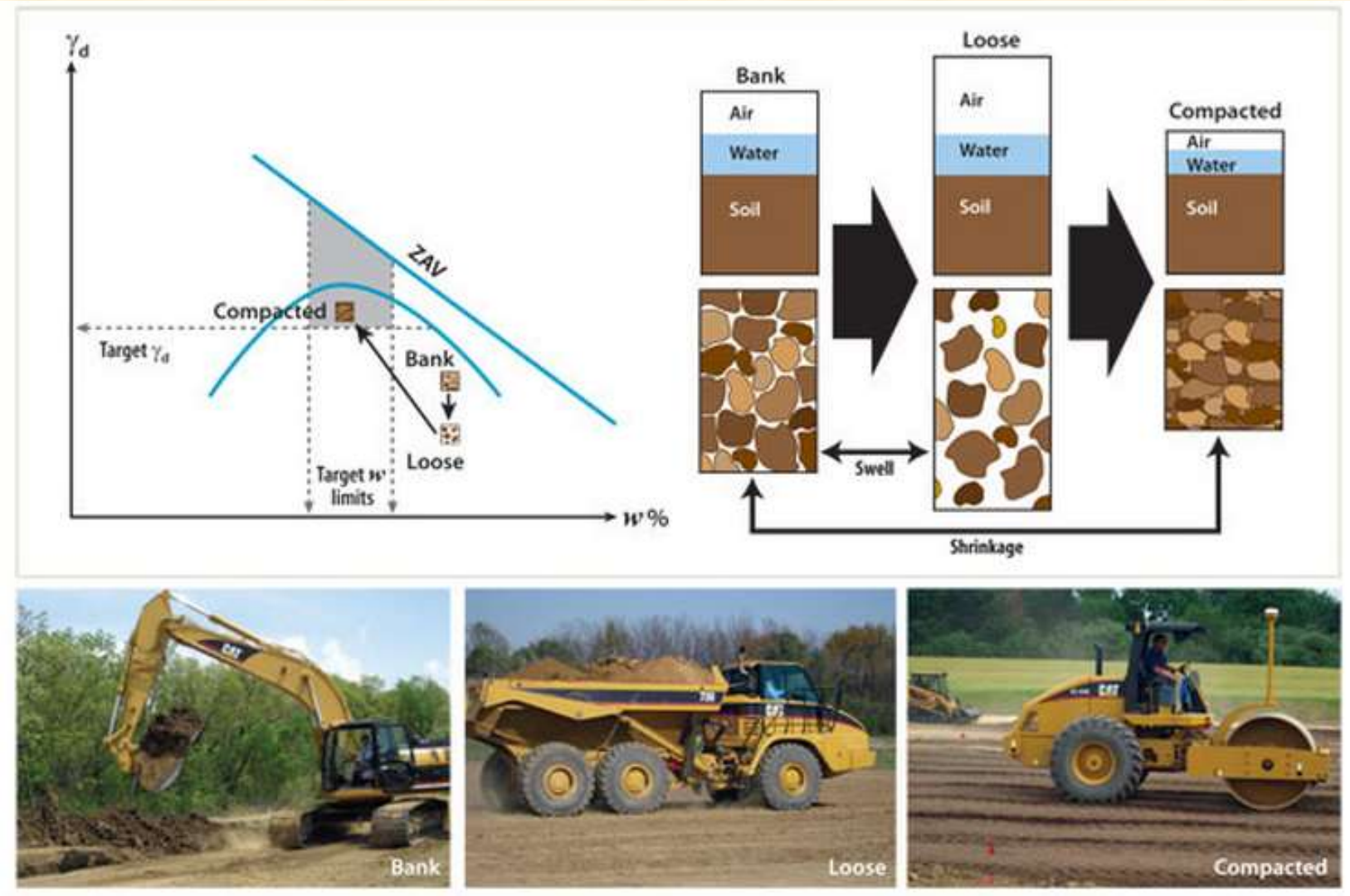
γ_d
ZAV
Compacted
Target γ_d
Bank
Loose
Target w limits
w %
Bank
Air
Water
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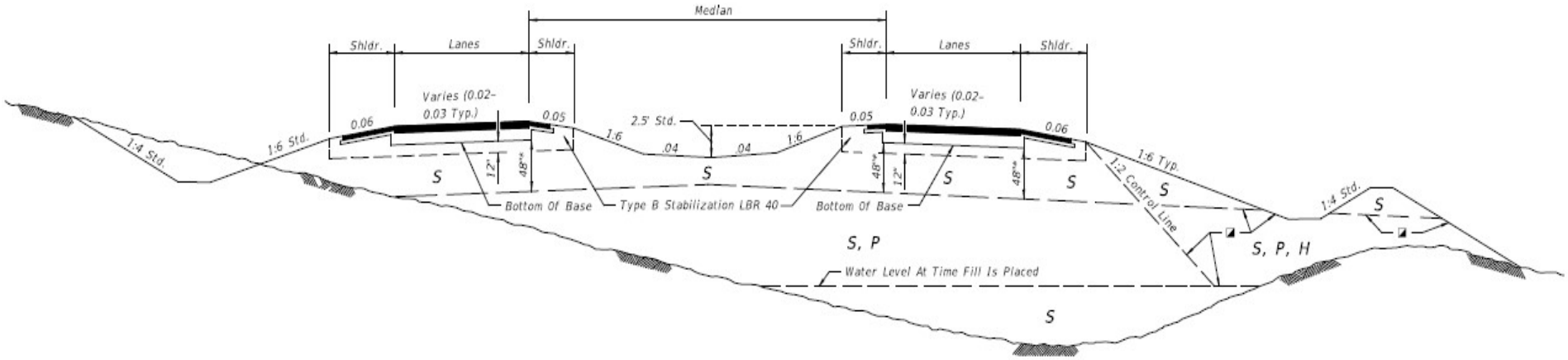
Compacted
Air
Water
Soil
Swell
Shrinkage
Bank
Loose
Compacted

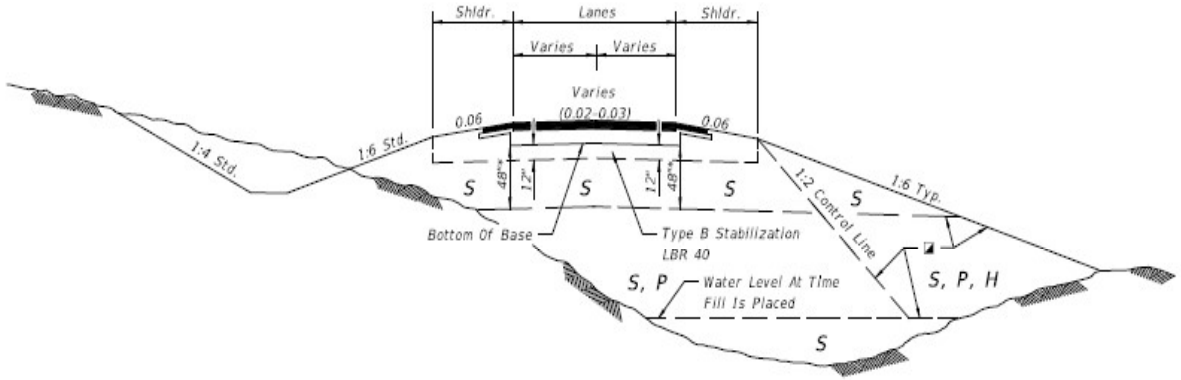
Earthwork

Objectives

- Earthwork Specifications (Based on Jan 2022)
  - 120 Embankment
  - 125 Excavation for Structures and Pipes
  - 160 Stabilization
  - 200 Rock Base
  - 548 Mechanically Stabilized Earth (MSE) walls
- Earthwork Records System (ERS)
  - QC / VT Logbook
  - ERS Plot Program Coding



DIVIDED ROADWAYS



UNDIVIDED ROADWAY

GENERAL NOTES:

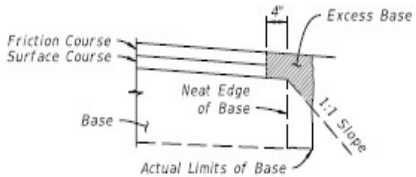
1. Roadway dimensions are representative. Subgrade dimensions and control lines are standard. The details shown on this Index do not supersede the details shown in the Plans or Indexes 120-002 and 160-001.

2. Plastic (P) soils may be placed above the existing water level (at the time of construction) to within 4 feet of the proposed base. It should be placed uniformly in the lower portion of the embankment for some distance along the project rather than full depth for short distances.

3. High Plastic (H) soils excavated within the project limits may be used in embankment construction as indicated on this Index. High Plastic soils are not to be used for embankment construction when obtained from outside the project limits.

4. Select (S) soils having an average organic content of more than two and one-half (2.5) percent, or having an individual test value which exceeds four (4) percent, are not permitted in the subgrade portion of the roadbed. Select (S), Plastic (P), or High Plastic (H) soils having an average organic content of more than five (5) percent, or an organic content individual test result which exceeds seven (7) percent, are not permitted in the portion of embankment inside the control line, unless written authorization is provided by the District Geotechnical Engineer; these soils may be used for embankment construction outside the control line, unless restricted by the Plans or otherwise specified in the Plans, provided they can be compacted sufficiently to sustain a drivable surface for operational vehicles as approved by the Engineer. Determine average organic content from the test results from a minimum of three randomly selected samples from each stratum or stockpile of a particular material. Perform tests in accordance with AASHTO T 267 on the portion of a sample passing the No. 4 sieve.

5. Highly organic soils, composed primarily of partially decayed organic matter, often dark brown or black in color with an odor of decay, and sometimes fibrous, are designated as muck. Further, any stratum or stockpile of soil which contains pockets of highly organic material may be designated as Muck (M). Highly organic soils are not permitted within the subgrade or embankment portion of the roadbed.



NOTES:

1. All material in the shaded area is excess base to be removed.

2. There is no additional payment for removal of excess base material.

REMOVAL OF EXCESS BASE MATERIAL

SYMBOL	SOIL	CLASSIFICATION (AASHTO M 145)
S	Select	A-1, A-3, A-2-4 **
P	Plastic	A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7 (ALL WITH LL < 50)
H	High Plastic	A-2-5, A-2-7, A-5 Or A-7 (ALL WITH LL > 50)
M	Muck	A-8

Classification listed left to right in order of preference.

◪ See General Notes Nos. 4 & 5 for utilization of soils classified as organic material or muck.

** Certain types of A-2-4 material are likely to retain excess moisture and may be difficult to dry and compact. They should be used in the embankment above the water level existing at time of construction. They may be used in the subgrade portion of the roadbed when approved by the District Materials Engineer. A-2-4 material placed below the existing water level must be nonplastic and contain less than 15% passing the No. 200 U.S. Standard sieve.

* For cut sections this dimension may be reduced to 24"; see Index 120-002. For minor collectors and local facilities this dimension may be reduced to 18".

GENERAL NOTES AND FLEXIBLE PAVEMENT

LOT's

- 120-8.1 Embankment Construction – LOTs
- What is the maximum length of a LOT?
  - Mainline pavement lanes, turn lanes, ramps, **parking lots,** concrete box culverts and retaining wall systems
    - A LOT is defined as a single lift of finished embankment not to exceed 500 feet.
  - Shoulder-only areas, shared use paths, and sidewalk areas
    - A LOT is defined as a single lift of finished embankment not to exceed 2,000 feet.

Reclaimed Asphalt Pavement (RAP)

- Two methods for RAP usage in embankment
  - Soil and RAP Mixture (120-8.4.2)
    - 4” of RAP with 8”-10” of Embankment Soil
  - Alternate Soil and RAP Layer Construction (120-8.4.3)
    - 6” - 12” of Embankment & 6” RAP alternate
- The Contractor must demonstrate feasibility with 500’ test section

Reclaimed Asphalt Pavement (RAP)

- Where is RAP prohibited?
  - Construction areas that are below the seasonal high groundwater table elevation
  - Behind and below MSE Wall backfill
  - Base material other than on shoulders
  - The upper 6 inches of the Embankment layer

Maximum Lift Thickness

- 120-8.2.1.1 – Lists maximum lift thickness based on group number.

120-8.2.1.1 Maximum Compacted Lift Thickness Requirements:
Construct the embankment in successive layers with lifts up to a maximum listed in Table 120-1 below based on the embankment material classification group.

Table 120-1

Group	AASHTO Soil Class	Maximum Lift Thickness	Thick Lift Control Test Section Requirements
1	A-3	12 inches	Not Needed
	A-2-4 (No. 200 Sieve ≤ 15%)		
2	A-1	6 inches without Control Test Section	Maximum of 12 inches per 120-8.2.1.2
	A-2-4 (No. 200 Sieve > 15%)		
	A-2-5, A-2-6, A-2-7, A-4, A-5, A-6		
	A-7 (Liquid Limit < 50)		

120-8.2.1.2 Thick Lift Requirements: For embankment materials classified as Group 2 in Table 120-1 above, the option to perform thick lift construction in

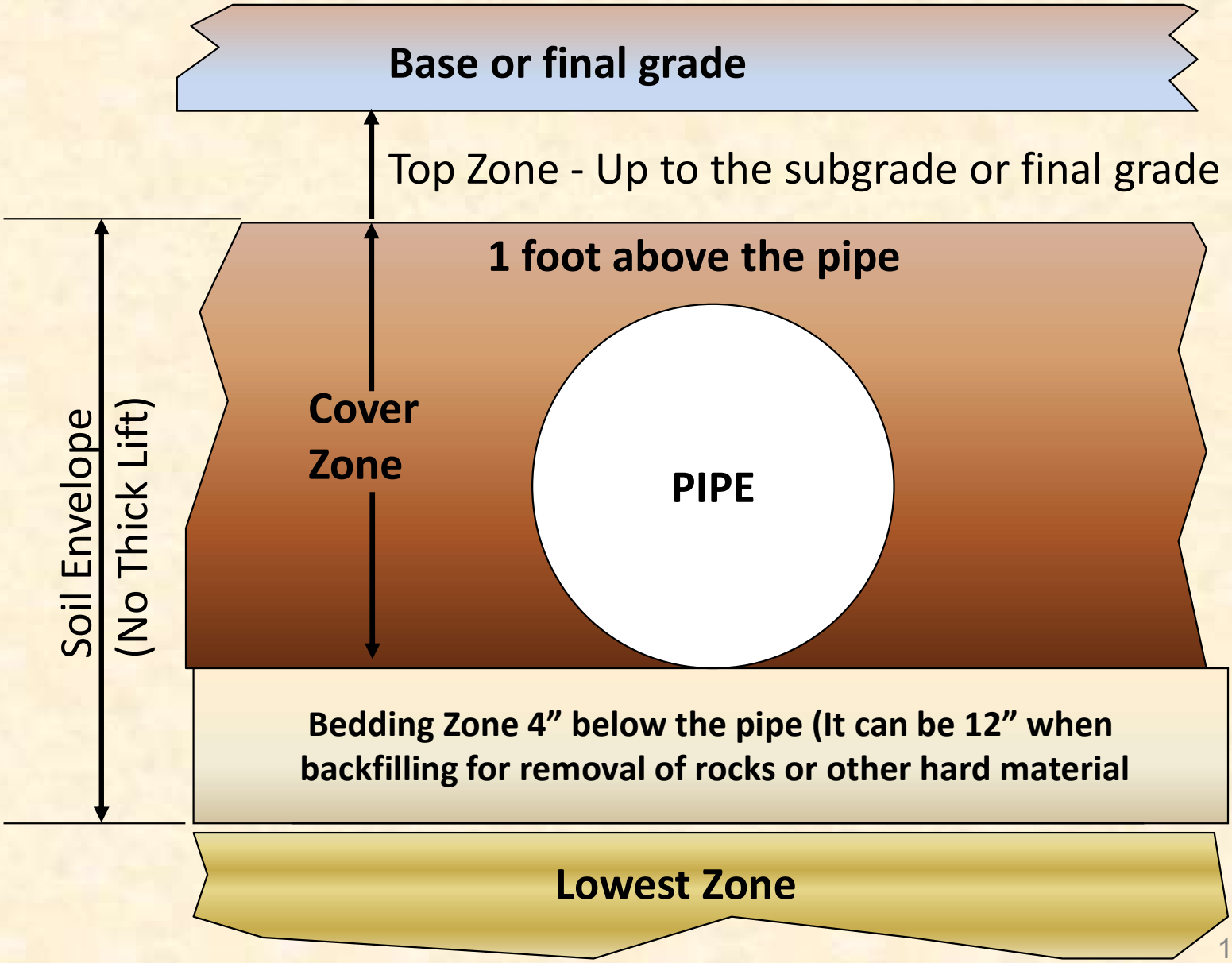
Thicklift Test Section

- Notify the Engineer prior to beginning construction of a test section.
- Meet the requirements of 120-8.2.1
- Construct a test section of the length of one full LOT.
- Perform five QC tests at random locations within the test section.
- All five QC tests and a Department Verification test must meet the density required by 120-10.2
- Identify the test section with the compaction effort and soil classification in the Density Logbook.

