



U.S. Department of Energy



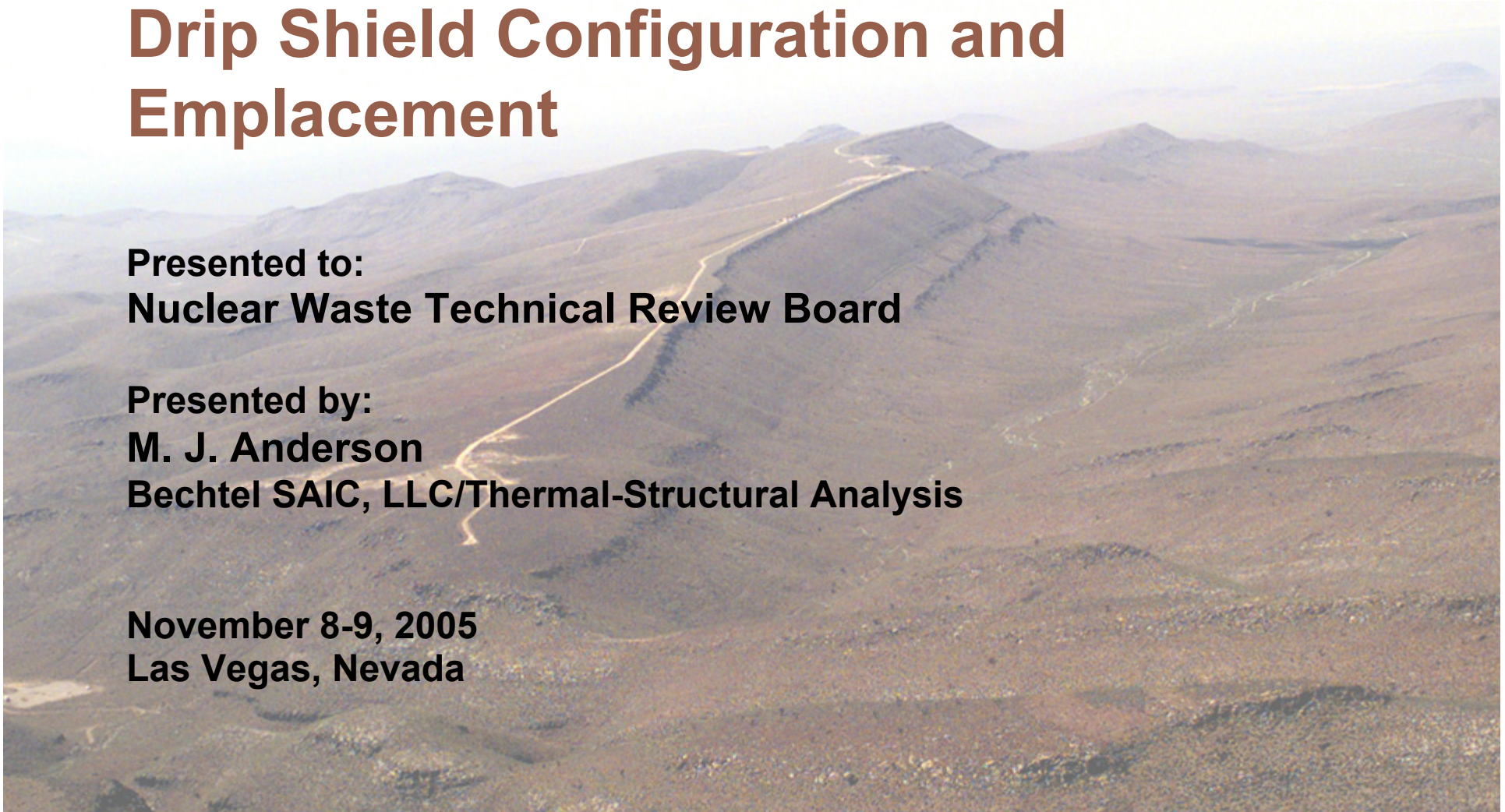
OFFICE OF CIVILIAN RADIOACTIVE  
WASTE MANAGEMENT

# Drip Shield Configuration and Emplacement

**Presented to:  
Nuclear Waste Technical Review Board**

**Presented by:  
M. J. Anderson  
Bechtel SAIC, LLC/Thermal-Structural Analysis**

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Las Vegas, Nevada**



# Drip Shield

## Functional and Operational Requirements

- **Preclosure – not Important to Safety but must:**
  - Be installed just prior to repository closure
  - Facilitate installation
  - Not preclude waste package retrieval
- **Postclosure – Important to Waste Isolation and must:**
  - Prevent seepage entering the drift from dripping onto the waste packages after repository closure
  - Protect the waste package from direct impact from rockfall



