

CONSTRUCTION BRIEFING • JUNE 2019

STEVE SLOMSKI, OFFICE OF CONSTRUCTION ADMINISTRATION



OHIO DEPARTMENT OF
TRANSPORTATION

GEOTECHNICAL UPDATE

- Geotechnically Sensitive Projects
 - SS 878
 - S 1015
- C&MS Updates
 - Chemical Stabilization
 - MSE & Prefabricated Walls

GEOTECHNICALLY SENSITIVE PROJECTS

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- Prior to 2018, Several projects had huge Change Orders resulting from unappreciated geotechnical problems
 - Existing unstable slope slid during embankment placement
 - Inappropriate foundation type - micropiles, high loads, clay
 - Temporary excavation support changed by contractor

GEOTECHNICALLY SENSITIVE PROJECTS

- Change Orders resulted from inadequate designs, plan errors, construction changes or construction practices
- Committee formed to improve Design and Construction
 - Central Office & District staff
 - Design & Construction staff
- Identify projects and features that need added oversight

GEOTECHNICALLY SENSITIVE PROJECTS

- Project Types Include:
 - Geohazard remediation
 - Problematic geology
 - High fills with special benching
 - Fills on soft ground
 - Rock cuts
 - Ground improvements
 - Complex geotechnical instrumentation
 - Foundations modified for uncommon geotechnical performance

ACTION ITEMS - COMPLETED

- Identify projects in ELLIS as *Geotechnically Sensitive*
- Require OGE & DGE to review plans at Stage 2
- Require Geotechnical Design Consultant to review and certify Stage 2 and Final Plans
- Revise SS878 to describe inspection requirements

ACTION ITEMS - FUTURE

- Create a Special Provision to contain all notes, specifications, requirements, etc. that address the sensitive feature
- Allow the Geotechnical Design Consultant to provide the construction testing and inspection services
- Define the line of communication, and circumstances, between Construction staff and DO, CO, Design Engineers, SS 878 Consultants, when issues arise

ACTION ITEMS - FUTURE

- Identify processes in Construction for dealing with changed conditions, waiving/changing plan requirements
- Create documentation and reporting for “Special Benching” to be included in the as-built mapping
- Develop a “Field Review Checklist” required with submission of each milestone

SUPPLEMENTAL SPECIFICATION 878

Inspection and Compaction Testing of Unbound Materials

SS878 - REVISIONS EMPHASIZE INSPECTION

- Added emphasis that the Item is **both** *Inspection of the Work* and *Compaction Testing Services*
- **Inspection** involves observations that the material, the placement, and the compaction conform to specification requirements
- Consultant inspectors and ODOT ones have the same monitoring responsibilities

SS878 - INSPECTION & COMPACTION TESTING

- **878.04 Inspection and Field Testing**
- Subdivided to identify tasks and their requirements
 - A. Inspection - added definition and requirements
 - B. Field Testing - no change
 - C. Notification - no change

SS878.04 - INSPECTION & COMPACTION TESTING

A. Inspection. *Perform inspection to ensure the placement and compaction of unbound materials conform with Contract Documents. Take photographs showing initial condition, the daily progress of the work, unusual conditions, noncompliant work, and corrective actions.*

SS878.04.A - INSPECTION (CONTINUED)

Inspection includes observations, measurements and verifications to ensure:

- Preceding activities have been completed (e.g., 201, 202)
- Surface ready to accept material
- Grading was checked - cross section, benching, typical section
- Correct material provided; no debris
- Spread to required lift thickness; not segregated
- Correct moisture content maintained during compaction

SS878.04.A - INSPECTION (CONTINUED)

Inspection observations, measurements and verifications to ensure:

- Compaction used correct roller and number of passes
- Corrective actions taken to address failing tests or unstable materials
- For 205 and 206: stabilization chemical applied at required rate; chemical, added water and soil thoroughly mixed; and curing coat correctly applied.

SS878 - INSPECTION & COMPACTION TESTING

878.05 Forms and Weekly Reports.

Provide accurate inspection information, tests, and calculations. Report inspections on Department forms to include a daily report and the construction quality documentation forms for the items inspected. Report the compaction tests on Department forms described in S-1015. Furnish the inspections, photographs, compaction test results, and measurements to the Engineer daily...

SUPPLEMENT 1015

Compaction Testing of Unbound Materials

S 1015 - REVISED FOR TESTING FREQUENCY

- Increased compaction testing frequency to:
 - Every Day
 - Every Lift (except 611 and 503 backfill)
- ***1015.09 Number of Tests. Divide the work into lots as shown in the following table. Perform the minimum number of compaction tests as shown in the table each day of material placement.***

S 1015 - COMPACTION TESTING FREQUENCY TABLE

TABLE 1015.09-1 MINIMUM NUMBER OF
COMPACTION TESTS **PER DAY**

Item	Maximum Lot Size*	Minimum Number of Compaction Tests
203 and 205 lift area > 2500 yd ²	2000 yd ³	One per Lot or One for every lift, whichever results in more compaction tests
lift area ≤ 2500 yd ²	500 yd ³	One per Lot or One every 2nd lift, whichever results in more compaction tests

Remainder of table is the same.