Initial Equipment Comparison

- 120-10.1.1
  - Before first density can be taken on the job, perform three-way comparison between IA to QC, IA to Verification, and QC to Verification.
  - Once gauge has been verified in a 3-way comparison, then those verified gauges can be used to verify additional gauges on the project by performing a 2-way comparison (QC to VT).
  - Ensure that the difference between any two computed dry densities does not exceed 2 pcf between gauges from the same manufacturer, and 3 pcf between gauges from different manufacturers.

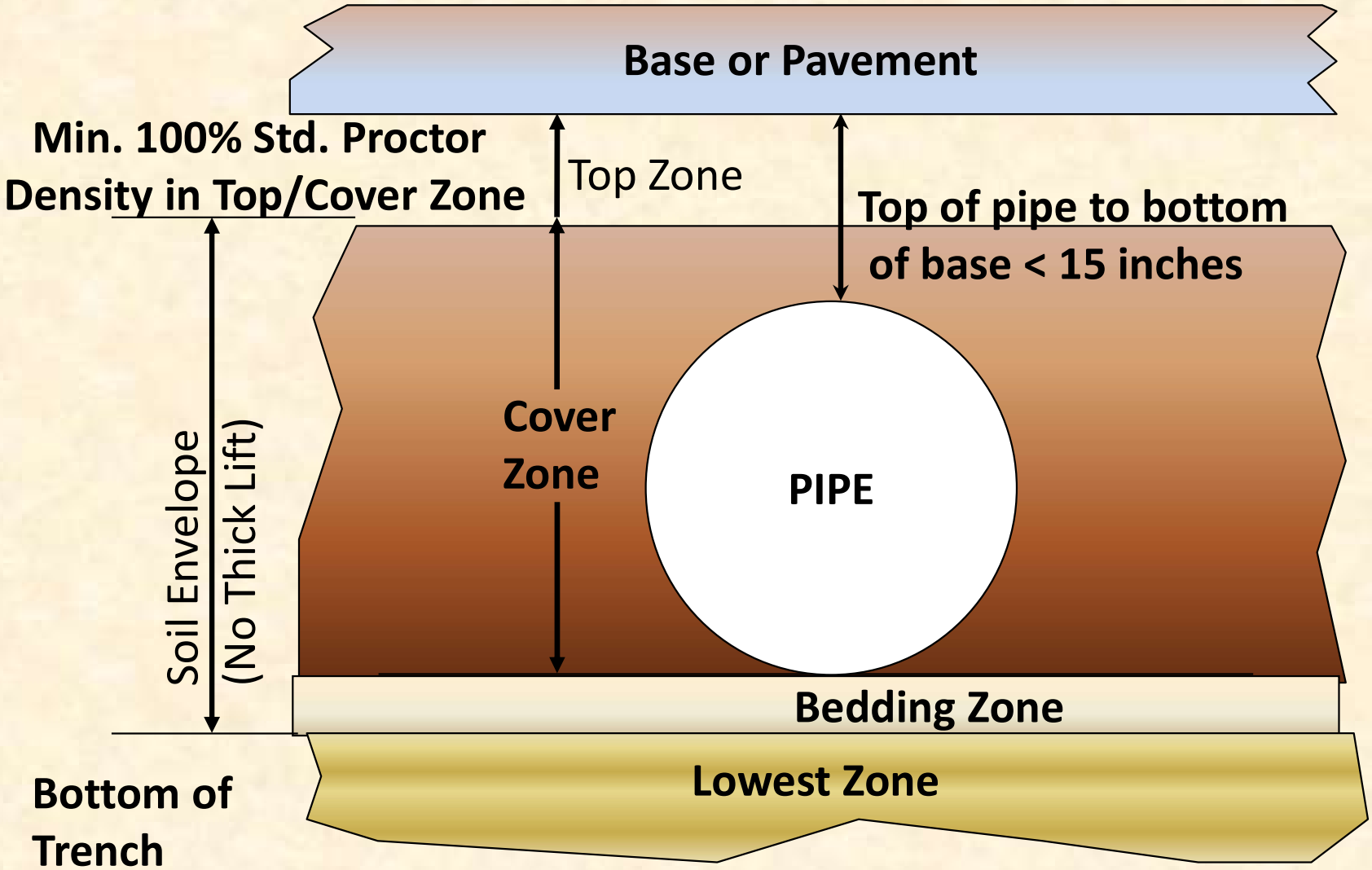
Pipe Zones 125-8.3



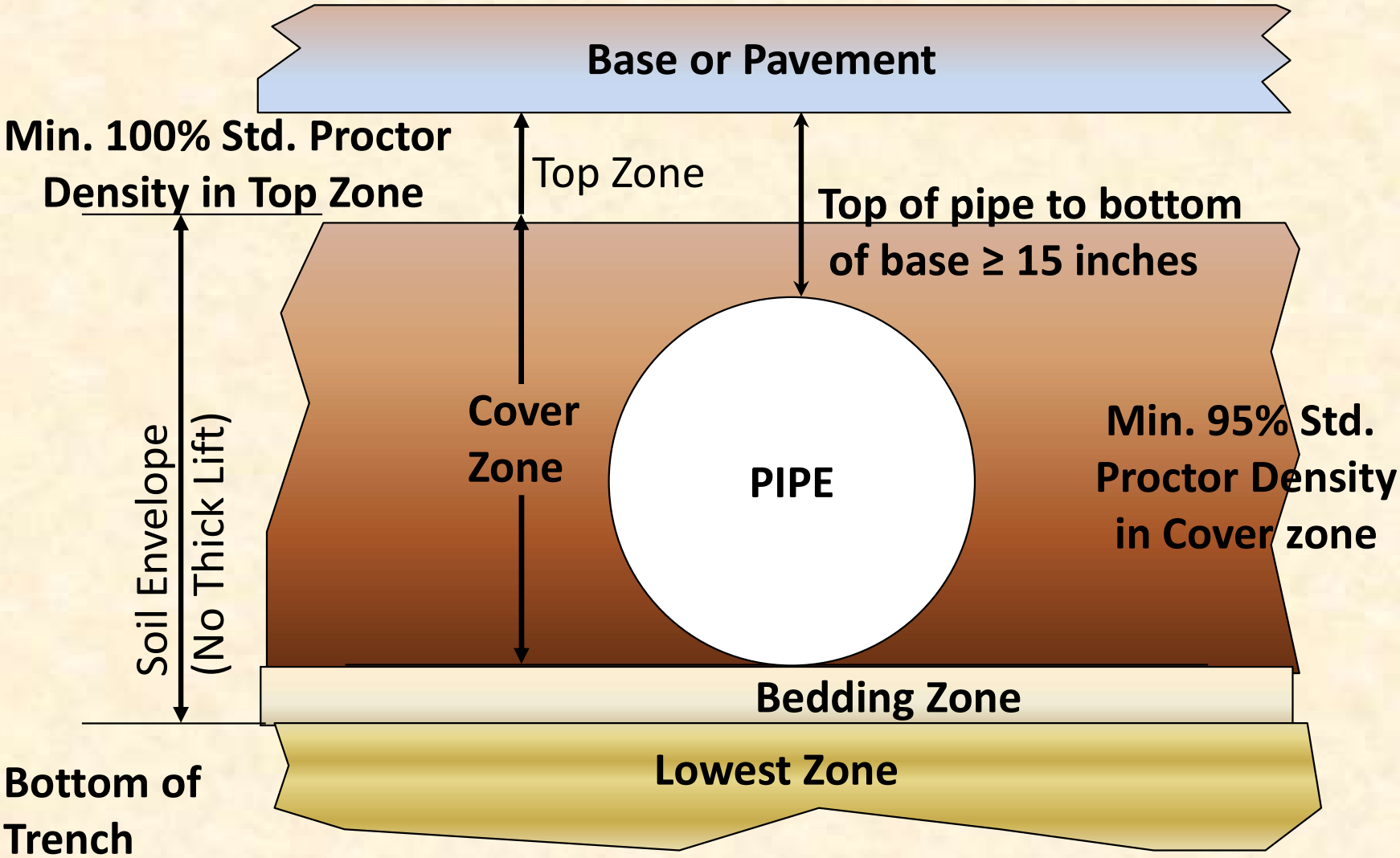
125 – Pipe Backfill Density

- Compaction requirements are the same for both Concrete and Metal Pipe
- If top of pipe is less than 15 inches below base
  - 100% standard Proctor within cover zone
- If top of pipe is greater than 15 inches below base
  - 95% standard Proctor within cover zone
- Structure backfill requires 100% of standard Proctor regardless of the depth

100% Density in Cover Zone and Top Zone



95% Density in Cover Zone



Pipe and Structure Compacted in One Operation

- 125-8.1.1 states “Backfill for structures and pipe compacted in one operation will be considered as one LOT within the cover zone”
- Drainage structures require 100% density regardless of the depth.

Pipe and Structure Compacted in One Operation

- If pipe and structure are compacted in one operation, one density test that meets 100% density may represent both pipe and structure.
  - Density tests must be taken at random locations along structure and pipe

Max. Lift Thickness

- 125-8.1.6 – In the **soil envelope**, maximum allowed thickness of backfill is 6 inches.
- 125-8.1.6.1 – Maximum allowable thick lift compaction requirements based on AASHTO Soil Class

Group	AASHTO Soil Class	Maximum Lift Thickness		Thick Lift Control Test Section Requirements	
		Within Cover Zone	Above Soil Envelope	Within Cover Zone	Above Soil Envelope
1	A-3	6 inches	12 inches	N/A	Not Needed
	A-2-4 (No. 200 Sieve ≤ 15%)				
2	A-1	6 inches without control test section		N/A	Maximum of 12 inches per 120-8.2.1.2
	A-2-4 (No. 200 Sieve > 15%)				
	A-2-5, A-2-6, A-2-7, A-4, A-5, A-6				
	A-7 (Liquid Limit < 50)				

Thicklift Test Section (Strip)

- Notify the Engineer prior to beginning construction of a test section.
- Meet the requirements of 125-8.1.6.1
- Construct a test section of the length of one full LOT.
- Perform five QC tests at random locations within the test section.
- All five QC tests and a Department Verification test must meet the density required by 125-9.2
- Identify the test section with the compaction effort and soil classification in the Density Logbook.

Reduced Frequency Testing

- Number of passing density tests required before reduced frequency density testing is allowed;
  - **Embankment:** **After 12 tests (1 per 2 LOTs)** per 120-10.1.6
  - **Pipe Backfill:** **After 6 tests (1 per 2 LOTs)*** per 125-9.1.1
  - ***Reduced frequency for pipe backfill in the trench box is reduced to one test per four LOTs**
  - LOTS are to be selected randomly when reduced frequency testing is performed

Stabilization Materials

160-2 Materials

- Commercial Material
- Existing Base
- Local Materials (as defined in 914)
- RAP or RAP Blended Material

Stabilization Materials

- Commercial Material
  - If Commercial material is used as a stabilizer, then the material must be obtained from an approved production facility and the product must be "Certified for FDOT" as specified in 914-2.1 and Aggregate Rule 1-103, FAC.
  - The delivery tickets must be collected and kept with the CEI's office for records.

Stabilization Materials

- Existing Base
  - Inform the Engineer of the location of existing base that will be excavated and stockpiled to be used as stabilizer.
  - Obtain the Engineer's approval in writing before using Existing Base.

Local Materials 160-2.2

- Local material has to be tested at the source (440A) before spreading on the roadway
  - Atterberg Limits
    - Liquid Limit ≤ 40
    - Plastic Index ≤ 10
  - AASHTO T267 Organic Content
    - 3 Individual Organic Content ≤ 4%
    - Average of 3 individual samples ≤ 2.5%

RAP or RAP Blend Stabilizing Material

RAP/RAP Blend as Stabilizer

- 440A testing must be performed at the source to prove that the organic content is failing due to asphalt content
- After Engineer's approval in writing, the contractor may spread and mix the material.
- After mixing, FM 5-563 (Asphalt Content) test must be performed to ensure that the AC limit doesn't exceed 4.0%
- Failure may indicate too much Asphalt or the presence of a material with a high organic content

Stabilization Materials

- **160-2.4 Granular Subbase:** The Engineer may allow, at no additional cost to the Department, the substitution of 6 inches of Granular Subbase
  - Must meet the requirements of 290-2 & 290-3
  - The 6” substitution is only when 12" of Type B Stabilization requiring a Limerock Bearing Ratio (LBR) value of 40 is specified
  - The correlation between design structural number and subbase substitution is not linear.

Rock Base

- Construct the base in multiple courses of equal thickness
  - Individual courses shall not be greater than 6 inches or less than 3 inches
- Thicklift allowed if approved by test section
  - Construct according to 200-5.2
  - 8-inch maximum lift thickness

Existing Rock

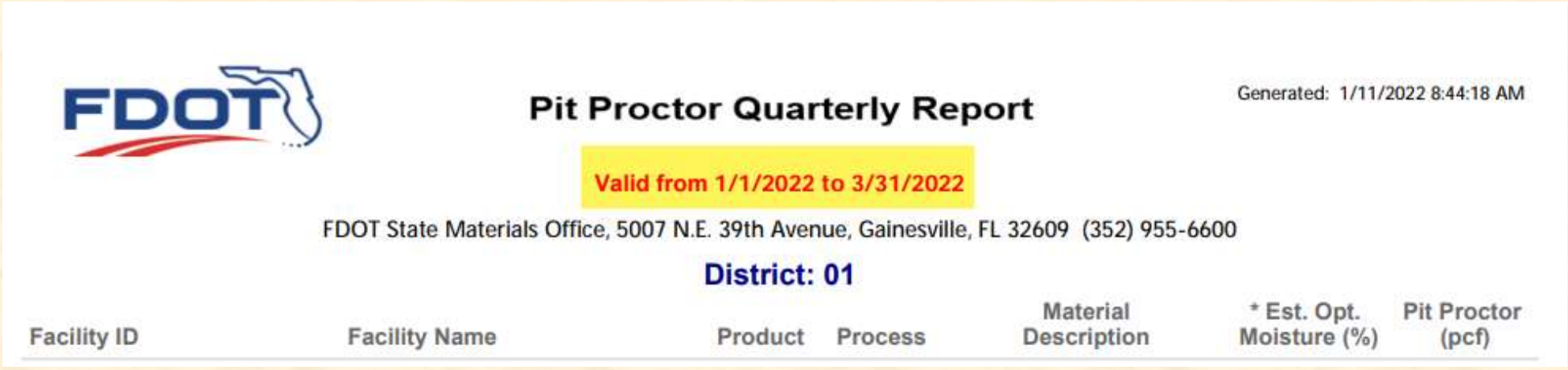
- Additional items in spec 200
  - Existing Rock
  - Pit Proctor
- Effective 2015, Existing Rock may be used on the project meeting the requirement of 200-2.2.
  - The existing rock must be material that was previously “Certified for FDOT”.