# Drip Shield Illustration

## Drip Shield Materials

Plates- Ti-7

Connector, Bulkheads, Beams &  
Stiffeners - Ti-24

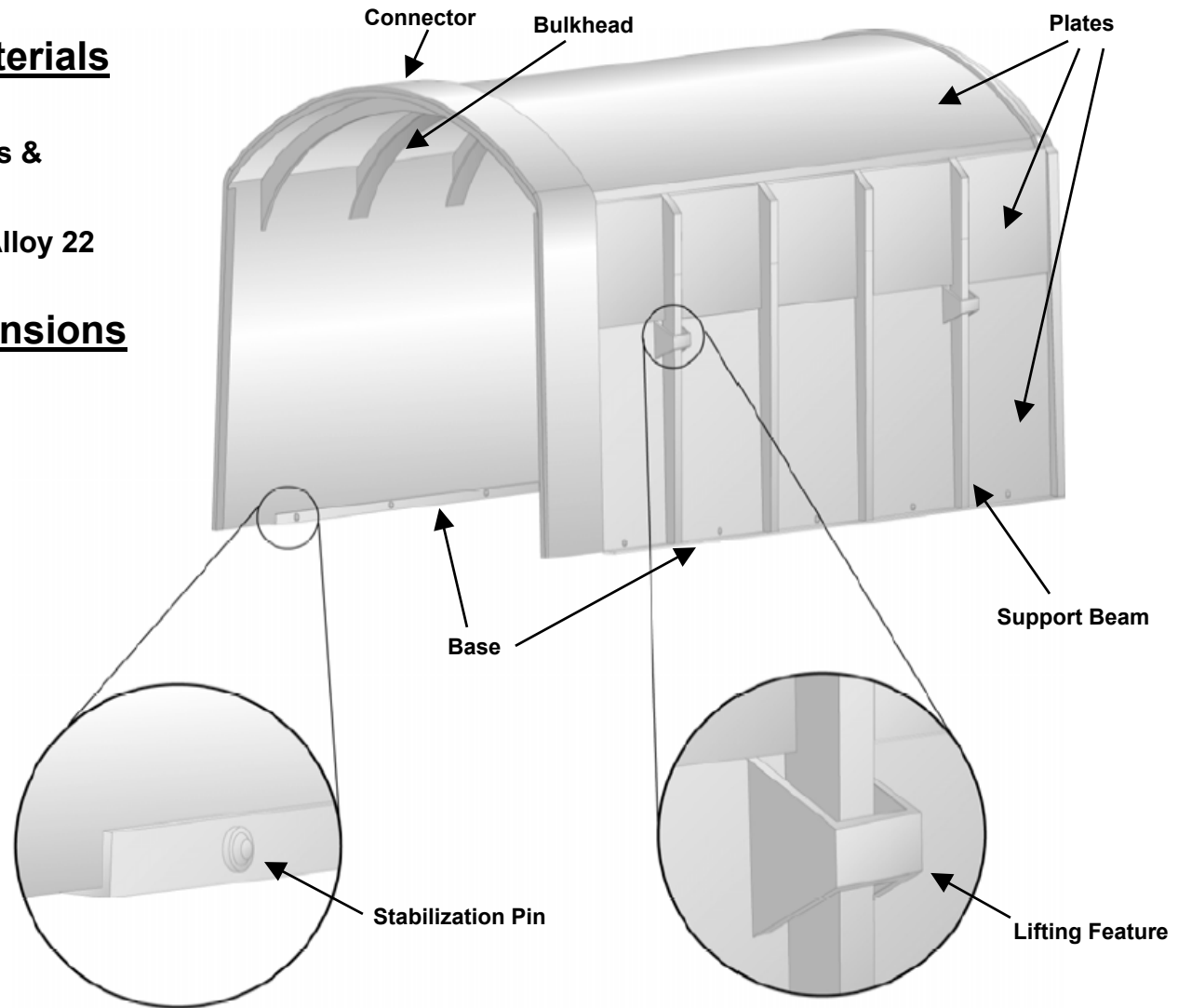
Bases & Stabilization Pins - Alloy 22

