A portion of the subsurface information for U-2519CB was included in the subsurface inventory for U-2519DA. Please refer to correct inventory for the section of the project you wish to view.

ID: U-2519DA

CONTRACT: C202829

CONTENTS

NOTE: SEE SHEET 2A FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

LINE	STATION	PLAN	PROFILE	XSECTS
-L-	9+80-39+40	4-12	19-27	79-137
-COL1-	18+20.586-40+75.5	7, 9-10, 12	28-34	108-123, 131-149
-COL2-	12+99.474-39+40	5-8, 10-11	35-42	88-104, 124-130
-RP1DB-	8+86.127-25+02.083	7-9, 15-16	43-47	97-99, 150-152
-RP1BD-	17+72.399-40+00	8-10, 12-13	48+54	153-166
-RP1A-	10+00-18+07.437	8,10,13	55-57	167-168
-RP1B-	10+00-15+39.350	8,13	58	-
-RP1C-	10+00-17+01.928	9, 15	59-60	-
-RP1D-	10+00-14+86.961	9-10,15	61-62	161-165
-LP1B-	10+00-14+68.808	8	63-64	-
-LP1D-	10+00-14+68.808	9	65-66	-
-RP2B-	10+00-12+40	11	67	-
-RP3C-	10+00-15+07.685	18	68	-
-Y1-	8+00-35+80	8-9,13-18	-	153-157, 169-174
-TT1-	10+00-11+61.707	8,13	69	-
-TT3-	10+00-13+42.324	8	70	-
-TT4-	10+00-35+68.068	4-8, 13	71-74	175
-TT5-	10+00-17+88.776	13-14	75-76	-
-TT6-	10+00-18+40	8,10-11	77-78	-
RW1	-	176	177	-
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

ROADWAY SUBSURFACE INVESTIGATION

STATE PROJ. 34817.1.2 I.D. U-2519DA F.A. PROJ. DPR-0100(001)

COUNTY CUMBERLAND

PROJECT DESCRIPTION FAYETTEVILLE OUTER LOOP FROM EAST OF SR 1415 TO EAST OF NC 24 (BRAGG BLVD.)

INVENTORY

METRIC

ALL DIMENSIONS IN THESE PLANS ARE IN METERS AND/OR MILLIMETERS UNLESS OTHERWISE SHOWN

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2519DA	1	188

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34817.1.2	NHF-DPR-0100(001)	PE
34817.2.4	NHF-100(9)	R/W and UTIL
34817.3.12	NHF-0100(21)	CONST

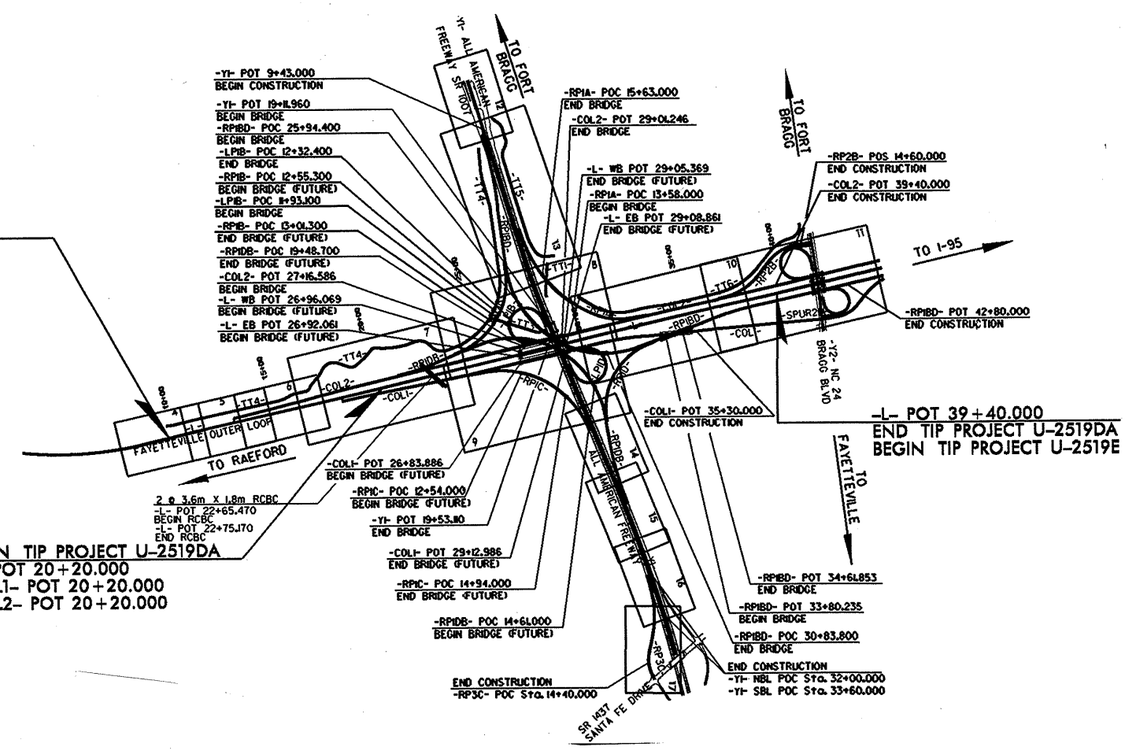
CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL UNIT @ (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA IS PART OF THE CONTRACT.

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

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

-L- POT 9+80.000 LA =
BEGIN R/W PROJECT U-2519DA
-L- POT 996+86.94 (ENGLISH) LB
END R/W PROJECT U-2519CB



NC DOT PERSONNEL
C.D. CZAJKA

F&R PERSONNEL
L.B. GILCHRIST
J.W. GILCHRIST
D.A. CARR
J.D. SECHULSTER
T.N. FICKLING
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MACTEC PERSONNEL
D.E. RHODES
B. MILLER

INVESTIGATED BY C.A. YOUNGBLOOD
CHECKED BY N.T. ROBERSON
SUBMITTED BY N.T. ROBERSON
DATE OCTOBER 2007

NORTH CAROLINA LICENSED SEAL 1959 GEOLOGIST CHERYL A. YOUNGBLOOD
10/2/07

DRAWN BY: T.T. WALKER, F.W. RACEY, JR., C.D. CZAJKA

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NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
U-2519DA	34817.1.2	2	188

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

METRIC

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER 30 cm ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

VERY STIFF, GRAY SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤35% PASSING #200)							SILT-CLAY MATERIALS (>35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING # 10	50 MX											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
# 40	30 MX	50 MX	51 MN											
# 200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN			
LIQUID LIMIT / PLASTIC INDEX	6 MX		N.P.	40 MX / 10 MX	41 MN / 10 MX	40 MX / 11 MN	41 MN / 11 MN	40 MX / 10 MX	41 MN / 10 MX	40 MX / 11 MN	41 MN / 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0	0	4 MX			8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

P.I. OF A-7-5 ≤ L.L. - 30 ; P.I. OF A-7-6 > L.L. - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (kN/m^2)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	<4 4 TO 10 10 TO 30 30 TO 50 >50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	<2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 >30	<25 25 TO 50 50 TO 100 100 TO 200 200 TO 400 >400

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.0	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F. SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE MM: 305 | 75 | 2.0 | 0.25 | 0.05 | 0.005
GRAIN SIZE IN.: 12" | 3"

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL — SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED- INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE
UNIFORM- INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE (ALSO POORLY GRADED).
GAP-GRADED- INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS; ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 30
MODERATELY COMPRESSIBLE	LIQUID LIMIT 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT- CLAY SOILS
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%
MODERATELY ORGANIC	5 - 10%	12 - 20%
HIGHLY ORGANIC	>10%	>20%

OTHER MATERIAL	
TRACE	1 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
HIGHLY	35% AND ABOVE

GROUND WATER

WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING.
STATIC WATER LEVEL AFTER 24 HOURS.
PW PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA
SPRING OR SEEPAGE

MISCELLANEOUS SYMBOLS

ROADWAY EMBANKMENT WITH SOIL DESCRIPTION
SOIL SYMBOL
ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS
INFERRED SOIL BOUNDARIES
INFERRED ROCK LINE
ALLUVIAL SOIL BOUNDARY
25/025 DIP/DIP DIRECTION OF ROCK STRUCTURES
SOUNDING ROD

SPT CPT DPT DMT VST PMT TEST BORING
AUGER BORING
CORE BORING
MW MONITORING WELL
PIEZOMETER INSTALLATION
SLOPE INDICATOR INSTALLATION
SPT N-VALUE
REF SPT REFUSAL

SAMPLE DESIGNATIONS
S- BULK SAMPLE
SS- SPLIT SPOON SAMPLE
ST- SHELBY TUBE SAMPLE
RS- ROCK SAMPLE
RT- RECOMPACTED TRIAXIAL SAMPLE
CBR - CBR SAMPLE

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F. - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED
FRAGS. - FRAGMENTS
MED. - MEDIUM
PMT - PRESSUREMETER TEST
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT
W - MOISTURE CONTENT
V. - VERY
VST - VANE SHEAR TEST

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B-___
- [ ] BK-51
- [X] CME-45B MARSH BUGGY
- [X] CME-550
- [X] CME-45C TRACK
- [X] CME-550 TRACK
- [X] CME-55 SKID

ADVANCING TOOLS:
- [ ] CLAY BITS
- [X] 152 mm CONTINUOUS FLIGHT AUGER
- [X] 203 mm HOLLOW AUGERS
- [X] HARD FACED FINGER BITS
- [X] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [ ] TRICONE ____ mm STEEL TETH
- [ ] TRICONE ____ mm TUNG.-CARB.
- [ ] CORE BIT
- [X] 76.2mm DRAG BIT

HAMMER TYPE:
- [X] AUTOMATIC [X] MANUAL

CORE SIZE:
- [ ] -B_____
- [ ] -N_____
- [ ] -H_____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [X] HAND AUGER
- [ ] SOUNDING ROD
- [X] VANE SHEAR TEST
- [X] DCP

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 2.5 cm PER 50 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLOWS:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT YIELDS SPT N VALUES > 100 BLOWS PER 30 cm.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V. SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 2.5 cm. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
SEVERE (SEV.)	ALL ROCKS EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BLOWS PER 30 cm.*
VERY SEVERE (V. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS SPT N VALUES < 100 BLOWS PER 30 cm.*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 6 mm DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 1 mm DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 25 mm MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOFT	CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL CENTIMETERS IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 25 mm OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 3 m
WIDE	1 TO 3 m
MODERATELY CLOSE	30 TO 100 cm
CLOSE	5 TO 30 cm
VERY CLOSE	LESS THAN 5 cm

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 1 m
THICKLY BEDDED	0.5 - 1 m
THINLY BEDDED	0.05 - 0.5 m
VERY THINLY BEDDED	10 - 50 mm
THICKLY LAMINATED	2.5 - 10 mm
THINLY LAMINATED	< 2.5 mm

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N) OF A 63.5 kg HAMMER FALLING 0.76 METERS REQUIRED TO PRODUCE A PENETRATION OF 30 cm INTO SOIL WITH A 5 cm OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS LESS THAN 2.5 cm PENETRATION WITH 50 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: XXX
XXX
XXX ELEVATION: XXX

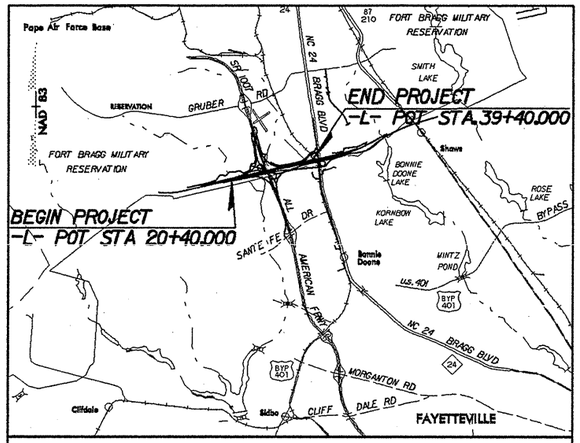
NOTES:

REVISED 09/15/00

TIP PROJECT: U-2519DA

PROJECT: 34817.2.4

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

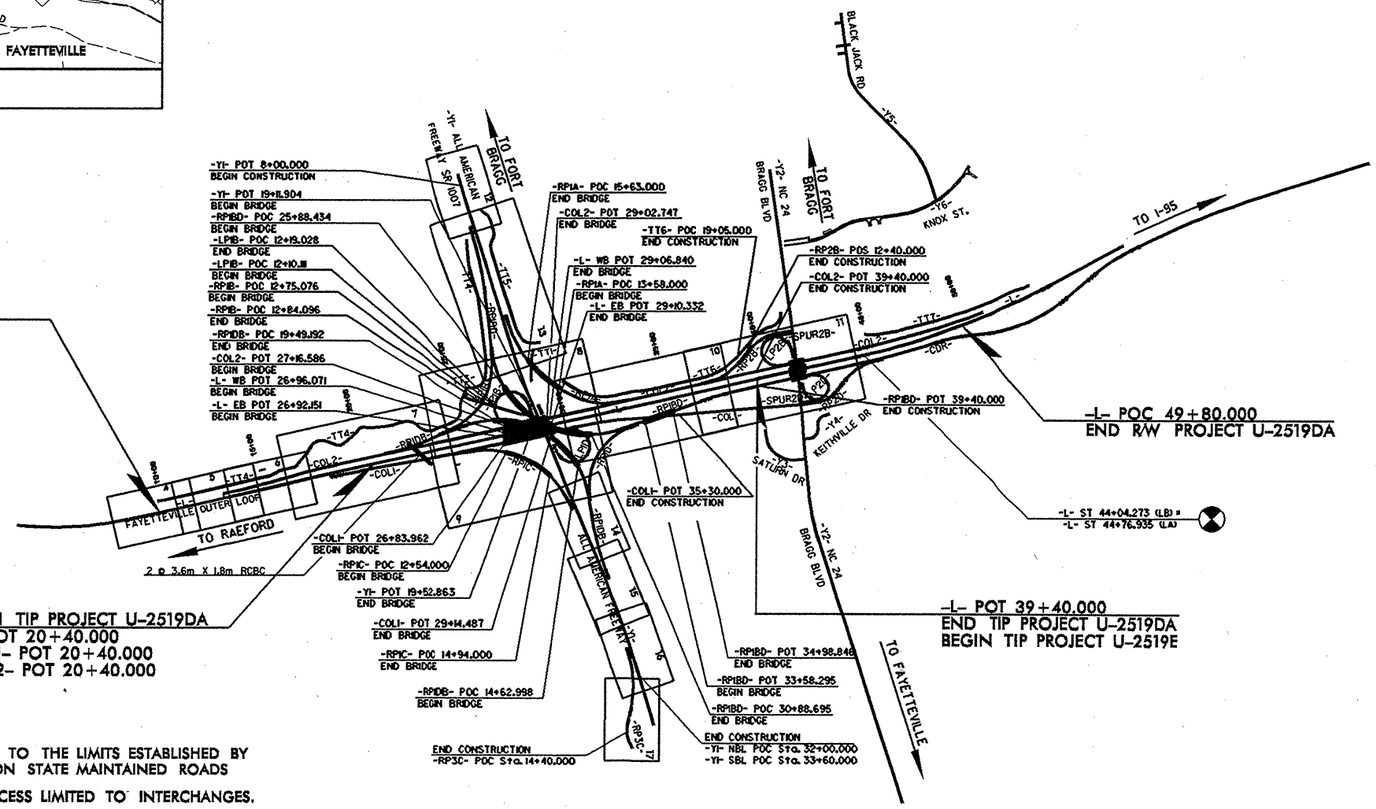
LOCATION: FAYETTEVILLE OUTER LOOP FROM EAST OF SR 1415 TO WEST OF NC 24 (BRAGG BOULEVARD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, CULVERTS, & SIGNING

ALL DIMENSIONS IN THESE PLANS ARE IN METERS AND/OR MILLIMETERS UNLESS OTHERWISE SHOWN

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2519DA	2A	188

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34817.1.2	NHF-DPR-0100(001)	P.E.
34817.2.4	NHF-100(9)	R/W and Utilities



CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II ON FORT BRAGG ROADS, METHOD III ON STATE MAINTAINED ROADS

THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS LIMITED TO INTERCHANGES.

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALE

5 0 10 — PLANS

5 0 10 — PROFILE (HORIZONTAL)

1 0 2 — PROFILE (VERTICAL)

DESIGN DATA

ADT 2007 = 27300
ADT 2030 = 66200
DHV = 9 %
D = 55 %
T = 12 %
(DUALS 8 %, TTST 4 %)
V = 110 km/h

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2519DA	1.667	KM.
LENGTH STRUCTURES TIP PROJECT U-2519DA	0.233	KM.
TOTAL LENGTH TIP PROJECT U-2519DA	1.900	KM.

NOTE: EB LANE BRIDGE STATIONING USED TO DETERMINE LENGTH OF STRUCTURES

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607
PREPARED FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MAY 19, 2006

LETTING DATE: MAY 19, 2009

NCDOT CONTACT: CATHY S. HOUSER, P.E. — ROADWAY DESIGN - PROJECT ENGINEER

DENNIS J. MORY, P.E. — PROJECT ENGINEER

HENRY W. BARE — PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER — SIGNATURE: P.E.

ROADWAY DESIGN — SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER — P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR — DATE

FILE: $FILE$ $TIME$
DATE: $DATE$

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

October 1, 2007

STATE PROJECT: 34817.1.2 (U-2519DA)
FEDERAL PROJECT: NHF-DPR-0100(1)
COUNTY: Cumberland

DESCRIPTION: Fayetteville Outer Loop from east of SR 1415 to west of NC 24 (Bragg Blvd.)

SUBJECT: Geotechnical Report –Inventory

Project Description

The project consists of constructing a four lane divided facility on new location for the Fayetteville Outer Loop (-L-). The project begins east of SR 1415 and extends east for 2.96 kilometers to west of NC 24 (Bragg Blvd.)

A geotechnical investigation was originally conducted in August, September and October, 1998 and additional borings were performed in August and October, 2000 and again in November and December, 2005. Borings were advanced utilizing an ATV-mounted CME-550, two track rigs; one mounted with CME-45C and the other mounted with CME-550, a skid mounted CME-55 and a marsh buggy mounted CME-45B drill machines with automatic and manual hammers and a hand auger. Standard Penetration Tests were performed at selected locations and additional borings were advanced using continuous flight augers. Representative soil samples were collected for visual classification in the field and selected samples were submitted for laboratory analysis by the Materials and Tests Unit or by Froehling & Robertson, Inc. The following alignments were investigated

Line	Station(±)
-L-	9+80 to 39+40
-COL1-	18+20.586 to 40+75.5
-COL2-	12+99.474 to 39+40
-RP1DB-	8+86.127 to 25+02.083
-RP1BD-	17+72.399 to 40+00
-RP1A-	10+00 to18+07.437
-RP1B-	10+00 to 15+39.350
-RP1C-	10+00 to 17+01.928
-RP1D-	10+00 to 14+86.961
-LP1B-	10+00 to 14+68.808
-LP1D-	10+00 to 14+68.808
-RP2B-	10+00 to 12+40
-RP3C-	10+00 to 15+07.685
-Y1-	8+00 to 35+80
-TT1-	10+00 to 11+61.707
-TT3-	10+00 to 13+42.324
-TT4-	10+00 to 35+68.068
-TT5-	10+00 to 17+88.776
-TT6-	10+00 to 18+40

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT
1589 MAIL SERVICE CENTER
RALEIGH NC 27699-1589

TELEPHONE: 919-250-4088
FAX: 919-250-4237

WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
CENTURY CENTER COMPLEX
ENTRANCE B-2
1020 BIRCH RIDGE DRIVE
RALEIGH NC

Areas of Special Geotechnical Interest

1) Plastic and Highly Plastic Clays: Plastic clays and clayey sands with plasticity indices above 20 were encountered on the project at the following intervals

Line	Station (±)
-L-	9+80 to 14+48.5
-L-	16+88 to 17+99
-L-	22+21 to 23+42.5
-L-	24+62.4 to 25+23.2
-COL1-	19+91 to 20+94
-COL2-	13+58 to 14+25
-COL2-	17+02.5 to 18+47
-RP1BD-	22+38.5 to 23+91.5
-RP1A-	16+10 to18+07.437
-RP1D-	12+59.5 to 14+19
-RP3C-	10+00 to 13+20
-TT3-	11+53.4 to 12+58.9
-TT4-	10+99 to 13+07
-TT4-	17+28.8 to 17+92.2
-TT4-	31+29 to 34+02
-TT4-	35+12 to 35+67.360
-TT6-	20+84.8 to 22+06.5

Clay materials encountered in the Cape Fear Formation are generally moderately to highly plastic.

2) Organic Soils: The following sections contain organic soils that were encountered on the project.

Line	Station (±)
-L-	15+22 to 15+57
-L-	21+86.5 to 23+46
-L-	27+08 to 29+15
-L-	31+20 to 32+76
-COL1-	22+06 to 23+80
-COL1-	32+75 to 32+86
-COL2-	15+60.7 to 15+72
-COL2-	21+99.6 to 22+53.3
-COL2-	27+27 to 29+09
-COL2-	30+23 to 31+72
-RP1DB-	23+11 to 24+09
-RP1BD-	27+41 to 28+08.5
-RP1BD-	32+60 to 33+38.4
-RP1D-	14+32 to 14+86.961
-LP1B-	14+20.5 to 14+68.808

3) Groundwater: The following areas exhibit a high water table, seasonal high ground water or the potential for groundwater related construction problems

Line	Station (±)
-L-	15+22 to 15+57
-L-	21+86.5 to 23+46
-L-	31+20 to 32+76
-COL1-	22+25 to 23+80
-COL1-	32+39 to 32+89
-COL2-	21+37 to 23+25
-COL2-	30+40 to 31+00
-RP1BD-	23+05 to 24+66
-RP1BD-	32+86 to 33+32
-TT3-	10+83 to 13+42.324
-TT4-	16+26 to 16+59
-TT5-	15+46 to 15+89

4) Monitoring Wells: USGS monitoring wells were found within the proposed right of way at the following stations

Line	Station (±) and Offset m.(±)
-RP1A-	USGS MW#16: 10+48.6, 21.2m RT.
-RP1A-	USGS MW#7: 12+61.9, 27.5m LT.
-RP1A-	USGS MW#6: 12+65.7, 27.9m LT.
-RP1A-	USGSMW#5: 13+59.7, 59.0m RT.