Pit Proctor

- Effective 2015, Pit Proctor program was introduced
  - Optional for Contractor
  - Contractor notifies the Engineer in writing of the option to use the Pit Proctor process
- The Pit Proctor values are updated by SMO the first day of each calendar quarter based on previous quarter test results on the following website: https://www.fdot.gov/materials/laboratory/geotechnical/aggregates/pitproctor/index.shtm

Pit Proctor

- Pit Proctor is a quarterly process which is documented at the top of the report. The information on the report is only valid for the time frame noted “Valid from…”



FDOT

Pit Proctor Quarterly Report

Generated: 1/11/2022 8:44:18 AM

Valid from 1/1/2022 to 3/31/2022

FDOT State Materials Office, 5007 N.E. 39th Avenue, Gainesville, FL 32609 (352) 955-6600

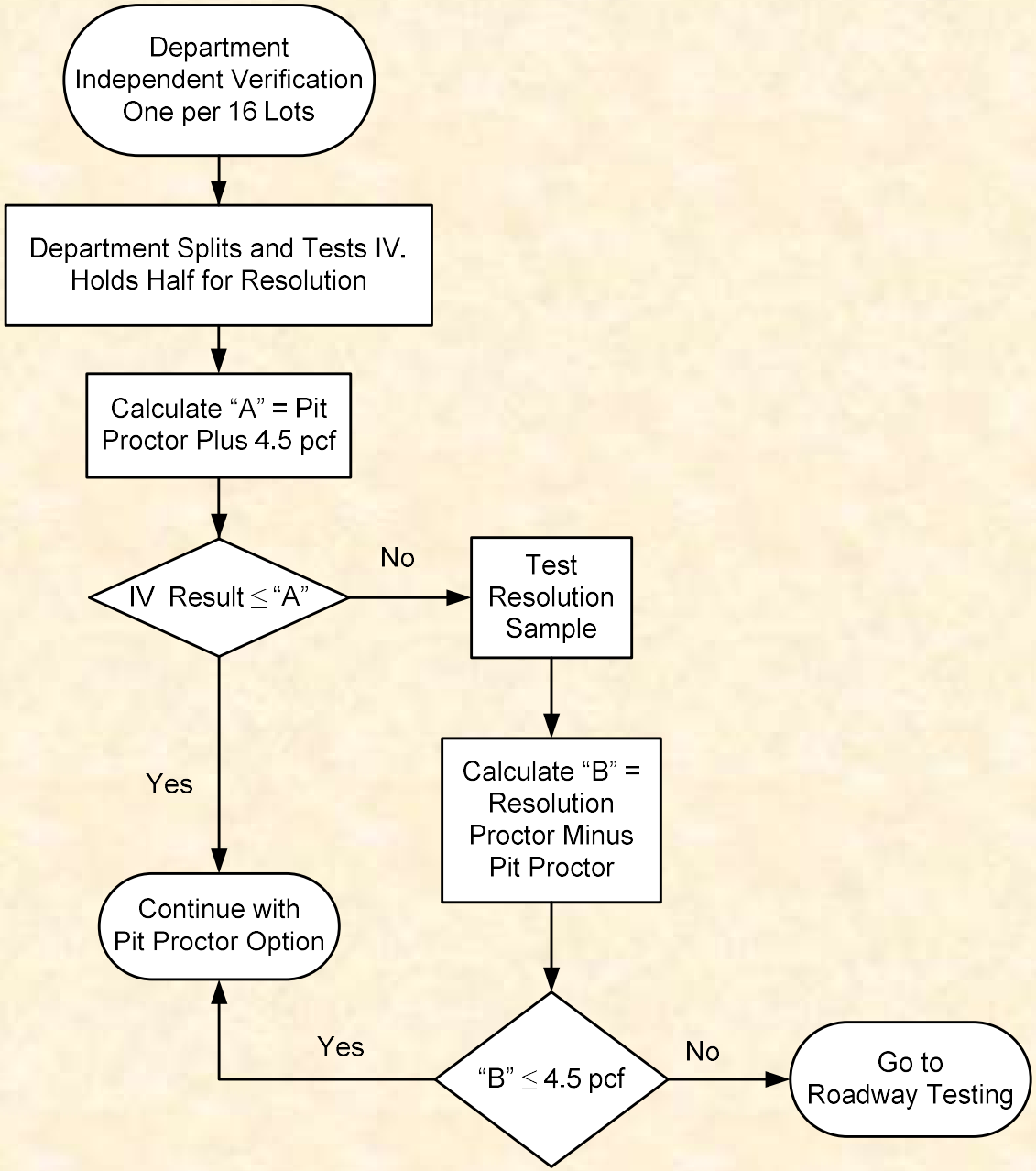
District: 01

Facility ID	Facility Name	Product	Process	Material Description	* Est. Opt. Moisture (%)	Pit Proctor (pcf)

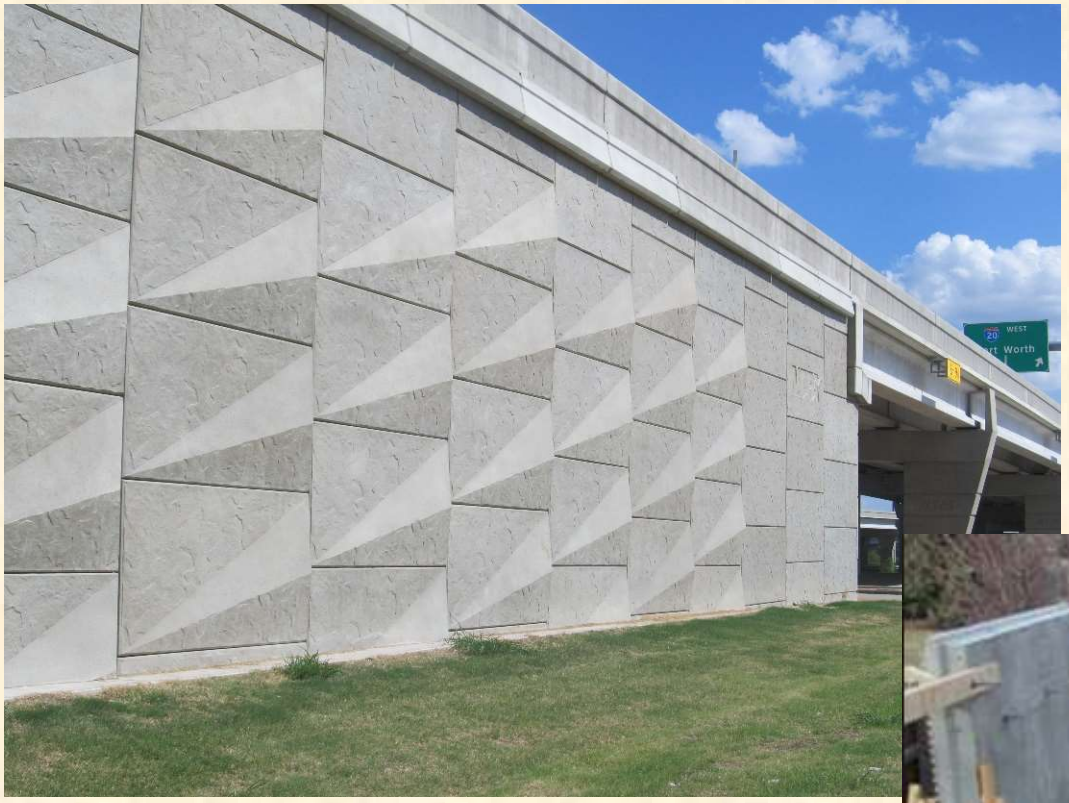
Pit Proctor

- Density tests must use current quarter Pit Proctor value to calculate percent density compaction regardless of when they brought the material to the job.
- QC reports the Pit Proctor value into MAC and IV tests every 16 LOTs to verify the accuracy of the Pit Proctor
  - IV Proctor can't exceed 4.5 pcf of Pit Proctor

Pit Proctor Flow Chart



MSE Wall



Required Tests for MSE Wall

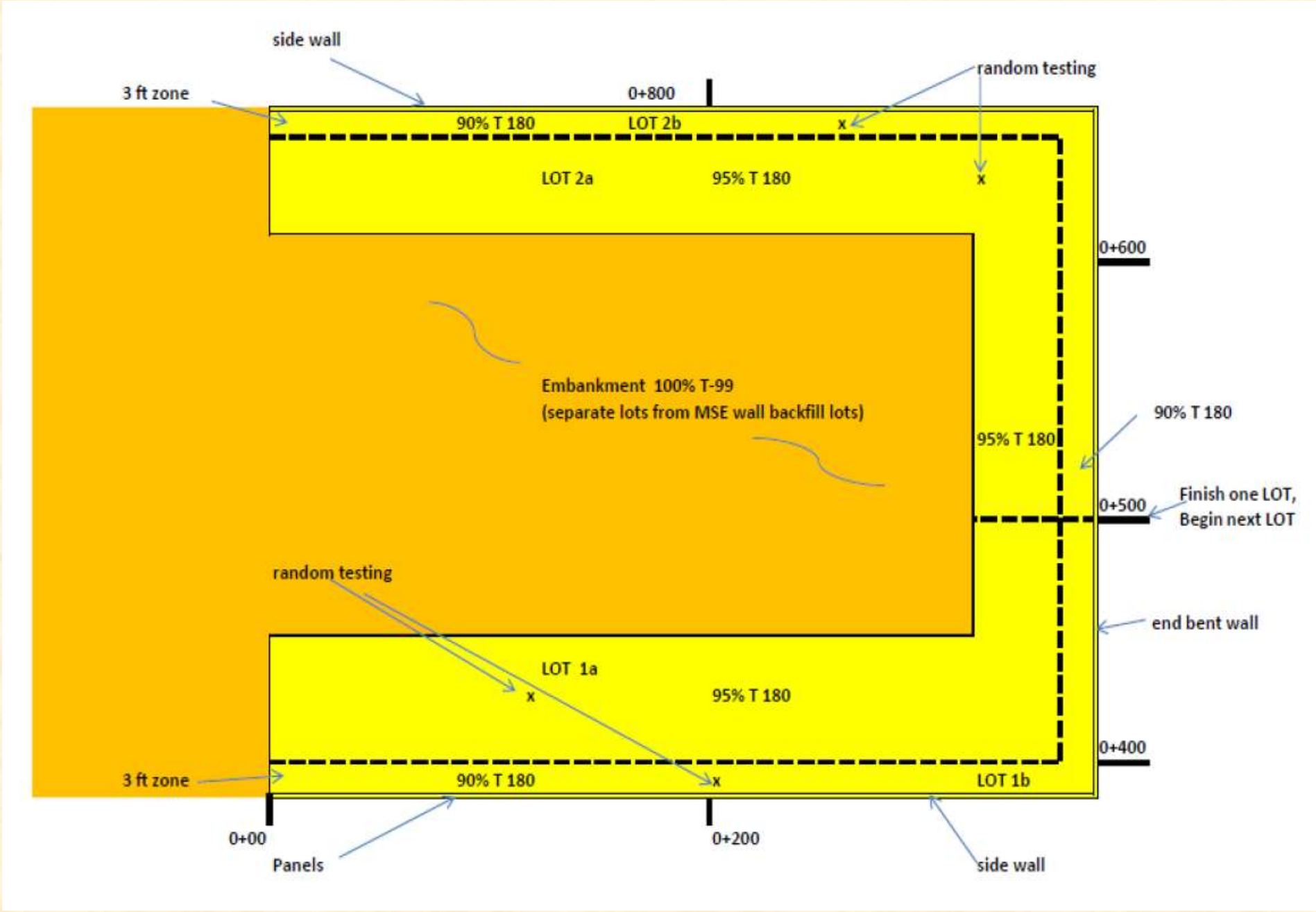
- Contractor must test the MSE Wall backfill at the source and submit signed and sealed certification by a Professional Engineer registered in the State of Florida proving that the results have met the requirements of Section 548-2.6.2
- At point of placement appropriate tests must be ran again and reported to the Department database (MAC) as specified in 548-9

LOT Definition for Retaining Wall Systems

- A LOT is defined as a single lift of finished embankment not to exceed 500 feet in length or cumulative length of continuous, interconnected walls.

- Backfill within 3 feet from the panels and backfill beyond 3 feet from the panels are separate LOTs.

548 LOTs


side wall
3 ft zone
0+800
random testing
90% T 180
LOT 2b
x
LOT 2a
95% T 180
x
0+600
Embankment 100% T-99
(separate lots from MSE wall backfill lots)
90% T 180
95% T 180
0+500
Finish one LOT,
Begin next LOT
random testing
end bent wall
LOT 1a
x
95% T 180
0+400
3 ft zone
90% T 180
x
LOT 1b
0+00
0+200
Panels
side wall

Additional LOT Details

- Strips up to 8 feet wide between two retaining wall volumes constructed with the same material in one operation may be considered as one LOT with the retaining wall volumes.

- Overlapping retaining wall volumes may be considered one LOT, excluding the 3 feet width behind the panels.

