

INTRODUCTION

THIS REPORT CONSISTS OF THE SOILS INVESTIGATION OF A 10.3-KILOMETER SECTION OF THE USR 33 RELOCATION, LINKING THE PROPOSED FOUR-LANE EXTENSION OF USR 33 FROM ATHENS TO SHADE WITH THE EXISTING FOUR-LANE PORTION OF USR 33 AT DARWIN. THE NORTHERN HALF OF THE ALIGNMENT IS WITHIN ATHENS COUNTY IN LODI TOWNSHIP. THE SOUTHERN HALF OF THE ALIGNMENT IS WITHIN BEDFORD TOWNSHIP IN MEIGS COUNTY.

THE RESULTS OF THE FOUR-LANE EXTENSION OF USR 33 FROM ATHENS TO SHADE ARE PRESENTED IN A SEPARATE REPORT BY OTHERS.

MAXIMUM PROPOSED CUTS AND FILL EMBANKMENTS ARE SHOWN IN THE PROJECT INDEX ON THE FOLLOWING SHEET. PLEASE NOTE THAT THESE QUANTITIES ARE BASED ON THE FOUR-LANE CROSS SECTIONS. IT IS UNDERSTOOD THAT INITIALLY ONLY TWO LANES OF THE PROPOSED HIGHWAY WILL BE CONSTRUCTED.

GEOLOGY AND OBSERVATIONS OF THE PROJECT

BOTH ATHENS COUNTY AND MEIGS COUNTY LIE ENTIRELY WITHIN THE UNGLACIATED SECTION OF THE ALLEGHENY PLATEAU. THE AREA IS MATURELY DISSECTED, WELL-DRAINED AND IS CHARACTERIZED BY STEEP-SIDES, "V" SHAPED VALLEYS AND NARROWLY ROUNDED HILLTOPS. ELEVATIONS ALONG THE ALIGNMENT RANGE FROM APPROXIMATELY 200 METERS AT THE SOUTHERN MOST PORTION, AT DARWIN, TO APPROXIMATELY 293 METERS IN SOUTHERN ATHENS COUNTY.

THE UPLANDS ARE COVERED WITH A THIN LAYER OF RESIDUAL SOILS; SOILS FORMED IN PLACE BY THE DISINTEGRATION AND DECOMPOSITION OF ROCKS AND THE CONSEQUENT WEATHERING OF THE MINERAL MATERIALS. SOILS CONSIST PREDOMINANTLY OF SANDS AND CLAYS, VERY SIMILAR TO THE SHALES, MUDSTONES, AND SANDSTONES ON WHICH THEY LIE. THE TRANSITION TO BEDROCK IS VERY SUBTLE, AND IN MOST CASES, NOT CLEARLY IDENTIFIABLE, UNLESS THE PARENT ROCK IS SANDSTONE, SILTSTONE, OR LIMESTONE.

SOILS IN THE VALLEYS ARE GENERALLY DESCRIBED AS COLLUVIAL (CONSISTING OF ALLUVIAL IN PART) SOILS OVERLYING RESIDUAL SOILS. COLLUVIAL SOILS (COLLUVIUM) ARE LOOSE AND INCOHERENT DEPOSITS TYPICALLY FOUND AT THE FOOT OF A SLOPE OR CLIFF, BROUGHT THERE CHIEFLY BY GRAVITY. ALLUVIAL SOILS (ALLUVIUM) ARE (INTERMIXED) WATER-LAID DEPOSITS. TYPICALLY, SOILS IN THE VALLEY RUN DEEPER THAN ON THE SLOPES AND HILLTOPS, HOWEVER, THE SOILS ARE SIMILAR TO THOSE ON THE HILLS, CONSISTING PREDOMINANTLY OF SAND AND CLAY, AND THE TRANSITION TO BEDROCK IS EQUALLY DIFFICULT TO IDENTIFY.

BOTH ATHENS AND MEIGS COUNTIES, ALONG THE ALIGNMENT, ARE COMPRISED OF BEDROCK OF PENNSYLVANIA AGE. THE ROCK STRATA IN THIS AREA OF SOUTHEASTERN OHIO DIPS GENTLY TO THE EAST-SOUTHEAST AT A RATE OF APPROXIMATELY 6 METERS PER KILOMETER.

THE BEDROCK WAS DEPOSITED UNDER REGULAR SUCCESSION OF VARYING ENVIRONMENTAL CONDITIONS THAT WERE REPEATED MANY TIMES. AS A RESULT, THE ROCKS SHOW A DEFINITE SUCCESSION OF STRATA REPRESENTING ONE SEQUENCE OF CHANGING SEDIMENTARY CONDITIONS. A SEQUENCE OF STRATA MATCHING ONE DEPOSITIONAL CYCLE IS TERMED A CYCLOTHEM. CYCLOTHEMS ARE TYPICALLY ASSOCIATED WITH UNSTABLE SHELF OR INTERIOR BASIN CONDITIONS IN WHICH ALTERNATE MARINE TRANSGRESSIONS AND REGRESSIONS OCCUR. THE NON-MARINE SEDIMENTS OCCUR IN THE LOWER HALF OF THE CYCLOTHEM AND THE MARINE SEDIMENTS IN THE UPPER HALF. IN OHIO, EACH CYCLOTHEM IS USUALLY DEFINED AS THE SERIES BETWEEN A COAL-TO-COAL INTERVAL. THE LITHOLOGY OF THE ROCKS THAT COMPRISE THE PENNSYLVANIA SYSTEM IN OHIO CONSIST OF ALTERNATING CLAY, COAL, SHALE, LIMESTONE AND SANDSTONE BEDS. THESE BEDS LACK A REAL PERSISTENCE AND VARY GREATLY IN THICKNESS OVER A SHORT DISTANCE.

THE LAND USAGE ALONG THE ENTIRE ALIGNMENT IS GENERALLY DESCRIBED AS ALTERNATING FOREST AND PASTURE WITH VERY FEW CULTIVATED FIELDS. TYPICALLY, THE VALLEYS AND STEEPLY SLOPING HILLS ARE TREE COVERED, AND THE FLATTER SIDEHILLS AND HILLTOPS ARE PASTURE. BECAUSE OF THE RELIEF, THE AREA IS WELL DRAINED WITH CREEKS AT THE BOTTOM OF EVERY VALLEY AND DRAINAGE PATHS DOWN THE SIDES OF MOST OF THE HILLS. PRATTS FORK IS THE LARGEST WATER CROSSING FOR THE ALIGNMENT, LOCATED AT STATION 39+800. THE VALLEY IN THIS VICINITY CREATES SIDEHILL FILLS FOR THE SECTION BETWEEN STATIONS 39+700 AND 40+000. DRAINAGE PATHS ARE EASILY IDENTIFIABLE BY THE EROSION OF THE EASILY ERODIBLE SURFICIAL RED CLAYS AND/OR MUDSTONE/SHALE. THE ALIGNMENT IS TRAVERSED SEVERAL TIMES, TYPICALLY ALONG RIDGE TOPS, BY COUNTY AND TOWNSHIP ROADS, WITH RURAL RESIDENCES AND FARMS SCATTERED THROUGHOUT.

SOME SIGNS OF SMALL SURFICIAL SLUMPS HAVE BEEN OBSERVED ON THE STEEP SLOPES AND NEAR THE VALLEY BOTTOMS, ALONG CREEK BEDS. HOWEVER, THIS IS GENERALLY RESTRICTED TO THE AREA NORTH OF STATION 42+800. SANDSTONE OUTCROPS WERE FREQUENTLY OBSERVED ON THE STEEP SLOPES. EXPOSED RED SOILS AND ROCK (RED BEDS) IN THE VALLEYS AND ON THE SLOPES SHOWING EVIDENCE OF SEVERE DECOMPOSITION FROM EROSION HAVE BEEN REPORTED NORTH OF THE PROJECT AREA.

EXPLORATION

EXPLORATORY BORINGS WERE MADE BY MEANS OF A TRUCK-MOUNTED OR ATV-MOUNTED ROTARY DRILLING RIG, UTILIZING HOLLOW-STEM CONTINUOUS FLIGHT AUGERS TO ADVANCE THE HOLES IN SOIL, OR A GEOPROBE MODEL 4220, A VEHICLE-MOUNTED, HYDRAULICALLY-POWERED MACHINE THAT UTILIZES STATIC FORCE AND PERCUSSION TO ADVANCE A 122-CENTIMETER LONG BY 5.1-CENTIMETER DIAMETER SOIL SAMPLER. WHERE BORINGS EXTENDED INTO THE BEDROCK (AFTER ENCOUNTERING SPLIT-SPOON SAMPLE REFUSAL), A DOUBLE TUBE DIAMOND BIT CORE BARREL (EITHER WIRELINE OR CONVENTIONAL EQUIPMENT) WAS USED TO CORE (THE BEDROCK). CORING PRODUCED NX-SIZED (5.3-CENTIMETER DIAMETER) CORES, FROM WHICH THE TYPE OF ROCK AND ITS GEOLOGICAL CHARACTERISTICS WERE DETERMINED.

BORINGS WITH A "B" PREFIX WERE DRILLED BY RESOURCE INTERNATIONAL, INC. BETWEEN DECEMBER 15, 1997 AND JUNE 10, 1998 AND INCLUDE ALL GEOPROBE HOLES. BORINGS WITH AN "R" OR "SB" PREFIX WERE DRILLED BY DODSON-STILSON, INC. BETWEEN FEBRUARY 15, 1999 AND JULY 6, 2000.

INVESTIGATIONAL FINDINGS

SOIL DRILLED ALONG THE ALIGNMENT IS GENERALLY BETWEEN 1.0 AND 5.0 METERS THICK, AVERAGING APPROXIMATELY 2.0 METERS THICK ON THE UPLANDS AND 3.0 METERS THICK IN THE VALLEYS. HOWEVER, THERE WERE SEVERAL LOCATIONS WHERE RESIDUAL SOILS WERE AS GREAT AS 9.0 METERS THICK ON THE UPLANDS (E.G. B-83). THE TRANSITION TO BEDROCK IS NOT EASILY DISCERNABLE WHERE THE SURFACE ROCK IS SHALE, CLAY-SHALE, OR MUDSTONE. WHERE SANDSTONE, LIMESTONE, OR SILTSTONE IS THE SURFACE ROCK, TRANSITION (TO ROCK) WAS EASILY DISCERNABLE.

THE SOILS ARE PREDOMINANTLY COHESIVE, DESCRIBED AS CLAY (A-7-6), SILTY CLAY (A-6b), SILT AND CLAY (A-6a), AND SANDY SILT (A-4a). IN THE SOUTHERN HALF OF THE ALIGNMENT AND IN THE RIVER VALLEYS, THE SOILS BECOME MORE GRANULAR.

IT WAS VERY COMMON, IN THE VALLEYS OF THE SOUTHERN HALF OF THE ALIGNMENT, TO ENCOUNTER VERY LOOSE SAND, EXHIBITING HIGH MOISTURE CONTENTS, INTERBEDDED WITH SOFT CLAYS. THIS IS BEST IDENTIFIED IN B-128 (STATION+ 45+627), WHERE 8.7 METERS OF VERY LOOSE WATER BEARING SAND WITH SOFT CLAY INTERBEDS WAS ENCOUNTERED. SIMILAR TYPES OF SOILS WERE ALSO ENCOUNTERED IN B-154 (2.7 METERS) AND B-156 (3.8 METERS).

LABORATORY TESTING INDICATES THAT THE NATURAL MOISTURE CONTENTS OF THE SOIL ENCOUNTERED TO A DEPTH OF 1.5 METERS ARE TYPICALLY AT OR BELOW ABOVE THEIR CORRESPONDING PLASTIC LIMITS. HOWEVER, BECAUSE OF THE HIGHLY PLASTIC NATURE OF THE CLAYS ENCOUNTERED, THE MOISTURE CONTENTS DO NOT TYPICALLY APPROACH THE SOILS' CORRESPONDING LIQUID LIMITS. ALSO WITHIN THIS SURFACE DEPTH, MANY NON-PLASTIC SOILS WITH HIGH MOISTURE CONTENTS (>20%) WERE ENCOUNTERED, SUCH AS B-136, B-142, AND B-146. VALLEY BORINGS, INCLUDING B-128, B-129, B-149, B-154, AND B-156 EXHIBITED RELATIVELY THICK INTERVALS (>1.5 METERS) OF NON-PLASTIC SOILS WITH HIGH MOISTURE CONTENTS AND/OR COHESIVE SOILS AT OR NEAR THEIR CORRESPONDING LIQUID LIMITS. WITH THE EXCEPTION OF A FEW BORINGS (I.E., B-128), MOISTURE CONTENTS TYPICALLY DECREASE BELOW THE SURFICIAL 1.5 METERS, DOWN TO TYPICALLY LESS THAN 10% IN THE TRANSITIONAL MATERIAL (SOFT WEATHERED BEDROCK).

BEDROCK CAN BE EXPECTED IN EVERY CUT SECTION GREATER THAN 3.0 METERS. BEDROCK WITHIN THE NORTHERN HALF OF THE ALIGNMENT CONSISTED PREDOMINANTLY OF SHALE, CLAYSTONE, AND/OR MUDSTONE, PREDOMINANTLY IN POOR CONDITION. INTERBEDS OF SANDSTONE, LIMESTONE, AND SILTSTONE WERE ENCOUNTERED THROUGHOUT; SOME SECTIONS ARE QUITE MASSIVE. THE MUDSTONE AND SOME SHALE WAS OCCASIONALLY SLICKENSIDED. AS MENTIONED ABOVE, WHERE THESE BEDROCKS WERE ENCOUNTERED, THE ROCK CONDITION WAS TYPICALLY SO POOR THAT IT WAS DIFFICULT TO IDENTIFY THE TRANSITION FROM SOIL TO ROCK.

IN THE SOUTHERN HALF OF THE ALIGNMENT, MUCH OF THE BEDROCK ENCOUNTERED CONSISTED OF MEDIUM TO MODERATELY HARD SANDSTONE AND SILTSTONE WITH VERY SOFT TO SOFT SHALE, CLAYSTONE, AND MUDSTONE INTERBEDS OF VARYING THICKNESSES. THE SANDSTONE IS SOMEWHAT FRIABLE (POORLY CEMENTED). MUCH OF THE SANDSTONE AND SILTSTONE IS IN FAIR TO GOOD CONDITION, AS EXHIBITED BY THE RQDS, HOWEVER, SEVERAL SANDSTONE SECTIONS EXHIBITED VERY POOR RQDS. IN MOST OF THESE CASES, THE SANDSTONE WAS IN VERY THIN CHIPS, COMMONLY REFERRED TO AS THE POKER CHIP PHENOMENON. THIS IS POSSIBLY A RESULT OF WETTING AND DRYING THE ROCK, CAUSING SHRINKAGE. THE SHALE, CLAY-SHALE AND MUDSTONE ARE ALL TYPICALLY OF POOR QUALITY. THE MUDSTONE AND SHALE WERE OCCASIONALLY SLICKENSIDED AND DETERIORATED WHEN EXPOSED TO WATER. VERY FEW, THIN, LIMESTONE INTERBEDS, TYPICALLY LESS THAN 1.0 METER THICK, WERE ENCOUNTERED.

THIN LAYERS OF COAL, GENERALLY LESS THAN A METER THICK, WERE ENCOUNTERED THROUGHOUT THE PROJECT, BUT WERE MORE PREDOMINANT SOUTH OF STATION 48+600.

WITH THE EXCEPTION OF THE PRATTS FORK AND SHADE RIVER VALLEYS, GROUNDWATER IN ATHENS AND MEIGS COUNTIES IS SCARCE AT BEST. FEW PERCHED LENSES OF GROUNDWATER WERE ENCOUNTERED DURING THE DRILLING PROCESS WITHIN THE SOIL. THE MOST NOTABLE GROUNDWATER CONDITION ENCOUNTERED WAS IN B-128, WHERE WATER-BEARING SAND CAUSED HEAVING OF SAND (UNDER HYDROSTATIC PRESSURE) IN THE AUGERS DURING THE DRILLING PROCESS. GROUNDWATER WAS ENCOUNTERED WITHIN THE SANDSTONE BEDROCK IN B-151, AT ELEVATION 226.4 METERS. IT IS NOTED THAT, SINCE THIS BEDROCK WAS AUGERED FULL DEPTH, NOT REQUIRING THE USE OF WATER, GROUNDWATER COULD BE IDENTIFIED WITHIN THE ROCK. TYPICALLY, WITHIN THE ROCK, IT WAS IMPOSSIBLE TO IDENTIFY GROUNDWATER SINCE WATER WAS BEING USED DURING THE CORING PROCESS. GROUNDWATER FOR THE AREA CAN BE FOUND IN ALTERNATING LAYERS OF SHALE AND THIN SANDSTONE WITH YIELDS OF LESS THAN 1.0 GALLON PER MINUTE. GROUNDWATER CAN BE EXPECTED IN THE VALLEYS, OVERLYING IMPERVIOUS BEDROCK.

CALCULATED	CHECKED
RS	DAA

SOIL PROFILE

ATH-33-40.981

PROJECT INDEX					
		PLAN VIEW	PROFILE	CUT	FILL EMB.
FROM	TO	SHEET	SHEET	MAX. (m.)	MAX. (m.)
U.S. 33 MAINLINE					
39 + 430	39 + 770	16	17	18.0	14.6
39 + 770	40 + 110	18	19	19.6	14.7
40 + 110	40 + 450	21	22	8.6	21.6
40 + 450	40 + 790	23	24	17.2	14.8
40 + 790	41 + 130	25	26	6.4	20.4
41 + 130	41 + 470	28	29	13.4	11.3
41 + 470	41 + 810	30	31	30.0	4.0
41 + 810	42 + 150	33	34	21.4	16.3
42 + 150	42 + 490	36	37	11.2	9.6
42 + 490	42 + 830	38	39	6.8	32.3
42 + 830	43 + 170	40	41	7.4	33.5
43 + 170	43 + 510	42	43	11.1	10.0
43 + 510	43 + 850	45	46	6.2	38.0
43 + 850	44 + 190	47	48	16.7	32.3
44 + 190	44 + 530	49	50	16.4	31.5
44 + 530	44 + 870	51	52	24.0	20.4
44 + 870	45 + 210	53	54	23.0	27.2
45 + 210	45 + 550	56	57	16.3	18.8
45 + 550	45 + 890	58	59	17.0	13.3
45 + 890	46 + 230	61	62	22.4	14.2
46 + 230	46 + 570	64	65	25.0	4.2
46 + 570	46 + 910	67	68	10.9	4.4
46 + 910	47 + 250	70	71	11.8	7.0
47 + 250	47 + 590	73	74	13.2	11.4
47 + 590	47 + 930	75	76	8.0	14.5
47 + 930	48 + 270	77	78	10.2	12.3
48 + 270	48 + 610	79	80	14.6	3.5
48 + 610	48 + 950	82	83	17.2	11.5
48 + 950	49 + 290	85	86	30.2	4.0
49 + 290	49 + 630	88	89	11.7	2.5
49 + 630	49 + 890.950	90	91	5.0	1.6
TR 68 (RIGHT OF MAINLINE)					
1 + 000	1 + 220	92	92	2.0	5.6
TR 68 (LEFT OF MAINLINE)					
2 + 000	2 + 094.570	93	93	1.7	0.2
TR 67					
1 + 000	1 + 140	94	94	2.0	5.2
CR 89					
1 + 908.418	2 + 150	95	95	3.7	2.1
2 + 150	2 + 410	96	96	3.0	8.1
2 + 410	2 + 608.091	97	97	1.0	1.5
TR 412					
11 + 000	11 + 230	98	98	5.5	0.5
11 + 230	11 + 500	99	99	4.8	3.4
11 + 500	11 + 607.637	101	101	3.0	0.6
TR 243 (RIGHT OF MAINLINE)					
0 + 007.500	0 + 162	102	102	5.3	0.2
TR 243 (LEFT OF MAINLINE)					
0 + 000	0 + 180	103	103	2.6	1.0
SR 681 (AT GRADE)					
50 + 901.011	51 + 150	104	104	4.2	4.0
51 + 150	51 + 400	105	105	6.5	8.1
51 + 400	51 + 650	106	106	10.6	4.8
51 + 650	51 + 799.983	107	107	3.0	1.8
OLD US 33 (AT GRADE)					
46 + 000	46 + 250	108	108	16.8	3.0
46 + 250	46 + 438	109	109	1.9	1.4

NOTE: THE ABOVE QUANTITES ARE BASED ON FOUR-LANE CROSS SECTIONS.

CROSS SECTION INDEX		
ROADWAY	STATION	SHEET
U.S. 33 MAINLINE	39+636.470	110
	40+020	111
	40+700	112
	41+600	113
	41+900	114
	43+220	115
	43+900	116
	44+920	117
	45+040	118
	45+120	119
	45+400	120
	45+800	121
	45+900	122
	46+520	123
	46+860	124
	47+060	125
	48+380	126
	48+480	127
	49+020	128
	49+180	129
	49+260	130
CR 89	2+360	131
SR 681 (AT GRADE)	51+240	132

SUMMARY OF SOIL TEST DATA
U.S. ROUTE 33 MAINLINE

BORINGS DRILLED BY RESOURCE INTERNATIONAL, INC.
* DENOTES SAMPLE TAKEN AT OR NEAR GRADE.

	Northing & Easting	From To	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L	P.I	W.C.	ODOT Class.
(B-81)	135483.100 637608.700	0-0.5 0.5-0.9 1.1-1.7 1.8-2.3 2.6-2.9 3.6-3.7	SAME AS 1.1-1.7 SAME AS 1.1-1.7 0 8 28 36 28 38						17	27 25 26 10	VISUAL VISUAL A-6b VISUAL VISUAL VISUAL
(B-82)	135236.700 637650.600	0-0.5 0.5-0.9 1.1-1.5 1.8-2.3 2.6-3.1 4.1-4.6 5.6-6.1 7.2-7.5	BROWN SANDY SILT, SOME CLAY, TRACE GRAVEL SAME AS 1.8-2.3 SAME AS 1.8-2.3 2 2 67 -29- BROWN WEATHERED SANDSTONE SAME AS 2.6-3.1 BROWN TO RED INDURATED CLAY/ WEATHERED MUDSTONE SAME AS 5.6-6.1							22 18 14 14 12 12 12	VISUAL VISUAL VISUAL A-3a VISUAL VISUAL VISUAL VISUAL
(B-83)	135042.200 637696.100	0-0.5 0.5-0.9 1.1-1.5 1.8-2.3 2.6-3.1 4.1-4.6 5.6-6.1 7.2-7.6	BROWN CLAYEY SILT, SOME SAND RED CLAY, LITTLE SILT, TRACE SAND SAME AS 0.5-0.9 REDDISH-BROWN SANDY CLAY, SOME SILT SAME AS 1.8-2.3 SAME AS 1.8-2.3 SAME AS 7.2-7.6 1 2 6 47 44 38						18	27 32 18 22 26 25 29 29	VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL A-6b
(B-84)	134940.800 637738.400	0-0.5 0.5-0.9 1.1-1.5 1.8-2.3 2.6-3.1 4.2-4.3	SAME AS 0.5-0.9 1 2 7 38 52 SAME AS 0.5-0.9 SAME AS 0.5-0.9 SAME AS 0.5-0.9 GRAY WEATHERED SANDSTONE							14 18 15 13 9	VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL
(B-85)	134817.900 637750.900	0-0.5 0.5-0.7 1.1-1.2 1.8-1.9	BROWN SAND AND GRAVEL, SOME SILT LIGHT BROWN WEATHERED SANDSTONE SAME AS 0.5-0.7 SAME AS 0.5-0.7							12 8 5 5	VISUAL VISUAL VISUAL VISUAL
(B-86)	134828.600 637803.800	0-1.2 1.2-1.3 1.3-1.5	LIGHT BROWNISH-GRAY SILTY CLAY, LITTLE SAND SAME AS 0-1.2 BROWN-GRAY INDURATED CLAY/ WEATHERED MUDSTONE							15 10	VISUAL VISUAL VISUAL
(B-87)	134749.400 637864.800	0-0.2 0.2-1.6	DARK BROWN CLAYEY SILT, SOME SAND BROWN-GRAY CLAY, SOME SILT, LITTLE SAND							26 24	VISUAL VISUAL
(B-88)	134590.900 637895.100	0-0.5 0.5-0.9 1.1-1.5 1.8-2.1 2.6-2.8 4.1-4.3 5.6-6.0 7.2-7.4 8.7-9.1 10.2-10.4	BROWN SANDY CLAY, SOME SILT SAME AS 0-0.5 SAME AS 0-0.5 BROWN WEATHERED SANDSTONE SAME AS 1.8-2.1 SAME AS 1.8-2.1 GRAY INDURATED CLAY/ WEATHERED MUDSTONE BROWN WEATHERED SILTSTONE GRAY WEATHERED SHALE GRAY WEATHERED MUDSTONE							14 16 14 10 10 9 9 9 9	VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL
(B-89)	134612.600 637981.900	0-0.5 0.5-0.9 1.1-1.5 1.8-2.1 2.6-2.7	BROWN SILTY CLAY, SOME SAND, LITTLE GRAVEL SAME AS 0-0.5 REDDISH-BROWN INDURATED CLAY/ WEATHERED MUDSTONE SAME AS 1.1-1.5 BROWN WEATHERED SANDSTONE							20 20 15 8 3	VISUAL VISUAL VISUAL VISUAL VISUAL
(B-90)	134612.600 638018.700	0-0.5 0.5-0.9 1.1-1.4 1.8-2.0	BROWN-GRAY SILTY CLAY, SOME SAND SAME AS 0-0.5 BROWN WEATHERED SANDSTONE SAME AS 1.1-1.4							19 23 7 7	VISUAL VISUAL VISUAL VISUAL

	Northing & Easting	From To	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L	P.I	W.C.	ODOT Class.
(B-91)	134401.400 638162.700	0-0.5 0.5-0.9 1.1-1.5 1.8-2.3 2.6-2.9 4.1-4.4 5.7-5.9	BROWN SILTY CLAY, SOME SAND, TRACE GRAVEL SAME AS 0-0.5 SAME AS 0-0.5 SAME AS 0-0.5 SAME AS 0-0.5 GRAY WEATHERED SANDSTONE SAME AS 4.1-4.4							22 21 15 16 11 7 5	VISUAL VISUAL VISUAL VISUAL VISUAL* VISUAL* VISUAL
(B-92)	134245.300 638290.700	0-1.2 1.2-1.8	BROWN-GRAY CLAY, SOME SILT, LITTLE SAND SAME AS 0-1.2							19	VISUAL VISUAL
(B-93)	134144.700 638294.900	0-0.1 0.1-0.3 0.3-0.6	DARK BROWN-GRAY CLAYEY SILT, LITTLE ORGANICS, TRACE SAND BROWN SILTY CLAY, SOME SAND, TRACE GRAVEL BROWN WEATHERED SANDSTONE							35 20	VISUAL VISUAL VISUAL
(B-94)	134184.300 638387.300	0-0.1 0.1-1.8	DARK BROWN CLAYEY SILT, LITTLE ORGANICS, TRACE SAND 0 1 8 41 50							30 28	VISUAL VISUAL
(B-95)	133967.400 638390.100	0-0.5 0.5-0.9 1.1-1.6 1.8-2.3 2.6-2.8	BROWN SANDY SILT, TRACE CLAY BROWN SILTY CLAY, TRACE SAND SAME AS 0.5-0.9 BROWN INDURATED CLAY/ WEATHERED MUDSTONE SAME AS 1.8-2.3							26 17 12	VISUAL VISUAL VISUAL VISUAL VISUAL
(B-96)	133823.600 638498.600	0-0.1 0.1-0.9 0.9-1.7	BROWN SANDY CLAY, SOME ORGANICS, LITTLE SILT BROWN SILTY CLAY, SOME SAND, TRACE GRAVEL BROWN SANDY CLAY, LITTLE SILT, TRACE GRAVEL							31 23 17	VISUAL VISUAL VISUAL
(B-97)	133685.300 638409.000	0-0.5 0.5-0.9 1.1-1.5 1.8-2.3 2.6-3.1 4.1-4.3 5.6-5.8 7.2-7.4	BROWN SILTY SAND, TRACE CLAY SAME AS 0-0.5 RED, GREEN, BROWN, & PURPLE INDURATED CLAY/WEATHERED MUDSTONE SAME AS 1.1-1.5 SAME AS 1.1-1.5 SAME AS 1.1-1.5 GRAY LEACHED LIMESTONE GRAY INDURATED CLAY/ WEATHERED MUDSTONE							16 9	VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL
(B-98)	133579.400 638467.100	0-0.5 0.5-0.9 1.1-1.5 1.8-2.3 2.6-3.0	SAME AS 0.5-0.9 15 3 5 34 43 48 27 SAME AS 0.5-0.9 BROWN INDURATED CLAY/ WEATHERED MUDSTONE SAME AS 1.8-2.3							37 26 15	VISUAL A-7-6 VISUAL VISUAL* VISUAL
(B-99)	133420.200 638484.000	0-0.5 0.5-1.1 1.1-1.5 1.8-2.3 2.6-3.1 4.1-4.2	BROWN-GRAY SILTY CLAY, LITTLE SAND, TRACE GRAVEL SAME AS 0-0.5 SAME AS 0-0.5 SAME AS 0-0.5 SAME AS 0-0.5 BROWN WEATHERED SANDSTONE							27 21 21	VISUAL VISUAL VISUAL VISUAL VISUAL
(B-100)	133285.600 638508.700	0-0.5 0.5-0.9 1.1-1.5 1.8-2.3 2.6-3.1 4.1-4.6 5.6-5.9 7.2-7.4 8.7-8.9 10.2-10.4	BROWN SILTY CLAY, LITTLE SAND, TRACE GRAVEL BROWN-GRAY TO RED INDURATED CLAY/ WEATHERED MUDSTONE SAME AS 0.5-0.9 SAME AS 0.5-0.9 SAME AS 0.5-0.9 SAME AS 0.5-0.9 SAME AS 0.5-0.9 SAME AS 0.5-0.9 SAME AS 0.5-0.9 SAME AS 0.5-0.9							23 16 15 15 15 15 15 15 15	VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL
(B-101)	133159.400 638496.600	0.3-0.8 1.1-1.5 1.8-2.3 2.6-2.7	MOTTLED RED & GRAY SILTY CLAY, LITTLE SAND SAME AS 0.3-0.8 11 8 20 38 23 28 10 BROWN WEATHERED SANDSTONE							16 15 9	VISUAL VISUAL A-4a VISUAL

CALCULATED
TAH
CHECKED
DAA

SOIL PROFILE

ATH-33-40.981

4 / 132

702
949

SUMMARY OF SOIL TEST DATA
U.S. ROUTE 33 MAINLINE

BORINGS DRILLED BY RESOURCE INTERNATIONAL, INC.

* DENOTES SAMPLE TAKEN AT OR NEAR GRADE.

	Northing & Easting	From To	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L	P.I	W.C.	ODOT Class.		Northing & Easting	From To	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L	P.I	W.C.	ODOT Class.	
(B-102)	133039.100 638549.700	0-0.5 0.5-0.9 1.1-1.5 1.8-2.3 2.6-3.1 4.1-4.6 5.6-6.1 7.2-7.5 8.6-8.7	SAME AS 0.5-0.9 4 1 3 40 52							27 23 16 16 20	VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL*		(B-114A)	131732.600 639023.500	0-0.5 0.5-0.9 1.1-1.5 1.8-2.1 2.6-2.8	BROWN SILTY CLAY, SOME SAND, TRACE GRAVEL SAME AS 0-0.5 SAME AS 0-0.5 BROWN & GRAY WEATHERED SANDSTONE SAME AS 1.8-2.1							23 20 14	VISUAL VISUAL VISUAL VISUAL VISUAL
(B-103)	132861.600 638523.000	0-0.6 0.6-1.2	BROWN SILTY CLAY, LITTLE SAND BROWN-GRAY INDURATED CLAY/ WEATHERED MUDSTONE							23	VISUAL VISUAL		(B-115)	131546.800 639021.000	0-0.5 0.5-1.8 1.8-3.0	DARK BROWN SILTY CLAY, SOME SAND, TRACE GRAVEL 19 11 17 -53- REDDISH-BROWN CLAYEY SILT, SOME SAND, TRACE GRAVEL							26 26 19	VISUAL VISUAL VISUAL
(B-104)	132684.900 638556.600	0-0.5 0.5-0.9 1.1-1.5 1.8-2.3 2.6-3.1 4.4-4.6	SAME AS 0.5-0.9 3 1 15 33 48 BROWN CLAYEY SILT, LITTLE SAND, TRACE GRAVEL REDDISH-BROWN INDURATED CLAY/ WEATHERED MUDSTONE SAME AS 1.8-2.3 SAME AS 1.8-2.3							20 17 18 13 14 6	VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL		(B-116)	131450.600 639127.100	0-0.5 0.5-0.9 1.1-1.5 1.8-2.3 2.6-3.1 4.1-4.6 5.6-5.9 7.2-7.5 8.7-8.9 10.2-10.4 11.7-11.9	BROWN SILTY CLAY, LITTLE SAND, TRACE GRAVEL SAME AS 0-0.5 BROWN TO RED INDURATED CLAY/WEATHERED MUDSTONE SAME AS 1.1-1.5 SAME AS 1.1-1.5 SAME AS 1.1-1.5 SAME AS 1.1-1.5 SAME AS 1.1-1.5 SAME AS 1.1-1.5 SAME AS 1.1-1.5 SAME AS 1.1-1.5							18 15 12 11 10	VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL
(B-105)	132604.200 638631.800	0-0.5 0.5-0.9 1.1-1.5 1.8-2.3 2.6-3.1 4.1-4.4	SAME AS 0.5-0.9 0 16 47 -37- BROWN INDURATED CLAY/ WEATHERED MUDSTONE SAME AS 1.8-2.3 GRAY WEATHERED SHALE							15 14 14	VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL		(B-117)	131296.300 639126.600	0-0.1 0.1-1.5 1.5-2.0 2.0-2.3 2.3-3.0	DARK BROWN CLAYEY SILT, SOME SAND, TRACE ORGANICS SAME AS 1.5-2.0 8 0 6 -86- SAME AS 1.5-2.0 BROWN WEATHERED SANDSTONE							25 19 19 19 16	VISUAL VISUAL VISUAL VISUAL VISUAL
(B-106)	132439.400 638641.500	0-0.1 0.1-0.6	0 9 68 17 6 BROWN WEATHERED SANDSTONE							8	A-3a VISUAL		(B-118)	131187.900 639173.600	0-0.1 0.1-1.8	BROWN CLAYEY SILT, SOME SAND, TRACE GRAVEL, TRACE ORGANICS BROWN SANDY CLAY, SOME SILT, TRACE GRAVEL							24 22	VISUAL VISUAL
(B-107)	132330.200 638742.300	0-0.5 0.5-0.9 1.1-1.5 1.8-2.3 2.6-3.1 4.1-4.6 5.6-5.9 7.2-7.5 8.7-9.0 9.6-9.9	BROWN-GRAY SILTY CLAY, LITTLE SAND SAME AS 0-0.5 SAME AS 0-0.5 SAME AS 0-0.5 VARIEGATED BROWN, GRAY, & RED INDURATED CLAY/WEATHERED MUDSTONE SAME AS 2.6-3.1 SAME AS 2.6-3.1 SAME AS 2.6-3.1 SAME AS 2.6-3.1 SAME AS 2.6-3.1 SAME AS 2.6-3.1							20 29 30 19	VISUAL VISUAL VISUAL*		(B-119)	131006.500 639207.200	0-0.5 0.5-0.9 1.1-1.5 1.8-2.3 2.6-3.1 4.1-4.6 5.7-5.8	REDDISH-BROWN CLAY, SOME SILT, LITTLE SAND SAME AS 0-0.5 REDDISH-BROWN INDURATED CLAY/WEATHERED MUDSTONE SAME AS 1.1-1.5 SAME AS 1.1-1.5 SAME AS 1.1-1.5 SAME AS 1.1-1.5 BROWN WEATHERED SANDSTONE							29 31	VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL
(B-108)	132291.000 638650.300	0-0.5 0.5-0.9 1.1-1.5 1.8-2.3 2.6-3.1 4.1-4.2 5.6-5.7	REDDISH-BROWN SILTY CLAY, TRACE SAND SAME AS 0-0.5 SAME AS 0-0.5 SAME AS 0-0.5 BROWN INDURATED CLAY/ WEATHERED MUDSTONE BROWN WEATHERED SANDSTONE SAME AS 4.1-4.2							24 31 23 26	VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL		(B-120)	130911.800 639291.000	0-0.5 0.5-0.9 1.1-1.5 1.8-2.3 2.6-3.1 4.1-4.4 5.6-6.0 7.2-7.4 8.7-8.9 10.2-10.5 11.7-11.9	BROWN SANDY SILT, LITTLE CLAY SAME AS 0-0.5 BROWN SILTY CLAY, TRACE SAND REDDISH-BROWN INDURATED CLAY/WEATHERED MUDSTONE SAME AS 1.8-2.3 SAME AS 1.8-2.3 SAME AS 1.8-2.3 SAME AS 1.8-2.3 SAME AS 1.8-2.3 SAME AS 1.8-2.3 SAME AS 1.8-2.3							19 16 13	VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL
(B-109)	132310.600 638696.300	0-0.5 0.5-0.9 1.1-1.5 1.8-2.1 2.6-2.9 4.1-4.4 5.6-6.1 7.2-7.3 8.7-8.8	BROWN SILTY CLAY, LITTLE SAND SAME AS 0-0.5 VARIEGATED BROWN, RED, & GRAY INDURATED CLAY/WEATHERED MUDSTONE SAME AS 1.1-1.5 SAME AS 1.1-1.5 SAME AS 1.1-1.5 SAME AS 1.1-1.5 BROWN WEATHERED SANDSTONE SAME AS 7.2-7.3							21 26	VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL*		(B-121)	130764.500 639353.600	0-1.2 1.2-1.7	REDDISH-BROWN CLAY, SOME SILT, LITTLE SAND LIGHT BROWNISH-GRAY INDURATED CLAY, WEATHERED MUDSTONE							22 9	VISUAL VISUAL
(B-110)	132126.500 638774.500	0-0.5 0.5-0.9 1.1-1.5 1.8-2.0 2.6-2.8 4.1-4.3	BROWN SILTY CLAY, SOME SAND BROWN SILTY SAND BROWN WEATHERED SANDSTONE SAME AS 1.8-2.0 SAME AS 1.8-2.0 SAME AS 1.8-2.0							20 13	VISUAL VISUAL*		(B-123)	130591.396 639506.659	0-0.5 0.5-0.9 1.1-1.6 1.8-2.3 2.6-3.1 4.1-4.6 5.7-6.1 7.2-7.5 8.7-8.8	SAME AS 1.8-2.3 SAME AS 1.8-2.3 SAME AS 1.8-2.3 0 2 3 -95- REDDISH-BROWN INDURATED CLAY/WEATHERED MUDSTONE SAME AS 2.6-3.1 SAME AS 2.6-3.1 SAME AS 2.6-3.1 SAME AS 2.6-3.1 SAME AS 2.6-3.1				34 17	16 15 13 15 6	VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL		
(B-111)	131988.500 638833.200	0-0.5 0.5-0.9 1.1-1.3 1.8-2.0 2.6-2.8 4.1-4.3 5.6-5.8 7.2-7.4 8.7-9.1 9.6-9.8	SAME AS 0.5-0.9 1 2 12 58 27 BROWN WEATHERED SANDSTONE SAME AS 1.1-1.3 SAME AS 1.1-1.3 SAME AS 1.1-1.3 SAME AS 1.1-1.3 SAME AS 1.1-1.3 GRAY INDURATED CLAY/ WEATHERED MUDSTONE SAME AS 8.7-9.1							21 18 11 11 9	VISUAL VISUAL VISUAL VISUAL VISUAL VISUAL*		(B-124)	130562.053 639439.637	0-0.5 0.5-0.9 1.1-1.6 1.8-2.3 2.6-2.8	BROWN CLAY, SOME SILT, LITTLE TO TRACE SAND SAME AS 0.0-0.5 SAME AS 0.0-0.5 SAME AS 0.0-0.5 BROWN SHALE							32 29 19 11	VISUAL VISUAL VISUAL VISUAL
(B-112)	131832.100 638899.700	0-0.7 0.7-1.2	LIGHT BROWN WEATHERED SANDSTONE BROWN-GRAY INDURATED CLAY/ WEATHERED MUDSTONE							14	VISUAL VISUAL		(B-125)	130542.491 639393.623	0-0.5 0.5-0.9 1.1-1.6 1.8-2.0 2.6-2.8	SAME AS 0.5-0.9 1 2 27 33 37 29 14 BROWN WEATHERED SANDSTONE SAME AS 1.1-1.6 SAME AS 1.1-1.6 SAME AS 1.1-1.6							29 16	VISUAL A-6a VISUAL VISUAL VISUAL
(B-113)	131665.200 638916.300	0-0.7 0.7-1.6 1.6-1.8	REDDISH-BROWN WEATHERED SANDSTONE BROWN SILTY CLAY, SOME SAND DARK BROWN CLAYEY SILT, SOME SAND							17 51	VISUAL VISUAL VISUAL		(B-126)	130362.252 639468.074	0-0.5 0.5-1.1 1.1-1.6 1.8-2.0 2.6-3.1 3.4-3.5	SAME AS 0.5-1.1 1 8 25 21 45 34 20 SAME AS 0.5-1.1 SAME AS 0.5-1.1 3 1 5 26 65 44 24 GRAY WEATHERED SANDSTONE							18 21 20 22 21	VISUAL A-6b VISUAL VISUAL A-7-6 VISUAL
(B-114)	131684.800 638962.300	0-0.6 0.6-1.5 1.5-1.6	REDDISH-BROWN SILTY CLAY, LITTLE SAND BROWNISH-GRAY INDURATED CLAY/ WEATHERED MUDSTONE DARK BROWN CLAYEY SILT, SOME SAND							27 10 22	VISUAL VISUAL VISUAL													

CALCULATED
TAH
CHECKED
DAA

SOIL PROFILE

ATH-33-40.981

5 / 132

703
949

U.S. ROUTE 33 MAINLINE

NP SHOWN IN LIQUID LIMIT AND PLASTICITY INDEX COLUMNS INDICATES MATERIAL IS NON-PLASTIC.

CALCULATED	CHECKED
TAH	DAA

SOIL PROFILE

ATH-33-40.981

SUMMARY OF SOIL TEST DATA

U.S. ROUTE 33 MAINLINE

BORINGS DRILLED BY RESOURCE INTERNATIONAL, INC.

	Northing & Easting	From To	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L	P.I	W.C.	ODOT Class.	
(B-156)	127283.915 641188.058	0-0.5	SAME AS 0.5-0.9								24	VISUAL
		0.5-0.9	7	23	35	17	18				21	A-3a
		1.1-1.6	SAME AS 0.5-0.9								24	VISUAL
		1.8-2.2	BROWN AND GRAY SILTY CLAY, LITTLE SAND								22	VISUAL
		2.6-3.1	GRAY SANDY SILT, TRACE CLAY								22	VISUAL
		4.1-4.2	GRAY SANDSTONE									VISUAL
(B-157)	127196.370 641333.790	0-0.5	SAME AS 0.5-0.9								10	VISUAL
		0.5-0.9	15	5	22	38	20				23	A-4a
		1.1-1.6	SAME AS 0.5-0.9								18	VISUAL
		1.8-2.2	BROWN SANDY CLAY, SOME SILT, TRACE GRAVEL								20	VISUAL
		2.6-3.0	SAME AS 1.8-2.2								7	VISUAL
(B-158)	127157.112 641285.619	0-0.5	BROWN SILTY CLAY, SOME SAND								23	VISUAL
		0.5-0.9	BROWN SILTY SAND, LITTLE CLAY								16	VISUAL
		1.1-1.6	9	8	3	-80-	50	28		24	A-7-6	
		1.8-2.3	BLACK COAL									VISUAL
		2.6-3.0	GRAY MUDSTONE								11	VISUAL
(B-159)	127107.549 641222.649	0-0.5	37	1	3	10	49				35	VISUAL
		0.5-0.9	SAME AS 0.0-0.5								28	VISUAL
		1.1-1.6	BROWN AND GRAY CLAYEY SILT, TRACE SAND								11	VISUAL
		1.8-2.0	BROWN SANDSTONE								22	VISUAL
(B-160)	127022.596 641360.884	0-0.5	SAME AS 0.5-1.0								20	VISUAL
		0.5-1.0	4	17	34	16	29	29	14		19	A-6a
		1.1-1.6	0	5	31	-64-		32	18		20	A-6b
		1.8-2.3	SAME AS 1.1-1.6								18	VISUAL
		2.6-3.1	BROWN WEATHERED SILTSTONE								5	VISUAL
		4.5-4.9	SAME AS 2.6-3.1									VISUAL
(B-161)	126879.544 641390.959	0-0.5	BROWN SILTY CLAY, SOME SAND, TRACE GRAVEL								26	VISUAL
		0.5-0.9	BROWN SAND, SOME SILT, TRACE CLAY, TRACE GRAVEL								21	VISUAL
		1.1-1.6	0	18	57	-25-					20	A-3a
		1.8-2.3	BROWN SANDY CLAY, LITTLE SILT, TRACE SAND, TRACE GRAVEL								21	VISUAL
		2.6-2.7	GRAY WEATHERED SANDSTONE								6	VISUAL

CALCULATED
TAH
CHECKED
DAA

SOIL PROFILE

ATH-33-40.981

7 / 132

705
949

SUMMARY OF SOIL TEST DATA
U.S. ROUTE 33 MAINLINE

* DENOTES SAMPLE TAKEN AT OR NEAR GRADE.

Boring	Station & Offset	Depth From To	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	% W.C.	ODOT Class	Boring	Station & Offset	Depth From To	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	% W.C.	ODOT Class	Boring	Station & Offset	Depth From To	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	% W.C.	ODOT Class																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
R-40	39+634.71 37.50 m Rt	0.0 - 0.37	TOPSOIL									VISUAL	R-42	40+029.13 58.19 m Rt.	0.0 - 0.21	TOPSOIL									VISUAL	SB-51	40+884.10 Centerline	0.0 - 0.18	TOPSOIL									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		0.37 - 0.91	15	12	29	17	27	26	12	15	A-6a	0.21 - 1.83			0	2	19	48	31	30	13	20	A-6a*	0.18 - 0.91	BROWN SANDY SILT, VISUAL									A-4a																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
		0.91 - 1.68	16	16	10	24	34	40	21	18	A-6b	1.83 - 2.44			BROWN SANDY SILT, VISUAL									A-4a	0.91 - 1.83			BROWN SILTY CLAY, VISUAL									A-6b																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
		1.68 - 2.44	BROWN AND GRAY SILTY CLAY, VISUAL												A-6b	2.44 - 3.96	BROWN SILT AND CLAY, VISUAL											A-6a	1.83 - 4.57	SEVERELY WEATHERED GRAY SHALE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		2.44 - 3.66	PURPLE AND GRAY SILTY CLAY, VISUAL												A-6b	3.96 - 4.88	BROWN GRAVEL WITH SAND AND SILT, VISUAL											A-2-4	4.57 - 7.32	GRAY CLAYSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		3.66 - 4.27	DARK GRAY AND BLACK SILT AND CLAY, VISUAL												A-6a	4.88 - 6.10	GRAY LIMESTONE											VISUAL	R-46	41+229.99 0.03 m Lt.	0.0 - 0.15	TOPSOIL									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
		4.27 - 4.72	GRAY GRAVEL WITH SAND, VISUAL												A-1b	6.10 - 7.32	GRAY SANDSTONE											VISUAL			0.15 - 0.76	BROWN SANDY SILT, VISUAL									A-4a																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
		4.72 - 5.03	GRAY SANDY SILT, VISUAL												A-4a	7.32 - 7.62	GRAY SILTSTONE											VISUAL			0.76 - 3.35	SEVERELY WEATHERED BROWN SHALE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
R-41	39+635.00 63.52 m Rt.	0.0 - 0.40	TOPSOIL									VISUAL			8.56 - 9.14	GRAY LIMESTONE									VISUAL			3.35 - 5.33			SEVERELY WEATHERED RED SHALE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
		0.40 - 1.68	2	11	21	35	31	29	12	18	A-6a	9.14 - 9.45			BROWN SANDSTONE									VISUAL	5.33 - 6.10			SEVERELY WEATHERED GRAY LIMESTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
		1.68 - 3.20	0	8	15	32	45	43	20	26	A-7-6	9.45 - 10.03			GRAY LIMESTONE									VISUAL	6.10 - 6.58			BROWN CLAYSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
		3.20 - 4.57	BROWNISH GRAY SILT AND CLAY, VISUAL												A-6a	10.03 - 10.82	BROWN SANDSTONE											VISUAL	6.58 - 7.77	GRAY AND BROWN SANDSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		4.57 - 4.88	BROWN SILT AND CLAY, VISUAL												A-6a	10.82 - 11.73	GRAY LIMESTONE											VISUAL	7.77 - 8.53	GRAY SILTSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		4.88 - 6.10	GRAY SILT AND CLAY, VISUAL												A-6a	11.73 - 17.83	BROWN SANDSTONE											VISUAL	8.53 - 9.14	GRAY SANDSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
SB-7	39+650.23 24.68 m Lt.	0.0 - 0.34	TOPSOIL									VISUAL	SB-52	40+344.43 84.67 m Rt.	0.0 - 1.68	BROWN SILT AND CLAY									A-4a	SB-1	41+250.38 4.99 m Lt.	0.0 - 0.46	TOPSOIL									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		0.34 - 1.52	BROWN SILT AND CLAY, VISUAL												A-6a	1.68 - 3.05	GRAY SANDSTONE											VISUAL	0.46 - 1.83	BROWN, GRAY, AND RED SILTY CLAY, VISUAL									A-6b																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		1.52 - 1.80	GRAY SANDSTONE												VISUAL	3.05 - 5.03	GRAY LIMESTONE											VISUAL	1.83 - 2.80	BROWN SILT AND CLAY, VISUAL									A-6a																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		1.80 - 2.90	BROWN SANDSTONE												VISUAL	5.03 - 5.79	GRAY SANDSTONE											VISUAL	2.80 - 3.66	BROWN SHALE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		2.90 - 4.05	GRAY SANDSTONE												VISUAL	SB-53	40+457.61 71.05 m Lt.	0.0 - 0.15	TOPSOIL									VISUAL	3.66 - 4.02	GRAY SANDSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		4.05 - 4.85	GRAY LIMESTONE												VISUAL*			0.15 - 0.91	GRAVEL WITH SAND AND SILT									A-2-4	4.02 - 4.97	GRAY SILTSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		4.85 - 11.28	BROWN SANDSTONE												VISUAL			0.91 - 2.59	SEVERELY WEATHERED GRAY SILTSTONE									VISUAL	4.97 - 5.18	LIGHT GRAY SILTSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		11.28 - 12.80	GRAY SANDSTONE												VISUAL			2.59 - 6.55	GRAY SANDSTONE									VISUAL	5.18 - 5.64	RED CLAYSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		12.80 - 13.29	DARK GRAY SHALE												VISUAL			6.55 - 6.86	GRAY CLAYSTONE									VISUAL	5.64 - 5.82	GRAY SILTSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		13.29 - 13.93	GRAY SANDSTONE												VISUAL			R-43	40+487.98 36.98 m Lt.	0.0 - 1.68	BROWN SANDY SILT, VISUAL									A-4a	SB-6	41+413.83 19.89 m Lt.	0.0 - 0.40	TOPSOIL									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
13.93 - 14.33	DARK GRAY SANDSTONE										VISUAL	1.68 - 3.20	GRAY SILTY CLAY, VISUAL									A-6b	0.40 - 1.83	BROWN SILTY CLAY, VISUAL									A-6b																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
SB-15	39+888.61 19.81m Lt.	0.0 - 0.43	TOPSOIL									VISUAL	R-44	40+603.64 51.83 m Lt.	0.0 - 0.18	TOPSOIL									VISUAL	R-47	41+570.00 0.01m Rt.	0.0 - 0.10	TOPSOIL									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		0.43 - 3.35	LIGHT BROWN GRAVEL WITH SAND, VISUAL												A-1-b	0.18 - 0.92	BROWN SANDY SILT, VISUAL											A-4a	0.10 - 0.76	BROWN SILTY CLAY, VISUAL									A-6b																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		3.35 - 3.47	DARK BROWN SILTY CLAY, VISUAL												A-6b	0.92 - 1.68	MOTTLED BROWN AND GRAY SANDY SILT, VISUAL											A-4a	0.76 - 1.22	BROWN SANDY SILT, VISUAL									A-4a																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		3.47 - 4.88	BROWN AND GRAY SILT AND CLAY, VISUAL												A-6a	1.68 - 2.44	GRAY SILTY CLAY, VISUAL											A-6b	1.22 - 1.68	BROWN SILT AND CLAY, VISUAL									A-6a																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		4.88 - 5.64	BLACK SILT AND CLAY, VISUAL												A-6a	2.44 - 3.20	REDDISH BROWN SILTY CLAY, VISUAL											A-6b	1.68 - 6.40	BROWN AND RED SILTY CLAY, VISUAL									A-6b																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		5.64 - 5.85	GRAY SILTY CLAY, VISUAL												A-6b	3.20 - 3.97	GRAY SANDY SILT, VISUAL											A-4a	6.40 - 15.33	RED CLAYSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		5.85 - 6.40	COAL												VISUAL	3.97 - 4.57	SEVERELY WEATHERED GRAY SILTSTONE											VISUAL	15.33 - 19.17	GRAY SILTSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		6.40 - 6.71	DARK GRAY SHALE												VISUAL	4.57 - 5.22	GRAY SILTSTONE											VISUAL	19.17 - 24.38	GRAY CLAYSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		6.71 - 6.86	GRAY SHALE												VISUAL	5.22 - 6.07	GRAY SANDSTONE											VISUAL	R-48	41+599.99 81.96 m Rt.	0.0 - 0.08	TOPSOIL									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
		6.86 - 7.92	GRAY LIMESTONE												VISUAL	6.07 - 8.45	GRAY SILTSTONE											VISUAL			0.08 - 0.91	BROWN SILTY CLAY, VISUAL									A-6b																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
7.92 - 9.45	GRAY CLAYSTONE										VISUAL	8.45 - 14.94	BROWN AND GRAY SANDSTONE									VISUAL	0.91 - 1.68	BROWN AND GRAY SILT AND CLAY, VISUAL									A-6a*																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
SB-59	39+927.77 2.21m Lt.	0.0 - 0.18	TOPSOIL									VISUAL	R-45	40+824.99 Centerline	0.0 - 0.18	TOPSOIL									VISUAL			0.08 - 0.91	BROWN SILTY CLAY, VISUAL									A-6b																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		0.18 - 0.46	BROWN SILT AND CLAY, VISUAL												A-6a	0.18 - 1.07	BROWN SANDY SILT, VISUAL											A-4a*	0.91 - 1.68	BROWN AND GRAY SILT AND CLAY, VISUAL									A-6a*																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		0.46 - 1.52	SEVERELY WEATHERED BROWN SANDSTONE												VISUAL	1.07 - 1.37	GRAY LIMESTONE											VISUAL	1.68 - 2.44	RED AND BROWN SILT AND CLAY, VISUAL									A-6a																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		1.52 - 7.47	BROWN SANDSTONE												VISUAL*	1.37 - 15.15	BROWN SANDSTONE											VISUAL	2.44 - 3.96	BROWN SANDY SILT, VISUAL									A-4a																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				

* DENOTES SAMPLE TAKEN AT OR NEAR GRADE.

CALCULATED MRS	CHECKED DAA
-------------------	----------------

SOIL PROFILE

ATH-33-40.981

SUMMARY OF SOIL TEST DATA

U.S. ROUTE 33 MAINLINE

* DENOTES SAMPLE TAKEN AT OR NEAR GRADE.
NOTE: NP SHOWN IN LIQUID LIMIT AND PLASTICITY INDEX COLUMNS INDICATES MATERIAL IS NON-PLASTIC.

Boring	Station & Offset	Depth From To	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	% W.C.	ODOT Class	Boring	Station & Offset	Depth From To	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	% W.C.	ODOT Class	Boring	Station & Offset	Depth From To	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	% W.C.	ODOT Class																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
R-62	45+040.16 61.75 m Lt.	0.0 - 0.08	TOPSOIL									VISUAL	R-69	45+805.25 27.86 m Rt.	0.0 - 0.05	TOPSOIL									VISUAL	R-74	46+375.29 50.07 m Rt.	0.0 - 0.40	TOPSOIL									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
		0.08 - 0.91	BROWN SILT AND CLAY, VISUAL									A-6a			0.05 - 0.92	7	14	24	38	17	32	13	16	A-6a	0.40 - 1.68			REDDISH BROWN SILTY CLAY, VISUAL									A-6b																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
		0.91 - 3.05	BROWN SILTSTONE									VISUAL*			0.92 - 1.19	GRAY AND DARK GRAY SILT AND CLAY, VISUAL									A-6a			1.68 - 3.96	BROWN SILTY CLAY, VISUAL									A-6b																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
		3.05 - 6.31	BROWN SANDSTONE									VISUAL			1.19 - 2.71	GRAY COARSE AND FINE SAND, VISUAL									A-3a			3.96 - 4.72	SEV. WEATHERED DARK BROWN SANDSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
		6.31 - 9.24	SEVERELY WEATHERED GRAY CLAYSTONE									VISUAL			2.71 - 3.44	SEV. WEATHERED BROWN AND GRAY CLAYSTONE									VISUAL			4.72 - 5.33	SEVERELY WEATHERED GRAY LIMESTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
		9.24 - 10.67	GRAY SILTSTONE									VISUAL											5.33 - 6.10	GRAY LIMESTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
		10.67 - 11.52	REDDISH BROWN CLAYSTONE									VISUAL			R-70	45+860.02 0.03 m Lt.	0.0 - 0.10	TOPSOIL										VISUAL	6.10 - 7.56	BROWN SANDSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
		11.52 - 12.28	GRAY LIMESTONE									VISUAL					0.10 - 0.92	DARK BROWN GRAVEL WITH SAND AND SILT, VISUAL										A-2-4	7.56 - 9.66	GRAY SANDSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
		12.28 - 14.17	GRAY SILTSTONE									VISUAL					0.92 - 3.05	SEV. WEATHERED BROWN AND GRAY SANDSTONE										VISUAL	9.66 - 9.94	GRAY CLAYSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
		14.17 - 18.59	REDDISH BROWN CLAYSTONE									VISUAL					3.05 - 5.24	BROWN AND GRAY SANDSTONE										VISUAL*	9.94 - 10.58	GRAY SILTSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
SB-42	45+305.24 4.40 m Rt.	0.0 - 0.33	TOPSOIL									VISUAL																6.49 - 7.62	COAL AND CARBONACEOUS SHALE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
		0.33 - 0.91	BROWN SANDY SILT, VISUAL									A-4a	7.62 - 8.84	GRAY SANDSTONE									VISUAL	15.24 - 15.42	BROWN CLAYSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		0.91 - 2.44	BROWN COARSE AND FINE SAND, VISUAL									A-3a														15.42 - 16.00	BROWN SANDSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		2.44 - 2.77	BROWN SILT AND CLAY, VISUAL									A-6a	R-71	45+899.81 28.09 m Lt.	0.0 - 0.13	TOPSOIL									VISUAL	16.00 - 17.25	LIGHT GRAY LIMESTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		2.77 - 3.35	COAL									VISUAL			0.13 - 0.92	BROWN SILT AND CLAY, VISUAL									A-6a	17.25 - 22.04	BROWN AND GRAY SANDSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		3.35 - 4.88	GRAY CLAYSTONE									VISUAL			0.92 - 1.52	SEVERELY WEATHERED BROWN SANDSTONE									VISUAL	22.04 - 22.86	LIGHT GRAY LIMESTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		4.88 - 6.71	GRAY SANDSTONE									VISUAL			1.52 - 2.50	LIGHT GRAY SANDSTONE									VISUAL	22.86 - 25.91	BROWN AND GRAY SANDSTONE									VISUAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	</

CALCULATED
MRS
CHECKED
DAA

SOIL PROFILE

ATH-33-40.981

708
949

SUMMARY OF SOIL TEST DATA
U.S. ROUTE 33 MAINLINE

* DENOTES SAMPLE TAKEN AT OR NEAR GRADE.

NOTE: NP SHOWN IN LIQUID LIMIT AND PLASTICITY INDEX COLUMNS INDICATES MATERIAL IS NON-PLASTIC.

Boring	Station & Offset	Depth From To	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	% W.C.	ODOT Class	Boring	Station & Offset	Depth From To	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	% W.C.	ODOT Class	Boring	Station & Offset	Depth From To	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	% W.C.	ODOT Class										
R-79	46+860.00	0.0 - 0.09	TOPSOIL									VISUAL	SB-37	47+749.13	0.0 - 0.33	TOPSOIL									VISUAL	R-91	48+379.99	0.0 - 0.09	TOPSOIL									VISUAL							
	51.99 m Rt.	0.09 - 0.43	BROWN SILT AND CLAY, VISUAL									A-6a*		0.27 m Lt.	0.33 - 1.83	BROWN AND RED SILT AND CLAY, VISUAL									A-6a		10.00 m Lt.	0.09 - 0.91	0	9	50	23	18	17	7	13	A-4a								
		0.43 - 0.92	BROWN SILT, VISUAL									A-4b			1.83 - 2.44	LIGHT BROWN COARSE AND FINE SAND, VISUAL									A-3a			0.91 - 1.68	BROWN COARSE AND FINE SAND, VISUAL									A-3a							
		0.92 - 6.10	SEVERELY WEATHERED BROWN SANDSTONE									VISUAL			2.44 - 3.05	SEV. WEATHERED LIGHT BROWN SANDSTONE									VISUAL			1.68 - 4.42	SEVERELY WEATHERED BROWN SILTSTONE									VISUAL							
		6.10 - 6.86	BROWN SANDSTONE									VISUAL			3.05 - 5.64	LIGHT BROWN SANDSTONE									VISUAL			4.42 - 7.62	GRAY SANDSTONE									VISUAL							
		11.92 - 13.41	GRAY SILTSTONE									VISUAL															7.62 - 16.46	BROWN SANDSTONE									VISUAL*								
SB-40	46+898.31	0.0 -0.11	TOPSOIL									VISUAL	R-85	47+840.04	0.0 - 0.34	TOPSOIL									VISUAL	R-93	48+478.12	0.0 - 0.46	TOPSOIL									VISUAL							
	4.16 m Lt.	0.11 - 0.91	BROWN SILT, VISUAL									A-4b		65.12 m Lt.	0.34 - 0.61	BROWN SILT AND CLAY, VISUAL									A-6a*		29.38 m Rt.	0.46 - 1.07	BROWN AND GRAY COARSE AND FINE SAND, VISUAL									A-3a							
		0.91 - 1.98	BROWN AND GRAY SILTY CLAY, VISUAL									A-6b			0.61 - 0.91	BROWN SILT AND CLAY, VISUAL									A-6a			1.07 - 1.16	SEVERELY WEATHERED BROWN SANDSTONE									VISUAL							
		1.98 - 3.05	BROWN SHALE									VISUAL			0.91 - 2.44	BROWN SILT AND CLAY, VISUAL									A-6a																				
		3.05 - 5.18	BROWN AND GRAY SANDSTONE									VISUAL			2.44 - 3.05	SEVERELY WEATHERED BROWN SANDSTONE									VISUAL																				
														3.05 - 7.19	BROWN SANDSTONE									VISUAL	R-92	48+480.00	0.0 - 0.12	TOPSOIL									VISUAL								
														7.19 - 13.53	GRAY SANDSTONE									VISUAL		30.00 m Lt.	0.12 - 2.44	BROWN COARSE AND FINE SAND, VISUAL									A-3a								
R-82	47+052.36	0.0 - 0.09	AGGREGATE BASE									VISUAL			13.53 - 15.39	DARK GRAY SILTSTONE									VISUAL			2.44 - 4.42	SEVERELY WEATHERED BROWN SANDSTONE									VISUAL							
	42.45 m Lt.	0.09 - 1.37	0	8	12	51	29	29	10	20	A-4b*			15.39 - 16.15	BROWN SANDSTONE									VISUAL			4.42 - 14.94	BROWN SANDSTONE									VISUAL*								
		1.37 - 3.05	BROWN AND GRAY SHALE									VISUAL																																	
		3.05 - 5.73	BROWN SANDSTONE									VISUAL	R-86	47+939.99	0.0 - 0.40	TOPSOIL									VISUAL	R-94	48+619.91	0.0 - 0.15	TOPSOIL									VISUAL							
		5.73 - 6.34	BROWN AND GRAY SHALE									VISUAL		45.01 m Lt.	0.40 - 0.91	BROWN SILT AND CLAY, VISUAL									A-6a*		Centerline	0.15 - 1.83	0	18	45	21	16	20	6	15	A-4a								
		6.34 - 7.25	BROWN SANDSTONE									VISUAL			0.91 - 1.68	REDDISH BROWN SILTY CLAY, VISUAL									A-6b			1.83 - 3.20	BROWN COARSE AND FINE SAND, VISUAL									A-3a							
		7.25 - 10.58	GRAY AND BROWN CLAYSTONE									VISUAL			1.68 - 2.44	RED. BRN. AND LT. BROWN SILT AND CLAY, VISUAL									A-6a			3.20 - 7.01	SEVERELY WEATHERED GRAY SILTSTONE									VISUAL*							
		10.58 - 13.41	GRAY SILTSTONE									VISUAL			2.44 - 3.05	SEV. WEATHERED LIGHT BROWN SILTSTONE									VISUAL			7.01 - 7.62	COAL									VISUAL							
														3.05 - 4.11	SEV. WEATHERED LIGHT BROWN SANDSTONE									VISUAL			7.62 - 8.81	SEVERELY WEATHERED GRAY SILTSTONE									VISUAL								
														4.11 - 4.33	GRAY SANDSTONE									VISUAL																					
R-81	47+059.94	0.0 - 0.06	AGGREGATE BASE									VISUAL			4.33 - 6.10	BROWN SANDSTONE									VISUAL																				
	1.11 m Rt.	0.06 - 1.52	SEV. WEATHERED LIGHT BROWN SANDSTONE									VISUAL			6.10 - 8.87	GRAY SILTSTONE									VISUAL	SB-35	48+676.95	0.0 - 0.38	TOPSOIL									VISUAL							
		1.52 - 5.49	BROWN SANDSTONE									VISUAL			8.87 - 13.20	GRAY AND BROWN SANDSTONE									VISUAL		Centerline	0.38 - 0.91	GRAY SILT AND CLAY, VISUAL									A-6a							
		5.49 - 7.32	GRAY AND RED CLAYSTONE									VISUAL*															0.91 - 1.92	GRAY SANDY SILT, VISUAL									A-4a								
		7.32 - 10.03	GRAY SILTSTONE									VISUAL															1.92 - 2.44	GRAY AND BROWN SILTY CLAY, VISUAL									A-6b								
		10.03 - 11.58	GRAY SANDSTONE									VISUAL	R-87	48+100.02	0.0 - 0.24	TOPSOIL																					VISUAL								
														0.24 - 0.91	DARK BROWN COARSE AND FINE SAND, VISUAL									A-3a			3.20 - 4.97	SEVERELY WEATHERED GRAY SHALE									VISUAL								
														0.91 - 3.05	SEVERELY WEATHERED BROWN SANDSTONE									VISUAL																					
SB-39	47+143.36	0.0 - 0.37	TOPSOIL									VISUAL			3.05 - 11.89	BROWN SANDSTONE									VISUAL*	R-95	48+780.84	0.0 - 3.20	BROWN GRAVEL WITH SAND, VISUAL									A-1-b							
	1.12 m Rt.	0.37 - 0.91	BROWN SILT AND CLAY, VISUAL									A-6a															3.20 - 4.57	SEVERELY WEATHERED BROWN SANDSTONE									VISUAL								
		0.91 - 1.83	BROWN AND GRAY SILT AND CLAY, VISUAL									A-6a															4.57 - 17.92	BROWN SANDSTONE									VISUAL*								
		1.83 - 5.58	SEV. WD. BROWN AND LIGHT GRAY SANDSTONE									VISUAL	R-88	48+194.71	0.0 - 0.09	TOPSOIL									VISUAL			17.92 - 18.62	COAL									VISUAL							
														0.09 - 0.91	0									2	14	74	10	NP	NP	29	A-4b			18.62 - 19.05	GRAY CLAYSTONE									VISUAL	
R-83	47+179.92	0.0 - 0.37	TOPSOIL									VISUAL			0.91 - 1.68	0									19	43	22	16	19	6	17	A-4a			19.05 - 19.48	GRAY LIMESTONE									VISUAL
	0.32 m Rt.	0.37 - 0.92	BROWN AND GRAY SILT AND CLAY, VISUAL									A-6a			1.68 - 2.44	GRAY COARSE AND FINE SAND, VISUAL									A-3a			19.48 - 22.86	GRAY CLAYSTONE									VISUAL							
		0.92 - 4.42	BROWNISH GRAY SILT AND CLAY, VISUAL									A-6a*			2.44 - 3.20	SEVERELY WEATHERED GRAY SHALE									VISUAL			22.86 - 23.90	BROWN SANDSTONE									VISUAL							
		4.42 - 6.25	SEV. WEATHERED BROWNISH GRAY SHALE									VISUAL			3.20 - 7.01	SEVERELY WEATHERED GRAY CLAYSTONE									VISUAL			23.90 - 25.60	GRAY, RED, AND BROWN CLAYSTONE									VISUAL							
		6.25 - 8.78	GRAY SANDSTONE									VISUAL			7.01 - 8.35	SEV. WEATHERED GRAY AND DARK GRAY SHALE									VISUAL																				
R-84	47+200.08	0.0 - 0.21	TOPSOIL									VISUAL	R-89	48+229.28	0.0 - 0.12	TOPSOIL									VISUAL	SB-30	48+840.60	0.0 - 0.25	TOPSOIL									VISUAL							
	28.06 m Lt.	0.21 - 0.92	BROWN SILT AND CLAY, VISUAL									A-6a		0.39 m Rt.	0.12 - 0.91	BROWN SILT AND CLAY, VISUAL									A-6a		5.80 m Rt.	0.25 - 2.59	BROWN SILT AND CLAY, VISUAL									A-6a							
		0.92 - 1.68	BROWN COARSE AND FINE SAND, VISUAL									A-3a			0.91 - 3.96	BROWN COARSE AND FINE SAND, VISUAL									A-3a			2.59 - 3.35	BROWN SANDY SILT, VISUAL									A-4a							
		1.68 - 4.73	BROWN SANDSTONE									VISUAL			3.96 - 7.62	SEVERELY WEATHERED BROWN SANDSTONE									VISUAL			3.35 - 4.27	SEVERELY WEATHERED GRAY SHALE									VISUAL							
		4.73 - 6.10	SEVERELY WEATHERED GRAY CLAYSTONE									VISUAL			7.62 - 9.54	SEVERELY WEATHERED DARK GRAY SHALE									VISUAL			4.27 - 4.88	DARK BROWN SANDY SILT, VISUAL									A-4a							
		6.10 - 8.23	GRAY CLAYSTONE									VISUAL															4.88 - 5.36	BROWN SANDSTONE									VISUAL								
		8.23 - 13.41	GRAY SANDSTONE									VISUAL*	R-90	48+259.95	0.0 - 0.15	TOPSOIL									VISUAL			5.36 - 6.13	GRAY LIMESTONE									VISUAL							
		13.41 - 14.33	BROWN AND GRAY SANDSTONE									VISUAL		27.98 m Lt.	0.15 - 0.91	ORANGISH BROWN SANDY SILT, VISUAL									A-4a			6.13 - 8.08	GRAY SANDSTONE									VISUAL							
														0.91 - 3.96	SEV. WEATHERED ORANGE AND GRAY SHALE									VISUAL																					
														3.96 - 12.50	BROWN SANDSTONE									VISUAL*																					
SB-38	47+610.18	0.0 - 0.14	TOPSOIL									VISUAL																									VISUAL								
	2.09 m Rt.	0.14 - 0.70	BROWN SILT AND CLAY, VISUAL									A-6a																									A-6a								
		0.70 - 1.19	BROWN COARSE AND FINE SAND, VISUAL									A-3a		SB-36	48+302.40	0.0 - 0.25	TOPSOIL									VISUAL			3.66 - 4.42	SEVERELY WEATHERED GRAY SHALE									VISUAL						
		1.19 - 3.35	BROWN FINE SAND, VISUAL									A-3		Centerline	0.25 - 0.91	BROWN SANDY SILT, VISUAL									A-4a			4.42 - 4.63	GRAY FINE GRAINED SANDSTONE									VISUAL							
		3.35 - 4.57	SEVERELY WEATHERED GRAY SANDSTONE									VISUAL			0.91 - 2.13	BROWN AND GRAY COARSE AND FINE SAND, VISUAL									A-3a			4.63 - 5.18	LIGHT GRAY LIMESTONE									VISUAL							
		4.57 - 7.68	GRAY SANDSTONE									VISUAL			2.13 - 4.94	SEVERELY WEATHERED BROWN SANDSTONE									VISUAL			5.18 - 7.99	GRAY SANDSTONE									VISUAL							
		7.68 - 7.77	COAL									VISUAL																																	
		7.77 - 7.89	DARK GRAY UNDERCLAY									VISUAL																																	
		7.89 - 8.23	DARK GRAY SHALE									VISUAL																																	

NOTE: NP SHOWN IN LIQUID LIMIT AND PLASTICITY INDEX COLUMNS INDICATES MATERIAL IS NON-PLASTIC

	12 / 132	ATH-33-40.981	SOIL PROFILE	CALCULATED MRS
				CHECKED DAA

SUMMARY OF SOIL TEST DATA
SIDE ROADS

* DENOTES SAMPLE TAKEN AT OR NEAR GRADE.

Boring	Northing & Easting	From	To	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L	P.I	W.C.	ODOT Class.
TR 68 (Right of Mainline)												
R-1	1+023.07, 1.22 m Rt.	0.00	0.09	AGGREGATE BASE								VISUAL
		0.09	2.59	3	5	16	40	36	38	18	27	A-6b
		2.59	2.83	SEVERELY WEATHERED BROWN AND GRAY SHALE								VISUAL
R-2	1+104.76, 7.18 m Lt.	0.00	0.09	AGGREGATE BASE								VISUAL
		0.09	1.07	REDISH BROWN SILT AND CLAY (VISUAL)								A-6a
		1.07	3.05	SEVERELY WEATHERED BROWN SHALE								VISUAL
R-39	1+133.00, CL	0.00	0.15	TOPSOIL								VISUAL
		0.15	2.59	SILT AND CLAY (VISUAL)								A-6a
		2.59	4.57	SEVERELY WEATHERED GRAY SHALE								VISUAL CLASS
TR 68 (Right of Mainline)												
R-3	2+008.90, 1.92 m Lt.	0.00	0.15	AGGREGATE BASE								VISUAL
		0.15	1.83	BROWN SILTY CLAY (VISUAL)								A-6b*
		1.83	2.87	SEVERELY WEATHERED GRAY SANDSTONE								VISUAL
R-4	2+069.16, 1.45 m Rt.	0.00	0.06	AGGREGATE BASE								VISUAL
		0.06	1.52	21	17	34	13	15	28	13	22	A-2-6*
		1.52	2.74	GRAY SILTY CLAY (VISUAL)								A-6b
		2.74	3.05	SEVERELY WEATHERED GRAY AND REDDISH BROWN SHALE								VISUAL
TR 67												
R-5	1+020.57, 1.02 m Lt.	0.00	0.09	AGGREGATE BASE								VISUAL
		0.09	1.07	REDDISH BROWN CLAY (VISUAL)								A-7-6*
		1.07	2.99	SEVERELY WEATHERED REDDISH BROWN SHALE								VISUAL
R-6	1+116.76, 4.65 m Lt.	0.00	0.09	AGGREGATE BASE								VISUAL
		0.09	2.68	SEVERELY WEATHERED GRAY SHALE								VISUAL
CR 89												
R-7	2+039.83, CL	0.00	0.12	AGGREGATE BASE								VISUAL
		0.12	1.68	1	1	4	38	56	52	34	20	A-7-6
		1.68	2.68	BROWN SANDSTONE FRAGMENTS								VISUAL
R-8	2+140.90, CL	0.00	0.09	AGGREGATE BASE								VISUAL
		0.09	1.07	REDDISH BROWN CLAY (VISUAL)								A-7-6
		1.07	2.99	SEVERELY WEATHERED BROWN SHALE								VISUAL
B-101	2+247.94, 12.97 m Rt.	0.00	0.10	GRAY GRAVEL								VISUAL
		0.10	1.60	MOTTLED RED AND GRAY SILTY CLAY (VISUAL)								A-6b
		1.60	2.10	11	8	20	38	23	28	10	9	A-4a
		2.10	2.70	SEVERELY WEATHERED BROWN SANDSTONE								VISUAL
R-38	2+359.94, 25.95 m Lt.	0.00	0.30	TOPSOIL								VISUAL
		0.30	2.44	REDDISH BROWN SILTY CLAY (VISUAL)								A-6b
		2.44	3.43	BROWN SANDSTONE								VISUAL
R-37	2+360.01, 0.01 m Lt.	0.00	0.30	TOPSOIL								VISUAL
		0.30	0.91	BROWN SILT AND CLAY (VISUAL)								A-6a
		0.91	1.83	BROWN SANDY SILT (VISUAL)								A-4a
		1.83	3.40	BROWN SHALE								VISUAL
R-9	2+361.04, 12.58 m Rt.	0.00	0.15	AGGREGATE BASE								VISUAL
		0.15	2.44	REDDISH BROWN SILTY CLAY (VISUAL)								A-6b
		2.44	6.10	SEVERELY WEATHERED BROWNISH GRAY SHALE								VISUAL
R-10	2+480.00, CL	0.00	0.15	AGGREGATE BASE								VISUAL
		0.15	1.98	1	8	4	53	34	42	21	24	A-7-6
		1.98	2.44	SEVERELY WEATHERED REDDISH BROWN AND BROWN SHALE								VISUAL
		2.44	3.05	GRAY SILTY CLAY (VISUAL)								A-6b

Boring	Northing & Easting	From To	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L	P.I	W.C.	ODOT Class.
TR 412											
R-11	10+998.32, 1.06 m Lt.	0.00 - 0.21	AGGREGATE BASE								VISUAL*
		0.21 - 2.87	SEVERELY WEATHERED BROWN AND GRAY SHALE								VISUAL
R-12	11+120.42, 0.64 m Lt.	0.00 - 0.09	AGGREGATE BASE								VISUAL
		0.09 - 2.59	REDDISH BROWN SILTY CLAY (VISUAL)								A-6b
		2.59 - 4.42	SEVERELY WEATHERED BROWNISH GRAY SHALE								VISUAL*
R-13	11+220.12, 3.51 m Rt.	0.00 - 0.09	AGGREGATE BASE								VISUAL
		0.09 - 3.05	SEVERELY WEATHERED BROWN SHALE								VISUAL
		3.05 - 3.99	LIGHT GRAY LIMESTONE								VISUAL
		3.99 - 5.79	BROWN SANDSTONE								VISUAL*
SB-48	11+349.19, 3.11 m Lt.	0.00 - 0.30	TOPSOIL								VISUAL
		0.30 - 1.68	BROWN SANDY SILT (VISUAL)								A-4a
		1.68 - 2.44	BROWN COARSE AND FINE SAND (VISUAL)								A-3a
		2.44 - 3.66	BROWN AND GRAY SILTY CLAY (VISUAL)								A-6b
		3.66 - 3.96	DARK BROWN SILT AND CLAY (VISUAL)								A-6a
		3.96 - 6.10	SEVERELY WEATHERED GRAYISH BROWN SILTSTONE								VISUAL*
		6.10 - 6.95	GRAY SILTSTONE								VISUAL
		6.95 - 8.32	GRAY AND DARK GRAY SANDSTONE								VISUAL
B-110	11+368.32, 7.93 m Lt.	8.32 - 8.78	GRAY SILTSTONE								VISUAL
		0.00 - 0.10	TOPSOIL								VISUAL
		0.10 - 0.50	BROWN SILTY CLAY (VISUAL)								A-6b
		0.50 - 1.00	BROWN SILTY SAND (VISUAL)								A-4a
		1.00 - 4.90	SEVERELY WEATHERED BROWN SANDSTONE								VISUAL
		4.90 - 5.50	BROWN SANDSTONE								VISUAL*
		5.50 - 7.90	GRAY MUDSTONE								VISUAL
		7.90 - 12.50	GRAY SANDSTONE								VISUAL
		12.50 - 17.10	BROWN SANDSTONE								VISUAL
SB-47	11+394.59, 2.49 m Rt.	0.00 - 0.09	TOPSOIL								VISUAL
		0.09 - 2.44	0	5	60	20	15	19	3	16	A-3a
		2.44 - 4.57	BROWN AND GRAY SILTY CLAY (VISUAL)								A-6b*
		4.57 - 5.79	GRAY SHALE								VISUAL
		5.79 - 9.60	GRAY SANDSTONE								VISUAL
R-14	11+489.64, 4.69 m Rt.	0.00 - 0.15	TOPSOIL								VISUAL
		0.15 - 1.83	BROWN SILT AND CLAY (VISUAL)								A-6a
		1.83 - 3.05	SEVERELY WEATHERED BROWN SANDSTONE								VISUAL
		3.05 - 7.01	BROWN SANDSTONE								VISUAL*
		7.01 - 7.50	GRAY CLAYSTONE								VISUAL
R-15	11+599.58, 0.93 m Lt.	7.50 - 8.84	GRAY SILTSTONE								VISUAL
		0.00 - 0.09	AGGREGATE BASE								VISUAL
		0.09 - 2.44	2	9	28	41	20	21	5	19	A-4a*
		2.44 - 3.05	SEVERELY WEATHERED GRAY SANDSTONE								VISUAL

CALCULATED
TAH
CHECKED
DAA

SOIL PROFILE

ATH-33-40.981

13 / 132

711
949

SUMMARY OF SOIL TEST DATA
SIDE ROADS

* DENOTES SAMPLE TAKEN AT OR NEAR GRADE.

