Florida Department of Transportation

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GOVERNOR

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Tallahassee, FL 32399-0450

STEPHANIE KOPELOUSOS
INTERIM SECRETARY

February 28, 2007

Dr. Leslie McCarthy, PhD, P.E.
Program Operations Engineer
Federal Highway Administration
545 John Knox Road, Suite 200
Tallahassee, Florida 32303

Re: Office of Design, Specifications
Section 120
Proposed Specification: 1200800 Excavation and Embankment

Dear Dr. McCarthy:

We are submitting, for your approval, two copies of a proposed Special Provision for Excavation and Embankment.

This change was proposed by Tom Malerk of the State Materials Office to reflect new requirements for shoulder only construction, bike/shared use paths and sidewalks.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via Email to SP965DB or duane.brautigam@dot.state.fl.us.

If you have any questions relating to this specification change, please call Duane F. Brautigam, State Specifications Engineer at 414-4110.

Sincerely,

Duane F. Brautigam, P.E.
State Specifications Engineer

DFB/ft
Attachment
cc: General Counsel
Florida Transportation Builders' Assoc.
State Construction Engineer

EXCAVATION AND EMBANKMENT.

(REV ~~2-12-07~~*2-27-07*)

SUBARTICLE 120-8-1 (of the Supplemental Specifications) is deleted and the following substituted:

120-8.1 General: Construct embankments for shoulder only construction areas, sidewalks*, and bike/shared use paths,* in sections of not less than 300 feet in length or for the full length of the embankment.

120-8.1.1 Quality Control: The Engineer will not require a Quality Control Plan. ~~A LOT is defined as one Day's Production in a period of time no greater than 24 hours or e a minimum of 2000 feet of embankment is constructed.~~*A LOT is defined as one Day's Production in a period of time no greater than 24 hours or a minimum of 2000 feet of constructed embankment, whichever is greater.*

120-8.1.1.1: Initial Rolling Pattern Test Section: Apply 120-10.1.~~4~~*3*. Manipulate soil to obtain a moisture condition within – 2 % or + 1 % of optimum moisture content according to AASHTO T 99. Prepare a minimum 500-foot-long test section. Determine the number of passes required to achieve the density requirements of 120-10.2. Use this number of passes as the acceptable rolling pattern for the equipment used and soil type.

120-8.1.1.2 Production: Compact subsequent lifts using the accepted rolling pattern, then notify the Engineer 24 hours before proof rolling. Perform proof rolling with a minimum 12-cubic yard tandem axle dump truck, fully loaded with soil, or other equipment approved by the Engineer that will reveal any soft, yielding, or spongy areas. Run the equipment longitudinally with less than 18" of unrolled area between tire strips. Correct any instability observed during the proof roll, to the satisfaction of the Engineer by discing, aerating, recompacting, removing and replacing material. After taking corrective measures, proof roll affected areas to ensure the stability of the lift. Do not place subsequent lifts until the Engineer accepts the proof-rolled section. The Engineer may perform Independent Verification (IV) density testing and reject the section if density does not meet the acceptance criteria. Correct any sections failing the acceptance criteria. The engineer may elect to take verification density tests in areas that the contractor is unable to proof roll.

ARTICLE 120-10 (of the Supplemental Specifications) is deleted and the following substituted:

120-10 Acceptance Program.

120-10.1 General Requirements:

120-10.1.1 Initial Equipment Comparison: Before initial production, perform a comparison test using the Quality Control, Verifications and Independent Assurance gauges. Unless the Engineer instructs, do not perform the initial equipment comparison more than once per project. When comparing the computed dry density of one nuclear gauge to a second gauge, ensure that the difference between the two computed dry densities does not exceed 2 lb/ft^3 between gauges from the same

manufacturer, and 3 lb/ft^3 between gauges from different manufacturers. Repair or replace any Quality Control gauge that does not compare favorably with the IA gauge.

Perform a comparison analysis between the Quality Control nuclear gauge and the Verification nuclear gauge any time a nuclear gauge or repaired nuclear gauge is first brought to the project. Repair and replace any Quality Control gauge that does not compare favorably with the Verification gauge at any time during the remainder of the project. Calibrate all Quality Control gauges annually.

