MSE Walls: From Innovation to Every Day Best Practices

*Design It Right…. Build It Right … Care For It Right*

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Executive Director
Association for Metallically Stabilized Earth
Earliest MSE – From Natural to Inventive
Modern MSE – Engineering Innovation

- Precast Panels, Steel Reinfs
- Segmental Blocks, Steel or Geosynthetic Reinfs
- Wire Baskets, Steel or Geosynthetic Reinfs

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MSE Innovation in Ohio

I-90 Cleveland (2015)

In Great Condition! (1984 – 32 yrs)

I-75 Dayton (Wright Brothers)

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MSE Best Practice Is

A strategic and systematic process of...

• Designing
• Constructing
• Inspecting
• Operating/maintaining
• Upgrading/expanding

... MSE walls throughout their lifecycle.
<table>
<thead>
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<th><strong>Best Practices: Responsibilities</strong></th>
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# Best Practices: Responsibilities

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<td><strong>Owner</strong></td>
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Best Practices: **Assure Durability**

- **Reinforcements**
  - Electrochemical, environmental
  - Installation damage
- **Facings**
  - Concrete Strength
  - Joints, filters, bearing materials
  - Drainage, freeze-thaw
- **Site "Durability"**
  - Drainage, erosion
  - Accidents, spills
Best Practices: Quality Plans and Specs

- Quality results require quality plans and specs
  - Thorough
  - Detailed
  - Realistic and accurate
- Followed by attentive inspection
Best Practices: Inspection

• Control of materials
  – Panels, reinforcements, joint materials
  – Backfill – grain size, moisture, electrochemistry

• Control of processes
  – Wall erection – plumbness, alignment, finish details
  – Backfill placement and compaction
  – Drainage systems/runoff control
  – Barrier/coping

• Record-keeping – facilitates monitoring
Inspection Requires …

- Trained inspectors who understand MSE construction

**CONSIDER THIS:**
NHI training course  
# 132080:  
*Inspection of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes*

*Google "NHI 132080"*
Best Practices: Prepare the Foundation

Undercut and Replace

Grade and Proof roll
Foundation Details Matter

Start Right
to
End Right

Level

Smooth

Straight

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Best Practice for Panel Installation

Align

Plumb

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Steel Reinforcement Connections

Insert Connector

Tighten Nut

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Best Practice for Block Facing Installation

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Geosynthetic Reinforcement Connections

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Critical Best Practice: Drainage

Facing Joints

Backslope

Whole Site

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Adjustments Needed at Obstructions
Drainage: Collect It, Direct It

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Best Practice: Design for Obstructions

If obstructions *must* be in the MSE fill – *design for them!*

- Recommended max pipe diameter $D = 24''$ *(reinforcement vertical spacing $\leq 33''$)*

- Recommended max foundation diameter $D = 36''$ *(allow room for soil reinforcements!)*

- Offset from panel to obstruction $\geq 1.5 \times D$ *(to allow for reinforcement skew or splay)*
Use MSE-Appropriate Backfill

Clay backfill = poor friction and drainage

Good friction, drainage and performance with granular backfill

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Excellent Compaction for Long Life

Good compaction produces

- Overall stability
- Deformation control
- Drainage and runoff control

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Best Practice: Asset Management to Maximize Life and Performance

- Comprehensive design and specs
- Materials selection
- Construction practices
- QA/QC, inspection, as-builts, photos
- Once built, maintain, monitor condition
- Wall component repairs are possible

➢ IF YOU KNOW WHAT YOU BUILT AND ITS CONDITION!
Best Practices
Yield Good Results

THANK YOU

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