548 LOTs

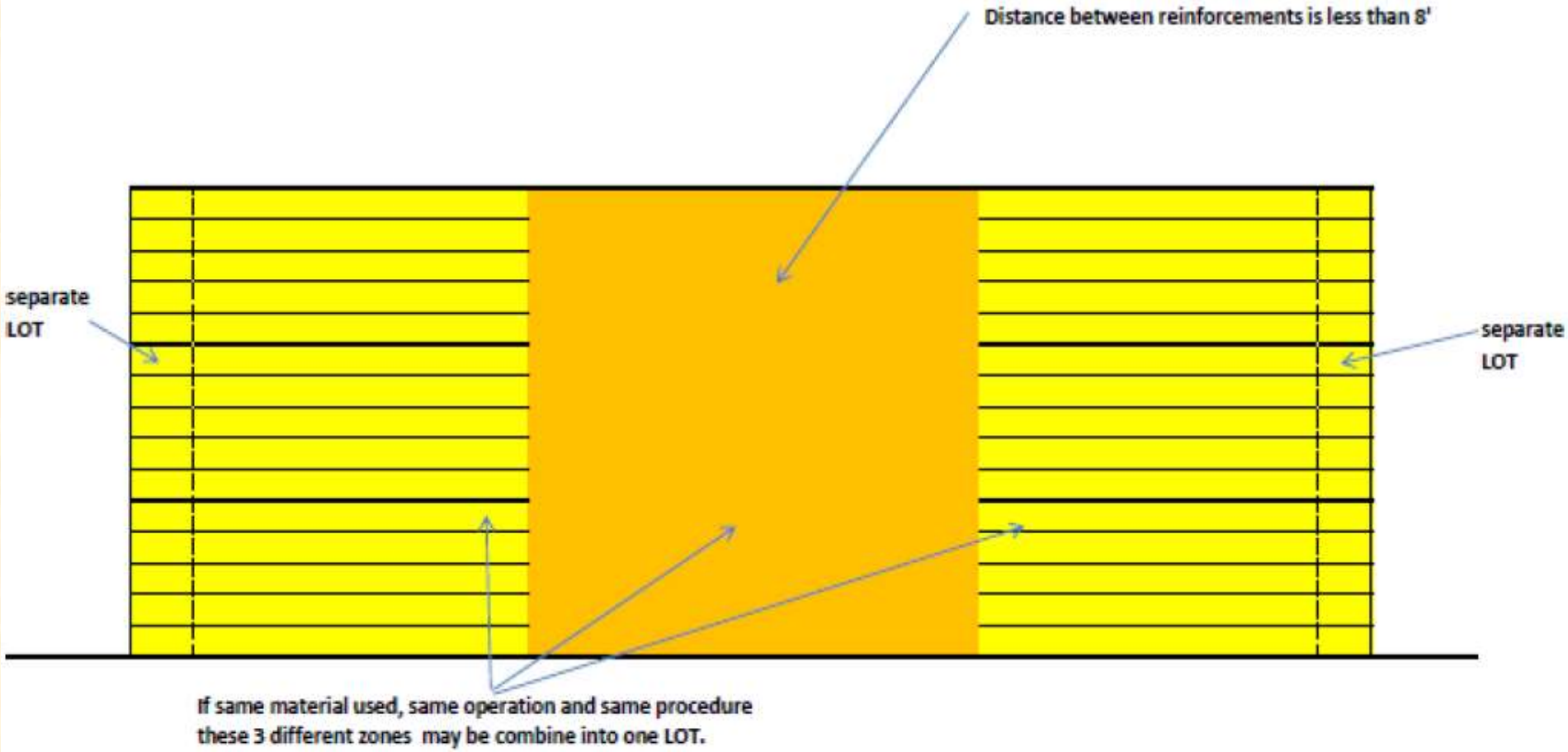
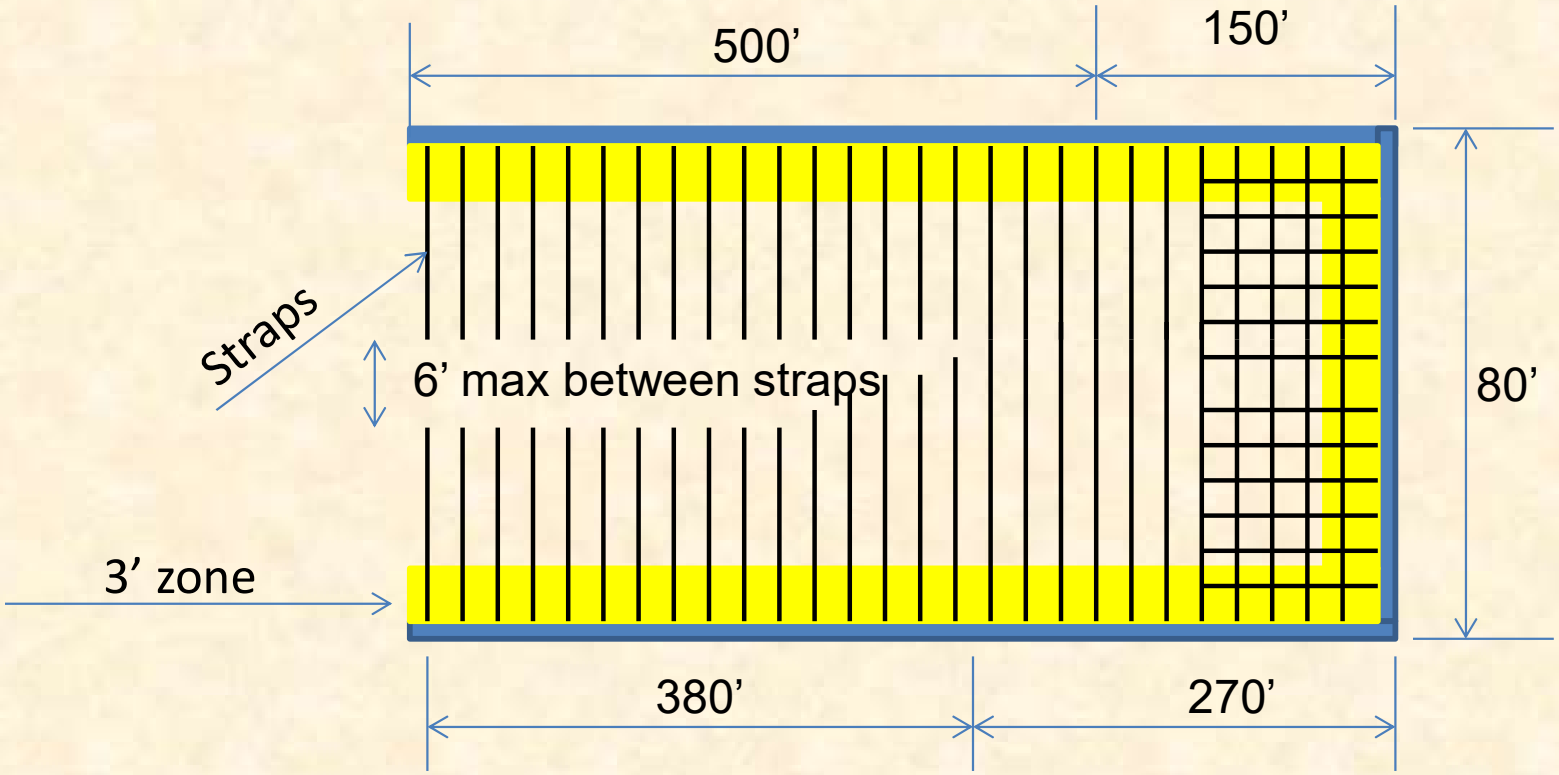


Figure 58 . Paralell walls, with a narrow gap between reinforcements

https://www.fdot.gov/construction/geotech/geotech.shtm

MSE Wall Example



- The contractor places this area in one lift and compacts in each zone in one operation.
- What is the minimum number of density tests for one lift in this scenario?

Optional Materials for Wall Backfill

- 548-2.6.4 Coarse Aggregate Backfill
  - Use Size No 57 through Size No 89 (unless restricted in the Plans)
  - Must test aggregate for pH, resistivity, sulfate, and chloride content
- 548-8.5.2 Flowable Fill
  - Metallic wall components must be completely encapsulated by the flowable fill.

Rolling Pattern

- Within 3’ of all MSE Wall Backfill Types
  - Achieve compaction of all backfill types within three feet of the back of the wall face using a power operated roller or plate weighing less than 1,000 pounds.
- Coarse Aggregate Backfill

Min # of Passes	Equipment Weight Limit
3 passes	Between 600 and 1000 pounds
2 Passes	Greater than 1000 pounds

Optional Acceptance for Backfill

- 548-9.4.1 Optional Acceptance Criteria for A-3 and A-2-4 Materials
  - Obtain a minimum density of 95% of the maximum dry density as determined by AASHTO T99 within 3 feet behind the wall face and obtain a minimum density of 100% of the maximum dry density as determined by AASHTO T99 beyond 3 feet behind the wall face.

EARTHWORK RECORDS SYSTEM (ERS)

Earthwork Records System

- ERS also known as density logbook is a group of logbooks with pertinent field data put together for earthwork construction
- These paper logbooks or electronic logbooks (MAC-ERS), provide as-built records of the pavement substructure
  - Graphical representation of the materials used to build the earthwork layers
  - Densities achieved for each construction type (i.e. roadway, MSE walls, pipe backfill, etc.)

Earthwork Records System

- Paper logbook is composed of forms that can be obtained from Departments Forms Library
  - Form 675-020-27 is maintained by the Contractor (QC)
  - Form 675-020-28 maintained by the Engineer (VT).
- Electronic logbook (MAC-ERS) includes the same information from the forms listed above.
- ERS is used as the acceptance method for material certification

Earthwork Records System

- MAC-ERS is let on jobs on or after 10/2021
- District Materials Office will be providing the MAC-ERS training.
- The training is provided for project personnel that will have an upcoming project in MAC-ERS.
- Training videos and instructions manual are available from the following website:
  - https://www.fdot.gov/materials/mac

Contractor's Responsibilities

- Quality Control
  - Plot roadway and drainage sheets
    - Data entry to generate plots in MAC
  - Assemble the QC ERS Form 675-020-27
  - Maintain the QC ERS throughout the project.
  - Take QC densities
  - Sample, split and test for Proctors
  - Maintain resolution and verification samples
  - Sample for all QC lab tests
  - QC takes resolution density tests
  - Meet the requirements of the contract.

Department's Responsibilities

- Verification
  - Verify Contractor's test results
  - Review ERS for completeness and accuracy.
  - Provide the reference gauge for comparisons on new gauges brought to the project
  - Sample for LBR
  - Verification density testing
  - Witness surface and depth checks

Department's Responsibilities

- District Materials IA
  - Assist project personnel to ensure Earthwork documentation can be understood
  - Provide the reference nuclear density gauge for initial comparison
  - Review ERS to ensure all deficiencies are resolved before final acceptance
  - Perform Quality Performance Reviews for technicians (QPR's)
  - Observe ongoing construction

675-020-27

CONTRACTOR'S QC EARTHWORK RECORDS SYSTEM

- QC logbook maintained by the Contractor and consists of pages for:
  - Initial Equipment Comparison
  - Earthwork Density Report
  - Pavement Plot
  - Summary of Proctors
  - LOT Index and Special Conditions
  - Stabilizing Mixing Depth
  - Rock Base Thickness

Downloads:

Plot Software

https://www.fdot.gov/construction/download

Forms

https://pdl.fdot.gov/

Form Number	Form Title	Office
675-020-05	Pipe Backfill Code Sheet	MATERIALS
675-020-06	Embankment, Subgrade, and Base Code Sheet	MATERIALS
675-020-27	Contractor Quality Control Density Record System	MATERIALS
675-020-28	Verification Earthwork Density Record System	MATERIALS