Boring	Northing & Easting	From To	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L	P.I	W.C.	ODOT Class.
TR 243 (Right of Mainline)											
R-16	0+080.70,	0.00 - 0.15	AGGREGATE BASE								VISUAL*
	1.35 m Rt.	0.15 - 2.71	SEVERELY WEATHERED BROWN SANDSTONE								VISUAL
R-17	0+161.09,	0.00 - 0.12	AGGREGATE BASE								VISUAL
	1.62 m Lt.	0.12 - 2.87	SEVERELY WEATHERED BROWN SANDSTONE								VISUAL*
R-81	47+059.94,	0.00 - 0.06	AGGREGATE BASE								VISUAL
	1.11 m Lt	0.06 - 1.52	SEVERELY WEATHERED BROWN SANDSTONE								VISUAL
	(US 33)	1.52 - 5.49	BROWN SANDSTONE								VISUAL
		5.49 - 7.32	GRAY AND RED CLAYSTONE								VISUAL*
		7.32 - 10.03	GRAY SILTSTONE								VISUAL
		10.03 - 11.58	GRAY SANDSTONE								VISUAL
TR 243 (Left of Mainline)											
R-20	0+035.62,	0.00 - 0.40	TOPSOIL								VISUAL*
	0.49 m Rt.	0.40 - 1.07	BROWN AND GRAY CLAY (VISUAL)								A-7-6
		1.07 - 3.05	SEVERELY WEATHERED BROWN AND GRAY SHALE								VISUAL
R-21	0+129.81,	0.00 - 0.30	TOPSOIL								VISUAL*
	2.70 m Rt.	0.30 - 0.76	AGGREGATE BASE								VISUAL
		0.76 - 2.68	SEVERELY WEATHERED LIGHT BROWN SHALE								VISUAL

Boring	Northing & Easting	From To	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L	P.I	W.C.	ODOT Class.
SR 681 (At Grade)											
R-22	51+049.22, 2.27 m Rt.	0.00 - 0.24	ASPHALT CONCRETE AND AGGREGATE BASE								VISUAL
		0.24 - 3.05	SEVERELY WEATHERED BROWN SHALE								VISUAL*
R-23	51+169.26, 0.84 m Lt.	0.00 - 0.37	ASPHALT CONCRETE AND AGGREGATE BASE								VISUAL
		0.37 - 2.13	7	9	11	30	43	45	21	21	A-7-6
		2.13 - 3.20	BROWN SILTY CLAY (VISUAL)								A-6b
		3.20 - 4.88	BROWN AND GRAY COARSE AND FINE SAND (VISUAL)								A-3a
		4.88 - 5.85	GRAY SANDY SILT (VISUAL)								A-4a
		5.85 - 8.02	SEVERELY WEATHERED GRAY SHALE								VISUAL
R-34	51+245.99, 32.02 m Rt.	0.00 - 0.21	TOPSOIL								VISUAL
		0.21 - 1.83	BROWN SANDY SILT (VISUAL)								A-4a
		1.83 - 2.71	GRAY SILT AND CLAY (VISUAL)								A-6a
		2.71 - 3.41	GRAY SHALE FRAGMENTS								VISUAL
R-24	51+246.00, 3.00 m Rt.	0.00 - 0.24	TOPSOIL								VISUAL
		0.24 - 4.11	BROWN SILT AND CLAY (VISUAL)								A-6a
		4.11 - 5.09	SEVERELY WEATHERED GRAY SHALE								VISUAL
R-25	51+288.77, 1.34 m Lt.	0.00 - 0.46	ASPHALT CONCRETE AND AGGREGATE BASE								VISUAL
		0.46 - 3.20	SEVERELY WEATHERED BROWN SHALE								VISUAL
R-26	51+410.24, 19.49 m Rt.	0.00 - 0.30	AGGREGATE BASE								VISUAL
		0.30 - 1.07	BROWN COARSE AND FINE SAND (VISUAL)								A-3a
		1.07 - 2.59	BROWN SILT AND CLAY (VISUAL)								A-6a
		2.59 - 4.39	SEVERELY WEATHERED BROWN SHALE								VISUAL
R-27	51+490.55, 21.21 m Lt.	0.00 - 0.21	TOPSOIL								VISUAL
		0.21 - 3.51	SEVERELY WEATHERED BROWN SANDSTONE								VISUAL
		3.51 - 4.88	SEVERELY WEATHERED BLACK SHALE								VISUAL
		4.88 - 7.77	SEVERELY WEATHERED GRAY SHALE								VISUAL
		7.77 - 8.53	GRAY LIMESTONE								VISUAL
		8.53 - 13.26	GRAY CLAYSTONE								VISUAL*
		13.26 - 13.56	COAL								VISUAL
		13.56 - 14.17	BLACK SHALE								VISUAL
		14.17 - 15.24	GRAY SILTSTONE								VISUAL
R-28	51+619.60, 2.45 m Lt.	0.00 - 0.27	ASPHALT CONCRETE AND AGGREGATE BASE								VISUAL
		0.27 - 0.91	POSSIBLE FILL: BROWN SANDY SILT (VISUAL)								A-4a
		0.91 - 3.05	BROWN SANDY SILT (VISUAL)								A-4a
R-29	51+696.59, 2.71 m Lt.	0.00 - 0.37	ASPHALT CONCRETE AND AGGREGATE BASE								VISUAL
		0.37 - 1.68	0	1	3	28	68	52	30	20	A-7-6*
		1.68 - 2.59	BROWN SILTY CLAY (VISUAL)								A-6b
		2.59 - 3.05	BROWN SANDY SILT (VISUAL)								A-4a

CALCULATED
TAH
CHECKED
DAA

SOIL PROFILE

ATH-33-40.981

14 / 132

712
949

SUMMARY OF SOIL TEST DATA
SIDE ROADS

* DENOTES SAMPLE TAKEN AT OR NEAR GRADE.

Boring	Northing & Easting	From To	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L	P.I	W.C.	ODOT Class.
Old US 33 (At Grade)											
R-27	46+027.22, 36.29 m Lt.	0.00 - 0.21	TOPSOIL								VISUAL
		0.21 - 3.51	BROWN SANDSTONE								VISUAL
		3.51 - 4.88	BLACK SHALE								VISUAL
		4.88 - 7.77	SEVERELY WEATHERED GRAY SHALE								VISUAL
		7.77 - 8.53	SEVERELY WEATHERED GRAY LIMESTONE								VISUAL
		8.53 - 13.26	GRAY CLAYSTONE								VISUAL*
		13.26 - 13.56	COAL								VISUAL
		13.56 - 14.17	BLACK SHALE								VISUAL
		14.17 - 15.24	GRAY SILTSTONE								VISUAL
R-30	46+069.98, 0.01 m Lt.	0.00 - 0.15	TOPSOIL								VISUAL
		0.15 - 1.07	0	20	37	19	24	23	9	14	A-4a
		1.07 - 7.62	SEVERELY WEATHERED REDDISH BROWN SANDSTONE								VISUAL
		7.62 - 8.38	SEVERELY WEATHERED GRAY SHALE								VISUAL
		8.38 - 10.00	GRAY SILTSTONE								VISUAL
		10.00 - 10.52	COAL								VISUAL
		10.52 - 10.97	GRAY SILTSTONE								VISUAL
		10.97 - 13.41	GRAY LIMESTONE								VISUAL
		13.41 - 17.25	RED AND GRAY SILTSTONE								VISUAL*
		17.25 - 17.86	COAL								VISUAL
		17.86 - 19.20	DARK GRAY CLAYSTONE								VISUAL
R-31A	46+192.35, 13.05 m Rt.	0.00 - 0.37	TOPSOIL								VISUAL
		0.37 - 1.07	BROWN SANDY SILT (VISUAL)								A-4a
		1.07 - 5.64	SEVERELY WEATHERED BROWN SANDSTONE								VISUAL*
		5.64 - 6.00	SEVERELY WEATHERED GRAY SHALE								VISUAL
R-33	46+341.84, 3.27 m Lt.	0.00 - 0.24	ASPHALT CONCRETE								VISUAL*
		0.24 - 1.83	2	3	14	33	48	48	28	22	A-7-6
		1.83 - 3.05	BROWN SILT AND CLAY (VISUAL)								A-6a

CALCULATED
TAH
CHECKED
DAA

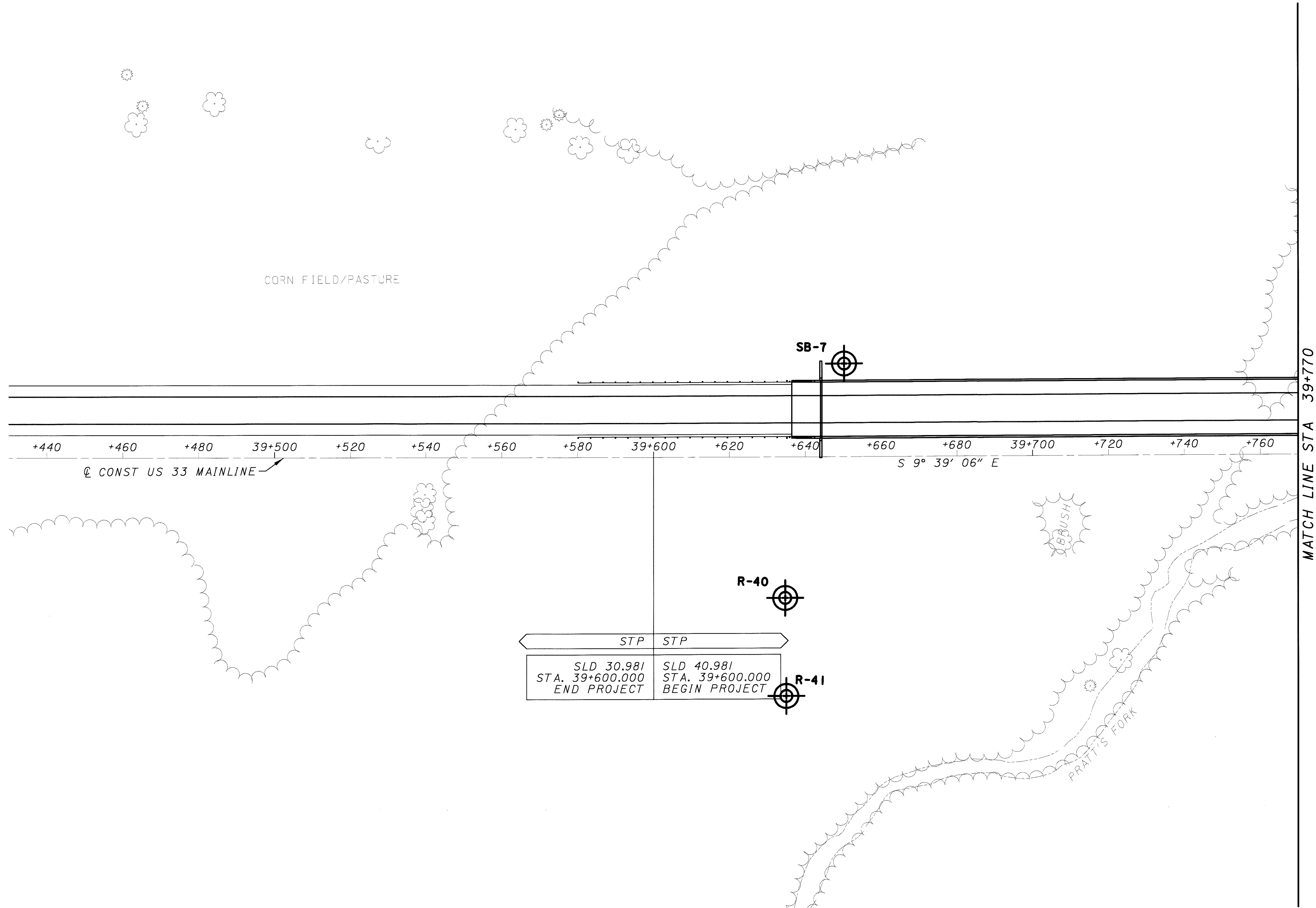
SOIL PROFILE

ATH-33-40.981

15 / 132

713
949

02/06/01
09:33:17 AM
Me:\proj\982\1016-00\DS1\geot\tech\plan33_01.dgn



0 10 20
HORIZONTAL
SCALE IN METERS

CALCULATED	CHECKED
RS	DAA

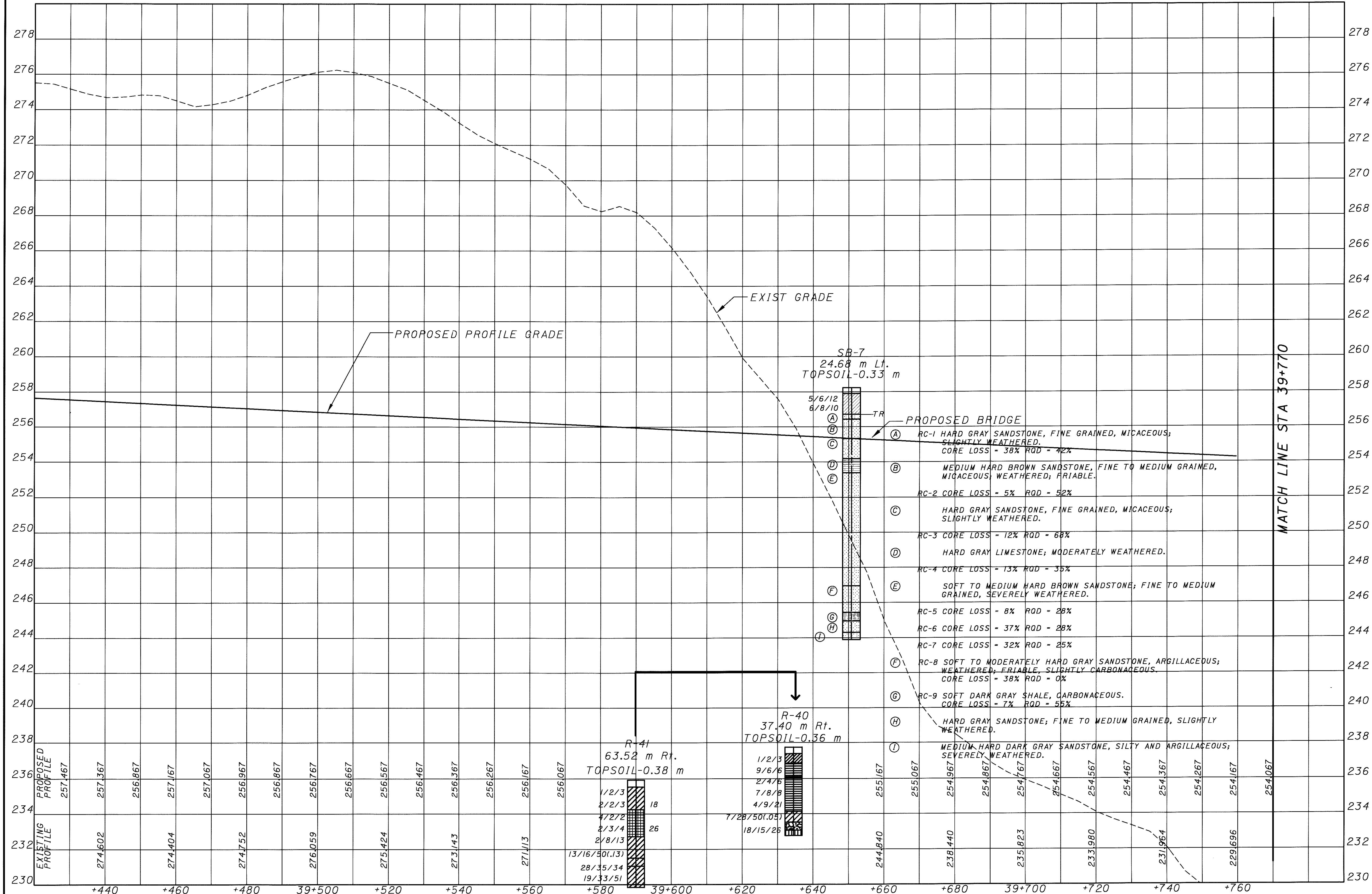
SOIL PROFILE
STA. 39+430 TO STA. 39+770

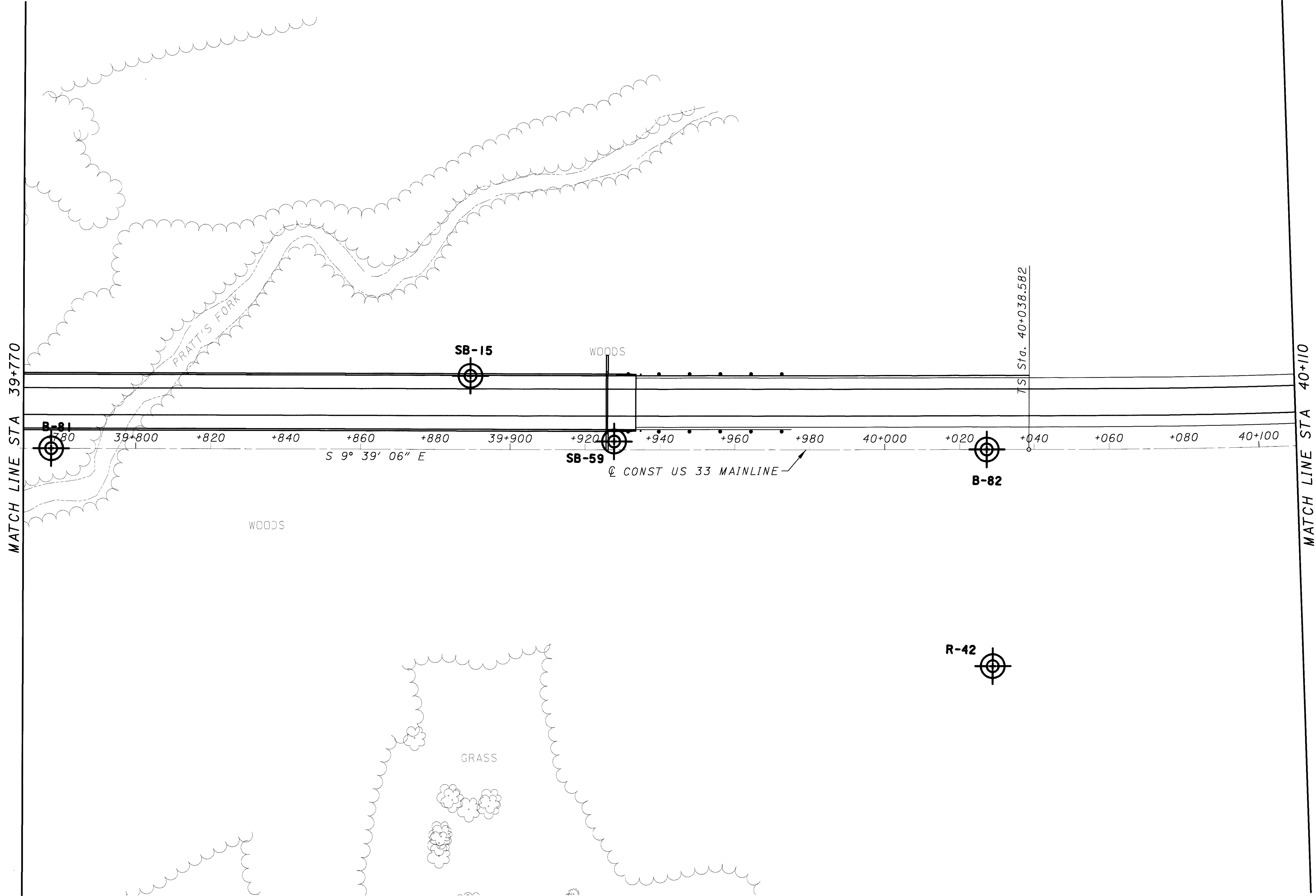
ATH-33-40.981

16 / 132

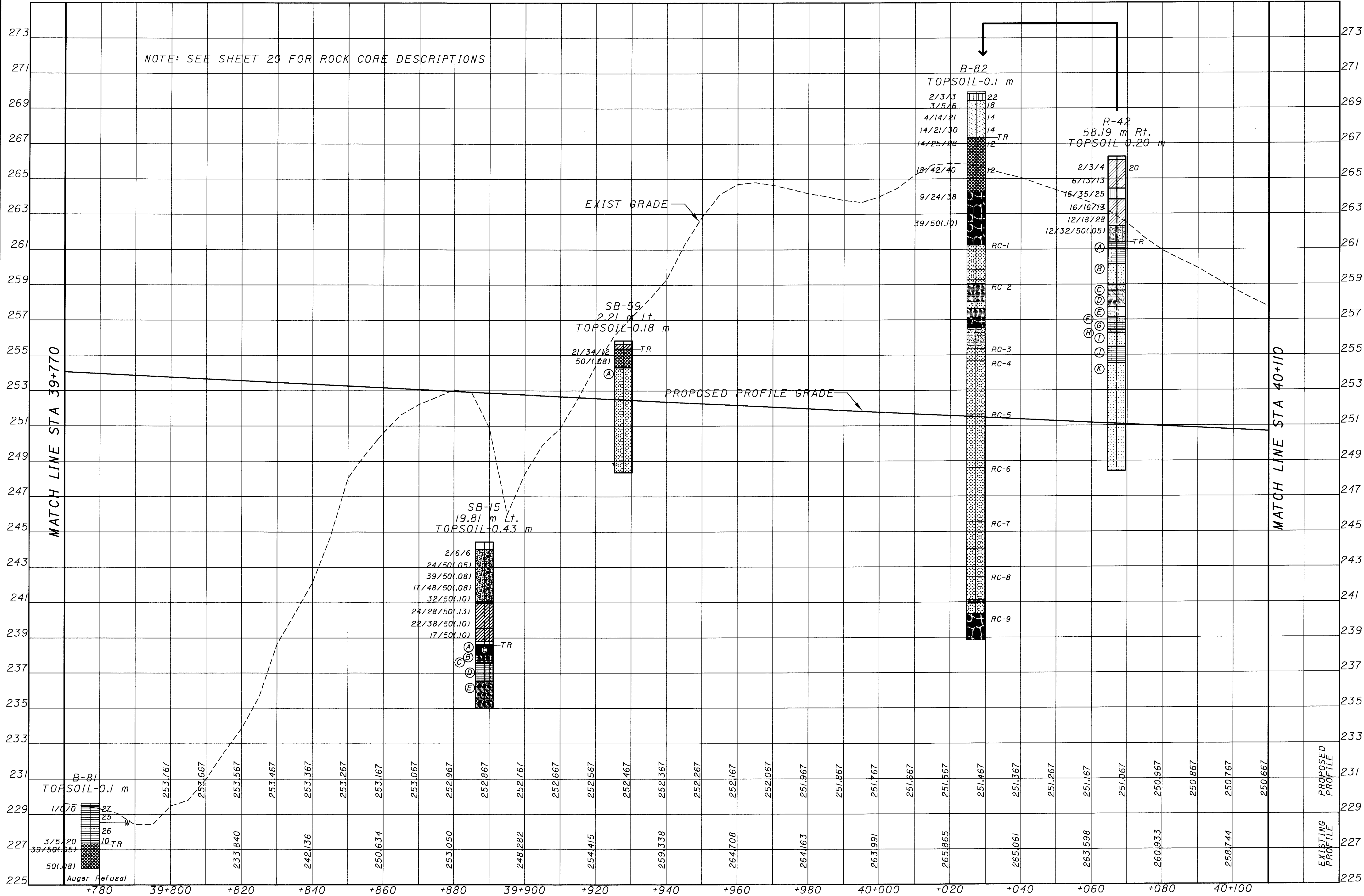
714
949

02/06/01
11:38:13 AM
\\msproj\9821\106-00\US\gootech\gts33_01.dgn





02/06/01
10:41:11 AM
M:\proj\1982\1016_00\DSI\geotech\gfu33_02.dgn



CALCULATED		DC	CHECKED	DAA
SOIL PROFILE STA. 39+770 TO STA. 40+110				
ATH-33-40.981				
19		132		
717		949		

- SB-15
- (A) RC-1 VERY SOFT BLACK COAL; CORE LOSS.
CORE LOSS =100% RQD = 0%
- (B) RC-2 SOFT DARK GRAY SHALE, CARBONACEOUS;
WEATHERED; LOSS.
CORE LOSS = 5% RQD = 55%
- (C) MEDIUM HARD GRAY SHALE, CALCAREOUS;
WEATHERED; BROKEN.
- (D) HARD GRAY LIMESTONE; MODERATELY WEATHERED.
- (E) RC-3 SOFT GRAY CLAYSTONE, CALCAREOUS; WEATHERED.
CORE LOSS = 28% RQD = 58%

- SB-59
- (A) RC-1 MEDIUM HARD TO HARD BROWN SANDSTONE, FINE TO
COARSE GRAINED, MICACEOUS.
CORE LOSS = 15% RQD = 76%
- RC-2 CORE LOSS = 3% RQD = 97%
- RC-3 NO CORE LOSS RQD = 98%

- B-82
- RC-1 SANDSTONE; BROWN, MEDIUM HARD, SLIGHTLY BROKEN,
SLIGHTLY JOINTED, MEDIUM GRAINED, CALCAREOUS,
MODERATELY WEATHERED.
CORE LOSS = 4% RQD = 34%
- SANDSTONE; GRAY, MEDIUM TO MODERATELY HARD, MASSIVE,
FINE GRAINED, MICACEOUS.
- RC-2 SHALE; GRAY, VERY SOFT TO SOFT, HIGHLY BROKEN,
HIGHLY JOINTED, ARENACEOUS, FISSILE.
CORE LOSS = 3% RQD = 8%
- SANDSTONE; GRAY, MEDIUM TO MODERATELY HARD, SLIGHTLY
BROKEN, SLIGHTLY JOINTED, MICACEOUS.
- SHALE; GRAY, VERY SOFT TO SOFT, HIGHLY BROKEN,
HIGHLY JOINTED, ARENACEOUS, FISSILE.
- MUDSTONE; GRAY, SOFT TO VERY SOFT, HIGHLY BROKEN,
HIGHLY JOINTED, SILTY.
- RC-3 SILTSTONE; GRAY, SOFT, MASSIVE.
CORE LOSS = 17% RQD = 66%
- RC-4 SANDSTONE; BROWN, MEDIUM TO MODERATELY HARD, MASSIVE,
COARSE GRAINED.
NO CORE LOSS RQD = 92%
- RC-5 NO CORE LOSS RQD = 97%
- RC-6 NO CORE LOSS RQD = 82%
- RC-7 SANDSTONE; GRAY, MODERATELY HARD, SLIGHTLY BROKEN TO
MASSIVE, SLIGHTLY JOINTED, COARSE GRAINED,
CROSS-BEDDED, CARBONACEOUS, MICACEOUS.
NO CORE LOSS RQD = 44%
- RC-8 CORE LOSS = 14% RQD = 50%
- SHALE; BLACK, SOFT, HIGHLY BROKEN, FISSILE,
SLICKENSIDED, CARBONACEOUS, FOSSILIFEROUS.
- SANDSTONE; GRAY, MODERATELY HARD, SLIGHTLY BROKEN,
SLIGHTLY JOINTED, CARBONACEOUS, LAMINATED,
MICACEOUS.
- RC-9 MUDSTONE; GRAY, SOFT TO VERY SOFT, HIGHLY
BROKEN, HIGHLY JOINTED, FISSILE, CARBONACEOUS,
LAMINATED SPARSELY FOSSILIFEROUS.
CORE LOSS = 11% RQD = 15%

- R-42
- (A) RC-1 HARD GRAY LIMESTONE; WEATHERED TO MODERATELY
WEATHERED; CONTAINS MICACEOUS ARENACEOUS LAMINAE.
CORE LOSS = 13% RQD = 87%
- RC-2 CORE LOSS = 10% RQD = 68%
- (B) HARD GRAY SANDSTONE; WEATHERED; CONTAINS LIMESTONE
CLASTS.
- RC-3 NO CORE LOSS RQD = 20%
- (C) HARD GRAY SILTSTONE, MICACEOUS; WEATHERED.
- (D) SOFT GRAY CLAYSTONE; SEVERELY WEATHERED.
- (E) HARD GRAY LIMESTONE, ARGILLACEOUS; WEATHERED; PYRITIC.
- RC-4 NO CORE LOSS RQD = 88%
- (F) HARD BROWN SANDSTONE, ARGILLACEOUS; WEATHERED;
CONTAINS CLAY LAMINAE.
- (G) HARD GRAY LIMESTONE; WEATHERED.
- (H) VERY SOFT BROWN CLAYSTONE, MICACEOUS; SEVERELY
WEATHERED.
- (I) RC-5 MEDIUM HARD BROWN SANDSTONE; MODERATELY WEATHERED.
NO CORE LOSS RQD = 85%
- (J) HARD GRAY LIMESTONE; BROWN LAMINATIONS; SLIGHTLY
WEATHERED.
- (K) RC-6 MEDIUM HARD TO SOFT BROWN SANDSTONE, MICACEOUS;
LAMINATED; SEVERELY WEATHERED; VERY BROKEN.
CORE LOSS = 3% RQD = 0%
- RC-7 CORE LOSS = 15% RQD = 22%
- RC-8 NO CORE LOSS RQD = 15%
- RC-9 CORE LOSS = 15% RQD = 7%

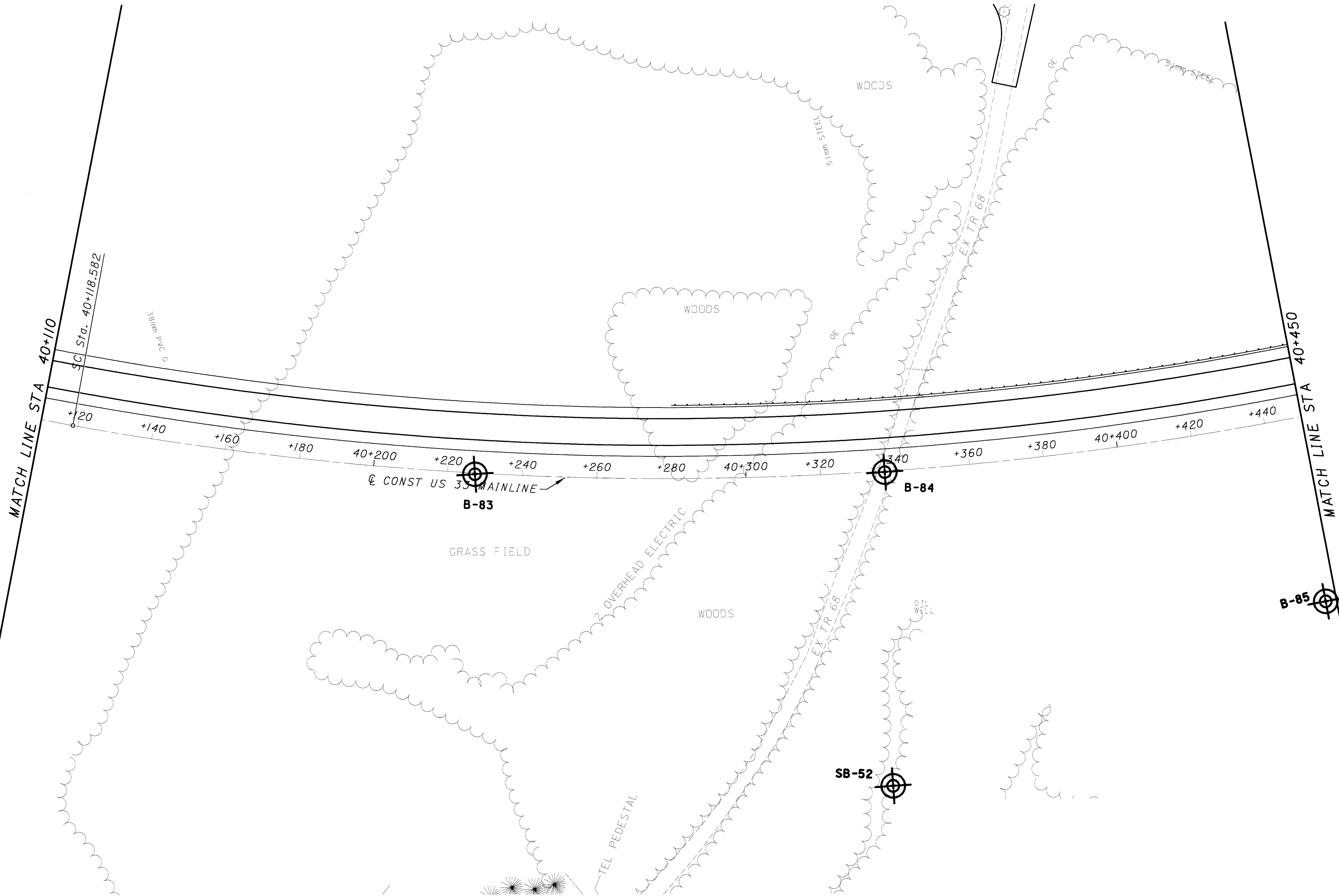
SOIL PROFILE
STA. 39+770 TO STA. 40+110

ATH-33-40.981

20 / 132

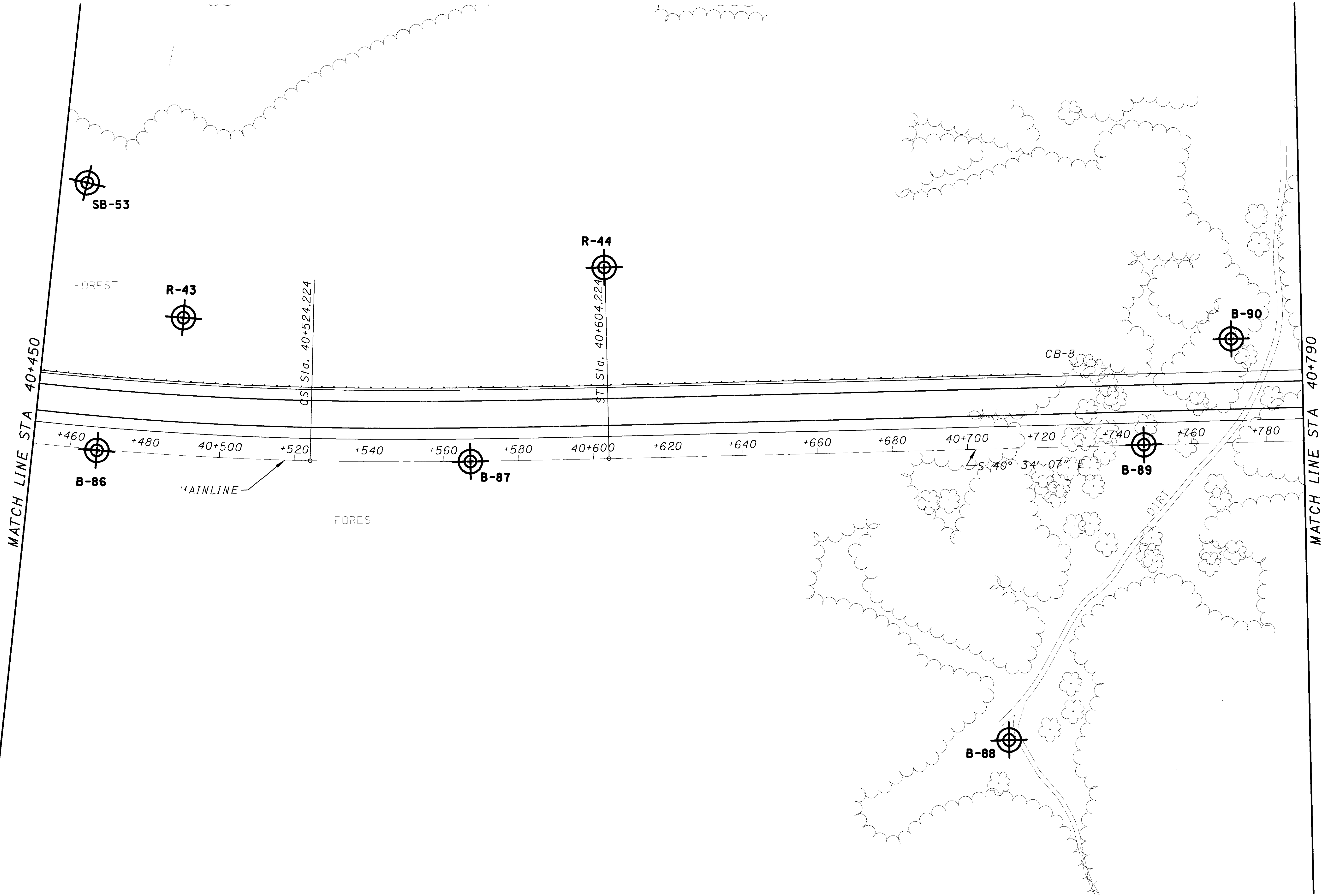
718
949

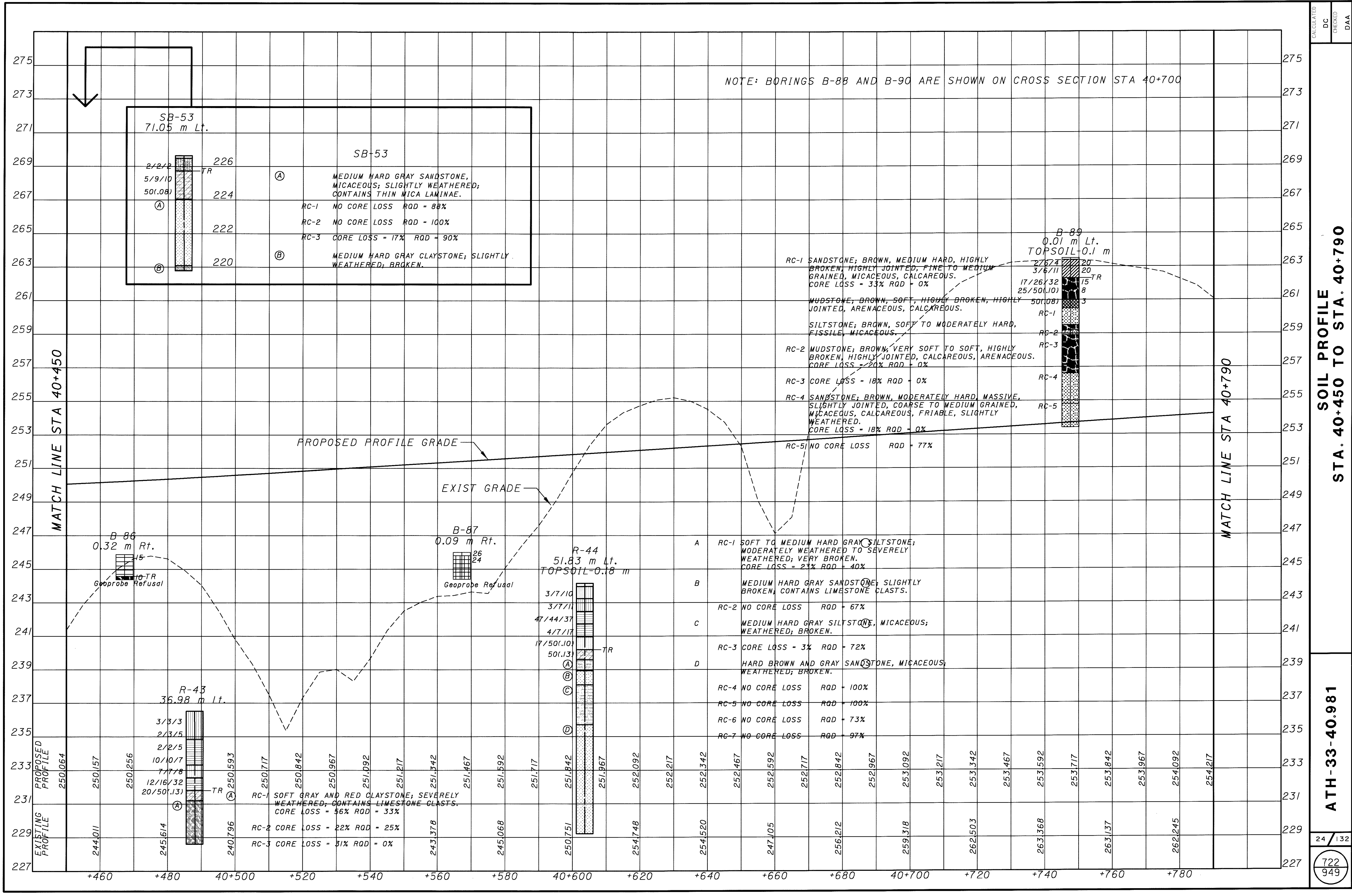
CALCULATED
DC
CHECKED
DAA

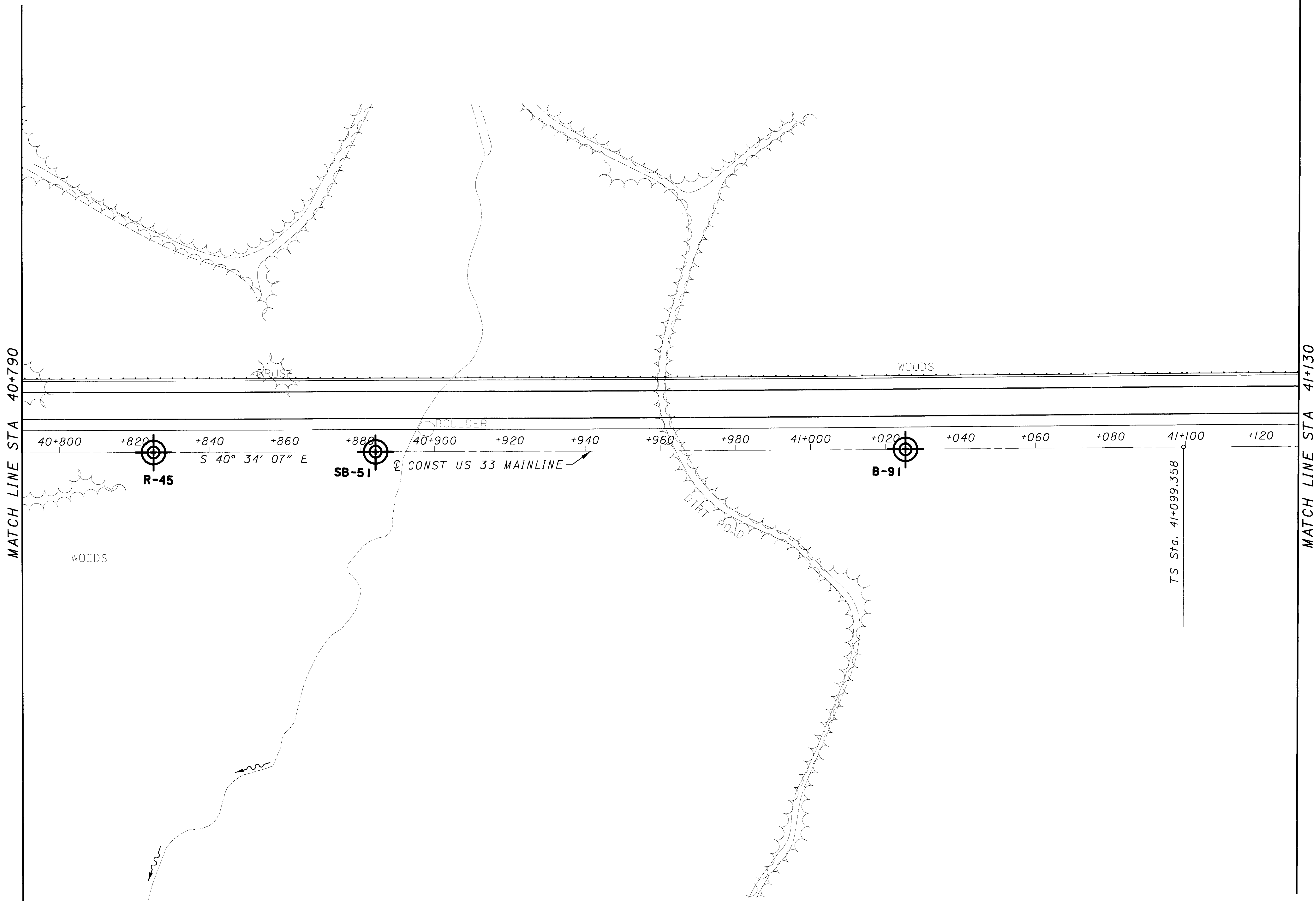


 0 10 20 HORIZONTAL SCALE IN METERS	CALCULATED RS	SOIL PROFILE STA. 40+110 TO STA. 40+450	ATH-33-40.981	21 / 132
	CHECKED DAA			719 949

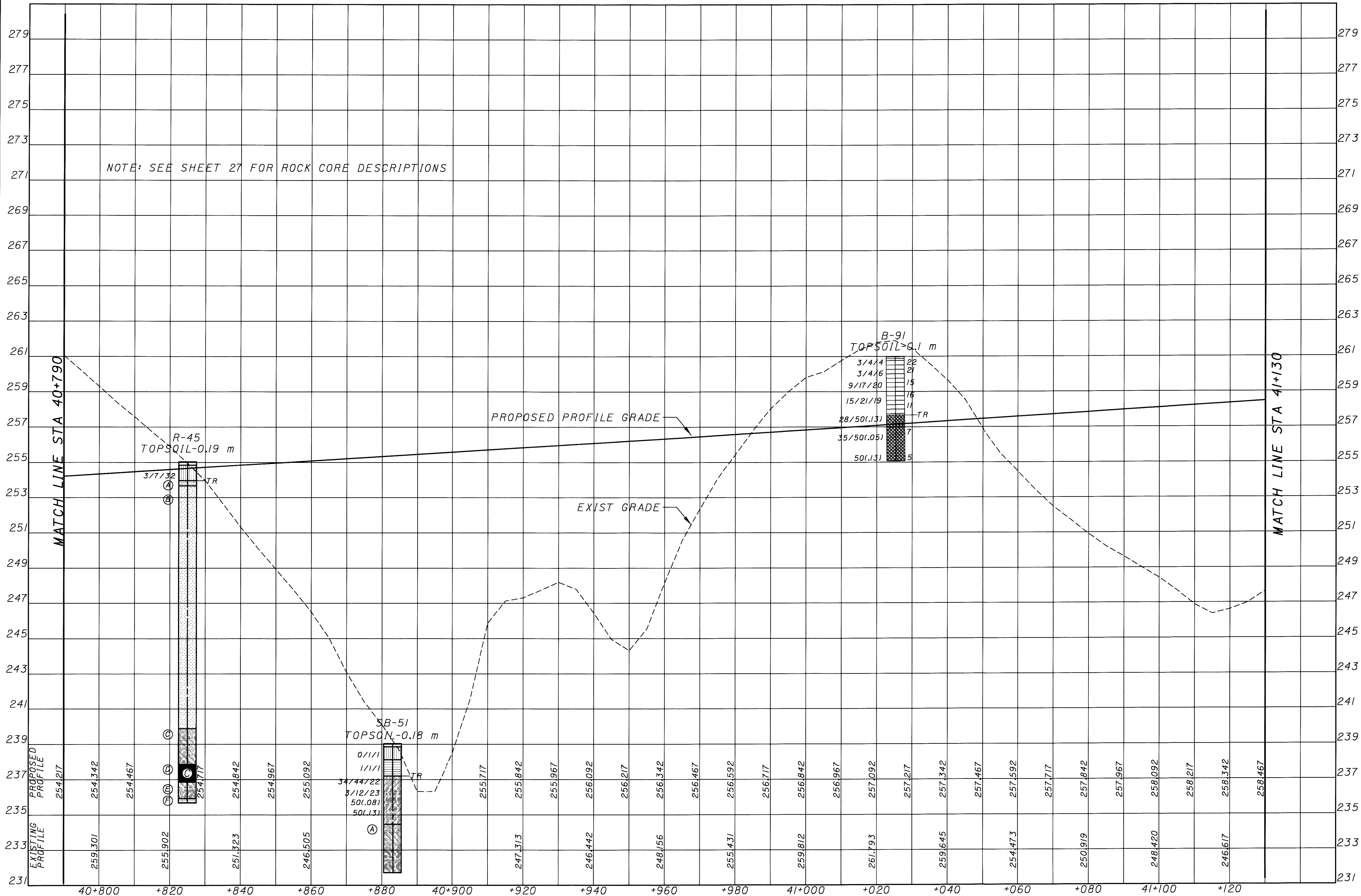








02/06/01
10:54:46 AM
M:\proj\982\006_00\DSI\geotech\gfs33_05.dgn



R-45

Ⓐ RC-1 HARD GRAY LIMESTONE; WEATHERED.
CORE LOSS = 10% RQD = 28%

Ⓑ MEDIUM HARD BROWN SANDSTONE, MICACEOUS;
WEATHERED; BROKEN.

RC-2 NO CORE LOSS RQD = 10%

RC-3 NO CORE LOSS RQD = 32%

RC-4 CORE LOSS = 3% RQD = 32%

RC-5 CORE LOSS = 15% RQD = 0%

RC-6 CORE LOSS = 8% RQD = 8%

RC-7 CORE LOSS = 37% RQD = 0%

RC-8 CORE LOSS = 3% RQD = 15%

RC-9 CORE LOSS = 2% RQD = 48%

RC-10 CORE LOSS = 17% RQD = 28%

Ⓒ VERY SOFT DARK GRAY CLAYSTONE; SEVERELY
WEATHERED.

RC-11 CORE LOSS = 3% RQD = 50%

Ⓓ SOFT BLACK COAL; WEATHERED WITH CARBONACEOUS
SHALE.

RC-12 NO CORE LOSS RQD = 47%

Ⓔ MEDIUM HARD GRAY CLAYSTONE; WEATHERED.

Ⓕ HARD GRAY LIMESTONE; WEATHERED; BROKEN.

SB-51

Ⓐ SOFT GRAY CLAYSTONE, MICACEOUS;
WEATHERED; SLIGHTLY CALCAREOUS.

RC-1 CORE LOSS = 25% RQD = 14%

RC-2 CORE LOSS = 7% RQD = 28%

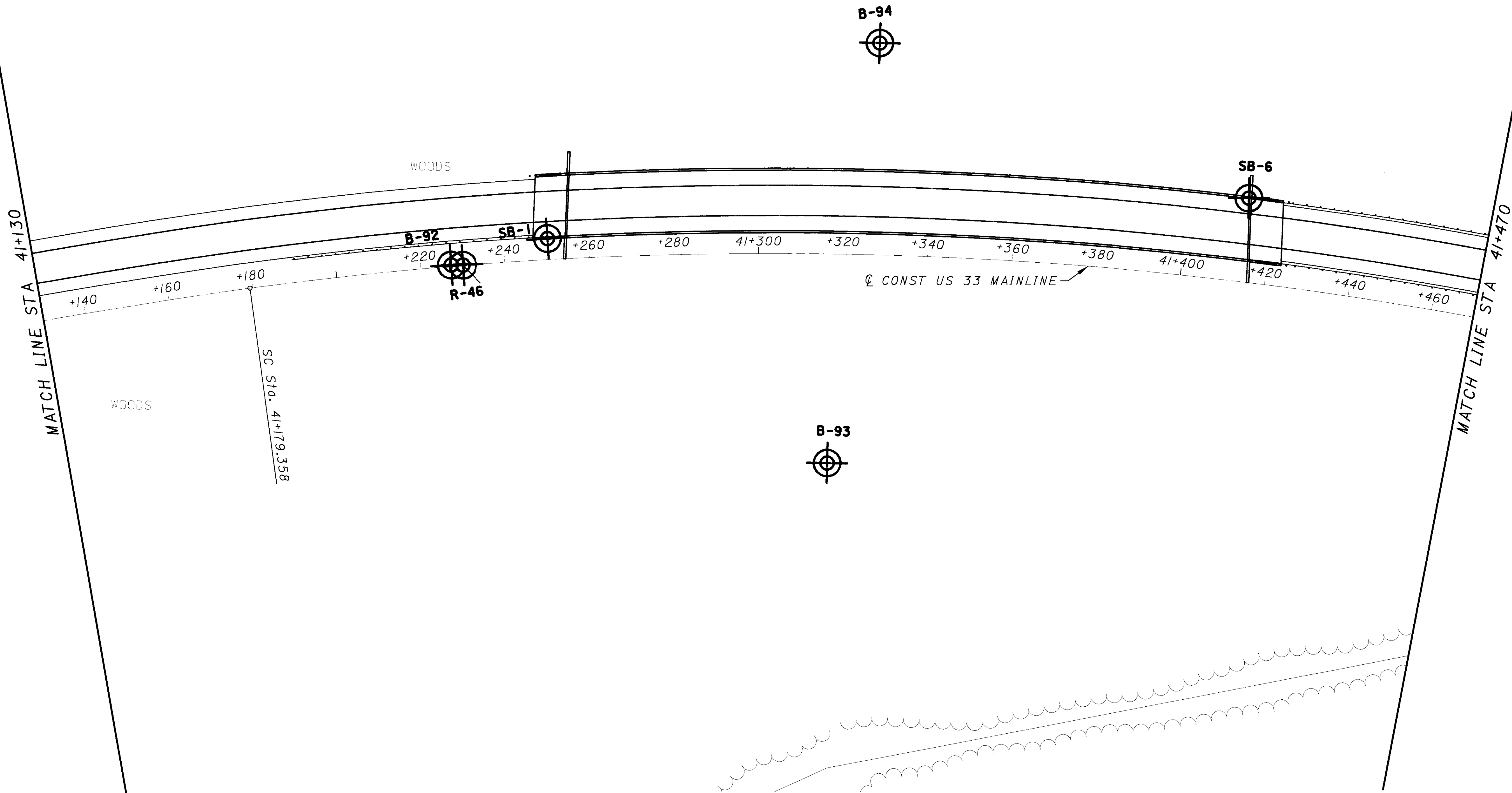
SOIL PROFILE
STA. 40+790 TO STA. 41+130

ATH-33-40.981

27 / 132

725
949

CALCULATED
DC
CHECKED
DAA



HORIZONTAL SCALE IN METERS			
CALCULATED RS	CHECKED DAA		
SOIL PROFILE STA. 41+130 TO STA. 41+470			
ATH-33-40.981			
28 / 132			
<table border="1"><tr><td>726</td></tr><tr><td>949</td></tr></table>		726	949
726			
949			

MATCH LINE STA 41+470

+480

41+500

+520

+540

+560

+580

41+600

+620

+640

+660

+680

41+700

+720

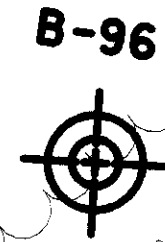
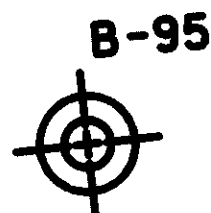
+740

+760

+780

41+800

S 4° 17' 30" E



GRAVEL ROAD

B-96

457 mm GAS

R-47

CS Sta. 41+669.196

CONST US 33 MAINLINE

ST Sta. 41+749.196

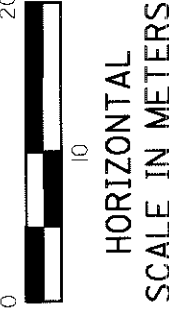
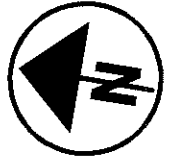
GATE

DIRT DRIVE

R-48

MOWED FIELD

MATCH LINE STA 41+810



CALCULATED
RS
CHECKED
DAA

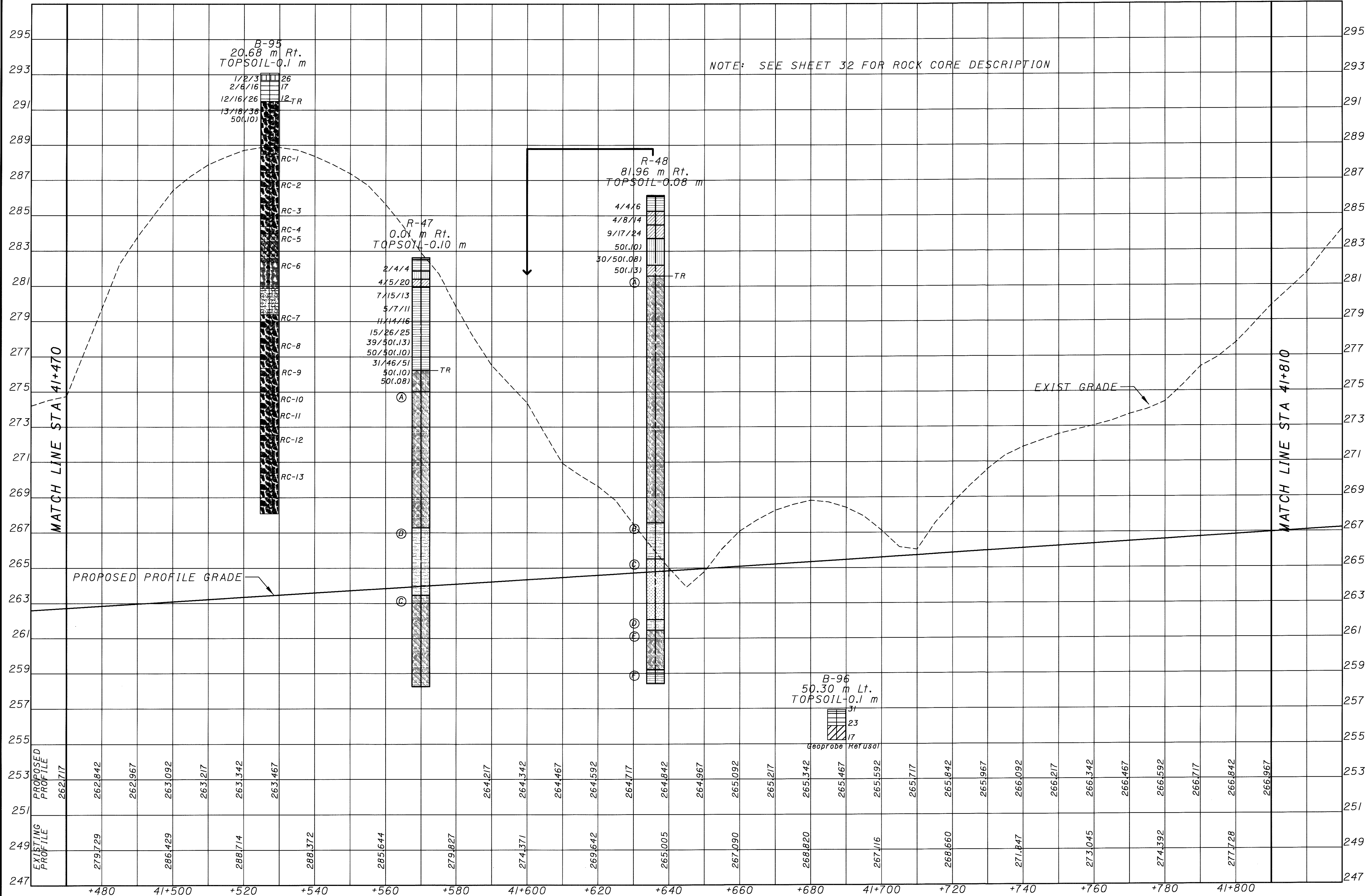
SOIL PROFILE
STA. 41+470 TO STA. 41+810

ATH-33-40.981

30 / 132

728
949

02/06/01
10:16:37 AM
M:\proj\9821\016_00\DSI\geotech\fig33_01.dgn



SOIL PROFILE
STA. 41+470 TO STA. 41+810

ATH-33-40.981

31 / 32
729
949

CALCULATED
DC
CHECKED
DAA

R-47

(A) RC-1 SOFT RED CLAYSTONE; MODERATELY WEATHERED; VERY BROKEN.
CORE LOSS - 12% RQD - 45%

RC-2 CORE LOSS - 20% RQD - 50%

RC-3 CORE LOSS - 18% RQD - 28%

RC-4 CORE LOSS - 7% RQD - 90%

RC-5 CORE LOSS - 7% RQD - 77%

RC-6 NO CORE LOSS RQD - 0%

(B) MEDIUM HARD GRAY SILTSTONE, MICACEOUS; WEATHERED.
NO CORE LOSS RQD - 100%

RC-7 NO CORE LOSS RQD - 100%

RC-8 NO CORE LOSS RQD - 100%

(C) MEDIUM HARD GRAY CLAYSTONE; WEATHERED; CONTAINS LIMESTONE CLASTS AND ARENACEOUS LAYERS.
NO CORE LOSS RQD - 100%

RC-9 NO CORE LOSS RQD - 100%

RC-10 NO CORE LOSS RQD - 100%

RC-11 CORE LOSS - 5% RQD - 95%

R-48

(A) RC-1 SOFT BROWN AND RED CLAYSTONE; MODERATELY WEATHERED.
CORE LOSS - 58% RQD - 0%

RC-2 CORE LOSS - 2% RQD - 43%

RC-3 CORE LOSS - 10% RQD - 73%

RC-4 NO CORE LOSS RQD - 85%

RC-5 NO CORE LOSS RQD - 78%

RC-6 CORE LOSS - 12% RQD - 80%

RC-7 CORE LOSS - 7% RQD - 87%

RC-8 CORE LOSS - 12% RQD - 87%

RC-9 CORE LOSS - 15% RQD - 83%

RC-10 NO CORE LOSS RQD - 90%

(B) RC-11 MEDIUM HARD GRAY SILTSTONE, MICACEOUS; WEATHERED; CONTAINS LIMESTONE BEDDING.
NO CORE LOSS RQD - 93%

RC-12 NO CORE LOSS RQD - 100%

(C) HARD GRAY SANDSTONE, MICACEOUS; THIN BEDDED; WEATHERED; CONTAINS OCCASIONAL LIMESTONE LAMINATIONS; SLIGHTLY PYRITIC; FINE-GRAINED.
NO CORE LOSS RQD - 100%

RC-13 NO CORE LOSS RQD - 100%

RC-14 NO CORE LOSS RQD - 100%

(D) MEDIUM HARD TO HARD GRAY SILTSTONE, MICACEOUS; WEATHERED.
NO CORE LOSS RQD - 100%

(E) RC-15 MEDIUM HARD GRAY CLAYSTONE; WEATHERED; CONTAINS LIMESTONE CLASTS.
NO CORE LOSS RQD - 100%

RC-16 NO CORE LOSS RQD - 100%

(F) HARD GRAY LIMESTONE; ARGILLACEOUS; WEATHERED; CONTAINS SILTSTONE LAMINATIONS.

B-95

RC-1 MUDSTONE; VARIEGATED BROWN, GRAY AND RED, VERY SOFT TO MEDIUM HARD, HIGHLY BROKEN, SLIGHTLY JOINTED, CALCAREOUS, NON-BEDDED, SILTY, SLIGHTLY WEATHERED.
CORE LOSS - 40% RQD - 0%

RC-2 CORE LOSS - 59% RQD - 0%

RC-3 CORE LOSS - 51% RQD - 0%

RC-4 CORE LOSS - 33% RQD - 0%

RC-5 CLAYSHALE; BROWN, SOFT, HIGHLY BROKEN, FISSILE, SLICKENSIDED, SLIGHTLY WEATHERED.
CORE LOSS - 10% RQD - 0%

RC-6 SHALE; GRAY, MEDIUM HARD, HIGHLY BROKEN, SILTY, FISSILE, RARE SLICKENSIDES, SLIGHTLY WEATHERED.
NO CORE LOSS RQD - 31%

SILTSTONE; GRAY, MEDIUM HARD, MASSIVE, MICACEOUS, ARGILLACEOUS.

RC-7 MUDSTONE; VARIEGATED RED, GRAY AND PURPLE, VERY SOFT TO SOFT, HIGHLY BROKEN, NON-BEDDED, SILTY, CALCAREOUS, SLICKENSIDED.
CORE LOSS - 2% RQD - 0%

RC-8 CORE LOSS - 2% RQD - 23%

RC-9 NO CORE LOSS RQD - 18%

RC-10 CORE LOSS - 27% RQD - 14%

RC-11 CORE LOSS - 4% RQD - 9%

RC-12 CORE LOSS - 24% RQD - 8%

RC-13 CORE LOSS - 5% RQD - 52%

SOIL PROFILE
STA. 41+470 TO STA. 41+810

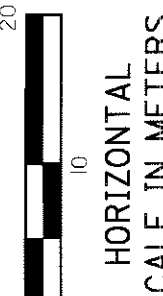
ATH-33-40.981

32 / 132

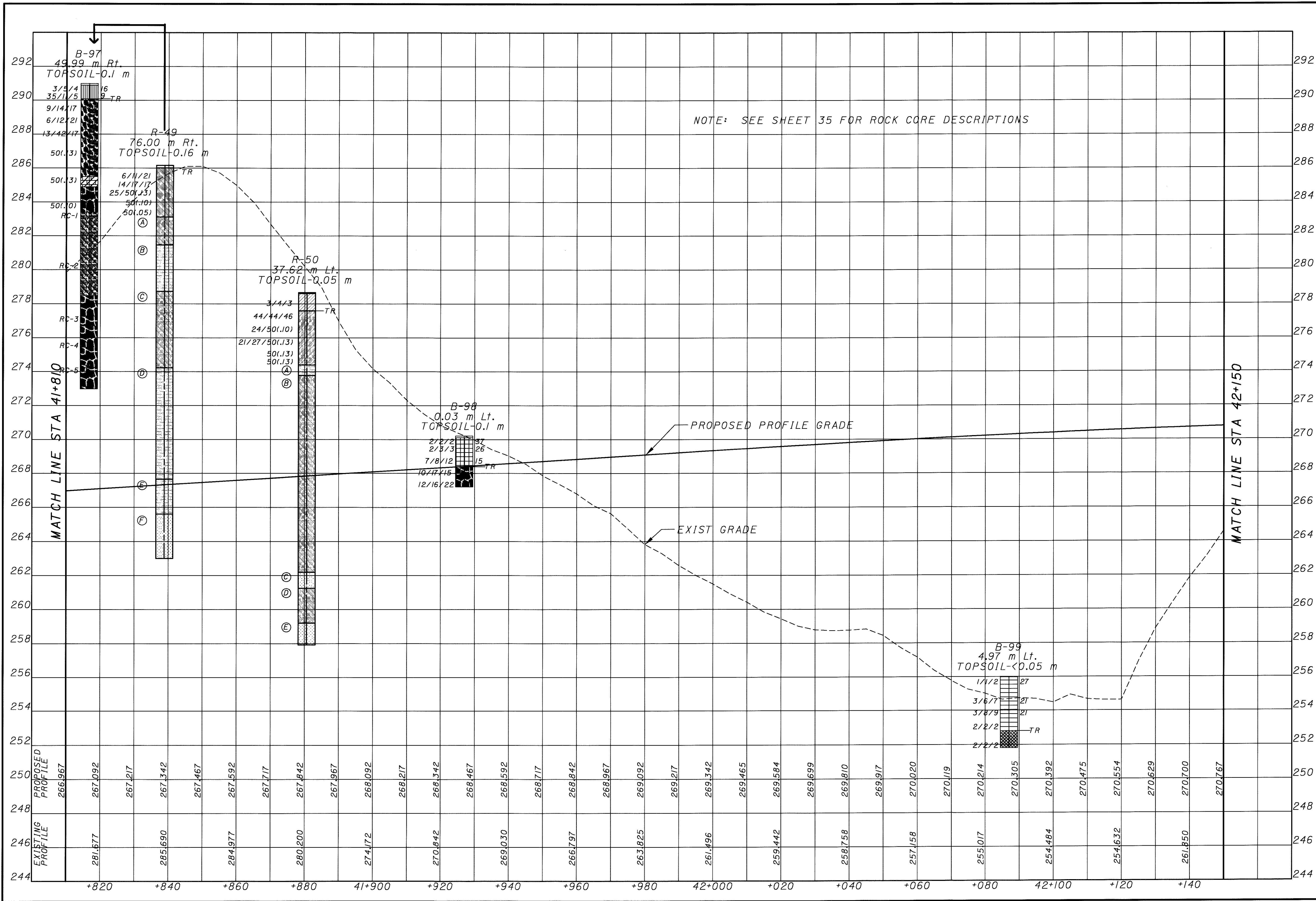
730
949

CALCULATED
DC
CHECKED
DAA



	
 HORIZONTAL SCALE IN METERS	
CALCULATED RS	CHECKED DAA
SOIL PROFILE STA. 41+810 TO STA. 42+150	
ATH-33-40.981	
33	132
731	949

02/06/01
10:46:58 AM
M:\proj\9821\016_00\DSI\geotech\ufu33_08.dgn



B-97
RC-1 CLAYSHALE; GRAY, SOFT, HIGHLY BROKEN, FISSILE,
SLIGHTLY MICACEOUS, WITH INTERBEDDED GRAY, MEDIUM
LIMESTONE LENSES UP TO 5 CM THICK.
CORE LOSS = 8% RQD = 14%

RC-2 CORE LOSS = 2% RQD = 20%

RC-3 MUDSTONE; GRAY, SOFT TO MEDIUM, MASSIVE, CALCAREOUS,
NON-BEDDED, SLICKENSIDED.
NO CORE LOSS RQD = 52%

RC-4 NO CORE LOSS RQD = 17%

RC-5 CORE LOSS = 75% RQD = 44%

R-49

Ⓐ RC-1 SOFT GRAYISH BROWN CLAYSTONE, CALCAREOUS, WEATHERED,
BROKEN.
CORE LOSS = 50% RQD = 8%

RC-2 CORE LOSS = 15% RQD = 35%

Ⓑ MEDIUM HARD GRAY SILTSTONE WITH LIMESTONE CLASTS,
WEATHERED, BROKEN, WITH RUST STAINING.

RC-3 CORE LOSS = 15% RQD = 77%

RC-4 CORE LOSS = 28% RQD = 35%

Ⓒ SOFT GRAY CLAYSTONE; WEATHERED TO SEVERELY WEATHERED.

RC-5 NO CORE LOSS RQD = 70%

RC-6 NO CORE LOSS RQD = 65%

RC-7 NO CORE LOSS RQD = 48%

Ⓓ MEDIUM HARD GRAY SILTSTONE, MICACEOUS; SEVERELY
WEATHERED.

RC-8 CORE LOSS = 20% RQD = 72%

RC-9 CORE LOSS = 27% RQD = 30%

RC-10 NO CORE LOSS RQD = 78%

Ⓔ MEDIUM HARD GRAY SILTSTONE, CALCAREOUS, ARGILLACEOUS,
CONTAINS LIMESTONE CLASTS, WEATHERED.

RC-11 NO CORE LOSS RQD = 92%

RC-12 CORE LOSS = 5% RQD = 83%

RC-13 NO CORE LOSS RQD = 97%

Ⓕ HARD GRAY SANDSTONE; FINE GRAINED, SLIGHTLY ARGILLACEOUS,
MODERATELY WEATHERED.

RC-14 NO CORE LOSS RQD = 100%

R-50

Ⓐ RC-1 SOFT TO MEDIUM HARD BROWN SILTSTONE; WEATHERED; BROKEN.
CORE LOSS = 12% RQD = 28%

Ⓑ SOFT BROWN CLAYSTONE; WEATHERED TO SEVERELY WEATHERED;
VERY BROKEN.

RC-2 CORE LOSS = 60% RQD = 13%

RC-3 CORE LOSS = 3% RQD = 77%

RC-4 NO CORE LOSS RQD = 65%

RC-5 NO CORE LOSS RQD = 92%

RC-6 CORE LOSS = 23% RQD = 28%

RC-7 CORE LOSS = 45% RQD = 7%

RC-8 CORE LOSS = 38% RQD = 20%

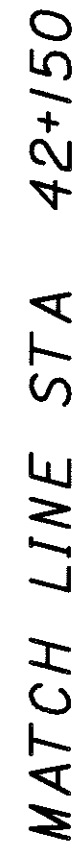
Ⓒ RC-9 SOFT BROWN SANDSTONE; WEATHERED.
CORE LOSS = 42% RQD = 0%

Ⓓ SOFT GRAY CLAYSTONE; WEATHERED.

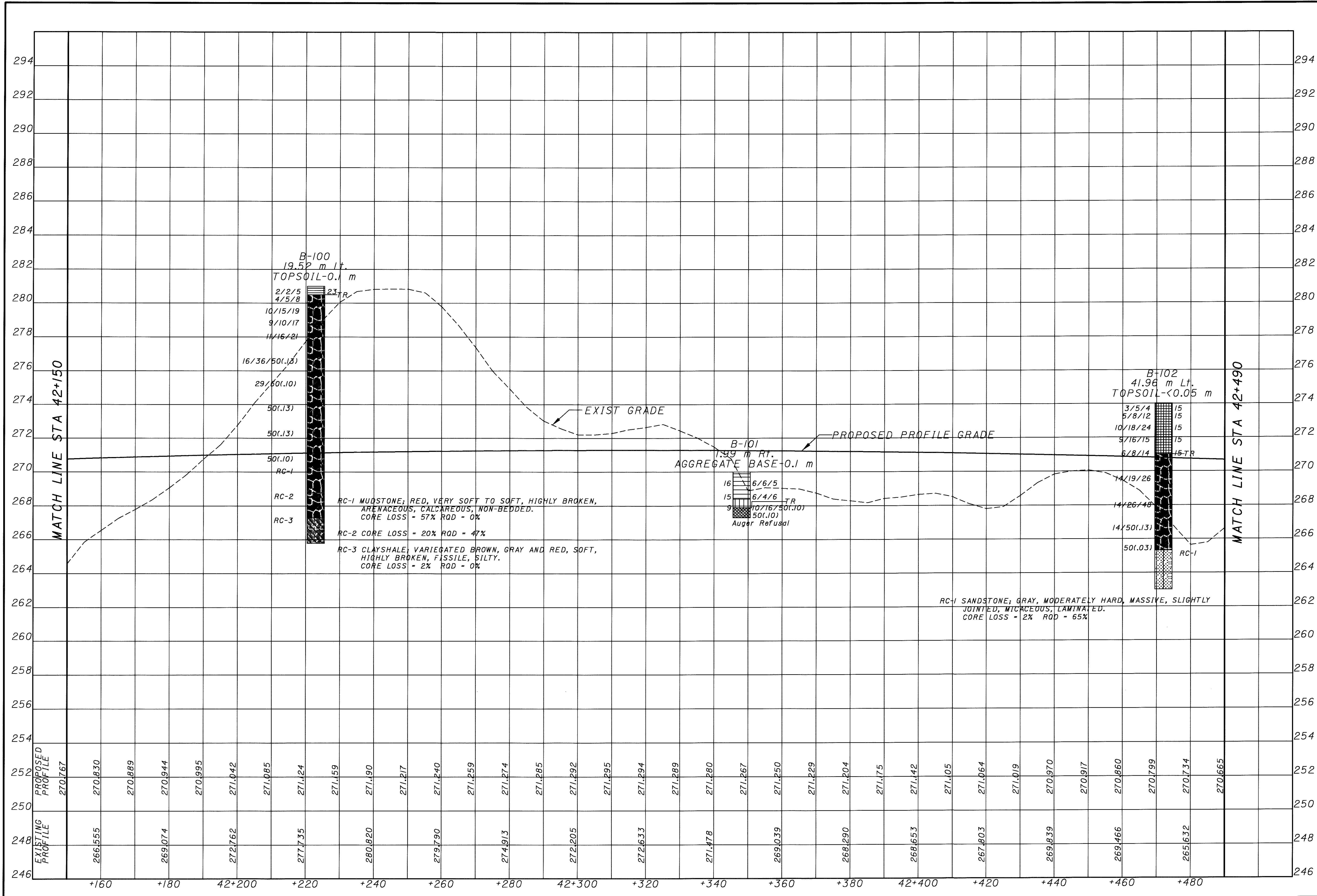
RC-10 NO CORE LOSS RQD = 43%

Ⓔ MEDIUM HARD GRAY SANDSTONE, FINE GRAINED, MICACEOUS,
WEATHERED.