Other wells may be present along the project corridor that were not detected

5) Debris: Concrete debris were located within the right of way at the following stations

Line	Station (±)
-L-	9+85, 18m Lt.
-L-	9+91, 22m Lt.
-L-	10+74, 16.5m Rt.
-L-	10+74, 21.0m Rt.
-L-	10+99, 1.5m Lt.
-L-	10+99, 3.0m Rt.
-L-	11+03, 5.5m Lt.
-L-	11+08, 9.8m Rt.
-L-	11+27, 25m Lt.
-L-	11+28, 42m Lt.

6) Old Building Foundations: Remnant concrete building foundations, concrete drainage channel, in/above ground metal pipes and underground metal bunkers were found within the proposed right of way between the following stations

Line	Station (±)
-L-	9+80 to 15+40

The building foundation are shown on the plan view at approximate locations. They were mapped by F&R's field personnel using ground survey provided by NCDOT Location and Surveys Unit and historic plan sheets and utility maps provided by Fort Bragg.

7) Abandoned Sewer Lines: Abandoned sanitary sewer lines with manholes were found within the proposed right of right at the following stations

Line	Station (±)
-L-	10+22.0, 34.5m Lt.
-L-	11+46.0, 35.0m Lt.
-L-	12+68.0, 37.0m Lt.
-L-	13+80.0, 31.0m Lt.
-L-	15+18.0, 76.5m Lt.

Physiography and Geology

The project is located in the flat to gently rolling terrain of the Coastal Plain Physiographic Province. Land use along the project corridor consists of Fort Bragg Military Reservation, homes and woods. Geologically, the project located within the Middendorf Formation underlain by the Cape Fear Formation, both formations are Upper Cretaceous in age. The formations are derived from the multiple transgressions and regressions of sea level. Soils are derived from coastal plain sediments. Beaver Creek, Big Branch Creek and an unnamed tributary of the Cape Fear River Basin drain the project.

Soil Properties

Soils encountered at the project site include artificial fill, roadway embankment, alluvial and coastal plain sediments that include the Middendorf and Cape Fear Formations.

Artificial Fill soils are present along the existing "soil tank trails" on Fort Bragg Military Reservation. These soils consist of tan to red brown, dry, very loose to medium dense, silty sand (A-2-4).

Roadway Embankment soils are present along the existing All American Freeway. These soils primarily consist of tan, orange to red, dry to moist, medium dense to dense, fine, silty and clayey sand (A-3, A-2-4, A-2-6) and stiff, silty clay (A-7-6).

Alluvial deposits are located within Beaver Creek, Big Branch Creek, unnamed creek and unnamed tributaries and wetland areas that traverse the project. These soils are primarily gray to black, moist to saturated, very loose to loose, fine, silty and clayey sand (A-3, A-2-4, A-2-6) with little to moderate organic matter and soft, sandy silt (A-4), sandy and silty clay (A-6, A-7-6) with high plasticity and little to high organic content.

Middendorf Formation soils occur at or near the ground surface along the entire project. They are comprised of tan, gray, and red-brown, dry to saturated, very loose to dense, silty, clayey, fine to coarse sand (A-2-4, A-2-6, A-3, A-1-b) and red-brown, tan to gray, dry to saturated, soft to very stiff, sandy and silty clay (A-6, A-7-6) with low to high plastic indices. Lesser amounts of tan-gray, moist to wet, very soft to soft, sandy silt (A-4) are also present.

Cape Fear Formation soils underlie the Middendorf Formation and consist of gray and tan, dry to wet, very stiff to hard, sandy and silty clay, low to highly plastic (A-6, A-7-6) and gray, moist, medium dense to very dense, clayey and silty sand (A-2-6, A-2-4).

Ground Water

Groundwater was encountered in approximately one third of the borings throughout the project. Areas that exhibit high groundwater are listed in "Areas of Special Geotechnical Interest"

Culvert

A double 3.6m x 1.8m RCBC and four 1200mm RCP will be constructed at -L- 22+70.32. The new culvert will direct the flow of Big Branch Creek across the project on a skew of 55 degrees. There were three standard penetration tests performed on or near the culvert alignment. Alluvial soils were encountered consisting of gray to black, wet to saturated, very loose, fine, silty and clayey sands (A-3, A-2-4, A-2-6) and very soft to soft, sandy silt (A-4) and sandy and silty clays (A-6, A-7-6) with organic content. Coastal Plain soil underlies the alluvial soils and consist of gray, tan and red, dry to saturated, very loose to medium dense, fine, silty sand (A-3, A-2-4) and gray-tan, dry to wet, stiff to very stiff, sandy and silt clay (A-6, A-7-6) of the Middendorf Formation.

A single 1.8m x 1.8m RCBC will be constructed at -L- 30+73, 67.3m Lt. and -RP1A- 12+36.4, 29.8m Lt. This new culvert will direct the flow of a unnamed tributary to Beaver Creek between the -L- and -RP1A- alignments. There were three standard penetration tests performed near the culvert alignment. Alluvial soils were encountered consisting of black and brown, wet to saturated, very loose to loose, silty sand (A-2-4) with organic matter. Coastal Plain soils underlie the alluvial soils and consist of tan, gray and red, moist to saturated, loose to medium dense, coarse, clayey sand (A-1-b, A-2-6) and tan and gray, moist to saturated, medium stiff to hard, sandy and silty clay (A-6, A-7-6).

Prepared by,
Cheryl A. Youngblood
Cheryl A. Youngblood, L.G.
Project Geological Engineer

UNDISTRUBED SAMPLES

The following "Shelby" tube samples was taken to provide data for the in-situ strength of the soil.

Sample No.	Location	Depth (m.)	Test
ST-1	-RP1BD-: 35+78, 19.2m Rt,	4.50-5.11	Triaxial CU
ST-2	-RP1BD-: 35+50, 5.0m Rt.	2.50-2.88	Triaxial CU
ST-3	-RP1BD- 32+54, 6.5m Rt.	4.61-5.23	Triaxial CU

EARTHWORK BALANCE SHEET

Project: U-2519DA
Computed By: CMKR

County: CUMBERLAND

SHEET 1
3C

STATION	UNCLASSIFIED EXCAVATION				UNDERCUT EXCAV.	EMBANKMENT			TOTAL EMB. + 25%	BORROW	WASTE		
	TOTAL	SUITABLE EARTH	ROCK	UNSUITABLE EARTH		TOTAL	EARTH	ROCK			SUITABLE	ROCK	UNSUITABLE
SUMMARY #1													
-L- 20+40.000 TO -L- 26+92.151 (BRIDGE)	9,409	8,244		1,165	9,156	288,980	288,980		361,225	352,981	0		10,321
-RP1DB- 19+48.700 (BRIDGE) TO -RP1DB- 23+90.574	581	581				80,159	80,159		100,199	99,618	0		0
-RP1B- 13+02.124 TO -RP1B- 14+53.283	433	433				11,640	11,640		14,550	14,117	0		0
-RP1C- 11+32.636 TO -RP1C- 12+54.000	0	0				14,680	14,680		18,350	18,350	0		0
-LP1B- 10+89.657 TO -LP1B- 11+93.100 (BRIDGE)	110	110				21,963	21,963		27,454	27,344	0		0
-LP1B- 12+32.400 (BRIDGE) TO -LP1B- 14+12.799	8,695	8,695				5,349	5,349		6,686	0	2,009		0
-TT4- 17+06.175 TO -TT4- 27+20.000	224	224				4,492	4,492		5,615	5,391	0		0
SUBTOTAL: SUMMARY #1	19,452	18,287	0	1,165	9,156	427,263	427,263	0	534,079	517,801	2,009	0	10,321
SUMMARY #2													
-L- 29+10.332 (BRIDGE) TO -L- 39+40.000	22,659	22,659			6,324	518,593	518,593		648,241	625,582	0		6,324
-COL1- 30+40.000 TO -COL1- 35+30.000	2,976	2,976			436	77,247	77,247		96,559	93,583	0		436
-RP1BD- 30+83.800 (BRIDGE) TO -RP1BD- 33+80.235 (BRIDGE)	0	0			2,932	159,656	159,656		199,570	199,570	0		2,932
-RP1BD- 34+61.853 (BRIDGE) TO -RP1BD- 39+40.000	0	0				63,847	63,847		79,809	79,809	0		0
-RP1A- 11+16.392 TO -RP1A- 13+58.000	0	0				52,272	52,272		65,340	65,340	0		0
-TT6- 10+00.000 TO -TT6- 18+48.673	38	38				1,758	1,758		2,198	2,160	0		0
-RP2B- 10+78.525 TO -RP2B- 12+40.000	0	0				8,531	8,531		10,664	10,664	0		0
SUBTOTAL: SUMMARY #2	25,673	25,673	0	0	9,692	881,904	881,904	0	1,102,381	1,076,708	0	0	9,692
SUMMARY #3													
-Y1- 9+43.000 TO -Y1- 19+11.810 LT. (BRIDGE)	4,194	4,194				5,341	5,341		6,676	2,482	0		0
-Y1- 9+67.474 TO -Y1- 19+11.810 RT. (BRIDGE)	15,140	15,140				4,573	4,573		5,716	0	9,424		0
-RP1BD- 20+25.588 TO -RP1BD- 25+94.000 (BRIDGE)	27,029	15,673		11,356	587	12,770	12,770		15,963	290	0		11,943
-RP1A- 15+63.000 (BRIDGE) TO -RP1A- 16+87.284	7,405	2,661		4,744	524	1,381	1,381		1,726	0	935		5,268
-RP1B- 10+76.394 TO -RP1B- 12+57.165 (BRIDGE)	4,086	4,086				1,983	1,983		2,479	0	1,607		0
-TT1- 10+00.000 TO -TT1- 11+61.707	266	266				130	130		163	0	103		0
-TT3- 10+62.339 TO -TT3- 13+25.057	32,428	32,428				54	54		68	0	32,360		0
-TT4- 27+20.000 TO -TT4- 35+68.068	315	315				1,937	1,937		2,421	2,106	0		0
-TT5- 11+90.000 TO -TT5- 17+88.776	1,121	1,121				1,297	1,297		1,621	500	0		0
SUBTOTAL: SUMMARY #3	91,984	75,884	0	16,100	1,111	29,466	29,466	0	36,833	5,378	44,429	0	17,211
SUMMARY #4													
-Y1- 19+56.000 (BRIDGE) TO -Y1- 30+00.000 LT.	24,269	24,269				8,224	8,224		10,280	0	13,989		0
-Y1- 19+56.000 (BRIDGE) TO -Y1- 30+00.000 RT.	3,437	3,437				20,897	20,897		26,121	22,684	0		0
-RP1DB- 10+96.266 TO -RP1DB- 14+61.000 (BRIDGE)	16,488	16,488				41,601	41,601		52,001	35,513	0		0
-RP1C- 14+94.000 (BRIDGE) TO -RP1C- 16+10.268	0	0				13,091	13,091		16,364	16,364	0		0
-RP1D- 10+56.603 TO -RP1D- 13+99.357	14	14				72,762	72,762		90,953	90,939	0		0
-LP1D- 10+80.823 TO -LP1D- 14+04.723	161,959	161,959				8,847	8,847		11,059	0	150,900		0
SUBTOTAL: SUMMARY #4	206,167	206,167	0	0	0	165,422	165,422	0	206,778	165,500	164,889	0	0
SUMMARY #5													
-Y1- 30+00.000 TO -Y1- 32+00.000 LT.	509	509				19	19		24	0	485		0
-Y1- 30+00.000 TO -Y1- 33+60.000 RT.	1,798	1,798				480	480		600	0	1,198		0
-RP3C- 11+44.632 TO -RP3C- 14+40.000	382	382				779	779		974	592	0		0
SUBTOTAL: SUMMARY #5	2,689	2,689	0	0	0	1,278	1,278	0	1,598	592	1,683	0	0

Note: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

Note: Quantities are approximate only. The Resident Engineer will recross-section the work accurately when the project is staked out. These cross-section notes will be used in computing the final quantities for which the contractor will be paid.

EARTHWORK BALANCE SHEET

Project: U-2519DA

County: CUMBERLAND

SHEET 2

3D

STATION	UNCLASSIFIED EXCAVATION				UNDERCUT EXCAV.	EMBANKMENT			TOTAL EMB. + 25%	BORROW	WASTE		
	TOTAL	SUITABLE EARTH	ROCK	UNSUITABLE		TOTAL	EARTH	ROCK 0%			SUITABLE EARTH	ROCK	UNSUIT.
SUBTOTAL (SUMMARIES 1-5)	345,965	328,700	0	17,265	19,959	1,505,333	1,505,333	0	1,881,669	1,765,979	213,010	0	37,224
SHOULDER MATERIAL						15,500	15,500		19,375	19,375			
LOSS DUE CLEARING & GRUBBING	(6,500)	(6,500)								6,500			
GRADE POINT UNDERCUT					1,000	1,000	1,000		1,250	1,250			1,000
ADDITIONAL UNDERCUT EXCAVATION					7,000	7,000	7,000		8,750	8,750			7,000
WASTE TO BE USED IN LIEU OF BORROW										(213,010)	(213,010)		
CHIPPED TIRES TO BE USED IN LIEU OF BORROW										(18,130)			
PROJECT TOTAL	339,465	322,200	0	17,265	27,959	1,528,833	1,528,833	0	1,911,044	1,570,714	0	0	45,224
ESTIMATE 5% TO REPLACE TOPSOIL IN BORROW PITS										78,536			
GRAND TOTAL	339,465	322,200	0	17,265	27,959	1,528,833	1,528,833	0	1,911,044	1,649,250	0	0	45,224
SAY	339,500				28,000					1,649,300			
CL IV SUBGRADE STABILIZATION = 1200 mtons													
SHALLOW UNDERCUT = 600 m^3													
DRAINAGE DITCH EXCAVATION = 4660 m^3													
SELECT GRANULAR MATERIAL = 28,700 m^3													
PAVEMENT STRUCTURE VOLUME = 9,900 m^3													

NOTE: EARTH TO BE DISPLACED BY ROCK TO BE SWELLED BY 0%

Note: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

Note: Embankment volumes shown include additional volume for 125mm over subgrade for Grading & Structure only plans

Note: Quantities are approximate only. The Resident Engineer will recross-section the work accurately when the project is staked out. These cross-section notes will be used in computing the final quantities for which the contractor will be paid.

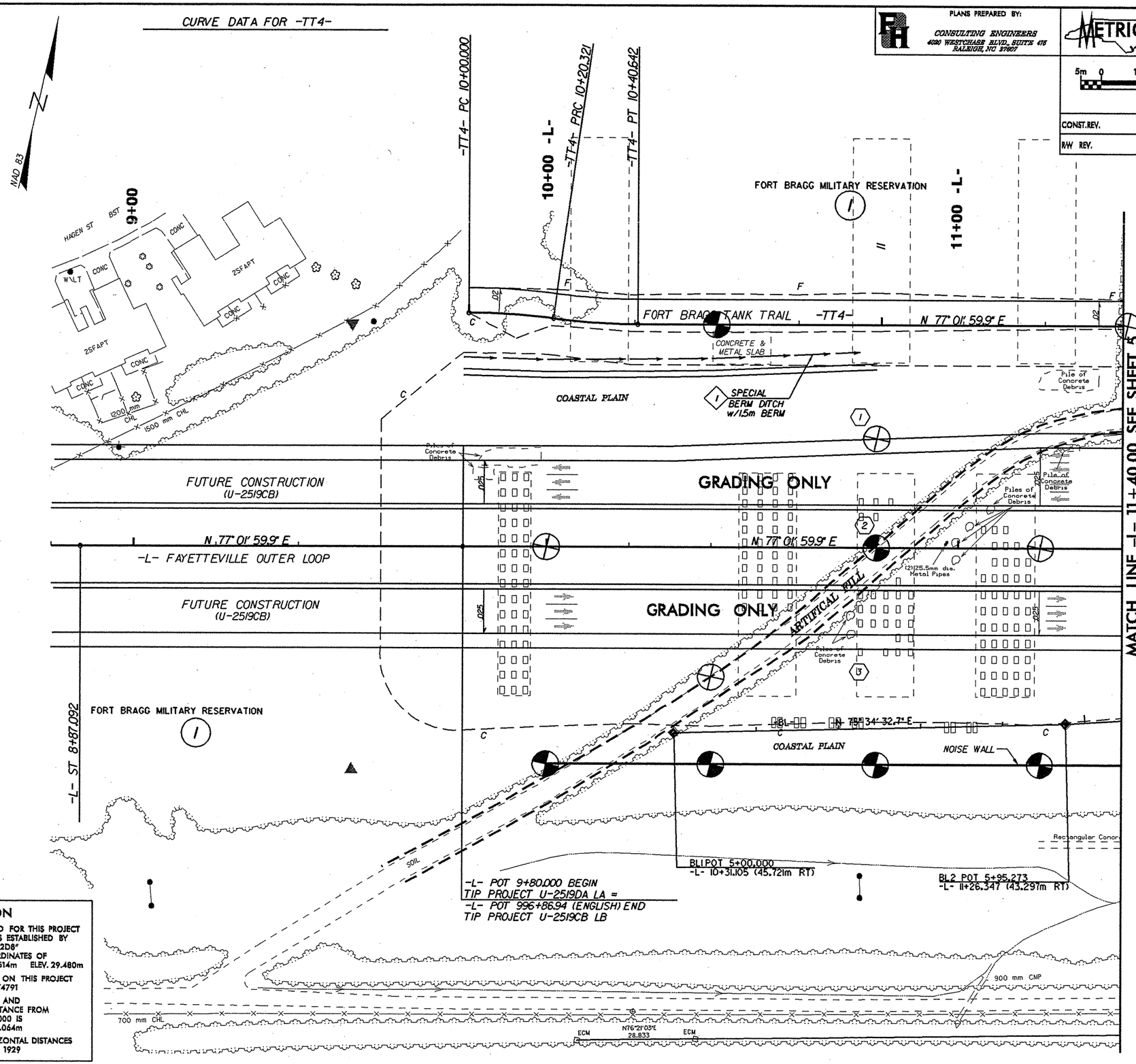
PLANS PREPARED BY:
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.
R/W REV.



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT GPS FOR MONUMENT "X2D8" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 154,807.5364m EASTING: 625,333.9514m ELEV. 29.480m

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999874791

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "X2D8" TO -L- STATION 9+80.000 IS S 74°-34'-18.5" W 15,854.064m

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NGVD 1929

FILE: $FILES
DATE: $DATE$ $TIME$

SEE SHEETS 30-37 FOR -L- PROFILE
SEE SHEETS 85-89 FOR -TT4- PROFILE

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4030 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

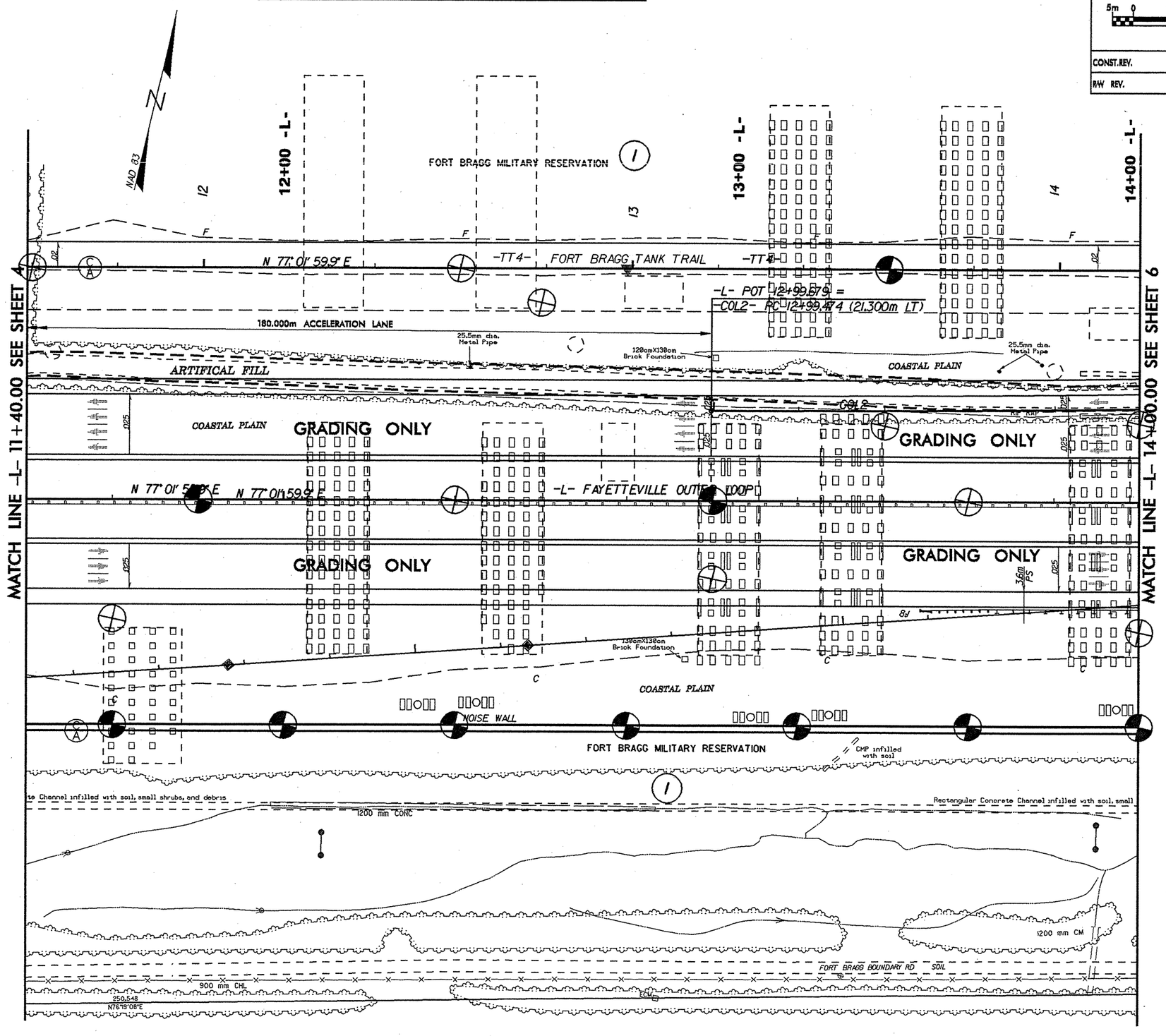
METRIC
5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.
R/W REV.

