



CUY-90-14.90

PID 77332/85531

APPENDIX GE-03

**Soil Profile
(Reference Document)**

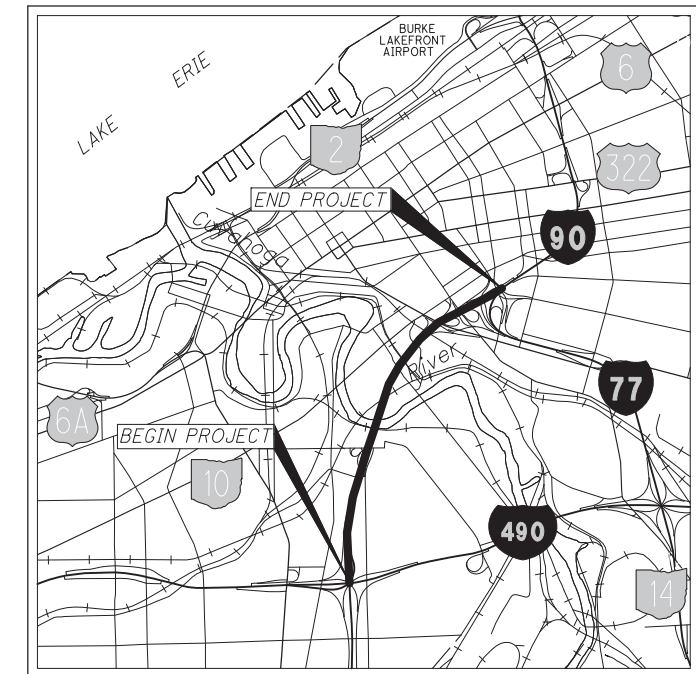
State of Ohio
Department of Transportation
Jolene M. Molitoris, Director

**Innerbelt Bridge
Construction Contract Group 1 (CCG1)**

INDEX OF SHEETS		
LOCATION FROM STA.	TO STA.	PLAN VIEW & PROFILE SHEET NUMBERS
W.B. I-90 MAINLINE		
97+02.06	177+65.00	47, 49, 51-53, 56-61, 64-66, 69-70, 73
TEMPORARY W.B. I-90 MAINLINE		
501+50.00	515+50.00	64, 69, 71
TEMPORARY RAMP A3		
2999+00	3009+20.95	69, 73-74
RAMP A4		
600+26.44	609+41.34	64, 69, 72
RAMP A5		
697+89.30	720+42.80	59, 62-64, 67
RAMP A6		
800+00	814+00	51, 54, 56
RAMP A7		
1000+00	1013+96	47-50
W. 14TH ST. EXT.		
100+00	108+80.78	51, 55
ONTARIO ST.		
690+69.56	697+89.30	64, 68
COMMERCIAL RD.		
10+00	20+07.23	64, 75, 77
E. 9TH ST.		
11+54.79	26+00	59, 75-76, 78
BROADWAY AVE.		
10+00	24+73.88	78-79
E. 14TH ST.		
10+01.13	14+75.51	78, 80
STATION	CROSS SECTION SHEET NUMBERS	
W.B. I-90 MAINLINE		
111+00	81	
114+00	82	
115+00	83	
118+50	84-85	
126+50	86-87	
128+00	88-89	
131+00	90-91	
134+00	92-93	
137+00	94-95	
139+50	96-97	
158+50	98-99	
167+00	100	
171+50	101	
WEST ABUTMENT		
A-A'	102-103	
B-B'	104-105	
C-C'	106-107	
D-D'	108-109	
E-E'	110-111	
TEMPORARY RAMP A3		
3000+10	112	
3003+50	113	
RAMP A6		
806+50	114	

LEGEND

DESCRIPTION	ODOT CLASS
GRAVEL AND/OR STONE FRAGMENTS	A-1-a
GRAVEL AND/OR STONE FRAGMENTS W/ SAND	A-1-b
GRAVEL AND/OR STONE FRAGMENTS W/ SAND & SILT	A-2-4
GRAVEL AND/OR STONE FRAGMENTS W/ SAND, SILT, & CLAY	A-2-6
FINE SAND	A-3
COURSE & FINE SAND	A-3a
SANDY SILT	A-4a
SILT	A-4b
SILT AND CLAY	A-6a
SILTY CLAY	A-6b
ELASTIC CLAY	A-7-5
CLAY	A-7-6
ORGANIC SILT	A-8a
ORGANIC CLAY	A-8b
ORGANIC	VISUAL
WOODY PEAT	VISUAL
BOULDERY ZONE	VISUAL
SHALE	VISUAL
WEATHERED SHALE	VISUAL
UNCONTROLLED FILL	VISUAL
CONCRETE	VISUAL
PAVEMENT OR BASE = X = APPROXIMATE THICKNESS (ASPHALT, CONCRETE, BRICK, SANDSTONE OR GRANITE PAVERS, BERM)	VISUAL
SOD AND TOPSOIL = X = APPROXIMATE THICKNESS	VISUAL
BORING LOCATION - PLAN VIEW	
INSTRUMENTED BORING LOCATION - PLAN VIEW	
HISTORIC BORING LOCATION (PRE-2006) - PLAN VIEW	
DRIVE SAMPLE AND/OR ROCK CORE BORING PLOTTED TO VERTICAL SCALE ONLY. HORIZONTAL BAR INDICATES A CHANGE IN STRATIGRAPHY.	
N ₆₀ INDICATES STANDARD PENETRATION RESISTANCE NORMALIZED TO 60% DRILL ROD ENERGY RATIO.	
X/Y/Z INDICATES NUMBER OF BLOWS FOR "STANDARD PENETRATION TEST" X = NUMBER OF BLOWS FOR FIRST 6 INCHES Y = NUMBER OF BLOWS FOR SECOND 6 INCHES Z = NUMBER OF BLOWS FOR THIRD 6 INCHES	
N INDICATES NUMBER OF BLOWS FOR 12 INCHES.	
N ₆ INDICATES NUMBER OF BLOWS FOR 12 INCHES IN 6-INCH INCREMENTS.	
WC INDICATES WATER CONTENT IN PERCENT.	
INDICATES STATIC WATER ELEVATION.	
W INDICATES FREE WATER ELEVATION.	
INDICATES A PLASTIC MATERIAL WITH A MOISTURE CONTENT EQUAL TO OR GREATER THAN THE LIQUID LIMIT MINUS 3.	
INDICATES A NON-PLASTIC MATERIAL WITH A MOISTURE CONTENT GREATER THAN 25 % OR GREATER THAN 19 % WITH A WET APPEARANCE.	
R REFUSAL OF SPLIT-BARREL SAMPLER IN HARD OR VERY-DENSE SOIL.	
P INDICATES A SHELBY TUBE OR PRESS SAMPLE.	
TR INDICATES TOP OF BEDROCK.	



LOCATION MAP
SCALE IN MILES

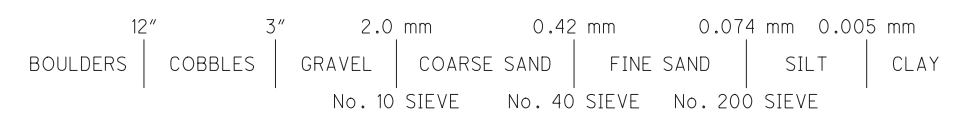
NOTE: BORING LOGS AND/OR PROFILES (BASED ON INFORMATION AVAILABLE AT THE TIME OF SUBMITTAL) ARE SUBMITTED IN A BINDER UNDER SEPARATE COVER.

PROJECT DESCRIPTION

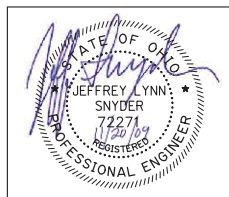
AS PART OF THE CUY-90-14.52 PROJECT, IT IS PLANNED TO RECONFIGURE APPROXIMATELY 1.6 MILES OF WESTBOUND I-90 (STA. 97+02.06 TO APPROXIMATE STA. 177+65) IN CLEVELAND, CUYAHOGA COUNTY, OHIO. ASSOCIATED WORK INVOLVED IN THIS PROJECT IS THE CONSTRUCTION OF A NEW FIVE-LANE BRIDGE STRUCTURE OVER THE CUYAHOGA RIVER VALLEY. ENTRANCE AND EXIT RAMP AT EAST 14TH STREET, EAST 9TH STREET, ONTARIO STREET AND ABBEY AVENUE WILL BE RECONFIGURED AND CONSTRUCTED. RECONFIGURATION OF THE WEST 14TH STREET EXTENSION, COMMERCIAL ROAD, BROADWAY AVENUE, AND EAST 9TH STREET IS ALSO INCLUDED IN THIS PROJECT.

- CONTINUED ON SHEET 2 -

PARTICLE SIZE DEFINITIONS



RECON. - VARIOUS (BBCM, B&P) 2006, 2009
 DRILLING - BBCM, B&P 2006, 2009
 DRAWN - TJM/MRM
 REVIEWED - BKS/JLS



AVAILABLE INFORMATION

NUMEROUS HISTORICAL RECORDS WERE SEARCHED TO GATHER HISTORICAL BORING INFORMATION IN THE GENERAL VICINITY OF THIS PROJECT. SEVERAL SUBSURFACE INVESTIGATIONS HAVE BEEN PERFORMED IN THE GENERAL PROJECT VICINITY AS EARLY AS 1923. AVAILABLE INFORMATION WITHIN THE PROJECT LIMITS OBTAINED FROM THE HISTORICAL RECORDS SEARCH IS LISTED AS FOLLOWS:

- SOIL PROFILES WERE AVAILABLE FOR THE 1923 INVESTIGATION PERFORMED BY THE CLEVELAND UNION TERMINAL COMPANY FOR THE CUYAHOGA VIADUCT BRIDGE, WHICH IS NOW OWNED AND OPERATED BY THE GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY.
- MULTIPLE SUBSURFACE INVESTIGATIONS WERE CONDUCTED BY ODOT IN 1958, 1963, 1964, 1990 AND 1992. THE PRE-1990 ODOT INVESTIGATIONS WERE GENERALLY PERFORMED FOR THE PLANNED INNERBELT FREEWAY AND BRIDGE. THE 1990 AND 1992 ODOT BORINGS WERE PERFORMED TO INVESTIGATE THE OBSERVED SLOPE MOVEMENTS IN THE VICINITY OF THE WEST END PIER AND PIER 1 OF THE EXISTING INNERBELT BRIDGE.
- HOWARD, NEEDLES, TAMMEN & BERGENOFF CONSULTING ENGINEERS (HNTB) PERFORMED INVESTIGATIONS BETWEEN 1954 AND 1956 PRIMARILY AT THE PROPOSED ABUTMENT AND PIER LOCATIONS FOR THE EXISTING INNERBELT BRIDGE.
- SOIL PROFILES WERE AVAILABLE FOR THE 1955 INVESTIGATION BY NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY (NYC & ST. L.R.R.) FOR THE VERTICAL LIFT BRIDGE CARRYING A RAILROAD LINE (NOW OWNED BY NORFOLK SOUTHERN CORPORATION) OVER THE CUYAHOGA RIVER LOCATED IMMEDIATELY TO THE NORTH OF THE EXISTING INNERBELT BRIDGE.
- IN 1986, BORINGS WERE PERFORMED BY THE DAVID V. LEWIN CORPORATION (LEWIN) AT THE SITE OF A PROPOSED DOMED STADIUM. THE SITE IS NOW OCCUPIED BY PROGRESSIVE FIELD.
- IN 1986 AND 1987, R&R INTERNATIONAL, INC. (R&R) PERFORMED BORINGS FOR THE EXISTING ABBEY AVENUE VIADUCT OVER THE EXISTING NORFOLK SOUTHERN RAILROAD AND SCRANTON ROAD.
- IN 2000 AND 2001, DLZ CORPORATION (DLZ) PERFORMED THREE (3) BORINGS ADJACENT TO THE EXISTING INNERBELT BRIDGE AS A PART OF A STABILITY EVALUATION FOR THE CUY-90-15.24 PROJECT.
- BBC&M ENGINEERING, INC. (BBCM) PERFORMED SUBSURFACE INVESTIGATIONS BETWEEN 1994 AND 2006 GENERALLY TO INVESTIGATE VARIOUS ASPECTS OF THE CUY-90-15.24 AND CUY-90-14.52 PROJECTS. THE SUBSURFACE INVESTIGATIONS ALSO INCLUDED INSTALLATION OF INSTRUMENTATION SUCH AS INCLINOMETERS AND PIEZOMETERS. THE PURPOSE OF THE BBCM INVESTIGATIONS IN THE 1990'S WAS TO MONITOR THE SLOPE MOVEMENTS AT THE WEST END PIER AND PIER 1 OF THE EXISTING INNERBELT BRIDGE AND AID THE DESIGN OF A STABILIZATION STRUCTURE ADJACENT TO PIER 1. THE CONSTRUCTION OF THIS STABILIZATION STRUCTURE WAS COMPLETED IN 1999. AN ADDITIONAL SUBSURFACE INVESTIGATION AT THE WEST BANK OF THE CUYAHOGA RIVER WAS PERFORMED BY BBCM IN 2006 TO EVALUATE THE LIMITS OF INSTABILITY IN THE WEST BANK SLOPE AND EVALUATE VARIOUS ALTERNATIVES FOR STABILIZING THE SLOPE IN SUPPORT OF THE FOUNDATIONS IN THIS AREA FOR THE PROPOSED NEW BRIDGE (WESTBOUND I-90 BRIDGE) TO BE LOCATED JUST NORTH OF THE EXISTING INNERBELT BRIDGE. OHIO UNIVERSITY PERFORMED SEVERAL CPT TESTS IN CONJUNCTION WITH BBCM'S 2006 INVESTIGATION.
- BBCM PERFORMED A PRELIMINARY SUBSURFACE INVESTIGATION IN 2006 FOR THE PROPOSED WESTBOUND I-90 BRIDGE ALIGNMENT. IN ADDITION TO THE BORINGS PERFORMED FOR THE PROPOSED WESTBOUND I-90 BRIDGE, BORINGS WERE PERFORMED FOR THE FOLLOWING: EXISTING ROADWAYS TO BE REHABILITATED OR RECONFIGURED; NEW ROADWAYS; NEW, REHABILITATED AND/OR RECONFIGURED INTERCHANGE RAMPS; THE I-90 MAINLINE; AND, ASSOCIATED NEW AND REHABILITATED STRUCTURES (I.E. BRIDGES AND RETAINING WALLS).

ALL AVAILABLE SOIL INFORMATION THAT CAN BE CONVENIENTLY SHOWN ON THE SOIL PROFILE SHEETS HAS BEEN SO REPORTED. THE LOGS OF BORINGS, SOIL PROFILES (WHERE BORINGS WERE NOT AVAILABLE), AND CPT LOGS HAVE BEEN SUBMITTED SEPARATELY FROM THESE SOIL PROFILE SHEETS IN A BINDER PER ODOT'S REQUEST. THIS BINDER ALSO CONTAINS MANY BORINGS THAT ARE SHOWN ON THE PLAN SHEETS BUT HAVE BEEN EXCLUDED FROM THE PROFILES AND CROSS-SECTIONS EITHER FOR CLARITY OF PRESENTATION OR DUE TO THEIR RELATIVELY LARGE DISTANCE FROM PROJECT CENTERLINES AND BASELINES. ADDITIONAL NOTES REGARDING THE LOCATION OF SUBSURFACE DATA ARE PROVIDED ON THE INDIVIDUAL PLAN AND PROFILE SHEETS.

ADDITIONAL SUBSURFACE EXPLORATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE OFFICE OF GEOTECHNICAL ENGINEERING AT 1600 WEST BROAD STREET OR THE OFFICE OF STRUCTURAL ENGINEERING AT 1980 WEST BROAD STREET.

SUBSURFACE EXPLORATION

TO SUPPLEMENT THE SUBSURFACE INVESTIGATIONS PERFORMED BY BBCM BETWEEN 1994 AND 2006 BASED ON THE MOST RECENT PLANS FOR THE CUY-90-14.52 PROJECT, BARR & PREVOST (B&P) PERFORMED 80 BORINGS BETWEEN MAY AND OCTOBER OF 2009 AND BBCM PERFORMED SEVEN (7) BORINGS BETWEEN JUNE AND SEPTEMBER OF 2009. ADDITIONALLY, ODOT PERFORMED TWO (2) CPT TESTS ON AUGUST 18, 2009.

THE BORINGS WERE DRILLED WITH EITHER AN ATV-MOUNTED (ALL-TERRAIN VEHICLE) OR A TRUCK-MOUNTED DRILLING RIG. DISTURBED, BUT REPRESENTATIVE, SOIL SAMPLES WERE OBTAINED BY LOWERING A 2-INCH O.D. SPLIT-BARREL SAMPLER TO THE BOTTOM OF THE BORING AND DRIVING IT INTO THE SOIL BY BLOWS FROM A 140-POUND HAMMER FREELY FALLING 30 INCHES (ASTM D1586 - STANDARD PENETRATION TEST). SPLIT BARREL SAMPLES WERE EXAMINED IMMEDIATELY AFTER RECOVERY AND REPRESENTATIVE PORTIONS WERE PRESERVED IN AIRTIGHT GLASS JARS. WHERE POSSIBLE, 3-INCH O.D. SHELBY TUBE SAMPLERS WERE HYDRAULICALLY PUSHED IN SOIL EXHIBITING COHESION TO OBTAIN "UNDISTURBED" SAMPLES. WHERE ENCOUNTERED, BEDROCK WAS CORED USING AN NX OR SIMILAR SIZED DIAMOND BIT ROCK CORE BARREL WITH WATER AS A CIRCULATING/COOLING FLUID. RETRIEVED ROCK CORE SAMPLES WERE STORED IN COMPARTMENTAL CORE BOXES. UPON COMPLETION, THE DEPTH TO ANY ACCUMULATED GROUNDWATER WAS MEASURED, THE BORINGS WERE BACKFILLED OR SEALED IN ACCORDANCE WITH ODOT REQUIREMENTS, AND THE SURFACE OF THE EXISTING PAVEMENT AT THE BORING LOCATIONS WAS REPAIRED USING COLD-PATCH ASPHALT OR CONCRETE, WHERE APPROPRIATE.

THE LOGS OF BORINGS FOR THESE 2009 SUBSURFACE INVESTIGATIONS HAVE ALSO BEEN INCLUDED SEPARATELY IN THE AFOREMENTIONED BINDER OF LOGS AND SOIL PROFILES.

GEOLOGY AND EXPLORATION FINDINGS

THE MAJORITY OF THE PROJECT LIMITS LIE WITHIN THE PRESENT CUYAHOGA RIVER VALLEY. A LARGE PORTION OF THE CUYAHOGA RIVER VALLEY IS CLASSIFIED AS "MADE LAND" WITH URBAN COVER COMPOSED OF FILL MATERIALS OF VARIABLE COMPOSITION AND DEPTH. BENEATH THE FILL MATERIALS, SUBSURFACE INVESTIGATIONS PERFORMED BY BBCM, BARR & PREVOST, AND OTHERS HAVE ENCOUNTERED APPROXIMATELY 20 TO 50 FEET OF ALLUVIUM DEPOSITS OF HOLOCENE AGE CONSISTING PREDOMINANTLY OF VERY-LOOSE TO MEDIUM-DENSE SANDS AND SILTS AND VERY-SOFT TO MEDIUM STIFF SILTY CLAY AND CLAY OF VARIABLE ORGANIC CONTENT. THE ALLUVIUM MATERIALS WERE DEPOSITED BY THE PRECURSOR TO THE CUYAHOGA RIVER. BENEATH THE ALLUVIUM DEPOSITS, APPROXIMATELY 55 TO 100 FEET OF LACUSTRINE DEPOSITS CONSISTING PRIMARILY OF MEDIUM-STIFF TO VERY STIFF SILTY CLAYS WERE GENERALLY ENCOUNTERED. THESE LACUSTRINE SOILS WERE DEPOSITED BY A SERIES OF LARGE PROGLACIAL LAKES WHICH COVERED THE GREATER CLEVELAND AREA NEAR THE END OF THE WISCONSINAN GLACIAL PERIOD. SLOPE FAILURES OBSERVED IN THE RIVER VALLEY SIDE SLOPES HAVE OCCURRED PRIMARILY WITHIN THESE LACUSTRINE DEPOSITS. MANY SLOPE FAILURES HAVE BEEN OBSERVED OVER THE YEARS ON THE SIDE SLOPES ADJACENT TO THE CUYAHOGA RIVER. THE LACUSTRINE DEPOSITS OVERLIE APPROXIMATELY 25 TO 65 FEET OF TILL FROM THE WISCONSINAN OR ILLINOIAN GLACIAL PERIODS. THE TILL PRIMARILY CONSISTS OF DENSE TO VERY-DENSE SANDY SILT OR VERY-STIFF TO HARD CLAYEY SILT. BENEATH THE TILL, OHIO DEVONIAN SHALE WAS ENCOUNTERED, WHICH CONTAINS ORGANIC MATTER AND NATURAL GAS. THIS GAS IS KNOWN TO PERCOLATE UPWARDS THROUGH THE SHALE BECOMING TRAPPED IN POCKETS THROUGHOUT THE LOWER PORTION OF THE OVERLYING SEDIMENTS.

SPECIFICATIONS

ALL BORINGS PERFORMED BY BBCM IN 2006 WERE GENERALLY PERFORMED IN ACCORDANCE WITH THE 1995 ODOT "SPECIFICATIONS FOR SUBSURFACE INVESTIGATIONS." BORINGS PERFORMED IN 2006 TO INVESTIGATE THE PAVEMENT SUBGRADES WERE ALSO PERFORMED IN GENERAL ACCORDANCE WITH ODOT OFFICES OF CONSTRUCTION ADMINISTRATION AND GEOTECHNICAL ENGINEERING GEOTECHNICAL BULLETIN GBI, "PLAN SUBGRADES", REVISED JUNE 29, 2005. ALL BORINGS PERFORMED BY BBCM AND BARR & PREVOST IN 2009 WERE GENERALLY PERFORMED IN ACCORDANCE WITH THE ODOT "SPECIFICATIONS FOR GEOTECHNICAL EXPLORATIONS", REVISED JANUARY 16, 2009. THE BORINGS PERFORMED BY BARR & PREVOST IN 2009 TO INVESTIGATE THE PAVEMENT SUBGRADES WERE ALSO PERFORMED IN GENERAL ACCORDANCE WITH THE GBI DOCUMENT, REVISED JANUARY 18, 2007. THE BORINGS PERFORMED BY ODOT AND BBCM IN THE 1990'S WERE PRESUMABLY PERFORMED IN GENERAL ACCORDANCE WITH THE 1984 ODOT "SPECIFICATIONS FOR SUBSURFACE INVESTIGATIONS" ALTHOUGH THIS COULD NOT BE VERIFIED. IT IS UNKNOWN IF THE OTHER INVESTIGATIONS LOCATED WITHIN THE PROJECT LIMITS WERE PERFORMED IN ACCORDANCE WITH ANY SPECIFICATIONS.

SUMMARY OF UNCONFINED COMPRESSION STRENGTH (UCS) TESTING DATA - SOIL

ORIGINAL BORING NO.	SGE BORING NO.	SAMPLE NO.	SAMPLE ELEVATION (MSL)	UNCONFINED COMPRESSIVE STRENGTH (PSF)
B-022-1-09*	B-022-1-09*	ST-1	609.4' - 608.4'	3060
B-022-1-09*	B-022-1-09*	ST-3	605.4' - 604.4'	7128
B-023-0-09	B-023-0-09	ST-20	592.5' - 590.5'	2970
B-023-0-09	B-023-0-09	ST-23A	577.5' - 575.5'	1933
B-023-0-09	B-023-0-09	ST-28A	552.5' - 550.5'	3251
B-025-0-09	B-025-0-09	ST-19	613.0' - 612.0'	1370
B-025-0-09	B-025-0-09	ST-29A	563.0' - 561.0'	3617
B-028-0-09	B-028-0-09	ST-18A	618.9' - 617.4'	4233
B-028-0-09	B-028-0-09	ST-26A	578.9' - 576.9'	2301
B-032-0-09	B-032-0-09	ST-20	609.6' - 607.6'	2837
B-032-0-09	B-032-0-09	ST-25	584.6' - 583.6'	2136
B-032-0-09	B-032-0-09	ST-27	574.1' - 573.1'	2183
B-2	B-002-0-00	P-1	539.0' - 537.0'	1640
B-3	B-003-0-00	P-2	517.0' - 515.0'	2100
B-4	B-004-0-00	P-1	562.0' - 560.0'	340
B-4	B-004-0-00	P-2	552.0' - 550.0'	1680
B-4	B-004-0-00	P-5	487.0' - 485.0'	7120
B-4	B-004-0-86	S-12	624.8' - 622.8'	3175
B-4	B-004-0-86	S-13	619.8' - 617.8'	1280
B-4	B-004-0-86	S-15	609.8 - 607.8	1890
B-106A**	B-106-A-58**	93268	628.7' - 627.7'	2960
B-106A**	B-106-A-58**	93269	624.7' - 623.7'	1180
B-106A**	B-106-A-58**	93271	603.7' - 602.7'	3780
B-106A**	B-106-A-58**	93272	584.7' - 583.7'	3740

*BORING B-022-1-09 WAS PERFORMED TO RECOVER SHELBY TUBE SAMPLES AND NO LOG WAS CREATED. RESULTS FOR TESTS FROM BORING B-022-1-09 ARE SHOWN ON LOG FOR BORING B-022-0-09.
**SAMPLE ELEVATIONS ARE APPROXIMATE.

SUMMARY OF SLAKE DURABILITY (SD) TESTING DATA ON SHALE BEDROCK

SGE BORING NO.	SAMPLE NO.	SAMPLE ELEVATION (MSL)	TEST FLUID/ SLURRY TYPE	SLAKE DURABILITY INDEX, Id ₂ (%)
B-022-0-09	NQ-1	479.4' - 477.4'	WATER	86.9
B-022-0-09	NQ-1	479.4' - 477.4'	MINERAL	89.7
B-022-0-09	NQ-1	479.4' - 477.4'	POLYMER	93.1
B-022-0-09	NQ-2	474.4' - 472.4'	WATER	80.6
B-022-0-09	NQ-2	474.4' - 472.4'	MINERAL	91.5
B-022-0-09	NQ-2	474.4' - 472.4'	POLYMER	92.3
B-022-0-09	NQ-3	462.4' - 460.4'	WATER	96.8
B-031-0-09	NQ-1	466.5' - 464.5'	WATER	79.4
B-031-0-09	NQ-2	461.5' - 459.5'	WATER	73.1
B-031-0-09	NQ-3	449.5' - 447.5'	WATER	82.7
B-035-0-09	55	447.6' - 443.6'	WATER	90.3
B-035-0-09	55	447.6' - 443.6'	MINERAL	90.1
B-035-0-09	55	447.6' - 443.6'	POLYMER	93.1
B-035-0-09	56	440.0' - 436.6'	WATER	85.2
B-035-0-09	56	440.0' - 436.6'	MINERAL	87.7
B-035-0-09	56	440.0' - 436.6'	POLYMER	92.0
B-035-0-09	57	429.0' - 425.0'	WATER	85.3
B-035-0-09	57	429.0' - 425.0'	MINERAL	80.9
B-035-0-09	57	429.0' - 425.0'	POLYMER	86.4
B-037-1-09	50	452.6' - 450.0'	WATER	81.0
B-037-1-09	50	452.6' - 450.0'	MINERAL	86.1
B-037-1-09	50	452.6' - 450.0'	POLYMER	87.6
B-037-1-09	51	444.7' - 441.0'	WATER	84.9
B-037-1-09	51	444.7' - 441.0'	MINERAL	85.7
B-037-1-09	51	444.7' - 441.0'	POLYMER	88.4
B-037-1-09	52	440.0' - 435.0'	WATER	85.2
B-037-1-09	52	440.0' - 435.0'	MINERAL	85.5
B-037-1-09	52	440.0' - 435.0'	POLYMER	88.0
B-039-0-09	NQ-1	428.1' - 426.1'	WATER	25.6
B-039-0-09	NQ-2	420.2' - 418.8'	WATER	73.0
B-039-0-09	NQ-3	409.6' - 407.6'	WATER	79.8
B-040-0-09	NQ-2	397.7' - 396.7'	WATER	95.2
B-040-0-09	NQ-3	385.8' - 384.8'	WATER	90.2
B-041-0-09	NQ-1	394.9' - 392.0'	WATER	88.5
B-041-0-09	NQ-2	388.8' - 385.9'	WATER	94.6
B-041-0-09	NQ-3	377.9' - 375.9'	WATER	96.4
B-042-0-09	NQ-1	399.5' - 396.7'	WATER	96.7
B-042-0-09	NQ-2	393.0' - 390.4'	WATER	98.5
B-042-0-09	NQ-3	382.9' - 380.7'	WATER	97.3
B-043-0-09	NQ-3	407.3' - 405.3'	WATER	86.4
B-043-0-09	NQ-4	400.3' - 398.3'	WATER	88.8
B-043-0-09	NQ-5	389.3' - 386.3'	WATER	97.3
B-044-0-09	NQ-1	421.1' - 418.6'	WATER	93.9
B-044-0-09	NQ-2	416.1' - 413.6'	WATER	97.1
B-044-0-09	NQ-2	409.9' - 405.8'	WATER	96.6
B-044-0-09	NQ-3	404.6' - 402.6'	WATER	96.4
B-045-0-09	NQ-1	417.7' - 415.7'	WATER	95.8
B-045-0-09	NQ-3	402.9' - 399.7'	WATER	89.9



**SUMMARY OF UNCONFINED COMPRESSION STRENGTH (UCS) TESTING DATA - SHALE BEDROCK**

ORIGINAL BORING NO.	SGE BORING NO.	SAMPLE NO.	SAMPLE ELEVATION (MSL)	UNCONFINED COMPRESSIVE STRENGTH (PSI)	POISSON'S RATIO
B-022-0-09	B-022-0-09	NQ-1	478.8' - 478.5'	1480	-----
B-022-0-09	B-022-0-09	NQ-2	471.9' - 471.6'	1040	-----
B-022-0-09	B-022-0-09	NQ-3	456.2' - 455.9'	1930	-----
B-031-0-09	B-031-0-09	NQ-1	465.6' - 465.3'	1460	-----
B-031-0-09	B-031-0-09	NQ-2	460.7' - 460.4'	5200	-----
B-031-0-09	B-031-0-09	NQ-3	448.8' - 448.5'	2790	-----
B-035-0-09	B-035-0-09	55	444.7' - 444.5'	2120	-----
B-035-0-09	B-035-0-09	56	439.2' - 438.9'	1140	-----
B-035-0-09	B-035-0-09	57	428.2' - 427.9'	2260	-----
B-037-1-09	B-037-1-09	50	453.0' - 452.6'	1530	-----
B-037-1-09	B-037-1-09	51	442.4' - 442.1'	1570	-----
B-037-1-09	B-037-1-09	52	439.2' - 438.8'	1730	-----
B-039-0-09	B-039-0-09	NQ-1	428.6' - 428.3'	9	-----
B-039-0-09	B-039-0-09	NQ-2	421.7' - 421.4'	1260	-----
B-039-0-09	B-039-0-09	NQ-3	409.2' - 409.0'	1310	-----
B-040-0-09	B-040-0-09	NQ-2	397.6' - 397.4'	6440	-----
B-041-0-09	B-041-0-09	NQ-1	394.8' - 394.5'	2130	-----
B-041-0-09	B-041-0-09	NQ-2	387.1' - 386.8'	2190	-----
B-041-0-09	B-041-0-09	NQ-3	375.6' - 375.3'	3260	-----
B-041-0-09	B-041-0-09	NQ-3	374.3' - 373.9'	3790	-----
B-042-0-09	B-042-0-09	NQ-1	399.5' - 399.1'	1100	-----
B-042-0-09	B-042-0-09	NQ-2	393.0' - 392.7'	4020	-----
B-042-0-09	B-042-0-09	NQ-2	392.0' - 391.7'	1240	-----
B-042-0-09	B-042-0-09	NQ-3	384.3' - 384.1'	4100	-----
B-043-0-09	B-043-0-09	NQ-3	406.8' - 406.5'	2470	-----
B-043-0-09	B-043-0-09	NQ-4	403.7' - 403.4'	2590	-----
B-043-0-09	B-043-0-09	NQ-5	388.3' - 388.0'	3950	-----
B-044-0-09	B-044-0-09	NQ-1	421.0' - 420.7'	3380	-----
B-044-0-09	B-044-0-09	NQ-2	416.5' - 416.2'	6700	-----
B-044-0-09	B-044-0-09	NQ-2	409.8' - 409.5'	5830	-----
B-045-0-09	B-045-0-09	NQ-3	401.7' - 401.4'	3070	-----
B-045-0-09	B-045-0-09	NQ-3	399.6' - 399.3'	2410	-----
B-05-01	B-001-0-06	55	446.4'	1477	-----
B-05-03	B-003-0-06	39	439.6'	1311	-----
B-05-04	B-004-0-06	50	430.8'	1116	-----
B-05-07	B-007-0-06	48	454.9'	1113	-----
B-05-11	B-011-0-06	54	450.1'	209	-----
B-05-12	B-012-0-06	56	444.7'	1021	-----
B-05-13	B-013-0-06	35	427.5'	1553	-----
B-05-13	B-013-0-06	37	419.5'	2955	0.39
B-05-13	B-013-0-06	40	401.5'	348	-----
B-05-14	B-014-0-06	36	411.2'	1313	-----
B-05-14	B-014-0-06	37	399.7'	1198	-----
B-05-14	B-014-0-06	39	389.2'	3228	0.13
B-05-15	B-015-0-06	47	378.6'	2057	-----
B-05-15	B-015-0-06	48	372.6'	2916	-----
B-05-15	B-015-0-06	49	367.6'	2322	0.4
B-05-16	B-016-0-06	36	435.0'	2295	-----
B-105A	B-105-A-06	34	430.7'	828	-----
B-4	B-004-0-55	N/A	435.9'	430	-----
B-4	B-004-0-55	N/A	434.0'	676	-----
B-4	B-004-0-55	N/A	429.8'	685	-----

SUMMARY OF CONFINED COMPRESSION STRENGTH (CCS) TESTING DATA - SHALE BEDROCK

ORIGINAL BORING NO.	SGE BORING NO.	SAMPLE NO.	SAMPLE ELEVATION (MSL)	UNCONFINED COMPRESSIVE STRENGTH (PSI)
B-1	B-001-0-55	N/A	446.1'	5550
B-1	B-001-0-55	N/A	445.7'	3530
B-1	B-001-0-55	N/A	435.9'	10930
B-1	B-001-0-55	N/A	435.7'	11500
B-1	B-001-0-55	N/A	425.9'	9460
B-1	B-001-0-55	N/A	425.7'	4500
B-1	B-001-0-55	N/A	422.8'	9610
B-1	B-001-0-55	N/A	422.5'	7550
B-1	B-001-0-55	N/A	420.9'	8230
B-1	B-001-0-55	N/A	420.7'	4800
B-1	B-001-0-55	N/A	418.1'	8920
B-1	B-001-0-55	N/A	417.8'	5060
B-1	B-001-0-55	N/A	416.0'	8180
B-1	B-001-0-55	N/A	415.7'	8450
B-1	B-001-0-55	N/A	413.6'	8280
B-1	B-001-0-55	N/A	413.5'	1600
B-1	B-001-0-55	N/A	412.0'	11220
B-1	B-001-0-55	N/A	410.7'	6200
B-2	B-002-0-55	N/A	441.8'	5300
B-2	B-002-0-55	N/A	436.8'	4800
B-2	B-002-0-55	N/A	432.8'	5100
B-2	B-002-0-55	N/A	426.8'	5900
B-2	B-002-0-55	N/A	424.4'	4800
B-2	B-002-0-55	N/A	423.0'	5100
B-2	B-002-0-55	N/A	417.8'	7200
B-3	B-003-0-55	N/A	436.2'	5680
B-3	B-003-0-55	N/A	426.5'	4840
B-3	B-003-0-55	N/A	422.5'	4440
B-3	B-003-0-55	N/A	421.0'	4760

SUMMARY OF DIRECT SHEAR (DS) TESTING DATA REMOLDED SOIL SAMPLES

ORIGINAL BORING NO.	SGE BORING NO.	SAMPLE NO.	APPROX. SAMPLE ELEVATION (MSL)	COHESION (TSF)	SOIL FRICTION ANGLE (deg)	TEST TYPE*
B-106A	B-106-A-58	92940	660.7' - 659.7'	0.12	23.2	QUICK, UU
B-106A	B-106-A-58	92943	657.7' - 656.7'	0.0	48.1	QUICK, UU
B-106A	B-106-A-58	92941	652.7' - 651.7'	0.08	38.7	QUICK, UU
B-106A	B-106-A-58	92942	646.7' - 645.7'	0.08	31.4	QUICK, UU
B-106A	B-106-A-58	93270	604.7' - 603.7'	0.02	5.7	QUICK, UU
B-106A	B-106-A-58	93274	554.7' - 553.7'	0.02	11.3	QUICK, CU

*UU = UNCONSOLIDATED UNDRAINED, CU = CONSOLIDATED, UNDRAINED

SUMMARY OF LOSS-ON-IGNITION (LOI) TESTING DATA

ORIGINAL BORING NO.	SGE BORING NO.	SAMPLE NO.	SAMPLE ELEVATION (MSL)	LOI (%)
B-016-0-09	B-016-0-09	11	647.7' - 646.2'	3.1
B-030-0-09	B-030-0-09	1	677.8' - 676.3'	2.0
B-042-0-09	B-042-0-09	3	578.4' - 576.9'	2.1
B-042-0-09	B-042-0-09	4	575.9' - 574.4'	1.0
B-042-0-09	B-042-0-09	7	568.4' - 566.9'	4.6
B-042-0-09	B-042-0-09	9	563.4' - 561.9'	2.6
B-043-0-09	B-043-0-09	6	570.8' - 569.3'	2.8
B-043-0-09	B-043-0-09	7	568.3' - 566.8'	14
B-044-0-09	B-044-0-09	7	564.6' - 563.1'	18.9
B-044-0-09	B-044-0-09	10	557.1' - 555.6'	8.9
SB-14	S-014-0-06	12A	634.2' - 633.7'	2.19
SB-14	S-014-0-06	12B	633.7' - 632.7'	4.35
SB-17	S-017-0-06	12	630.9' - 629.4'	2.81
VB-2	V-002-0-06	2B	575.8' - 574.8'	5.41
VB-2	V-002-0-06	6A	566.3' - 565.9'	3.35
VB-2	V-002-0-06	12	541.3' - 539.8'	2.17
VB-5	V-005-0-06	6B	568.4' - 567.9'	25.14
VB-5	V-005-0-06	7	566.9' - 565.4'	11.33
VB-5	V-005-0-06	8	564.4' - 562.9'	3.63
VB-5	V-005-0-06	9	559.4' - 557.9'	2.58
VB-7	V-007-0-06	5A	574.0' - 573.7'	17.49
VB-7	V-007-0-06	6	571.5' - 570.0'	6.35
VB-7	V-007-0-06	7A	569.0' - 568.2'	3.3
VB-7	V-007-0-06	7B	568.2' - 567.5'	20.55
VB-7	V-007-0-06	8	566.5' - 565.0'	14.63
VB-8	V-008-0-06	4	574.8' - 573.3'	18.53
VB-8	V-008-0-06	5	572.3' - 570.8'	5.64
VB-8	V-008-0-06	6	569.8' - 568.3'	5.8
VB-8	V-008-0-06	7	567.3' - 565.8'	14.4
VB-8	V-008-0-06	8	564.8' - 563.3'	9.13
VB-8	V-008-0-06	9	559.8' - 558.3'	4.79
VB-8	V-008-0-06	10	556.8' - 554.8'	3.5
VB-8	V-008-0-06	11	554.8' - 553.3'	2.35
VB-8	V-008-0-06	12	549.8' - 548.3'	2.23
VB-9	V-009-0-06	3	574.1' - 572.6'	6.61
VB-9	V-009-0-06	4	571.6' - 570.1'	7.26
VB-9	V-009-0-06	5	569.1' - 567.6'	15
VB-9	V-009-0-06	6	566.6' - 565.1'	14.6
VB-9	V-009-0-06	7	564.1' - 562.6'	10.2
VB-9	V-009-0-06	8	561.6' - 560.1'	3.72
VB-9	V-009-0-06	28	552.6' - 550.6'	3.81
VB-10	V-010-0-06	5	573.3' - 571.8'	6.81
VB-10	V-010-0-06	25	572.8' - 570.8'	7.56
VB-10	V-010-0-06	6	570.8' - 569.3'	6.78
VB-10	V-010-0-06	27	568.8' - 566.8'	8.01
VB-10	V-010-0-06	7	568.3' - 566.8'	16.82
VB-10	V-010-0-06	8	565.8' - 564.3'	12.74
VB-10	V-010-0-06	9	561.3' - 559.8'	5.32
VB-10	V-010-0-06	10	556.3' - 554.8'	2.38
VB-15	V-015-0-06	17	557.8' - 555.8'	2.59

SHEET INDEX OF SOIL BORING LOCATIONS

ORIGINAL BORING NO.	SGE BORING NO.	COMPANY (ABBREVIATED)	LOCATION OF BORING	
			BORING MARKER (PLAN)	BORING PROFILE
B-001-0-09	B-001-0-09	B&P	47	48
B-002-0-09	B-002-0-09	B&P	47	47
B-003-0-09	B-003-0-09	B&P	47	48
B-004-0-09	B-004-0-09	B&P	47	47
B-005-0-09	B-005-0-09	B&P	47	47
B-006-0-09	B-006-0-09	B&P	47	48
B-007-0-09	B-007-0-09	B&P	47	47
B-008-0-09	B-008-0-09	B&P	47	48
B-009-0-09	B-009-0-09	B&P	47	47
B-010-0-09	B-010-0-09	B&P	47	47
B-011-0-09	B-011-0-09	B&P	47	48
B-012-0-09	B-012-0-09	B&P	47	47
B-012-1-09	B-012-1-09	B&P	47	48
B-012-2-09	B-012-2-09	B&P	49	50
B-013-0-09	B-013-0-09	B&P	49	49
B-014-0-09	B-014-0-09	B&P	49	50
B-015-0-09	B-015-0-09	B&P	49	49
B-016-0-09	B-016-0-09	B&P	49	81
B-017-0-09	B-017-0-09	B&P	49	49
B-018-0-09	B-018-0-09	B&P	49	82
B-019-0-09	B-019-0-09	B&P	51	83
B-019-1-09	B-019-1-09	B&P	51	83
B-020-0-09	B-020-0-09	B&P	51	52, 83
B-021-0-09	B-021-0-09	B&P	51	52
B-022-0-09	B-022-0-09	B&P	51	52, 84
B-022-1-09	B-022-1-09	B&P	51	N/A - NO LOG
B-023-0-09	B-023-0-09	B&P	51	52
B-023-1-09	B-023-1-09	B&P	51	114
B-023-2-09	B-023-2-09	B&P	51	54, 114
B-024-0-09	B-024-0-09	B&P	51	55
B-025-0-09	B-025-0-09	B&P	51	52
B-027-0-09	B-027-0-09	B&P	51	54
B-027-1-09	B-027-1-09	B&P	51	54
B-028-0-09	B-028-0-09	B&P	51	54
B-029-0-09	B-029-0-09	B&P	51	55
B-030-0-09	B-030-0-09	B&P	51	54
B-031-0-09	B-031-0-09	B&P	51	52
B-032-0-09	B-032-0-09	B&P	51	54, 55
B-033-0-09	B-033-0-09	B&P	51	54
B-034-0-09	B-034-0-09	B&P	51	55, 86
B-035-0-09	B-035-0-09	BBCM	56	57, 88
B-036-0-09	B-036-0-09	BBCM	56	110
B-037-0-09	B-037-0-09	BBCM	56	110
B-037-1-09	B-037-1-09	BBCM	56	57, 90
B-037-2-09	B-037-2-09	BBCM	56	111
B-038-0-09	B-038-0-09	BBCM	56	110
B-038-1-09	B-038-1-09	BBCM	56	111
B-039-0-09	B-039-0-09	B&P	56	57, 94
B-040-0-09	B-040-0-09	B&P	56	57
B-041-0-09	B-041-0-09	B&P	59	60
B-042-0-09	B-042-0-09	B&P	59	60
B-043-0-09	B-043-0-09	B&P	59	60
B-044-0-09	B-044-0-09	B&P	59	60
B-045-0-09	B-045-0-09	B&P	64	65
B-047-0-09	B-047-0-09	B&P	64	67, 98
B-047-1-09	B-047-1-09	B&P	64	65, 98
B-048-0-09	B-048-0-09	B&P	64	65, 67
B-050-0-09	B-050-0-09	B&P	64	67
B-051-0-09	B-051-0-09	B&P	64	65
B-052-0-09	B-052-0-09	B&P	64	67
B-053-0-09	B-053-0-09	B&P	64	68
B-054-0-09	B-054-0-09	B&P	64	72, 100
B-055-0-09	B-055-0-09	B&P	64	65, 71, 100
B-056-0-09	B-056-0-09	B&P	64	72
B-058-0-09	B-058-0-09	B&P	64	71
B-059-0-09	B-059-0-09	B&P	64	65
B-060-0-09	B-060-0-09	B&P	69	70, 71, 101
B-061-0-09	B-061-0-09	B&P	69	72, 101
B-062-0-09	B-062-0-09	B&P	69	101
B-063-0-09	B-063-0-09	B&P	69	70
B-064-0-09	B-064-0-09	B&P	69	71
B-067-0-09	B-067-0-09	B&P	69	74
B-068-0-09	B-068-0-09	B&P	69	74
B-069-0-09	B-069-0-09	B&P	69	74, 113
B-070-0-09	B-070-0-09	B&P	59, 75	76
B-070-1-09	B-070-1-09	B&P	59, 75	76

B&P = BARR & PREVOST
 BBCM = BBC&M ENGINEERING, INC.
 DLZ = DLZ CORPORATION
 HNTB = HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS
 LEWIN = DAVID V. LEWIN CORPORATION
 ODOT = OHIO DEPARTMENT OF TRANSPORTATION
 R&R = R&R INTERNATIONAL, INC.

SHEET INDEX OF SOIL BORING LOCATIONS (CONT.)

ORIGINAL BORING NO.	SGE BORING NO.	COMPANY (ABBREVIATED)	LOCATION OF BORING	
			BORING MARKER (PLAN)	BORING PROFILE
B-070-2-09	B-070-2-09	B&P	75	N/A - SEE BINDER
B-070-3-09	B-070-3-09	B&P	75	N/A - SEE BINDER
B-071-0-09	B-071-0-09	B&P	75	76
B-072-0-09	B-072-0-09	B&P	75	76
B-073-0-09	B-073-0-09	B&P	75	76
B-073-1-09	B-073-1-09	B&P	75	76
B-074-0-09	B-074-0-09	B&P	75	76
B-075-0-09	B-075-0-09	B&P	78	79
B-076-0-09	B-076-0-09	B&P	78	79
B-076-1-09	B-076-1-09	B&P	78	79
B-076-2-09	B-076-2-09	B&P	78	79
B-076-3-09	B-076-3-09	B&P	78	79
B-077-0-09	B-077-0-09	B&P	78	80
B-05-01	B-001-0-06	BBCM	56	57
B-05-02	B-002-0-06	BBCM	56	108
B-05-03	B-003-0-06	BBCM	56	102
B-05-04	B-004-0-06	BBCM	56	106
B-05-07	B-007-0-06	BBCM	51	88
B-05-08	B-008-0-06	BBCM	51	52, 86
B-05-11	B-011-0-06	BBCM	56	88
B-05-12	B-012-0-06	BBCM	56	90
B-05-13	B-013-0-06	BBCM	56	94
B-05-14	B-014-0-06	BBCM	56	94
B-05-15	B-015-0-06	BBCM	56	57, 96
B-05-16	B-016-0-06	BBCM	56	57, 92
B-105A	B-105-A-06	BBCM	56	92, 104
B-108A	B-108-A-06	BBCM	56	108
B-2	B-002-0-00	DLZ	56	94
B-3	B-003-0-00	DLZ	56	96
B-4	B-004-0-00	DLZ	59	N/A - SEE BINDER
B-204	B-204-0-98	BBCM	56	N/A - NO LOG
B-303	B-303-0-98	BBCM	56	N/A - NO LOG
B-201	B-201-0-96	BBCM	56	N/A - SEE BINDER
B-202	B-202-0-96	BBCM	56	N/A - SEE BINDER
B-203	B-203-0-96	BBCM	56	N/A - SEE BINDER
B-1	B-001-0-96	BBCM	64	N/A - SEE BINDER
B-2	B-002-0-96	BBCM	64	N/A - SEE BINDER
B-101	B-101-0-94	BBCM	56	102
B-102	B-102-0-94	BBCM	56	102
B-103	B-103-0-94	BBCM	56	N/A - SEE BINDER
B-104	B-104-0-94	BBCM	56	N/A - SEE BINDER
B-105	B-105-0-94	BBCM	56	N/A - SEE BINDER
B-106	B-106-0-94	BBCM	56	N/A - SEE BINDER
B-107	B-107-0-94	BBCM	56	108
B-108	B-108-0-94	BBCM	56	N/A - SEE BINDER
B-109	B-109-0-94	BBCM	56	92, 108
B-110	B-110-0-94	BBCM	56	92
B-10	B-010-0-92	ODOT	56	N/A - SEE BINDER
B-1	B-001-0-90	ODOT	56	N/A - SEE BINDER
B-2	B-002-0-90	ODOT	56	106
B-3	B-003-0-90	ODOT	56	104
B-4	B-004-0-90	ODOT	56	N/A - SEE BINDER
B-5	B-005-0-90	ODOT	56	106
B-6	B-006-0-90	ODOT	56	N/A - SEE BINDER
B-7	B-007-0-90	ODOT	56	N/A - SEE BINDER
B-8	B-008-0-90	ODOT	56	92, 106
B-9	B-009-0-90	ODOT	56	N/A - SEE BINDER
B-4	B-004-0-86	LEWIN	69	N/A - SEE BINDER
B-5	B-005-0-86	LEWIN	64	N/A - SEE BINDER
B-8	B-008-0-86	R & R	51	N/A - SEE BINDER
B-10	B-010-0-64	ODOT	49	49, 82
B-84	B-084-0-64	ODOT	49	81
B-90	B-090-0-64	ODOT	49	N/A - SEE BINDER
B-6	B-006-0-63	ODOT	51	N/A - SEE BINDER
B-13	B-013-0-63	ODOT	51	N/A - SEE BINDER
B-23	B-023-0-63	ODOT	51	N/A - SEE BINDER
B-103	B-103-0-58	ODOT	69	71
B-106	B-106-0-58	ODOT	69	N/A - SEE BINDER
B-106A	B-106-A-58	ODOT	69	N/A - SEE BINDER
B-111	B-111-0-58	ODOT	73	N/A - SEE BINDER
B-114	B-114-0-58	ODOT	73	N/A - SEE BINDER
B-121	B-121-0-58	ODOT	78	N/A - SEE BINDER
BE-1	B-001-E-56	HNTB	64	N/A - SEE BINDER
BE-2	B-002-E-56	HNTB	64	N/A - SEE BINDER
BE-3	B-003-E-56	HNTB	64	N/A - SEE BINDER
BE-4	B-004-E-56	HNTB	64	N/A - SEE BINDER



PID NO.
77332

SOIL PROFILE

CUY-90-14.52



SHEET INDEX OF SOIL BORING LOCATIONS (CONT.)

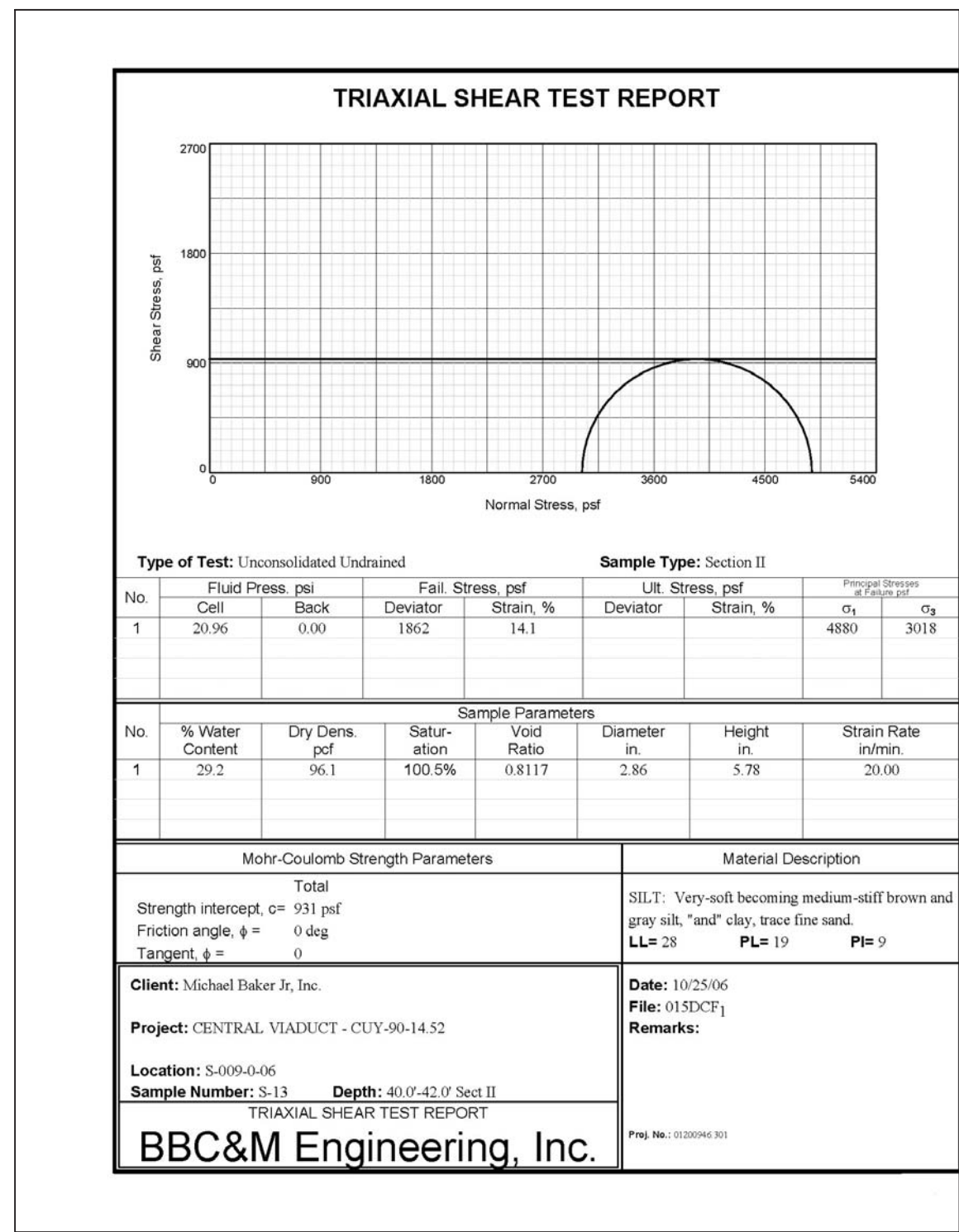
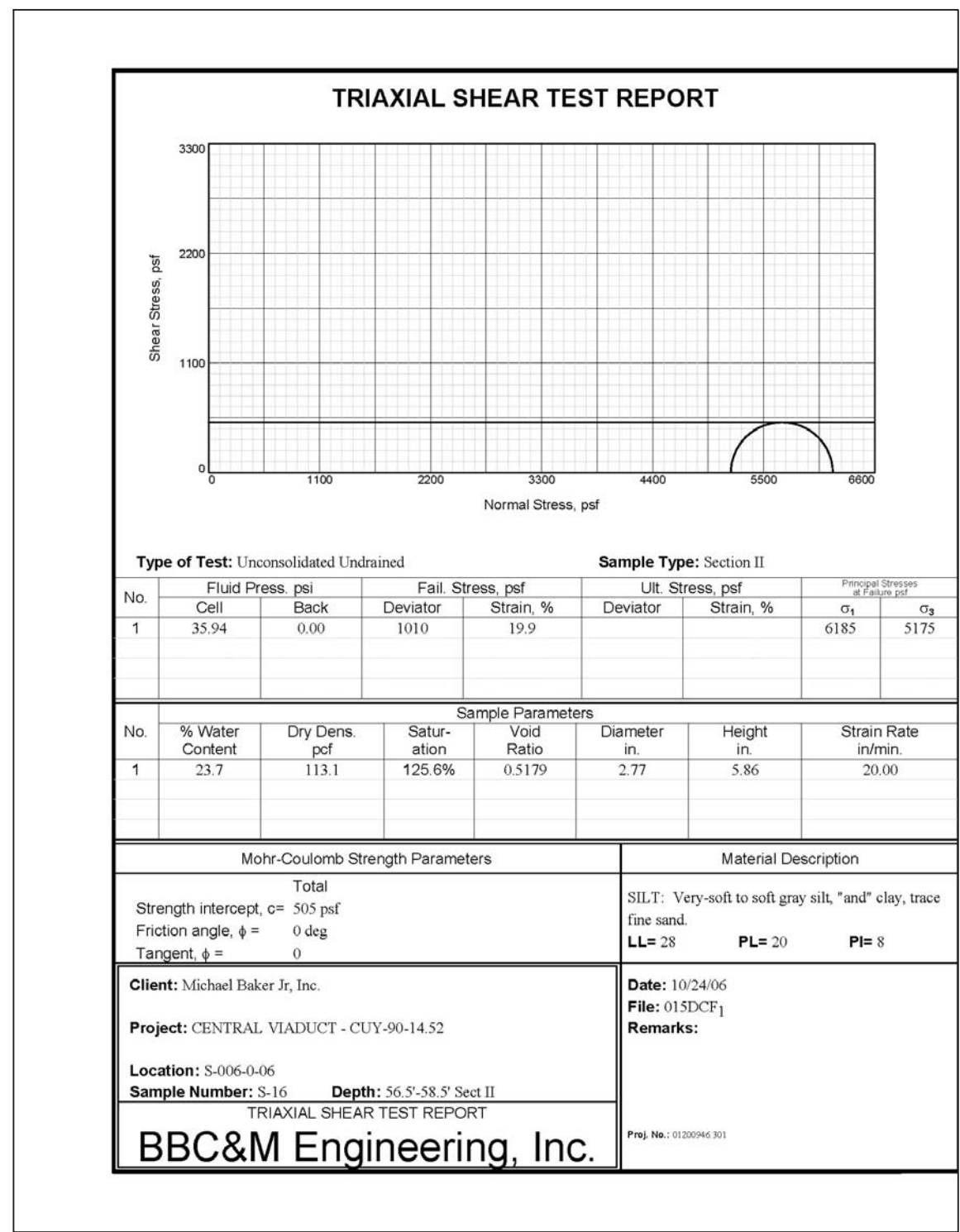
ORIGINAL BORING NO.	SGE BORING NO.	COMPANY (ABBREVIATED)	LOCATION OF BORING	
			BORING MARKER (PLAN)	BORING PROFILE
BE-5	B-005-E-56	HNTB	64	N/A - SEE BINDER
BE-6	B-006-E-56	HNTB	64	N/A - SEE BINDER
BE-7	B-007-E-56	HNTB	64	71
BE-8	B-008-E-56	HNTB	64	N/A - SEE BINDER
BE-9	B-009-E-56	HNTB	64	N/A - SEE BINDER
BE-10	B-010-E-56	HNTB	69	N/A - SEE BINDER
BE-11	B-011-E-56	HNTB	69	N/A - SEE BINDER
B-1	B-001-0-55	NYC & ST LRR	56	110
B-2	B-002-0-55	NYC & ST LRR	56	92, 110
B-3	B-003-0-55	NYC & ST LRR	56	94
B-4	B-004-0-55	NYC & ST LRR	56	N/A - SEE BINDER
Boring-1	B-001-1-55	HNTB	56	N/A - SEE BINDER
Boring-2	B-002-1-55	HNTB	56	N/A - SEE BINDER
BW-1	B-001-W-55	HNTB	56	N/A - SEE BINDER
BW-2	B-002-W-55	HNTB	56	104
BW-3	B-003-W-55	HNTB	56	N/A - SEE BINDER
BW-4	B-004-W-55	HNTB	51	N/A - SEE BINDER
BW-5	B-005-W-55	HNTB	51	N/A - SEE BINDER
BW-6	B-006-W-55	HNTB	51	86
A	B-00A-0-54	HNTB	59	N/A - SEE BINDER
B	B-00B-0-54	HNTB	59	N/A - SEE BINDER
C	B-00C-0-54	HNTB	64	N/A - SEE BINDER
1	B-001-0-54	HNTB	56	N/A - SEE BINDER
2	B-002-0-54	HNTB	56	N/A - SEE BINDER
3	B-003-0-54	HNTB	56	N/A - SEE BINDER
4	B-004-0-54	HNTB	56	N/A - SEE BINDER
5	B-005-0-54	HNTB	56	N/A - SEE BINDER
6	B-006-0-54	HNTB	56	N/A - SEE BINDER
7	B-007-0-54	HNTB	56	N/A - SEE BINDER
8	B-008-0-54	HNTB	56	N/A - SEE BINDER
9	B-009-0-54	HNTB	59	N/A - SEE BINDER
10	B-010-0-54	HNTB	59	N/A - SEE BINDER
11	B-011-0-54	HNTB	59	N/A - SEE BINDER
12	B-012-0-54	HNTB	59	N/A - SEE BINDER
13	B-013-0-54	HNTB	59	N/A - SEE BINDER
14	B-014-0-54	HNTB	59	N/A - SEE BINDER
15	B-015-0-54	HNTB	59	N/A - SEE BINDER
16	B-016-0-54	HNTB	59	N/A - SEE BINDER
17	B-017-0-54	HNTB	64	N/A - SEE BINDER
18	B-018-0-54	HNTB	64	N/A - SEE BINDER
19	B-019-0-54	HNTB	64	N/A - SEE BINDER
20	B-020-0-54	HNTB	64	N/A - SEE BINDER
C-049-0-09	C-049-0-09	ODOT	64	N/A - SEE BINDER
C-057-0-09	C-057-0-09	ODOT	64	N/A - SEE BINDER
C-05-01	C-001-0-06	OU	56	N/A - SEE BINDER
C-05-02	C-002-0-06	OU	56	N/A - SEE BINDER
C-05-03	C-003-0-06	OU	56	N/A - SEE BINDER
C-05-04	C-004-0-06	OU	56	N/A - SEE BINDER
C-05-05	C-005-0-06	OU	51	N/A - SEE BINDER
C-05-06	C-006-0-06	OU	51	N/A - SEE BINDER
C-05-07	C-007-0-06	OU	51	N/A - SEE BINDER
C-05-08	C-008-0-06	OU	51	N/A - SEE BINDER
C-05-09	C-009-0-06	OU	51	N/A - SEE BINDER
C-05-10	C-010-0-06	OU	51	N/A - SEE BINDER
C-05-11	C-011-0-06	OU	56	N/A - SEE BINDER
C-05-12	C-012-0-06	OU	56	N/A - SEE BINDER
C-05-13	C-013-0-06	OU	56	N/A - SEE BINDER
C-05-14	C-014-0-06	OU	56	N/A - SEE BINDER
C-05-15	C-015-0-06	OU	56	N/A - SEE BINDER
P-1	P-001-0-94	BBCM	56	N/A - SEE BINDER
P-2	P-002-0-94	BBCM	56	104
P-3	P-003-0-94	BBCM	56	N/A - SEE BINDER
P-4	P-004-0-94	BBCM	56	N/A - SEE BINDER
P-5	P-005-0-94	BBCM	56	N/A - SEE BINDER
RB-1	R-001-0-06	BBCM	47	48
RB-2	R-002-0-06	BBCM	49	50
RB-3	R-003-0-06	BBCM	49	50
RB-4	R-004-0-06	BBCM	49	49
RB-5	R-005-0-06	BBCM	73	N/A - SEE BINDER
RB-6	R-006-0-06	BBCM	73	N/A - SEE BINDER
RB-7	R-007-0-06	BBCM	59, 75	76
RB-8	R-008-0-06	BBCM	75	76
RB-9	R-009-0-06	BBCM	75	76
RB-10	R-010-0-06	BBCM	78	N/A - SEE BINDER
RB-11	R-011-0-06	BBCM	78	79

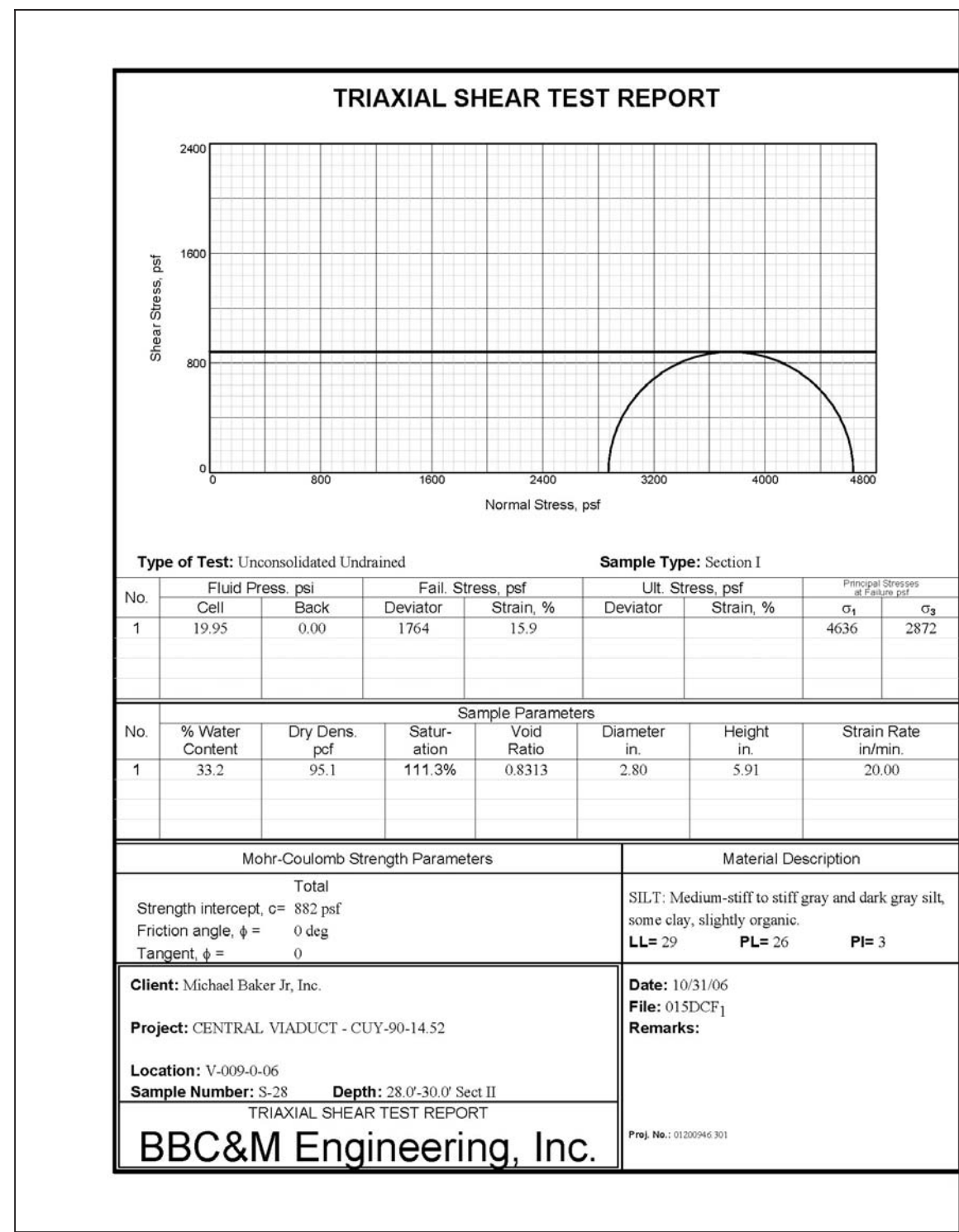
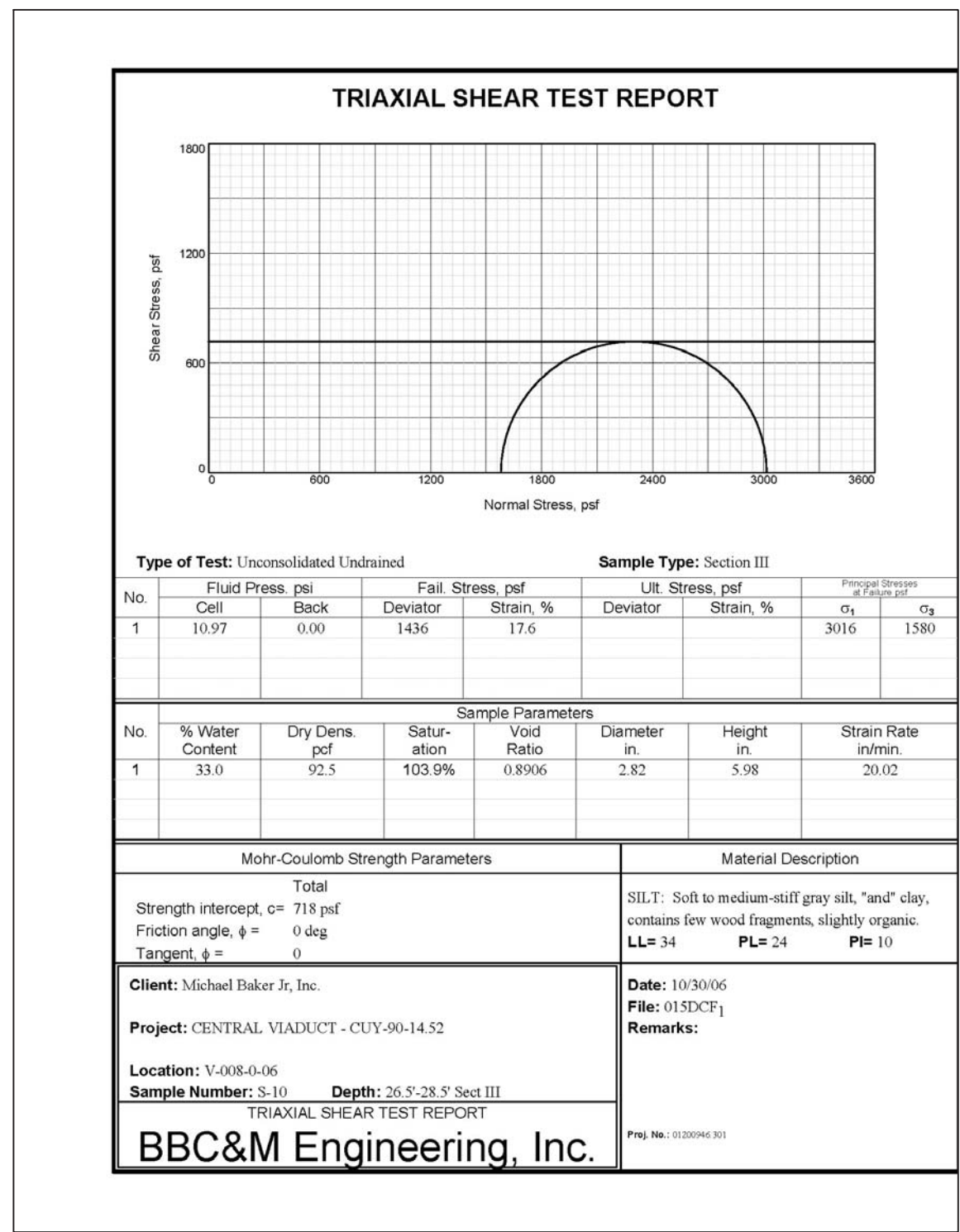
BBCM = BBC&M ENGINEERING, INC.
 CUT = CLEVELAND UNION TERMINAL COMPANY
 HNTB = HOWARD, NEEDLES, TAMMEN & BERGENOFF CONSULTING ENGINEERS
 NYC&ST LRR = NEW YORK, CHICAGO & ST. LOUIS RAILROAD COMPANY
 ODOT = OHIO DEPARTMENT OF TRANSPORTATION
 OU = OHIO UNIVERSITY

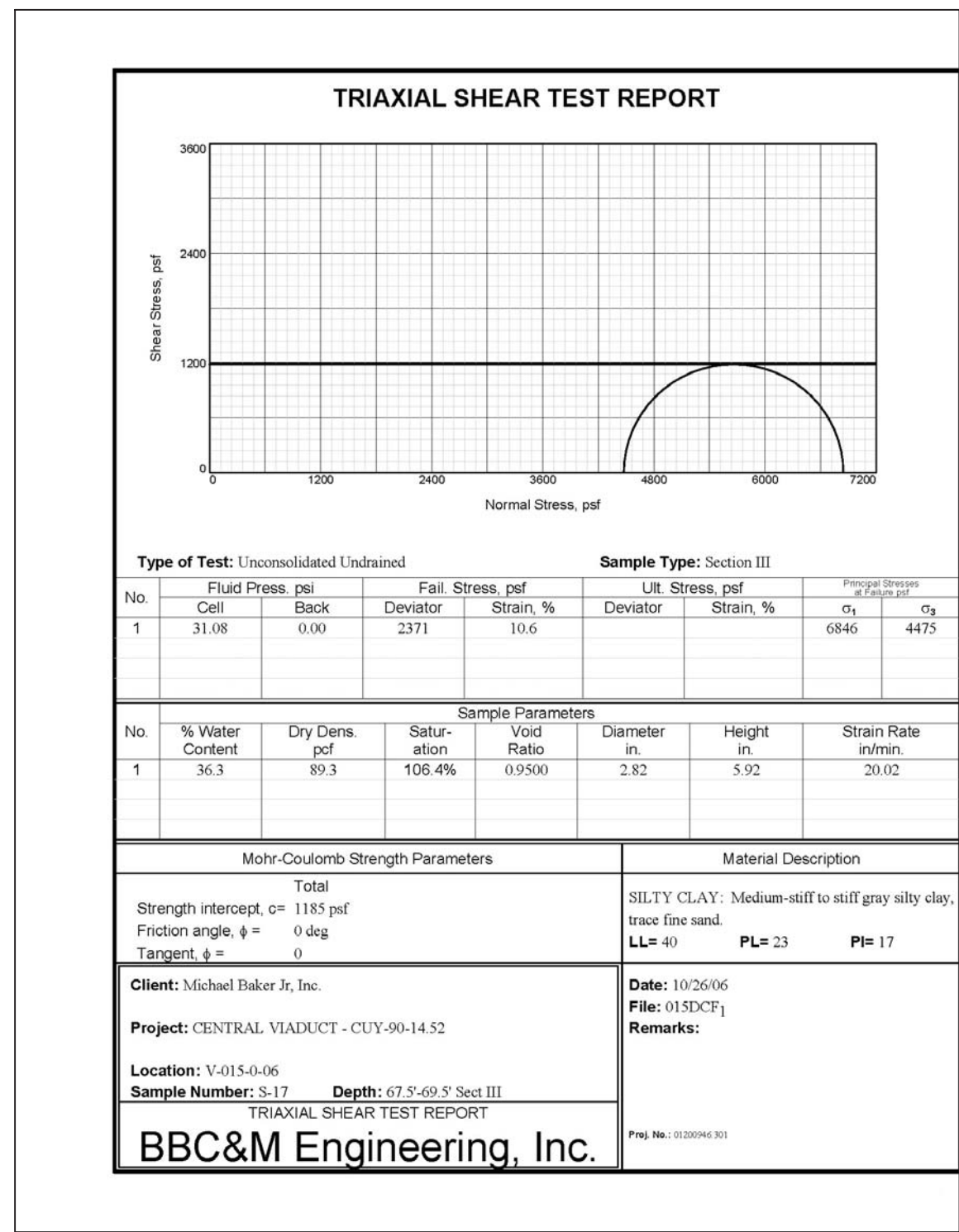
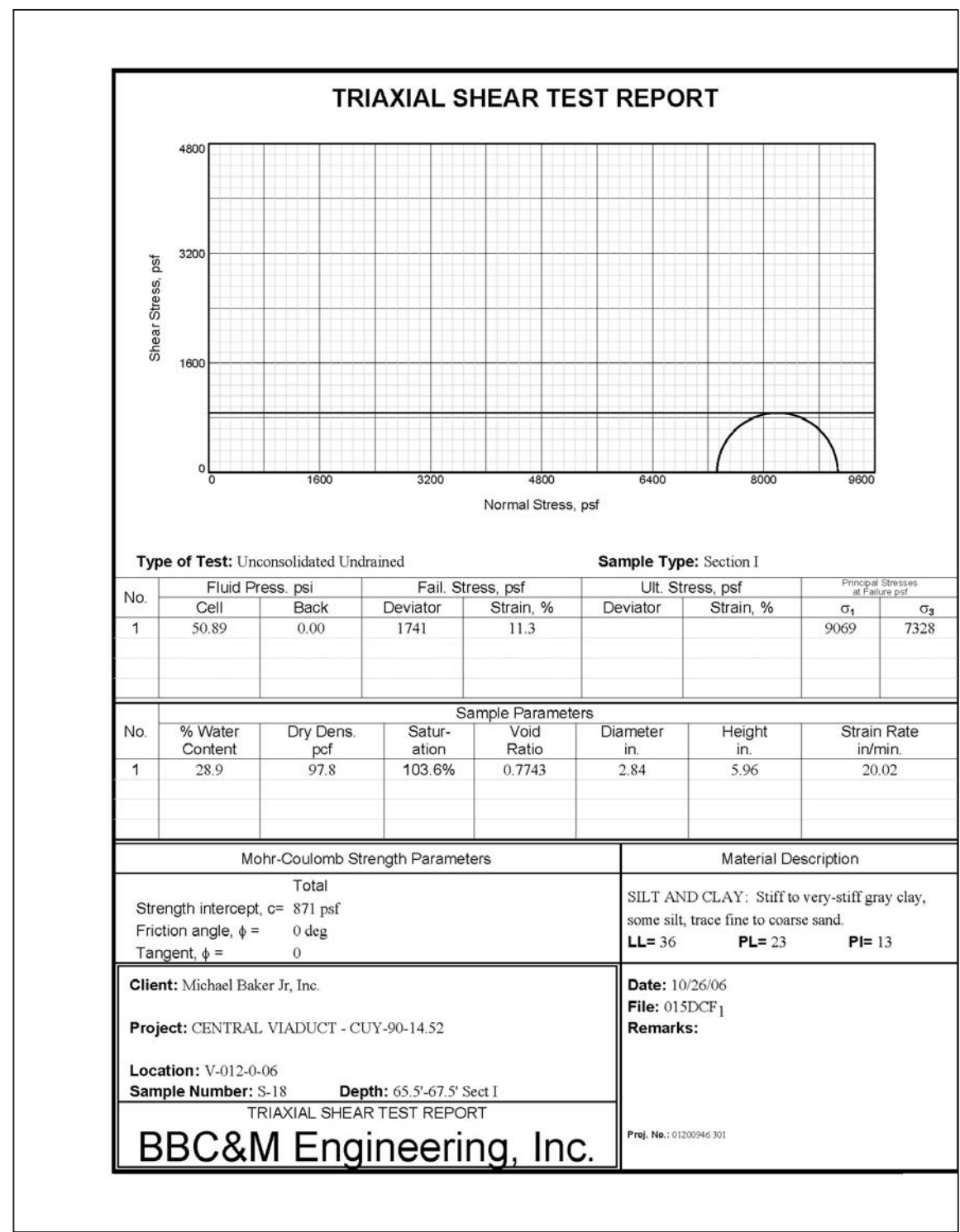
SHEET INDEX OF SOIL BORING LOCATIONS (CONT.)

