Earthwork Specifications Updates

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Update and Changes

- Update on changes made to Specifications, Policies, & Procedures
- Feedback from Process Reviews and input from Construction personnel.

Specifications

- 120-8.1 Embankment Construction - LOTs
  - Mainline pavement lanes, turn lanes, ramps, parking lots, concrete box culverts and retaining wall systems define LOT as a single lift of finished embankment not to exceed 500 feet.
  - Shoulder-Only areas, bike/shared use paths, and sidewalk areas a LOT is defined as 2000 feet or one Day's Production, whichever is greater.

Specifications

- 120-8.4 Reclaimed Asphalt Pavement (RAP) Method:
- Do not use RAP material in the following areas:

1) Construction areas that are below the seasonal high groundwater table elevation

2) MSE Wall backfill.

Specifications

- Question from Industry – How is Independent Verification processed.
- Section 120-10 Independent Verification
  - 120-10.1.5 - In addition to the Verification testing, the Engineer may perform additional Independent Verification (IV) testing. The Engineer will evaluate and act upon the IV test results in the same manner as Verification test results.

Specifications

- Acceptance Program - 120-10 & 125-9
  - Both QC and VT inspectors are required to select test locations, including station, offset and Lifts using a random number generator approved by the Engineer.
  - A Chart has been added to the Earthwork Record System forms to assist with generating Random Numbers.

125 - Pipe Backfill

- Test Strip Requirements for 12 inch thick compacted lifts

Requirements for max. 12 inch thick compacted Earthwork		
Section	**Embankment 120-8.2**	**Pipe Backfill 125-8.1**
A-3 and A-2-4 soils with up to 15% fines	No Test strip required	Test strip required
A-1, Plastic materials, and A-2-4 Materials with greater than 15% fines	Test strip required	Test strip required

- 125-8.1.6 – maximum allowed thickness of backfill in the soil envelope is 6 inches.

125 – Pipe Backfill

- Reduce Frequency Testing for Pipe Backfill and Embankment
- 125-9.1.1 - Reduced Frequency in pipe backfill is allowed after 6 passing tests
- 125-9.1.1 - requires LOTS to be selected randomly when reduced frequency testing is performed
- 120-10 - Reduced Frequency testing allowed after 12 consecutive passing tests

125 – Pipe Backfill

- Plastic pipe backfill requires 95% of Standard Proctor.
- Concrete and Metal pipes backfill requires 100% of Standard Proctor.
- Structure backfill requires 100% of Standard proctor regardless of the type of pipe joining the structures.

160 - Stabilizing

- **160-3.2.1** Sampling and Testing of Local Material: Randomly select locations for sampling using a random number generator approved by the Engineer and test at the minimum frequency listed in the table below before mixing. The Engineer will reject the material for failing QC test results. The Engineer will sample for Verification and Resolution testing at the minimum frequency listed in the table below. The Engineer will perform Verification tests at the minimum frequency listed in the table below.

Test Name	Quality Control	Verification	Resolution
Liquid Limit (LL), Plastic Index (PI), and Organic Content	One per two LOTs	One per eight LOTs	One per eight LOTs

Stabilization

- Proposed Change to 160-4.3.2.1 Bearing Value & Soil Classification:
- Requires the Engineer to collect a separate sample for LBR.
- The Engineer will *collect a* sample *at a different location other than the location where the sample was collected in 160-4.3.1.3*
- Status – Reviewing comments from Industry Review.

160 - Stabilizing

- Changes to Section 160-4.3.2.1 continued
- ***160-4.3.2.1.1 Unsoaked LBR:***
- *Verification testing for LBR was moved to a new section.*
- *The Engineer will sample and test the initial LOT for one soaked and one unsoaked LBR if consideration of the Unsoaked LBR has been approved.*

Stabilization

- Changes to Section 160-4.3.2.1 continued

- **160-4.3.2.1 Bearing Value & Soil Classification:**
- Clarified that subgrade meet requirements of Liquid Limit and Plastic Index per 160-3.4 after mixing.
- "If Local Material is used for stabilizing, the Engineer will determine compliance with embankment utilization requirements *and 160-3.4"*

- Status – Submitted to FHWA for Review
  - Expected implementation January 2011.

Retaining Wall Systems

- Payment for embankment of borrow excavation behind Retaining Wall Systems?

- **548-10 Basis of Payment:**
- The cost of granular fill for the normal roadway template will be included in the cost of embankment or borrow excavation, as applicable.
- The Basis of Estimates Manual reflects this wording.