For Comparison:

1 test per 2000 CY of 8-inch lift ≈ 1 test per 10,000 SY (90,000 SF)

1 test per 500 CY of 8-inch lift ≈ 1 test per 2,500 SY (22,500 SF)

S 1015 - COMPACTION TESTING FREQUENCY TABLE

- * Maximum Lot Size footnote guidance:
Smaller areas may be combined into one lot, not to exceed the maximum lot size, by the Engineer to maintain a workable system. For example, two or more areas containing small quantities of embankment material could be combined into one lot, provided that each of the smaller areas are tested and that the frequencies of testing are similar.

2019 CONSTRUCTION AND MATERIAL SPECIFICATIONS



2019 C&MS - SCHEDULE

- July 1, 2019 - All plan packages submitted will reference the 2019 C&MS
- July 19, 2019 - Final SS800 for 2016 C&MS
- January 2020 - Publish the 2020 edition of the Construction Administration Manual of Procedures

ITEM 204 SUBGRADE COMPACTION & PROOF ROLLING

- Incorporated *SS861 Geogrid for Subgrade Stabilization*
 - Construction activities in C&MS **204.07.B**
 - Geogrid material new C&MS Item **712.15**
 - SS861 retired for the 2019 C&MS

ITEM 206 CHEMICALLY STABILIZED SUBGRADE

- Meet with a stabilization contractor who critiqued our process
 - Initial mixing pass without adding water is outdated
 - Mixing soil to have more than 60 percent passing No.4 sieve is too strict, not attainable, damages cementing process, and testing frequency is not defined
 - Applying cure coat: 'immediately' vs. timely

ITEM 206 CHEMICALLY STABILIZED SUBGRADE

- Cement quantity measured for payment
 - Weight delivered; weight calculated; or allow an overage percentage
 - *206.07. The Department will measure cement or lime by the number of tons incorporated in the completed and accepted work.*

ITEM 206 CHEMICALLY STABILIZED SUBGRADE

- 206.05.A. Spreading (also GB1 Section G)
 - Default cement spreading rate to 5 percent
 - Default dry density for soil of 115 lbs/ft³
- 206.05.B.1. Mixing - Cement -
 - *After the initial mixing, remix the soil and introduce water through the mixer to bring the mixed material to between 2 and 4 percent above optimum moisture content for cement...*

ITEM 206 CHEMICALLY STABILIZED SUBGRADE

- 206.05.D. Curing - Revised to:

By the end of each day's operation, *cover the stabilized work area's surface with curing coat for curing the chemically stabilized subgrade.*

- Old language:

Immediately after the compaction and shaping...

- Still can't let the surface dry out!