120-10.1.~~3~~ *2* Density over 105%: When a QC computed dry density results in a value greater than 105% of the applicable Proctor maximum dry density, the Engineer will perform an Independent Verification density test within 5 feet. If the Independent Verification density results in a value greater than 105%, the Engineer will investigate the compaction methods, examine the applicable Standard Proctor Maximum Density and material description. The Engineer may collect and test an Independent Verification Standard Proctor Maximum Density sample for acceptance in accordance with the criteria of 120-10.2.

120-10.1.~~4~~ *3* Quality Control Tests:

120-10.1.4*3*.1 Standard Proctor Maximum Density Determination: Determine the Quality Control standard Proctor maximum density and optimum moisture content by sampling and testing the material in accordance with the specified test method listed in 120-10.2.

120-10.1.4*3*.2 Density Testing Requirements: Ensure compliance to the requirements of 120-10.2 by Nuclear Density testing in accordance with FM 1-T 238. Determine the in-place moisture content for each density test. Use Florida Method FM 1-T 238, FM 5-507 (Determination of Moisture Content by Means of a Calcium Carbide Gas Pressure Moisture Tester), or ASTM D 4643 (Laboratory Determination of Moisture Content of Granular Soils By Use of a Microwave Oven) for moisture determination.

120-10.1.4*3*.3 Soil Classification: Perform soil classification tests on the sample collected in 120-10.1.4*3*.1, in accordance with AASHTO T-88. Classify soils in accordance with AASHTO M–145 in order to determine compliance with embankment utilization requirements. Unless required by the Engineer, do not test or classify materials for stabilized subgrade or base.

120-10.1.~~5~~ *4* Department Verification: The Engineer will conduct a Verification test(s) in order to accept all materials and work associated with 120-10.1.4*3*. The Engineer will verify the Quality Control results if they meet the Verification Comparison Criteria, otherwise the Engineer will implement Resolution procedures.

The Engineer will select test locations, including Station, Offset, and Lift, using a Random Number generator based on the Lots under consideration. Each Verification test evaluates all work represented by the Quality Control testing completed in those LOTs.

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.

When the project requires less than four Quality Control tests per material type, the Engineer reserves the right to accept the materials and work through visual inspection.

120-10.2 Acceptance Criteria: Obtain a minimum Quality Control (QC) density of 100% of the standard Proctor maximum density as determined by AASHTO T 99, Method C, with the following exceptions: 1) embankment constructed by the hydraulic method as specified in 120-8.3; 2) material placed outside the standard minimum slope as specified in 120-8.2.4; and 3) other areas specifically excluded herein.

120-10.3 Additional Requirements:

120-10.3.1 Frequency: Conduct QC sampling and testing at a minimum frequency listed in the table below. The Engineer will perform Verification sampling and tests at a minimum frequency listed in the table below.

Test Name	Quality Control	Verification
Standard Proctor Maximum Density	One per soil type	One per soil type
Rolling Pattern Test Section	One per soil type	NA
Density – Rolling Pattern Test Section	Five per 500 feet	Two per 500 feet
Soil Classification	One per Rolling Pattern Test Section	One per Standard Proctor Maximum Density
Rolling Pattern	One per LOT per soil type	N.A.
Proof Roll	One per LOT	Witness
Density - Production	N.A.	Engineer's option.

120-10.3.2 Test Selection and Reporting: Determine test locations including Stations and offsets, using the random number generator approved by the Engineer. Do not use note pads or work sheets to record data for later transfer to the Density Log Book. Notify the Engineer upon successful completion of Quality Control testing on each LOT.

120-10.4 Verification Comparison Criteria and Resolution Procedures:

120-10.4.1 Standard Proctor Maximum Density Determination: The Engineer will verify the Quality Control results if the results compare within 4.5 lb/ft^3 of the Verification test result. Otherwise, the Engineer will take one additional sample of material from the soil type in question. The State Materials Office or an AASHTO accredited laboratory designated by the State Materials Office will perform Resolution testing. The material will be sampled and tested in accordance with AASHTO T 99, Method C.

The Engineer will compare the Resolution Test results with the Quality Control test results. If all Resolution Test results are within 4.5 lb/ft^3 of the corresponding Quality Control test results, the Engineer will use the Quality Control test results for material acceptance purposes for each LOT with that soil type. If the Resolution Test result is not within 4.5 lb/ft^3 of the Contractor's Quality Control test, the Verification Test result will be used for material acceptance purposes.