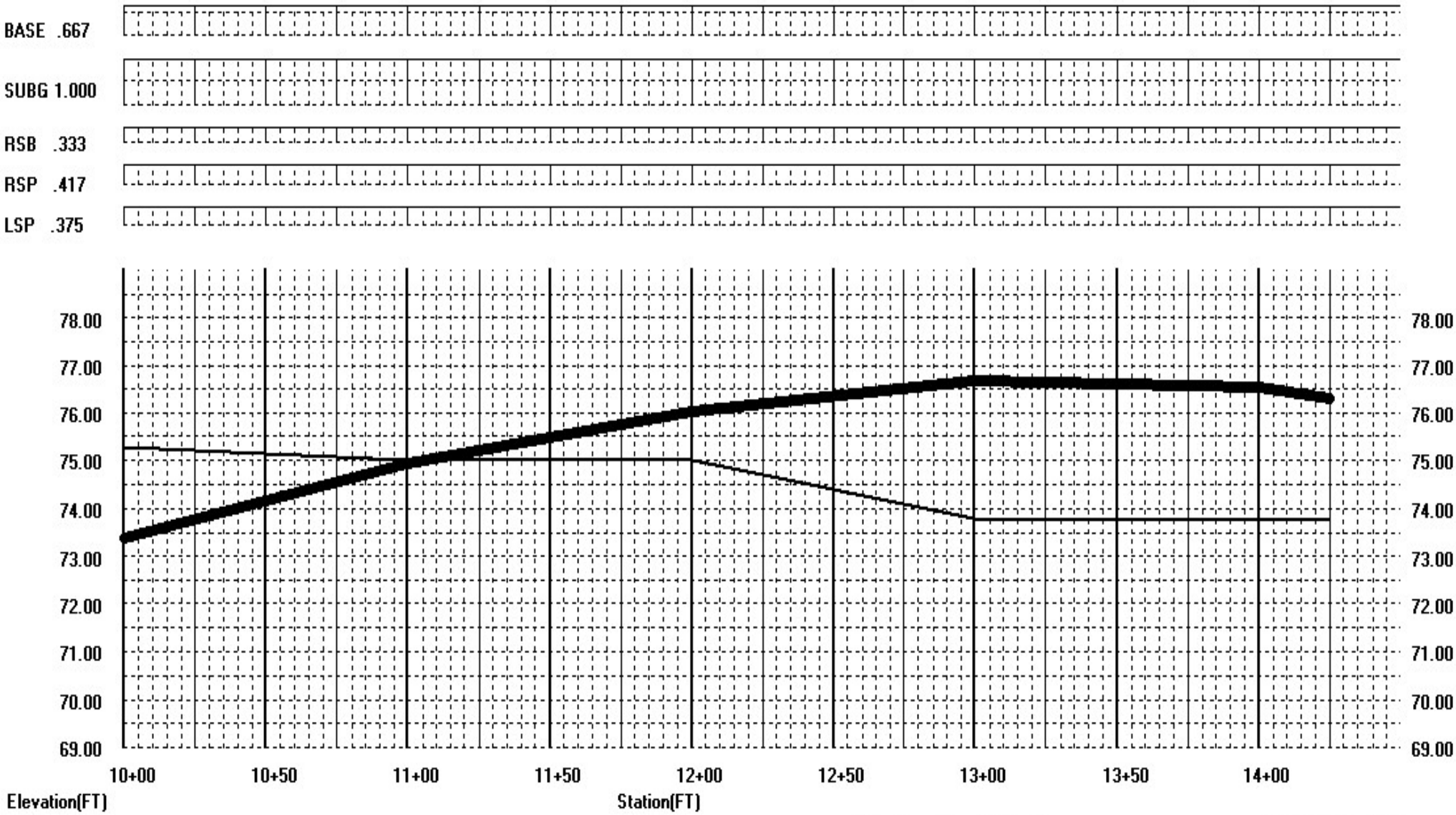
Plot Preview Screen

File Print Next Previous

FDOT Project 21791145201

Density - Embankment - non SI

PINE LOG ROAD



Plan Elevations Verified by _____

DLBPLOT Ver 1.1.1

Plot Preview Screen

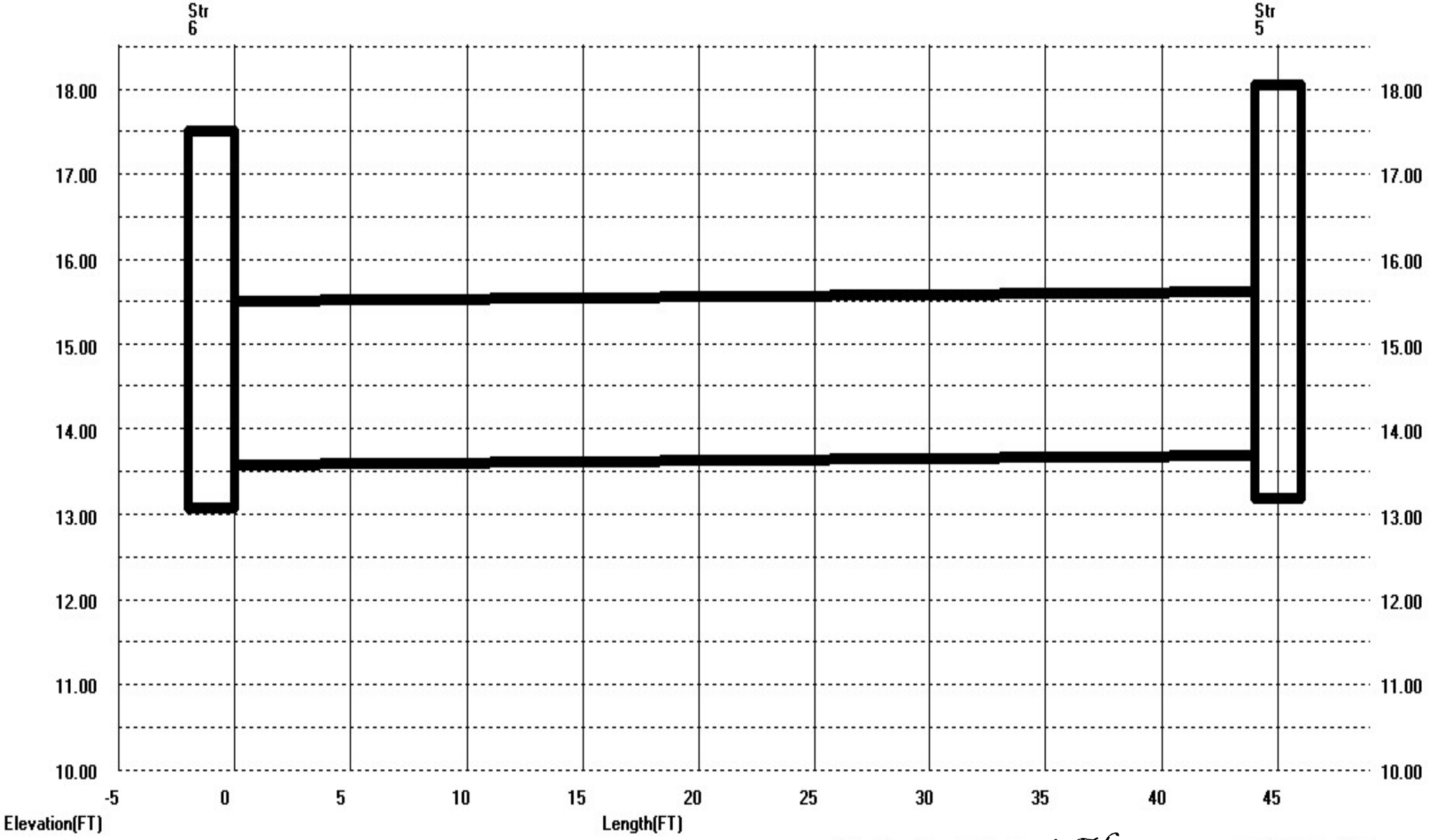
File Print Next Previous

FDOT Project 21066935201

Density - Drainage Structure - non SI

44.000 Feet of 18 inch Round Concrete Pipe

Sta 33+65 to Sta 33+65



Plan Elevations Verified by WH

DLBPLOT Ver 1.1.1

REMEMBER

- Contact the Earthwork Team at the District Materials Office if any support is needed
- Check with the Materials Office about:
  - Preliminary Pages
  - Requirements of LOT Index
  - Coding elevations from Plans
  - Using the DLB Plot Program
  - Other Logbook questions

Classroom Exercise

- QC Sample - 108 pcf
- VT Proctor - 113 pcf

- Resolution Proctor - 116 pcf

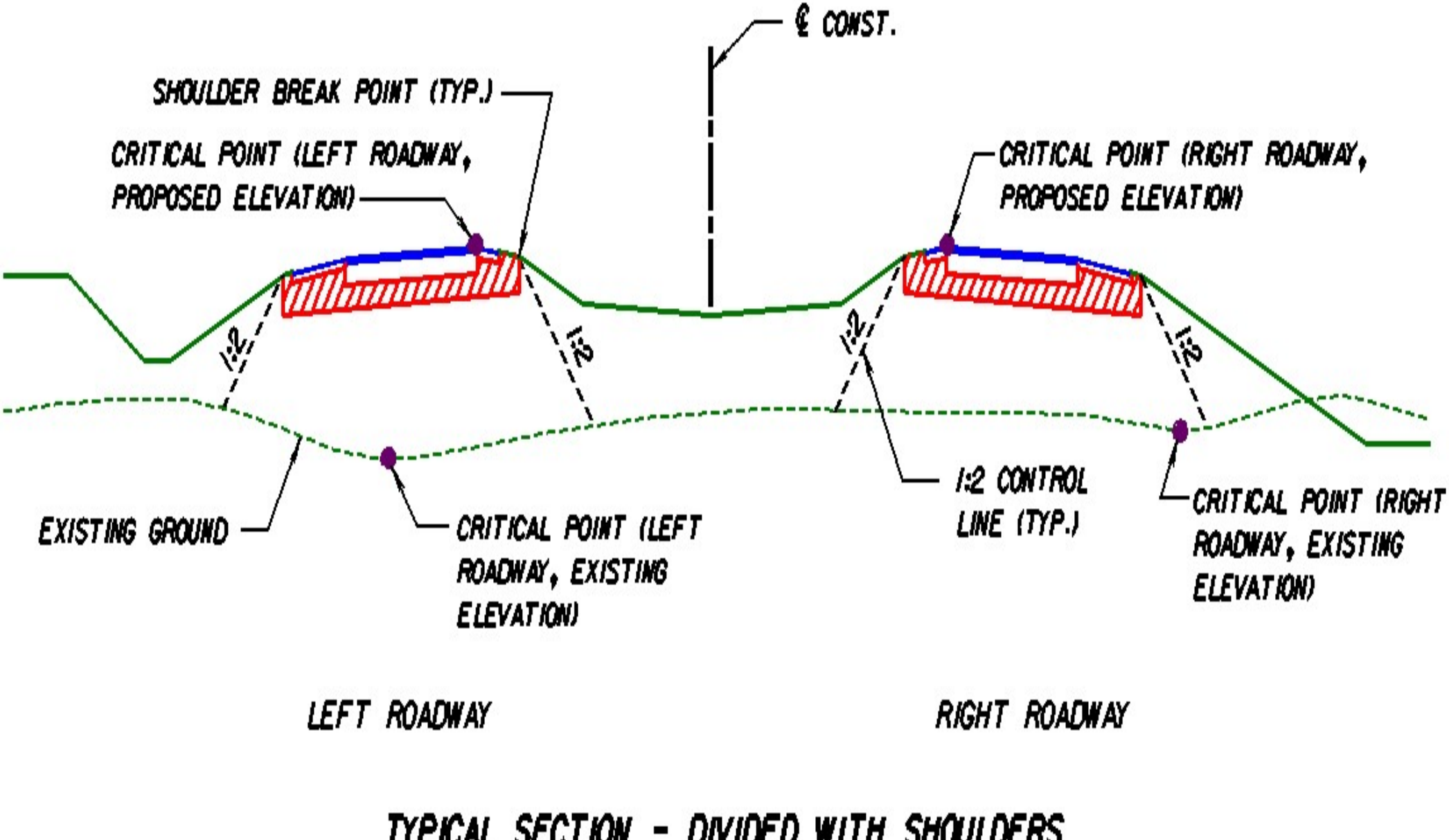
- Which Proctor should you use?

Logbook Plot Program Coding

Roadway & Drainage Plots

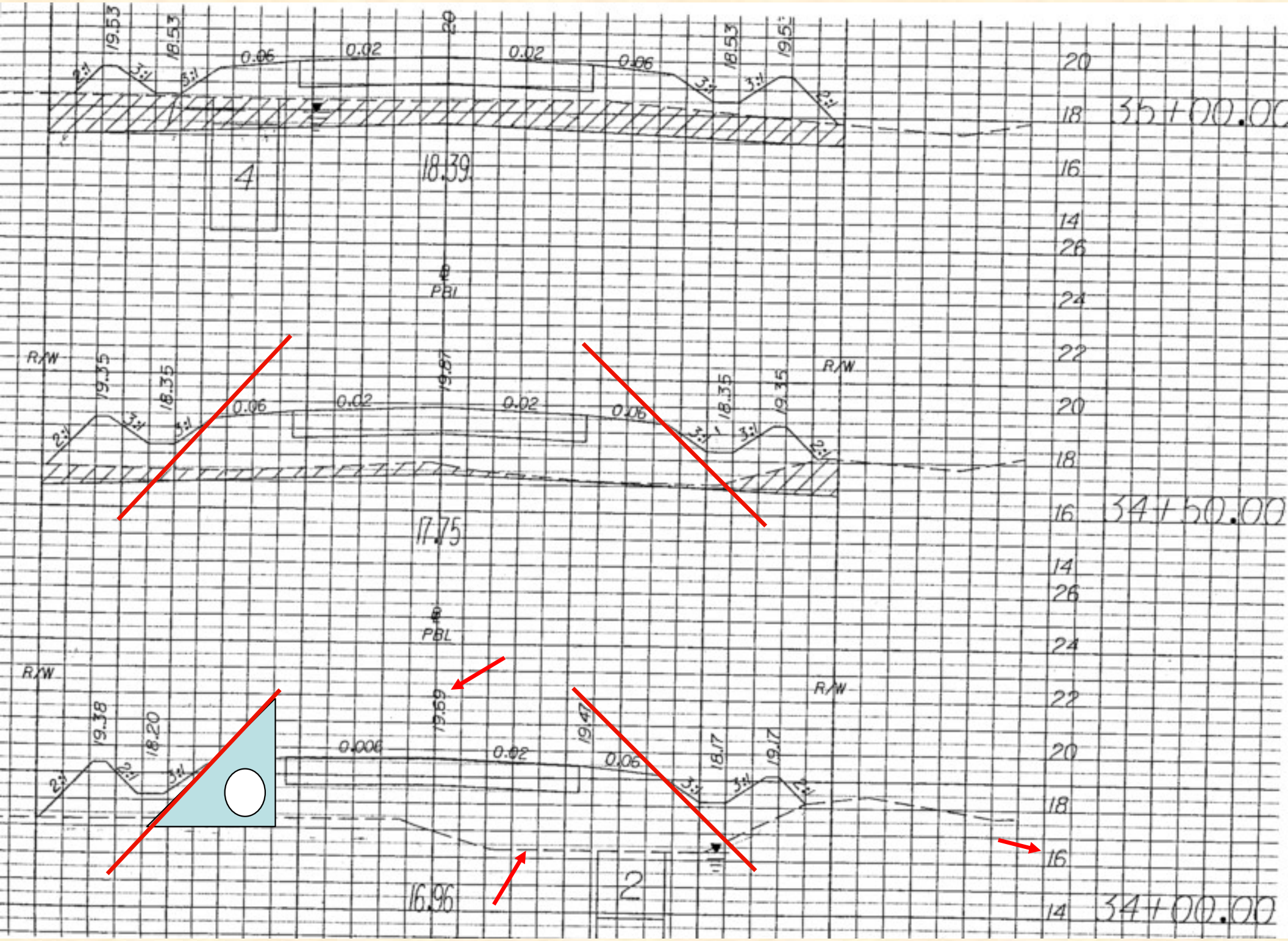
Required for Coding Roadway

- Highest proposed pavement elevation
- Lowest existing ground elevation
- Code for unsuitable material
- Locate shoulder break points and draw the 1V:2H control line
- Code thickness of Asphalt, Base, & Subgrade
- Code Shoulder Base, Shoulder Subgrade, Sidewalk, etc.



TYPICAL SECTION - DIVIDED WITH SHOULDERS

Code Critical points for both Left and Right Roadways from each Cross Section


35+00.00
34+50.00
34+00.00
R/W
PBL
0.06
0.02
2:1
3:1
5:1
18.39
17.75
16.96
19.53
18.53
19.35
18.35
19.38
18.20
19.47
18.17
19.17
4
2

PROJECT NUMBER	21066935201	PAGE NO: 1

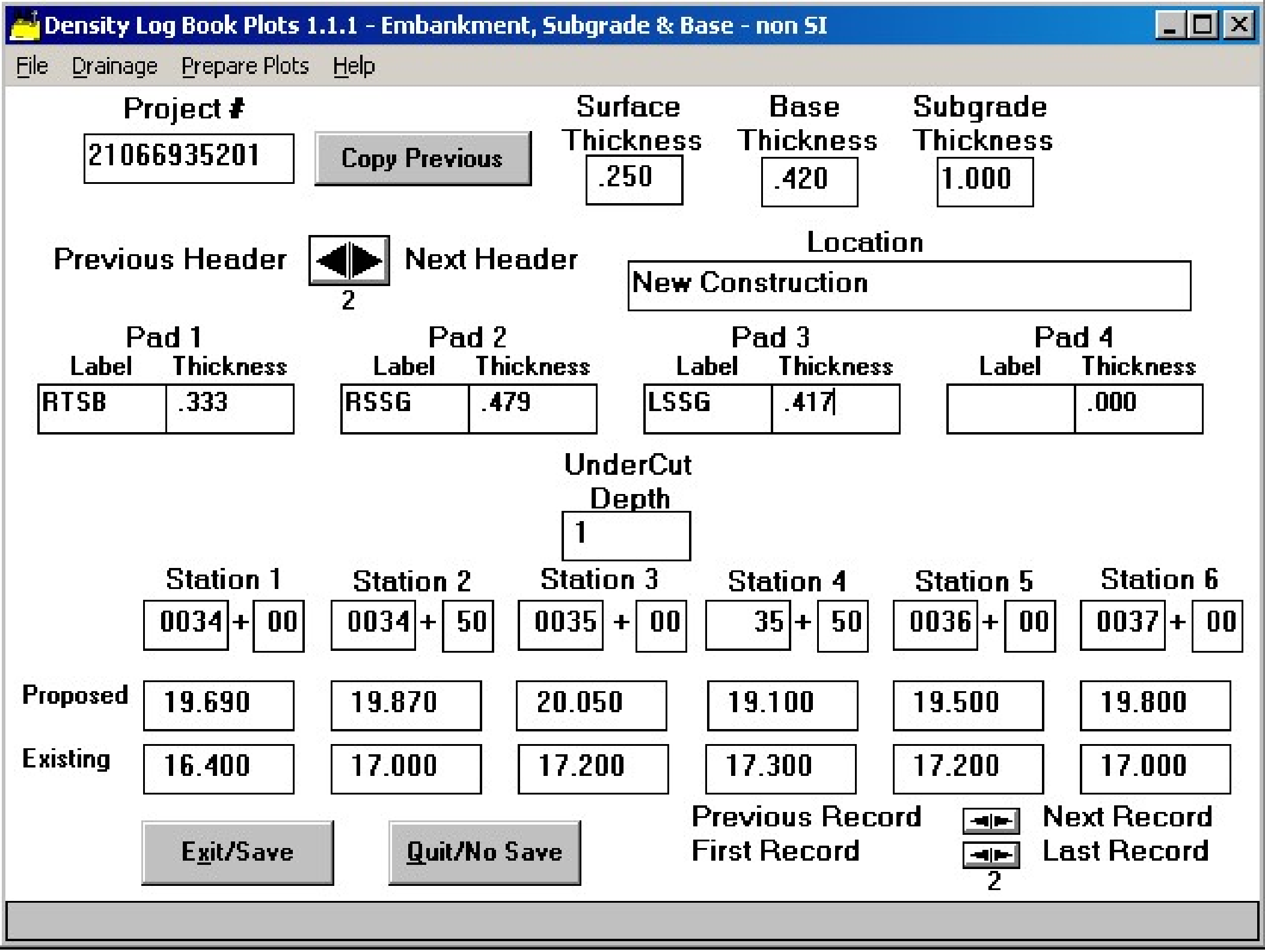
SURFACE THICKNESS .250	BASE THICKNESS 0.420	SUBGRADE THICKNESS 1.00	UNDERCUT 1.00