## Drip Shield Dimensions

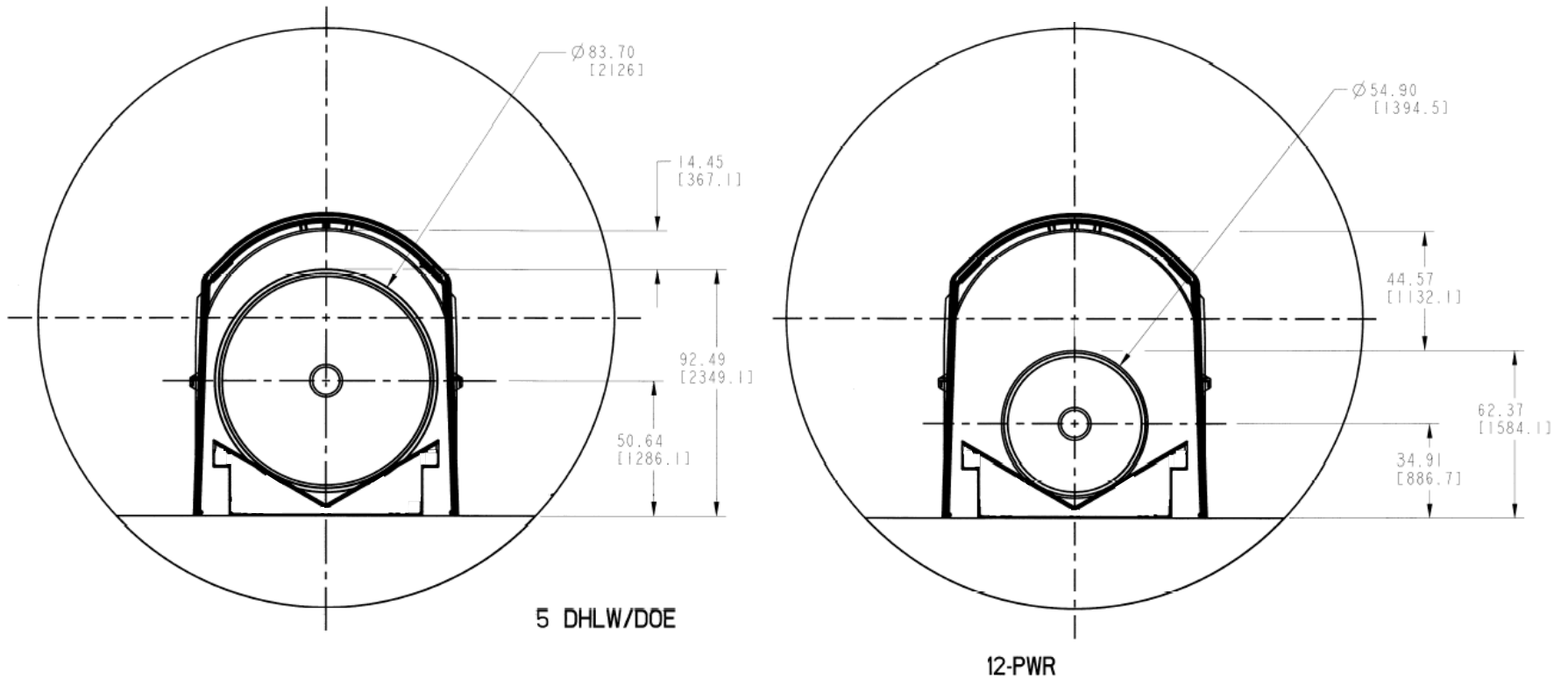
Maximum Height  $\approx$  114" (9.5')

Maximum Length  $\approx$  228" (19')

Weight  $\approx$  11,000 lb



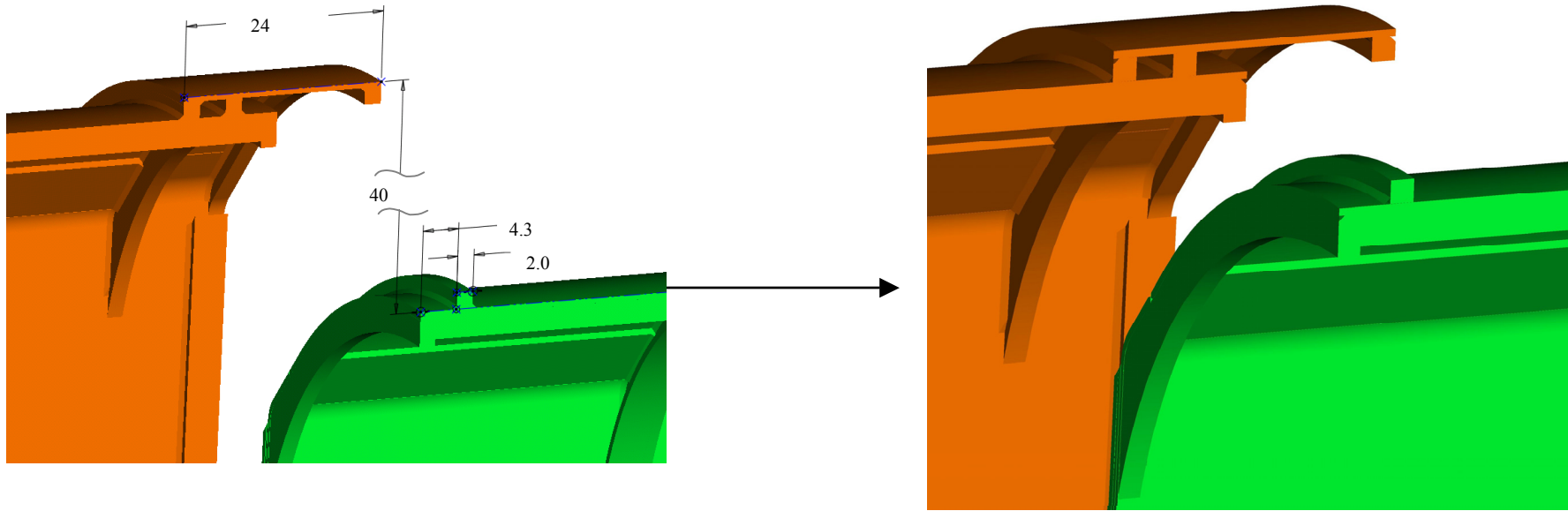
# Drip Shields with Emplaced Waste Packages



