

Minimum Testing Frequency Specifications for Roads, Storm Drainage, Utilities and Sampling Procedures

Pinellas County Public Works Construction Division

Revised May 24, 2022

Tom Washburn, P.E.

Transportation Division Director
Pinellas County Engineer – Transportation

Paul Giuliani, P.E.

Construction Management Division Director

Contents

- Backfill for Pipe Trenches and Structures3
- Roadway Embankment and Fill4
- Stabilized Subgrade5
- Limerock / Crushed Concrete / Shell / Base Material7
- Concrete9
- Bituminous Concrete (Asphalt)11

BACKFILL FOR PIPE TRENCHES AND STRUCTURES

PIPE TRENCHES / STRUCTURES

TYPE OF TESTING	METHOD	MINIMUM REQUIREMENT	LOCATION AND RECOMMENDED MINIMUM TESTING FREQUENCY
IN-PLACE DENSITY TESTING WITHIN THE ROADWAY AND OUTSIDE THE ROADWAY BUT WITHIN THE RIGHT OF WAY	AASHTO T-191 AASHTO T-310 FDOT FM 1-T 238	100% OF MAXIMUM DRY DENSITY	1 TEST PER 1' VERTICAL IN A STAGGERED PATTERN PER 500 LF OR PART THEREOF OF UNINTERRUPTED RUN OF PIPE BEGINNING AT 2' OVER TOP OF PIPE FOR PIPE LESS THAN 12" DIAMETER AND TRENCH WIDTH LESS THAN 2', TOP OF PIPE FOR PIPE LESS THAN 12" DIAMETER AND TRENCH WIDTH OVER 2' OR FOR PIPE 12" TO 24", AND AT THE SPRING LINE FOR PIPE DIAMETER GREATER THAN 24".

LABORATORY TESTING

SOURCE/TYPE OF UNIFORM	METHOD	MINIMUM REQUIREMENT	LOCATION AND RECOMMENDED MINIMUM TESTING FREQUENCY
SOIL CLASSIFICATION	AASHTO M-145	A-1 OR A-3	1 TEST PER 1' VERTICAL IN A STAGGERED PATTERN PER 500 LF OR PART THEREOF OF UNINTERRUPTED RUN OF PIPE BEGINNING AT 2' OVER TOP OF PIPE FOR PIPE LESS THAN 12" DIAMETER AND TRENCH WIDTH LESS THAN 2', TOP OF PIPE FOR PIPE LESS THAN 12" DIAMETER AND TRENCH WIDTH OVER 2' OR FOR PIPE 12" TO 24", AND AT THE SPRING LINE FOR PIPE DIAMETER GREATER THAN 24".
MOISTURE-DENSITY RELATIONS OF SOILS-STANDARD METHOD (PROCTOR)	AASHTO T-99	N/A	1 TEST PER 1' VERTICAL IN A STAGGERED PATTERN PER 500 LF OR PART THEREOF OF UNINTERRUPTED RUN OF PIPE BEGINNING AT 2' OVER TOP OF PIPE FOR PIPE LESS THAN 12" DIAMETER AND TRENCH WIDTH LESS THAN 2', TOP OF PIPE FOR PIPE LESS THAN 12" DIAMETER AND TRENCH WIDTH OVER 2' OR FOR PIPE 12" TO 24", AND AT THE SPRING LINE FOR PIPE DIAMETER GREATER THAN 24".

ROADWAY EMBANKMENT AND FILL

IN-PLACE DENSITY TESTING

TYPE OF TESTING	METHOD	MINIMUM REQUIREMENT	LOCATION AND RECOMMENDED MINIMUM TESTING FREQUENCY
IN-PLACE DENSITY TESTING	AASHTO T-191 AASHTO T-310 FDOT FM 1-T 238	100% OF MAXIMUM DRY DENSITY	1 TEST FOR EVERY 500 LF OR PART THEREOF WITH NO FEWER THAN 2 PER STREET. 1 TEST PER 1' VERTICAL IN A STAGGERED PATTERN.