CURVE DATA FOR -COL2-



SEE SHEETS 30-37 FOR -L- PROFILE
SEE SHEETS 42-47 FOR -COL2- PROFILE
SEE SHEETS 85-89 FOR -TT4- PROFILE

FILE: SFILES
DATE: $DATE$ $TIME$

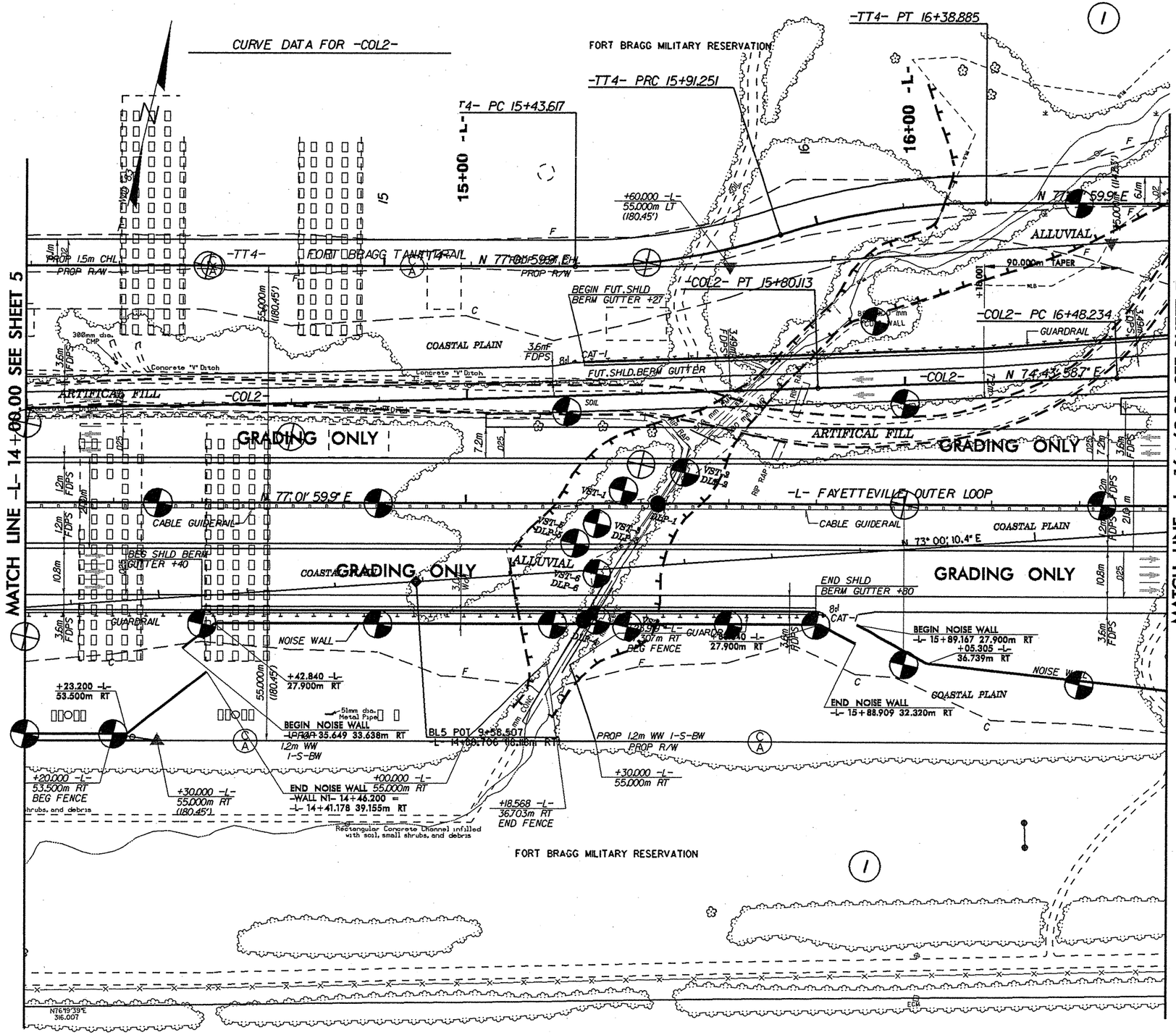
PLANS PREPARED BY:
CONSULTING ENGINEERS
4030 WESTCHASE BLVD. SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

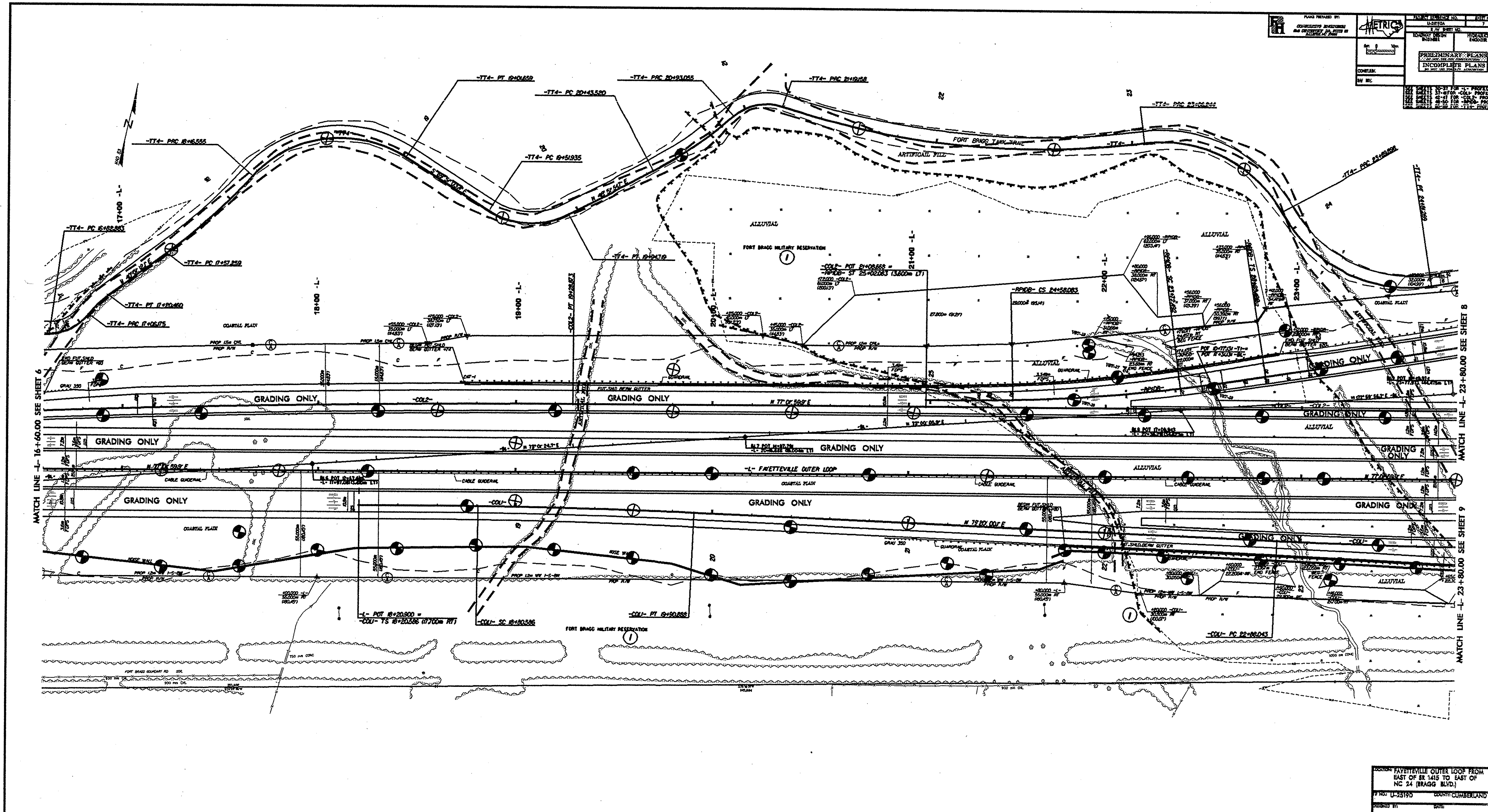
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

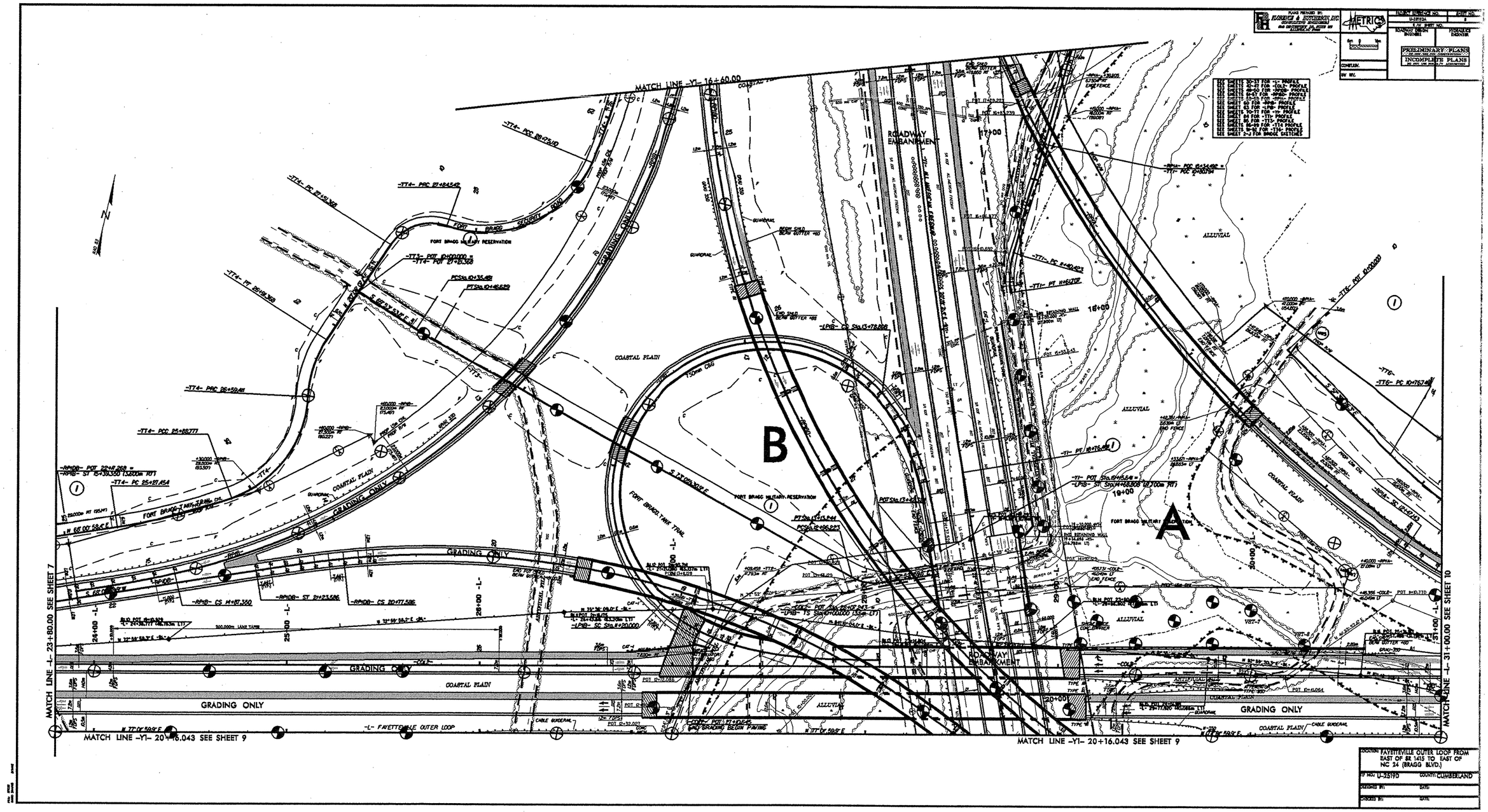
CONST. REV.
R/W REV.



SEE SHEETS 30-37 FOR -L- PROFILE
SEE SHEETS 42-47 FOR -COL2- PROFILE
SEE SHEETS 85-89 FOR -TT4- PROFILE

FILE: $FILE$
DATE: $DATE$ $TIME$


PLANS PREPARED BY:
CONSULTING ENGINEERS
METRIC
PROJECT REFERENCE NO.
SHEET NO.
U-2519DA
7
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
CONST.REV.
R/W REV.
SEE SHEETS 30-37 FOR -L- PROFILE
SEE SHEETS 37-41 FOR -COLl- PROFILE
SEE SHEETS 42-47 FOR -COL2- PROFILE
SEE SHEETS 48-50 FOR -RPIDB- PROFILE
-TT4- PRC 18+16.555
-TT4- PT 19+01.659
-TT4- PC 20+43.520
-TT4- PRC 20+93.055
-TT4- PRC 21+19.158
-TT4- PC 19+51.935
-TT4- PT 19+94.719
-TT4- PC 16+82.883
-TT4- PC 17+57.259
-TT4- PT 17+20.460
-TT4- PRC 17+06.175
-TT4- PRC 23+69.895
17+00 -L-
18+00 -L-
19+00 -L-
20+00 -L-
21+00 -L-
22+00 -L-
23+00 -L-
-COL2- PT 19+28.873
-COL2- POT 21+08.668 =
-RPIDB- ST 25+02.083 (3.600m LT)
-RPIDB- CS 24+58.083
FORT BRAGG TANK TRAIL
ARTIFICAIL FILL
ALLUVIAL
FORT BRAGG MILITARY RESERVATION
COASTAL PLAIN
GRADING ONLY
-COL2-
-RPIDB-
-COL1-
N 77° 01' 59.9" E
N 73° 01' 24.1" E
N 73° 00' 05.9" E
N 79° 20' 00.1" E
-L- FAYETTEVILLE OUTER LOOP
CABLE GUIDERAIL
GUARDRAIL
NOISE WALL
FUT. SHLD. BERM GUTTER
END FENCE
PROP R/W
MATCH LINE -L- 16+60.00 SEE SHEET 6
MATCH LINE -L- 23+80.00 SEE SHEET 8
MATCH LINE -L- 23+80.00 SEE SHEET 9
-L- POT 18+20.900 =
-COL1- TS 18+20.586 (17.700m RT)
-COL1- SC 18+80.586
-COL1- PT 19+90.888
-COL1- PC 22+88.043
FORT BRAGG BOUNDARY RD
LOCATION: FAYETTEVILLE OUTER LOOP FROM EAST OF SR 1415 TO EAST OF NC 24 (BRAGG BLVD.)
TIP NO.: U-2519D
COUNTY: CUMBERLAND
DESIGNED BY:
DATE:
CHECKED BY:
DATE:

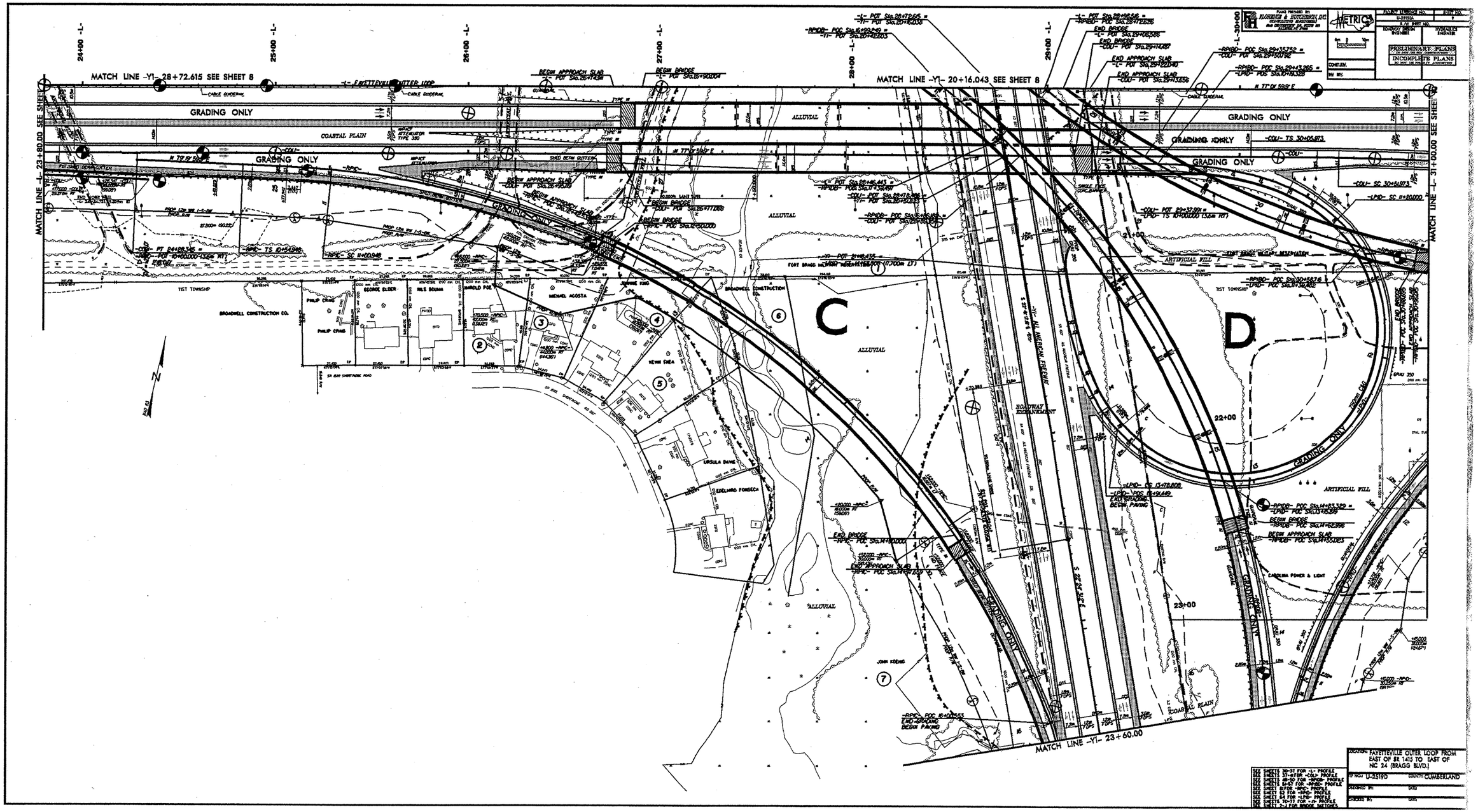


LOCATION: FAYETTEVILLE OUTER LOOP FROM EAST OF SR 1415 TO EAST OF NC 24 (BRAGG BLVD.)

TIP NO.: U-2519D COUNTY: CUMBERLAND

DESIGNED BY: DATE:

CHECKED BY: DATE:


MATCH LINE -Y1- 28+72.615 SEE SHEET 8
MATCH LINE -Y1- 20+16.043 SEE SHEET 8
MATCH LINE -L- 23+80.00 SEE SHEET
MATCH LINE -L- 31+00.00 SEE SHEET
MATCH LINE -Y1- 23+60.00
GRADING ONLY
COASTAL PLAIN
ALLUVIAL
ARTIFICIAL FILL
C
D
24+00
25+00
26+00
27+00
28+00
29+00
22+00
23+00
BROADWELL CONSTRUCTION CO.
PHILIP CRAIG
GEORGE ELDER
MICHAEL ACOSTA
KEVIN SHEA
URSULA DAVIS
EDELMIRO FONSECA
JOHN KOENIG
ROADWAY EMBANKMENT
CAROLINA POWER & LIGHT
METRIC
PRELIMINARY PLANS
INCOMPLETE PLANS
LOCATION: FAYETTEVILLE OUTER LOOP FROM EAST OF SR 1415 TO EAST OF NC 24 (BRAGG BLVD.)
TIP NO.: U-2519D
COUNTY: CUMBERLAND

CURVE DATA FOR -RPIA-

CURVE DATA FOR -COLI-

CURVE DATA FOR -RPIBD-

CURVE DATA FOR -RPID-

CURVE DATA FOR -TT6-

PLANS PREPARED BY: HARDESTY & HUTCHENSON, INC. CONSULTING ENGINEERS 800 CONNECTICUT AVE. NORTH OF NORFOLK, CT. 06857 (203) 847-3806

METRIC

CONTRACT NO.