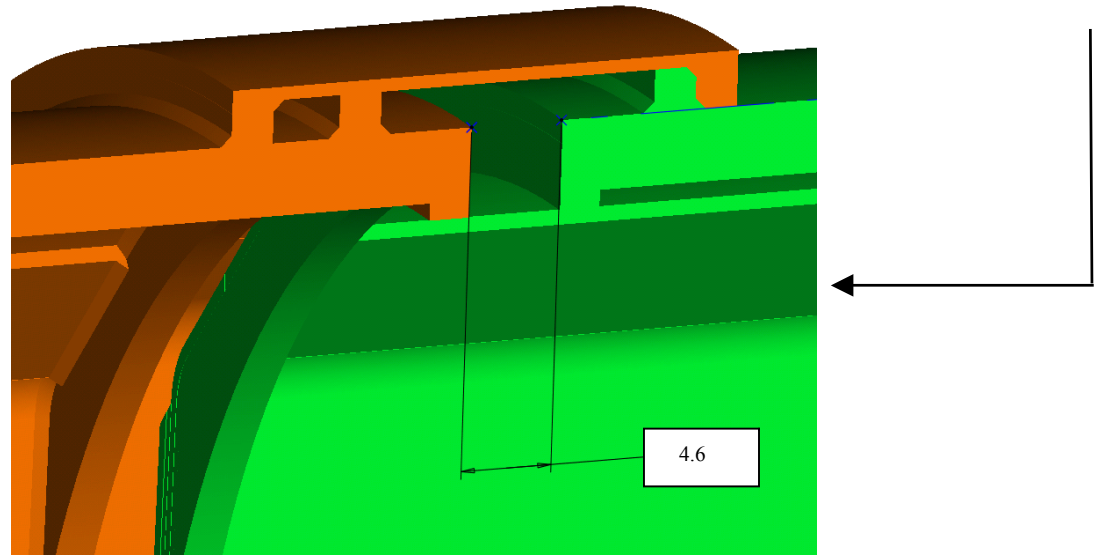
Dimensions are in inches (mm in brackets)