GB1: PLAN SUBGRADES - GLOBAL STABILIZATION

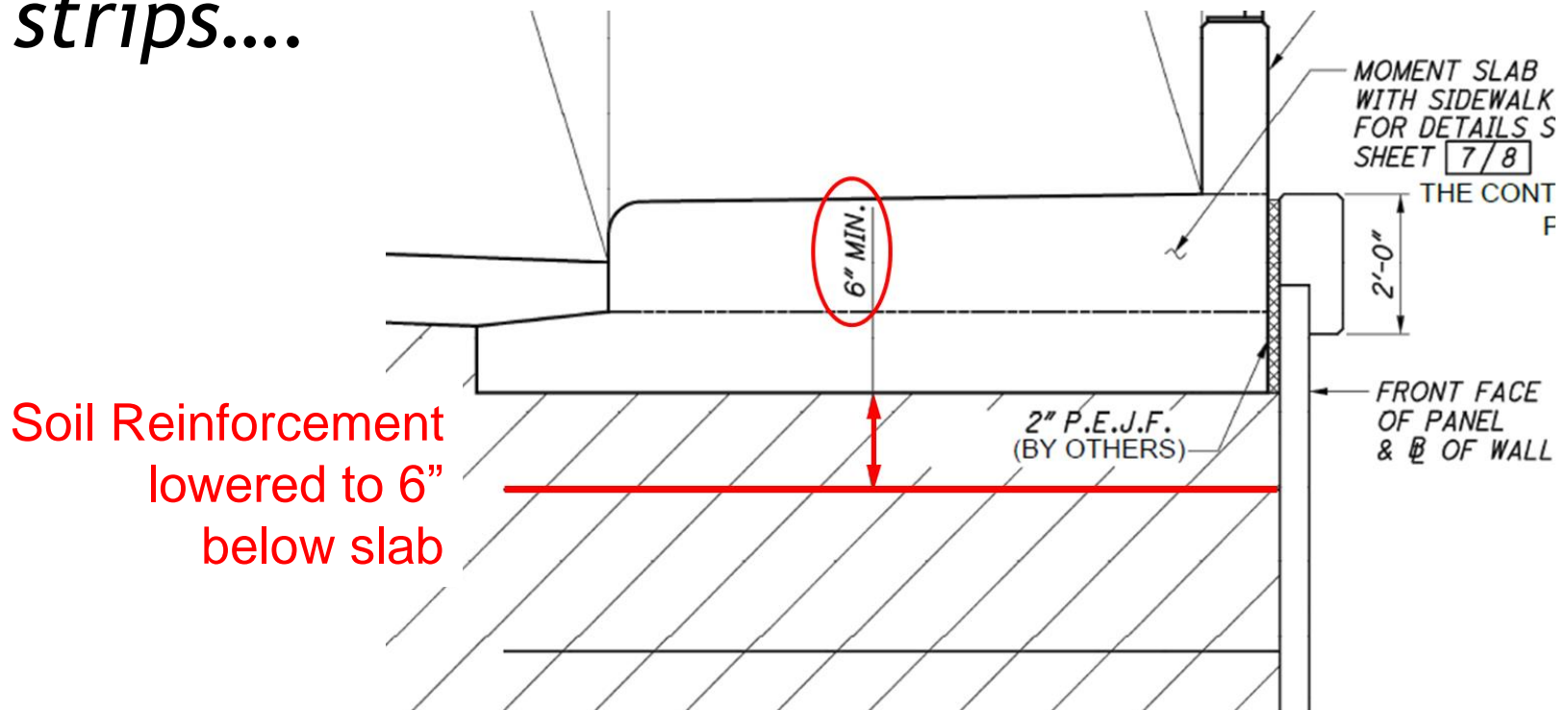
- Section D. Designing Subgrade Stabilization
 - GB1 Figure B - 16” deep treatment replaced with 14” deep treatment
 - Chemically stabilizing when sulfate contents are below 5,000 ppm
 - “...Where it is determined that soil is present where a majority of sulfate content values are found to be greater than 3,000 parts per million (ppm), or individual soil samples with sulfate contents greater than 5,000 ppm are present, contact the District Geotechnical Engineer to discuss options...”

ITEM 304 AGGREGATE BASE

- Revised 304.03 to have the Contractor, rather than Project:
 - Sample the material from the stockpile
 - Create the moisture-density curve to determine the optimum moisture content used for compaction
- Added small quantity exception:
 - Total volume less than 1000 cubic yards
 - Optimum moisture content may come from a laboratory curve that is within **one year** of the placement date

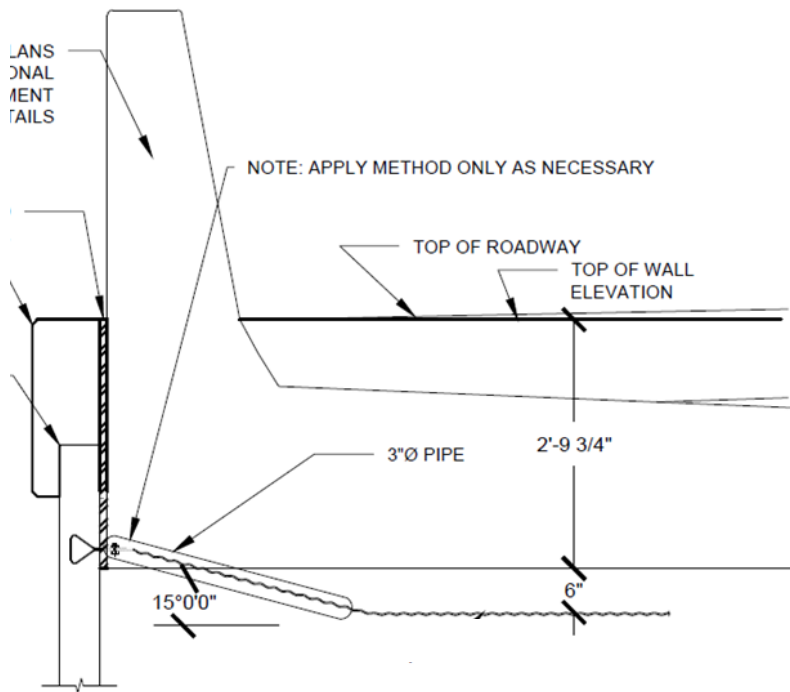
SS840 MSE WALL - OBSTRUCTION CONFLICTS

- Soil reinforcement & obstruction conflicts
 - moment slabs, footings, approach slabs
- 840.04.A.13 states: *Do not provide a design that bends steel strips or geotechnical strips....*



