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PROJECT: 43741.1.FS1 REFERENCE: W-5518



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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY: COLUMBUS

PROJECT DESCRIPTION: CONSTRUCT OVERPASS OF SR 1574 (OLD US 74) OVER US 74

SITE DESCRIPTION: BRIDGE NO. 412 ON SR 1574 (OLD US 74) OVER US 74 AT -L- STATION 24+06.36

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5518 (43741.1.FS1)	01	13

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IS IT CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.
2. BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL:

Jacob C. Wessell, PE

Shawn McGuire

Michael D. Mason

D. T. Chalmers, CWC

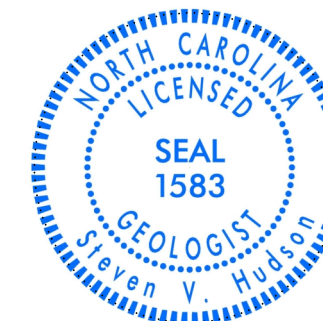
INVESTIGATED BY: CATLIN ENGINEERS AND SCIENTISTS

DRAWN BY: Steven V. Hudson, L.G., CWC

CHECKED BY: Steven V. Hudson, L.G., CWC

SUBMITTED BY: Steven V. Hudson, L.G., CWC

DATE: APRIL 2015

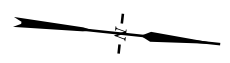
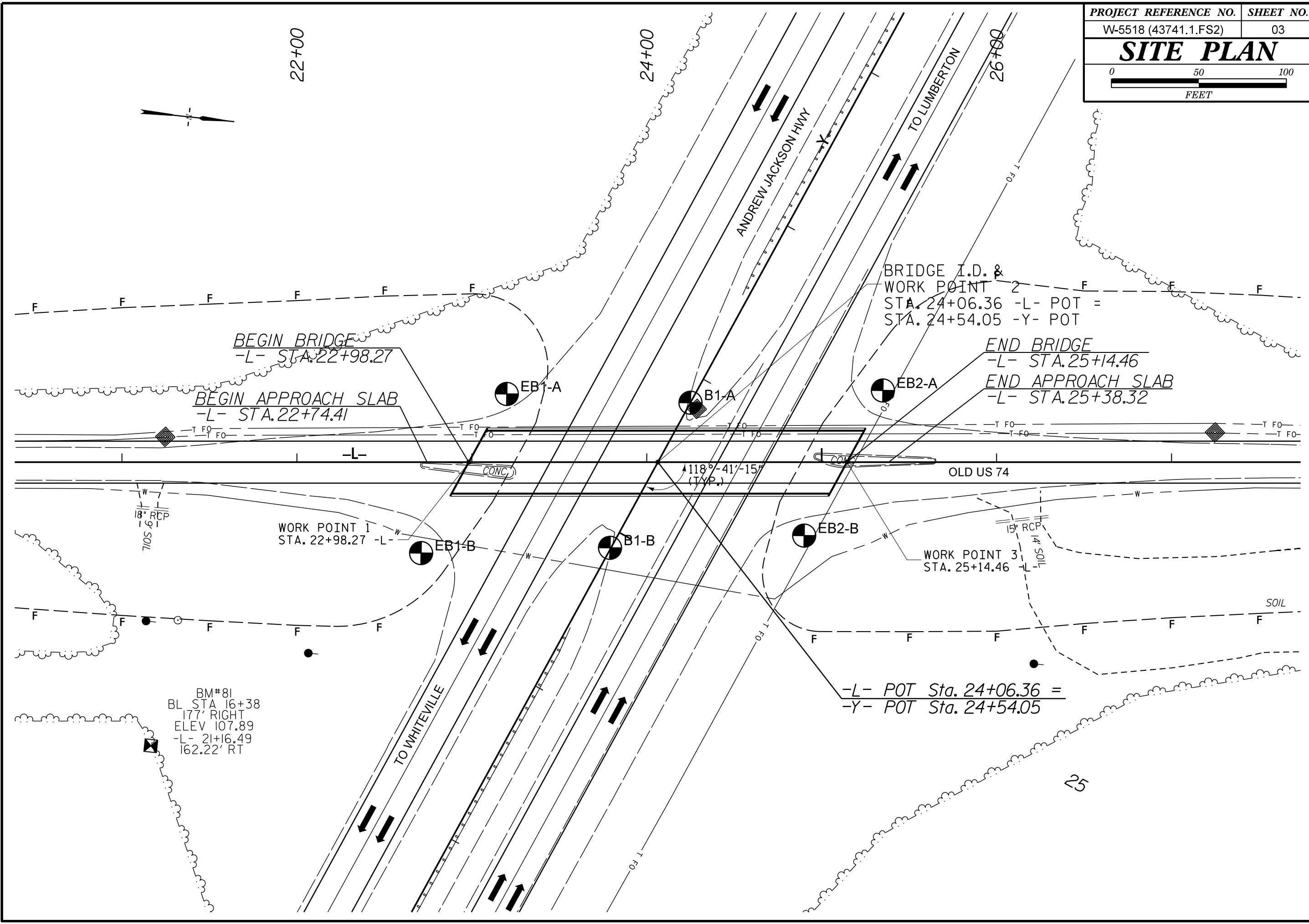


DocuSigned by:
Steven V. Hudson 5/27/2015

SIGNATURE DATE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

Table with 4 main columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, and TERMS AND DEFINITIONS. Includes sub-sections like SOIL LEGEND AND AASHTO CLASSIFICATION, CONSISTENCY OR DENSENESS, TEXTURE OR GRAIN SIZE, SOIL MOISTURE - CORRELATION OF TERMS, PLASTICITY, and COLOR.



BM#81
 BL STA 16+38
 177' RIGHT
 ELEV 107.89
 -L- 21+16.49
 162.22' RT

-L- POT Sta. 24+06.36 =
 -Y- POT Sta. 24+54.05

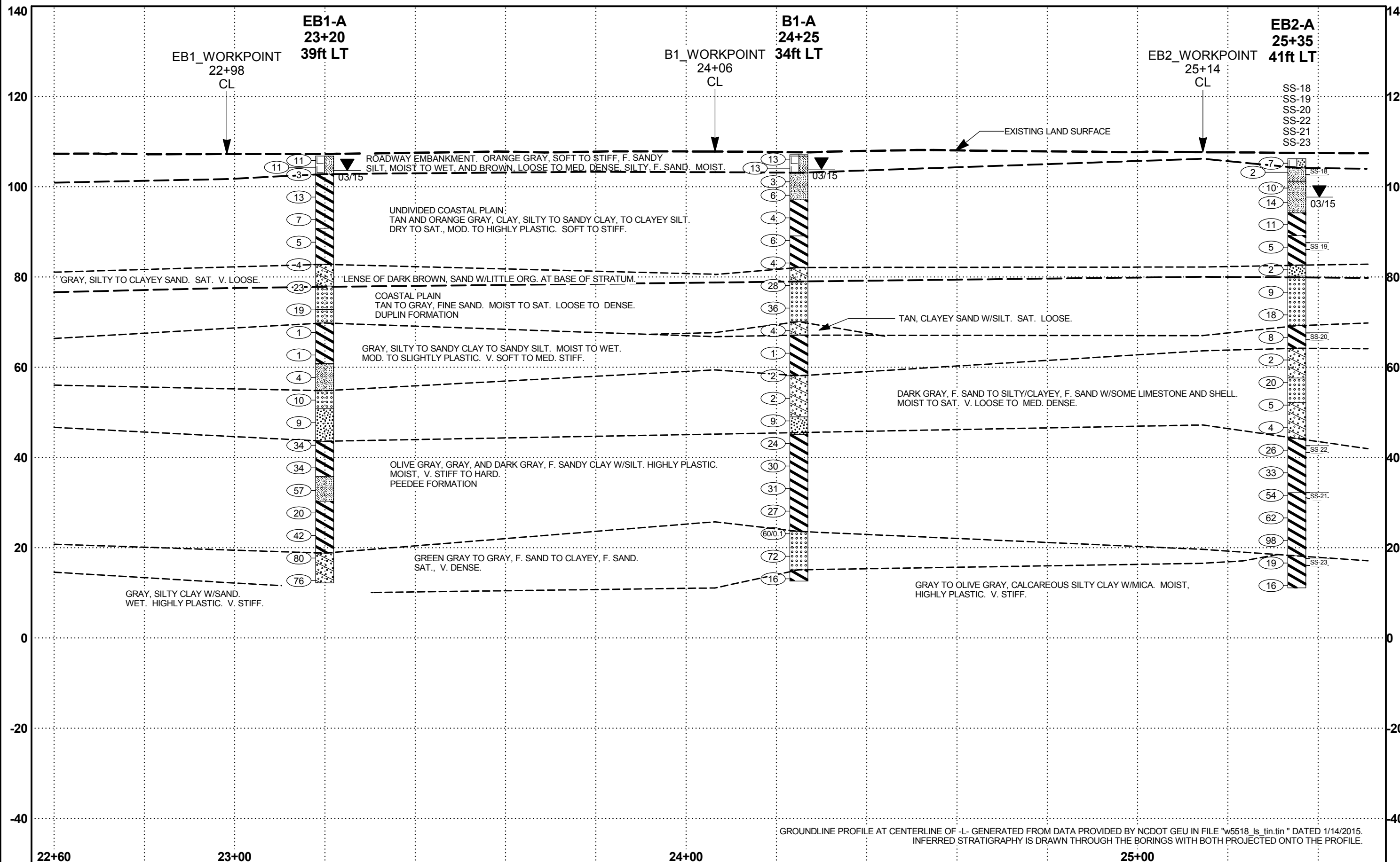
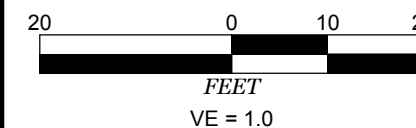
BRIDGE I.D. &
 WORK POINT 2
 STA. 24+06.36 -L- POT =
 STA. 24+54.05 -Y- POT

