dimensions

### 2.2 D-Cell Fixative Application

1. Assemble the D-Cell wall sprayer and locate sprayer into D-Cell.
2. Initiate supply air to the sprayer.
3. Compressed air supply of 8-10 psi at 10-12 scfm required to drive both nozzles.
4. Startup pumps with fixative and bring up to pressure.
5. A minimum of 8 gal./min. (4-gal./min. per spray nozzle) will be delivered the sprayer at a pressure of 3500 psi.
6. After 10 minutes stop spraying.
7. Stop the pump and the flow of fixative and secure the air supply to the sprayer.
8. Inspect D-Cell for complete coverage.
9. Clean equipment as needed.
10. After a total of 10 minutes has passed or the test has been stopped due to adequate coverage, record the following:

Total spray time elapsed	Time
Estimated fixative usage	gal

Estimated flow rate	gal/min
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### 2.3 Test Observations and Conclusions


### 2.4 Inspection/Test Acceptance

<b>Contractor Engineer:</b>	_____	_____
	Signature	Date
<b>CPCCo Approval:</b>	_____	_____
	Signature	Date
<b>Other:</b>	_____	_____
	Signature	Date

## 3 A-Cell Foam Dam Installation

Test Instructions.

### 3.1 Mock-Up Assembly

Fabricate a pass through the East A-Cell wall including HVAC filter frame and roughing filter. Include a 10' x 10' x 4' basin in front of the roughing filter for the introduction of grout in 12" lifts to determine if the foam dam will prevent grout from entering the duct work.

### 3.2 Install Foam Dam

1. Insert the Foam Dam Gun through the penetration.
2. Ensure a camera is operating and visual of the inside of the duct work and back side of the roughing filter is confirmed.
3. Rotate the end nozzle as needed to apply foam dam in the desired location.
4. Apply a foam dam around the entire perimeter of the 2' x 4' roughing filter face.
5. Make the foam dam at least 2-3" thick to ensure a good seal. More thickness can be added if needed.
6. Apply the foam to completely cover the roughing filter in multiple passes if needed to build up sufficient thickness and coverage.
7. Allow the foam to fully expand and cure.
8. Inspect the foam dam seal visually for any gaps or leaks before proceeding with grouting.

9. Add more foam if any weak spots or gaps are identified.
10. Clean equipment as needed.

**3.3 Performing Grout Leak Test**

1. Ensure the foam dam is fully cured and adhered to the roughing filter and frame.
2. Place a 12" lift of grout into grout basin.
3. Check for leaks past the foam dam.
4. Allow grout to cure for a minimum of 24 hours and install a second 12" lift of grout.
5. Check for leaks past the foam dam.
6. Allow grout to cure for a minimum of 24 hours and install a third 12" lift of grout.
7. Check for leaks past the foam dam.
8. Allow grout to cure for a minimum of 24 hours and install a fourth 12" lift of grout.
9. Check for leaks past the foam dam.
10. After completion of foam dam installation and testing record the following:

Total foam application time elapsed	Time
Estimated foam usage	gal
Visible grout leakage past foam dam.	Yes/No

**3.4 Test Observations and Conclusions**


**3.5 Inspection/Test Acceptance**

	<b>Contractor Engineer:</b>	_____	_____
		Signature	Date
	<b>CPCCo Approval:</b>	_____	_____
		Signature	Date
	<b>Other:</b>	_____	_____
		Signature	Date

## 4 Pipe Trench Fixative Application

Test Instructions.

### 4.1 Pipe Trench Mock-Up Assembly

1. Assemble a half-length mockup of the Pipe Trench. The Pipe Trench is 21' long, 4' wide and 5' to 6' tall with a sloping bottom. Penetrations into the trench are 5' long, 1' below the trench top (See Figure 2). A half-length mockup will be 10.5' long.
2. Assemble Trench Pipe Sprayer.
3. Connect a minimum 50 feet of fixative and air supply hose to sprayer.
4. Suspend sprayer assembly. Use ballast plates as necessary to adjust the sprayer center of gravity for proper balancing.