REMARKS: Ratliff Rd New Construction

	PAD 1	PAD 2	PAD 3	PAD 4
LABEL	RTSB	RSSG	LSSG	
THICKNESS	.333	.479	.417	

	STATION 1	STATION 2	STATION 3	STATION 4	STATION 5	STATION 6
STATION	20 + 50	021 + 00	21 + 50	22 + 50	23 + 50	24 + 80
PROPOSED	17.80	18.50	18.75	19.10	19.50	19.80
EXISTING	14.50	14.80	14.85	17.30	17.20	17.00
STATION	32+89	33 + 50	34 + 00	35 +00	+	
PROPOSED	19.80	19.70	19.69	20.05		
EXISTING	17.00	15.70	16.40	17.20		
STATION	35 + 00	36+00	37+00	38+00	38+50	
PROPOSED	20.05	20.41	20.78	21.14	21.33	
EXISTING	17.20	16.90	18.66	18.70	20.30	
STATION	+	+	+	+	+	
PROPOSED						
EXISTING						

RECORD NO._____ HEADER NO._____


Density Log Book Plots 1.1.1 - Embankment, Subgrade & Base - non SI
File
Drainage
Prepare Plots
Help
Project #
21066935201
Copy Previous
Surface Thickness
.250
Base Thickness
.420
Subgrade Thickness
1.000
Previous Header
Next Header
2
Location
New Construction
Pad 1
Label
Thickness
RTSB
.333
Pad 2
Label
Thickness
RSSG
.479
Pad 3
Label
Thickness
LSSG
.417
Pad 4
Label
Thickness
.000
UnderCut Depth
1
Station 1
0034 + 00
Station 2
0034 + 50
Station 3
0035 + 00
Station 4
35 + 50
Station 5
0036 + 00
Station 6
0037 + 00
Proposed
19.690
19.870
20.050
19.100
19.500
19.800
Existing
16.400
17.000
17.200
17.300
17.200
17.000
Exit/Save
Quit/No Save
Previous Record
First Record
Next Record
Last Record
2

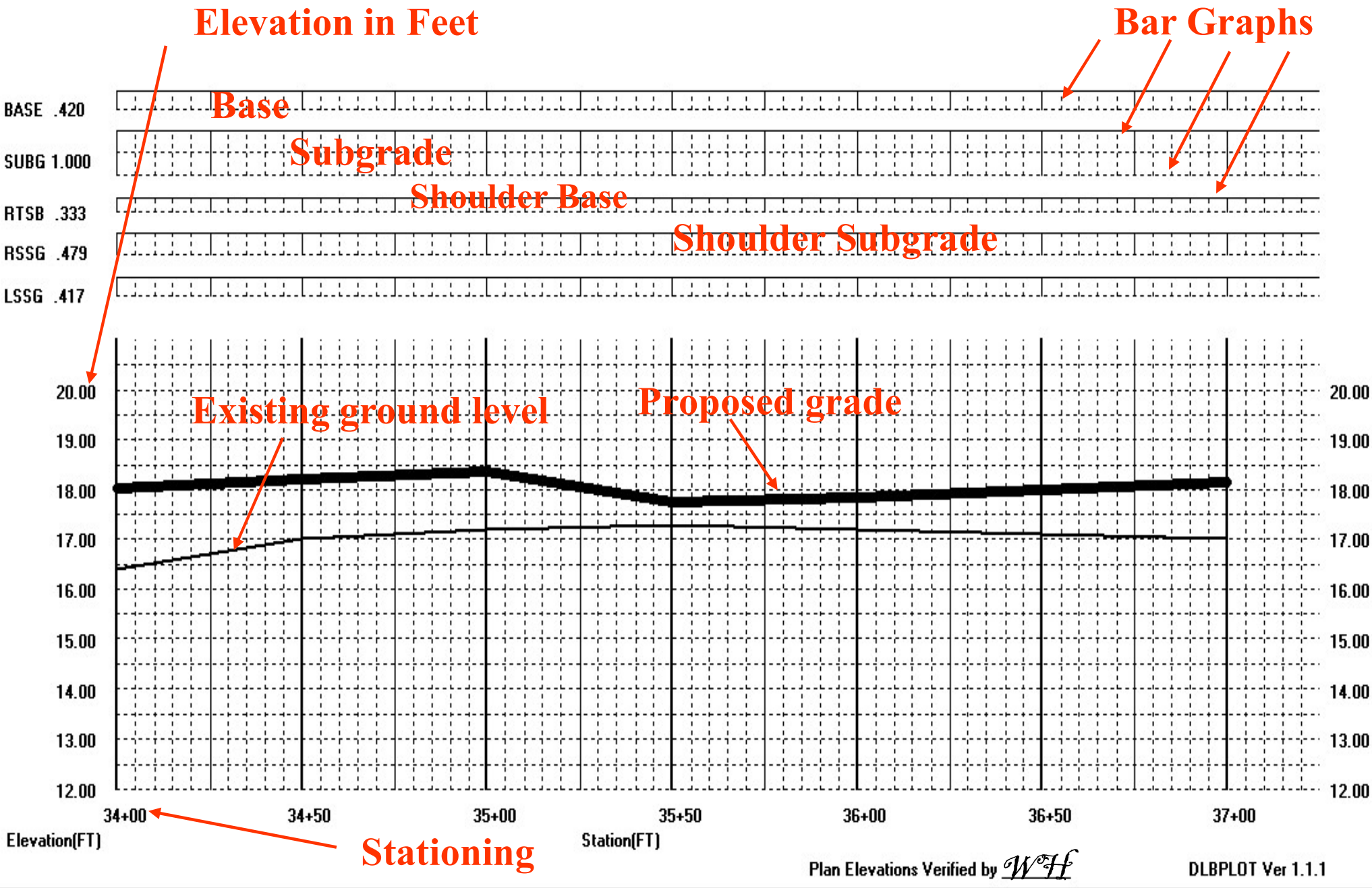
Plot Preview Screen

File Print Next Previous

FDOT Project 21066935201

Density - Embankment - non SI

New Construction

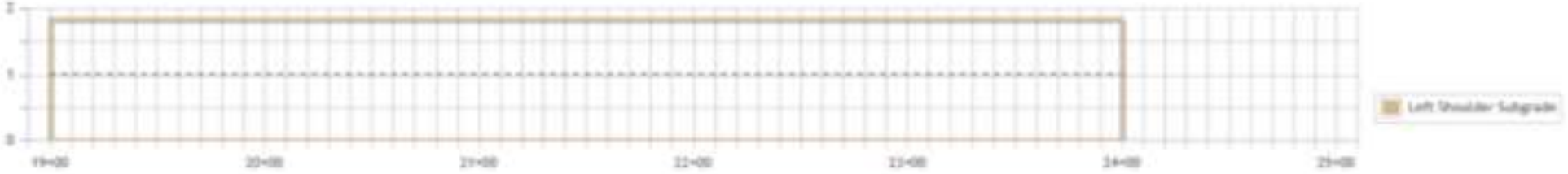


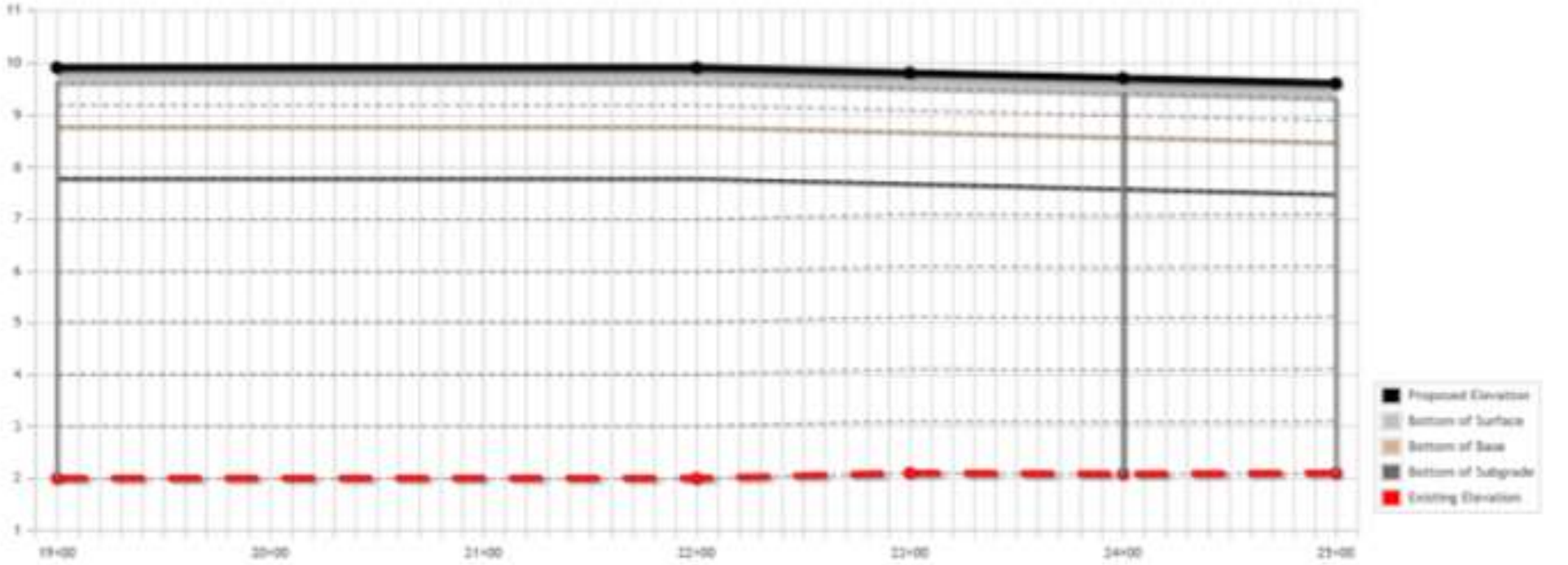
Plan Elevations Verified by WH

DLBPLOT Ver 1.1.1

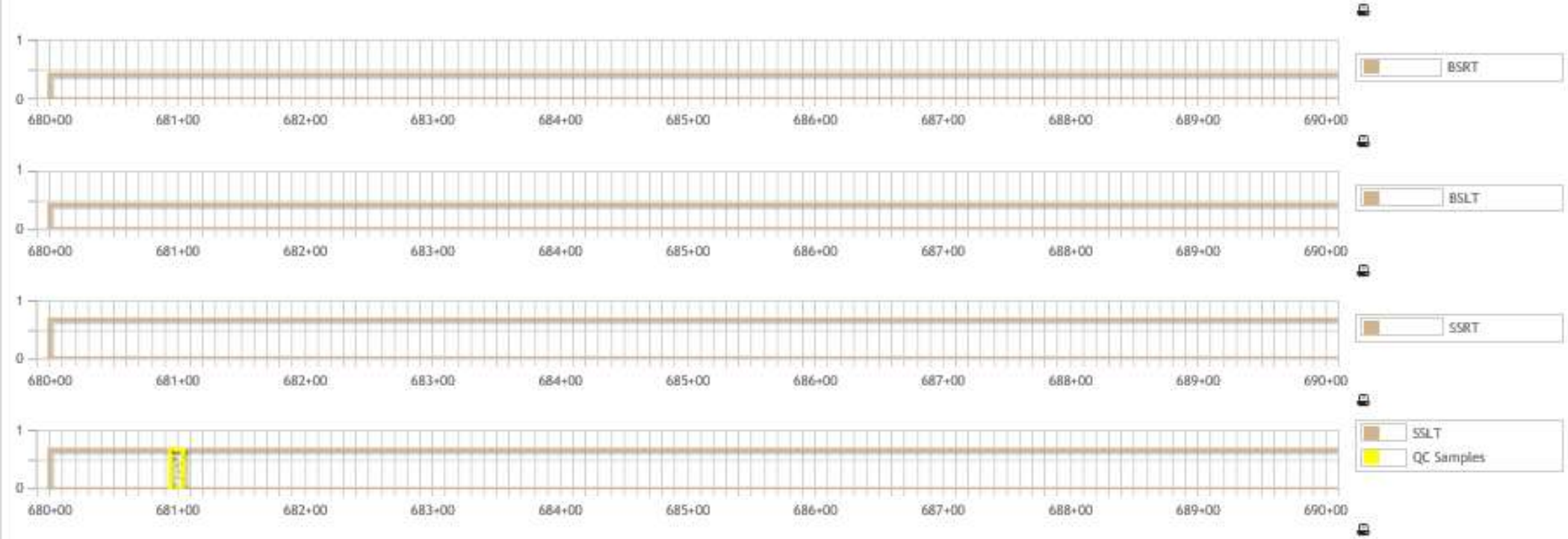
ESB (Left Roadway)

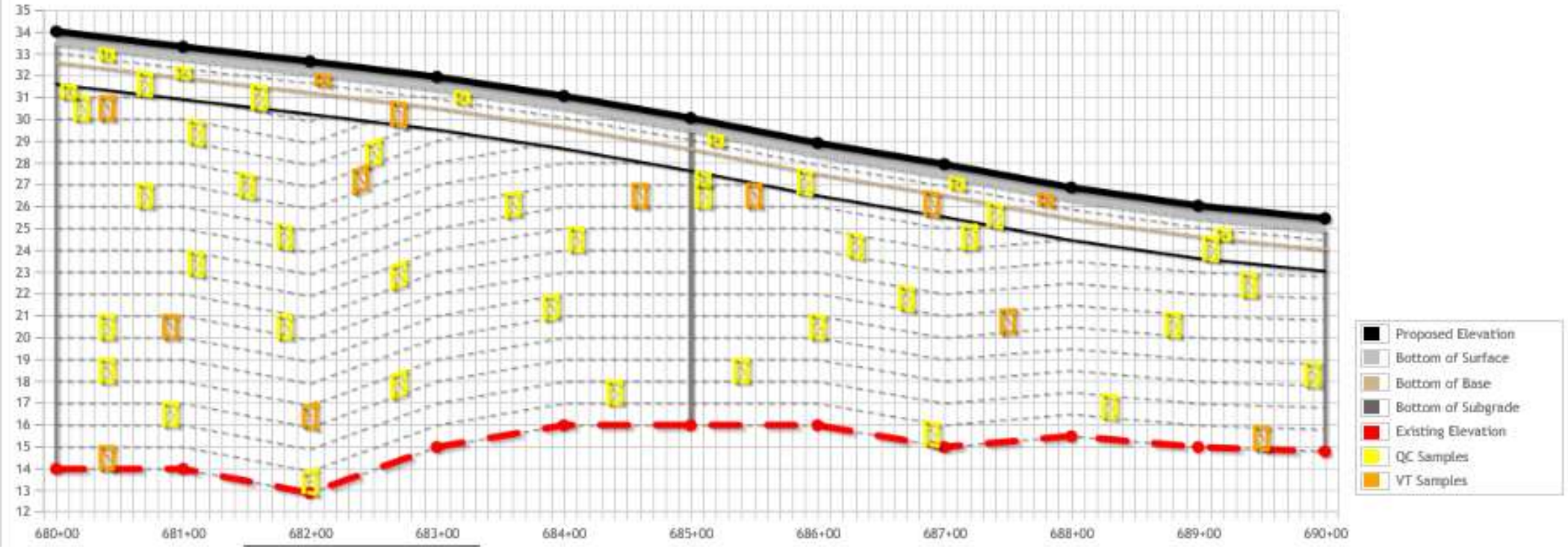
Starting Station | Ending Station | Material | Sample Level | Minimum Y Axis to Display | Maximum Y Axis to Display