PROJECT REFERENCE NO. U-2519DA — SHEET NO. 10

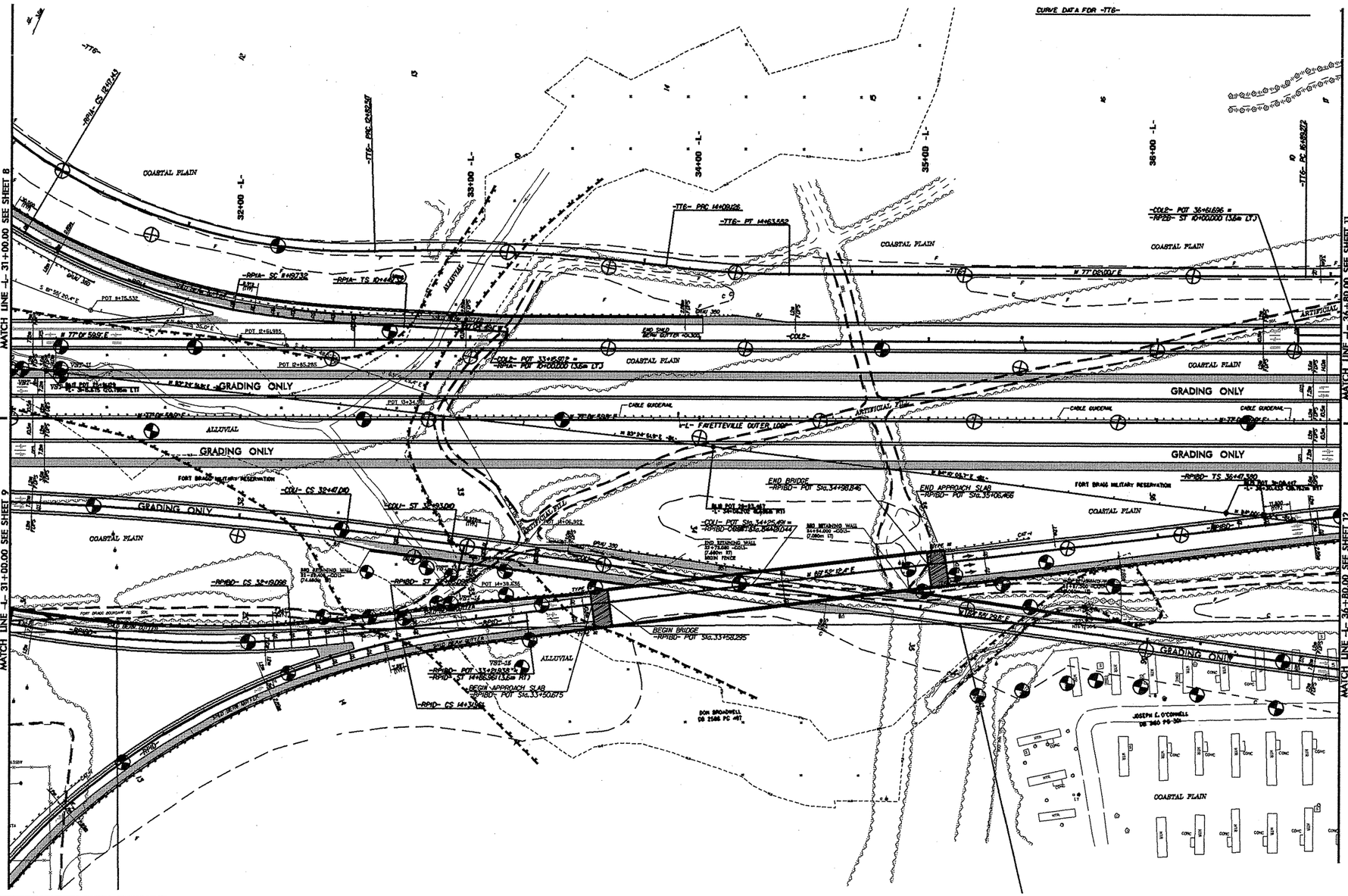
R/W SHEET NO.

ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

PRELIMINARY PLANS — NOT FOR CONSTRUCTION

INCOMPLETE PLANS — DO NOT USE FOR CONSTRUCTION

SHEET 1 TO SHEET 9 FOR -L- PROFILE
SHEET 11 TO SHEET 15 FOR -COLI- PROFILE
SHEET 16 TO SHEET 17 FOR -COLI- PROFILE
SHEET 18 TO SHEET 21 FOR -RPIA- PROFILE
SHEET 22 TO SHEET 27 FOR -RPIBD- PROFILE
SHEET 28 TO SHEET 29 FOR -RPID- PROFILE
SHEET 30 TO SHEET 32 FOR -RPID- PROFILE
SHEET 33 TO SHEET 35 FOR -TT6- PROFILE
SHEET 36 TO SHEET 38 FOR BRIDGE SKETCHES
SHEET 39 TO SHEET 40 FOR WALL DETAILS



LOCATION: FAYETTEVILLE OUTER LOOP FROM EAST OF SR 1415 TO EAST OF NC 24 (BRAGG BLVD.)

TIP NO.: U-2519D — COUNTY: CUMBERLAND

DESIGNED BY: — DATE:

CHECKED BY: — DATE:

PLANS PREPARED BY:
FLORENCE & HUTCHISON, INC.
ENGINEERING CONSULTANTS
1008 CONNECTICUT AVENUE
NEW CANAAN, CONNECTICUT 06840

SHEETS 2-3 FOR -L- PROFILE	
SHEETS 4-5 FOR -COL2- PROFILE	
SHEETS 6-7 FOR -RP2B- PROFILE	
SHEETS 8-9 FOR -LP2B- PROFILE	
SHEETS 10-11 FOR -SPUR2B- PROFILE	
SHEETS 12-13 FOR -TT6- PROFILE	
SHEETS 14-15 FOR -Y2- PROFILE	
SHEETS 16-17 FOR BRIDGE SKETCHES	

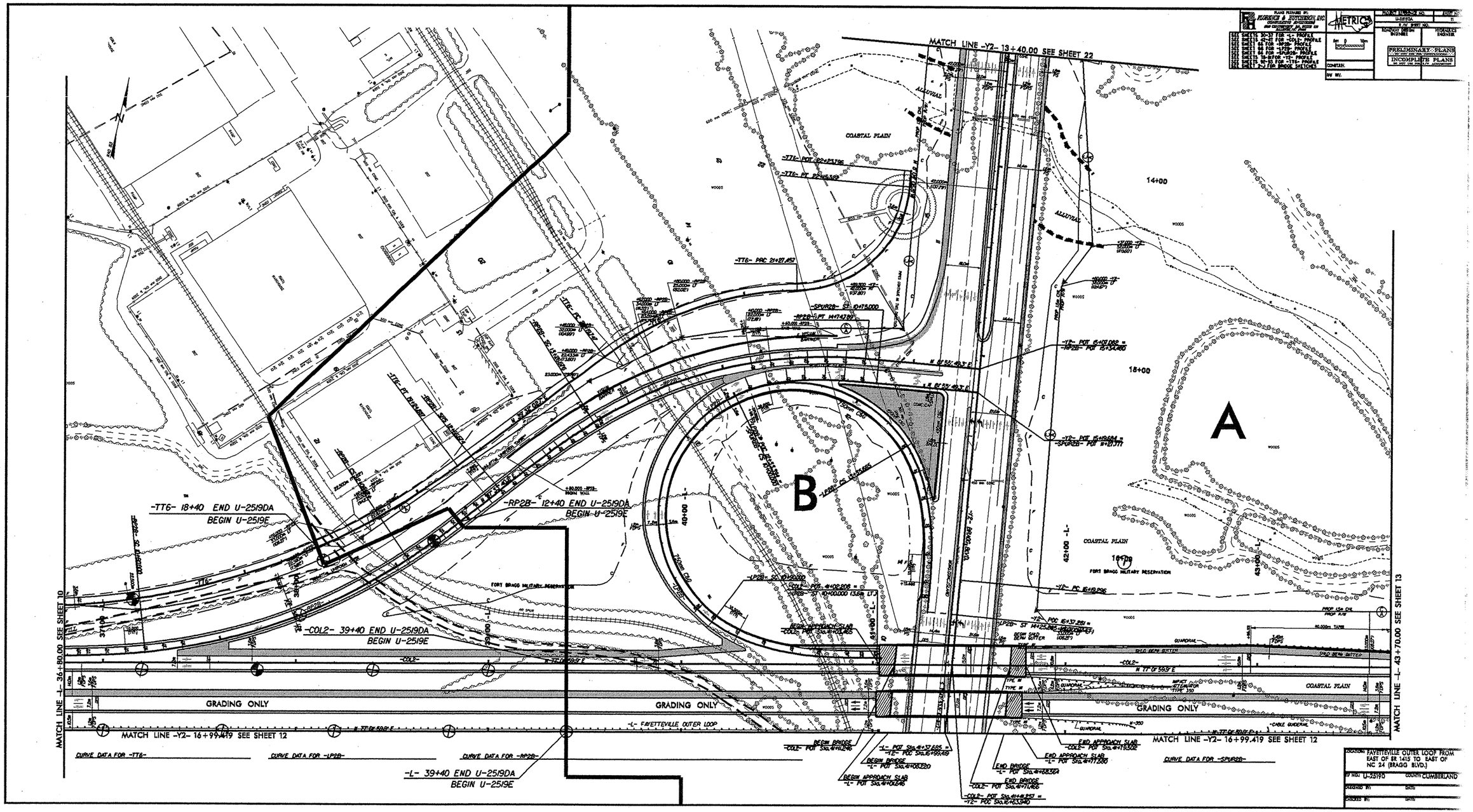
METRIC

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	21
R/W SHEET NO.	
STRUCTURE DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION PURPOSES
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONTRACT:

R/W SKT.

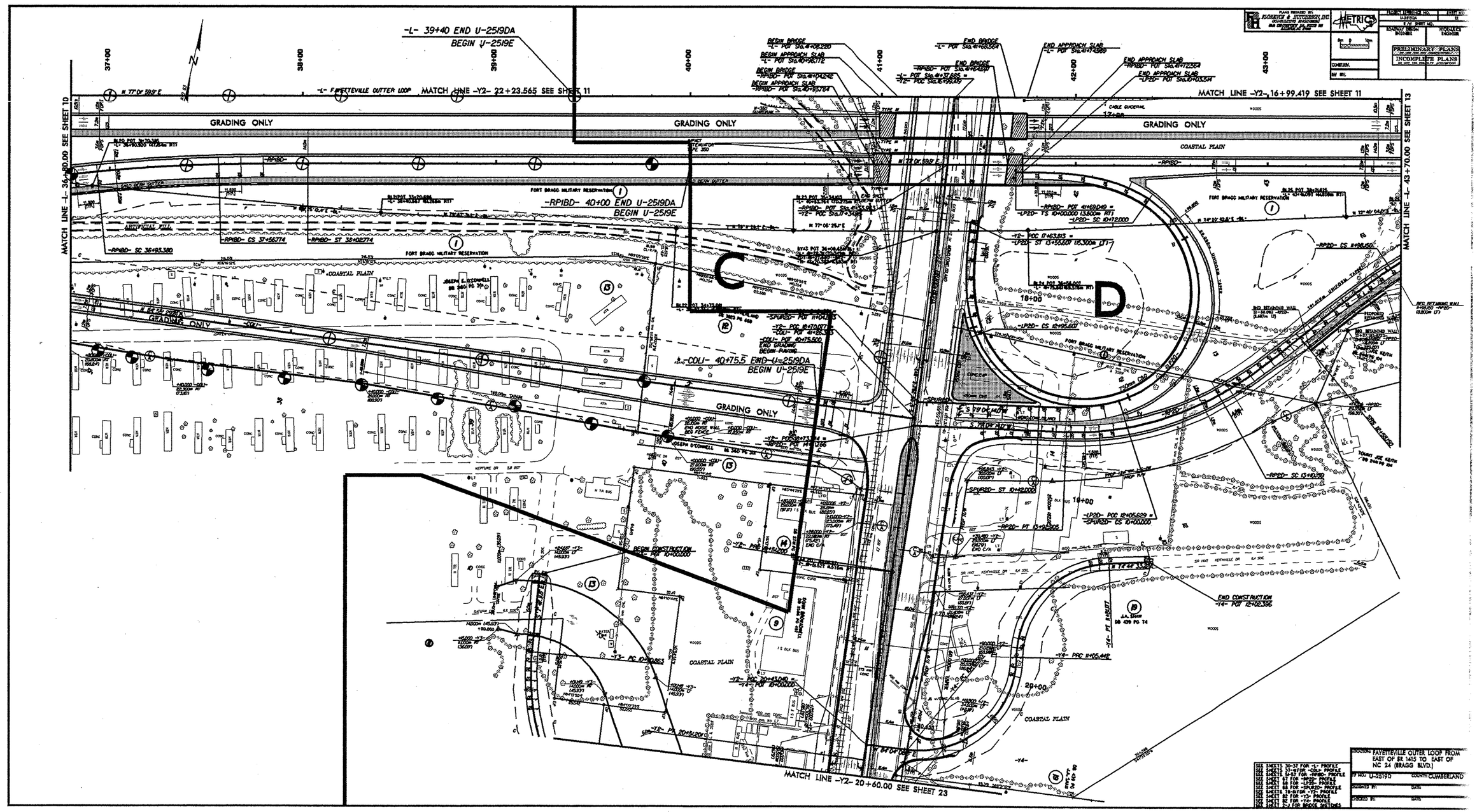


LOCATION: FAYETTEVILLE OUTER LOOP FROM EAST OF SR 1415 TO EAST OF NC 24 (BRAGG BLVD.)

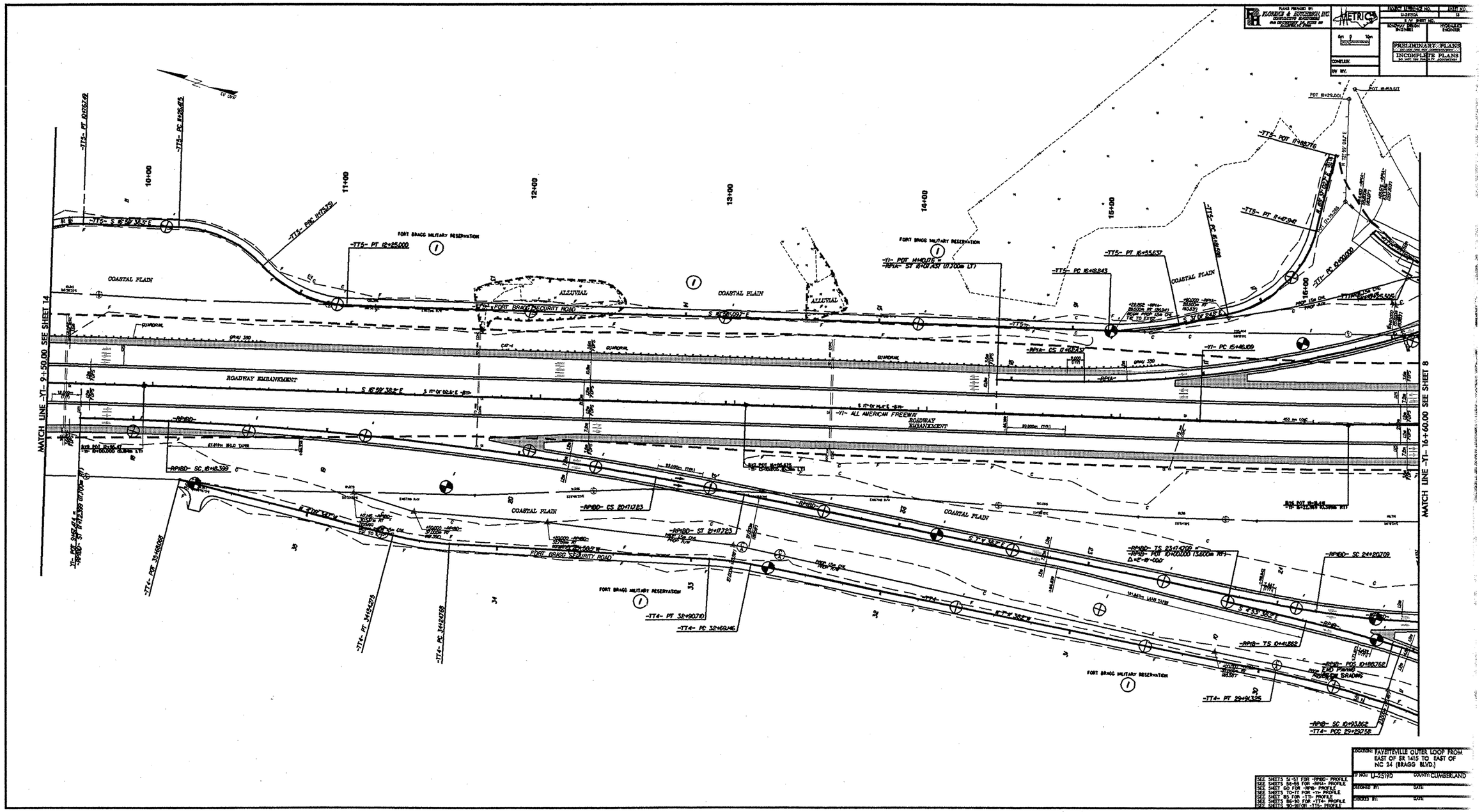
TIP NO.: U-2519D COUNTY: CUMBERLAND

DESIGNED BY: DATE:

CHECKED BY: DATE:



-L- 39+40 END U-2519DA
BEGIN U-2519E
MATCH LINE -Y2- 22+23.565 SEE SHEET 11
MATCH LINE -Y2- 16+99.419 SEE SHEET 11
MATCH LINE -L- 36+80.00 SEE SHEET 10
MATCH LINE -L- 43+70.00 SEE SHEET 13
MATCH LINE -Y2- 20+60.00 SEE SHEET 23
GRADING ONLY
COASTAL PLAIN
FORT BRAGG MILITARY RESERVATION
-RPIBD- 40+00 END U-2519DA
BEGIN U-2519E
-COLI- 40+75.5 END U-2519DA
BEGIN U-2519E
C
D
END CONSTRUCTION
PRELIMINARY PLANS
INCOMPLETE PLANS
FAYETTEVILLE OUTER LOOP FROM EAST OF SR 1415 TO EAST OF NC 24 (BRAGG BLVD.)
U-2519D
CUMBERLAND


PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
PROJECT ENGINEERS
PROJECT REFERENCE NO.
U-2519A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
INCOMPLETE PLANS
MATCH LINE -Y1- 9+50.00 SEE SHEET 14
MATCH LINE -Y1- 16+60.00 SEE SHEET 8
10+00
11+00
12+00
13+00
14+00
15+00
16+00
COASTAL PLAIN
ALLUVIAL
FORT BRAGG MILITARY RESERVATION
FORT BRAGG SECURITY ROAD
ROADWAY EMBANKMENT
-Y1- ALL AMERICAN FREEWAY
ROADWAY EMBANKMENT
-TT5- PT 12+25.000
-TT5- PT 15+55.637
-TT5- PC 15+48.843
-Y1- PC 15+46.109
-RPIA- CS 0+82.30
-RPIB- SC 15+16.399
-RPIBD- CS 20+11.283
-RPIBD- ST 21+17.723
-RPIBD- TS 23+47.709
-RPIB- POT 10+00.000 (3.600m RT)
-RPIB- SC 24+20.709
-RPIB- TS 01+41.862
-RPIB- POC 10+88.762
-RPIB- SC 10+93.862
-TT4- PT 32+90.710
-TT4- PC 32+69.146
-TT4- PT 34+34.075
-TT4- PC 34+24.168
-TT4- PT 29+96.325
-TT4- POC 29+29.758
PROPOSED GRADING
EXISTING R/W
GUARDRAIL
DRAIN 330
CONTROL LINE
PRELIMINARY
INCOMPLETE
CONSTRUCTION
R/W SEC.
LOCATION: FAYETTEVILLE OUTER LOOP FROM EAST OF SR 1415 TO EAST OF NC 24 (BRAGG BLVD.)
TIP NO. U-2519D
COUNTY: CUMBERLAND
DRAWN BY:
DATE:
CHECKED BY:
DATE:
SEE SHEETS 51-57 FOR -RPIBD- PROFILE
SEE SHEETS 58-59 FOR -RPIA- PROFILE
SEE SHEET 60 FOR -RPIB- PROFILE
SEE SHEETS 70-77 FOR -Y1- PROFILE
SEE SHEET 85 FOR -TT5- PROFILE
SEE SHEETS 86-90 FOR -TT4- PROFILE
SEE SHEETS 30-31 FOR -TT1- PROFILE

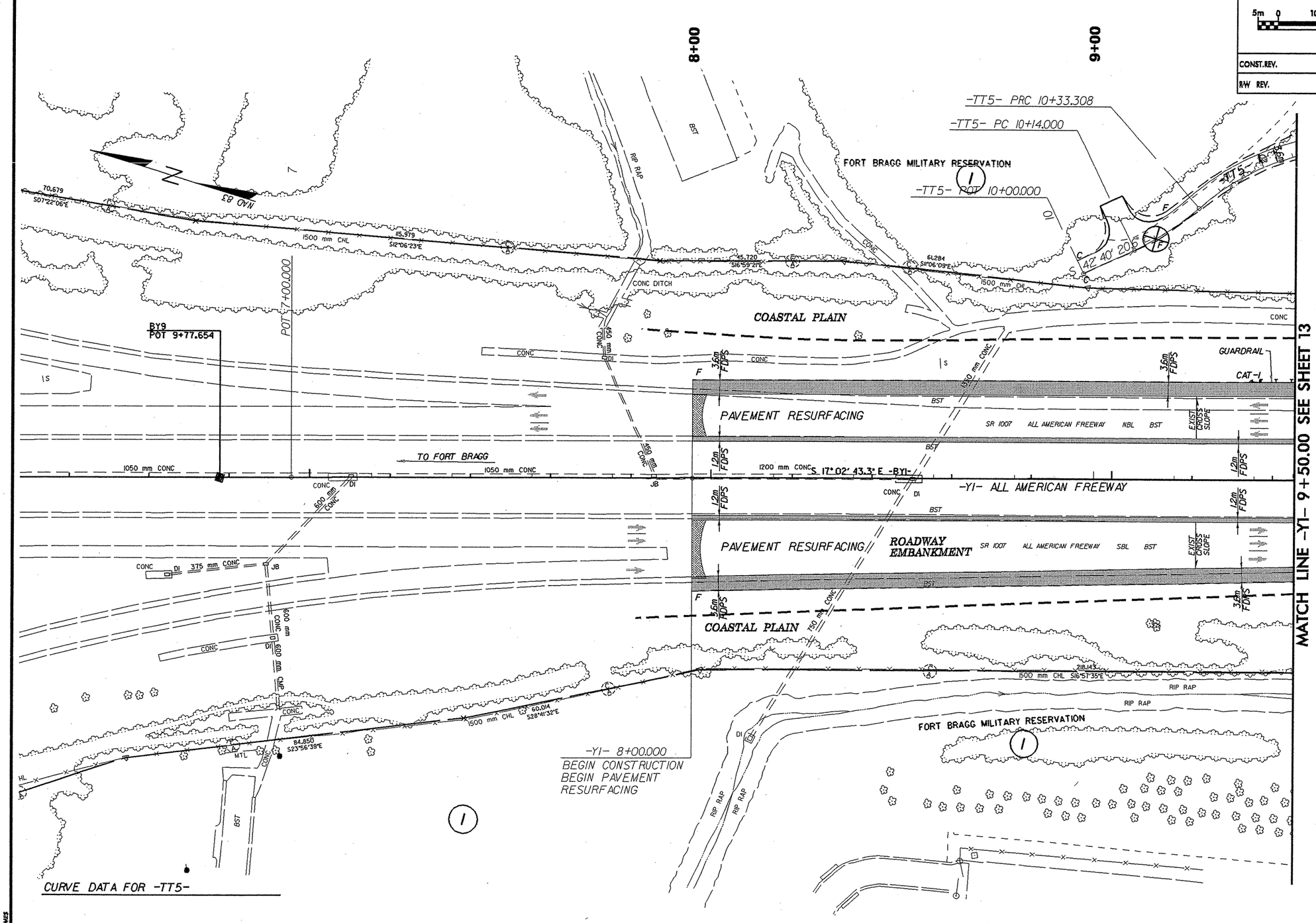
PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.
R/W REV.