END BRIDGE
 -L- STA. 25+14.46
 END APPROACH SLAB
 -L- STA. 25+38.32

WORK POINT 1
 STA. 22+98.27 -L-

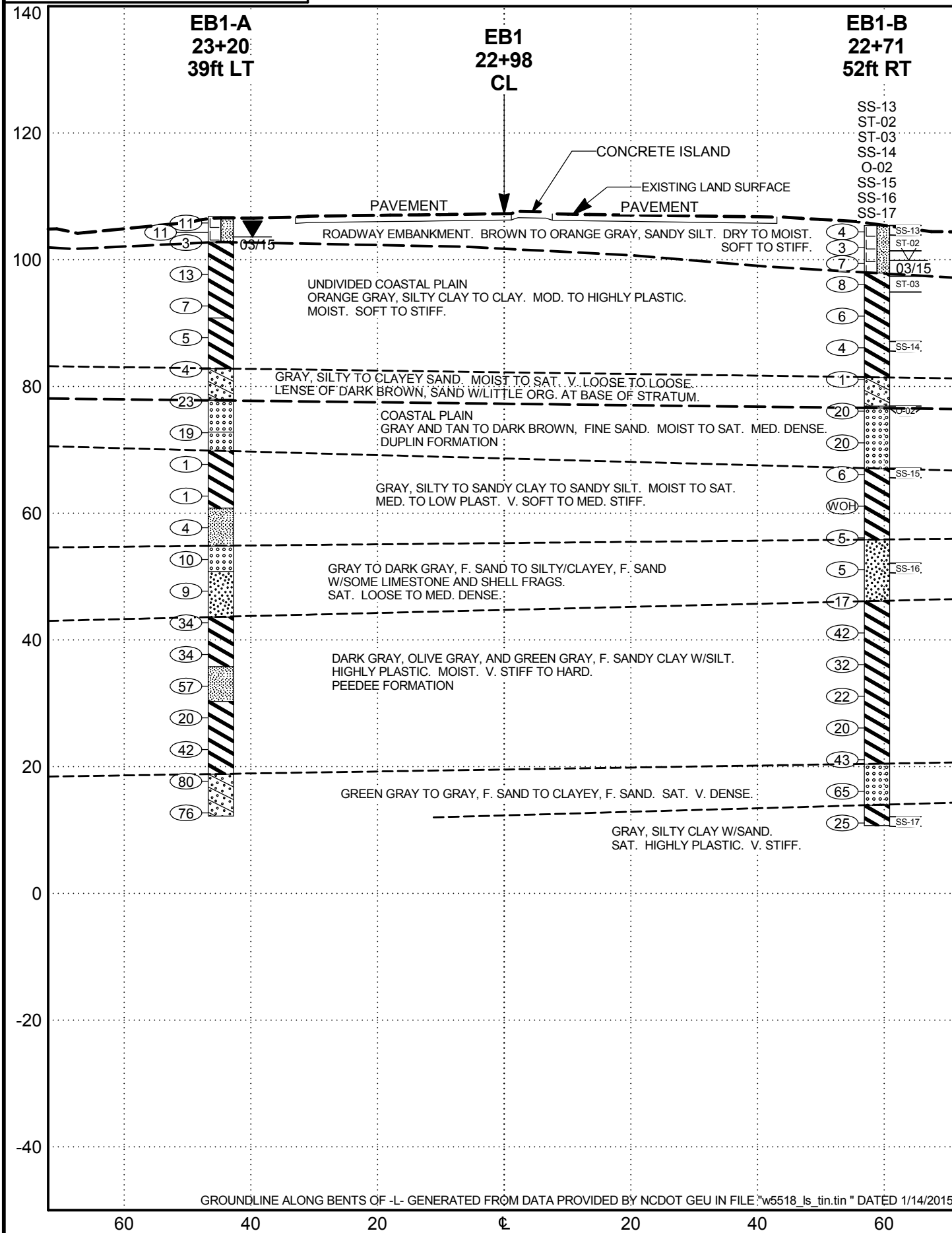
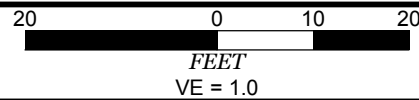
WORK POINT 3
 STA. 25+14.46 -L-

PROFILE CENTERLINE -L-



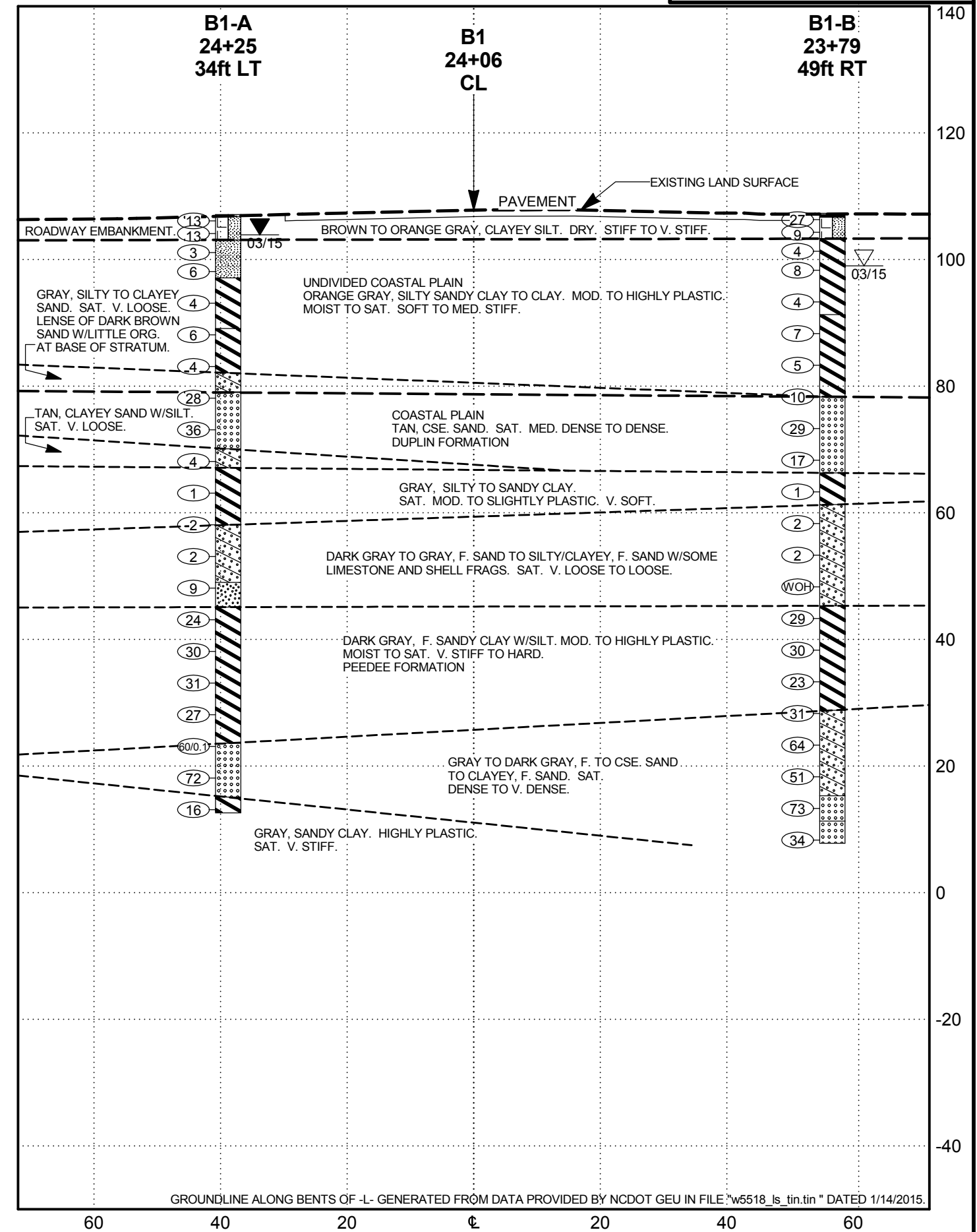
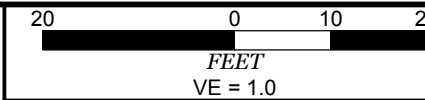
GROUNDLINE PROFILE AT CENTERLINE OF -L- GENERATED FROM DATA PROVIDED BY NCDOT GEU IN FILE "w5518_ls_tin.tin" DATED 1/14/2015. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.

**CROSS SECTION
 END BENT 1
 SKEW = 118°41'15"**

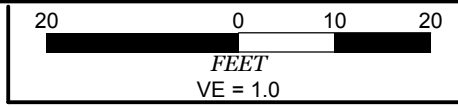


GROUNDLINE ALONG BENTS OF -L- GENERATED FROM DATA PROVIDED BY NCDOT GEU IN FILE "w5518_ls_tin.tin" DATED 1/14/2015.