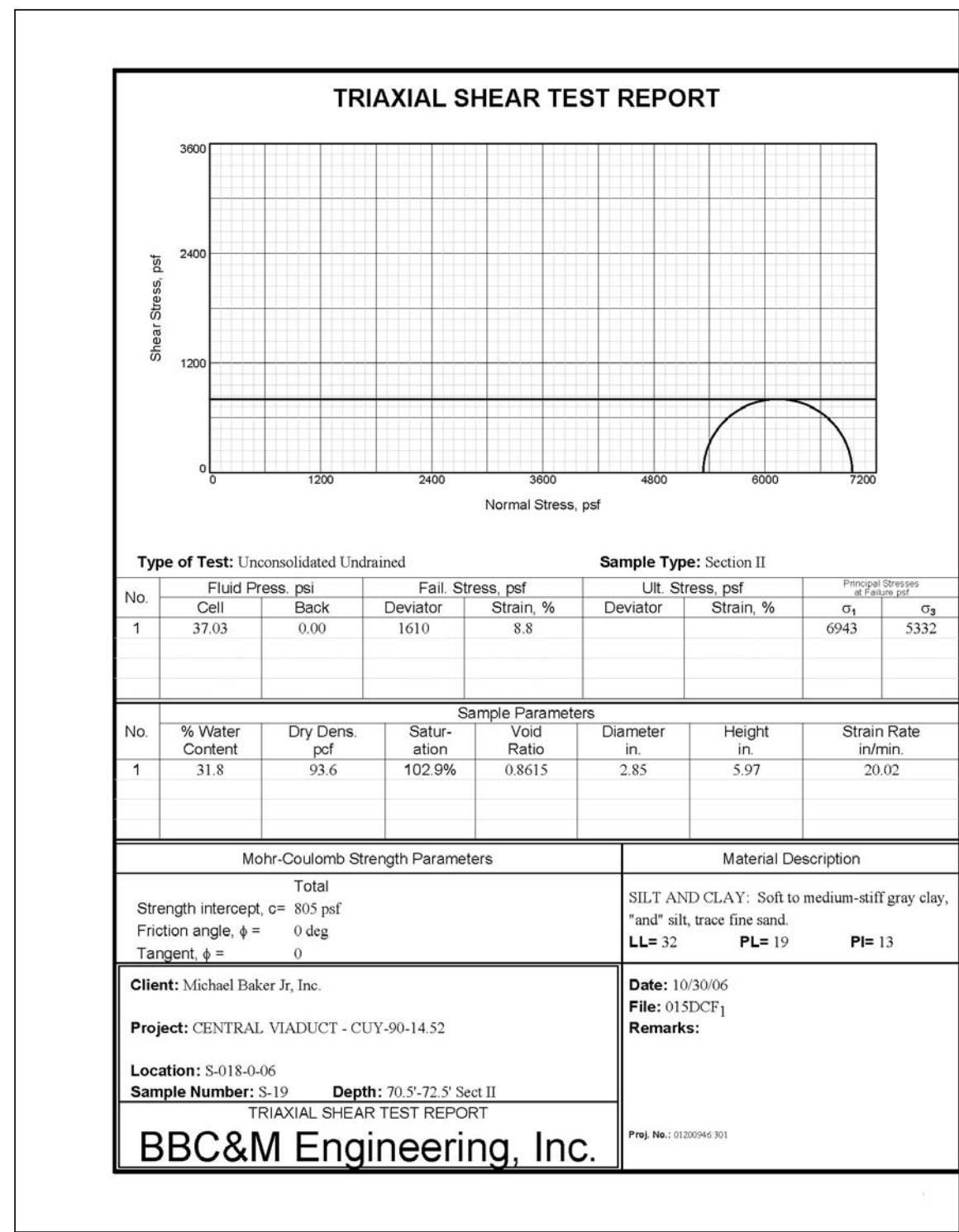
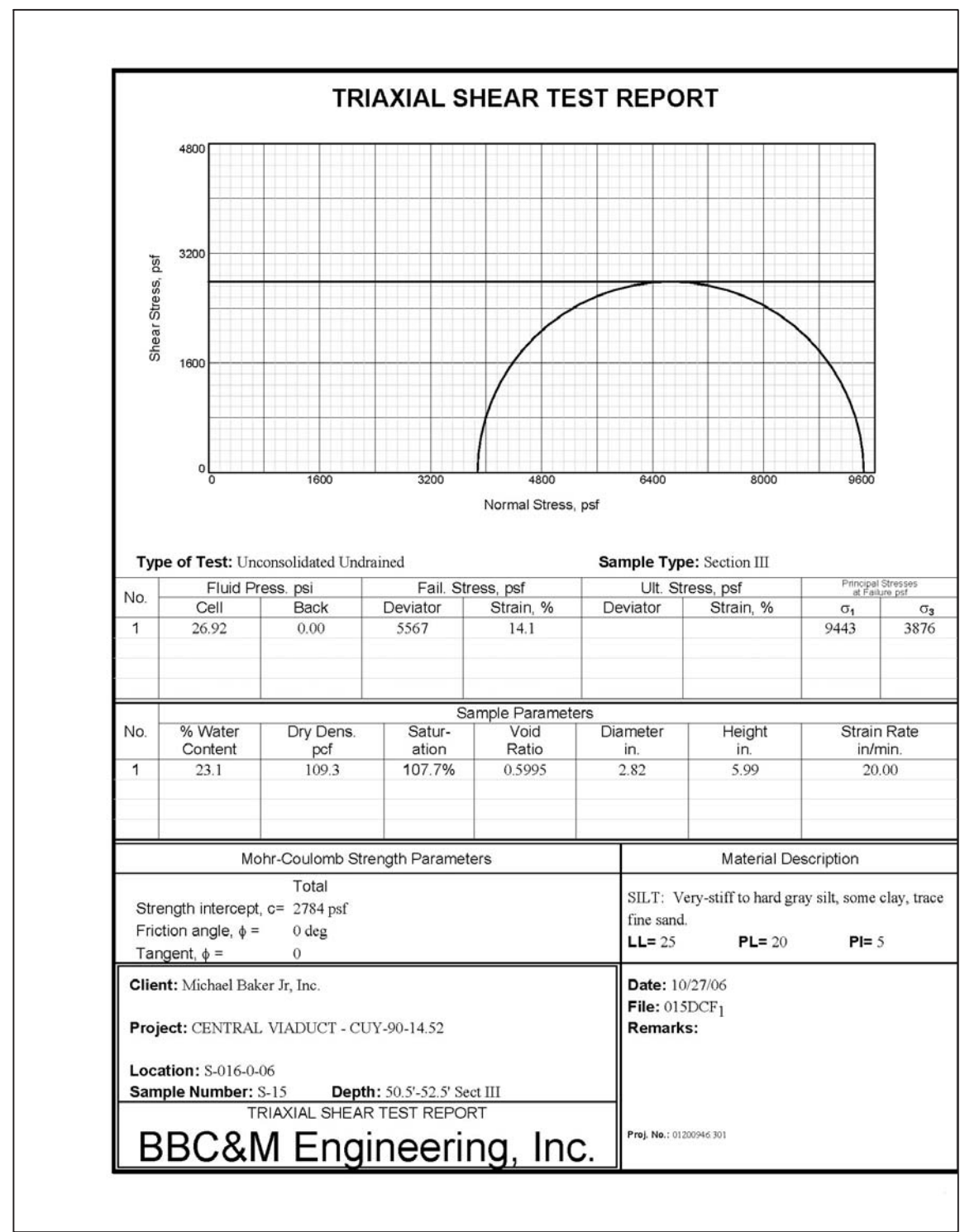
ORIGINAL BORING NO.	SGE BORING NO.	COMPANY (ABBREVIATED)	LOCATION OF BORING	
			BORING MARKER (PLAN)	BORING PROFILE
RB-12	R-012-0-06	BBCM	78	79, 80
RB-13	R-013-0-06	BBCM	78	79
RB-14	R-014-0-06	BBCM	75	77
RB-15	R-015-0-06	BBCM	64	77
RB-16	R-016-0-06	BBCM	78	80
RB-17	R-017-0-06	BBCM	73	N/A - SEE BINDER
RB-18	R-018-0-06	BBCM	73	N/A - SEE BINDER
RB-22	R-022-0-06	BBCM	73	N/A - SEE BINDER
RB-23	R-023-0-06	BBCM	73	N/A - SEE BINDER
R-201	R-201-0-58	ODOT	69	N/A - SEE BINDER
R-202	R-202-0-58	ODOT	69	N/A - SEE BINDER
R-204	R-204-0-58	ODOT	73	N/A - SEE BINDER
SB-1	S-001-0-06	BBCM	49	49
SB-2	S-002-0-06	BBCM	49	50
SB-3	S-003-0-06	BBCM	49	49
SB-4	S-004-0-06	BBCM	49	50
SB-5	S-005-0-06	BBCM	49	50
SB-6	S-006-0-06	BBCM	49	49
SB-7	S-007-0-06	BBCM	49	50
SB-8	S-008-0-06	BBCM	49	49
SB-9	S-009-0-06	BBCM	51	52
SB-10	S-010-0-06	BBCM	51	84
SB-11	S-011-0-06	BBCM	51	52
SB-12	S-012-0-06	BBCM	51	52
SB-13	S-013-0-06	BBCM	69	70, 72
SB-14	S-014-0-06	BBCM	69	70
SB-15	S-015-0-06	BBCM	69	70
SB-16	S-016-0-06	BBCM	69	74
SB-17	S-017-0-06	BBCM	69	74
SB-18	S-018-0-06	BBCM	69	74
SB-19	S-019-0-06	BBCM	73	112
SB-20	S-020-0-06	BBCM	73	74, 112
SB-21	S-021-0-06	BBCM	73	N/A - SEE BINDER
SB-22	S-022-0-06	BBCM	73	N/A - SEE BINDER
SB-23	S-023-0-06	BBCM	73	N/A - SEE BINDER
SB-27	S-027-0-06	BBCM	75	76
SB-28	S-028-0-06	BBCM	75	76
SB-29	S-029-0-06	BBCM	78	76, 79
T-9	T-009-0-23	CUT	78	N/A - SEE BINDER
T-9-1/2	T-009-1-23	CUT	78	N/A - SEE BINDER
T-11	T-011-0-23	CUT	78	N/A - SEE BINDER
T-12	T-012-0-23	CUT	78	N/A - SEE BINDER
T-13-1/2	T-013-1-23	CUT	75	N/A - SEE BINDER
T-14	T-014-0-23	CUT	75	N/A - SEE BINDER
T-16-1/2	T-016-1-23	CUT	75	N/A - SEE BINDER
T-17	T-017-0-23	CUT	75	N/A - SEE BINDER
T-18	T-018-0-23	CUT	64	N/A - SEE BINDER
T-18-1/2	T-018-1-23	CUT	64	N/A - SEE BINDER
T-19	T-019-0-23	CUT	64	N/A - SEE BINDER
VB-2	V-002-0-06	BBCM	56	96
VB-3	V-003-0-06	BBCM	56	N/A - SEE BINDER
VB-4	V-004-0-06	BBCM	59	60
VB-5	V-005-0-06	BBCM	59	60
VB-7	V-007-0-06	BBCM	59	62
VB-8	V-008-0-06	BBCM	59	62
VB-9	V-009-0-06	BBCM	59	62
VB-10	V-010-0-06	BBCM	59	62
VB-11	V-011-0-06	BBCM	64	65
VB-11A	V-011-A-06	BBCM	64	67
VB-12	V-012-0-06	BBCM	64	98
VB-13	V-013-0-06	BBCM	64	65, 77
VB-14	V-014-0-06	BBCM	64	65
VB-15	V-015-0-06	BBCM	64	65
VB-16	V-016-0-06	BBCM	64	100
VB-17	V-017-0-06	BBCM	64	65, 71
VB-18	V-018-0-06	BBCM	64	72
WB-1	W-001-0-06	BBCM	51	53
WB-2	W-002-0-06	BBCM	51	53
WB-3	W-003-0-06	BBCM	51	54
WB-4	W-004-0-06	BBCM	51	54
WB-5	W-005-0-06	BBCM	69	74
WB-6	W-006-0-06	BBCM	69	113
WB-7	W-007-0-06	BBCM	73	74
WB-8	W-008-0-06	BBCM	69	72



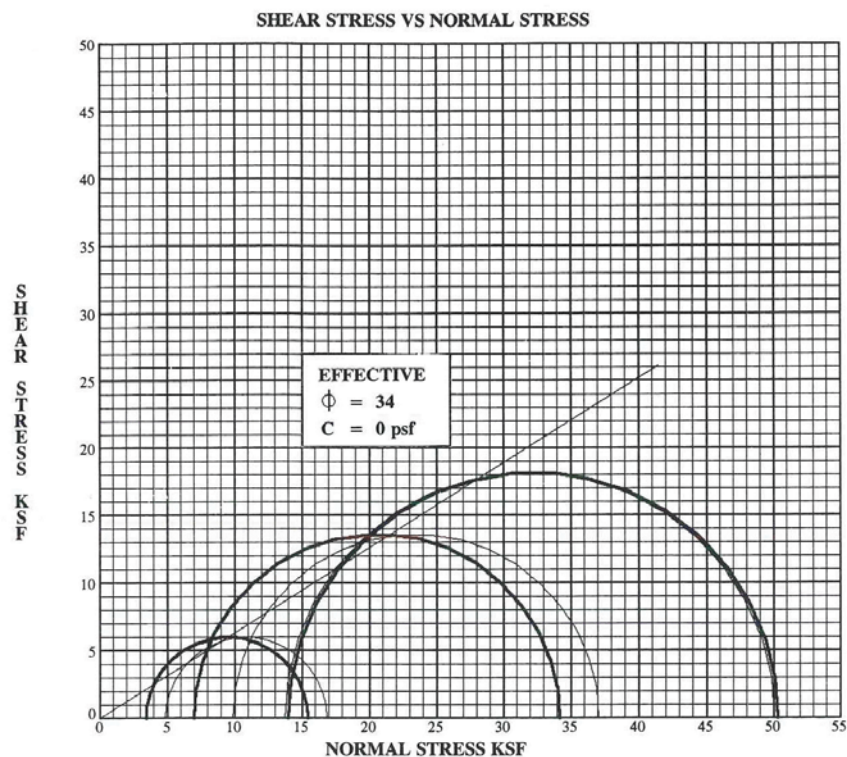








SUMMARY OF TRIAXIAL COMPRESSION TESTS
SATURATED, CONSOLIDATED, UNDRAINED
(RESIDUAL PLOTTED)

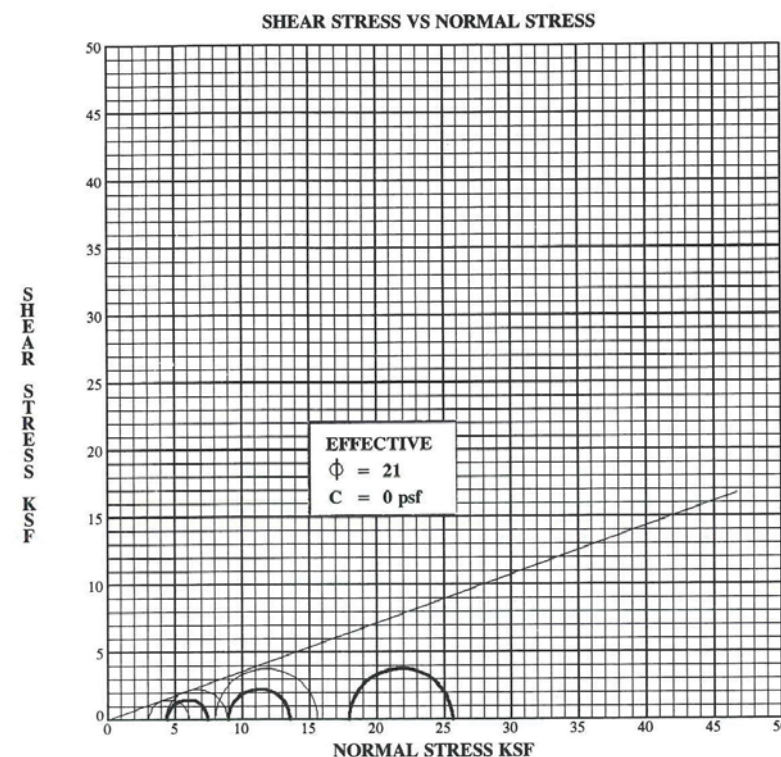


Specimen Identification	Classification	DD	MC%
B-101 S-11 I 55.0'-56.8'	Gray silt, trace fine to medium sand, trace clay, few lenses of fine sand. A-4b (8)	110	19
B-101 S-11 II 55.0'-56.8'	Gray silt, trace fine to medium sand, trace clay, few lenses of fine sand. A-4b (8)	113	18
B-101 S-11 III 55.0'-56.8'	Gray silt, trace fine to medium sand, trace clay, few lenses of fine sand. A-4b (8)	114	18



PROJECT CUY-90-15.24
LOCATION Cleveland, Ohio
JOB NO. 4500 DATE 10/31/94

SUMMARY OF TRIAXIAL COMPRESSION TESTS
SATURATED, CONSOLIDATED, UNDRAINED
(RESIDUAL PLOTTED)



Specimen Identification	Classification	DD	MC%
B-101 S-22 I 105.0'-107.0'	Stiff gray silty clay, trace fine to coarse sand, trace fine gravel, few silt nodules. A-7-6 (12)	90	32
B-101 S-22 II 105.0'-107.0'	Stiff gray silty clay, trace fine to coarse sand, trace fine gravel, few silt nodules. A-7-6 (12)	91	32
B-101 S-22 III 105.0'-107.0'	Stiff gray silty clay, trace fine to coarse sand, trace fine gravel, few silt nodules. A-7-6 (12)	92	31



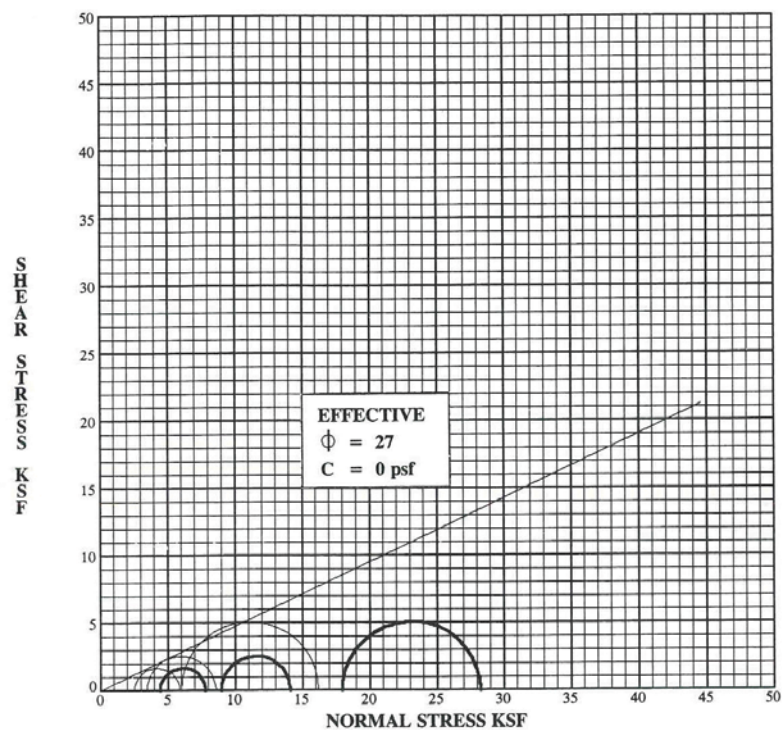
PROJECT CUY-90-15.24
LOCATION Cleveland, Ohio
JOB NO. 4500 DATE 10/31/94



SUMMARY OF TRIAXIAL COMPRESSION TESTS

SATURATED, CONSOLIDATED, UNDRAINED
(RESIDUAL PLOTTED)

SHEAR STRESS VS NORMAL STRESS



TOTAL STRESS ——— EFFECTIVE STRESS ———

Specimen Identification	Classification	DD	MC%
B-102 S-23 I 115.5'-117.1'	Medium-stiff to stiff gray silty clay, trace fine to coarse sand, trace fine gravel. A-6b(11)	94	30
B-102 S-23 II 115.5'-117.1'	Medium-stiff to stiff gray silty clay, trace fine to coarse sand, trace fine gravel. A-6b(11)	94	30
B-102 S-23 III 115.5'-117.1'	Medium-stiff to stiff gray silty clay, trace fine to coarse sand, trace fine gravel. A-6b(11)	95	29

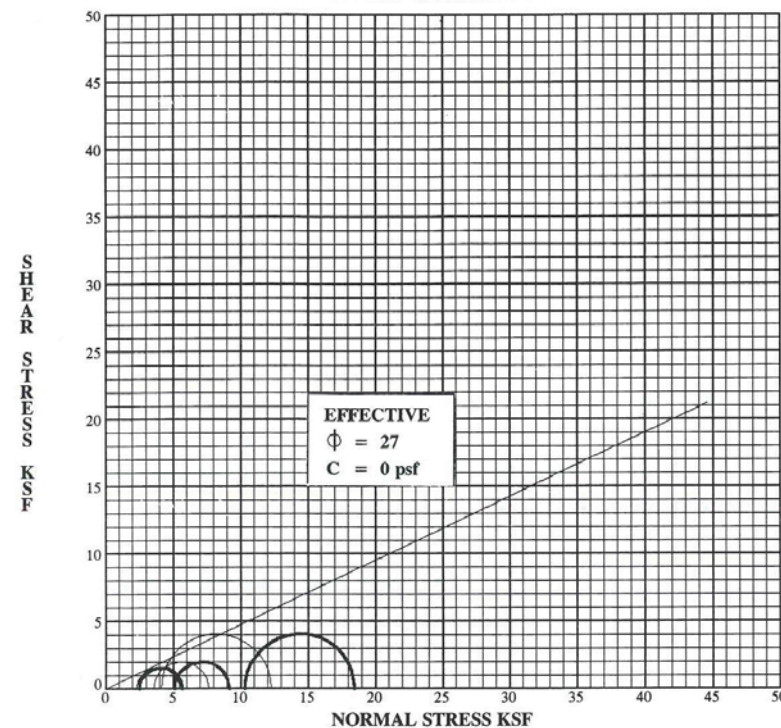


PROJECT CUY-90-15.24
LOCATION Cleveland, Ohio
JOB NO. 4500 DATE 10/31/94

SUMMARY OF TRIAXIAL COMPRESSION TESTS

SATURATED, CONSOLIDATED, UNDRAINED
(RESIDUAL PLOTTED)

SHEAR STRESS VS NORMAL STRESS



TOTAL STRESS ——— EFFECTIVE STRESS ———

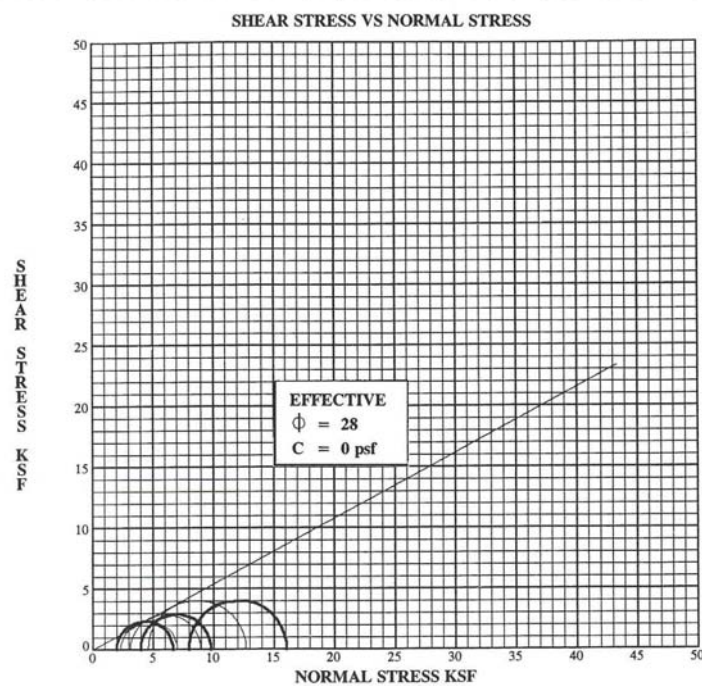
Specimen Identification	Classification	DD	MC%
P-2 S-9 I 42.5'-44.5'	Stiff to very-stiff gray silty clay, trace fine to coarse sand, trace fine gravel, many lenses and seams of silt. A-6a (10)	93	31
P-2 S-9 II 42.5'-44.5'	Stiff to very-stiff gray silty clay, trace fine to coarse sand, trace fine gravel, many lenses and seams of silt. A-6a (10)	98	27
P-2 S-9 III 42.5'-44.5'	Stiff to very-stiff gray silty clay, trace fine to coarse sand, trace fine gravel, many lenses and seams of silt. A-6a (10)	98	25



PROJECT CUY-90-15.24
LOCATION Cleveland, Ohio
JOB NO. 4500 DATE 10/31/94



SUMMARY OF TRIAXIAL COMPRESSION TESTS
SATURATED, CONSOLIDATED, UNDRAINED
(RESIDUAL PLOTTED)



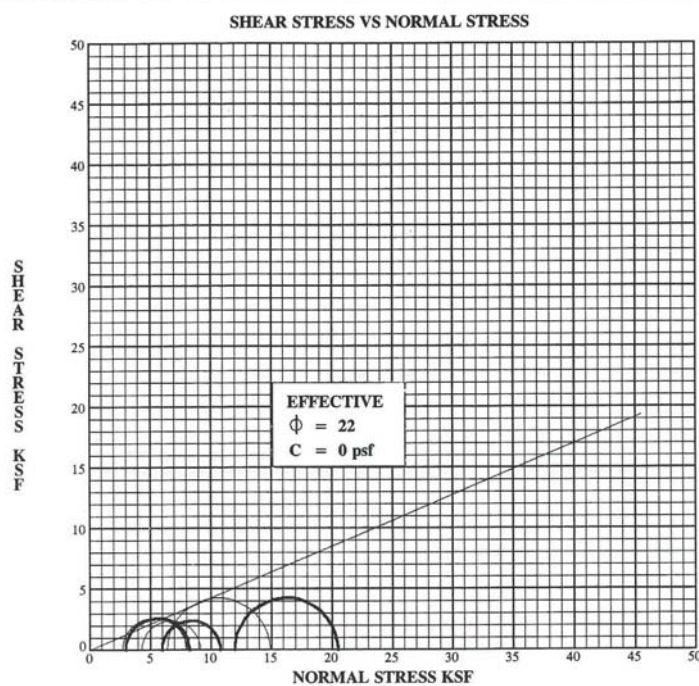
TOTAL STRESS ——— EFFECTIVE STRESS ———

Specimen Identification	Classification	DD	MC%
B-109 S-8 I 36.0'-37.8'	Stiff gray silty clay inter-bedded with silt, trace fine to medium sand. A-6a (10)	102	25
B-109 S-8 II 36.0'-37.8'	Stiff gray silty clay inter-bedded with silt, trace fine to medium sand. A-6a (10)	101	25
B-109 S-8 III 36.0'-37.8'	Stiff gray silty clay inter-bedded with silt, trace fine to medium sand. A-6a (10)	102	25



PROJECT CUY-90-15.24
LOCATION Cleveland, Ohio
JOB NO. 4500 DATE 11/4/94

SUMMARY OF TRIAXIAL COMPRESSION TESTS
SATURATED, CONSOLIDATED, UNDRAINED
(RESIDUAL PLOTTED)



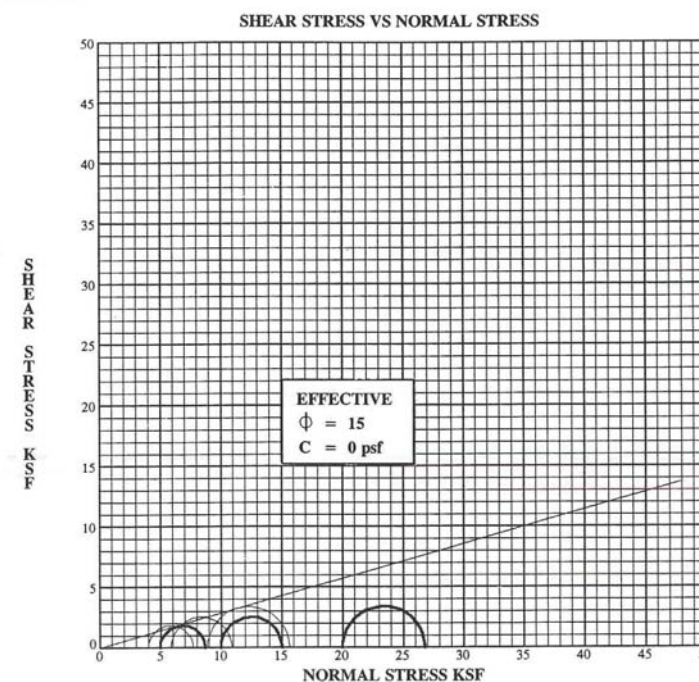
TOTAL STRESS ——— EFFECTIVE STRESS ———

Specimen Identification	Classification	DD	MC%
B-109 S-13 I 69.5'-71.3'	Stiff gray silty clay, trace fine to coarse sand, trace fine gravel. A-6b (10)	105	23
B-109 S-13 II 69.5'-71.3'	Stiff gray silty clay, trace fine to coarse sand, trace fine gravel. A-6b (10)	106	22
B-109 S-13 III 69.5'-71.3'	Stiff gray silty clay, trace fine to coarse sand, trace fine gravel. A-6b (10)	107	22



PROJECT CUY-90-15.24
LOCATION CLEVELAND, OHIO
JOB NO. 4500 DATE 11/15/94

SUMMARY OF TRIAXIAL COMPRESSION TESTS
SATURATED, CONSOLIDATED, UNDRAINED
(RESIDUAL PLOTTED)

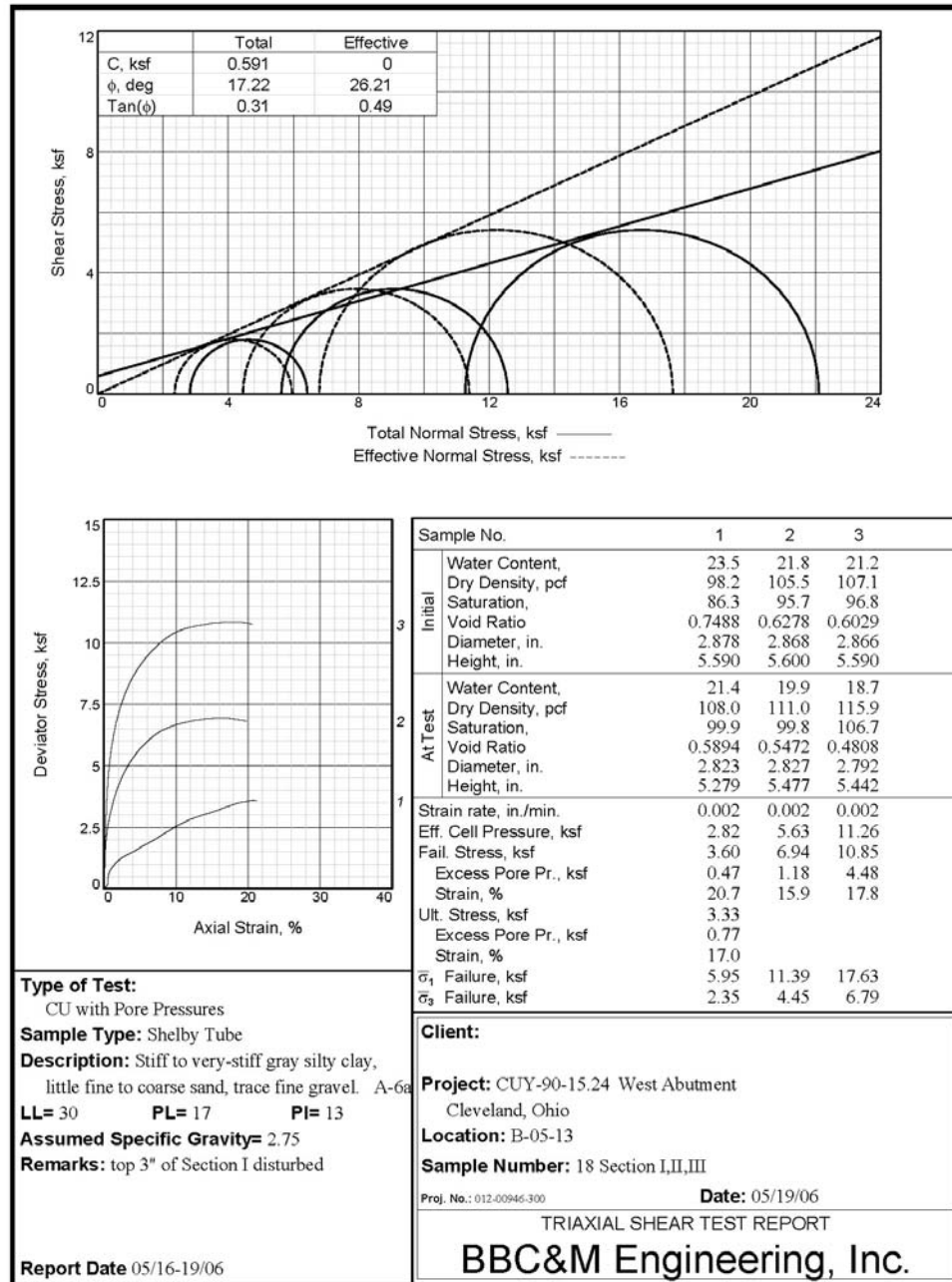


TOTAL STRESS ——— EFFECTIVE STRESS ———

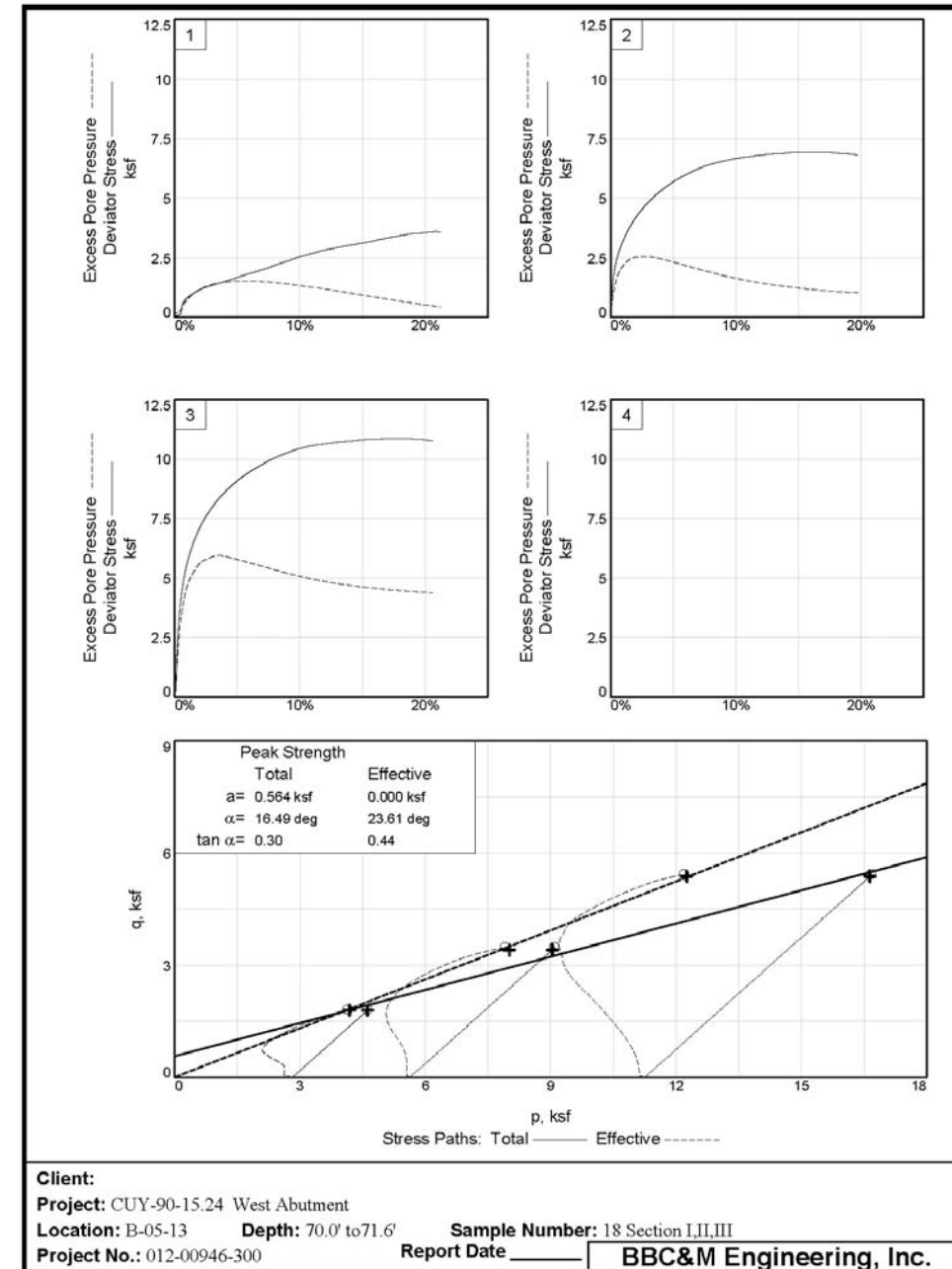
Specimen Identification	Classification	DD	MC%
B-109 S-24 I 124.5'-126.2'	Very-stiff gray silty clay, trace fine to coarse sand, trace fine gravel, contains few lenses of silt. A-6b (10)	103	23
B-109 S-24 II 124.5'-126.2'	Very-stiff gray silty clay, trace fine to coarse sand, trace fine gravel, contains few lenses of silt. A-6b (10)	98	27
B-109 S-24 III 124.5'-126.2'	Very-stiff gray silty clay, trace fine to coarse sand, trace fine gravel, contains few lenses of silt. A-6b (10)	107	20



PROJECT CUY-90-15.24
LOCATION CLEVELAND, OHIO
JOB NO. 4500 DATE 12/10/94

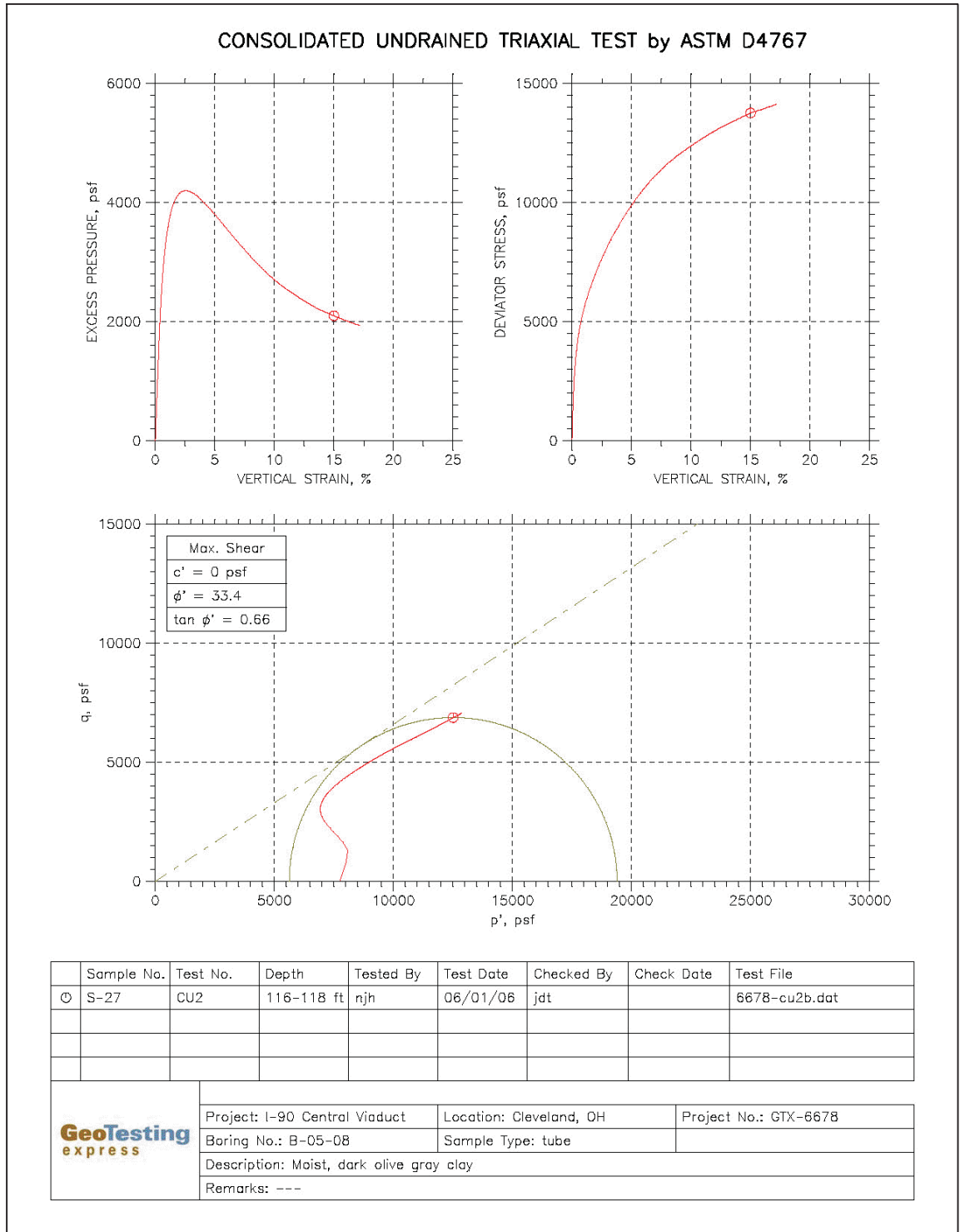
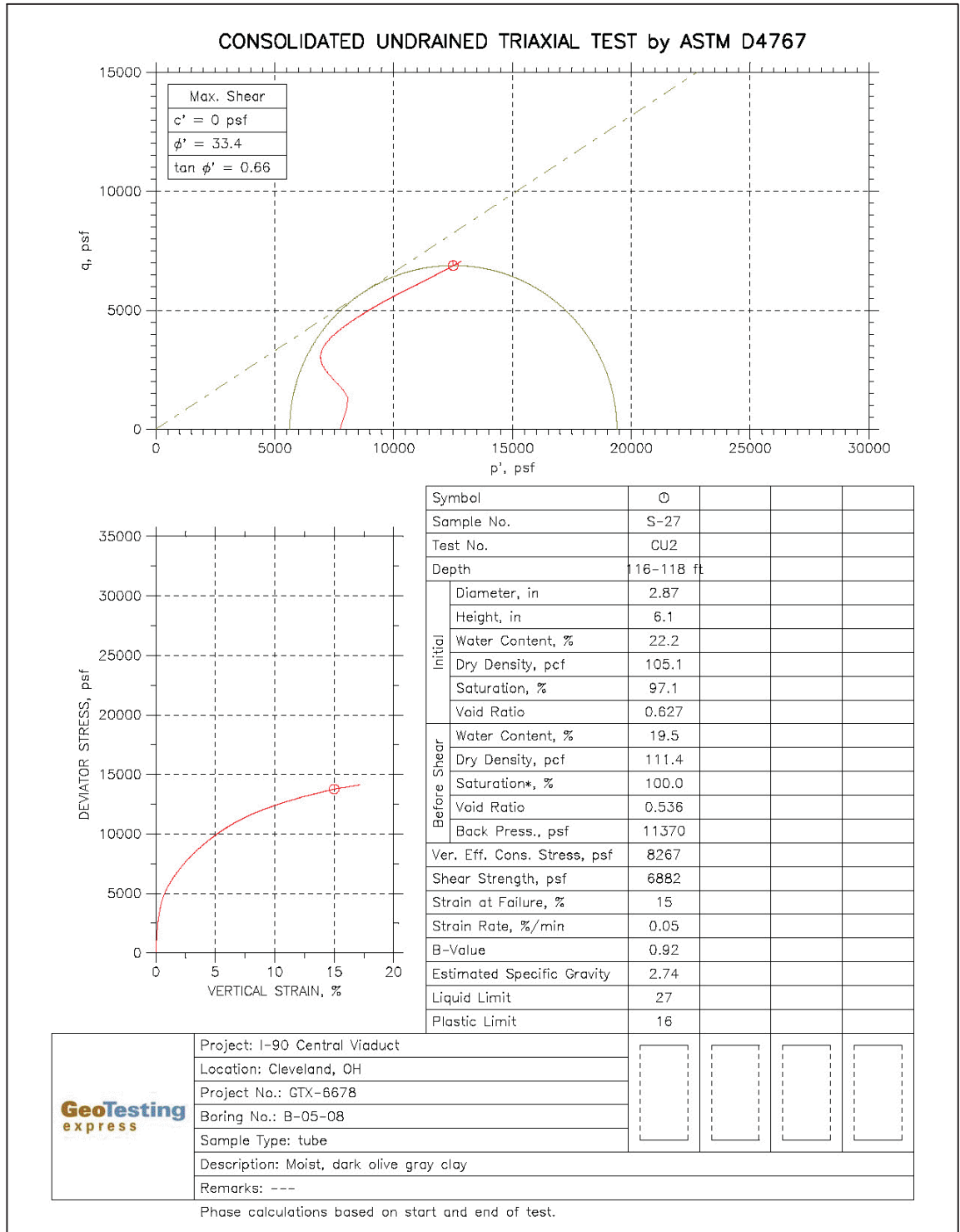


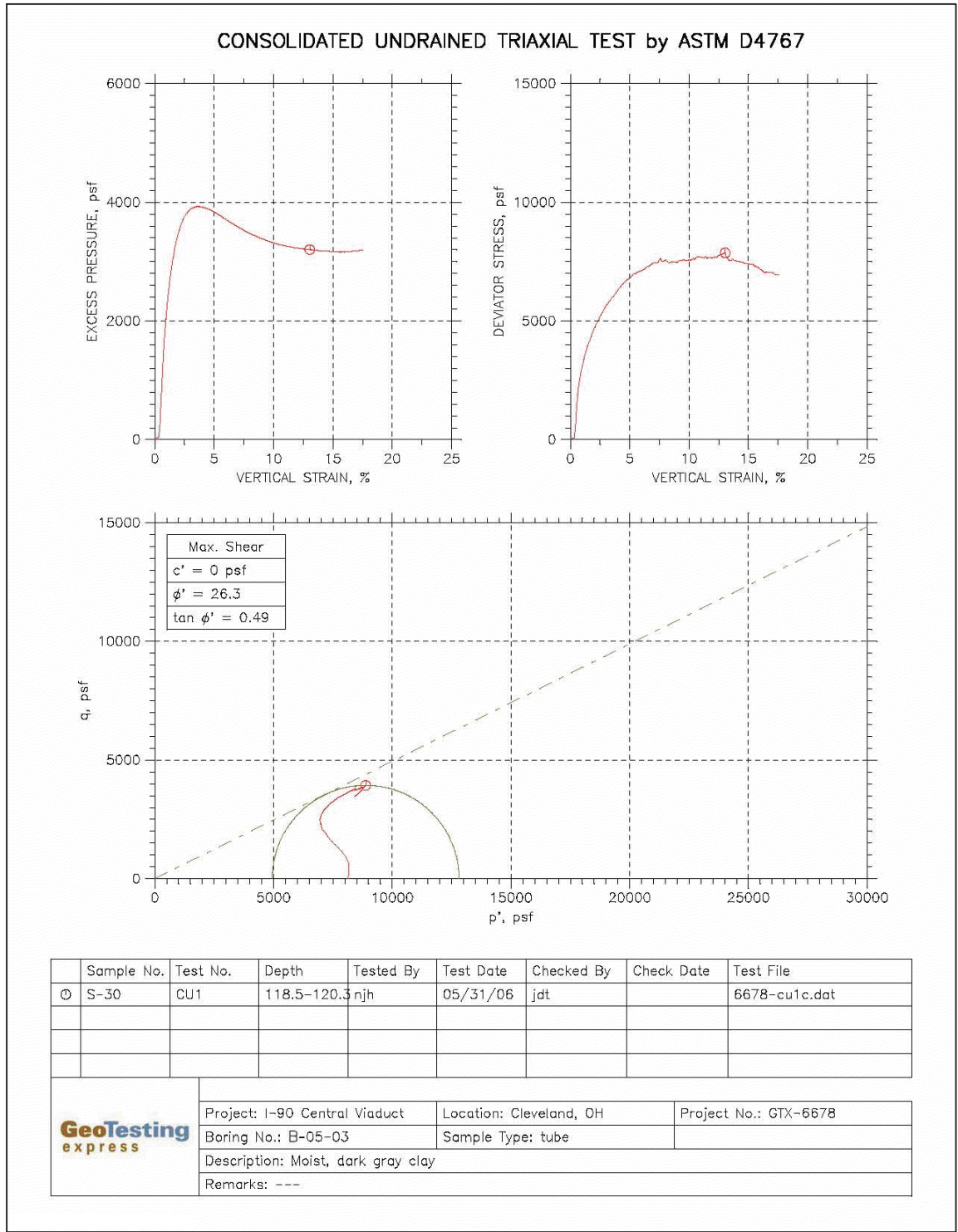
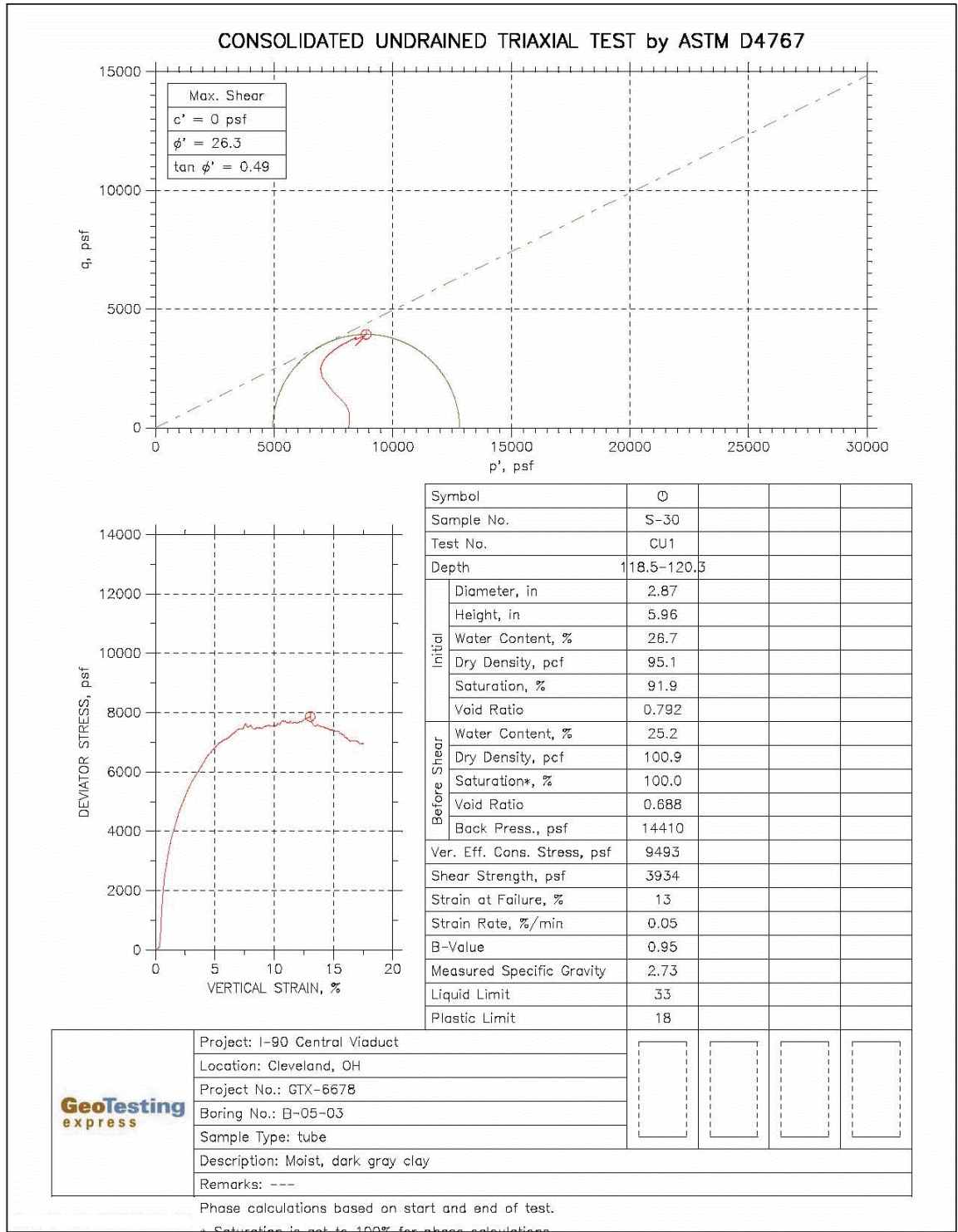
Tested By: JJ _____ Checked By: JJ _____

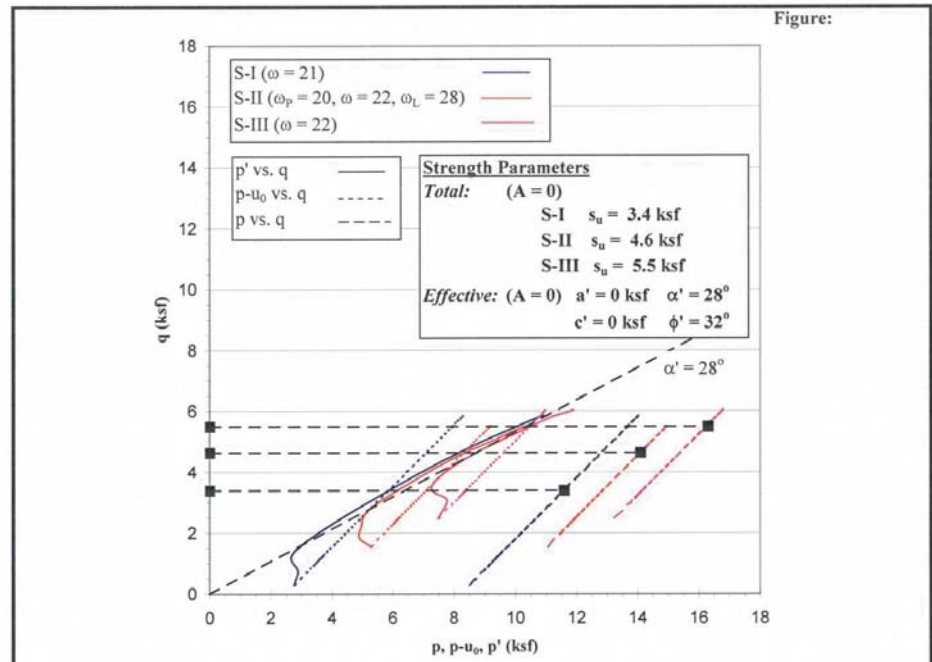


Tested By: JJ _____ Checked By: JJ _____







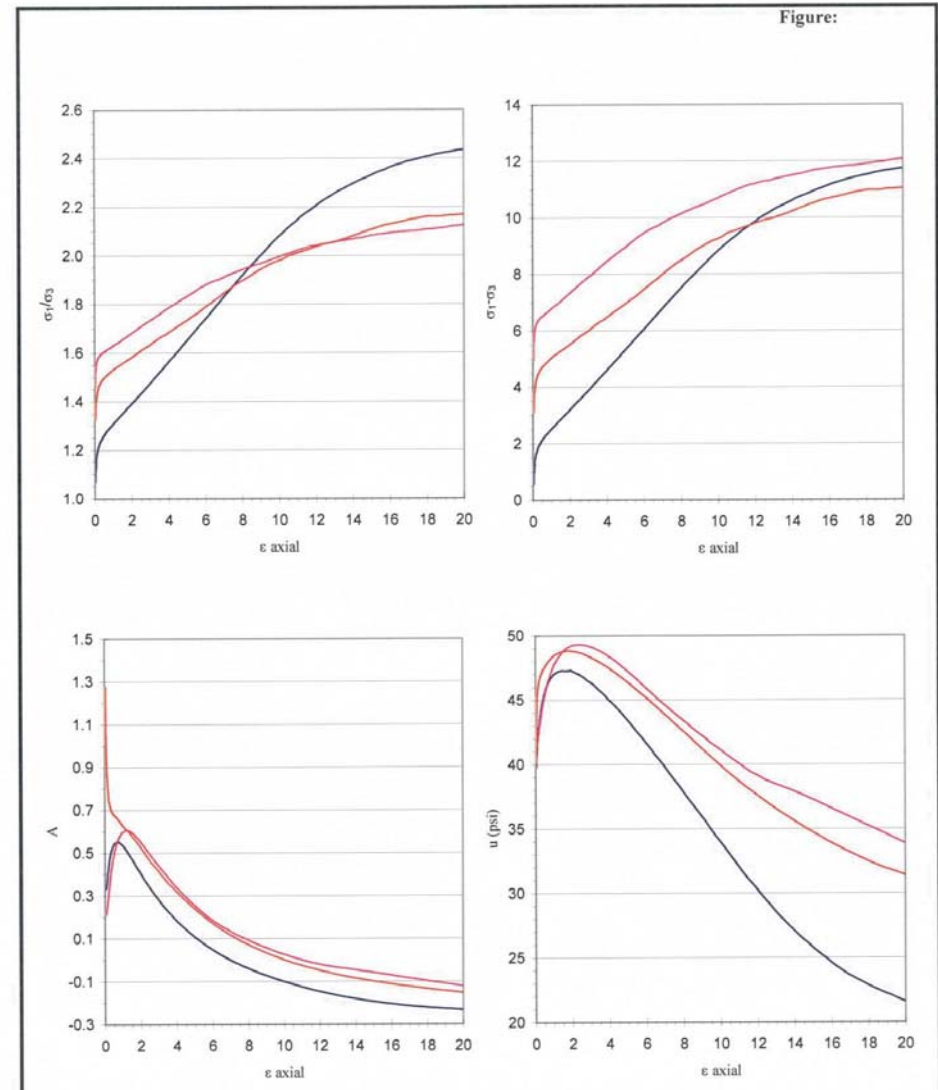


Type of Test: CK₀UTXC with pore pressure measurements
 Description: SILT - Medium-stiff to very-stiff gray silt, some to "and" clay, trace fine sand.
 Assumed Specific Gravity: 2.75

Sample No.	I	II	III	
Initial	Water Content	21.3	22.4	21.5
	Dry Density, pcf	111.0	107.8	107.2
	Saturation	107.2	103.9	98.3
	Void Ratio	0.546	0.592	0.602
	Diameter, in	2.87	2.86	2.88
	Height, in	5.60	5.61	5.59
At Test	Water Content	18.3	20.1	19.0
	Dry Density, pcf	115.7	113.3	112.6
	Saturation	103.8	107.3	99.5
	Void Ratio	0.484	0.516	0.525
	Diameter, in	2.82	2.82	2.85
	Height, in	5.55	5.48	5.41

BBC&M ENGINEERING, INC. - Triaxial Compression Test Report

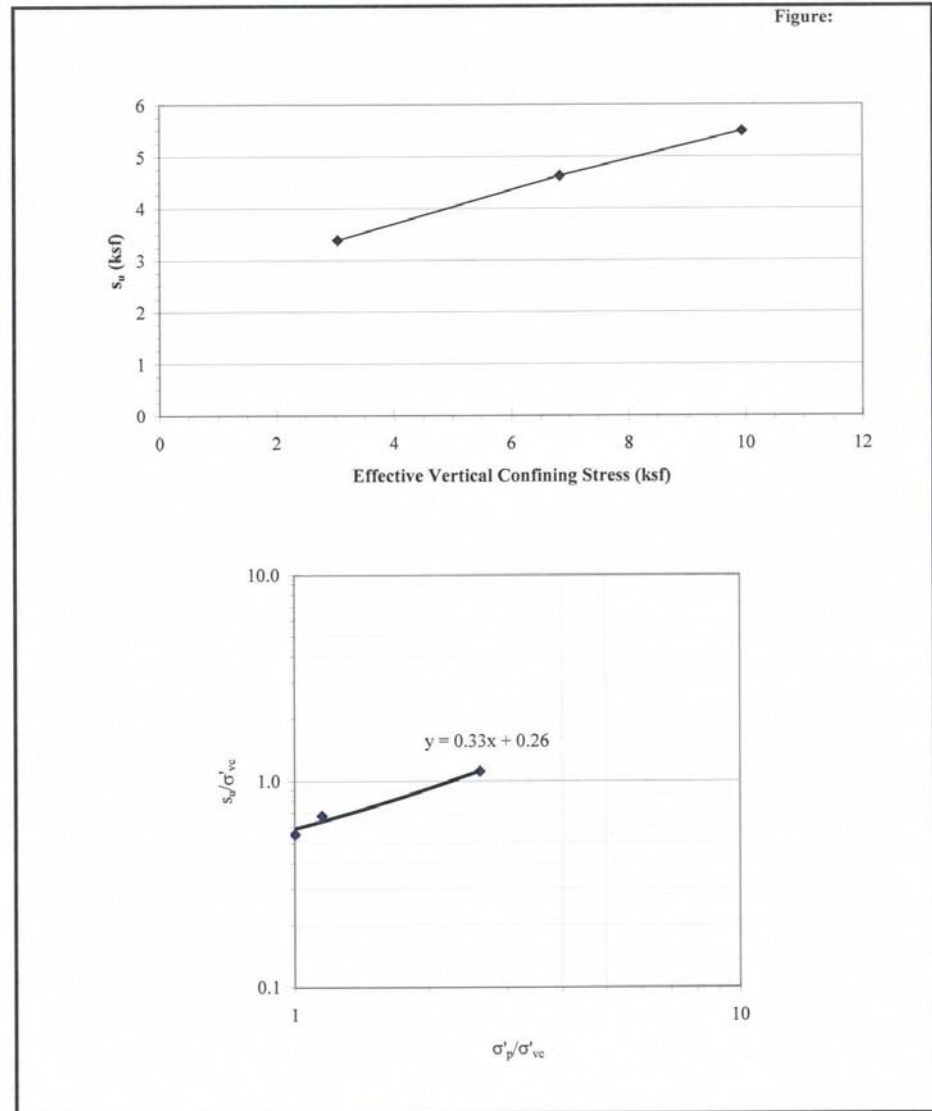
Boring: B-05-01
 Sample: S13, Sec I to III
 Depth: 55' to 57'
 Project: CUY-90.15.24 West Abutment
 Project No: 012 00946.300
 Client: Micheal Baker Jr. Inc.