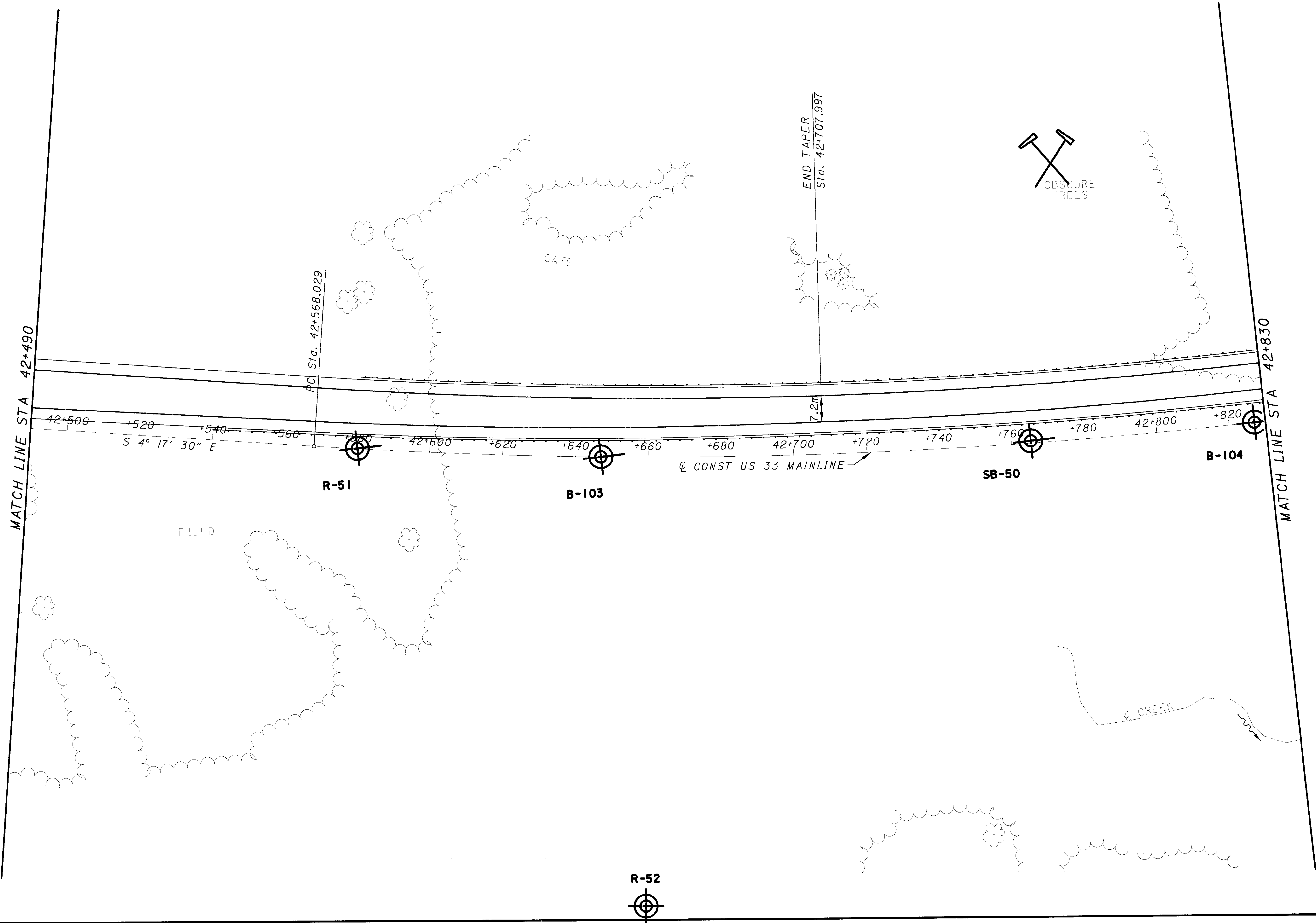
RC-11 CORE LOSS = 2% RQD = 83%



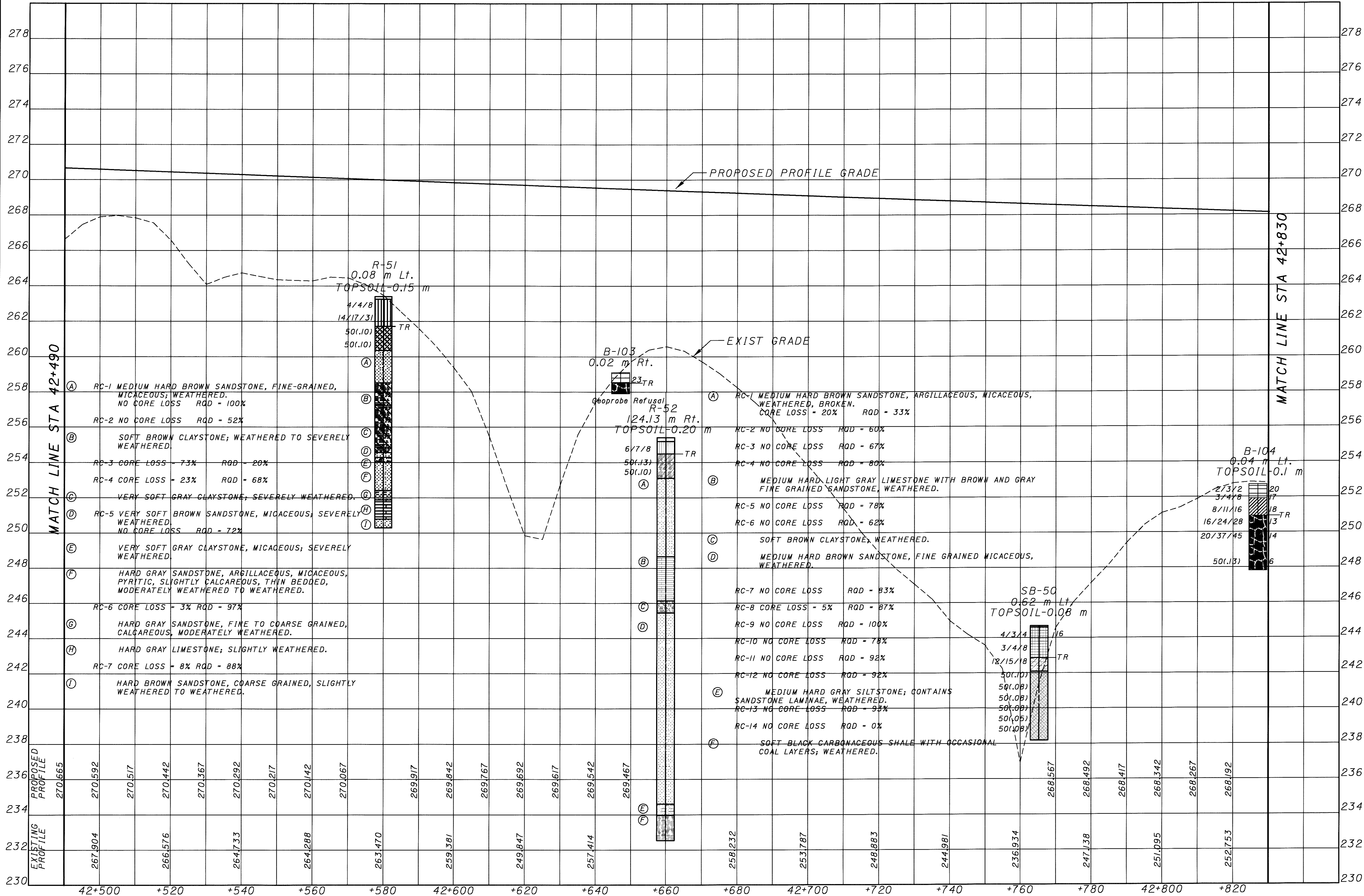
02/06/01
10:37:06 AM
M:\proj\3821\016-00\US\geotech\grfu33_09.dgn

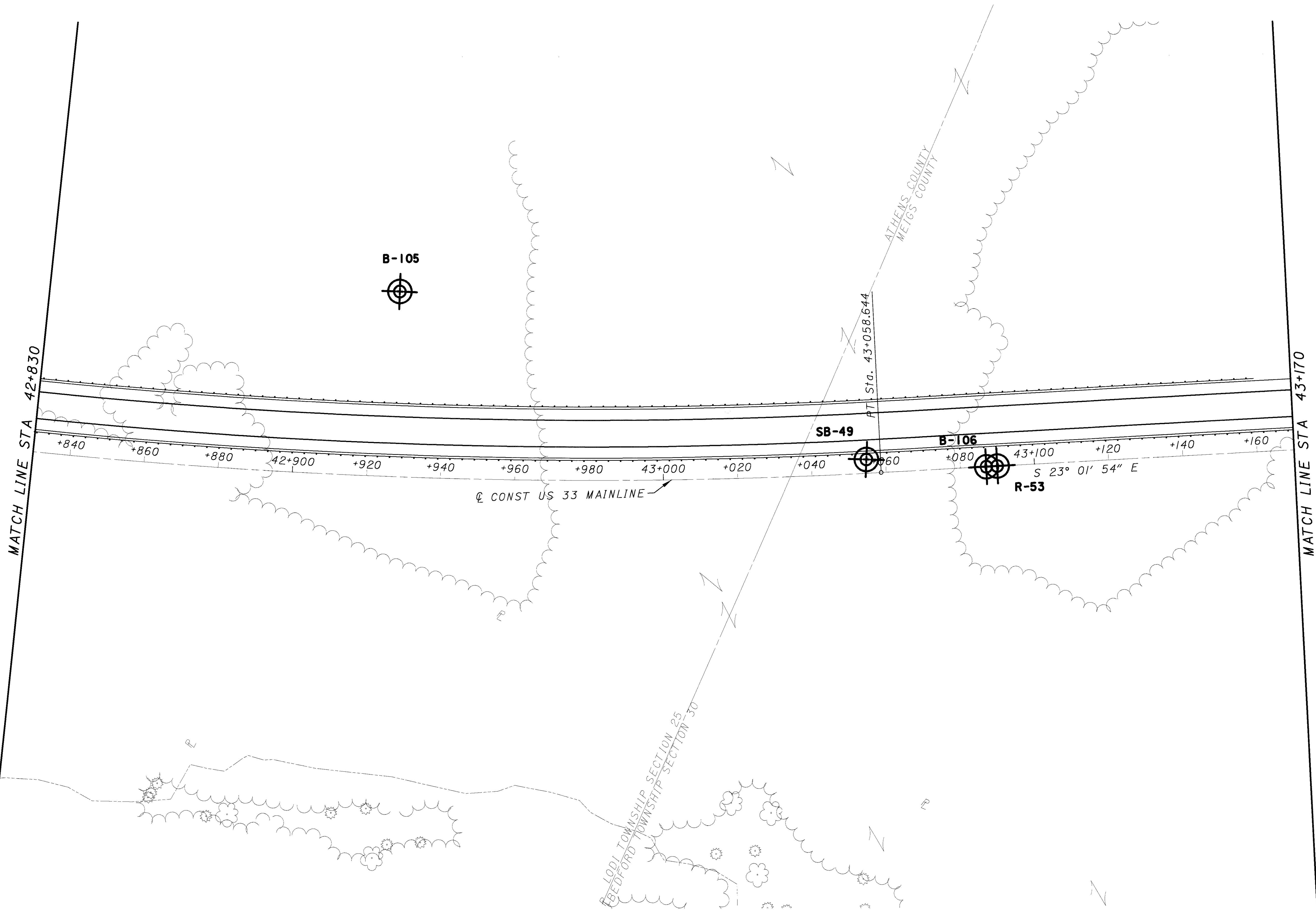


02/06/01
05:44:42 AM
M:\proj\9821\016-00\DS1\geotech\plan33_10.dgn

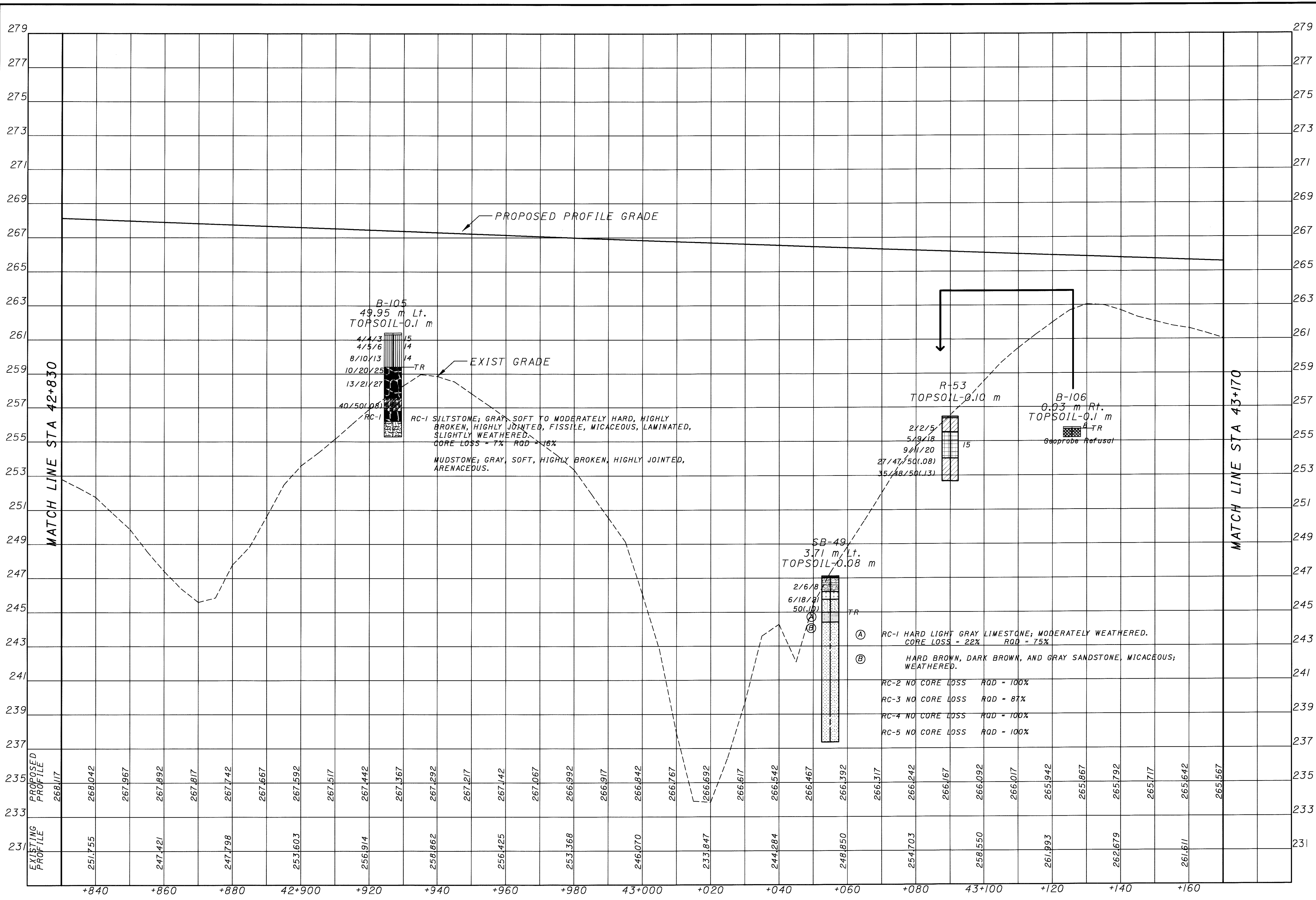


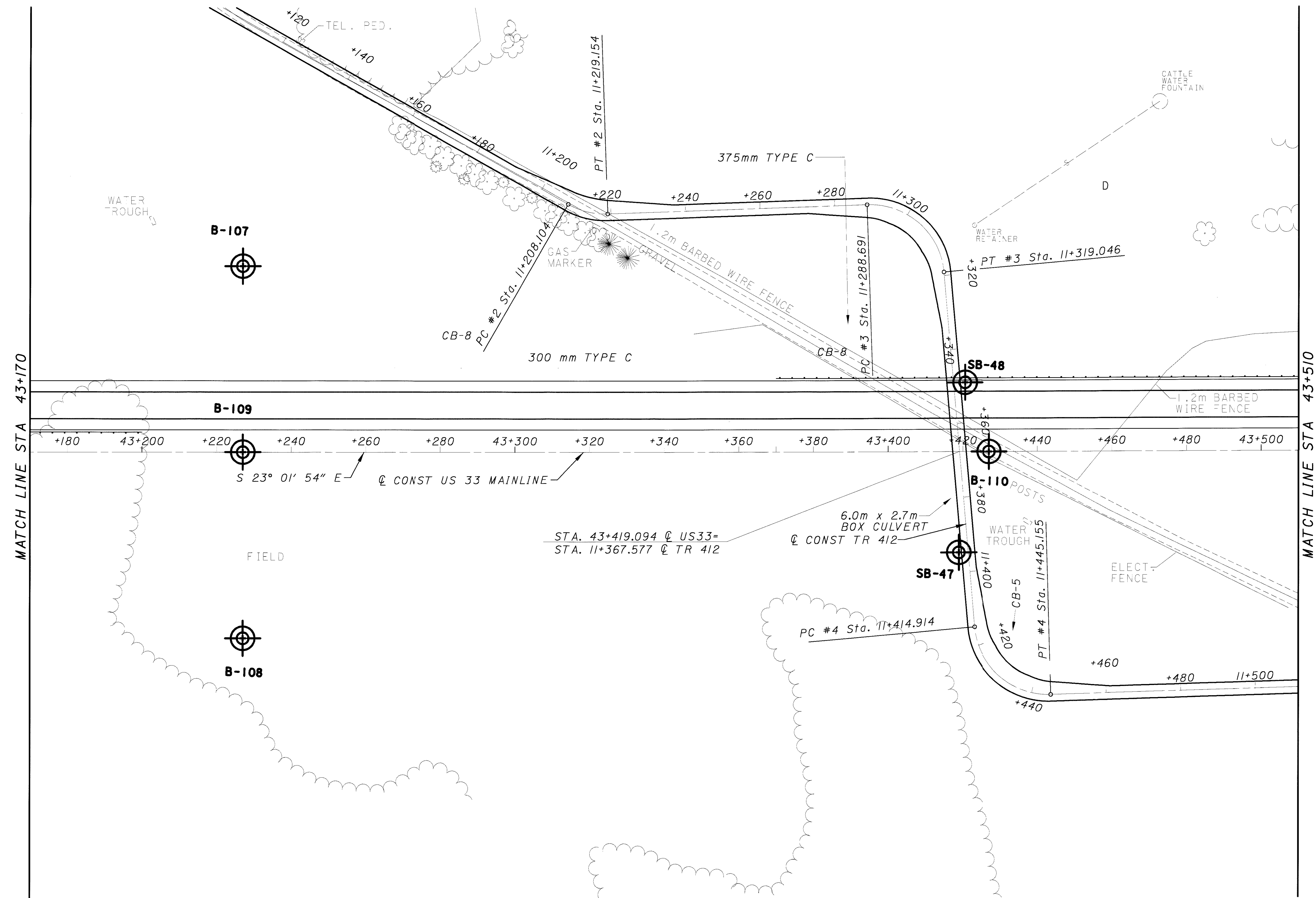
ATH-33-40.981		SOIL PROFILE STA. 42+490 TO STA. 42+830		 HORIZONTAL SCALE IN METERS 0 10 20	
38 / 132		CALCULATED RS		CHECKED DAA	





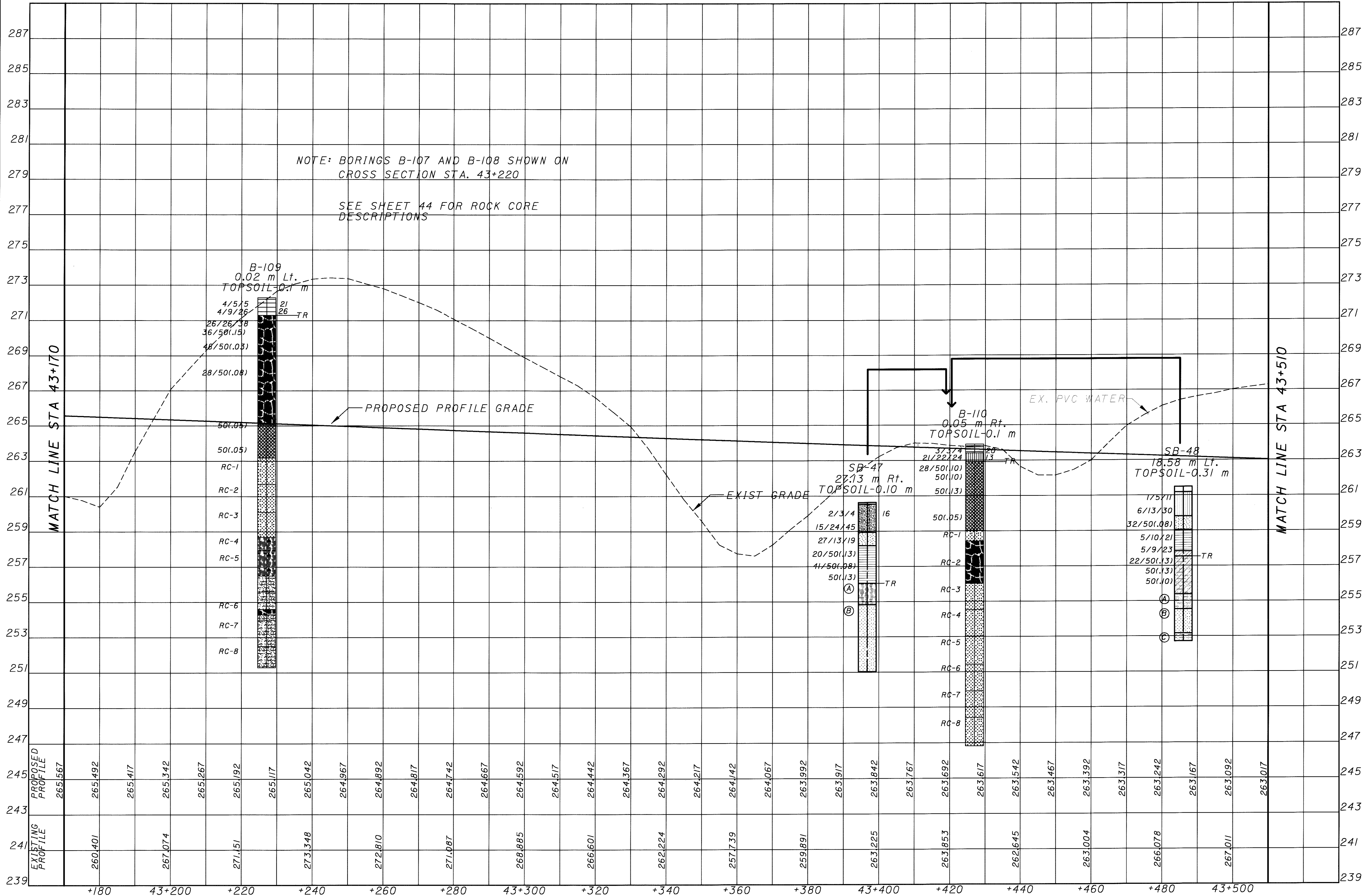
02/06/01
10:41:04 AM
M:\proj\982\016-00\DS\geotech\gufu33_11.dgn





 HORIZONTAL SCALE IN METERS	CALCULATED RS CHECKED DAA	SOIL PROFILE STA. 43+170 TO STA. 43+510	ATH-33-40.981	42 / 132
				740 949

02/06/01
10:41:28 AM
M:\p\ro\1982\1016-00\US\geotech\gfu33.12.dgn



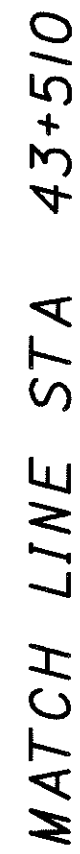
B-109
RC-1 SANDSTONE; BROWN TO GRAY, SOFT TO MEDIUM, SLIGHTLY
BROKEN, MEDIUM GRAINED, CROSS-BEDDED, MICACEOUS.
CORE LOSS = 2% RQD = 15%
RC-2 NO CORE LOSS RQD = 52%
RC-3 CORE LOSS = 2% RQD = 40%
RC-4 SHALE; DARK GRAY, MEDIUM, HIGHLY BROKEN, CARBONACEOUS,
FISSILE, SILTY
NO CORE LOSS RQD = 15%
RC-5 SILTSTONE; GRAY, MEDIUM HARD, MASSIVE, SLIGHTLY
MICACEOUS.
CORE LOSS = 1% RQD = 52%
RC-6 SILTSTONE; GRAY, MEDIUM, MASSIVE, SLIGHTLY MICACEOUS,
INTERBEDDED MUDSTONE; GRAY, SOFT TO MEDIUM, HIGHLY
BROKEN.
CORE LOSS = 1% RQD = 53%
RC-7 SILTSTONE; GRAY, MEDIUM, HIGHLY BROKEN, ARGILLACEOUS,
MICACEOUS.
CORE LOSS = 1% RQD = 0%
RC-8 NO CORE LOSS RQD = 0%

B-110
RC-1 SANDSTONE; BROWN, SOFT, MASSIVE, SLIGHTLY JOINTED,
COARSE GRAINED, MICACEOUS, INTERBEDDED MUDSTONE; GRAY
VERY SOFT TO SOFT, HIGHLY BROKEN, HIGHLY JOINTED,
ARENACEOUS.
CORE LOSS = 2% RQD = 42%
RC-2 MUDSTONE; GRAY, VERY SOFT TO SOFT, HIGHLY BROKEN, HIGHLY
JOINTED, ARENACEOUS.
NO CORE LOSS RQD = 29%
RC-3 SANDSTONE; GRAY, MODERATELY HARD, MASSIVE, SLIGHTLY
JOINTED, FINE GRAINED, MICACEOUS, LAMINATED.
CORE LOSS = 3% RQD = 84%
RC-4 CORE LOSS = 5% RQD = 92%
RC-5 CORE LOSS = 2% RQD = 50%
RC-6 SANDSTONE; BROWN, MODERATELY HARD, HIGHLY BROKEN,
HIGHLY GRAINED, COARSE GRAINED, CALCAREOUS, MICACEOUS,
ARGILLACEOUS.
NO CORE LOSS RQD = 0%
RC-7 CORE LOSS = 2% RQD = 19%
RC-8 CORE LOSS = 2% RQD = 0%

SB-47
A RC-1 MEDIUM HARD GRAY SHALE; WEATHERED TO SEVERELY
WEATHERED.
CORE LOSS = 7% RQD = 88%
B HARD GRAY SANDSTONE, MICACEOUS; WEATHERED.
RC-2 NO CORE LOSS RQD = 100%
SB-48
A RC-1 MEDIUM HARD GRAY SILTSTONE, ARENACEOUS.
CORE LOSS = 4% RQD = 91%
B HARD GRAY AND DARK GRAY SANDSTONE, ARGILLACEOUS,
MICACEOUS; WEATHERED TO MODERATELY WEATHERED.
RC-2 NO CORE LOSS RQD = 100%
C MEDIUM HARD GRAY SILTSTONE, MICACEOUS; WEATHERED.

SOIL PROFILE
STA. 43+170 TO STA. 43+510

ATH-33-40.981



CALCULATED	RS	CHECKED	DAA
------------	----	---------	-----

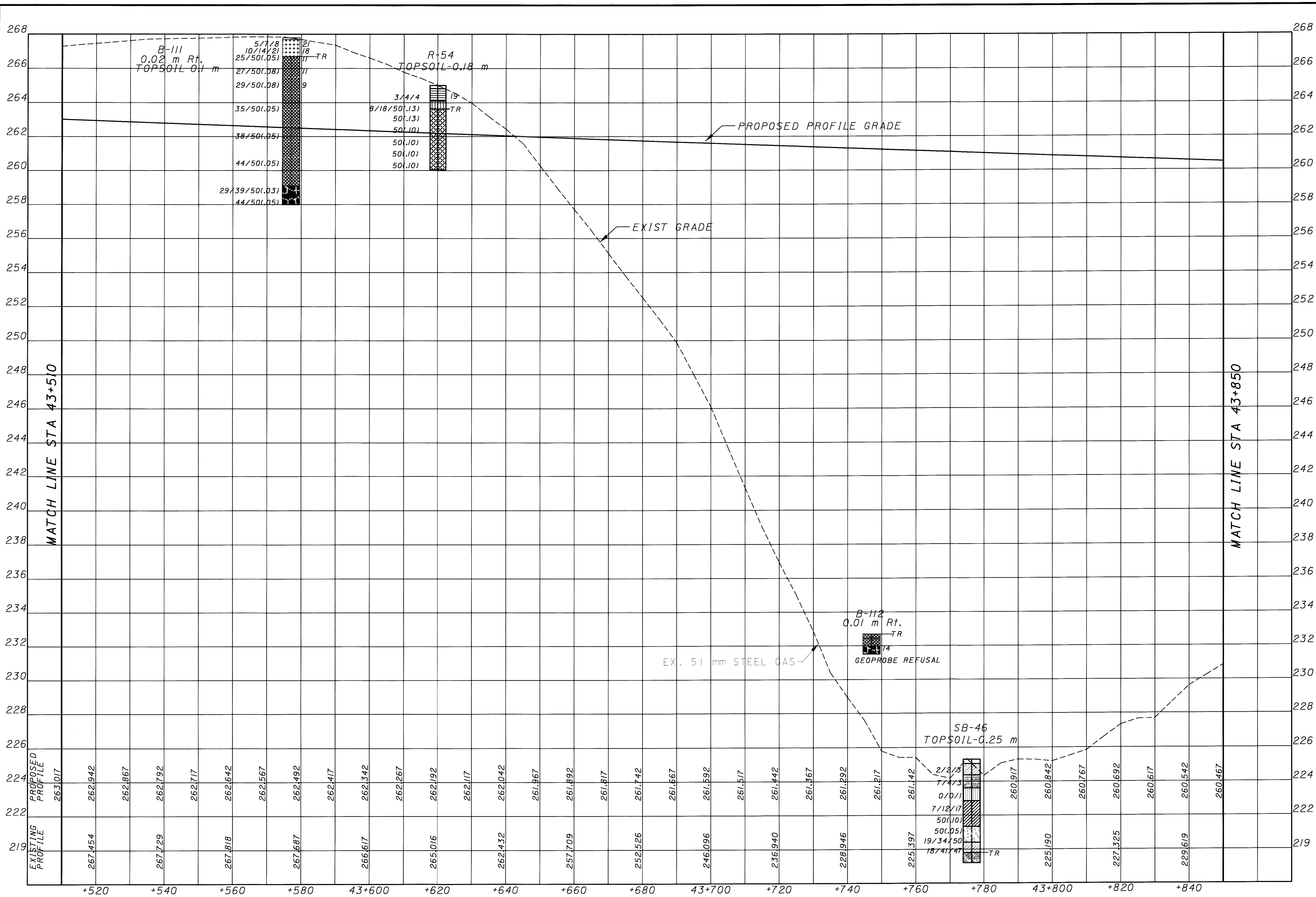
SOIL PROFILE
STA. 43+510 TO STA. 43+850

ATH-33-40.981

45 / 132

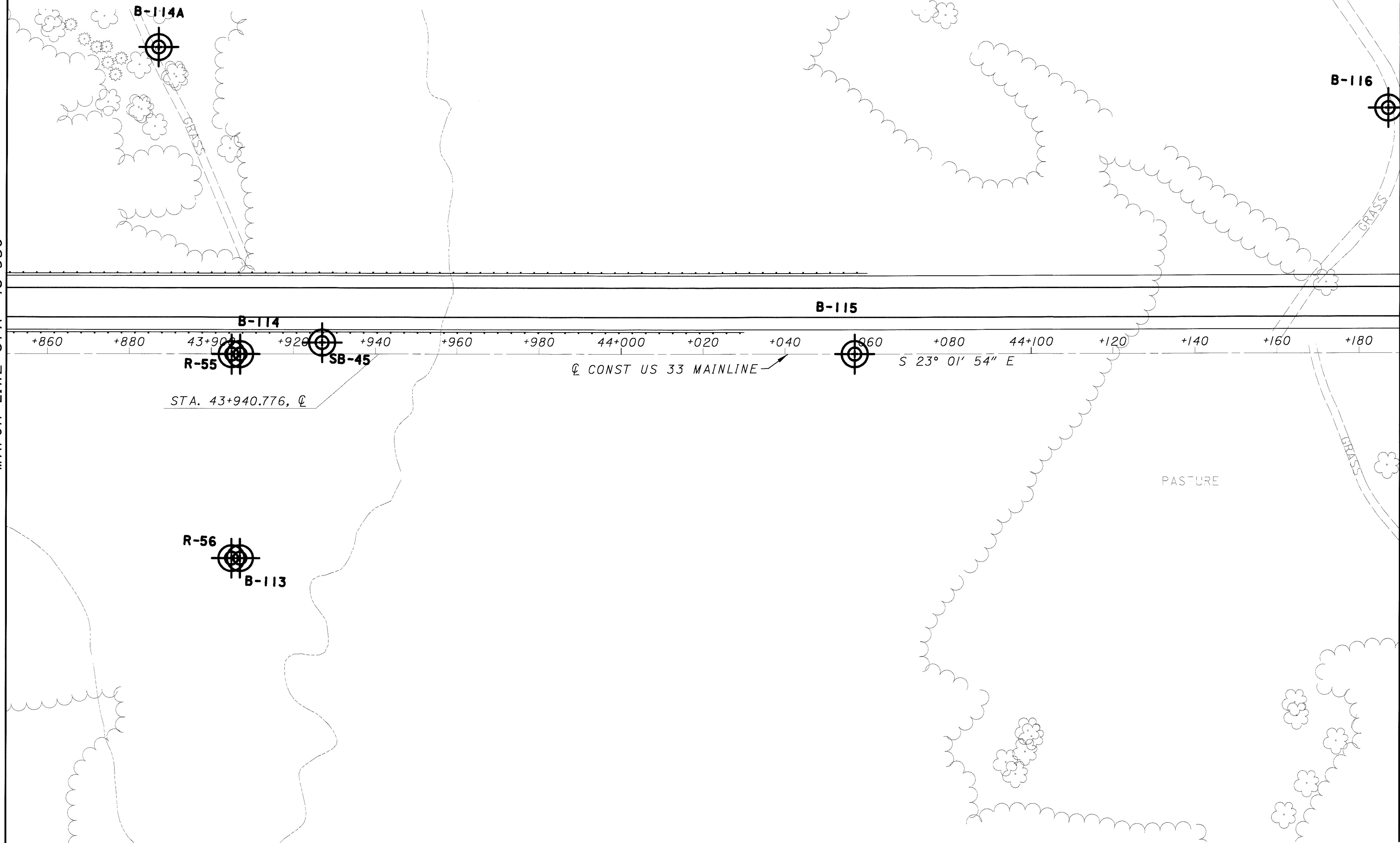
$$\frac{743}{949}$$

02/06/01
10:41:52 AM
M:\p\o\1382\1016-00\SDS\geo\tech\g33.13.dgn



02/06/01
09:47:21AM
M:\p\ro\1382\N016-00\DS\GeoTech\plan33_14.dgn

MATCH LINE STA 43+850



MATCH LINE STA 44+190

ATH-33-40.981

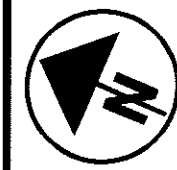
SOIL PROFILE
STA. 43+850 TO STA. 44+190

47 / 132

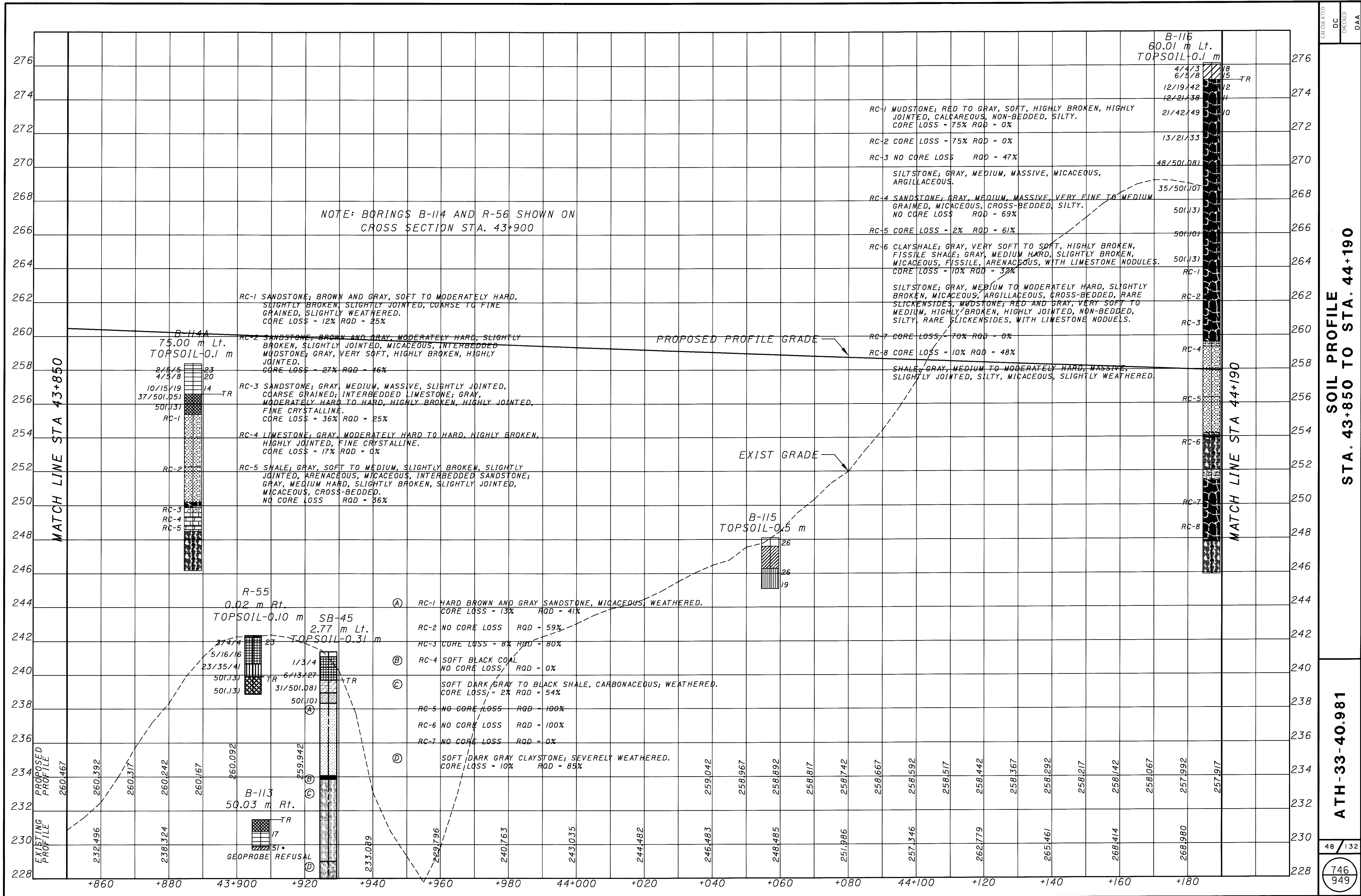
745
949

CALCULATED
RS
CHECKED
DAA

0 10 20
HORIZONTAL
SCALE IN METERS



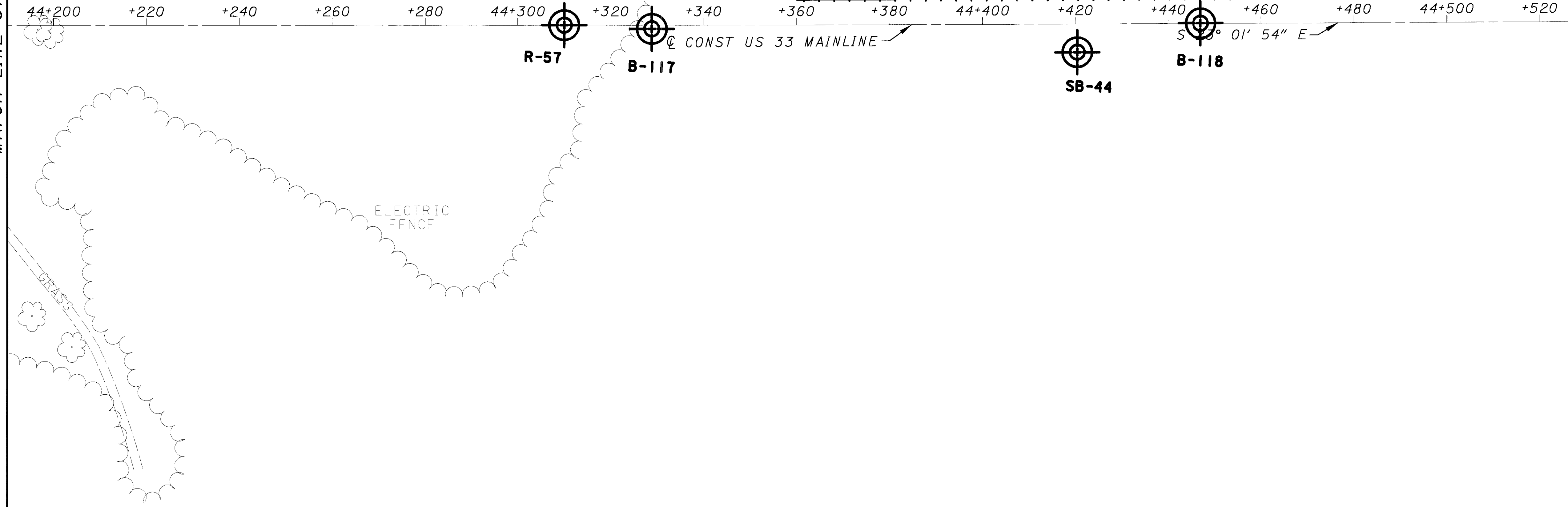
02/06/01
10:43:09 AM
M:\proj\01\9821\016-00\DS1\geotech\fig133 14.dgn



CALCULATED
DC
CHECKED
DAA

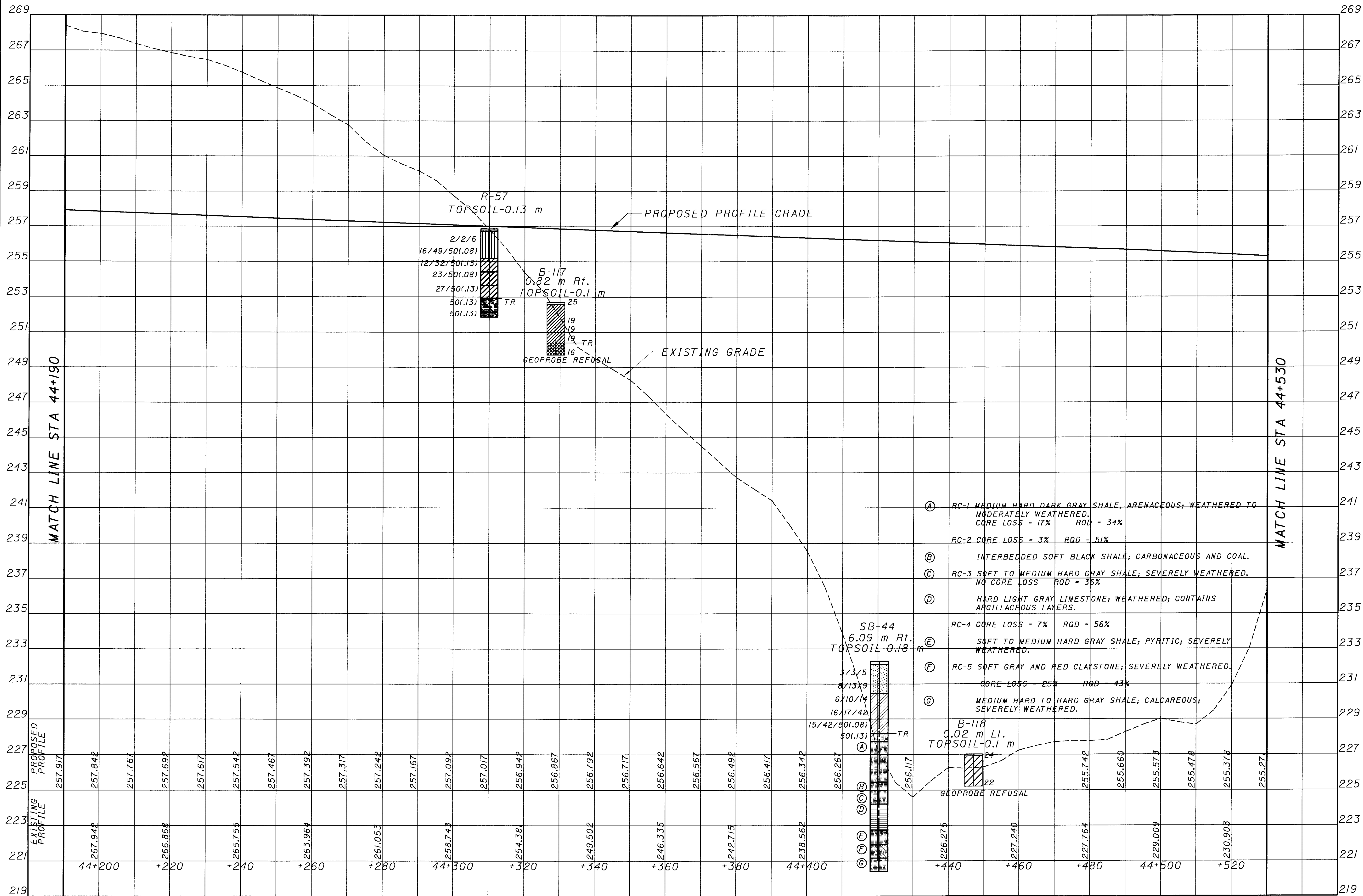
SOIL PROFILE
STA. 43+850 TO STA. 44+190

MATCH LINE STA 44+190



MATCH LINE STA 44+530

02/05/01
10:44:29 AM
M:\proj\382\016-00\DSN\geotech\g.fu33_15.dgn



02/06/01
05:18:22 AM
M:\Proj\9821\016-00\DS\geotech\plan33_16.dgn

MATCH LINE STA 44+530

+540 +560 +580 44+600 +620 +640 +660 +680 44+700 +720 +740 +760 +780 44+800 +820 +840 +860

CONST
US 33 MAINLINE

B-119

WOODS

BRIARS

BRIARS

GRASS

B-120

S 23° 01' 54" E

BRIARS

R-58

MATCH LINE STA 44+870

51 / 132
749
949

ATH-33-40.981

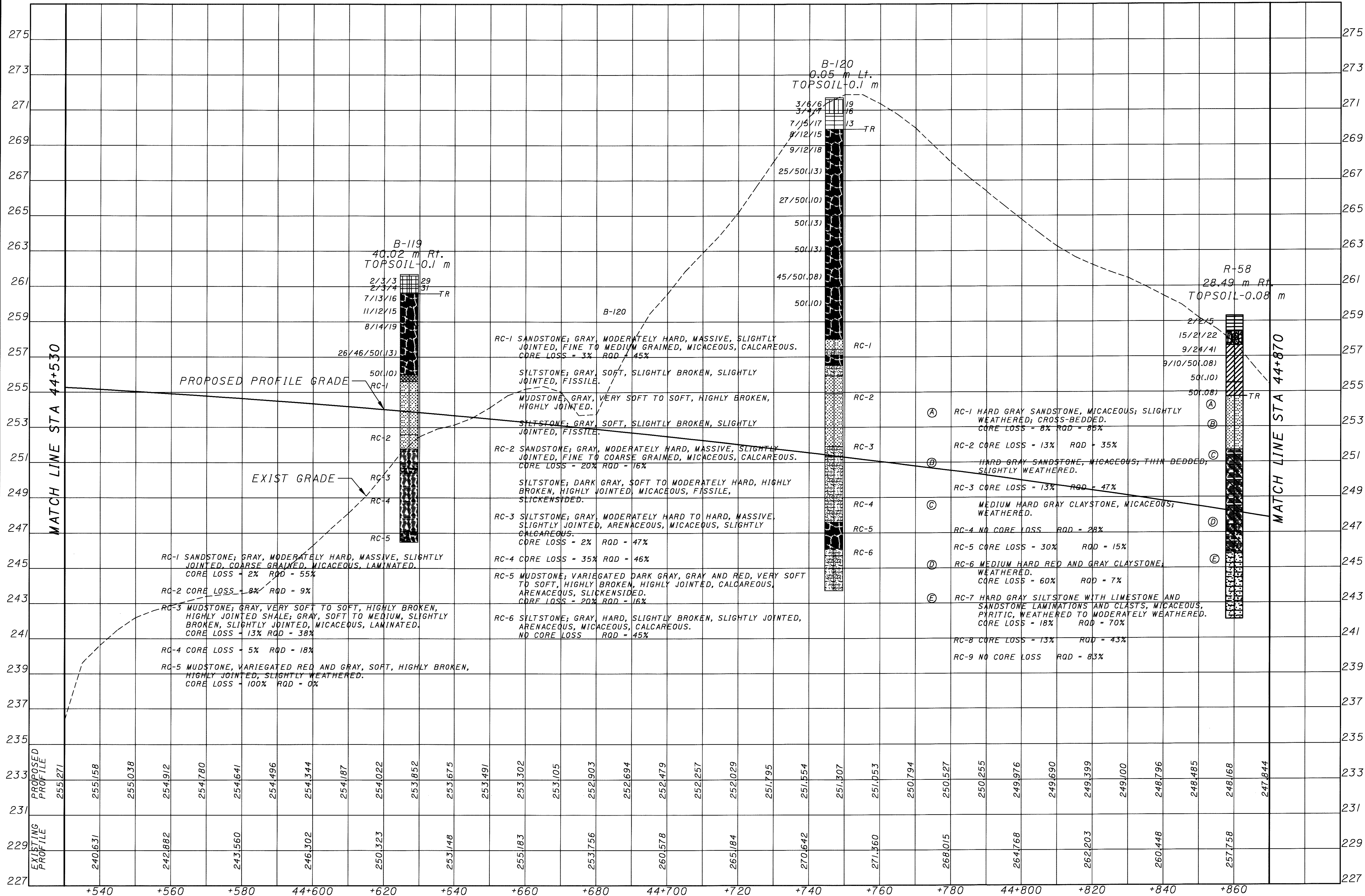
SOIL PROFILE
STA. 44+530 TO STA. 44+870

CALCULATED
RS
CHECKED
DAA

0 10 20
HORIZONTAL
SCALE IN METERS



07/06/01
10:50:09 AM
M:\proj\01\9821\016-00\DS1\geol\tech\fig\1u33_16.dgn



02/06/01
09:48:39 AM
M:\proj\3821\016 00\05\geotech\plan33-17.dgn

MATCH LINE STA 44+870

+880 44+900 +920 +940 **SB-43** +960 +980 45+000 +020 +040 +060 +080 45+100 +120 +140 +160 +180 45+200
CONST US 33 MAINLINE S 23° 01' 54" E

B-121

R-60
R-59

R-63

R-64

R-61

R-62

B-125

B-123

B-124

WOODS

WOODS

FIELD

FIELD

MATCH LINE STA 45+210

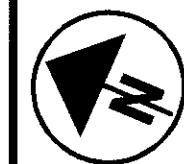
53 / 132
751
949

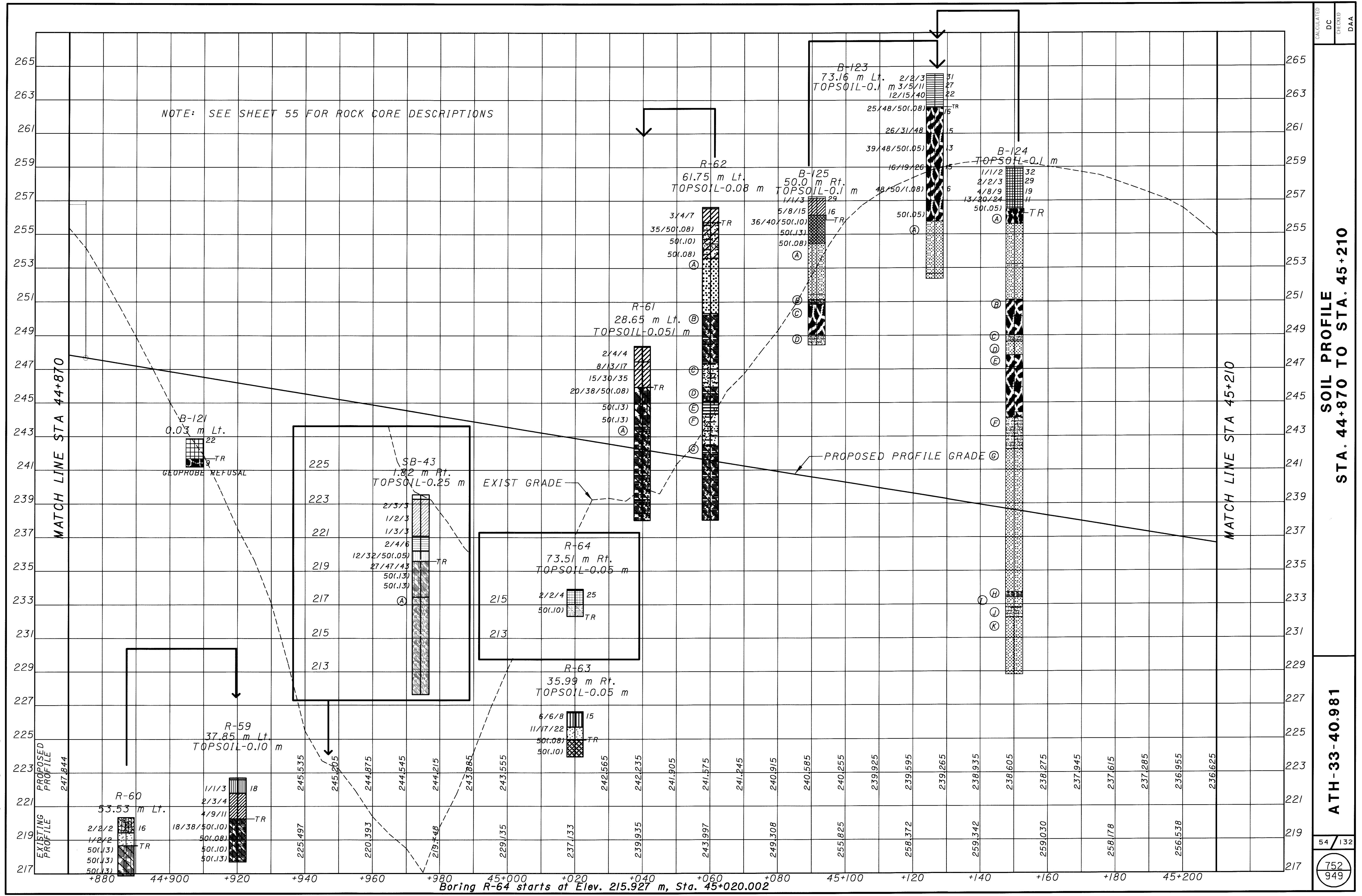
ATH-33-40.981

SOIL PROFILE
STA. 44+870 TO STA. 45+210

CALCULATED
RS
CHECKED
DAA

0 10 20
HORIZONTAL
SCALE IN METERS





SB-43

(A) RC-1 MEDIUM HARD GRAY, RED, AND BROWN CLAYSTONE, PYRITIC, MICACEOUS, SLIGHTLY CALCAREOUS; CONTAINS OCCASIONAL LIMESTONE LENSES, SEVERELY WEATHERED.
CORE LOSS - 13% RQD - 36%

RC-2 NO CORE LOSS RQD = 60%

RC-3 CORE LOSS = 23% RQD = 52%

R-62

(A) RC-1 SOFT BROWN SANDSTONE, MICACEOUS; MODERATELY WEATHERED; SLIGHTLY BROKEN TO MASSIVE.
CORE LOSS - 17% RQD = 67%

RC-2 CORE LOSS - 18 RQD = 80%

RC-3 CORE LOSS = 10% RQD = 38%

(B) VERY SOFT GRAY CLAYSTONE; WEATHERED; SLIGHTLY BROKEN; OCCASIONALLY CALCAREOUS IN SMALL BANDS.

RC-4 NO CORE LOSS RQD = 40%

RC-5 CORE LOSS - 25% RQD = 27%

(C) SOFT GRAY SILTSTONE, MICACEOUS; WEATHERED; BROKEN-SLIGHTLY BROKEN.

RC-6 CORE LOSS -57% RQD = 0%

(D) SOFT REDDISH BROWN CLAYSTONE; SEVERELY WEATHERED; VERY BROKEN.

RC-7 NO CORE LOSS RQD = 77%

(E) MEDIUM HARD GRAY LIMESTONE; WEATHERED; SLIGHTLY BROKEN.

(F) MEDIUM HARD GRAY SILTSTONE, MICACEOUS, LAMINATED, WEATHERED, SLIGHTLY BROKEN.

RC-8 CORE LOSS = 27% RQD = 10%

(G) SOFT REDDISH BROWN CLAYSTONE, CALCAREOUS; SEVERELY WEATHERED; VERY BROKEN; CONTAINS COARSE SAND AND GRAVEL CLASTS.

RC-9 CORE LOSS - 38% RQD = 0%

RC-10 CORE LOSS = 80% RQD = 7%

RC-11 CORE LOSS - 38% RQD = 17%

B-123

(A) RC-1 SANDSTONE; GRAY, MEDIUM, MASSIVE, FINE GRAINED, MICACEOUS, SLIGHTLY WEATHERED.
CORE LOSS - 5% RQD = 63%

RC-2 NO CORE LOSS RQD = 100%

B-125

(A) RC-1 SANDSTONE; BROWN, SOFT TO MEDIUM HARD, HIGHLY BROKEN, FINE TO MEDIUM GRAINED, SILTY, FRIABLE, MICACEOUS.
CORE LOSS = 5% RQD = 0%

(B) RC-2 CLAYSHALE; BROWN, SOFT, HIGHLY BROKEN, SILTY.
CORE LOSS = 39% RQD = 0%

(C) MUDSTONE; GREENISH GRAY, VERY SOFT TO SOFT, HIGHLY BROKEN, NON-BEDDED, SLIGHTY JOINTED.

(D) RC-3 SILTSTONE; GRAY, MEDIUM HARD, HIGHLY BROKEN, ARGILLACEOUS, CROSS-BEDDED, PYRITIC.
NO CORE LOSS RQD = 0%

R-61

(A) RC-1 SOFT RED, GRAY, AND BROWN CLAYSTONE, MICACEOUS, SEVERELY WEATHERED, ARENACEOUS, CONTAINS LIMESTONE, SILTSTONE, AND SANDSTONE CLASTS.
CORE LOSS - 21% RQD = 25%

RC-2 CORE LOSS = 62% RQD = 12%

RC-3 CORE LOSS = 50% RQD = 0%

RC-4 CORE LOSS = 68% RQD = 0%

B-124

(A) RC-1 SHALE; BROWN, SOFT, HIGHLY BROKEN, MICACEOUS, SILTY.
SANDSTONE; BROWN AND GRAY, MEDIUM HARD, HIGHLY BROKEN, FINE GRAINED, MICACEOUS, SLIGHTLY WEATHERED.
NO CORE LOSS RQD = 18%

RC-2 CORE LOSS = 3% RQD = 20%

(B) RC-3 MUDSTONE; GRAY, VERY SOFT TO SOFT, HIGHLY BROKEN, NON-BEDDED, SILTY, WITH GRAY CLAY SEAMS UP TO 10 CM THICK.
CORE LOSS = 4% RQD = 16%

(C) SILTSTONE; GRAY, MEDIUM, MICACEOUS, SLIGHTLY BROKEN.

(D) RC-4 SANDSTONE; GRAY, MEDIUM, MASSIVE, FINE GRAINED, CROSS-BEDDED, MICACEOUS.
NO CORE LOSS RQD = 41%

(E) RC-5 MUDSTONE; VARIEGATED GRAY, RED, AND PURPLE, VERY SOFT TO SOFT, HIGHLY BROKEN, NON-BEDDED, SLIGHTLY CALCAREOUS, WITH LIMESTONE NODULES.
CORE LOSS = 67% RQD = 0%

RC-6 CORE LOSS = 10% RQD = 0%

RC-7 CORE LOSS = 44% RQD = 0%

RC-8 CORE LOSS = 10% RQD = 38%

(F) RC-9 SILTSTONE; GRAY, MEDIUM HARD, MASSIVE, MICACEOUS, ARGILLACEOUS, WITH LIMESTONE NODULES.
NO CORE LOSS RQD = 67%

(G) SANDSTONE; GRAY, MEDIUM TO MODERATELY HARD, FINE GRAINED, MICACEOUS, SILTY.

RC-10 SANDSTONE; BROWN TO GRAY, MODERATELY HARD, MASSIVE, FINE TO COARSE GRAINED, MICACEOUS, SLIGHTLY WEATHERED, WITH LIMESTONE NODULES.
NO CORE LOSS RQD = 70%

RC-11 NO CORE LOSS RQD = 60%

RC-12 CORE LOSS = 5% RQD = 68%

(H) SHALE; BROWN, SOFT TO MEDIUM, HIGHLY BROKEN, SILTY, SLIGHTLY JOINTED.

(I) SANDSTONE; GRAY, MEDIUM, MASSIVE, FINE GRAINED, MICACEOUS, CROSS-BEDDED.

(J) RC-13 SILTSTONE; GRAY, MEDIUM, MICACEOUS, ARGILLACEOUS, SLIGHTLY BROKEN.
CORE LOSS = 2% RQD = 38%

(K) SANDSTONE; BROWN TO LIGHT GRAY, MEDIUM TO MODERATELY HARD, SLIGHTLY BROKEN, COARSE GRAINED, MICACEOUS, SLIGHTLY JOINTED, WITH INTERBEDDED LIGHT GRAY CLAY SEAMS UP TO 10 CM THICK.

RC-14 CORE LOSS = 5% RQD = 48%

MATCH LINE STA 45+210

+220 +240 +260 +280 45+300 +320 +340 +360 +380 45+400 +420 +440 +460 +480 45+500 +520 +540

SB-42

B-126

BARN
COLLAPSED

BLOCK
BUILDING

CONST US 33 MAINLINE

R-67

R-66

R-65

SB-16

B-127

FIELD

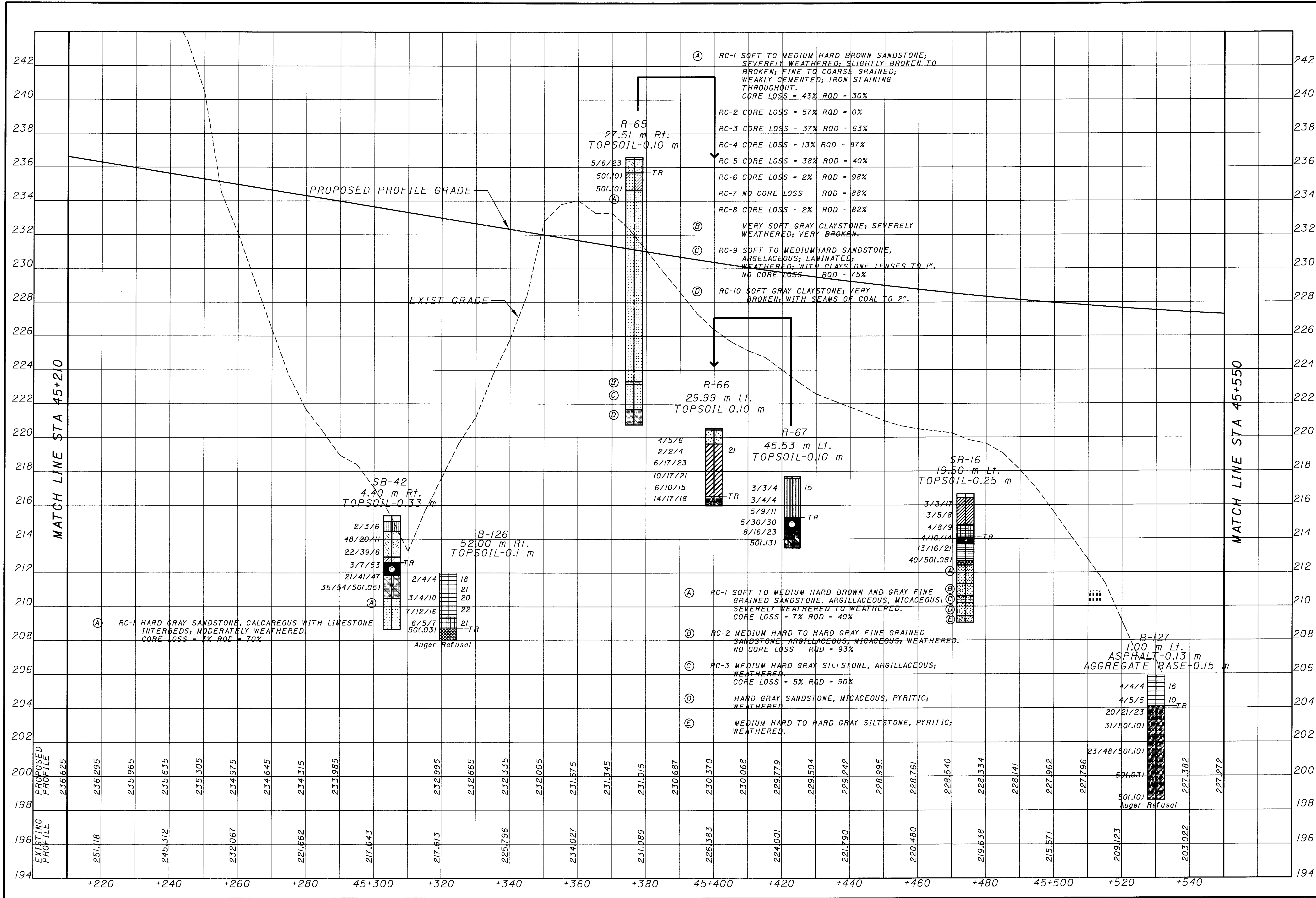
BRUSH

EX CR 40

WEST BRANCH SHADE RIVER

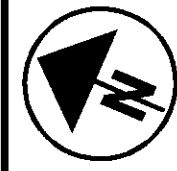
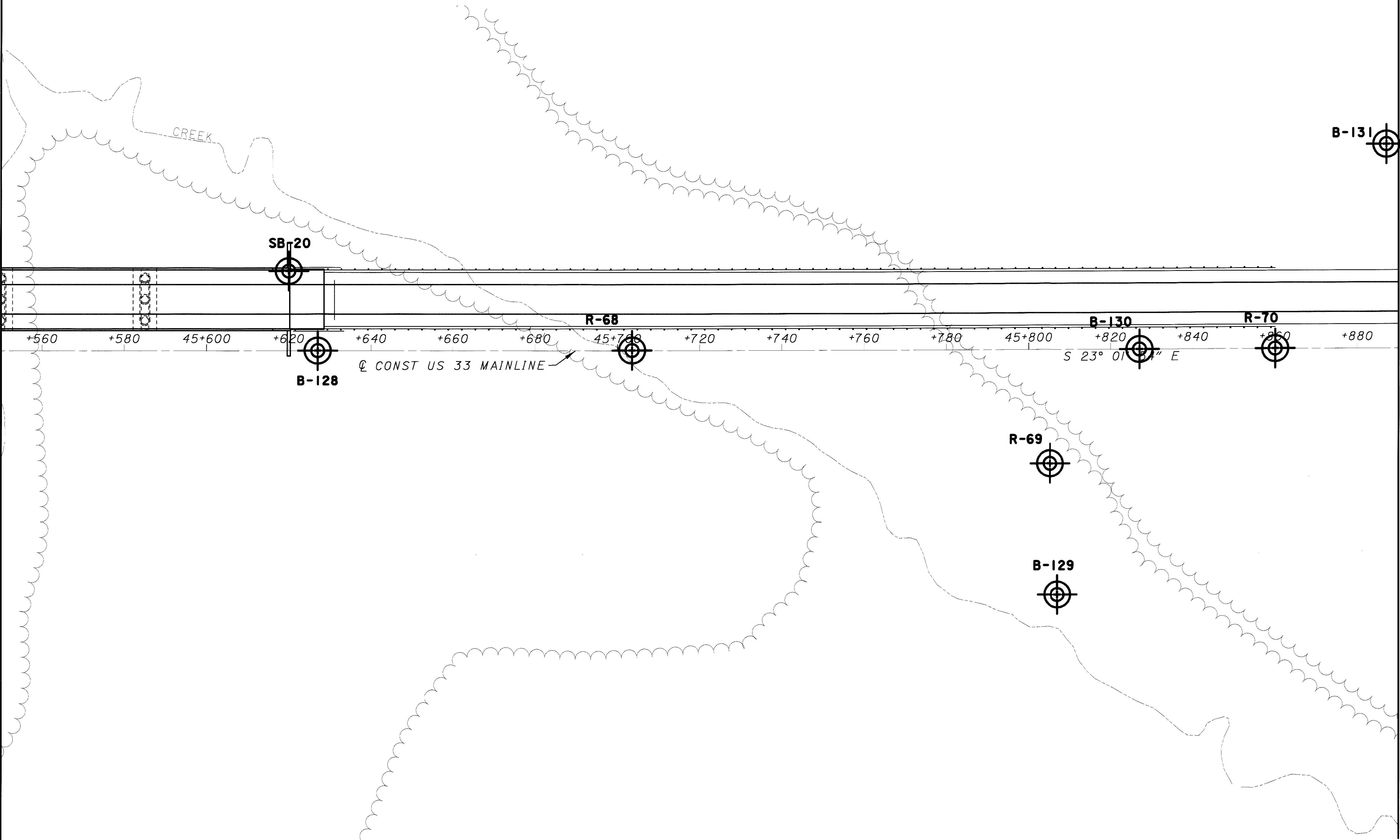
MATCH LINE STA 45+550

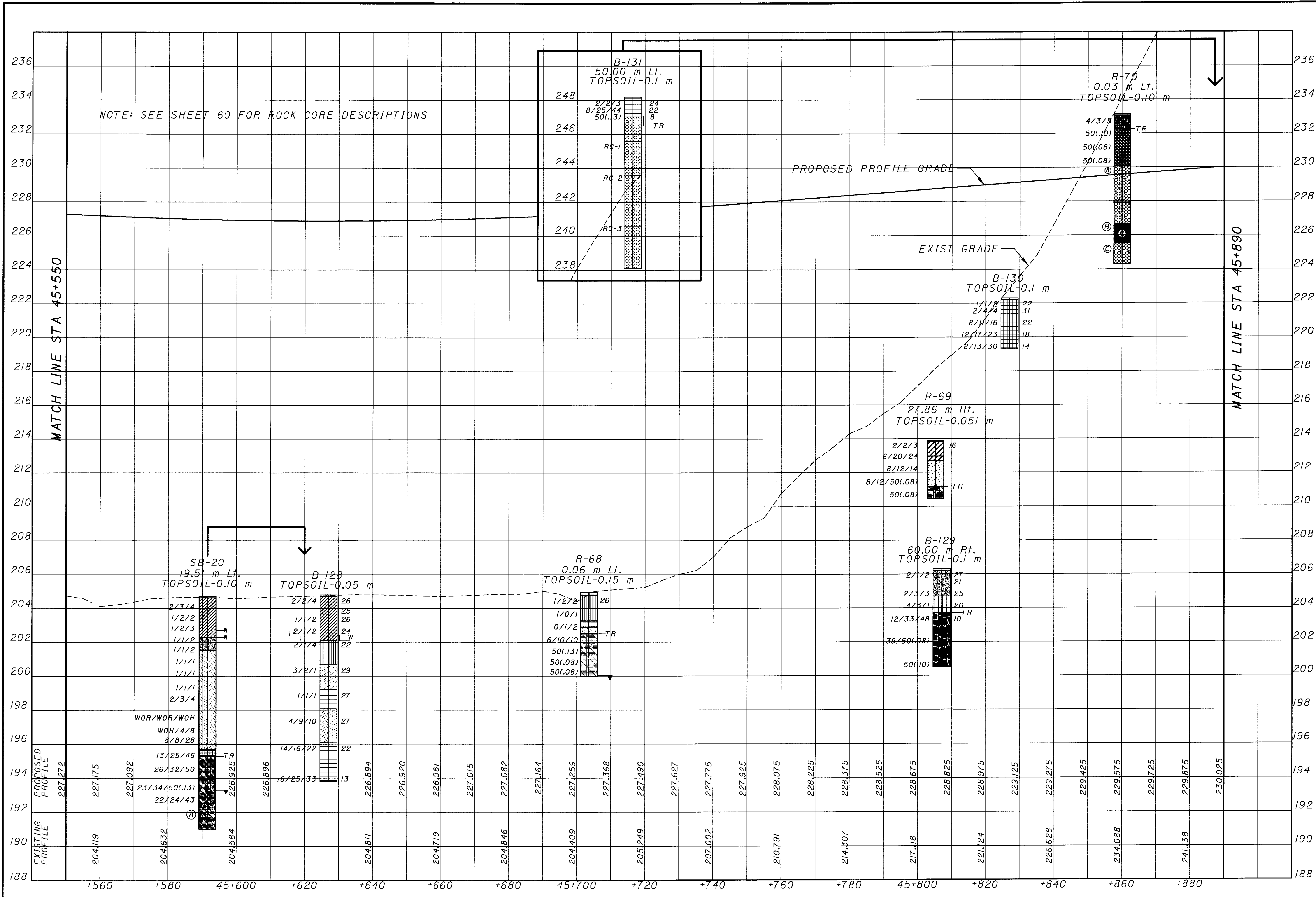
07/06/01
10:52:49 AM
M:\Proj\9821\016-00\US\geotech\gfu33.18.dgn



02/06/01
09:49:15 AM
M:\proj\198\1\1016-00\DSI\geotech\plan33_1B.dgn

MATCH LINE STA 45+550





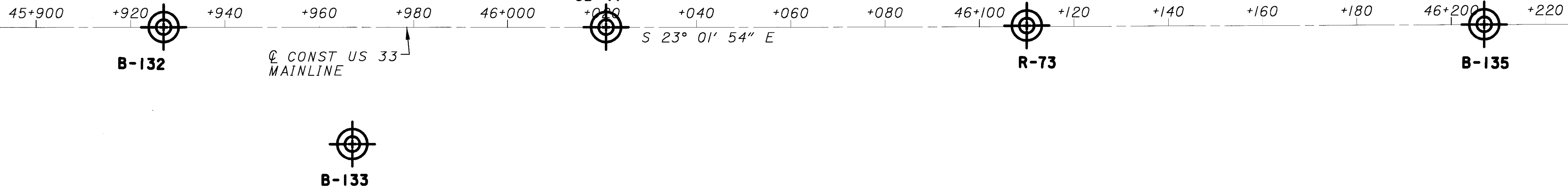
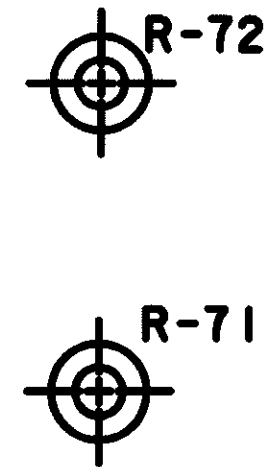
SB-20
RC-1 SOFT TO MEDIUM HARD RED, GRAY AND BROWN
CLAYSTONE.
CORE LOSS - 42% RQD - 22%

- R-70
- Ⓐ RC-1 MEDIUM HARD TO HARD BROWN AND GRAY
SANDSTONE, MICACEOUS, WEATHERED,
SLIGHTLY BROKEN.
CORE LOSS - 6% RQD - 94%
RC-2 NO CORE LOSS RQD - 92%
- Ⓑ MEDIUM HARD GRAY SANDSTONE;
MODERATELY WEATHERED, CONTAINS COAL
BLOSSOMS, POORLY CEMENTED.
RC-3 NO CORE LOSS RQD - 77%
- Ⓒ RC-4 SOFT BLACK COAL AND CARBONACEOUS SHALE,
VERY BROKEN, WEATHERED.
CORE LOSS - 10% RQD - 33%
RC-5 CORE LOSS - 5% RQD - 87%
- Ⓓ HARD GRAY SANDSTONE, MICACEOUS,
MODERATELY WEATHERED, CONTAINS THIN
DARK GRAY LAMINAE.

B-131
RC-1 SANDSTONE; BROWN, MODERATELY HARD, MASSIVE, MEDIUM TO
COARSE GRAINED, MICACEOUS.
NO CORE LOSS RQD - 77%
RC-2 NO CORE LOSS RQD - 78%
RC-3 NO CORE LOSS RQD - 92%

07/06/01
09:49:46 AM
Me:\proj\9821\0106-00\US1\geotech\plans\3.20.dgn

MATCH LINE STA 45+890



MATCH LINE STA 46+230

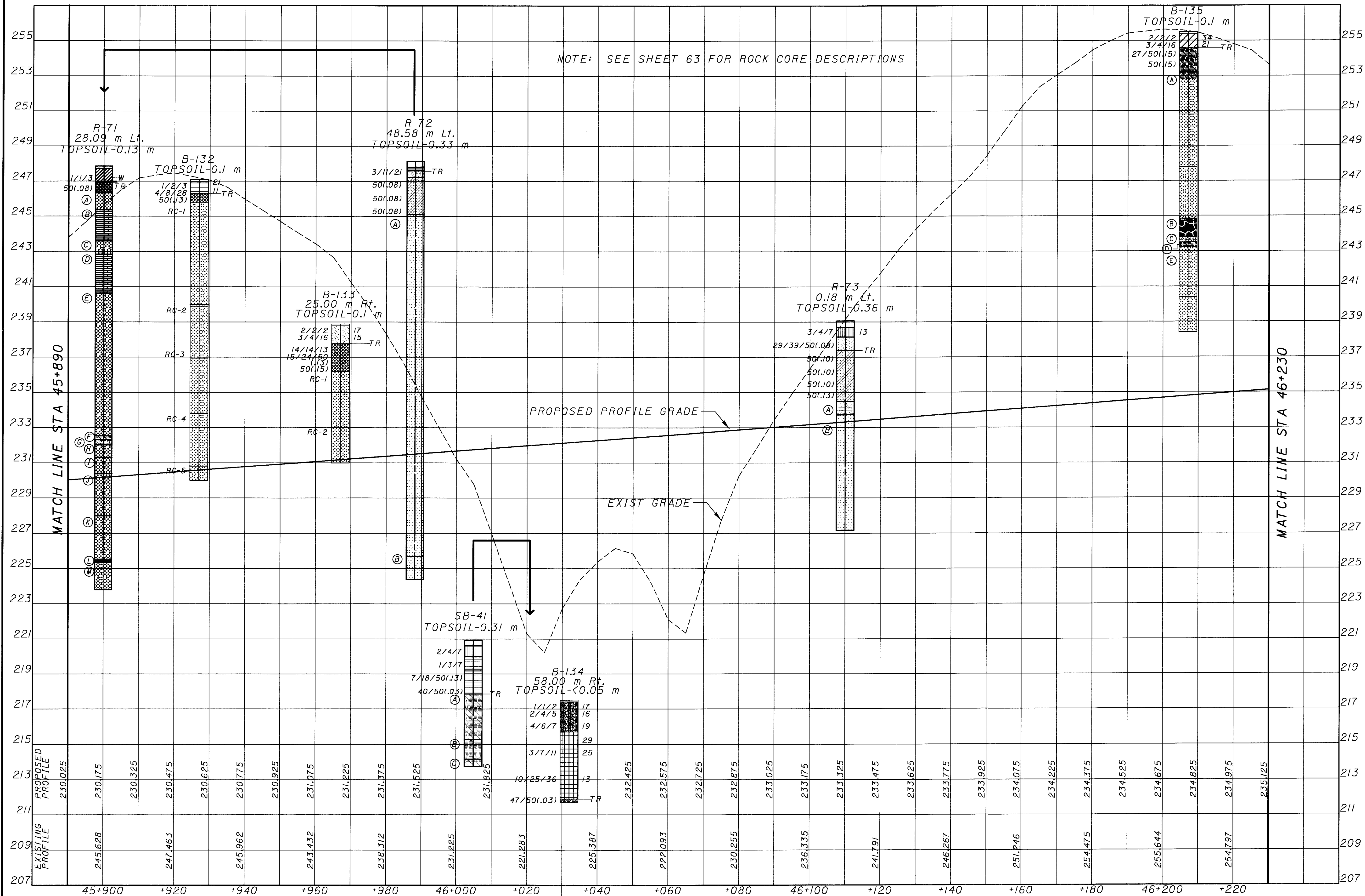
61 / 132
759
949

ATH-33-40.981

SOIL PROFILE
STA. 45+890 TO STA. 46+230

CALCULATED
RS
CHECKED
DAA





R-71

(A) RC-1 MEDIUM HARD TO HARD, LIGHT GRAY SANDSTONE, CALCAREOUS, MICACEOUS, WEATHERED.
CORE LOSS = 8% RQD = 92%

(B) HARD, GRAY LIMESTONE, SLIGHTLY MICACEOUS, WEATHERED TO MODERATELY WEATHERED.

RC-2 NO CORE LOSS RQD = 100%

(C) RC-3 MEDIUM HARD TO HARD, BROWN SANDSTONE, MICACEOUS, MODERATELY WEATHERED, SLIGHTLY BROKEN.
NO CORE LOSS RQD = 100%

(D) HARD, LIGHT GRAY LIMESTONE, SLIGHTLY MICACEOUS, MODERATELY WEATHERED TO WEATHERED, CONTAINS BROWN AND GRAY MICACEOUS SANDSTONE LAYERS.

RC-4 CORE LOSS = 30% RQD = 70%

(E) RC-5 MEDIUM HARD TO HARD, BROWN AND GRAY SANDSTONE, MICACEOUS, SLIGHTLY BROKEN, CONTAINS LIMESTONE CLASTS.
NO CORE LOSS RQD = 100%

RC-6 NO CORE LOSS RQD = 100%

RC-7 NO CORE LOSS RQD = 100%

RC-8 NO CORE LOSS RQD = 90%

RC-9 NO CORE LOSS RQD = 100%

RC-10 NO CORE LOSS RQD = 100%

(F) SOFT TO MEDIUM HARD, GRAY CLAYSTONE, WEATHERED.

(G) MEDIUM HARD, GRAY SILTSTONE, WEATHERED.

(H) HARD, GRAY, FINE GRAINED SANDSTONE, MICACEOUS, WEATHERED.

(I) RC-11 HARD, GRAY, FINE GRAINED SANDSTONE, MICACEOUS, MODERATELY WEATHERED.
CORE LOSS = 2% RQD = 92%

(J) MEDIUM HARD, BROWN AND GRAY, SANDSTONE, MICACEOUS, WEATHERED, BROKEN.

RC-12 NO CORE LOSS RQD = 90%

RC-13 NO CORE LOSS RQD = 88%

(K) HARD, GRAY SANDSTONE, ARGILLACEOUS, MICACEOUS, WEATHERED.

RC-14 NO CORE LOSS RQD = 87%

(L) SOFT, BLACK COAL, WITH CARBONACEOUS SHALE, MODERATELY WEATHERED.

(M) RC-15 HARD, GRAY SANDSTONE, ARGILLACEOUS, MICACEOUS, WEATHERED.
NO CORE LOSS RQD = 100%

SB-41

(A) RC-1 SOFT GRAY AND RED CLAYSTONE; SEVERELY WEATHERED; BROKEN.
CORE LOSS = 83% RQD = 0%

RC-2 CORE LOSS = 50% RQD = 28%

(B) SOFT TO MEDIUM HARD GRAY SHALE; SEVERELY WEATHERED; CONTAINS CALCAREOUS BANDING.

RC-3 CORE LOSS = 20% RQD = 76%

(C) SOFT RED AND GRAY CLAYSTONE; SEVERELY WEATHERED.

R-72

(A) RC-1 MEDIUM HARD TO HARD, BROWN AND GRAY, SANDSTONE, MICACEOUS, ARGILLACEOUS, CONTAINS DARK BROWN LAMINAE AND CLAYSTONE CLASTS, MODERATELY WEATHERED.
CORE LOSS = 4% RQD = 96%

RC-2 NO CORE LOSS RQD = 100%

RC-3 NO CORE LOSS RQD = 100%

RC-4 NO CORE LOSS RQD = 92%

RC-5 CORE LOSS = 5% RQD = 95%

RC-6 CORE LOSS = 3% RQD = 97%

RC-7 NO CORE LOSS RQD = 100%

RC-8 NO CORE LOSS RQD = 87%

RC-9 NO CORE LOSS RQD = 82%

RC-10 NO CORE LOSS RQD = 85%

RC-11 CORE LOSS = 8% RQD = 83%

RC-12 CORE LOSS = 5% RQD = 90%

RC-13 NO CORE LOSS RQD = 97%

(B) MEDIUM HARD TO HARD, GRAY SANDSTONE, CONTAINS BLACK CARBONIFEROUS SHALE LAMINAE, MICACEOUS, WEATHERED.
RC-14 NO CORE LOSS RQD = 100%

R-73

(A) RC-1 SOFT TO MEDIUM HARD BROWN SILTSTONE, MICACEOUS, ARGILLACEOUS, WEATHERED, VERY BROKEN.
CORE LOSS = 15% RQD = 29%

(B) HARD GRAY SANDSTONE, MICACEOUS, WEATHERED.

RC-2 NO CORE LOSS RQD = 100%

RC-3 NO CORE LOSS RQD = 100%

RC-4 NO CORE LOSS RQD = 100%

RC-5 NO CORE LOSS RQD = 100%

RC-6 CORE LOSS = 3% RQD = 95%

B-135

RC-1 SANDSTONE; BROWN AND GRAY, MEDIUM TO MODERATELY HARD, SLIGHTLY BROKEN, MEDIUM TO COARSE GRAINED, MICACEOUS, CROSS-BEDDED, FRIABLE.
CORE LOSS = 5% RQD = 31%

RC-2 CORE LOSS = 3% RQD = 28%

RC-3 CORE LOSS = 3% RQD = 11%

RC-4 CORE LOSS = 100% RQD = 0%

RC-5 MUDSTONE; GRAY, VERY SOFT, HIGHLY BROKEN, NON-BEDDED, SILTY, SLICKENSIDED, WITH RARE CHERT NODULES.
CORE LOSS = 4% RQD = 0%

SILTSTONE; GRAY, MEDIUM, HIGHLY BROKEN, MICACEOUS.

CLAYSHALE; BROWN, SOFT, HIGHLY BROKEN, SILTY, SLIGHTLY MICACEOUS.