Starting Station: 680+00 | Ending Station: 690+00 | Material | Sample Level | Minimum Y Axis to Display | Maximum Y Axis to Display | Refresh





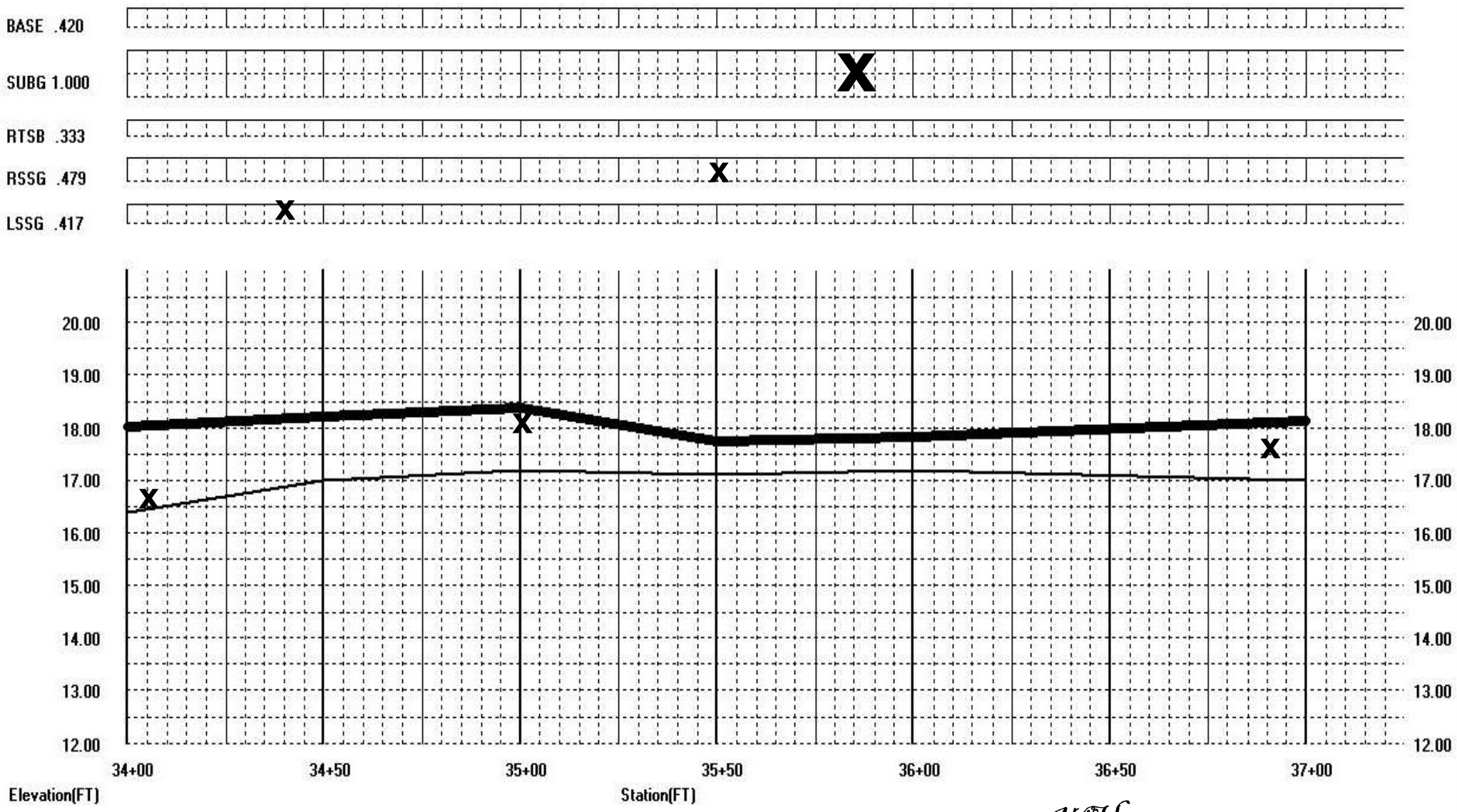
Plot Preview Screen

File Print Next Previous

FDOT Project 21066935201

Density - Embankment - non SI

Ratliff Rd New Const.



Plan Elevations Verified by WH

ERSPLOT Ver 2.0.0

CONTRACTOR - QC DENSITY RECORDS
Earthwork Density Report

Project FIN: 21066935201
Type of Const: Embankment / Subgrade

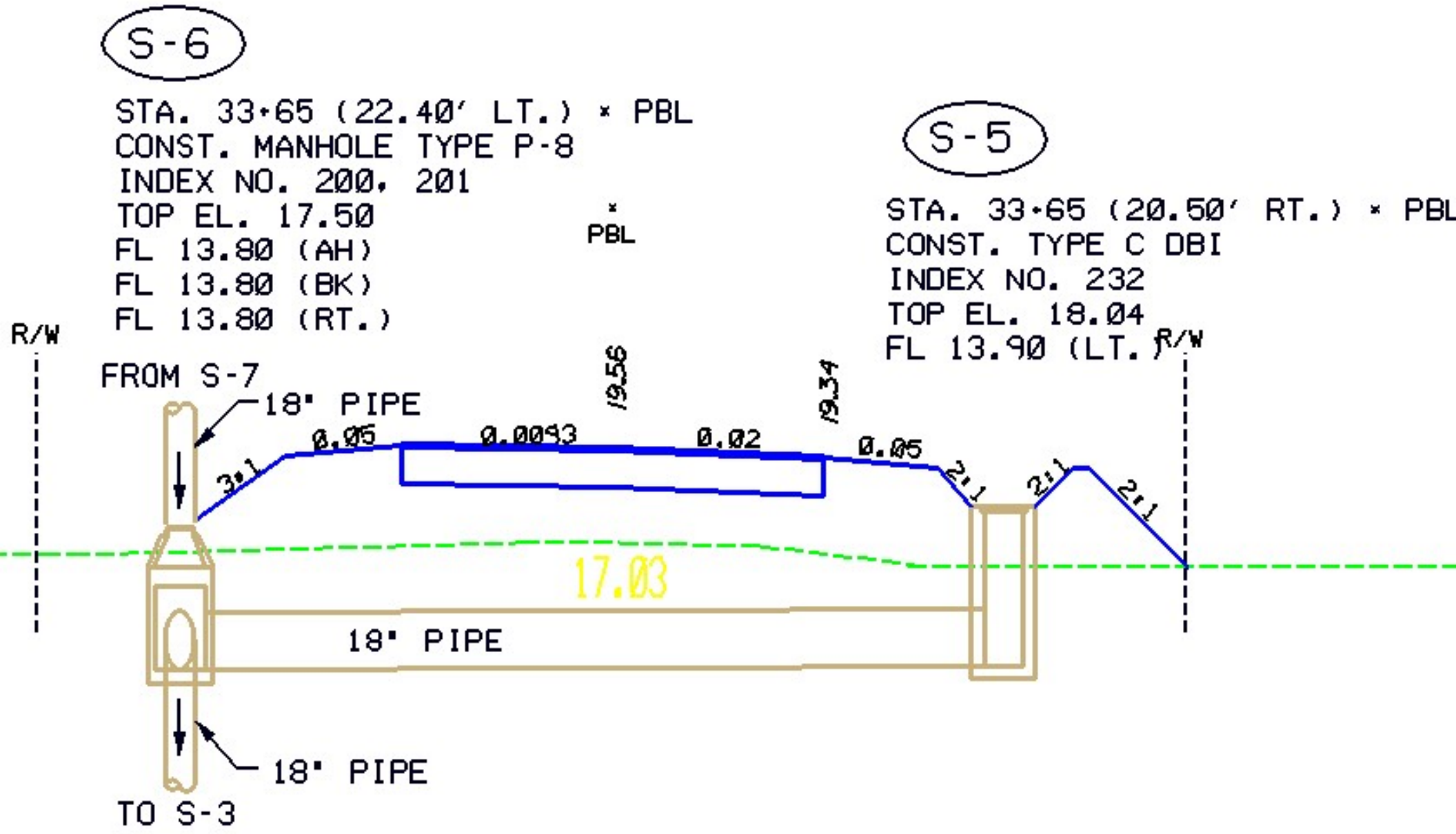
FROM STATION 34 + 00 TO STATION 37 + 00

LOT No.	RF	Date	TIN	Gauge Serial No.	STD. Dns./Mst. Count	Max. Dens. / Sample No.	Test No.	Station	Offset	Lift No.	Test Depth	Soil Dns./Mst Count	Wet Dens.	% Moist.	Dry Dens.	% Max Dens.	Status / Disp.
								Embankment									
1-15	X	11-23-09	J52551781	20481	2858 688	113.0 E001Q	1	34 + 05	33'rt C/L Const.	1/4	6	2849 587	125.7	9.1	115.2	102	P
2-15	X	12-16-09	L51668855	20481	2180 687	113.0 E001Q	2	36 + 85	30'rt C/L Const.	3/4	6	2840 580	125.0	9.0	114.7	102	P
3-15	X	12-16-09	L51668855	20481	2180 687	113.0 E001Q	3	35 + 00	40'rt C/L Const.	4/4	6	2843 583	124.4	8.7	114.4	101	P
								Subgrade									
1-15		12-30-09	L51668855	20481	2858 691	121 S001Q	1	35 + 85	35'rt C/L Const.	1/1	12	2840 587	130.0	8.0	120.4	100	P
								Lt Shoulder SG									
1-15		1-3-10	L51668855	20481	2980 694	121 S001Q	1	34 + 40	18'lt C/L Const.	1/1	5	2845 586	129.4	7.4	120.5	100	P
								Rt Shoulder SG									
1-15		1-3-10	L51668855	20481	2980 694	121 S001Q	1	35 + 50	13'rt C/L Const.	1/1	6	2847 584	130.3	8.1	120.5	100	P

Disposition Letter Code:	V – LOTs Verified by Verification Test R – LOTs Verified by Resolution Procedure N – LOTs Not Verified and Resolution initiated

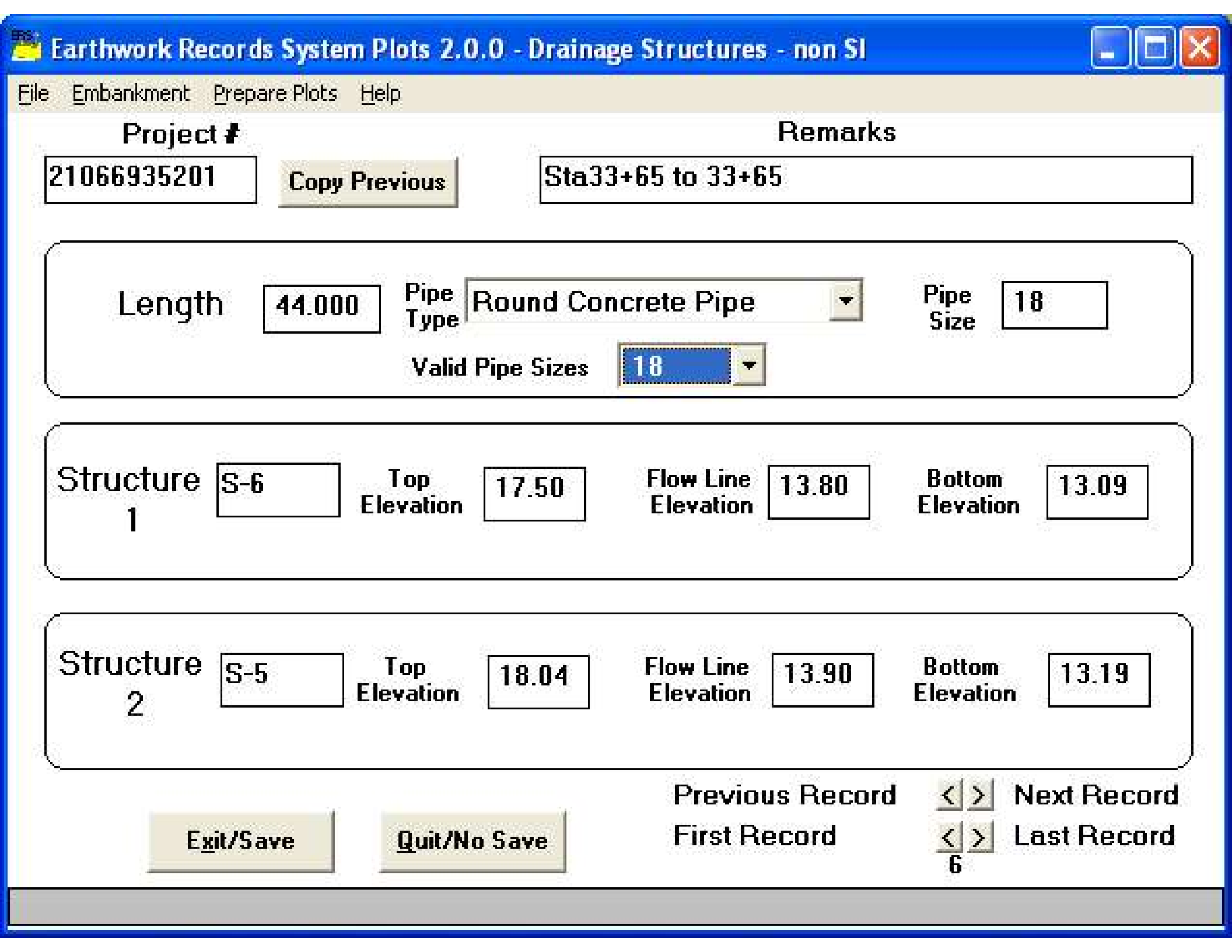
Required for Coding Drainage

- Flow line
- Top & bottom structure elevation
- Length & size of pipe
- These values are manually read from the Plans; this information is rarely given in one place.
  - May require cross referencing with plan/profile view or summary of drainage structures.



Some structure tops & bottoms must be scaled from cross sections.

We need to find the lengths of pipe.