SEE SHEETS 71-77 FOR -Y1- PROFILE
SEE SHEETS 90-91 FOR -TT5- PROFILE

FILE: $FILES
DATE: $DATES
$TIMES

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

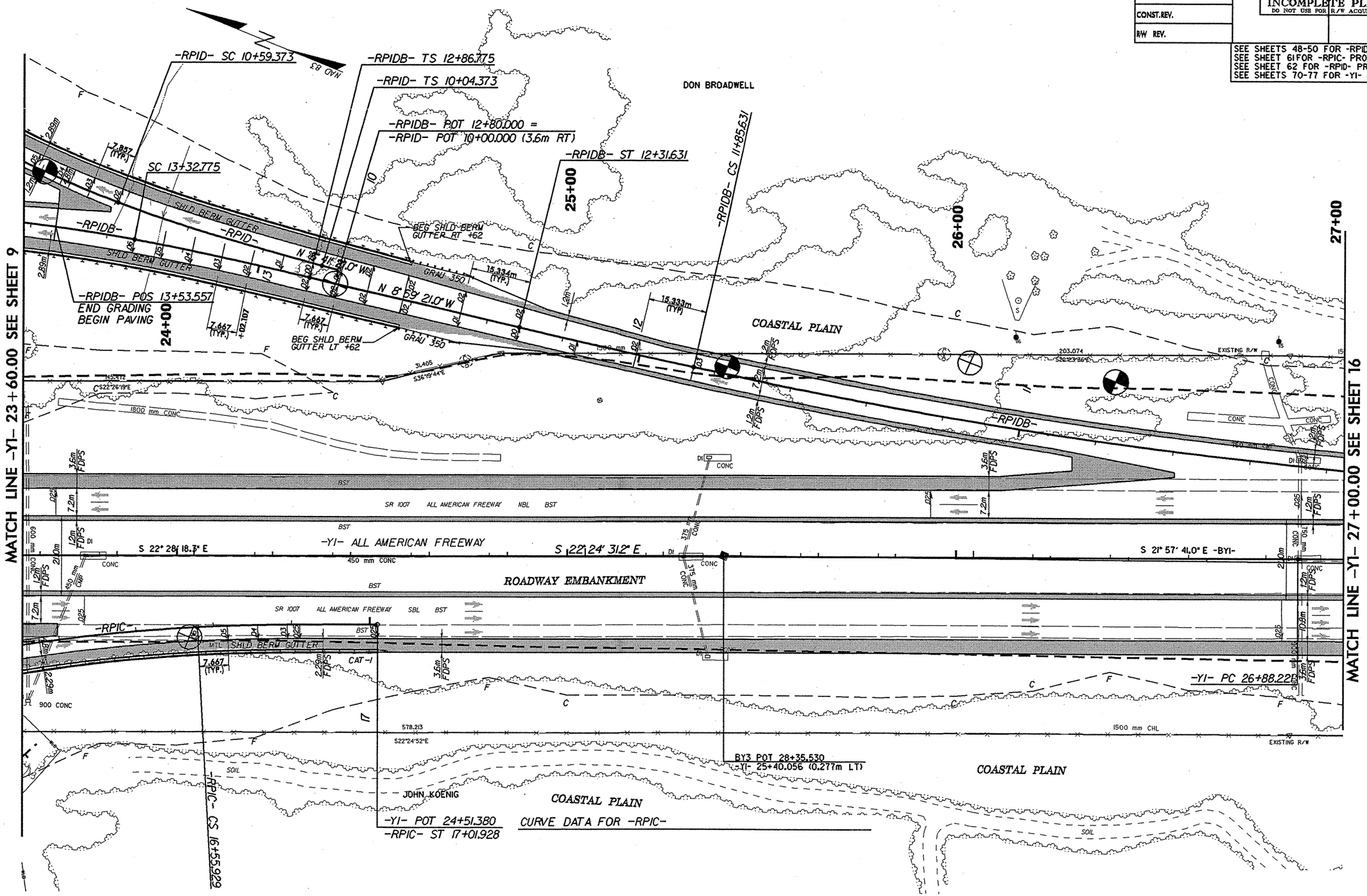
5m 0 10m

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.

R/W REV.

SEE SHEETS 48-50 FOR -RPIDB- PROFILE
SEE SHEET 61 FOR -RPIC- PROFILE
SEE SHEET 62 FOR -RPID- PROFILE
SEE SHEETS 70-77 FOR -YI- PROFILE



FILE: SFILES
DATE: SDATES
STIMES

CURVE DATA FOR -Y1- CURVE DATA FOR -RPIDB-

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4080 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

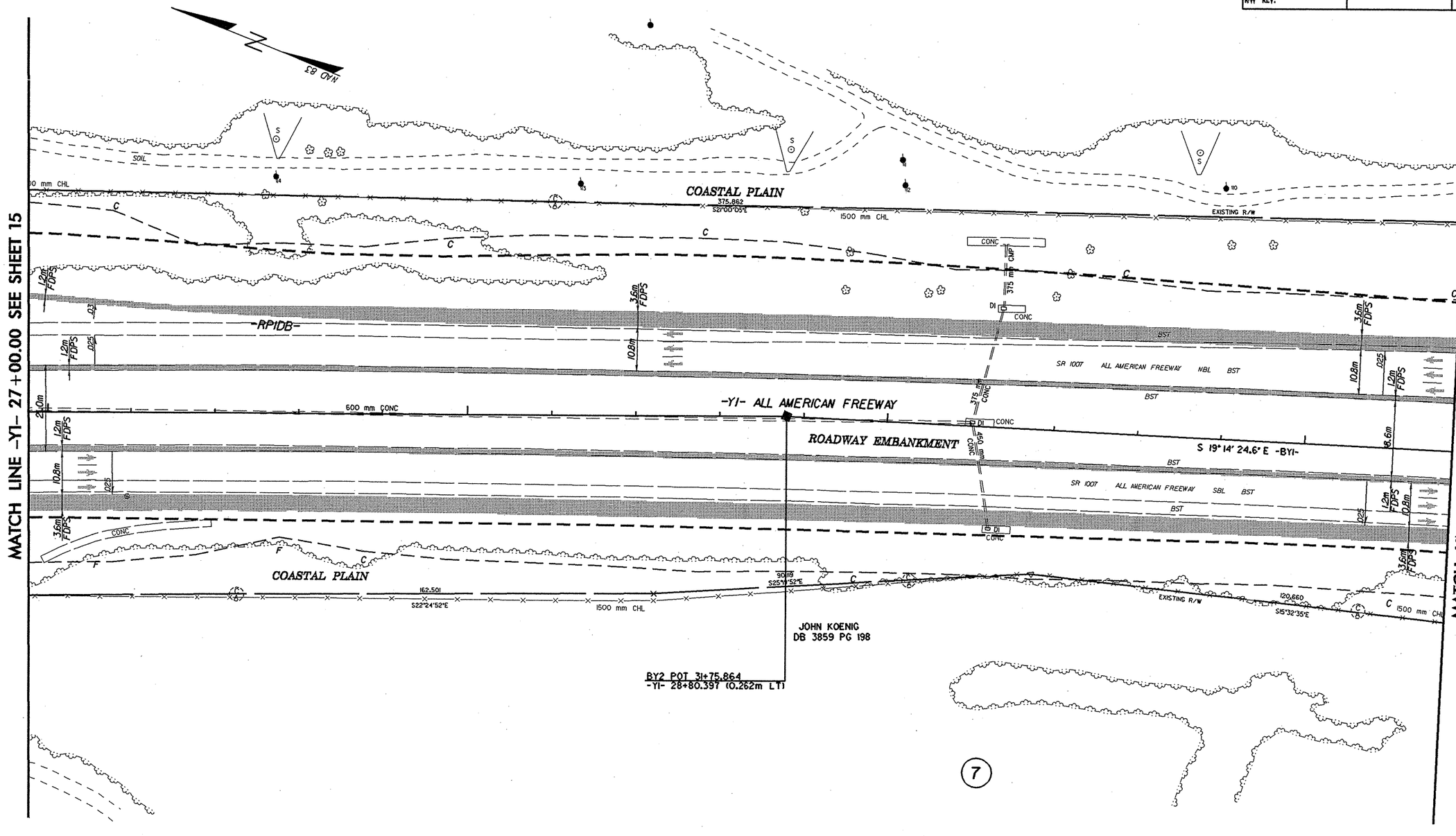
CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



SEE SHEETS 48-51 FOR -RPIDB- PROFILE
SEE SHEETS 70-77 FOR -Y1- PROFILE

FILE: $FILE$
DATE: $DATE$ $TIME$

CURVE DATA FOR -Y1-	CURVE DATA FOR -RP3C-		
PI Sta 31+34.716	PIs Sta 10+38.608	PI Sta 11+76.412	PIs Sta 13+09.124
Δ = 7° 18' 35.1" (RT)	θs = 0° 14' 47.1"	Δ = 25° 00' 16.9" (RT)	θs = 3° 16' 26.6"
L = 891.779	θs = 3° 16' 26.9"	L = 229.118	Ls = 60.000
T = 446.495	Ls = 60.000	T = 116.412	LT = 40.007
R = 6,990.000	LT = 38.608	R = 525.000	ST = 20.006
Se = 0.025	ST = 21.408	Se = 0.06	

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4030 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

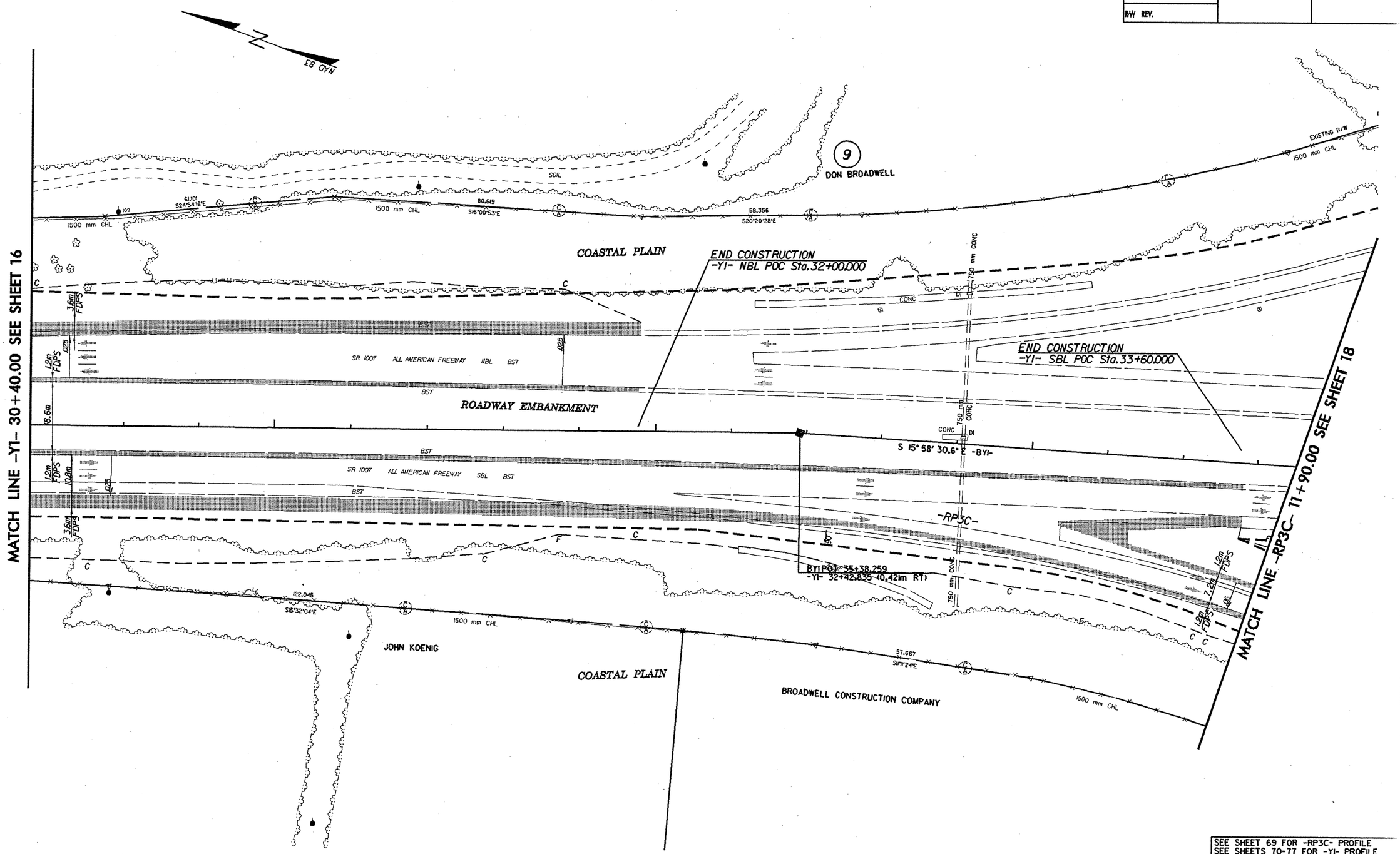
CONST. REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



SEE SHEET 69 FOR -RP3C- PROFILE
SEE SHEETS 70-77 FOR -Y1- PROFILE

FILE: 8FRLES
DATE: 8/24/18 STAMES

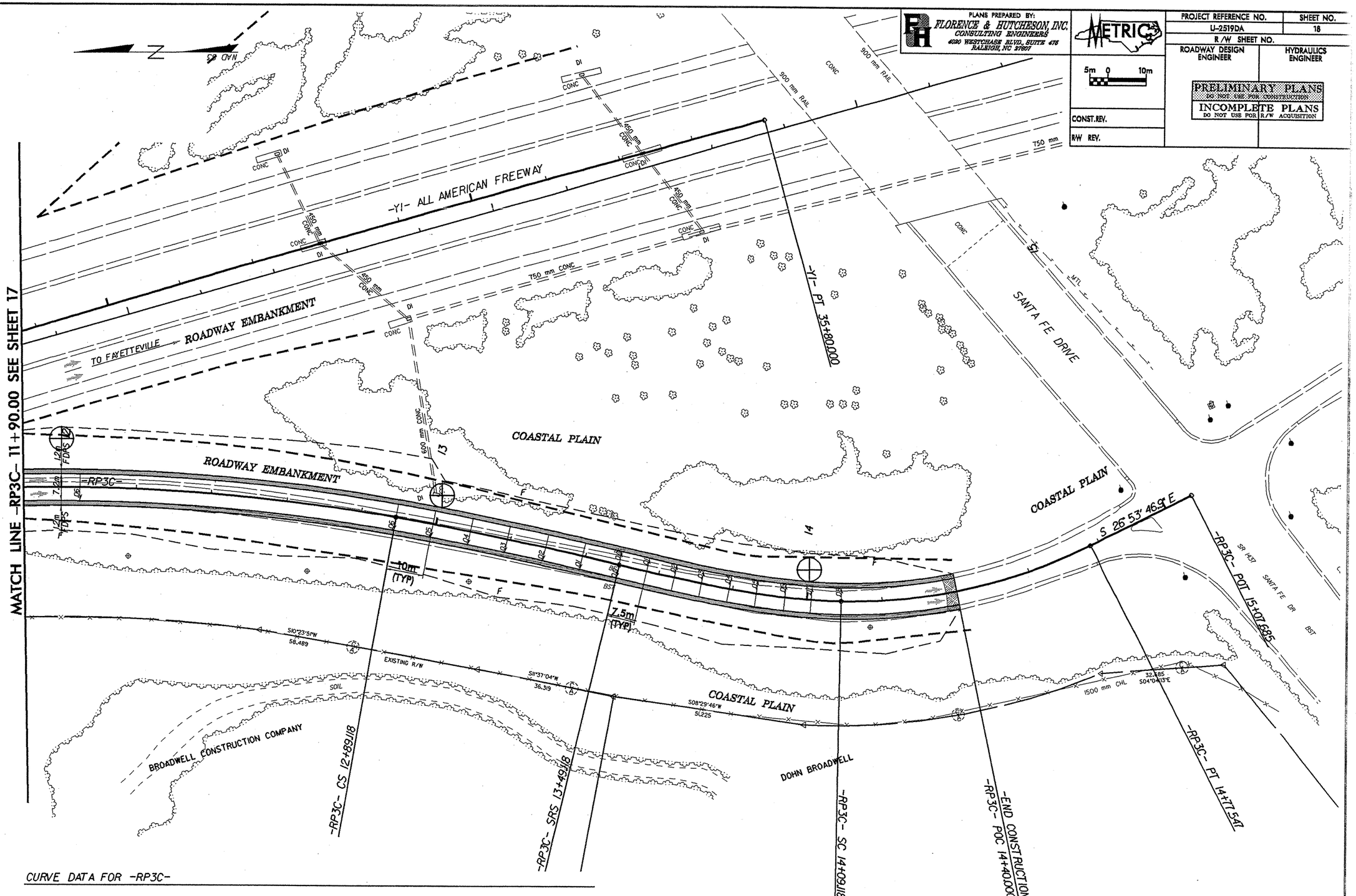
PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4030 WESTCHASE BLVD. SUITE 476
RALEIGH, NC 27607

METRIC
5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

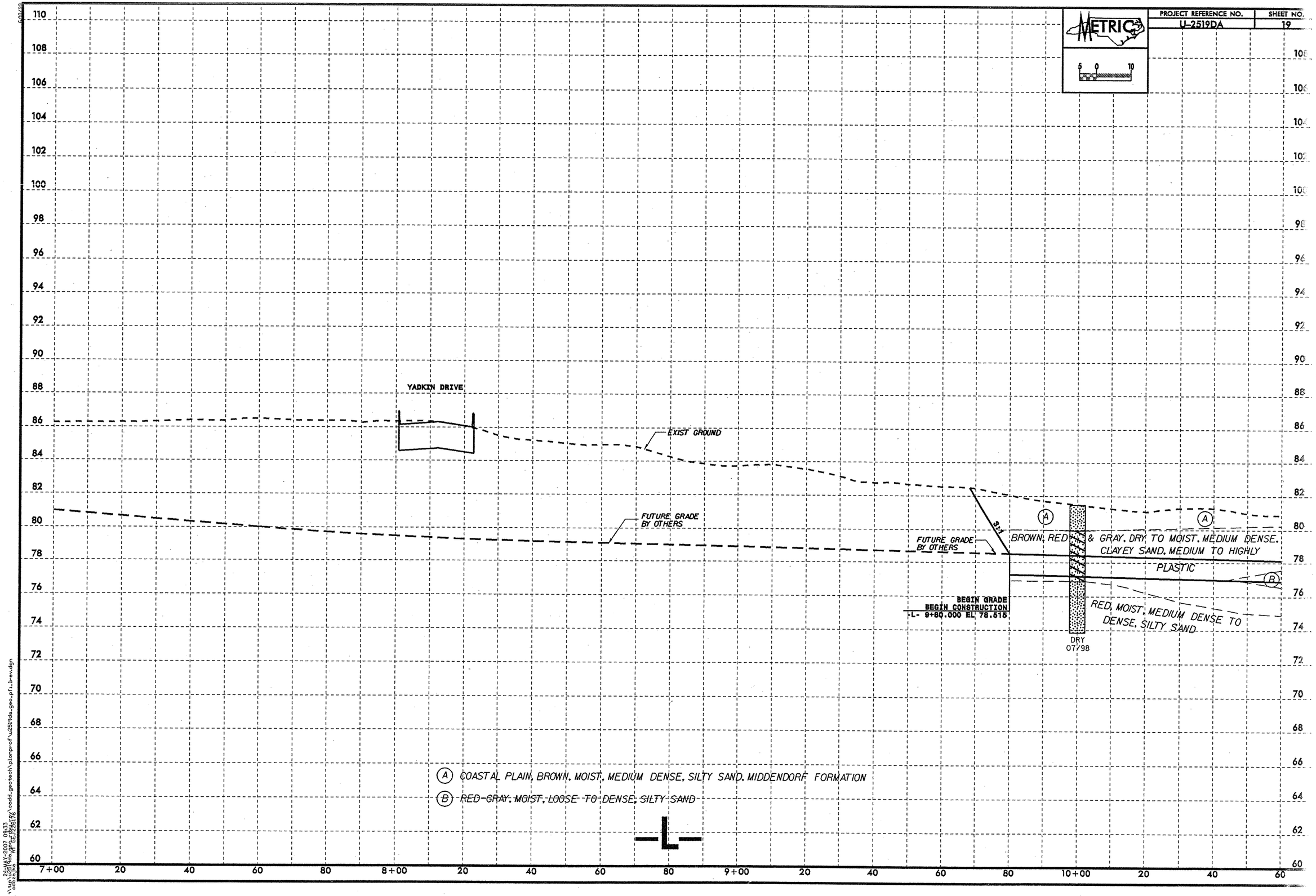
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.
R/W REV.