120-10.4.2 Density Testing: *Density testing is not required in shoulder only construction areas, sidewalks, and bike/shared use paths.*

120-10.4.3 Soil Classification: The Engineer will verify the Quality Control results if the Verification results identify matching soil classifications. Otherwise, the Engineer will take one additional sample of material from the soil type in question.

The State Materials Office or an AASHTO accredited laboratory designated by the State Materials Office will perform Resolution testing. The material will be sampled and tested in accordance with AASHTO T 88.

The Engineer will compare the Resolution Test results with the Quality Control test results. If the Resolution test matches the Quality Control classification, the Engineer will use the Quality Control classification for material acceptance purposes. If the Resolution Test result does not match the Contractor's Quality Control classification, the Verification Test result will be used for material acceptance purposes.

EXCAVATION AND EMBANKMENT.
(REV 2-27-07)

SUBARTICLE 120-8-1 (of the Supplemental Specifications) is deleted and the following substituted:

120-8.1 General: Construct embankments for shoulder only construction areas, sidewalks, and bike/shared use paths, in sections of not less than 300 feet in length or for the full length of the embankment.

120-8.1.1 Quality Control: The Engineer will not require a Quality Control Plan. A LOT is defined as one Day's Production in a period of time no greater than 24 hours or a minimum of 2000 feet of constructed embankment, whichever is greater.

120-8.1.1.1: Initial Rolling Pattern Test Section: Apply 120-10.1.3. Manipulate soil to obtain a moisture condition within – 2 % or + 1 % of optimum moisture content according to AASHTO T 99. Prepare a minimum 500-foot-long test section. Determine the number of passes required to achieve the density requirements of 120-10.2. Use this number of passes as the acceptable rolling pattern for the equipment used and soil type.

120-8.1.1.2 Production: Compact subsequent lifts using the accepted rolling pattern, then notify the Engineer 24 hours before proof rolling. Perform proof rolling with a minimum 12-cubic yard tandem axle dump truck, fully loaded with soil, or other equipment approved by the Engineer that will reveal any soft, yielding, or spongy areas. Run the equipment longitudinally with less than 18" of unrolled area between tire strips. Correct any instability observed during the proof roll, to the satisfaction of the Engineer by discing, aerating, recompacting, removing and replacing material. After taking corrective measures, proof roll affected areas to ensure the stability of the lift. Do not place subsequent lifts until the Engineer accepts the proof-rolled section. The Engineer may perform Independent Verification (IV) density testing and reject the section if density does not meet the acceptance criteria. Correct any sections failing the acceptance criteria. The engineer may elect to take verification density tests in areas that the contractor is unable to proof roll.

ARTICLE 120-10 (of the Supplemental Specifications) is deleted and the following substituted:

120-10 Acceptance Program.

120-10.1 General Requirements:

120-10.1.1 Initial Equipment Comparison: Before initial production, perform a comparison test using the Quality Control, Verifications and Independent Assurance gauges. Unless the Engineer instructs, do not perform the initial equipment comparison more than once per project. When comparing the computed dry density of one nuclear gauge to a second gauge, ensure that the difference between the two computed dry densities does not exceed 2 lb/ft^3 between gauges from the same manufacturer, and 3 lb/ft^3 between gauges from different manufacturers. Repair or replace any Quality Control gauge that does not compare favorably with the IA gauge.

Perform a comparison analysis between the Quality Control nuclear gauge and the Verification nuclear gauge any time a nuclear gauge or repaired nuclear gauge is first brought to the project. Repair and replace any Quality Control gauge that does not compare favorably with the Verification gauge at any time during the remainder of the project. Calibrate all Quality Control gauges annually.

120-10.1.2 Density over 105%: When a QC computed dry density results in a value greater than 105% of the applicable Proctor maximum dry density, the Engineer will perform an Independent Verification density test within 5 feet. If the Independent Verification density results in a value greater than 105%, the Engineer will investigate the compaction methods, examine the applicable Standard Proctor Maximum Density and material description. The Engineer may collect and test an Independent Verification Standard Proctor Maximum Density sample for acceptance in accordance with the criteria of 120-10.2.

120-10.1.3 Quality Control Tests:

120-10.1.3.1 Standard Proctor Maximum Density Determination: Determine the Quality Control standard Proctor maximum density and optimum moisture content by sampling and testing the material in accordance with the specified test method listed in 120-10.2.

