

Managing North Carolina's MSE Wall Assets through Design, Construction and Performance

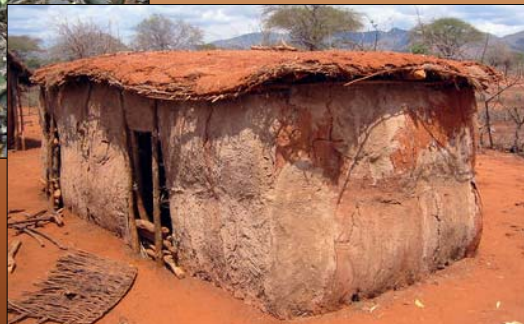
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Asset Management: Build It Right ... Care For It Right



Early Earth Reinforcement Systems



Asset Management: Build It Right ... Care For It Right



Early Asset Management



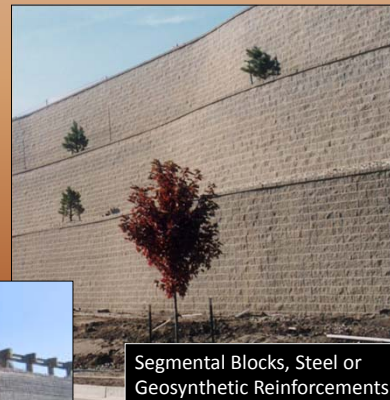
Asset Management: *Build It Right ... Care For It Right*



Modern Earth Reinforcement Systems



Precast Panels, Steel Reinforcements



Segmental Blocks, Steel or Geosynthetic Reinforcements



Welded Wire Baskets, Steel or Geosynthetic Reinforcements



Asset Management: *Build It Right ... Care For It Right*



Modern Asset Management

FHWA says ...

"Transportation Asset Management is a strategic and systematic process of operating, maintaining, upgrading, and expanding physical assets effectively throughout their lifecycle."

MSE-focused definition ...

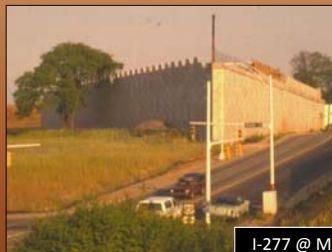
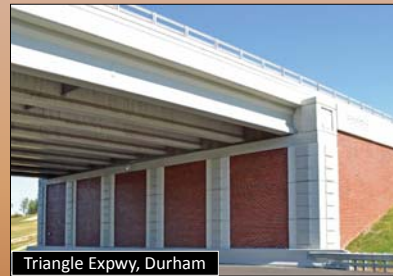
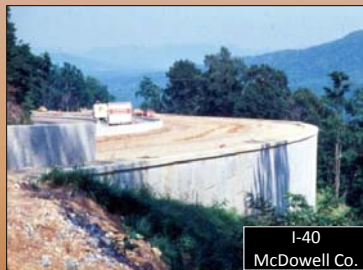
Transportation Asset Management is a strategic and systematic process of DESIGNING, BUILDING, operating, maintaining, upgrading, and expanding physical assets (*MSE walls*) throughout their lifecycle.