**CROSS SECTION
 BENT 1
 SKEW = 118°41'15"**



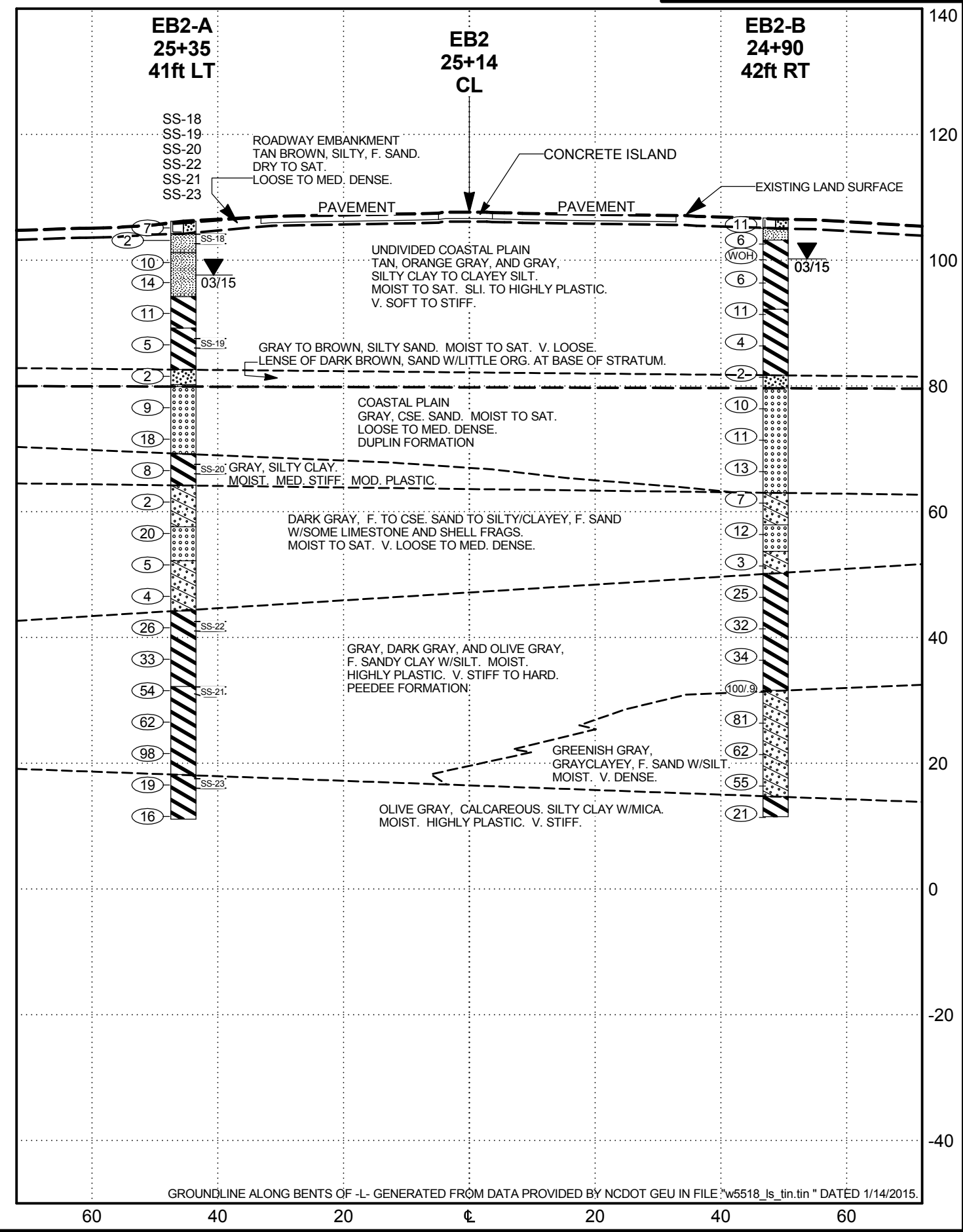
GROUNDLINE ALONG BENTS OF -L- GENERATED FROM DATA PROVIDED BY NCDOT GEU IN FILE "w5518_ls_tin.tin" DATED 1/14/2015.



**CROSS SECTION
 END BENT 2
 SKEW = 118°41'15"**

PROJECT REFERENCE NO.	SHEET
W-5518 (43741.1.FS1)	06
BRIDGE NO. 412 ON SR 1574 (OLD US 74) OVER US 74 AT -L- STATION 24+06.36	

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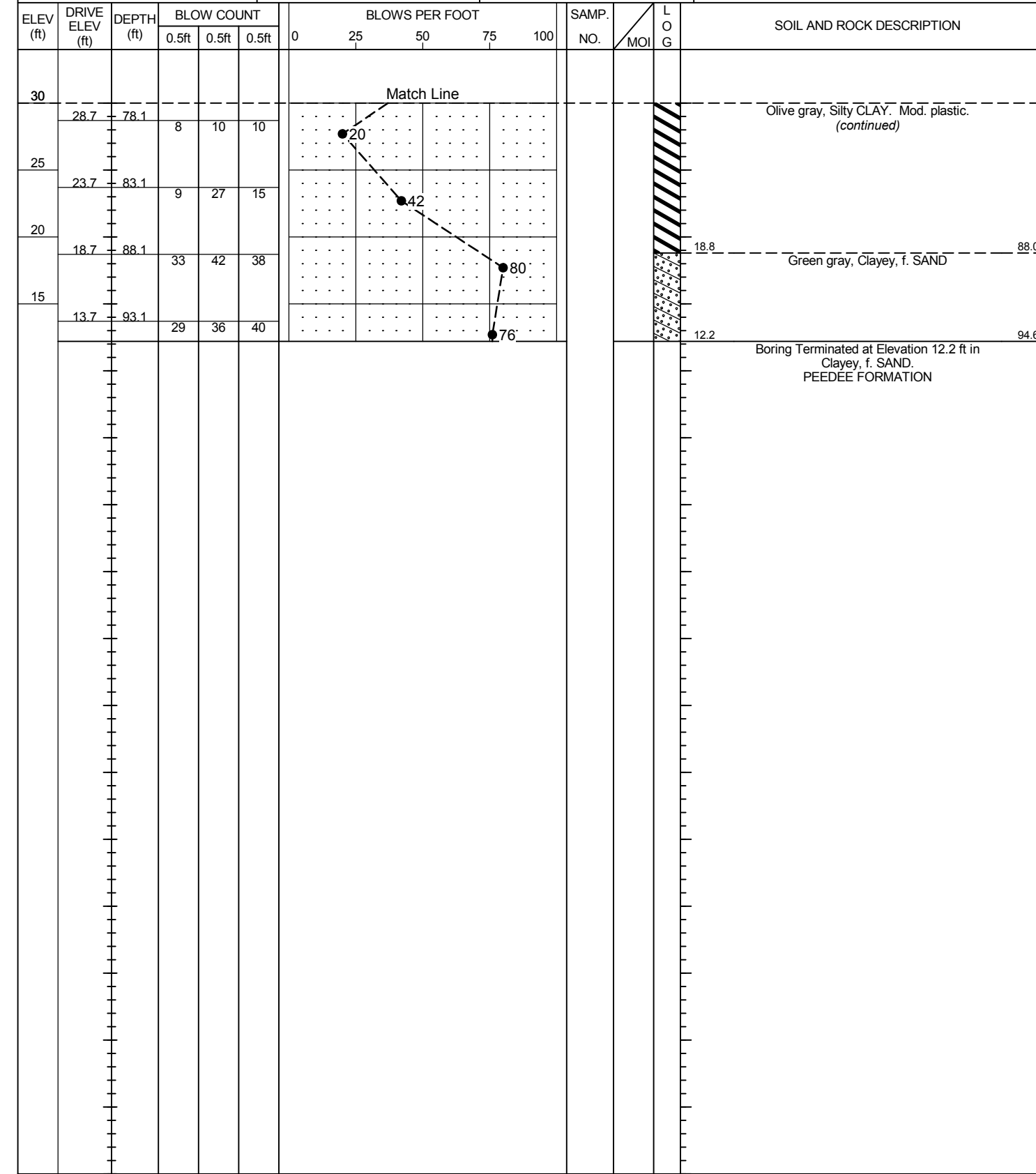
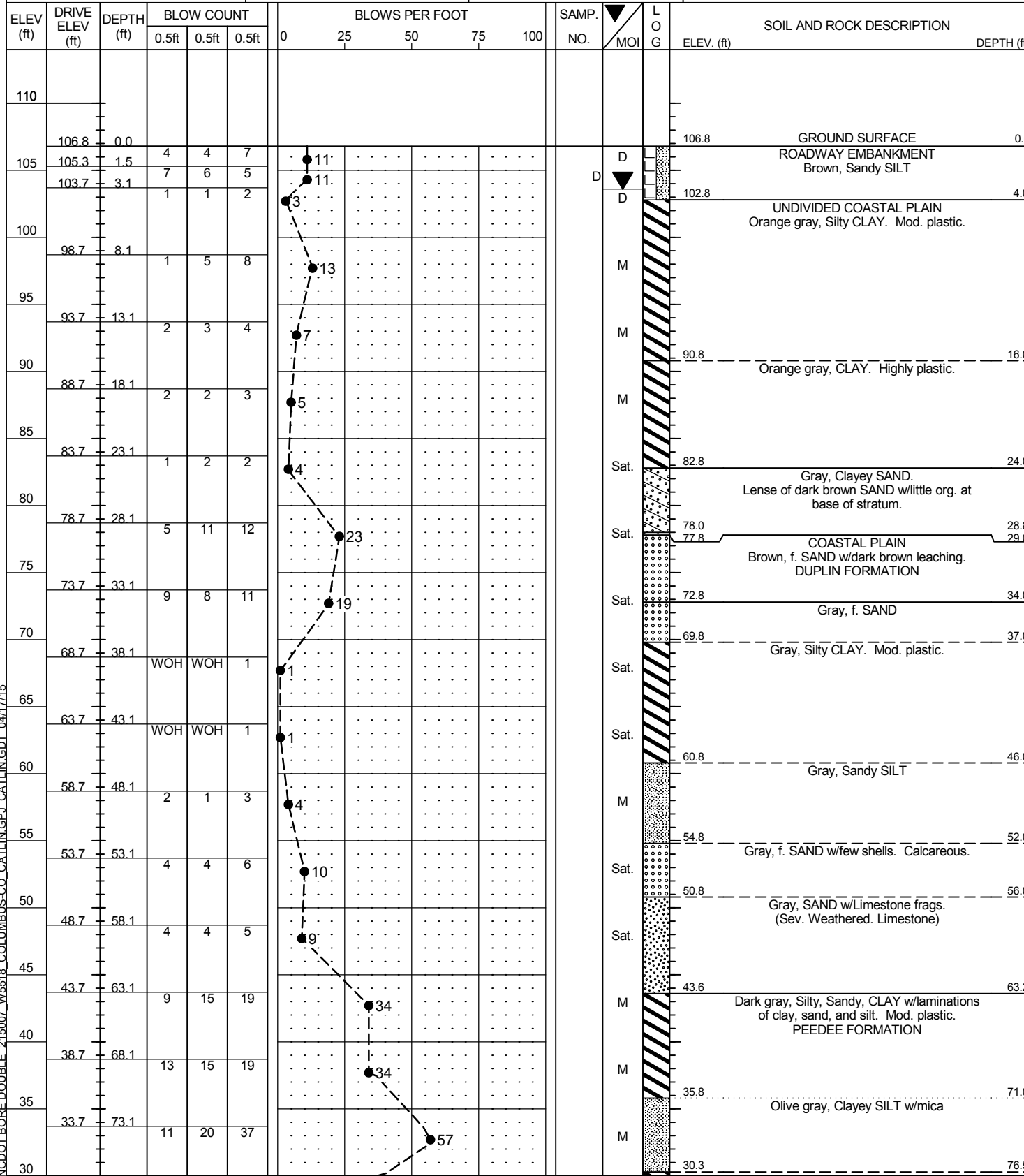
NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT



WBS 43741.1.FS1	TIP W-5518	COUNTY COLUMBUS	GEOLOGIST Shawn McGuire
SITE DESCRIPTION BRIDGE NO. 412 ON SR 1574 (OLD US 74) OVER US 74 AT -L- STATION 24+06.36			GROUND WTR (ft)
BORING NO. EB1-A	STATION 23+20	OFFSET 39ft LT	ALIGNMENT -L-
COLLAR ELEV. 106.8 ft	TOTAL DEPTH 94.6 ft	NORTHING 231,447	EASTING 2,039,203
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 77.0% 01/27/2015		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER William J. Miller	START DATE 03/10/15	COMP. DATE 03/10/15	SURFACE WATER DEPTH N/A

WBS 43741.1.FS1	TIP W-5518	COUNTY COLUMBUS	GEOLOGIST Shawn McGuire
SITE DESCRIPTION BRIDGE NO. 412 ON SR 1574 (OLD US 74) OVER US 74 AT -L- STATION 24+06.36			GROUND WTR (ft)
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DRILLER William J. Miller	START DATE 03/10/15	COMP. DATE 03/10/15	SURFACE WATER DEPTH N/A



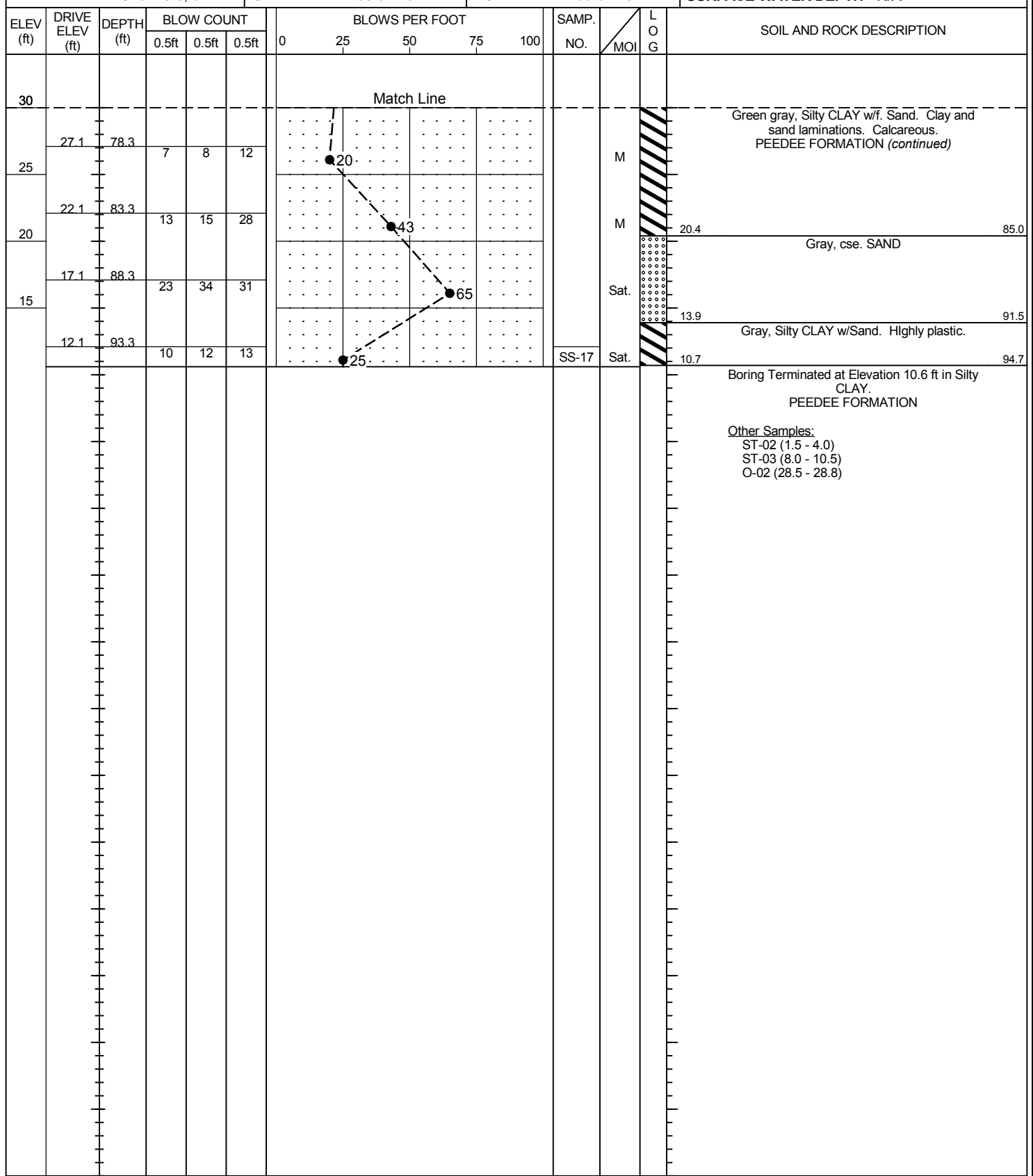
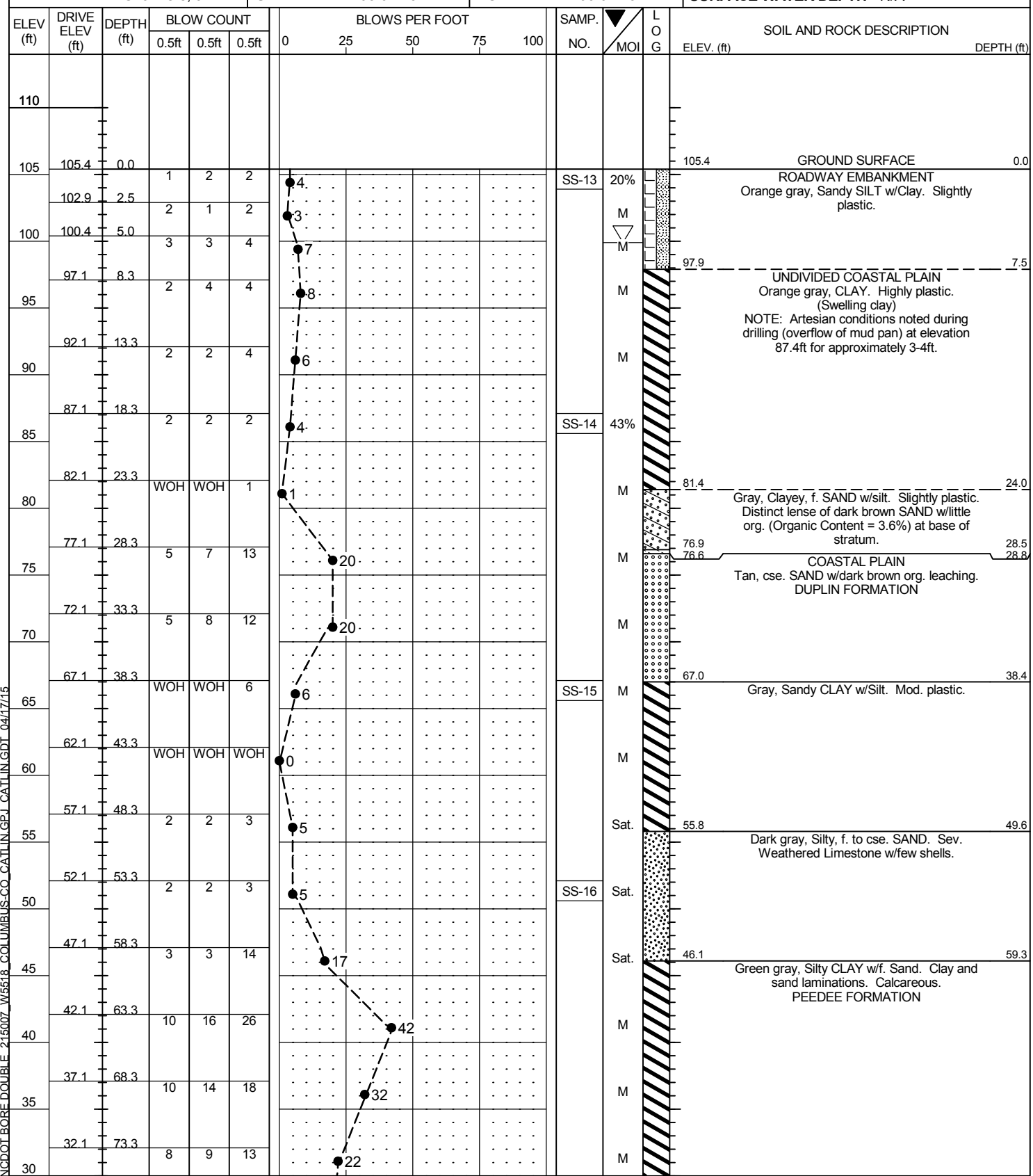
NCDOT BORE DOUBLE 215007_W5518_COLUMBUS_CO_CATLIN_GPL_CATLIN_GDT_04/17/15



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 43741.1.FS1	TIP W-5518	COUNTY COLUMBUS	GEOLOGIST Shawn McGuire
SITE DESCRIPTION BRIDGE NO. 412 ON SR 1574 (OLD US 74) OVER US 74 AT -L- STATION 24+06.36			GROUND WTR (ft)
BORING NO. EB1-B	STATION 22+71	OFFSET 52ft RT	ALIGNMENT -L-
COLLAR ELEV. 105.4 ft	TOTAL DEPTH 94.8 ft	NORTHING 231,408	EASTING 2,039,299
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 75.2% 01/27/2015		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER D.T. Chalmers, Jr.	START DATE 03/04/15	COMP. DATE 03/04/15	SURFACE WATER DEPTH N/A

WBS 43741.1.FS1	TIP W-5518	COUNTY COLUMBUS	GEOLOGIST Shawn McGuire
SITE DESCRIPTION BRIDGE NO. 412 ON SR 1574 (OLD US 74) OVER US 74 AT -L- STATION 24+06.36			GROUND WTR (ft)
BORING NO. EB1-B	STATION 22+71	OFFSET 52ft RT	ALIGNMENT -L-
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DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 75.2% 01/27/2015		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER D.T. Chalmers, Jr.	START DATE 03/04/15	COMP. DATE 03/04/15	SURFACE WATER DEPTH N/A