Earthwork Record system

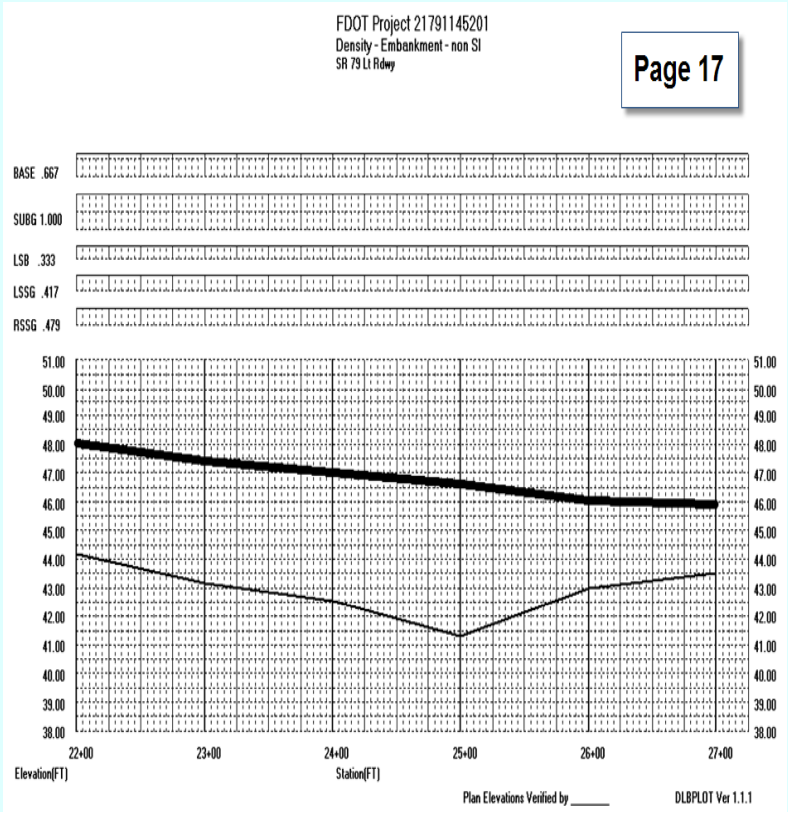
- The Earthwork Record System is composed of the Density Record System form 675-020-27 maintained by the Contractor (QC) and form 675-020-28 maintained by the Engineer(VT).
- Included is an update of changes made to these forms.

Earthwork Record System

- Gauge comparison sheet has been added to document initial gauge comparisons required by 120- 10.1.1
- Requires gauge calibration sheets be kept with the Density Log Books.
- A column that documents construction of LOTs with reduced frequency according to Spec 120-10.1.6 and 125-9.1.1 has been added.

Earthwork Record System

- Changed LOT numbering to require a LOT number and page number. Field density test results for page 17 of the Density Log Book should be labeled 1-17, 2-17,3,17 etc.



CONTRACTOR - QC DENSITY RECORDS

Earthwork Density Report

Project FIN: 21791145201

Type of Construction: **Embankment**

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Lot # - Page #	RF	Date	Tech. ID	Gauge Serial No.	Std. Dens. Count	Std. Moist. Count	Max. Dens. / Sample No.	Test No.	Station	Offset	Lift No.	Test Depth	Soil Dens. Count	Soil Moist. Count	Wet Dens.	% Moist.	Dry Dens.	% Max Dens.	Status / Disp.
1-17	N	11/3/2009	L12050183-000	35629	2256	773	111 / E0005Q	1	1383+65	L CLCONSTR	17/40	6	2251	167	123.9	10.3	112.3	101	P V
2-17	N	11/3/2009	L12050183-000	35629	2256	773	111 / E0005Q	2	1381+10	L CLCONSTR	18-19/40	12	466	183	126.2	11.2	113.5	102	P V
3-17	N	11/9/2009	L12050183-000	35629	2263	777	109 / E0004Q	3	1384+20	L CLCONSTR	20-21/40	12	669	105	115.4	6.2	108.7	100	P V

Earthwork Record System

- A random number generator chart with directions has been added to both the QC and Verification earthwork Record System forms.
- A standard sample number format has been added to the QC and Verification Earthwork Record system forms.
  - For example the first embankment split proctor would be labeled E001Q for QC and E001V for VT.

Future Developments for ERS

- Density Log Book to LIMS
  - Goal: Store field density data into LIMS database.
- Approach:
  - Create program (currently an excel spreadsheet) for individual field technicians to enter, share, and display field density data
  - Remote upload of test results to LIMS
- Status - Beta program has been developed:
  - Pilot project on the Turnpike
  - Considering a project in District 2

Future Developments for ERS

- Benefits:
  - Provides a backed up, searchable record of field density tests
  - Speeds up department reviews
- Challenges:
  - Requires duplicate entry of data
  - Some personnel do not have access to laptops
  - Requires a meeting to share files
- Implementation Date
  - No implementation date is set

Highlights & Questions

- Specifications
- Earthwork Record System Forms
- Spreadsheet
- Thanks to all for your input.