RC-6 SANDSTONE; BROWN, MEDIUM, MASSIVE, FINE TO MEDIUM GRAINED, CROSS-BEDDED, SLIGHTLY FRIABLE.
NO CORE LOSS RQD = 29%

RC-7 CORE LOSS = 7% RQD = 64%

B-132

RC-1 SANDSTONE; LIGHT BROWN, MEDIUM HARD, MASSIVE, MEDIUM GRAINED, FRIABLE, CROSS-BEDDED, SLIGHTLY WEATHERED, SLIGHTLY JOINTED.
CORE LOSS = 5% RQD = 75%

RC-2 CORE LOSS = 3% RQD = 66%

RC-3 SANDSTONE; GRAY TO BROWN, MODERATELY HARD, MASSIVE, FINE TO COARSE GRAINED, MICACEOUS, CROSS-BEDDED.
CORE LOSS = 1% RQD = 80%

RC-4 CORE LOSS = 1% RQD = 71%

RC-5 CORE LOSS = 1% RQD = 70%

RC-6 CORE LOSS = 16% RQD = 35%

B-133

RC-1 SANDSTONE; BROWN, MEDIUM HARD, HIGHLY BROKEN.
CORE LOSS = 40% RQD = 0%

RC-2 SANDSTONE; BROWN, MEDIUM HARD, HIGHLY BROKEN, MEDIUM GRAINED, MICACEOUS, WITH HIGHLY WEATHERED SILTSTONE LENSES UP TO 1 CM THICK.
CORE LOSS = 52% RQD = 0%

CALCULATED
DC
CHECKED
DAA

SOIL PROFILE
STA. 45+890 TO STA. 46+230

ATH-33-40.981

63 / 132

761
949

02/06/01
09:51:20 AM
M:\proj\9821\06-00\05\geol\ech\plan33-21.dgn

MATCH LINE STA 46+230

+240

+260

+280

46+300

+320

+340

+360

+380

46+400

+420

+440

+460

+480

46+500

+520

+540

+560

Q CONST US 33 MAINLINE

S 23° 01' 54" E



B-136

WOODS

R-74



B-137

WOODS



R-75



R-76



B-138



R-77



R-78

MATCH LINE STA 46+570

64 / 132

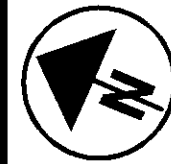
762
949

ATH-33-40.981

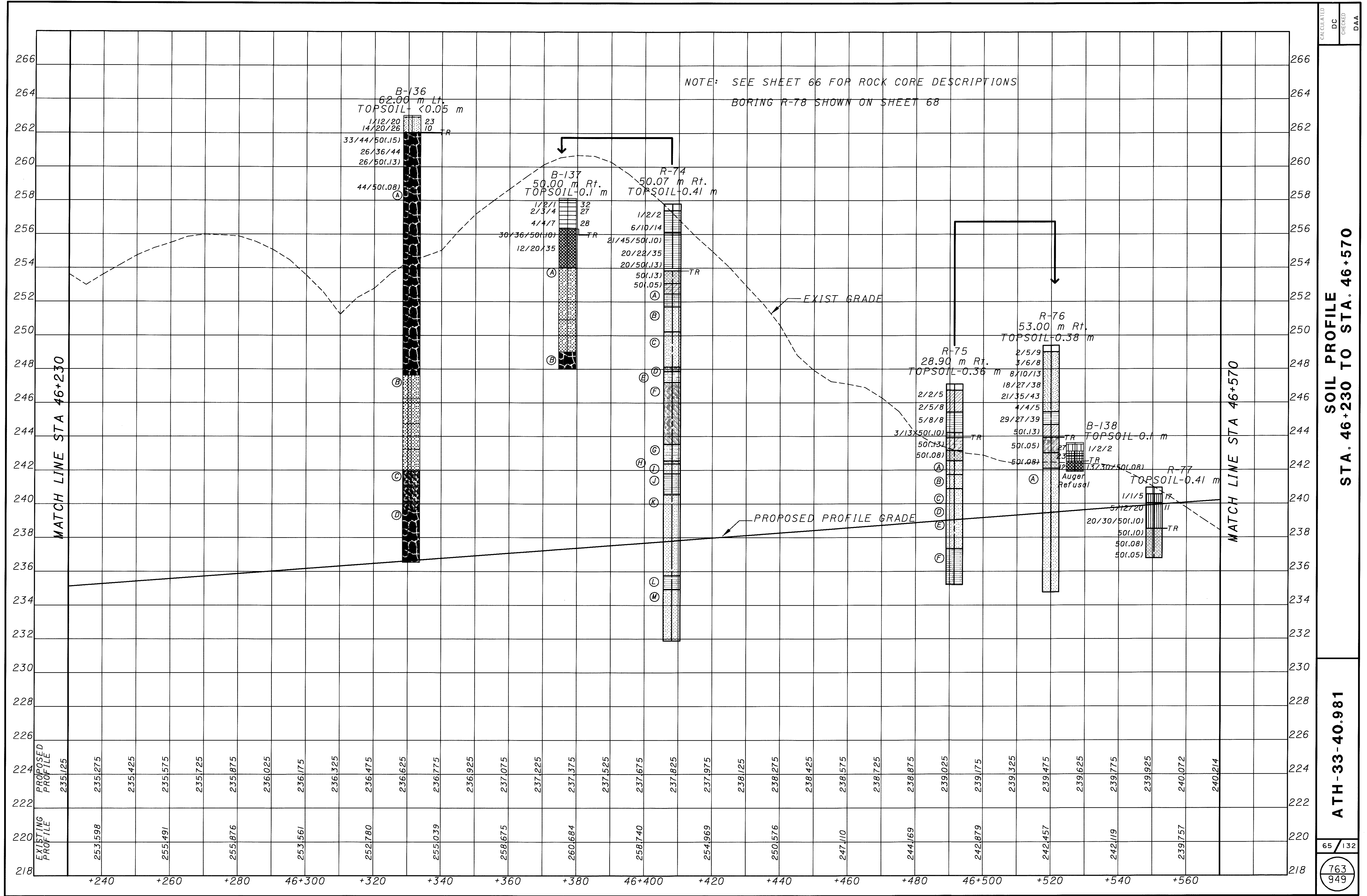
SOIL PROFILE
STA. 46+230 TO STA. 46+570

CALCULATED
RS
CHECKED
DAA

0 10 20
HORIZONTAL
SCALE IN METERS



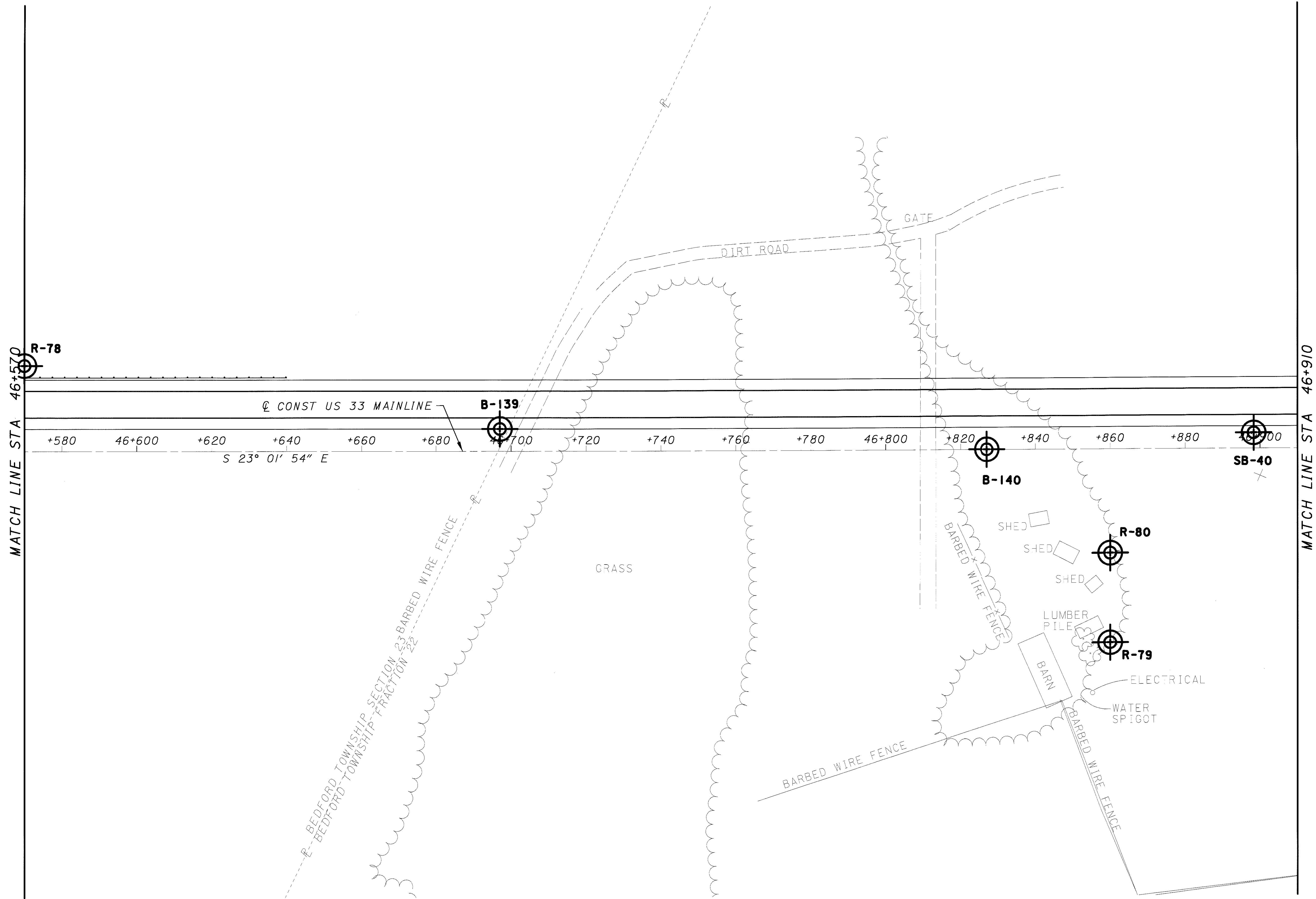
02/06/01
03:03:41PM
M:\P\01\382\1016_00\05\geotechn\grf\33_21.dgn



R-74
Ⓐ RC-1 HARD GRAY LIMESTONE, SLIGHTLY WEATHERED
CORE LOSS = 30% RQD = 60%
Ⓑ RC-2 HARD BROWN SANDSTONE, MICACEOUS, SLIGHTLY
WEATHERED TO WEATHERED.
NO CORE LOSS RQD = 100%
Ⓒ HARD GRAY SANDSTONE, MICACEOUS, MODERATELY
WEATHERED TO WEATHERED.
RC-3 NO CORE LOSS RQD = 100%
RC-4 CORE LOSS = 5% RQD = 80%
Ⓓ VERY SOFT TO SOFT GRAY CLAYSTONE, SLIGHTLY
WEATHERED TO WEATHERED.
Ⓔ SOFT TO MEDIUM HARD GRAY SILTSTONE, SLIGHTLY
WEATHERED TO WEATHERED; BROKEN.
Ⓕ MEDIUM HARD GRAY CLAYSTONE, MODERATELY WEATHERED;
CONTAINS ARENACEOUS LAYERS.
RC-5 CORE LOSS = 8% RQD = 80%
RC-6 CORE LOSS = 73% RQD = 0%
RC-7 CORE LOSS = 3% RQD = 73%
Ⓖ MEDIUM HARD TO HARD GRAY SILTSTONE, WEATHERED.
Ⓗ RC-8 MEDIUM HARD BROWN CLAYSTONE, MODERATELY WEATHERED
NO CORE LOSS RQD = 97%
Ⓘ MEDIUM HARD TO HARD BROWN SANDSTONE, SLIGHTLY
MICACEOUS; MODERATELY WEATHERED TO WEATHERED.
Ⓝ HARD LIGHT GRAY LIMESTONE, SLIGHTLY WEATHERED.
RC-9 NO CORE LOSS RQD = 100%
Ⓚ HARD BROWN AND GRAY SANDSTONE, MICACEOUS, MODERATELY
WEATHERED; CONTAINS DARK BROWN LAMINAE.
RC-10 CORE LOSS = 3% RQD = 97%
RC-11 CORE LOSS = 2% RQD = 98%
RC-12 NO CORE LOSS RQD = 100%
Ⓛ HARD LIGHT GRAY LIMESTONE, CONTAINS CLAYSTONE
CLASTS.
Ⓜ RC-13 MEDIUM HARD BROWN AND GRAY SANDSTONE, MICACEOUS.
CORE LOSS = 2% RQD = 98%
RC-14 CORE LOSS = 2% RQD = 98%

B-136
Ⓐ RC-1 MUDSTONE; VARIEGATED RED, BROWN, AND GRAY,
VERY SOFT TO MEDIUM, HIGHLY BROKEN,
NON-BEDDED, SILTY, CALCAREOUS, SLIGHTLY
JOINTED, WITH RARE NODULAR LIMESTONE.
CORE LOSS = 23% RQD = 0%
RC-2 CORE LOSS = 2% RQD = 0%
RC-3 CORE LOSS = 56% RQD = 0%
RC-4 CORE LOSS = 78% RQD = 0%
RC-5 CORE LOSS = 40% RQD = 0%
RC-6 CORE LOSS = 28% RQD = 0%
RC-7 CORE LOSS = 90% RQD = 0%
RC-8 CORE LOSS = 12% RQD = 0%
RC-9 NO CORE LOSS RQD = 0%
RC-10 CORE LOSS = 4% RQD = 8%
Ⓑ RC-11 SANDSTONE; BROWN TO GRAY, MEDIUM,
MASSIVE, FINE TO MEDIUM GRAINED,
CROSS-BEDDED, MICACEOUS, SLIGHTLY,
FRIABLE.
NO CORE LOSS RQD = 80%
RC-12 CORE LOSS = 4% RQD = 35%
RC-13 NO CORE LOSS RQD = 33%
RC-14 CORE LOSS = 4% RQD = 27%
Ⓒ RC-15 CLAYSHALE; GRAY, SOFT TO MEDIUM HARD,
HIGHLY BROKEN, SILTY, SLIGHTLY PYRITIC,
WITH INTERBEDDED GRAY, MODERATELY HARD,
SILTSTONE LENSES UP TO 8 CM THICK.
NO CORE LOSS RQD = 16%
RC-16 CORE LOSS = 50% RQD = 0%
Ⓓ RC-17 MUDSTONE; RED AND GRAY, VERY SOFT TO
MEDIUM HARD, HIGHLY BROKEN, CALCAREOUS,
NON-BEDDED, SLICKENSIDED, SILTY.
CORE LOSS = 42% RQD = 0%
RC-18 NO CORE LOSS RQD = 0%
RC-19 CORE LOSS = 75% RQD = 0%
RC-20 CORE LOSS = 5% RQD = 0%

B-137
Ⓐ RC-1 SANDSTONE; BROWN TO GRAY, MEDIUM, MASSIVE,
MEDIUM GRAINED, MICACEOUS, CROSS-BEDDED,
FRIABLE.
CORE LOSS = 1% RQD = 64%
RC-2 NO CORE LOSS RQD = 62%
Ⓑ MUDSTONE; GRAY, VERY SOFT TO SOFT, HIGHLY
BROKEN, MICACEOUS, SLIGHTLY PYRITIC.
R-76
Ⓐ RC-1 MEDIUM HARD BROWN AND GRAY SANDSTONE, MODERATELY
WEATHERED, CONTAINS DARK BROWN LAMINAE AND
CLAYSTONE CLASTS.
CORE LOSS = 4% RQD = 94%
RC-2 NO CORE LOSS RQD = 100%
RC-3 NO CORE LOSS RQD = 100%
RC-4 NO CORE LOSS RQD = 100%
RC-5 NO CORE LOSS RQD = 100%
R-75
Ⓐ RC-1 MEDIUM HARD BROWN SANDSTONE, MICACEOUS, MODERATELY
WEATHERED TO WEATHERED, CONTAINS DARK BROWN
LAMINAE.
CORE LOSS = 6% RQD = 94%
Ⓑ MEDIUM HARD TO HARD GRAY SANDSTONE, CALCAREOUS,
MODERATELY WEATHERED, SLIGHTLY MICACEOUS.
RC-2 NO CORE LOSS RQD = 100%
Ⓒ HARD BROWN AND GRAY SANDSTONE, MICAACEOUS, MODERATELY
WEATHERED.
RC-3 NO CORE LOSS RQD = 100%
Ⓓ HARD LIGHT GRAY SANDSTONE, CALCAREOUS, MODERATELY
WEATHERED, MICACEOUS.
Ⓔ MEDIUM HARD LIGHT GRAY SANDSTONE, MICACEOUS,
WEATHERED.
Ⓕ HARD LIGHT GRAY LIMESTONE, MICACEOUS, MODERATELY
WEATHERED.
RC-4 NO CORE LOSS RQD = 97%



0

10

20

HORIZONTAL
SCALE IN METERS

CALCULATED
RS

CHECKED
DAA

ATH-33-40.981

67 / 132

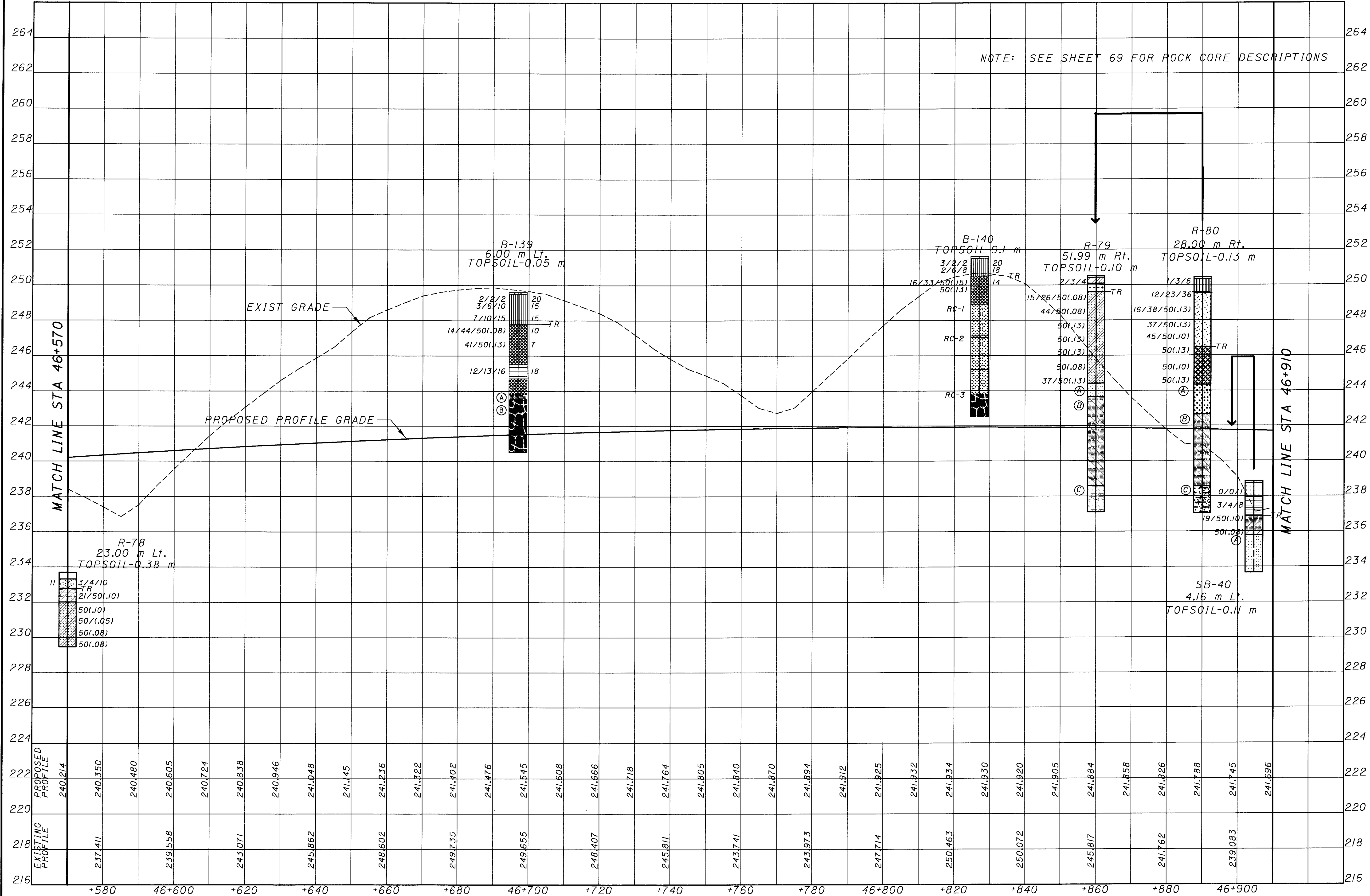
765

949

SOIL PROFILE
STA. 46+570 TO STA. 46+910

N

02/06/01 AM
10:55:00 AM
\\snp\proj\382\1016-00\US\Xgeotech\gtu33.22.dgn



SB-40
Ⓐ RC-1 HARD BROWN AND GRAY SANDSTONE, MICACEOUS;
WEATHERED TO MODERATELY WEATHERED.
CORE LOSS - 29% RQD - 17%

RC-2 NO CORE LOSS RQD - 60%

R-79
Ⓐ RC-1 MEDIUM HARD BROWN SANDSTONE, MICACEOUS,
WEATHERED.
CORE LOSS - 23% RQD - 67%

Ⓑ SOFT BROWN CLAYSTONE, SEVERLY WEATHERED.

RC-2 CORE LOSS - 20% RQD - 60%

RC-3 CORE LOSS - 52% RQD - 20%

RC-4 CORE LOSS - 67% RQD - 0%

Ⓒ RC-5 MEDIUM HARD GRAY SILTSTONE WITH
INTERBEDDED, SANDSTONE, WEATHERED.
NO CORE LOSS RQD - 100%

R-80
Ⓐ RC-1 MEDIUM HARD, BROWN SANDSTONE, MICACEOUS,
WEATHERED.
CORE LOSS - 12% RQD - 88%

RC-2 CORE LOSS - 22% RQD - 62%

Ⓑ SOFT, BROWN AND GRAY CLAYSTONE, WEATHERED
TO SEVERELY WEATHERED.

RC-3 CORE LOSS - 58% RQD - 0%

RC-4 CORE LOSS - 60% RQD - 0%

Ⓒ RC-5 MEDIUM HARD, GRAY SILTSTONE, SLIGHTLY
MICACEOUS, WEATHERED.
NO CORE LOSS RQD - 100%

B-139
Ⓐ RC-1 CLAY-SHALE; GRAY, SOFT, HIGHLY BROKEN,
SILTY, MICACEOUS, SLIGHTLY WEATHERED.
CORE LOSS - 21% RQD - 0%

Ⓑ MUDSTONE, RED AND GRAY, VERY SOFT TO
SOFT, HIGHLY BROKEN, NON-BEDDED, SILTY,
WITH NODULAR LIMESTONE.

RC-2 CORE LOSS - 60% RQD - 0%

RC-3 CORE LOSS - 50% RQD - 0%

RC-4 CORE LOSS - 68% RQD - 0%

RC-5 CORE LOSS - 40% RQD - 0%

B-140
RC-1 SANDSTONE; BROWN TO DARK BROWN, MEDIUM,
FINE GRAINED, SLIGHTLY BROKEN, MICACEOUS.
CORE LOSS - 25% RQD - 36%

RC-2 SANDSTONE; GRAY, HARD, MASSIVE, FINE
GRAINED, CALCAREOUS, MICACEOUS.
NO CORE LOSS RQD - 70%

SANDSTONE; DARK BROWN TO BROWN, MEDIUM
TO MODERATELY HARD, SLIGHTLY BROKEN,
SLIGHTLY JOINTED, FINE TO MEDIUM
GRAINED, MICACEOUS, CROSS-BEDDED,
SLIGHTLY CARBONACEOUS.

RC-3 MUDSTONE; BROWNISH GRAY, SOFT, HIGHLY
BROKEN, NON-BEDDED, SILTY.
NO CORE LOSS RQD - 24%

SOIL PROFILE
STA. 46+570 TO STA. 46+910

ATH-33-40.981

69 / 132

767
949

CALCULATED
DC
CHECKED
DAA

02/06/01
09:53:08 AM
M:\p\proj\982\016-00\DSI\geotech\plan33_23.dgn

MATCH LINE STA 46+910

+920

+940

+960

+980

47+000

+020

+040

R-81

B-141

Sta. 0+162.173
END WORK

Sta. 0+077.500
BEGIN WORK

+080

47+100

+120

+140

SB-39

+160

R-83

47+200

+220

B-142

+240

R-84

MATCH LINE STA 47+250

Q CONST US 33 MAINLINE

Q CONST
TR 243

1.2m BARBED WIRE

1.2m BARBED WIRE

GRAVEL DR.

1
STY. FR.
#40420

SAT.
DISH

1.2m BARBED WIRE

1.2m BARBED WIRE

1.2m BARBED WIRE

GRASS

WOOD
BARN

BRUSH

0

10

20

HORIZONTAL
SCALE IN METERS

CALCULATED

RS

CHECKED

DAA

ATH-33-40.981

70 / 132

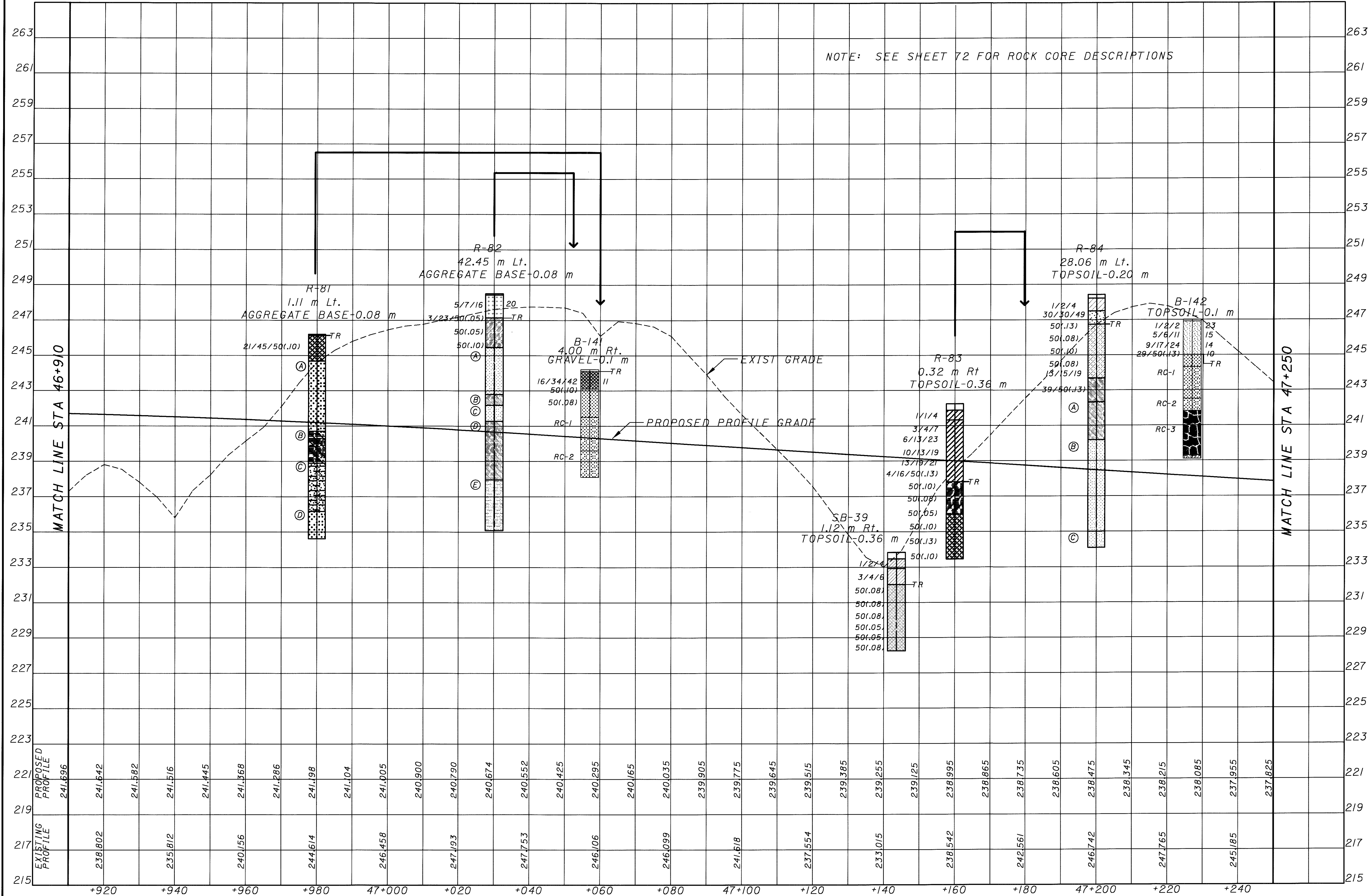
768

949

SOIL PROFILE
STA. 46+910 TO STA. 47+250

N

02/06/01
09:55:35 AM
\\s01\proj\382\1016-00\Drawings\p00tech\gfu33_23.dgn



SOIL PROFILE
STA. 46+910 TO STA. 47+250

ATH-33-40.981

71 132
769
949

CALCULATED
DC
CHECKED
DAA

- R-81
- (A) RC-1 SOFT TO MEDIUM HARD BROWN SANDSTONE, POORLY CEMENTED, MICACEOUS, SEVERELY WEATHERED WITH DECOMPOSED LAYERS.
CORE LOSS - 36% RQD - 29%
- RC-2 CORE LOSS - 100% RQD - 0%
- RC-3 CORE LOSS - 13% RQD - 43%
- (B) RC-4 SOFT GRAY AND RED CLAYSTONE, CONTAINS SILTSTONE AND LIMESTONE CLASTS, WEATHERED.
CORE LOSS - 53% RQD - 0%
- RC-5 CORE LOSS - 27% RQD - 10%
- (C) SOFT TO MEDIUM HARD GRAY SILTSTONE, MICACEOUS, BROKEN, CONTAINS CALCAREOUS BANDING, WEATHERED.
- RC-6 NO CORE LOSS RQD - 17%
- (D) RC-7 HARD, GRAY SANDSTONE, MICACEOUS, PYRITIC, SLIGHTLY CALCAREOUS WITH ARGILLACEOUS INTERBEDS, WEATHERED TO SLIGHTLY WEATHERED.
NO CORE LOSS RQD - 88%

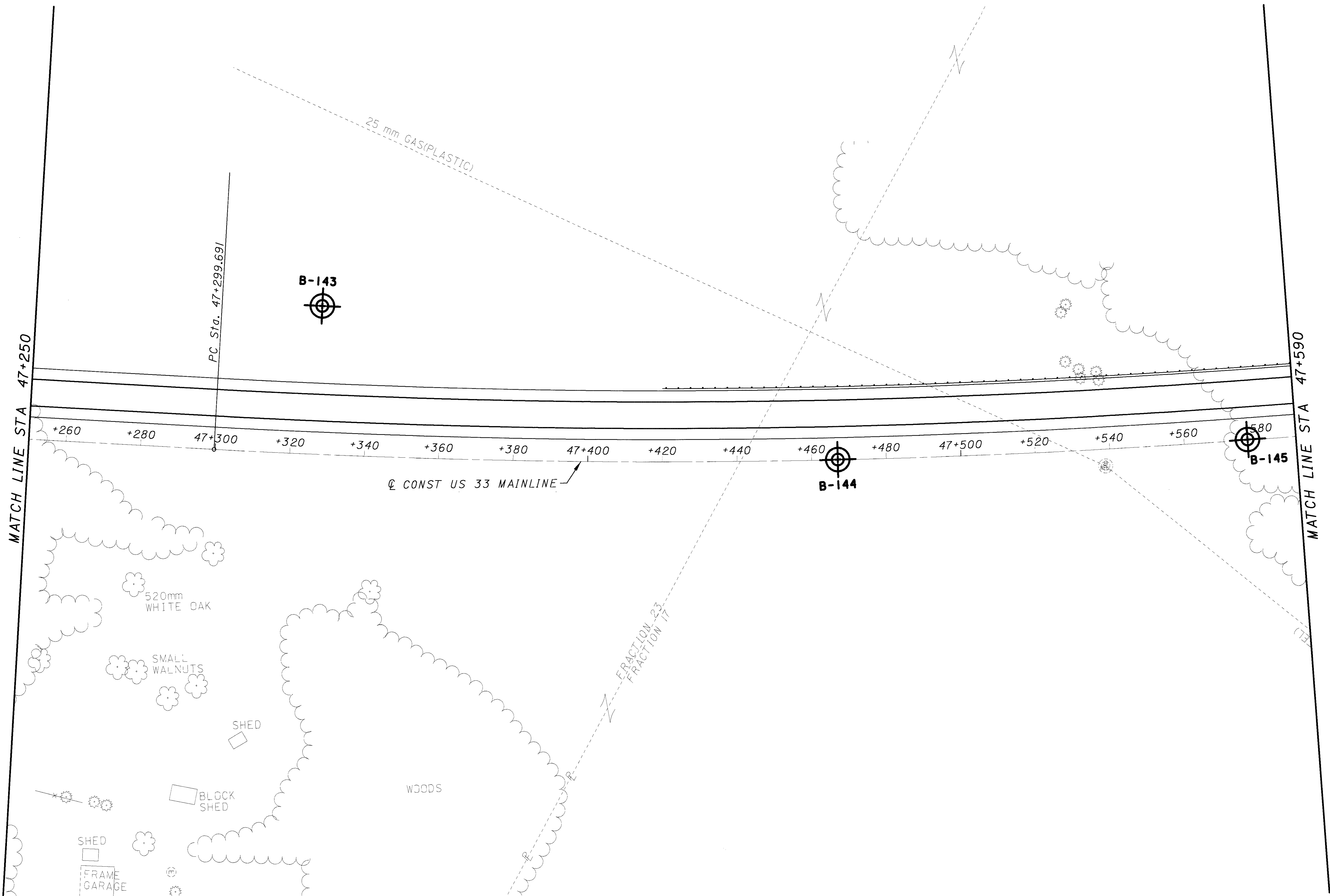
- B-141
- RC-1 SANDSTONE; BROWN, SOFT, HIGHLY BROKEN, VERY FINE GRAINED, SILTY, MICACEOUS, FRIABLE.
CORE LOSS - 4% RQD - 0%
- RC-2 SANDSTONE; DARK BROWN, MEDIUM, SLIGHTLY BROKEN, MICACEOUS, CROSS-BEDDED.
CORE LOSS - 17% RQD - 45%

- R-82
- (A) RC-1 SOFT BROWN SANDSTONE, MICACEOUS, WEATHERED TO SEVERELY WEATHERED.
CORE LOSS - 90% RQD - 0%
- RC-2 CORE LOSS - 28% RQD - 0%
- (B) SOFT GRAY CLAYSTONE, SLIGHTLY CALCAREOUS, SEVERELY WEATHERED, VERY BROKEN.
- RC-3 NO CORE LOSS RQD - 10%
- (C) SOFT BROWN SANDSTONE, MICACEOUS; SEVERELY WEATHERED.
- (D) SOFT GRAY AND BROWN CLAYSTONE, SLIGHTLY CALCAREOUS, SEVERELY WEATHERED, VERY BROKEN.
- RC-4 CORE LOSS - 58% RQD - 0%
- RC-5 CORE LOSS - 28% RQD - 25%
- RC-6 CORE LOSS - 2% RQD - 67%
- (E) MEDIUM HARD GRAY SILTSTONE, SLIGHTLY MICACEOUS; WEATHERED; CONTAINS ARGILLACEOUS AND ARENACEOUS LAYERS.
- RC-7 NO CORE LOSS RQD - 100%

- B-142
- RC-1 SANDSTONE; BROWN, MEDIUM HARD, HIGHLY BROKEN, FINE TO MEDIUM GRAINED, MICACEOUS, CROSS-BEDDED, FRIABLE.
CORE LOSS - 5% RQD - 0%
- RC-2 MUDSTONE; GRAY, VERY SOFT TO SOFT, HIGHLY BROKEN, SILTY, NON-BEDDED.
NO CORE LOSS RQD - 0%
- RC-3 SILTSTONE; GRAY, MEDIUM HARD, MASSIVE, ARENACEOUS, MICACEOUS, CROSS-BEDDED.
NO CORE LOSS RQD - 7%

- R-84
- (A) RC-1 SOFT GRAY CLAYSTONE; WEATHERED.
CORE LOSS - 6% RQD - 63%
- RC-2 CORE LOSS - 5% RQD - 82%
- (B) SOFT TO MEDIUM HARD GRAY SANDSTONE, ARGILLACEOUS, SLIGHTLY MICACEOUS, WEATHERED.
- RC-3 NO CORE LOSS RQD - 100%
- RC-4 CORE LOSS - 3% RQD - 98%
- (C) RC-5 SOFT BROWN AND GRAY SANDSTONE, ARGILLACEOUS, MICACEOUS; WEATHERED; BROKEN; CONTAINS LIMESTONE CLASTS.
NO CORE LOSS RQD - 89%

02/06/01 AM
09:53:36 AM
\\s:\proj\3621\06-00\DS\geol\tech\plan33_24.dgn



DRAWN
RS
CHECKED
DA

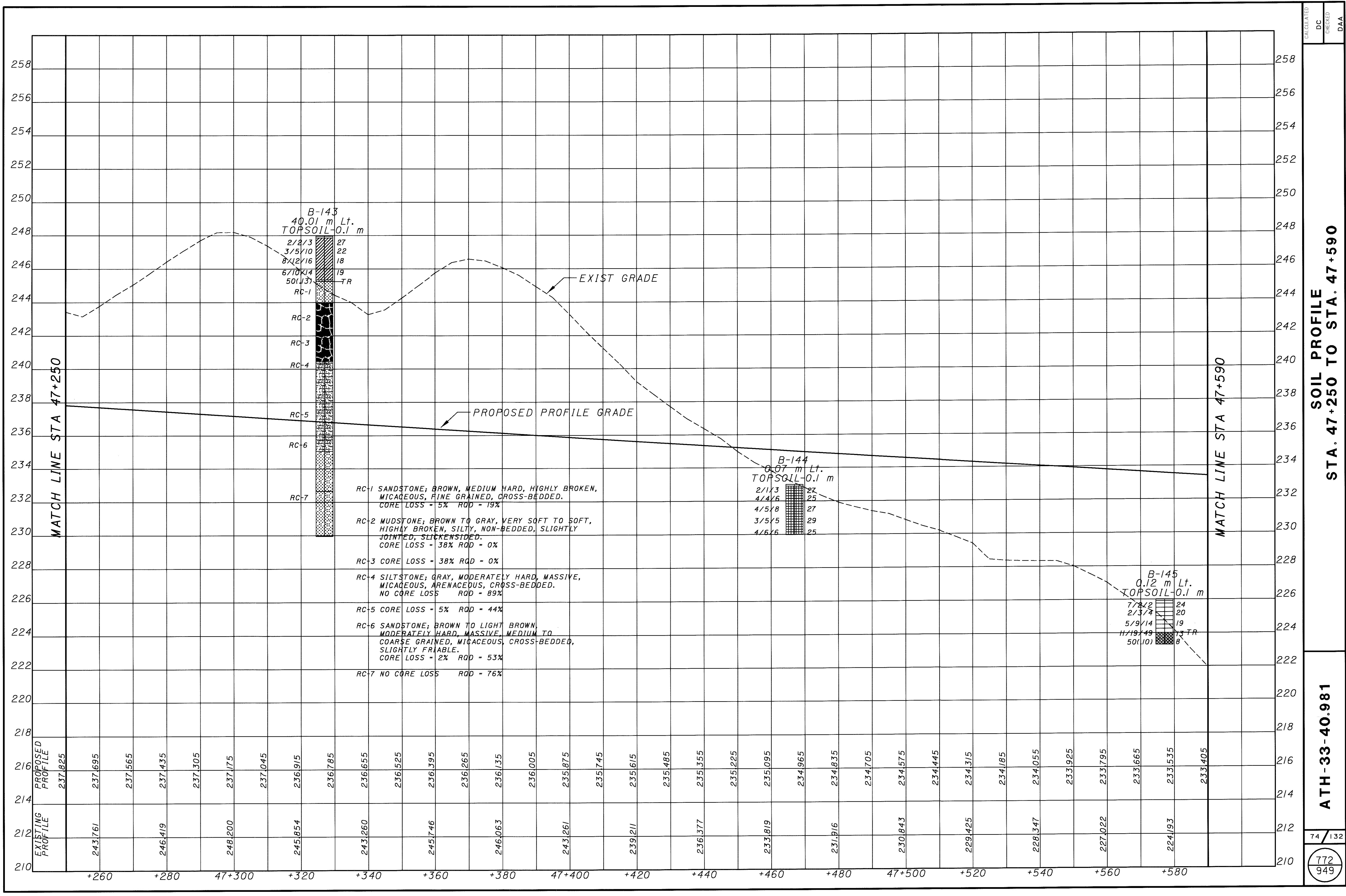
SOIL PROFILE
STA. 47+250 TO STA. 47+590

ATH-33-40.981

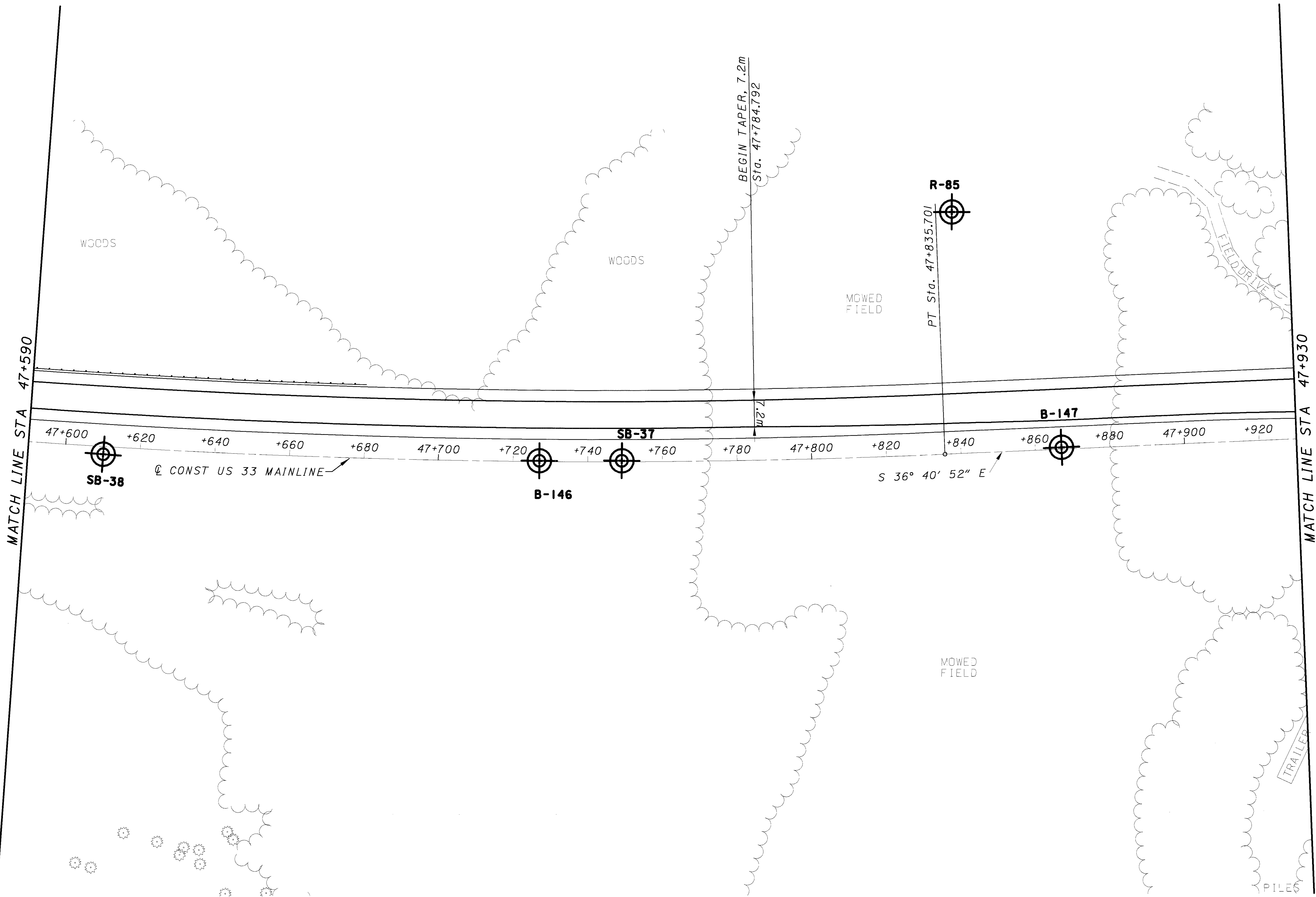
73 / 132

771
949

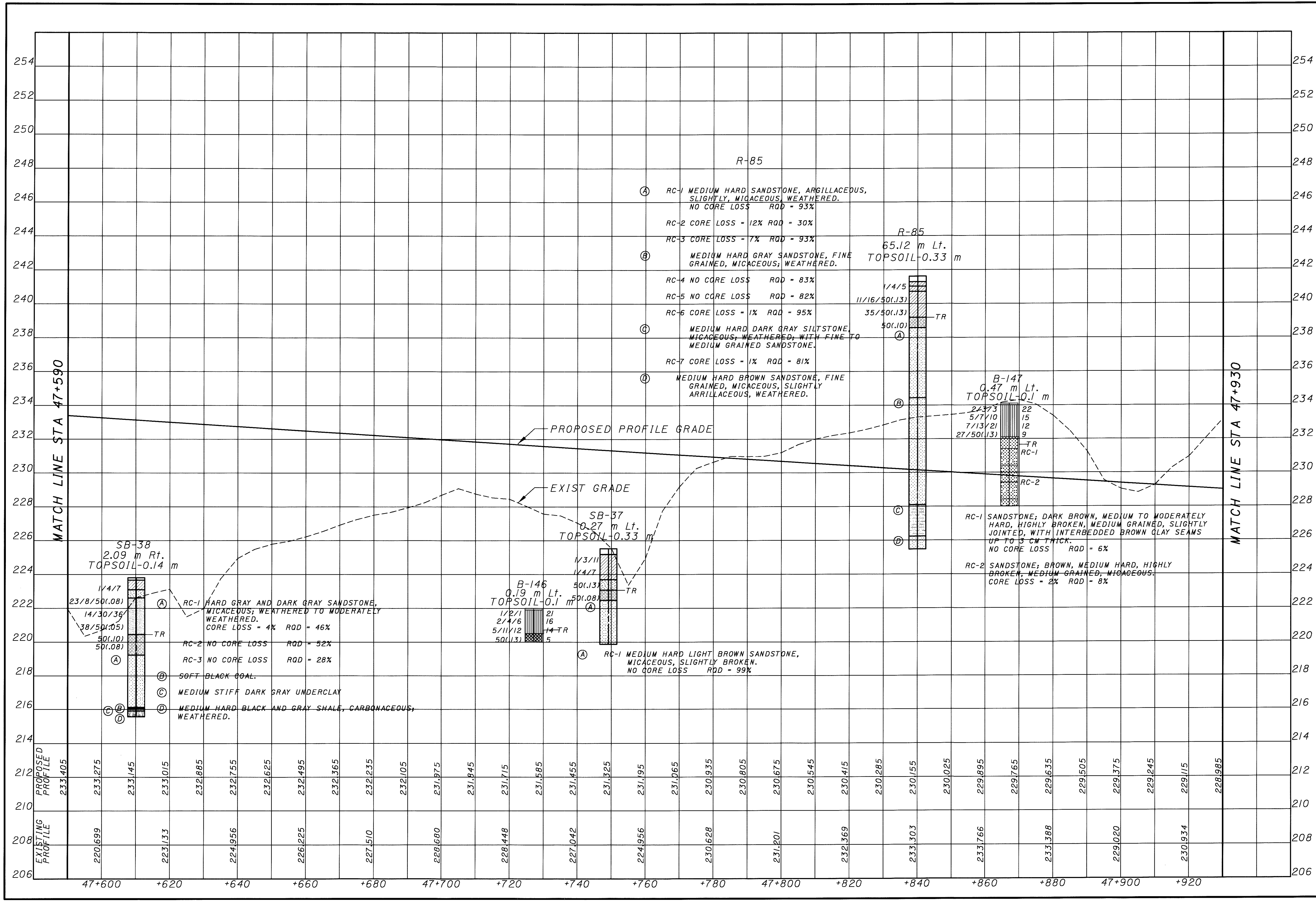
07/06/01
10:56:03 AM
M:\proj\9821\1016_00\DS1\geotech\gfu33_24.dgn



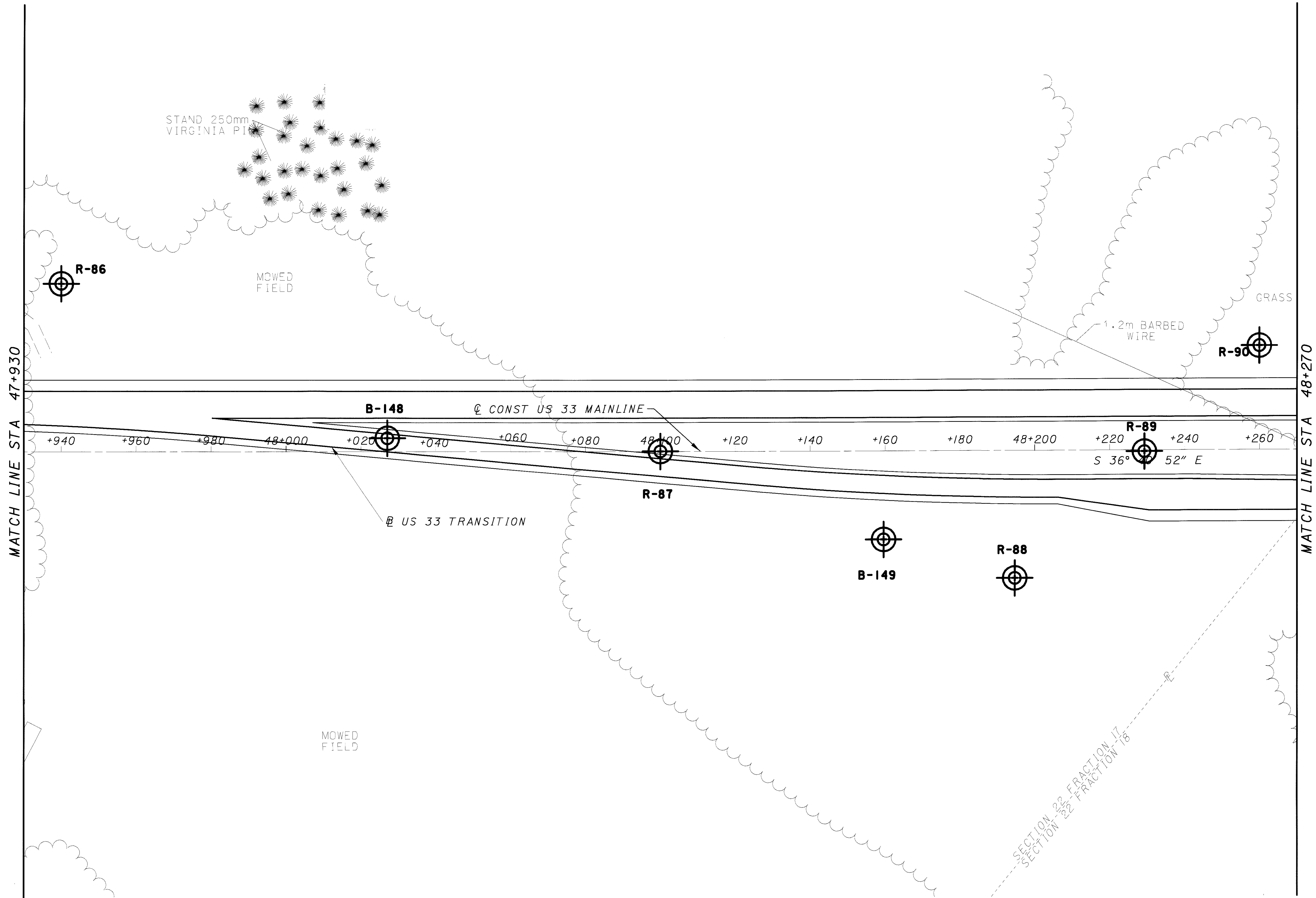
02/06/01
03:54:47 AM
\\MSDPROJ\382\016-00\US\geotech\plan33_25.dgn



 0 10 20 HORIZONTAL SCALE IN METERS	CALCULATED RS		ATH-33-40.981	SOIL PROFILE STA. 47+590 TO STA. 47+930	 0 10 20 HORIZONTAL SCALE IN METERS
	CHECKED DIA				
75		132	773 949		

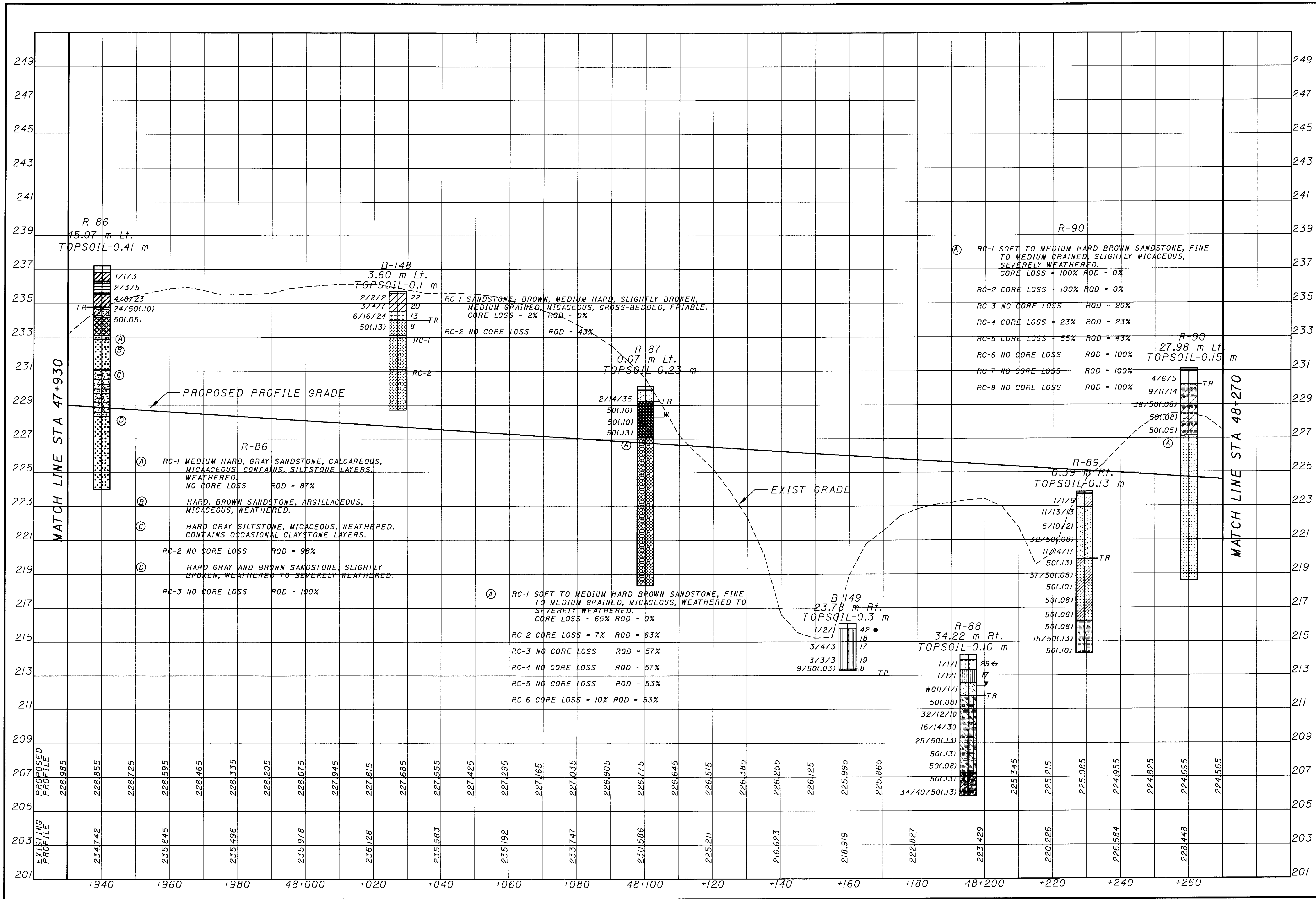


02/06/01
0955537 AM
Map of 18871016 00\DS\geol\tech\plan33_26.dgn

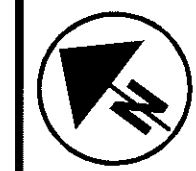
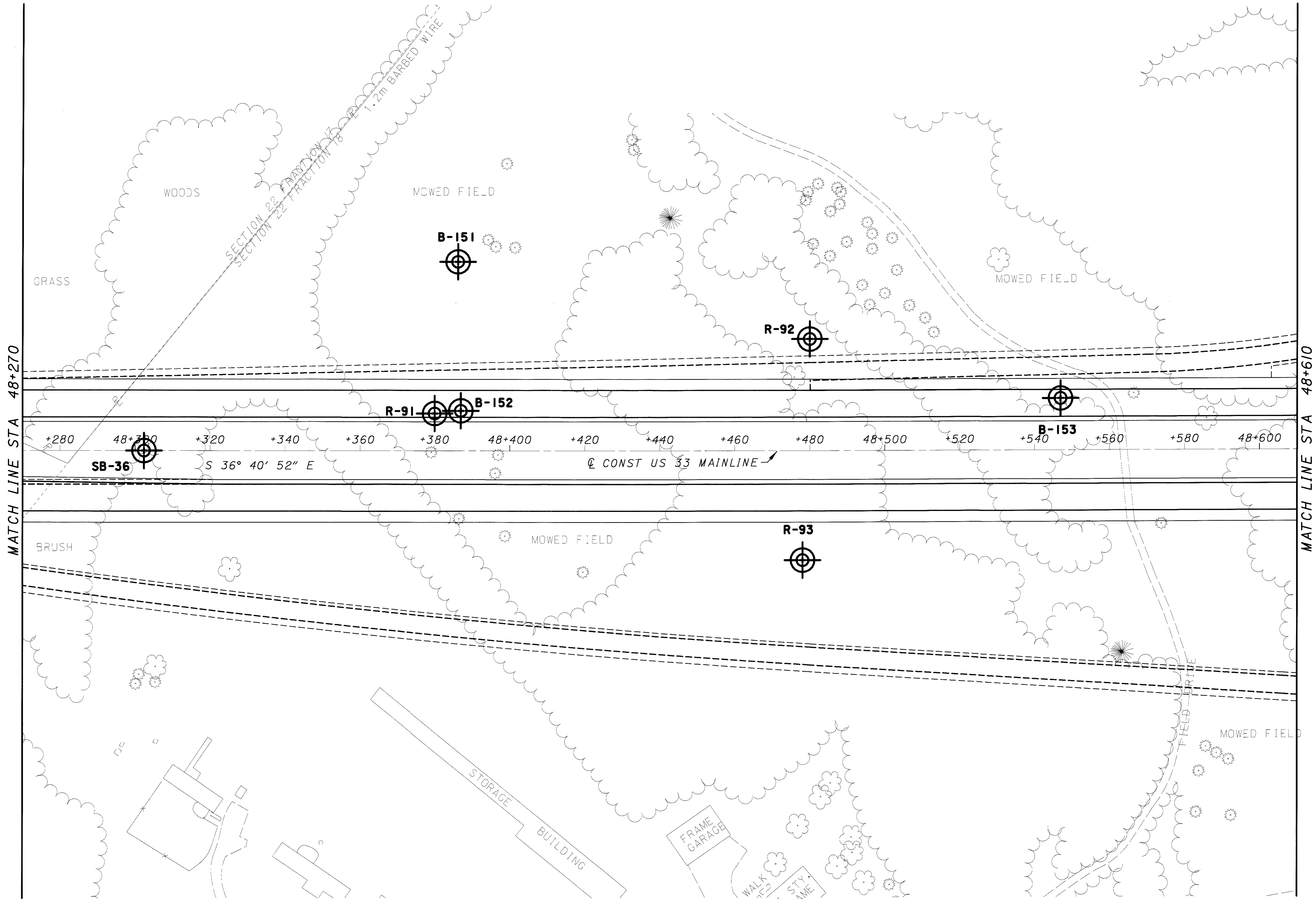


HORIZONTAL SCALE IN METERS	
CALCULATED RS	CHECKED DAA
ATH-33-40.981	
SOIL PROFILE STA. 47+930 TO STA. 48+270	
77 / 132	775 949

02/06/01
035645 / AM
M:\proj\0382\006-00\DS1\geotech\gfu33_26.dgn



02/06/01
09:56:55 AM
M:\proj\01362\1016_00\DS\ingtech\plan33-21.dgn



CALCULATED		CHECKED
RS		DAA

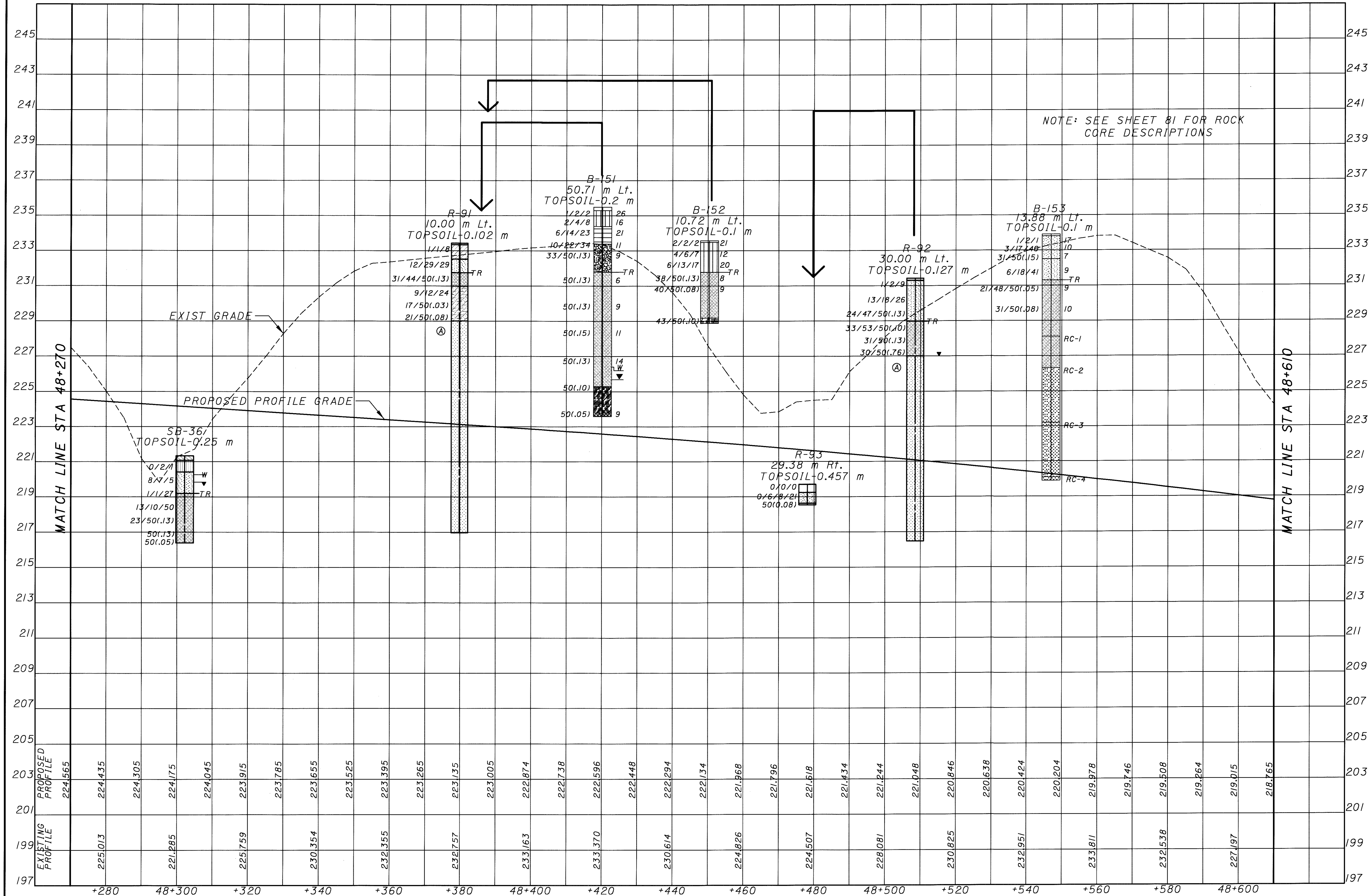
SOIL PROFILE
STA. 48+270 TO STA. 48+610

ATH-33-40.981

79 / 132

777
949

02/06/01
04:51 AM
\\fspro1\982\1016_00\DS\geotech\grfuss_21.dgn



R-91
Ⓐ RC-1 HARD, GRAY, SANDSTONE, ARGILLACEOUS, FINE TO VERY FINE
GRAINED, MICACEOUS, WEATHERED.
NO CORE LOSS RQD = 88%
RC-2 NO CORE LOSS RQD = 100%
RC-3 NO CORE LOSS RQD = 100%
RC-4 NO CORE LOSS RQD = 100%
RC-5 NO CORE LOSS RQD = 98%

R-92
Ⓐ RC-1 MEDIUM HARD, BROWN SANDSTONE, SLIGHTLY BROKEN,
ARGILLACEOUS, WTH.
CORE LOSS = 19% RQD = 76%
RC-2 NO CORE LOSS RQD = 100%
RC-3 NO CORE LOSS RQD = 100%
RC-4 NO CORE LOSS RQD = 100%

B-153
RC-1 SANDSTONE; BROWN, VERY SOFT, HIGHLY BROKEN, MEDIUM
GRAINED, SILTY, MICACEOUS, FRIABLE, WEATHERED.
NO CORE LOSS RQD = 0%
RC-2 SANDSTONE; BROWN, VERY SOFT TO SOFT, HIGHLY
BROKEN, MEDIUM GRAINED, MICACEOUS, FRIABLE.
CORE LOSS = 33% RQD = 0%
RC-3 SANDSTONE; BROWN, MEDIUM, HIGHLY BROKEN,
MICACEOUS, FRIABLE, SLIGHTLY WEATHERED.
CORE LOSS = 18% RQD = 0%
RC-4 CORE LOSS = 35% RQD = 0%

SOIL PROFILE
STA. 48+270 TO STA. 48+610

ATH-33-40.981

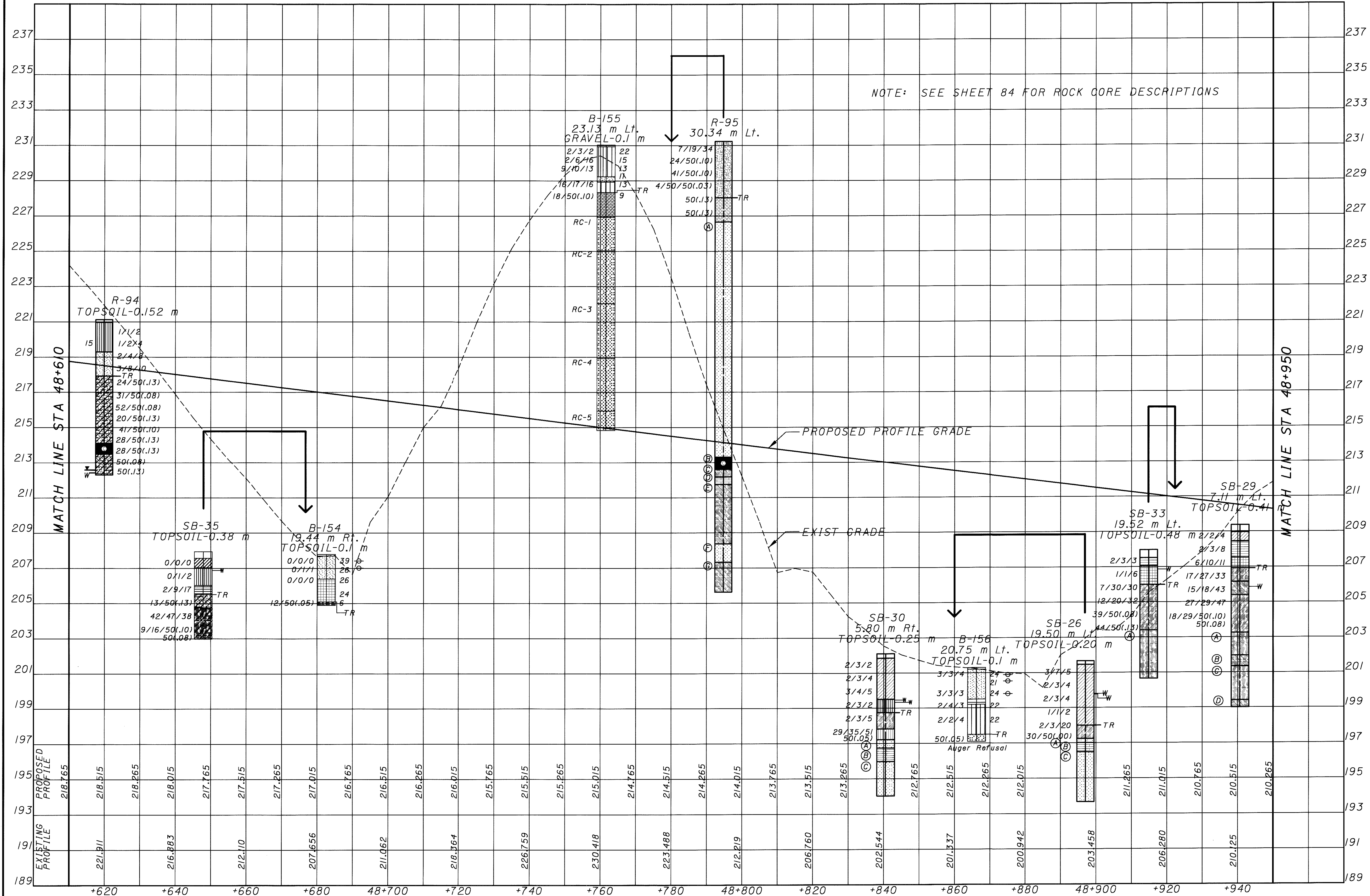


CALCULATED	RS	CHECKED	DAA
------------	----	---------	-----

ATH-33-40.981

$$\frac{780}{949}$$

02/06/01
05:13:41 AM
M:\P\01\982\016-00\US\geotech\g\33 78.dgn



R-95

A

RC-1

MEDIUM HARD BROWN SANDSTONE, MICACEOUS; POORLY CEMENTED; BROKEN; WEATHERED; CONTAINS ARGILLACEOUS CLASTS; FRIABLE.
CORE LOSS-14% RQD-86%

RC-2

CORE LOSS-5% RQD-90%

RC-3

CORE LOSS-15% RQD-85%

RC-4

CORE LOSS-5% RQD-68%

RC-5

NO CORE LOSS RQD-100%

RC-6

CORE LOSS-7% RQD-93%

RC-7

CORE LOSS-1% RQD-87%

B

RC-8

SOFT BLACK COAL, WEATHERED.
CORE LOSS-12% RQD-22%

C

SOFT GRAY CLAYSTONE, WEATHERED TO SLIGHTLY WEATHERED.

D

MEDIUM HARD TO HARD GRAY LIMESTONE, WEATHERED.

E

RC-9

SOFT GRAY CLAYSTONE, SLIGHTLY MICACEOUS; CONTAINS SILTSTONE CLASTS; SLIGHTLY WEATHERED.
CORE LOSS-80% RQD-0%

RC-10

CORE LOSS-0% RQD-88%

F

RC-11

VERY SOFT BROWN SANDSTONE, POORLY CEMENTED; WEATHERED.
CORE LOSS-68% RQD-8%

G

RC-12

SOFT GRAY, RED, AND BROWN CLAYSTONE, SLIGHTLY MICACEOUS; ARENACEOUS.
NO CORE LOSS RQD-95%

B-155

RC-1

SANDSTONE; BROWN, MEDIUM, SLIGHTLY BROKEN, COARSE TO MEDIUM GRAINED, CROSS-BEDDED, FRIABLE.
CORE LOSS-1% RQD = 22%

RC-2

CORE LOSS = 11% RQD = 25%

RC-3

SANDSTONE; BROWN TO GRAY, MEDIUM, MASSIVE, MEDIUM TO COARSE GRAINED, MICACEOUS, CROSS-BEDDED, FRIABLE.
NO CORE LOSS RQD = 47%

RC-4

CORE LOSS = 10% RQD = 42%

RC-5

NO CORE LOSS RQD = 21%

SB-30

A

RC-1

MEDIUM HARD BROWN SANDSTONE; SEVERELY WEATHERED.
NO CORE LOSS RQD = 67%

B

HARD GRAY LIMESTONE, ARENACEOUS; SLIGHTLY WEATHERED.

C

RC-2 NO CORE LOSS RQD = 92%

HARD GRAY SANDSTONE; WEATHERED TO SLIGHTLY WEATHERED.

RC-3 NO CORE LOSS RQD = 100%

SB-33

A

RC-1

SOFT TO MEDIUM HARD BROWN SHALE; SEVERELY WEATHERED TO WEATHERED.
CORE LOSS = 38% RQD = 63%

RC-2

NO CORE LOSS RQD = 100%

SB-26

A

RC-1

MEDIUM HARD GRAY FINE GRAINED SANDSTONE, MICAEIOUS; WEATHERED.
NO CORE LOSS RQD = 100%

B

HARD LIGHT GRAY LIMESTONE, MICACEOUS, ARENACEOUS; WEATHERED TO SLIGHTLY WEATHERED.

C

RC-2 NO CORE LOSS RQD = 100%
MEDIUM HARD TO HARD GRAY FINE TO MEDIUM GRAINED SANDSTONE, MICACEOUS; WEATHERED TO SLIGHTLY WEATHERED.

SB-29

A

RC-1

SOFT TO MEDIUM HARD GRAY SHALE, ARENACEOUS; WEATHERED.
CORE LOSS = 48% RQD = 38%

B

RC-2 SOFT TO MEDIUM HARD RED CLAYSTONE; WEATHERED
NO CORE LOSS RQD = 95%

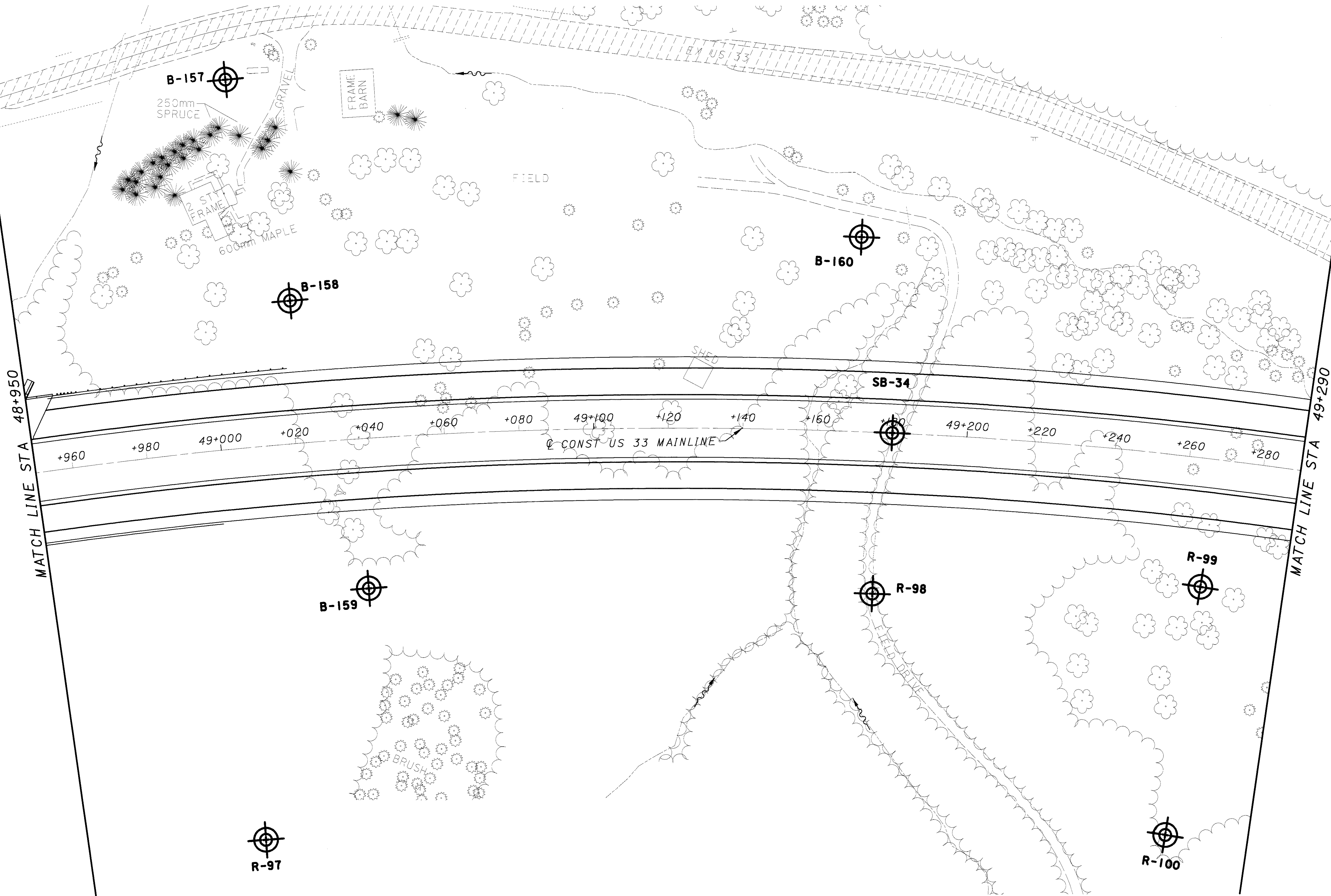
C

MEDIUM HARD GRAY SHALE, ARENACEOUS; WEATHERED.

D

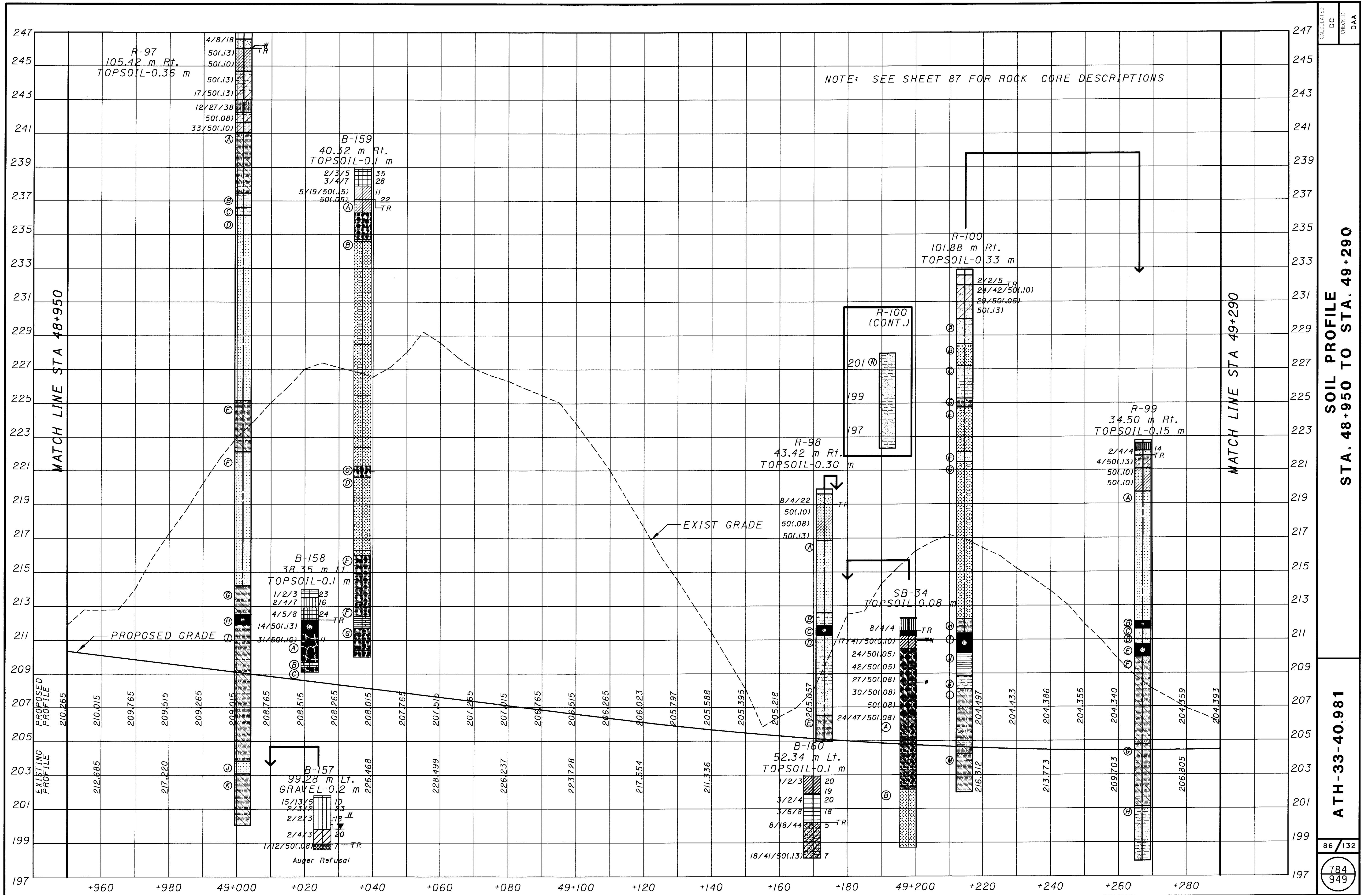
RC-3 NO CORE LOSS RQD = 100%
SOFT TO MEDIUM HARD RED CLAYSTONE; WEATHERED TO SEVERELY WEATHERED.