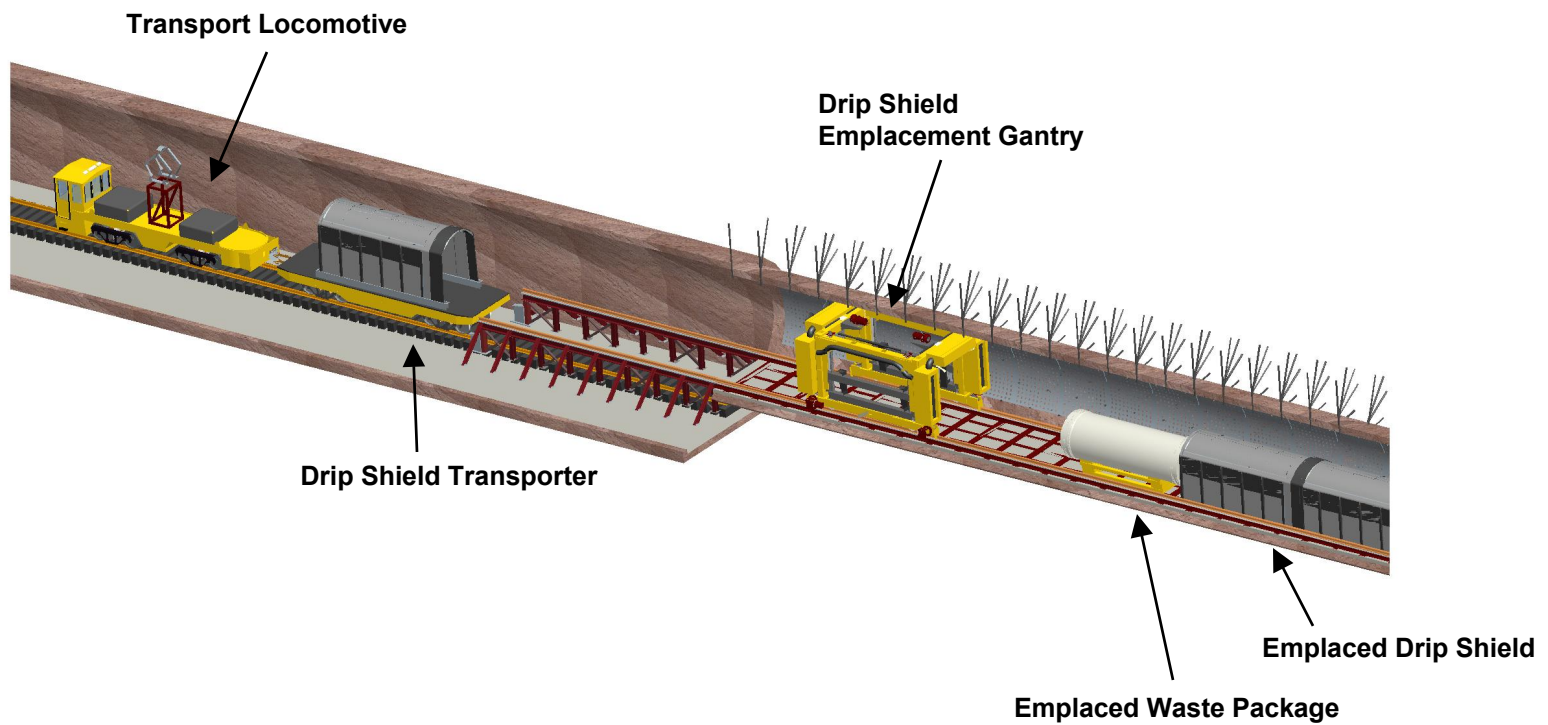
# Drip Shield Interface



Dimensions are in inches and are approximate

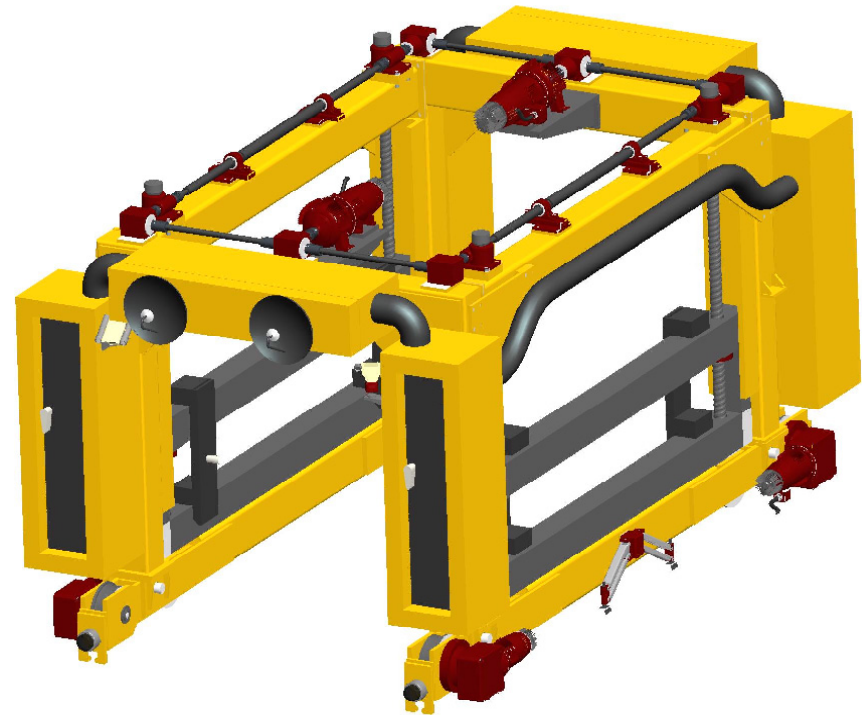


# Overall Picture Showing All the Equipment and the Interfaces



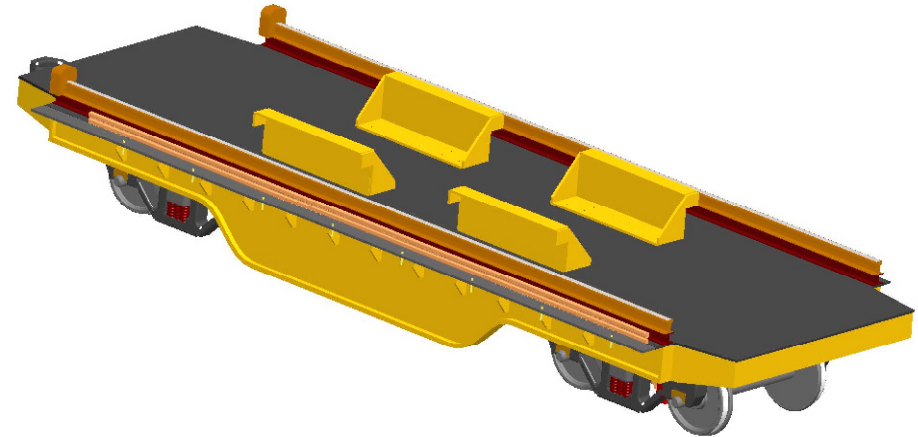
# Drip Shield Emplacement Gantry

- Based upon a gantry type crane
- Rail based
- Self propelled
- Remotely operated
- Lifting mechanism
- Lifting feature



# Drip Shield Gantry Transporter

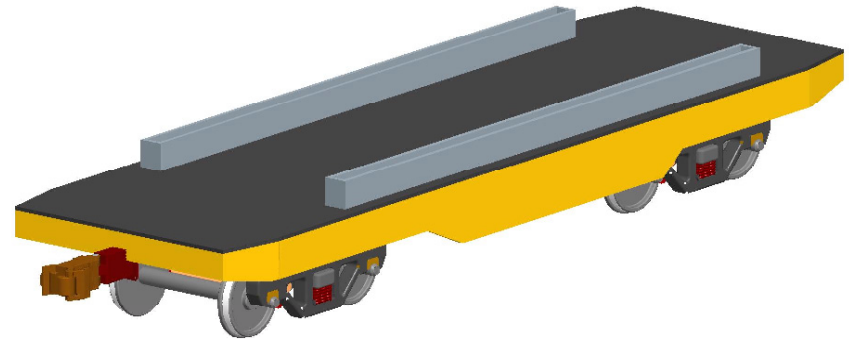
- **Based upon a commercial railroad flat bed car**
- **Two location features**