BBC&M ENGINEERING, INC. - Triaxial Compression Test Report

Boring: B-05-01
 Sample: S13, Sec I to III
 Depth: 55' to 57'
 Project: CUY-90.15.24 West Abutment
 Project No: 012 00946.300
 Client: Micheal Baker Jr. Inc.



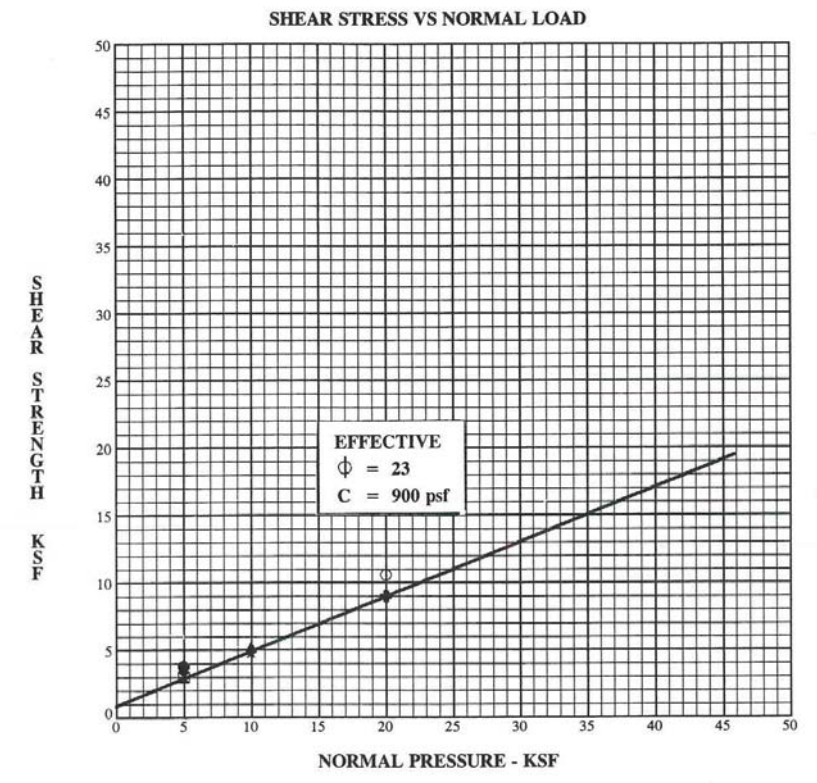


BBC&M ENGINEERING, INC. - Triaxial Compression Test Report

Project: CUY-90.15.24 West Abutment
 Project No: 012 00946.300
 Client: Micheal Baker Jr. Inc.

Boring: B-05-01
 Sample: S13, Sec I to III Depth: 55' to 57'

SUMMARY OF DIRECT SHEAR TESTS
 SATURATED, CONSOLIDATED, DRAINED



Specimen Identification	Normal Load	Type Plot	Classification	DD	MC%
● B-101 S-32 IV 140.0'-142.0'	5.00 KSF	Peak	Stiff gray silty clay, trace fine	105	22
✕	5.00 KSF	RESIDUAL	to coarse sand, trace fine		
▲	10.0 KSF	Peak	gravel, many lenses and seams	105	23
★	10.0 KSF	RESIDUAL	of silt. A-6b (12)		
○	20.0 KSF	Peak		104	23
⊕	20.0 KSF	RESIDUAL			



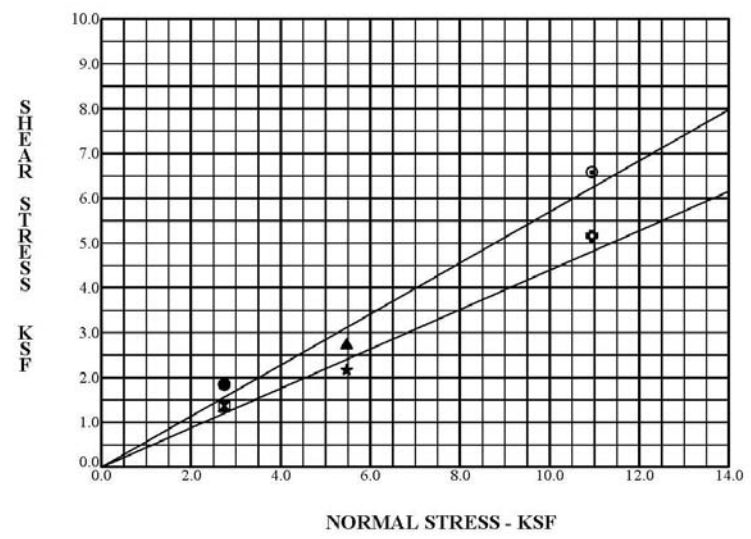
PROJECT: CUY-90-15.24
 LOCATION: Cleveland, Ohio
 JOB NO.: 4500 DATE: 10/29/94



SUMMARY OF DIRECT SHEAR TESTS
SATURATED, CONSOLIDATED, DRAINED
ASTM D3080; AASHTO T-236



SHEAR STRESS VS NORMAL STRESS



DATA INTERPRETATION RESULTS		
Test Method	Drained Friction Angle	Drained Cohesion (ksf)
Peak	30°	0
Residual	24°	0

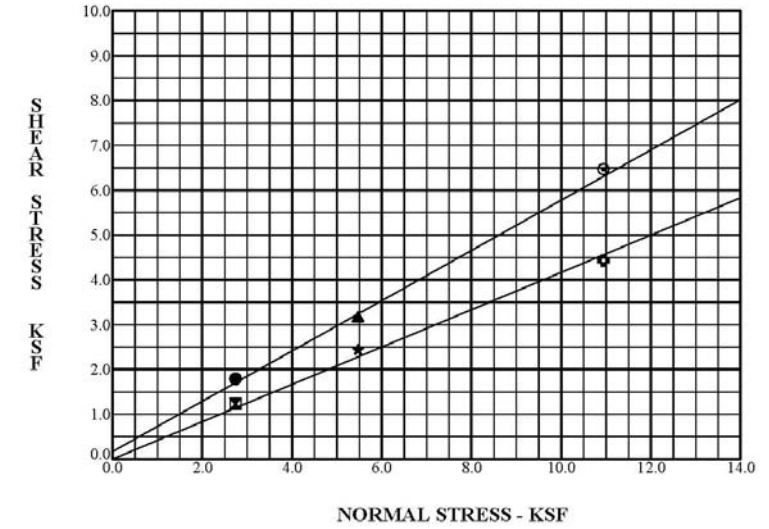
Specimen Identification	Normal Load	Type Plot	Classification	DD	MC%
● B-037-1 S-22 II 66.0' to 68.0'	2.74 ksf	PEAK	Soft to stiff gray SILT AND CLAY, trace fine to coarse sand, trace fine gravel, contains few lenses and seams of silt, moist.	96	28
⊗ B-037-1 S-22 II 66.0' to 68.0'	2.74 ksf	RESIDUAL		96	28
▲ B-037-1 S-22 II 66.0' to 68.0'	5.47 ksf	PEAK		94	30
★ B-037-1 S-22 II 66.0' to 68.0'	5.47 ksf	RESIDUAL		94	30
◎ B-037-1 S-22 II 66.0' to 68.0'	10.94 ksf	PEAK		100	24
⊕ B-037-1 S-22 II 66.0' to 68.0'	10.94 ksf	RESIDUAL		100	24

PROJECT CUY-90-14.52, West Abutment
 LOCATION Cleveland, Ohio
 JOB NO. 012.00946.307 DATE 9/16/09

SUMMARY OF DIRECT SHEAR TESTS
SATURATED, CONSOLIDATED, DRAINED
ASTM D3080; AASHTO T-236



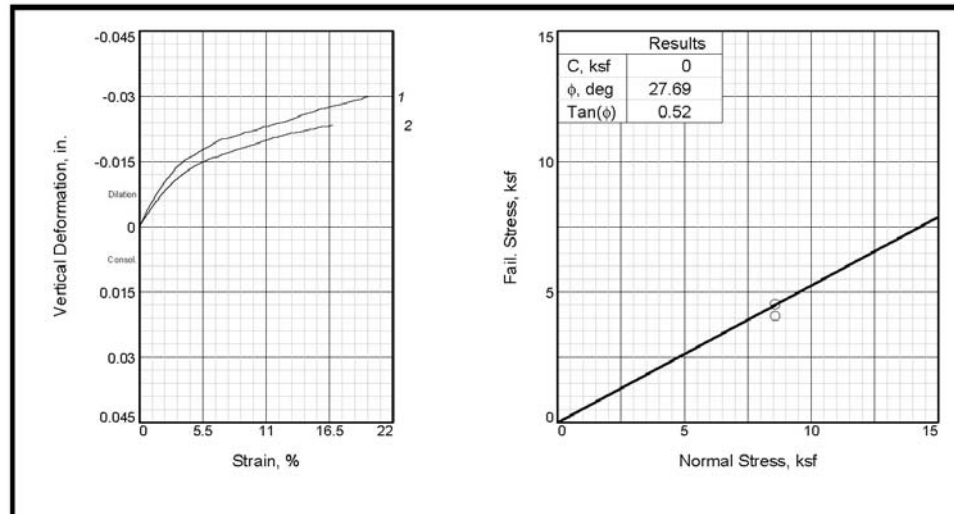
SHEAR STRESS VS NORMAL STRESS



DATA INTERPRETATION RESULTS		
Test Method	Drained Friction Angle	Drained Cohesion (ksf)
Peak	29°	0.2
Residual	23°	0

Specimen Identification	Normal Load	Type Plot	Classification	DD	MC%
● B-037-1 S-24 II 70.0' to 72.0'	2.74 ksf	PEAK	Medium-stiff gray SILTY CLAY, trace fine to coarse sand, trace fine gravel, contains few lenses and seams of silt, moist.	91	32
⊗ B-037-1 S-24 II 70.0' to 72.0'	2.74 ksf	RESIDUAL		91	32
▲ B-037-1 S-24 II 70.0' to 72.0'	5.47 ksf	PEAK		94	29
★ B-037-1 S-24 II 70.0' to 72.0'	5.47 ksf	RESIDUAL		94	29
◎ B-037-1 S-24 II 70.0' to 72.0'	10.94 ksf	PEAK		98	28
⊕ B-037-1 S-24 II 70.0' to 72.0'	10.94 ksf	RESIDUAL		98	28

PROJECT CUY-90-14.52, West Abutment
 LOCATION Cleveland, Ohio
 JOB NO. 012.00946.307 DATE 9/16/09



	1	2
Sample No.	1	2
Water Content, %	28.1	28.1
Dry Density, pcf	91.9	91.9
Saturation, %	91.0	91.0
Void Ratio	0.8333	0.8333
Diameter, in.	2.500	2.500
Height, in.	1.000	1.000
Initial		
Water Content, %	20.9	20.9
Dry Density, pcf	107.6	107.6
Saturation, %	99.8	99.8
Void Ratio	0.5662	0.5662
Diameter, in.	2.500	2.500
Height, in.	0.854	0.854
At Test		
Normal Stress, ksf	8.600	8.600
Fail. Stress, ksf	4.514	4.059
Strain, %	7.6	6.8
Ult. Stress, ksf		
Strain, %		
Strain rate, in./min.	0.001	0.001

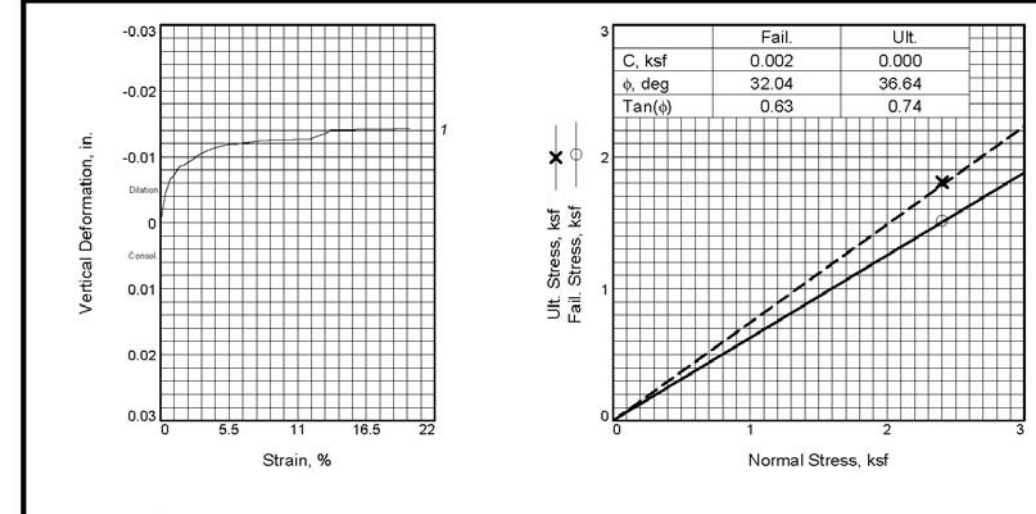
Sample Type: Shelby Tube
Description: Soft to medium gray silty clay, trace fine sand, many lenses of silt.
LL= 35 PL= 20 PI= 15
Assumed Specific Gravity= 2.7
Remarks:

Client:
Project: CUY-90-15.24 West Abutment
 Cleveland, Ohio
Location: B-108A
Sample Number: 26 Section I **Depth:** 117.0' to 117.5'
 Proj. No.: 012-00946-300 **Date:** 05/14-16/06

DIRECT SHEAR TEST REPORT
BBC&M Engineering, Inc.

Report Date 05/16/06

Tested By: BR **Checked By:** JJ



	1
Sample No.	1
Water Content, %	23.6
Dry Density, pcf	104.1
Saturation, %	99.9
Void Ratio	0.6494
Diameter, in.	2.500
Height, in.	1.000
Initial	
Water Content, %	20.9
Dry Density, pcf	109.1
Saturation, %	100.4
Void Ratio	0.5737
Diameter, in.	2.500
Height, in.	0.954
At Test	
Normal Stress, ksf	2.400
Fail. Stress, ksf	1.516
Strain, %	5.6
Ult. Stress, ksf	1.806
Strain, %	20.0
Strain rate, in./min.	0.002

Sample Type: Shelby Tube
Description: Very-stiff gray silty clay, trace fine to coarse sand, trace fine gravel, many lenses of silt.
LL= 36 PL= 20 PI= 16
Assumed Specific Gravity= 2.75
Remarks: Residual Shear
 A-6b(10)

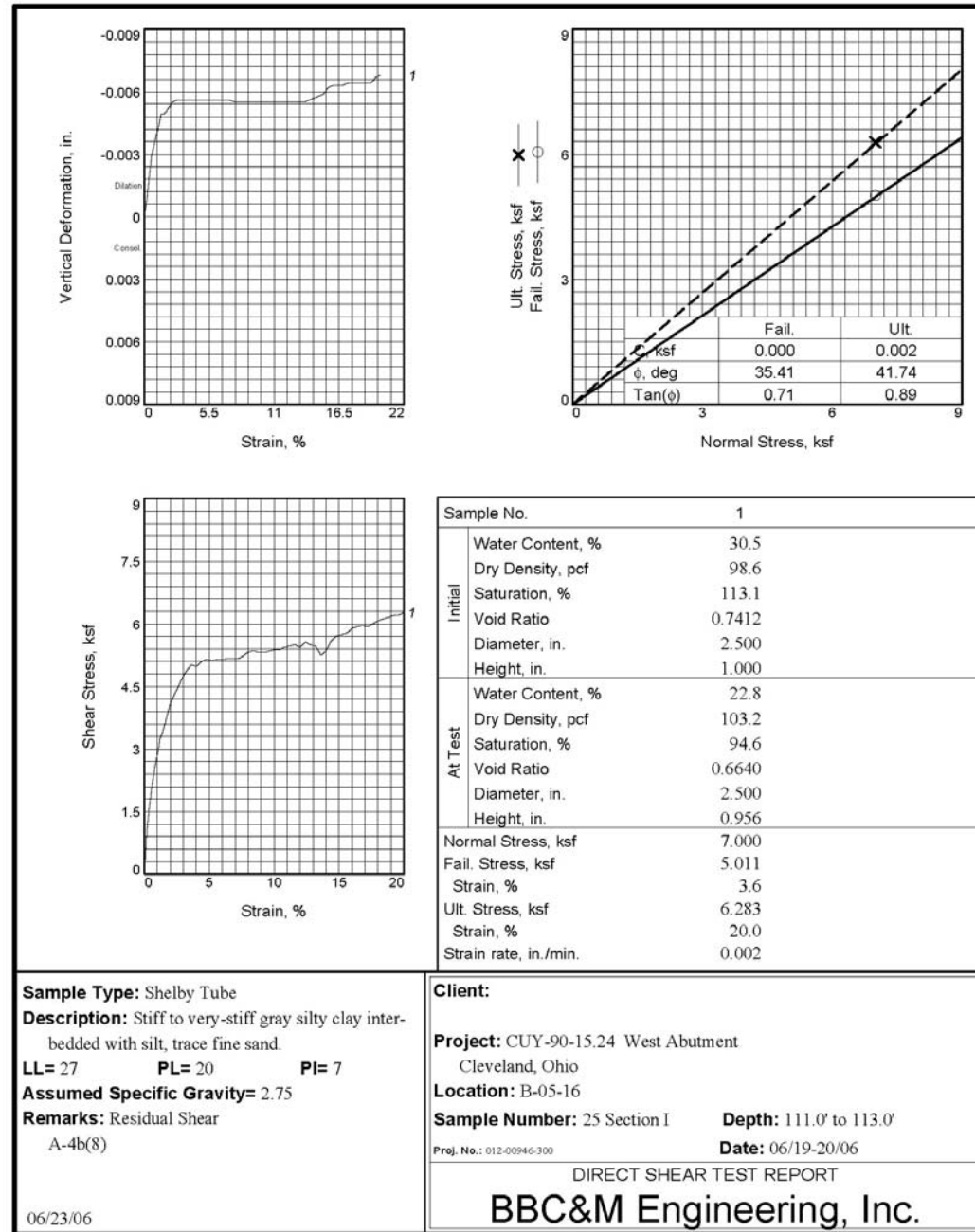
Client:
Project: CUY-90-15.24 West Abutment
 Cleveland, Ohio
Location: B-05-16
Sample Number: 7 **Depth:** 24.0' to 26.0'
 Proj. No.: 012-00946-300 **Date:** 06/16-19/06

DIRECT SHEAR TEST REPORT
BBC&M Engineering, Inc.

06/20/06

Tested By: SW **Checked By:** JJ



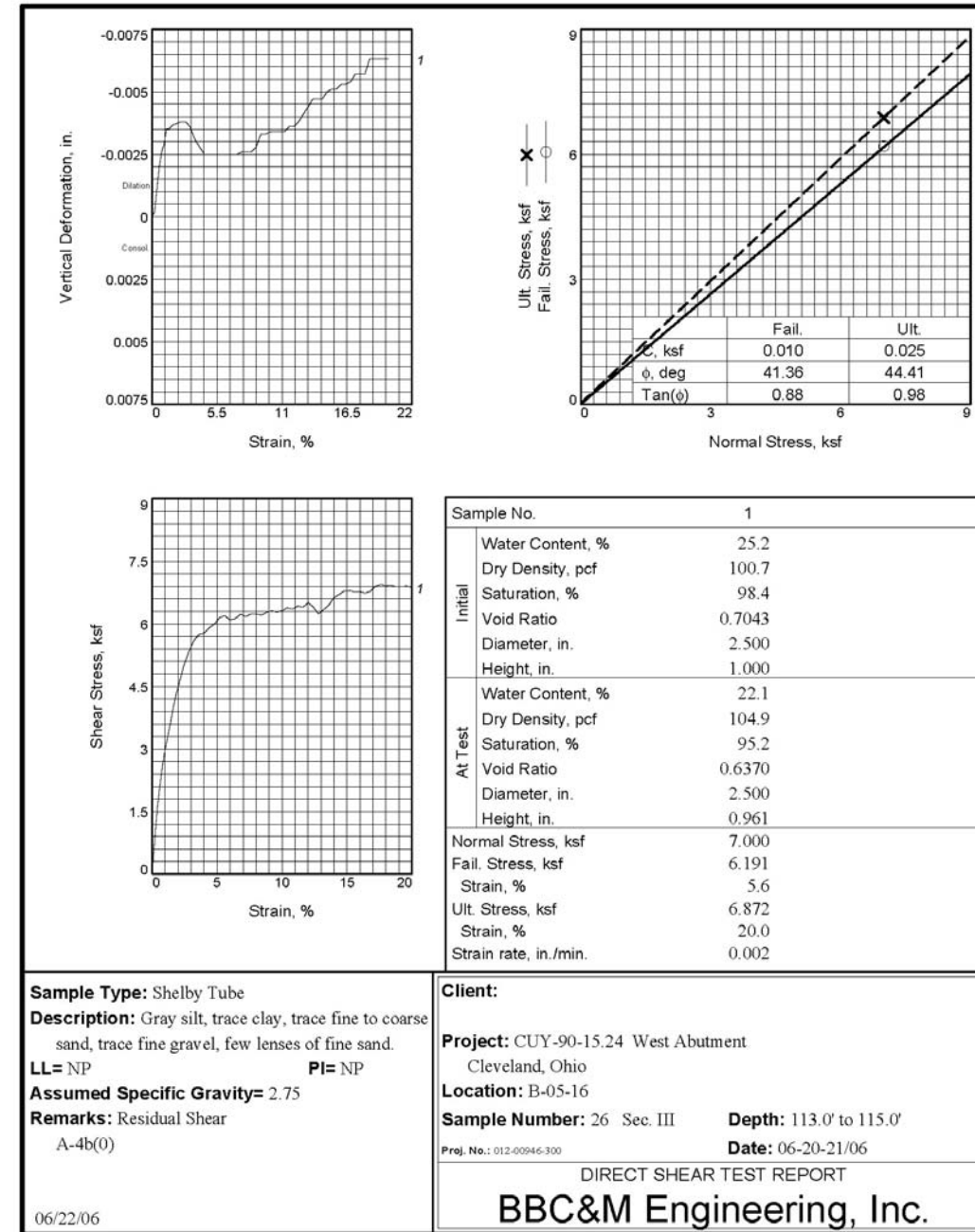


Sample Type: Shelby Tube
Description: Stiff to very-stiff gray silty clay interbedded with silt, trace fine sand.
LL= 27 PL= 20 PI= 7
Assumed Specific Gravity= 2.75
Remarks: Residual Shear
 A-4b(8)

Client:
Project: CUY-90-15.24 West Abutment
 Cleveland, Ohio
Location: B-05-16
Sample Number: 25 Section I **Depth:** 111.0' to 113.0'
 Proj. No.: 012-00946-300 **Date:** 06/19-20/06

DIRECT SHEAR TEST REPORT
BBC&M Engineering, Inc.

Tested By: SW _____ Checked By: JJ _____



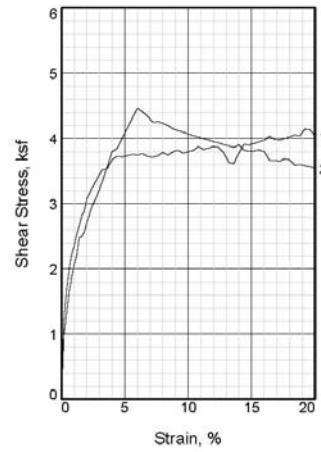
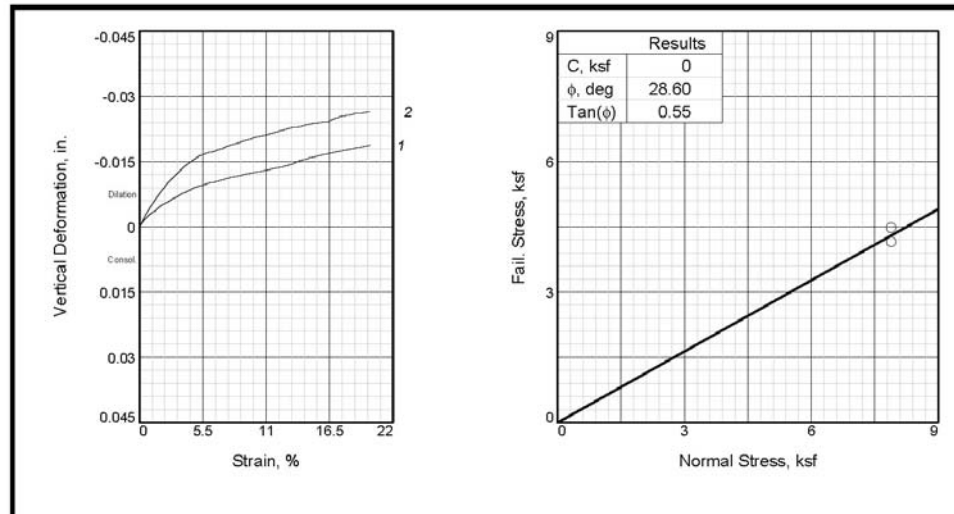
Sample Type: Shelby Tube
Description: Gray silt, trace clay, trace fine to coarse sand, trace fine gravel, few lenses of fine sand.
LL= NP PI= NP
Assumed Specific Gravity= 2.75
Remarks: Residual Shear
 A-4b(0)

Client:
Project: CUY-90-15.24 West Abutment
 Cleveland, Ohio
Location: B-05-16
Sample Number: 26 Sec. III **Depth:** 113.0' to 115.0'
 Proj. No.: 012-00946-300 **Date:** 06-20-21/06

DIRECT SHEAR TEST REPORT
BBC&M Engineering, Inc.

Tested By: SW _____ Checked By: JJ _____



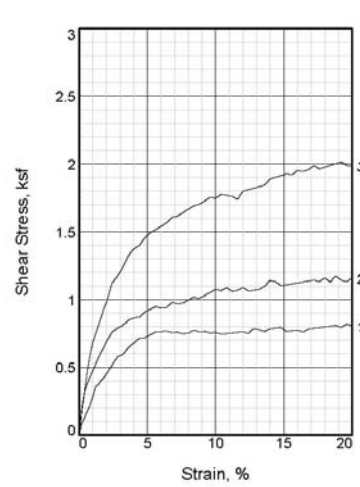
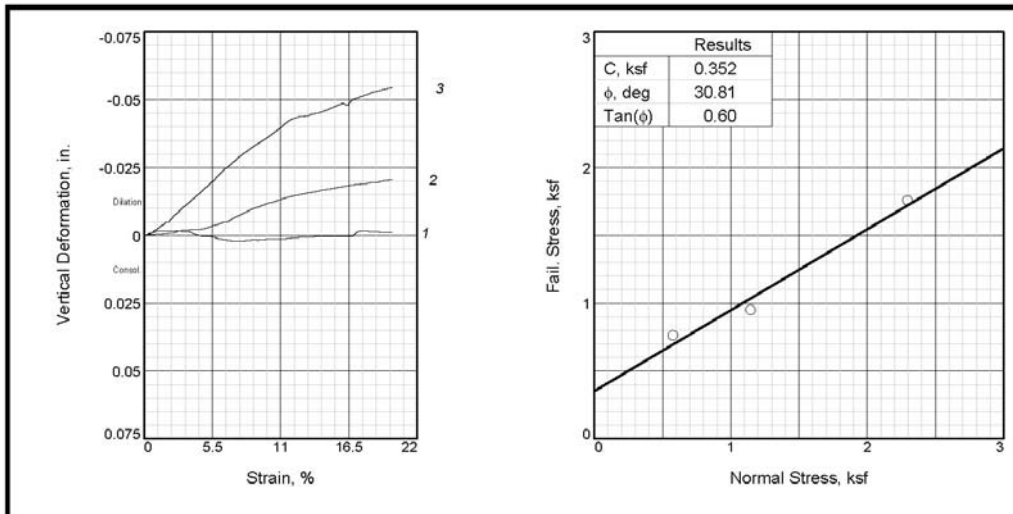


Sample No.	1	2
Water Content, %	27.9	27.9
Dry Density, pcf	94.1	94.1
Saturation, %	93.1	93.1
Void Ratio	0.8238	0.8238
Diameter, in.	2.500	2.500
Height, in.	1.000	1.000
Water Content, %	24.0	24.0
Dry Density, pcf	103.5	103.5
Saturation, %	99.9	99.9
Void Ratio	0.6593	0.6593
Diameter, in.	2.500	2.500
Height, in.	0.910	0.910
Normal Stress, ksf	7.900	7.900
Fail. Stress, ksf	4.146	4.467
Strain, %	19.2	6.0
Ult. Stress, ksf		
Strain, %		
Strain rate, in./min.	0.012	0.002

Sample Type: Shelby Tube
Description: Medium-stiff gray silty clay, trace fine sand.
LL= 34 PL= 18 PI= 16
Assumed Specific Gravity= 2.75
Remarks: 1= initial Shear
 2= Residual Shear
Report Date 05/25/06

Client:
Project: CUY-90-15.24 West Abutment
 Cleveland, Ohio
Location: B-105A
Sample Number: 23 I **Depth:** 103.0' to 105.0'
 Proj. No.: 012-00946-300 **Date:** 02/24/06
 DIRECT SHEAR TEST REPORT
BBC&M Engineering, Inc.

Tested By: MA **Checked By:** JJ



Sample No.	1	2	3
Water Content, %	80.1	80.1	206.5
Dry Density, pcf	44.1	39.9	21.4
Saturation, %	77.6	67.9	81.6
Void Ratio	2.6817	3.0665	6.5795
Diameter, in.	2.500	2.500	2.500
Height, in.	1.000	1.000	1.000
Water Content, %	137.0	89.0	97.9
Dry Density, pcf	45.7	43.1	24.3
Saturation, %	139.5	83.7	44.8
Void Ratio	2.5547	2.7656	5.6760
Diameter, in.	2.500	2.500	2.500
Height, in.	0.966	0.926	0.881
Normal Stress, ksf	0.580	1.150	2.300
Fail. Stress, ksf	0.759	0.948	1.754
Strain, %	7.2	5.6	9.6
Ult. Stress, ksf			
Strain, %			
Strain rate, in./min.	0.002	0.002	0.002

Sample Type: Shelby Tube
Description: PEAT: Very-soft gray organic clay, "and" silt, trace to little fine to coarse sand,woody.
Assumed Specific Gravity= 2.6
Remarks: Initial Shear

Client: Michael Baker Jr, Inc.
Project: CENTRAL VIADUCT - CUY-90-14.52
 Cuyahoga County, Ohio
Location: V-010-0-06
Sample Number: 27 **Depth:** 16.0'to18.0' SECT IV
 Proj. No.: 012 00946 301 **Date:** 02/14/07
 DIRECT SHEAR TEST REPORT
BBC&M Engineering, Inc.





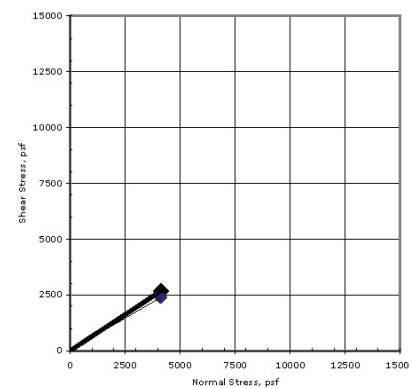
Client:	Geocomp Consulting		
Project Name:	I-90 Central Viaduct		
Project Location:	Cleveland, OH		
GTX #:	6678	Tested By:	njh/md
Test Date:	05/30/06	Checked By:	jdt
Boring ID:	B-05-08		
Sample ID:	S-27		
Depth, ft.	116-118 ft		
Description:	Moist, olive gray clay		
Preparation:	Extruded from tube, cut and trimmed and tested at the as-received moisture and density.		

Direct Shear and Residual Shear by ASTM D 3080

Parameter	Point 1	Point 2	Point 3
Test No.	RS10		
Initial Moisture Content, %	21		
Initial Dry Density, pcf	108		
Nominal Rate of Shear Strain, inches/min	0.0002		
Vertical Consolidation Stress, psf	4130		
Peak Shear Stress, psf	2677		
Post-Peak Shear Stress, psf	2385		
Final Moisture Content, %	19		

Notes: Residual values taken near the end of the final shear step.	Peak Friction Angle:	33.0	degrees
	Peak Cohesion:	0	psf
	Post Peak Friction Angle:	30.0	degrees
	Post Peak Cohesion:	0	psf

Normal Stress vs. Shear Stress



Comments: See attached plots for additional information



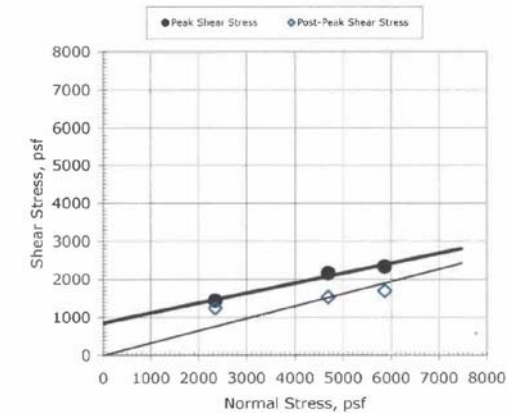
Client:	Geocomp Consulting		
Project Name:	I-90 Bridge		
Project Location:	OH		
GTX #:	9236	Tested By:	md
Test Date:	08/19/09	Checked By:	jdt
Boring ID:	B-037-1		
Sample ID:	S-21		
Depth, ft.	64-66		
Description:	Moist, brown clay with sand lenses		
Preparation:	Extruded from tube, cut and trimmed and tested at the as-received moisture and density.		

Residual Shear by USACOE EM1110

Parameter	Point 1	Point 2	Point 3
Test No.	RS-1	RS-2	RS-3A
Initial Moisture Content, %	21.3	28.9	27.1
Initial Dry Density, pcf	104	94.5	95.8
Nominal Rate of Shear Strain, inches/min	0.0005	0.0005	0.0005
Vertical Consolidation Stress, psf	2346	4691	5864
Peak Shear Stress, psf	1441	2159	2335
Post-Peak Shear Stress, psf	1241	1528	1696
Final Moisture Content, %	22.9	28.0	27.1

Peak Friction Angle:	14.7	degrees
Peak Cohesion:	854.2	psf
Post Peak Friction Angle:	17.9	degrees
Post Peak Cohesion:	0.0	psi

Normal Stress vs. Shear Stress



Comments: See attached plots for additional information



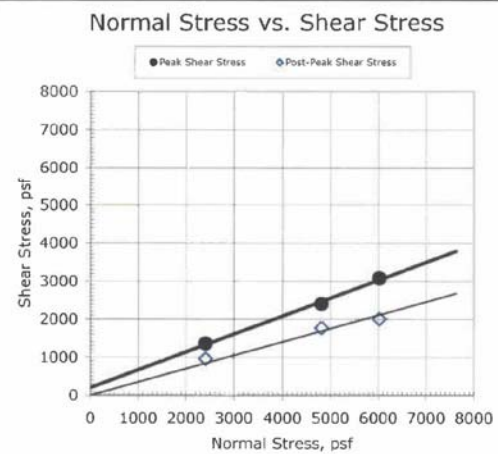


Client:	Geocomp Consulting		
Project Name:	I-90 Bridge		
Project Location:	OH		
GTX #:	9236	Tested By:	md
Test Date:	08/19/09	Checked By:	jdt
Boring ID:	B-037-1		
Sample ID:	S-22		
Depth, ft.	66-68		
Description:	Moist, brown clay with sand lenses		
Preparation:	Extruded from tube, cut and trimmed and tested at the as-received moisture and density.		

Residual Shear by USACOE EM1110

Parameter	Point 1	Point 2	Point 3
Test No.	RS-4	RS-5	RS-6
Initial Moisture Content, %	27.9	24.8	22.1
Initial Dry Density, pcf	95.8	100.0	101.0
Nominal Rate of Shear Strain, inches/min	0.0008	0.0008	0.0008
Vertical Consolidation Stress, psf	2408	4816	6020
Peak Shear Stress, psf	1356	2399	3079
Post-Peak Shear Stress, psf	960	1770	2007
Final Moisture Content, %	30.8	25.5	25.5

Peak Friction Angle:	25.2	degrees
Peak Cohesion:	199.8	psf
Post Peak Friction Angle:	19.4	degrees
Post Peak Cohesion:	0.0	psi



Comments: See attached plots for additional information

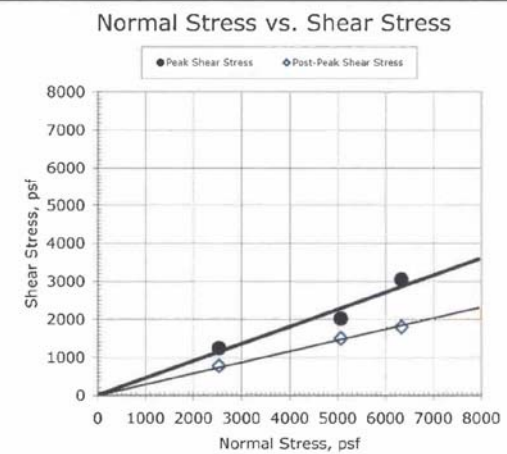


Client:	Geocomp Consulting		
Project Name:	I-90 Bridge		
Project Location:	OH		
GTX #:	9236	Tested By:	md
Test Date:	08/20/09	Checked By:	jdt
Boring ID:	B-037-1		
Sample ID:	S-24		
Depth, ft.	70-72		
Description:	Moist, brown clay		
Preparation:	Extruded from tube, cut and trimmed and tested at the as-received moisture and density.		

Residual Shear by USACOE EM1110

Parameter	Point 1	Point 2	Point 3
Test No.	RS-7	RS-8	RS-9
Initial Moisture Content, %	35.0	33.6	30.7
Initial Dry Density, pcf	86.7	87.4	92.0
Nominal Rate of Shear Strain, inches/min	0.0003	0.0003	0.0003
Vertical Consolidation Stress, psf	2533	5067	6333
Peak Shear Stress, psf	1243	2018	3045
Post-Peak Shear Stress, psf	775	1500	1800
Final Moisture Content, %	33.5	34.7	28.5

Peak Friction Angle:	24.2	degrees
Peak Cohesion:	11.5	psf
Post Peak Friction Angle:	16.2	degrees
Post Peak Cohesion:	0.0	psi



Comments: See attached plots for additional information





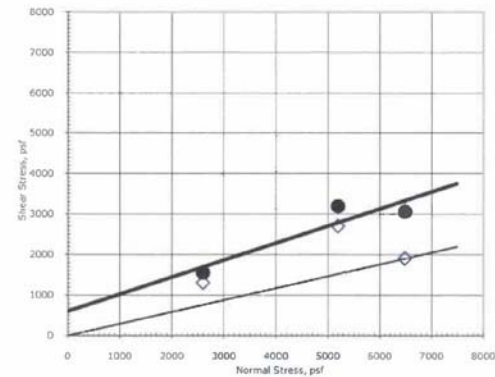
Client:	Geocomp Consulting		
Project Name:	I-90 Bridge		
Project Location:	OH		
GTX #:	9236	Tested By:	md
Test Date:	08/20/09	Checked By:	jdt
Boring ID:	B-037-1		
Sample ID:	S-25		
Depth, ft.	72-74		
Description:	Moist, brown clay		
Preparation:	Extruded from tube, cut and trimmed and tested at the as-received moisture and density.		

Residual Shear by USACOE EM1110

Parameter	Point 1	Point 2	Point 3
Test No.	RS-10	RS-11	RS-12
Initial Moisture Content, %	25.5	24.4	25.8
Initial Dry Density, pcf	99.4	100.0	98.0
Nominal Rate of Shear Strain, inches/min	0.0002	0.0002	0.0002
Vertical Consolidation Stress, psf	2596	5192	6490
Peak Shear Stress, psf	1555	3188	3056
Post-Peak Shear Stress, psf	1300	2700	1900
Final Moisture Content, %	24.4	25.4	24.3

Peak Friction Angle:	22.8	degrees
Peak Cohesion:	600.0	psf
Post Peak Friction Angle:	16.3	degrees
Post Peak Cohesion:	0.0	psi

Normal Stress vs. Shear Stress



Comments: See attached plots for additional information



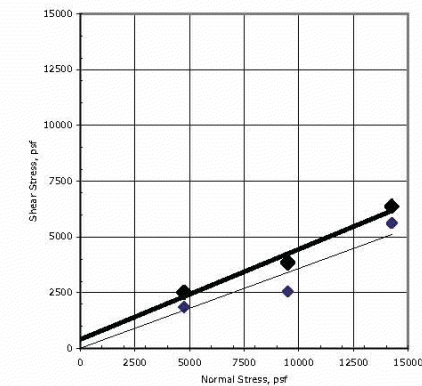
Client:	Geocomp Consulting		
Project Name:	I-90 Central Viaduct		
Project Location:	Cleveland, OH		
GTX #:	6678	Tested By:	njh/md
Test Date:	05/06-05/19/06	Checked By:	jdt
Boring ID:	B-05-03		
Sample ID:	S-29		
Depth, ft.	116.5-118.5 ft		
Description:	Moist, dark gray clay		
Preparation:	Extruded from tube, cut and trimmed and tested at the as-received moisture and density.		

Direct Shear and Residual Shear by ASTM D 3080

Parameter	Point 1	Point 2	Point 3
Test No.	RS5	RS4	RS6
Initial Moisture Content, %	26	26	24
Initial Dry Density, pcf	98.2	97.4	99.1
Nominal Rate of Shear Strain, inches/min	0.003	0.003	0.001
Vertical Consolidation Stress, psf	4748	9500	14249
Peak Shear Stress, psf	2519	3849	6367
Post-Peak Shear Stress, psf	1851	2559	5611
Final Moisture Content, %	31	25	22

Notes: Residual values taken near the end of the final shear step.	Peak Friction Angle:	22.0	degrees
	Peak Cohesion:	398	psf
	Post Peak Friction Angle:	19.7	degrees
	Post Peak Cohesion:	0	psf

Normal Stress vs. Shear Stress



Comments: See attached plots for additional information





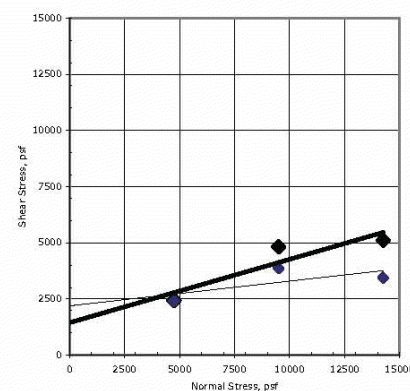
Client:	Geocomp Consulting		
Project Name:	I-90 Central Viaduct		
Project Location:	Cleveland, OH		
GTX #:	6678	Tested By:	njh/md
Test Date:	05/06-05/19/06	Checked By:	jdt
Boring ID:	B-05-03		
Sample ID:	S-30		
Depth, ft.	118.5-120.3 ft		
Description:	Moist, dark gray clay		
Preparation:	Extruded from tube, cut and trimmed and tested at the as-received moisture and density.		

Direct Shear and Residual Shear by ASTM D 3080

Parameter	Point 1	Point 2	Point 3
Test No.	RS1	RS2	RS3
Initial Moisture Content, %	20	28	21
Initial Dry Density, pcf	103	99.0	94.7
Nominal Rate of Shear Strain, inches/min	0.003	0.003	0.001
Vertical Consolidation Stress, psf	4749	9500	14249
Peak Shear Stress, psf	2433	4818	5111
Post-Peak Shear Stress, psf	2400	3858	3444
Final Moisture Content, %	23	24	22

Notes: Residual values taken near the end of the final shear step.	Peak Friction Angle:	15.7	degrees
	Peak Cohesion:	1444	psf
	Post Peak Friction Angle:	6.3	degrees
	Post Peak Cohesion:	2190	psf

Normal Stress vs. Shear Stress



Comments: See attached plots for additional information



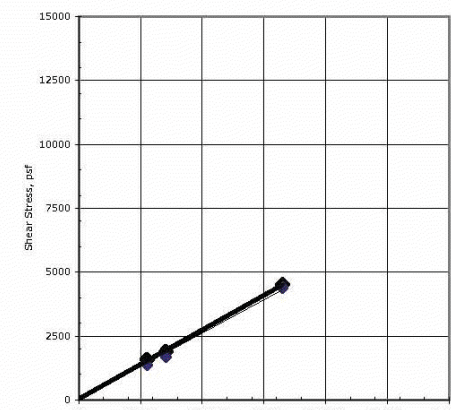
Client:	Geocomp Consulting		
Project Name:	I-90 Central Viaduct		
Project Location:	Cleveland, OH		
GTX #:	6678	Tested By:	njh/md
Test Date:	05/06-05/19/06	Checked By:	jdt
Boring ID:	B-05-04		
Sample ID:	S-27		
Depth, ft.	72-74 ft.		
Description:	Moist, very dark grayish brown clay		
Preparation:	Extruded from tube, cut and trimmed and tested at the as-received moisture and density.		

Direct Shear and Residual Shear by ASTM D 3080

Parameter	Point 1	Point 2	Point 3
Test No.	RS7	RS8	RS9
Initial Moisture Content, %	22	21	22
Initial Dry Density, pcf	107	107	107
Nominal Rate of Shear Strain, inches/min	0.0004	0.0004	0.0004
Vertical Consolidation Stress, psf	2752	3519	8258
Peak Shear Stress, psf	1580	1891	4519
Post-Peak Shear Stress, psf	1374	1681	4393
Final Moisture Content, %	23	23	20

Notes: Residual values taken near the end of the final shear step.	Peak Friction Angle:	28.4	degrees
	Peak Cohesion:	43	psf
	Post Peak Friction Angle:	27.5	degrees
	Post Peak Cohesion:	0	psf

Normal Stress vs. Shear Stress



Comments: See attached plots for additional information



**Consolidated Undrained Direct Simple Shear Test of Cohesive Soil
by ASTM D 6528**

Client: Geocomp Consulting GTX#: 6678
 Project Name: I-90 Central Viaduct Test Date: 05/07/06
 Project Location: Cleveland, OH

Boring ID: B-05-03
 Sample ID: S-29
 Depth, ft: 116.5-118.5 ft

Visual Description: Moist, dark gray clay

Test Equipment: Top and bottom box (circular) = 2.62 in diameter. Load cells and LVDT's connected to data acquisition system for shear force, normal load, horizontal and vertical displacement; surface area = 5.39 in², soil height = 1 inch

Test Condition: inundated

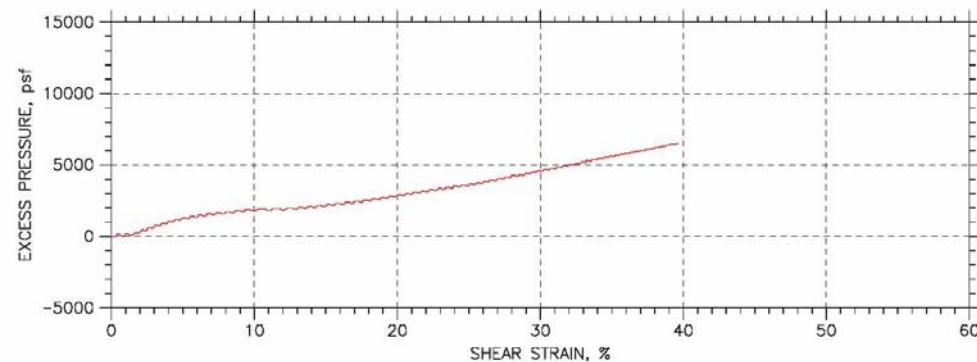
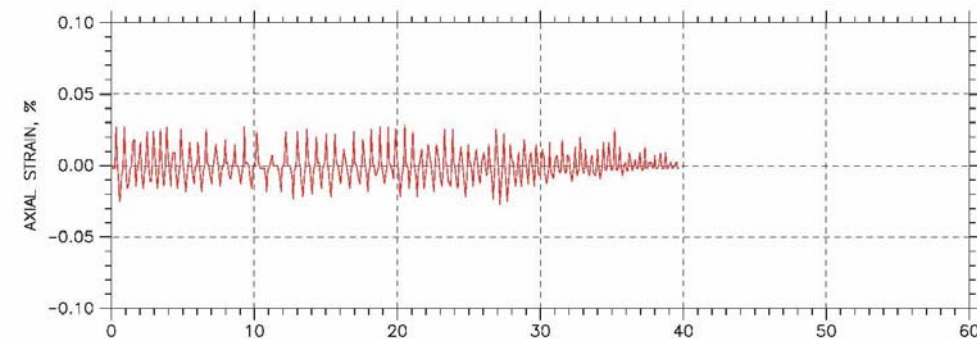
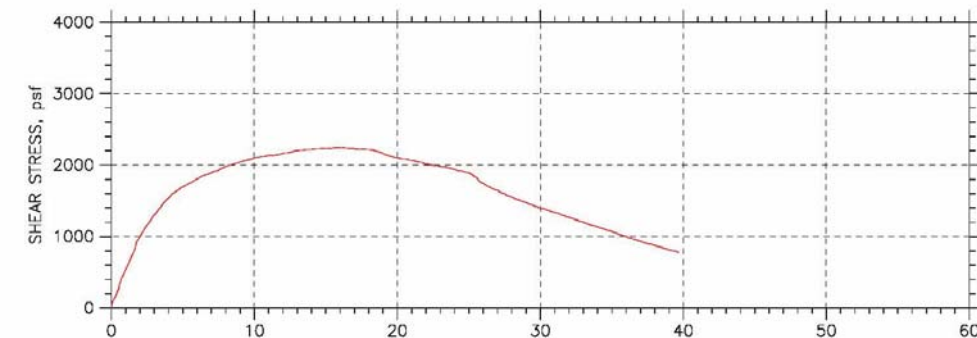
Sample Type and Preparation: Extruded from tube, cut, trimmed and placed into apparatus at as-received density and moisture content.

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-1				
Initial Moisture Content, %	29				
Initial Dry Density, pcf	96.3				
Nominal Rate of Shear Strain, %/min	0.0008				
Vertical Consolidation Stress, psf	9500				
Final Moisture Content, %	28				
Measured Peak Shear Stress, psf	2240				
Shear Strain at Peak Shear Stress, %	15.6				
Membrane Correction, psf	73				
S / σ'_{vs}	0.23				

Comments: Tested By: njh Checked By: jdt

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

DIRECT SIMPLE SHEAR TEST

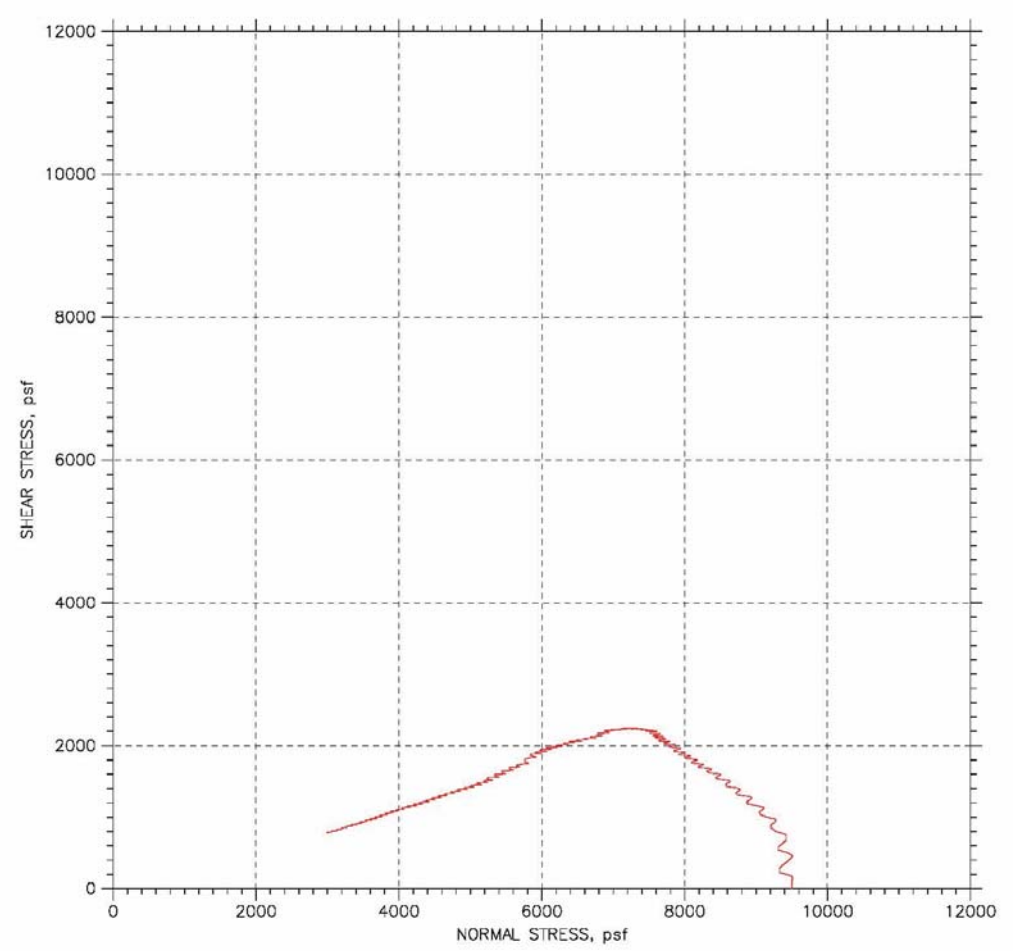


Project: I-90 Central Viaduct	Location: Cleveland, OH	Project No.: GTX-6678
Boring No.: B-05-03	Tested By: njh	Checked By: jdt
Sample No.: S-29	Test Date: 05/05/06	Depth: 115.5-118.5
Test No.: DSS-1	Sample Type: tube	Elevation: ---
Description: Moist, dark gray clay		
Remarks: 500 lb vertical load cell - 500 lb low profile horizontal load cell		1.5 membrane
File: \\Geocompdb1\projects\GTX6678\6678-DSS-1.dat		





DIRECT SIMPLE SHEAR TEST



Project: I-90 Central Viaduct	Location: Cleveland, OH	Project No.: GTX-6678
Boring No.: B-05-03	Tested By: njh	Checked By: jdt
Sample No.: S-29	Test Date: 05/05/06	Depth: 115.5-118.5
Test No.: DSS-1	Sample Type: tube	Elevation: ---
Description: Moist, dark gray clay		
Remarks: 500 lb vertical load cell - 500 lb low profile horizontal load cell		1.5 membrane
File: \\Geocomp\db1\projects\GTX6678\6678-DSS-1.dat		

Consolidated Undrained Direct Simple Shear Test of Cohesive Soil by ASTM D 6528

Client: Geocomp Consulting GTX#: 6678
 Project Name: I-90 Central Viaduct Test Date: 05/08/06
 Project Location: Cleveland, OH

Boring ID: B-05-03
 Sample ID: S-30
 Depth, ft: 118.5-120.3 ft

Visual Description: Moist, dark gray clay

Test Equipment: Top and bottom box (circular) = 2.62 in diameter. Load cells and LVDT's connected to data acquisition system for shear force, normal load, horizontal and vertical displacement; surface area = 5.39 in², soil height = 1 inch

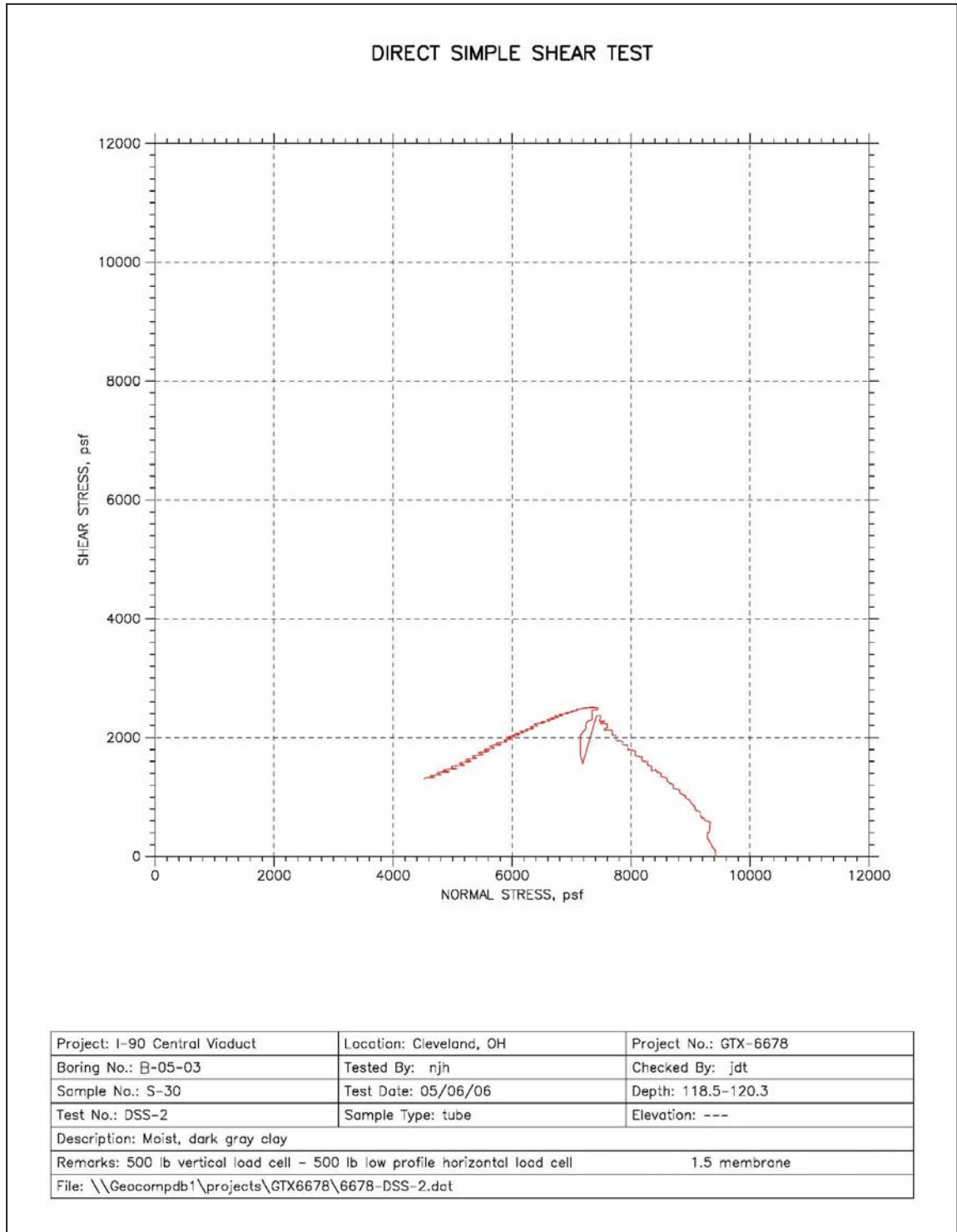
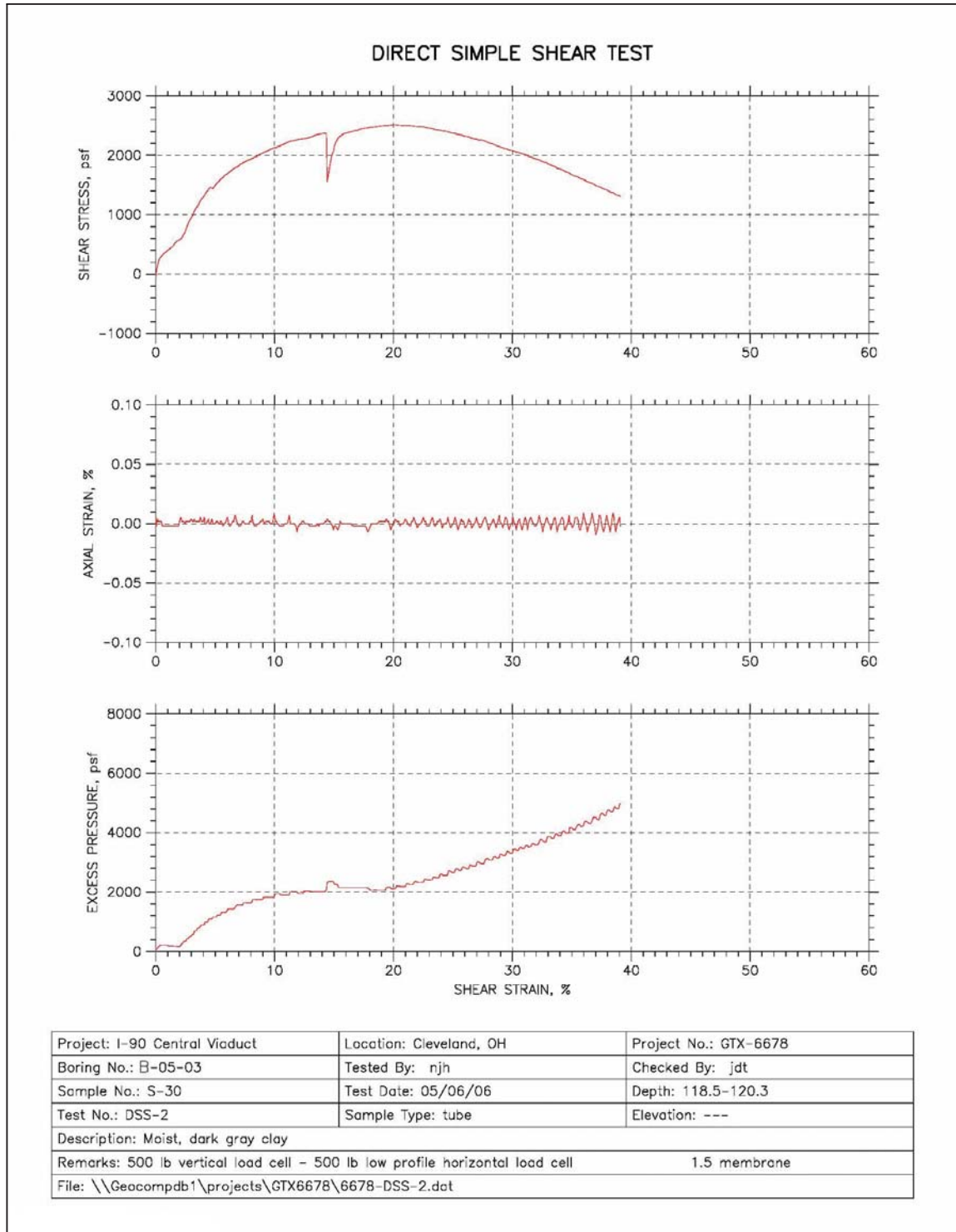
Test Condition: inundated

Sample Type and Preparation: Extruded from tube, cut, trimmed and placed into apparatus at as-received density and moisture content.

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-2				
Initial Moisture Content, %	26				
Initial Dry Density, pcf	99.3				
Nominal Rate of Shear Strain, %/min	0.0008				
Vertical Consolidation Stress, psf	9500				
Final Moisture Content, %	29				
Measured Peak Shear Stress, psf	2514				
Shear Strain at Peak Shear Stress, %	20.0				
Membrane Correction, psf	78				
S / σ'_{vs}	0.26				

Comments: Tested By: njh Checked By: jdt

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.



**Consolidated Undrained Direct Simple Shear Test of Cohesive Soil
by ASTM D 6528**

Client: Geocomp Consulting GTX#: 6678
 Project Name: I-90 Central Viaduct Test Date: 05/30/06
 Project Location: Cleveland, OH

Boring ID: B-05-04
 Sample ID: S-27
 Depth, ft: 72-74 ft

Visual Description: Moist, very dark grayish brown clay

Test Equipment: Top and bottom box (circular) = 2.62 in diameter. Load cells and LVDT's connected to data acquisition system for shear force, normal load, horizontal and vertical displacement; surface area = 5.39 in², soil height = 1 inch

Test Condition: inundated

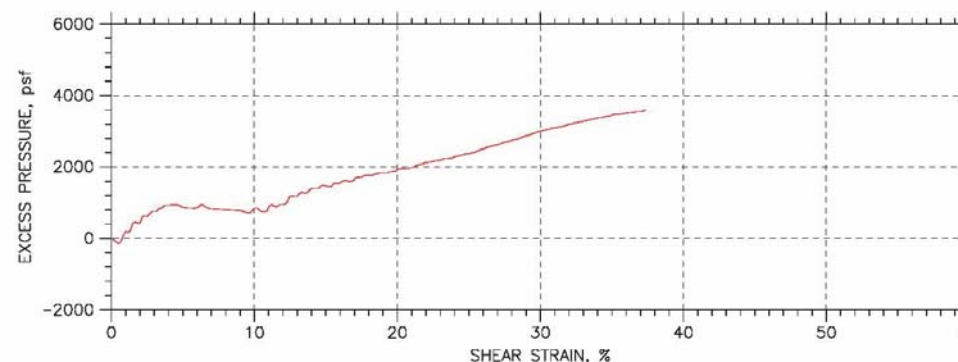
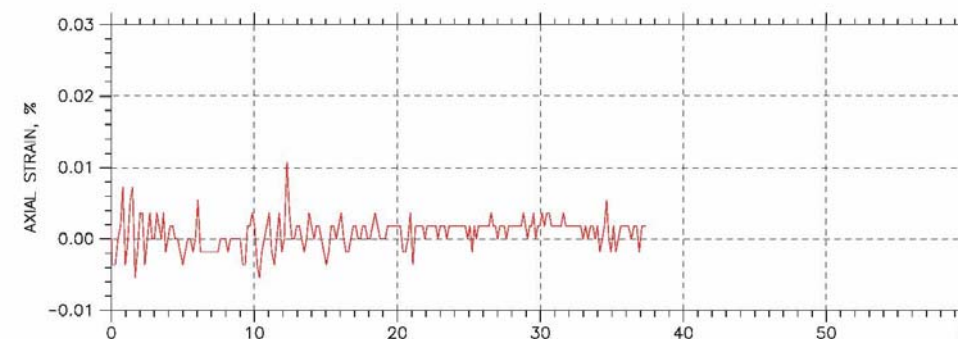
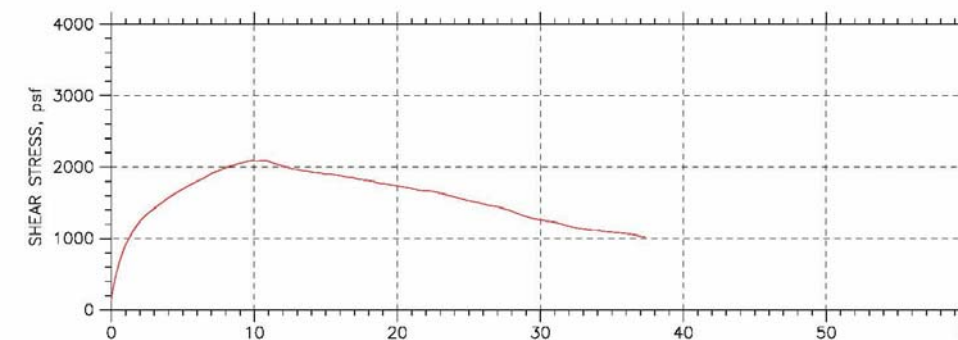
Sample Type and Preparation: Extruded from tube, cut, trimmed and placed into apparatus at as-received density and moisture content.