02/06/01
09:58:26 AM
M:\proj\01\382\006_00\US33\goortech\plan33_29.dgn



HORIZONTAL SCALE IN METERS	
CALCULATED RS	CHECKED DAA
SOIL PROFILE STA. 48+950 TO STA. 49+290	
ATH-33-40.981	
85 / 132	
783 949	

02/06/01
05:58:05 AM
\\npr01\982\N016-00\N1\geo\tech\grfu33.29.dgn



B-158		
Ⓐ	RC-1	MUDSTONE, GRAY, SOFT, HIGHLY BROKEN, NON-BEDDED, SILTY. CORE LOSS = 78% RQD = 0%
Ⓑ		LIMESTONE, GRAY, MODERATELY HARD, HIGHLY BROKEN, FINE CRYSTALLINE, SLIGHTLY JOINTED.
Ⓒ	RC-2	MUDSTONE, GRAY, SOFT, HIGHLY BROKEN, NON-BEDDED, SILTY. CORE LOSS = 50% RQD = 0%
R-100		
Ⓐ	RC-1	MEDIUM HARD, BROWN SILTSTONE, MICACEOUS, ARENACEOUS, WEATHERED TO SEVERELY WEATHERED. CORE LOSS = 19% RQD = 75%
	RC-2	NO CORE LOSS RQD = 100%
Ⓑ		HARD, BROWN SANDSTONE, MICACEOUS, VERY THIN BEDDED, SLIGHTLY BROKEN, WEATHERED.
Ⓒ		MEDIUM HARD, GRAY SILTSTONE WITH CLAYSTONE INTERBEDS, SLIGHTLY MICACEOUS, WEATHERED.
	RC-3	CORE LOSS = 1% RQD = 99%
Ⓓ		SOFT, BROWN CLAYSTONE, SEVERELY WEATHERED.
Ⓔ		HARD, BROWN, GRAY, AND LIGHT GRAY, SANDSTONE, FINE TO COARSE GRAINED, CALCAREOUS, SLIGHTLY MICACEOUS, WEATHERED TO SLIGHTLY WEATHERED.
Ⓕ	RC-4	HARD, BROWN AND GRAY SANDSTONE, FINE TO MEDIUM GRAINED, POORLY CEMENTED, SLIGHTLY BROKEN WITH RUST STAINING. NO CORE LOSS RQD = 94%
Ⓖ		HARD, LIGHT GRAY AND BROWN, SANDSTONE, FINE TO MEDIUM GRAINED, POORLY CEMENTED, MICACEOUS, WEATHERED.
	RC-5	NO CORE LOSS RQD = 95%
	RC-6	NO CORE LOSS RQD = 100%
	RC-7	NO CORE LOSS RQD = 78%
Ⓗ		MEDIUM HARD, DARK GRAY CLAYSTONE, PYRITIC, SEVERELY WEATHERED.
Ⓙ		SOFT BLACK COAL.
	RC-8	CORE LOSS = 17% RQD = 33%
Ⓚ		HARD GRAY LIMESTONE, ARGILLACEOUS, BROKEN WITH CLAY, WEATHERED.
	RC-9	NO CORE LOSS RQD = 37%
Ⓚ	RC-10	MEDIUM HARD, GRAY SILTSTONE, SLIGHTLY CARBONACEOUS, WEATHERED. NO CORE LOSS RQD = 95%
Ⓛ		SOFT, GRAY CLAYSTONE, BROKEN, CONTAINS LIMESTONE CLASTS, SEVERELY WEATHERED.
	RC-11	CORE LOSS = 38% RQD = 23%
Ⓜ	RC-12	MEDIUM HARD, GRAY, RED, DARK GRAY, AND BROWN CLAYSTONE, SLIGHTLY BROKEN, WEATHERED. CORE LOSS = 13% RQD = 78%
	RC-13	CORE LOSS = 17% RQD = 65%
Ⓝ		MEDIUM HARD, GRAY SILTSTONE, MICACEOUS, CONTAINS LIMESTONE CLASTS, WEATHERED.
	RC-14	CORE LOSS = 8% RQD = 92%
	RC-15	CORE LOSS = 4% RQD = 94%
SB-34		
Ⓐ	RC-1	SOFT TO MEDIUM HARD RED AND GRAY CLAYSTONE, ARENACEOUS; SEVERELY WEATHERED. CORE LOSS = 8% RQD = 80%
	RC-2	CORE LOSS = 7% RQD = 88%
	RC-3	NO CORE LOSS RQD = 100%
Ⓑ	RC-4	MEDIUM HARD GRAY SANDSTONE, ARGILLACEOUS; SEVERELY WEATHERED. NO CORE LOSS RQD = 100%

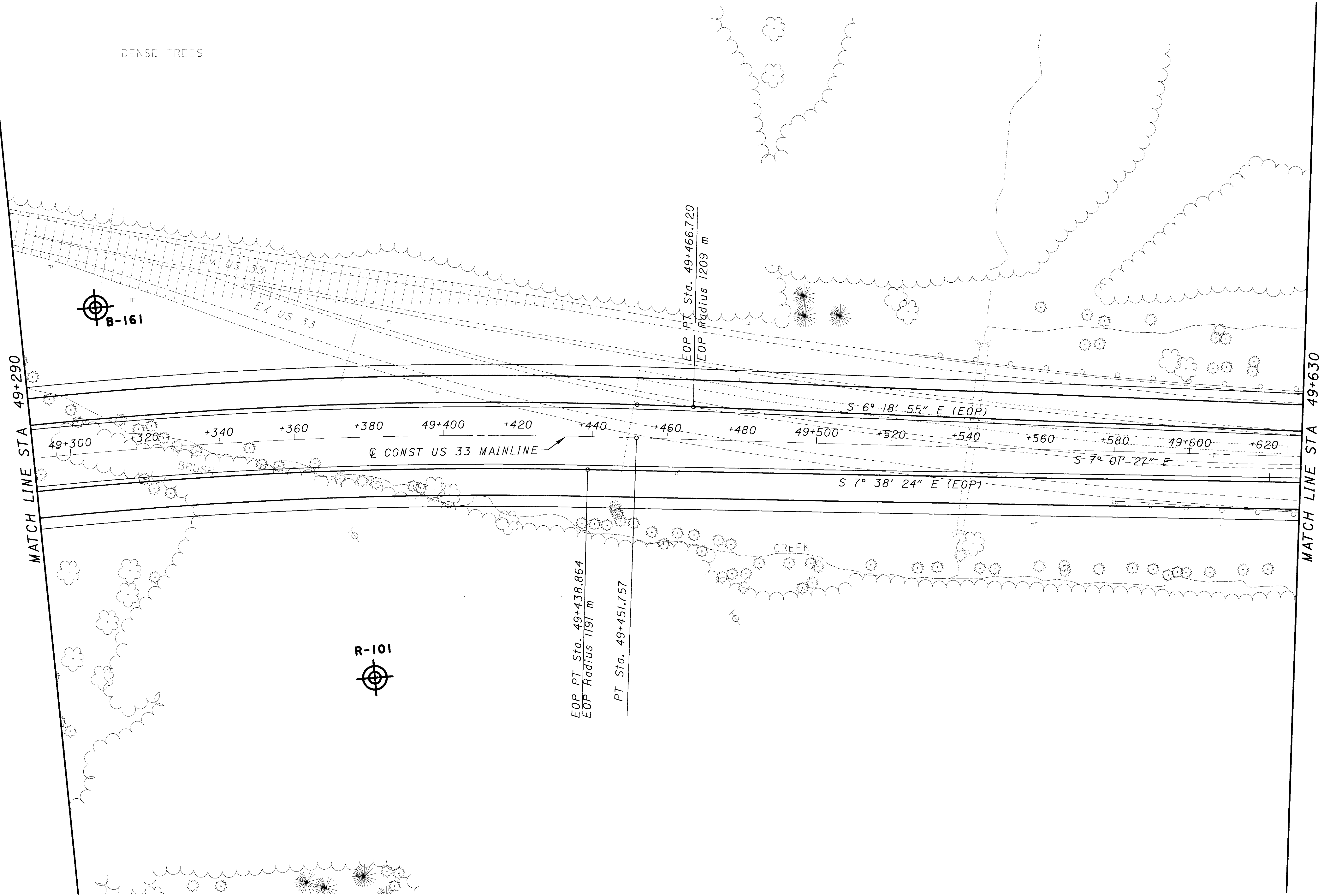
B-159		
Ⓐ	RC-1	SHALE; BROWN, MEDIUM, HIGHLY BROKEN, MICACEOUS, SILTY. CORE LOSS = 18% RQD = 0%
Ⓑ	RC-2	SANDSTONE; BROWN TO LIGHT GRAY, MODERATELY HARD TO HARD, MASSIVE, MEDIUM TO COARSE GRAINED, MICACEOUS, CROSS-BEDDED. NO CORE LOSS RQD = 65%
	RC-3	NO CORE LOSS RQD = 87%
	RC-4	NO CORE LOSS RQD = 88%
	RC-5	CORE LOSS = 8% RQD = 44%
Ⓒ	RC-6	SHALE; GRAY TO DARK GRAY, SOFT TO VERY SOFT, HIGHLY BROKEN, CARBONACEOUS, SLICKENSIDED, SPARELY FOSSILIFEROUS. CORE LOSS = 1% RQD = 53%
Ⓓ	RC-7	SANDSTONE; BROWN TO GRAY, MEDIUM TO MODERATELY HARD, MASSIVE, MEDIUM GRAINED, MICACEOUS, CROSS-BEDDED, SLIGHTLY WEATHERED. CORE LOSS = 1% RQD = 68%
Ⓔ	RC-8	SHALE; GRAY, MEDIUM, HIGHLY BROKEN, CARBONACEOUS, PYRITIC, SLICKENSIDED, SPARELY FOSSILIFEROUS. NO CORE LOSS RQD = 25%
	RC-9	CORE LOSS = 20% RQD = 7%
Ⓕ		LIMESTONE; GRAY, HIGHLY BROKEN, FINE CRYSTALLINE, SLIGHTLY JOINTED.
Ⓖ	RC-10	SHALE(60%); GRAY, MEDIUM, HIGHLY BROKEN, CALCAREOUS, SLIGHTLY JOINTED, WITH INTERBEDDED LIMESTONE(40%); GRAY, MEDIUM, HIGHLY BROKEN, FINE CRYSTALLINE, ARGILLACEOUS, SLIGHTLY JOINTED. CORE LOSS = 20% RQD = 0%
	RC-11	NO CORE LOSS RQD = 0%

R-99		
Ⓐ	RC-1	MEDIUM HARD, BROWN AND LIGHT GRAY SANDSTONE, MICACEOUS, WEATHERED. CORE LOSS = 10 RQD = 90%
	RC-2	NO CORE LOSS RQD = 100%
	RC-3	NO CORE LOSS RQD = 93%
	RC-4	CORE LOSS = 20% RQD = 53%
Ⓑ		SOFT BLACK COAL, BROKEN.
Ⓒ		HARD GRAY SANDSTONE, PYRITIC, SLIGHTLY WEATHERED.
Ⓓ		MEDIUM HARD GRAY SILTSTONE, PYRITIC, MICACEOUS, WEATHERED.
	RC-5	NO CORE LOSS RQD = 47%
Ⓔ		SOFT BLACK COAL, BROKEN.
Ⓕ	RC-6	SOFT TO MEDIUM HARD GRAY CLAYSTONE, SLIGHTLY MICACEOUS, WEATHERED TO SEVERELY WEATHERED. CORE LOSS = 62% RQD = 25%
	RC-7	CORE LOSS = 3% RQD = 42%
	RC-8	NO CORE LOSS RQD = 70%
Ⓖ	RC-9	SOFT TO MEDIUM HARD, RED AND GRAY CLAYSTONE, WEATHERED. CORE LOSS = 5% RQD = 95%
	RC-10	CORE LOSS = 47% RQD = 53%
	RC-11	CORE LOSS = 5% RQD = 45%
	RC-12	MEDIUM HARD GRAY SILTSTONE, BROKEN, WEATHERED TO SLIGHTLY WEATHERED. CORE LOSS = 5% RQD = 94%

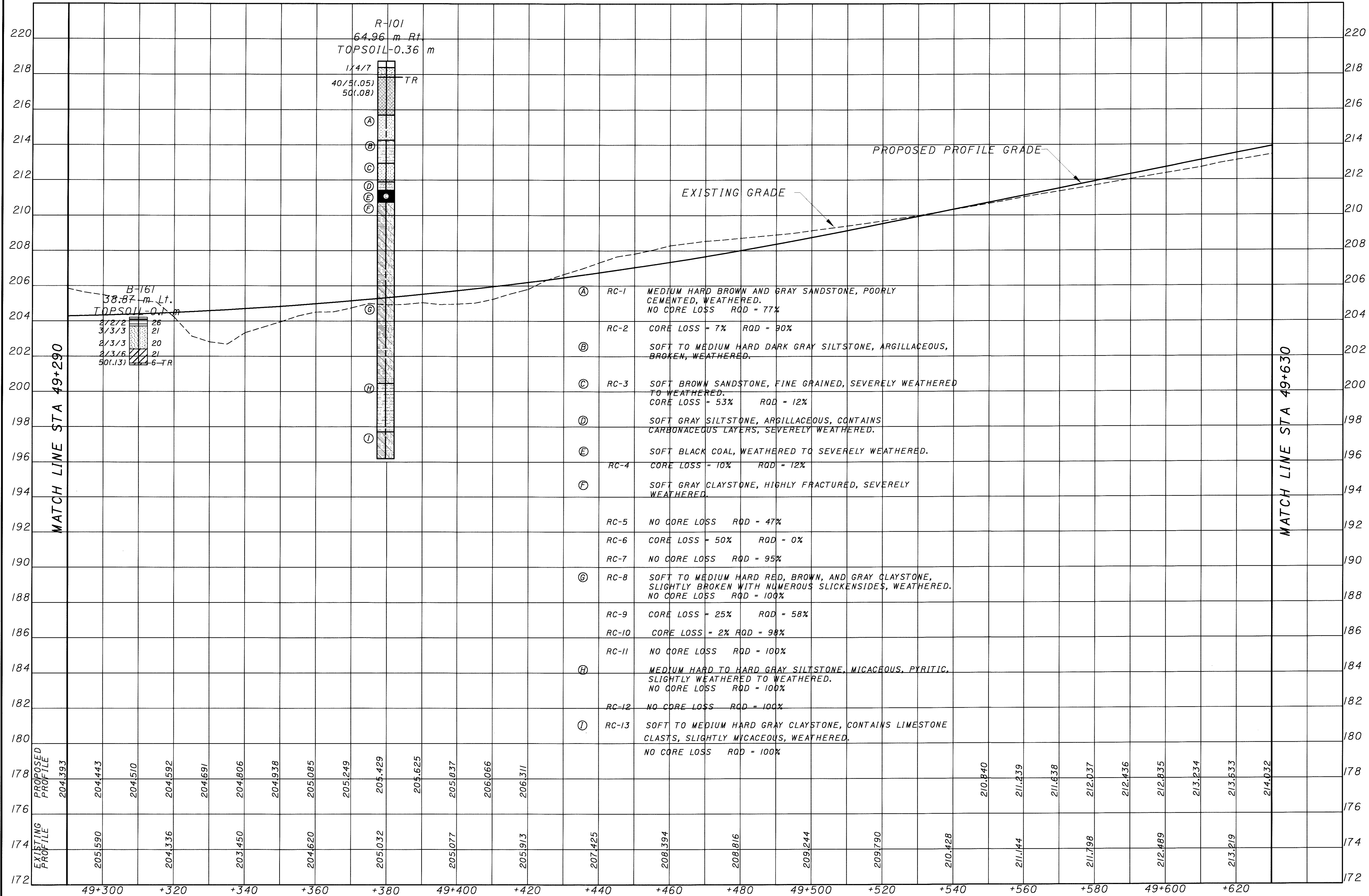
R-97		
Ⓐ	RC-1	SOFT TO MEDIUM HARD GRAY CLAYSTONE, SLIGHTLY WEATHERED TO WEATHERED, BROKEN. CORE LOSS = 33% RQD = 67%
	RC-2	CORE LOSS = 55% RQD = 0%
	RC-3	NO CORE LOSS RQD = 75%
Ⓑ		MEDIUM HARD GRAY SILTSTONE, MICACEOUS, WEATHERED, CONTAINS LIMESTONE CLASTS.
Ⓒ	RC-4	MEDIUM HARD BROWN SILTSTONE, ARENACEOUS, MICACEOUS, SLIGHTLY CALCAREOUS, WEATHERED. NO CORE LOSS RQD = 100%
Ⓓ		MEDIUM HARD TO HARD BROWN SANDSTONE, MICACEOUS.
	RC-5	NO CORE LOSS RQD = 100%
	RC-6	NO CORE LOSS RQD = 100%
	RC-7	NO CORE LOSS RQD = 99%
Ⓔ		MEDIUM HARD BROWN CLAYSTONE, ARENACEOUS, WEATHERED, BROKEN.
	RC-8	NO CORE LOSS RQD = 98%
Ⓕ	RC-9	HARD BROWN AND GRAY SANDSTONE, MICACEOUS, WEATHERED. NO CORE LOSS RQD = 100%
	RC-10	NO CORE LOSS RQD = 100%
	RC-11	NO CORE LOSS RQD = 90%
Ⓖ		MEDIUM HARD DARK GRAY CLAYSTONE, PYRITIC, BROKEN, WEATHERED TO SLIGHTLY WEATHERED.
Ⓗ		SOFT TO MEDIUM HARD BLACK COAL, WEATHERED.
Ⓙ	RC-12	MEDIUM HARD GRAY CLAYSTONE, BROKEN FRACTURES, CALCAREOUS, ARENACEOUS, WEATHERED, CONTAINS LIMESTONE CLASTS. NO CORE LOSS RQD = 81%
	RC-13	NO CORE LOSS RQD = 93%
	RC-14	CORE LOSS = 3% RQD = 91%
Ⓚ		HARD GRAY SANDSTONE, MICACEOUS, ARGILLACEOUS, PYRITIC, WEATHERED.
Ⓚ	RC-15	MEDIUM HARD GRAY CLAYSTONE, MICACEOUS, BROKEN, SLIGHTLY WEATHERED TO WEATHERED, CONTAINS CLAY SEAMS THROUGHOUT. CORE LOSS = 1% RQD = 95%

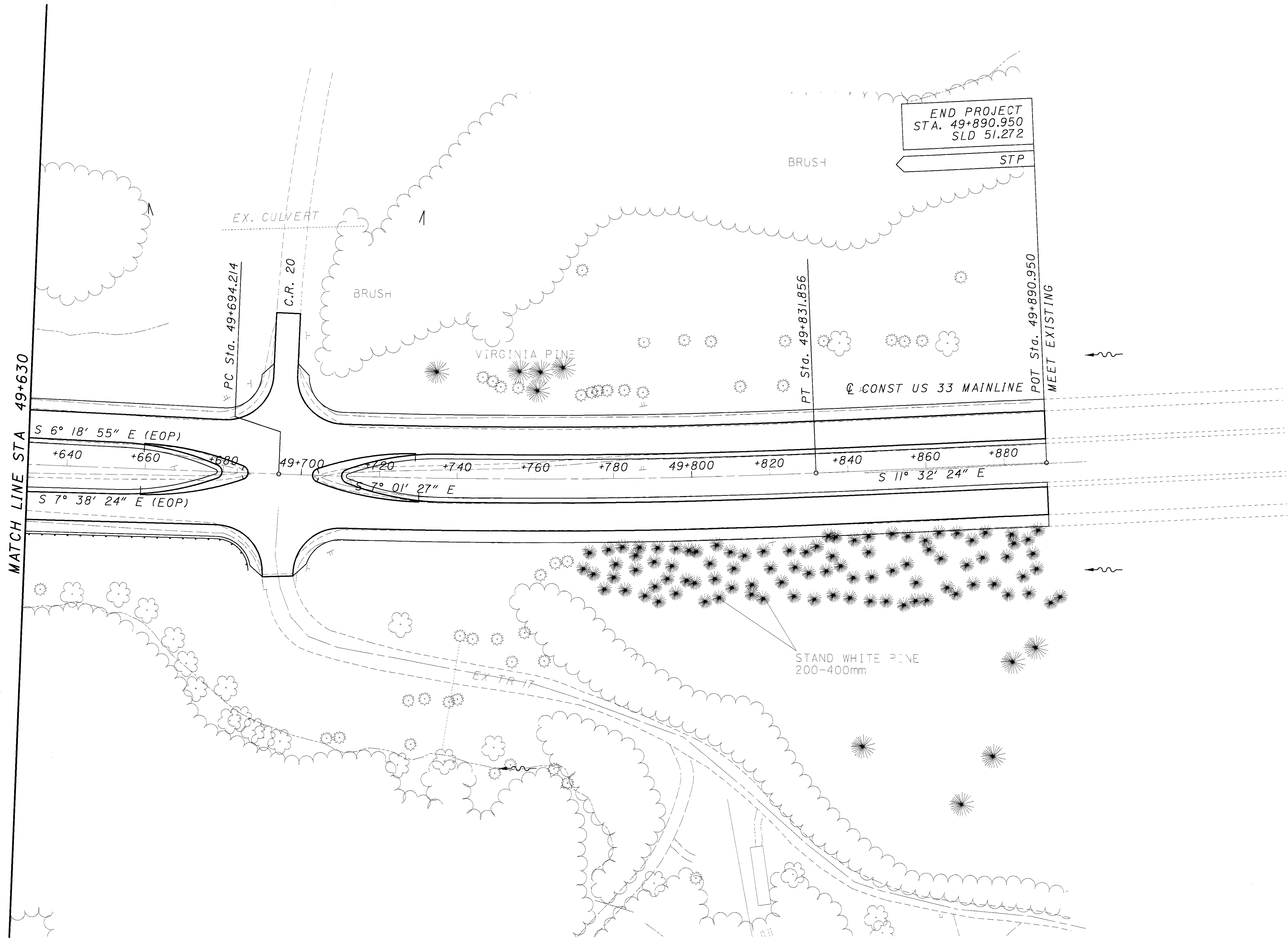
R-98		
Ⓐ	RC-1	SOFT TO MEDIUM HARD BROWN SANDSTONE, POORLY CEMENTED, MICACEOUS, WEATHERED TO SEVERELY WEATHERED. NO CORE LOSS RQD = 100%
	RC-2	NO CORE LOSS RQD = 100%
Ⓑ	RC-3	MEDIUM HARD GRAY SILTSTONE, ARGILLACEOUS, WEATHERED. CORE LOSS = 7% RQD = 100%
Ⓒ		SOFT BLACK COAL.
Ⓓ	RC-4	MEDIUM HARD GRAY SILTSTONE, WEATHERED, SLIGHTLY BROKEN, CONTAINS ROCK CLASTS.
Ⓔ	RC-5	SOFT TO MEDIUM HARD RED, BROWN, GRAY CLAYSTONE, SLIGHTLY WEATHERED.

02/06/01
09:58:57 AM
\\snp\proj\382\1016_00\DS1\geotech\plan33_30.dgn

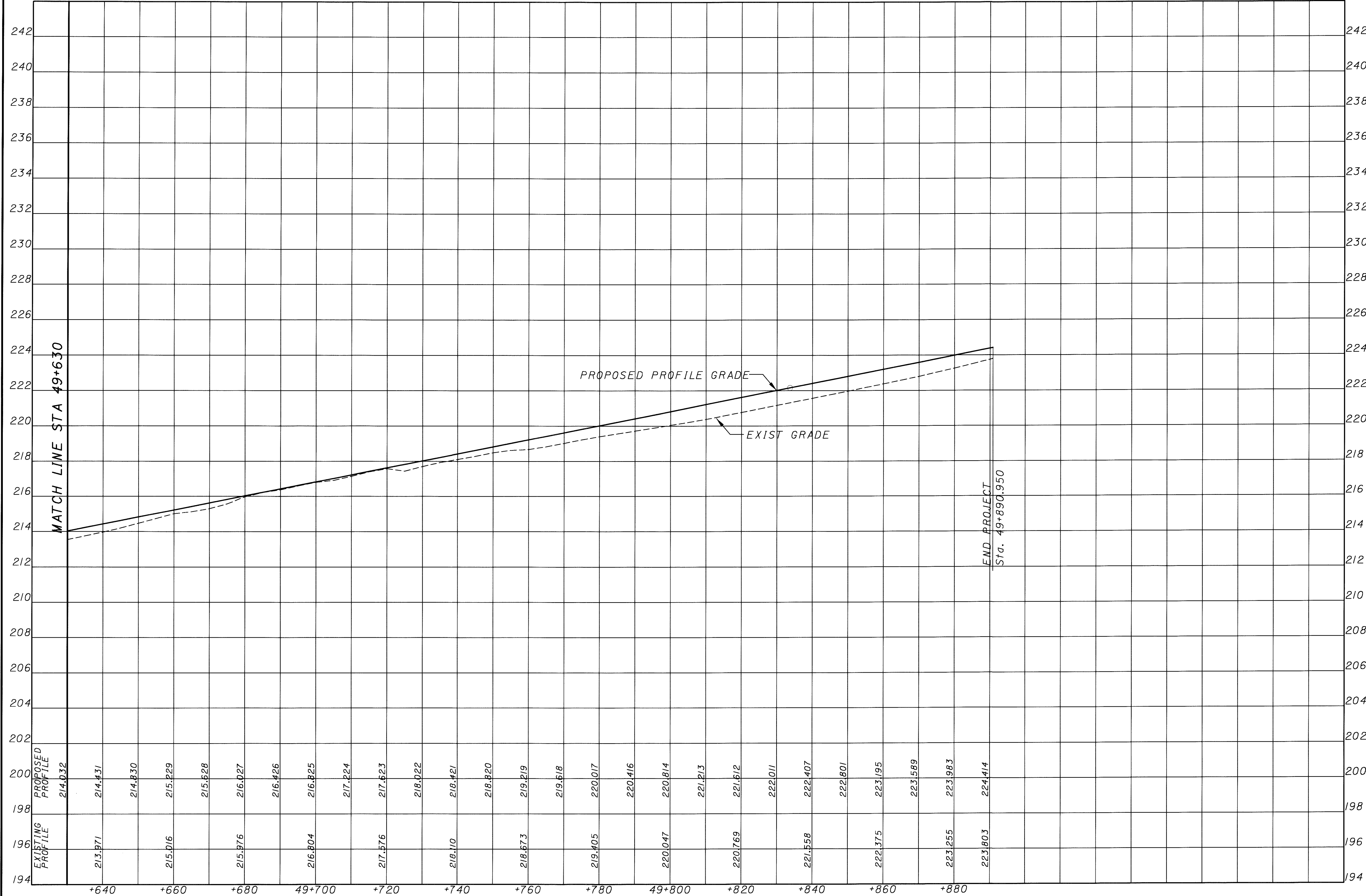


02/06/01 PM
03/27/16 PM
M:\Projects\3821\016-00\DS1\geol\tech\g1\33_30.dgn

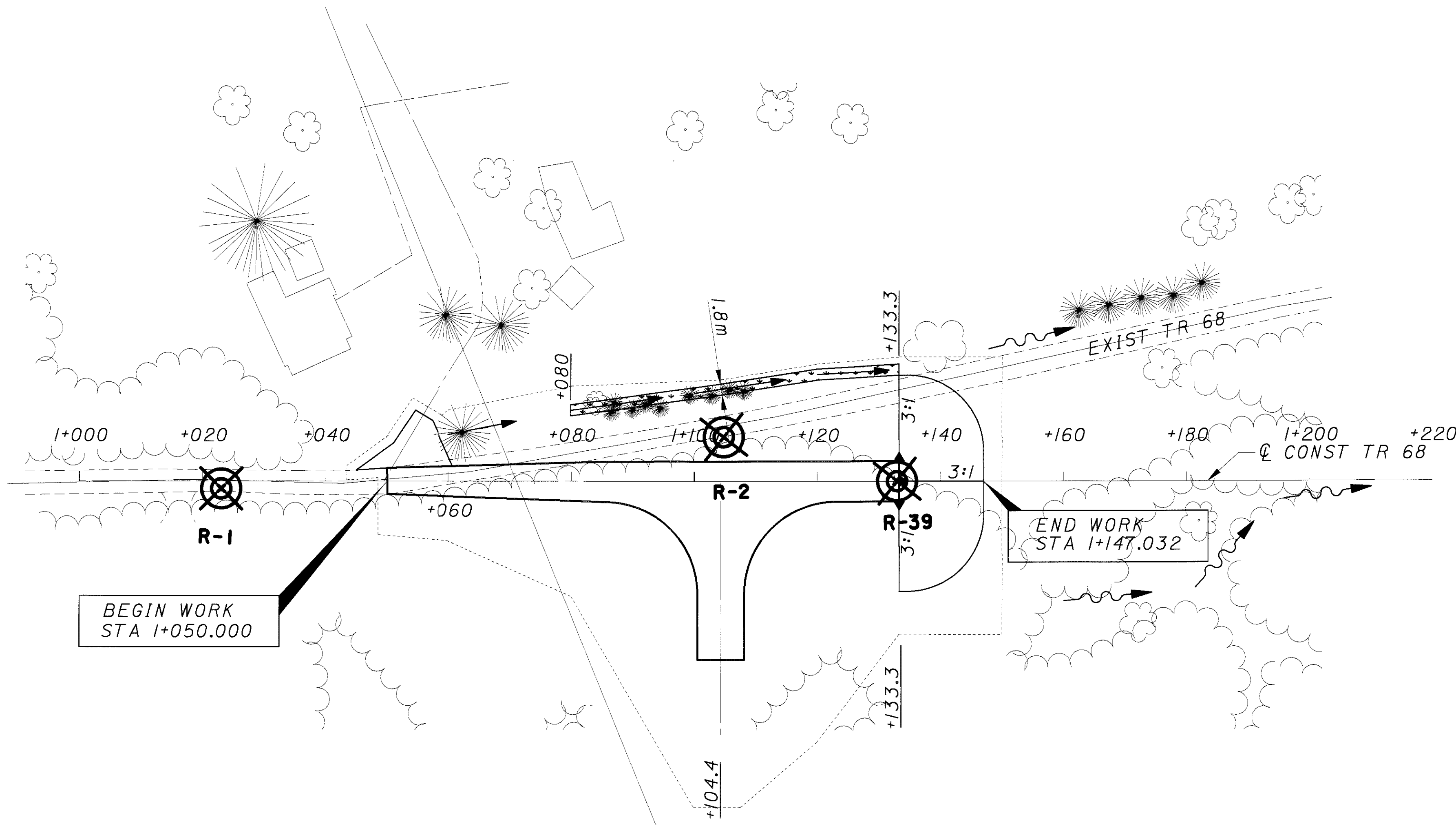
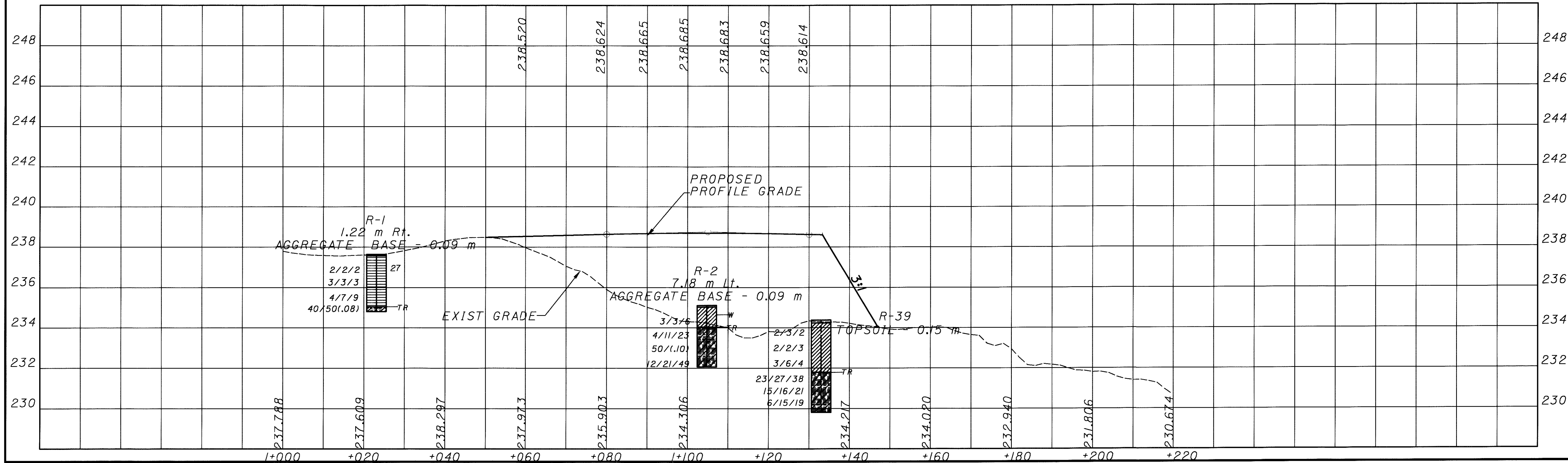




02/06/01
05:59:46 AM
\\s:\proj\382\1016_00\DS1\geotech\gfs33.dgn



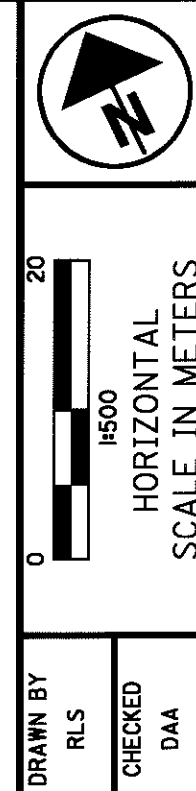
02/07/01
09:53:51 AM
Mc:\Proj\1382\1016-00\Drawings\geotech\Side\ords\vgp\TR68_L.dgn



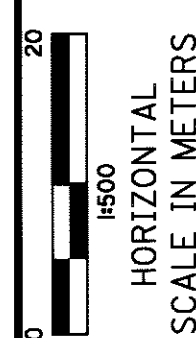
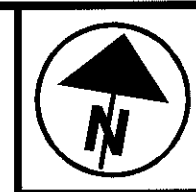
SOIL PROFILE
TR 68 STA 1+000 TO STA 1+220

ATH-33-40.981

92/132
790
949



02/07/01
09:44:44 AM
M:\p\ro\1382\1016-00\DS1\geo\tech\gpr\TR68_2.dgn



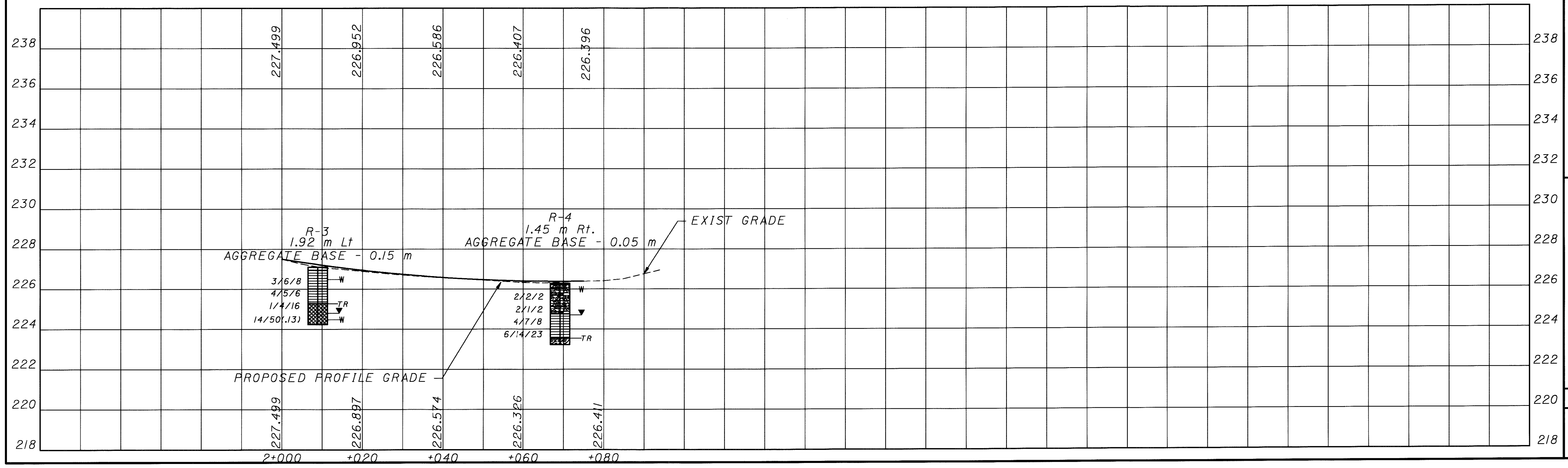
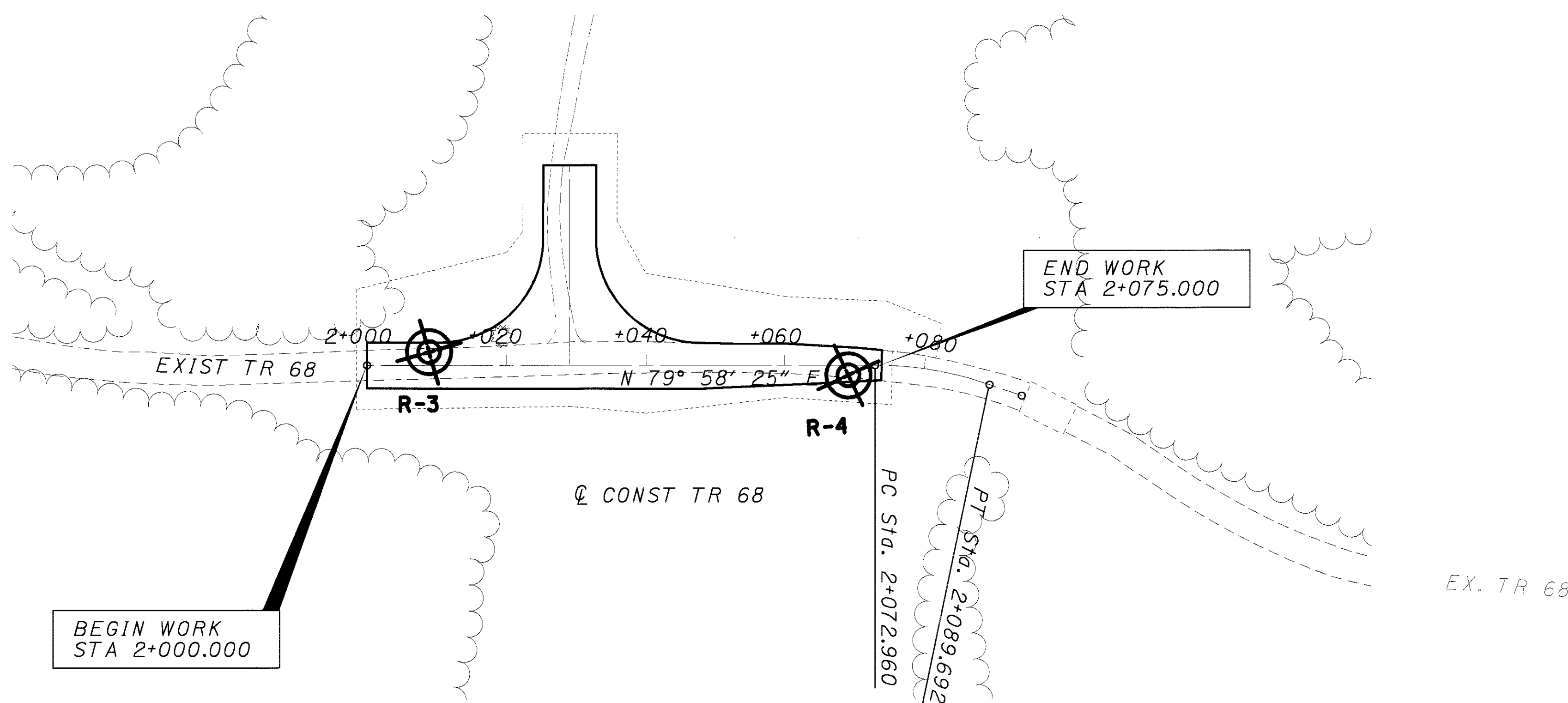
DRAWN BY
RLS
CHECKED
DAA

SOIL PROFILE
TR 68 STA 2+000 TO STA 2+094.570

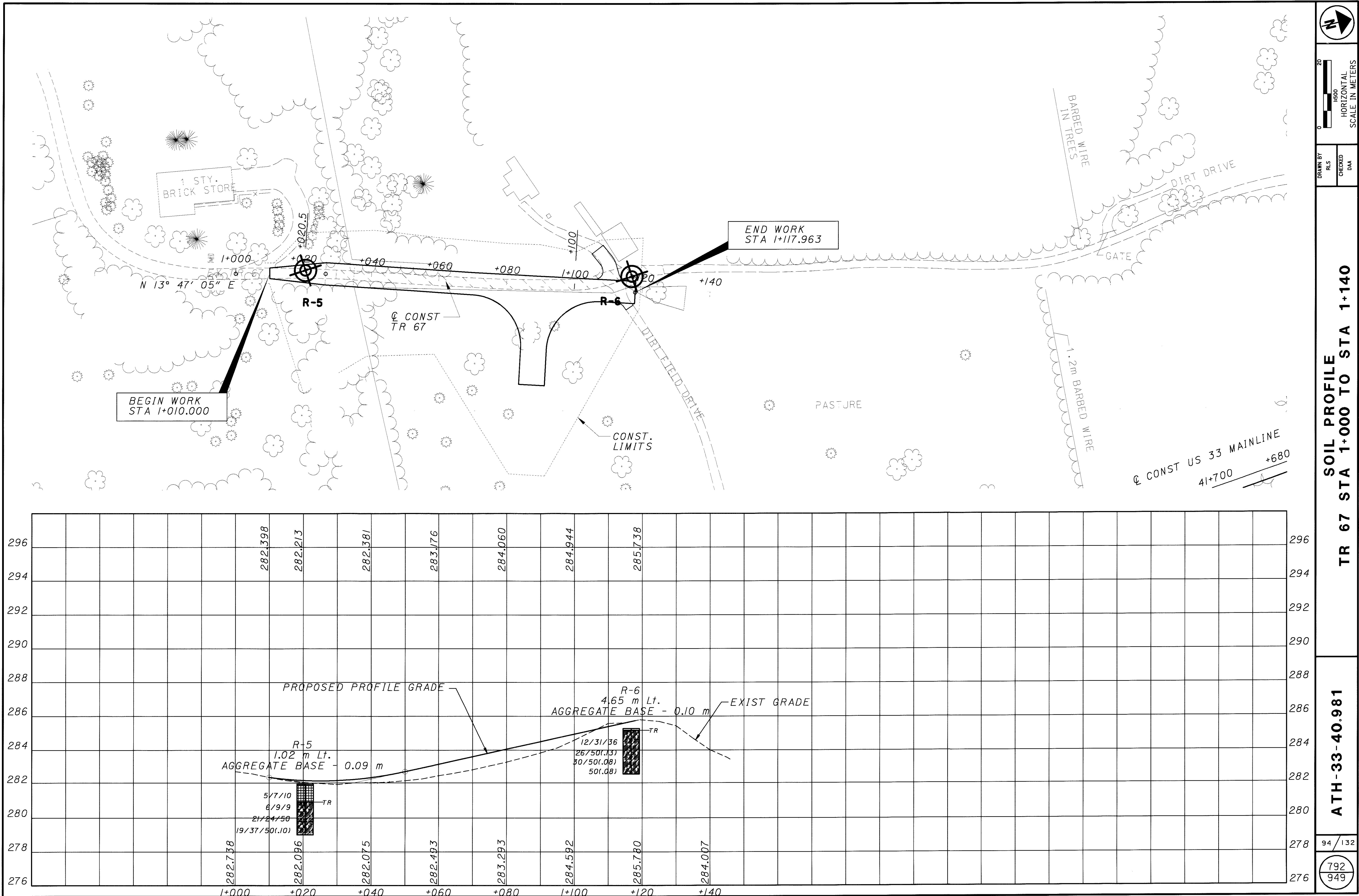
ATH-33-40.981

93 / 132

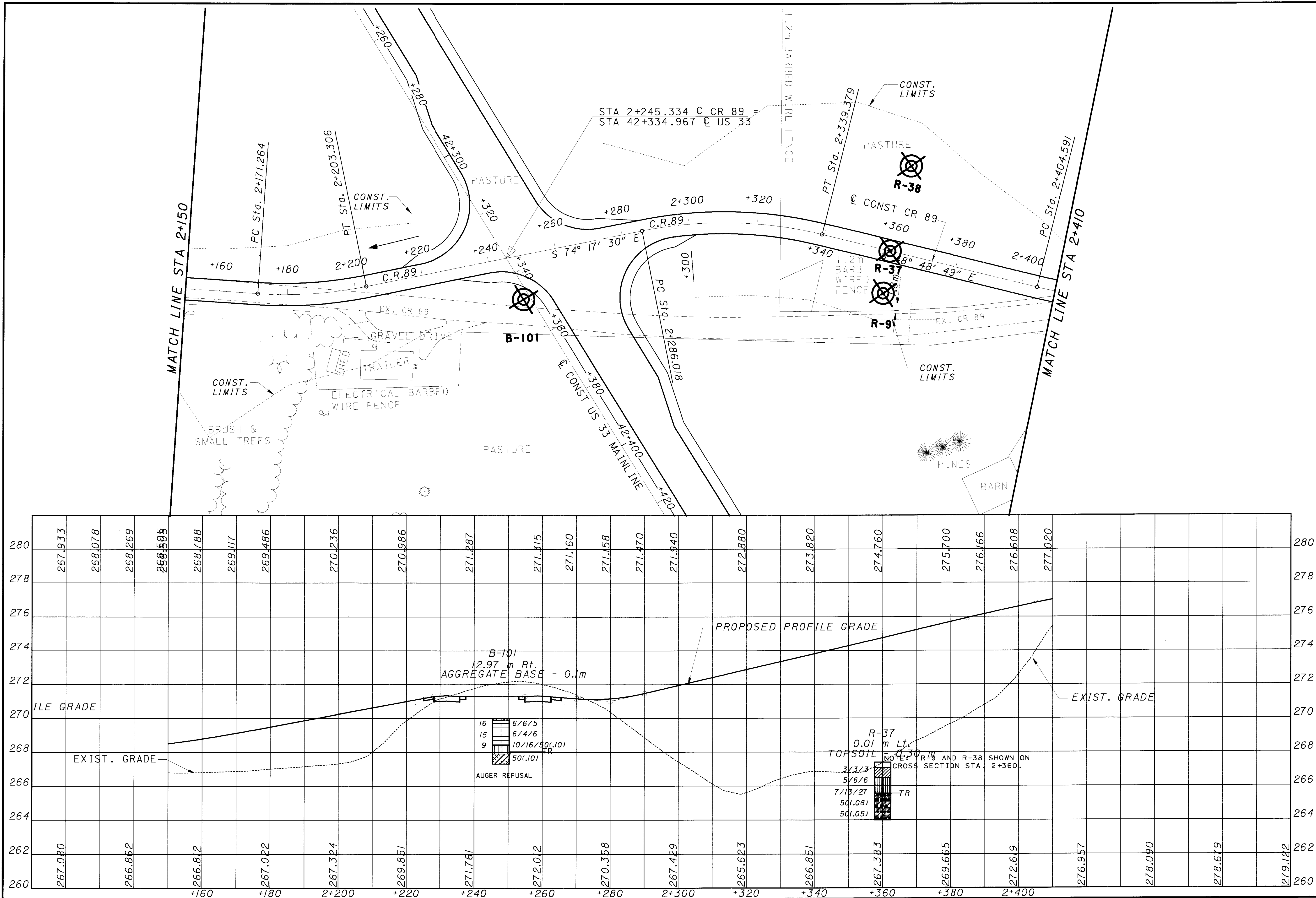
791
949



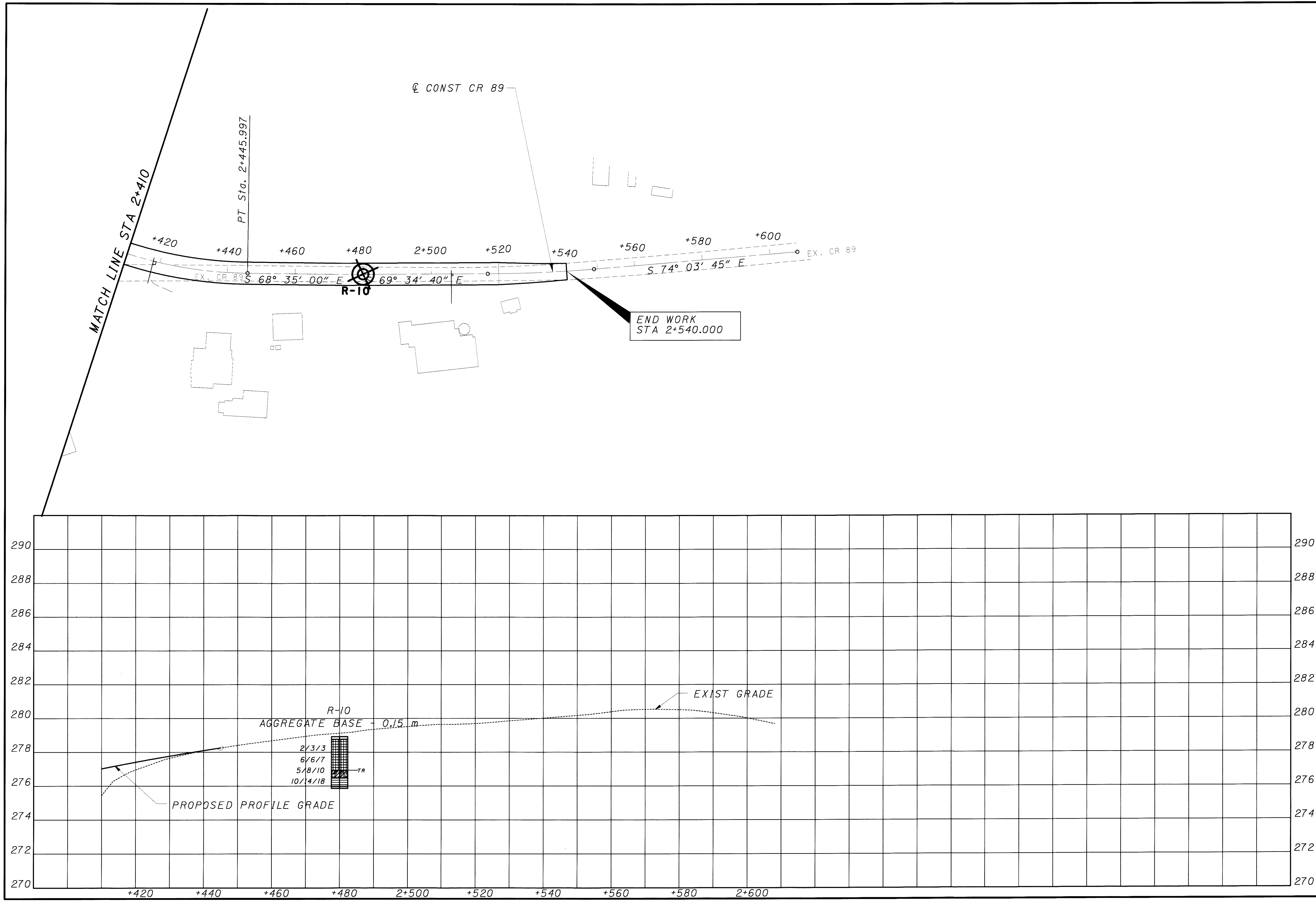
02/07/01
09:31:08 AM
\\s:\p\01382\006-00\US\geotech\SideRoads\gp\TR67.la.dgn



02/07/01
P:\2430 HM
MapProj\0621\0106-00\DSI\geotech\Revised Profile Sheets\gpcr89-2.dgn



02/01/01
05:01:24 AM
M:\projects\3821016-00\US\geotech\SideRoads\gpcr89_3.dgn




0
20
1500
HORIZONTAL
SCALE IN METERS

DRAWN BY
RLS

CHECKED
DAA

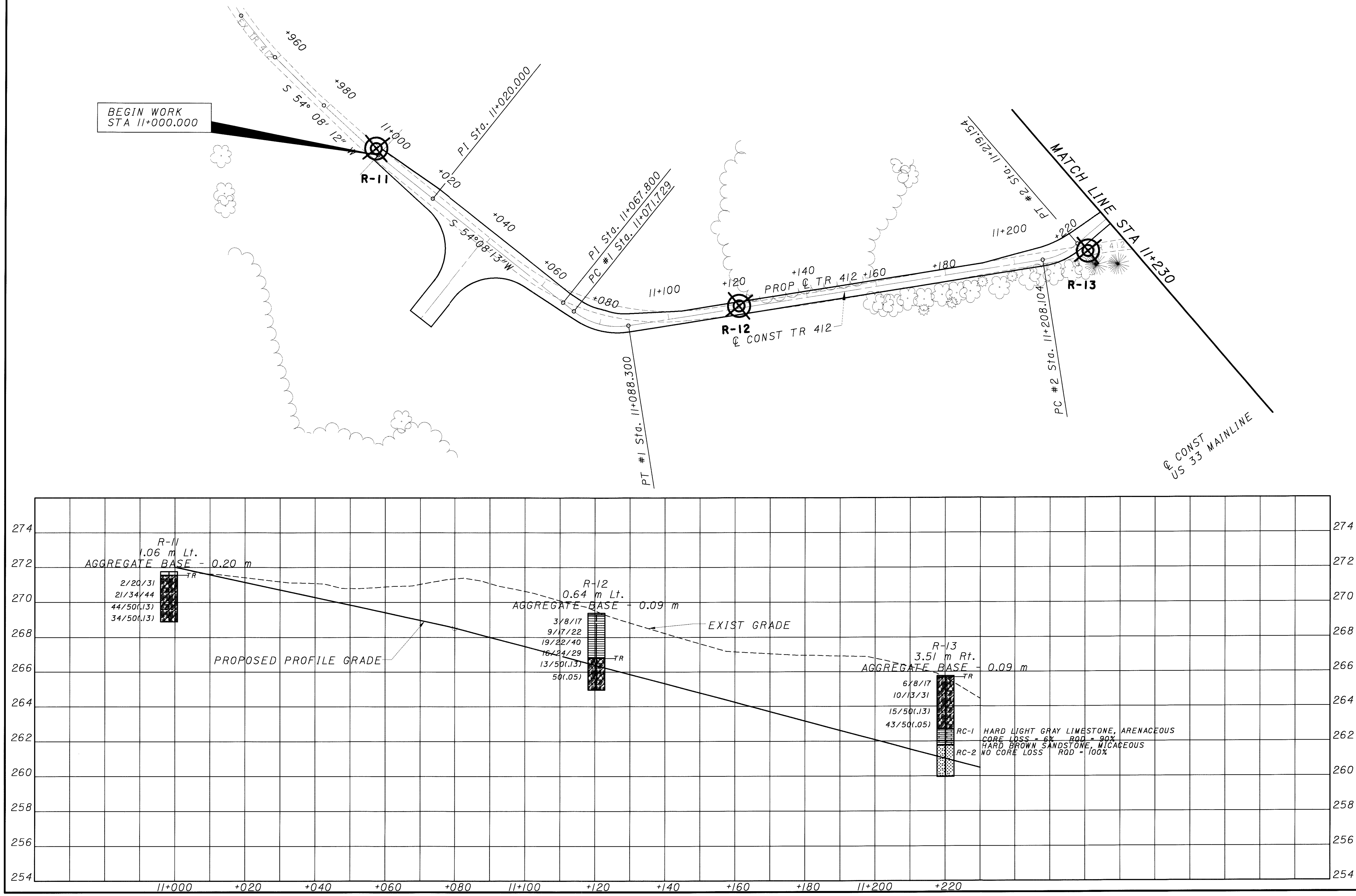
SOIL PROFILE
CR 89 STA 2+410 TO STA 2+608.091

ATH-33-40.981

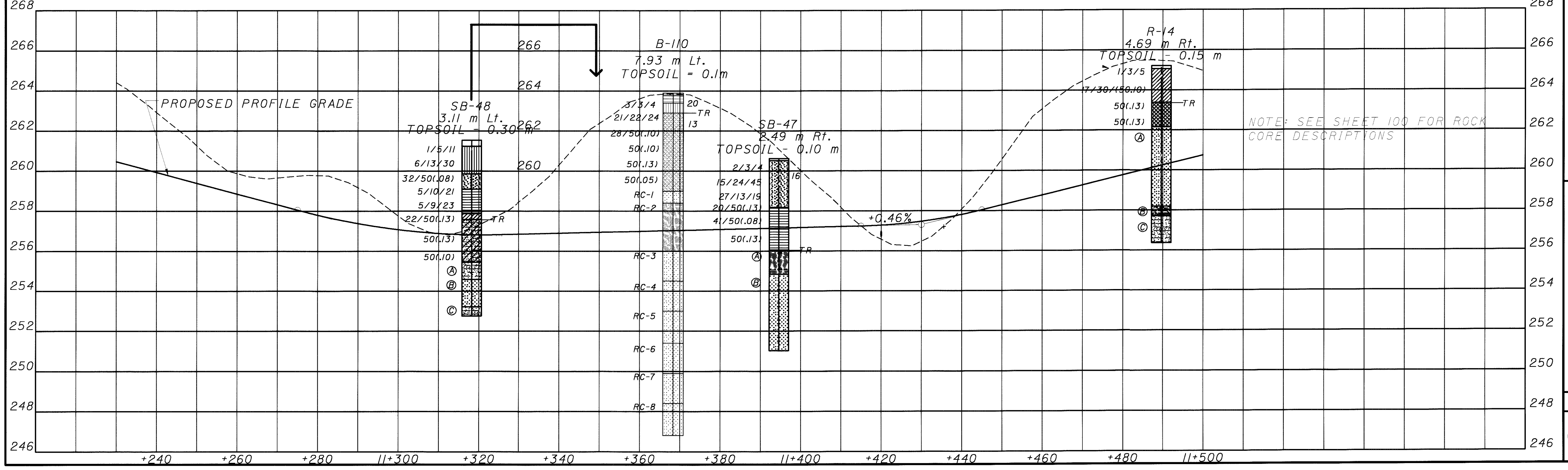
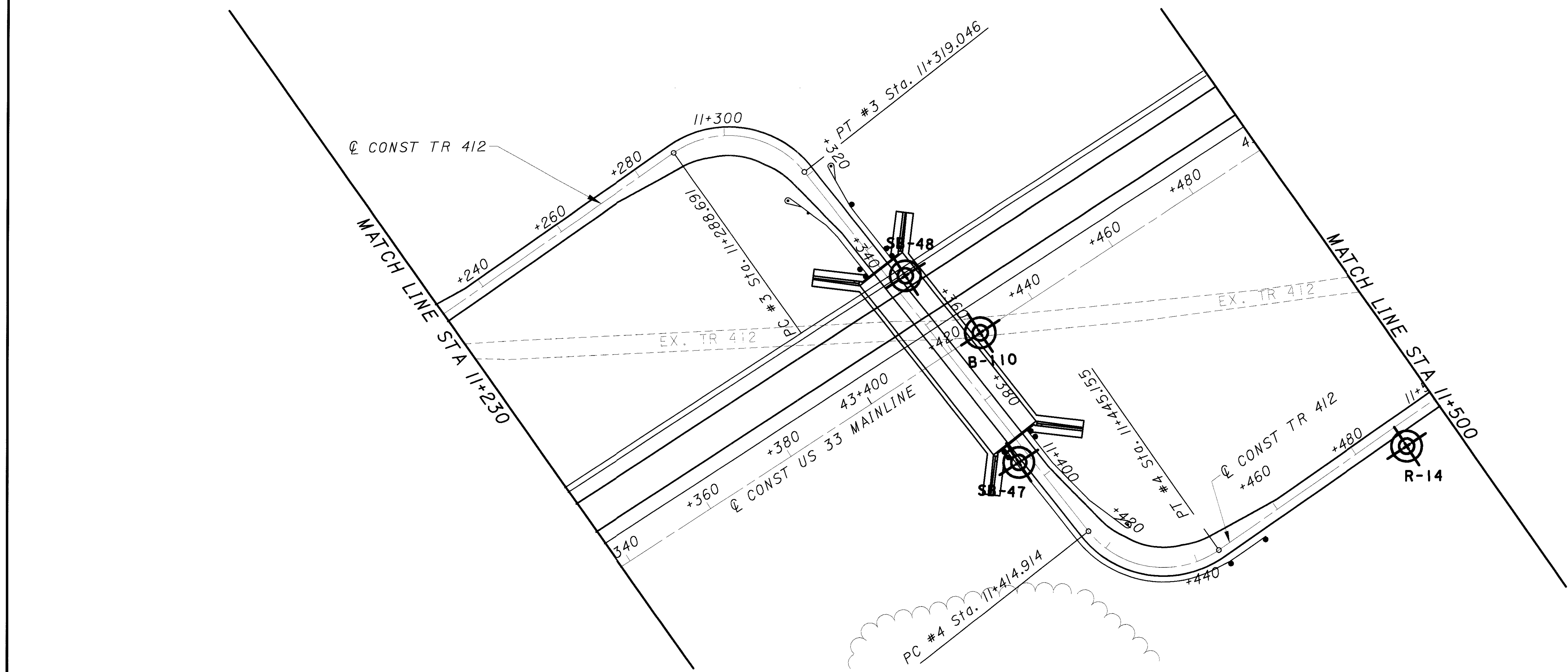
97/132

795
949

02/07/01
09:03:37 AM
M:\P\01\362\1016-00\DS1\geotech\Side\odds\vp1412.L.dgn



02/07/01
12:09:32 PM
M:\proj\382\016-00\Drawings\geotech\Side oods\gpt412.2.dgn



B-110

- RC-1 SANDSTONE; BROWN, SOFT, MASSIVE, SLIGHTLY JOINTED, COARSE GRAINED, MICACEOUS, INTERBEDDED MUDSTONE; GRAY VERY SOFT TO SOFT, HIGHLY BROKEN, HIGHLY JOINTED, ARENACEOUS.
CORE LOSS = 2% RQD = 42%
- RC-2 MUDSTONE; GRAY, VERY SOFT TO SOFT, HIGHLY BROKEN, HIGHLY JOINTED, ARENACEOUS.
NO CORE LOSS RQD = 29%
- RC-3 SANDSTONE; GRAY, MODERATELY HARD, MASSIVE, SLIGHTLY JOINTED, FINE GRAINED, MICACEOUS, LAMINATED.
CORE LOSS = 3% RQD = 84%
- RC-4 CORE LOSS = 5% RQD = 92%
- RC-5 CORE LOSS = 2% RQD = 50%
- RC-6 SANDSTONE; BROWN, MODERATELY HARD, HIGHLY BROKEN, HIGHLY GRAINED, COARSE GRAINED, CALCAREOUS, MICACEOUS, ARGILLACEOUS.
NO CORE LOSS RQD = 0%
- RC-7 CORE LOSS = 2% RQD = 19%
- RC-8 CORE LOSS = 2% RQD = 0%

R-14

- Ⓐ RC-1 HARD BROWN SANDSTONE, MICACEOUS
CORE LOSS = 13% RQD = 88%
- RC-2 NO CORE LOSS RQD = 92%
- Ⓑ RC-3 SOFT GRAY CLAYSTONE
NO CORE LOSS RQD = 100%
- Ⓒ MEDIUM HARD GRAY SILTSTONE, MICACEOUS

SB-47

- Ⓐ RC-1 MEDIUM HARD GRAY SHALE; WEATHERED TO SEVERELY WEATHERED.
CORE LOSS = 7% RQD = 88%
- Ⓑ HARD GRAY SANDSTONE, MICACEOUS; WEATHERED.
RC-2 NO CORE LOSS RQD = 100%

SB-48

- Ⓐ RC-1 MEDIUM HARD GRAY SILTSTONE, ARENACEOUS.
CORE LOSS = 4% RQD = 91%
- Ⓑ HARD GRAY AND DARK GRAY SANDSTONE, ARGILLACEOUS, MICACEOUS; WEATHERED TO MODERATELY WEATHERED.
RC-2 NO CORE LOSS RQD = 100%
- Ⓒ MEDIUM HARD GRAY SILTSTONE, MICACEOUS; WEATHERED.



HORIZONTAL
SCALE IN METERS

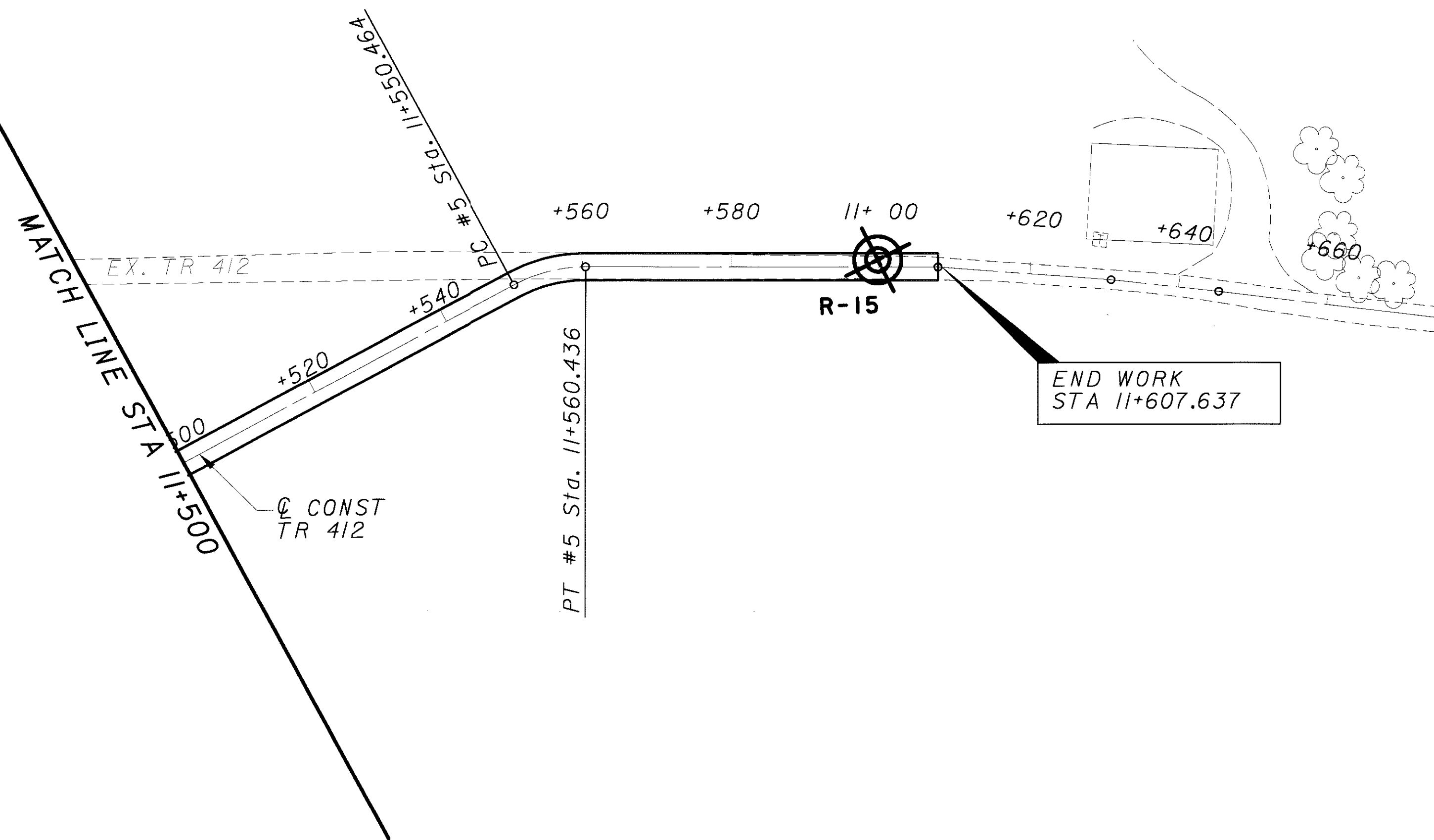
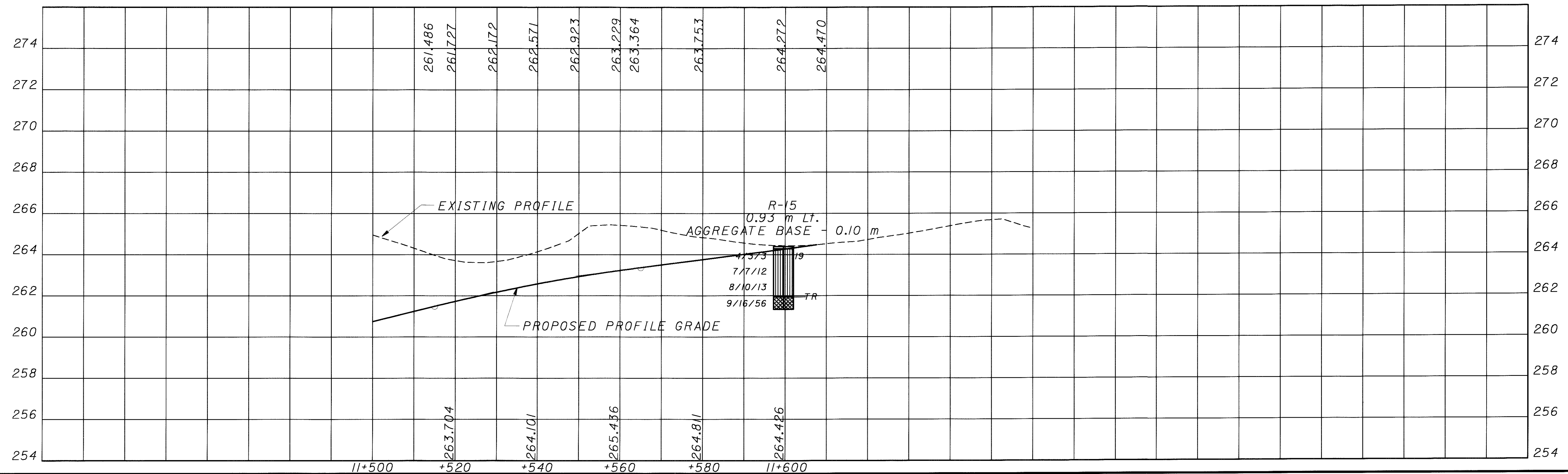
DRAWN BY
RLS
CHECKED
DAA

SOIL PROFILE
TR 412 STA 11+230 TO STA 11+500

ATH-33-40.981

100 / 132

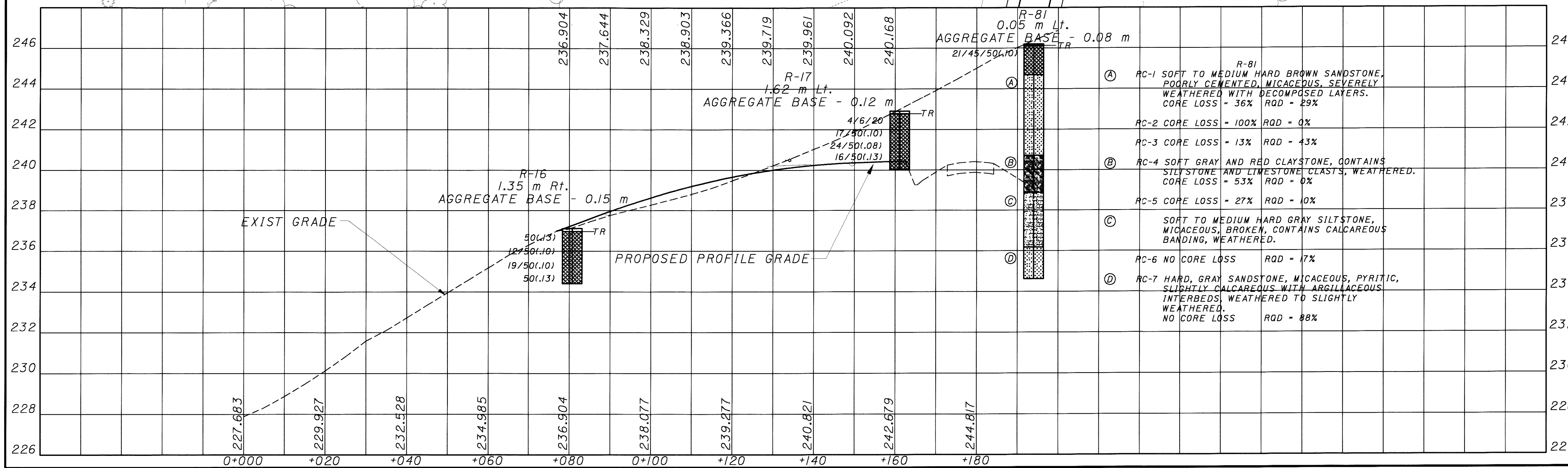
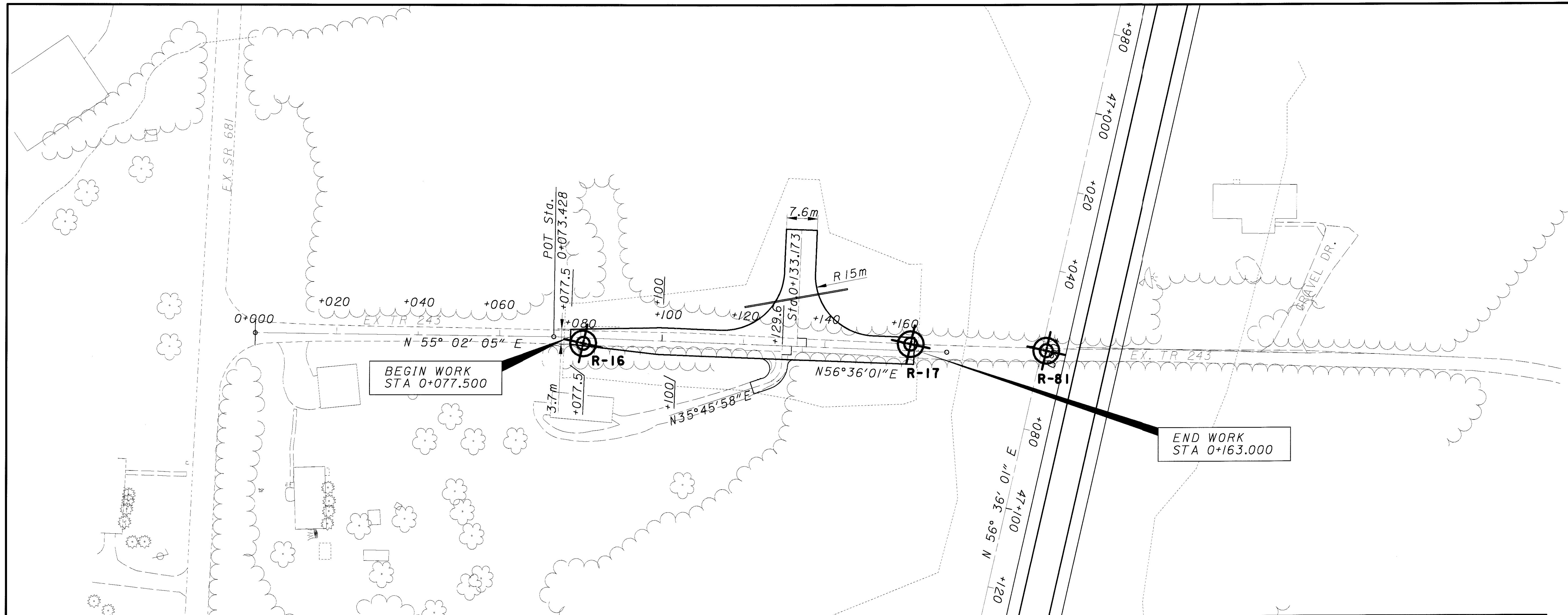
798
949



SOIL PROFILE

TR	412	STA	11+500	TO	STA	11+607.637
----	-----	-----	--------	----	-----	------------

02/07/01
09:06:28 AM
M:\Proj\13621\016_00\DS1\geotech\SideRoads\gpi\243_R.dgn



R-81	
SOFT TO MEDIUM HARD BROWN SANDSTONE, POORLY CEMENTED, MICACEOUS, SEVERELY WEATHERED WITH DECOMPOSED LAYERS.	
RC-1	CORE LOSS = 36% RQD = 29%
RC-2	CORE LOSS = 100% RQD = 0%
RC-3	CORE LOSS = 13% RQD = 43%
R-81	
SOFT TO MEDIUM HARD GRAY SILTSTONE, MICACEOUS, BROKEN, CONTAINS CALCAREOUS BANDING, WEATHERED.	
RC-4	CORE LOSS = 53% RQD = 0%
RC-5	CORE LOSS = 27% RQD = 10%
RC-6	NO CORE LOSS RQD = 17%
R-81	
HARD, GRAY SANDSTONE, MICACEOUS, PYRITIC, SLIGHTLY CALCAREOUS WITH ARGILLACEOUS INTERBEDS, WEATHERED TO SLIGHTLY WEATHERED.	
RC-7	NO CORE LOSS RQD = 88%

0

1500

20

HORIZONTAL

SCALE IN METERS

DRAWN BY

RLS

CHECKED

DAA

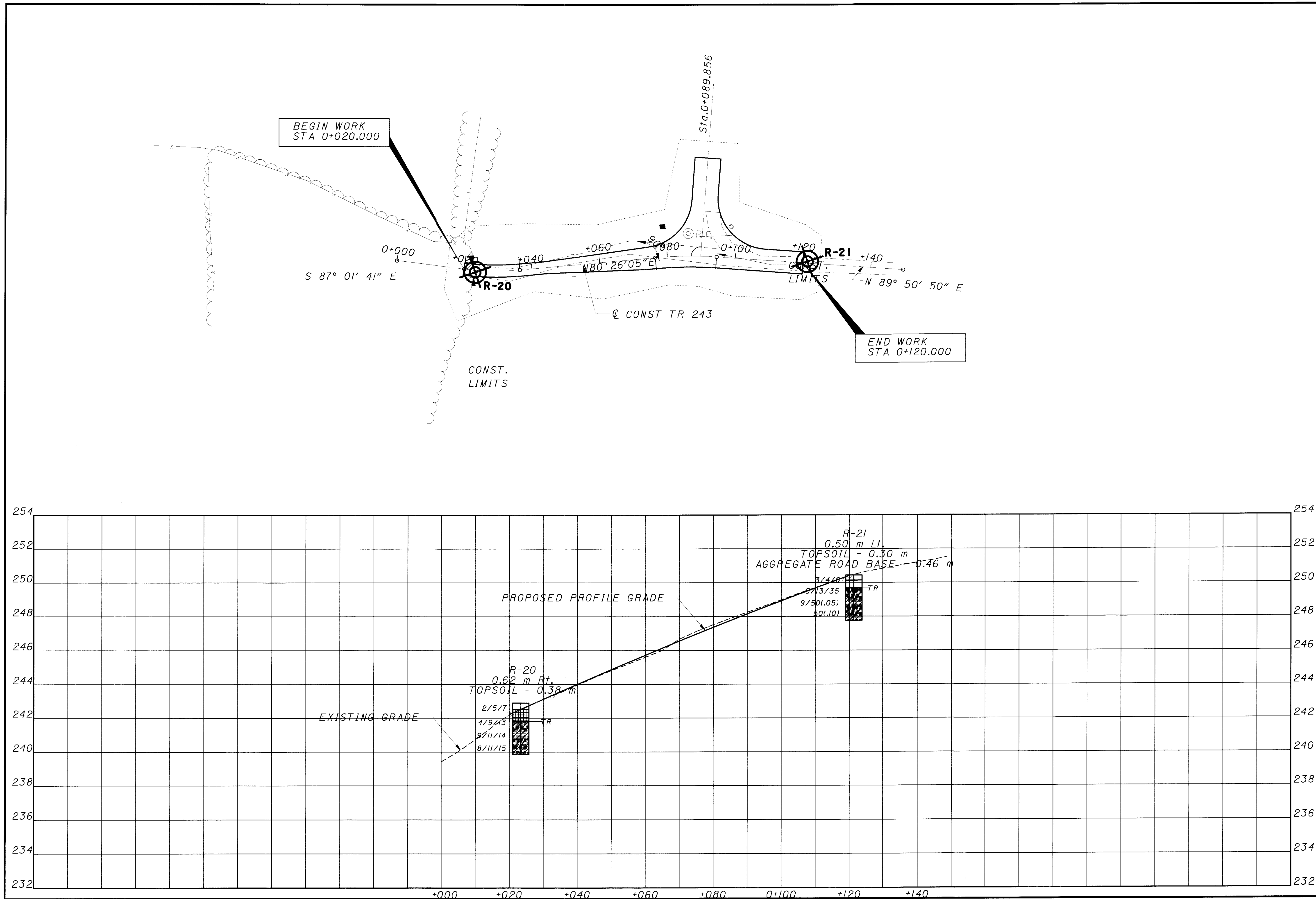
TR 243 STA 0+077.500 TO STA 0+162.000

ATH-33-40.981

102/132

800
949

02/07/01
12:05:04 PM
M:\Proj\1302\1016_00\DS\geotech\Revised Profile Shoots\gp 243.Ldgn



20
1500
HORIZONTAL
SCALE IN METERS

CALCULATED	BBD	CHECKED	TDW
------------	-----	---------	-----

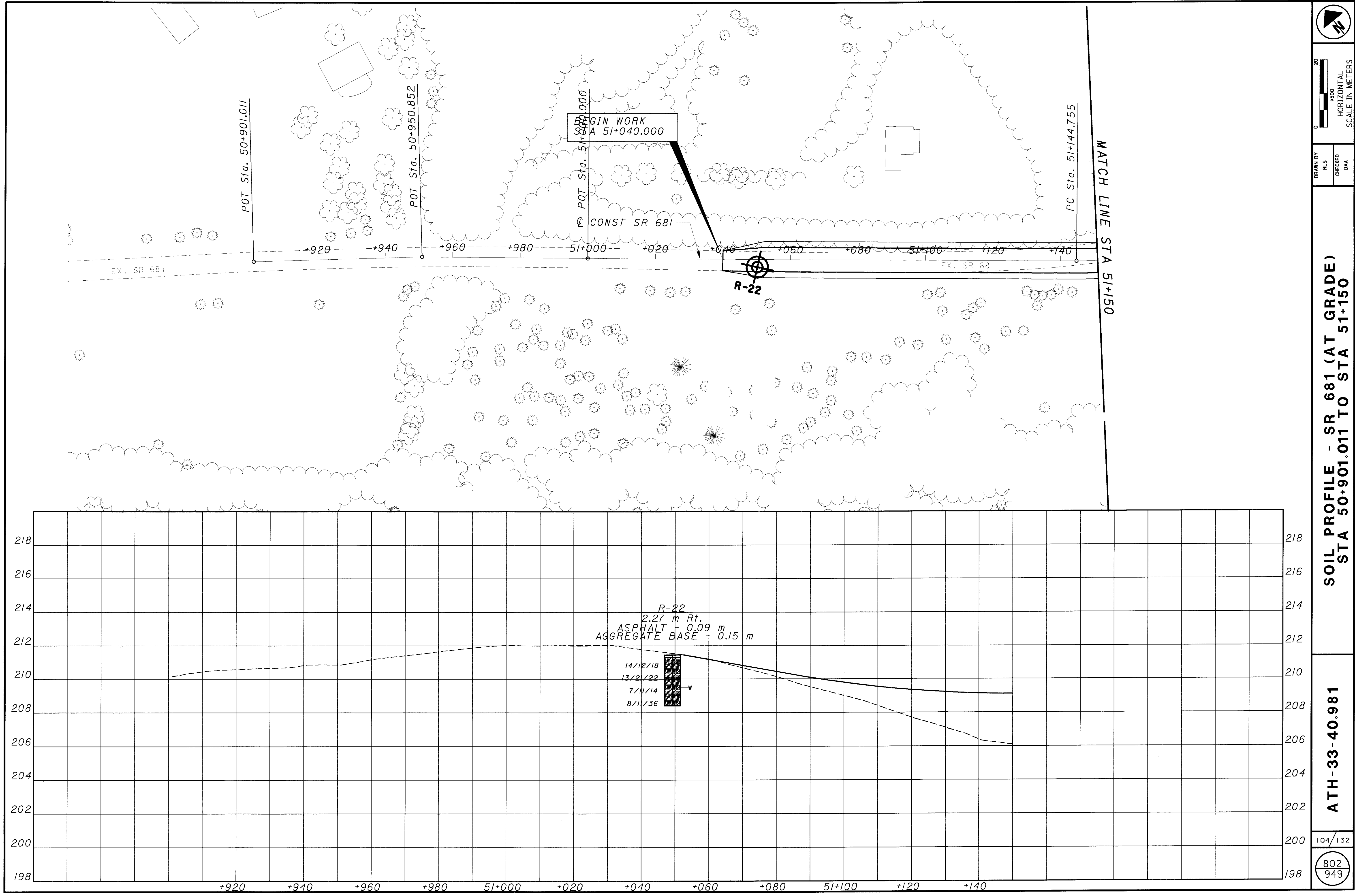
TR 243 PLAN & PROFILE
STA 0+020 TO STA 0+120

ATH-33-40.981

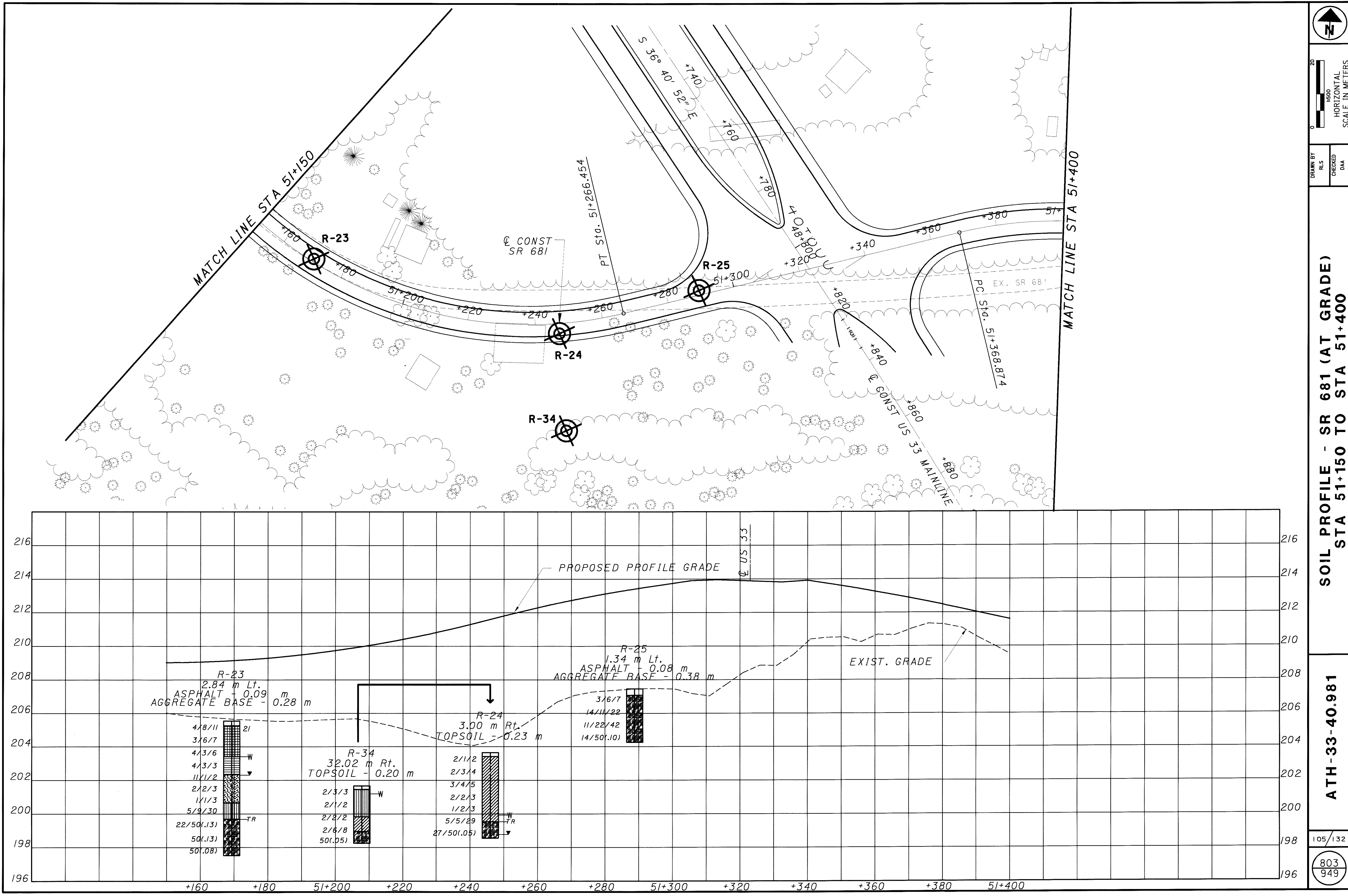
103/132

801
949

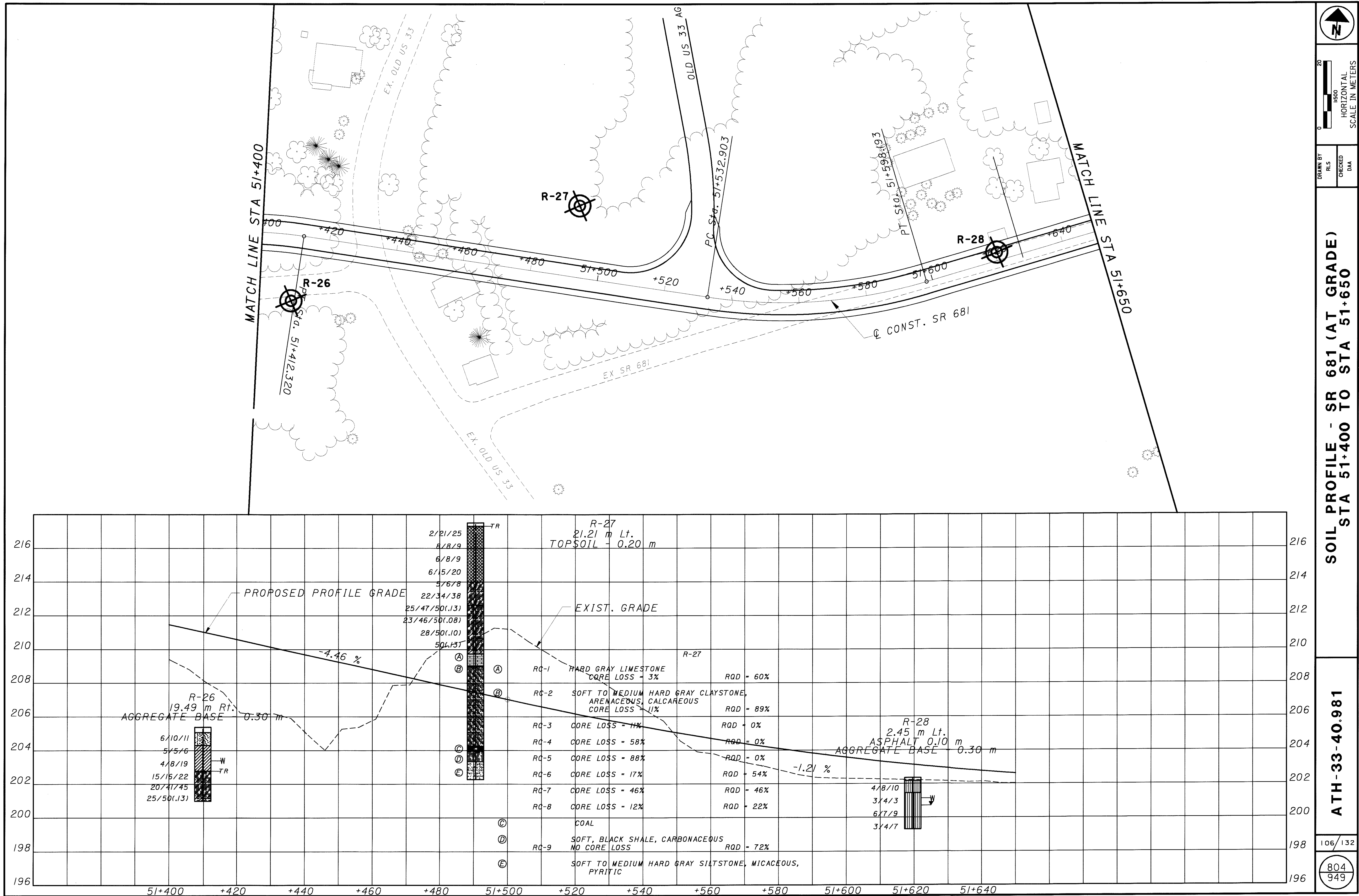
02/01/01
08:44:34 AM
M:\p\01\3821\0106 00\DS\geotech\sidaroads\vgp68\agl.dgn