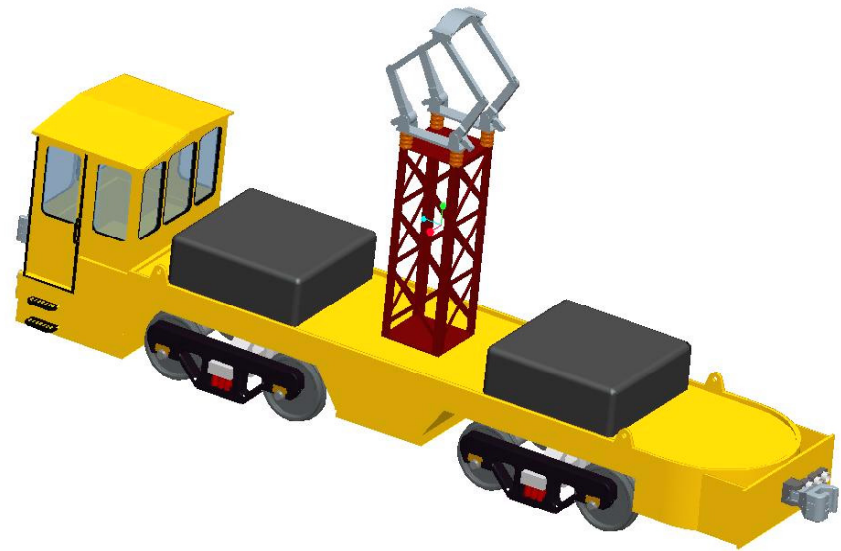
# Drip Shield Transporter

- **Based upon a commercial railroad flat bed car**
- **One location feature**



# Transport Locomotive

- **Based upon a commercial railroad locomotive**
- **Electrically operated**
- **Provides power and control**



# Steps to Emplace a Drip Shield

- **Transport drip shield to the transfer dock**
- **Move gantry to straddle the drip shield**
- **Raise the gantry lifting features, locate, and lift the drip shield**
- **Move the drip shield down the emplacement drift**