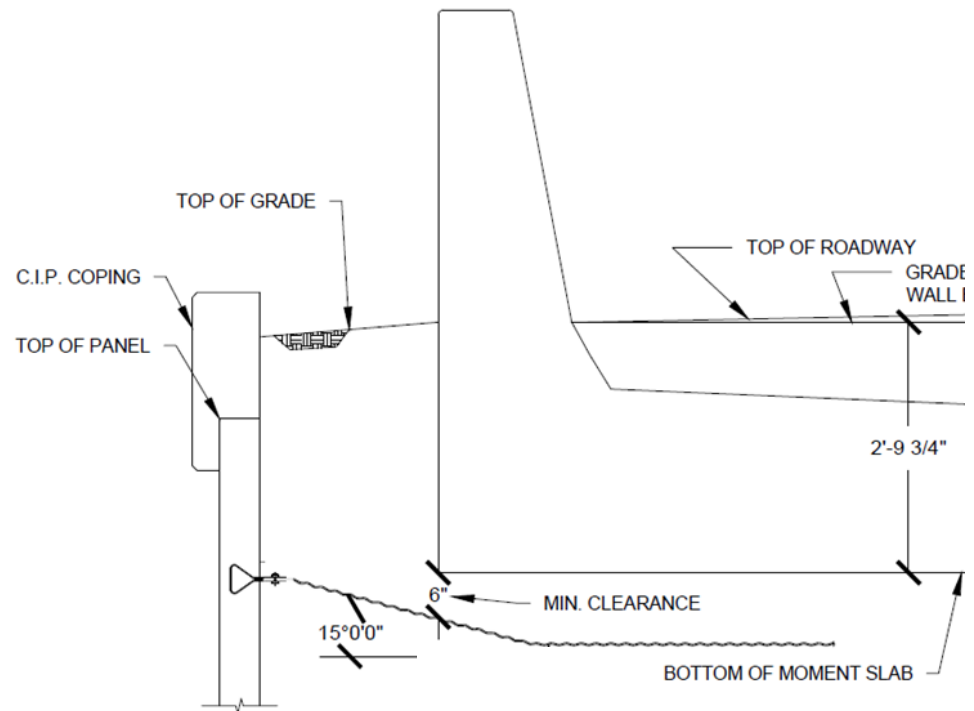
SS840 MSE WALL - SUPPLIER SOLUTIONS

- Use two steel angles & Hilti-bolts as connector.
- Bend reinforcement rather than move connector.



C.I.P. BARRIER AND MOMENT SLAB

NO SCALE



C.I.P. BARRIER AND MOMENT SLAB

NO SCALE

SS840 MSE WALL - REVISED REQUIREMENTS

- 840.04.A.13 Design Requirements -
...Otherwise, provide a special design to avoid the obstacle, such as a structural frame or attaching steel angles to panels using anchors or connection devices that are cast into the panel.
- 840.04.B.2.d Submittal of Drawings -
On elevation view show:
d. Obstructions to the soil reinforcement, such as catch basins or bottom of moment slabs.

SS840 MSE WALL - AESTHETIC FORMLINERS

- 840.04.B.5.f Panel Shop Drawings show:
 - f. *Aesthetic surface treatment details and limits, obtained from the contract documents. Minimum relief of aesthetic pattern formliners of 1.0 inches, unless otherwise indicated.*

SS840 MSE WALL - COPING

- 840.06.K.- Added expansion joint details
 - Provide expansion joints in the coping no more than every 20 feet along the length of the wall
 - Locate the expansion joints to align with the panel joints and to be oriented vertically
 - Provide additional expansion joints as necessary for breaks in wall slope and/or changes in the wall alignment
 - Install ½-inch thick PEJF in joints between coping sections

SS867 TEMPORARY WIRE FACED MSE WALL

- Issued 4/15/2016
- Replaced non-standardized Plan Notes; varied by Designer
- Applies to walls shown in Plans and Contractor designed alternatives

SS870 PREFABRICATED MODULAR RETAINING WALL

- Prefabricated Modular Retaining Wall (PMRW) are stacked modular units that act as a gravity type retaining wall
 - Crib walls, Bin walls, Modular block walls
 - Concrete or steel units/components
 - No soil reinforcements
 - No dry-cast concrete blocks/units
- Developed to start OGE approval process for PMRW systems to be used by ODOT
- Issued 1/18/2019
- Eventually C&MS 610 to be retired

QUESTIONS

Stephen Slomski, P.E.

State Construction Geotechnical Engineer

Stephen.Slomski@dot.ohio.gov

614-466-4318 (office) 614-562-1529 (cell)



Last updated 6/27/2019