SEE SHEET 69 FOR -RP3C- PROFILE
SEE SHEETS 70-77 FOR -Y1- PROFILE

FILE: SFILES
DATE: SDATES STAMES



METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
19
YADKIN DRIVE
EXIST GROUND
FUTURE GRADE BY OTHERS
FUTURE GRADE BY OTHERS
3:1
BROWN, RED & GRAY, DRY TO MOIST, MEDIUM DENSE, CLAYEY SAND, MEDIUM TO HIGHLY PLASTIC
RED, MOIST, MEDIUM DENSE TO DENSE, SILTY SAND
BEGIN GRADE
BEGIN CONSTRUCTION
-L- 9+80.000 EL 78.515
DRY
07/98
A COASTAL PLAIN, BROWN, MOIST, MEDIUM DENSE, SILTY SAND, MIDDENDORF FORMATION
B RED-GRAY, MOIST, LOOSE TO DENSE, SILTY SAND
-L-
7+00
8+00
9+00
10+00

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	20

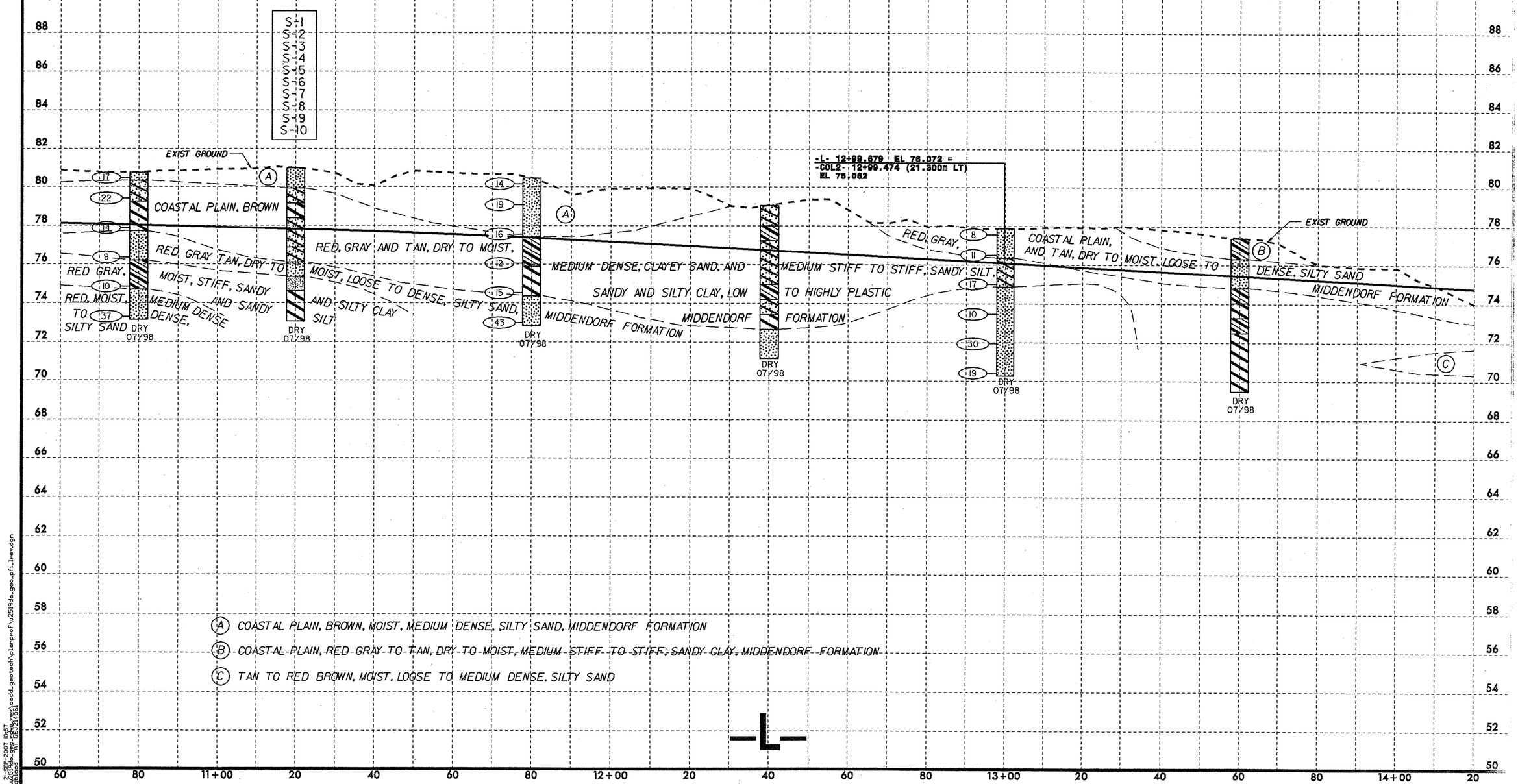
METRIC

5 0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
RT-4	CL	10+60.0	0.60-0.90	A-2-4(0)	21	NP	37.4	45.6	3.1	13.9	100.0	82.1	18.4	-	-
RT-5	CL	10+70.0	0.90-1.50	A-7-6(11)	51	29	27.7	21.6	6.5	44.2	100.0	84.9	51.4	-	-
CBR-2	1.50m LT.	10+80.0	2.50-3.40	A-7-6(9)	56	34	36.3	23.7	0.8	39.2	100.0	79.7	43.1	15.5	-
S-1	CL	11+20.0	0.00-1.07	A-2-4(0)	25	5	48.7	27.2	9.1	15.0	98.9	71.7	26.2	8.1	-
S-2	CL	11+20.0	1.07-1.83	A-2-7(3)	49	24	43.6	22.1	7.0	27.3	99.0	72.8	36.1	13.8	-
S-3	CL	11+20.0	1.83-2.59	A-7-6(12)	62	33	33.3	21.3	6.4	39.0	100.0	81.0	48.3	17.3	-
S-4	CL	11+20.0	2.59-3.35	A-2-7(4)	48	29	42.5	25.3	8.8	23.4	100.0	76.0	34.6	15.3	-
S-5	CL	11+20.0	3.35-4.11	A-2-7(4)	45	25	34.3	32.8	4.6	28.3	100.0	83.0	36.6	16.7	-
S-6	CL	11+20.0	4.11-4.88	A-2-6(1)	34	15	41.0	30.9	5.3	22.8	99.7	79.0	31.9	13.6	-
S-7	CL	11+20.0	4.88-5.64	A-2-4(0)	27	5	27.0	45.5	6.1	21.4	100.0	87.9	33.2	14.4	-
S-8	CL	11+20.0	5.64-6.40	A-4(2)	33	10	15.3	45.5	12.7	26.5	99.3	91.1	45.6	22.8	-
S-9	CL	11+20.0	6.40-7.16	A-7-6(16)	55	30	18.3	25.1	12.6	44.0	100.0	91.0	59.9	26.5	-
S-10	CL	11+20.0	7.16-7.92	A-7-6(12)	53	30	28.7	20.2	13.6	37.5	99.8	84.1	51.7	24.1	-
CBR-3	0.61m RT.	11+20.0	2.50-3.50	A-2-4(0)	30	9	57.4	22.8	4.5	15.3	99.5	63.8	21.6	9.6	-

*NOTE: CBR'S & RT'S WERE TAKEN FROM OFFSET BORINGS.



(A) COASTAL PLAIN, BROWN, MOIST, MEDIUM DENSE, SILTY SAND, MIDDENDORF FORMATION

(B) COASTAL PLAIN, RED-GRAY TO TAN, DRY TO MOIST, MEDIUM STIFF TO STIFF, SANDY CLAY, MIDDENDORF FORMATION

(C) TAN TO RED BROWN, MOIST, LOOSE TO MEDIUM DENSE, SILTY SAND

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PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	21

METRIC

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HAND TOOLS

*METRIC TONS

TEST NO.	STATION (-L-)	OFFSET	DEPTH INTERVAL	N_C	SHEAR STRENGTH *(TSF)	SOIL TYPE
VST-5	15+25.0	9.14m RT.	0.46		902	SAND
	15+25.0	9.14m RT.	0.61		656	SAND
	15+25.0	9.14m RT.	0.76		451	CLAY
	15+25.0	9.14m RT.	0.91		533	SAND
VST-3	15+30.0	4.57m RT.	0.46		656	SAND
	15+30.0	4.57m RT.	0.61		676	CLAY
	15+30.0	4.57m RT.	0.76		779	CLAY
	15+30.0	4.57m RT.	0.91		820	CLAY
	15+30.0	4.57m RT.	1.06		1271	SAND
	15+30.0	4.57m RT.	1.22		X	SAND
	15+30.0	4.57m RT.	1.37		861	CLAY
	15+30.0	4.57m RT.	1.52		533	SDY. CLAY
	15+30.0	4.57m RT.	1.68		492	CLAY
	15+30.0	4.57m RT.	1.83		451	CLAY
VST-6	15+30.0	16.20m RT.	0.46		328	SAND
	15+30.0	16.20m RT.	0.61		492	SAND
	15+30.0	16.20m RT.	0.76		615	SDY. CLAY
	15+30.0	16.20m RT.	0.91		574	SDY. CLAY
	15+30.0	16.20m RT.	1.06		615	SDY. CLAY
	15+30.0	16.20m RT.	1.22		1107	SAND
	15+30.0	16.20m RT.	1.37		656	CLAY
	15+30.0	16.20m RT.	1.52		902	CLAY
	15+30.0	16.20m RT.	1.68		1004	SDY. CLAY
	15+30.0	16.20m RT.	1.83		1189	CLAY
	15+30.0	16.20m RT.	1.83		1230	CLAY
VST-1	15+36.0	3.00m LT.	0.46		287	ORG. SILT
	15+36.0	3.00m LT.	0.61		492	SAND
	15+36.0	3.00m LT.	0.76		512	SAND
	15+36.0	3.00m LT.	0.91		492	SDY. CLAY
	15+36.0	3.00m LT.	1.06		266	MUCK
	15+36.0	3.00m LT.	1.22		656	CLAY
	15+36.0	3.00m LT.	1.37		574	CLAY
VST-2	15+50.0	7.30m LT.	0.61		1763	SAND
	15+50.0	7.30m LT.	0.91		1435	SAND
	15+50.0	7.30m LT.	1.06		635	CLAY
	15+50.0	7.30m LT.	1.30		574	MUCK
	15+50.0	7.30m LT.	1.37		820	SDY. MUCK
	15+50.0	7.30m LT.	1.52		574	MUCK
	15+50.0	7.30m LT.	1.68		943	SDY. CLAY
	15+50.0	7.30m LT.	1.83		1107	SDY. CLAY
	15+50.0	7.30m LT.	1.98		820	SDY. CLAY

HAND TOOLS

*METRIC TONS

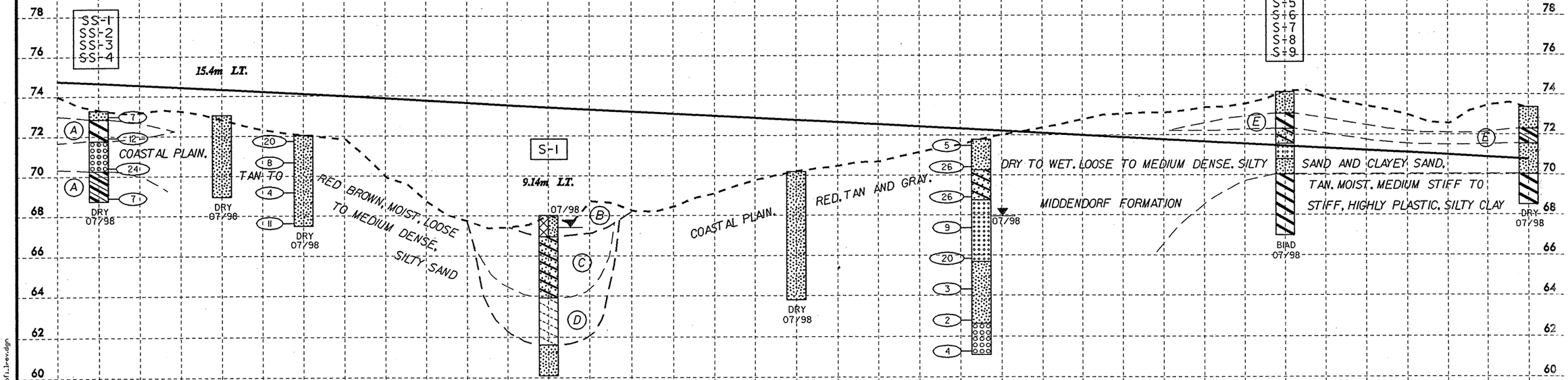
TEST NO.	STATION (-L-)	OFFSET	DEPTH INTERVAL	N_C	SHEAR STRENGTH *(TSF)	SOIL TYPE
VST-4	15+30.0	27.00m RT.	0.46		492	CLAY
	15+30.0	27.00m RT.	0.61		328	CLAY
	15+30.0	27.00m RT.	0.76		820	SAND
	15+30.0	27.00m RT.	0.91		287	SDY. CLAY
	15+30.0	27.00m RT.	1.06		1127	SDY. CLAY
	15+30.0	27.00m RT.	1.22		1394	SAND
DCP-5	15+25.0	9.14m RT.	0.00	WOH		A-3
	15+25.0	9.14m RT.	0.25	1.5		A-3
	15+25.0	9.14m RT.	0.50	WOH		A-3
	15+25.0	9.14m RT.	1.00	WOH		A-6
DCP-4	15+27.0	27.00m RT.	0.00	1.0		A-2-4
	15+27.0	27.00m RT.	0.25	1.5		A-2-4
	15+27.0	27.00m RT.	0.50	WOH		X
DCP-3	15+30.0	4.57m RT.	0.00	1.0		A-3
	15+30.0	4.57m RT.	0.25	WOH		A-7-6
DCP-6	15+30.0	16.20m RT.	0.00	WOH		A-2-4
	15+30.0	16.20m RT.	0.25	1.0		A-3
	15+30.0	16.20m RT.	0.50	1.0		A-3
	15+30.0	16.20m RT.	1.00	2.0		A-3
DCP-1	15+44.0	CL	0.00	WOH		A-4
	15+44.0	CL	0.25	2.0		A-7-6
	15+44.0	CL	0.50	WOH		A-2-4
	15+44.0	CL	1.00	WOH		X
	15+44.0	CL	1.50	11.0		X
DCP-2	15+50.0	7.30m LT.	0.00	1.5		A-2-4
	15+50.0	7.30m LT.	0.25	4.0		A-2-4
	15+50.0	7.30m LT.	0.50	5.5		A-6
	15+50.0	7.30m LT.	1.00	WOH		A-7-6
	15+50.0	7.30m LT.	1.50	2.0		A-2-6
	15+50.0	7.30m LT.	2.00	9.5		X
	15+50.0	7.30m LT.	2.25	23.5		X

X-UNABLE TO RECOVER SAMPLE IN HAND AUGER DUE TO SATURATED SOIL.

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
*RT-2	1.00m RT.	17+19.5	2.50-2.70	A-7-6(26)	63	36	16.2	13.1	14.1	56.6	100.0	92.0	72.0	-	-
RT-6	1.00m RT.	17+19.5	5.49-6.10	A-7-6(14)	59	35	20.8	19.3	10.2	49.7	99.9	88.2	60.4	-	-
S-1	CL	17+20.0	0.03-1.07	A-2-4(0)	23	2	37.1	37.4	5.5	20.0	99.8	79.7	29.0	10.2	-
S-2	CL	17+20.0	1.07-1.83	A-7-6(14)	57	33	25.5	24.6	7.8	42.1	100.0	85.3	53.3	17.7	-
S-3	CL	17+20.0	1.83-2.59	A-2-6(1)	36	14	36.8	32.0	6.1	25.1	100.0	79.6	35.6	12.2	-
S-4	CL	17+20.0	2.59-3.35	A-3(0)	20	NP	45.7	46.2	2.2	5.9	99.0	82.9	8.8	-	-
S-5	CL	17+20.0	3.35-4.11	A-2-4(0)	19	NP	73.4	16.2	3.8	6.6	98.8	53.4	11.1	13.8	-
S-6	CL	17+20.0	4.11-4.88	A-7-6(6)	51	26	39.9	20.0	8.1	32.0	100.0	75.8	41.2	21.5	-
S-7	CL	17+20.0	4.88-5.64	A-7-5(15)	56	32	25.4	20.9	9.6	44.1	100.0	87.8	55.3	23.4	-
S-8	CL	17+20.0	5.64-6.40	A-7-6(18)	58	36	21.5	22.4	8.3	47.8	100.0	88.5	58.0	22.4	-
S-9	CL	17+20.0	6.40-7.16	A-7-6(20)	58	35	20.2	19.9	11.3	48.6	100.0	89.5	61.9	25.9	-
RT-4	CL	17+20.0	0.60-0.90	A-2-4(0)	21	NP	37.4	45.6	3.1	13.9	100.0	82.1	18.4	-	-
RT-5	CL	17+20.0	0.90-1.50	A-7-6(11)	51	29	27.7	21.6	6.5	44.2	100.0	84.9	51.4	-	-
CBR-1	19.80m RT.	17+39.0	4.40-5.60	A-2-6(1)	37	16	28.6	37.7	4.4	29.3	99.8	85.9	33.9	18.6	-

NOTE: RT'S 4,5 & 6 BULK SAMPLES TAKEN AT SEVERAL DEPTHS IN ORDER TO OBTAIN ENOUGH MATERIAL TO TEST.



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-1	CL	14+30.0	0.00-0.45	A-2-4(0)	22	NP	45.8	45.7	3.7	4.8	99.5	77.2	11.3	1.5	-
SS-2	CL	14+30.0	1.07-1.52	A-7-5(43)	81	47	17.1	2.9	13.5	66.5	100.0	89.5	80.5	23.3	-
SS-3	CL	14+30.0	2.59-3.04	A-1-b(0)	23	NP	83.5	7.6	0.4	8.5	94.0	39.3	8.9	-	-
SS-4	CL	14+30.0	4.11-4.56	A-6(2)	36	14	17.0	43.8	5.7	33.5	100.0	89.7	41.0	20.7	-
S-1	9.14m LT.	15+40.0	4.11-6.40	-	-	-	-	-	-	-	-	-	-	-	6.2

DCP SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-1	9.14m RT.	15+25.0	0.91-1.05	A-6(6)	33	11	8.5	28.5	34.7	28.3	100.0	45.4	65.8	44.6	12.2
S-2	9.14m RT.	15+25.0	1.07-1.22	A-4(0)	24	NP	15.6	46.5	25.7	12.2	100.0	92.7	40.6	32.4	2.9
S-3	4.57m RT.	15+30.0	0.46-0.61	A-7-6(17)	46	21	5.0	16.2	22.5	56.3	100.0	98.3	79.4	54.3	-
S-1	7.30m LT.	15+50.0	1.62-1.83	A-5(1)	51	4	32.8	21.0	39.4	6.8	99.1	77.3	47.3	58.6	-

(A) RED, GRAY AND TAN, MOIST, MEDIUM STIFF TO STIFF, SANDY AND SILTY CLAY, LOW TO HIGHLY PLASTIC

(B) ARTIFICIAL FILL, BROWN-ORANGE, SATURATED, VERY LOOSE TO LOOSE, SILTY SAND

(C) ALLUVIUM, GRAY BROWN, SATURATED, LOOSE, CLAYEY SAND

(D) ALLUVIUM, BLACK, SATURATED, VERY LOOSE, ORGANIC SAND

(E) TAN AND RED, MOIST, MEDIUM STIFF, HIGHLY PLASTIC, SILTY CLAY

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PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	22

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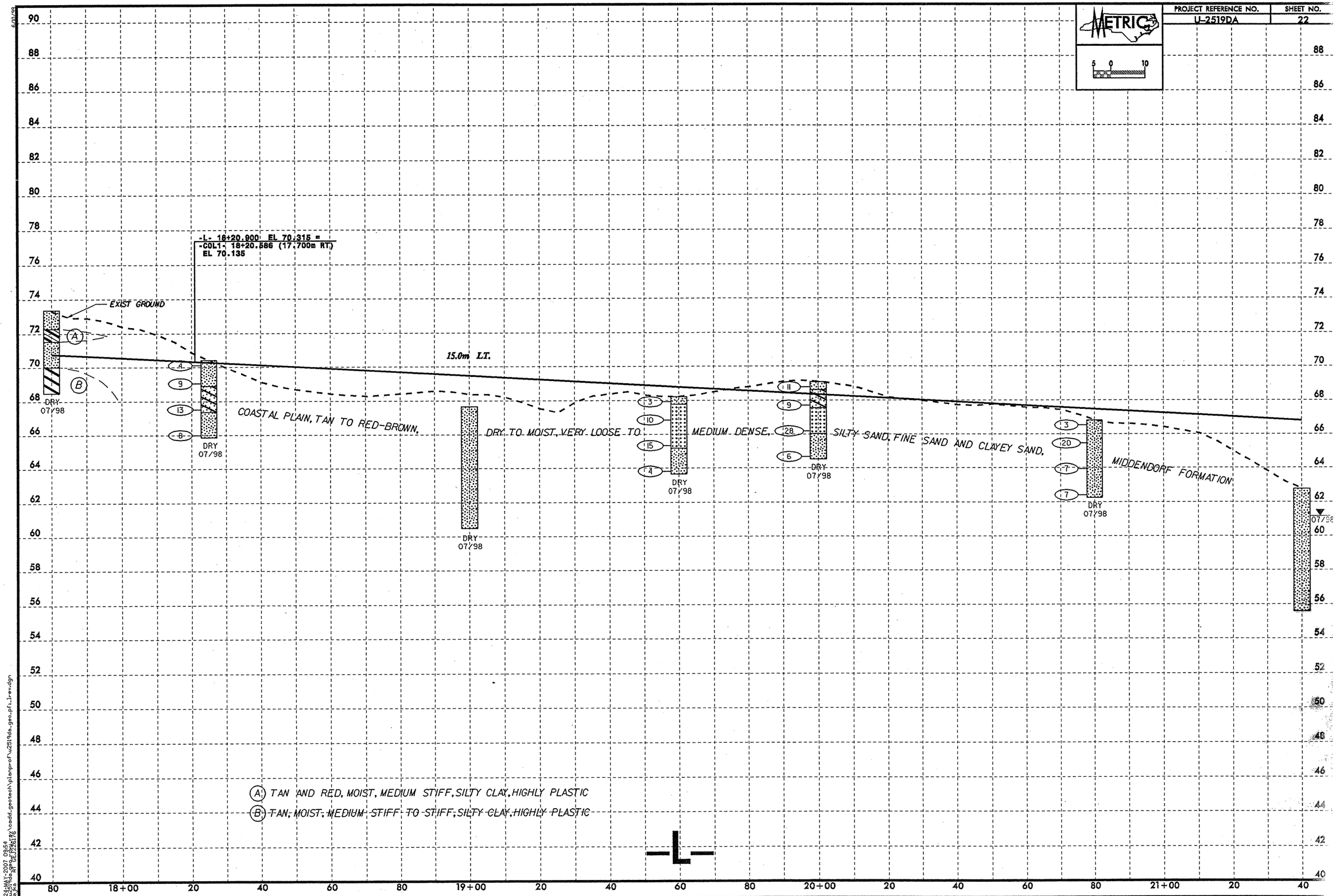