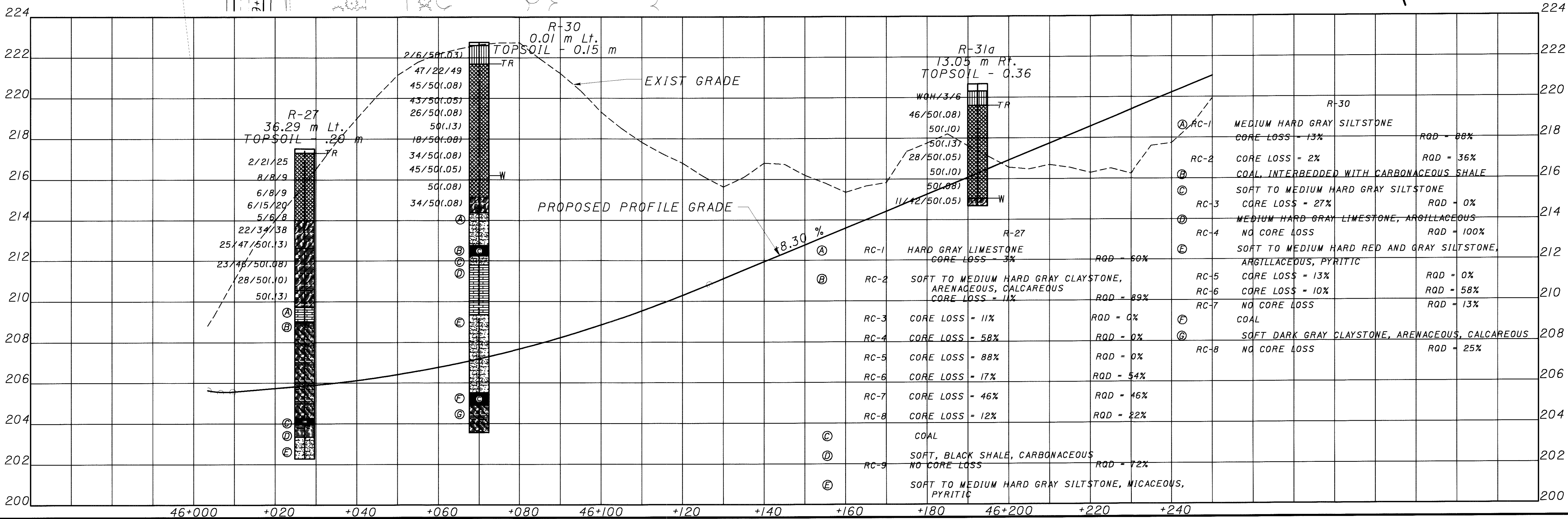
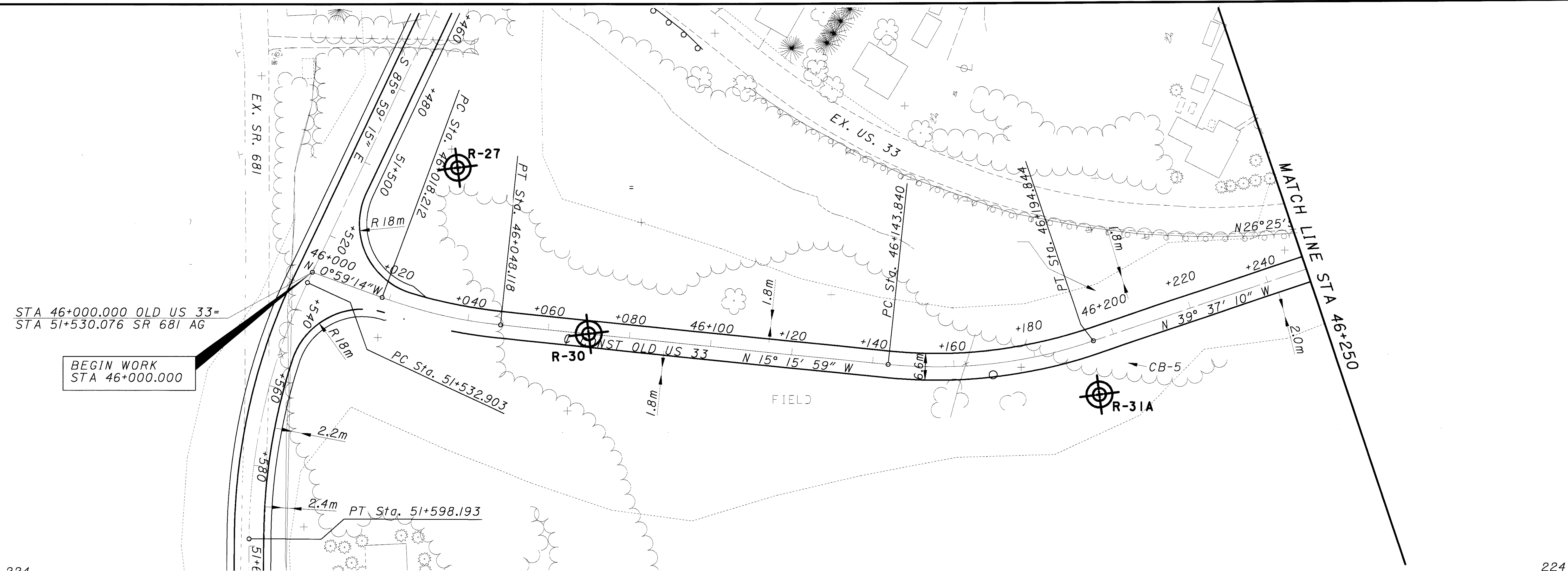
02/01/01
12:59:44 PM
M:\Proj\01\821\016-00\Drawings\geotech\Revised Profile Shoots\gp881\AC2.dgn



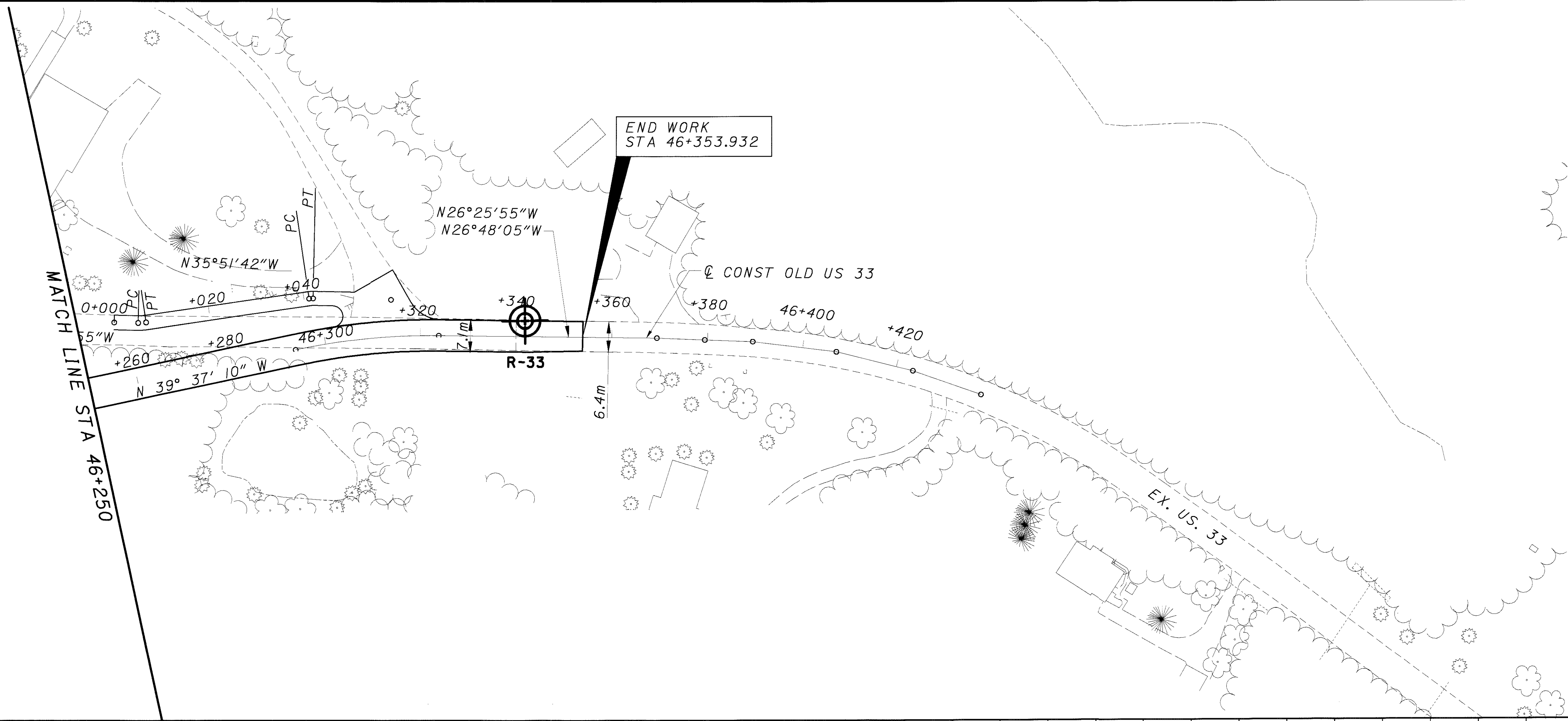
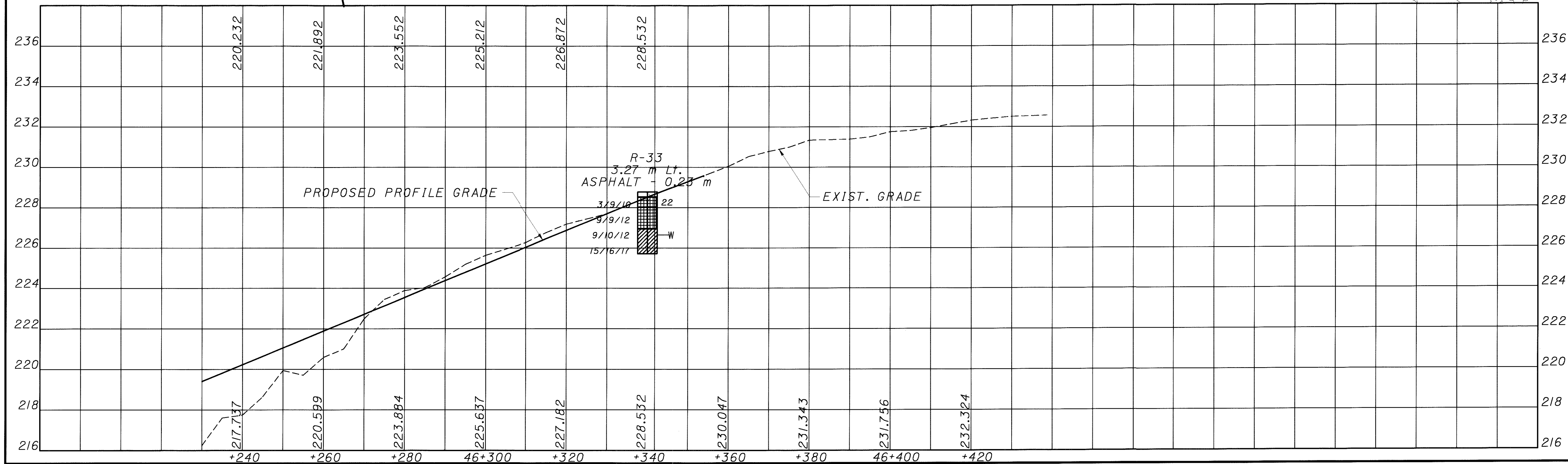
02/07/01
2:41:17 PM
MaxPro\J382\J016-00\ND5\geo\tech\Revised Profile Sheets\sp681\G3.dgn

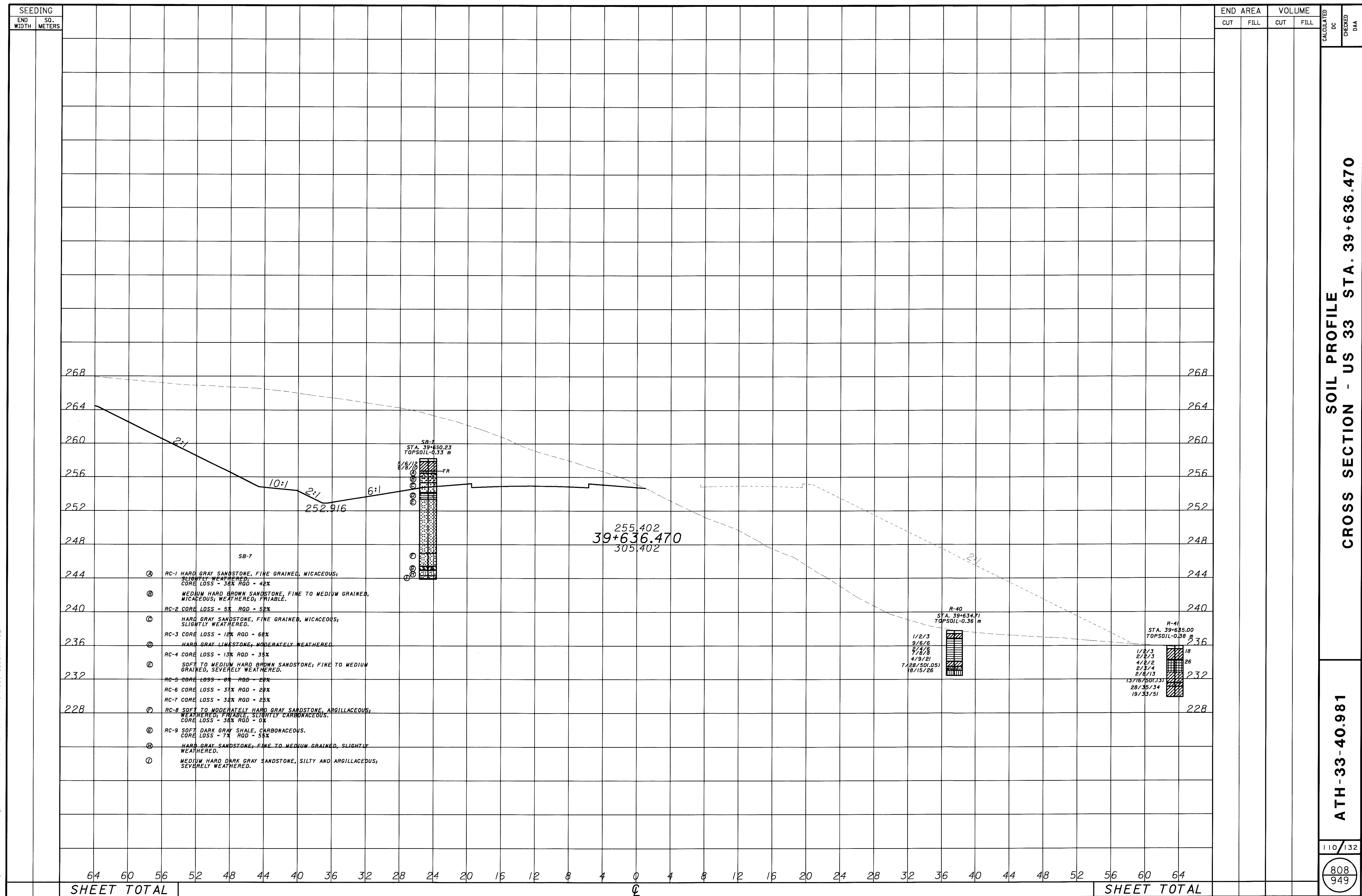


02/01/01
12:28:34 PM
M:\proj\1982\1016-00\DSI\geotech\Revised Profile Sheets\gpl335_1a.dgn



02/07/01
0950621AM
M:\P\01\382\1016-00\US\geotech\Slider\odas\gpl\335_2a.dgn

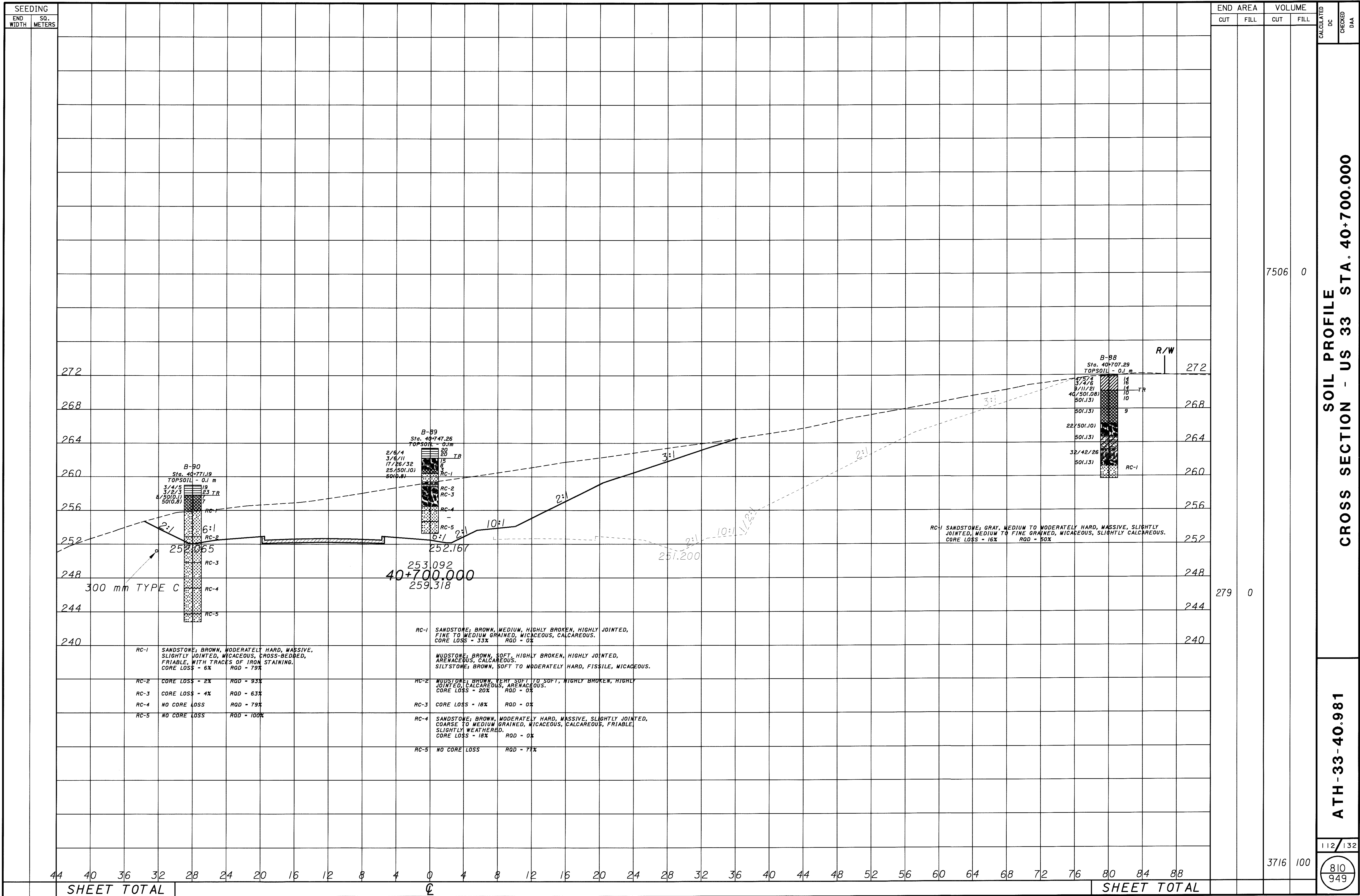




02/06/01
02:28:18 PM
M:\proj\3821\016-00\N5\geo\tech\Revised_Profile_Sheets\X539+636exRTV.dgn

[illegible]

02/06/01 PM
02:30:49 PM
M:\DPI\3621\016-00\DS\geotech\Revised Profile Sheets\VS40+700xR.V.dgn



SOIL PROFILE
CROSS SECTION - US 33 STA. 40+700.000

ATH-33-40.981

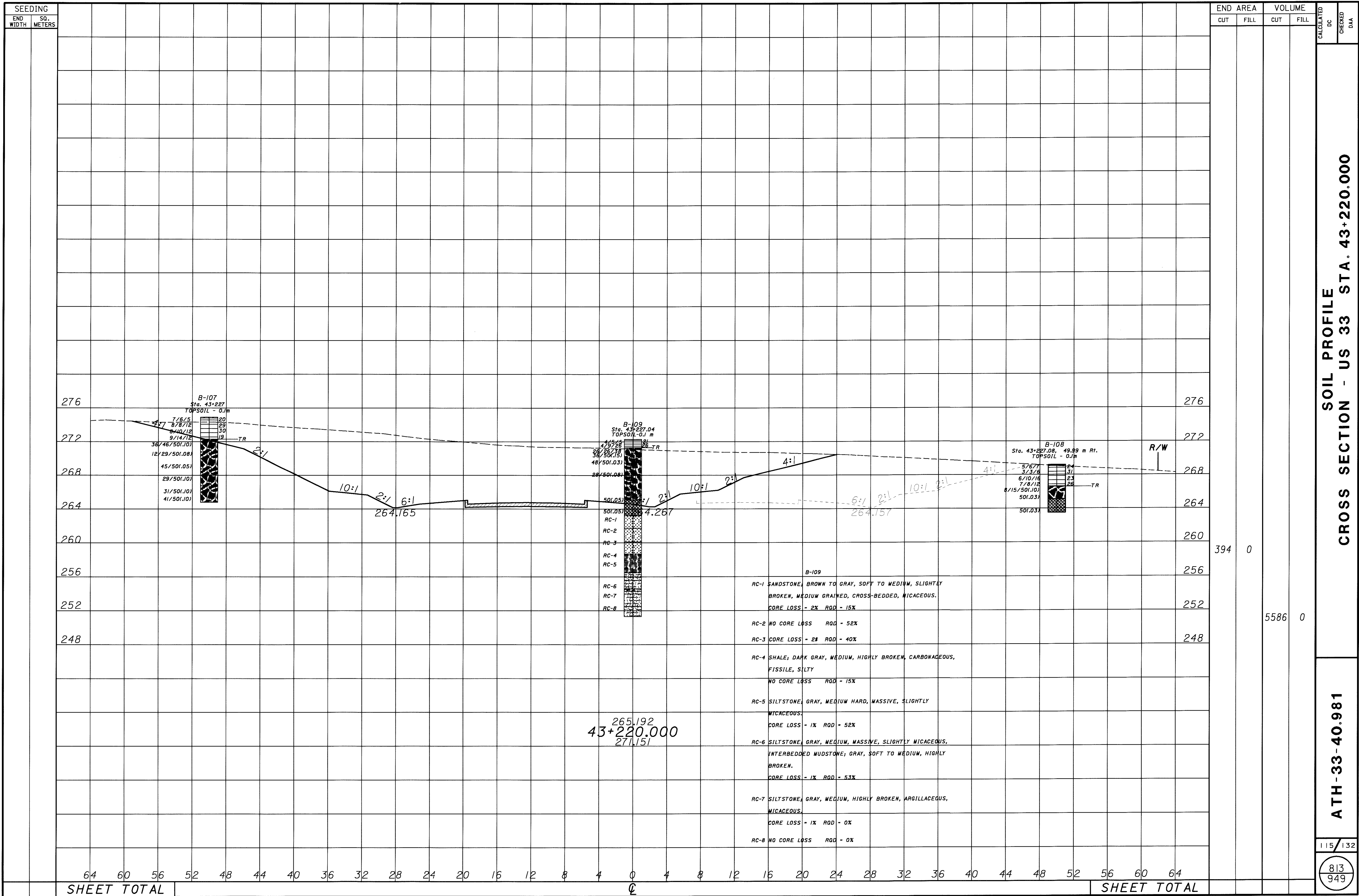
112/132

810
949

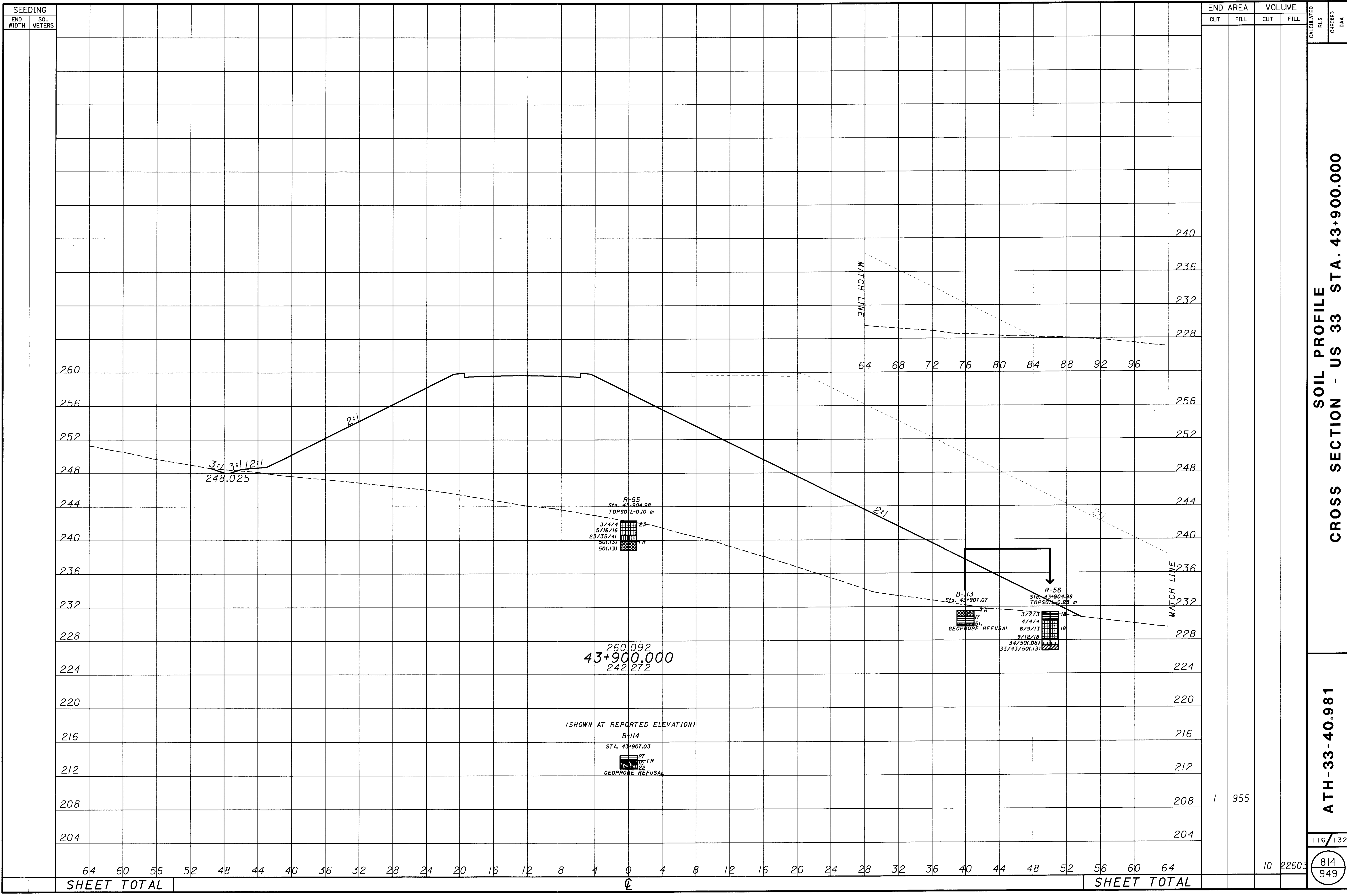
02/06/01
02:32:28 PM
M:\proj\982\1016 00\DS\geotech\Revised Profile Sheets\X5411600exREV.dgn

02/06/01
02:33:28 PM
M:\proj\982\016-00\DS\geotech\Revised Profile Sheets\XS41+900exRev.dgn

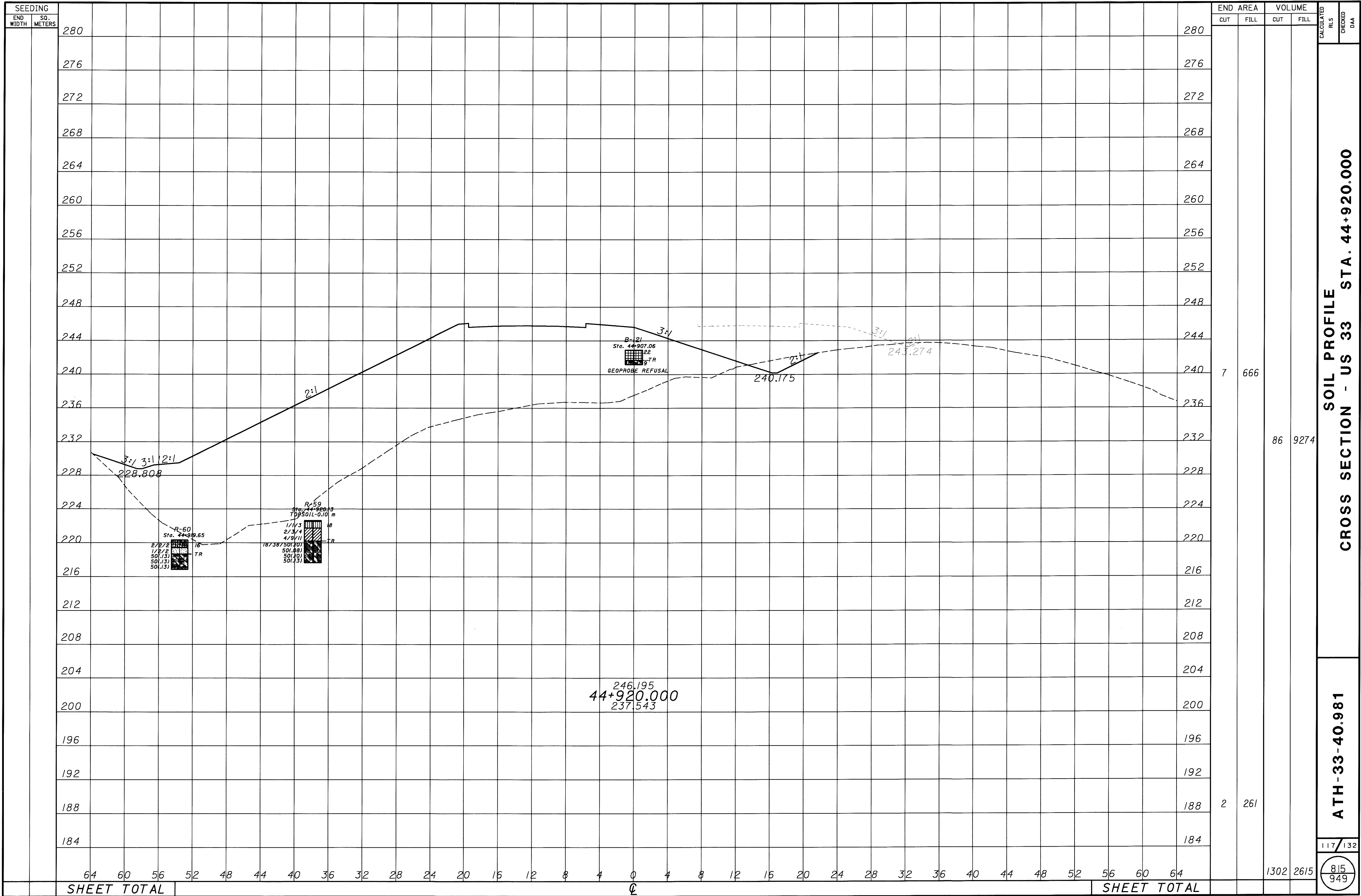
02/06/01 PM
02:35:26
\\prj01\382\006-00\Drawings\Profile Sheets\X5\31220exRLV.dgn



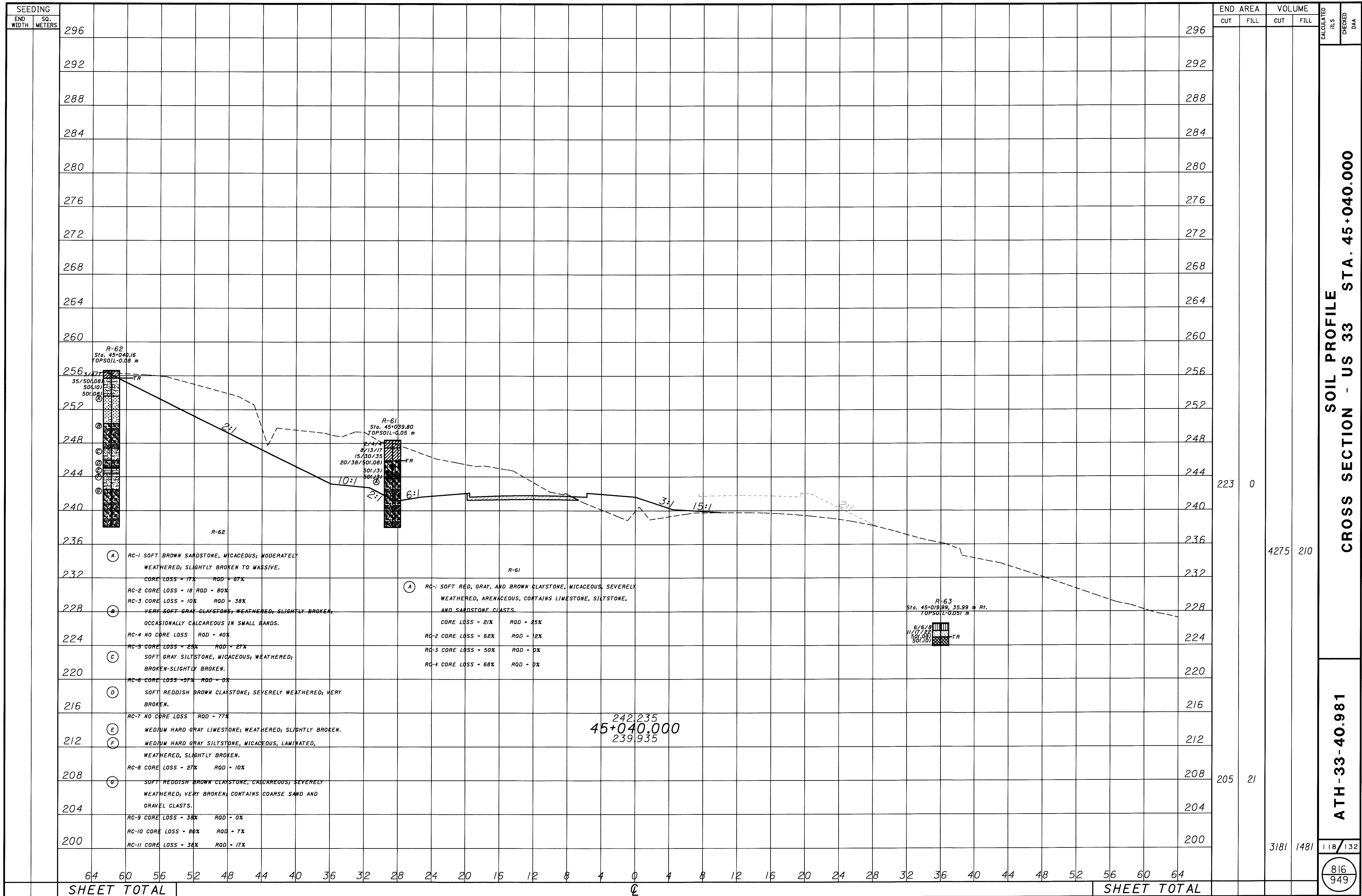
02/06/01
05:08:54 PM
M:\p\01\982\016 00\DSI\geotech\Revised Profile Sheets\X543+900ex.dgn

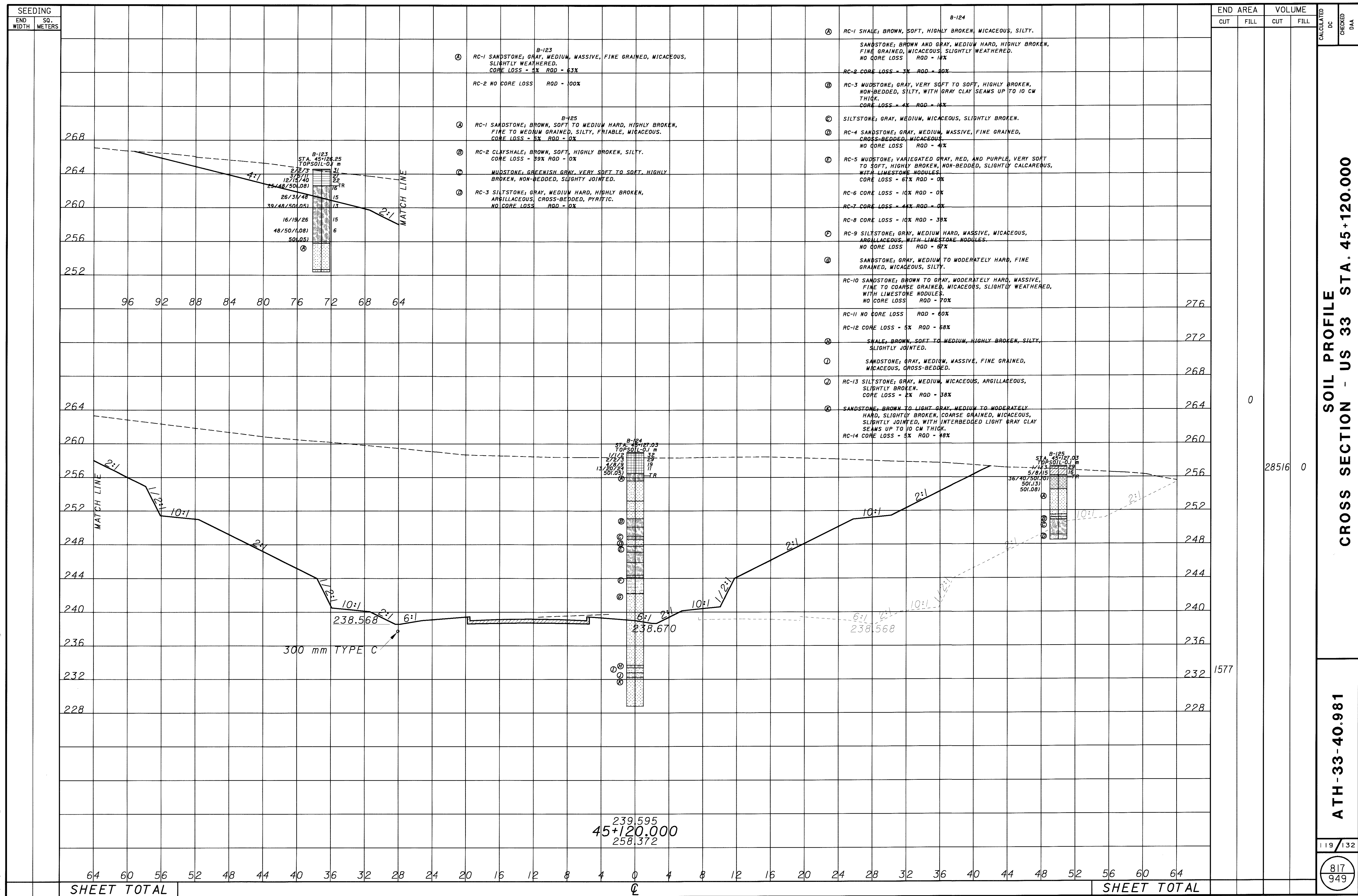


02/06/01 PM
034040 PM
W:\proj\362\N016 00\US\geotech\Revised Profile Sheets\44+920ex.dgn



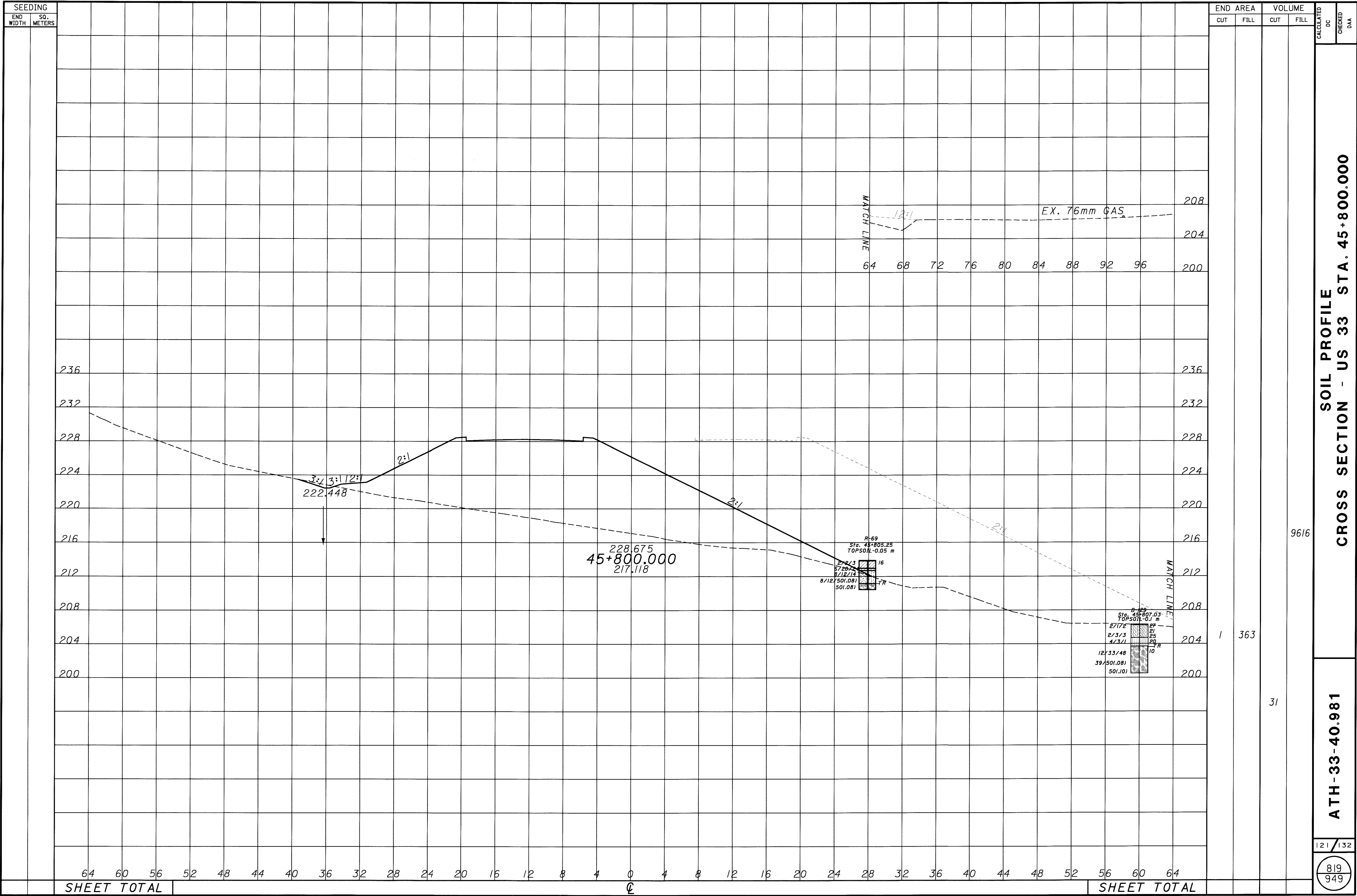
02/06/01
02:36:50 PM
McProj382106 00\DS\geotech\Revised Profile Sheet\54s-040xRLV.dgn





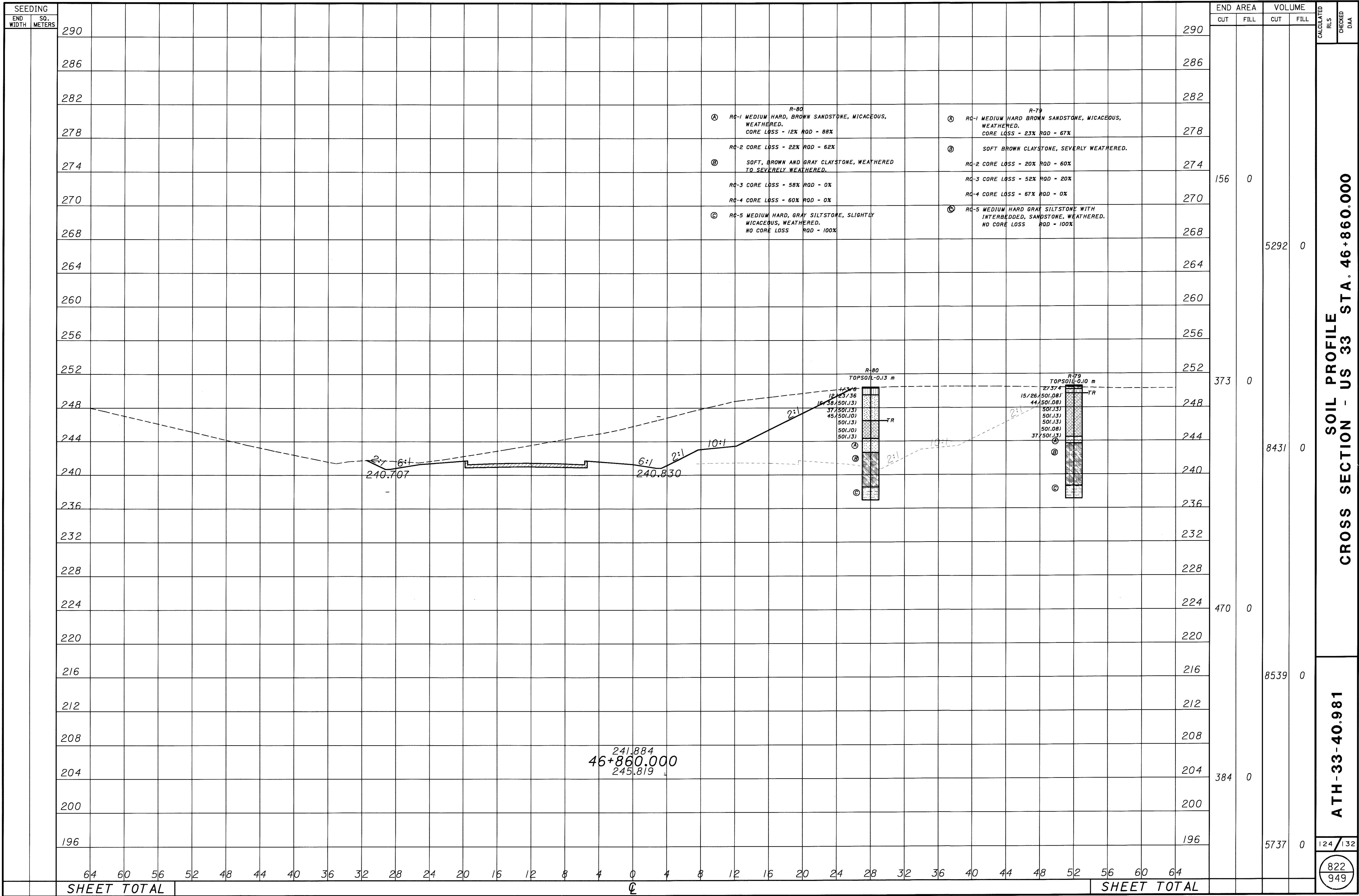
02/06/01
02:57:29 PM
M:\proj\982\1016-00\DS\gootech\Revised Profile Sheets\XS45 1020exREV.dgn

02/06/01
02/33/36
M:\p\01\382\1016-00\US\geotech\Revised Profile Sheet\5+800xREV.dgn

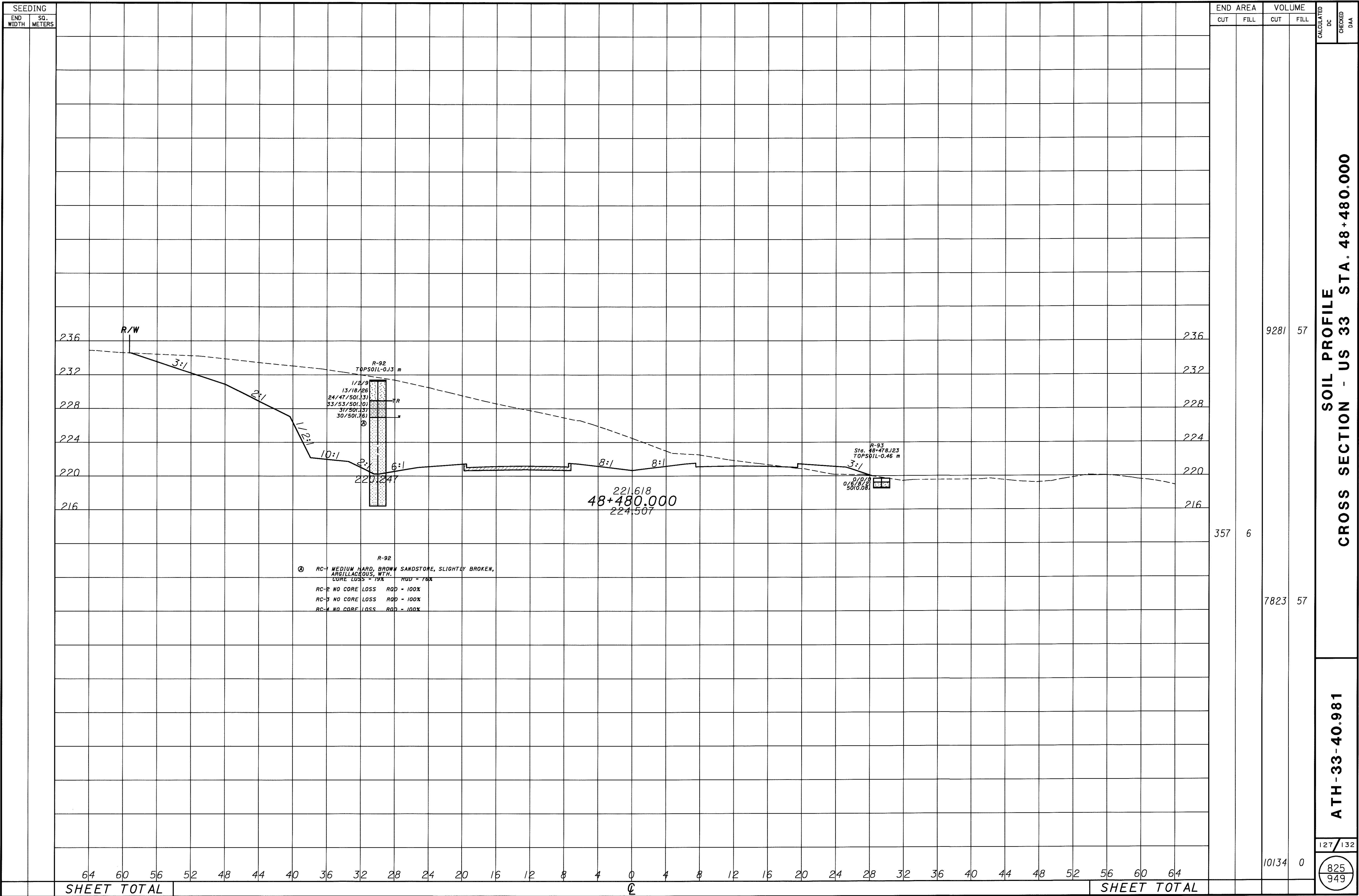


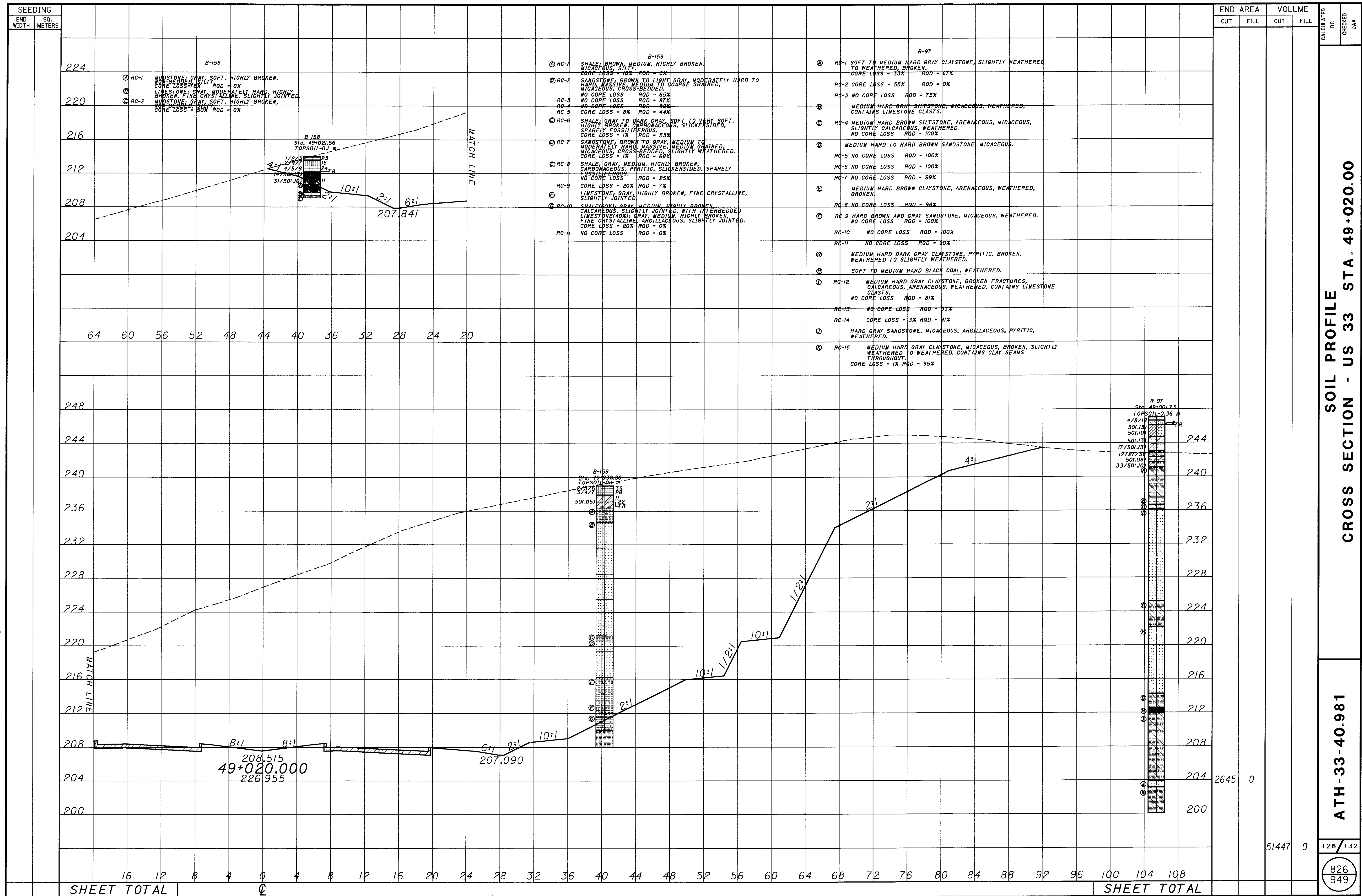
02/06/01
02:40:06 PM
M:\proj\982\016-00\DS\geotech\Revised Profile Sheets\XS45+900exRLV.dgn

02/06/01
02/02/25 TM
M:\p\01\3821\0016-00\DS1\geotech\Revised Profile Sheet\546-860exRLV.dgn



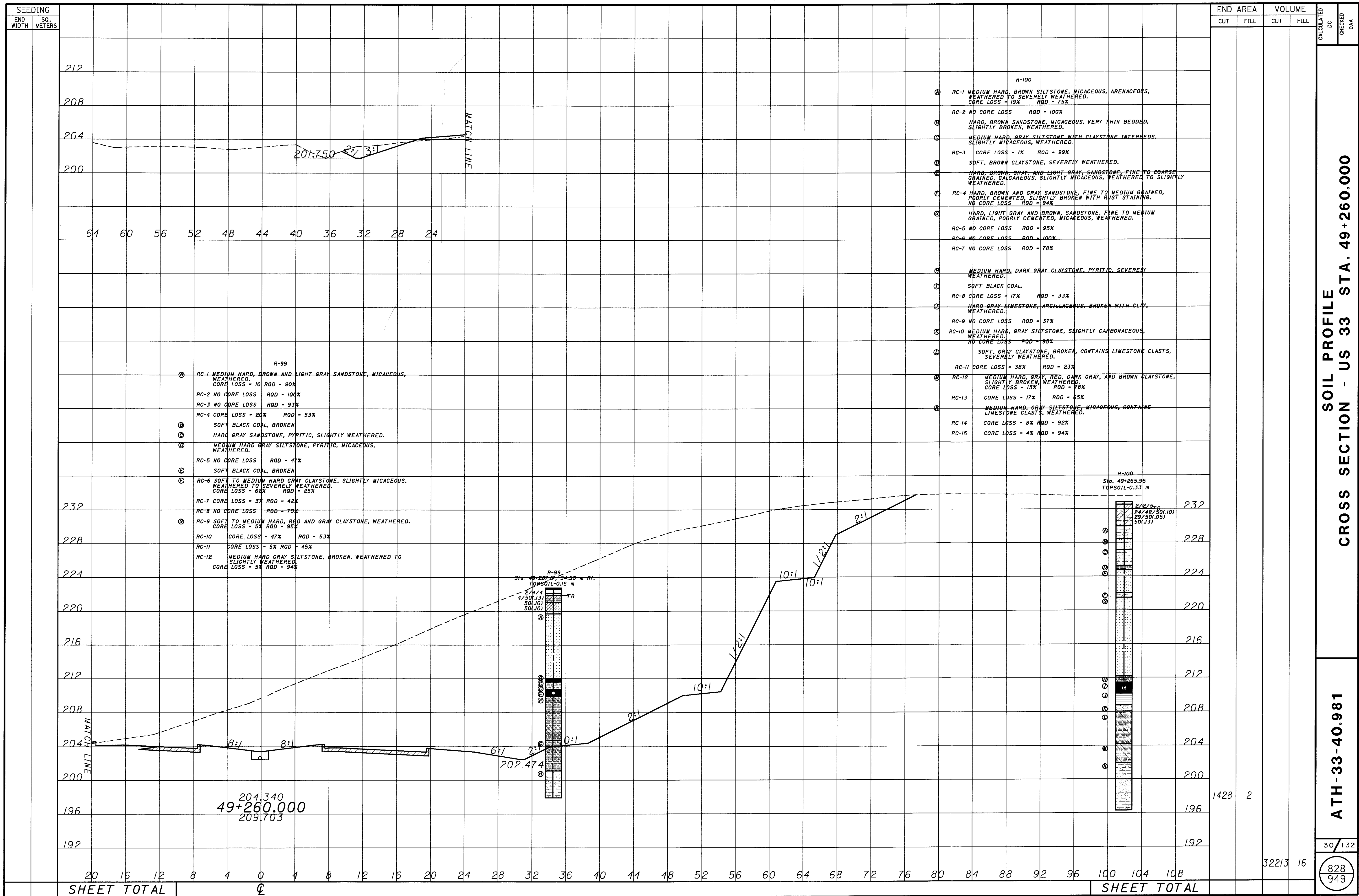
02/06/01 PM
02/06/01 PM
M:\p\01\3821\016_00\DS\geotech\Revised Profile Sheets\X5\8+480exREV.dgn



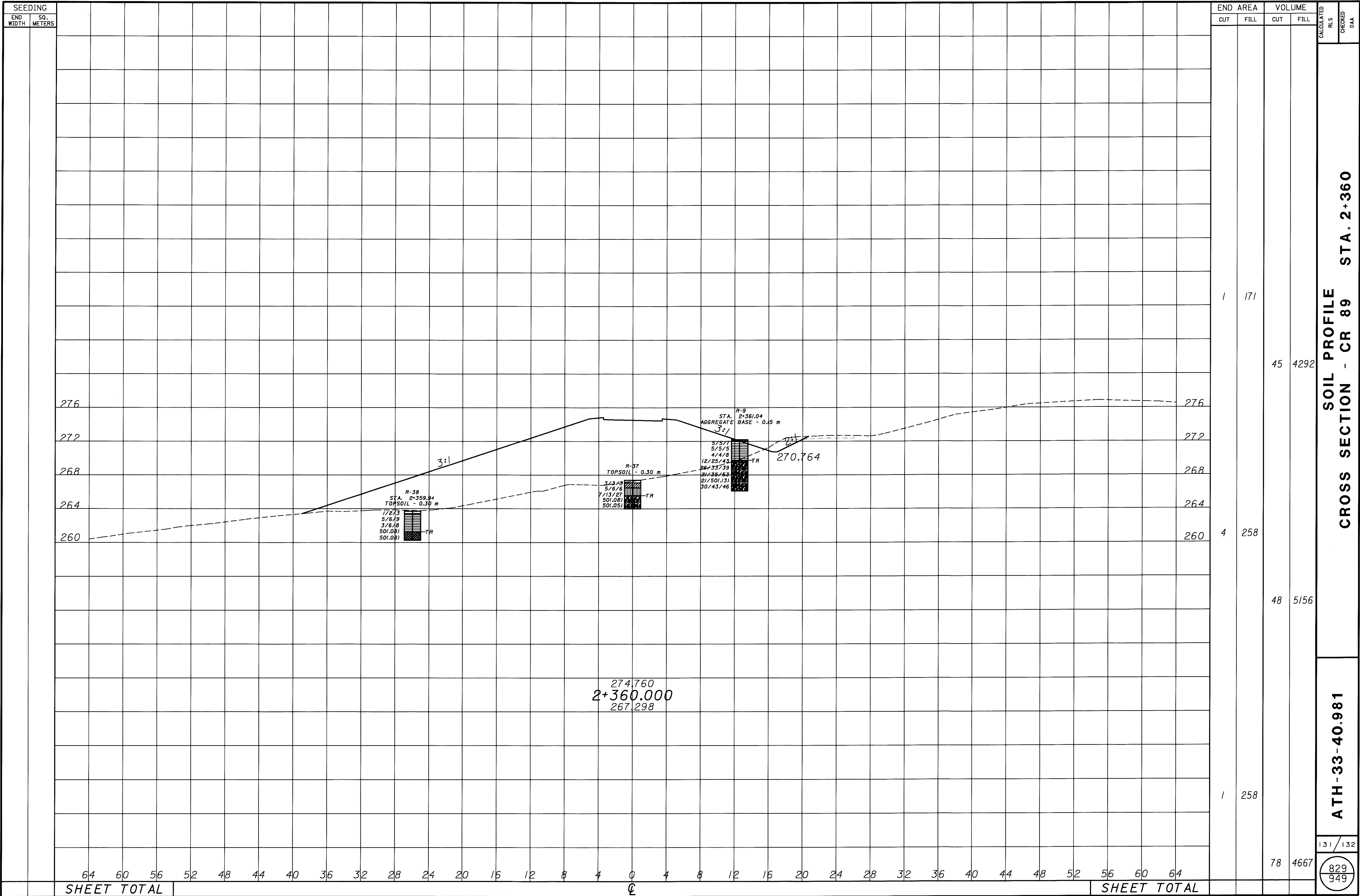


02/06/01
02:09:42 PM
C:\MsProj\9821N016-00\DS\geoTech\Revised_Profile_Sheet1s\X549+020oxREV.dgn

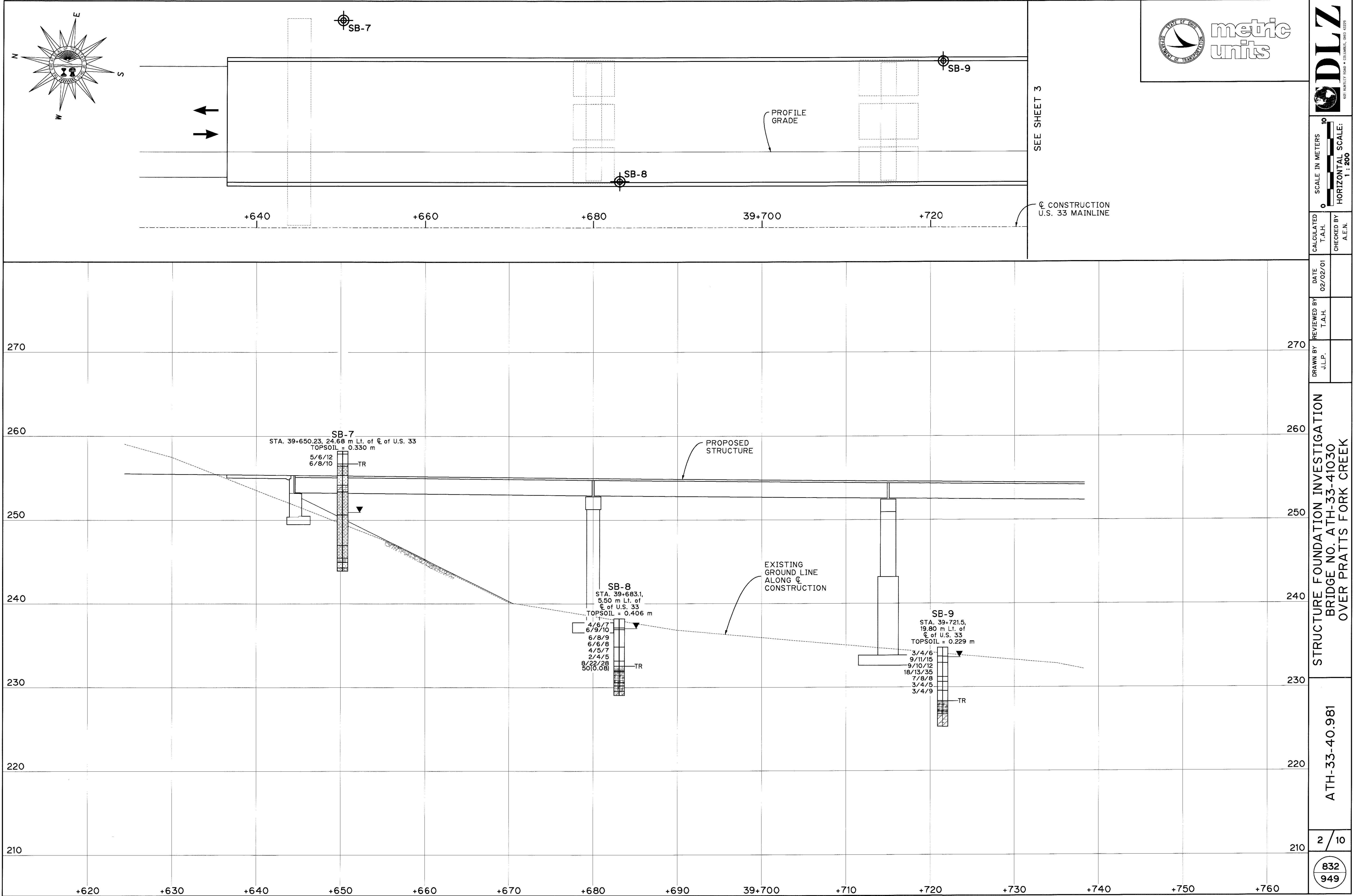
02/06/01
05:42:28 PM
MapInfo\1382\N1016 00\ND\SI\geotect\Revised Profile Sheets\X54912600xRLV.dgn

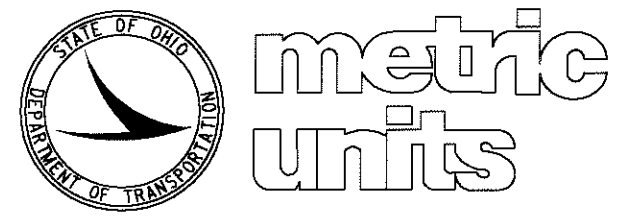
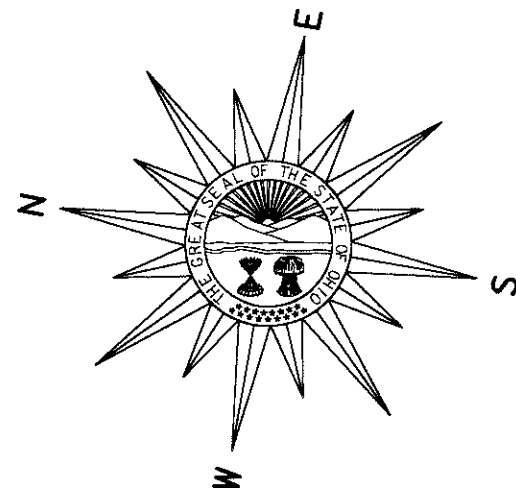


02/06/01
02455505
MeProj\982\106 00\DS\geotech\SideRoads\CR89xs.dgn



[illegible]





SCALE IN METERS
0 10
HORIZONTAL SCALE:
1 : 200

CALCULATED
T.A.H.
CHECKED BY
A.E.N.

DATE
02/02/01

REVIEWED BY
T.A.H.

DRAWN BY
J.L.P.

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. ATH-33-41030
OVER PRATTS FORK CREEK

ATH-33-40.981

3 / 10

833
949

SEE SHEET 2

SEE SHEET 4

PRATTS FORK CREEK

SB-11

SB-13

SB-10

SB-12

+740

+760

+780

39+800

+820

+840

CL CONSTRUCTION
U.S. 33 MAINLINE

PROFILE
GRADE

PROPOSED
STRUCTURE

EXISTING
GROUND LINE
ALONG CL
CONSTRUCTION

NORMAL WATER
EL. 229.23

HW50 = EL. 229.80

HW100 = EL. 229.90

SB-10

STA. 39+743.0
5.50 m Lt. of CL of U.S. 33
TOPSOIL = 0.305 m

2/4/10
6/5/8
5/5/5
1/2/2
4/4/6
6/21/14
14/31/36
40/50(0.08)

W

TR

SB-11

STA. 39+781.4
19.80 m Lt. of CL of U.S. 33
TOPSOIL = 0.254 m

2/2/2
2/2/2
1/2/24
50(0.08)
54/50(0.00)

W

TR

SB-12

STA. 39+803.2
5.40 m Lt. of CL of U.S. 33
TOPSOIL = 0.356 m

1/2/2
2/2/10
24/50(0.10)
50(0.15)
38/50(0.05)
50(0.08)

W

TR

SB-13

STA. 39+840.49
16.80 m Lt. of CL of U.S. 33
TOPSOIL = 0.381 m

2/13/4
3/6/8
6/9/10
2/3/5
12/24/37
37/50(0.15)
33/50(0.15)

W

TR

+720

+730

+740

+750

+760

+770

+780

+790

39+800

+810

+820

+830

+840

+850

+860

250

240

230

220

210

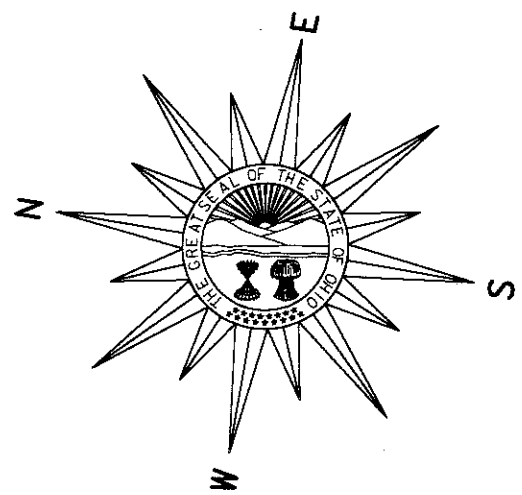
250

240

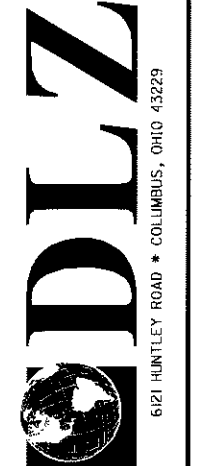
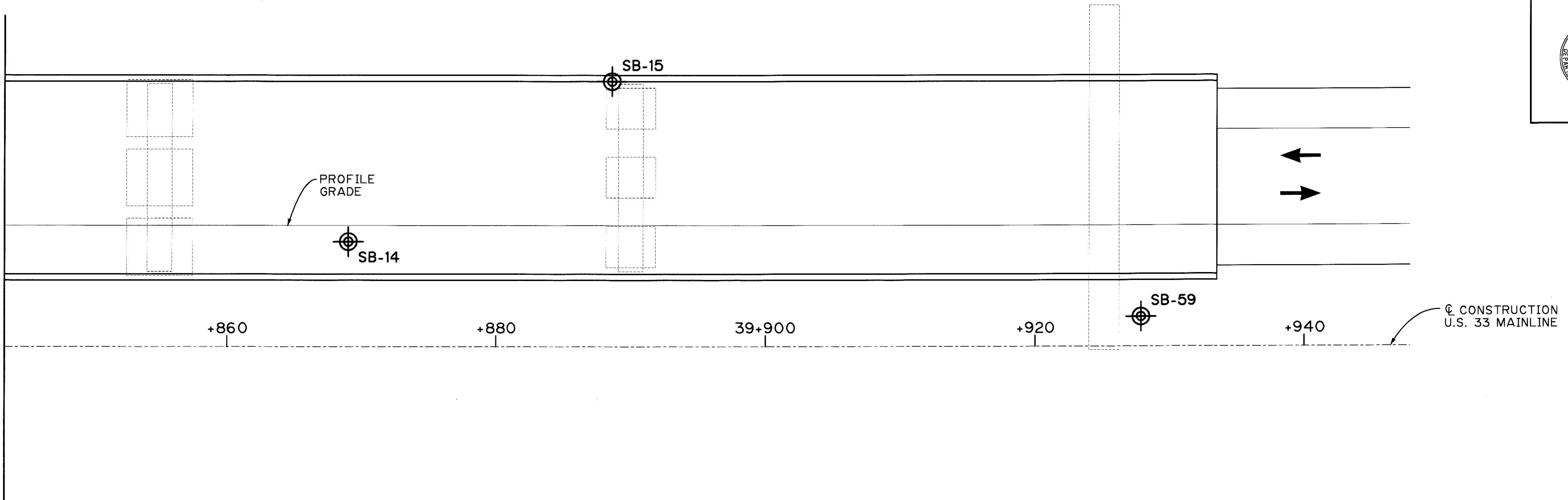
230

220

210

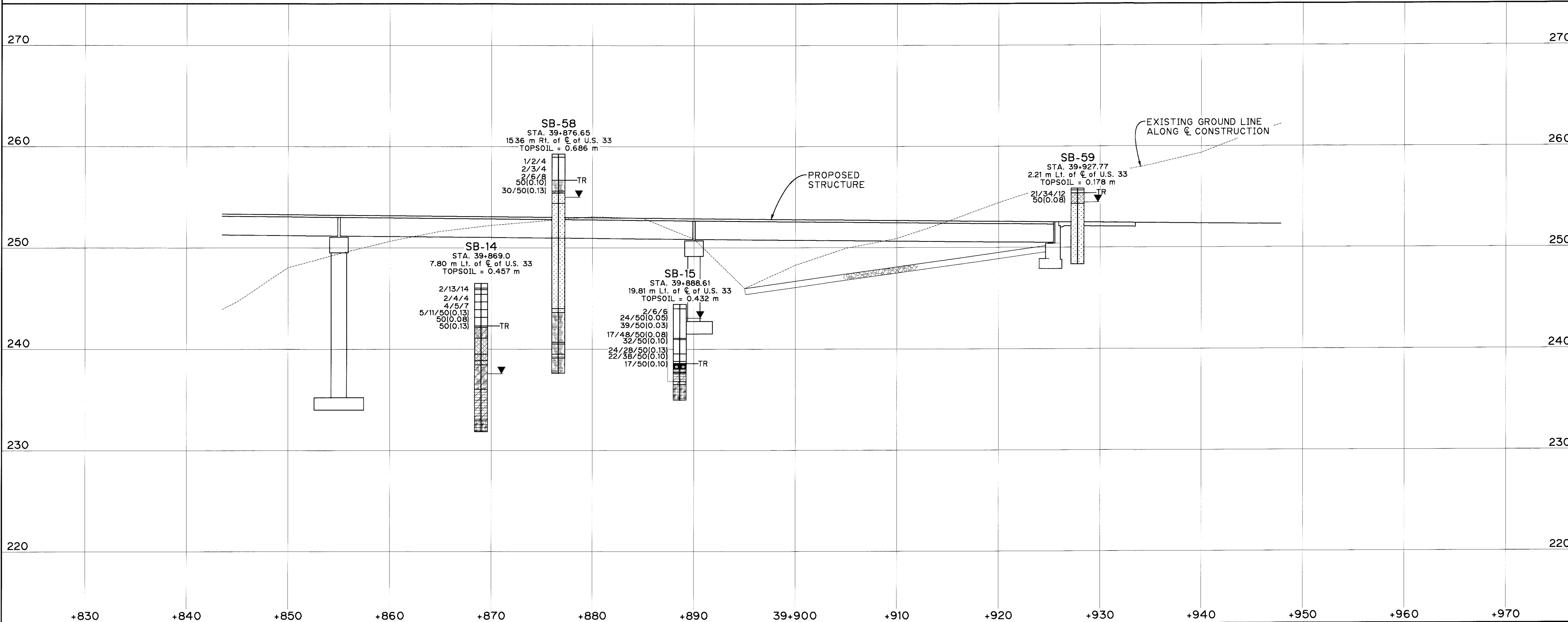


SEE SHEET 3



SCALE IN METERS
HORIZONTAL SCALE:
1 : 200

CALCULATED BY
DATE
02/02/01
REVIEWED BY
T.A.H.
DRAWN BY
J.L.P.
CHECKED BY
A.E.N.



STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. ATH-33-41030
OVER PRATTS FORK CREEK

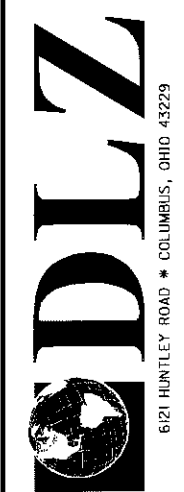
ATH-33-40.981
4 / 10
834
949

Client: ODOT District 10										Project: ATH-33-40.891 (US 33 over Pratts Fork)										Job No. 9821-3200.00									
LOG OF: Boring SB-7					Location: 39+650.23, 24.68 m Lt. of US 33 centerline					Date Drilled: 11/8/99					STANDARD PENETRATION (N)														
					WATER OBSERVATIONS:										Blows per 0.30 m														
					Water seepage at: none										10 20 30 40														
					Water level at completion: dry prior to coring																								
					7.32 m [24.0] (with core water)																								

Client: ODOT District 10				Project: ATH-33-40.891 (US 33 over Pratts Fork)				Job No. 9821-3200.00																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
LOG OF: Boring SB-8		Location: 39+683.1, 5.5 m Lt. of US 33 centerline		Date Drilled: 11/10/99		STANDARD PENETRATION (N)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Depth (m) [ft]	Elev (m) [ft]	Blows per 0.15 m [ft]	[ft]	Sample No.	Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: none Water level at completion: dry prior to coring 1.15 m [3.8] (with core water)	GRADATION					Blows per 0.30 m																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	10	20	30	40																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
							Moisture Content - % PL X Natural LL X 10 20 30 40																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
DESCRIPTION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
0	238.22																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												</

Client: ODOT District 10						Project: ATH-33-40.891 (US 33 over Pratts Fork)						Job No. 9821-3200.00					
LOG OF: Boring SB-7				Location: 39+650.23, 24.68 m Lt. of US 33 centerline				Date Drilled: 11/8/99				STANDARD PENETRATION (N)					
				WATER OBSERVATIONS:				GRADATION				Blows per 0.30 m					
				Water seepage at: none								10 20 30 40					
				Water level at completion: dry prior to coring													
				7.32 m [24.0'] (with core water)													

Client: ODOT District 10				Project: ATH-33-40.891 (US 33 over Pratts Fork)				Job No. 9821-3200.00					
LOG OF: Boring SB-8		Location: 39+683.1, 5.5 m Lt. of US 33 centerline		Date Drilled: 11/10/99		STANDARD PENETRATION (N)		Blows per 0.30 m					
Depth (m) [ft]	Elev. (m) [ft]	Blows per 0.15 m [ft]	Rec (m) [ft]	Sample No. Dive Press	Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: none Water level at completion: dry prior to coring 1.15 m [3.8'] (w ith core w ater)	GRADATION					10 20 30 40	
							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Moisture Content - % Natural PL X Natural LL X
DESCRIPTION													
[25] 7.62 8.02 [26.3]	230.30 [756.8] 230.20 [755.2]	Core 1.524 m [60"]	Rec 1.473 m [58"]	RQD 80%		Medium hard red and gray CLAYSTONE; weathered.							
8.69 [28.5]	229.53 [753.1]					Medium hard gray SILTY CLAYSTONE, slightly calcareous; weathered @ 8.44 m [27.7'], slickensided shear.							
9.14 [30]	229.08 [751.8]					Medium hard gray SILTSTONE, slightly calcareous; weathered; contains limestone clasts.							
Bottom of Boring - 9.14 m [30.0']													



CALCULATED
T.A.H.
CHECKED BY
A.E.N.

DATE
02/02/01

REVIEWED BY
T.A.H.

DRAWN BY
J.L.P.

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. ATH-33-41030
OVER PRATTS FORK CREEK

ATH-33-40.981

Client: ODOT District 10				Project: ATH-33-40.891 (US 33 over Pratts Fork)				Job No. 9821-3200.00							
LOG OF: Boring SB-9				Location: 39+721.5, 19.8 m Lt. of US 33 centerline				Date Drilled: 11/10/99				STANDARD PENETRATION (N) Blows per 0.30 m			
				WATER OBSERVATIONS: Water seepage at: none Water level at completion: dry prior to coring 1.15 m [3.8'] (w ith core w ater)				GRADATION				10 0 30 40			
												Moisture Content - % Natural			
				DESCRIPTION								PL X 10 20 30 40 LL X			
0 234.75				Topsoil removed by dozer ~ 0.229 m [9']											
1.07 233.68 [3.5']				Very stiff brown SILTY CLAY (A-6b), trace to little fine to coarse sand; damp.											
1.52 232.92 [5']				Hard brown and light brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp.											
1.83 232.92 [6.0']				Medium dense dark brown GRAVEL WITH SAND, SILT, AND CLAY (A-2-6); damp.											
3.05 231.24 [10']				@ 2.59 m - 3.05 m [8.5' - 10.0']; dense, light brown.											
3.51 231.24 [11.5']				Stiff brown SILTY CLAY (A-6b); contains fine sand seams; moist.											
4.11 230.64 [13.5']				Loose to medium dense light brown, dark brown and gray GRAVEL WITH SAND, SILT, AND CLAY (A-2-6); damp to moist.											
4.57 229.57 [15']															
5.18 229.57 [17.0']				Hard purple, brown and gray SILTY CLAY (A-6b); severely weathered claystone; damp.											
6.10 228.35 [20']															
6.40 228.35 [21.0']				Soft to medium hard gray SILTY CLAYSTONE; weathered. @ 6.40 m - 7.01 m [21.0' - 23.0']; slightly calcareous.											
7.62				@ 7.41 m [24.3'], contains limestone clasts.											
				@ 7.62 m [25.0'], contains limestone clasts.											