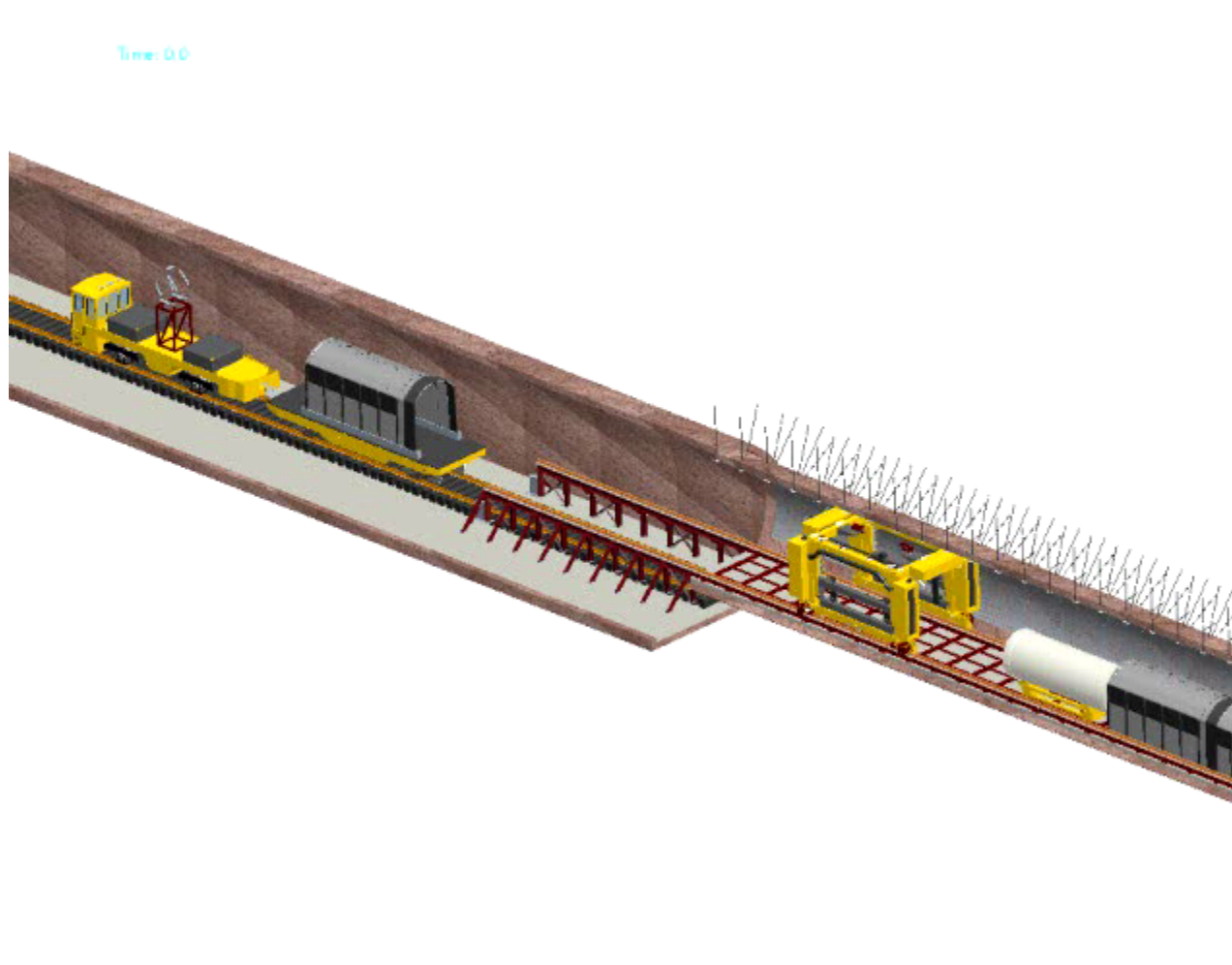


# Steps to Emplace a Drip Shield

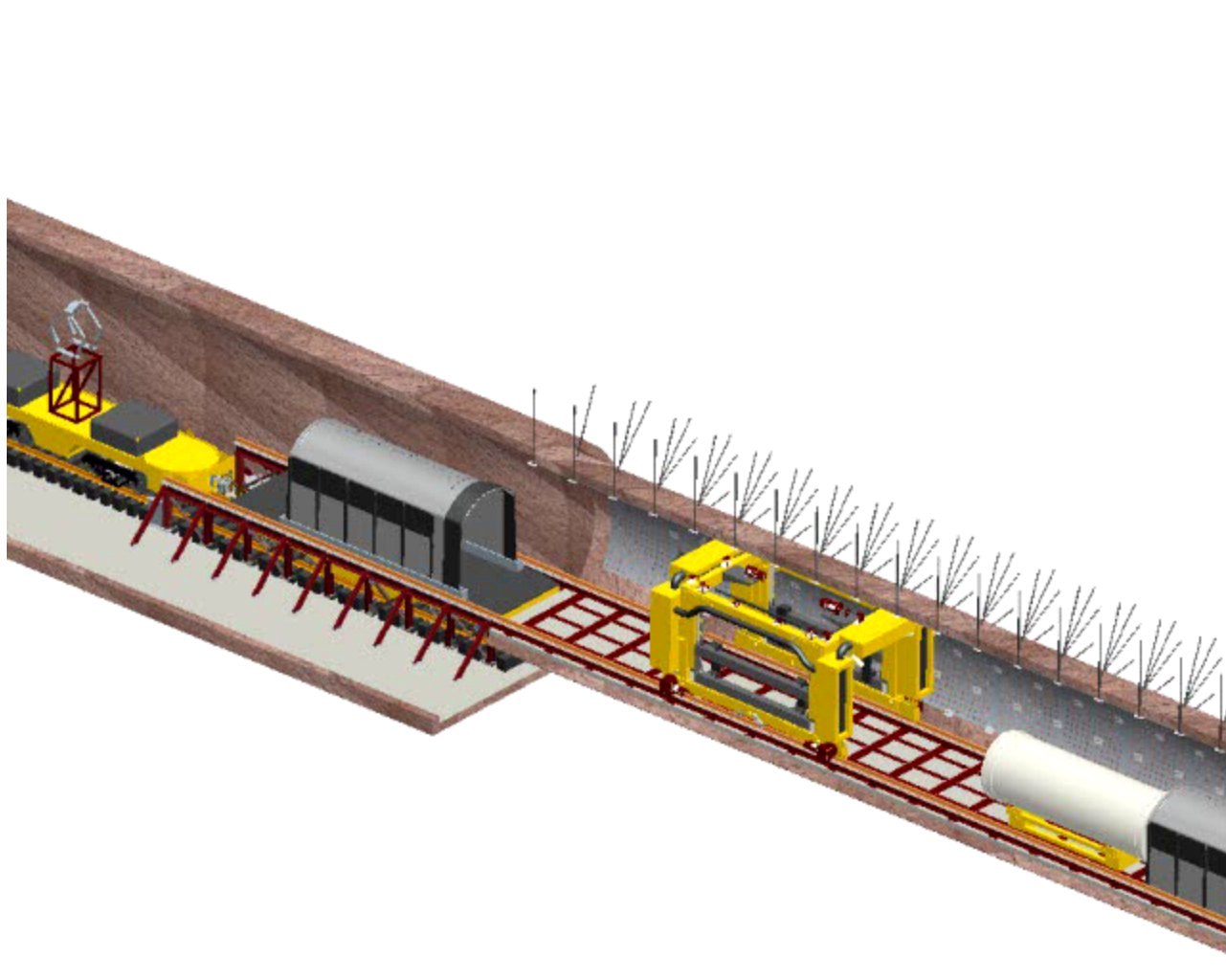
- **Position the drip shield in relation to the previously positioned drip shield**
- **Lower the gantry lifting feature to locate the two drip shields**
- **Verify the proper installation**
- **Raise the gantry lifting features and return the gantry to the drift entrance**