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	23

METRIC

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SOIL TEST RESULTS

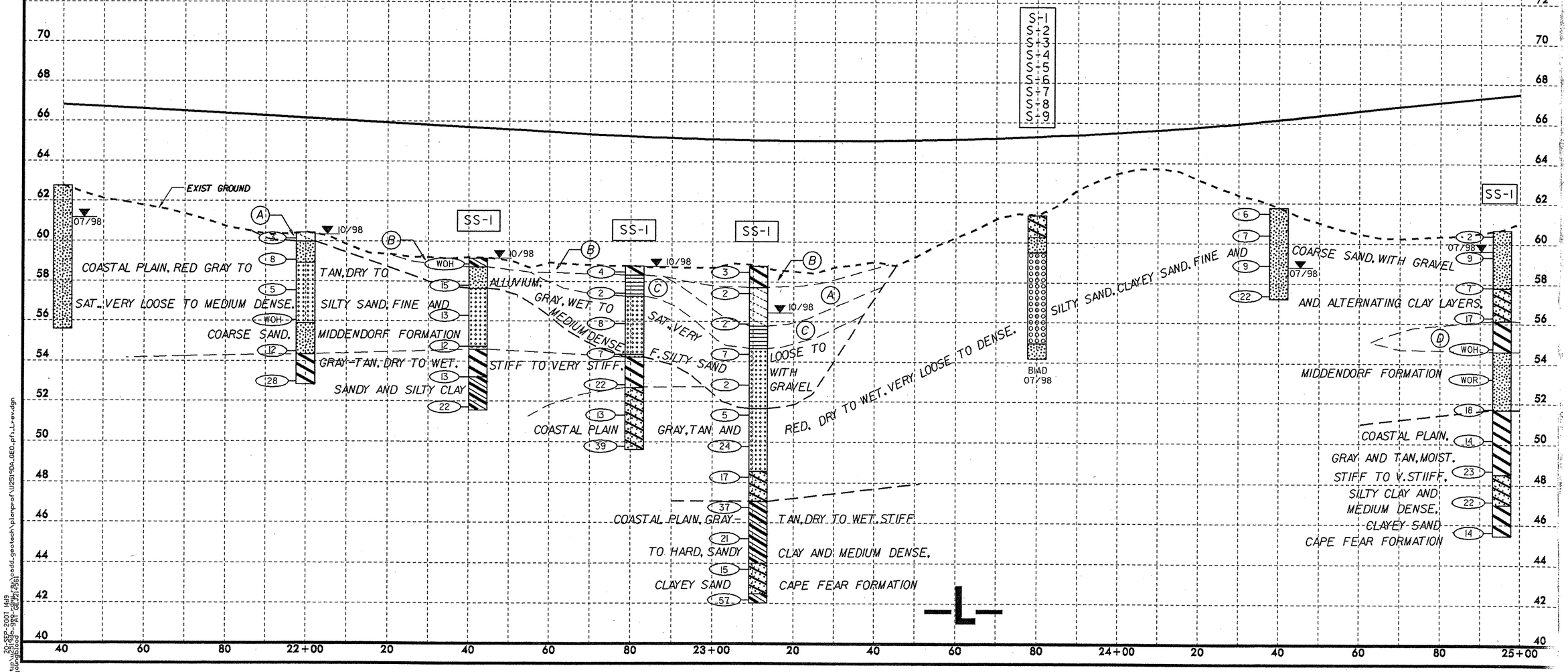
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-1	CL	22+42.3	0.00-0.45	A-6(5)	38	19	37.0	18.3	2.0	42.7	99.5	77.1	44.8	29.8	-
SS-1	CL	22+81.0	0.00-0.45	A-7-5(18)	56	22	16.1	9.1	16.7	58.1	100.0	95.2	75.2	87.7	-
SS-1	CL	23+11.4	0.00-0.45	A-7-5(7)	44	18	21.4	26.8	10.0	41.8	100.0	90.2	52.1	55.0	-
S-1	CL	23+80.0	0.06-1.07	A-2-6(0)	36	11	62.9	13.4	0.8	22.9	83.1	38.9	21.2	7.4	-
S-2	CL	23+80.0	1.07-1.83	A-2-4(0)	31	10	72.9	10.3	2.1	14.7	95.4	45.9	16.6	12.3	-
S-3	CL	23+80.0	1.83-2.59	A-1-b(0)	26	4	79.2	9.0	0.0	11.8	96.8	39.1	11.9	-	-
S-4	CL	23+80.0	2.59-3.35	A-1-b(0)	23	2	78.2	9.1	2.0	10.7	98.5	41.0	13.4	-	-
S-5	CL	23+80.0	3.35-4.11	A-1-b(0)	23	3	71.5	12.0	6.1	10.4	98.8	46.3	17.3	-	-
S-6	CL	23+80.0	4.11-4.88	A-1-b(0)	26	6	72.4	15.6	0.1	11.9	98.2	47.5	12.8	-	-
S-7	CL	23+80.0	4.88-5.64	A-1-b(0)	26	5	74.0	12.9	2.8	10.3	98.5	42.6	14.0	-	-
S-8	CL	23+80.0	5.64-6.40	A-1-b(0)	24	3	71.2	16.2	3.2	9.4	98.6	45.9	13.5	-	-
S-9	CL	23+80.0	6.40-7.16	A-2-4(0)	20	NP	68.5	18.7	3.2	9.6	99.2	51.1	14.0	27.1	-
SS-1	CL	24+96.0	3.04-3.49	A-6(13)	40	21	13.8	15.4	26.0	44.8	100.0	91.2	71.3	25.9	-

(A) ALLUVIUM, BLACK, WET, VERY LOOSE, ORGANIC, SAND

(B) ALLUVIUM, GRAY, WET TO SATURATED, VERY SOFT, SANDY AND SILTY CLAY

(C) ALLUVIUM, BLACK, WET TO SATURATED, VERY SOFT TO SOFT, ORGANIC, SANDY SILT

(D) TAN, GRAY & RED, WET TO SATURATED, VERY SOFT, HIGHLY PLASTIC, SILTY CLAY WITH ALTERNATING SAND LAYERS



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PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	24

METRIC

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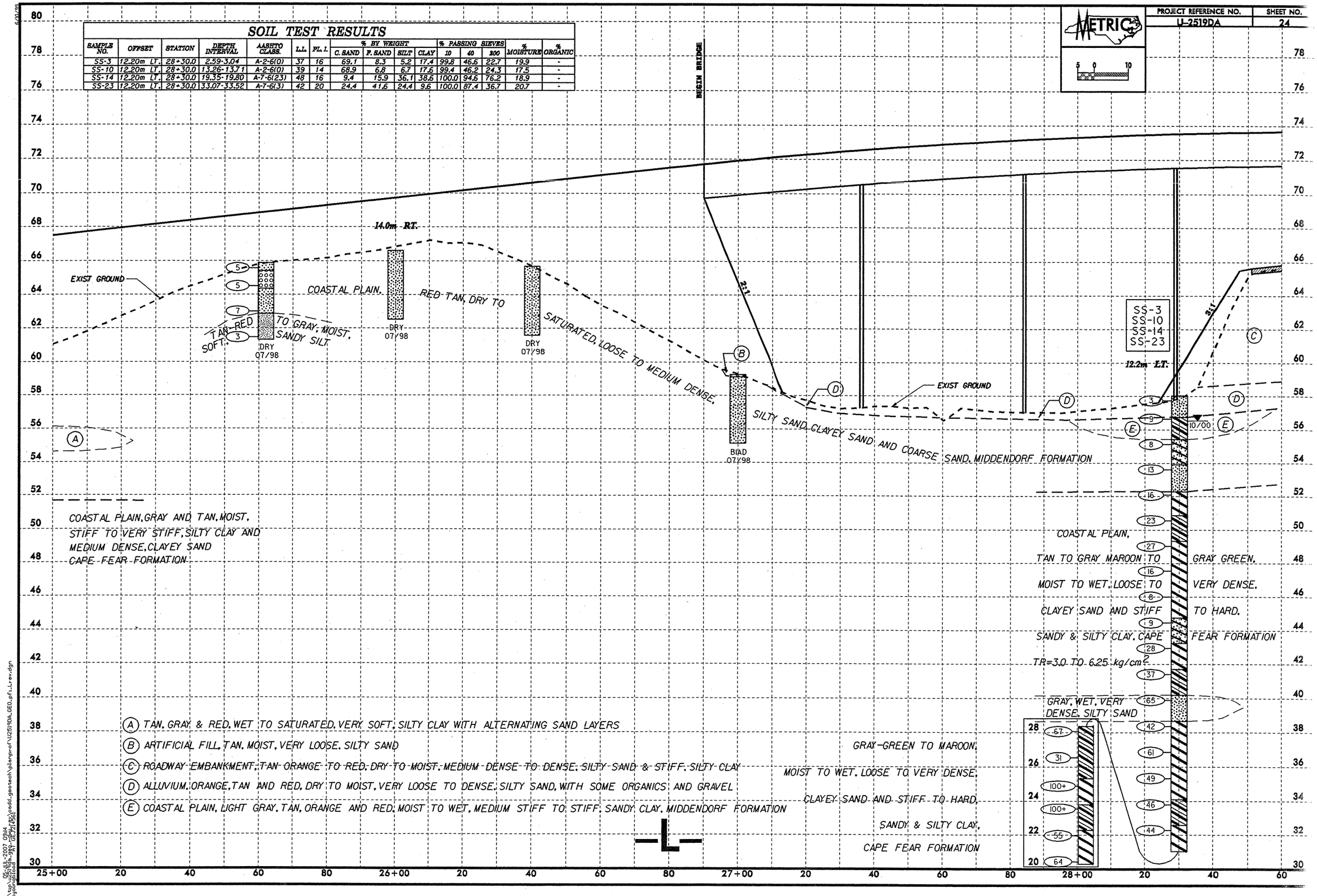
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-3	12.20m LT.	28+30.0	2.59-3.04	A-2-6(0)	37	16	69.1	8.3	5.2	17.4	99.8	46.6	22.7	19.9	-
SS-10	12.20m LT.	28+30.0	13.26-13.71	A-2-6(0)	39	14	68.9	6.8	6.7	17.6	99.4	46.2	24.3	17.5	-
SS-14	12.20m LT.	28+30.0	19.35-19.80	A-7-6(23)	48	16	9.4	15.9	36.1	38.6	100.0	94.6	76.2	18.9	-
SS-23	12.20m LT.	28+30.0	33.07-33.52	A-7-6(3)	42	20	24.4	41.6	24.4	9.6	100.0	87.4	36.7	20.7	-



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PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	25

METRIC

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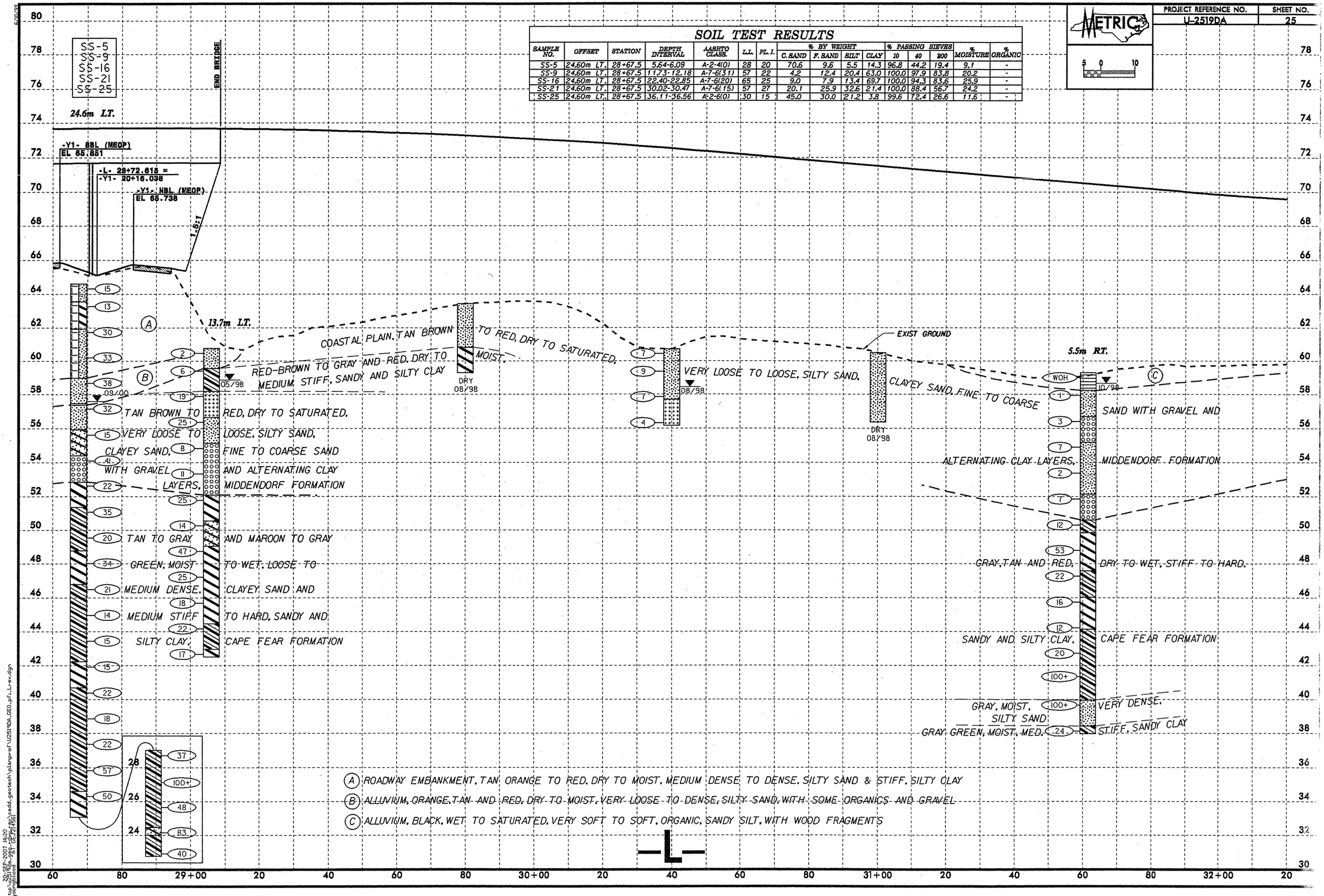
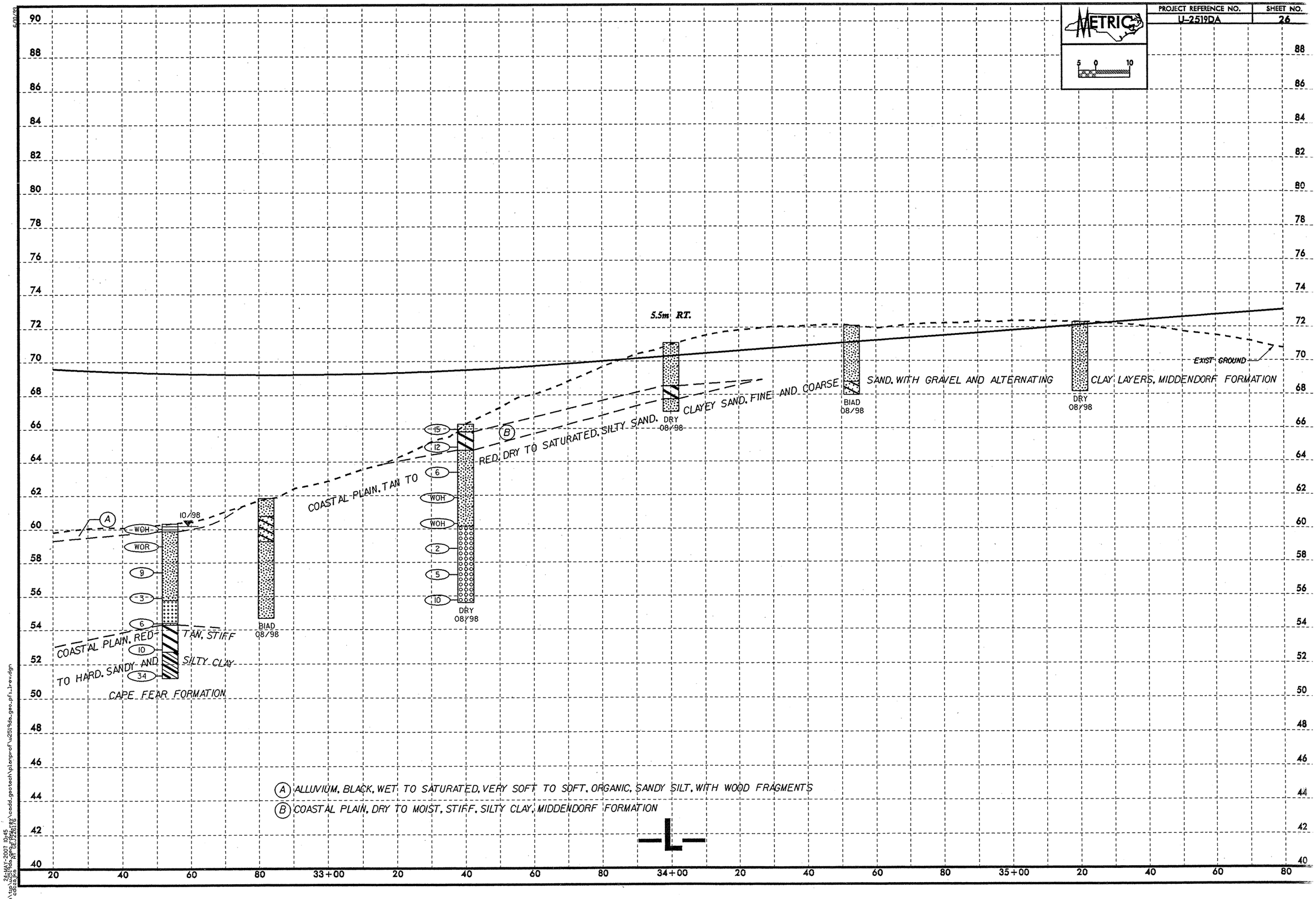
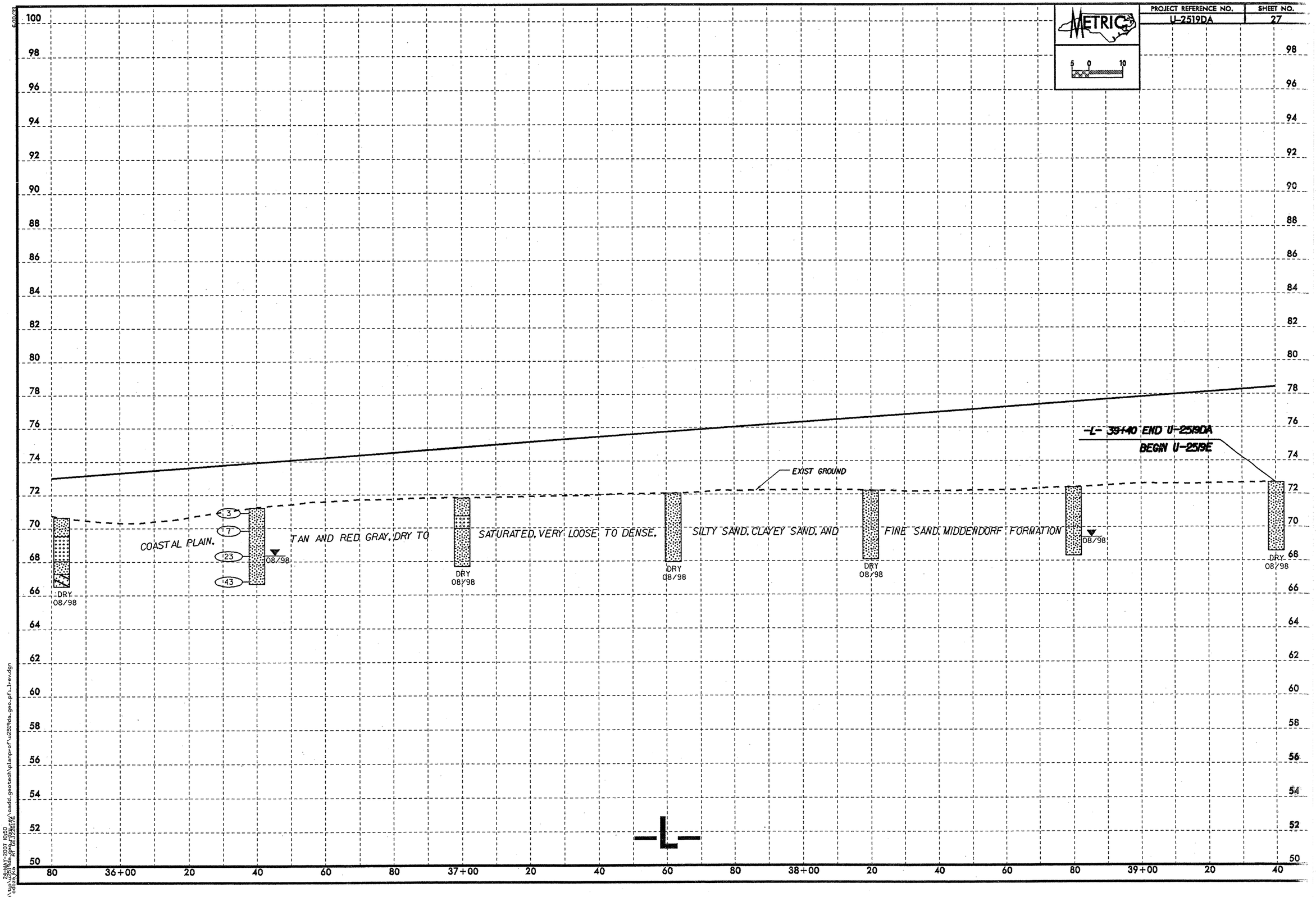
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PI. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-5	24.60m LT.	28+67.5	5.64-6.09	A-2-4(0)	28	20	70.6	9.6	5.5	14.3	96.8	44.2	19.4	9.1	-
SS-9	24.60m LT.	28+67.5	11.73-12.18	A-7-6(31)	57	22	4.2	12.4	20.4	63.0	100.0	97.9	83.8	20.2	-
SS-16	24.60m LT.	28+67.5	22.40-22.85	A-7-6(20)	65	25	9.0	7.9	13.4	69.7	100.0	94.3	83.6	25.9	-
SS-21	24.60m LT.	28+67.5	30.02-30.47	A-7-6(15)	57	27	20.1	25.9	32.6	21.4	100.0	88.4	56.7	24.2	-
SS-25	24.60m LT.	28+67.5	36.11-36.56	A-2-6(0)	30	15	45.0	30.0	21.2	3.8	99.6	72.4	26.6	11.6	-