LABORATORY TESTING

SOURCE/TYPE OF UNIFORM	METHOD	MINIMUM REQUIREMENT
SOIL CLASSIFICATION	AASHTO M-145	A-1 OR A-3
MOISTURE-DENSITY RELATIONS OF SOILS-STANDARD METHOD (PROCTOR)	AASHTO T-99	N/A

STABILIZED SUBGRADE

LABORATORY TESTING

SOURCE/TYPE OF UNIFORM	METHOD	MINIMUM REQUIREMENT	LOCATION AND RECOMMENDED MINIMUM TESTING FREQUENCY
PLASTICITY INDEX	AASHTO T-90	MAXIMUM 10	OBTAIN 1 SAMPLE PER 500 LF OR PART THEREOF, ALTERNATE SIDES OF CENTERLINE AND ALL MATERIAL CHANGES. NO LESS THAN 1 PER STREET. CURB LINE 1 PER 500 LF EACH SIDE OF ROAD.
LIQUID LIMIT	AASHTO T-89	MAXIMUM 40	OBTAIN 1 SAMPLE PER 500 LF OR PART THEREOF, ALTERNATE SIDES OF CENTERLINE AND ALL MATERIAL CHANGES. NO LESS THAN 1 PER STREET. CURB LINE 1 PER 500 LF EACH SIDE OF ROAD.
GRADATION	AASHTO T-27	97% PASSING 3.5"	OBTAIN 1 SAMPLE PER 500 LF OR PART THEREOF, ALTERNATE SIDES OF CENTERLINE AND ALL MATERIAL CHANGES. NO LESS THAN 1 PER STREET. CURB LINE 1 PER 500 LF EACH SIDE OF ROAD.
MOISTURE-DENSITY RELATIONS OF SOILS-MODIFIED METHOD (PROCTOR)	AASHTO T-180	N/A	OBTAIN 1 SAMPLE PER 500 LF OR PART THEREOF, ALTERNATE SIDES OF CENTERLINE AND ALL MATERIAL CHANGES. NO LESS THAN 1 PER STREET. CURB LINE 1 PER 500 LF EACH SIDE OF ROAD.
LIMEROCK BEARING RATIO (LBR)	FDOT FM 5-15	MINIMUM 40 OR PER PLAN	OBTAIN 1 SAMPLE PER 500 LF OR PART THEREOF, ALTERNATE SIDES OF CENTERLINE AND ALL MATERIAL CHANGES. NO LESS THAN 1 PER STREET. CURB LINE 1 PER 500 LF EACH SIDE OF ROAD.

FIELD TESTING

TYPE OF TESTING	METHOD	MINIMUM REQUIREMENT	LOCATION AND RECOMMENDED MINIMUM TESTING FREQUENCY
THICKNESS	N/A	PER PLANS $\frac{1}{2}$ " ALLOWABLE UNDERTOLERANCE	500' INTERVALS OR PART THEREOF ON ALTERNATE SIDES OF CENTERLINE. NO LESS THAN 1 PER STREET.
IN-PLACE DENSITY TESTING	AASHTO T-191 AASHTO T-310 FDOT FM 1-T 238	98% OF MAXIMUM DRY DENSITY	ROADWAY- 1 PER 500 LF OR PART THEROF IN A STAGGARED PATTERN MINIMUM 1 PER STREET. CURB LINE 1 TEST EVERY 500 LF ALONG EACH SIDE OF ROAD.

LIMEROCK / CRUSHED CONCRETE / SHELL / BASE MATERIAL

LABORATORY TESTING

SOURCE/TYPE OF UNIFORM	METHOD	MINIMUM REQUIREMENT	LOCATION AND RECOMMENDED MINIMUM TESTING FREQUENCY
LIMEROCK BEARING RATIO (LBR)	FDOT FM 5-515	MINIMUM 100 OR PER PLAN	OBTAIN 1 SAMPLE PER 500 LF FOR LIMEROCK OR 1000' LF FOR CRUSHED CONCRETE OR PART THEREOF ALTERNATE SIDES OF CENTERLINE AND ALL SOIL CHANGES. NO LESS THAN 1 PER STREET. CURB LINE 1 PER 500 LF ALONG EACH SIDE OF ROAD.
PLASTICITY INDEX	AASHTO T-90	NP	OBTAIN 1 SAMPLE PER 500 LF FOR LIMEROCK OR 1000' LF FOR CRUSHED CONCRETE OR PART THEREOF ALTERNATE SIDES OF CENTERLINE AND ALL SOIL CHANGES. NO LESS THAN 1 PER STREET. CURB LINE 1 PER 500 LF ALONG EACH SIDE OF ROAD.
LIQUID LIMIT	AASHTO T-89	MAXIMUM 35	OBTAIN 1 SAMPLE PER 500 LF FOR LIMEROCK OR 1000' LF FOR CRUSHED CONCRETE OR PART THEREOF ALTERNATE SIDES OF CENTERLINE AND ALL SOIL CHANGES. NO LESS THAN 1 PER STREET. CURB LINE 1 PER 500 LF ALONG EACH SIDE OF ROAD.
GRADATION – LIMEROCK	AASHTO T-27	97% PASSING 3.5"	OBTAIN 1 SAMPLE PER 500 LF FOR LIMEROCK OR 1000' LF FOR CRUSHED CONCRETE OR PART THEREOF ALTERNATE SIDES OF CENTERLINE AND ALL SOIL CHANGES. NO LESS THAN 1 PER STREET. CURB LINE 1 PER 500 LF ALONG EACH SIDE OF ROAD.
GRADATION – CRUSHED CONCRETE	AASHTO T-27	SEE PC SPEC 204	OBTAIN 1 SAMPLE PER 500 LF FOR LIMEROCK OR 1000' LF FOR CRUSHED CONCRETE OR PART THEREOF ALTERNATE SIDES OF CENTERLINE AND ALL SOIL CHANGES. NO LESS THAN 1 PER STREET. CURB LINE 1 PER 500 LF ALONG EACH SIDE OF ROAD.
MOISTURE-DENSITY RELATIONS OF SOILS- MODIFIED METHOD (PROCTOR)	AASHTO T-180	N/A	OBTAIN 1 SAMPLE PER 500 LF FOR LIMEROCK OR 1000' LF FOR CRUSHED CONCRETE OR PART THEREOF ALTERNATE SIDES OF CENTERLINE AND ALL SOIL CHANGES. NO LESS THAN 1 PER STREET. CURB LINE 1 PER 500 LF ALONG EACH SIDE OF ROAD.