Client: ODOT District 10				Project: ATH-33-40.891 (US 33 over Pratts Fork)				Job No: 9821-3200.00												
LOG OF: Boring SB-10				Location: 39+743.0, 5.5 m Lt. of US 33 centerline				Date Drilled: 11/11/99				STANDARD PENETRATION (N) Blows per 0.30 m								
Depth (m) [ft]		Elev. (m) [ft]		Blows per 0.15 m [in]		Sample No.		Hand Penetro- meter (kN/m ²) [tsf]		WATER OBSERVATIONS: Water seepage at: 3.51 m [11.5'] Water level at completion: dry prior to coring 0.98 m [3.2'] (w ith core w ater)		GRADATION				Moisture Content - % PL Natural LL				
												% Aggregate				X				
DESCRIPTION												% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	10 20 30 40			
Topsoil - 0.305 m [12"]																	10 20 30 40			
Very stiff dark brown SILT (A-4b), trace fine sand; slightly organic; damp.																	10 20 30 40			
Medium dense brown COARSE AND FINE SAND (A-3a), trace silty clay, trace gravel; damp.																	10 20 30 40			
Hard brown, gray and black SILTY CLAY (A-6b), trace fine to coarse sand; damp.																	10 20 30 40			
Medium dense brown COARSE AND FINE SAND (A-3a), some clayey silt, trace gravel, damp to moist.																	10 20 30 40			
Soft brown and gray SILTY CLAY (A-6b), little fine to coarse sand, trace gravel, moist. @ 2.62 m - 2.68 m [8.6' - 8.8'], coal and carbonaceous shale fragments.																	10 20 30 40			
Medium dense brown and red GRAVEL WITH SAND (A-1-b); moist to wet.																	10 20 30 40			
Hard gray SILTY CLAY (A-6b); decomposed silty shale; damp.																	10 20 30 40			
Severely weathered gray SILTY SHALE.																	10 20 30 40			
Soft gray SHALE; severely weathered.																	10 20 30 40			
Hard gray SANDSTONE, fine to medium grained, micaceous; slightly weathered.																	10 20 30 40			

Client: ODOT District 10				Project: ATH-33-40.891 (US 33 over Pratts Fork)				Job No. 9821-3200.00							
LOG OF: Boring SB-9				Location: 39+721.5, 19.8 m Lt. of US 33 centerline				Date Drilled: 11/10/99				STANDARD PENETRATION (N) Blows per 0.30 m			
Depth (m) [ft]	Elev. (m) [ft]	Blows per 0.15 m [in]	Sample No.	Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: none Water level at completion: dry prior to coring 1.15 m [3.8'] (with core water)	GRADATION						Moisture Content - % Natural			
						% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	PL X	LL X		
DESCRIPTION															
[25] 7.62	[745.2] 226.78	Core 3.048 m [120"]	Rec 2.794 m [110"]	RQD 75%		Soft to medium hard gray SILTY CLAYSTONE; weathered.									
[26-1] 9.14	[744.1] 225.30					Medium hard gray SILTSTONE; weathered.									
[30] 9.45	[739.2]					Bottom of Boring - 9.45 m [31.0']									
[31.0]															
[35] 10.67															
[40] 12.19															
[45] 13.72															

Client: ODOT District 10					Project: ATH-33-40.891 (US 33 over Pratts Fork)					Job No. 9821-3200.00																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
LOG OF: Boring SB-10					Location: 39+743.0, 5.5 m Lt. of US 33 centerline					Date Drilled: 11/11/99																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Depth (m) [ft]	Elev. (m) [ft]	Blows per 0.15 m [in]	Rec (m) [in]	Sample No. Drive Press	Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: 3.51 m [11.5] Water level at completion: dry prior to coring 0.98 m [3.2'] (w ith core w ater)	GRADATION					STANDARD PENETRATION (N) Blows per 0.30 m 10203040																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Moisture Content - % PL Natural LL X 10203040X																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
DESCRIPTION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
25	[733.9]	Core 3.048 m [120"]	Rec 2.794 m [110"]	RQD 92%		Hard gray SANDSTONE, fine to medium grained, micaceous; slightly weathered.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		



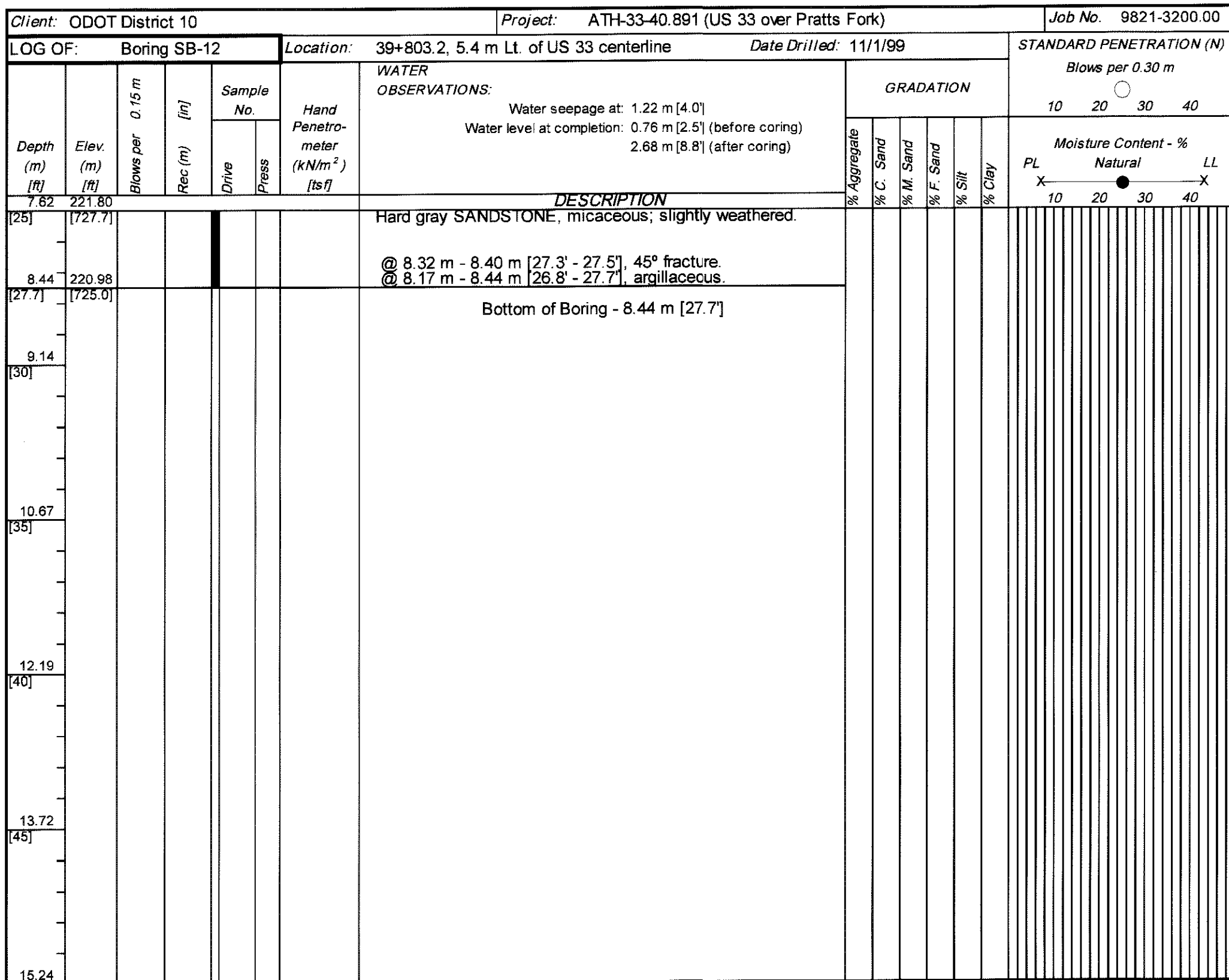
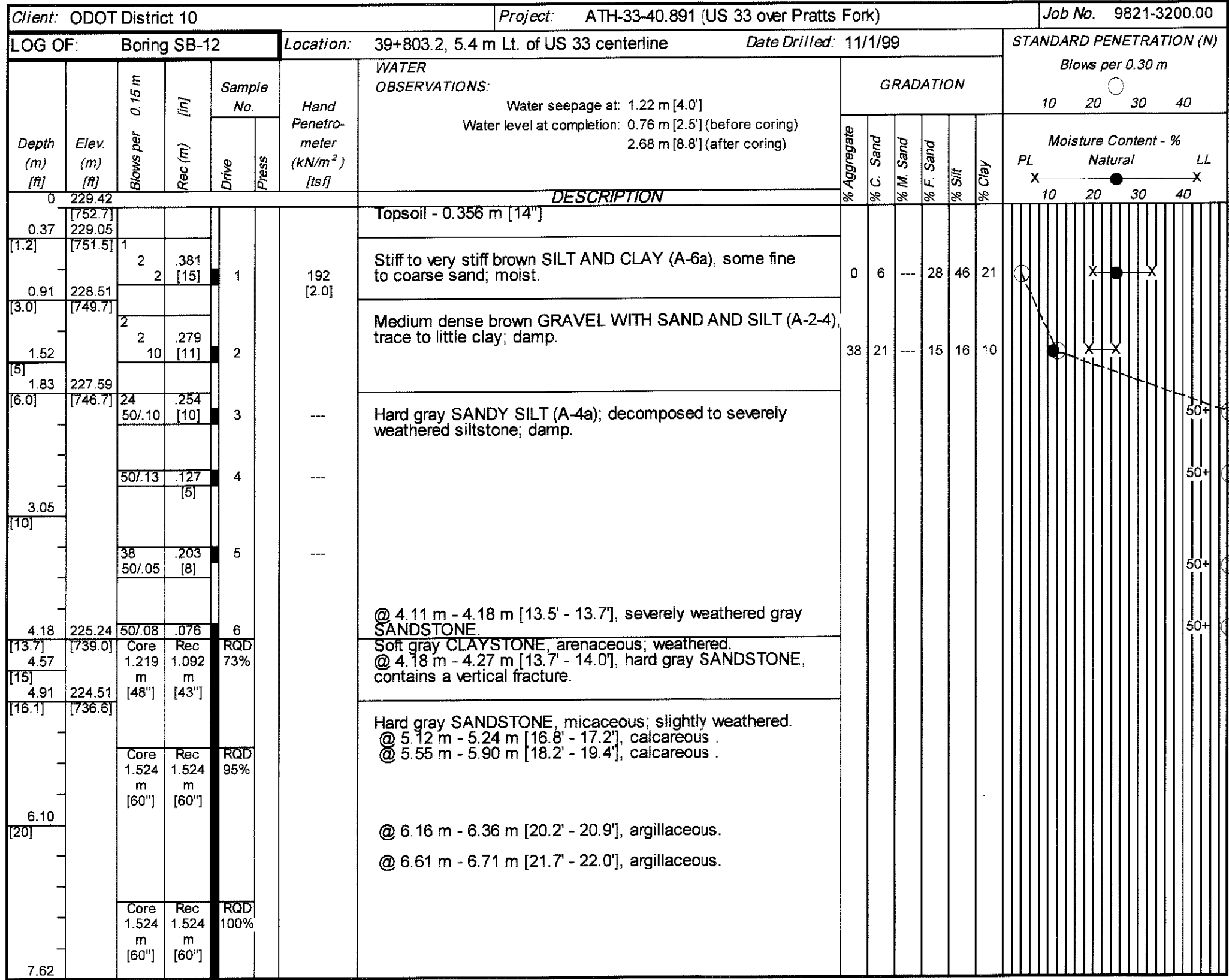
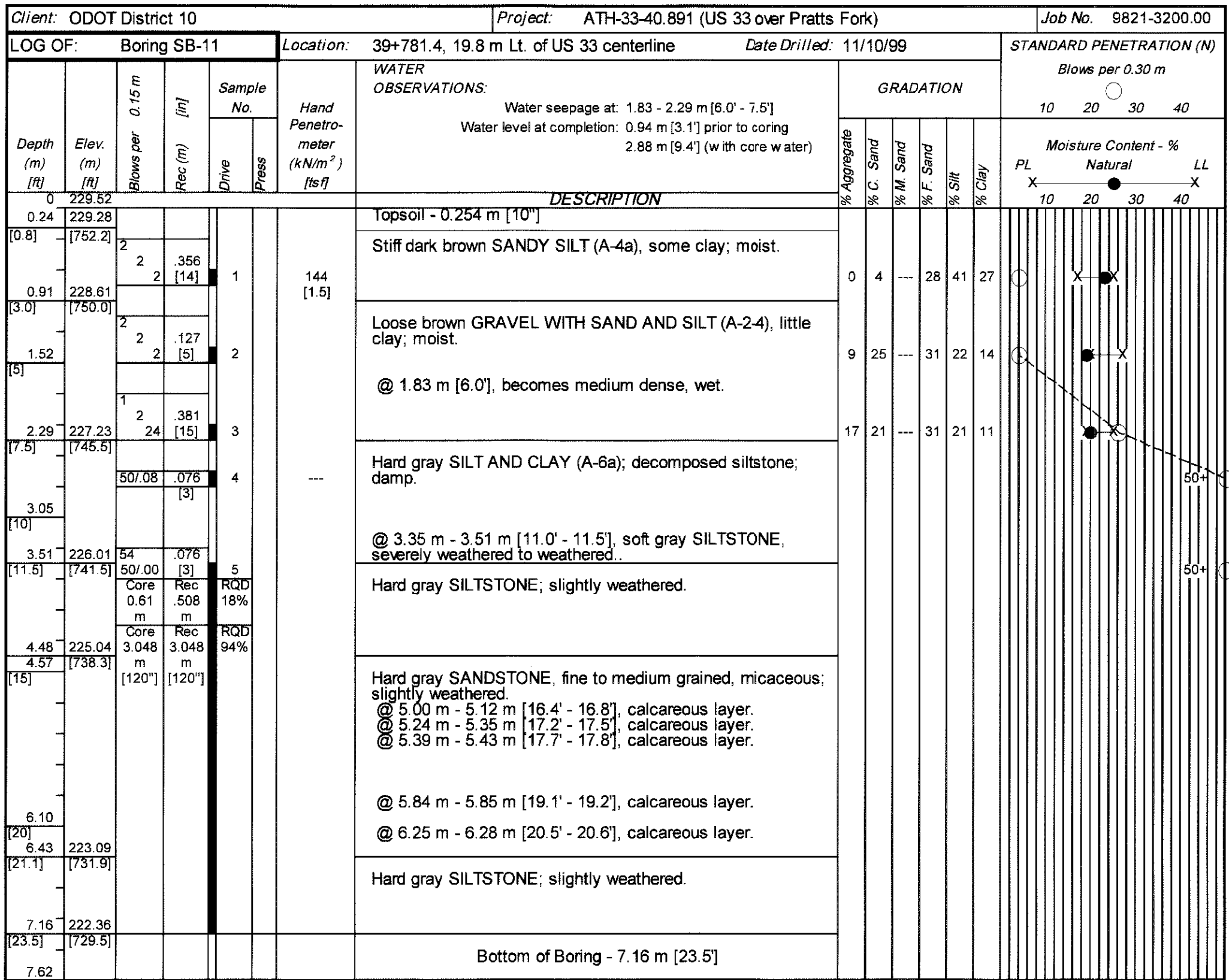
CALCULATED
T.A.H.
CHECKED BY
A.E.N.

DATE
02/02/01

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. ATH-33-41030
OVER PRATTS FORK CREEK

6 / 10

836
949



CALCULATED
T.A.H.
CHECKED BY
A.E.N.

DATE
02/02/01

REVIEWED BY
T.A.H.

DRAWN BY
J.L.P.

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. ATH-33-41030
OVER PRATTS FORK CREEK

ATH-33-40.981

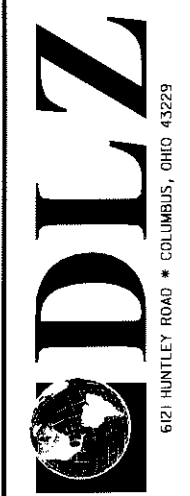
7 / 10

837
949

Client: ODOT District 10				Project: ATH-33-40.891 (US 33 over Pratts Fork)				Job No. 9821-3200.00							
LOG OF: Boring SB-15				Location: 39+888.61, 19.81 m Lt. of US 33 centerline				Date Drilled: 11/11/99				STANDARD PENETRATION (N) Blows per 0.30 m			
Depth (m) [ft]	Elev (m) [ft]	Blows per 0.15 m [in]	Sample No	Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: none Water level at completion: dry prior to coring 1.37 m [4.5'] (with core water)	GRADATION					Moisture Content - % Natural				
						% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	PL X	LL X		
DESCRIPTION															
0	244.44 [802.0]										Topsoil - 0.432 m [17"]				
0.43 [1.4]	244.01 [800.8]	2 6		.356 [14]	1										
1.52 [5]		24 50/05		203 [8]	2										
		39 50/08		229 [9]	3										
3.05 [10]		17 48		356 50/08 [14]	4										
3.35 [11.4]	241.09 [790.8]	32 50/10		254 [10]	5A 5B	--- ---					Hard dark brown SILTY CLAY (A-6b); decomposed shale; damp Hard brown and gray SILT AND CLAY (A-6a); decomposed siltstone; damp.				
4.57 [15]		24 28		.356 50/13 [14]	6	431+ [4.5+]									
4.88 [16.0]	239.56 [786.0]	22 38		.432 50/10 [17]	7A 7B	--- ---					Hard black SILT AND CLAY (A-6a); decomposed carbonaceous shale with coal stringers; damp.				
5.64 [18.5]	238.80 [783.5]	17 50/10		254 [10]	8	431+ [4.5+]					Hard gray SILTY CLAY (A-6b); decomposed shale; damp.				
6.10 [20.0]			Core		RCD						Very soft black COAL; core loss.				
6.40 [21.0]	238.04 [781.0]	0.305 Core	Rec	0.000 Rec	0% RCD						Soft dark gray SHALE, calcareous; weathered; LOSS.				
6.71 [22.5]	237.32 [779.5]	1.524 [60"]	1.448 [57"]	55%							Medium hard gray SHALE, calcareous; weathered; broken. Hard gray LIMESTONE; moderately weathered. @ 7.04 m - 7.19 m [23'1" - 23'6"]; Soft SHALE, weathered. @ 7.19 m - 7.38 m [23'6" - 24'2"]; vertical fracture. @ 7.41 m - 7.80 m [24'3" - 25'6"]; Soft SHALE weathered.				
7.62															

Client: ODOT District 10				Project: ATH-33-40.891 (US 33 over Pratts Fork)				Job No. 9821-3200.00							
LOG OF: Boring SB-59				Location: Sta. 39+927.77, 2.21 m Lt. of US 33 centerline				Date Drilled: 4/5/00				STANDARD PENETRATION (N) Blows per 0.30 m 10 20 30 40			
				WATER OBSERVATIONS: Water seepage at: none Water level at completion: none (before coring) 1.37 m [4.5'] (after coring, includes drilling water)				GRADATION							
												Moisture Content - % Natural PL X Natural LL X 10 20 30 40			
				DESCRIPTION											
0 255.83				Topsoil - 0.178 m (7")											
[0.6] 838.7				Very stiff brown SILT AND CLAY (A-6a); some fine to coarse sand, contains sandstone fragments; damp.											
0.46 255.37				Severely weathered brown SANDSTONE, argillaceous.											
[1.5] 837.8				@ 1.07 m - 1.16 m [3.5' - 3.8'], rust stained.											
1.52 254.31				Medium hard to hard brown SANDSTONE, fine to coarse grained, micaceous.											
[5] 834.4				@ 2.07 m - 2.41 m [6.8' - 7.9], loosely cemented.											
3.05				@ 3.26 m - 5.36 m [10.7' - 17.6'], gray, contains rust stains.											
[10]															
4.57															
[15]															
6.10															
[20]															
7.47 248.36															
[24.5] 814.8															
				Bottom of Boring - 7.47 m [24.5]											

Client: ODOT District 10						Project: ATH-33-40.891 (US 33 over Pratts Fork)						Job No. 9821-3200.00																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
LOG OF: Boring SB-15				Location: 39+888.61, 19.81 m Lt. of US 33 centerline						Date Drilled: 11/11/99				STANDARD PENETRATION (N) Blows per 0.30 m																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Depth (m) [ft]	Elev. (m) [ft]	Blows per 0.15 m [in]	Rec (m) [in]	Sample No.		Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: none Water level at completion: dry prior to coring 1.37 m [4.5'] (with core water)	GRADATION					Moisture Content - % Natural																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
				Drive	Press			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	PL X	Natural ●				LL X																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
7.82	236.82																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				



CALCULATED T.A.H.	CHECKED BY A.E.N.
DATE 02/02/01	
REVIEWED BY T.A.H.	
DRAWN BY J.L.P.	

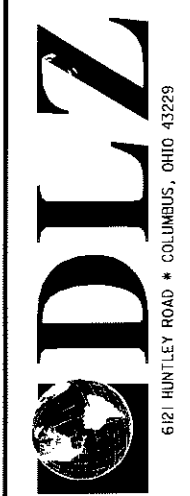
STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. ATH-33-41030
OVER PRATTS FORK CREEK

ATH-33-40.981

Client: ODOT District 10					Project: ATH-33-40.891 (US 33 over Pratts Fork)					Job No. 9821-3200.00																								
LOG OF: Boring SB-58					Location: 39+876.65, 15.36 m Rt. of US 33 centerline					Date Drilled: 4/3 & 4/4/00					STANDARD PENETRATION (N) Blows per 0.30 m																			
WATER OBSERVATIONS: Water seepage at: none Water level at completion: none (before coring) 4.27 m [14.0'] (after coring, includes drilling water)					GRADATION					10 20 30 40																								
										Moisture Content - % Natural PL X 10 20 30 40 LL X																								
DESCRIPTION					% Aggregate					% C. Sand					% M. Sand					% F. Sand					% Silt					% Clay				
Topsoil - 0.305 m [12"] Note: 381 mm [15"] topsoil removed prior to drilling.																																		
Stiff to very stiff brown SILTY CLAY (A-6b), little fine to coarse sand; contains limestone and sandstone fragments; damp to moist.																																		
Weathered SHALE fragments.																																		
Soft brown SHALE. @ 3.66 m - 3.75 m [12.0' - 12.3'], core loss.																																		
Medium hard to hard SANDSTONE, fine to coarse grained, micaceous. @ 3.84 m - 3.93 m [12.6' - 12.9'], high angle fracture cemented with clay @ 4.85 m - 4.88 m [15.3' - 16.0'], medium hard brown SHALE, interbedded sandstone seams.																																		
Hard brown SANDSTONE, fine to coarse grained, micaceous, contains rust stains. @ 4.88 m - 6.40 m [16.0' - 21.0'], slightly wuggy.																																		

Client: ODOT District 10				Project: ATH-33-40.891 (US 33 over Pratts Fork)				Job No. 9821-3200.00																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
LOG OF: Boring SB-58				Location: 39+876.65, 15.36 m Rt. of US 33 centerline				Date Drilled: 4/3 & 4/4/00				STANDARD PENETRATION (N) Blows per 0.30 m 10203040																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
				WATER OBSERVATIONS: Water seepage at: none Water level at completion: none (before coring) 4.27 m [14.0'] (after coring, includes drilling water)				GRADATION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
								% Aggregate % C. Sand % M. Sand % F. Sand % Silt % Clay				Moisture Content - % Natural PL X 10203040 LL X																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
DESCRIPTION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
15.24 [60]	244.03 [800.6]																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														</

Client: ODOT District 10						Project: ATH-33-40.891 (US 33 over Pratts Fork)						Job No. 9821-3200.00																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
LOG OF: Boring SB-58						Location: 39+876.65, 15.36 m Rt. of US 33 centerline						Date Drilled: 4/3 & 4/4/00						STANDARD PENETRATION (N) Blows per 0.30 m																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
Depth (m) [ft]		Elev. (m) [ft]		Blows per 0.15 m [in]		Sample No.		Hand Penetro- meter (kN/m ²) [tsf]		WATER OBSERVATIONS: Water seepage at: none Water level at completion: none (before coring) 4.27 m [14.0'] (after coring, includes drilling water)		GRADATION					Moisture Content - % Natural																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
																	PL X 10 20 30 40 LI X																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
DESCRIPTION																% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
7.62 [25]	251.65 [825.6]																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							



CALCULATED
T.A.H.
CHECKED BY
A.E.N.

DATE
02/02/01

REVIEWED BY
T.A.H.

DRAWN BY
J.L.P.

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. ATH-33-41030
OVER PRATTS FORK CREEK

ATH-33-40.981

10 / 10

840
949

GEOLOGY OF THE SITE

GENERALIZED GEOLOGIC REFERENCES REPORT THAT THE SITE IS LOCATED WITHIN THE UNGLACIATED SECTION OF THE ALLEGHENY PLATEAU. OVERBURDEN AT THE SITE CONSISTS OF THIN RESIDUAL SOILS ALONG RIDGETOPS AND HILLSIDES, COLLUVIAL SOILS AT THE BASE OF THE HILLSIDES, AND MINOR ALLUVIAL DEPOSITS ALONG STREAM CHANNELS. THE UNDERLYING BEDROCK AT THE SITE IS REPORTED TO BE SHALE, SANDSTONE, COAL, AND LIMESTONE OF MONONGAHELA SERIES ALONG THE HILLSIDES AND CONEMAUGH SERIES WITHIN THE VALLEY BOTTOM.

EXPLORATION

A TOTAL OF SIX BORINGS, SB-1 THROUGH SB-6, WERE DRILLED AT THE PROJECT BETWEEN OCTOBER 18, 1999 AND OCTOBER 28, 1999. THE BORINGS WERE DRILLED TO DEPTHS BETWEEN 9.75 AND 24.75 METERS (32.0 AND 81.2 FEET) BY MEANS OF A TRUCK-MOUNTED OR TRACK-MOUNTED (ATV) ROTARY-TYPE DILL RIG USING HOLLOWSTEM AUGERS. THE BORINGS WERE EXTENDED INTO BEDROCK AND BEDROCK WAS VERIFIED BY CORING IN ALL THE BORINGS.

INVESTIGATIONAL FINDINGS AND OBSERVATIONS

1. SOILS

AT THE GROUND SURFACE, 330 TO 483 MILLIMETERS (13 TO 19 INCHES) OF TOPSOIL WERE ENCOUNTERED BY THE BORINGS. BELOW THE TOPSOIL, THE BORINGS ENCOUNTERED PRIMARILY COHESIVE MATERIAL EXTENDING TO THE TOP OF BEDROCK. THE BORINGS ALONG THE HILLSIDES AND WITHIN THE VALLEY ENCOUNTERED PRIMARILY VERY STIFF TO HARD COHESIVE SOILS RANGING FROM CLAY (A-7-6) TO SILT AND CLAY (A-6a). A DECOMPOSED TO SEVERELY WEATHERED SILTSTONE, CLASSIFIED AS EITHER A VERY DENSE SANDY SILT (A-4a) OR A VERY STIFF SILTY CLAY (A-6b), WAS ENCOUNTERED JUST ABOVE COMPETENT ROCK IN BORINGS SB-3 AND SB-4.

2. BEDROCK

BEDROCK WAS ENCOUNTERED IN EACH OF THE SIX BORINGS DURING DRILLING AND GENERALLY CONSISTED OF VARYING DEPTHS OF SEVERELY WEATHERED BEDROCK OVERLYING MORE COMPETENT BEDROCK. COMPETENT BEDROCK WAS ENCOUNTERED IN THE BORINGS AT DEPTHS OF BETWEEN 2.29 AND 7.62 METERS (7.5 AND 25.0 FEET) AND GENERALLY CONSISTED OF SHALE, SILTSTONE, SANDSTONE, AND LIMESTONE.

3. GROUNDWATER

GROUNDWATER SEEPAGE WAS ENCOUNTERED IN BORING SB-4 AT DEPTHS OF BETWEEN 2.74 AND 2.92 METERS (9.0 AND 9.6 FEET) BELOW GROUND SURFACE. SEEPAGE WAS NOT DETECTED IN ANY OF THE OTHER BORINGS DURING DRILLING. WATER LEVELS PRIOR TO CORING WERE NOT DETECTED. AT COMPLETION OF DRILLING, WATER LEVELS RANGED FROM 0.91 TO 2.41 METERS (3.0 TO 7.9 FEET) BELOW GROUND SURFACE. HOWEVER, THE FINAL WATER LEVELS INCLUDED DRILLING WATER AND MAY NOT BE REPRESENTATIVE OF THE ACTUAL GROUNDWATER CONDITIONS AT THE SITE. IT IS ANTICIPATED THAT THE GROUNDWATER LEVEL AT THE SITE IS RELATED TO THE WATER LEVEL IN THE TRIBUTARY TO PRATTS FORK CREEK.

SCOUR ANALYSIS INFORMATION				
BORING NUMBER	SAMPLE NUMBER	DEPTH (m)	ODOT CLASSIFICATION	D50 SIZE (mm)
SB-3	S-2B	1.10-1.50 {3.5'-5.0'}	A-7-6	0.0053
SB-3	S-3A	1.80-2.30 {6.0'-7.5'}	A-7-6	0.0730
SB-3	S-4	2.59-3.05 {8.5'-10.0'}	A-6b	0.0068
SB-4	S-2	1.10-1.50 {3.5'-5.0'}	A-6a	0.1040
SB-4	S-3	1.80-2.30 {6.0'-7.5'}	A-6a	0.3970
SB-4	S-4	2.59-3.05 {8.5'-10.0'}	A-6b	0.0066

SYMBOLS OF ROCK TYPES

	SANDSTONE
	SILTSTONE
	WEATHERED CLAYSTONE
	WEATHERED LIMESTONE
	WEATHERED SANDSTONE
	WEATHERED SHALE
	WEATHERED SILTSTONE

PARTICLE SIZE DEFINITIONS

	300 mm	75 mm	2.0 mm	0.42 mm	0.074 mm	0.005 mm
Boulders	Cobbles	Gravel	Coarse Sand	Fine Sand	Silt	Clay
		No. 10 SIEVE	No. 40 SIEVE	No. 200 SIEVE		

NOTES

ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN ON THE STRUCTURE FOUNDATION INVESTIGATION SHEETS HAS BEEN SO REPORTED. ADDITIONAL SUBSURFACE INVESTIGATIONS 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 MATERIALS MANAGEMENT AT 1600 WEST BROAD STREET, THE OFFICE OF ROADWAY ENGINEERING OR THE OFFICE OF STRUCTURAL ENGINEERING AT 25 SOUTH FRONT STREET, COLUMBUS, OHIO 43215.

INFORMATION SHOWN BY THIS SUBSURFACE INVESTIGATION WAS OBTAINED SOLELY FOR USE IN ESTABLISHING DESIGN CONTROLS FOR THE PROJECT. THE STATE OF OHIO DOES NOT GUARANTEE THE ACCURACY OF THIS DATA AND IT IS NOT TO BE CONSTRUED AS A PART OF THE PLAN GOVERNING CONSTRUCTION OF THIS PROJECT

GENERAL INFORMATION

DRIVE SAMPLES

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED, ROTARY-TYPE DRILL RIG EMPLOYING A 50.80 mm O.D., 34.93 mm I.D., SPLIT-SPOON SAMPLER, AT CONTINUOUS, 0.75 m AND/OR 1.50 m DEPTH INTERVALS, DRIVEN BY MEANS OF A 63.5 kg HAMMER WITH A FREE FALL OF 0.76 m. THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLER THREE 0.15 m INCREMENTS IS CONSIDERED THE STANDARD PENETRATION TEST.

PRESS SAMPLES

PRESS SAMPLES ARE TAKEN BY MEANS OF MECHANICALLY POWERED, ROTARY-TYPE DRILL RIG, EMPLOYING A 76 mm O.D. THIN-WALL PRESS SAMPLING TUBE. THE PRESS SAMPLING TUBE IS ADVANCED BY CONTINUOUS UNIFORM PRESSURE APPLIED BY THE DRILL RIG.

CORE BORINGS

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED, ROTARY-TYPE DRILL RIG, EMPLOYING AN NQ2 OR NXM CORE BARREL WITH AN INDUSTRIAL DIAMOND CUTTING HEAD.

SAMPLING AND TESTING

THE BORING LOG SHEETS SHOW A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, TYPE OF SAMPLE, NUMBER OF BLOWS FOR THE STANDARD PENETRATION TEST IN THREE 0.15 m INCREMENTS, AND A SAMPLE DESCRIPTION BASED ON LABORATORY TEST RESULTS, UTILIZING THE ODOT CLASSIFICATION SYSTEM. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED ON UNDISTURBED SAMPLES, APPEAR GRAPHICALLY ON SEPARATE ENCLOSURES. ROCK SAMPLES ARE DISPLAYED ON THE LOG SHEETS, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, AMOUNT OF RECOVERY, AND A VISUAL CLASSIFICATION BASED ON TYPE, COLOR, DEGREE OF HARDNESS, GRAIN SIZE, DETERIORATION, BEDDING, ACID REACTION, AND OTHER QUALIFYING FACTORS.

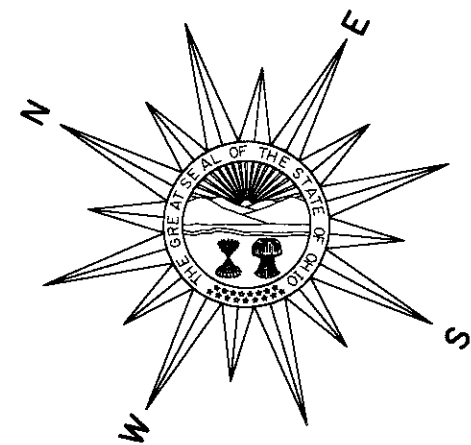
AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVELLY TO THE EXTENT THAT A SAMPLER CANNOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED, IN ORDER TO DETERMINE THE GENERAL CHARACTERISTICS OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING.

LEGEND

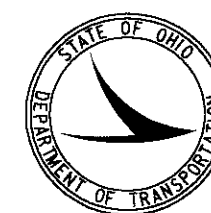
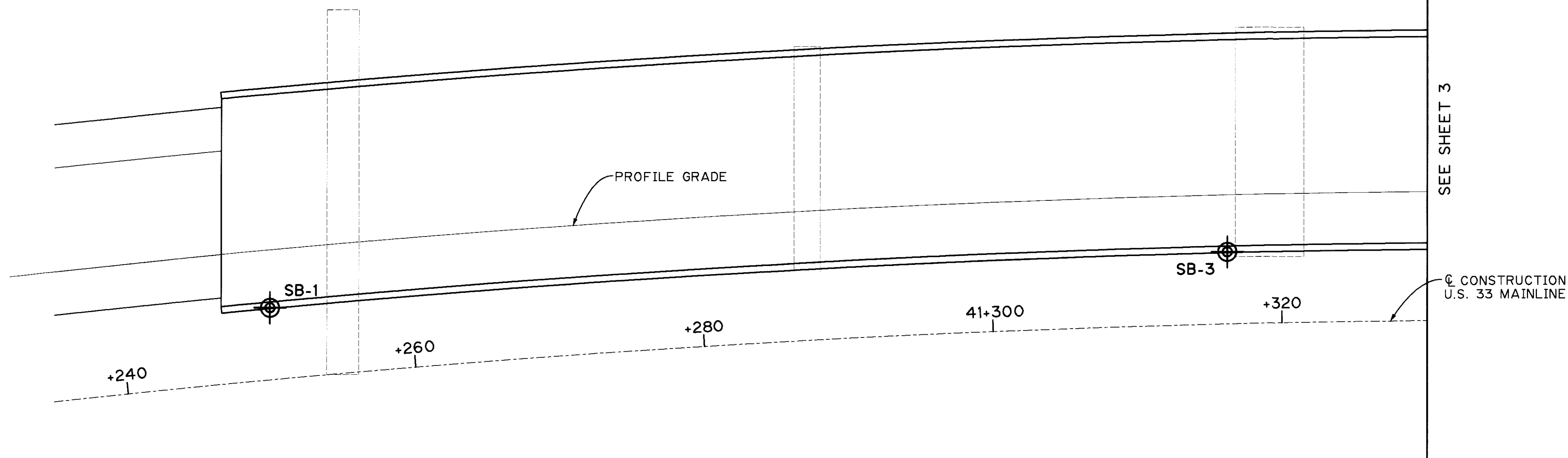
	PRESS SAMPLE, DRIVE SAMPLE, AND/OR CORE BORING LOCATION
TR	TOP OF ROCK
W—	INDICATES FREE WATER ELEVATION
▼—	INDICATES STATIC WATER ELEVATION

FIGURES BESIDE THE BORING IN PROFILE INDICATE THE NUMBER OF BLOWS FOR STANDARD PENETRATION TEST
 X = NUMBER OF BLOWS FOR FIRST 150 mm
 Y = NUMBER OF BLOWS FOR SECOND 150 mm
 Z = NUMBER OF BLOWS FOR THIRD 150 mm

INDICATES NUMBER OF BLOWS (50) TO DRIVE A SPLIT-BARREL SAMPLER A DEPTH OF (n) MILLIMETERS OTHER THAN THE NORMAL 150 MILLIMETER INCREMENT.



SB-2



metric
units



SCALE IN METERS
HORIZONTAL SCALE:
1" = 200'

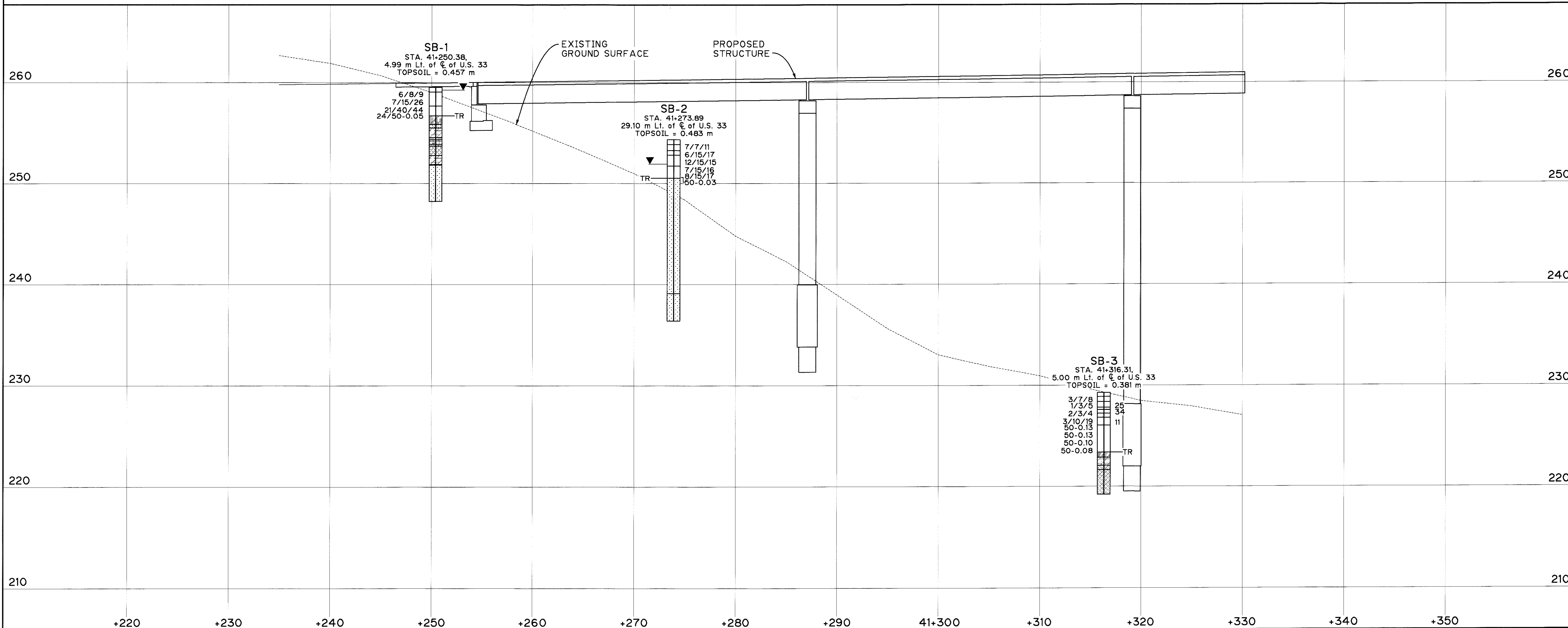
CALCULATED BY	DATE	REVIEWED BY	DRAWN BY
CHECKED BY	02/02/01	T.A.H.	J.L.P.
A.E.N.			

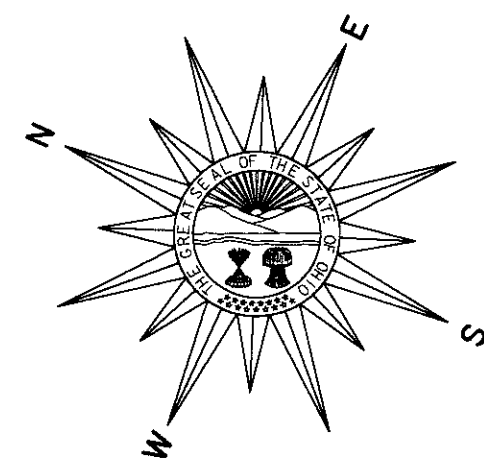
SOIL PROFILE
BRIDGE NO. ATH-33-42635
OVER TRIBUTARY TO PRATTS FORK CREEK

ATH-33-40.981

2 / 9

842
949





CL CONSTRUCTION
U.S. 33 MAINLINE

SEE SHEET 2

TRIBUTARY TO
PRATTS FORK
CREEK

SB-4

PROFILE GRADE

SB-5

SB-6

+340

+360

+380

41+400

+420



metric
units

CDLZ
COLUMBIAN DESIGN & LANDSCAPE ARCHITECTS, P.A.

SCALE IN METERS
0 10
HORIZONTAL SCALE:
1 : 200

CALCULATED
T.A.H.
CHECKED BY
A.E.N.

DATE
02/02/01

REVIEWED BY
T.A.H.

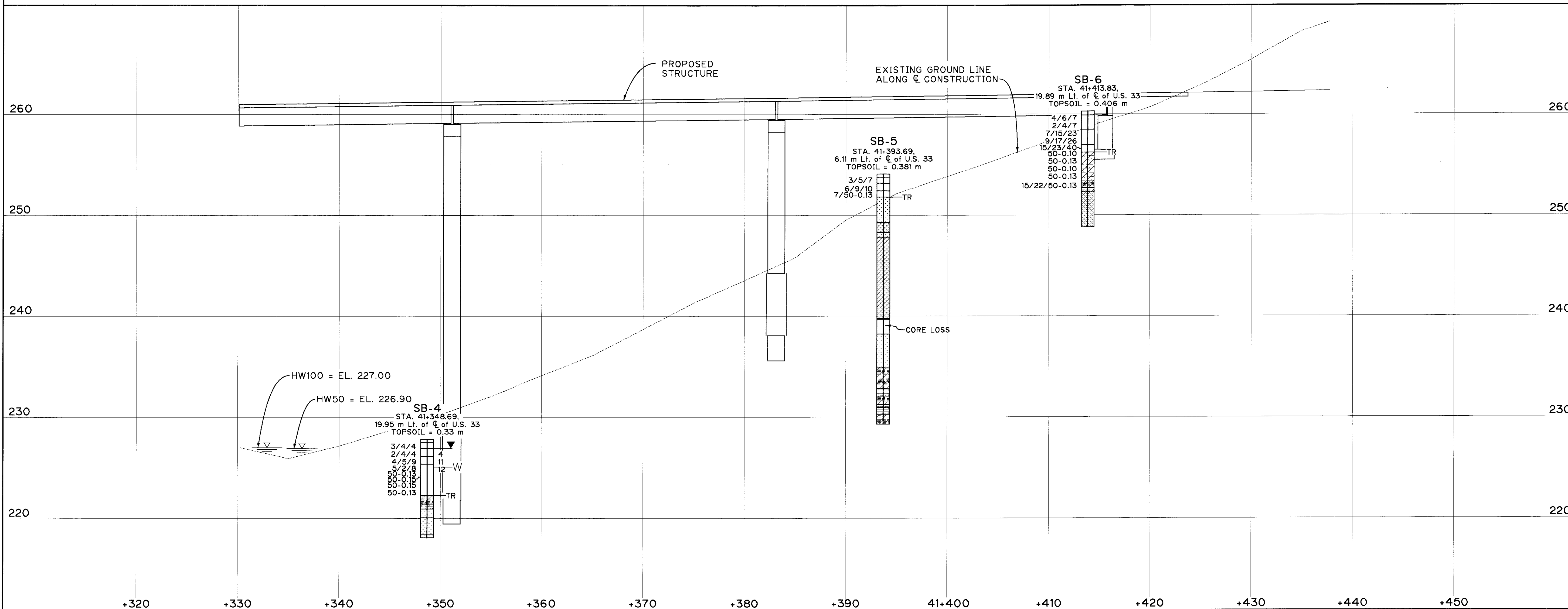
DRAWN BY
J.L.P.

SOIL PROFILE
BRIDGE NO. ATH-33-42635
OVER TRIBUTARY TO PRATTS FORK CREEK

ATH-33-40.981

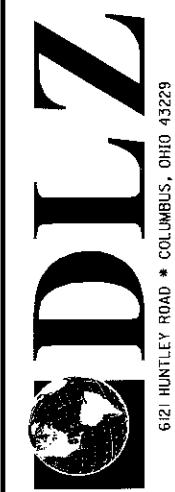
3 / 9

843
949



Client: ODOT District 10										Project: ATH-33-40.981 (US 33 over Pratts Fork Tributary)										Job No. 9821-3200.00																																																																																																													
LOG OF: Boring SB-1										Location: Sta. 41+250.38, 4.99 m Lt. of US 33 centerline										Date Drilled: 10/26-10/28/99										STANDARD PENETRATION (N) Blows per 0.30 m																																																																																																			
Depth (m) [ft] Elev. (m) [ft] Blows per 0.15 m [in] Rec (m) [ft] Drive Press										WATER OBSERVATIONS: Water seepage at: none Water level at completion: dry prior to coring 0.27 m [0.9'] (includes core water)										GRADATION										10 20 30 40																																																																																																			
																				Moisture Content - % PL Natural LL										X 10 20 30 40 X																																																																																																			
0 259.52										DESCRIPTION										% Aggregate										% C. Sand										% M. Sand										% F. Sand										% Silt										% Clay																																																											
0.46 259.06 6 8 279 1 431+ [4.5+]										Topsoil - 0.457 m [18"]																																																																																																																							
1.5 257.69 21 15 26 2 431+ [4.5+]										Hard brown, gray and red SILTY CLAY (A-6b); decomposed claystone; damp.																																																																																																																							
1.83 257.69 21 40 381 3 431+ [4.5+]										Hard brown SILT AND CLAY (A-6a), little gravel, trace fine to coarse sand; decomposed silty shale; damp.																																																																																																																							
2.80 256.72 24 50/05 203 4 ROD 0% 431+ [4.5+]										@ 2.59 m [8.5'], color change to red and brown.																																																																																																																							
3.05 255.86 24 50/05 203 4 ROD 0% 431+ [4.5+]										Soft brown SHALE; severely weathered.																																																																																																																							
3.66 255.86 24 50/05 203 4 ROD 0% 431+ [4.5+]										Hard gray SANDSTONE, micaceous, weathered.																																																																																																																							
4.02 255.50 24 50/05 203 4 ROD 0% 431+ [4.5+]										Hard gray SANDSTONE, weathered.																																																																																																																							
4.57 254.34 24 50/05 203 4 ROD 0% 431+ [4.5+]										@ 4.36 m - 4.51 m [14.3' - 14.8'], vertical fracture.																																																																																																																							
4.97 254.55 24 50/05 203 4 ROD 0% 431+ [4.5+]										@ 4.82 m [15.8'], 45° fracture.																																																																																																																							
5.18 254.34 24 50/05 203 4 ROD 0% 431+ [4.5+]										Medium hard light gray SILTSTONE; weathered.																																																																																																																							
5.64 253.88 24 50/05 203 4 ROD 0% 431+ [4.5+]										@ 5.09 m [16.7'] clay seam.																																																																																																																							
5.82 253.70 24 50/05 203 4 ROD 0% 431+ [4.5+]										Soft red CLAYSTONE; severely weathered; broken.																																																																																																																							
6.10 252.78 24 50/05 203 4 ROD 0% 431+ [4.5+]										Medium hard to hard gray SILTSTONE, calcareous; weathered.																																																																																																																							
6.74 252.78 24 50/05 203 4 ROD 0% 431+ [4.5+]										Hard brown and gray fine grained SANDSTONE, argillaceous, micaceous; weathered.																																																																																																																							
7.82 252.78 24 50/05 203 4 ROD 0% 431+ [4.5+]										@ 6.64 m [21.8'], clay seam.																																																																																																																							
										@ 6.71 m [22.0'], clay seam.																																																																																																																							
										Soft to medium hard dark gray SILTSTONE, slightly calcareous; severely weathered to weathered.																																																																																																																							

Client: ODOT District 10				Project: ATH-33-40.981 (US 33 over Pratts Fork Tributary)				Job No. 9821-3200.00							
LOG OF: Boring SB-1				Location: Sta. 41+250.38, 4.99 m Lt. of US 33 centerline				Date Drilled: 10/26-10/28/99				STANDARD PENETRATION (N) Blows per 0.30 m 10 20 30 40			
Depth (m) [ft]	Elev. (m) [ft]	Blows per 0.15 m [ft]	Rec (m) [ft]	Sample No.	Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: none Water level at completion: dry prior to coring 0.27 m [0.9'] (includes core water)	GRADATION					Moisture Content - % PL Natural LL X 10 20 30 40 X			
							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt				
7.62	251.90					DESCRIPTION									
7.69	251.83														
(25.2)	(826.2)					Hard light gray SANDSTONE, micaceous, slightly calcareous; fine grained.									
						@ 8.81 m [28.9'], color change to brown.									
9.14															
[30]															
10.67															
[36]															
11.28	248.24														
[37.0]	[814.4]														
12.19															
[40]															
13.72															
[45]															
15.24															



CALCULATED
T.A.H.
CHECKED BY
A.E.N.

DATE
02/02/01

REVIEWED BY
T.A.H.

DRAWN BY
J.L.P.

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. ATH-33-42635
OVER TRIBUTARY TO PRATTS FORK CREEK

ATH-33-40.981

4 / 9

844
949

Client: ODOT District 10				Project: ATH-33-40.981 (US 33 over Pratts Fork Tributary)				Job No. 9821-3200.00									
LOG OF: Boring SB-2				Location: Sta. 41+273.89, 29.10 m Lt. of US 33 centerline				Date Drilled: 10/26/99				STANDARD PENETRATION (N) Blows per 0.30 m 10 20 30 40					
Depth (m) (ft)	Elev. (m) (ft)	Blows per 0.15 m [ft]	[in]	Sample No.	Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: none Water level at completion: 2.41 m [7.9'] (includes core water)	GRADATION					Moisture Content - % PL Natural LL					
							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	X 10 20 30 40 X				
DESCRIPTION																	
0	254.34					Topsoil - 0.483 m [19"]											
0.48 [1.6]	253.86 [832.9]	7	279 [11]	1	431+ [4.5+]	Hard brown SILT AND CLAY (A-6a), little fine to coarse sand; damp.											
1.07 [3.5]	253.27 [830.9]	6	356 [14]	2	431+ [4.5+]	Hard brown GRAVEL WITH SAND, SILT, AND CLAY (A-2-6); decomposed to severely weathered siltstone; damp.											
1.52 [5]		12	356 [14]	3	431+ [4.5+]												
2.59 [8.5]	251.75 [826.0]	7	356 [14]	4	431+ [4.5+]	Hard brown SILT AND CLAY (A-6a), little fine to coarse sand, little gravel; decomposed to severely weathered silty shale; damp.											
3.05 [10]		8	305 [12]	5	431+ [4.5+]	@ 3.66 m - 3.69 m [12.0' - 12.1'], sandstone fragments.											
3.81 [12.5]	250.53 [821.9]	50/03	025	6	431+ [4.5+]	Hard gray and brown fine grained SANDSTONE, micaceous, slightly calcareous; slightly weathered.											
4.57 [15]		Core 1.524 m [60"]	Rec 1.524 m [60"]	RQD 100%													
6.10 [20]		Core 1.524 m [60"]	Rec 1.524 m [60"]	RQD 93%													
7.62		Core 1.524 m [60"]	Rec 1.524 m [60"]	RQD 95%		@ 7.04 m - 7.47 m [23.1' - 24.5'], arenaceous limestone.											

Client: ODOT District 10				Project: ATH-33-40.981 (US 33 over Pratts Fork Tributary)				Job No. 9821-3200.00							
LOG OF: Boring SB-2				Location: 41+273.9, 29.1m Lt.				Date Drilled: 10/26/99				STANDARD PENETRATION (N) Blows per 0.30 m 10 20 30 40			
Depth (m) [ft]	Elev. (m) [ft]	Blows per 0.15 m [ft]	Rec (m) [ft]	Sample No.	Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: none Water level at completion: 2.41 m [7.9'] (includes core water)	GRADATION					Moisture Content - % PL Natural LL X 10 20 30 40 X			
							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay			
DESCRIPTION															
7.62 [25]	246.72 [809.4]					Hard gray and brown fine grained SANDSTONE, micaceous, slightly calcareous; slightly weathered. @ 8.90 m - 9.14 m [29.2' - 30.0'], ~45° fracture with rust staining and partial clay infilled.									
			Core 1.524 m [60"]	Rec 1.524 m [60"]	RQD 100%										
9.14 [30]															
			Core 1.524 m [60"]	Rec 1.321 m [52"]	RQD 86%										
10.67 [35]															
			Core 1.524 m [60"]	Rec 1.422 m [56"]	RQD 93%										
12.19 [40]						@ 12.59 m [41.3'], argillaceous siltstone laminae become evident. @ 12.98 m - 13.08 m [42.6' - 42.9'], poorly cemented.									
			Core 1.524 m [60"]	Rec 1.321 m [52"]	RQD 86%										
13.72 [45]															
			Core 1.524 m [60"]	Rec 1.524 m [60"]	RQD 100%										
15.24															

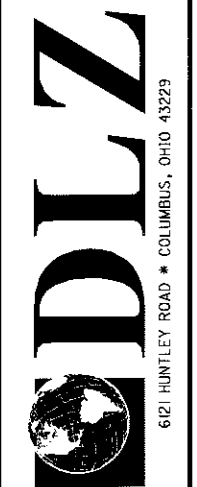
Client: ODOT District 10				Project: ATH-33-40.981 (US 33 over Pratts Fork Tributary)				Job No. 9821-3200.00							
LOG OF: Boring SB-2				Location: 41+273.9, 29.1m Lt.				Date Drilled: 10/26/99				STANDARD PENETRATION (N) Blows per 0.30 m 10203040			
Depth (m) (ft)	Elev. (m) (ft)	Blows per 0.15 m [ft]	Rec (m) [ft]	Sample No.	Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: none Water level at completion: 2.41 m [7.9'] (includes core water)	GRADATION					Moisture Content - % PL Natural LL X 10203040 X			
							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay			
DESCRIPTION															
15.24 [50]	239.10 [784.4]					Hard gray and brown fine grained SANDSTONE, micaceous; slightly weathered. @ 15.94 m - 16.06 m [52.3' - 52.7'], carbonaceous.									
16.76 [55]		Core 1.524 m [60"]	Rec 1.498 m [59"]	RQD 98%											
17.92 [58.8]	236.42 [775.7]					Bottom of Boring - 17.92 m [58.8'] Note: Boring was offset uphill from original staked location due to its presence on the edge of a sandstone bluff									
19.81 [65]		Core 0.762 m [30"]	Rec .762 m [30"]	RQD 100%											
21.34 [70]															
22.86															

Client: ODOT District 10				Project: ATH-33-40.981 (US 33 over Pratts Fork Tributary)				Job No. 9821-3200.00							
LOG OF: Boring SB-5				Location: Sta. 41+393.69, 6.11 m Lt. of US 33 centerline				Date Drilled: 10/19-20/99				STANDARD PENETRATION (N) Blows per 0.30 m 10 20 30 40			
Depth (m) [ft]	Elev. (m) [ft]	Blows per 0.15 m [in]	Sample No.	Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: none Water level at completion: dry prior to coring	GRADATION					Moisture Content - % PL Natural LL				
						% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	X 10 20 30 40 X			
DESCRIPTION															
0	254.08				Topsoil - 0.381 m [15"]										
0.38	253.70 (832.3)	3			287 [3.0] 431+ [4.5+]										
0.91	253.17 (830.6)	5	330 [13]	1A 1B		Very stiff reddish brown SILT AND CLAY (A-6a), some fine to coarse sand, trace to little gravel, damp.									
1.52	252.40 (826.1)	6			4.5+										
1.68	252.40 (826.1)	9	305 [12]	2		Hard, red and light brown SILT AND CLAY (A-6a), some fine to coarse sand, little to some gravel; decomposed claystone; damp.									
2.29	251.79 (826.1)	7	229 [9]	3	4.5+										
3.05		50/13				Hard light gray and light brown SILTY CLAY (A-6b), some fine to coarse sand, little to some gravel, decomposed to severely weathered silty shale; damp.									
4.78	249.30 (817.9)	Core 1.372 m [54"]	Rec 1.346 m [53"]	RQD 76%											
5.79	248.29 (814.6)	Core 1.524 m [60"]	Rec 1.524 m [60"]	RQD 97%		Hard gray fine to coarse grained SANDSTONE, calcareous, micaceous; slightly weathered, contains slight rust staining. @ 2.50 m - 2.59 m [8.2' - 8.5'], near vertical fracture, rust stained.									
6.25	247.83 (813.1)	Core 1.524 m [60"]	Rec 1.372 m [54"]	RQD 82%											
7.62		Core 1.524 m [60"]	Rec 1.346 m [53"]	RQD 84%		Hard brown and gray SANDSTONE, slightly calcareous; weathered. @ 5.35 m [17.5'], highly weathered, highly broken (possible loss).									

Client: ODOT District 10				Project: ATH-33-40.981 (US 33 over Pratts Fork Tributary)				Job No. 9821-3200.00											
LOG OF: Boring SB-5				Location: Sta. 41+393.69, 6.11 m Lt. of US 33 centerline		Date Drilled: 10/19-20/99		STANDARD PENETRATION (N) Blows per 0.30 m 10203040											
Depth (m) [ft]	Elev. (m) [ft]	Blows per 0.15 m [ft]	[ft]	Sample No.	Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: none Water level at completion: dry prior to coring						GRADATION				Moisture Content - % PL Natural LL 10203040			
						Dive	Press	Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
DESCRIPTION																			
15.24	238.84					CORE LOSS - weathered alternating shale and sandstone seen in nearby rock outcropping													
15.85	238.23					Hard gray fine to coarse SANDSTONE, slightly micaceous; slightly weathered; contains discontinuous coal laminae.													
16.76						@ 17.43 m [57.2'], weathered shale layer (possible loss). @ 17.62 m [57.8'], siltstone layer. @ 17.74 m - 18.07 m [58.2' - 59.3'], weathered shale layer (possible loss).													
18.29						@ 17.43 m [57.2'], weathered shale layer (possible loss). @ 17.62 m [57.8'], siltstone layer. @ 17.74 m - 18.07 m [58.2' - 59.3'], weathered shale layer (possible loss).													
19.20	234.88					Soft to medium hard dark gray to black SHALE, carbonaceous; weathered to decomposed (possible loss). @ 19.32 m [63.4'] and 19.84 m [65.1'], coal blossom. @ 19.93 m - 20.27 m [65.4' - 66.5'], highly weathered to decomposed shale with coal blossoms. @ 20.27 m - 20.45 m [66.5' - 67.1'], Soft, black COAL. @ 20.67 m - 20.76 m [67.8' - 68.1'], slickensided near vertical shear. @ 20.79 m - 21.28 m [68.2' - 69.8'], clay seam (possible loss).													
21.27	232.81					Hard light gray and dark gray LIMESTONE; weathered. @ 20.97 m - 21.76 m [68.8' - 71.4'], vertical fracture. @ 21.73 m - 21.76 m [71.3' - 71.4'], clay seam.													
21.98	232.10					Very soft to soft dark gray SHALE; highly weathered to decomposed (possible loss).													
22.86																			

Client: ODOT District 10				Project: ATH-33-40.981 (US 33 over Pratts Fork Tributary)				Job No. 9821-3200.00					
LOG OF: Boring SB-5				Location: Sta. 41+393.69, 6.11 m Lt. of US 33 centerline		Date Drilled: 10/19-20/99				STANDARD PENETRATION (N) Blows per 0.30 m 10 20 30 40			
Depth (m) [ft]	Elev. (m) [ft]	Blows per 0.15 m [in]	Sample No.	Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: none Water level at completion: dry prior to coring	GRADATION					Moisture Content - % Natural PL X 10 20 30 40 LL X		
						% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt			% Clay
DESCRIPTION													
7.82	[808.6]				Hard brown fine to coarse grained SANDSTONE, micaceous, slightly weathered to weathered. @ 7.92 m [26.0'], highly weathered, highly broken zone. <								

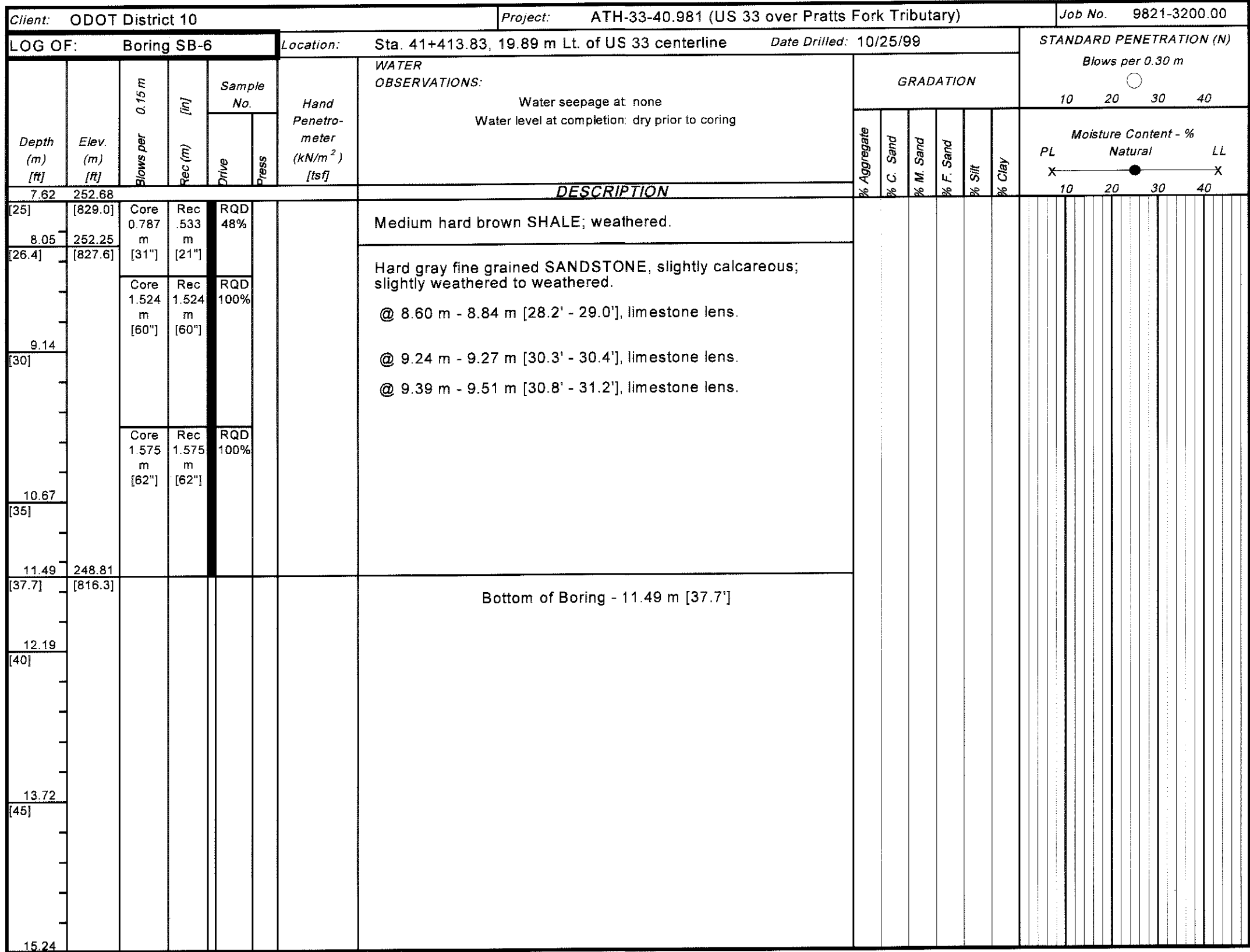
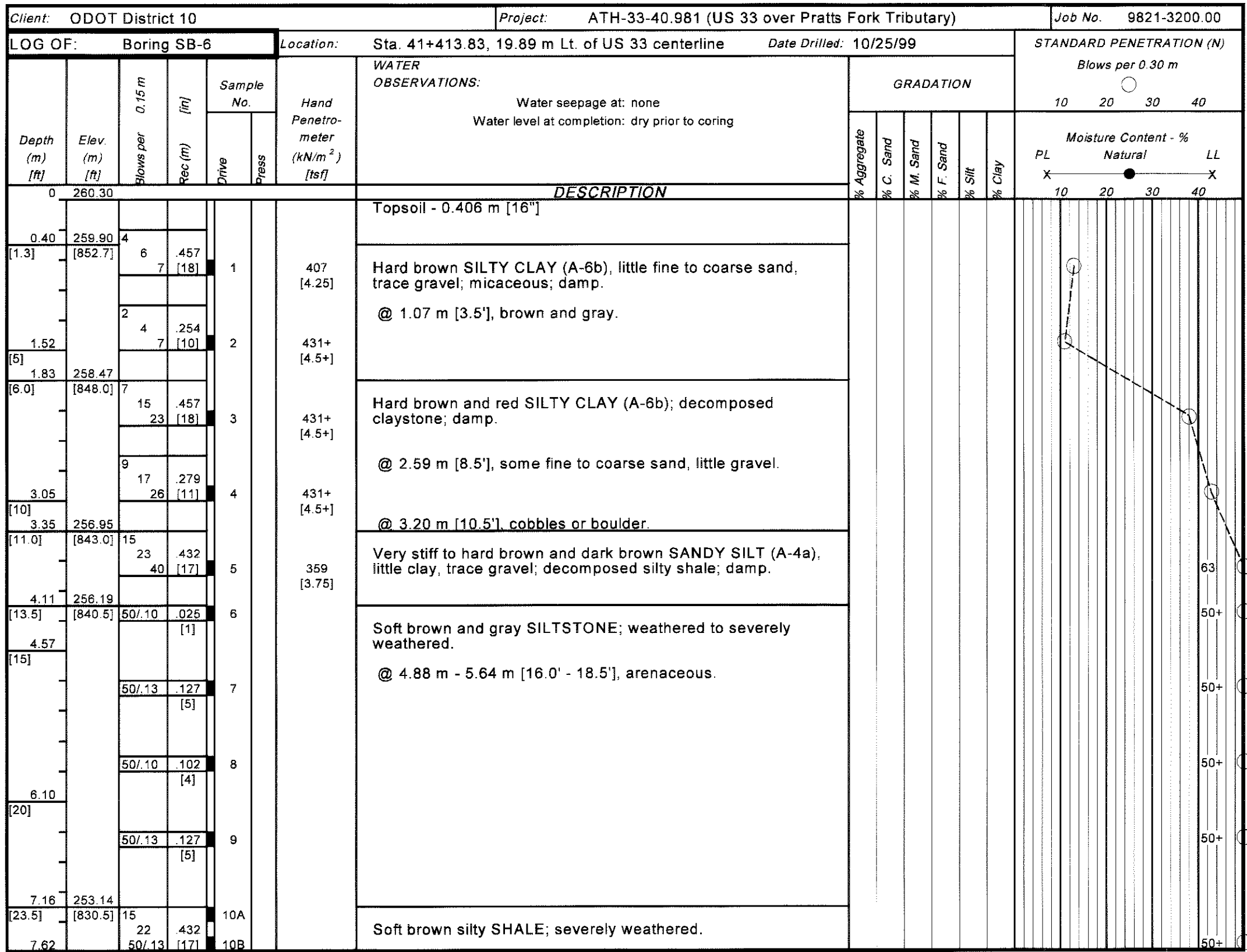
Client: ODOT District 10				Project: ATH-33-40.981 (US 33 over Pratts Fork Tributary)				Job No. 9821-3200.00							
LOG OF: Boring SB-5				Location: Sta. 41+393.69, 6.11 m Lt. of US 33 centerline				Date Drilled: 10/19-20/99				STANDARD PENETRATION (N) Blows per 0.30 m 10203040			
Depth (m) [ft]	Elev. (m) [ft]	Blows per 0.15 m [in]	Sample No.		Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: none Water level at completion: dry prior to coring	GRADATION					Moisture Content - % PL Natural LL 10203040			
			Rec	Drive			Press	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay		
22.86 231.22						DESCRIPTION									
[75] [758.6] 23.13 [230.95] [757.7]						Soft to medium hard gray LIMESTONE; highly weathered; slightly leached.									
Core 1.27 m [50"] Rec 1.270 m [50"] RQD 82%						Hard gray LIMESTONE; weathered. @ 23.20 m - 23.29 m [76.1' - 76.4'], vertical fracture. @ 23.59 m - 23.70 m [77.4' - 77.8'], broken.									
23.90 230.18 [755.2]						Medium hard gray SHALE; weathered to slightly weathered. @ 23.90 m - 23.99 m [78.4' - 78.7'], slightly calcareous.									
24.38															
[80]															
24.75 229.33 [752.4]						Bottom of Boring - 24.75 m [81.2']									
						Note: Boring was offset uphill from original staked location due to difficult access.									
25.91															
[85]															
27.43															
[90]															
28.96															
[95]															
30.48															



CALCULATED	T.A.H.
DATE	CHECKED BY
02/02/01	A.E.N.
REVIEWED BY	
T.A.H.	
DRAWN BY	
J.L.P.	

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. ATH-33-42635
OVER TRIBUTARY TO PRATTS FORK CREEK

ATH-33-40.981



CALCULATED
T.A.H.
CHECKED BY
A.E.N.

DATE
02/02/01

REVIEWED BY
T.A.H.

DRAWN BY
J.L.P.

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. ATH-33-42635
OVER TRIBUTARY TO PRATTS FORK CREEK

ATH-33-40.981

9 / 9

849
949

GENERALIZED GEOLOGIC REFERENCES REPORT THAT THE SITE IS LOCATED WITHIN THE UNGLACIATED SECTION OF THE ALLEGHENY PLATEAU. OVERBURDEN AT THE SITE CONSISTS OF THIN RESIDUAL SOILS ALONG RIDGETOPS AND HILLSIDES, COLLUVIAL SOILS AT THE BASE OF THE HILLSIDES, AND ALLUVIAL DEPOSITS ALONG STREAM CHANNELS. THE UNDERLYING BEDROCK AT THE SITE IS REPORTED TO BE SHALE, SANDSTONE, COAL, AND LIMESTONE OF MONONGAHELA SERIES ALONG THE HILLSIDES AND CONEMAUGH SERIES WITHIN THE VALLEY BOTTOM.

A TOTAL OF FIVE BORINGS, SB-16 THROUGH SB-20, WERE DRILLED AT THE PROJECT SITE BETWEEN DECEMBER 14, 1999 AND DECEMBER 29, 1999. THE BORINGS WERE DRILLED TO DEPTHS BETWEEN 7.62 AND 16.34 METERS (25.0 AND 53.6 FEET) BY MEANS OF A TRUCK-MOUNTED OR TRACK-MOUNTED (ATV) ROTARY-TYPE DILL RIG USING HOLLOWSTEM AUGERS. THE BORINGS WERE EXTENDED INTO BEDROCK AND BEDROCK WAS VERIFIED BY CORING IN ALL THE BORINGS.

1. SOILS

AT THE GROUND SURFACE, 102 TO 254 MILLIMETERS (4 TO 10 INCHES) OF TOPSOIL WERE ENCOUNTERED BY THE BORINGS. BELOW THE TOPSOIL THE BORINGS ENCOUNTERED PRIMARILY COHESIVE MATERIAL EXTENDING TO BEDROCK IN THE HILLSIDE BORINGS NORTH OF CR 40 (SB-16 AND SB-17), AND LAYERS OF BOTH COHESIVE AND GRANULAR MATERIAL IN THE BORINGS SOUTH OF CR 40 IN THE FLOODPLAIN OF THE STREAM (SB-18, SB-19, AND SB-20). BORINGS SB-16 AND SB-17 ENCOUNTERED PRIMARILY VERY STIFF TO HARD COHESIVE SOILS RANGING FROM CLAY (A-7-6) TO SILT AND CLAY (A-6a) WITH OCCASIONAL SANDY SILT (A-4a) LAYERS. BORING SB-18, LOCATED IMMEDIATELY SOUTH OF THE STREAM CHANNEL, ENCOUNTERED PRIMARILY SOFT TO MEDIUM STIFF SILT AND CLAY (A-6a), SILTY CLAY (A-6b), AND CLAY (A-7-6), WITH A VERY LOOSE SAND (A-3a) BETWEEN DEPTHS OF 1.68 AND 3.20 METERS (5.5 AND 10.5 FEET). BORINGS SB-19 AND SB-20 WERE LOCATED WITHIN THE FLOODPLAIN BETWEEN SHADE RIVER AND AN UNNAMED TRIBUTARY TO SHADE RIVER. BOTH BORINGS ENCOUNTERED PRIMARILY VERY LOOSE TO LOOSE SANDS (A-3 AND A-3a) CONTAINING ORGANIC MATERIAL BELOW 2.29 METERS (7.5 FEET) OF A MEDIUM STIFF TO STIFF SILT AND CLAY (A-6a). A VERY STIFF CLAY (A-7-6) WHICH WAS DECOMPOSED CLAYSTONE WAS ENCOUNTERED AT DEPTHS OF 9.02 TO 10.06 METERS (29.6 TO 33.0 FEET).

2. BEDROCK

BEDROCK WAS ENCOUNTERED IN EACH OF THE FIVE BORINGS DURING DRILLING AND GENERALLY CONSISTED OF VARYING THICKNESSES OF SEVERELY WEATHERED BEDROCK OVERLYING MORE COMPETENT BEDROCK. COMPETENT BEDROCK WAS ENCOUNTERED IN THE BORINGS AT DEPTHS OF BETWEEN 4.74 AND 14.81 METERS (15.0 AND 48.6 FEET) AND GENERALLY CONSISTED OF SOFT TO MEDIUM HARD CLAYSTONE AND MEDIUM HARD TO HARD SILTSTONE AND SANDSTONE.

3. GROUNDWATER

GROUNDWATER SEEPAGE WAS FIRST ENCOUNTERED IN BORINGS SB-18, SB-19, AND SB-20 AT DEPTHS OF BETWEEN 2.01 AND 3.35 METERS (6.69 TO 11.0 FEET) BELOW THE EXISTING GROUND SURFACE. SEEPAGE WAS NOT DETECTED IN BORINGS SB-16 AND SB-17. WATER LEVELS PRIOR TO CORING WERE DETECTED IN BORINGS SB-18 AND SB-20 AT DEPTHS OF 6.10 AND 11.43 METERS (20.0 AND 37.5 FEET), RESPECTIVELY. AT COMPLETION OF DRILLING, WATER LEVELS RANGED FROM 3.05 TO 6.10 METERS (10.0 TO 20.0 FEET). HOWEVER, THE FINAL WATER LEVELS INCLUDED DRILLING WATER AND MAY NOT BE REPRESENTATIVE OF THE ACTUAL GROUNDWATER CONDITIONS AT THE SITE.

- CLAYSTONE OR WEATHERED CLAYSTONE
- WEATHERED SANDSTONE
- WEATHERED SILTSTONE

	300 mm	75 mm	2.0 mm	0.42 mm	0.074 mm	0.005 mm
Boulders	Cobbles	Gravel	Coarse Sand	Fine Sand	Silt	Clay
		No. 10 SIEVE		No. 40 SIEVE	No. 200 SIEVE	

ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN ON THE STRUCTURE FOUNDATION INVESTIGATION SHEETS HAS BEEN SO REPORTED. ADDITIONAL SUBSURFACE INVESTIGATIONS 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 MATERIALS MANAGEMENT AT 1600 WEST BROAD STREET, THE OFFICE OF ROADWAY ENGINEERING OR THE OFFICE OF STRUCTURAL ENGINEERING AT 25 SOUTH FRONT STREET, COLUMBUS, OHIO 43215.

INFORMATION SHOWN BY THIS SUBSURFACE INVESTIGATION WAS OBTAINED SOLELY FOR USE IN ESTABLISHING DESIGN CONTROLS FOR THE PROJECT. THE STATE OF OHIO DOES NOT GUARANTEE THE ACCURACY OF THIS DATA AND IT IS NOT TO BE CONSTRUED AS A PART OF THE PLAN GOVERNING CONSTRUCTION OF THIS PROJECT.

DRIVE SAMPLES

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED, ROTARY-TYPE DRILL RIG EMPLOYING A 50.80 mm O.D., 34.93 mm I.D., SPLIT-SPOON SAMPLER, AT CONTINUOUS, 0.75 m AND/OR 1.50 m DEPTH INTERVALS, DRIVEN BY MEANS OF A 63.5 kg HAMMER WITH A FREE FALL OF 0.76 m. THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLER THREE 0.15 m INCREMENTS IS CONSIDERED THE STANDARD PENETRATION TEST.

PRESS SAMPLES

PRESS SAMPLES ARE TAKEN BY MEANS OF MECHANICALLY POWERED, ROTARY-TYPE DRILL RIG, EMPLOYING A 76 mm O.D. THIN-WALL PRESS SAMPLING TUBE. THE PRESS SAMPLING TUBE IS ADVANCED BY CONTINUOUS UNIFORM PRESSURE APPLIED BY THE DRILL RIG.

CORE BORINGS

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED, ROTARY-TYPE DRILL RIG, EMPLOYING AN NQ2 OR NXM CORE BARREL WITH AN INDUSTRIAL DIAMOND CUTTING HEAD.

SAMPLING AND TESTING

THE BORING LOG SHEETS SHOW A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, TYPE OF SAMPLE, NUMBER OF BLOWS FOR THE STANDARD PENETRATION TEST IN THREE 0.15 m INCREMENTS, AND A SAMPLE DESCRIPTION BASED ON LABORATORY TEST RESULTS, UTILIZING THE QDOT CLASSIFICATION SYSTEM. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED ON UNDISTURBED SAMPLES, APPEAR GRAPHICALLY ON SEPARATE ENCLOSURES. ROCK SAMPLES ARE DISPLAYED ON THE LOG SHEETS, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, AMOUNT OF RECOVERY, AND A VISUAL CLASSIFICATION BASED ON TYPE, COLOR, DEGREE OF HARDNESS, GRAIN SIZE, DETERIORATION, BEDDING, ACID REACTION, AND OTHER QUALIFYING FACTORS.

AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVELLY TO THE EXTENT THAT A SAMPLER CANNOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED, IN ORDER TO DETERMINE THE GENERAL CHARACTERISTICS OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING.

BORING NUMBER	SAMPLE NUMBER	DEPTH (m)	ODOT CLASSIFICATION	D50 SIZE (mm)
SB-18	S-3	1.83-2.29 {6.0'-7.5'}	A-3a	0.129
SB-18	S-5	3.35-3.81 {11.0'-12.5'}	A-6b	0.0076
SB-18	S-6	4.11-4.57 {13.5'-15.0'}	A-7-6	0.0054

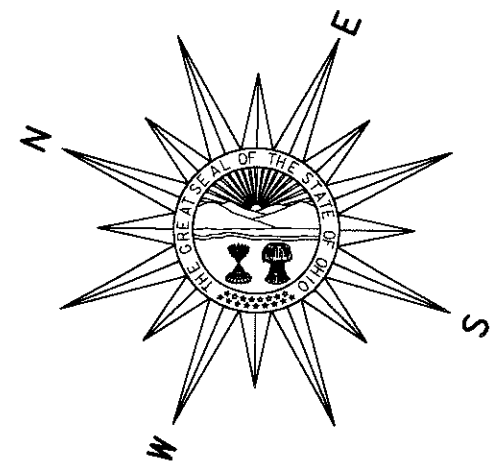
	PRESS SAMPLE, DRIVE SAMPLE, AND/OR CORE BORING LOCATION
	TOP OF ROCK
	INDICATES FREE WATER ELEVATION
	INDICATES STATIC WATER ELEVATION

FIGURES BESIDE THE BORING IN PROFILE
INDICATE THE NUMBER OF BLOWS FOR STANDARD
PENETRATION TEST

X/Y/Z

X = NUMBER OF BLOWS FOR FIRST 0.15 m
Y = NUMBER OF BLOWS FOR SECOND 0.15 m
Z = NUMBER OF BLOWS FOR THIRD 0.15 m

INDICATES NUMBER OF BLOWS (50) TO DRIVE A SPLIT-BARREL SAMPLER A DEPTH OF (n) METERS OTHER THAN THE NORMAL 0.15 m INCREMENT.



metric
units



SCALE IN METERS
HORIZONTAL SCALE:
1" = 200'

CALCULATED BY
T.A.H.
CHECKED BY
A.E.N.

DATE
02/02/01

REVIEWED BY
T.A.H.