NCDOT BORE DOUBLE 215007 W5518 COLUMBUS CO CATLIN GEL CATLIN GDT 04/17/15

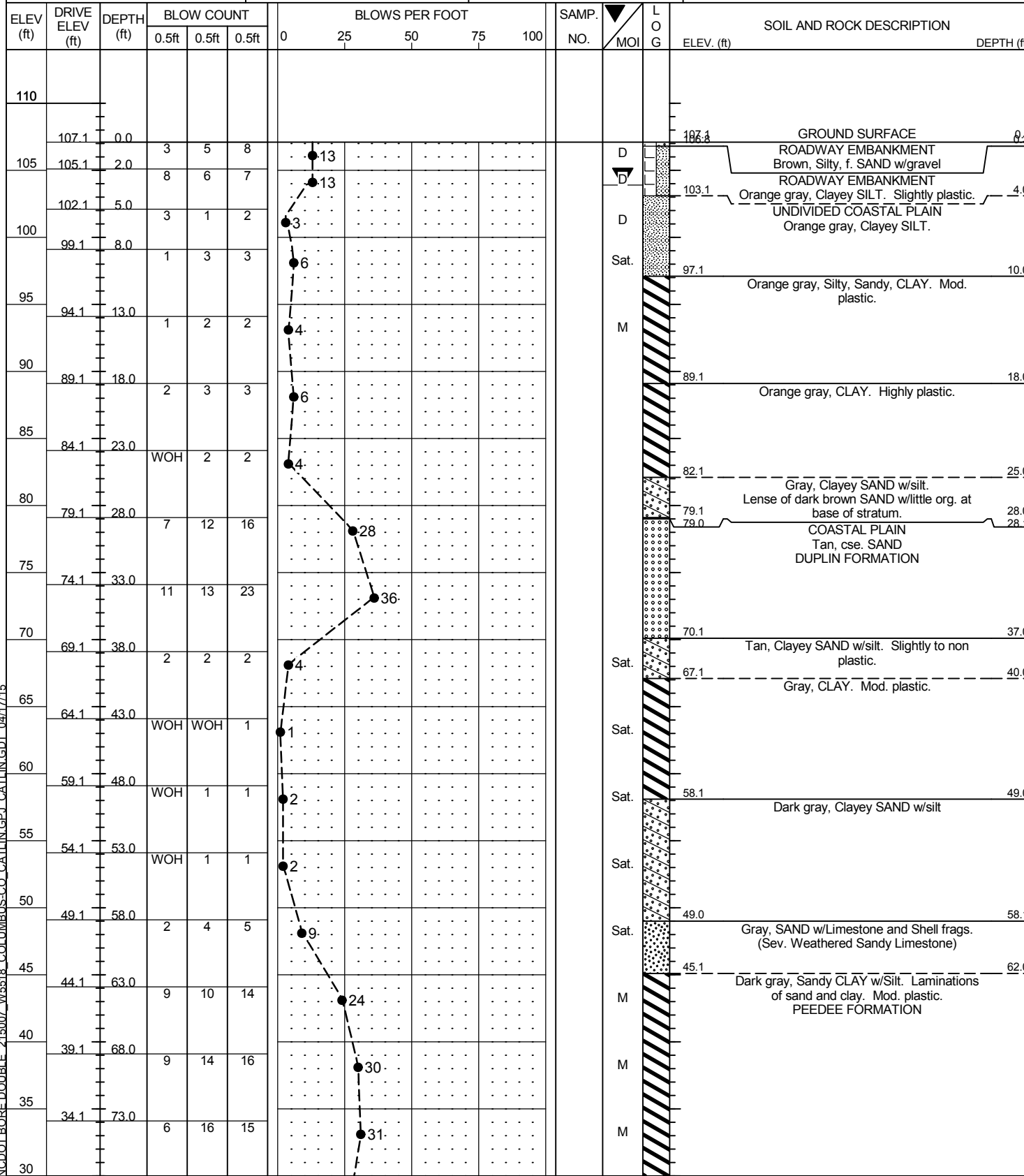


NCDOT GEOTECHNICAL ENGINEERING UNIT

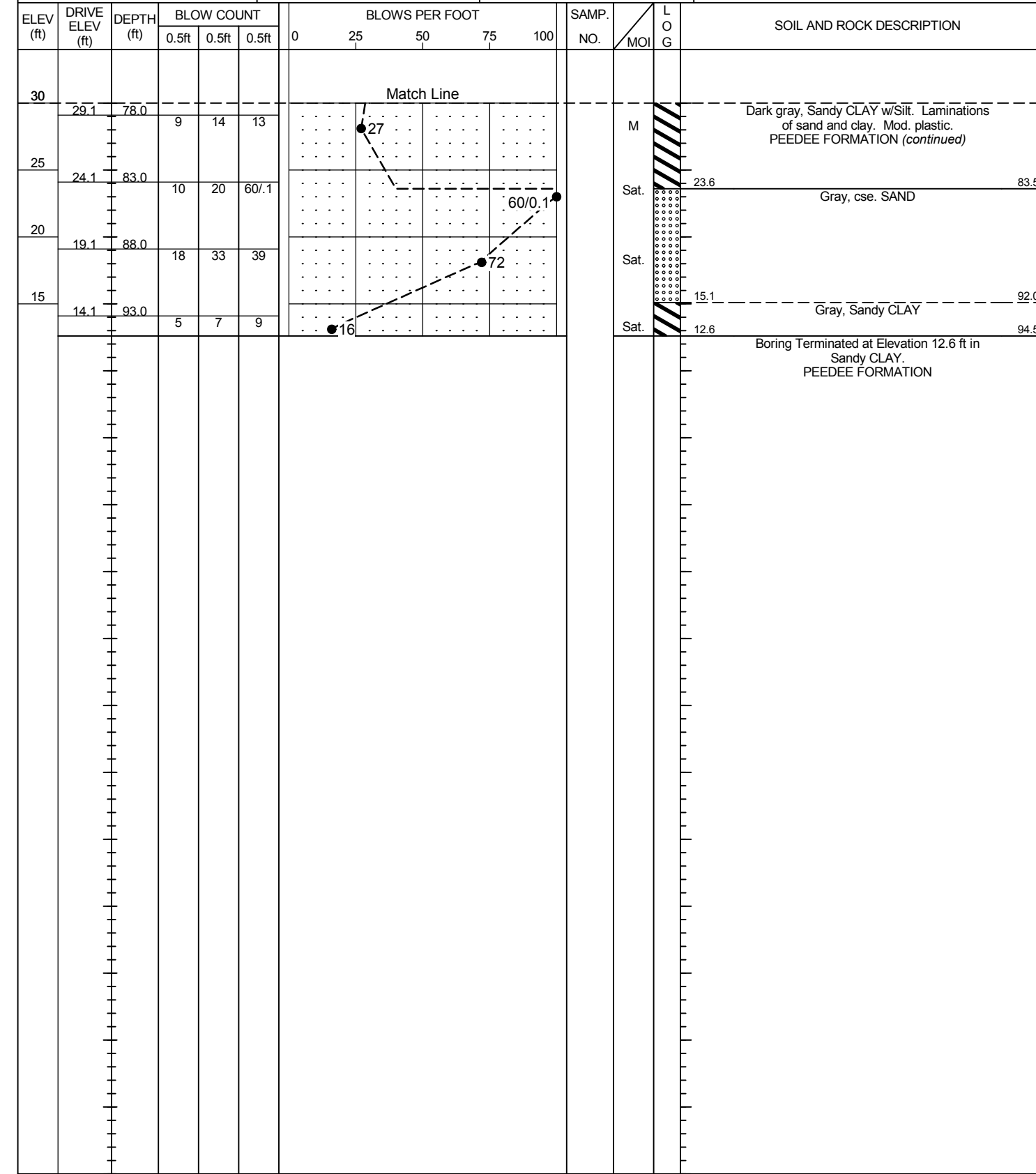
BORELOG REPORT



WBS 43741.1.FS1	TIP W-5518	COUNTY COLUMBUS	GEOLOGIST Shawn McGuire
SITE DESCRIPTION BRIDGE NO. 412 ON SR 1574 (OLD US 74) OVER US 74 AT -L- STATION 24+06.36			GROUND WTR (ft)
BORING NO. B1-A	STATION 24+25	OFFSET 34ft LT	ALIGNMENT -L-
COLLAR ELEV. 107.1 ft	TOTAL DEPTH 94.5 ft	NORTHING 231,552	EASTING 2,039,197
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 77.0% 01/27/2015		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER William J. Miller	START DATE 03/11/15	COMP. DATE 03/11/15	SURFACE WATER DEPTH N/A



WBS 43741.1.FS1	TIP W-5518	COUNTY COLUMBUS	GEOLOGIST Shawn McGuire
SITE DESCRIPTION BRIDGE NO. 412 ON SR 1574 (OLD US 74) OVER US 74 AT -L- STATION 24+06.36			GROUND WTR (ft)
BORING NO. B1-A	STATION 24+25	OFFSET 34ft LT	ALIGNMENT -L-
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DRILLER William J. Miller	START DATE 03/11/15	COMP. DATE 03/11/15	SURFACE WATER DEPTH N/A