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-3				
Initial Moisture Content, %	22				
Initial Dry Density, pcf	107				
Nominal Rate of Shear Strain, %/min	0.0008				
Vertical Consolidation Stress, psf	5506				
Final Moisture Content, %	21				
Measured Peak Shear Stress, psf	2092				
Shear Strain at Peak Shear Stress, %	10.7				
Membrane Correction, psf	64				
S / σ'_{vs}	0.37				

Comments: Tested By: njh Checked By: jdt

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

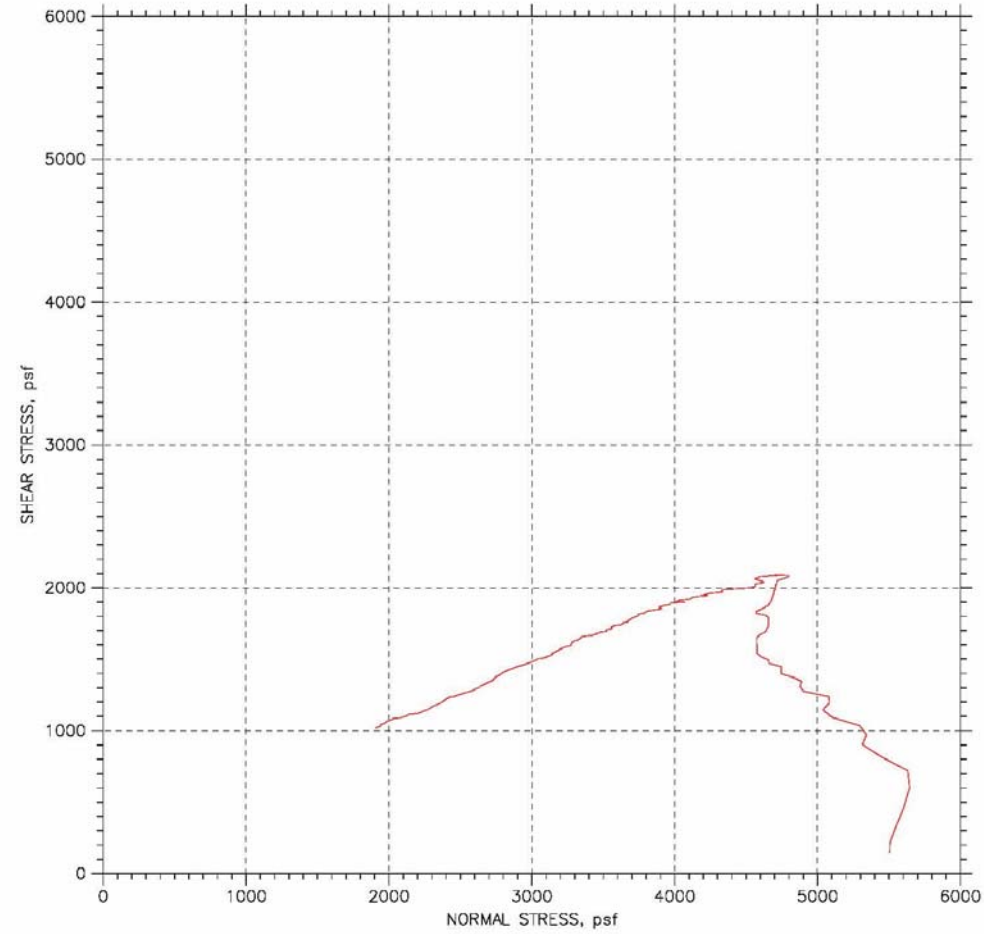
DIRECT SIMPLE SHEAR TEST



Project: I-90 Central Viaduct	Location: Cleveland, OH	Project No.: GTX-6678
Boring No.: B-05-04	Tested By: njh	Checked By: jdt
Sample No.: S-27	Test Date: 05/30/06	Depth: 72-74 ft
Test No.: DSS-3	Sample Type: ---	Elevation: ---
Description: Moist, very dark grayish brown clay		
Remarks: 1.5 membrane		
File: \\Geocompdb1\projects\GTX6678\6678-DSS3.dat		



DIRECT SIMPLE SHEAR TEST



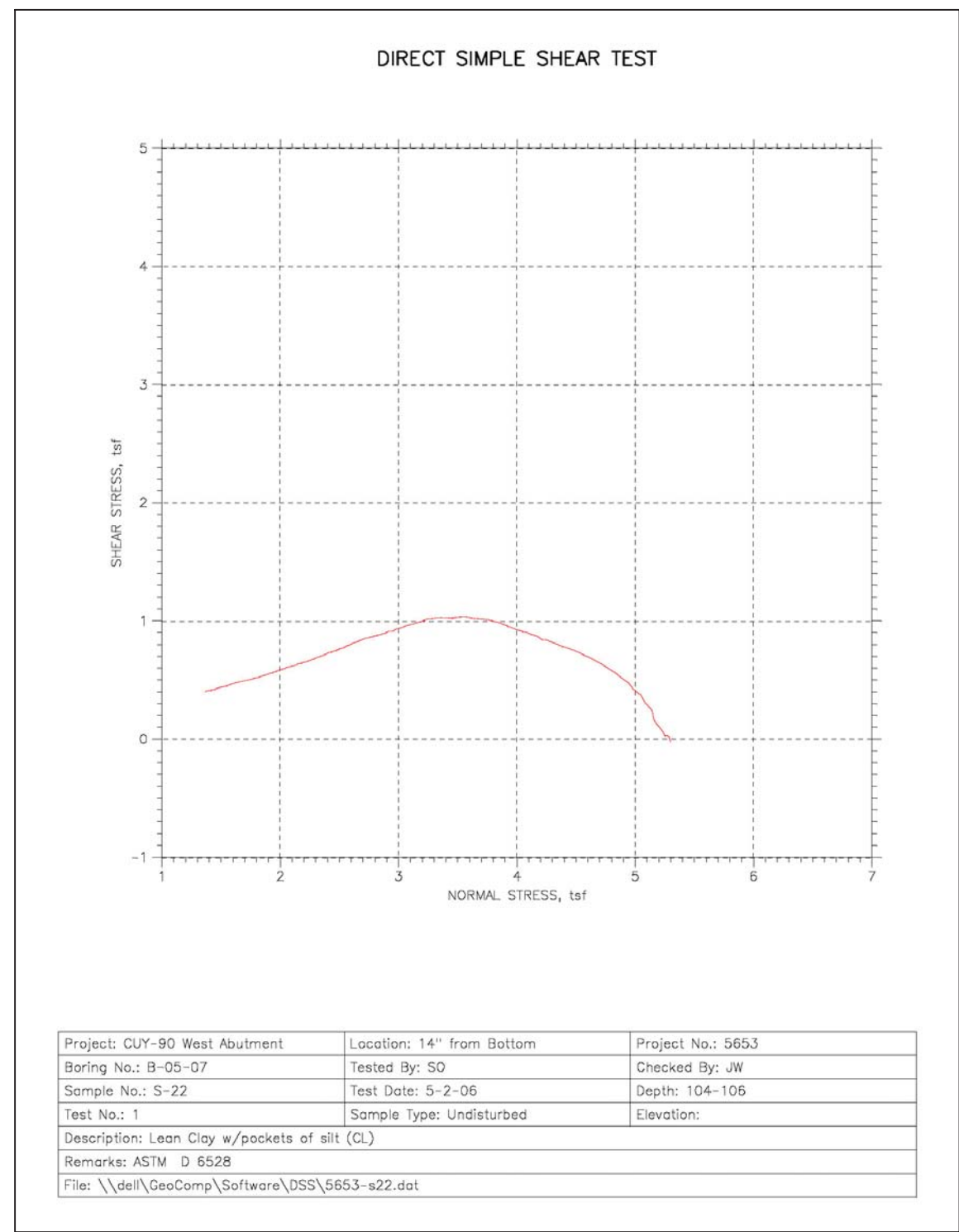
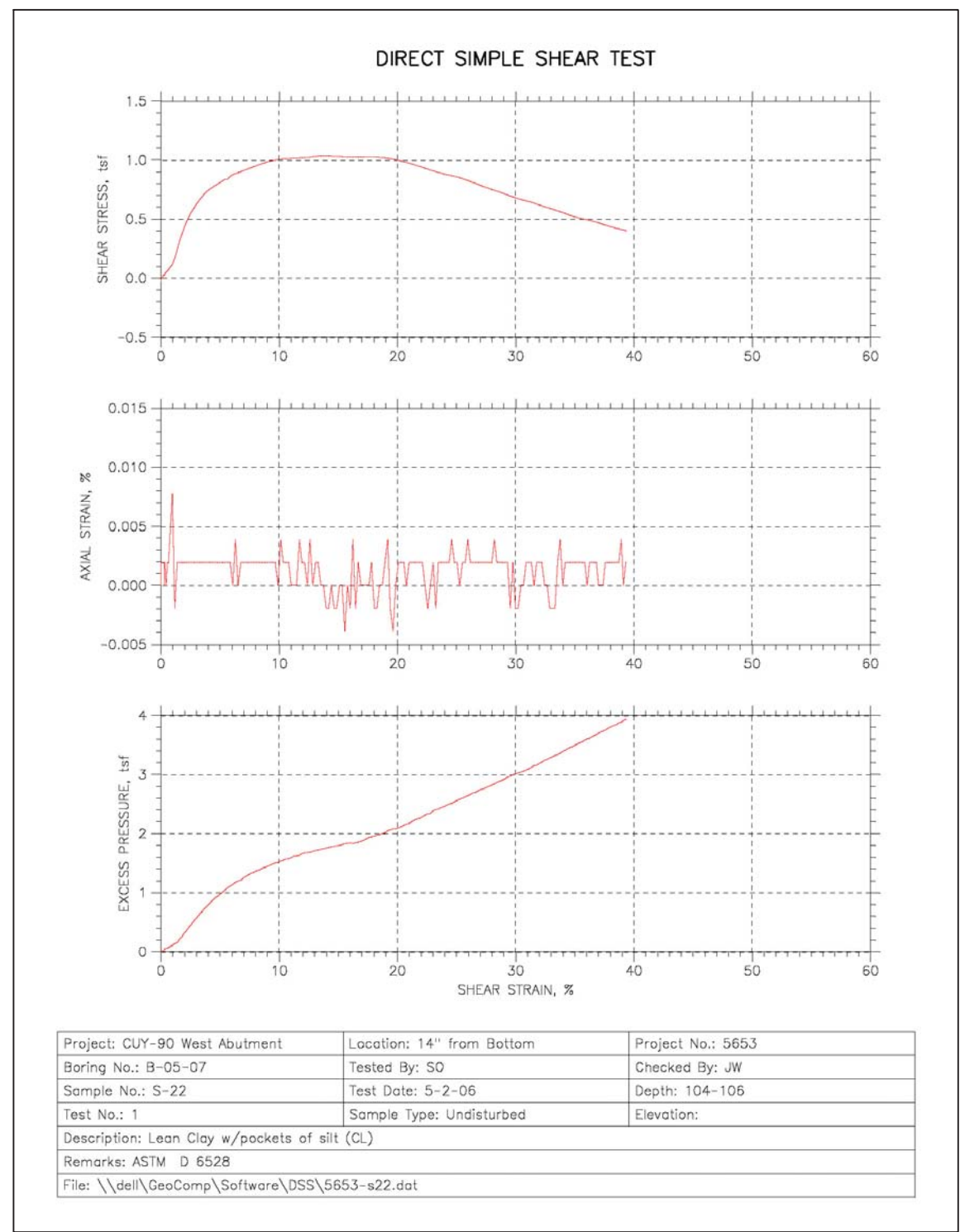
Project: I-90 Central Viaduct	Location: Cleveland, OH	Project No.: GTX-6678
Boring No.: B-05-04	Tested By: njh	Checked By: jdt
Sample No.: S-27	Test Date: 05/30/06	Depth: 72-74 ft
Test No.: DSS-3	Sample Type: ---	Elevation: ---
Description: Moist, very dark grayish brown clay		
Remarks: 1.5 membrane		
File: \\Geocompdb1\projects\GTX6678\6678-DSS3.dat		

Sample Info For DSS Specimens

Project: CUY-90 West Abutment					Job: 5653						
Client: BBC&M Engineering, Inc.					Date: 5/9/2006						
Test #	Boring	Sample #	Depth (ft)	WC %	Initial	Before Shear	Normal Load (TSF)	Additional Testing			
					Density (PCF)	Density (PCF)		Gs	LL	PL	PI
1	B-05-07	S-22	104-106	34.4	88.5	99.0	5.3 tsf	-----	40.1	22.5	17.6
2	B-05-02	S-14	44-46	28.8	94.3	99.9	2.8 tsf	-----	37.7	21.4	16.3
3	B-05-03	S-8	32-33.5	25.9	100.8	107.0	1.95 tsf	-----	34.8	18.8	16.0
4	B-05-02	S-32	122-124	21.2	103.2	110.1	5.3 tsf	-----	30.3	18.8	11.5

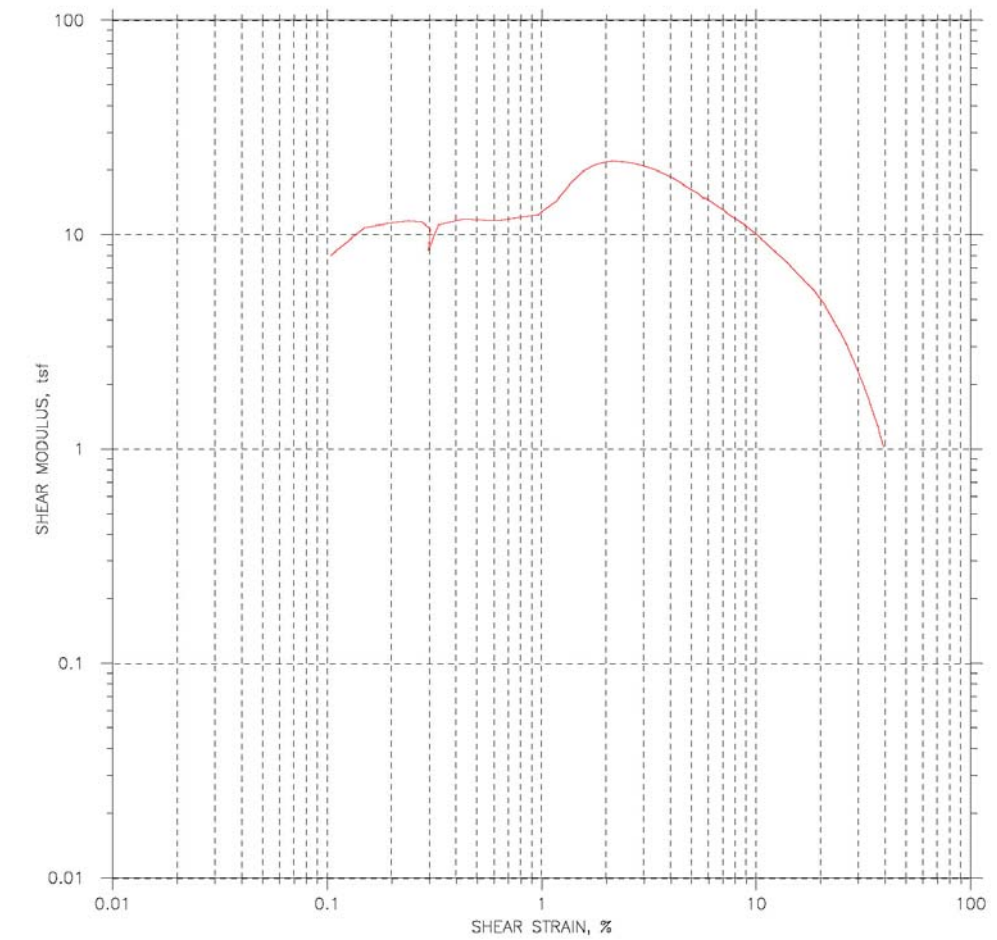
SOIL ENGINEERING TESTING, INC.





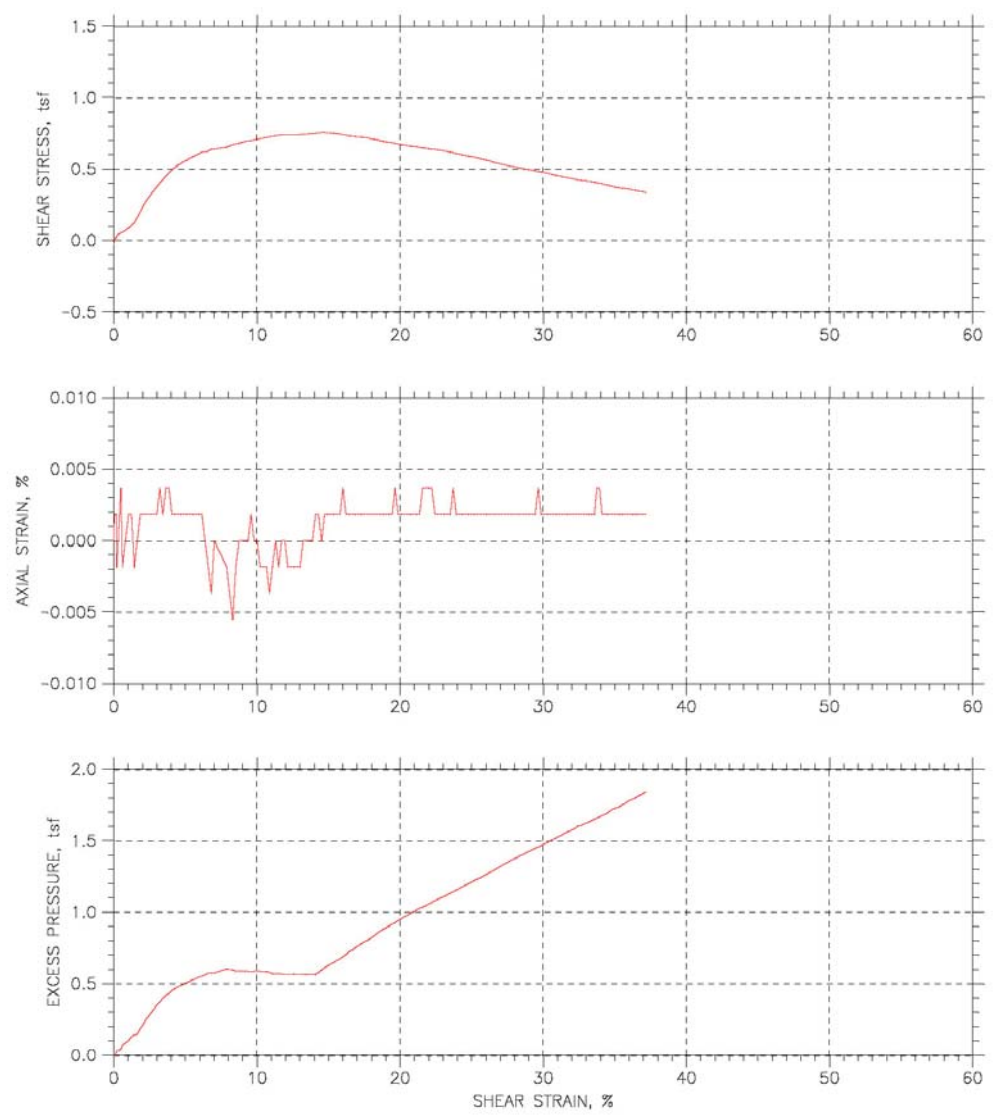


DIRECT SIMPLE SHEAR TEST



Project: CUY-90 West Abutment	Location: 14" from Bottom	Project No.: 5653
Boring No.: B-05-07	Tested By: SQ	Checked By: JW
Sample No.: S-22	Test Date: 5-2-06	Depth: 104-106
Test No.: 1	Sample Type: Undisturbed	Elevation:
Description: Lean Clay w/pockets of silt (CL)		
Remarks: ASTM D 6528		
File: \\dell\GeoComp\Software\DSS\5653-s22.dat		

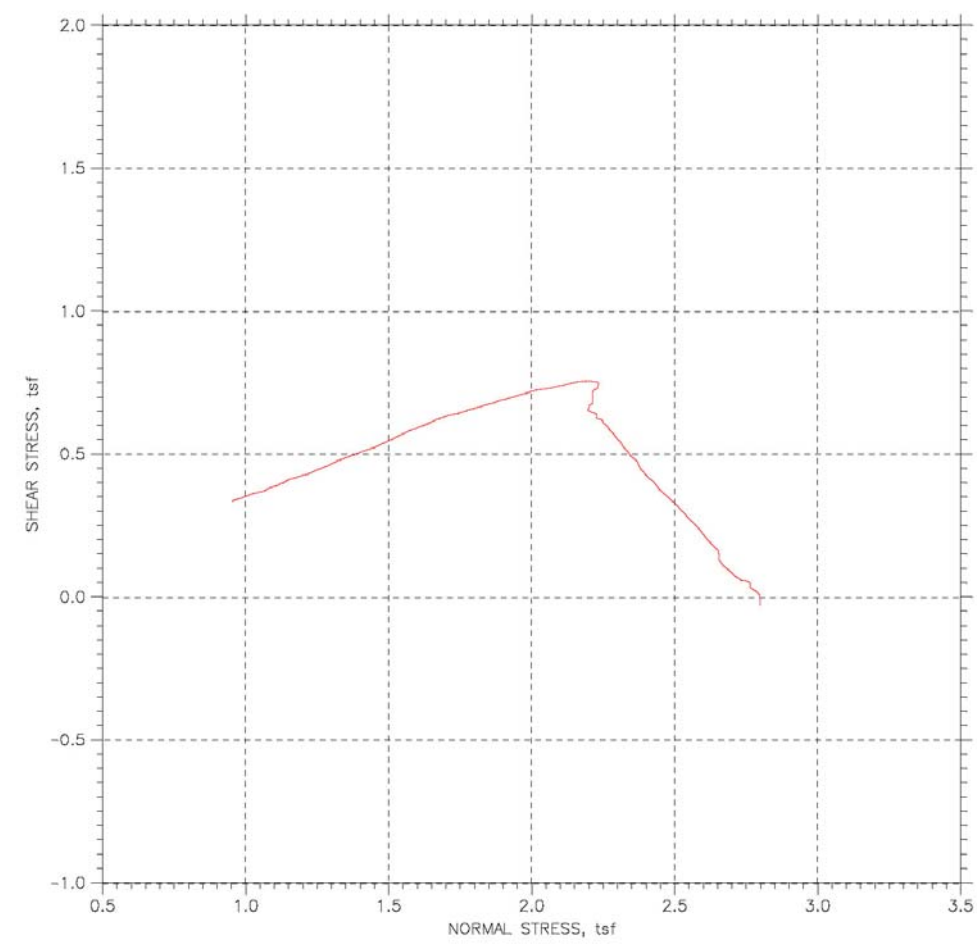
DIRECT SIMPLE SHEAR TEST



Project: CUY-90 West Abutment	Location: 14" from Bottom	Project No.: 5653
Boring No.: B-05-02	Tested By: SQ	Checked By: JW
Sample No.: S-14	Test Date: 11-6-05	Depth: 44-46
Test No.: 2	Sample Type: Undisturbed	Elevation:
Description: Lean Clay w/an occasional piece of coarse sand (CL)		
Remarks: ASTM D 6528		
File: \\dell\GeoComp\Software\DSS\5653-s14-mod2.dat		

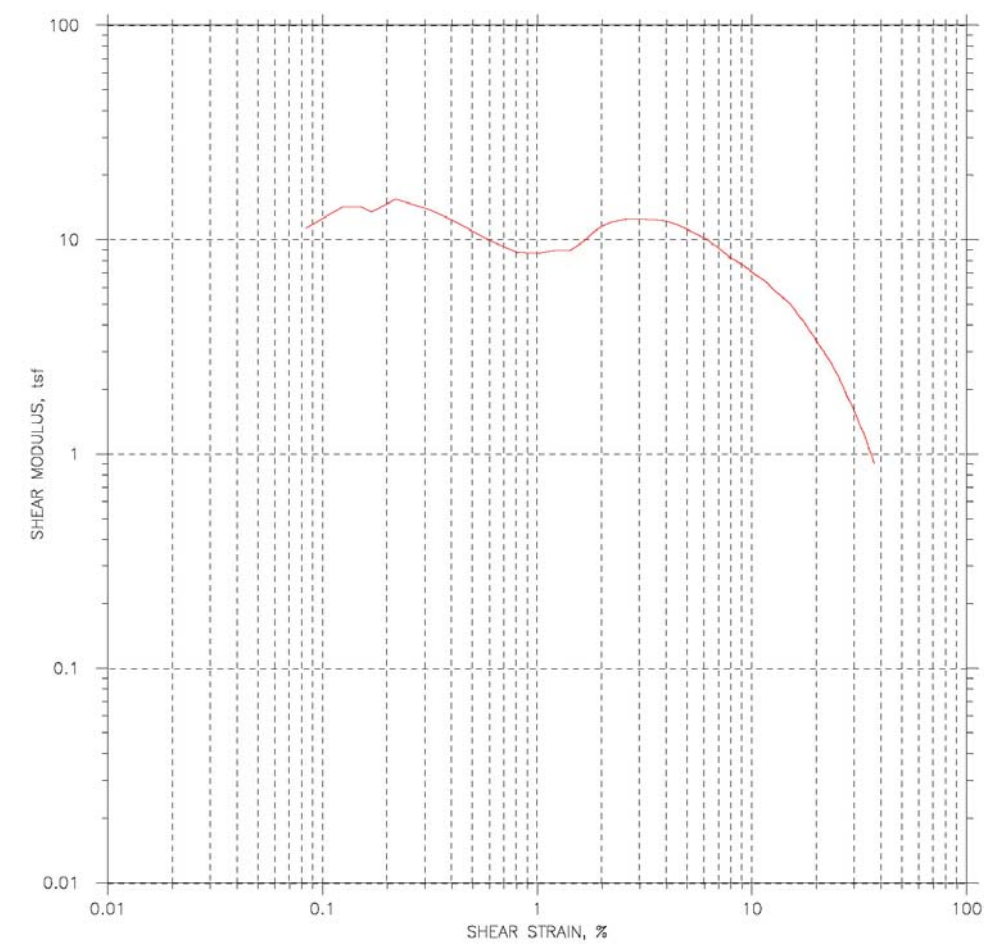


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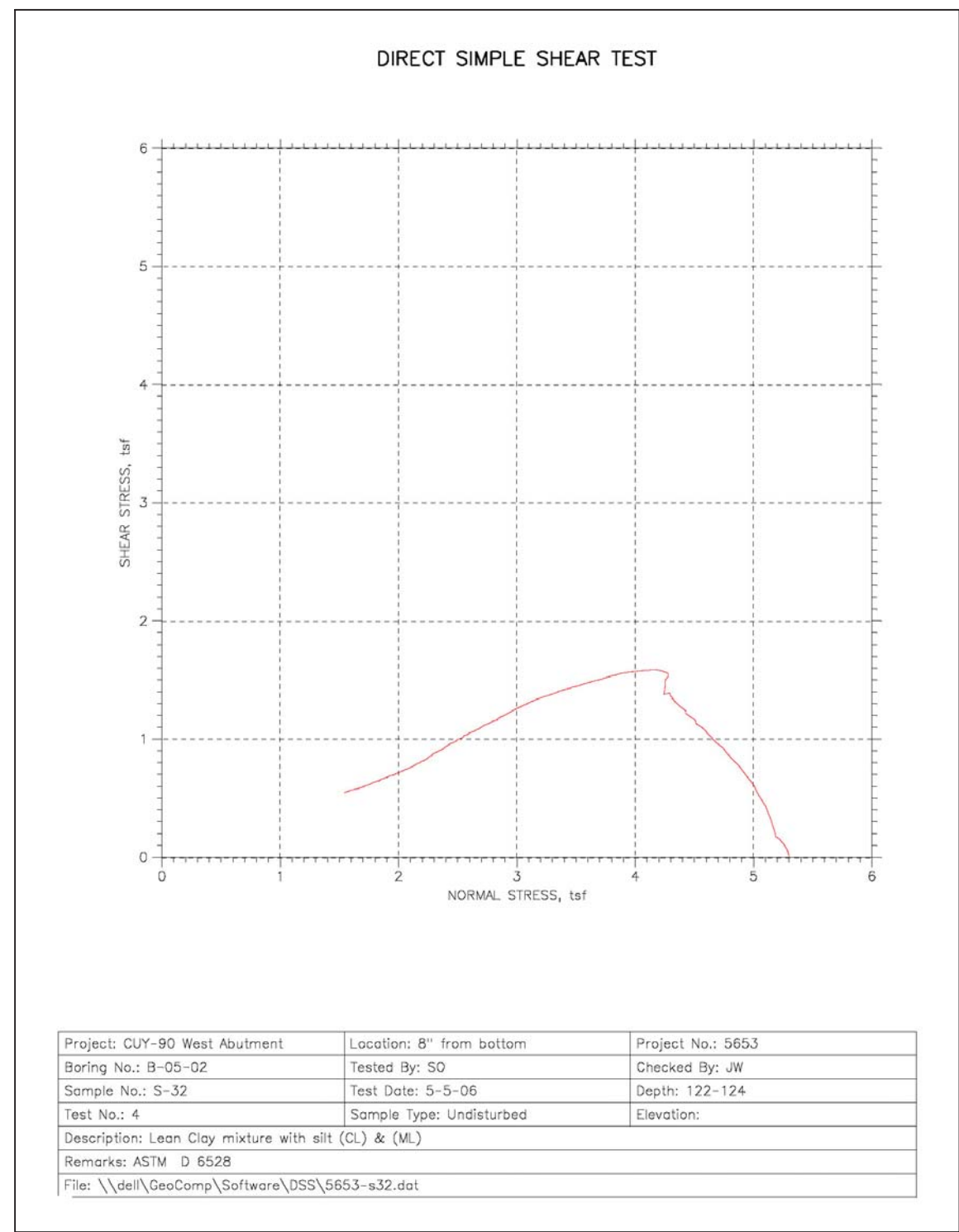
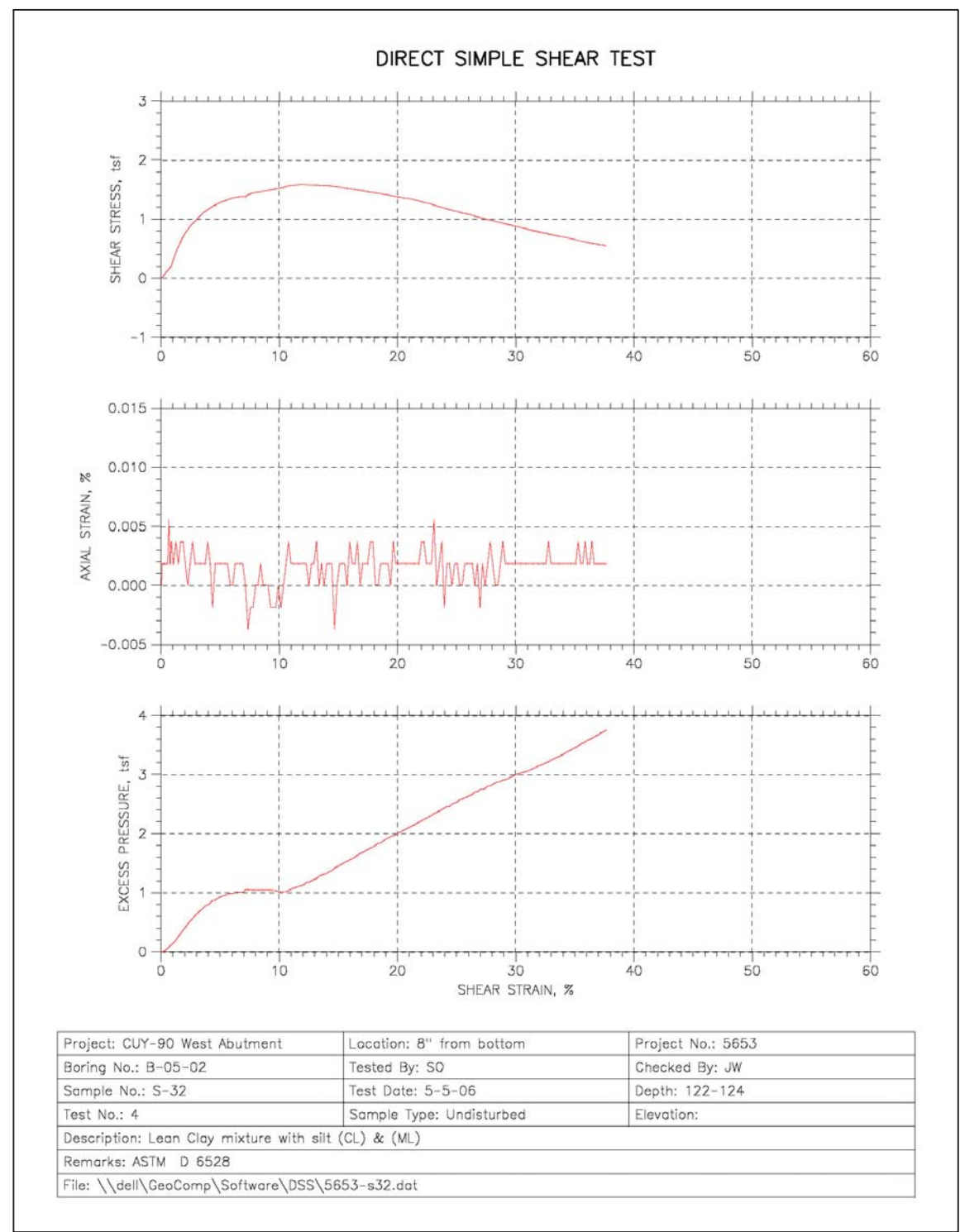


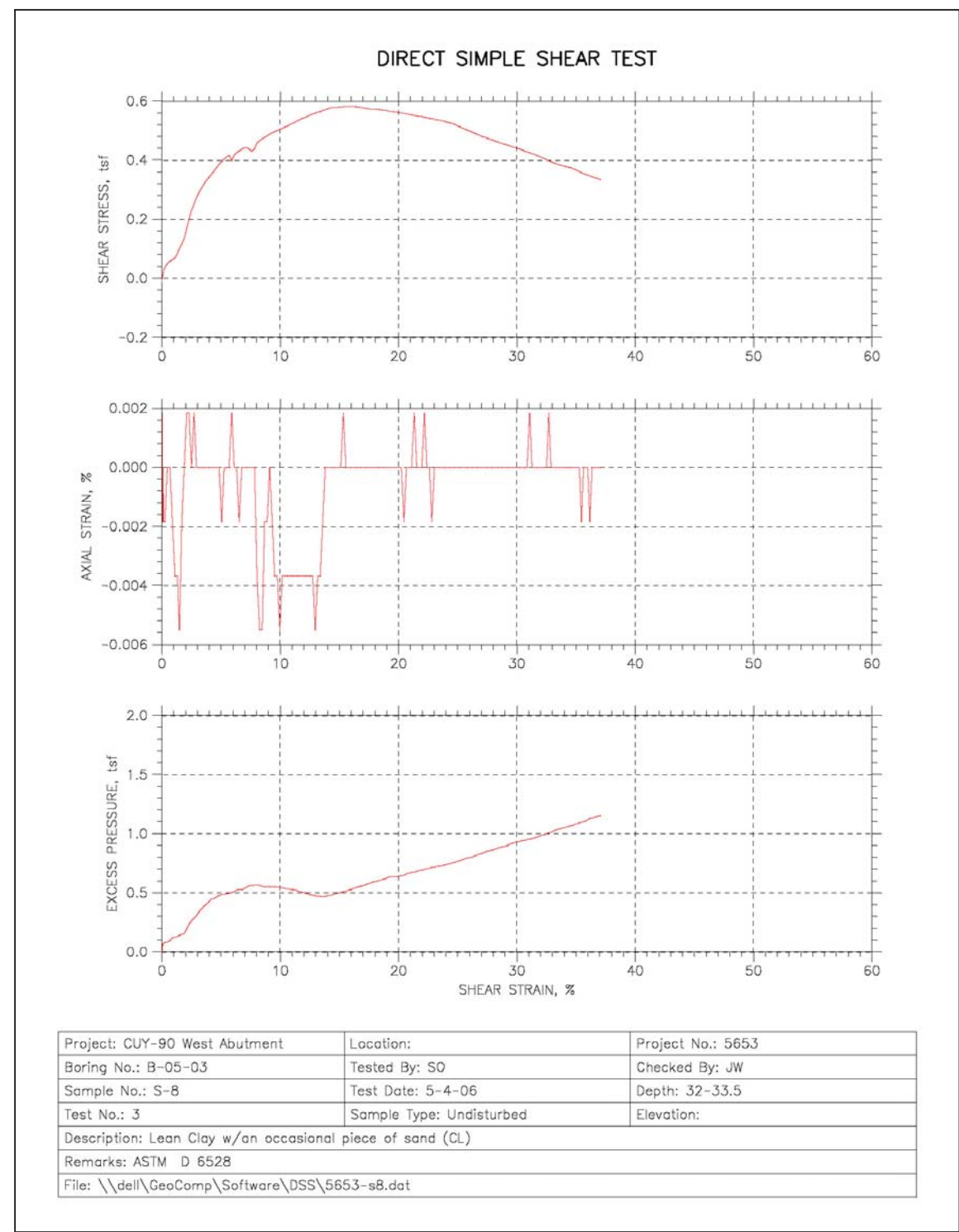
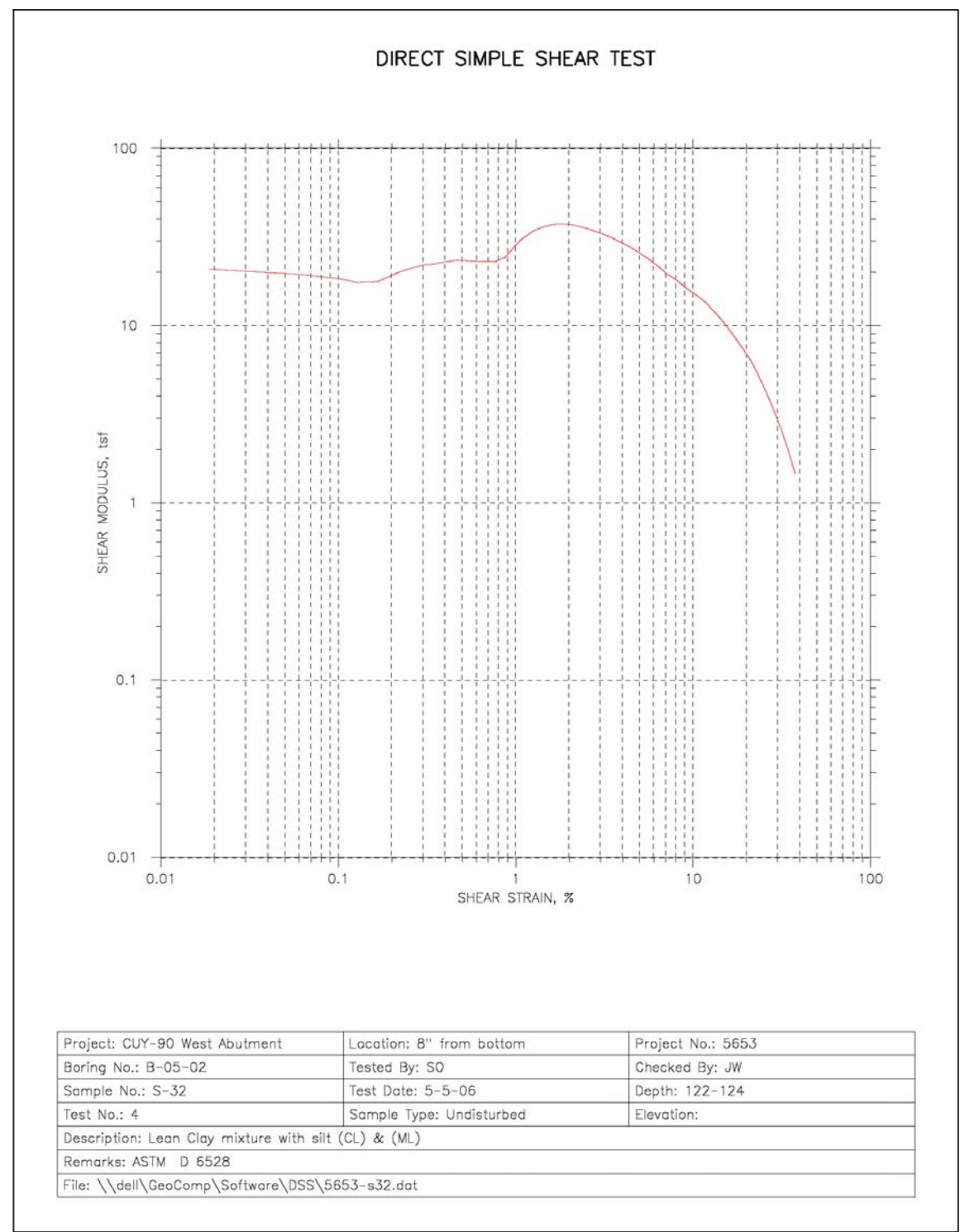
Project: CUY-90 West Abutment	Location: 14" from Bottom	Project No.: 5653
Boring No.: B-05-02	Tested By: SO	Checked By: JW
Sample No.: S-14	Test Date: 11-6-05	Depth: 44-46
Test No.: 2	Sample Type: Undisturbed	Elevation:
Description: Lean Clay w/an occasional piece of coarse sand (CL)		
Remarks: ASTM D 6528		
File: \\dell\GeoComp\Software\DSS\5653-s14-mod2.dat		

DIRECT SIMPLE SHEAR TEST



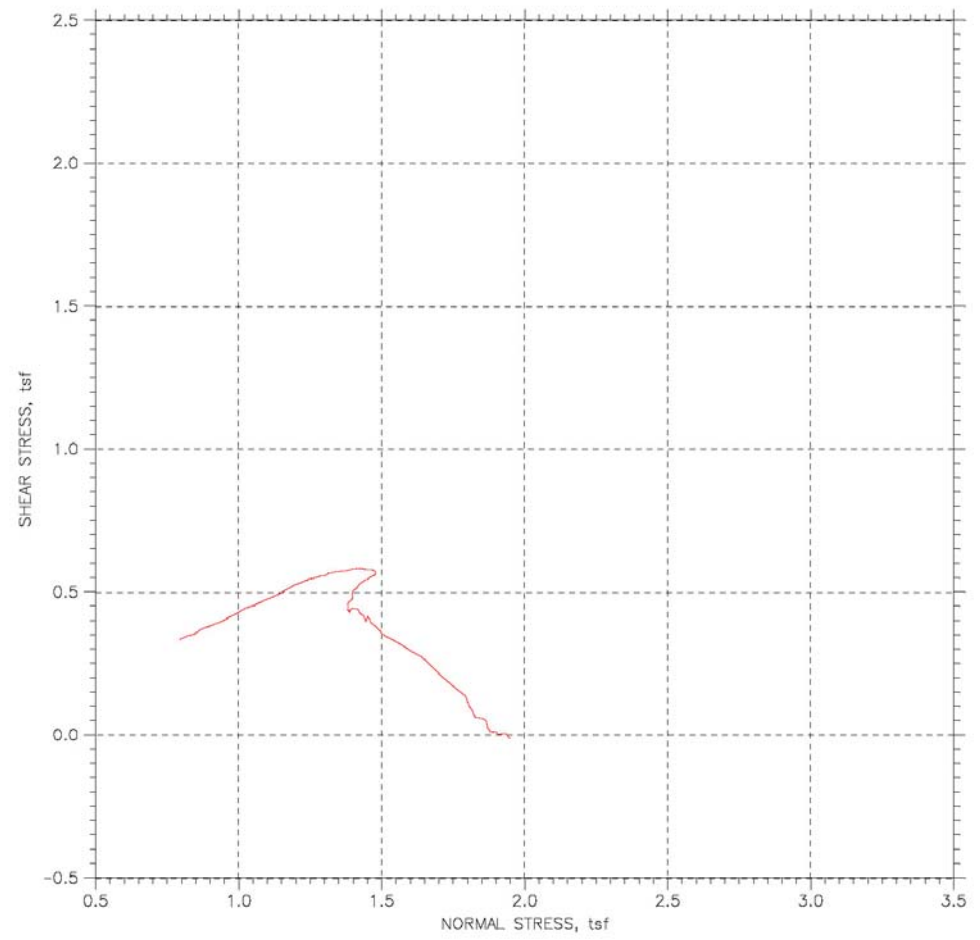
Project: CUY-90 West Abutment	Location: 14" from Bottom	Project No.: 5653
Boring No.: B-05-02	Tested By: SO	Checked By: JW
Sample No.: S-14	Test Date: 11-6-05	Depth: 44-46
Test No.: 2	Sample Type: Undisturbed	Elevation:
Description: Lean Clay w/an occasional piece of coarse sand (CL)		
Remarks: ASTM D 6528		
File: \\dell\GeoComp\Software\DSS\5653-s14-mod2.dat		





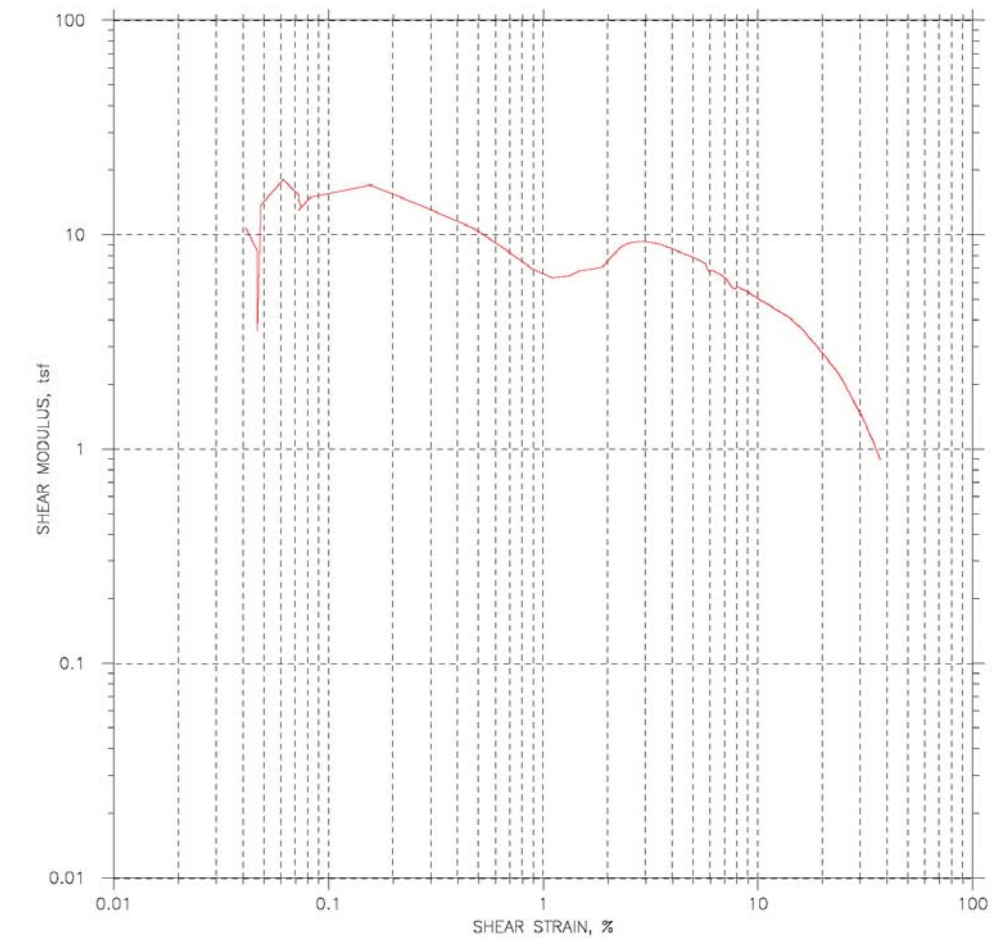


DIRECT SIMPLE SHEAR TEST



Project: CUY-90 West Abutment	Location:	Project No.: 5653
Boring No.: B-05-03	Tested By: SQ	Checked By: JW
Sample No.: S-8	Test Date: 5-4-06	Depth: 32-33.5
Test No.: 3	Sample Type: Undisturbed	Elevation:
Description: Lean Clay w/an occasional piece of sand (CL)		
Remarks: ASTM D 6528		
File: \\dell\GeoComp\Software\DSS\5653-s8.dat		

DIRECT SIMPLE SHEAR TEST

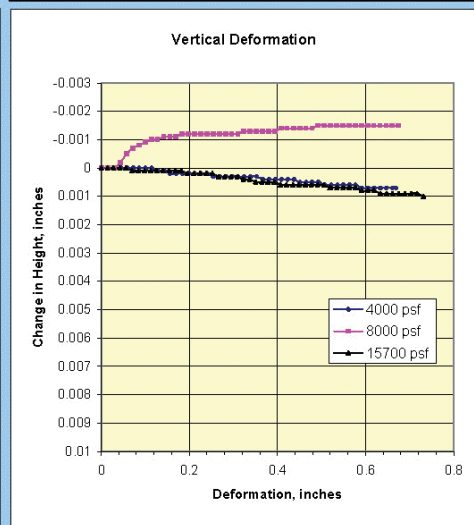
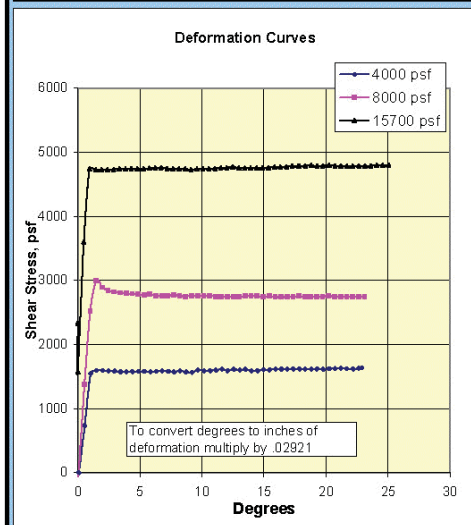
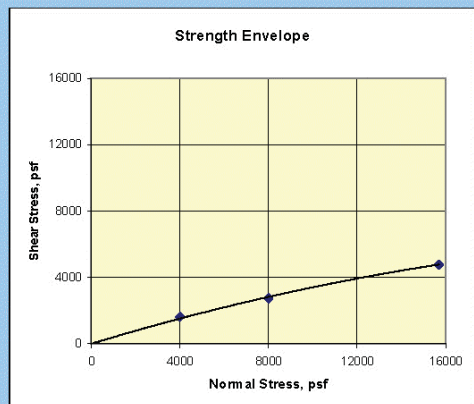
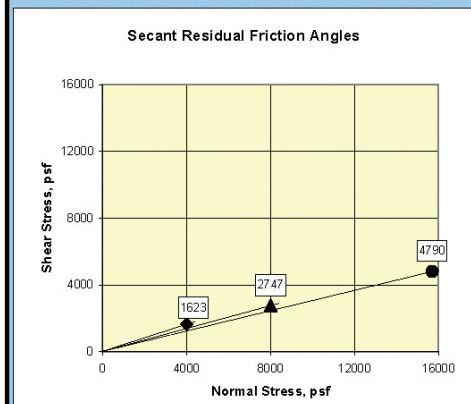


Project: CUY-90 West Abutment	Location:	Project No.: 5653
Boring No.: B-05-03	Tested By: SQ	Checked By: JW
Sample No.: S-8	Test Date: 5-4-06	Depth: 32-33.5
Test No.: 3	Sample Type: Undisturbed	Elevation:
Description: Lean Clay w/an occasional piece of sand (CL)		
Remarks: ASTM D 6528		
File: \\dell\GeoComp\Software\DSS\5653-s8.dat		



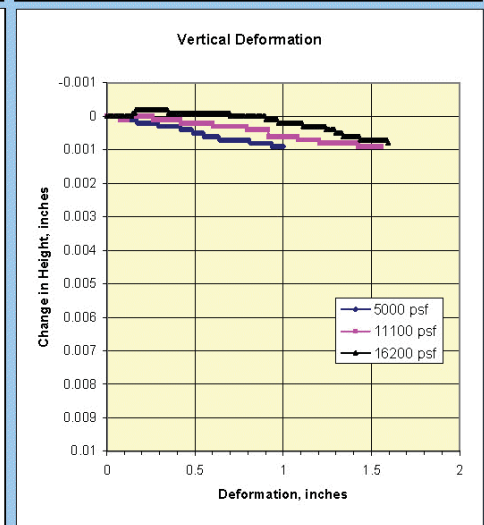
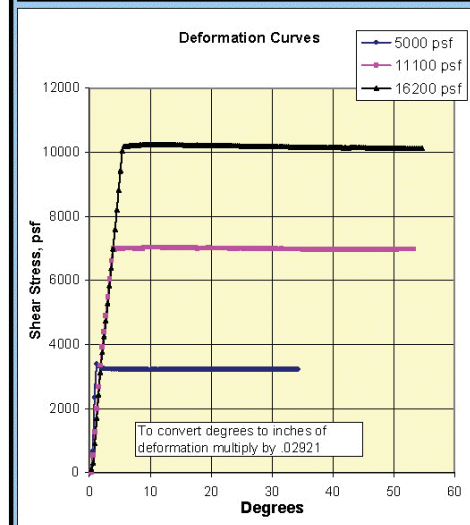
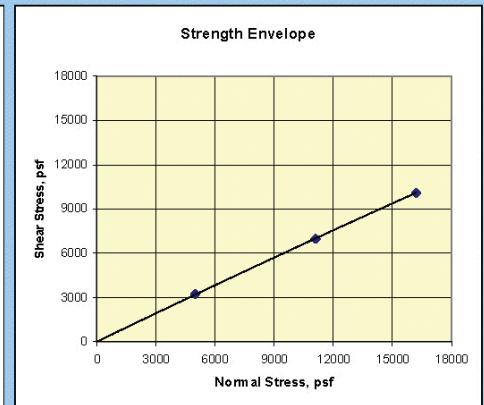
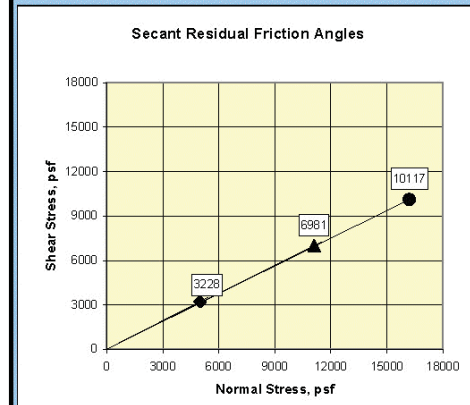
**Drained, Residual Torsional Ring Shear
Test ASTM D 6467**

Job No.:	607-002B	Boring:	B-05-11	Date:	5/5/2006	Undisturbed:	
Client:	BBCM	Sample:	S-24	By:	PJ	Peak:	
Project:	I-90 West Abutment	Depth:	92-93.5'	Checked:	DC	Residual:	
Soil Type:	Gray Lean CLAY	Clay, %:		Fully Softened:			X
Remarks:	A small friction correction was applied to each point. This material exhibited a tendency to break down during shearing. Lower strengths may be possible with further deformation.						
Normal Stress, psf	4000	8000	15700	LL:	35	Peak:	
Secant Phi, deg.	22	19	17	PL:	22	Residual:	X



**Drained, Residual Torsional Ring Shear
Test ASTM D 6467**

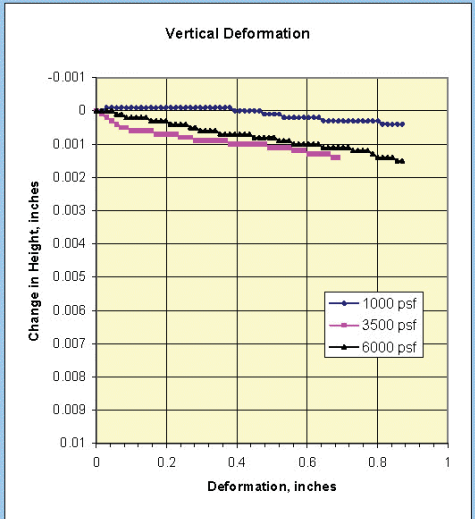
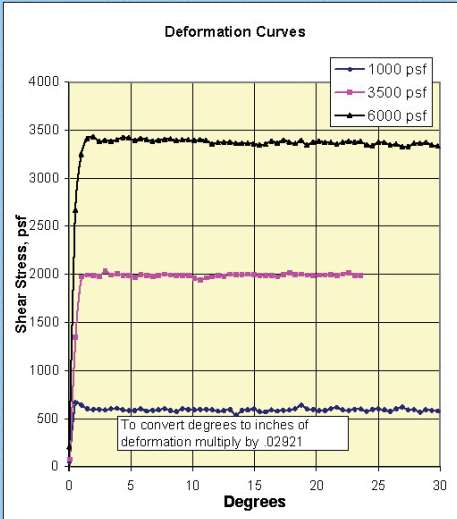
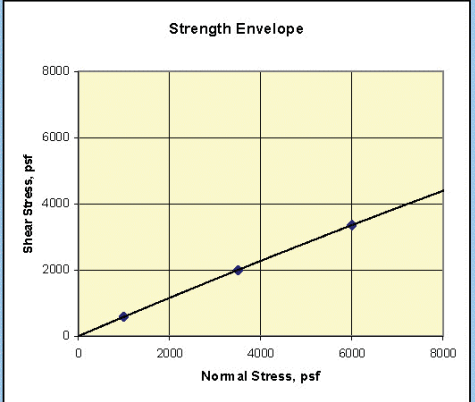
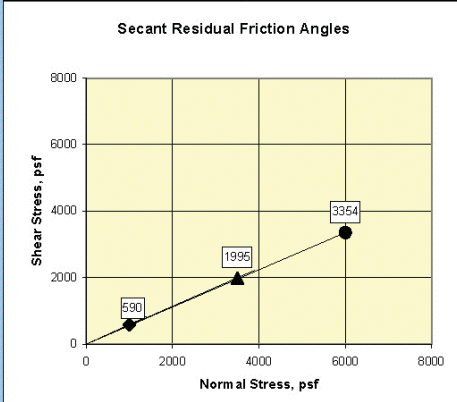
Job No.:	607-002	Boring:	B-05-02	Date:	5/5/2006	Undisturbed:	
Client:	BBCM	Sample:	S-35	By:	PJ	Peak:	
Project:	I90 West Abutment	Depth:	128.5-130'	Checked:	DC	Residual:	
Soil Type:	Gray SILT	Clay, %:		Fully Softened:			X
Remarks:	Dropped high load to 16.2ksf to avoid exceeding equip. capacity.						
Normal Stress, psf	5000	11100	16200	LL:	19	Peak:	
Secant Phi, deg.	33	32	32	PL:	21	Residual:	X





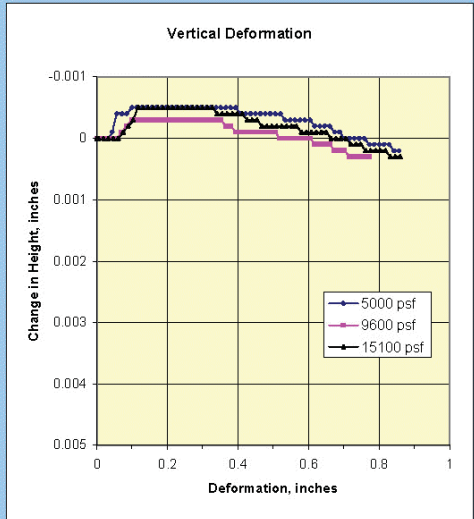
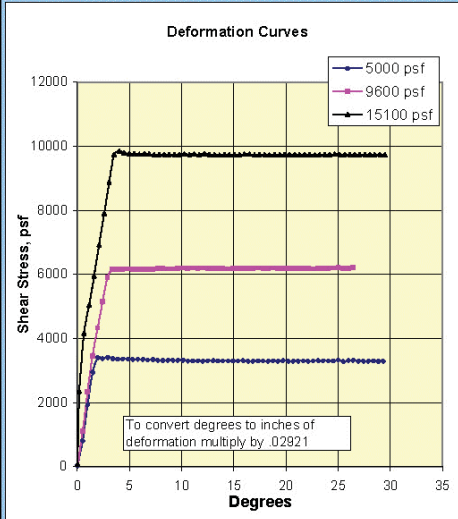
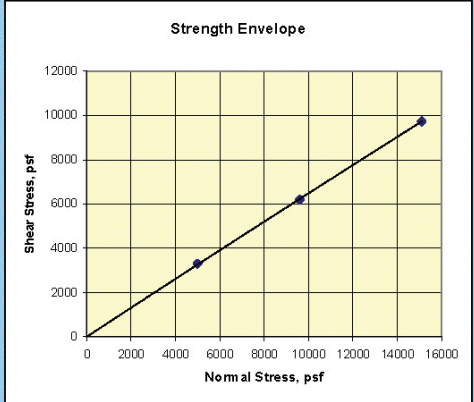
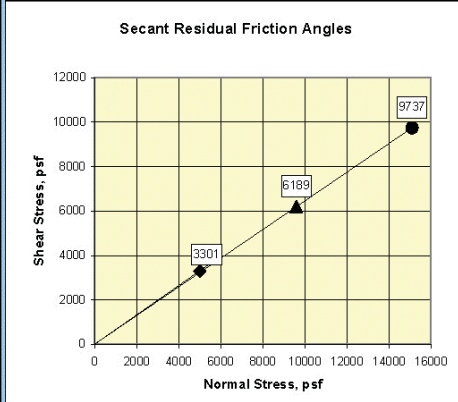
**Drained, Residual Torsional Ring Shear
Test ASTM D 6467**

Job No.:	607-001A	Boring:	B-05-03	Date:	5/1/2006	Undisturbed:	
Client:	BBCM	Sample:	S-7	By:	PJ	Peak:	
Project:	012 00946.300	Depth:	30-30.5'	Checked:	DC	Residual:	
Soil Type:	Bluish Gray CLAY (silty)			Clay, %:		Fully Softened:	X
Remarks:	A small friction correction applied to each point.						
Normal Stress, psf	1000	3500	6000	LL:	24	Peak:	
Secant Phi, deg.	31	30	29	PL:	17	Residual:	X



**Drained, Residual Torsional Ring Shear
Test ASTM D 6467**

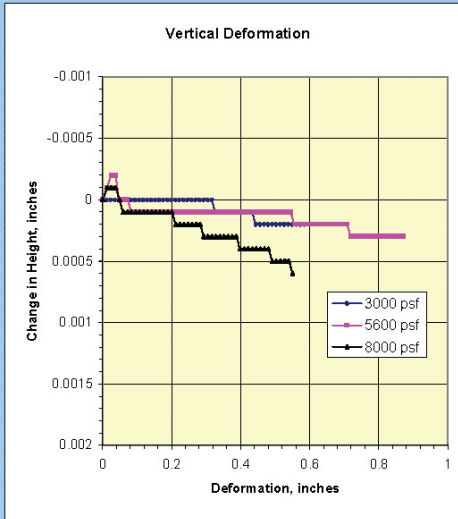
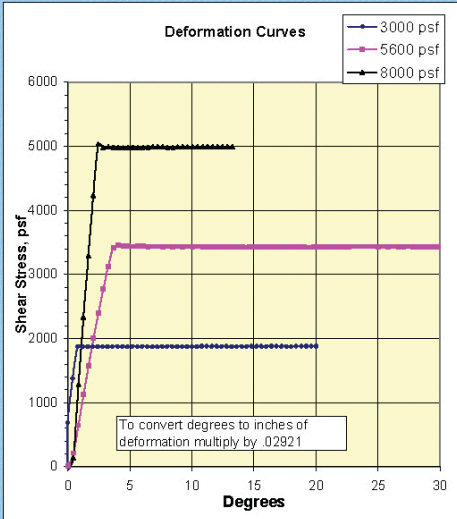
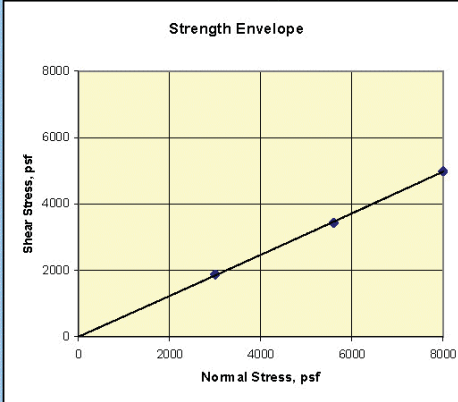
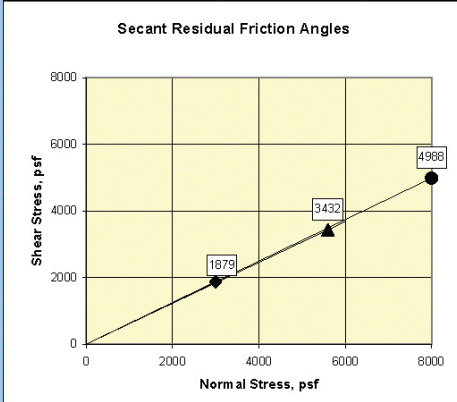
Job No.:	607-001B	Boring:	B-05-03	Date:	5/1/2006	Undisturbed:	
Client:	BBCM	Sample:	S-31B	By:	PJ	Peak:	
Project:	012 00946.300	Depth:	123.8-124.5	Checked:	DC	Residual:	X
Soil Type:	Gray Silt w/ Sand / Sandy SILT			Clay, %:		Fully Softened:	X
Remarks:	A small friction correction was applied to each point.						
Normal Stress, psf	5000	9600	15100	LL:	17	Peak:	
Secant Phi, deg.	33	33	33	PL:	18	Residual:	X





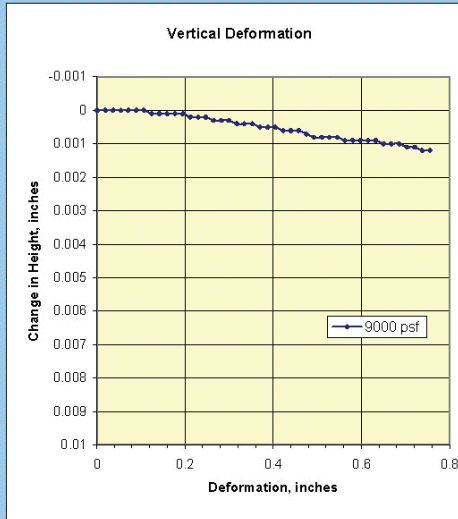
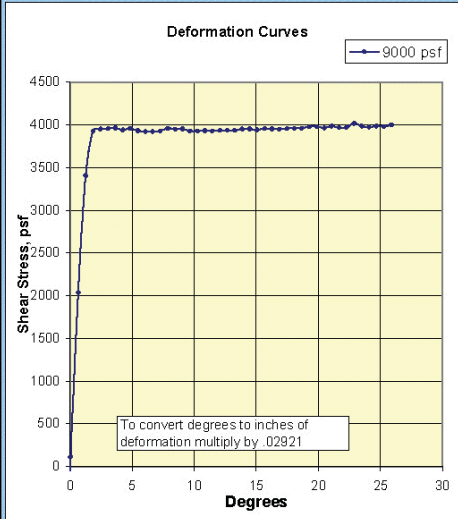
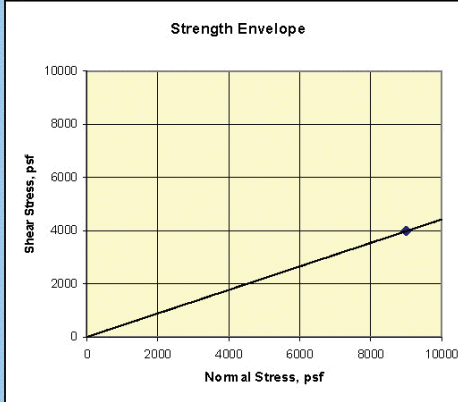
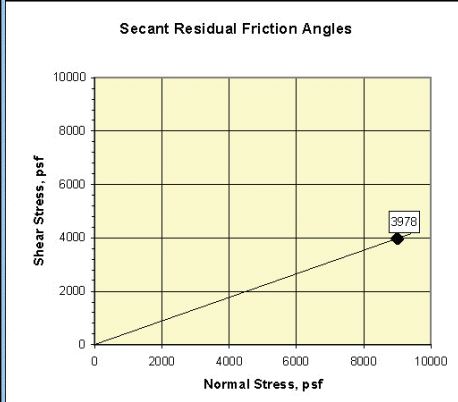
**Drained, Residual Torsional Ring Shear
Test ASTM D 6467**

Job No.:	607-001C	Boring:	B-05-04	Date:	5/1/2006	Undisturbed:		
Client:	BBCM	Sample:	S-23	By:	PJ	Peak:		
Project:	012 00946.300	Depth:	58.8-59.2'	Checked:	DC	Residual:		
Soil Type:	Greenish Gray SILTY CLAY w/ Sand			Clay, %:		Fully Softened:	X	
Remarks:	A small friction correction was applied to the 8 KSF POINT						Peak:	
Normal Stress, psf	3000	5600	8000	LL, %:	26	Peak:		
Secant Phi, deg.	32	32	32	PL:	19	Residual:	X	



**Drained, Residual Torsional Ring Shear
Test ASTM D 6467**

Job No.:	607-003	Boring:	B-05-04	Date:	5/19/2006	Undisturbed:		
Client:	BBCM	Sample:	S-36	By:	PJ	Peak:		
Project:	I-90 West Abutment	Depth:	113.5-114.5	Checked:	DC	Residual:		
Soil Type:	Gray Lean CLAY, trace Sand			Clay, %:		Fully Softened:	X	
Remarks:	A small friction correction was applied to this point.						Peak:	
Normal Stress, psf	9000	LL, %:	37	Peak:		Residual:	X	
Secant Phi, deg.	24	PL:	22	Residual:				



Barr Prevost
2800 Corporate Exchange Dr.
Suite 240, Columbus, OH 43231

Contact Information
Voice: 614-714-0270
Fax: 614-714-0323

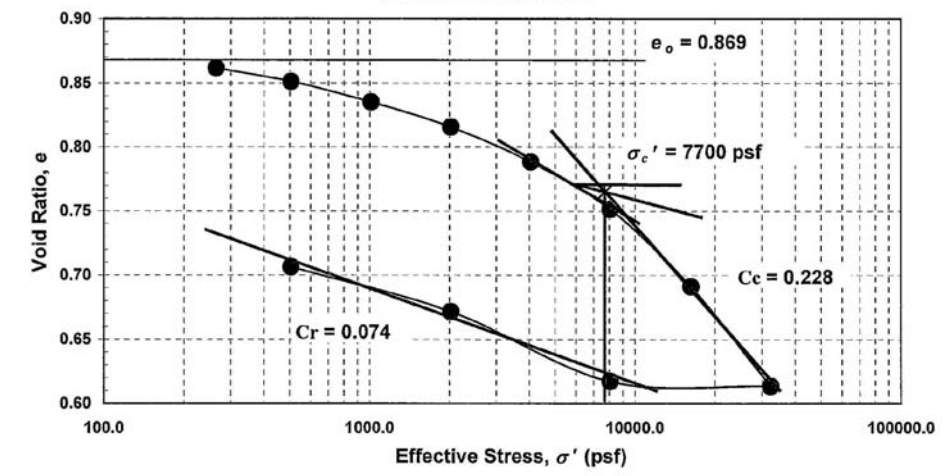
Consolidation Test

Project Name: CUY-90-15.24 Prepared by: JLee
 Source: B-022-1-09 (45.5' to 46.0') Checked by: _____
 Sample Number: ST-1 Date: 8/6/2009