Earthwork Records System Plots 2.0.0 - Drainage Structures - non SI
File
Embankment
Prepare Plots
Help
Project #
21066935201
Copy Previous
Remarks
Sta33+65 to 33+65
Length
44.000
Pipe Type
Round Concrete Pipe
Pipe Size
18
Valid Pipe Sizes
18
Structure 1
S-6
Top Elevation
17.50
Flow Line Elevation
13.80
Bottom Elevation
13.09
Structure 2
S-5
Top Elevation
18.04
Flow Line Elevation
13.90
Bottom Elevation
13.19
Previous Record
Next Record
First Record
Last Record
6
Exit/Save
Quit/No Save

Plot Preview Screen

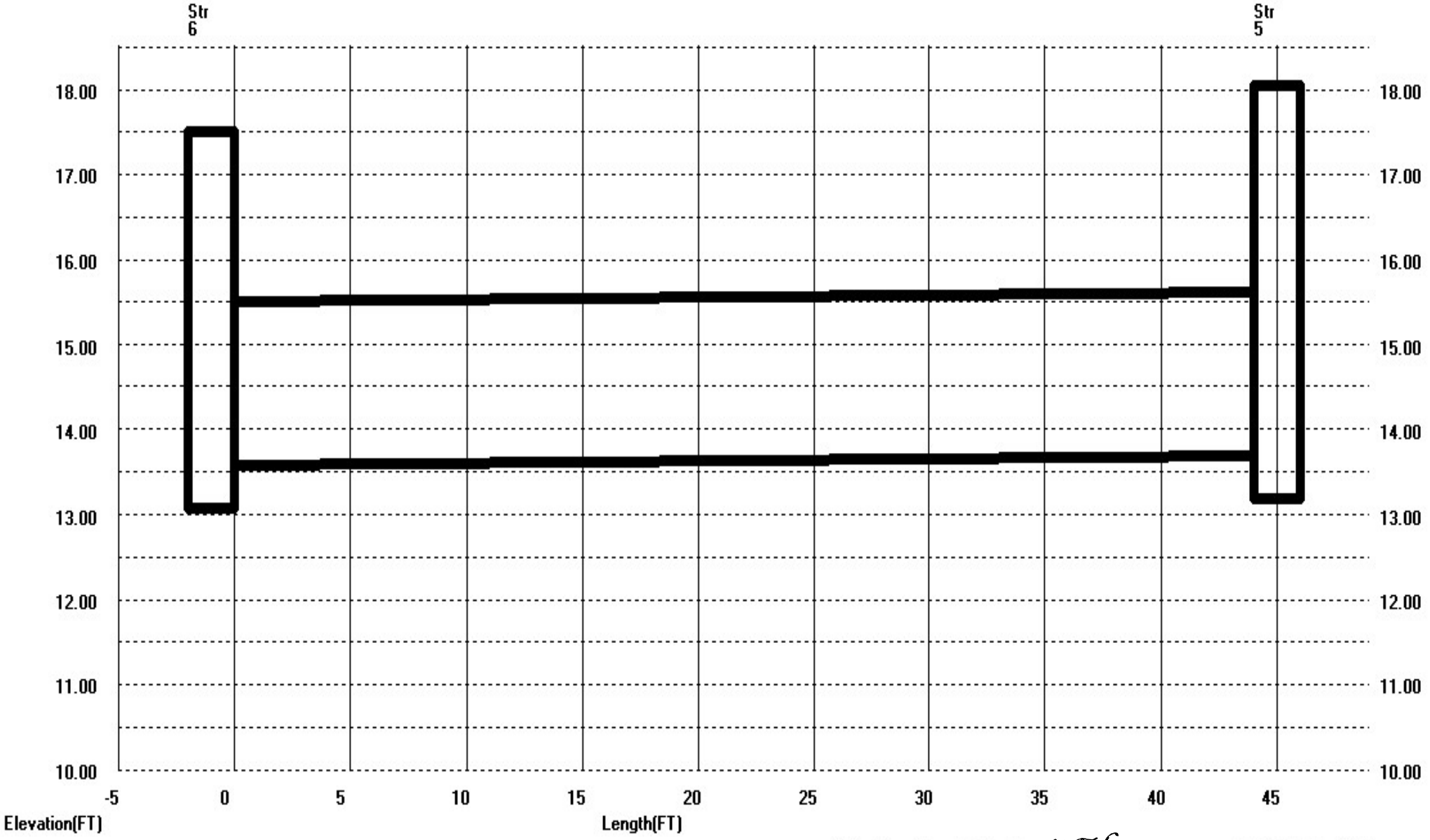
File Print Next Previous

FDOT Project 21066935201

Density - Drainage Structure - non SI

44.000 Feet of 18 inch Round Concrete Pipe

Sta 33+65 to Sta 33+65

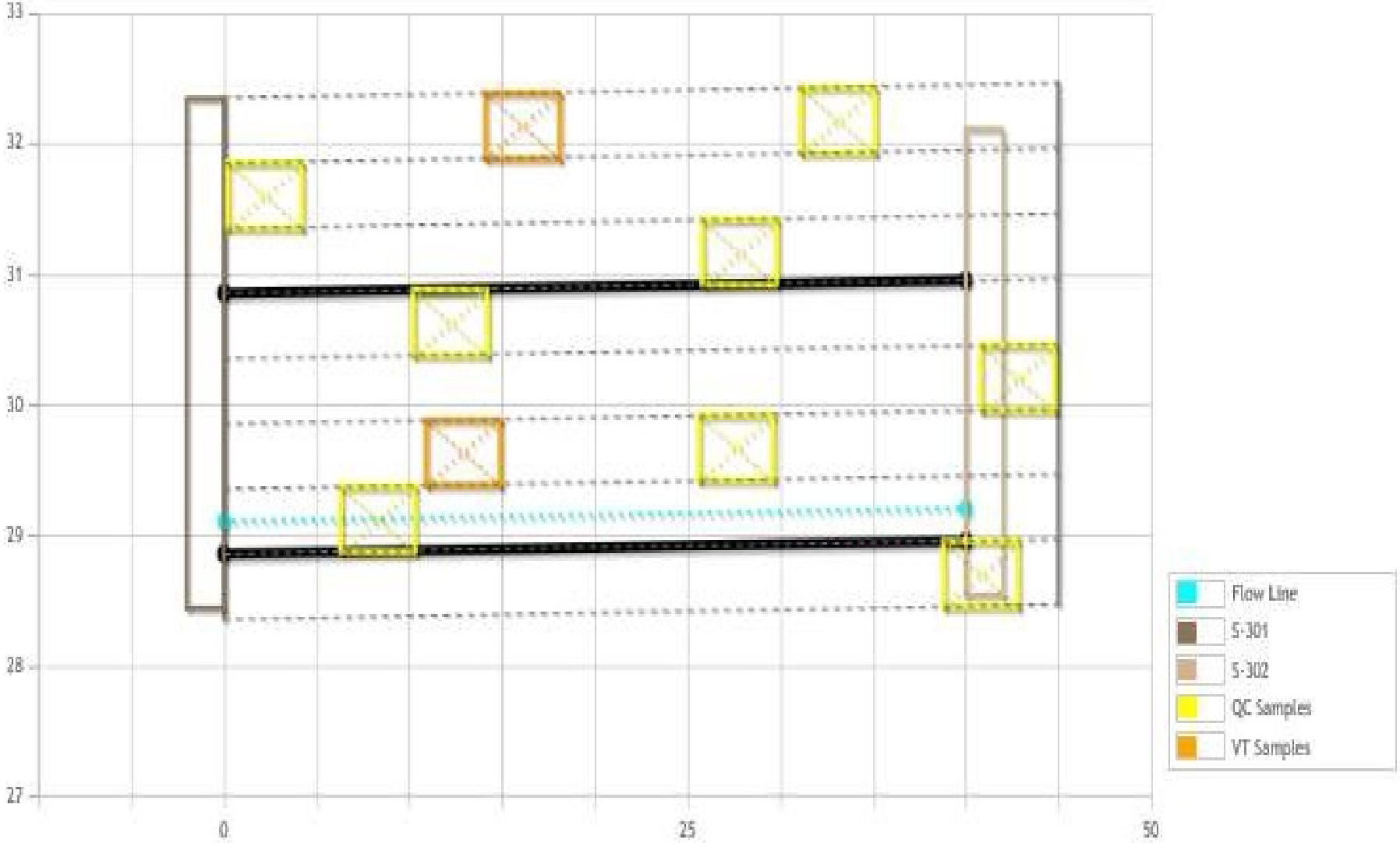


Plan Elevations Verified by WH

DLBPLOT Ver 1.1.1

Plot for Pipe *S-301 to S-302* from 681+35 to 681+35

Material	Sample Level	Minimum X Axis to Display	Maximum X Axis to Display	Minimum Y Axis to Display	Maximum Y Axis to Display

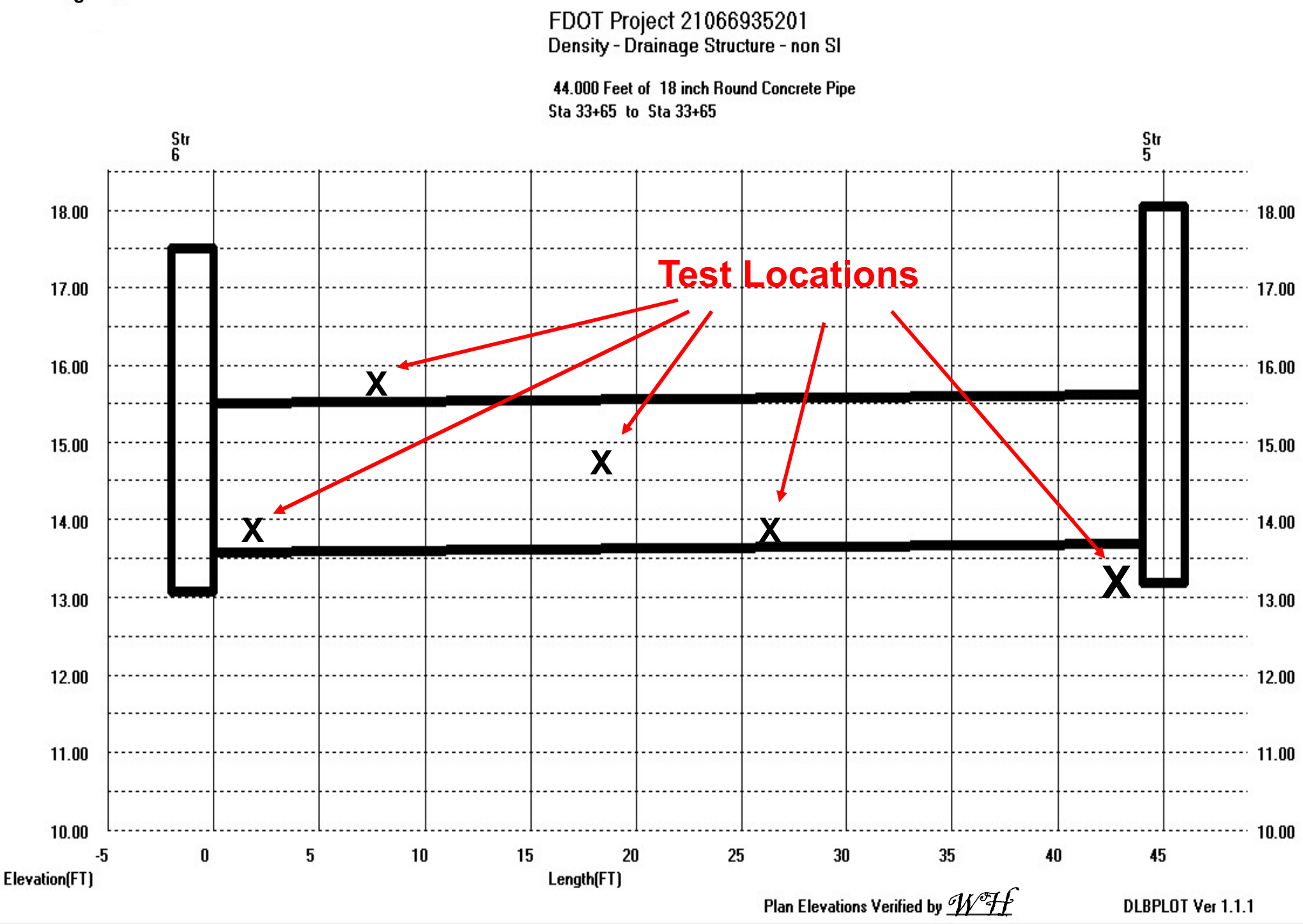


Comments

Pipe and S-302 100%

Plot Preview Screen

File Print Next Previous



CONTRACTOR - QC DENSITY RECORDS
Earthwork Density Report

Project FIN: 21066935201
Type of Const: Pick Backfill

FROM STATION 33 + 55 TO STATION 33 + 80

LOT No.	RF	Date	TIN	Gauge Serial No.	STD. Dns./Mst. Count	Max. Dens. / Sample No.	Test No.	Station	Offset	Lift No.	Test Depth	Soil Dns./Mst Count	Wet Dens.	% Moist.	Dry Dens.	% Max Dens.	Status / Disp.
								Pipe Backfill									
1-115	X	1-30-09	L51668855	20481	2534 687	118.0 E001Q	1	33 + 69	22'rt C/L Const.	1/10	6	2600 587	130.3	10.6	117.8	100	P
2-115	X	2-2-09	L51668855	20481	2534 687	118.0 E001Q	2	33 + 60	20'lt C/L Const.	2/10	6	2592 581	130.0	10.5	117.6	100	P
3-115	X	2-2-09	L51668855	20481	2567 685	118.0 E001Q	3	33 + 65	5'rt C/L Const.	2/10	6	2587 588	130.8	10.6	118.3	100	P
4-115	X	2-2-09	L51668855	20481	2567 685	118.0 E001Q	4	33 + 63	4'lt C/L Const.	4/10	6	2589 583	131.0	10.8	118.2	100	P
5-115	X	2-3-09	L51668855	20481	2567 685	118.0 E001Q	5	33 + 62	15'lt C/L Const.	6/10	6	2595 586	130.9	10.2	118.8	101	P

Phase 1

Disposition Letter Code:	V – LOTs Verified by Verification Test R – LOTs Verified by Resolution Procedure N – LOTs Not Verified and Resolution initiated

Find The Errors On The Density Report

LOT# – PAGE #

Incorrect Proctor

Appears Random # Generator wasn't used

Missing Total # of Lifts

Incorrect Soil Density & Moisture Counts

Page # & Letter (12A)

Max Density can't be over 105%

Florida Department of Transportation

675-020-27
Materials – 01/15

CONTRACTOR - QC DENSITY RECORDS
Earthwork Density Report

Page 12

Project FIN: 123456789
Type of Const: Embankment FROM STATION 30+00 TO STATION 35+00

LOT No.	RF	Date	TIN	Gauge Serial No.	STD. Dns/Mst Count	Max. Dens. / Sample No.	Test No.	Station	Offset	Lift No.	Test Depth	Soil Dns/Mst Count	Wet Dens.	% Moist.	Dry Dens.	% Max Dens.	Status / Disp.
1-12		2/10/2017	P14725874	369	2012 112	119 B001Q		30+00	18' RT B/L	1	12"	1223 732	132.1	10.1	12[illegible]	100.8	P
2-12		2/10/2017	P14725874	369	2012 112	119 B001Q		31+00	20' RT B/L	2	12"	1223 732	139.2	8.8	127.9	107	P
12-3		2/10/2017	P14725874	369	2012 112	119 B001Q		31+50	13' RT B/L	3	12"	1223 732	130.7	12.5	116.2	98	P
4-12		2/10/2017	P14725874	369	2012 112	119 B001Q		33+00	19'RT B/L	4	12"	1223 732	131.0	9.2	120.0	100	P
5-12		2/10/2017	P14725874	369	2012 112	119 B001Q		34+50	16' RT B/L	5	12'	1223 732	128.9	9.5	117.7	98	P
1-12		2/12/2017	P14725874	369	2299 209	121.8 S001Q		32+56	10' RT C/L	1	12"	2823 326	129.9	6.5	122.0	100	P
1-12		2/12/2017	P14725874	369	2299 209	119 B001Q		33+89	8' RT C/L	1	10"	2942	125.9	6.9	117.8	99	P

Disposition Letter Code: V – LOTs Verified by Verification Test R – LOTs Verified by Resolution Procedure N – LOTs Not Verified and Resolution Initiated

Stabilized Subgrade

Base

Failing Tests

Round to Whole #

Top Lift of Embankment is 6"

Max. thick lift allowed for base is only 8", but even for 8" test strip is required.

*From district 3 Density Workshop

QUESTIONS & ANSWERS