Asset Management: Build It Right ... Care For It Right



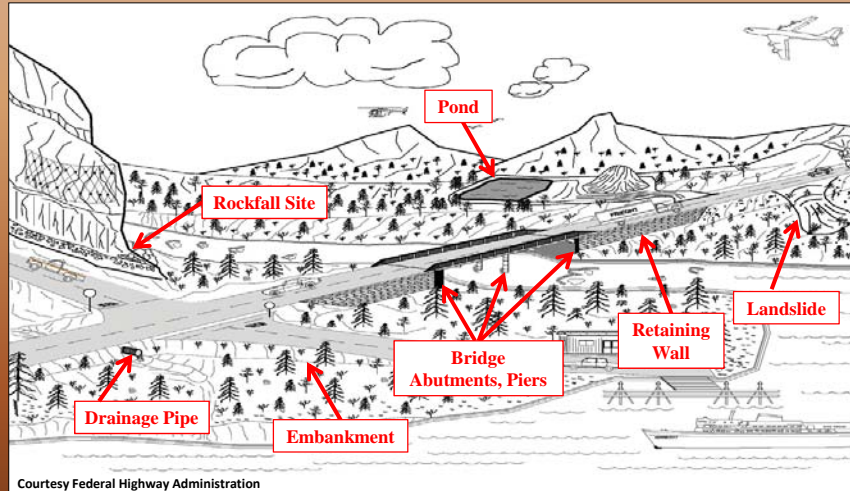
Some
NC
MSE
Wall
Assets



Asset Management: Build It Right ... Care For It Right



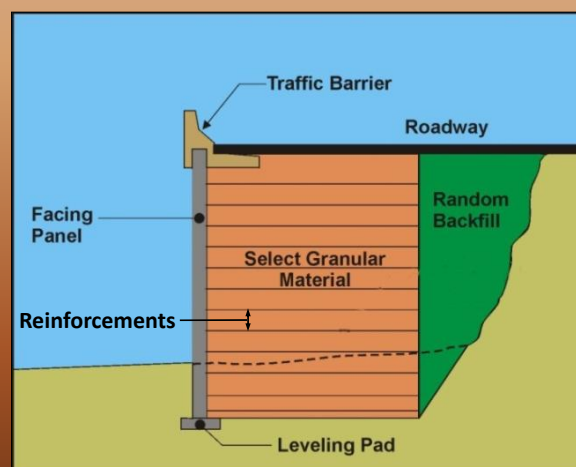
Transportation Corridors Contain Many Geotechnical Assets



Asset Management: Build It Right ... Care For It Right



For Asset Management, Design Matters



Asset Management: Build It Right ... Care For It Right



Components of an MSE Wall Asset

- Design
 - Stability: Sliding, overturning, bearing capacity, settlement, overall stability*
 - Strength: Reinforcements, connections
 - Durability: Reinforcements, facing
 - **Drainage: Direct water away from wall face, foundation**
- Specifications
 - Typically based on AASHTO
 - Covers backfill, construction procedures
- QA/QC
 - Construction inspection (conformance to specs)



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Components: *Drainage, Storm Water*



Collect it



Direct it



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Component: *Durability*

- Reinforcement Durability
 - Electrical, chemical *UV exposure*
 - Installation Damage
- Facing Durability
 - Joints, bearing materials
 - Drainage, freeze-thaw
- Site "Durability"
 - Drainage, erosion
 - Accidents, spills



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Components: *Plans and Specs*

- To construct a high quality asset,
need high quality plans and specs
 - Thorough
 - Detailed
 - Accurate
- ***Followed by thorough inspection***



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Component: *Construction Inspection* (for long-lasting results)

- 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



Asset Management: *Build It Right ... Care For It Right*



Construction Inspection

- Trained inspectors who understand MSE walls and what's important

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



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Site/Foundation Preparation



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Foundations – Critical Wall Details



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Construction Practice – Panel Facing



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Construction Practice – Connecting Steel Reinforcements



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Drainage – MSE



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Drainage – Roadway



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Backfill Selection is Critical



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Excellent Compaction for Long Life



Good Compaction Produces

- Overall stability
- Deformation control
- Drainage and runoff control



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One Last MSE Component: Planning for Asset Management

- As-built drawings
- Condition assessments (post-construction inspection)
- Maintenance plans
 - Drainage/siltation, erosion, vegetation, other
- Ability to address unforeseen situations
 - Wall identity, characteristics database
 - Monitoring stations (metal reinforcements)



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Plan to Manage Assets (rather than retrofit them)



Asset Management: Build It Right ... Care For It Right



MSE Asset Management is about *Maximizing Performance*

- Many components of MSE walls; most buried
- Key components to consider: design, specs, materials, construction, inspection (QA/QC)
- Managing an MSE wall asset starts with design, continues through the full structure life
- MSE wall assets lend themselves to monitoring, condition assessment, in-place repair

Build it Right ... Care For It Right!



Asset Management: Build It Right ... Care For It Right