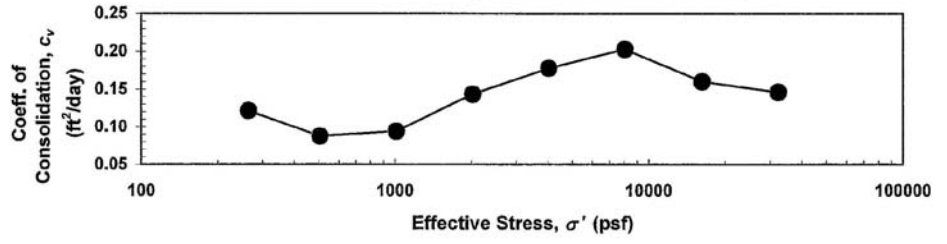
Test Specification: ASTM D 2435-04
 Initial Void Ratio: 0.869 Initial Bulk Unit Weight (lb/ft³): 118.0
 In-situ Vertical Effective Stress: 3273.6 psf Dry Unit Weight (lb/ft³): 90.2

Compression and Swelling Index
 Compression Index (*C_c*): 0.228 Preconsolidation Pressure (σ'_c): 7700 psf
 Swelling Index (*C_r*): 0.074 Over-Consolidation Ratio (*OCR*): 2.35

Consolidation Curve



Consolidation Coefficient vs. Vertical Effective Stress



Barr Prevost
2800 Corporate Exchange Dr.
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Contact Information
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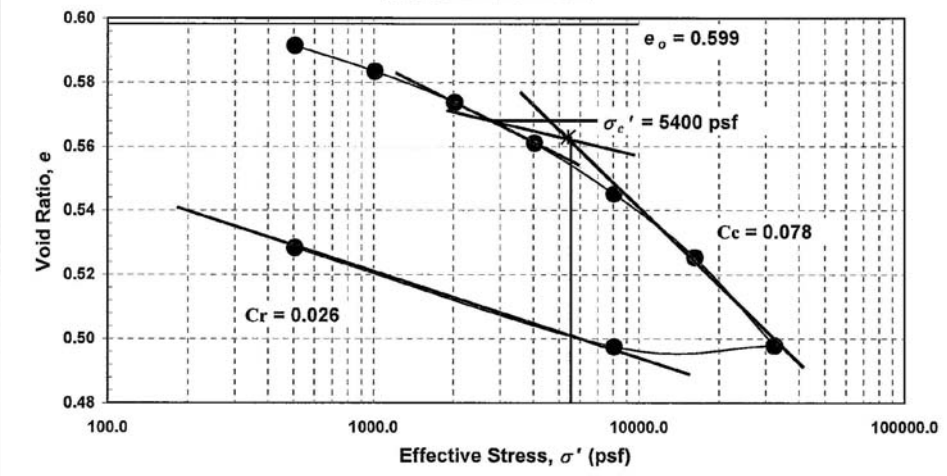
Consolidation Test

Project Name: CUY-90-15.24 Prepared by: JLee
 Source: B-022-1-09 (50.0' to 50.5') Checked by: _____
 Sample Number: ST-3 Date: 7/21/2009

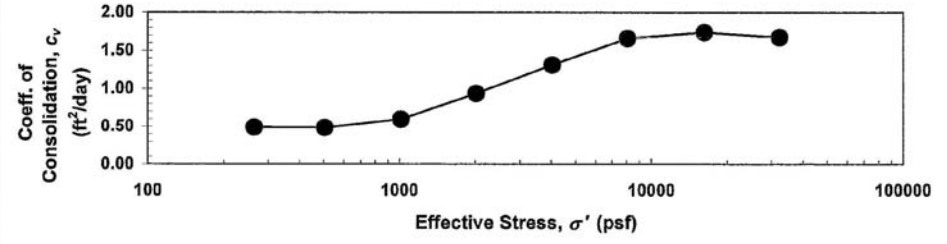
Test Specification: ASTM D 2435-04
 Initial Void Ratio: 0.599 Initial Bulk Unit Weight (lb/ft³): 127.2
 In-situ Vertical Effective Stress: 3504 psf Dry Unit Weight (lb/ft³): 105.4

Compression and Swelling Index
 Compression Index (*C_c*): 0.078 Preconsolidation Pressure (σ'_c): 5400 psf
 Swelling Index (*C_r*): 0.026 Over-Consolidation Ratio (*OCR*): 1.54

Consolidation Curve



Consolidation Coefficient vs. Vertical Effective Stress



Barr Prevost
2800 Corporate Exchange Dr.
Suite 240, Columbus, OH 43231

Contact Information
Voice: 614-714-0270
Fax: 614-714-0323

Consolidation Test

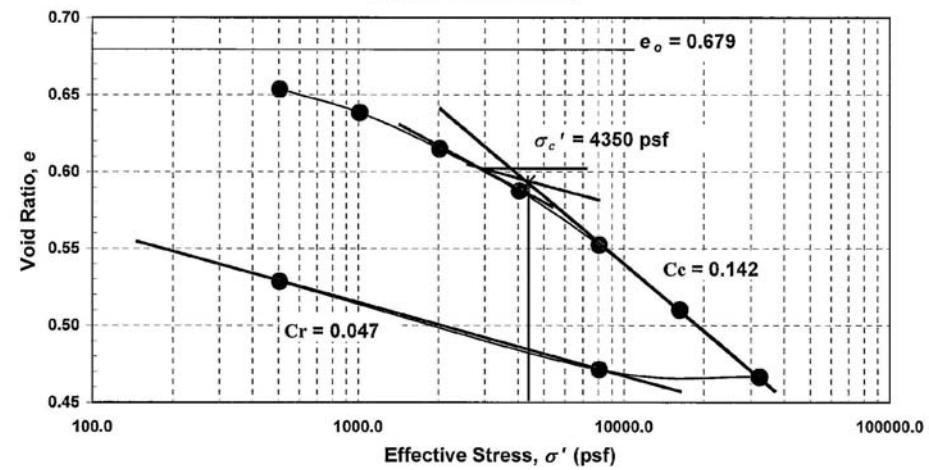
Project Name: CUY-90-15.24 Prepared by: JLee
 Source: B-022-1-09 (66.0' to 66.5') Checked by: _____
 Sample Number: ST-4 Date: 7/21/2009

Test Specification: ASTM D 2435-04
 Initial Void Ratio: 0.679 Initial Bulk Unit Weight (lb/ft³): 125.7
 In-situ Vertical Effective Stress: 4394.4 psf Dry Unit Weight (lb/ft³): 100.4

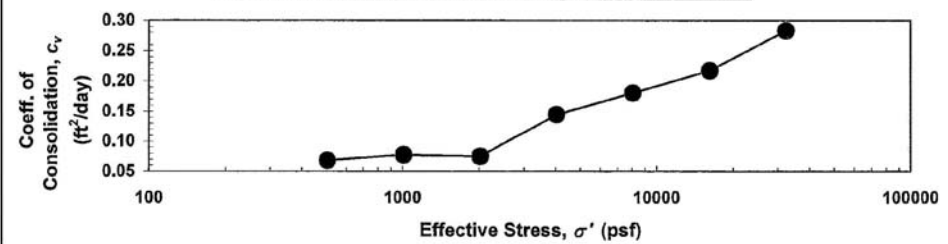
Compression and Swelling Index

Compression Index (C_c): 0.142 Preconsolidation Pressure (σ_c'): 4350 psf
 Swelling Index (C_r): 0.047 Over-Consolidation Ratio (OCR): 1.00

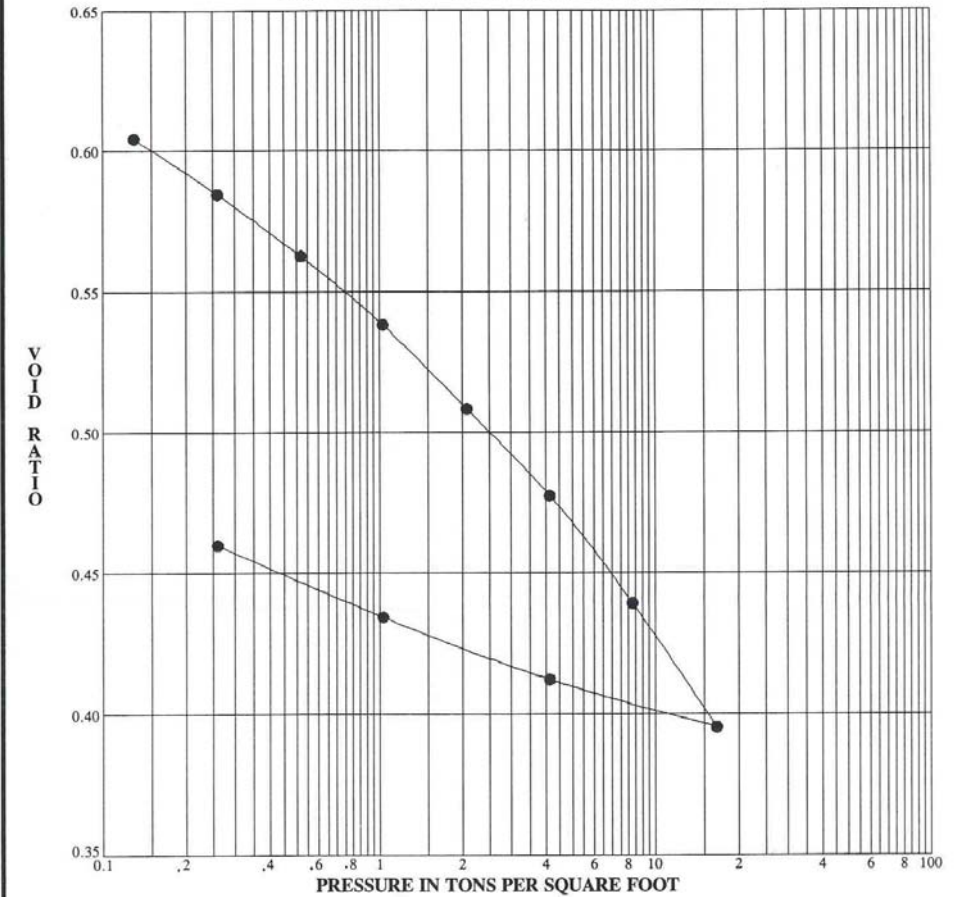
Consolidation Curve



Consolidation Coefficient vs. Vertical Effective Stress



PRESSURE - VOID RATIO CURVE

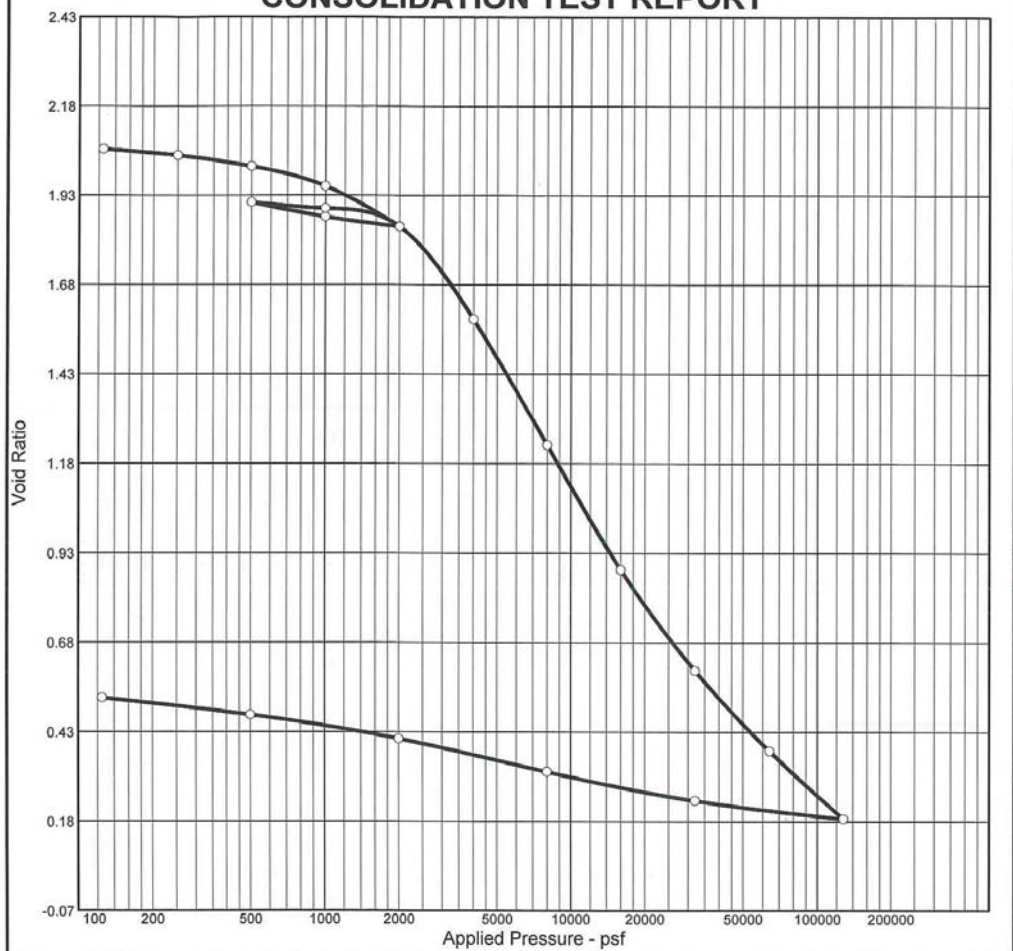


Specimen Identification	Classification
● B-102 S-25 IV 125.5'-127.5'	Soft gray silty clay, trace fine to coarse sand, contains many lenses of silt. A-6a (9)

MC	LL	PL	PI	DD	SG	Eo	Ef
24	29	17	12	102	2.68	0.6420	0.4596

	PROJECT	<u>CUY-90-15.24</u>
	LOCATION	<u>Cleveland, Ohio</u>
	JOB NO.	<u>4500</u> DATE <u>10/15/94</u>

CONSOLIDATION TEST REPORT



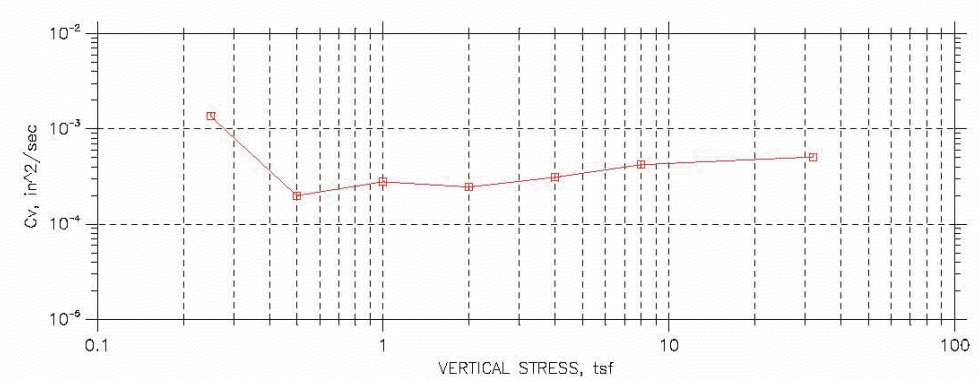
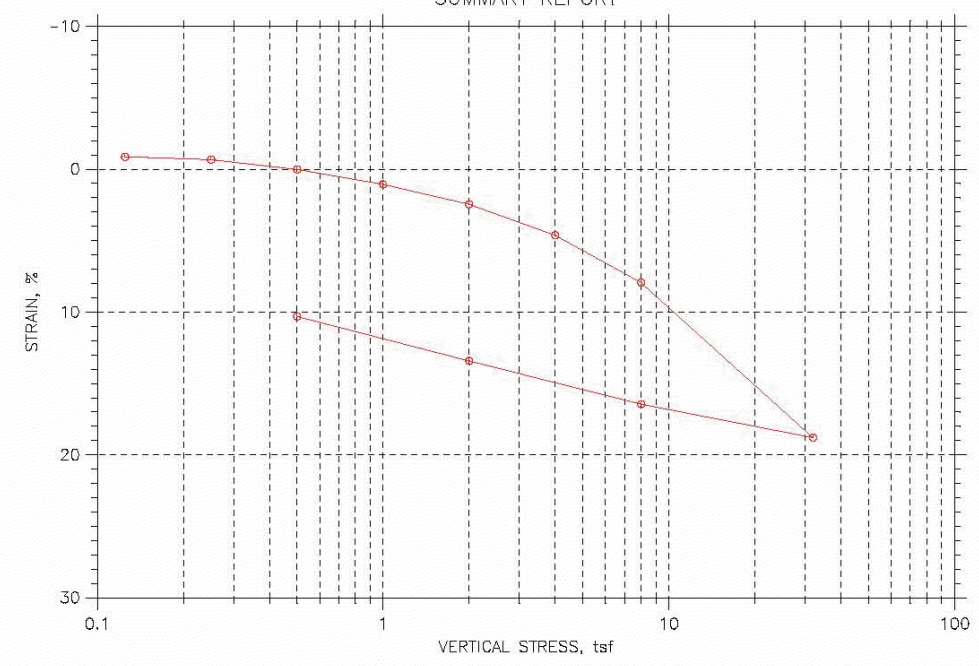
Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	USCS	AASHTO	Initial Void Ratio
Saturation	Moisture							
81.5 %	75.1 %	45.7	48	29	2.2460	A-8	2.069	

MATERIAL DESCRIPTION

PEAT: Very-soft gray and dark gray organic clay, "and" silt, trace to little fine sand, woody.

Project No. 01200946.301 Project: CENTRAL VIADUCT - CUY-90-14.52 Location: V-010-0-06	Client: Michael Baker Jr, Inc. Remarks: Sample 27 (16.0' - 18.0' Sect III)	BBC&M Engineering, Inc. Valley View, Ohio
------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------	---------------------------------------------------------

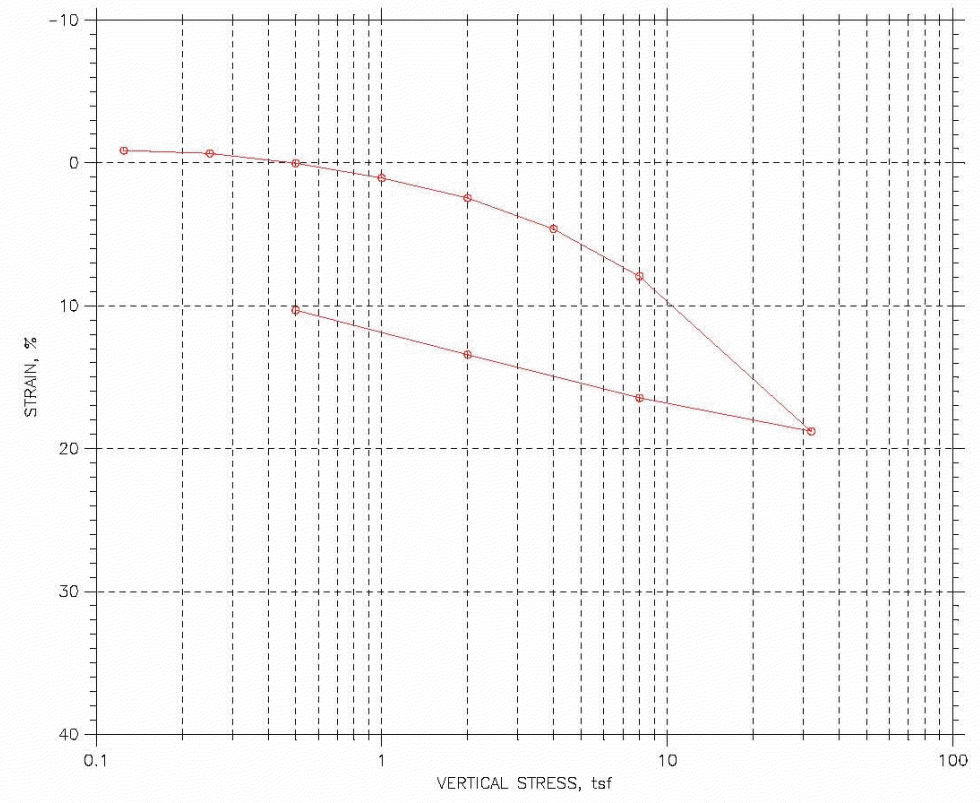
CONSOLIDATION TEST DATA SUMMARY REPORT



GeoTesting <i>express</i>	Project: I90 Central Viaduct	Location: Cleveland, OH	Project No.: GTX-6678
	Boring No.: B-05-03	Tested By: jdt	Checked By: njh
	Sample No.: S-29	Test Date: 05/05/06	Depth: 116.5-118.5
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: ---		



CONSOLIDATION TEST DATA
SUMMARY REPORT



		Before Test	After Test	
Overburden Pressure: ---		Water Content, %	28.73	22.08
Preconsolidation Pressure: ---		Dry Unit Weight, pcf	95.81	106.8
Compression Index: 2.54639e-313		Saturation, %	99.78	99.99
Diameter: 2.5 in	Height: 1 in	Void Ratio	0.79	0.61
LL: 35	PL: 18	PI: 17	GS: 2.75	

	Project: I90 Central Viaduct	Location: Cleveland, OH	Project No.: GTX-6678
	Boring No.: E-05-03	Tested By: jdt	Checked By: njh
	Sample No.: S-29	Test Date: 05/05/06	Depth: 116.5-118.5
	Test No.: C-1	Sample Type: Tube	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: ---		

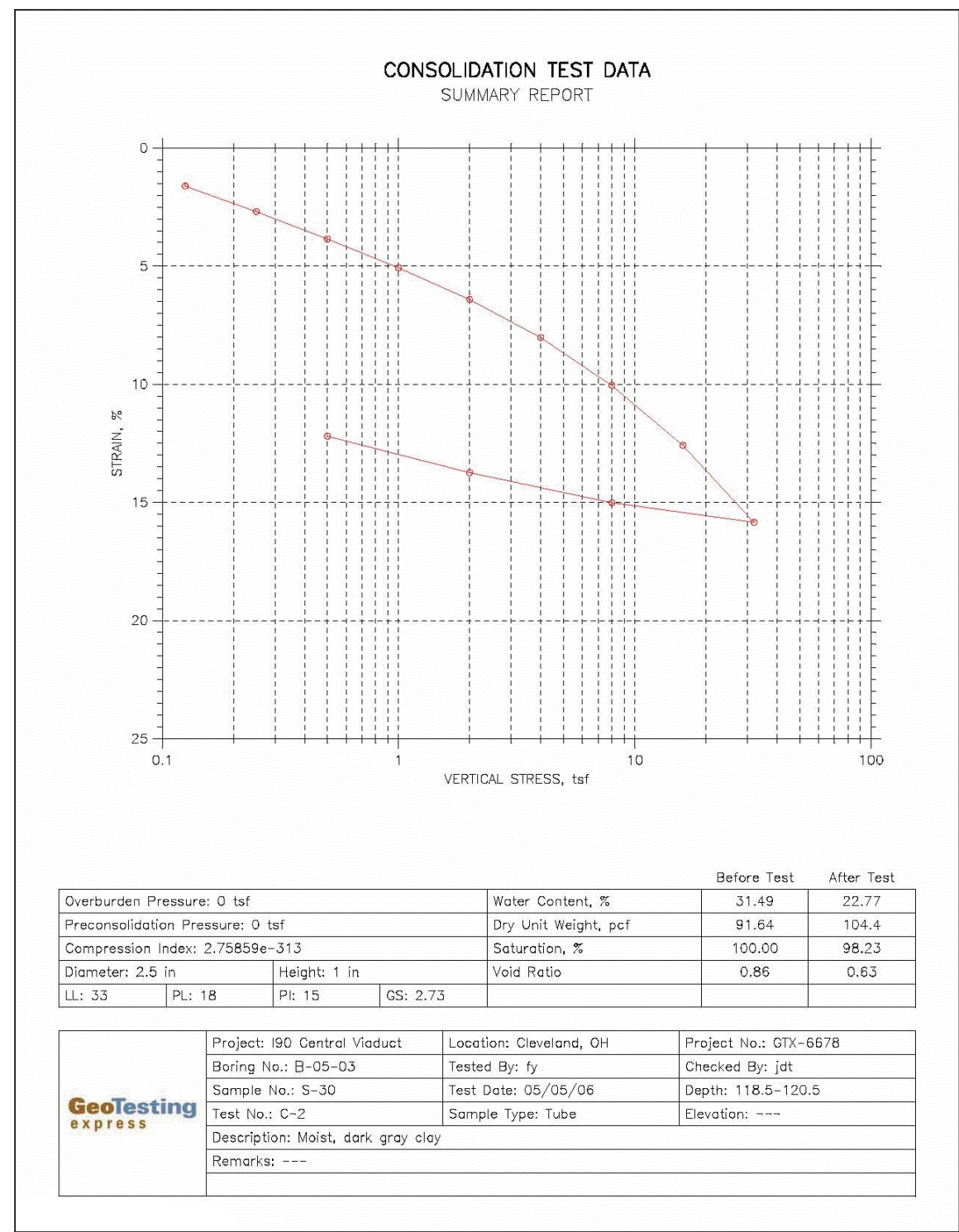
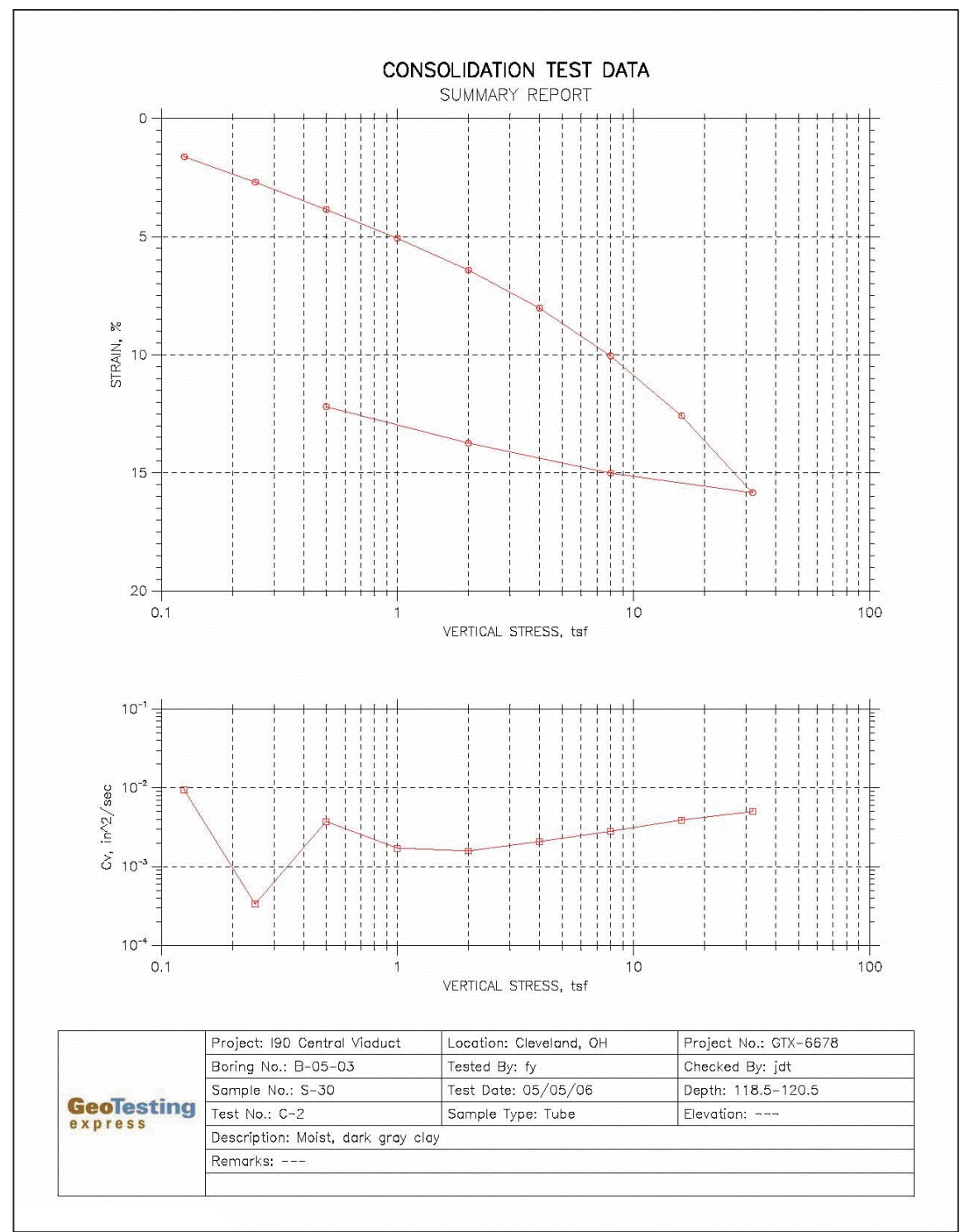
CONSOLIDATION TEST DATA

Project: I90 Central Viaduct	Location: Cleveland, OH	Project No.: GTX-6678
Boring No.: E-05-03	Tested By: jdt	Checked By: njh
Sample No.: S-29	Test Date: 05/05/06	Depth: 116.5-118.5
Test No.: C-1	Sample Type: Tube	Elevation: ---

Soil Description: Moist, dark gray clay
Remarks: ---

Measured Specific Gravity: 2.75	Liquid Limit: 35	Initial Height: 1.00 in
Initial Void Ratio: 0.79	Plastic Limit: 18	Specimen Diameter: 2.50 in
Final Void Ratio: 0.61	Plasticity Index: 17	

Container ID	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
dodge9		RING		30912
Wt. Container + Wet Soil, gm	93.18	370	361.78	157.13
Wt. Container + Dry Soil, gm	77.74	334.53	334.53	130.18
Wt. Container, gm	8.27	211.08	211.08	8.1
Wt. Dry Soil, gm	69.47	123.45	123.45	122.08
Water Content, %	22.23	28.73	22.08	22.08
Void Ratio	---	0.79	0.61	---
Degree of Saturation, %	---	99.78	99.99	---
Dry Unit Weight, pcf	---	95.806	106.82	---



		Before Test	After Test
Overburden Pressure: 0 tsf		31.49	22.77
Preconsolidation Pressure: 0 tsf		91.64	104.4
Compression Index: 2.75859e-313		100.00	98.23
Diameter: 2.5 in	Height: 1 in	Void Ratio	0.86
LL: 33	PL: 18	PI: 15	GS: 2.73



CONSOLIDATION TEST DATA

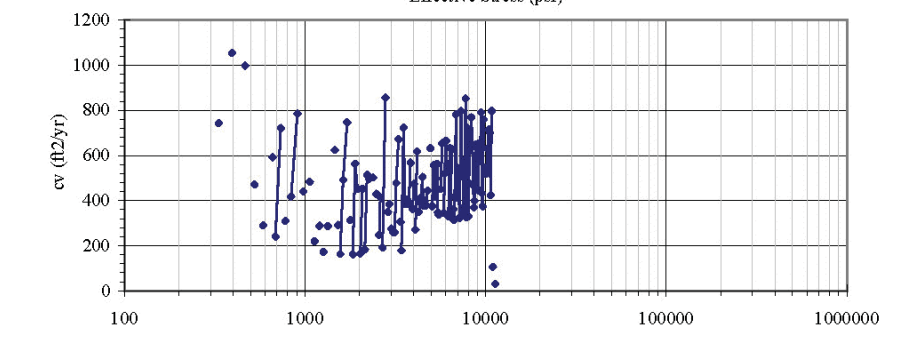
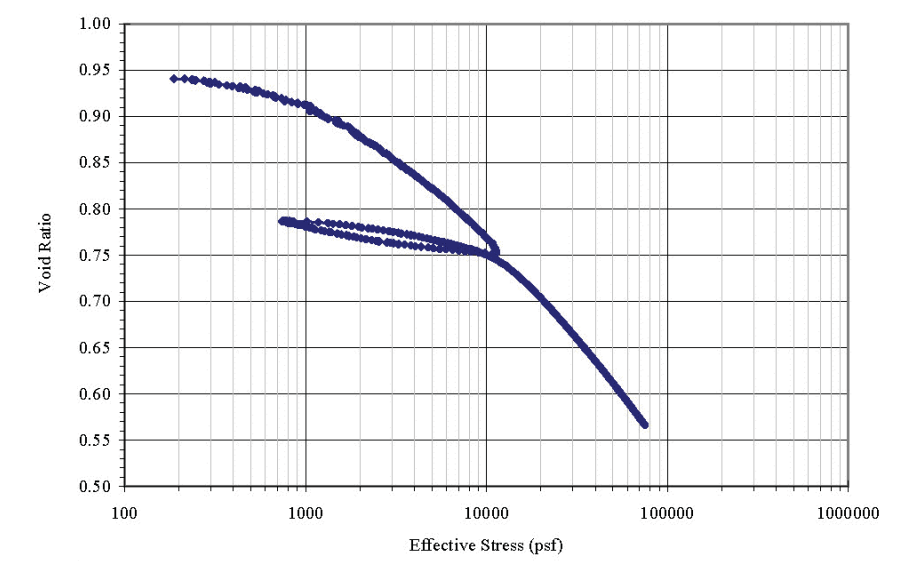
Project: I90 Central Viaduct	Location: Cleveland, OH	Project No.: GTX-6678
Boring No.: B-05-03	Tested By: fy	Checked By: jdt
Sample No.: S-30	Test Date: 05/05/06	Depth: 118.5-120.5
Test No.: C-2	Sample Type: Tube	Elevation: ---

Soil Description: Moist, dark gray clay
Remarks: ---

Measured Specific Gravity: 2.73	Liquid Limit: 33	Initial Height: 1.00 in
Initial Void Ratio: 0.86	Plastic Limit: 18	Specimen Diameter: 2.50 in
Final Void Ratio: 0.63	Plasticity Index: 15	

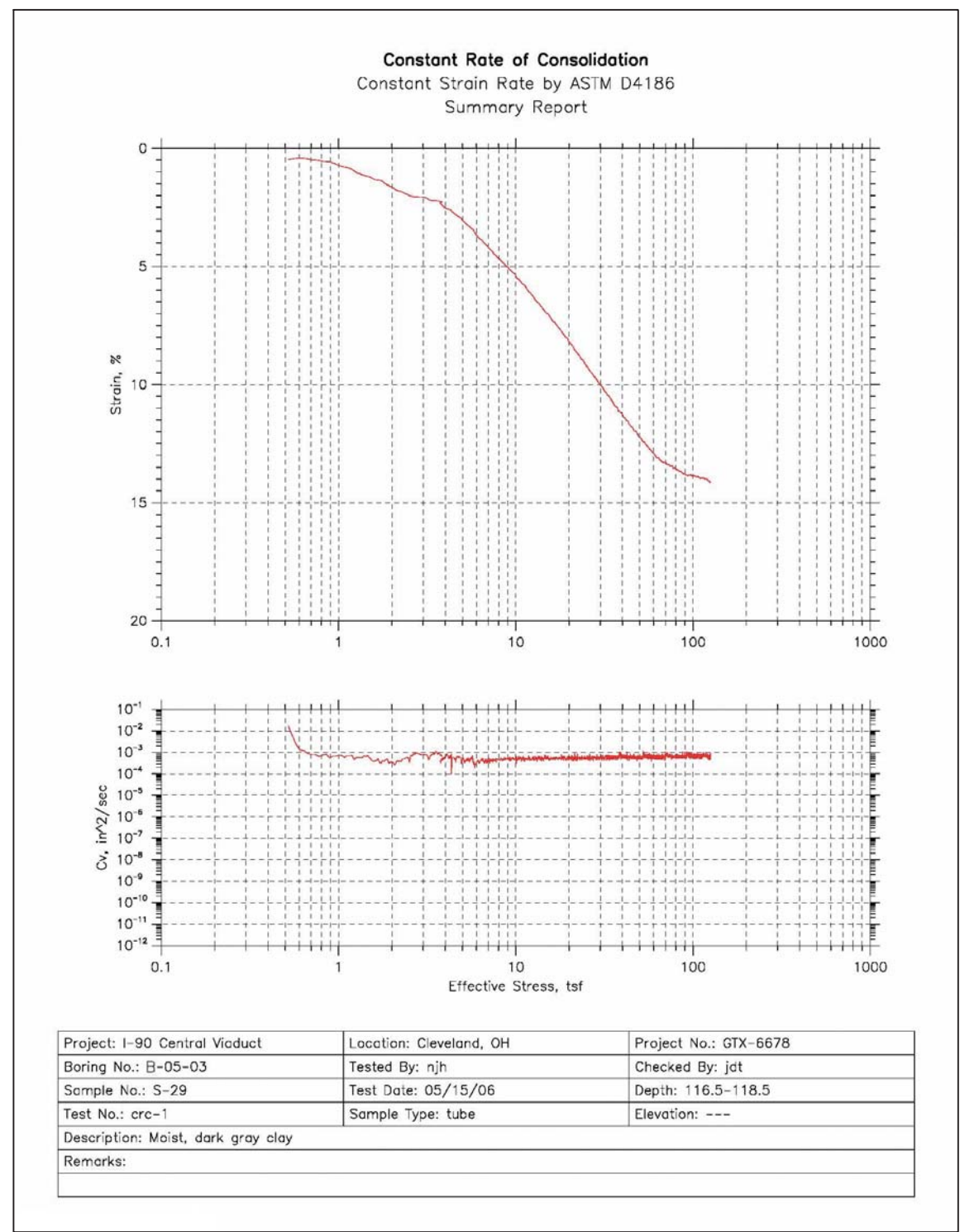
Container ID	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
	xtw	RING		dodge 5
Wt. Container + Wet Soil, gm	147.11	371.8	361.5	157.16
Wt. Container + Dry Soil, gm	117.33	334.62	334.62	129.53
Wt. Container, gm	8.26	216.53	216.53	8.17
Wt. Dry Soil, gm	109.07	118.09	118.09	121.36
Water Content, %	27.30	31.49	22.77	22.77
Void Ratio	---	0.86	0.63	---
Degree of Saturation, %	---	100.00	98.23	---
Dry Unit Weight, pcf	---	91.644	104.38	---

CONSTANT RATE OF STRAIN CONSOLIDATION



Initial Soil Properties							AASHTO Classification
Saturation	Moisture	γ_D (pcf)	e_0	LL	PL	PI	
95.1%	32.7%	88.7	0.959	36	26	10	A-4b
Soil Description: SILT: Medium-stiff to stiff gray and dark gray silt, some clay, slightly organic.							
Project No.	012 00946.301	Boring	V-009-0-06				
Project	CUY-90-14.52	Sample	28				
Client	Michael Baker Jr, Inc.	Depth	28.0' - 30.0'				

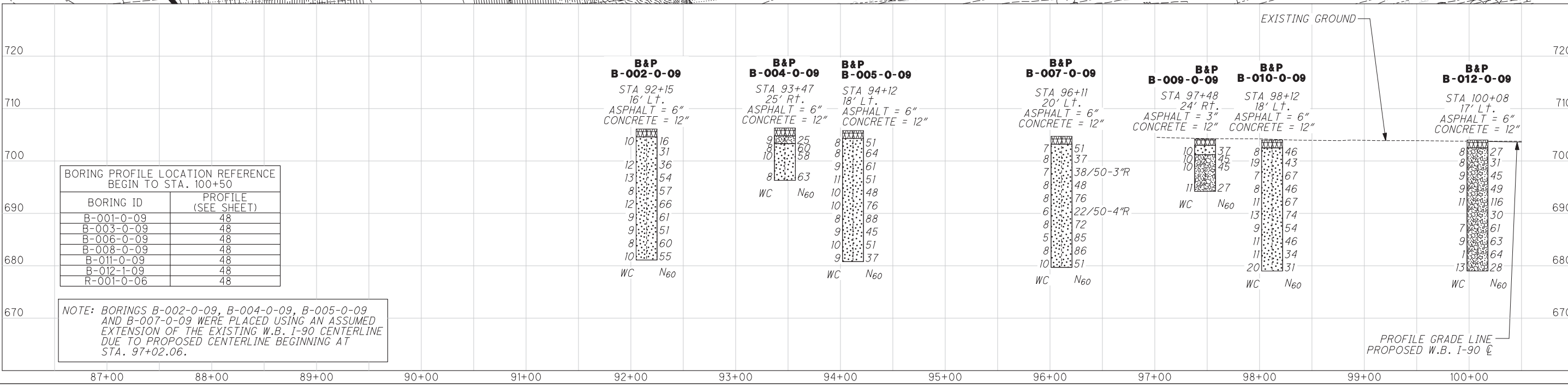
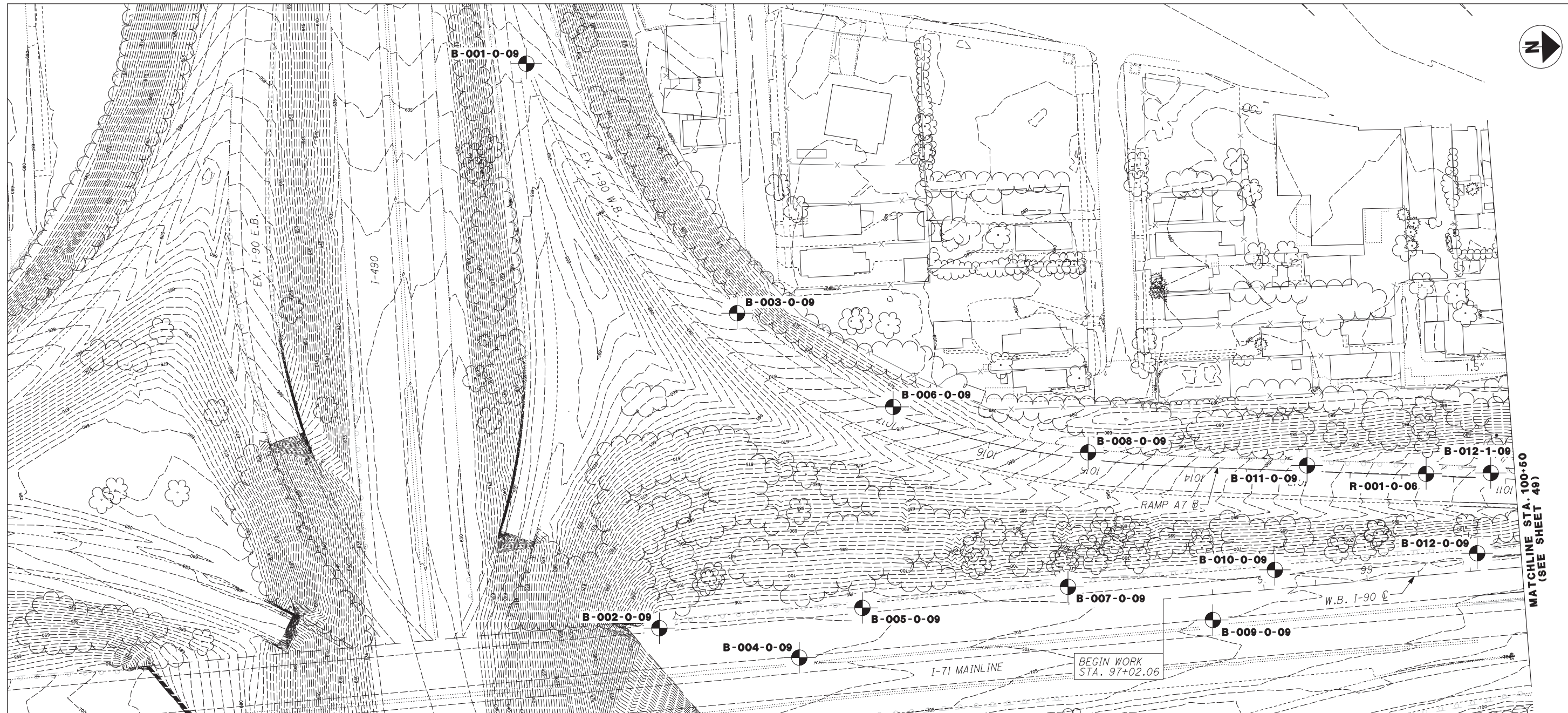




CRC TEST DATA

Project: I-90 Central Viaduct	Location: Cleveland, OH	Project No.: GTX-6678
Boring No.: B-05-03	Tested By: njh	Checked By: jdt
Sample No.: S-29	Test Date: 05/15/06	Depth: 116.5-118.5
Test No.: crc-1	Sample Type: tube	Elevation: ---
Soil Description: Moist, dark gray clay		
Remarks:		
Measured Specific Gravity: 2.75	Liquid Limit: 35	Initial Height: 1.00 in
Initial Void Ratio: 0.53	Plastic Limit: 18	Specimen Diameter: 2.50 in
Final Void Ratio: 0.34	Plasticity Index: 17	

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	sweet	RING		1355
Wt. Container + Wet Soil, gm	135.17	383.55	378.55	168.61
Wt. Container + Dry Soil, gm	111.25	360.47	360.47	150.77
Wt. Container, gm	7.98	216.07	216.07	8.32
Wt. Dry Soil, gm	103.27	144.4	144.4	142.45
Water Content, %	23.16	15.99	12.52	12.52
Void Ratio	---	0.53	0.34	---
Degree of Saturation, %	---	82.64	100.00	---
Dry Unit Weight, pcf	---	112.06	127.7	---



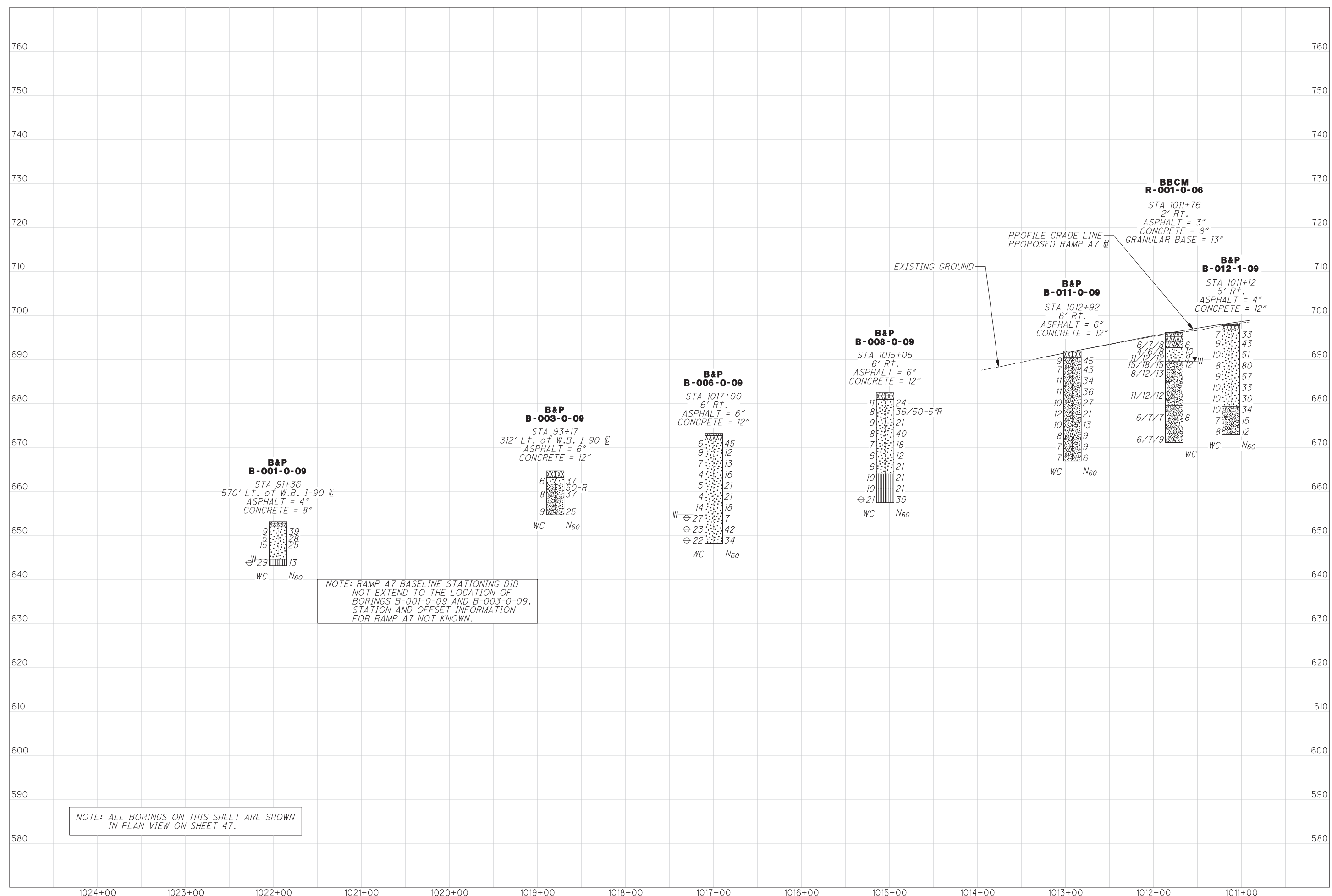
**BORING PROFILE LOCATION REFERENCE
BEGIN TO STA. 100+50**

BORING ID	PROFILE (SEE SHEET)
B-001-0-09	48
B-003-0-09	48
B-006-0-09	48
B-008-0-09	48
B-011-0-09	48
B-012-1-09	48
R-001-0-06	48

NOTE: BORINGS B-002-0-09, B-004-0-09, B-005-0-09 AND B-007-0-09 WERE PLACED USING AN ASSUMED EXTENSION OF THE EXISTING W.B. I-90 CENTERLINE DUE TO PROPOSED CENTERLINE BEGINNING AT STA. 97+02.06.

MATCHLINE STA. 100+50
(SEE SHEET 46)

BEGIN WORK
STA. 97+02.06



**B&P
B-001-0-09**
STA 91+36
570' Lt. of W.B. I-90
ASPHALT = 4"
CONCRETE = 8"

9	39
7	28
15	25
29	13

WC N60

**B&P
B-003-0-09**
STA 93+17
312' Lt. of W.B. I-90
ASPHALT = 6"
CONCRETE = 12"

6	37
8	37
9	25

WC N60

**B&P
B-006-0-09**
STA 1017+00
6' Rt.
ASPHALT = 6"
CONCRETE = 12"

6	45
9	12
7	13
4	16
5	21
4	21
14	18
27	7
23	42
22	34

WC N60

**B&P
B-008-0-09**
STA 1015+05
6' Rt.
ASPHALT = 6"
CONCRETE = 12"

11	24
8	36/50-5"R
9	21
8	40
7	18
6	12
6	21
10	21
10	21
21	39

WC N60

**B&P
B-011-0-09**
STA 1012+92
6' Rt.
ASPHALT = 6"
CONCRETE = 12"

9	45
7	43
11	34
11	36
10	27
12	21
10	13
8	9
7	9
7	6

WC N60

**BBCM
R-001-0-06**
STA 1011+76
2' Rt.
ASPHALT = 3"
CONCRETE = 8"
GRANULAR BASE = 13"

6	7/8
4	6/8
15	18/15
8	12/13
11	12/12
6	7/7
6	7/9

WC N60

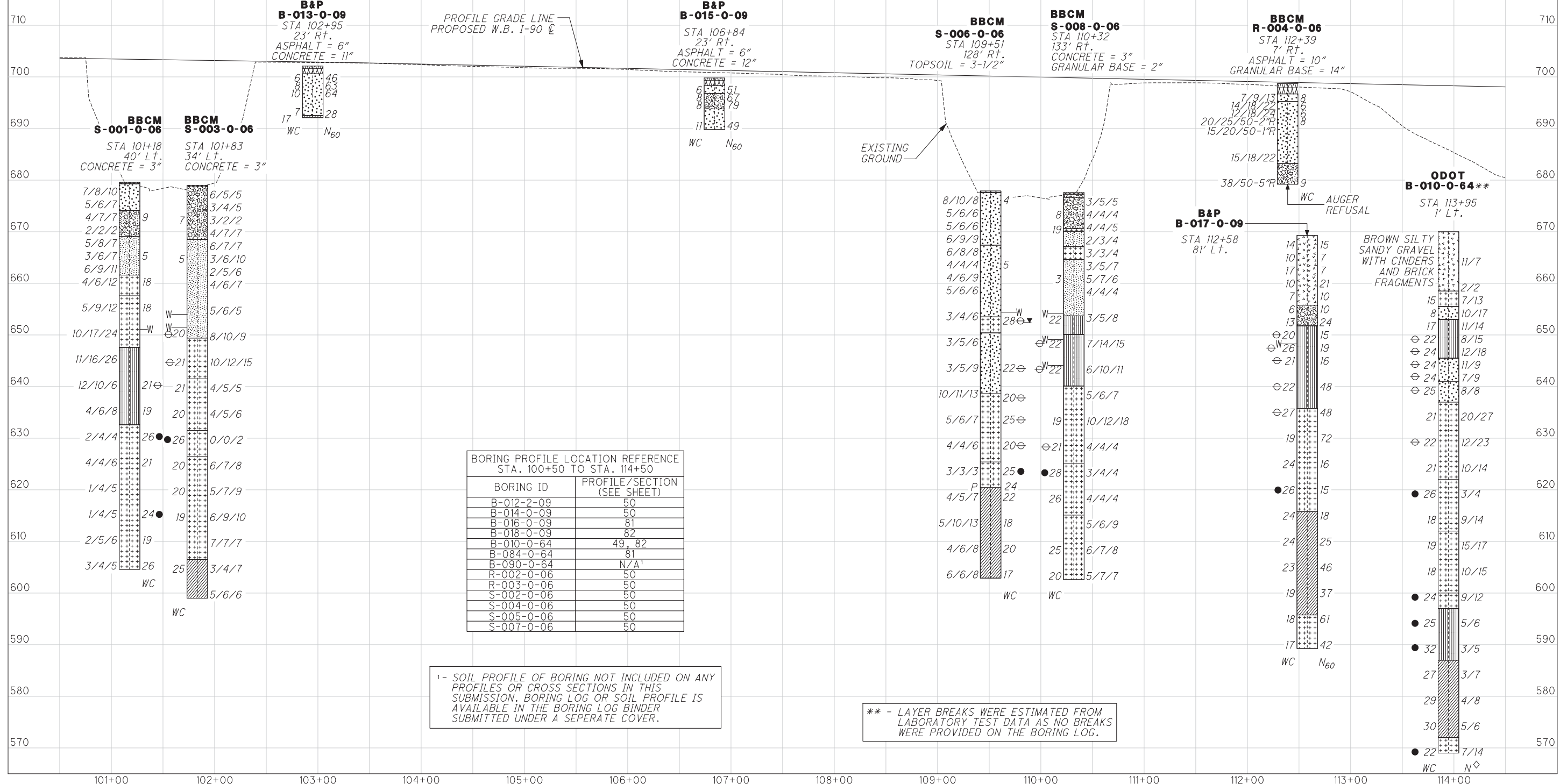
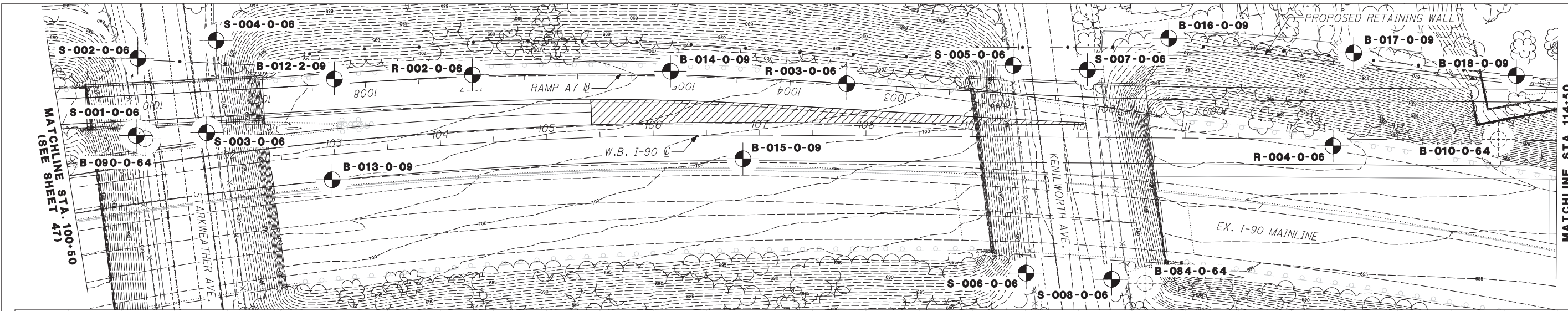
**B&P
B-012-1-09**
STA 1011+12
5' Rt.
ASPHALT = 4"
CONCRETE = 12"

7	33
9	43
10	51
8	80
9	57
10	33
10	30
10	34
7	15
8	12

WC N60

NOTE: RAMP A7 BASELINE STATIONING DID NOT EXTEND TO THE LOCATION OF BORINGS B-001-0-09 AND B-003-0-09. STATION AND OFFSET INFORMATION FOR RAMP A7 NOT KNOWN.

NOTE: ALL BORINGS ON THIS SHEET ARE SHOWN IN PLAN VIEW ON SHEET 47.



**BORING PROFILE LOCATION REFERENCE
STA. 100+50 TO STA. 114+50**

BORING ID	PROFILE/SECTION (SEE SHEET)
B-012-2-09	50
B-014-0-09	50
B-016-0-09	81
B-018-0-09	82
B-010-0-64	49, 82
B-084-0-64	81
B-090-0-64	N/A ¹
R-002-0-06	50
R-003-0-06	50
S-002-0-06	50
S-004-0-06	50
S-005-0-06	50
S-007-0-06	50

¹ - SOIL PROFILE OF BORING NOT INCLUDED ON ANY PROFILES OR CROSS SECTIONS IN THIS SUBMISSION. BORING LOG OR SOIL PROFILE IS AVAILABLE IN THE BORING LOG BINDER SUBMITTED UNDER A SEPERATE COVER.

** - LAYER BREAKS WERE ESTIMATED FROM LABORATORY TEST DATA AS NO BREAKS WERE PROVIDED ON THE BORING LOG.

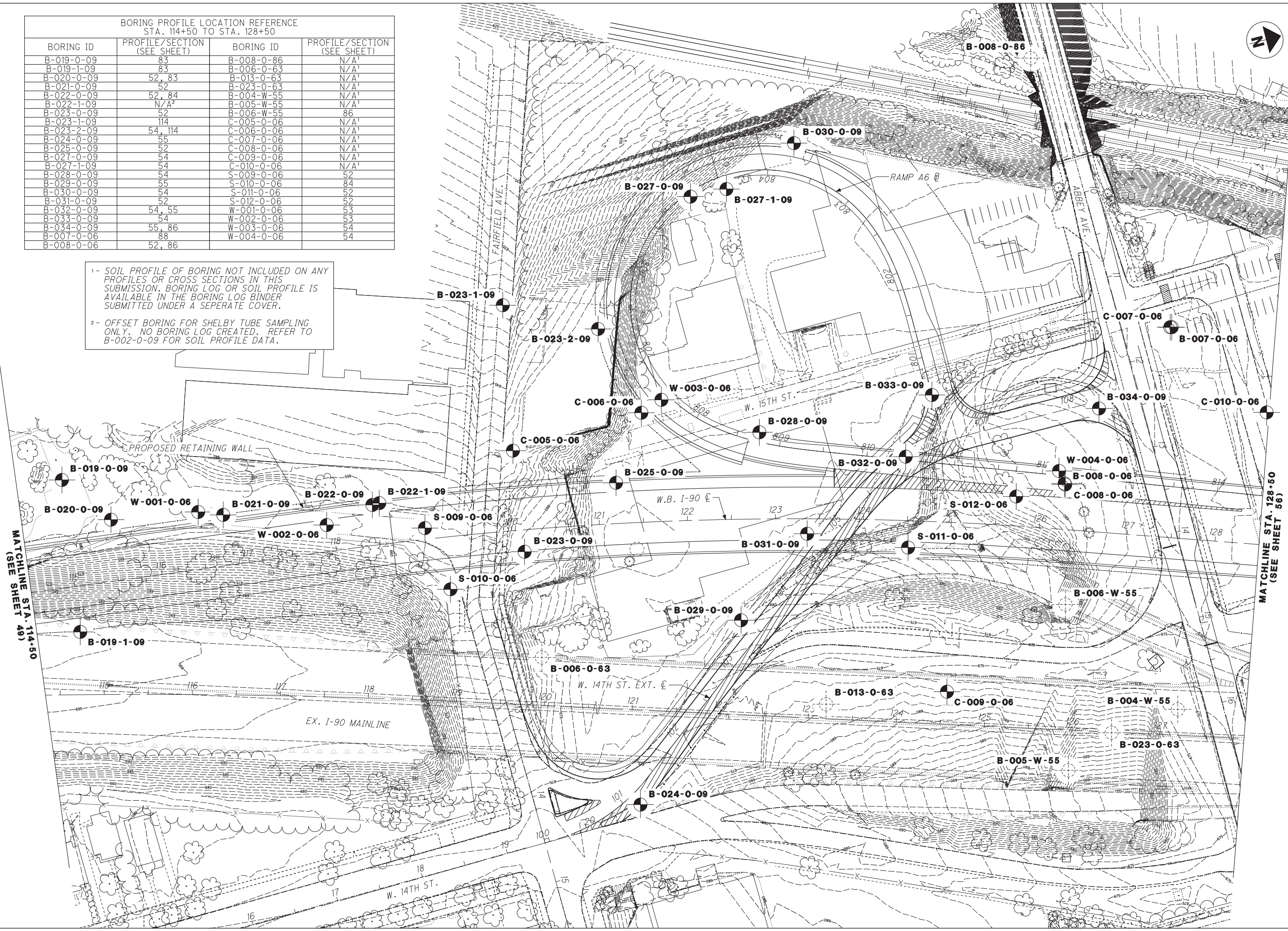


BORING PROFILE LOCATION REFERENCE
STA. 114+50 TO STA. 128+50

BORING ID	PROFILE/SECTION (SEE SHEET)	BORING ID	PROFILE/SECTION (SEE SHEET)
B-019-0-09	83	B-008-0-86	N/A ¹
B-019-1-09	83	B-006-0-63	N/A ¹
B-020-0-09	52, 83	B-013-0-63	N/A ¹
B-021-0-09	52	B-023-0-63	N/A ¹
B-022-0-09	52, 84	B-004-W-55	N/A ¹
B-022-1-09	N/A ²	B-005-W-55	N/A ¹
B-023-0-09	52	B-006-W-55	86
B-023-1-09	114	C-005-0-06	N/A ¹
B-023-2-09	54, 114	C-006-0-06	N/A ¹
B-024-0-09	55	C-007-0-06	N/A ¹
B-025-0-09	52	C-008-0-06	N/A ¹
B-027-0-09	54	C-009-0-06	N/A ¹
B-027-1-09	54	C-010-0-06	N/A ¹
B-028-0-09	54	S-009-0-06	52
B-029-0-09	55	S-010-0-06	84
B-030-0-09	54	S-011-0-06	52
B-031-0-09	52	S-012-0-06	52
B-032-0-09	54, 55	W-001-0-06	53
B-033-0-09	54	W-002-0-06	53
B-034-0-09	55, 86	W-003-0-06	54
B-007-0-06	88	W-004-0-06	54
B-008-0-06	52, 86		

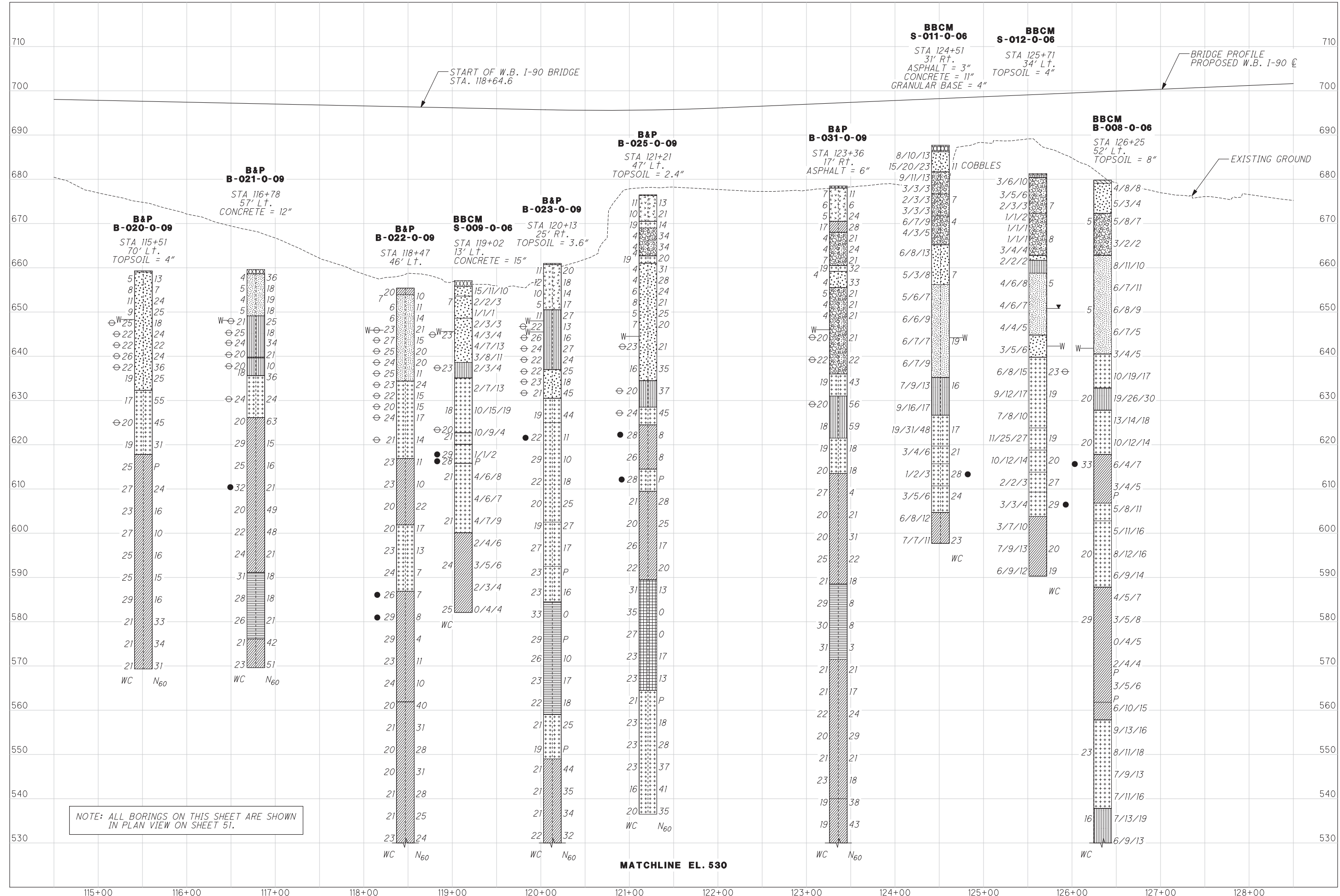
1- SOIL PROFILE OF BORING NOT INCLUDED ON ANY PROFILES OR CROSS SECTIONS IN THIS SUBMISSION. BORING LOG OR SOIL PROFILE IS AVAILABLE IN THE BORING LOG BINDER SUBMITTED UNDER A SEPERATE COVER.

2- OFFSET BORING FOR SHELBY TUBE SAMPLING ONLY. NO BORING LOG CREATED. REFER TO B-002-0-09 FOR SOIL PROFILE DATA.