NCDOT BORE DOUBLE 215007_W5518_COLUMBUS_CO_CATLIN_GPL_CATLIN_GDT_04/17/15

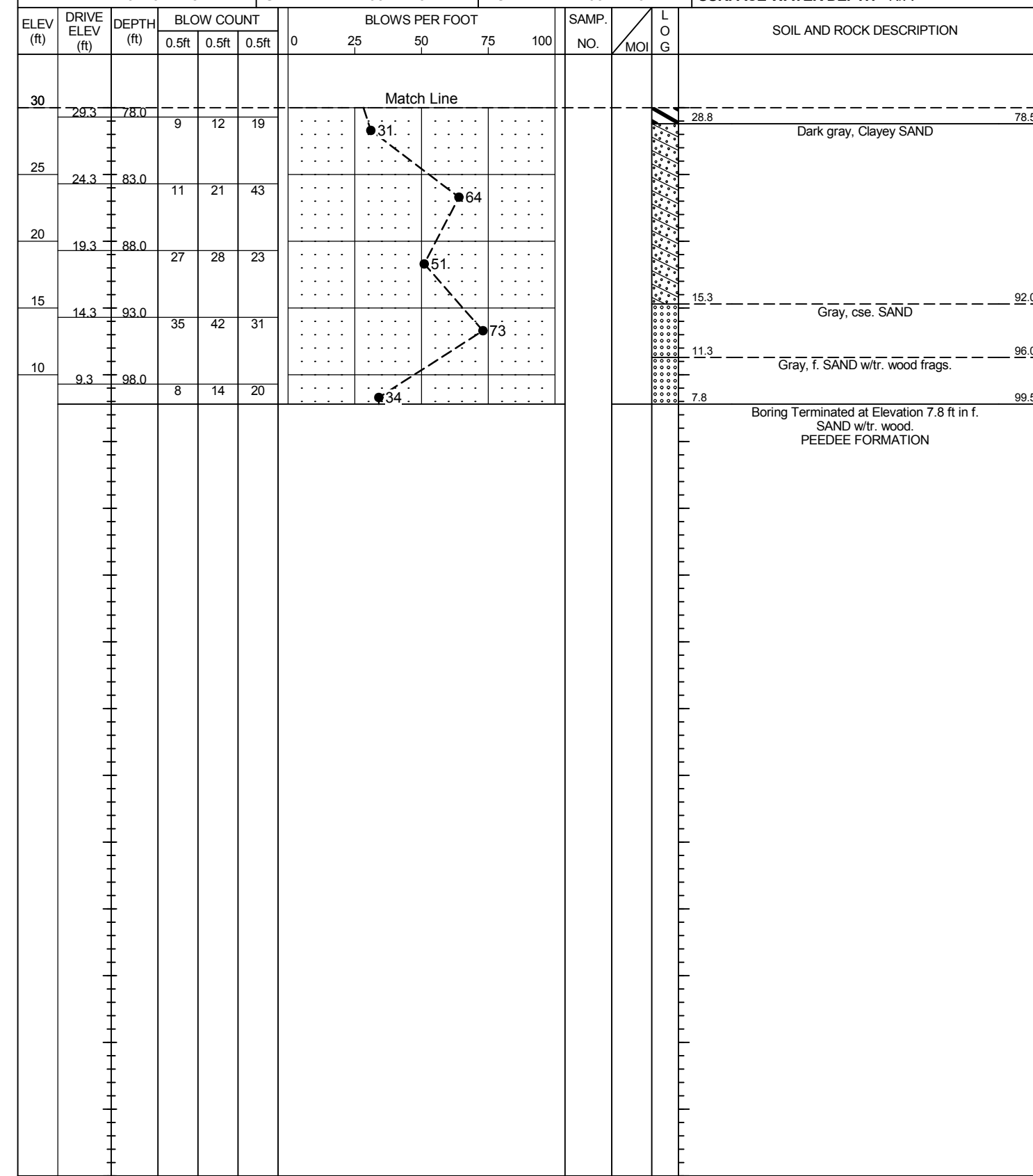
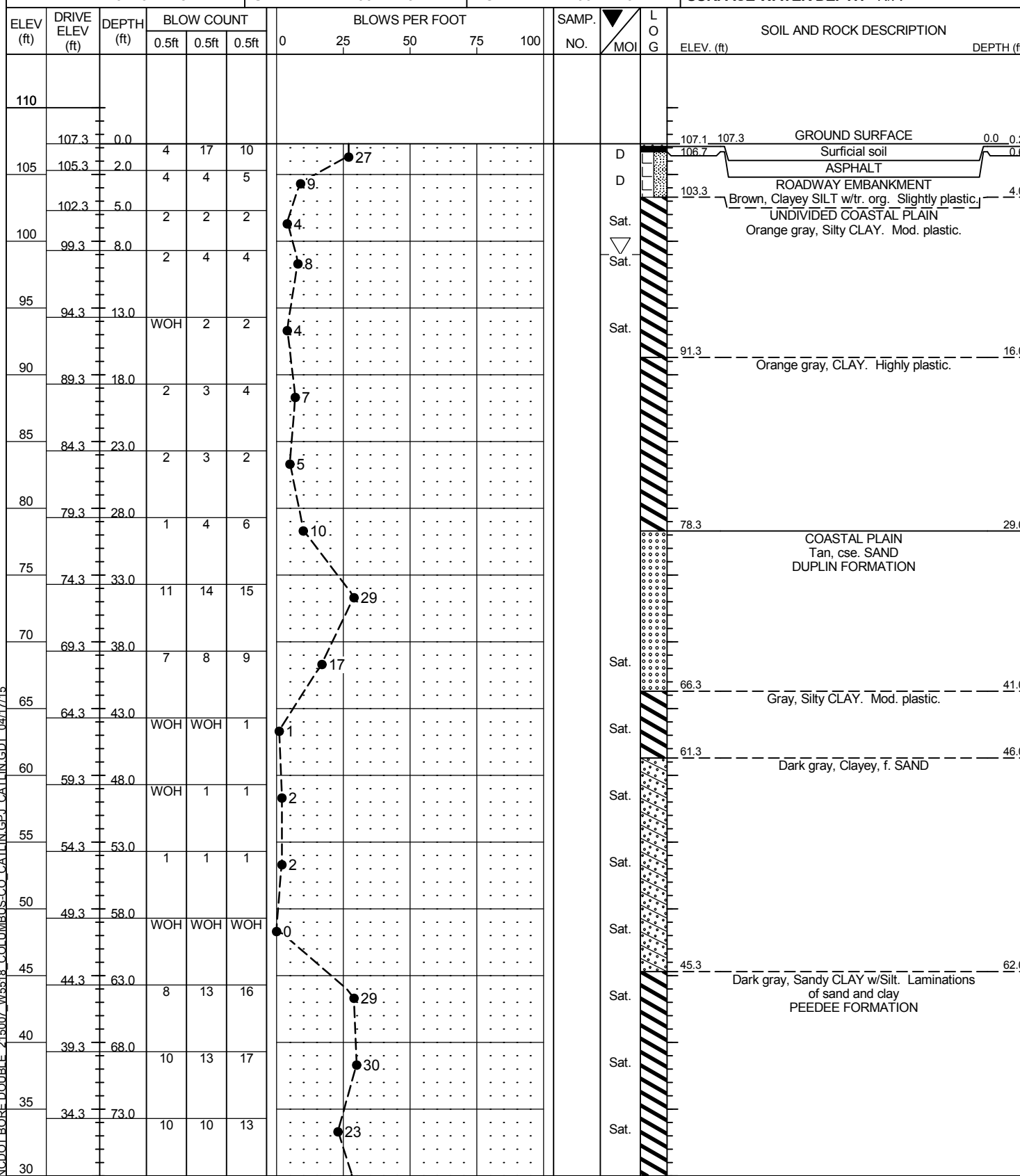


NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 43741.1.FS1	TIP W-5518	COUNTY COLUMBUS	GEOLOGIST Shawn McGuire
SITE DESCRIPTION BRIDGE NO. 412 ON SR 1574 (OLD US 74) OVER US 74 AT -L- STATION 24+06.36			GROUND WTR (ft)
BORING NO. B1-B	STATION 23+79	OFFSET 49ft RT	ALIGNMENT -L-
COLLAR ELEV. 107.3 ft	TOTAL DEPTH 99.5 ft	NORTHING 231,515	EASTING 2,039,285
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 77.0% 01/27/2015		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER William J. Miller	START DATE 03/12/15	COMP. DATE 03/12/15	SURFACE WATER DEPTH N/A

WBS 43741.1.FS1	TIP W-5518	COUNTY COLUMBUS	GEOLOGIST Shawn McGuire
SITE DESCRIPTION BRIDGE NO. 412 ON SR 1574 (OLD US 74) OVER US 74 AT -L- STATION 24+06.36			GROUND WTR (ft)
BORING NO. B1-B	STATION 23+79	OFFSET 49ft RT	ALIGNMENT -L-
COLLAR ELEV. 107.3 ft	TOTAL DEPTH 99.5 ft	NORTHING 231,515	EASTING 2,039,285
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 77.0% 01/27/2015		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER William J. Miller	START DATE 03/12/15	COMP. DATE 03/12/15	SURFACE WATER DEPTH N/A