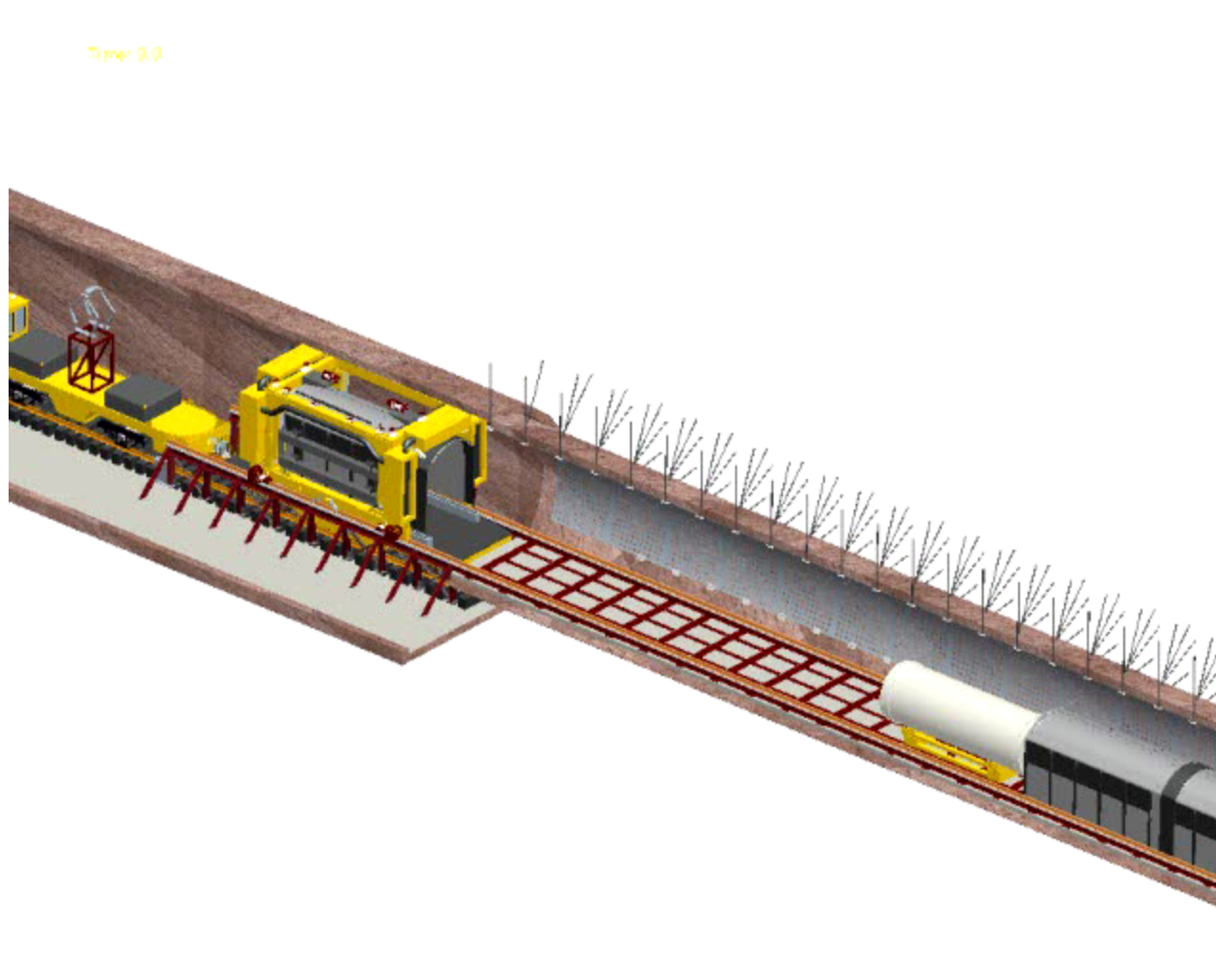
# Simulation 1 – Delivery of Drip Shield



# Simulation 2 – Gantry Picks up Drip Shield



# Simulation 3 – Gantry Emplaces Drip Shield



# Response to Board Questions

- **Question**

- **What data and/or prototypes for the drip shields and their emplacement devices are planned to be available in 2006? 2007? 2008?**

- **Response**

- **For the drip shields, configuration and assembly drawings and calculations supporting the demonstration of safety functions are available. Under the current schedule, support for prototype procurement will begin in 2008.**
- **For the drip shield gantry there is a conceptual design, but under the current schedule, there are no plans before 2008 to advance the design or produce a prototype**