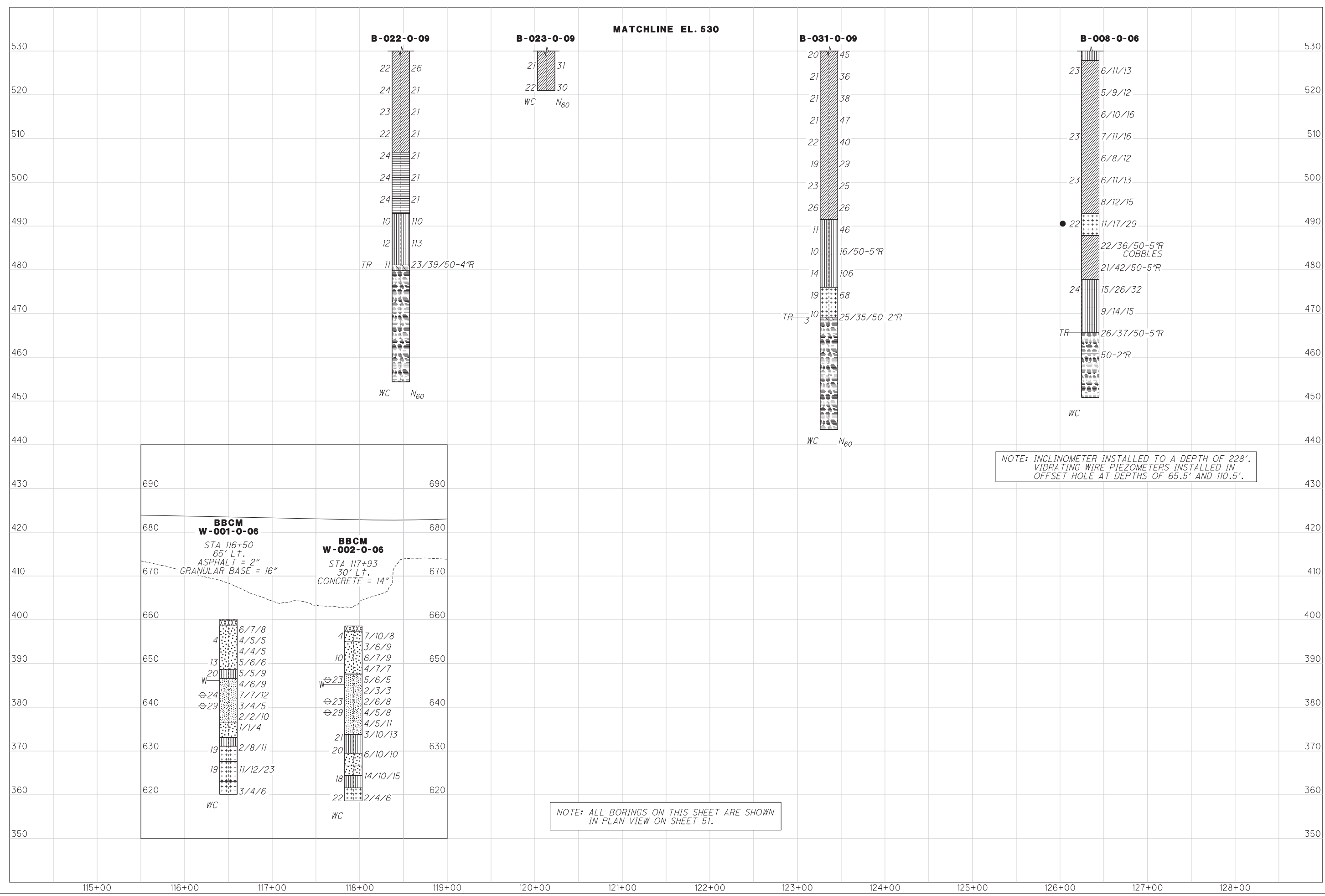
MATCHLINE STA. 114+50
(SEE SHEET 49)

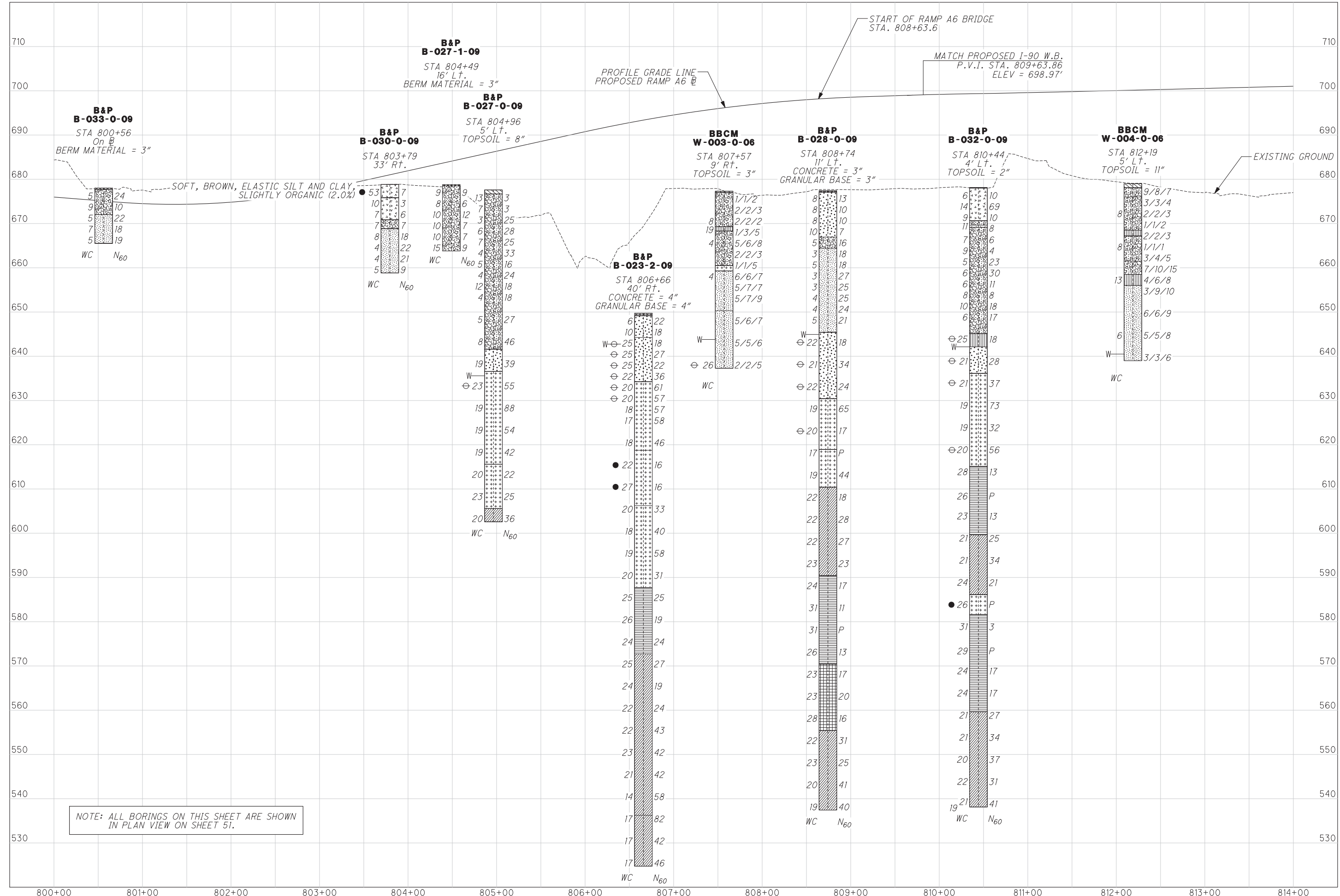
MATCHLINE STA. 128+50
(SEE SHEET 56)



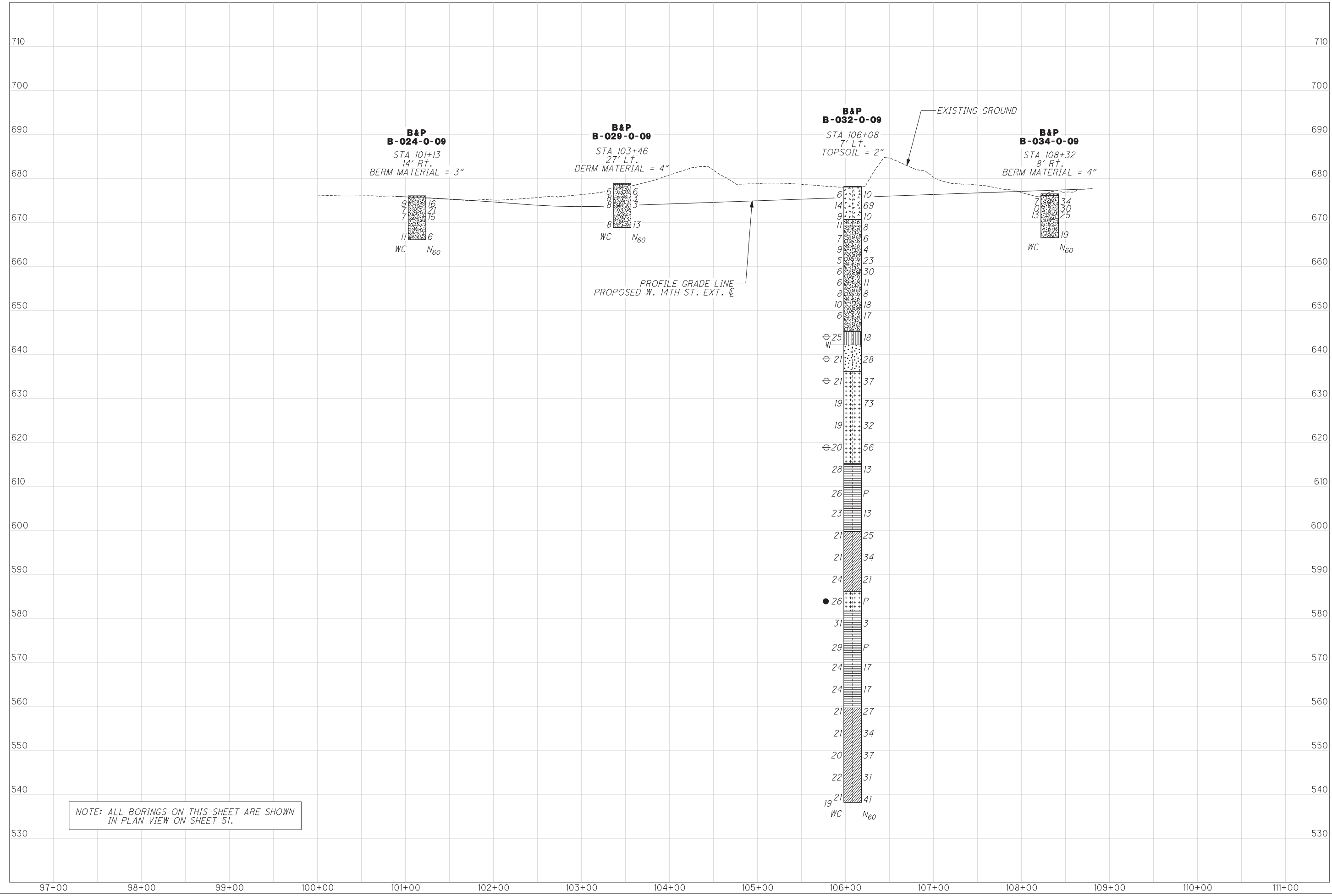
NOTE: ALL BORINGS ON THIS SHEET ARE SHOWN IN PLAN VIEW ON SHEET 51.

MATCHLINE EL. 530





NOTE: ALL BORINGS ON THIS SHEET ARE SHOWN IN PLAN VIEW ON SHEET 51.



NOTE: ALL BORINGS ON THIS SHEET ARE SHOWN IN PLAN VIEW ON SHEET 51.

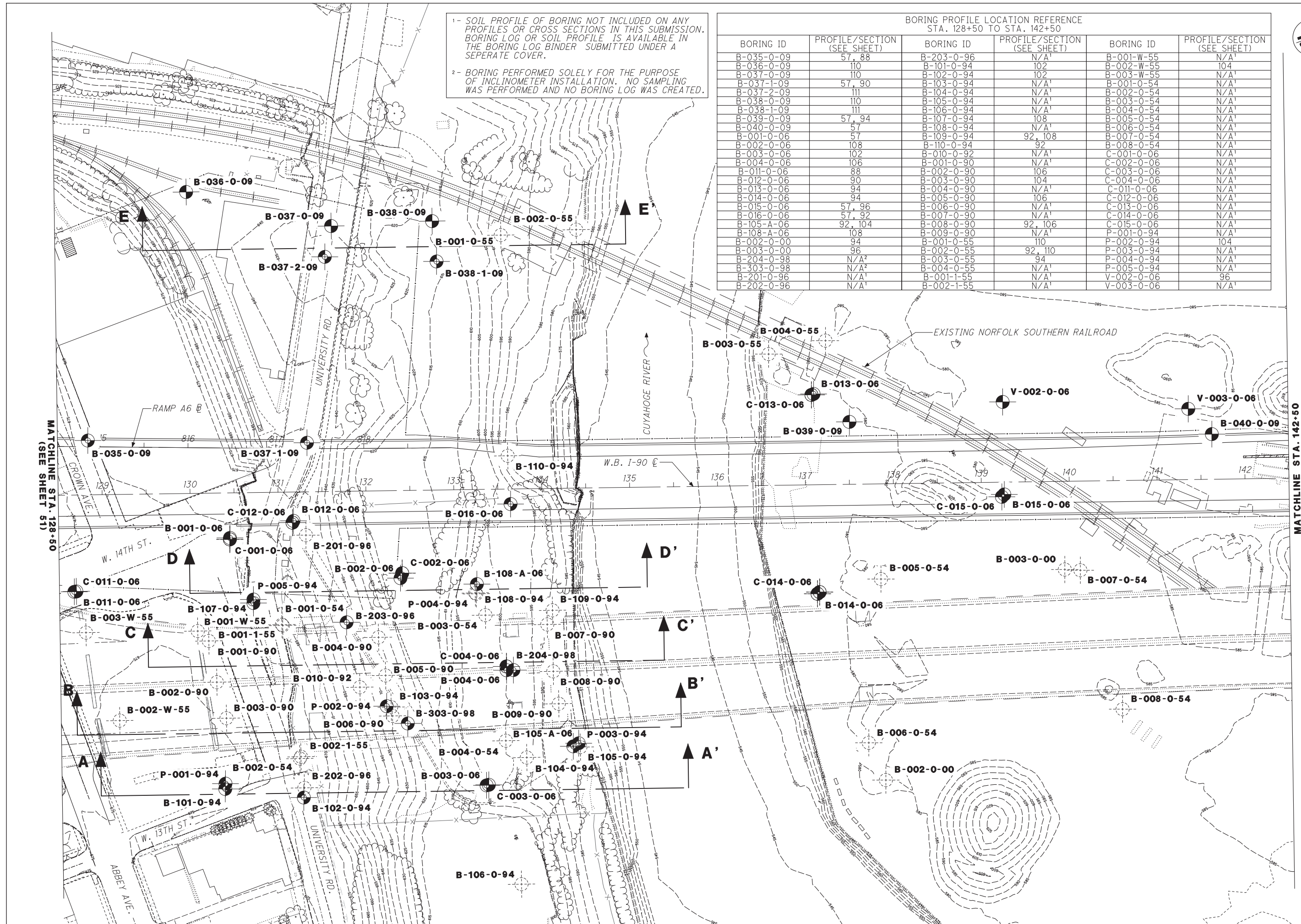


1 - SOIL PROFILE OF BORING NOT INCLUDED ON ANY PROFILES OR CROSS SECTIONS IN THIS SUBMISSION. BORING LOG OR SOIL PROFILE IS AVAILABLE IN THE BORING LOG BINDER SUBMITTED UNDER A SEPERATE COVER.

2 - BORING PERFORMED SOLELY FOR THE PURPOSE OF INCLINOMETER INSTALLATION. NO SAMPLING WAS PERFORMED AND NO BORING LOG WAS CREATED.

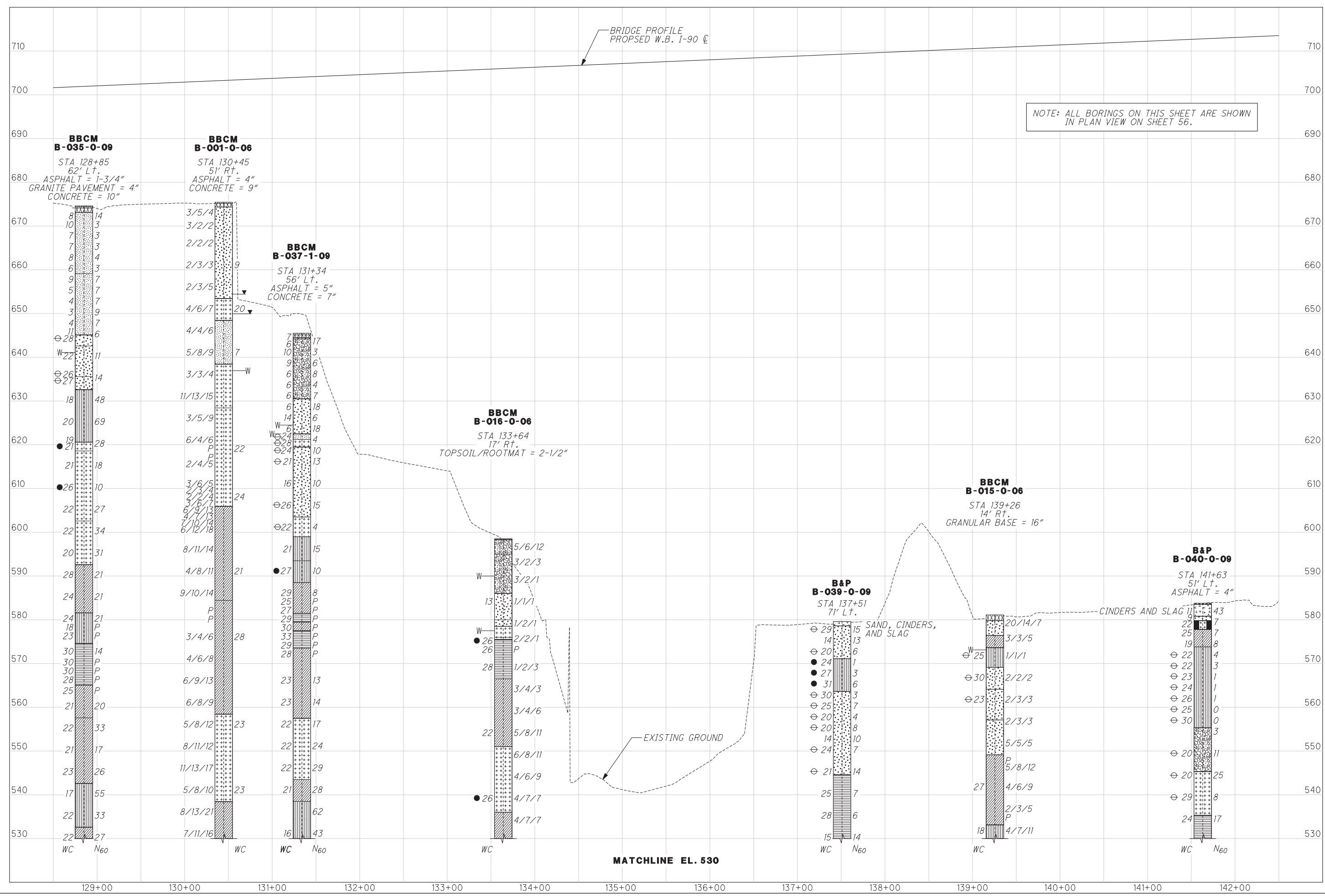
BORING PROFILE LOCATION REFERENCE
STA. 128+50 TO STA. 142+50

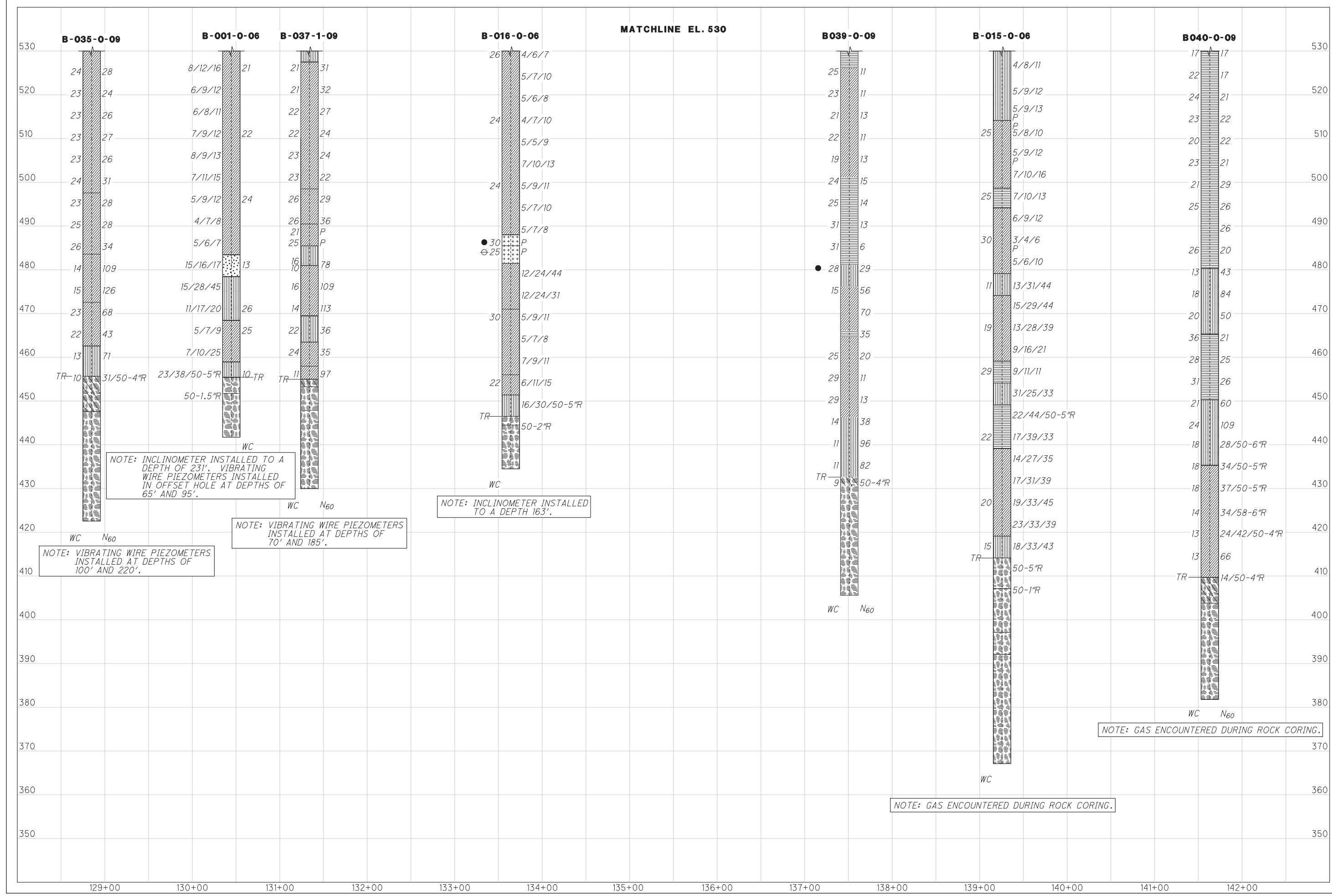
BORING ID	PROFILE/SECTION (SEE SHEET)	BORING ID	PROFILE/SECTION (SEE SHEET)	BORING ID	PROFILE/SECTION (SEE SHEET)
B-035-0-09	57, 88	B-203-0-96	N/A ¹	B-001-W-55	N/A ¹
B-036-0-09	110	B-101-0-94	102	B-002-W-55	104
B-037-0-09	110	B-102-0-94	102	B-003-W-55	N/A ¹
B-037-1-09	57, 90	B-103-0-94	N/A ¹	B-001-0-54	N/A ¹
B-037-2-09	111	B-104-0-94	N/A ¹	B-002-0-54	N/A ¹
B-038-0-09	110	B-105-0-94	N/A ¹	B-003-0-54	N/A ¹
B-038-1-09	111	B-106-0-94	N/A ¹	B-004-0-54	N/A ¹
B-039-0-09	57, 94	B-107-0-94	108	B-005-0-54	N/A ¹
B-040-0-09	57	B-108-0-94	N/A ¹	B-006-0-54	N/A ¹
B-001-0-06	57	B-109-0-94	92, 108	B-007-0-54	N/A ¹
B-002-0-06	108	B-110-0-94	92	B-008-0-54	N/A ¹
B-003-0-06	102	B-010-0-92	N/A ¹	C-001-0-06	N/A ¹
B-004-0-06	106	B-001-0-90	N/A ¹	C-002-0-06	N/A ¹
B-011-0-06	88	B-002-0-90	106	C-003-0-06	N/A ¹
B-012-0-06	90	B-003-0-90	104	C-004-0-06	N/A ¹
B-013-0-06	94	B-004-0-90	N/A ¹	C-011-0-06	N/A ¹
B-014-0-06	94	B-005-0-90	106	C-012-0-06	N/A ¹
B-015-0-06	57, 96	B-006-0-90	N/A ¹	C-013-0-06	N/A ¹
B-016-0-06	57, 92	B-007-0-90	N/A ¹	C-014-0-06	N/A ¹
B-105-A-06	92, 104	B-008-0-90	92, 106	C-015-0-06	N/A ¹
B-108-A-06	108	B-009-0-90	N/A ¹	P-001-0-94	N/A ¹
B-002-0-00	94	B-001-0-55	110	P-002-0-94	104
B-003-0-00	96	B-002-0-55	92, 110	P-003-0-94	N/A ¹
B-204-0-98	N/A ²	B-003-0-55	94	P-004-0-94	N/A ¹
B-303-0-98	N/A ²	B-004-0-55	N/A ¹	P-005-0-94	N/A ¹
B-201-0-96	N/A ¹	B-001-1-55	N/A ¹	V-002-0-06	96
B-202-0-96	N/A ¹	B-002-1-55	N/A ¹	V-003-0-06	N/A ¹



MATCHLINE STA. 128+50
(SEE SHEET 51)

MATCHLINE STA. 142+50
(SEE SHEET 59)





NOTE: INCLINOMETER INSTALLED TO A DEPTH OF 231'. VIBRATING WIRE PIEZOMETERS INSTALLED IN OFFSET HOLE AT DEPTHS OF 65' AND 95'.

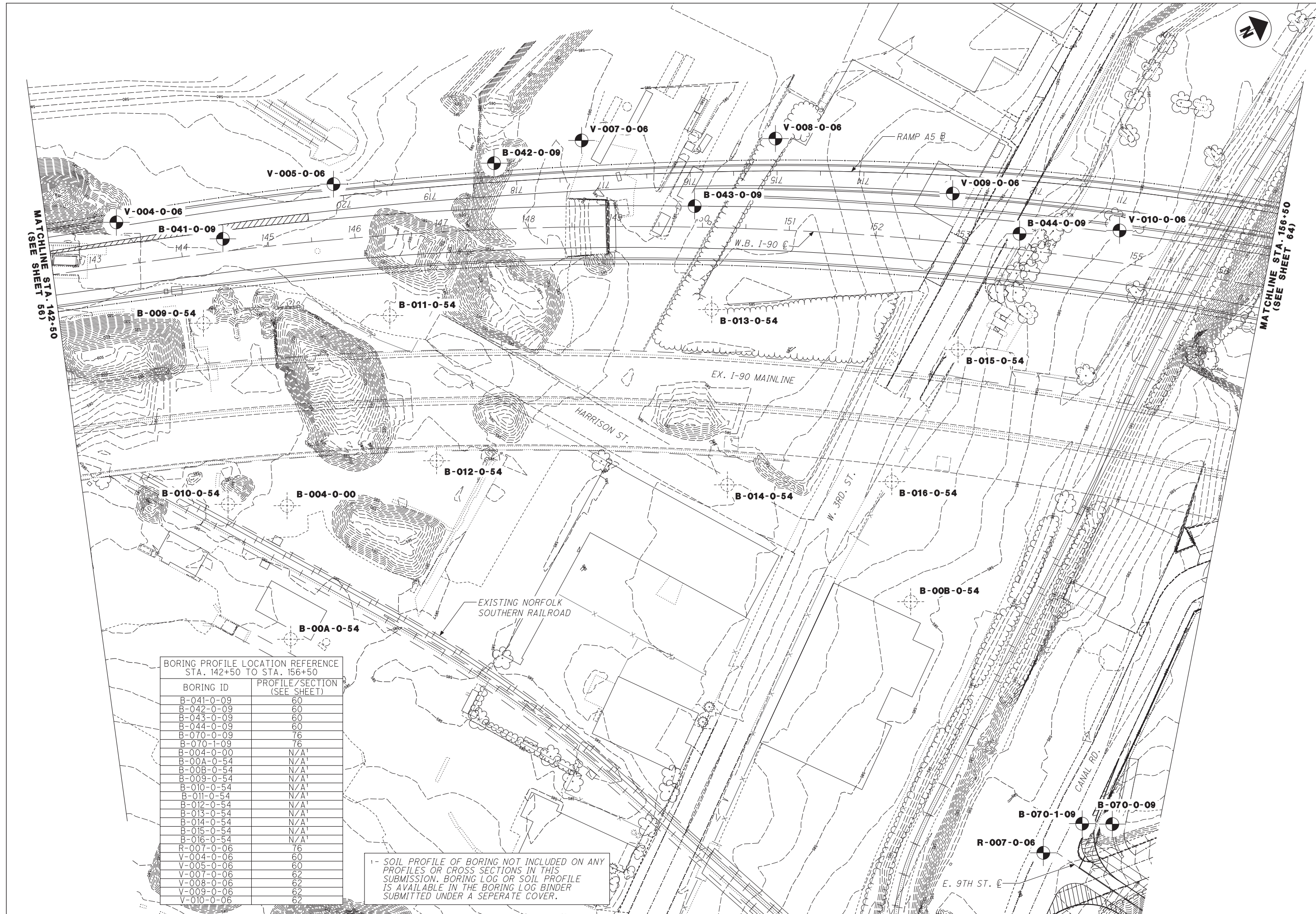
NOTE: VIBRATING WIRE PIEZOMETERS INSTALLED AT DEPTHS OF 70' AND 185'.

NOTE: INCLINOMETER INSTALLED TO A DEPTH 163'.

NOTE: VIBRATING WIRE PIEZOMETERS INSTALLED AT DEPTHS OF 100' AND 220'.

NOTE: GAS ENCOUNTERED DURING ROCK CORING.

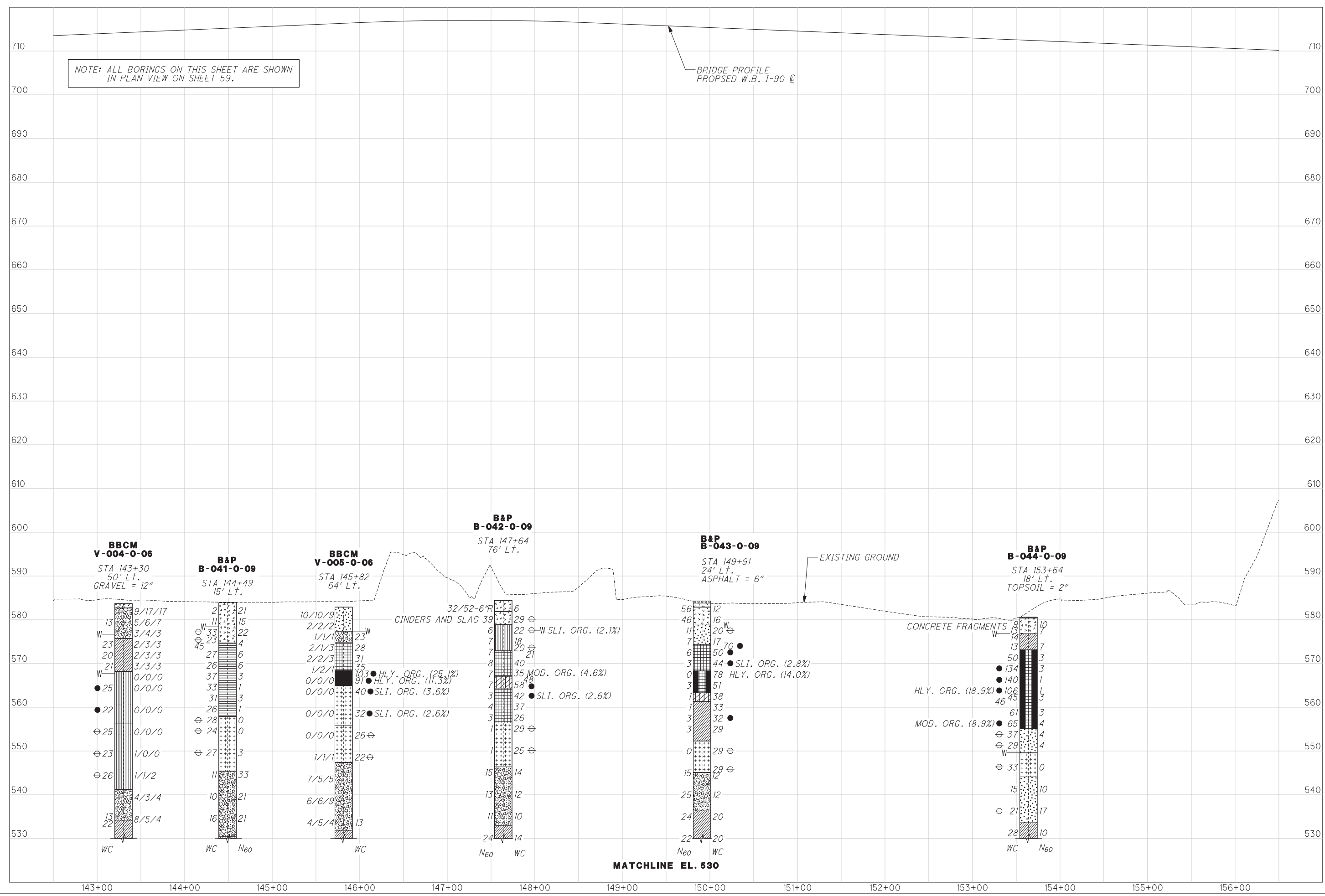
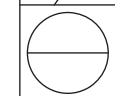
NOTE: GAS ENCOUNTERED DURING ROCK CORING.

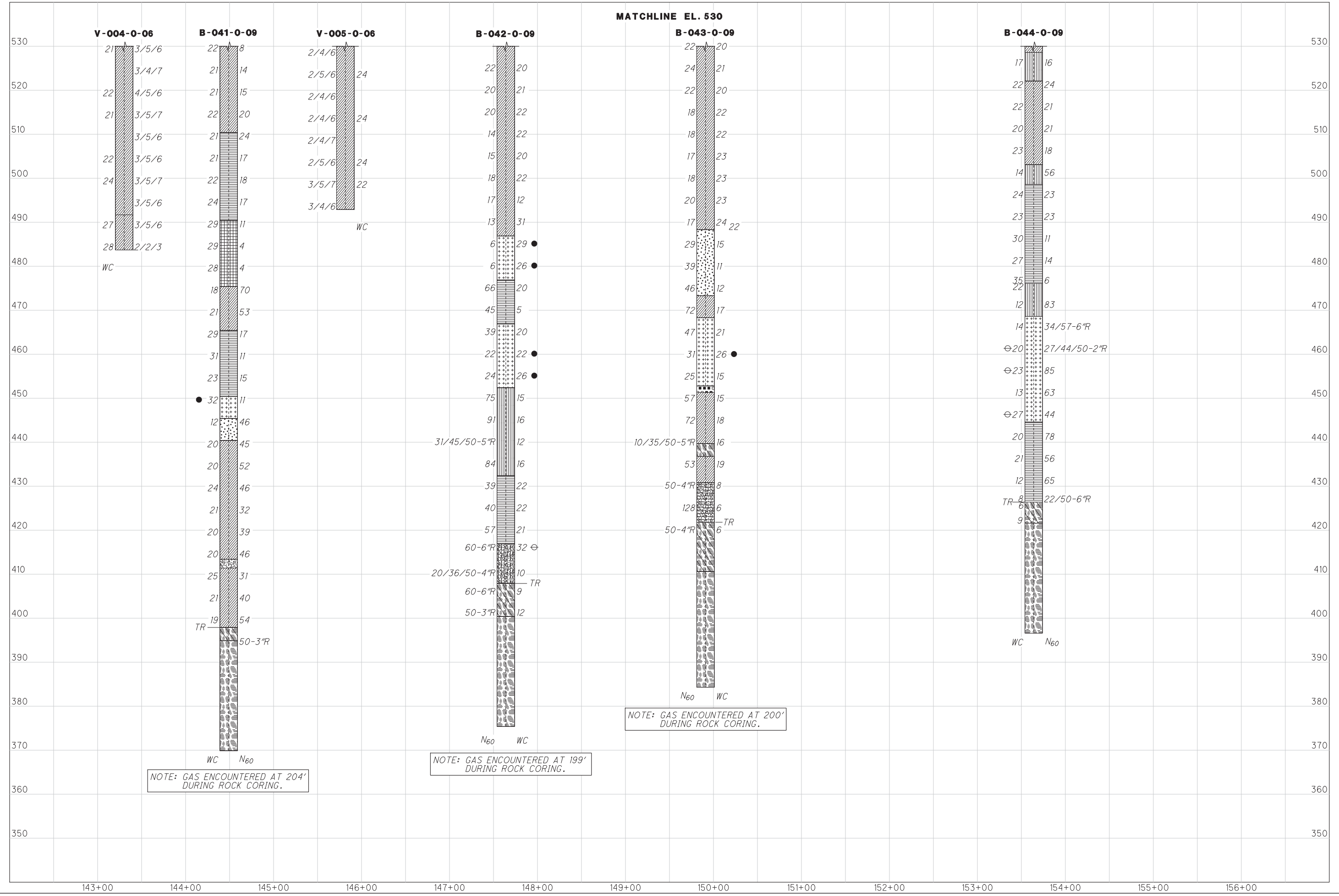


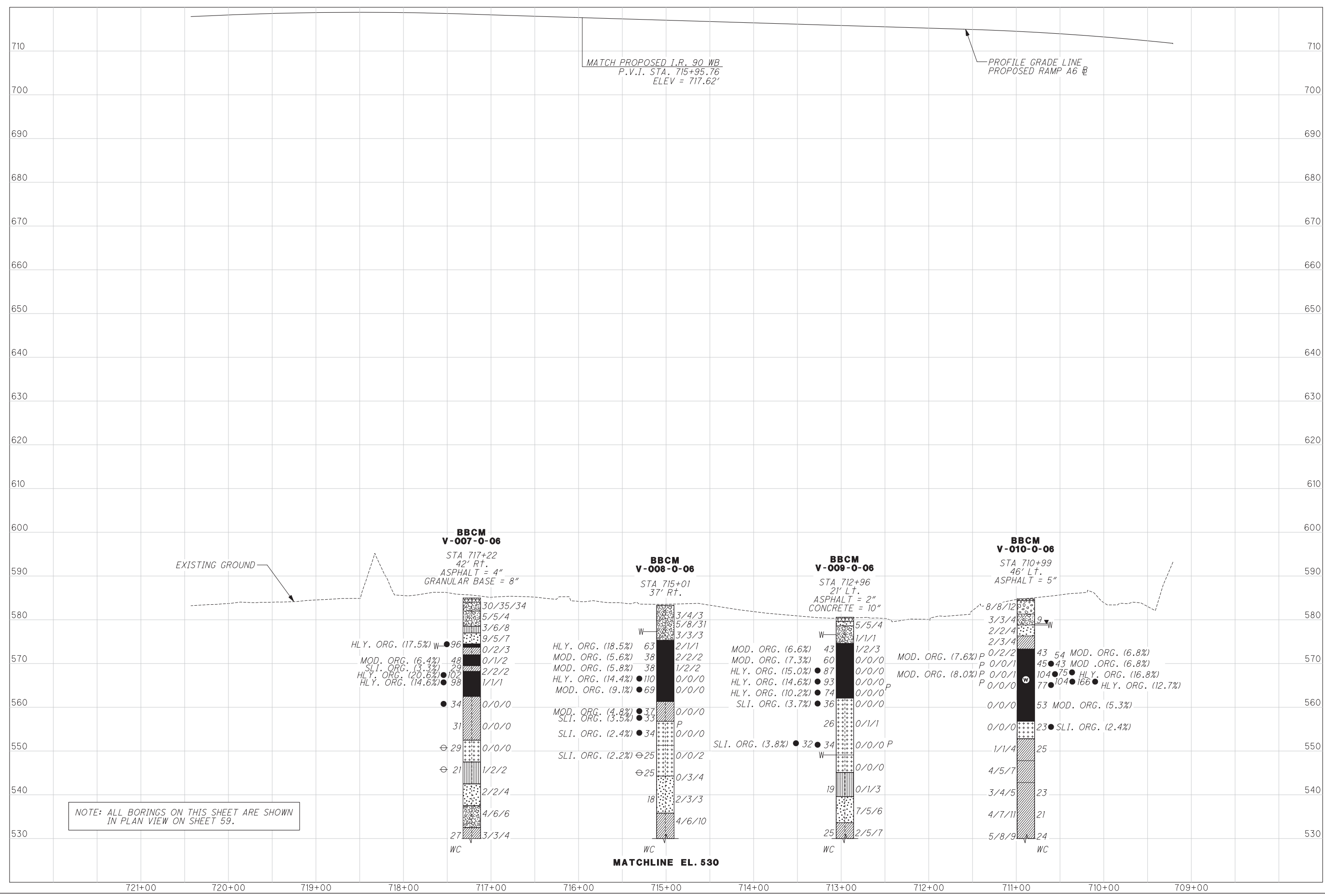
BORING PROFILE LOCATION REFERENCE
STA. 142+50 TO STA. 156+50

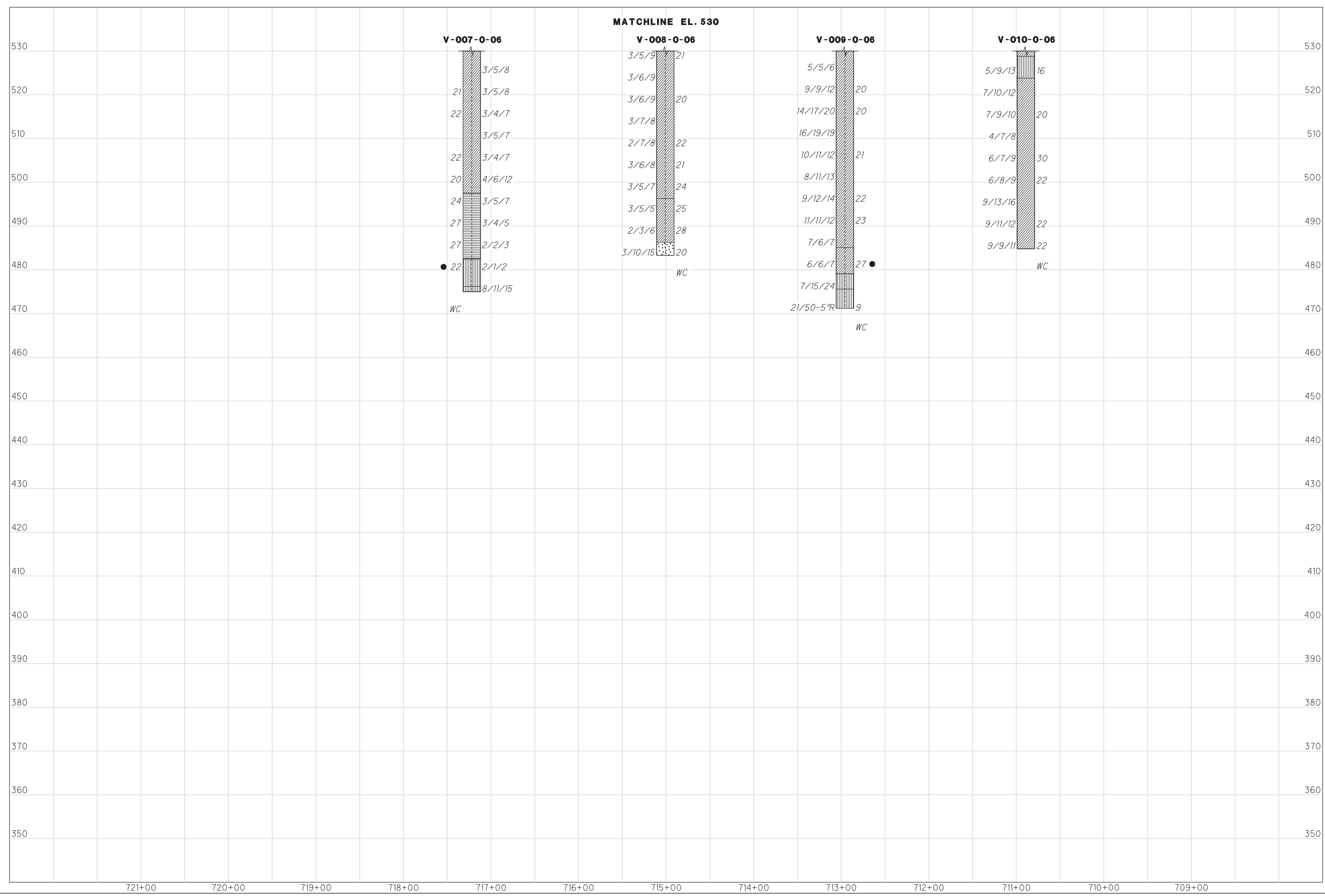
BORING ID	PROFILE/SECTION (SEE SHEET)
B-041-0-09	60
B-042-0-09	60
B-043-0-09	60
B-044-0-09	60
B-070-0-09	76
B-070-1-09	76
B-004-0-00	N/A
B-00A-0-54	N/A
B-00B-0-54	N/A
B-009-0-54	N/A
B-010-0-54	N/A
B-011-0-54	N/A
B-012-0-54	N/A
B-013-0-54	N/A
B-014-0-54	N/A
B-015-0-54	N/A
B-016-0-54	N/A
R-007-0-06	76
V-004-0-06	60
V-005-0-06	60
V-007-0-06	62
V-008-0-06	62
V-009-0-06	62
V-010-0-06	62

1- SOIL PROFILE OF BORING NOT INCLUDED ON ANY PROFILES OR CROSS SECTIONS IN THIS SUBMISSION. BORING LOG OR SOIL PROFILE IS AVAILABLE IN THE BORING LOG BINDER SUBMITTED UNDER A SEPERATE COVER.









721+00 720+00 719+00 718+00 717+00 716+00 715+00 714+00 713+00 712+00 711+00 710+00 709+00



BORING PROFILE LOCATION REFERENCE
STA. 156+50 TO STA. 170+50

BORING ID	PROFILE/SECTION (SEE SHEET)	BORING ID	PROFILE/SECTION (SEE SHEET)
B-045-0-09	65	B-008-E-56	N/A ¹
B-047-0-09	67, 98	B-009-E-56	N/A ¹
B-047-1-09	65, 98	B-00C-0-54	N/A ¹
B-048-0-09	65, 67	B-017-0-54	N/A ¹
B-050-0-09	67	B-018-0-54	N/A ¹
B-051-0-09	65	B-019-0-54	N/A ¹
B-052-0-09	67	B-020-0-54	N/A ¹
B-053-0-09	68	C-049-0-09	N/A ¹
B-054-0-09	72, 100	C-057-0-09	N/A ¹
B-055-0-09	65, 71, 100	R-015-0-06	77
B-056-0-09	72	T-018-0-23	N/A ¹
B-058-0-09	71	T-018-1-23	N/A ¹
B-059-0-09	65	T-019-0-23	N/A ¹
B-001-0-96	N/A ¹	V-011-0-06	65
B-002-0-96	N/A ¹	V-011-A-06	67
B-005-0-86	N/A ¹	V-012-0-06	98
B-001-E-56	N/A ¹	V-013-0-06	65, 77
B-002-E-56	N/A ¹	V-014-0-06	65
B-003-E-56	N/A ¹	V-015-0-06	65
B-004-E-56	N/A ¹	V-016-0-06	100
B-005-E-56	N/A ¹	V-017-0-06	65, 71
B-006-E-56	N/A ¹	V-018-0-06	72
B-007-E-56	71		

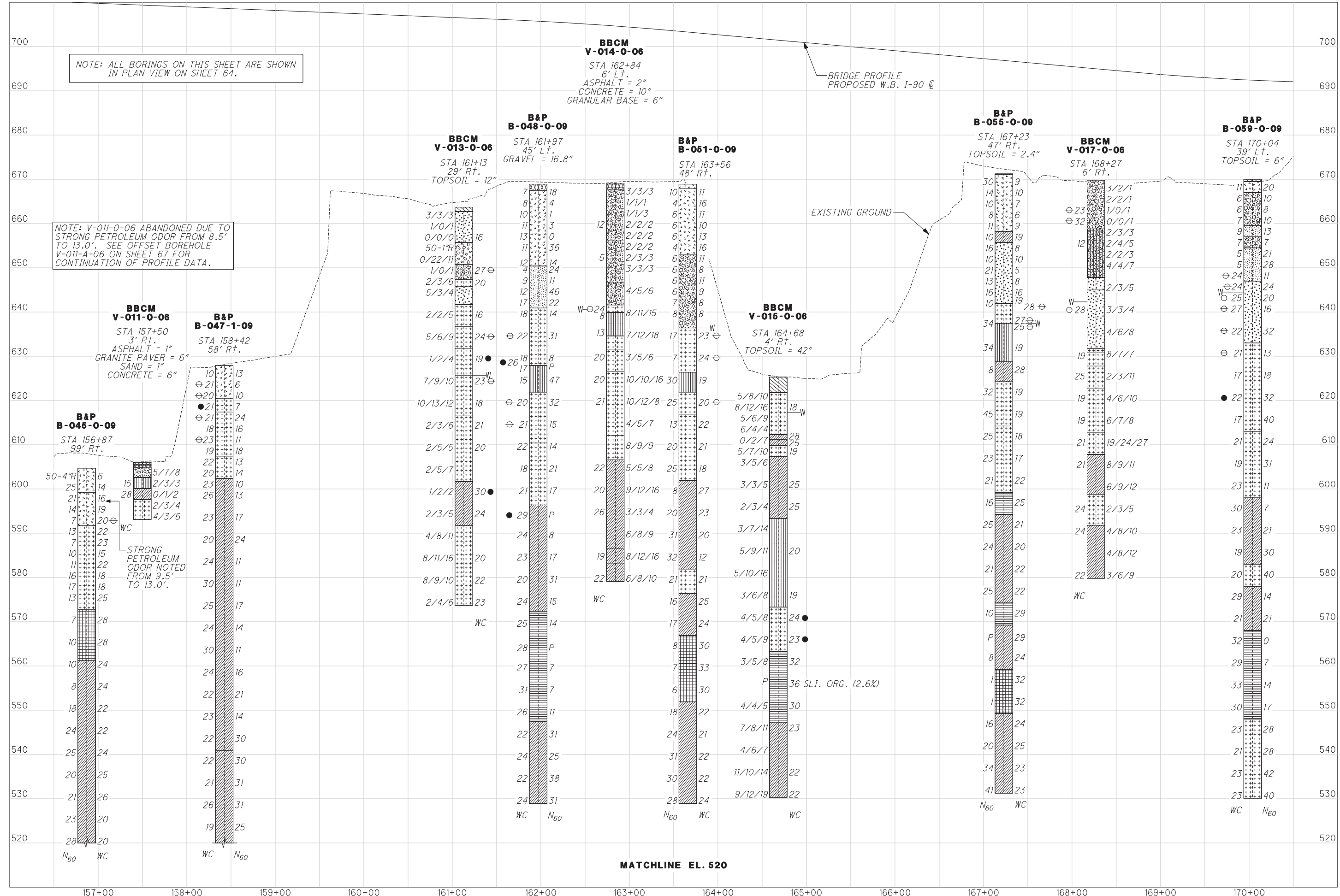
¹- SOIL PROFILE OF BORING NOT INCLUDED ON ANY PROFILES OR CROSS SECTIONS IN THIS SUBMISSION. BORING LOG OR SOIL PROFILE IS AVAILABLE IN THE BORING LOG BINDER SUBMITTED UNDER A SEPERATE COVER.



MATCHLINE STA. 156+50
(SEE SHEET 59)

MATCHLINE STA. 170+50
(SEE SHEET 69)

MATCHLINE STA. 13+50
(SEE SHEET 75)



NOTE: ALL BORINGS ON THIS SHEET ARE SHOWN IN PLAN VIEW ON SHEET 64.

NOTE: V-011-0-06 ABANDONED DUE TO STRONG PETROLEUM ODOR FROM 8.5' TO 13.0'. SEE OFFSET BOREHOLE V-011-A-06 ON SHEET 67 FOR CONTINUATION OF PROFILE DATA.

BBCM V-014-0-06
STA 162+84
6' LT.
ASPHALT = 2"
CONCRETE = 10"
GRANULAR BASE = 6"

BRIDGE PROFILE PROPOSED W.B. I-90

B&P B-048-0-09
STA 161+97
45' LT.
GRAVEL = 16.8"
BBCM V-013-0-06
STA 161+13
29' Rt.
TOPSOIL = 12"

B&P B-051-0-09
STA 163+56
48' Rt.

B&P B-055-0-09
STA 167+23
47' Rt.
TOPSOIL = 2.4"

BBCM V-017-0-06
STA 168+27
6' Rt.

B&P B-059-0-09
STA 170+04
39' Lt.
TOPSOIL = 6"

BBCM V-011-0-06
STA 157+50
3' Rt.
ASPHALT = 1"
GRANITE PAVER = 6"
SAND = 1"
CONCRETE = 6"

B&P B-047-1-09
STA 158+42
58' Rt.

BBCM V-015-0-06
STA 164+68
4' Rt.
TOPSOIL = 42"

B&P B-045-0-09
STA 156+87
99' Rt.

STRONG PETROLEUM ODOR NOTED FROM 9.5' TO 13.0'.

MATCHLINE EL. 520



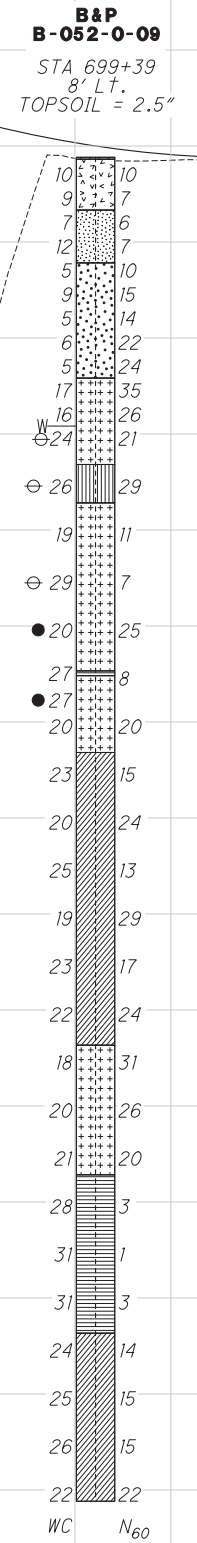
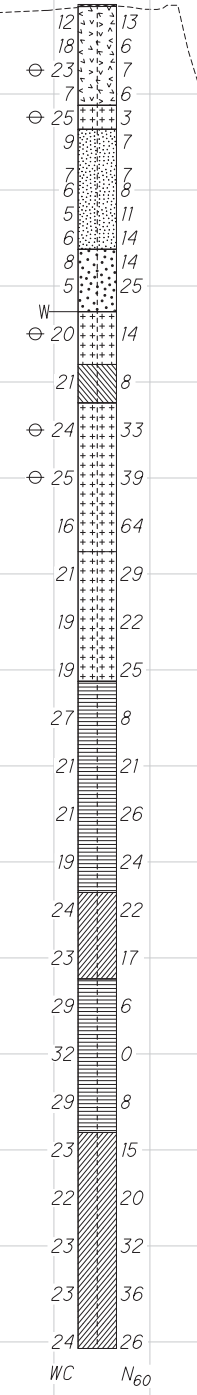
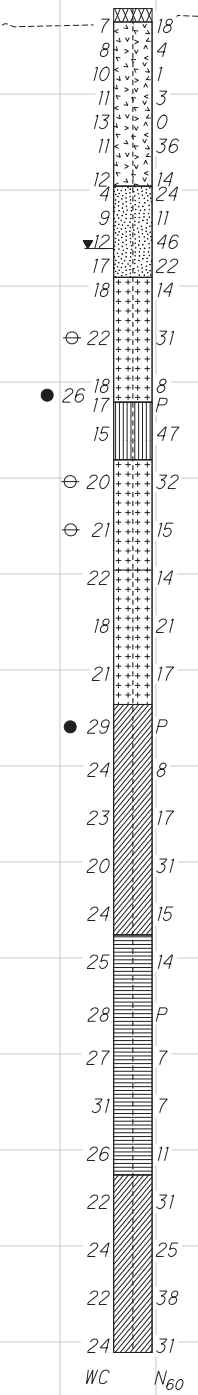
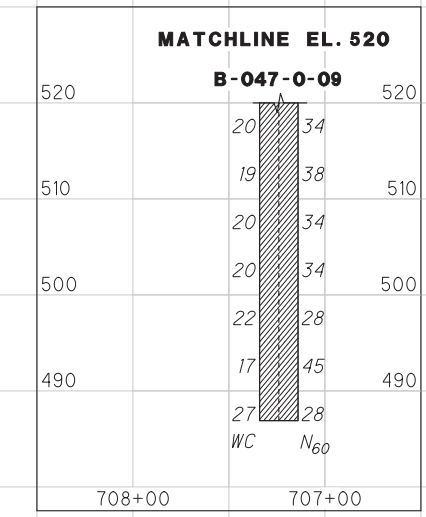
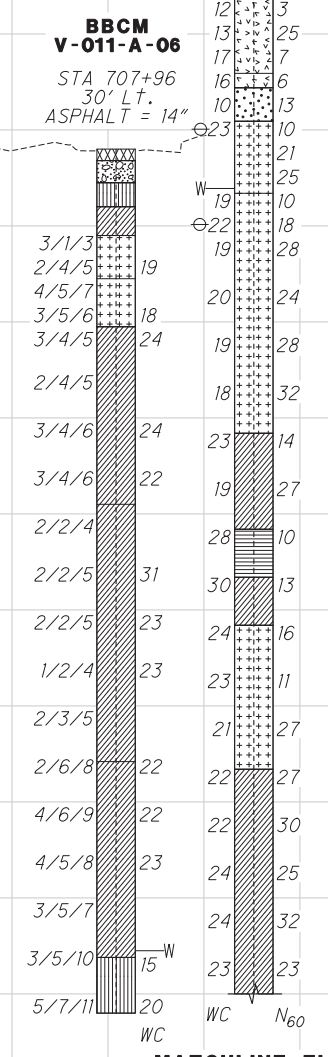
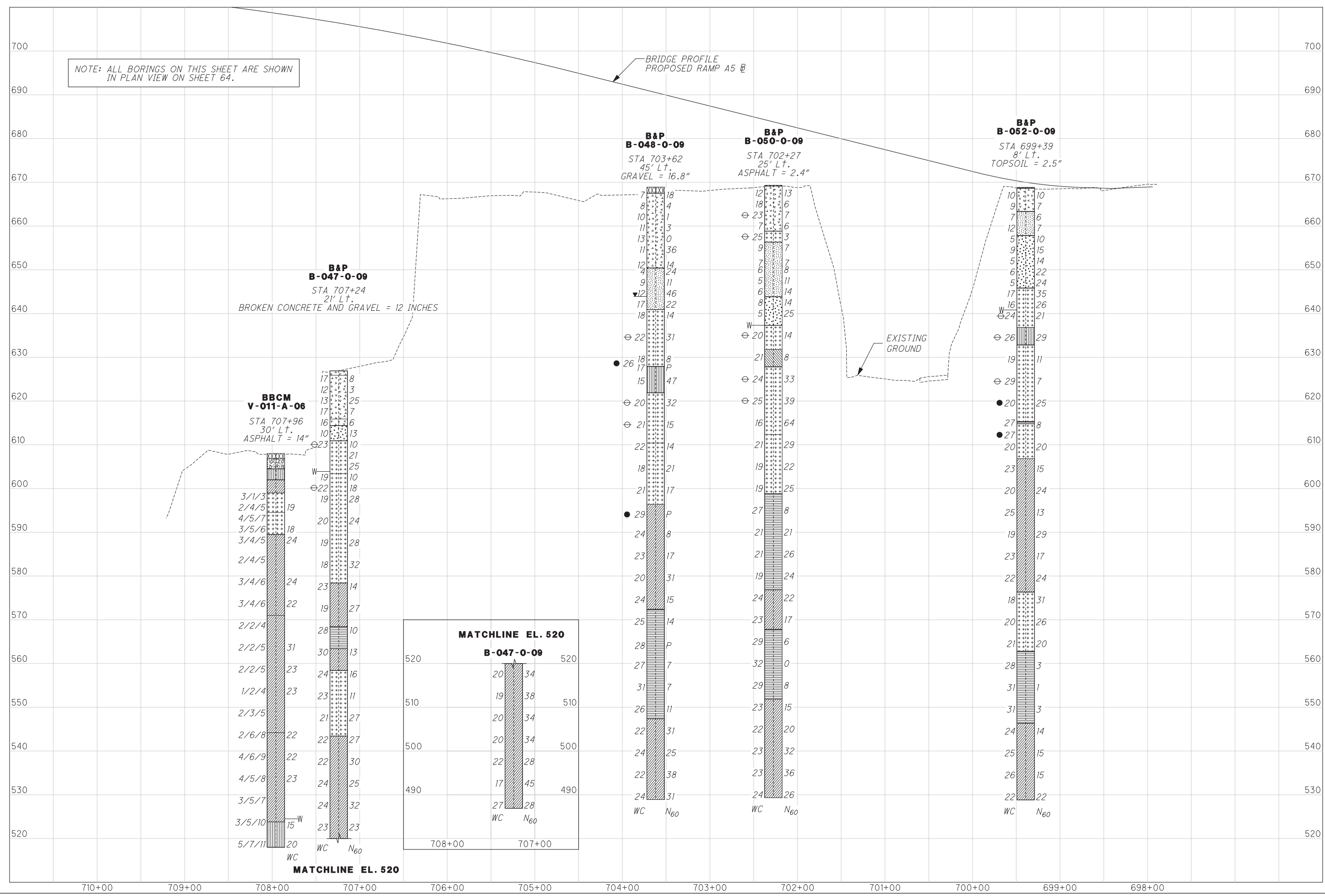
MATCHLINE EL. 520

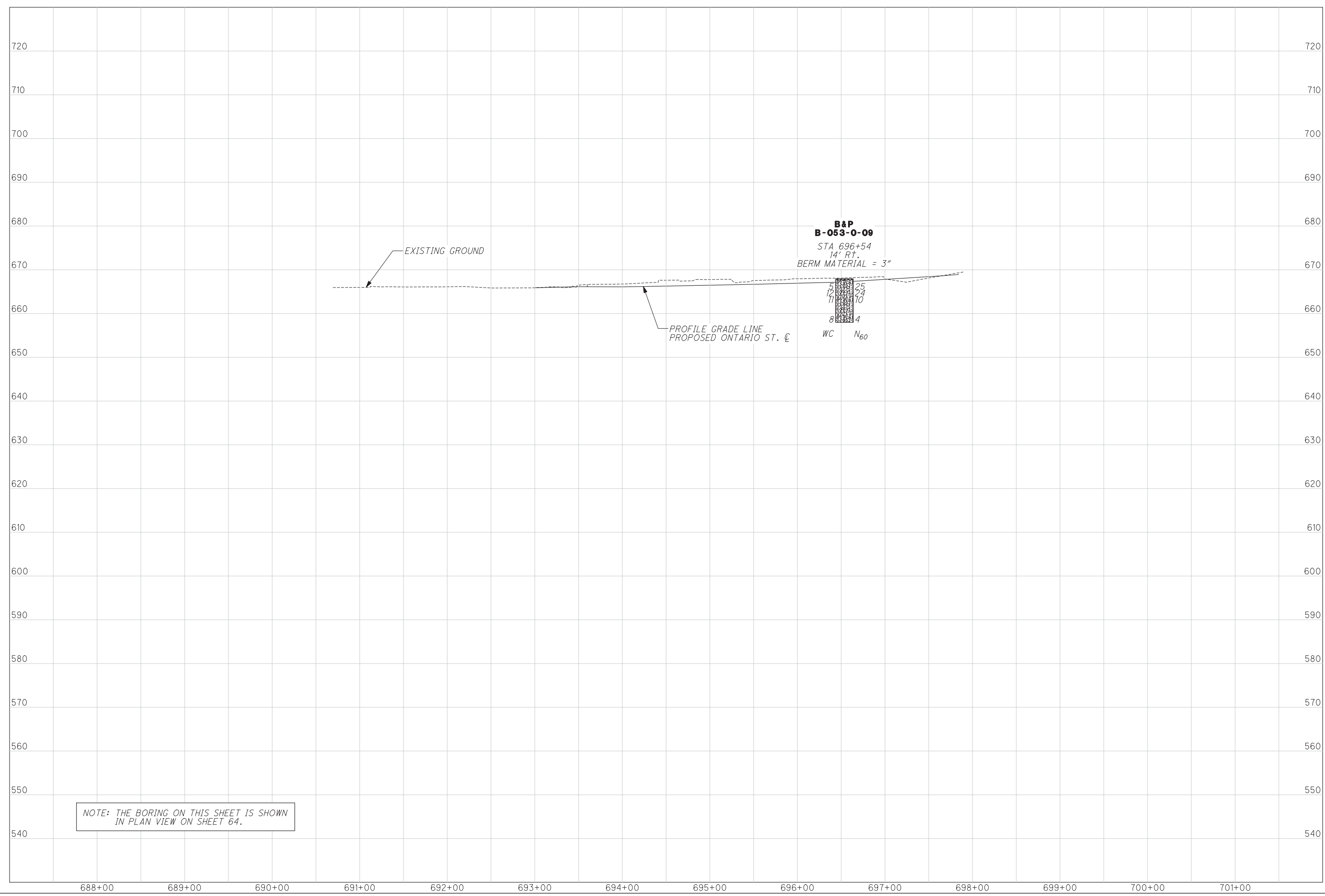




NOTE: ALL BORINGS ON THIS SHEET ARE SHOWN IN PLAN VIEW ON SHEET 64.

BRIDGE PROFILE
PROPOSED RAMP A5





NOTE: THE BORING ON THIS SHEET IS SHOWN
IN PLAN VIEW ON SHEET 64.