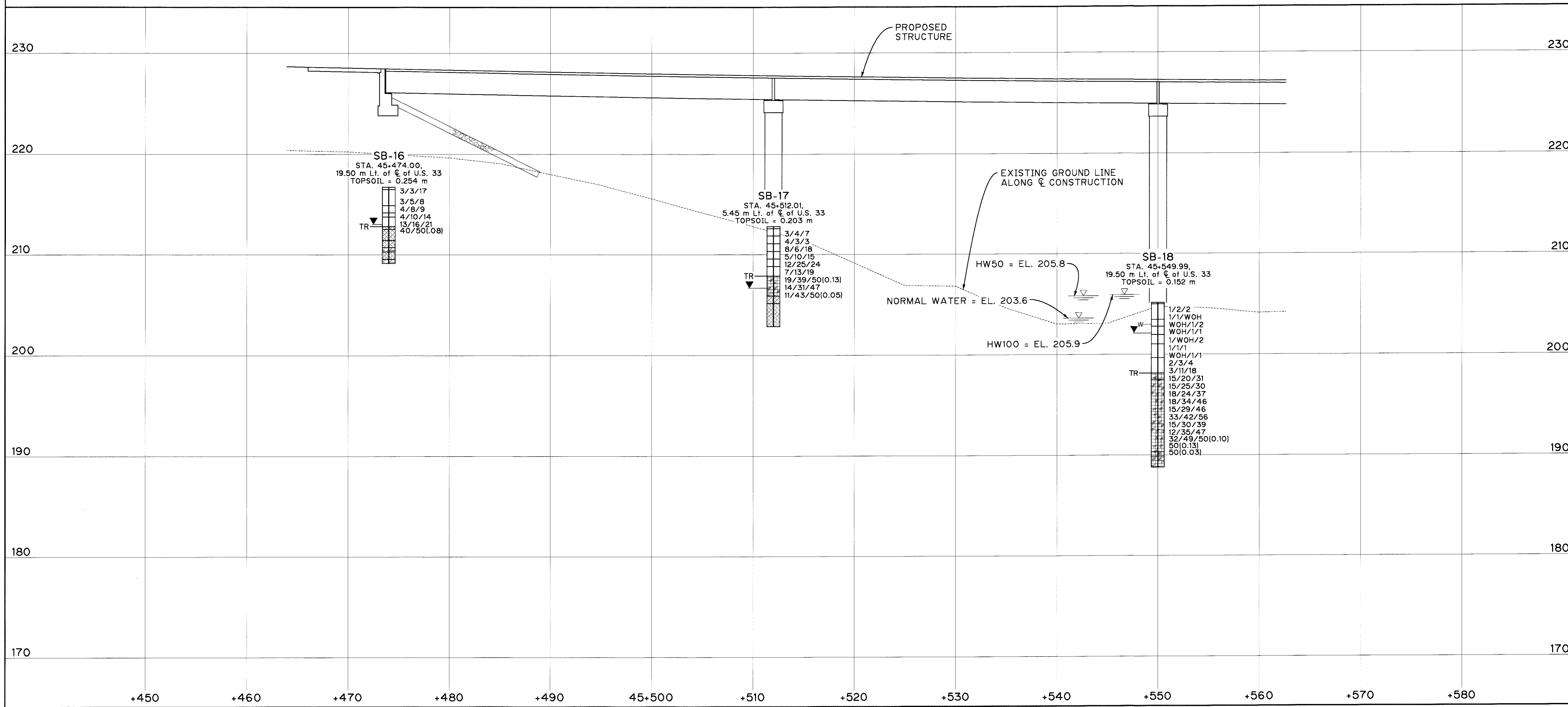
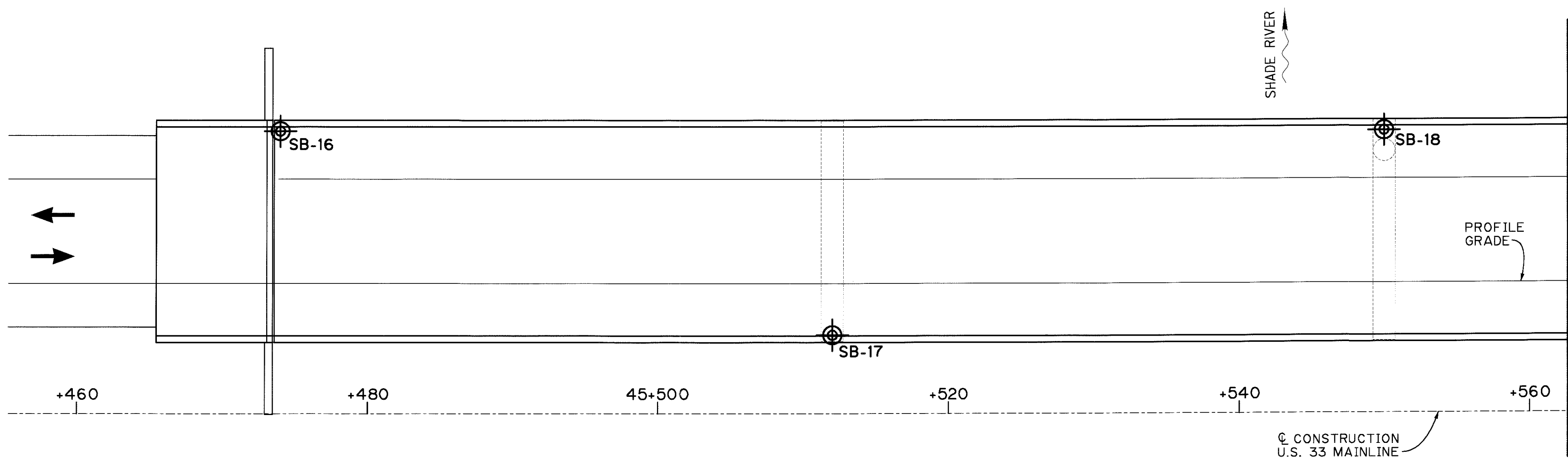
DRAWN BY
J.L.P.

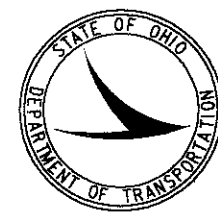
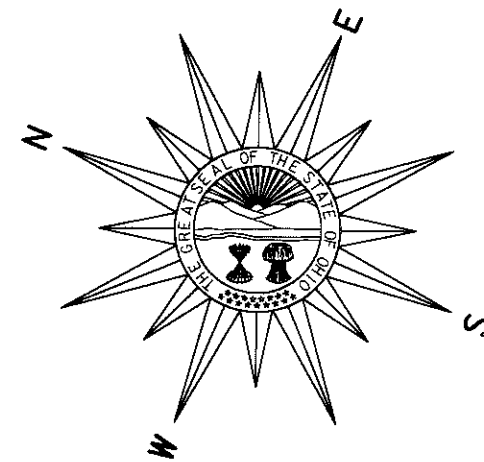
STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. MEG-33-02439
OVER SHADE RIVER AND COUNTY ROAD 40

ATH-33-40.981

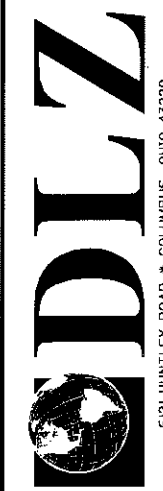
2 / 6

851
949





metric
units



SCALE IN METERS
0 10
HORIZONTAL SCALE:
1:200

CALCULATED
T.A.H.
CHECKED BY
A.E.N.

DATE
02/02/01

REVIEWED BY
T.A.H.

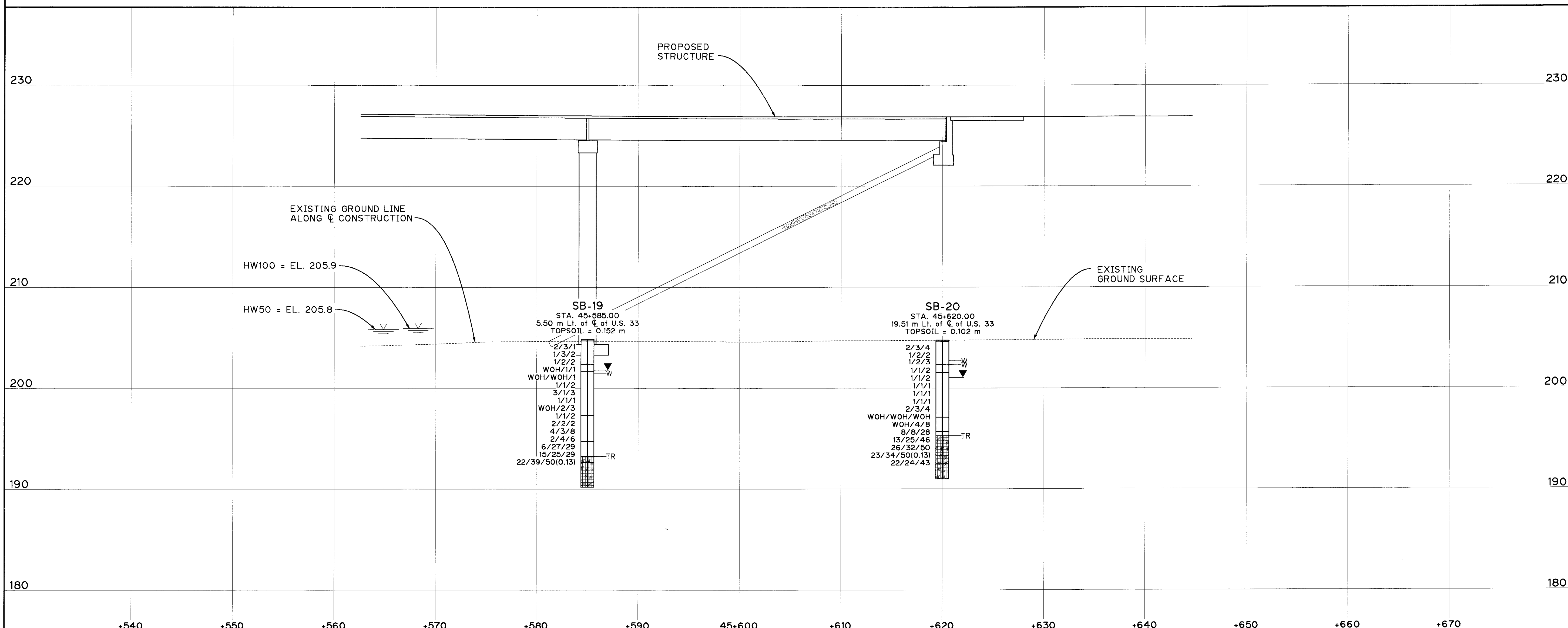
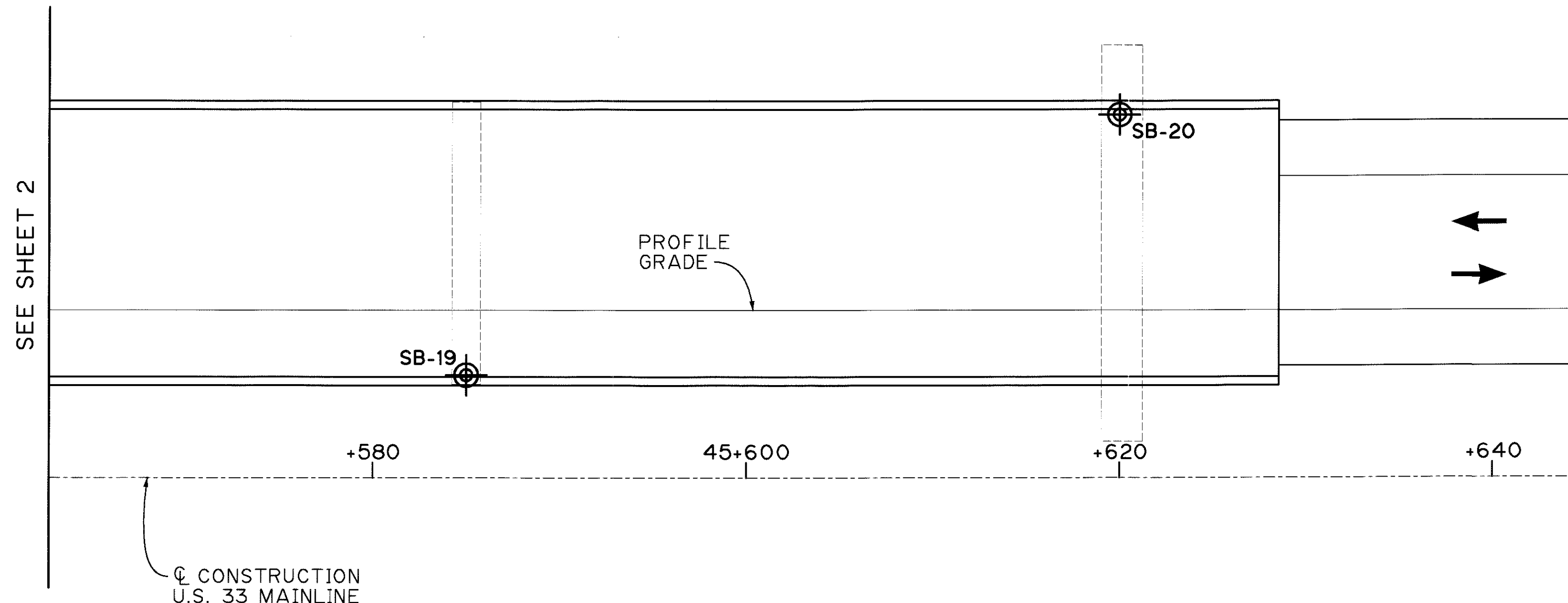
DRAWN BY
J.L.P.

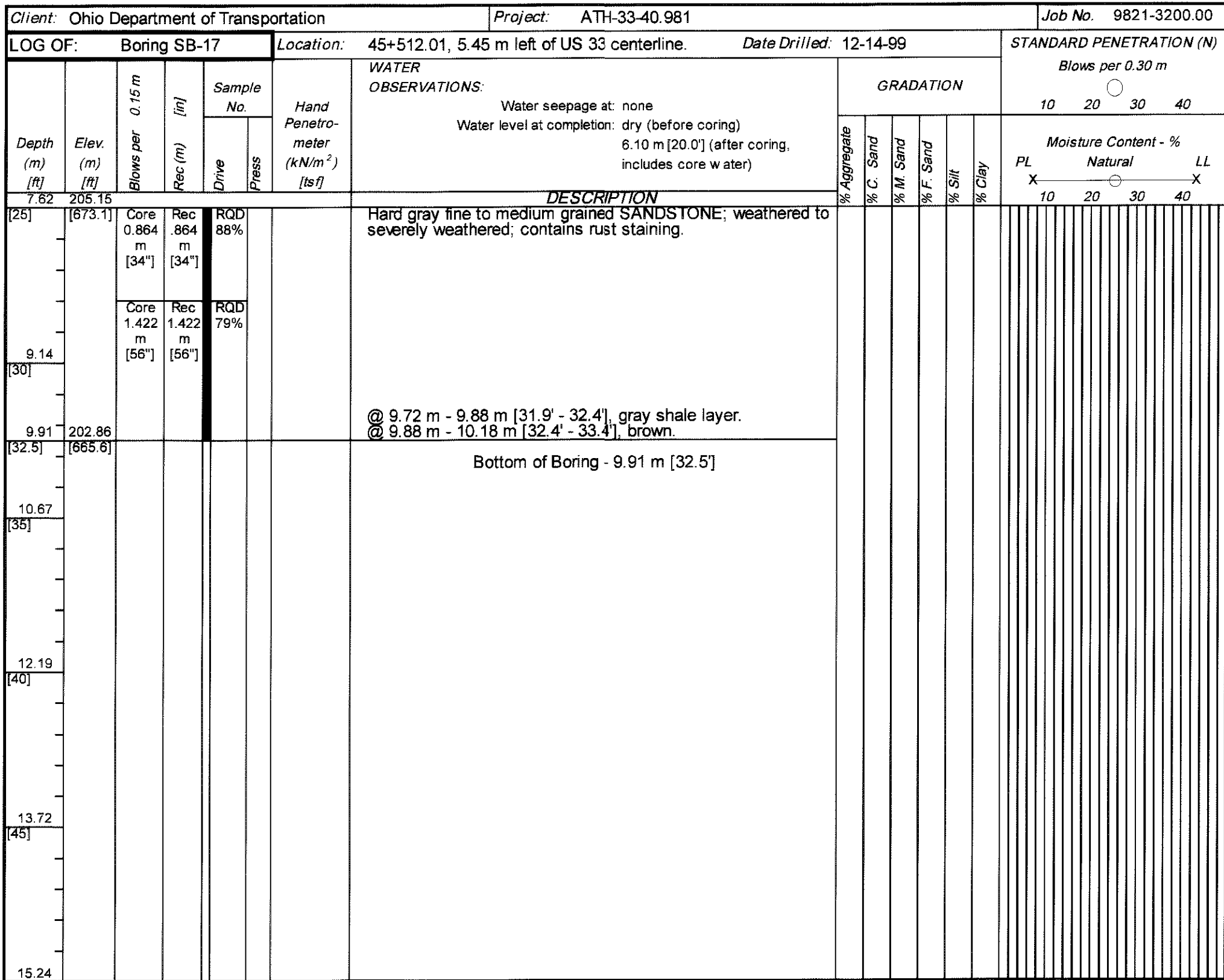
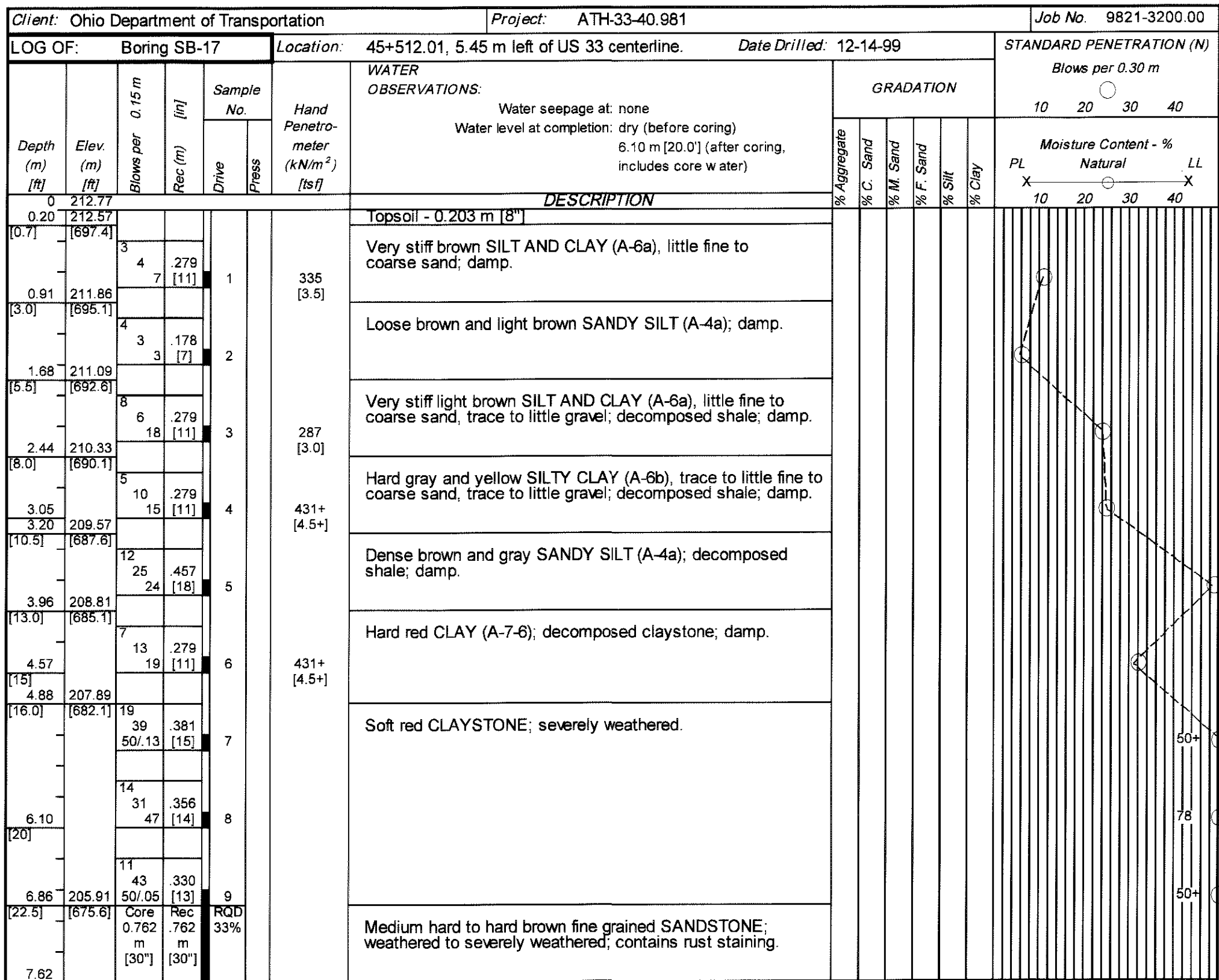
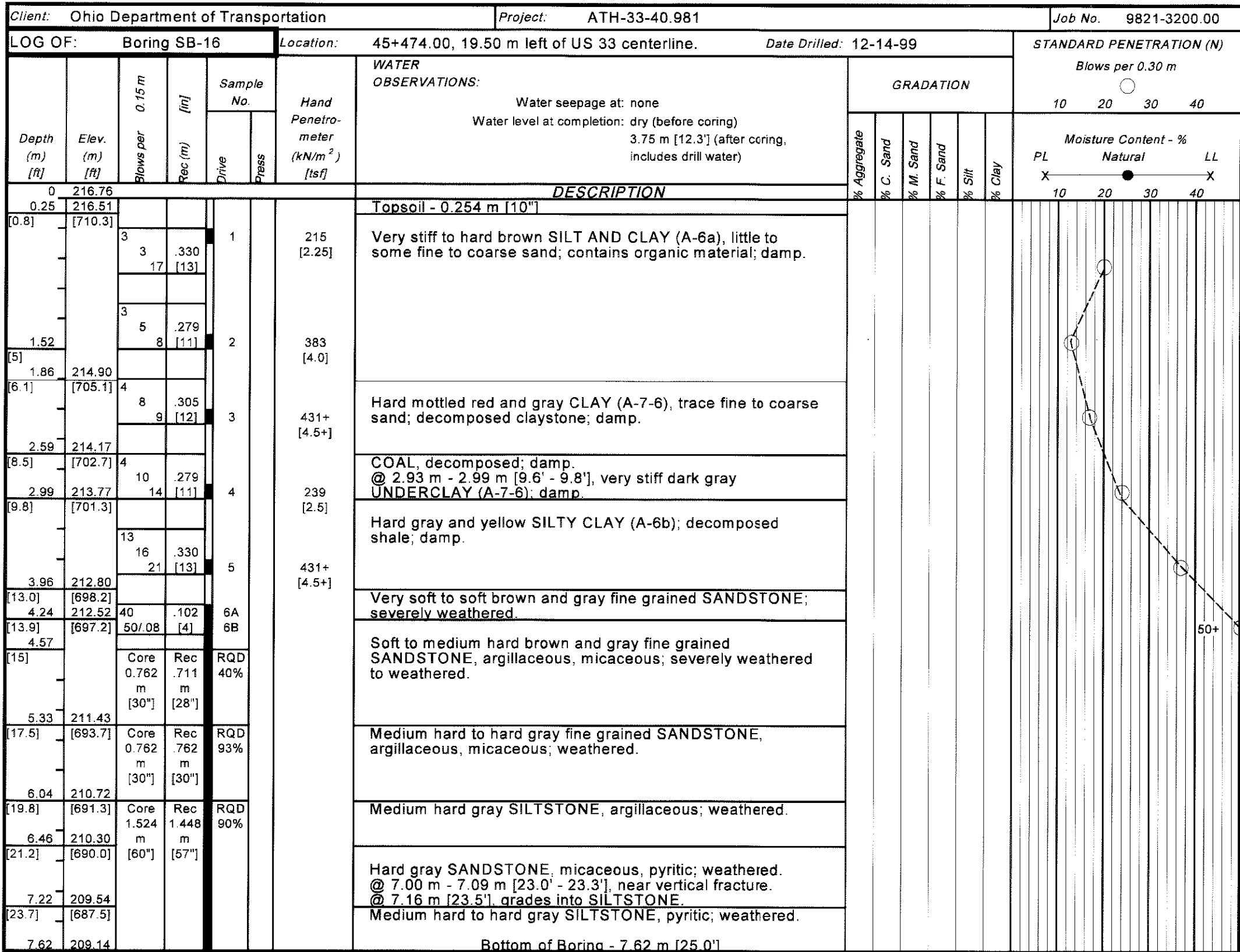
STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. MEG-33-02439
U.S. 33 OVER SHADE RIVER

ATH-33-40.981

3 / 6

852
949





CALCULATED
T.A.H.

DATE
02/02/01

REVIEWED BY
T.A.H.

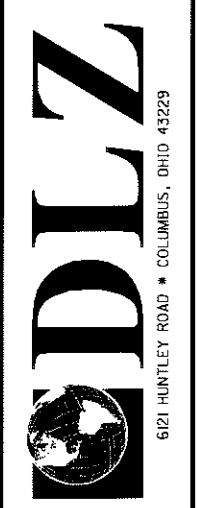
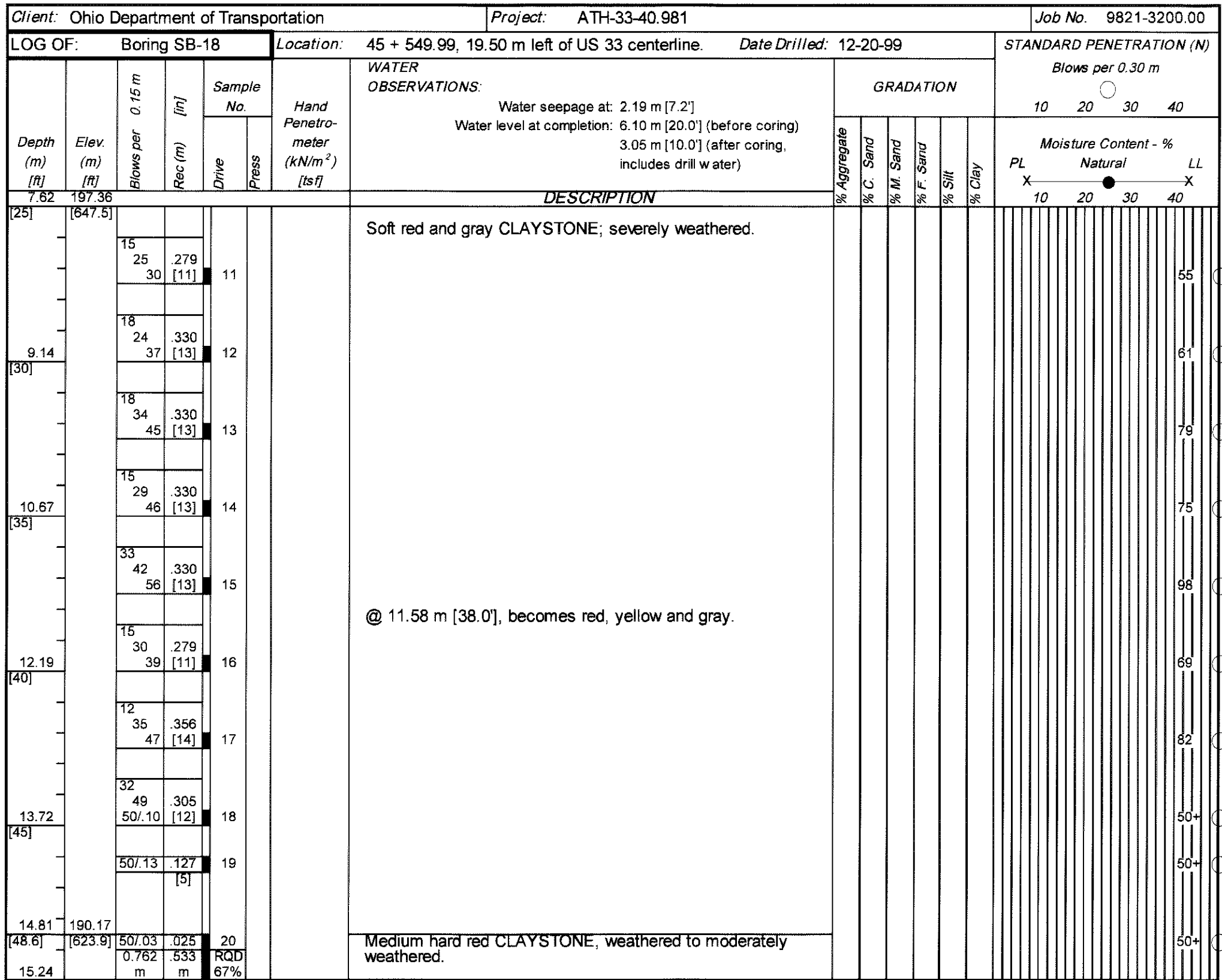
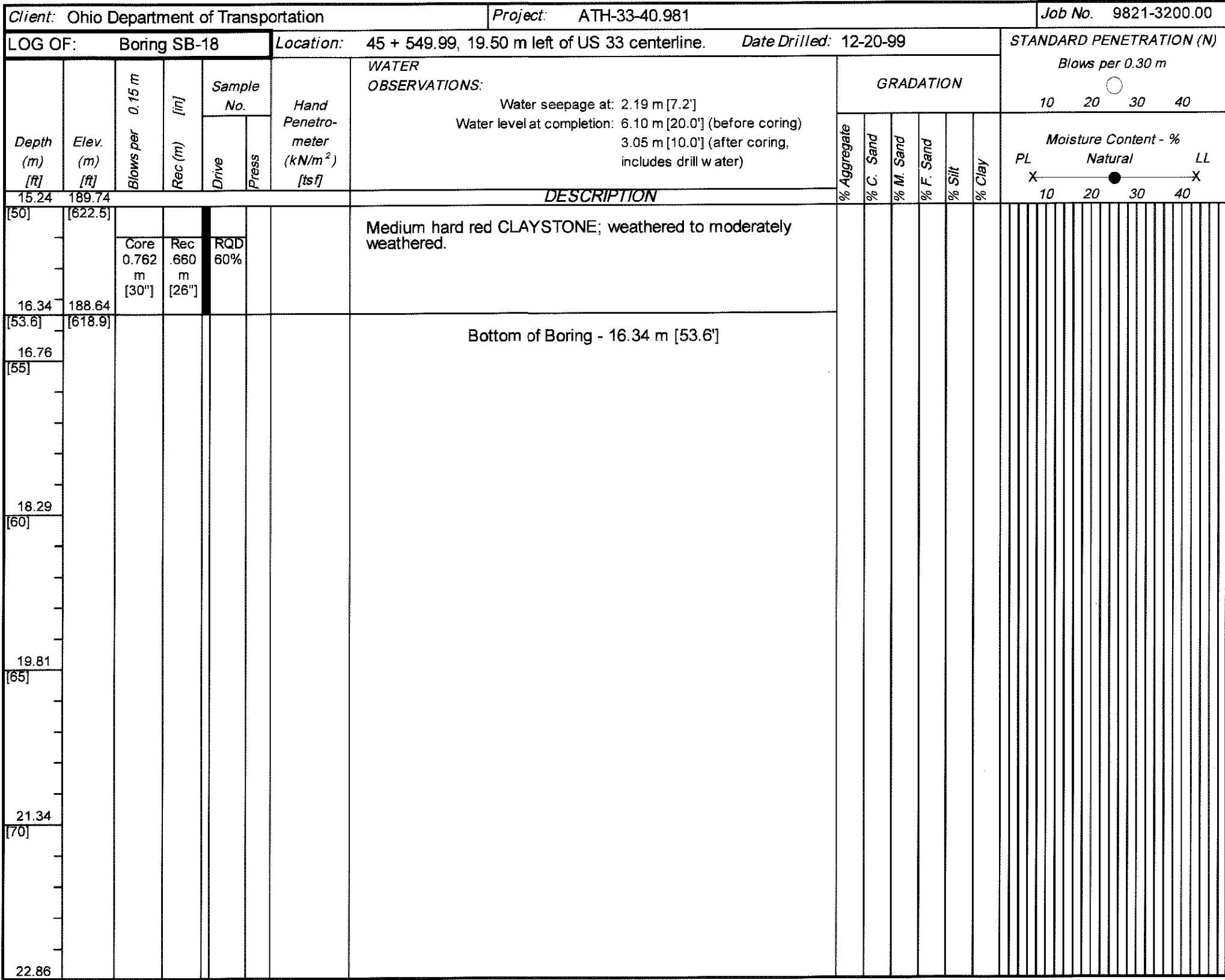
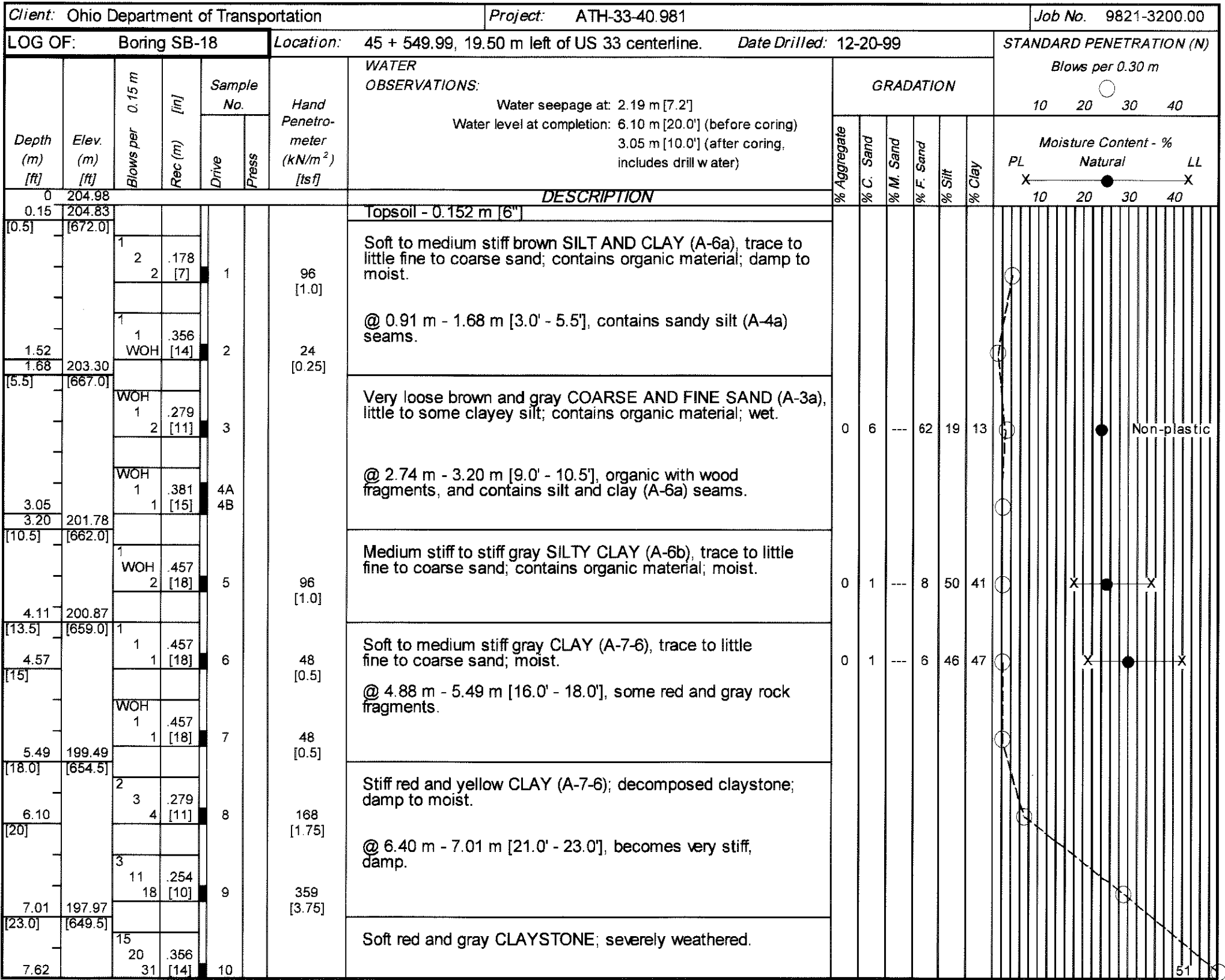
DRAWN BY
J.L.P.

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. MEG-33-02439
U.S. 33 OVER SHADE RIVER

ATH-33-40.981

4 / 6

853
949



CALCULATED
T.A.H.
CHECKED BY
A.E.N.

DATE
02/02/01

REVIEWED BY
T.A.H.

DRAWN BY
J.L.P.

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. MEG-33-02439
U.S. 33 OVER SHADE RIVER

ATH-33-40.981

5 / 6

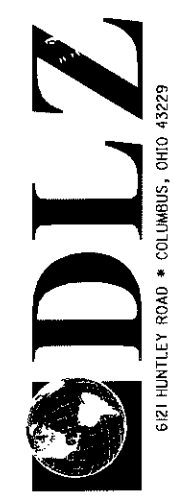
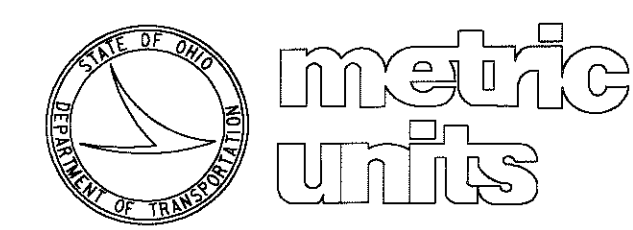
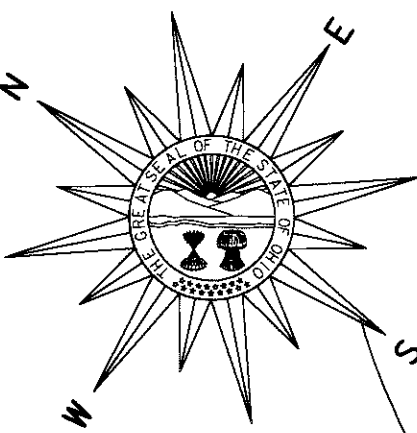
854
949

Client: Ohio Department of Transportation				Project: ATH-33-40.981				Job No. 9821-3200.00						
LOG OF: Boring SB-19		Location: 45 + 585.00, 5.50 m left of US 33 centerline.		Date Drilled: 12-22-99		STANDARD PENETRATION (N) Blows per 0.30 m								
Depth (m) [ft]	Elev. (m) [ft]	Blows per 0.15 m [in]	Sample No.	Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: 3.35 m [11.0'] Water level at completion: dry (before coring) 3.05 m [10.0'] (after coring, includes core water)	GRADATION					Moisture Content - % PL Natural LL			
						% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	X	10	20
DESCRIPTION														
0	204.84					Topsoil - 0.152 m [6"]								
0.15	204.69					Medium stiff to stiff brown SILT and CLAY (A-6a), trace fine sand; contains organic material; damp to moist.								
1.52														
2.44	202.40					Very loose brown SANDY SILT (A-4a); wet.								
3.05	201.64													
4.57						Very loose to loose gray COARSE AND FINE SAND (A-3a), trace to little clayey silt; trace gravel; contains organic material; wet.								
5.64						@ 4.18 m - 4.57 m [13.7' - 15.0'], contains wood fragments.								
6.10						@ 5.64 m [18.5], 0.15 m (6") sand heave.								
7.16						@ 7.16 m [23.5], 0.20 m (8") sand heave.								
7.16						@ 7.16 m - 7.62 m [23.5' - 25.0'], little to some clayey silt, trace to little gravel.								

Client: Ohio Department of Transportation				Project: ATH-33-40.981				Job No. 9821-3200.00							
LOG OF: Boring SB-20				Location: 45+620.00, 19.51 m left of US 33 centerline				Date Drilled: 12-29-99				STANDARD PENETRATION (N) Blows per 0.30 m			
Depth (m) [ft]	Elev. (m) [ft]	Blows per 0.15 m [in]	Sample No.	Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: 2.01 m [6.6'], 2.43 m [8.0'] Water level at completion: 11.43 m [37.5'] (before coring) 3.66 m [12.0'] (after coring, includes drill water)	GRADATION					Moisture Content - % PL Natural LL				
						% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	X		X	
DESCRIPTION															
0	204.73					Topsoil - 0.102 m [4"]									
0.10	204.63					Stiff brown SILT AND CLAY (A-6a), trace to little fine sand; contains organic material; damp.									
1.52						@ 0.91 m - 2.44 m [3.0' - 8.0'], medium stiff, moist.									
2.44	202.29					@ 2.01 m [6.6'], sand seam, wet.									
3.05	201.53					Very loose brown FINE SAND (A-3); contains organic material; wet.									
4.57						Very loose brown and gray COARSE AND FINE SAND (A-3a), trace to little clayey silt; contains organic material; moist.									
6.10															
7.62						@ 7.01 m - 7.62 m [23.0' - 25.0'], wet.									

Client: Ohio Department of Transportation					Project: ATH-33-40.981					Job No. 9821-3200.00																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
LOG OF: Boring SB-19			Location: 45 + 585.00, 5.50 m left of US 33 centerline.		Date Drilled: 12-22-99			STANDARD PENETRATION (N) Blows per 0.30 m																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
Depth (m) [ft]	Elev. (m) [ft]	Blows per 0.15 m [in]	Sample No.	Hand Penetrom- eter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: 3.35 m [11.0'] Water level at completion: dry (before coring) 3.05 m [10.0'] (after coring, includes core water)	GRADATION					Moisture Content - % Natural																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
						% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	PL X	10	20	30	40	LL X																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
DESCRIPTION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
[25]	[647.0]					Loose to medium dense gray and brown COARSE AND FINE SAND (A-3a), little clayey silt, little gravel; wet.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
		2	305																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				

Client: Ohio Department of Transportation				Project: ATH-33-40.981				Job No. 9821-3200.00				
LOG OF: Boring SB-20		Location: 45+620.00, 19.51 m left of US 33 centerline		Date Drilled: 12-29-99		STANDARD PENETRATION (N) Blows per 0.30 m						
Depth (m) [ft]	Elev. (m) [ft]	Blows per 0.15 m [in]	Sample No.	Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: 2.01 m [6.6'], 2.43 m [8.0'] Water level at completion: 11.43 m [37.5'] (before coring) 3.66 m [12.0'] (after coring, includes drill water)	GRADATION					10 20 30 40	
						% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Moisture Content - % PL Natural LL X 10 20 30 40 X
DESCRIPTION												
7.62	197.11											
	646.7											
		WOH										
		4										
		8										



SCALE IN METERS
HORIZONTAL SCALE:
1:200

CALCULATED
T.A.H.
CHECKED BY
A.E.N.

DATE
02/02/01

REVIEWED BY
T.A.H.

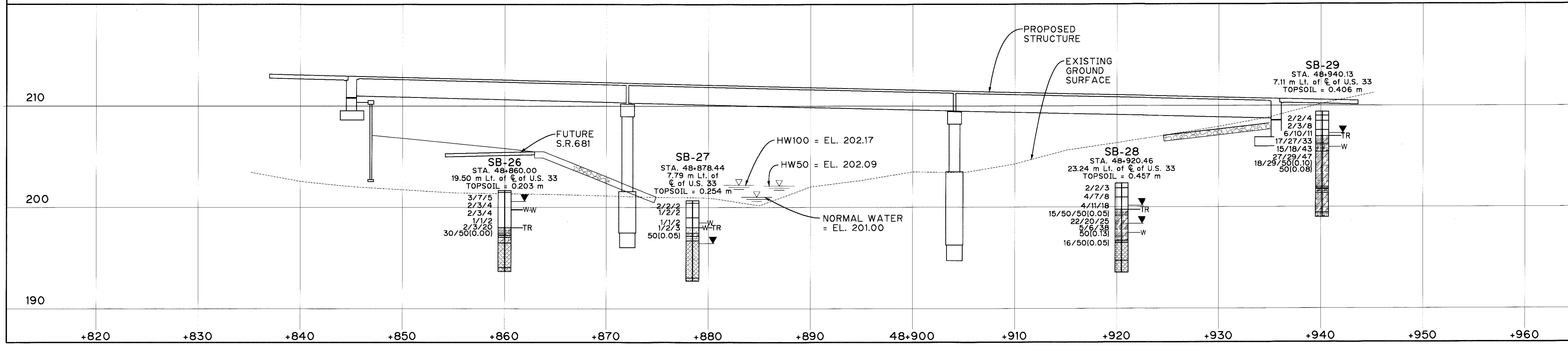
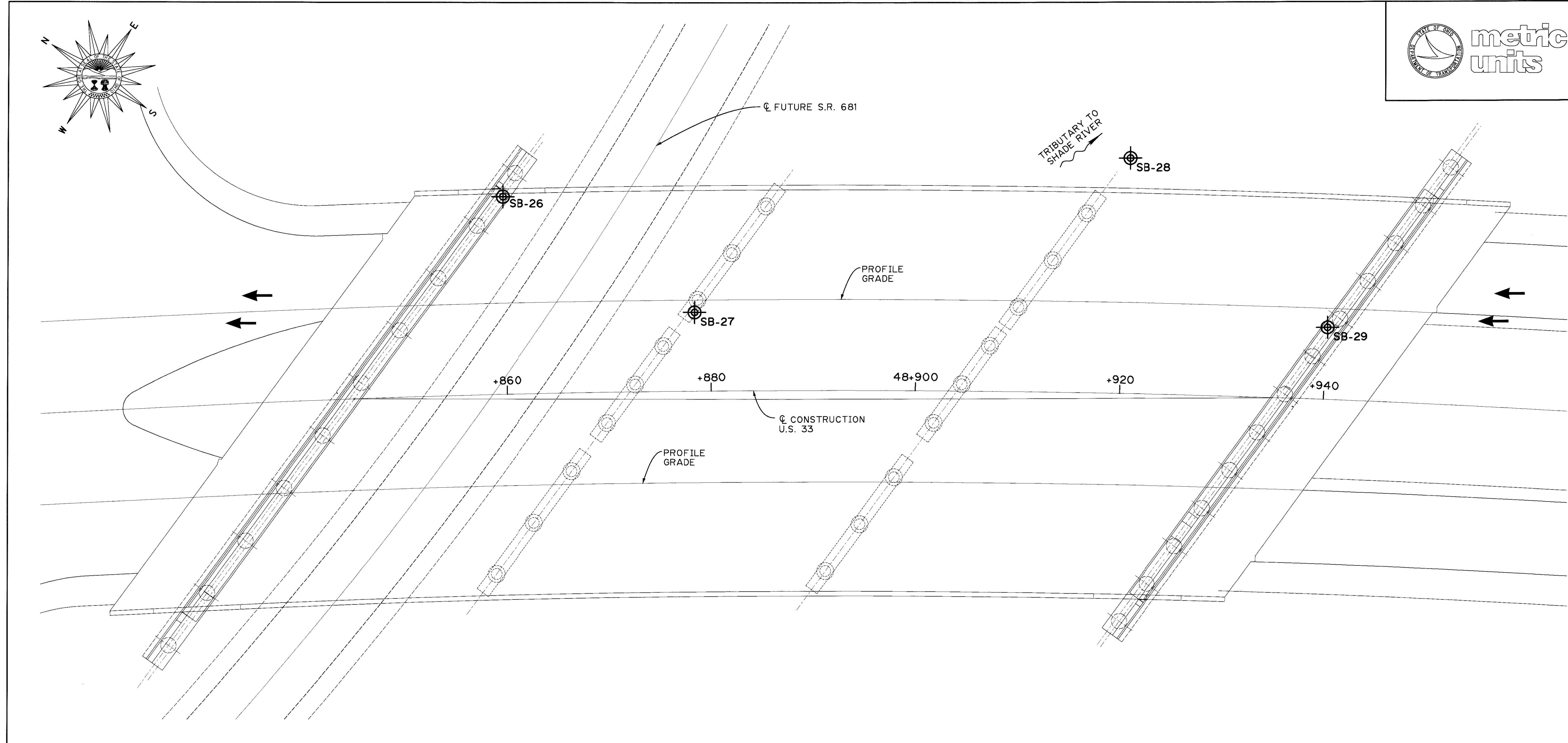
DRAWN BY
J.L.P.

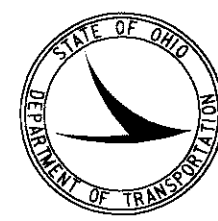
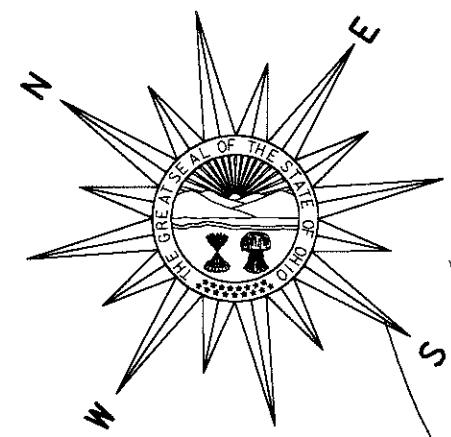
STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. MEG-33-05810
OVER TRIBUTARY TO SHADE RIVER

ATH-33-40.981

2 / 7

857
949





metric
units



SCALE IN METERS
HORIZONTAL SCALE:
1" = 200'

CALCULATED
T.A.H.
CHECKED BY
A.E.N.

DATE
02/02/01

REVIEWED BY
T.A.H.

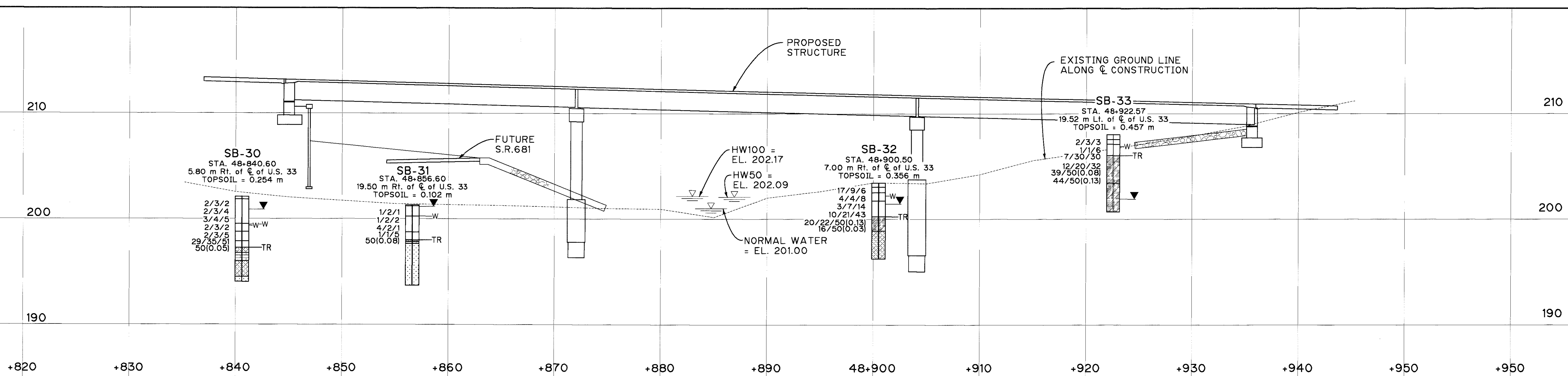
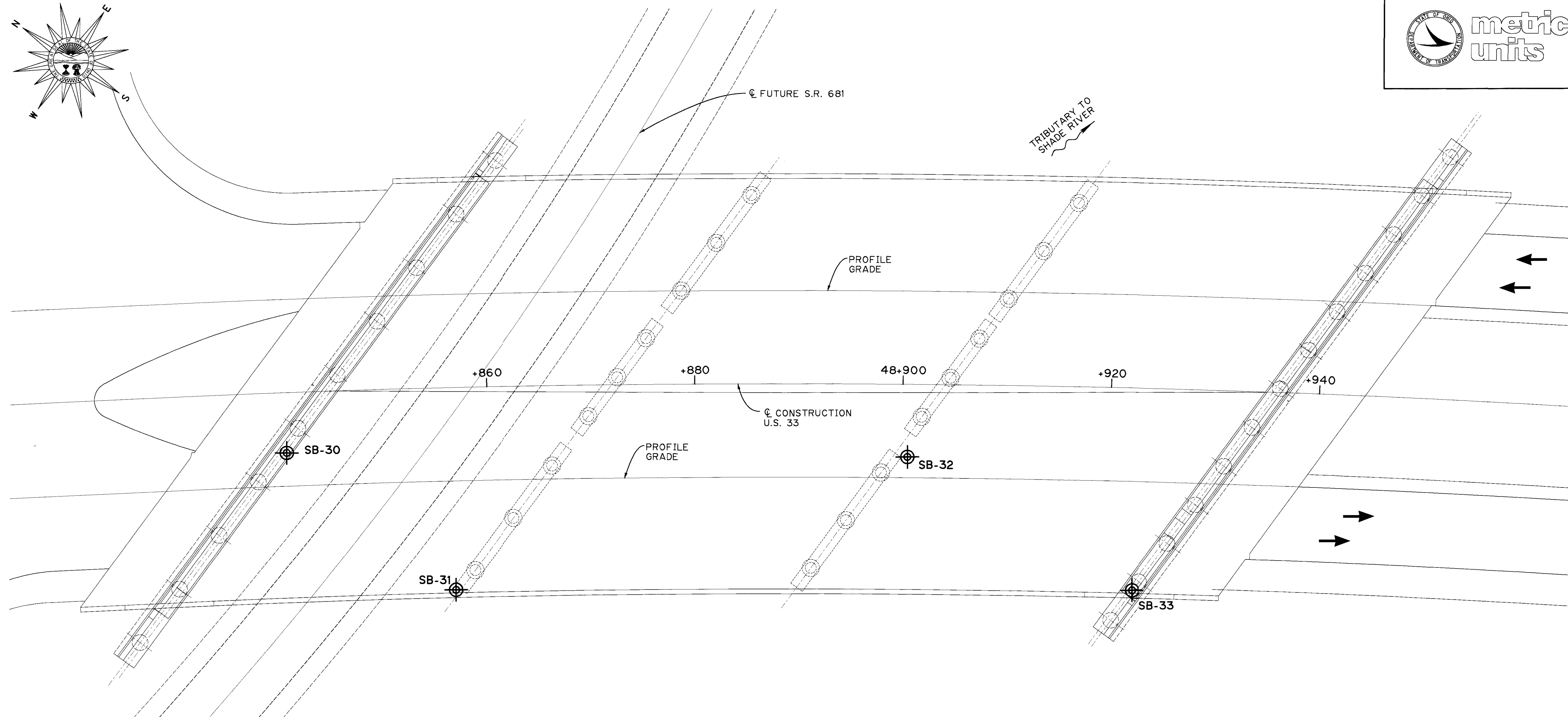
DRAWN BY
J.L.P.

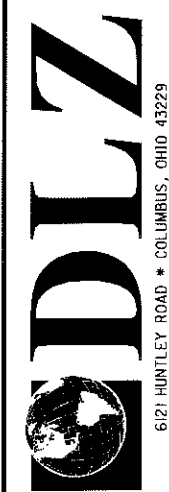
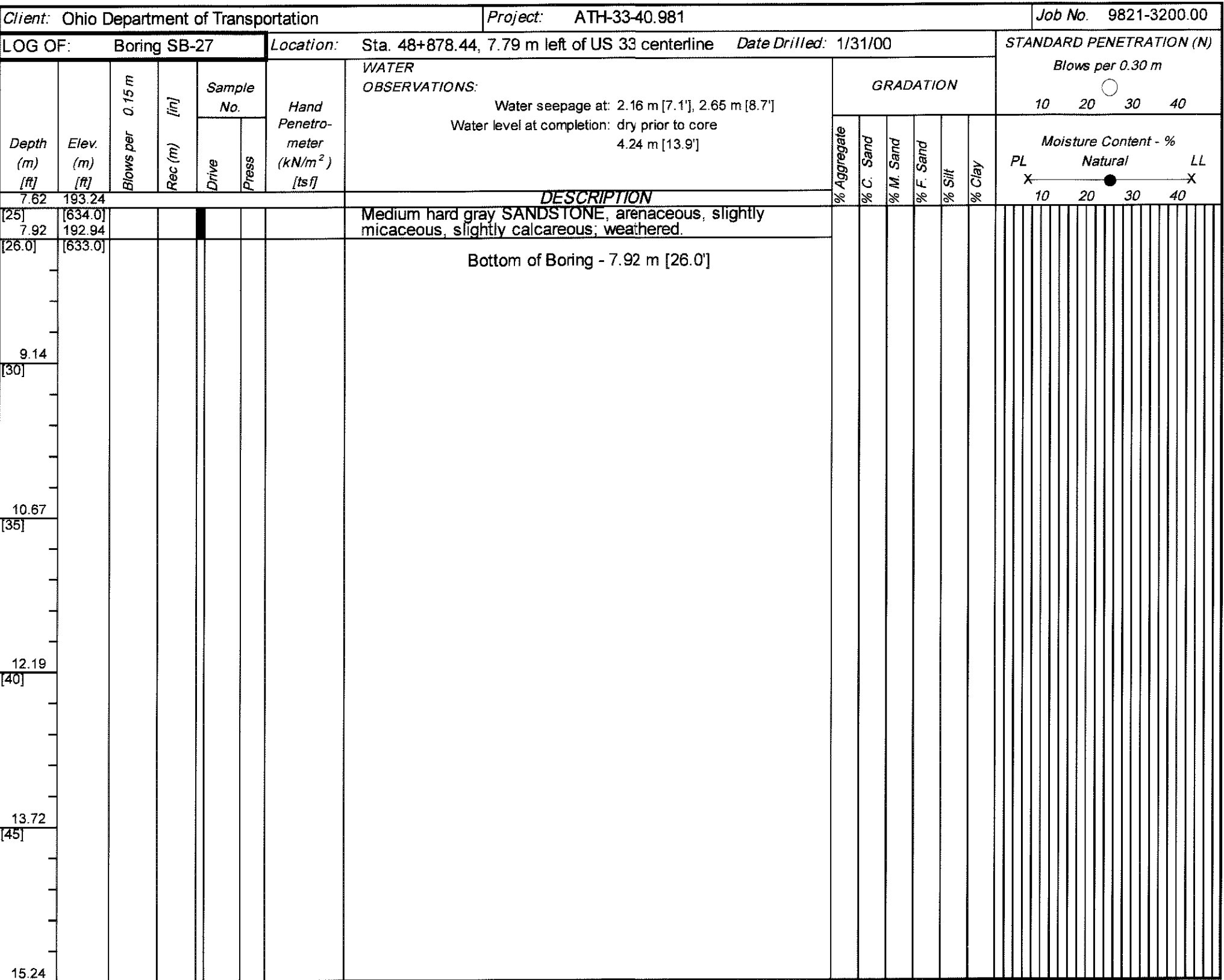
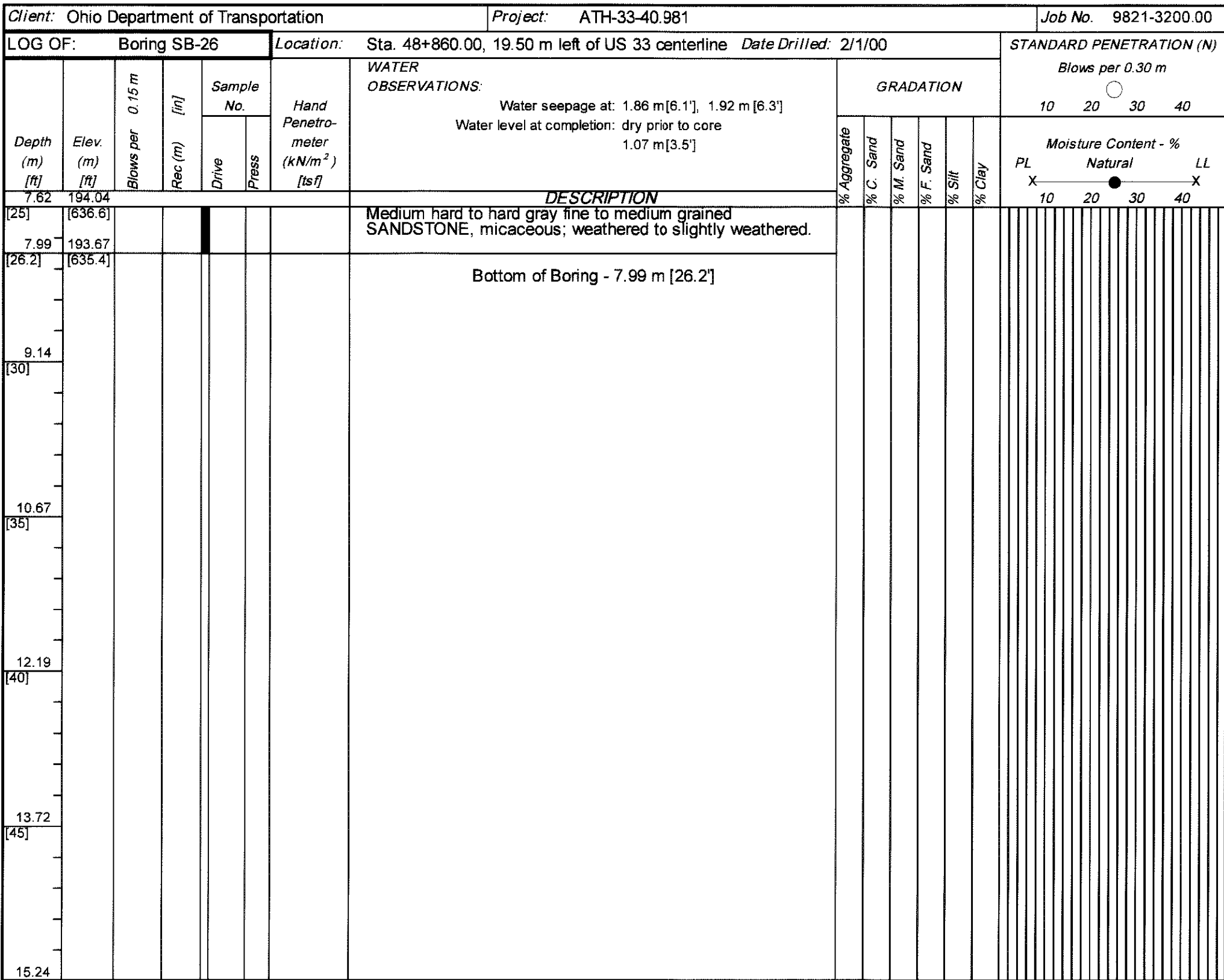
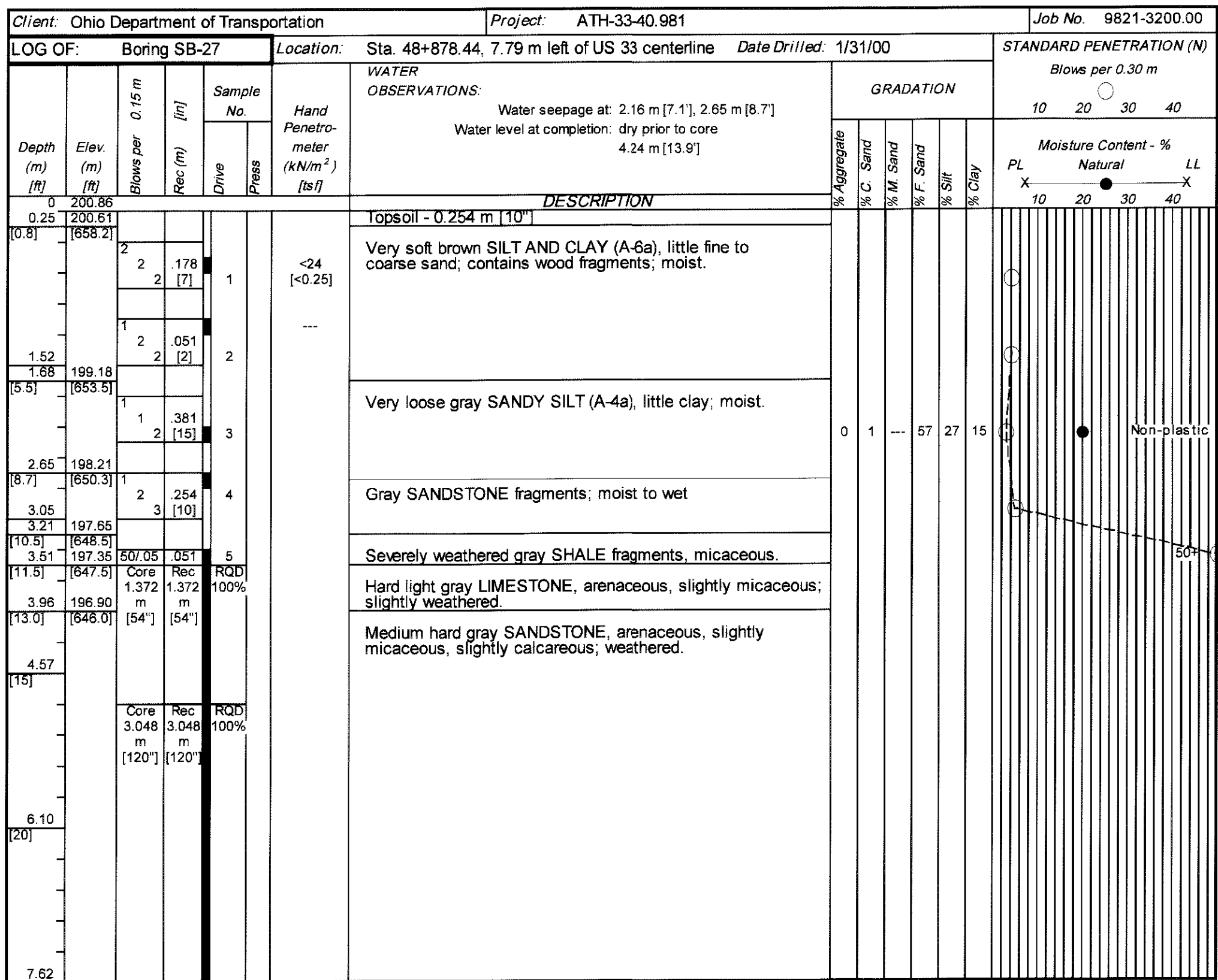
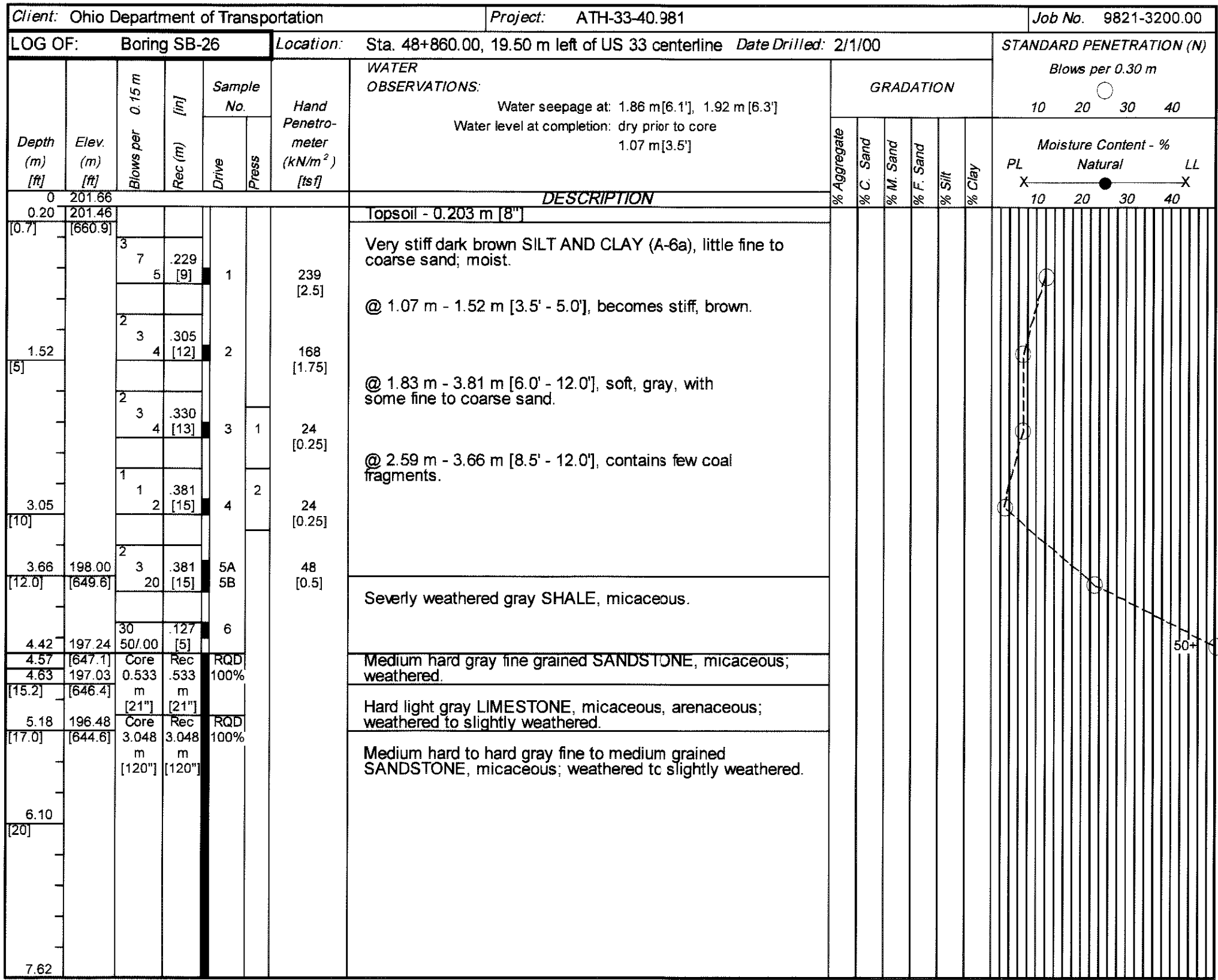
STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. MEG-33-05810
OVER TRIBUTARY TO SHADE RIVER

ATH-33-40.981

3 / 7

858
949





CALCULATED
T.A.H.
CHECKED BY
A.E.N.

DATE
02/02/01

REVIEWED BY
T.A.H.

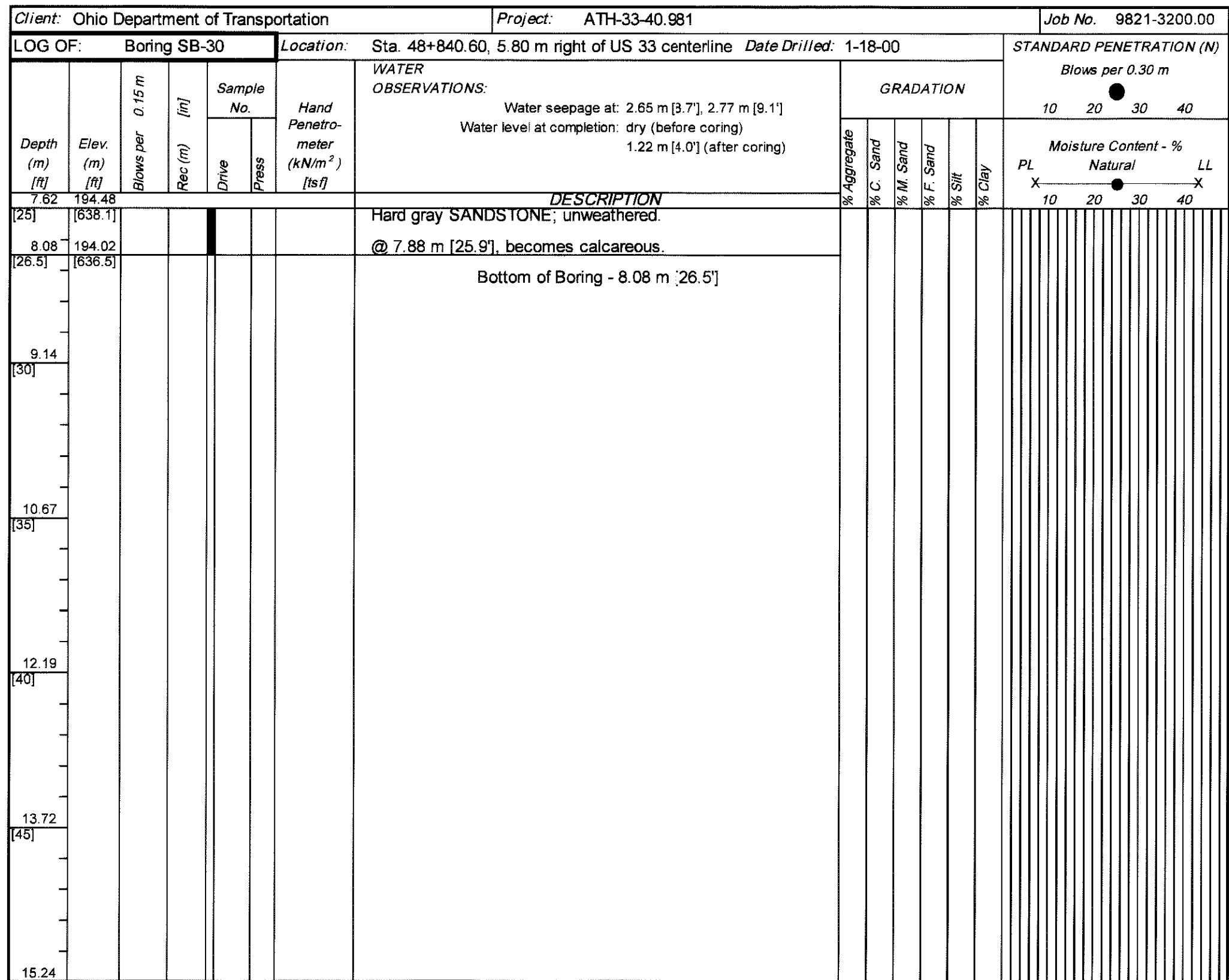
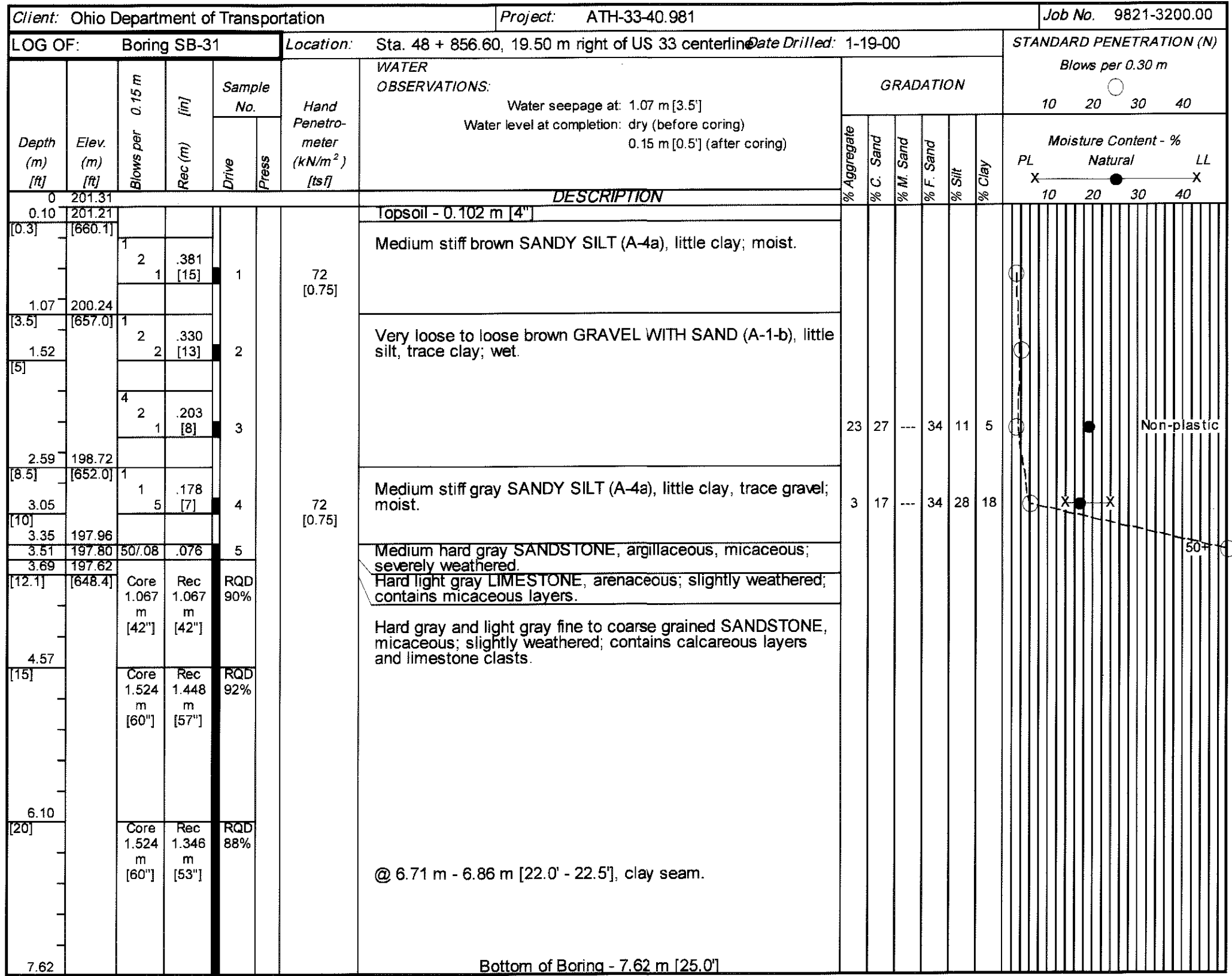
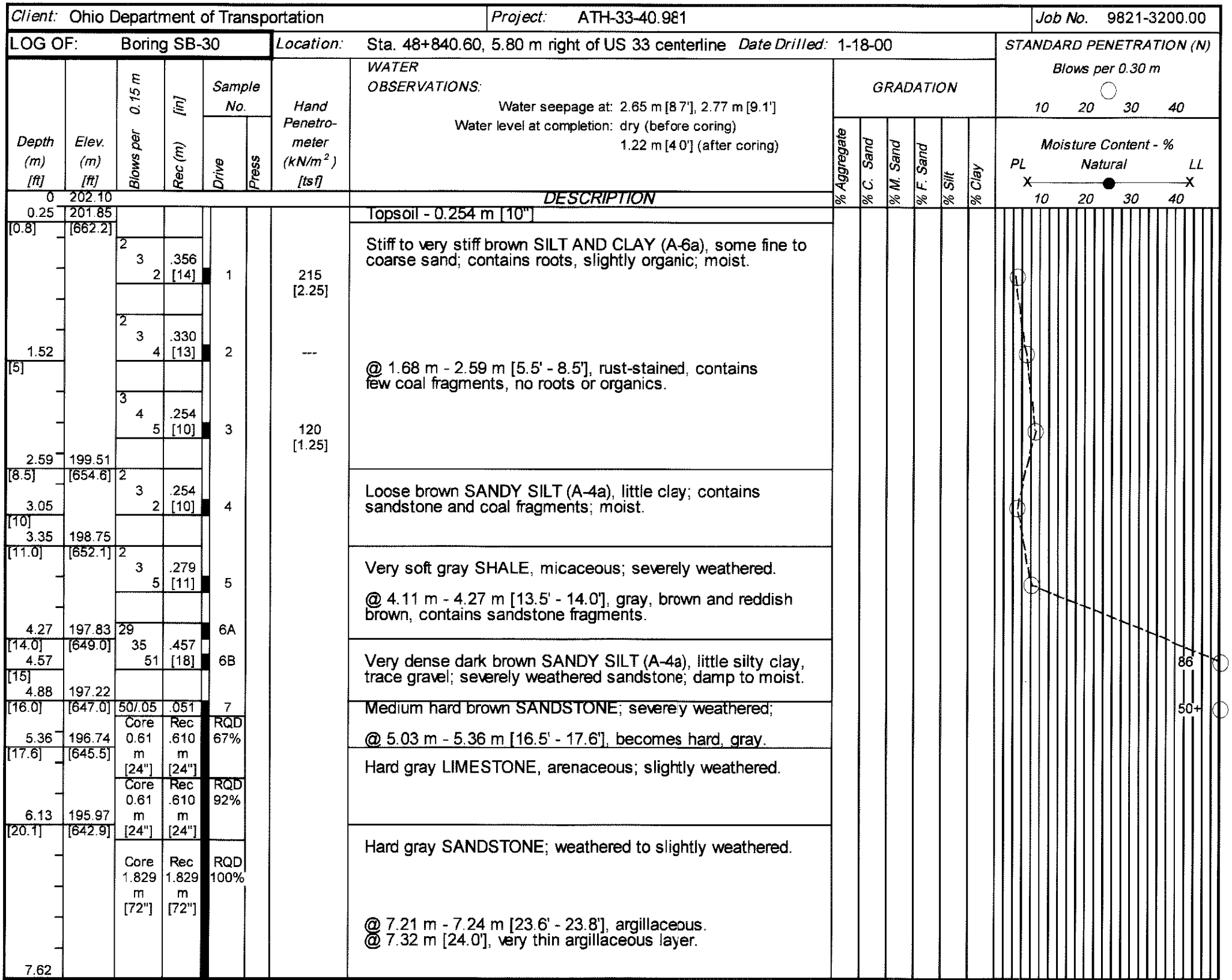
DRAWN BY
J.L.P.

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. MEG-33-05810
OVER TRIBUTARY TO SHADE RIVER

ATH-33-40.981

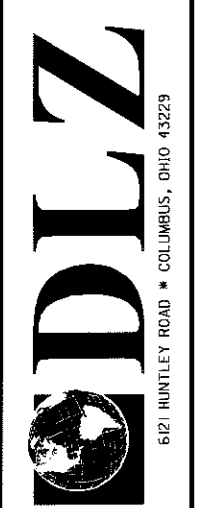
4 / 7

859
949



Client: Ohio Department of Transportation						Project: ATH-33-40.981						Job No. 9821-3200.00											
LOG OF: Boring SB-32						Location: Sta. 48+900.50, 7.00 m right of US 33 centerline						Date Drilled: 2-7-00						STANDARD PENETRATION (N) Blows per 0.30 m					
						WATER OBSERVATIONS: Water seepage at: 1.22 m [4.0'] Water level at completion: dry prior to coring 1.98 m [6.5'] after coring						GRADATION						Moisture Content - % Natural					
																		PL X 10 20 30 40 X					
DESCRIPTION																							
Topsoil - 0.356 m [14"]																							
Medium dense brown FINE SAND (A-3); trace sandstone fragments; damp.																							
Very stiff brown and gray SILTY CLAY (A-6b), little to some fine to coarse sand, little gravel; damp.																							
Very stiff to hard brown and gray CLAY (A-7-6); (decomposed claystone); damp.																							
Soft gray SHALE, arenaceous; severely weathered.																							
Hard gray SANDSTONE, micaceous contains dark gray argillaceous laminae; moderately weathered. @ 5.15 m - 5.27 m [16.9' - 17.3], weathered shale layer.																							
Bottom of Boring - 7.22 m [23.7']																							

Client: Ohio Department of Transportation						Project: ATH-33-40.981						Job No. 9821-3200.00					
LOG OF: Boring SB-33				Location: Sta. 48+922.57, 19.52 m left of US 33 centerline		Date Drilled: 2-9-00				STANDARD PENETRATION (N) Blows per 0.30 m							
Depth (m) [ft]	Elev. (m) [ft]	Blows per 0.15 m [in]	Rec (m) [in]	Sample No.	Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: 1.10 m [3.6'] Water level at completion: dry prior to coring 6.10 m [20.0'] after coring	GRADATION					Moisture Content - %					
							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	PL X	Natural ●	LL X		
DESCRIPTION																	
Topsoil - 0.457 m [18"]																	
Very stiff brown SILTY CLAY (A-6b), little fine to coarse sand, little gravel, damp.																	
Very stiff red and gray CLAY (A-7-6); damp.																	
Soft brown SHALE, arenaceous; severely weathered.																	
@ 2.59 m [8.5], becomes gray.																	
Soft to medium hard brown SHALE; severely weathered to weathered.																	
@ 6.55 m [21.5], moderately hard, weathered.																	
@ 6.52 m [21.4'] & 6.95 m [22.8'], 45° slickensided shear.																	
Bottom of Boring - 7.32 m [24.0']																	



CALCULATED
T.A.H.
CHECKED BY
A.E.N.

DATE
02/02/01

REVIEWED BY
T.A.H.
DRAWN BY
J.L.P.

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO.-MEG 33-05810
OVER TRIBUTARY TO SHADE RIVER

ATH-33-40.981

7 / 7

862
949