NCDOT BORE DOUBLE 215007_W5518_COLUMBUS_CO_CATLIN_GEL_CATLIN_GDT_04/17/15

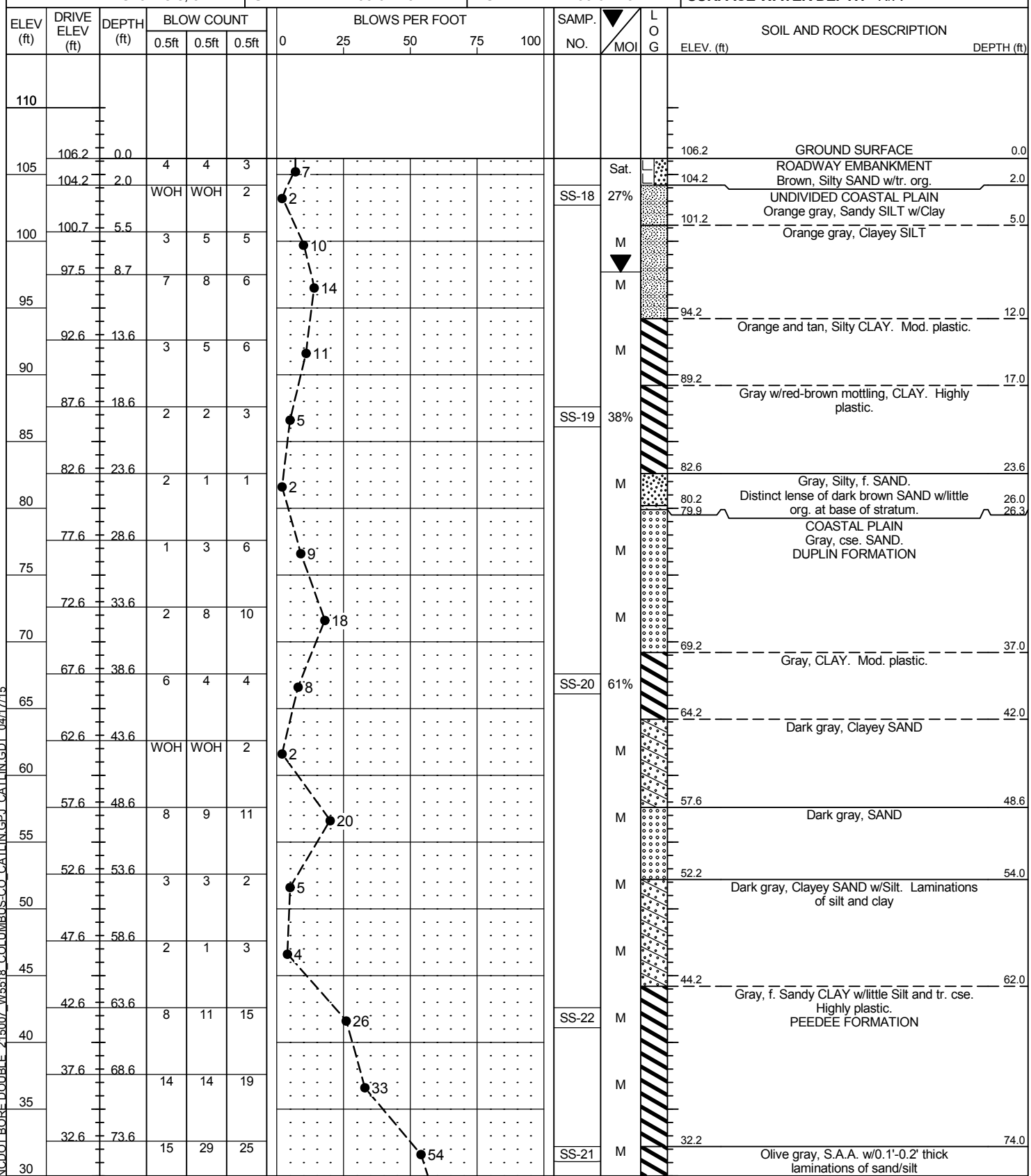


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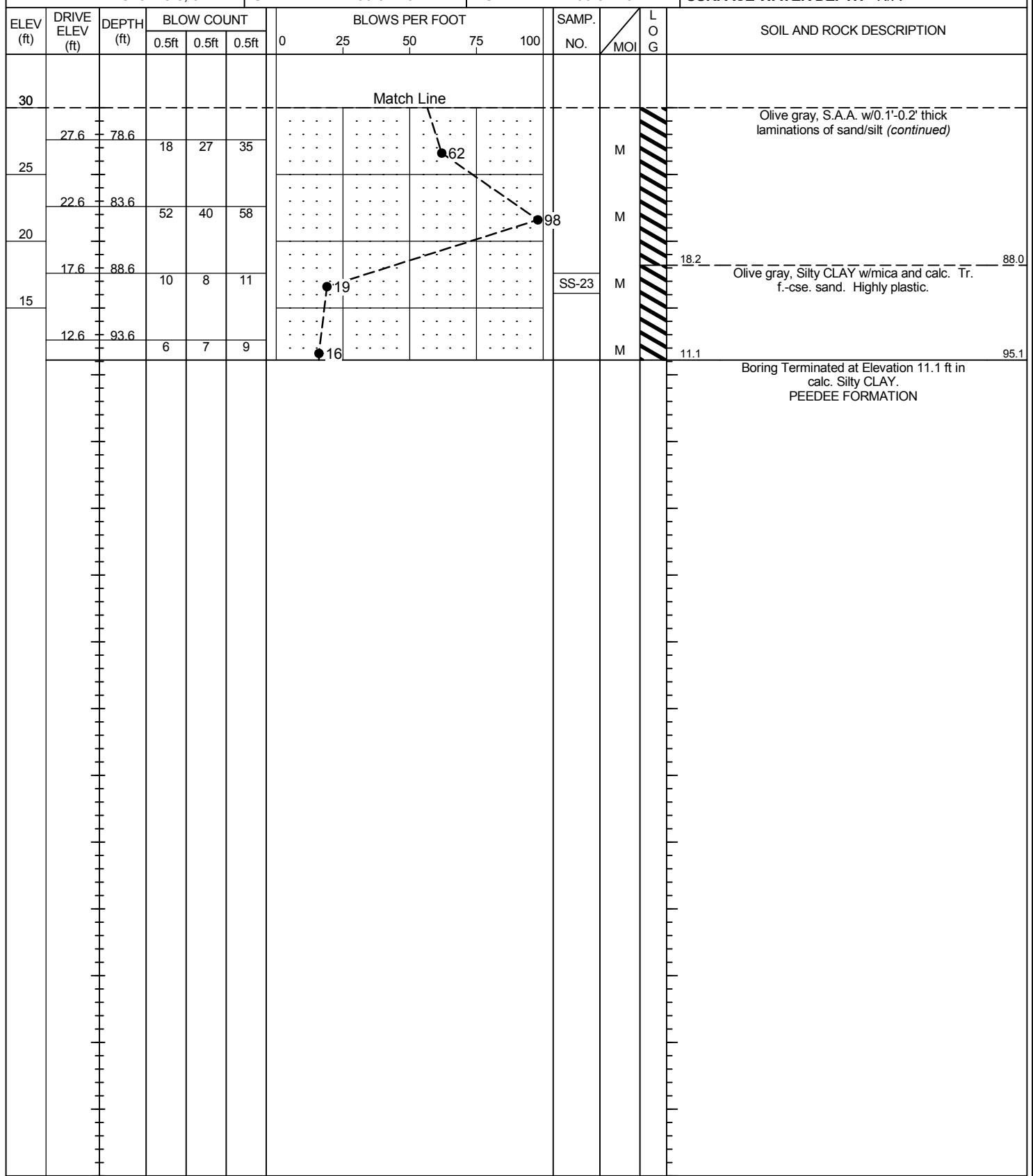
BORELOG REPORT



WBS 43741.1.FS1	TIP W-5518	COUNTY COLUMBUS	GEOLOGIST Shawn McGuire
SITE DESCRIPTION BRIDGE NO. 412 ON SR 1574 (OLD US 74) OVER US 74 AT -L- STATION 24+06.36			GROUND WTR (ft) 0 HR. 8.1
BORING NO. EB2-A	STATION 25+35	OFFSET 41ft LT	ALIGNMENT -L-
COLLAR ELEV. 106.2 ft	TOTAL DEPTH 95.1 ft	NORTHING 231,661	EASTING 2,039,179
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 75.2% 01/27/2015		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER D.T. Chalmers, Jr.	START DATE 03/02/15	COMP. DATE 03/02/15	SURFACE WATER DEPTH N/A



WBS 43741.1.FS1	TIP W-5518	COUNTY COLUMBUS	GEOLOGIST Shawn McGuire
SITE DESCRIPTION BRIDGE NO. 412 ON SR 1574 (OLD US 74) OVER US 74 AT -L- STATION 24+06.36			GROUND WTR (ft) 0 HR. 8.1
BORING NO. EB2-A	STATION 25+35	OFFSET 41ft LT	ALIGNMENT -L-
COLLAR ELEV. 106.2 ft	TOTAL DEPTH 95.1 ft	NORTHING 231,661	EASTING 2,039,179
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 75.2% 01/27/2015		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER D.T. Chalmers, Jr.	START DATE 03/02/15	COMP. DATE 03/02/15	SURFACE WATER DEPTH N/A



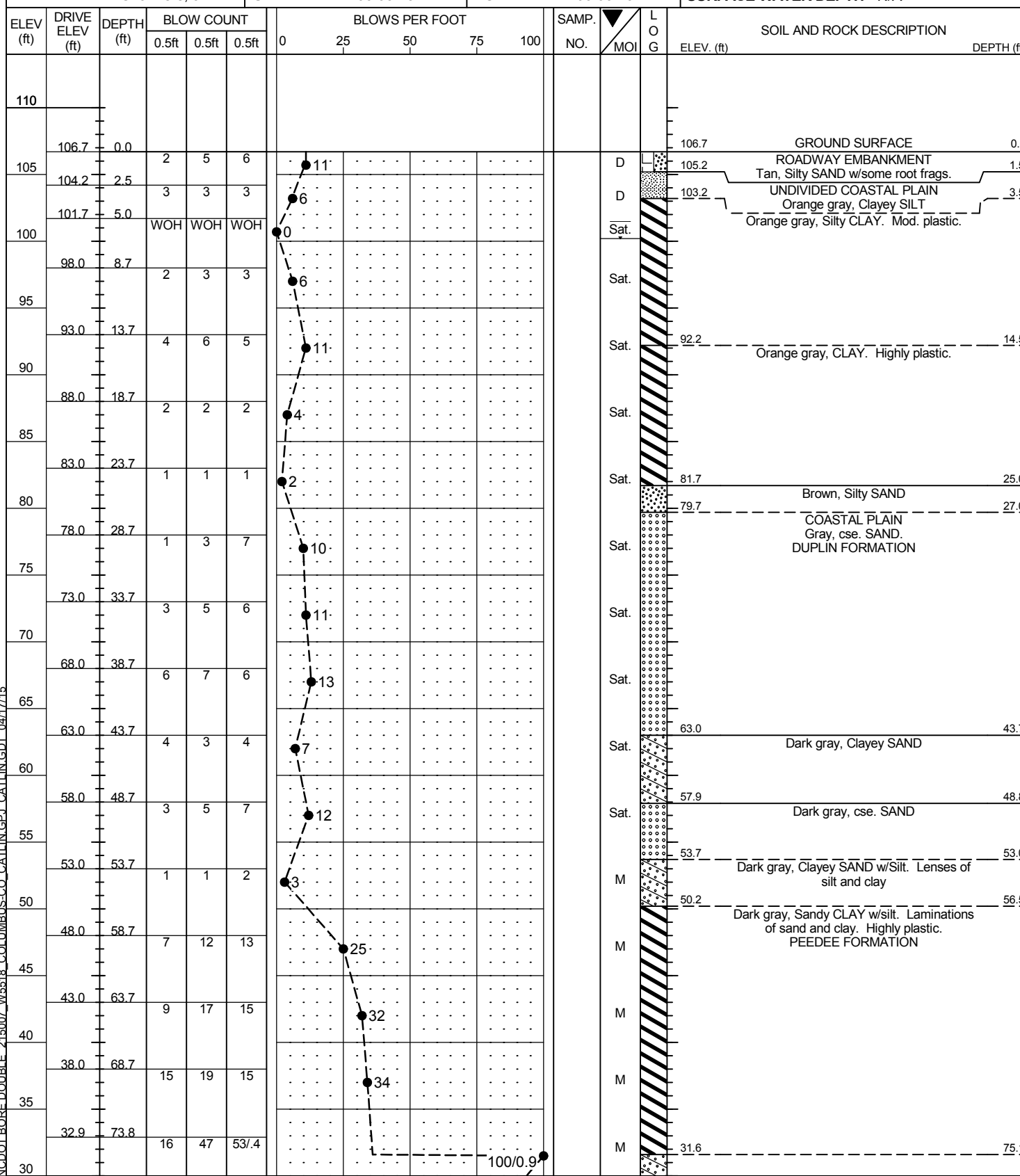
NCDOT BORE DOUBLE 215007 W-5518 COLUMBUS CO. CATLIN GEL CATLIN GDT 04/17/15