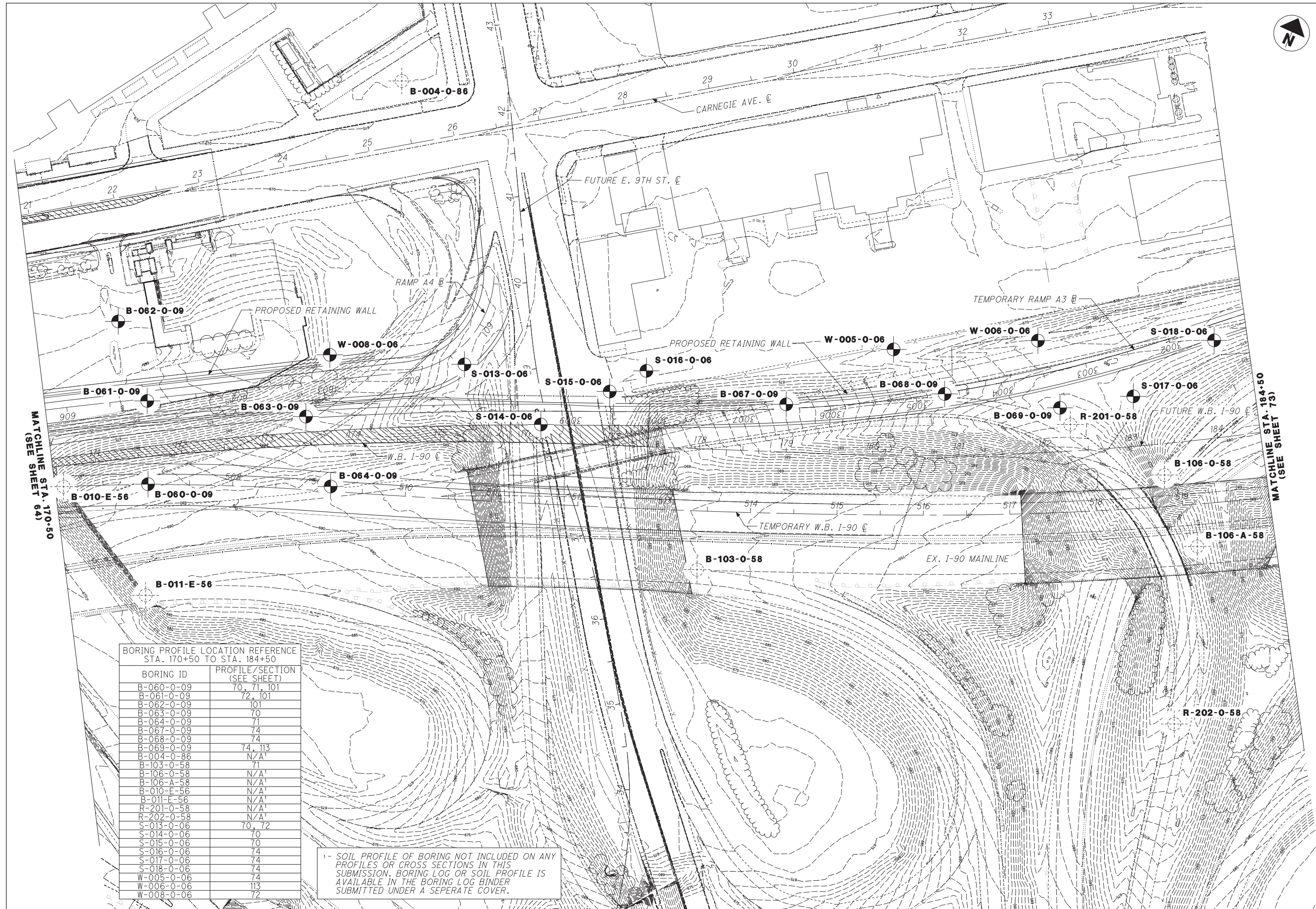
BBCM

HORIZONTAL SCALE
IN FEET

SOIL PROFILE - W.B. I-90
STA. 170+50 TO STA. 184+50

CUY-90-14.52

69 / 114



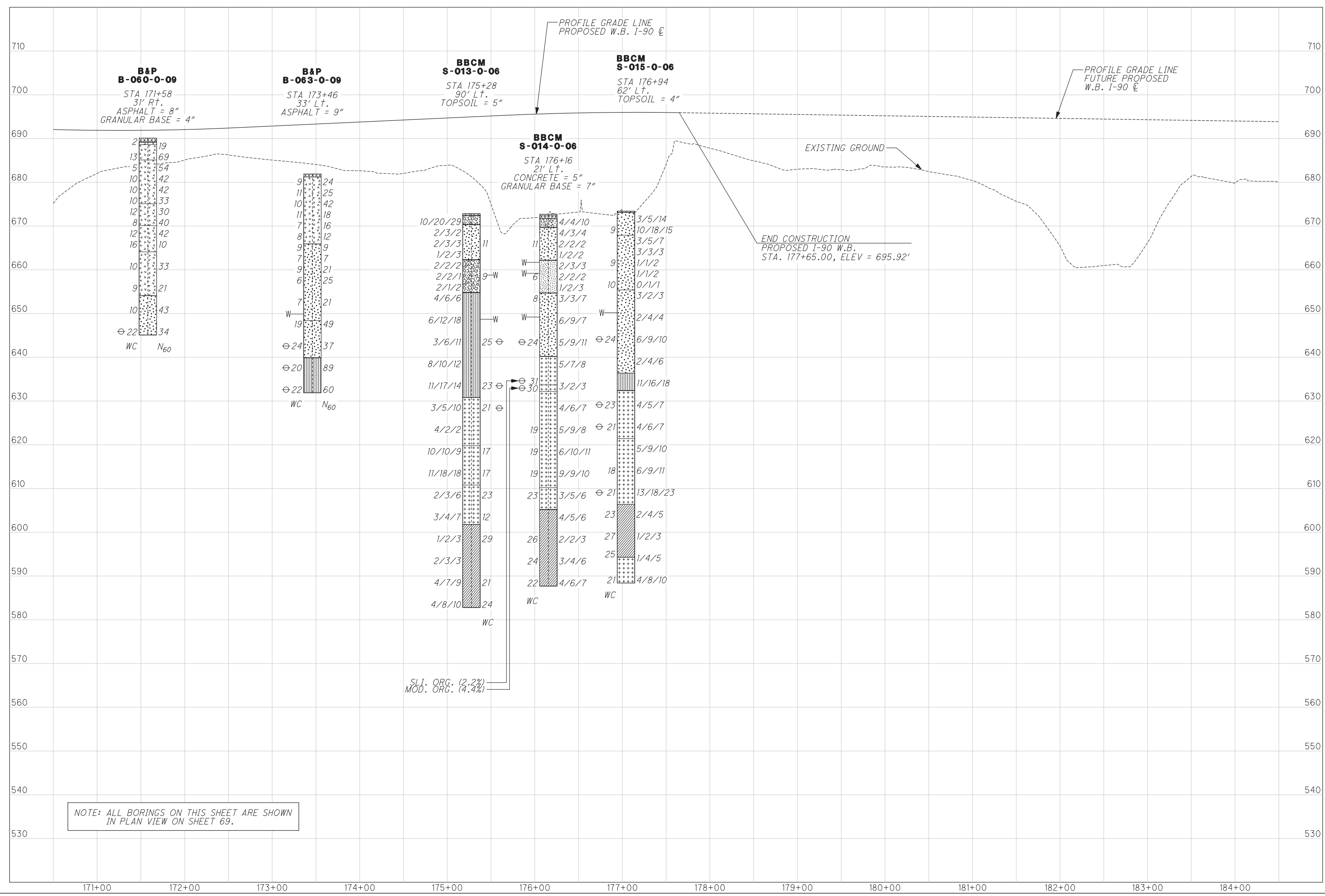
MATCHLINE STA. 170+50
(SEE SHEET 64)

MATCHLINE STA. 184+50
(SEE SHEET 73)

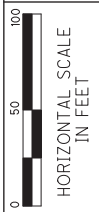
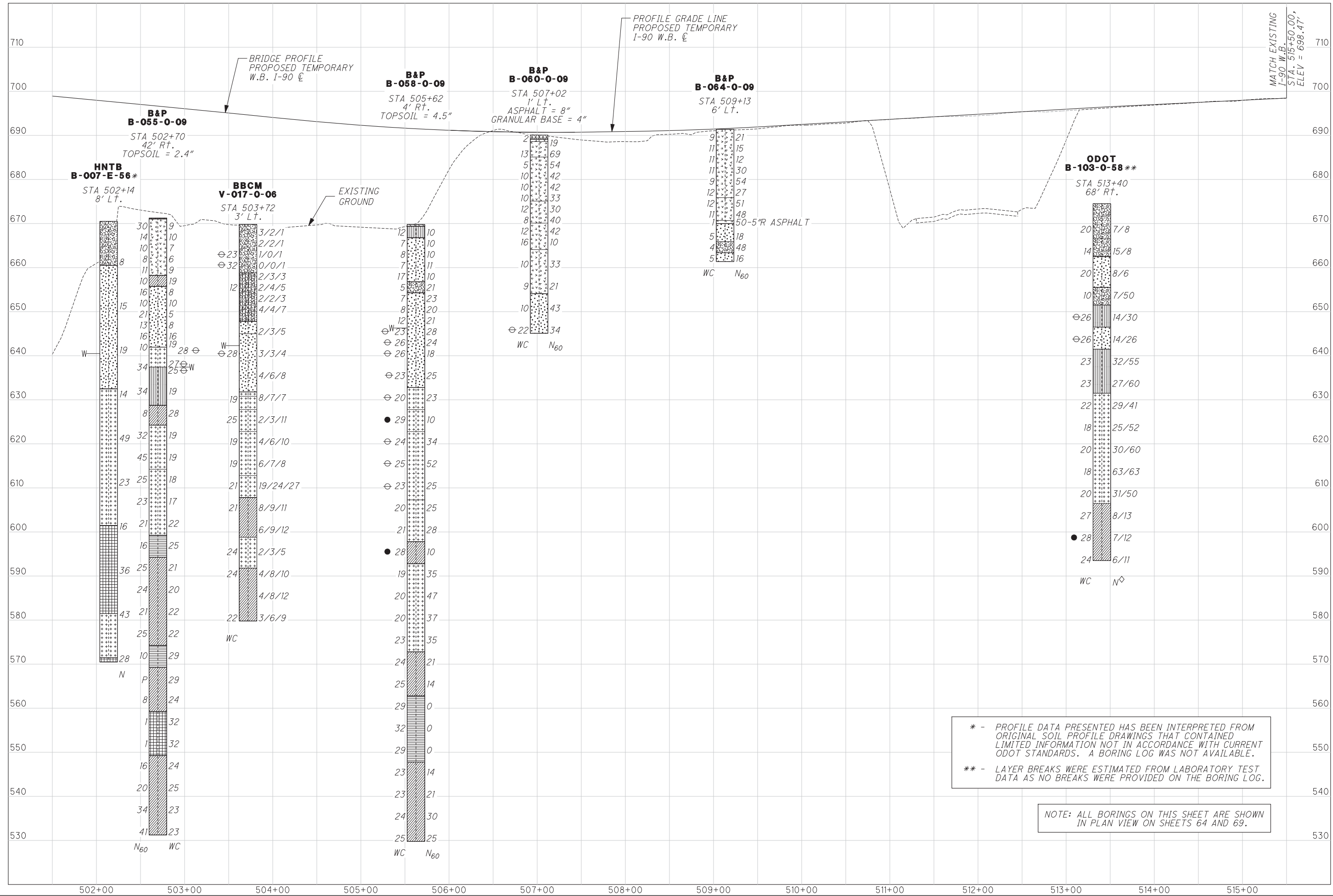
BORING PROFILE LOCATION REFERENCE
STA. 170+50 TO STA. 184+50

BORING ID	PROFILE/SECTION (SEE SHEET)
B-060-0-09	70, 71, 101
B-061-0-09	72, 101
B-062-0-09	101
B-063-0-09	70
B-064-0-09	71
B-067-0-09	74
B-068-0-09	74
B-069-0-09	74, 113
B-004-0-86	N/A ¹
B-103-0-58	71
B-106-0-58	N/A ¹
B-106-A-58	N/A ¹
B-010-E-56	N/A ¹
B-011-E-56	N/A ¹
R-201-0-58	N/A ¹
R-202-0-58	N/A ¹
S-013-0-06	70, 72
S-014-0-06	70
S-015-0-06	70
S-016-0-06	74
S-017-0-06	74
S-018-0-06	74
W-005-0-06	74
W-006-0-06	113
W-008-0-06	72

¹ - SOIL PROFILE OF BORING NOT INCLUDED ON ANY PROFILES OR CROSS SECTIONS IN THIS SUBMISSION. BORING LOG OR SOIL PROFILE IS AVAILABLE IN THE BORING LOG BINDER SUBMITTED UNDER A SEPERATE COVER.



NOTE: ALL BORINGS ON THIS SHEET ARE SHOWN IN PLAN VIEW ON SHEET 69.



SOIL PROFILE - TEMPORARY W.B. I-90
STA. 501+50 TO STA. 515+50

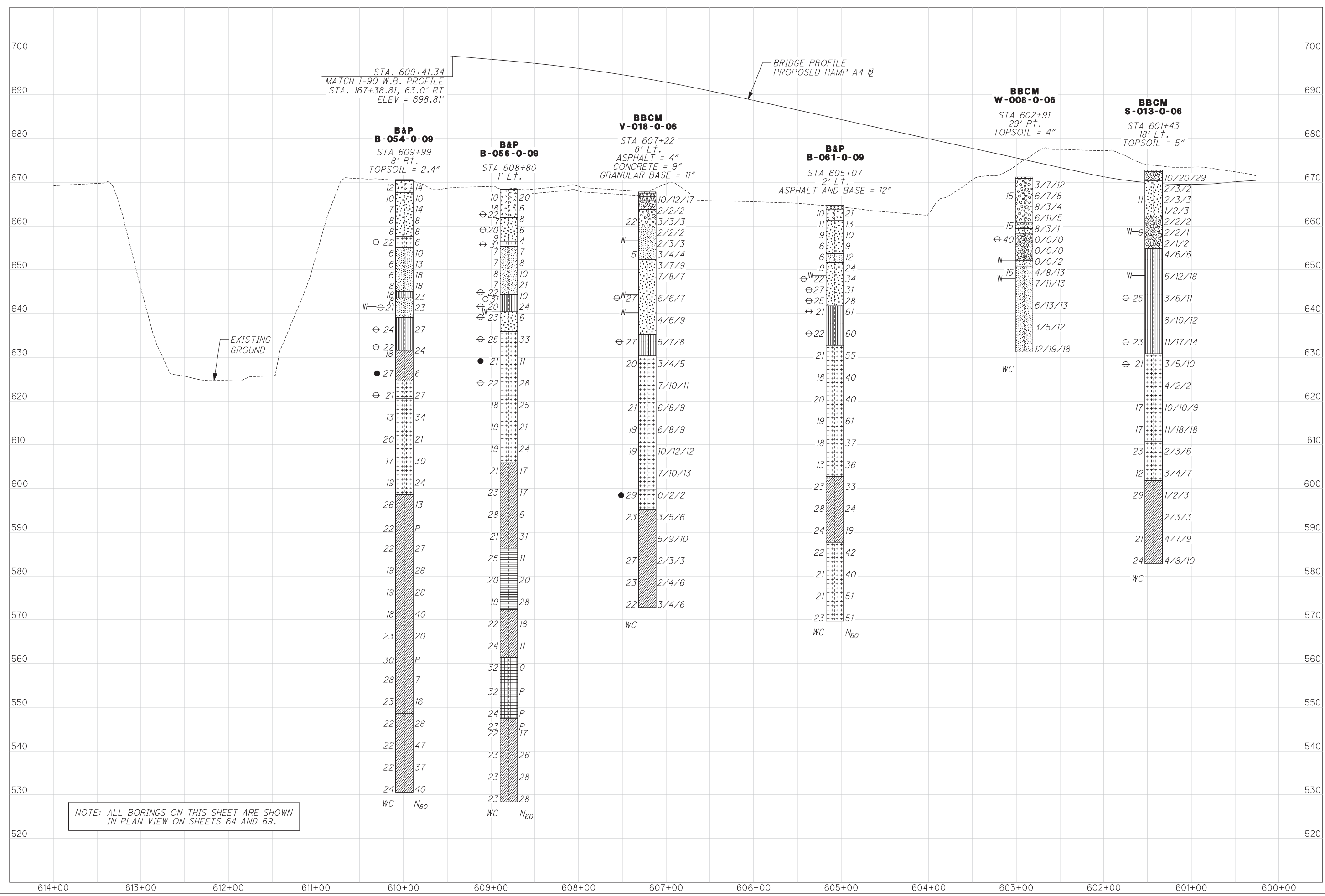
CUI-90-14.52



* - PROFILE DATA PRESENTED HAS BEEN INTERPRETED FROM ORIGINAL SOIL PROFILE DRAWINGS THAT CONTAINED LIMITED INFORMATION NOT IN ACCORDANCE WITH CURRENT ODOT STANDARDS. A BORING LOG WAS NOT AVAILABLE.

** - LAYER BREAKS WERE ESTIMATED FROM LABORATORY TEST DATA AS NO BREAKS WERE PROVIDED ON THE BORING LOG.

NOTE: ALL BORINGS ON THIS SHEET ARE SHOWN IN PLAN VIEW ON SHEETS 64 AND 69.



STA. 609+41.34
MATCH I-90 W.B. PROFILE
STA. 167+38.81, 63.0' RT
ELEV = 698.81'

BRIDGE PROFILE
PROPOSED RAMP A4 B

B&P
B-054-0-09
STA 609+99
8' RT.
TOPSOIL = 2.4"

B&P
B-056-0-09
STA 608+80
1' LT.

BBCM
V-018-0-06
STA 607+22
8' LT.
ASPHALT = 4"
CONCRETE = 9"
GRANULAR BASE = 11"

B&P
B-061-0-09
STA 605+07
2' LT.
ASPHALT AND BASE = 12"

BBCM
W-008-0-06
STA 602+91
29' RT.
TOPSOIL = 4"

BBCM
S-013-0-06
STA 601+43
18' LT.
TOPSOIL = 5"

EXISTING
GROUND

NOTE: ALL BORINGS ON THIS SHEET ARE SHOWN
IN PLAN VIEW ON SHEETS 64 AND 69.

WC

WC

WC N₆₀

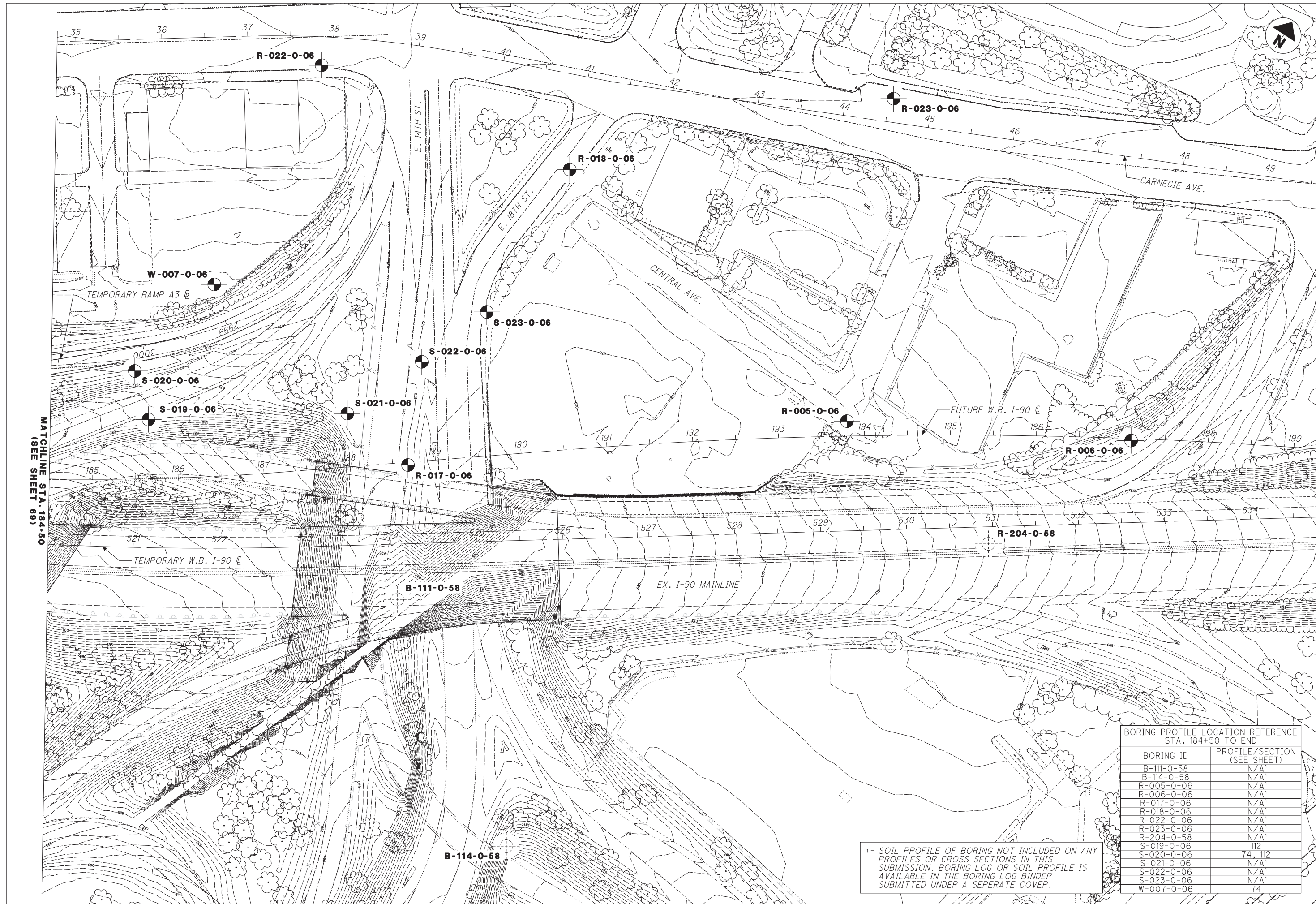
WC N₆₀

WC N₆₀

614+00 613+00 612+00 611+00 610+00 609+00 608+00 607+00 606+00 605+00 604+00 603+00 602+00 601+00 600+00

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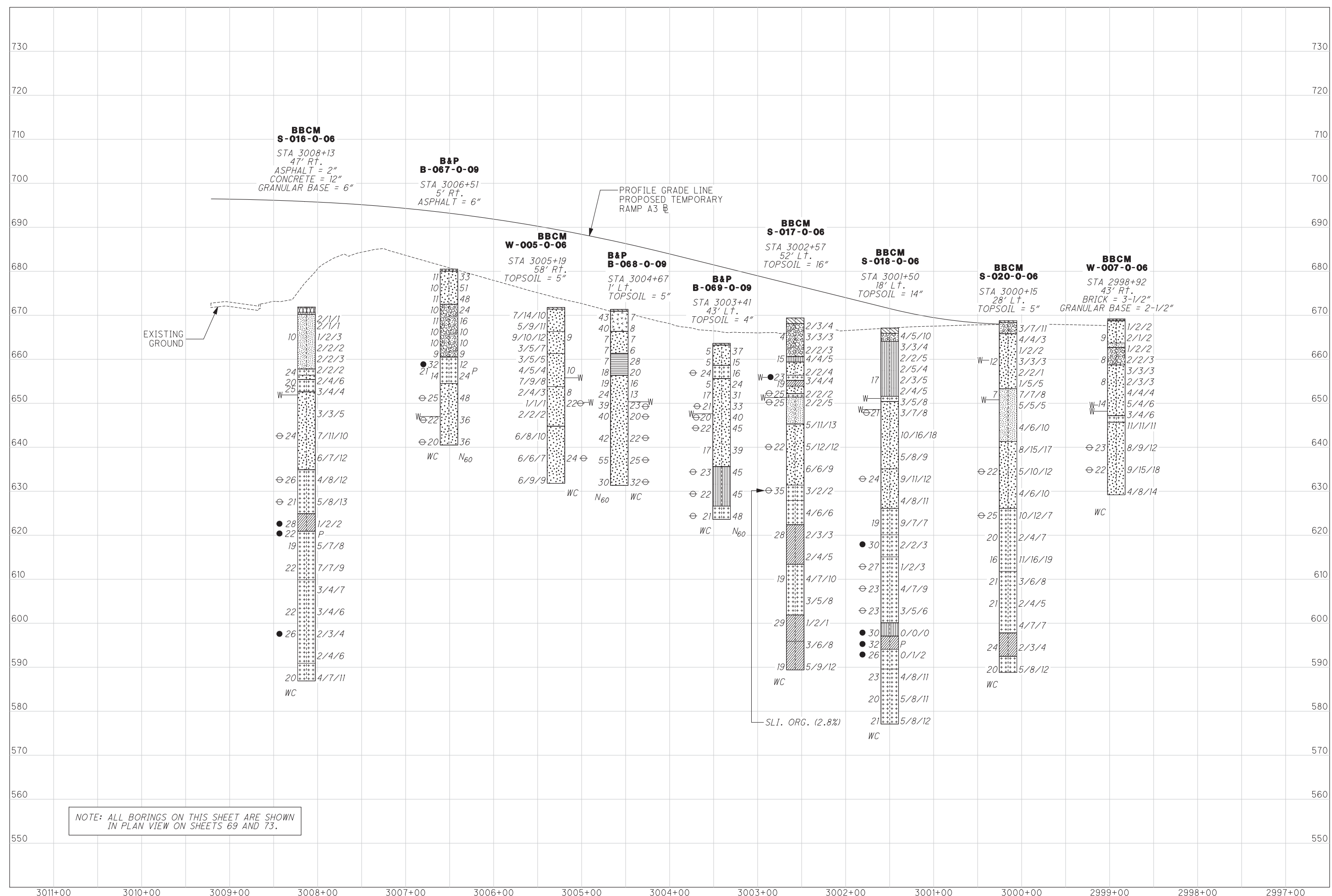
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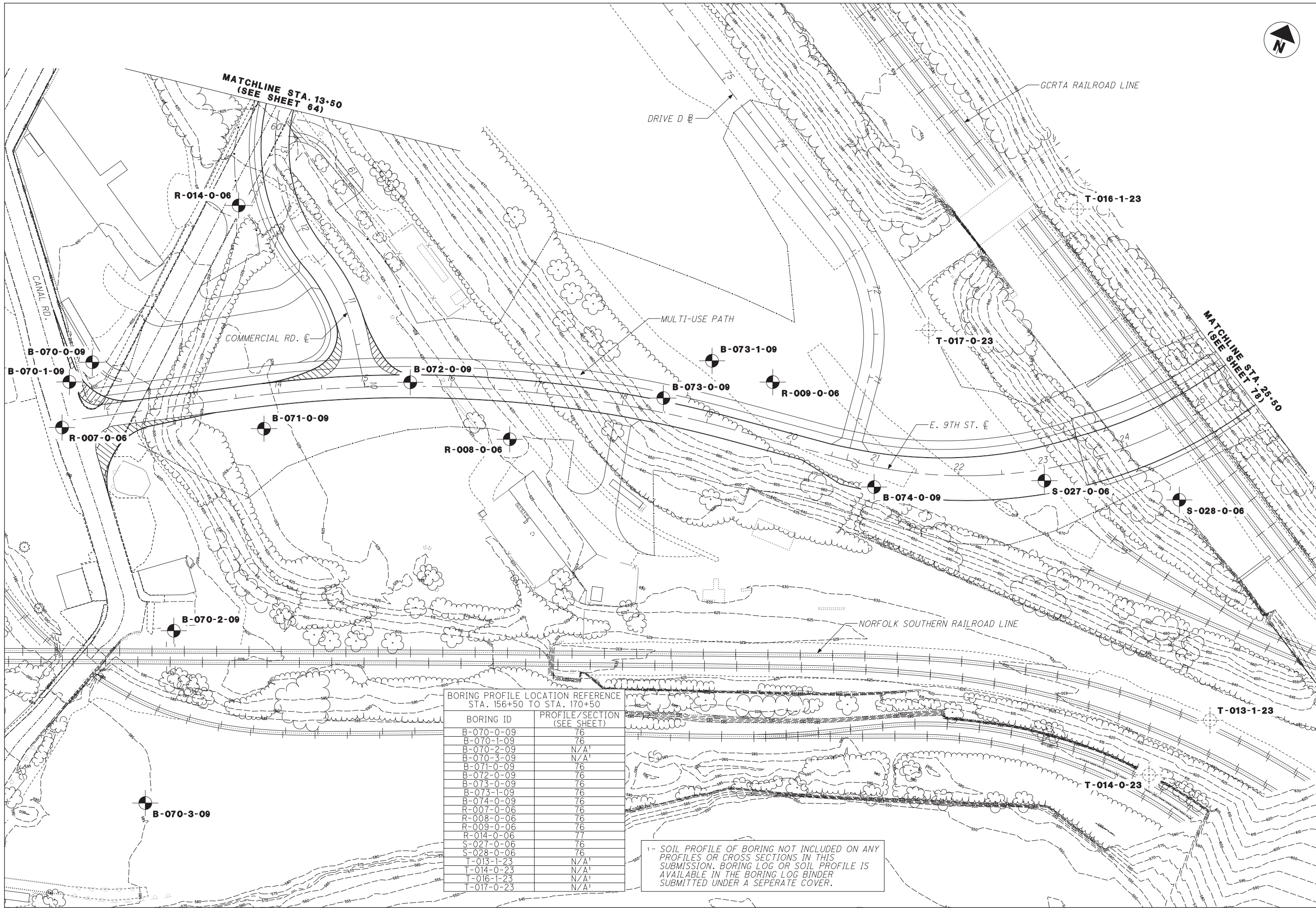


MATCHLINE STA. 184+50
(SEE SHEET 69)

BORING PROFILE LOCATION REFERENCE STA. 184+50 TO END	
BORING ID	PROFILE / SECTION (SEE SHEET)
B-111-0-58	N/A
B-114-0-58	N/A
R-005-0-06	N/A
R-006-0-06	N/A
R-017-0-06	N/A
R-018-0-06	N/A
R-022-0-06	N/A
R-023-0-06	N/A
R-204-0-58	N/A
S-019-0-06	112
S-020-0-06	74, 112
S-021-0-06	N/A
S-022-0-06	N/A
S-023-0-06	N/A
W-007-0-06	74

1- SOIL PROFILE OF BORING NOT INCLUDED ON ANY PROFILES OR CROSS SECTIONS IN THIS SUBMISSION. BORING LOG OR SOIL PROFILE IS AVAILABLE IN THE BORING LOG BINDER SUBMITTED UNDER A SEPERATE COVER.

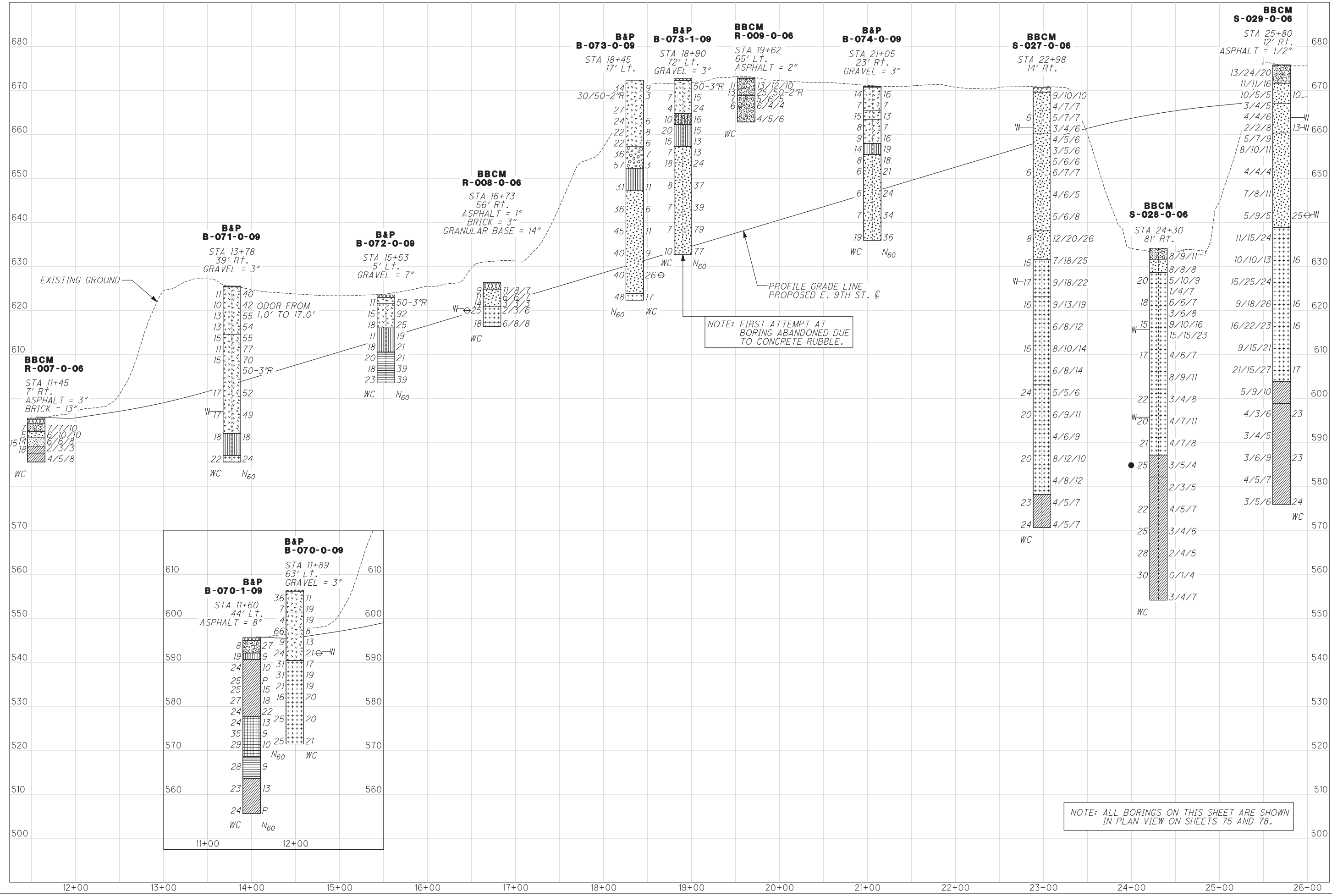


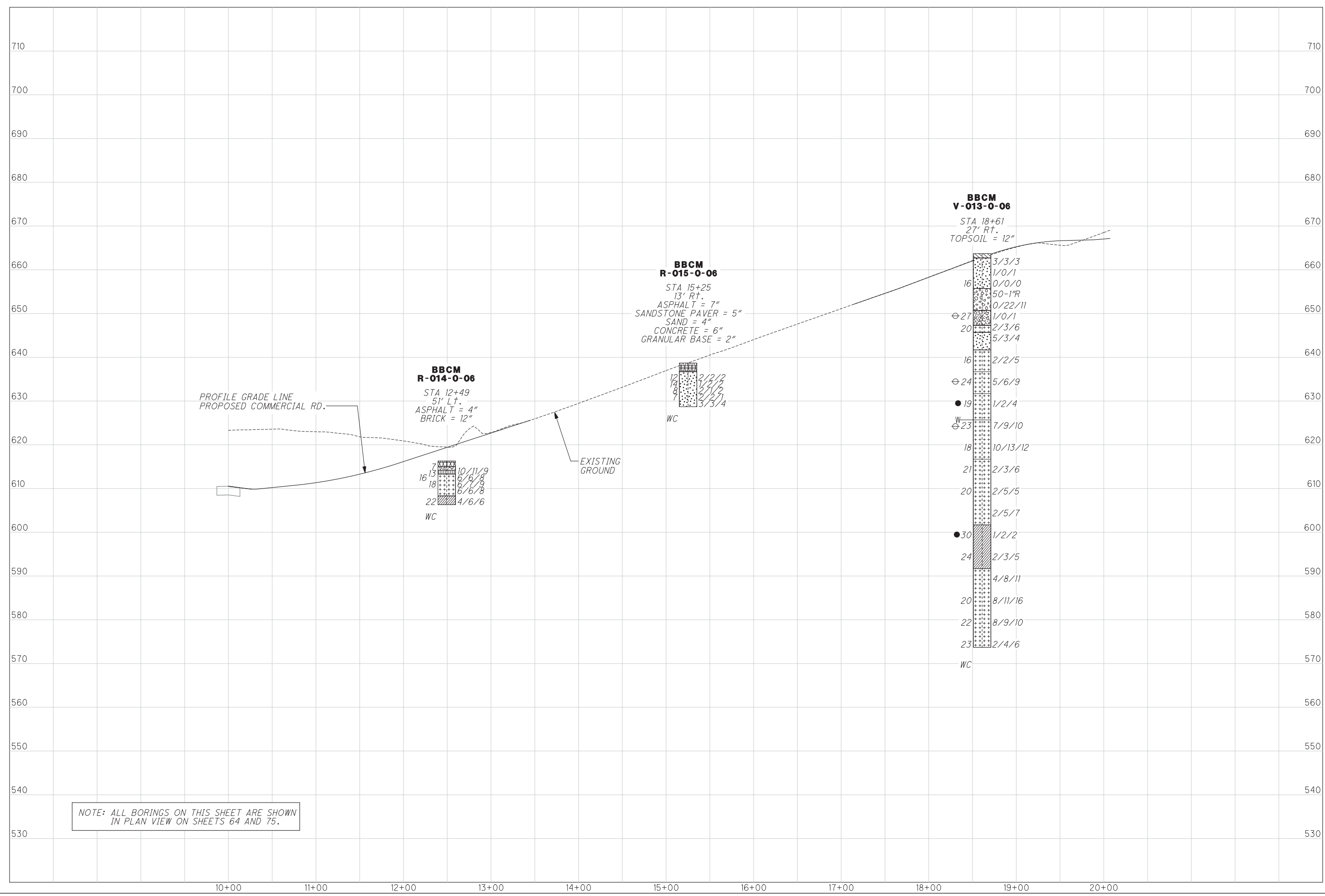


BORING PROFILE LOCATION REFERENCE
STA. 156+50 TO STA. 170+50

BORING ID	PROFILE/SECTION (SEE SHEET)
B-070-0-09	76
B-070-1-09	76
B-070-2-09	N/A ¹
B-070-3-09	N/A ¹
B-071-0-09	76
B-072-0-09	76
B-073-0-09	76
B-073-1-09	76
B-074-0-09	76
R-007-0-06	76
R-008-0-06	76
R-009-0-06	76
R-014-0-06	77
S-027-0-06	76
S-028-0-06	76
T-013-1-23	N/A ¹
T-014-0-23	N/A ¹
T-016-1-23	N/A ¹
T-017-0-23	N/A ¹

¹ - SOIL PROFILE OF BORING NOT INCLUDED ON ANY PROFILES OR CROSS SECTIONS IN THIS SUBMISSION. BORING LOG OR SOIL PROFILE IS AVAILABLE IN THE BORING LOG BINDER SUBMITTED UNDER A SEPERATE COVER.



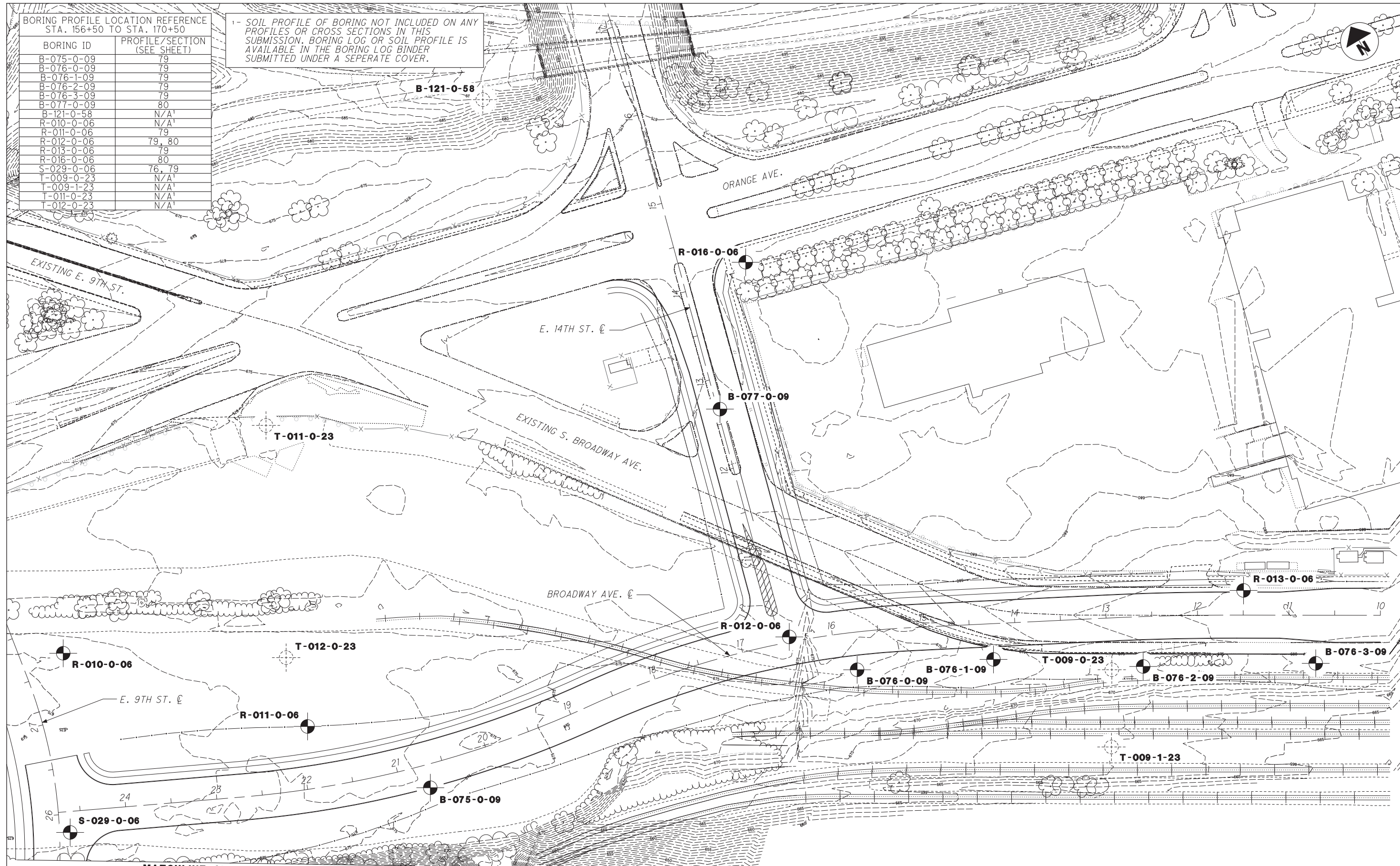


NOTE: ALL BORINGS ON THIS SHEET ARE SHOWN IN PLAN VIEW ON SHEETS 64 AND 75.

BORING PROFILE LOCATION REFERENCE
STA. 156+50 TO STA. 170+50

BORING ID	PROFILE/SECTION (SEE SHEET)
B-075-0-09	79
B-076-0-09	79
B-076-1-09	79
B-076-2-09	79
B-076-3-09	79
B-077-0-09	80
B-121-0-58	N/A ¹
R-010-0-06	N/A ¹
R-011-0-06	79
R-012-0-06	79, 80
R-013-0-06	79
R-016-0-06	80
S-029-0-06	76, 79
T-009-0-23	N/A ¹
T-009-1-23	N/A ¹
T-011-0-23	N/A ¹
T-012-0-23	N/A ¹

¹- SOIL PROFILE OF BORING NOT INCLUDED ON ANY
PROFILES OR CROSS SECTIONS IN THIS
SUBMISSION. BORING LOG OR SOIL PROFILE IS
AVAILABLE IN THE BORING LOG BINDER
SUBMITTED UNDER A SEPERATE COVER.



MATCHLINE STA. 25+50
(SEE SHEET 75)

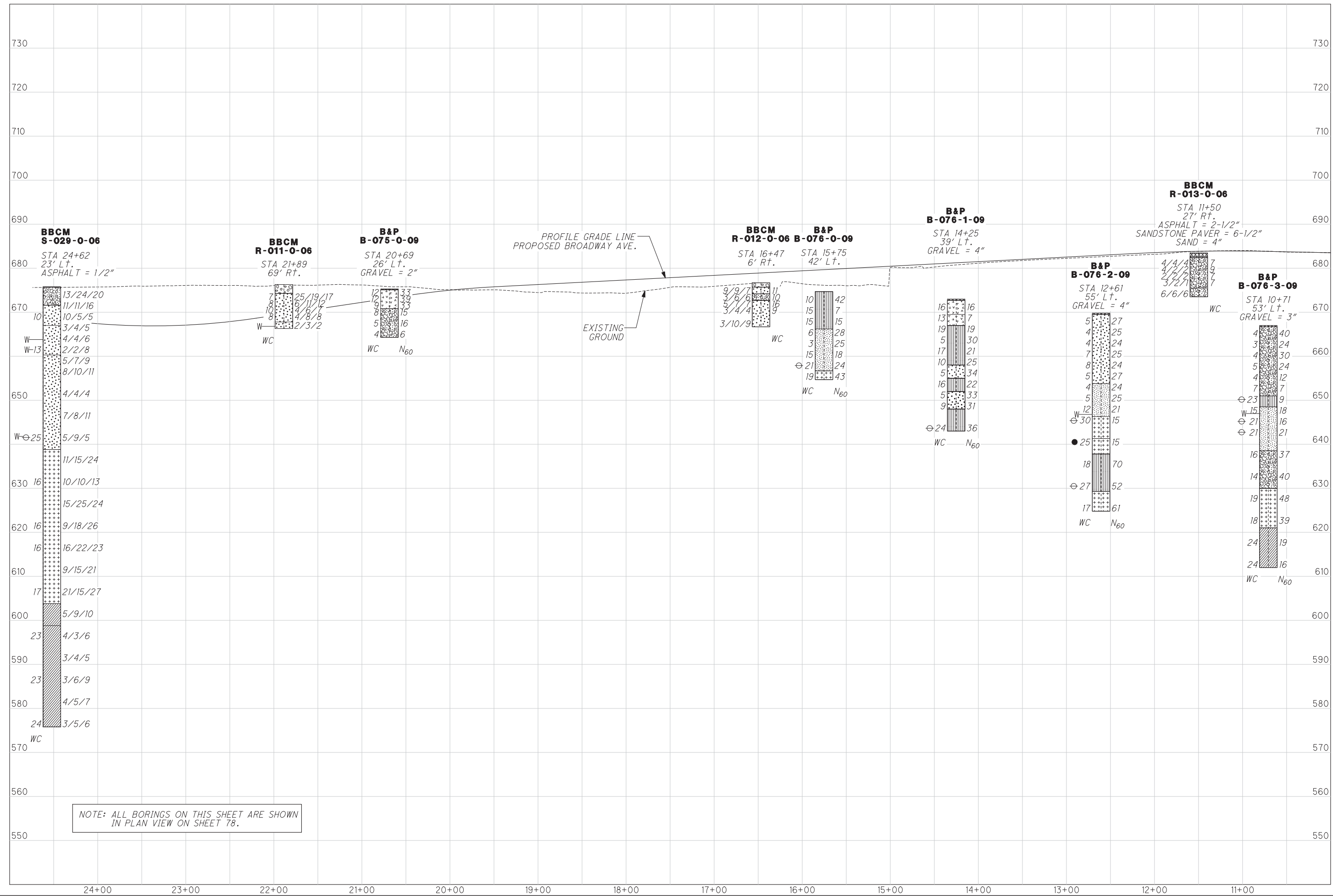


BBCM

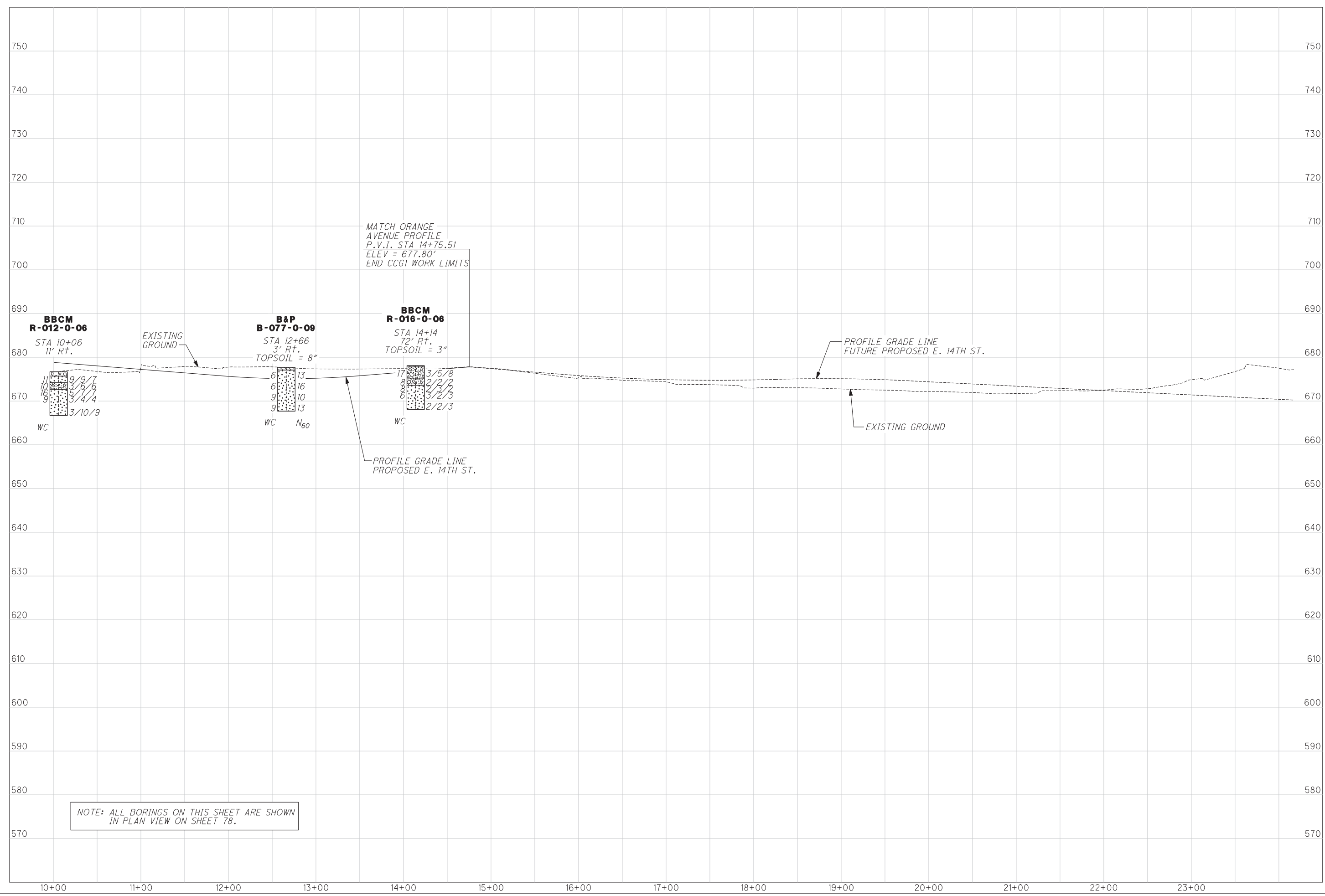
SOIL PROFILE - BROADWAY AVE.
STA. 10+00 TO STA 24+73.88

CUY-90-14.52



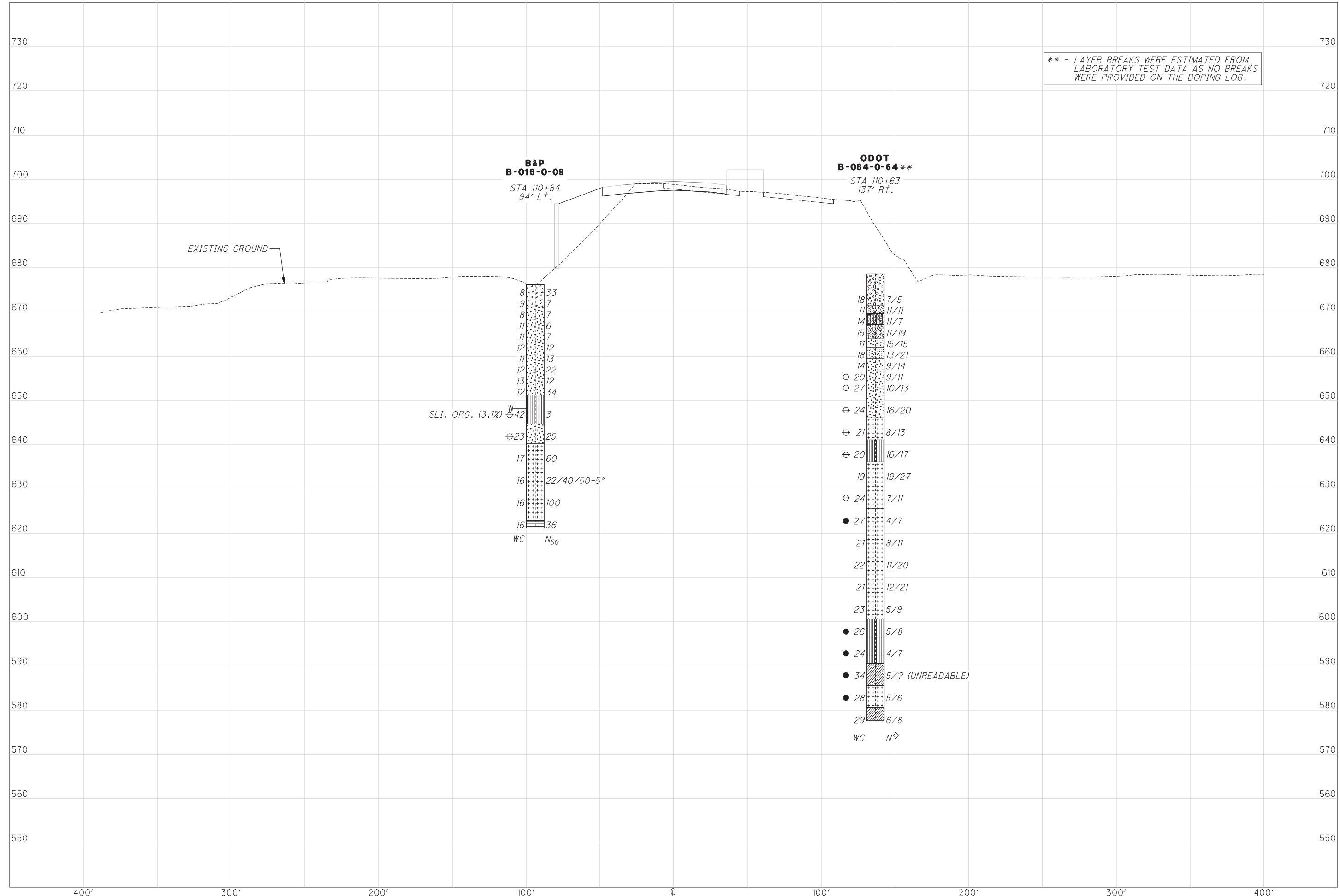


NOTE: ALL BORINGS ON THIS SHEET ARE SHOWN IN PLAN VIEW ON SHEET 78.



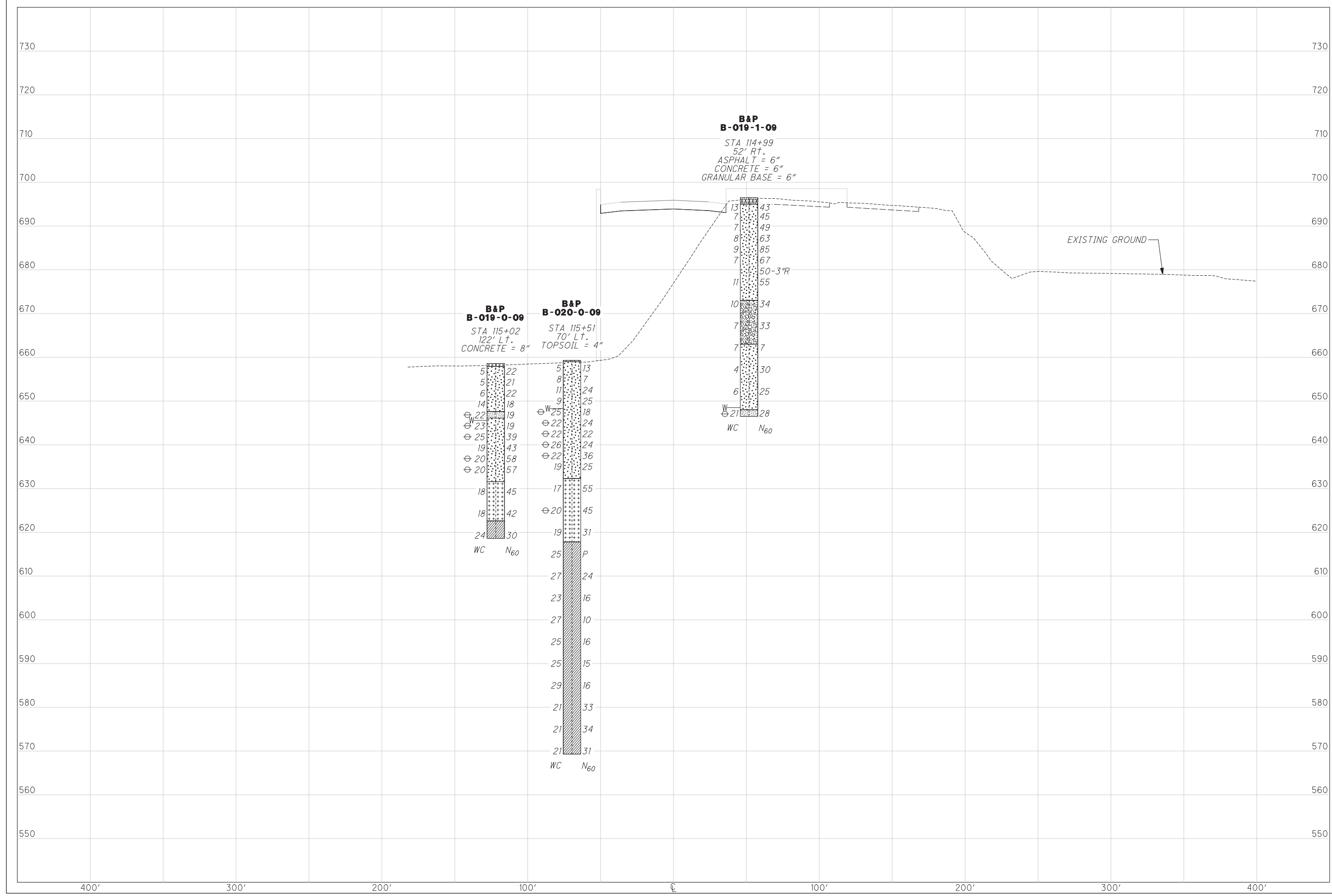


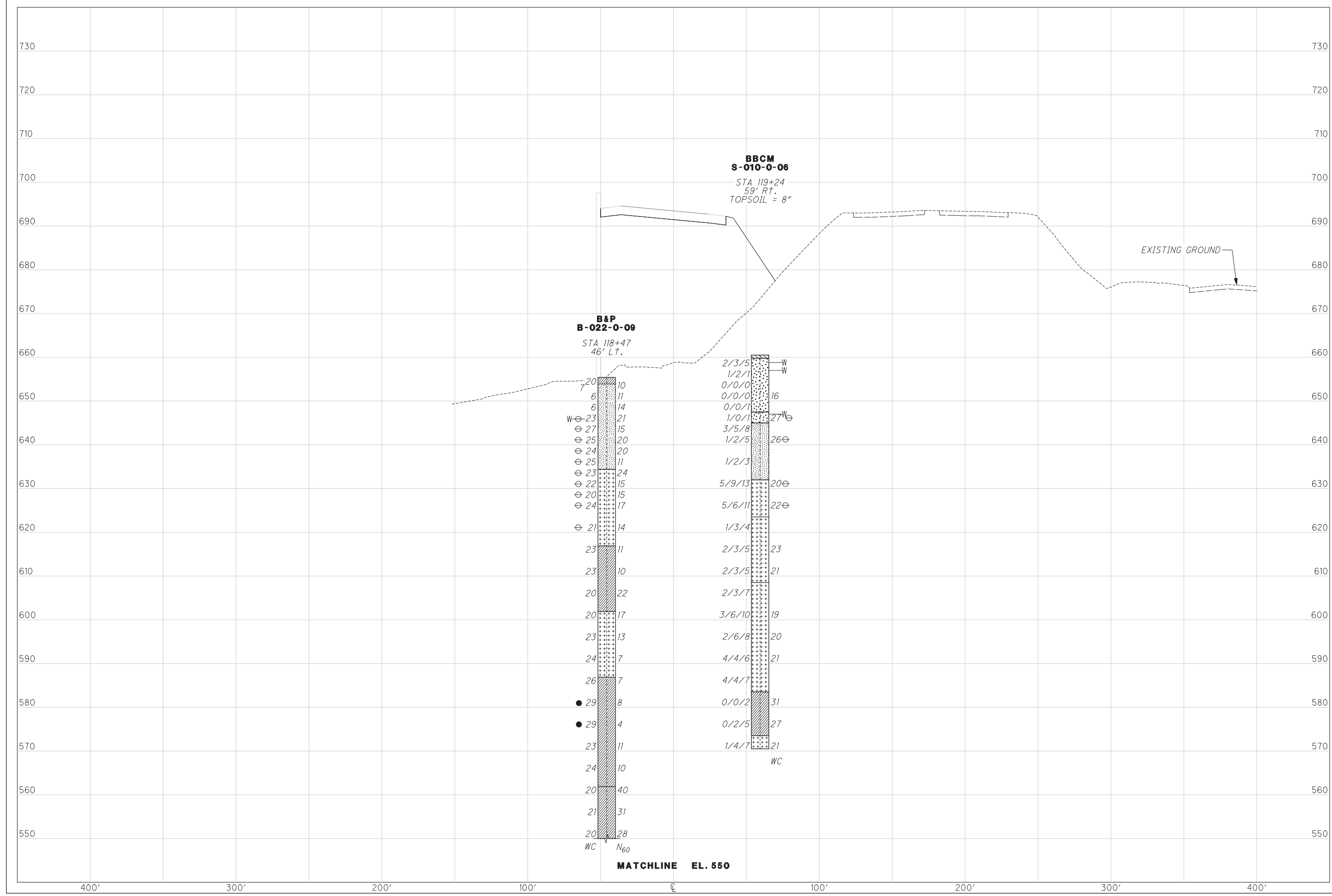
** - LAYER BREAKS WERE ESTIMATED FROM LABORATORY TEST DATA AS NO BREAKS WERE PROVIDED ON THE BORING LOG.



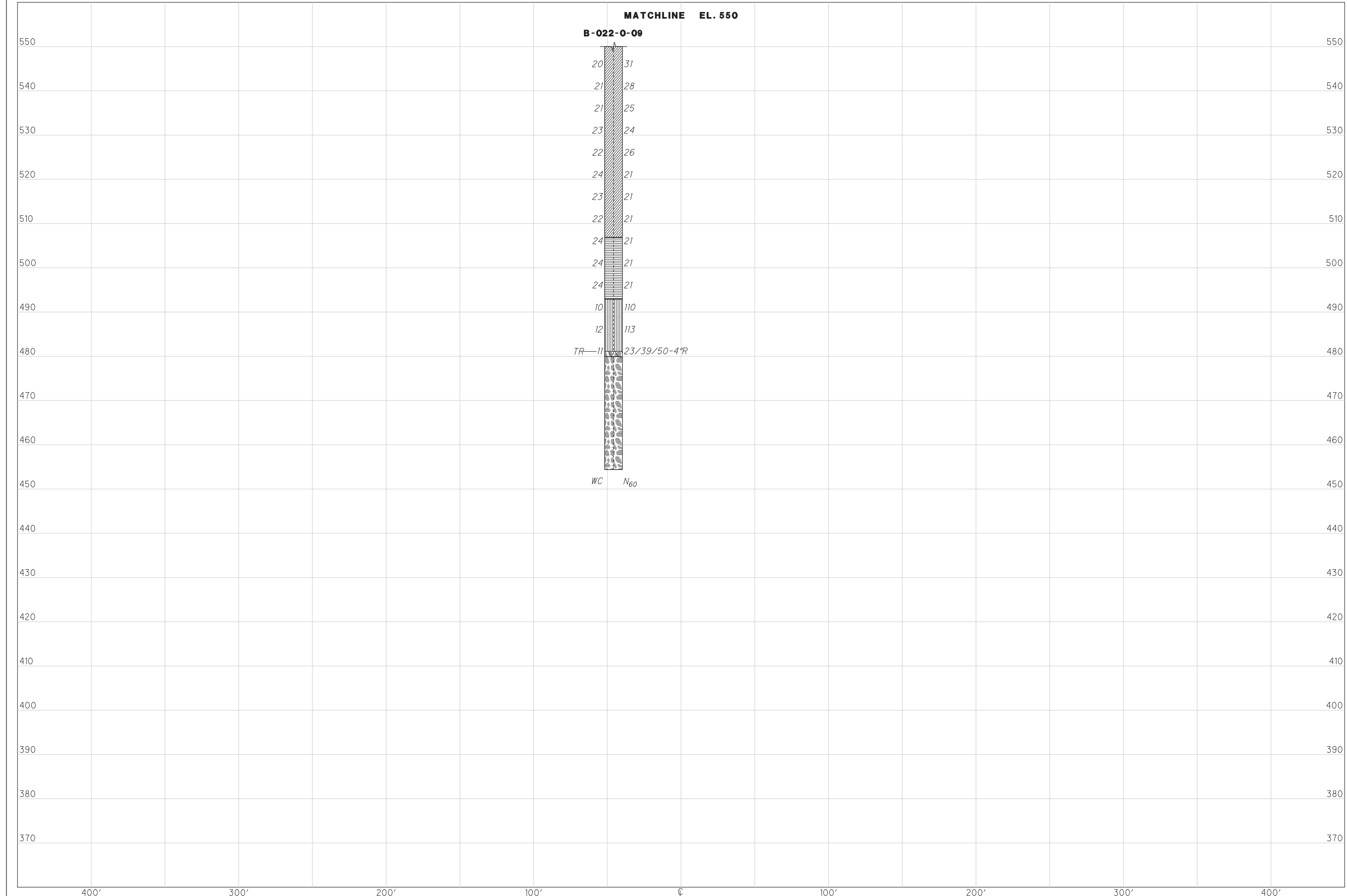
400' 300' 200' 100' 0' 100' 200' 300' 400'







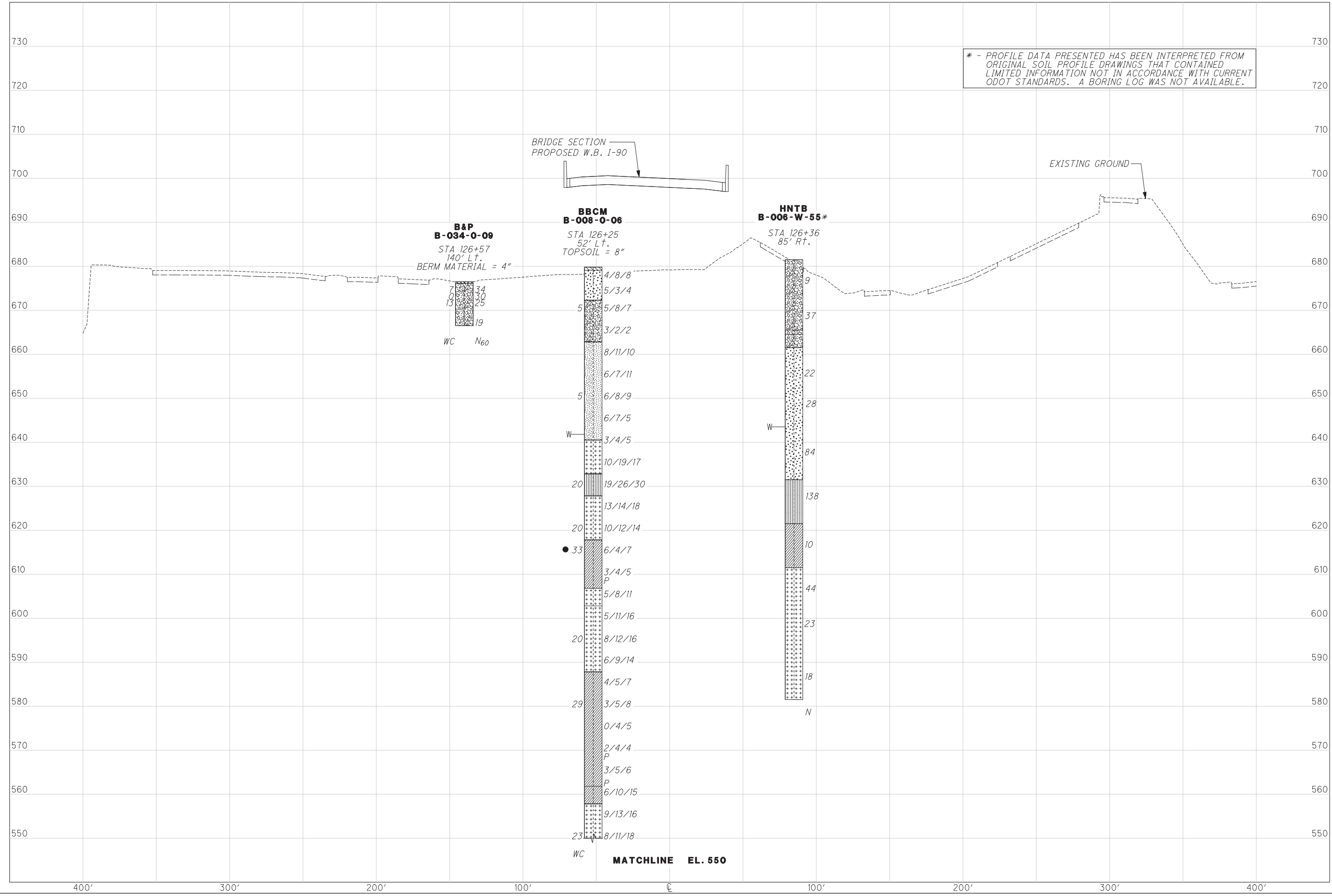
MATCHLINE EL. 550

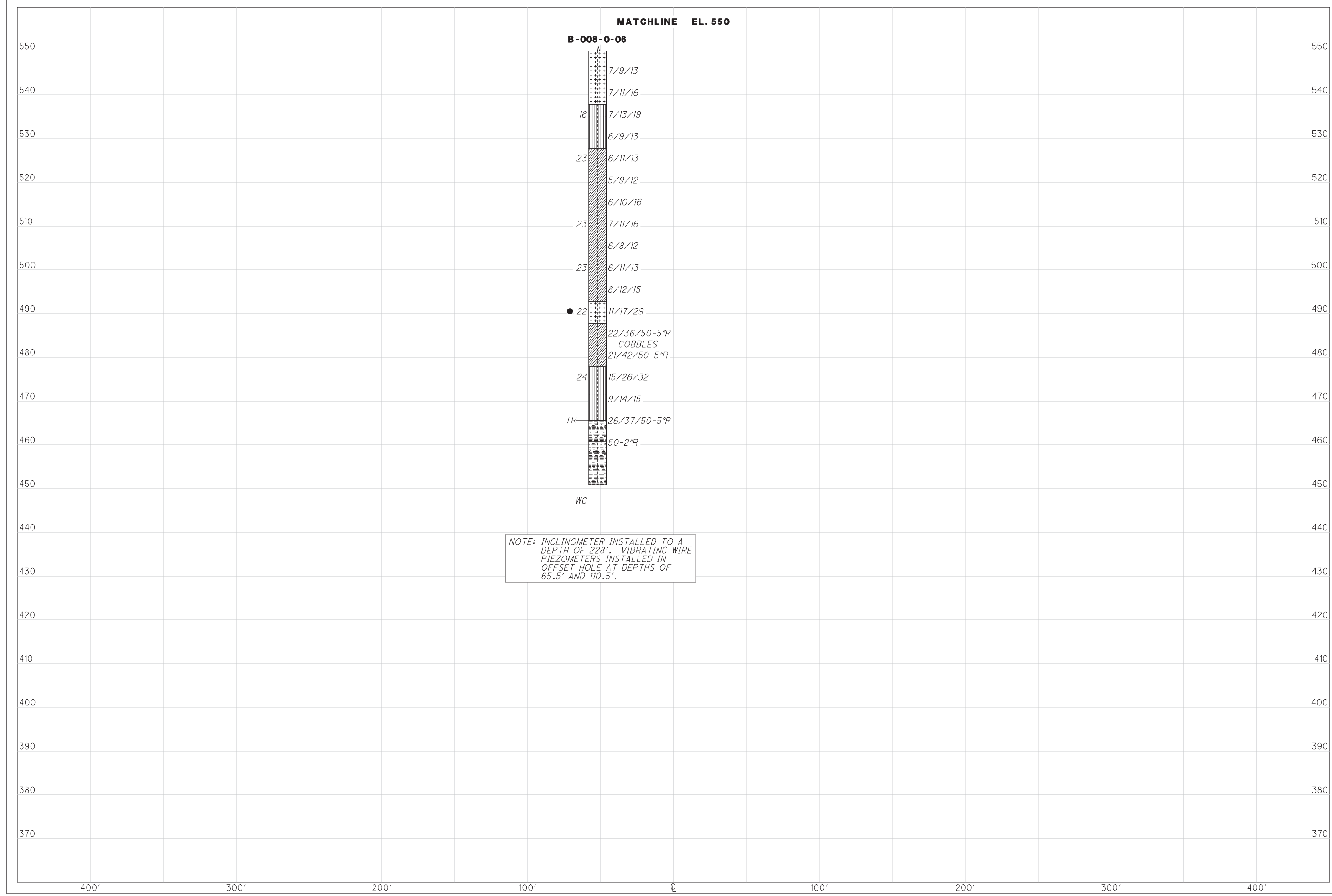


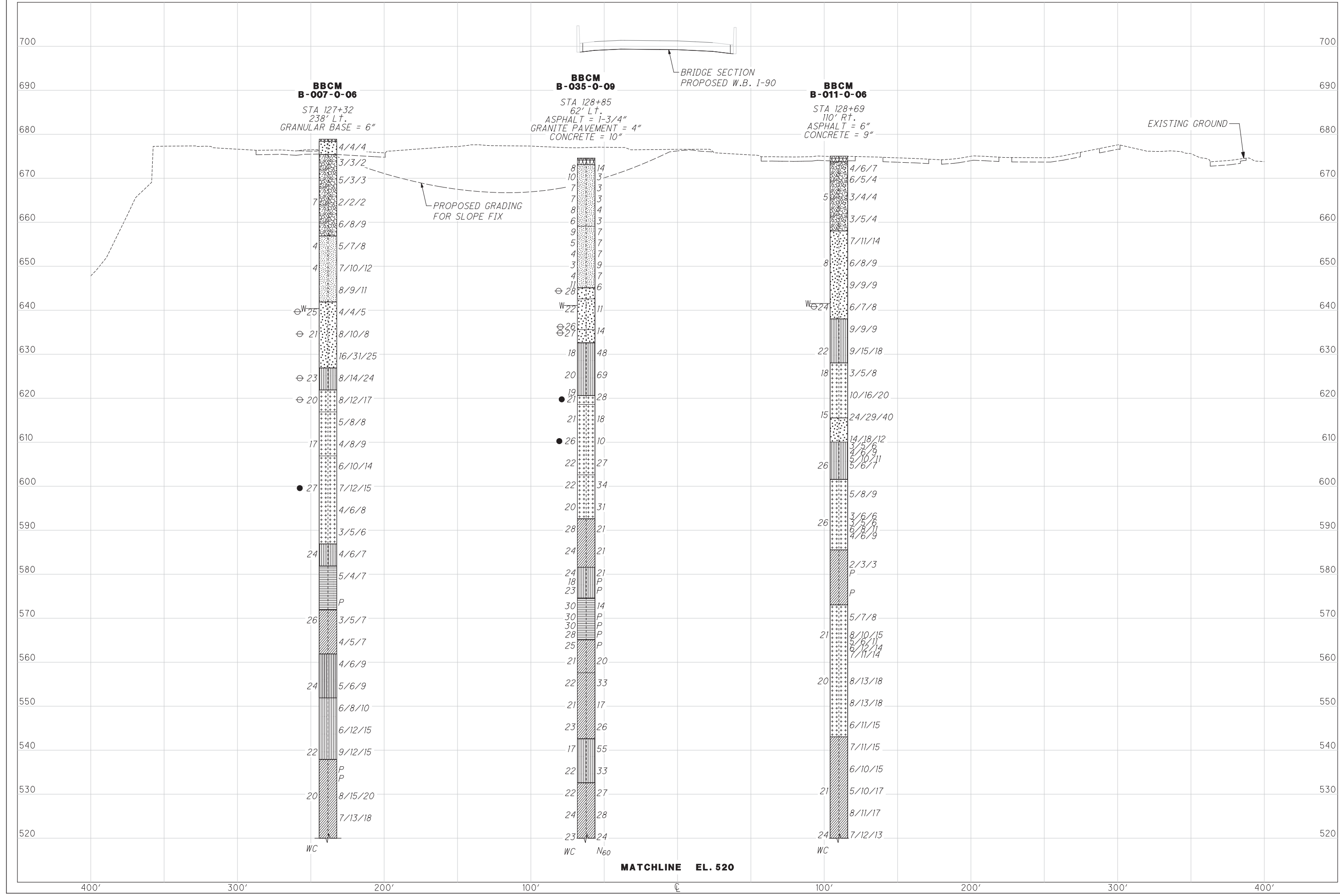
400' 300' 200' 100' CL 100' 200' 300' 400'



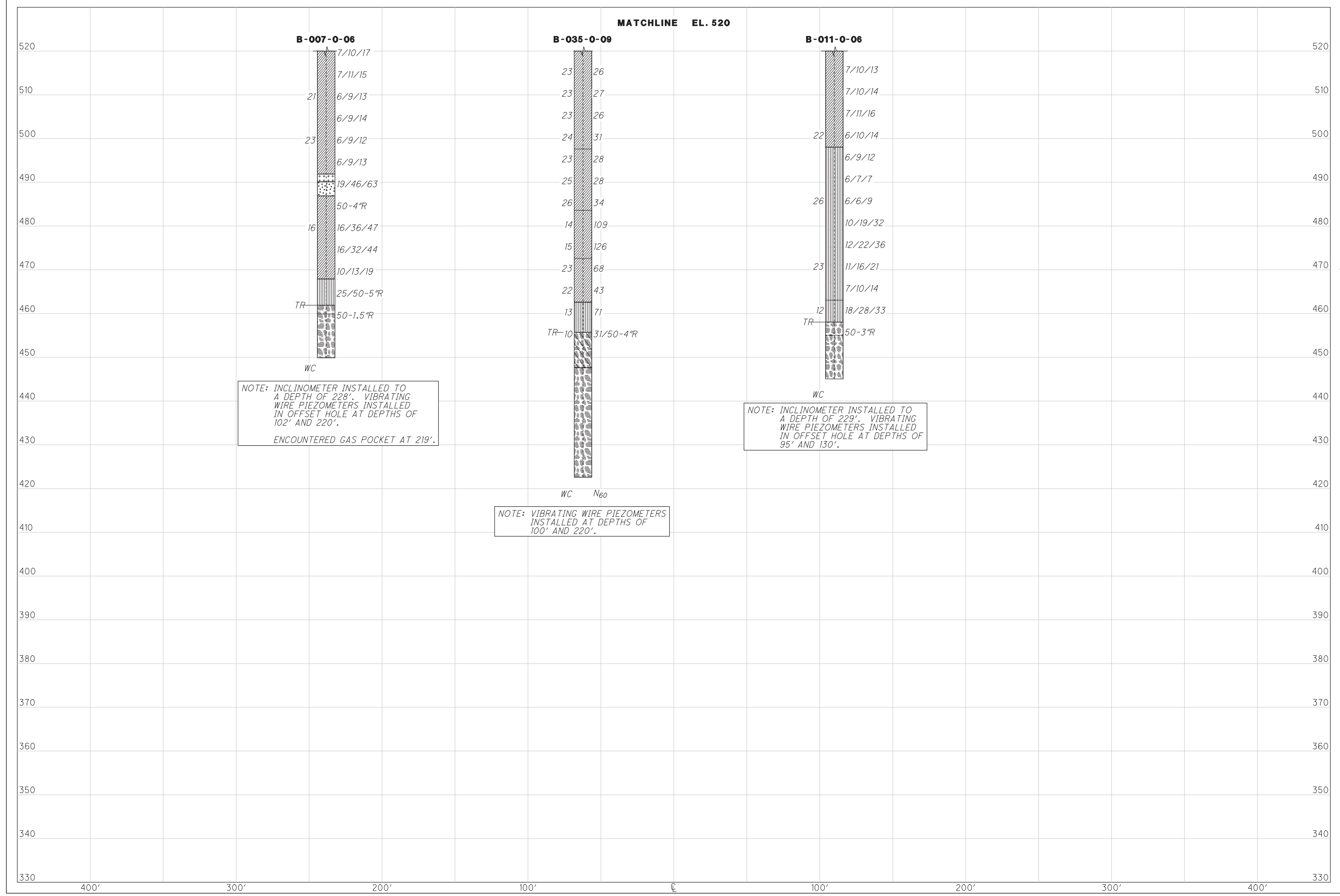
* - PROFILE DATA PRESENTED HAS BEEN INTERPRETED FROM ORIGINAL SOIL PROFILE DRAWINGS THAT CONTAINED LIMITED INFORMATION NOT IN ACCORDANCE WITH CURRENT ODOT STANDARDS. A BORING LOG WAS NOT AVAILABLE.