FIELD TESTING

SOURCE/TYPE OF UNIFORM	METHOD	MINIMUM REQUIREMENT	LOCATION AND RECOMMENDED MINIMUM TESTING FREQUENCY
THICKNESS	N/A	PER PLANS ½" ALLOWABLE UNDERTOLERANCE	500' INTERVALS OR PART THEREOF ON ALTERNATE SIDES OF CENTERLINE. NO LESS THAN 3 PER STREET.
IN-PLACE DENSITY TESTING	AASHTO T-191 AASHTO T-310 FDOT FM 1-T 238	98% OF MAXIMUM DRY DENSITY	ROADWAY- 1 PER 500 LF OR PART THEROF IN A STAGGARED PATTERN MINIMUM 1 PER STREET. CURB LINE 1 TEST EVERY 500 LF ALONG EACH SIDE OF ROAD.

CONCRETE

NON-STRUCTURAL

TYPE OF TESTING	METHOD	MINIMUM REQUIREMENT	LOCATION AND RECOMMENDED MINIMUM TESTING FREQUENCY
CAST COMPRESSIVE STRENGTH CYLINDERS	ASTM C31	3000 PSI @ 28 DAYS DO NOT EXCEED WATER TO CEMENT RATIO	CAST 1 SET OF 3 CYLINDERS PERIODICALLY THROUGHOUT THE PROJECT. ALL 3 CYLINDERS TO BE TESTED AT 28 DAYS PER ACI CODE FOR VALID TEST. CAST ADDITIONAL CYLINDERS FOR EARLY TEST BREAKS IF NEEDED.
SLUMP TEST	ASTM C 143	3000 PSI @ 28 DAYS DO NOT EXCEED WATER TO CEMENT RATIO	CAST 1 SET OF 3 CYLINDERS PERIODICALLY THROUGHOUT THE PROJECT. ALL 3 CYLINDERS TO BE TESTED AT 28 DAYS PER ACI CODE FOR VALID TEST. CAST ADDITIONAL CYLINDERS FOR EARLY TEST BREAKS IF NEEDED.
TEST COMPRESSIVE STRENGTH	ASTM C 39	3000 PSI @ 28 DAYS DO NOT EXCEED WATER TO CEMENT RATIO	CAST 1 SET OF 3 CYLINDERS PERIODICALLY THROUGHOUT THE PROJECT. ALL 3 CYLINDERS TO BE TESTED AT 28 DAYS PER ACI CODE FOR VALID TEST. CAST ADDITIONAL CYLINDERS FOR EARLY TEST BREAKS IF NEEDED.
TEMPERATURE OF FRESH CONCRETE	ASTM C 1064	3000 PSI @ 28 DAYS DO NOT EXCEED WATER TO CEMENT RATIO	CAST 1 SET OF 3 CYLINDERS PERIODICALLY THROUGHOUT THE PROJECT. ALL 3 CYLINDERS TO BE TESTED AT 28 DAYS PER ACI CODE FOR VALID TEST. CAST ADDITIONAL CYLINDERS FOR EARLY TEST BREAKS IF NEEDED.