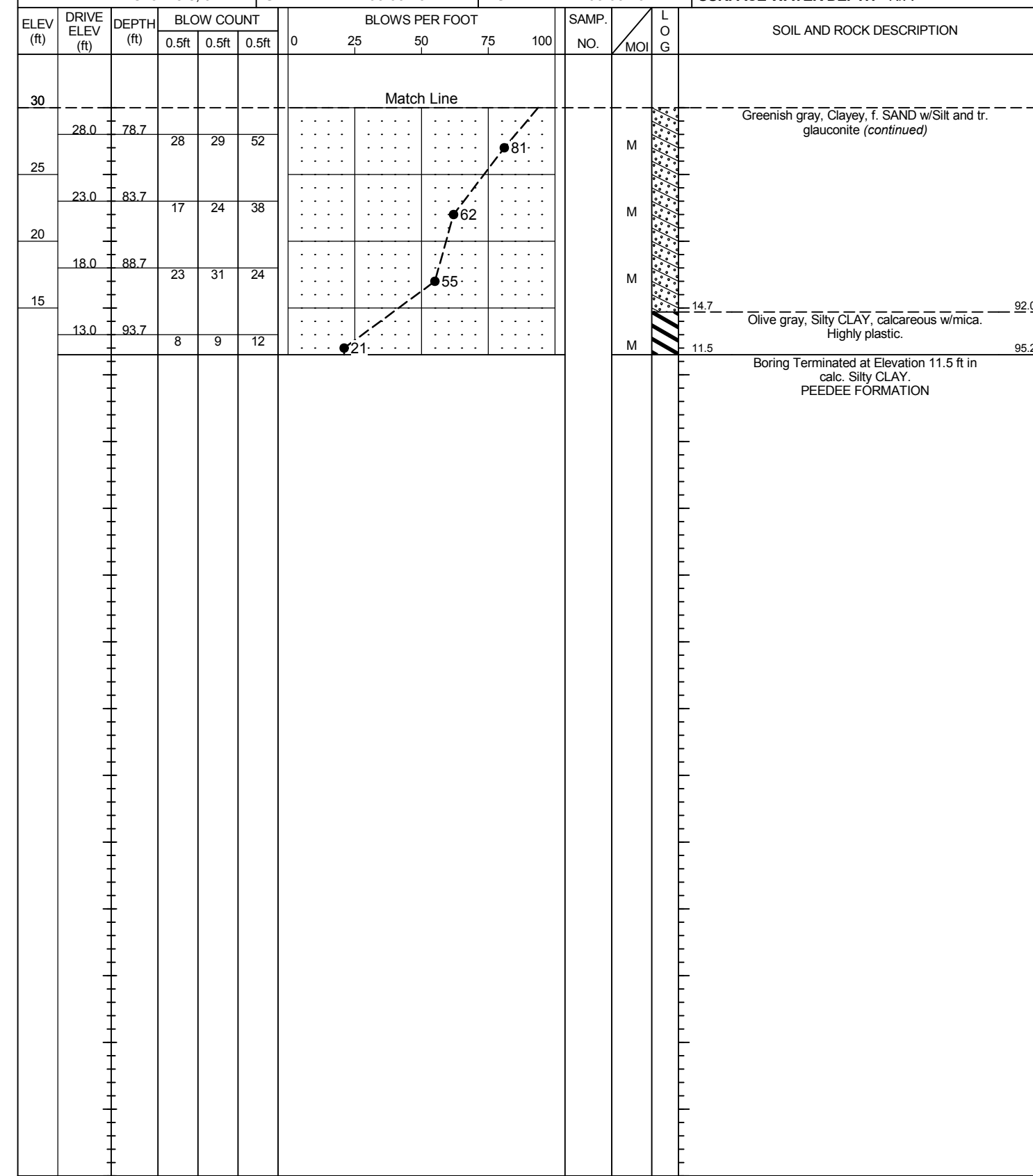
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BORELOG REPORT

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SITE DESCRIPTION BRIDGE NO. 412 ON SR 1574 (OLD US 74) OVER US 74 AT -L- STATION 24+06.36			GROUND WTR (ft)
BORING NO. EB2-B	STATION 24+90	OFFSET 42ft RT	ALIGNMENT -L-
COLLAR ELEV. 106.7 ft	TOTAL DEPTH 95.2 ft	NORTHING 231,625	EASTING 2,039,266
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 75.2% 01/27/2015		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER D.T. Chalmers, Jr.	START DATE 03/03/15	COMP. DATE 03/03/15	SURFACE WATER DEPTH N/A



WBS 43741.1.FS1	TIP W-5518	COUNTY COLUMBUS	GEOLOGIST Shawn McGuire
SITE DESCRIPTION BRIDGE NO. 412 ON SR 1574 (OLD US 74) OVER US 74 AT -L- STATION 24+06.36			GROUND WTR (ft)
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DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 75.2% 01/27/2015		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER D.T. Chalmers, Jr.	START DATE 03/03/15	COMP. DATE 03/03/15	SURFACE WATER DEPTH N/A



NCDOT BORE DOUBLE 215007_W5518_COLUMBUS_CO_CATLIN_GPL_CATLIN_GDT_04/17/15

NCDOT LABORATORY SUMMARY SHEET

AASHTO Standard Specifications

(As modified by NCDOT, Material and Tests Unit, 2004.)

TEST RESULTS

Field Sample Number	SS-13	SS-14	O-02	SS-15	SS-16	SS-17	SS-18	SS-19	SS-20	SS-22	SS-21	SS-23			
Lab Sample Number	SS-13	SS-14	O-02	SS-15	SS-16	SS-17	SS-18	SS-19	SS-20	SS-22	SS-21	SS-23			
Retained #4 Sieve %	0	0	N/A	0	0	0	0	0	0	0	0	0			
Passing #10 Sieve %	100	98.4	N/A	100	99.8	99.7	100	100	100	98.3	100	100			
Passing #40 Sieve %	99	100	N/A	97	97	97	99	100	92	95	97	98			
Passing #200 Sieve %	56	93	N/A	89	18	94	61	91	84	65	75	89			

MINUS NUMBER 10 FRACTION

SOIL MORTAR - 100%															
Coarse Sand Ret. #60 %	2.0	0.7	N/A	5.3	16.0	3.7	3.0	1.0	10.6	7.0	8.5	4.6			
Fine Sand Ret. #270 %	49.1	7.7	N/A	7.7	67.5	3.0	41.9	9.8	7.5	32.7	19.1	8.1			
Silt 0.05 - 0.005mm %	24.7	48.1	N/A	64.5	6.1	28.7	22.8	32.5	42.6	16.7	15.3	27.6			
Clay <0.005mm %	24.2	43.5	N/A	22.6	10.5	64.6	32.3	56.7	39.3	43.7	57.2	59.7			

Liquid Limit (LL)	23	69	N/A	42	30	123	28	66	46	52	64	88			
Plasticity Index (PI)	7	47	N/A	19	NP	86	9	45	17	28	38	56			
Organic Content %	N/A	N/A	3.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
AASHTO Classification /Group Index	A-4(1)	A-7-6(49)	N/A	A-7-6(18)	A-2-4(0)	A-7-5(96)	A-4(3)	A-7-6(45)	A-7-6(16)	A-7-6(17)	A-7-6(30)	A-7-5(58)			
Station	22+71	22+71	22+71	22+71	22+71	22+71	25+35	25+35	25+35	25+35	25+35	25+35			
Offset	52ft RT	52ft RT	52ft RT	52ft RT	52ft RT	52ft RT	41ft LT	41ft LT	41ft LT	41ft LT	41ft LT	41ft LT			
Alignment	-L-	-L-	-L-	-L-	-L-	-L-	-L-	-L-	-L-	-L-	-L-	-L-			
Boring Identification	EB1-B	EB1-B	EB1-B	EB1-B	EB1-B	EB1-B	EB2-A	EB2-A	EB2-A	EB2-A	EB2-A	EB2-A			
Depth (ft)	0.0	18.3	28.5	38.3	53.3	93.3	2.0	18.6	38.6	63.6	74.0	88.6			
to	1.5	19.8	28.8	39.8	54.8	94.8	3.5	20.1	40.1	65.1	75.1	90.1			
Field Moisture Content	20	43	N/A	N/A	N/A	N/A	27	38	61	N/A	N/A	N/A			
Tested By	MD Mason	MD Mason	MD Mason	MD Mason	MD Mason	MD Mason	MD Mason	MD Mason	MD Mason	MD Mason	MD Mason	MD Mason			
Submitted By	S. McGuire	S. McGuire	S. McGuire	S. McGuire	S. McGuire	S. McGuire	S. McGuire	S. McGuire	S. McGuire	S. McGuire	S. McGuire	S. McGuire			
Date Submitted	03/09/15	03/09/15	03/09/15	03/09/15	03/09/15	03/09/15	03/09/15	03/09/15	03/09/15	03/09/15	03/09/15	03/09/15			

NP = Non-Plastic

MICHAEL D. MASON
Laboratory Manager

Report Date: 3/31/2015
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