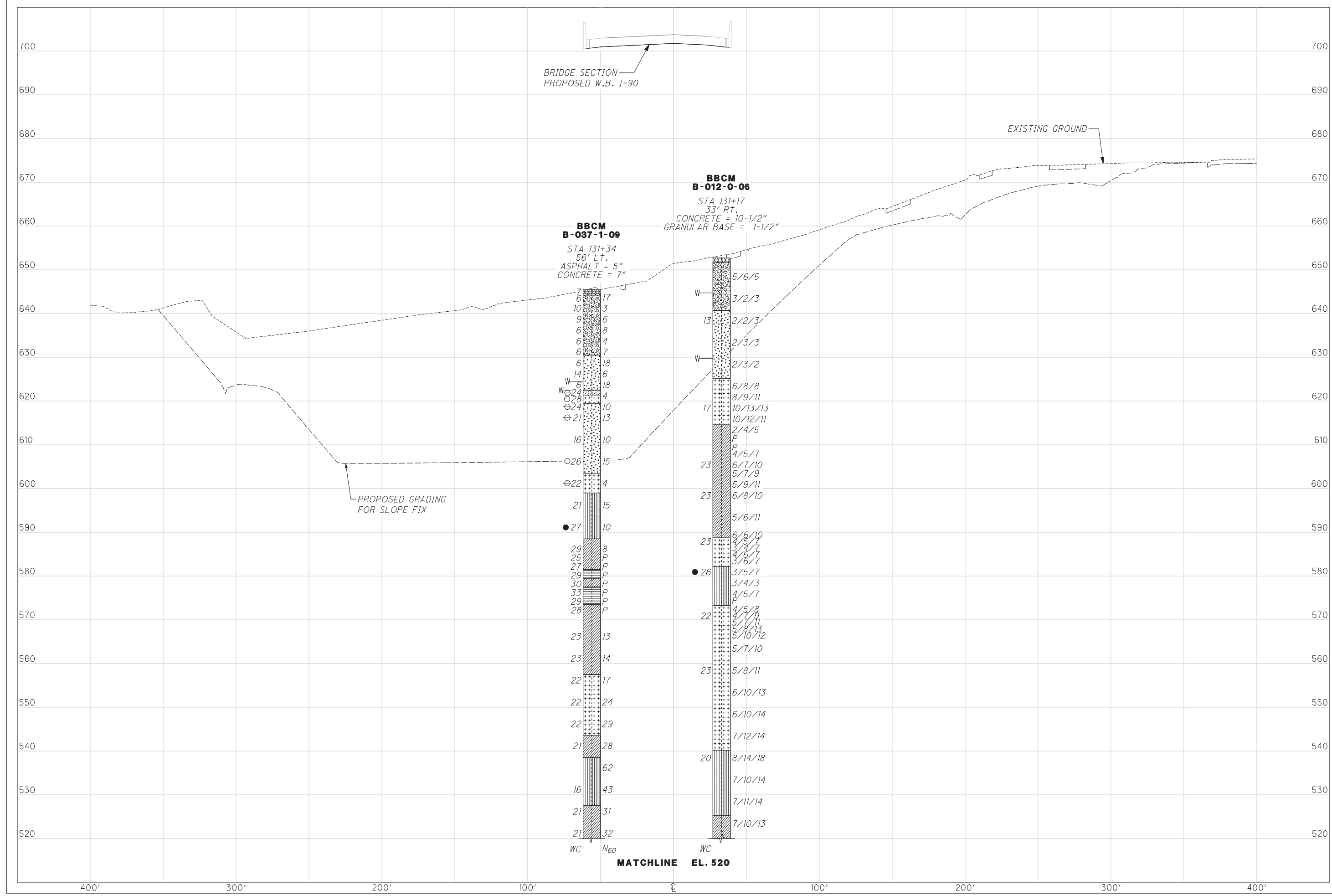


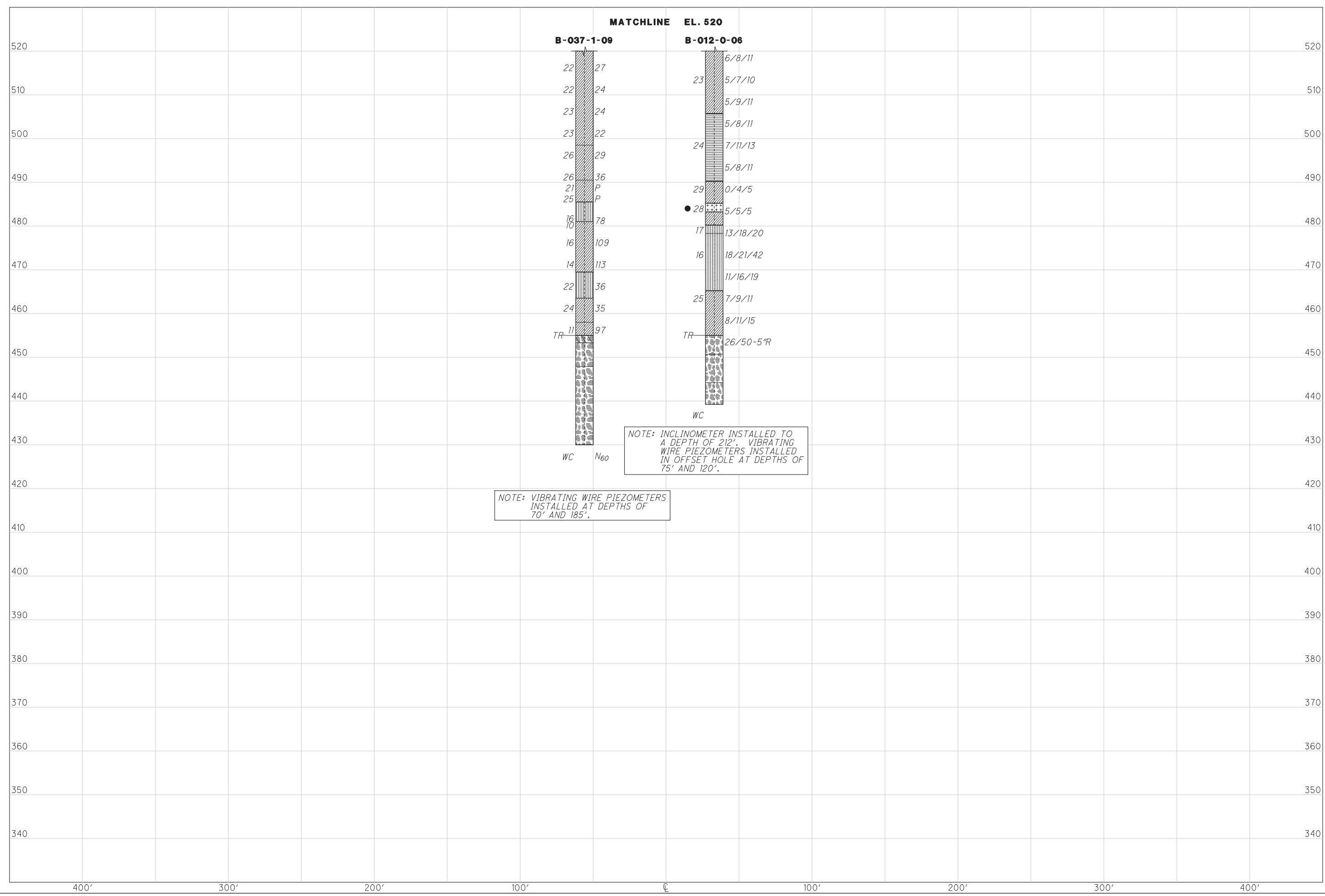




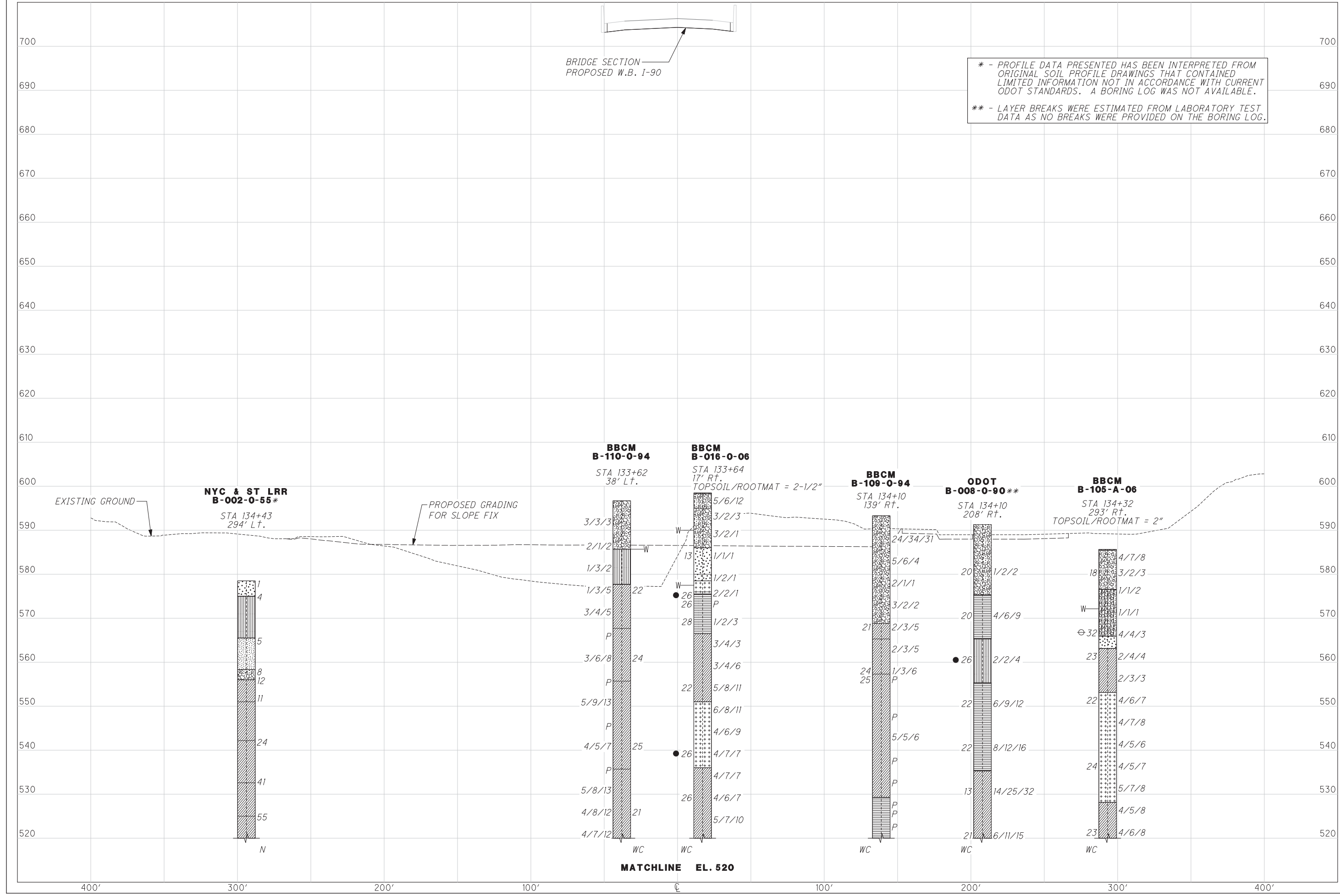
MATCHLINE EL. 520

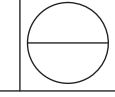
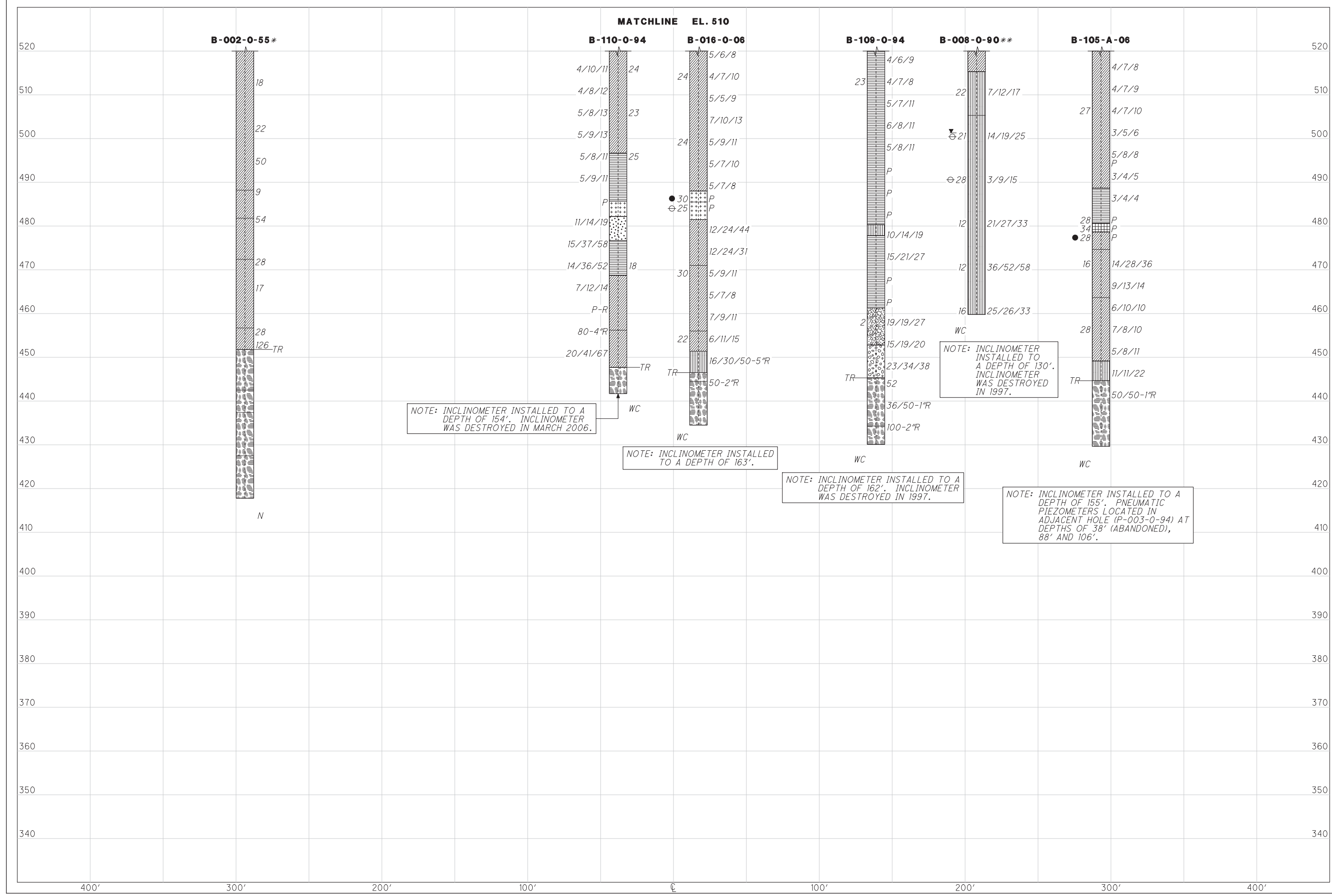


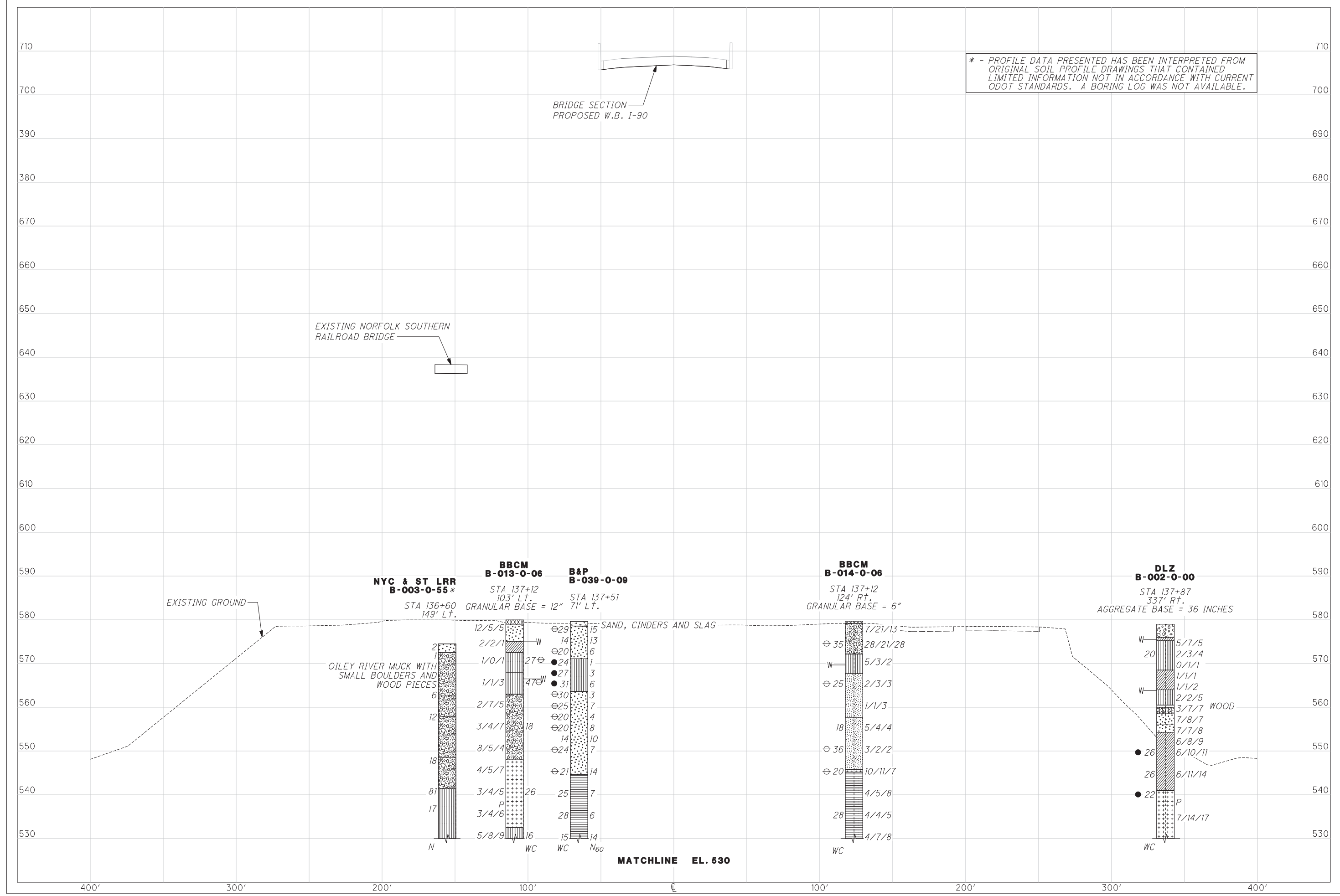




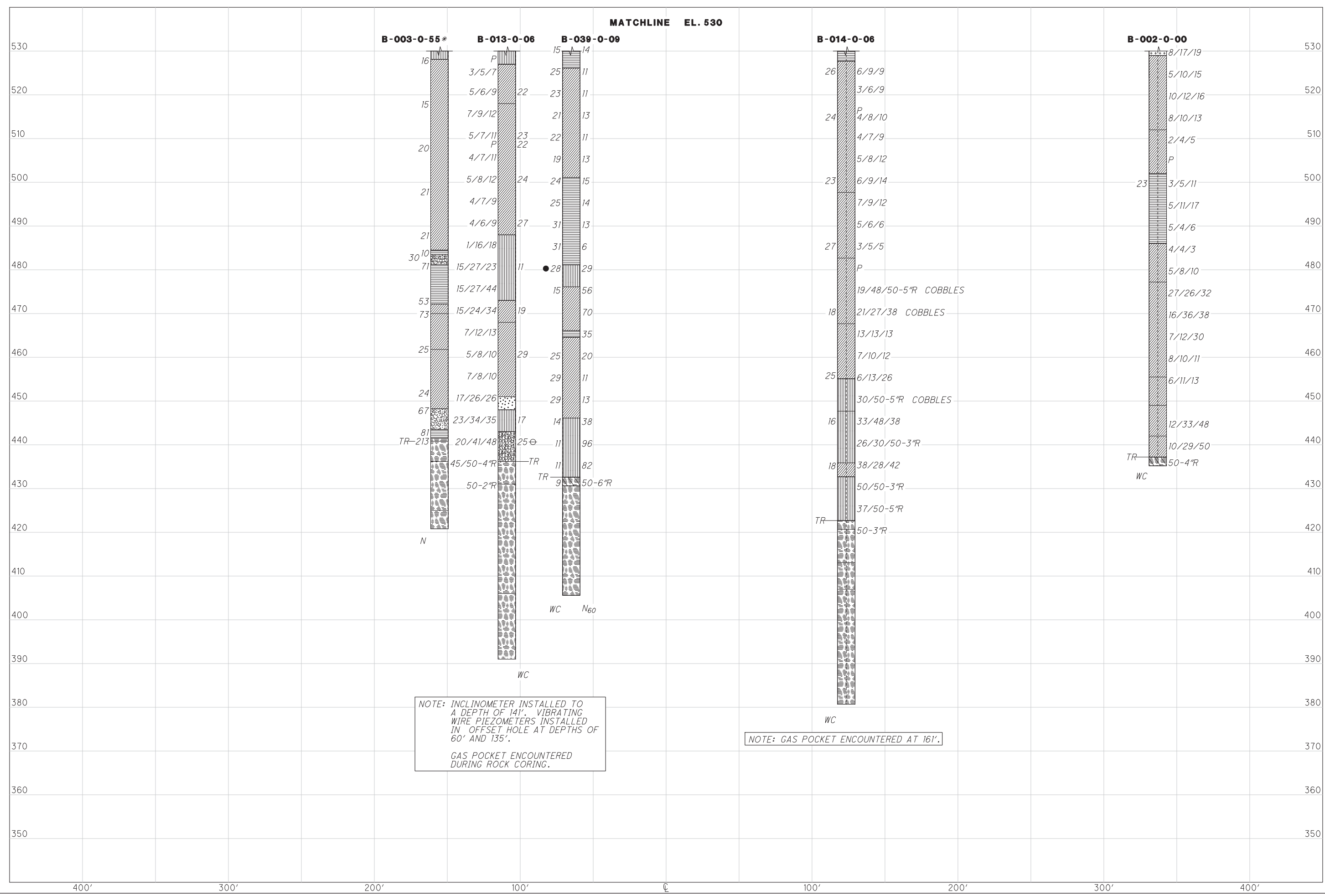
400' 300' 200' 100' 0' 100' 200' 300' 400'

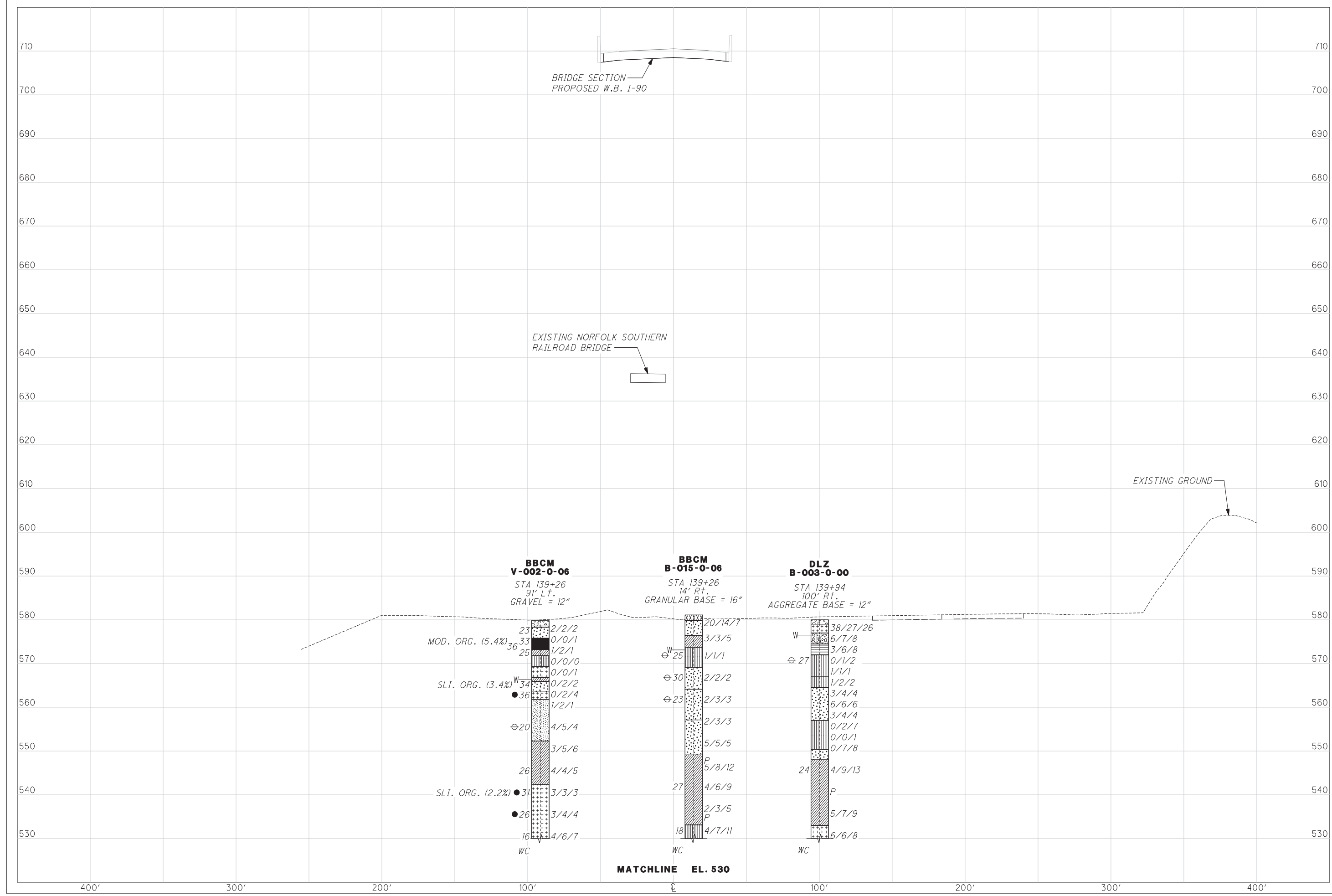


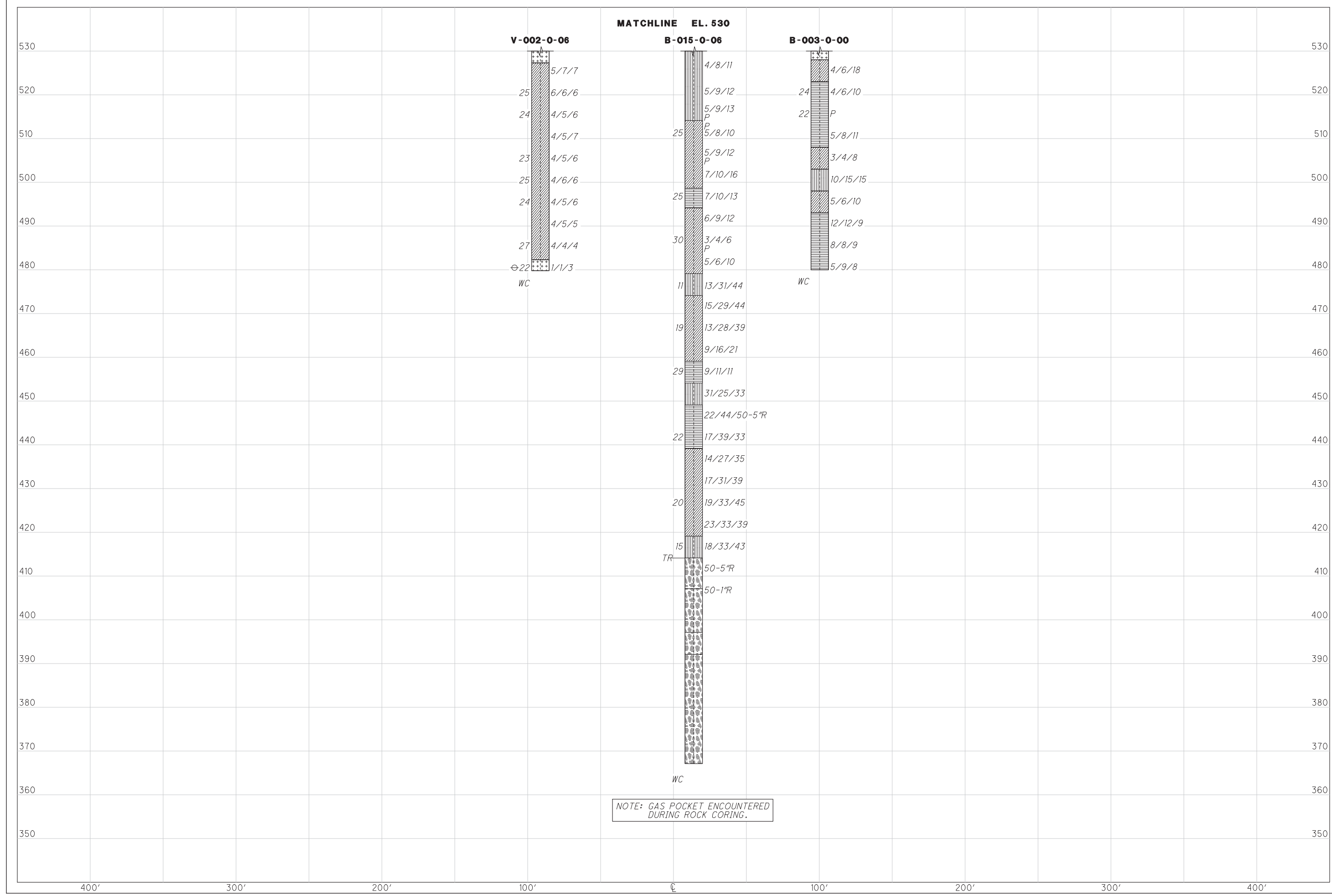




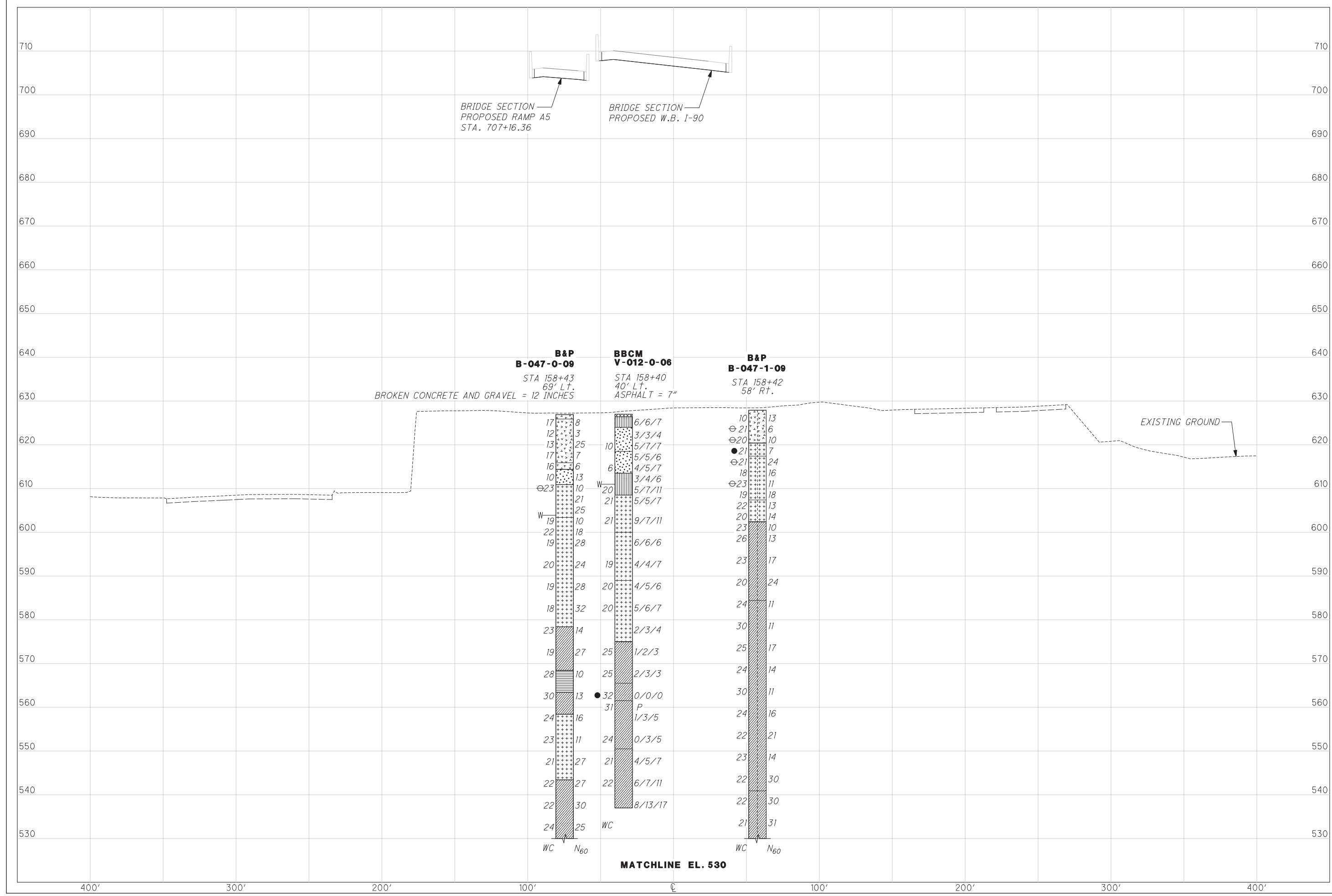
* - PROFILE DATA PRESENTED HAS BEEN INTERPRETED FROM ORIGINAL SOIL PROFILE DRAWINGS THAT CONTAINED LIMITED INFORMATION NOT IN ACCORDANCE WITH CURRENT ODOT STANDARDS. A BORING LOG WAS NOT AVAILABLE.

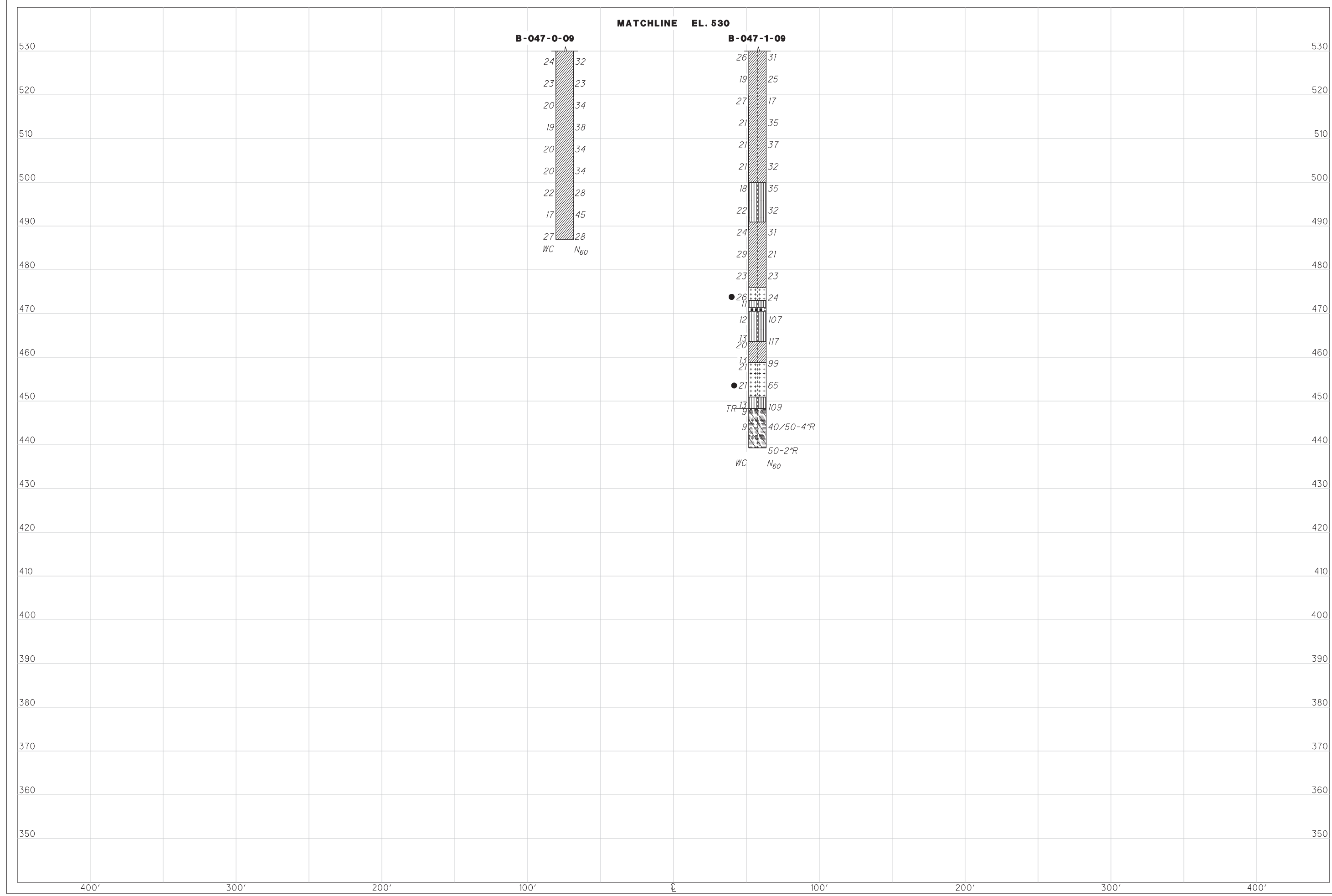




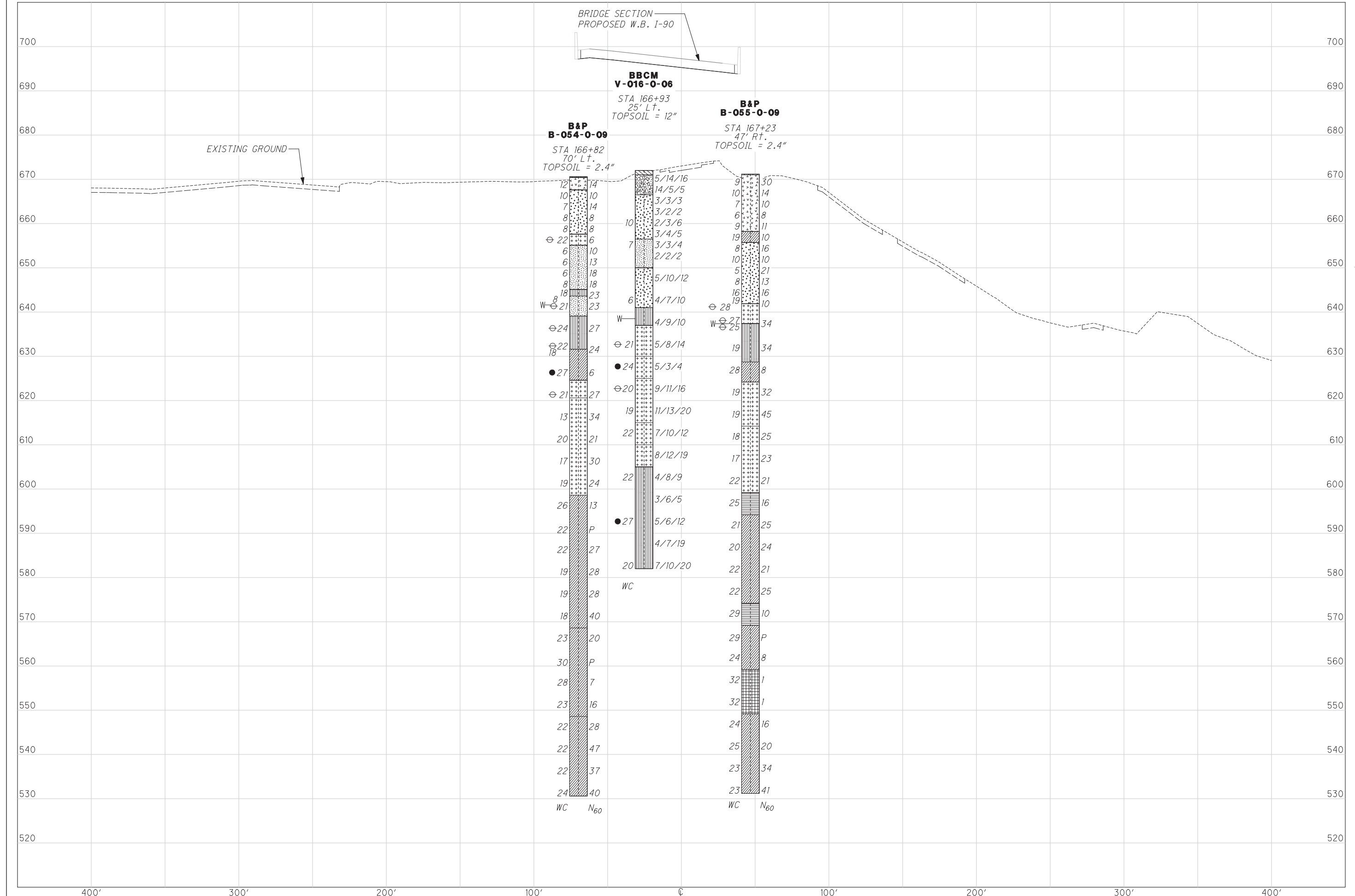


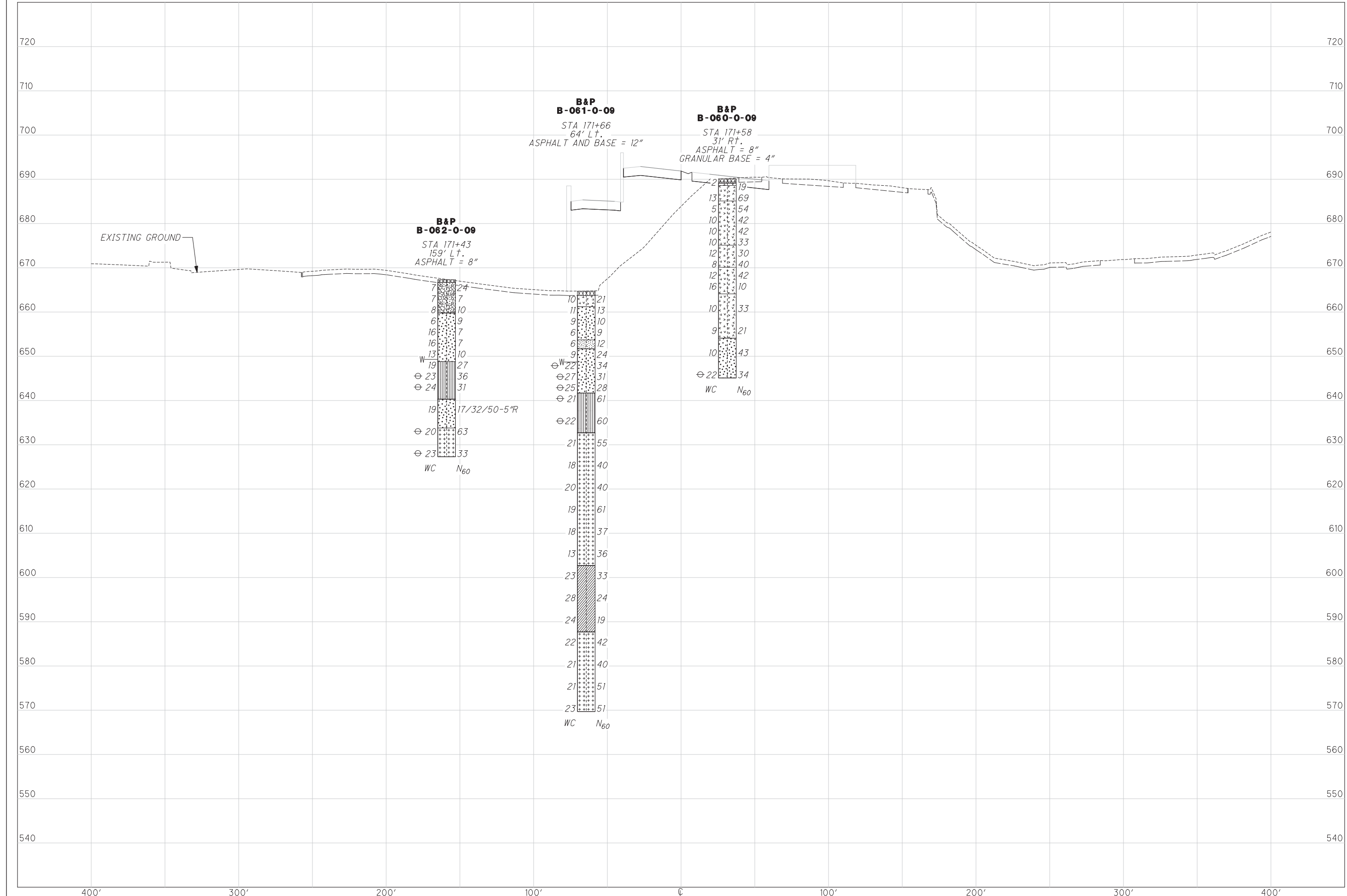
NOTE: GAS POCKET ENCOUNTERED DURING ROCK CORING.

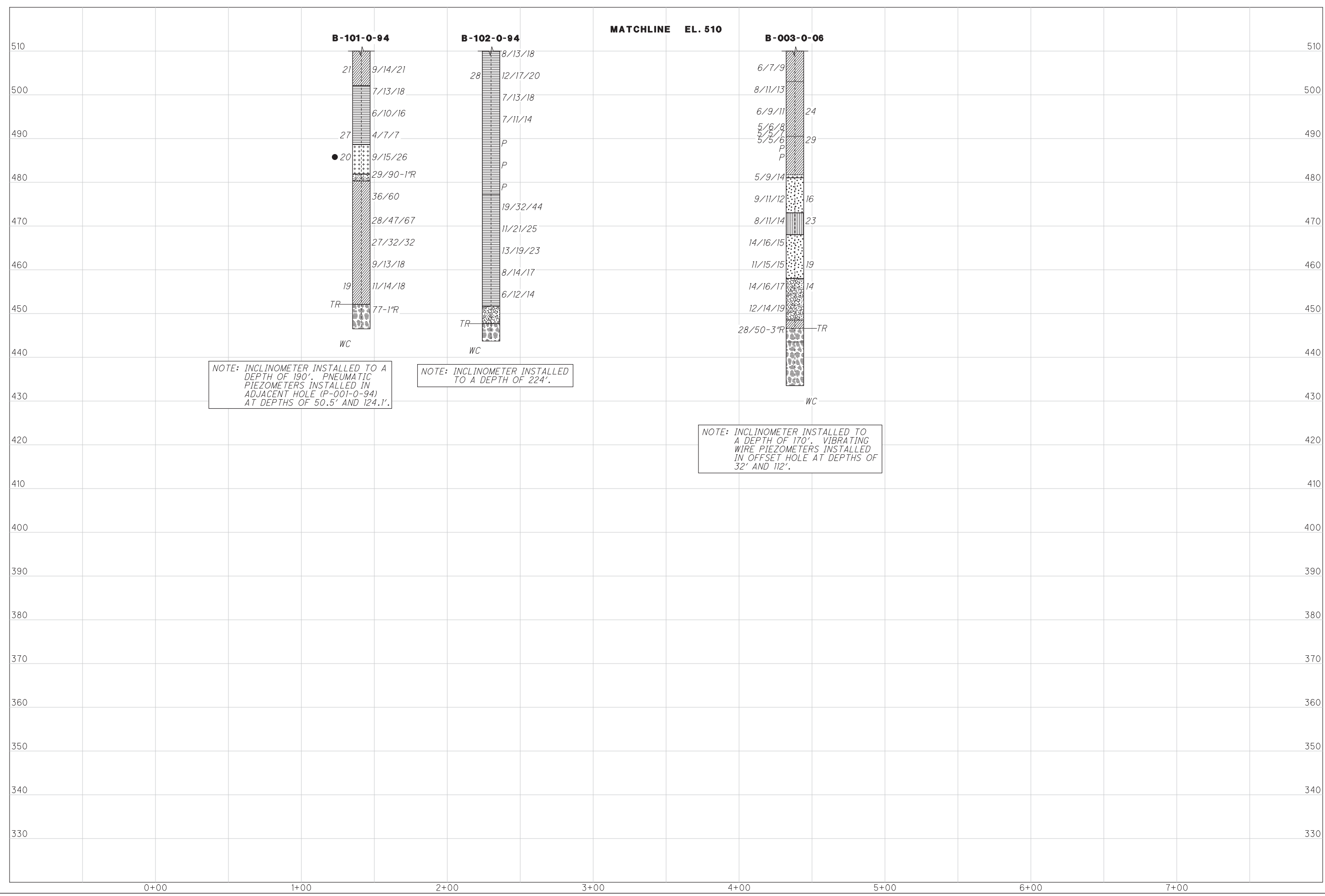


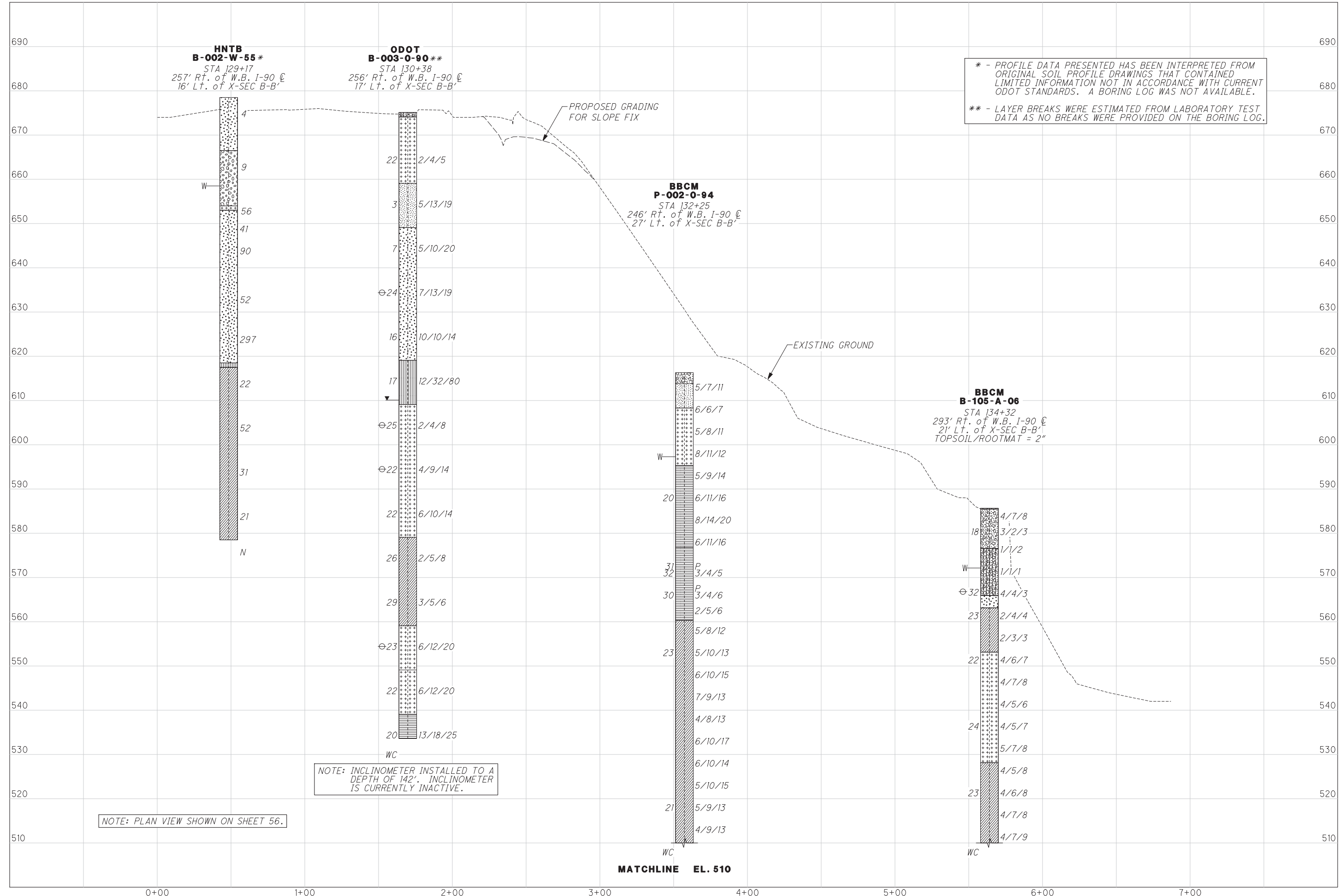


400' 300' 200' 100' 0' 100' 200' 300' 400'

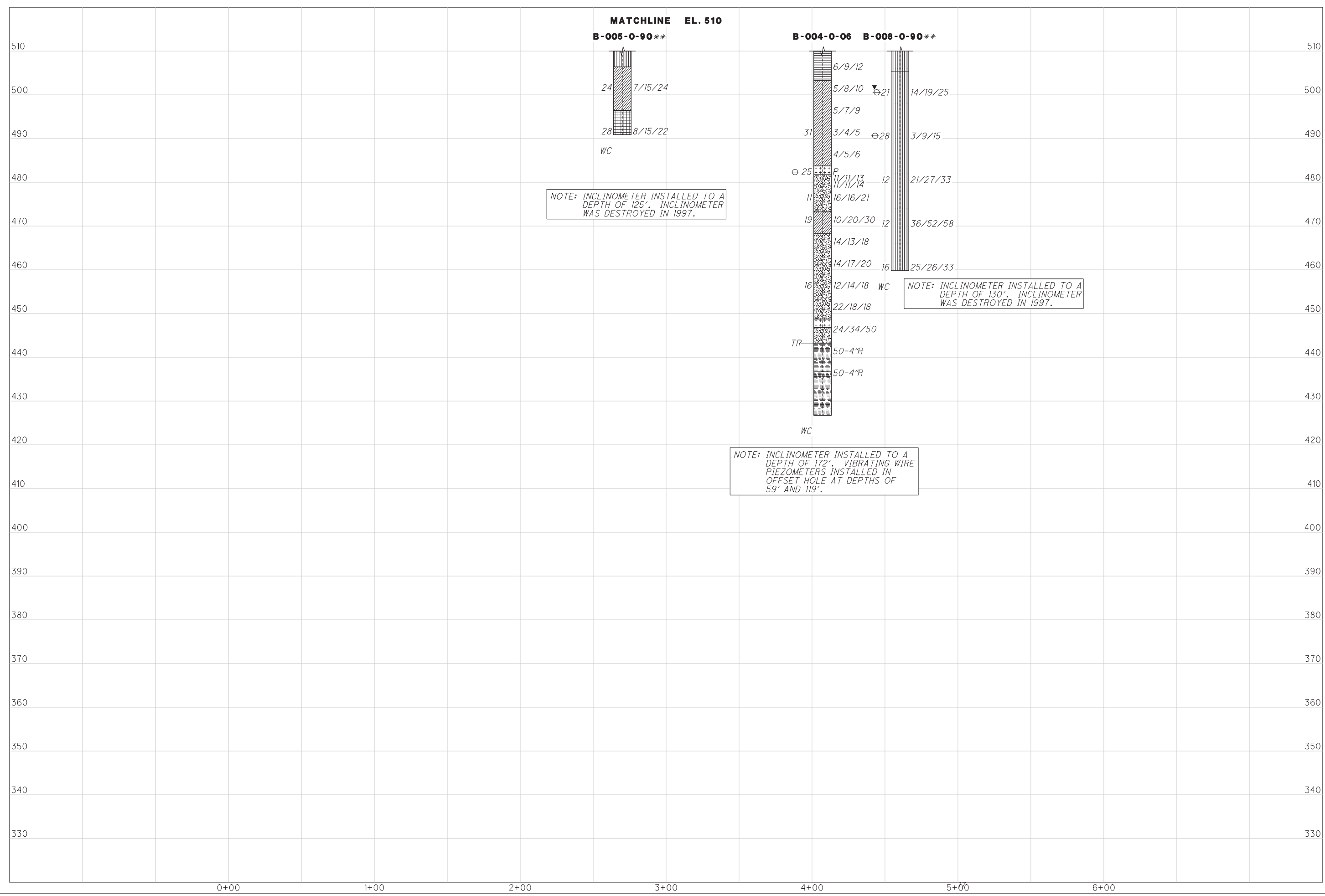


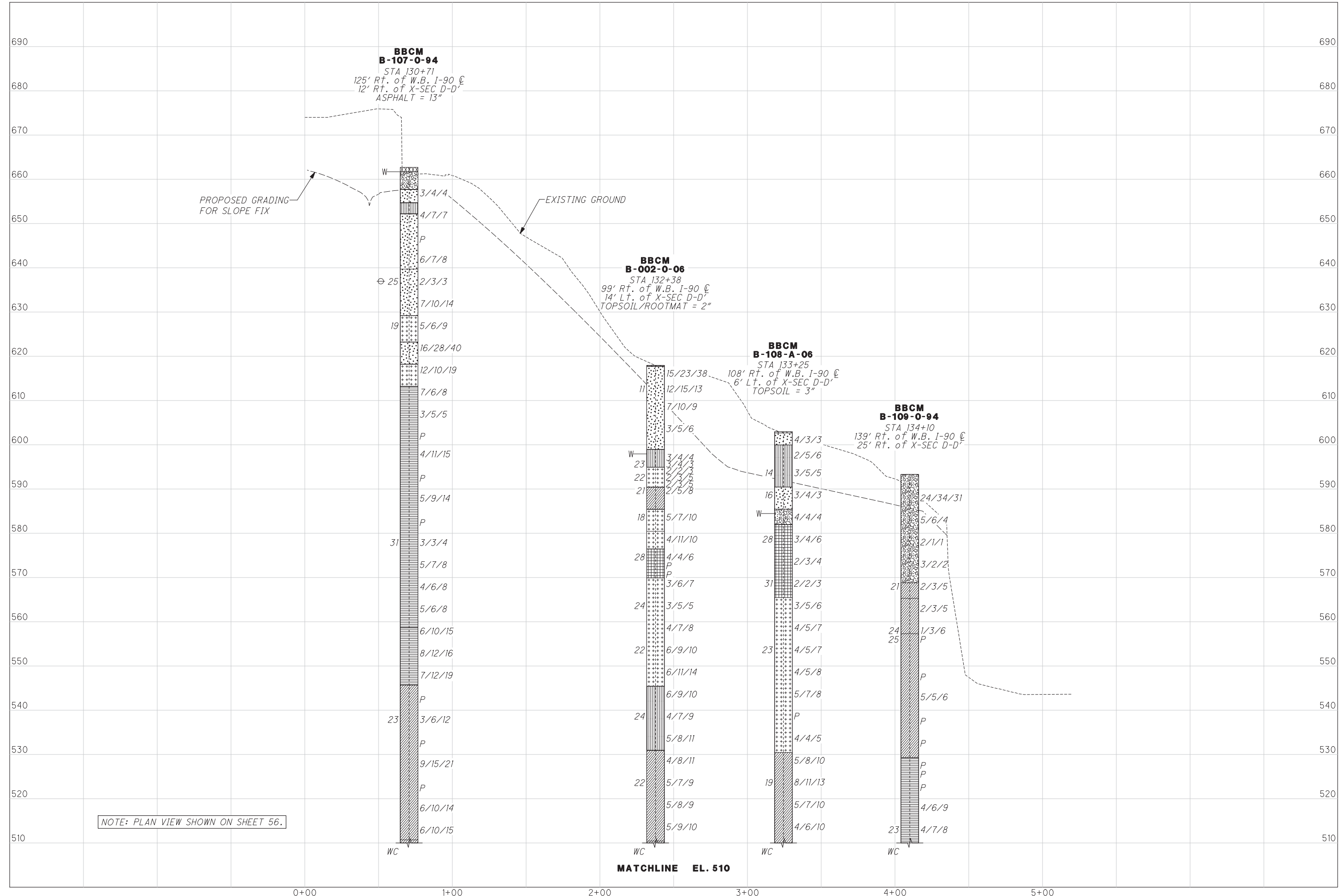






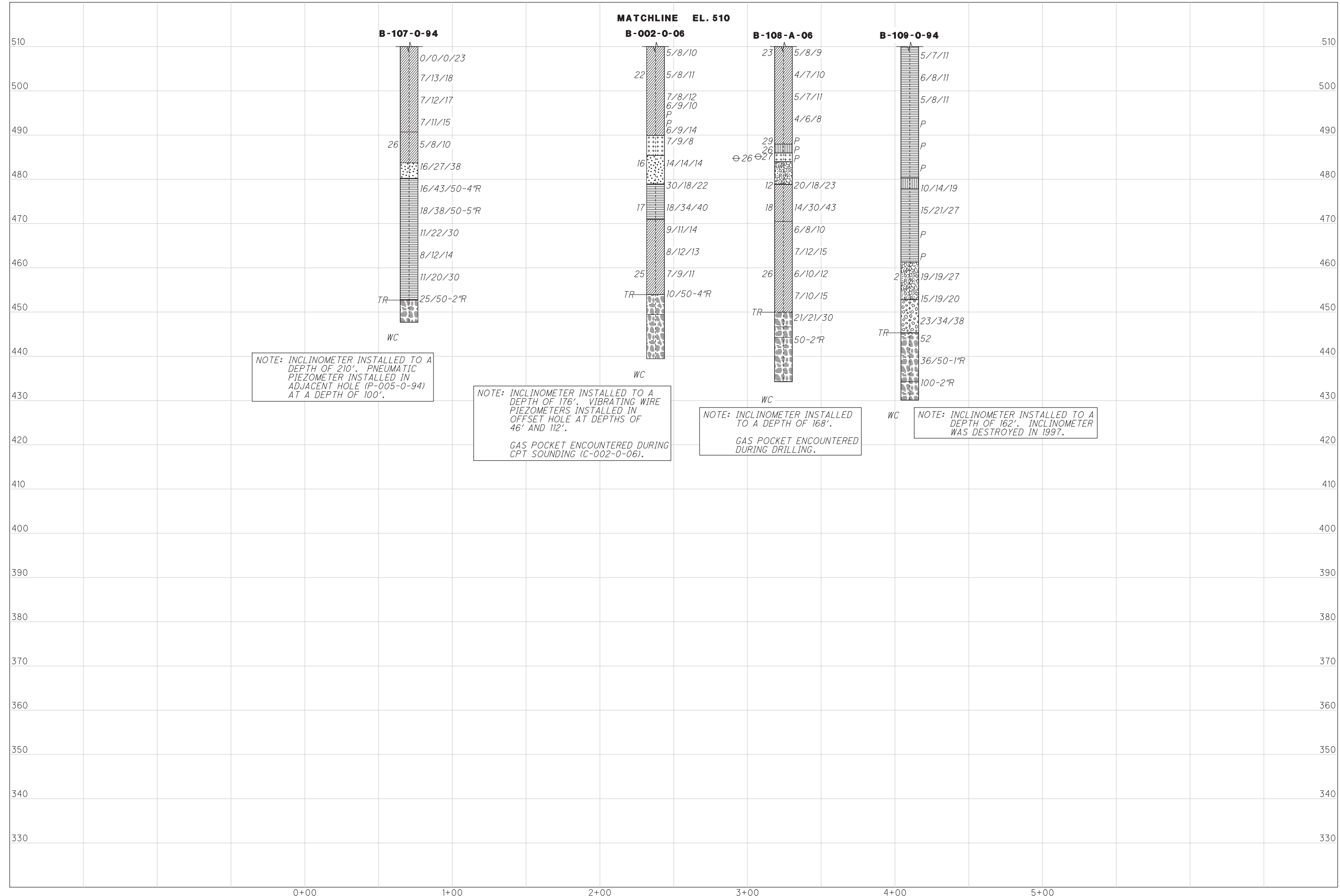






NOTE: PLAN VIEW SHOWN ON SHEET 56.

MATCHLINE EL. 510



NOTE: INCLINOMETER INSTALLED TO A DEPTH OF 210'. PNEUMATIC PIEZOMETER INSTALLED IN ADJACENT HOLE (P-005-0-94) AT A DEPTH OF 100'.

NOTE: INCLINOMETER INSTALLED TO A DEPTH OF 176'. VIBRATING WIRE PIEZOMETERS INSTALLED IN OFFSET HOLE AT DEPTHS OF 46' AND 112'. GAS POCKET ENCOUNTERED DURING CPT SOUNDING (C-002-0-06).

NOTE: INCLINOMETER INSTALLED TO A DEPTH OF 168'. GAS POCKET ENCOUNTERED DURING DRILLING.

NOTE: INCLINOMETER INSTALLED TO A DEPTH OF 162'. INCLINOMETER WAS DESTROYED IN 1997.