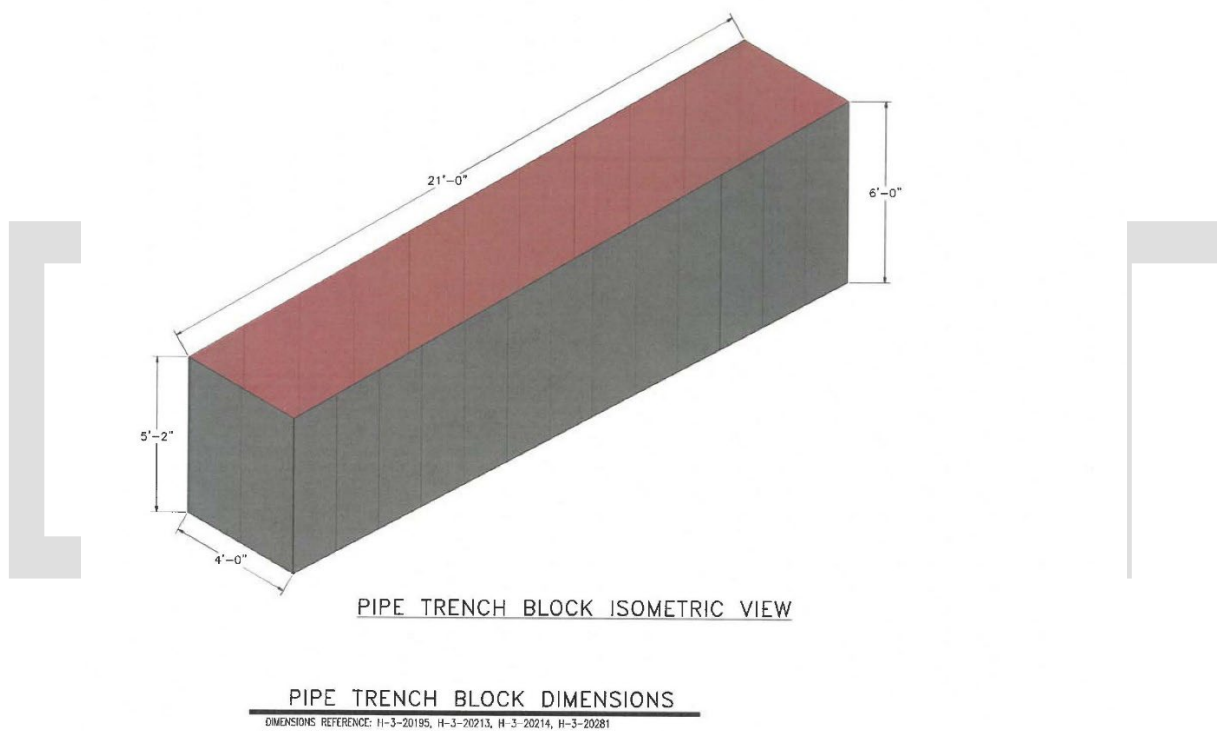


Figure 2: Pipe Trench Block Dimensions

### 4.2 Pipe Trench Fixative Application

1. Insert sprayer into access penetration. (See Figure 3 for pipe trench access penetrations configuration)



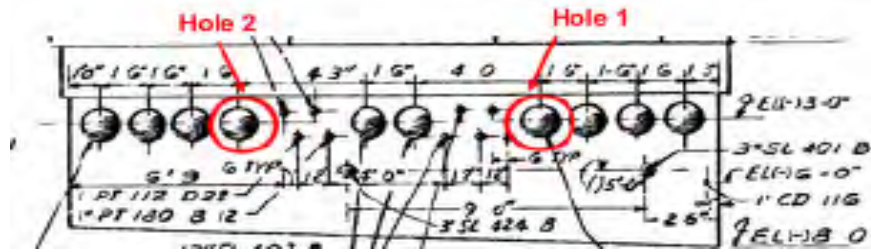


Figure 3: Pipe Trench Access Penetrations

2. Initiate supply air to sprayer.
3. Compressed air supply of 8 to 10 psi at 5 to 6 scfm required to drive sprayer motor and nozzles.
4. Startup pump with fixative and bring up to pressure.
5. A minimum of 4-gal./min. at 3500 psi will be delivered to the spraying nozzle.
6. After 5 minutes, or the Pipe Trench has complete fixative coverage, stop fixative supply pump. Stop compressed air.
7. Record the following data:

Total spray time elapsed	Time
Estimated fixative usage	gal
Estimated flow rate	gal/min

8. Check the Pipe Trench mockup for complete fixative coverage. If the coverage is incomplete, repeat Steps 2 through 7.
9. Once the pipe trench mockup has complete fixative coverage, stop fixative supply pump and compressed air.
10. Clean sprayer and equipment as needed.

#### 4.3 Test Observations and Conclusions


#### 4.4 Inspection/Test Acceptance

	<b>Contractor Engineer:</b> _____ Signature _____ Date _____
	<b>CPCCo Approval:</b> _____

<b>Other:</b>	Signature	Date
	_____ Signature	_____ Date

**5 Final Acceptance of Test Completion**

These signatures verify that all required tests specified in this Test Procedure have been successfully completed including the resolution of any discrepancies discovered during testing for all equipment.

Contractor Engineer: \_\_\_\_\_  
Signature
Date

Contractor QA/QC: \_\_\_\_\_  
Signature
Date

DRAFT