120-10.1.3.2 Density Testing Requirements: Ensure compliance to the requirements of 120-10.2 by Nuclear Density testing in accordance with FM 1-T 238. Determine the in-place moisture content for each density test. Use Florida Method FM 1-T 238, FM 5-507 (Determination of Moisture Content by Means of a Calcium Carbide Gas Pressure Moisture Tester), or ASTM D 4643 (Laboratory Determination of Moisture Content of Granular Soils By Use of a Microwave Oven) for moisture determination.

120-10.1.3.3 Soil Classification: Perform soil classification tests on the sample collected in 120-10.1.3.1, in accordance with AASHTO T-88. Classify soils in accordance with AASHTO M–145 in order to determine compliance with embankment utilization requirements. Unless required by the Engineer, do not test or classify materials for stabilized subgrade or base.

120-10.1.4 Department Verification: The Engineer will conduct a Verification test(s) in order to accept all materials and work associated with 120-10.1.3. The Engineer will verify the Quality Control results if they meet the Verification Comparison Criteria, otherwise the Engineer will implement Resolution procedures.

The Engineer will select test locations, including Station, Offset, and Lift, using a Random Number generator based on the Lots under consideration. Each Verification test evaluates all work represented by the Quality Control testing completed in those LOTs.

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.

When the project requires less than four Quality Control tests per material type, the Engineer reserves the right to accept the materials and work through visual inspection.

120-10.2 Acceptance Criteria: Obtain a minimum Quality Control (QC) density of 100% of the standard Proctor maximum density as determined by AASHTO T 99,

Method C, with the following exceptions: 1) embankment constructed by the hydraulic method as specified in 120-8.3; 2) material placed outside the standard minimum slope as specified in 120-8.2.4; and 3) other areas specifically excluded herein.

120-10.3 Additional Requirements:

120-10.3.1 Frequency: Conduct QC sampling and testing at a minimum frequency listed in the table below. The Engineer will perform Verification sampling and tests at a minimum frequency listed in the table below.

Test Name	Quality Control	Verification
Standard Proctor Maximum Density	One per soil type	One per soil type
Rolling Pattern Test Section	One per soil type	NA
Density – Rolling Pattern Test Section	Five per 500 feet	Two per 500 feet
Soil Classification	One per Rolling Pattern Test Section	One per Standard Proctor Maximum Density
Rolling Pattern	One per LOT per soil type	N.A.
Proof Roll	One per LOT	Witness
Density - Production	N.A.	Engineer's option.

120-10.3.2 Test Selection and Reporting: Determine test locations including Stations and offsets, using the random number generator approved by the Engineer. Do not use note pads or work sheets to record data for later transfer to the Density Log Book. Notify the Engineer upon successful completion of Quality Control testing on each LOT.

120-10.4 Verification Comparison Criteria and Resolution Procedures:

120-10.4.1 Standard Proctor Maximum Density Determination: The Engineer will verify the Quality Control results if the results compare within 4.5 lb/ft^3 of the Verification test result. Otherwise, the Engineer will take one additional sample of material from the soil type in question. The State Materials Office or an AASHTO accredited laboratory designated by the State Materials Office will perform Resolution testing. The material will be sampled and tested in accordance with AASHTO T 99, Method C.

The Engineer will compare the Resolution Test results with the Quality Control test results. If all Resolution Test results are within 4.5 lb/ft^3 of the corresponding Quality Control test results, the Engineer will use the Quality Control test results for material acceptance purposes for each LOT with that soil type. If the Resolution Test result is not within 4.5 lb/ft^3 of the Contractor's Quality Control test, the Verification Test result will be used for material acceptance purposes.

120-10.4.2 Density Testing: Density testing is not required in shoulder only construction areas, sidewalks, and bike/shared use paths.

120-10.4.3 Soil Classification: The Engineer will verify the Quality Control results if the Verification results identify matching soil classifications. Otherwise, the Engineer will take one additional sample of material from the soil type in question. The State Materials Office or an AASHTO accredited laboratory designated by the State

Materials Office will perform Resolution testing. The material will be sampled and tested in accordance with AASHTO T 88.

The Engineer will compare the Resolution Test results with the Quality Control test results. If the Resolution test matches the Quality Control classification, the Engineer will use the Quality Control classification for material acceptance purposes. If the Resolution Test result does not match the Contractor's Quality Control classification, the Verification Test result will be used for material acceptance purposes.