STRUCTURAL

TYPE OF TESTING	METHOD	MINIMUM REQUIREMENT	LOCATION AND RECOMMENDED MINIMUM TESTING FREQUENCY
CAST COMPRESSIVE STRENGTH CYLINDERS	ASTM C31	DESIGN STRENGTH @ 28 DAYS DO NOT EXCEED WATER TO CEMENT RATIO	CAST 1 SET OF 3 CYLINDERS PER 50 CUBIC YARDS FOR EACH DAY'S PLACEMENT. ALL 3 CYLINDERS TO BE TESTED AT 28 DAYS PER ACI CODE FOR VALID TEST. CAST ADDITIONAL CYLINDERS FOR EARLY TEST BREAKS IF NEEDED.
SLUMP TEST	ASTM C 143	DESIGN STRENGTH @ 28 DAYS DO NOT EXCEED WATER TO CEMENT RATIO	CAST 1 SET OF 3 CYLINDERS PER 50 CUBIC YARDS FOR EACH DAY'S PLACEMENT. ALL 3 CYLINDERS TO BE TESTED AT 28 DAYS PER ACI CODE FOR VALID TEST. CAST ADDITIONAL CYLINDERS FOR EARLY TEST BREAKS IF NEEDED.
AIR CONTENT TEST	ASTM C 231	DESIGN STRENGTH @ 28 DAYS DO NOT EXCEED WATER TO CEMENT RATIO	CAST 1 SET OF 3 CYLINDERS PER 50 CUBIC YARDS FOR EACH DAY'S PLACEMENT. ALL 3 CYLINDERS TO BE TESTED AT 28 DAYS PER ACI CODE FOR VALID TEST. CAST ADDITIONAL CYLINDERS FOR EARLY TEST BREAKS IF NEEDED.
TEST COMPRESSIVE STRENGTH CYLINDERS	ASTM C 39	DESIGN STRENGTH @ 28 DAYS DO NOT EXCEED WATER TO CEMENT RATIO	CAST 1 SET OF 3 CYLINDERS PER 50 CUBIC YARDS FOR EACH DAY'S PLACEMENT. ALL 3 CYLINDERS TO BE TESTED AT 28 DAYS PER ACI CODE FOR VALID TEST. CAST ADDITIONAL CYLINDERS FOR EARLY TEST BREAKS IF NEEDED.
TEMPERATURE OF FRESH CONCRETE	ASTM C 1064	DESIGN STRENGTH @ 28 DAYS DO NOT EXCEED WATER TO CEMENT RATIO	CAST 1 SET OF 3 CYLINDERS PER 50 CUBIC YARDS FOR EACH DAY'S PLACEMENT. ALL 3 CYLINDERS TO BE TESTED AT 28 DAYS PER ACI CODE FOR VALID TEST. CAST ADDITIONAL CYLINDERS FOR EARLY TEST BREAKS IF NEEDED.

ASPHALT

HOT MIX ASPHALT (HMA) SAMPLING

The Contractor shall be responsible for sampling the loose Hot Mix Asphalt (HMA). The sample shall be obtained by the Contractor's FDOT CTQP Qualified Asphalt Paving Level II Technician or his duly authorized and qualified representative. The HMA sample shall be taken at the plant and delivered to the Pinellas County representative on the project site with the load and truck number identified on the sample box or container and load ticket for transfer to the county's approved laboratory for testing. The sample may be picked up at the plant by either an authorized Pinellas County representative or the county's authorized testing laboratory technician. The loose HMA sample shall be immediately placed in an appropriate container that will prevent loss of material or segregation during transport and handling. The County may request the sample or samples from each days production be split into 2 samples sufficient in volume to perform extraction, gradation and determination of GMM (RICE) with one sample to be tested by the county's authorized testing lab and one sample retained by the county's authorized testing laboratory or authorized county representative for referee/verification testing. The Contractor should retain a sample sufficient in volume to perform extraction, gradation and determination of GMM (RICE) by their laboratory. In the event of out of tolerance results, the County may request the verification sample be tested and may also request the contractor's test results. Test results will then be compared. If any one sample test result are determined to be inconsistent with previous production samples, referee and Contractor test results, the test results may be disregarded as potential sampling error in which case, the remaining test results shall be averaged for adjustment purposes.

FOR ALL OTHER ASPHALT RELATED SAMPLING AND TESTING, REFER TO:

[PINELLAS COUNTY SUPPLEMENTAL SPECIFICATIONS FOR ROADWAY AND GENERAL CONSTRUCTION \(CURRENT EDITION\)](#)