Retaining Wall Initiatives

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Retaining Wall Initiatives

- MSE Wall Panel Repair SD
- Pre-fabricated Retaining Wall Systems (PRWS) Approval Process
- Revise Headwall SDs per LRFD
- CIP concrete cantilever wall SDs per LRFD
  - CHA, 1/2015 – 6/2016
MSE Wall Panel Repair

- Investigate deterioration causes
  - Suggest specification changes

- Consult wall suppliers, national experts; research new/modified procedures
  - Develop generic Standard Drawings for all potential conditions
CONCRETE REMOVAL LIMIT (MIN. OF 2 INCH BEYOND LIMITS OF SOUND CONCRETE)

LIMITS OF SOUND CONCRETE (DETERMINED IN THE FIELD)

REMOVE EXISTING CONCRETE

PARTIAL PANEL REPAIR
MSE Wall Panel Repair

Repair Methods List

Panel Repair Method 1
- Minor cosmetic facing repair

Panel Repair Method 2
- Part or full depth CIP replacement
- New pre-cast panel with helical anchors

Reinforcement Repair
- Drilled and grouted soil nails

Grout Fill – LSM Type 2
MSE Wall Panel Repair

Damage Types and Repair Methods

Type 1 (most extensive – all three conditions)
- Panel Repair Method 2
- Reinforcement repair where not functional
- Grout Fill

Type 2 (local panel damage, partial loss of fill)
- Panel Repair Method 1 or 2
- Grout Fill
MSE Wall Panel Repair

Damage Types and Repair Methods

Type 3 (panel displacement, partial loss of fill)
- Panel Repair Method 1 or 2 to close joints
- Grout Fill

Type 4 (least extensive – panel damage only)
- Panel Repair Method 1
MSE Wall Panel Repair

QUESTIONS?
Pre-fabricated Retaining Wall Systems (PRWS) Approval Process

- Submit
- Approve

Include on ODOT Approved Products List (APL)

- Established 4/1/2016
- Prior approval status will expire 12/31/2016
PRWS Approval Process

Including (but not limited to):

- Precast Gravity, Semi-Gravity, and Bin & Crib Wall Systems
- Gravity Modular Block and Large Block Retaining Wall Systems
- Mechanically Stabilized Earth (MSE) Wall Systems
PRWS Approval Process

Currently

- Limited to MSE Walls (2004 BDM), listed in SS840
- HITEC Evaluation Required
  - Expensive
  - Time-consuming
  - Defunct?
- Pre-LRFD, based on 2004 BDM and 2002 AASHTO
- No Time Renewal Requirement
PRWS Approval Process

Submit

- Letter of Intent (ODOT review in 4 weeks)
- Review Engineer Pre-qualification Requirements
- Detailed information
  - Retaining Wall System Evaluation Report
    - Prepared by Review Engineer
    - Sample long-hand calculations for specified cases
    - ID unique features
    - Highlight exceptions to AASHTO LRFD Specs
    - Shop Drawings
    - Etc.
PRWS Approval Process

- ODOT Technical Review
  - 16 weeks
  - Approved; Conditions of Approval (if any)
  - Rejected; Reasons for Rejection
PRWS Approval Process

http://www.dot.state.oh.us/Divisions/ConstructionMgt/Materials/Pages/default.aspx

QUESTIONS?
Headwall/Wingwall/CIP Wall

- Revise Standard Construction Drawing (SCD) HW-1.1
- Revise plan insert sheets for concrete headwalls for precast box culverts
- Verify SCD HW-2.1 and HW-2.2 and revise as necessary
Headwall/Wingwall/CIP Wall

NOTES

APPLICATION: Provide Full Height Headwalls for skewed and non-skewed culverts having a diameter or rise of 42” to 84” inclusive. Use Type “A” when the skew angle (Φ) is ten degrees or less and Type “B” when the skew angle is over ten degrees.

CONCRETE: Use 4000 psi compressive strength concrete.

REINFORCING STEEL: Provide epoxy coated #5 bars.

DETAILS AND QUANTITIES: Are shown for circular sections only. When used with reinforced elliptical concrete pipe or corrugated metal pipe arches, adjust dimensions and quantities to conform to those listed for the nearest size circular pipe. Apply the dimensions established by vertical diameter to span. Round all calculated dimensions established by horizontal diameter to the nearest 1”. Chamfer all exposed corners ¾”.

FOUNDATION: Where the soil borings indicate a bearing capacity of less than 2,600 pounds per square foot, increase the width of the footing.

HEADWALL LOCATION: Determine by the intersection of the embankment slope at the back of the headwall at point “K”. Provide 2:1 slopes adjacent to the headwall.

PAYMENT: Item 602 Concrete Masonry includes reinforcing.
Headwall/Wingwall/CIP Wall

- Perform an independent check of a new SCD Cast-in-place Reinforced Concrete Cantilever Retaining Wall and revise as necessary.
# Headwall/Wingwall/CIP Wall

## Case I: 15.5 ksf Factored Applied Seismic Pressure

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## Case II: 15.5 ksf Factored Total Seismic Pressure

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## Case III: 15.4 ksf Factored Total Seismic Pressure

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Headwall/Wingwall/CIP Wall

QUESTIONS?