METRIC
5 0 10
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
26
5.5m RT.
EXIST GROUND
SAND, WITH GRAVEL AND ALTERNATING CLAY LAYERS, MIDDENDORF FORMATION
CLAYEY SAND, FINE AND COARSE
RED, DRY TO SATURATED, SILTY SAND.
COASTAL PLAIN, TAN TO
COASTAL PLAIN, RED TO HARD, SANDY AND
TAN, STIFF
SILTY CLAY
CAPE FEAR FORMATION
10/98
BIAD 08/98
DRY 08/98
BIAD 08/98
DRY 08/98
DRY 08/98
15
12
6
WOH
WOH
2
5
10
WOH
WOR
9
3
6
10
34
A
B
A ALLUVIUM, BLACK, WET TO SATURATED, VERY SOFT TO SOFT, ORGANIC, SANDY SILT, WITH WOOD FRAGMENTS
B COASTAL PLAIN, DRY TO MOIST, STIFF, SILTY CLAY, MIDDENDORF FORMATION
90 88 86 84 82 80 78 76 74 72 70 68 66 64 62 60 58 56 54 52 50 48 46 44 42 40
20 40 60 80 33+00 20 40 60 80 34+00 20 40 60 80 35+00 20 40 60 80

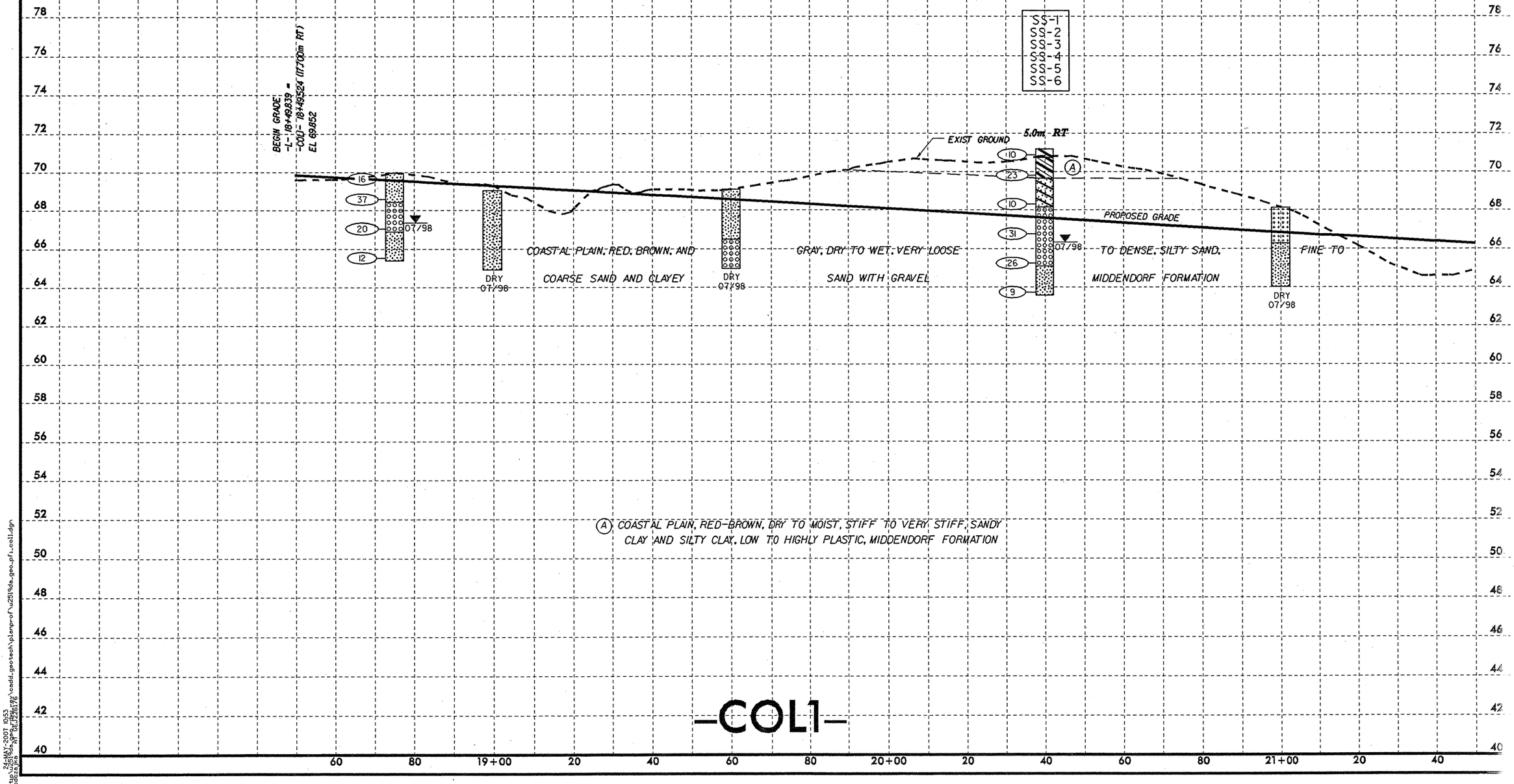

METRIC
5 0 10
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
27
-L- 39+40 END U-2519DA
BEGIN U-2519E
EXIST GROUND
COASTAL PLAIN.
TAN AND RED GRAY, DRY TO
SATURATED, VERY LOOSE TO DENSE,
SILTY SAND, CLAYEY SAND, AND
FINE SAND, MIDDENDORF FORMATION
3
7
23
43
08/98
DRY
08/98
-L-
100
98
96
94
92
90
88
86
84
82
80
78
76
74
72
70
68
66
64
62
60
58
56
54
52
50
80
36+00
20
40
60
80
37+00
20
40
60
80
38+00
20
40
60
80
39+00
20
40

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	28

METRIC 5 0 10

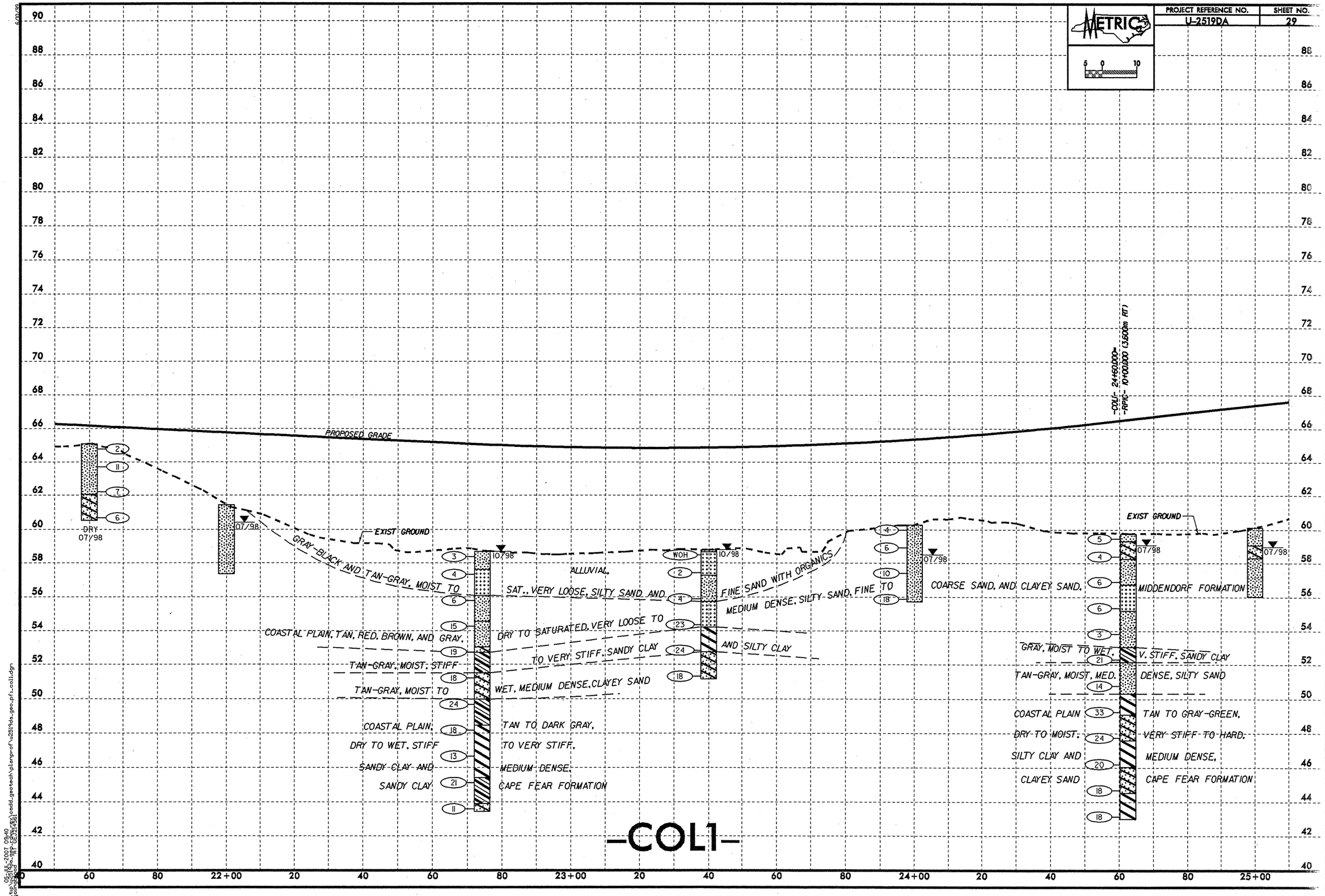
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-1	5.00m RT.	20+40.0	0.00-0.45	A-7-6(10)	50	28	16.5	38.0	9.7	35.8	100.0	93.2	49.1	16.7	-
SS-2	5.00m RT.	20+40.0	1.07-1.52	A-6(4)	36	14	21.5	31.0	9.1	38.4	100.0	88.5	51.2	10.1	-
SS-3	5.00m RT.	20+40.0	2.59-3.04	A-2-6(1)	33	15	24.9	48.4	2.8	23.9	99.8	89.2	34.3	14.0	-
SS-4	5.00m RT.	20+40.0	4.11-4.56	A-1-b(0)	24	NP	71.1	16.6	8.1	4.2	89.6	39.2	12.3	-	-
SS-5	5.00m RT.	20+40.0	5.64-6.09	A-1-b(0)	19	NP	85.0	7.2	3.5	4.3	94.6	18.4	8.4	-	-
SS-6	5.00m RT.	20+40.0	7.16-7.61	A-2-4(0)	23	NP	48.8	37.6	9.5	4.1	100.0	69.2	15.4	17.2	-

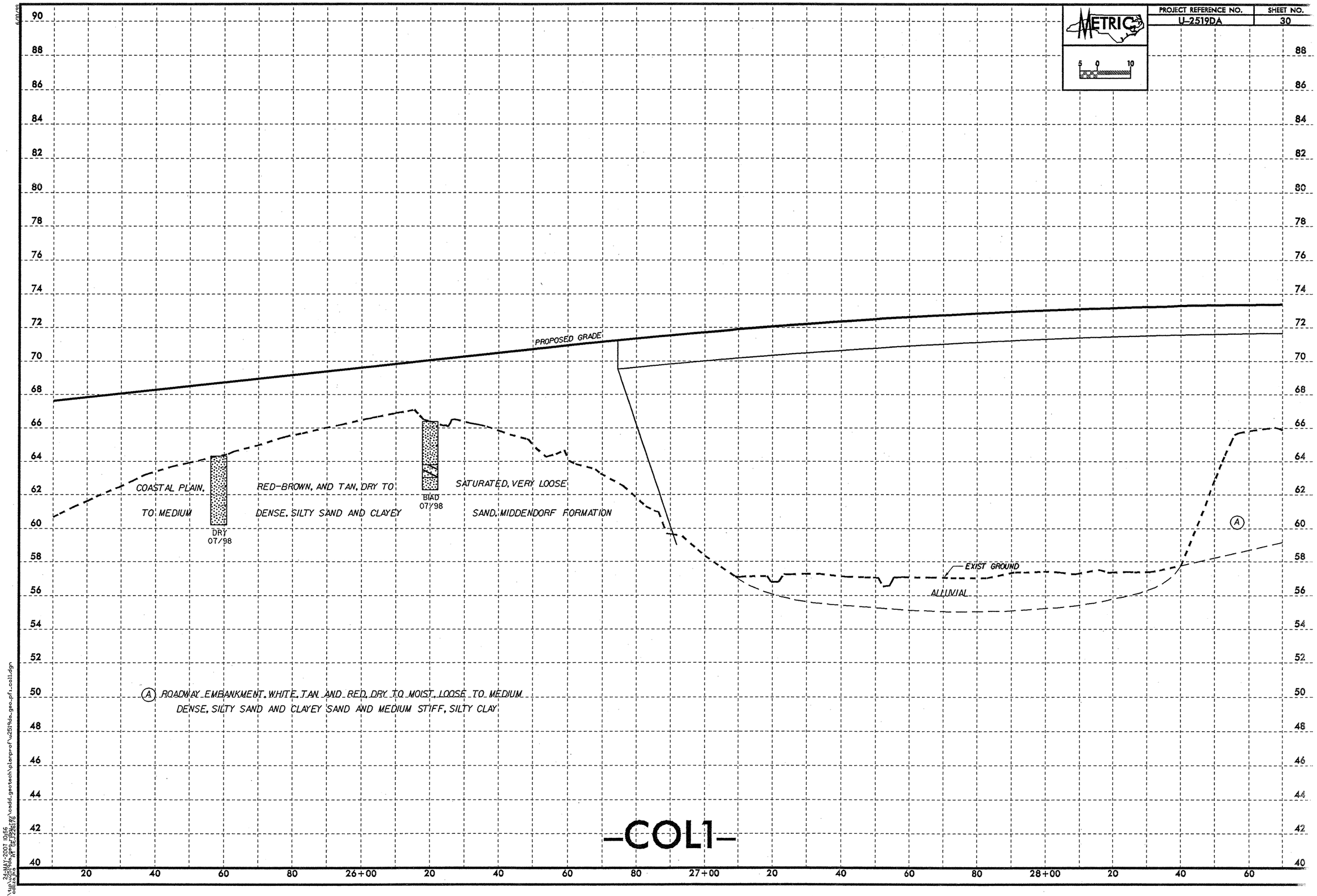


—COL1—

24-MAY-2007 10:53
\\tip\u2519da\PROJ\TIP\cadd_geotech\plan-prf\u2519da_geo_pfl_coll.dgn
cadjoe
AT 0C/26/178



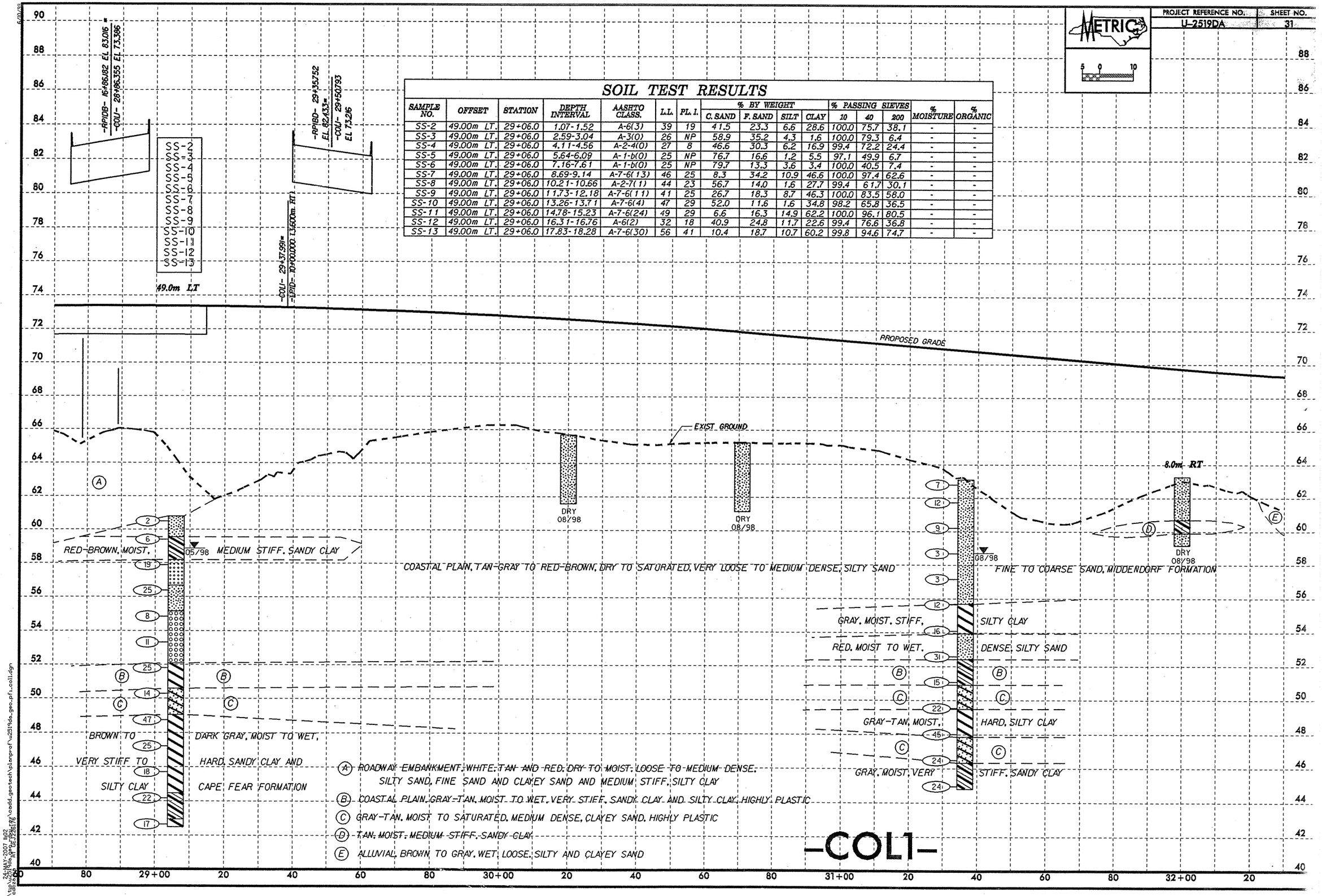
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
29
5 0 10
PROPOSED GRADE
EXIST GROUND
-COL1- 24+60.000=
-RPIC- 10+00.000 (3.600m RT)
DRY
07/98
10/98
GRAY-BLACK AND TAN-GRAY, MOIST TO
ALLUVIAL,
SAT., VERY LOOSE, SILTY SAND AND
FINE SAND WITH ORGANICS
MEDIUM DENSE, SILTY SAND, FINE TO
COARSE SAND, AND CLAYEY SAND,
MIDDENDORF FORMATION
COASTAL PLAIN, TAN, RED, BROWN, AND GRAY,
DRY TO SATURATED, VERY LOOSE TO
TO VERY STIFF, SANDY CLAY
AND SILTY CLAY
TAN-GRAY, MOIST, STIFF
TAN-GRAY, MOIST TO
WET, MEDIUM DENSE, CLAYEY SAND
COASTAL PLAIN,
DRY TO WET, STIFF
SANDY CLAY AND
SANDY CLAY
TAN TO DARK GRAY,
TO VERY STIFF,
MEDIUM DENSE,
CAPE FEAR FORMATION
GRAY, MOIST TO WET,
V. STIFF, SANDY CLAY
TAN-GRAY, MOIST, MED.
DENSE, SILTY SAND
COASTAL PLAIN
DRY TO MOIST,
SILTY CLAY AND
CLAYEY SAND
TAN TO GRAY-GREEN,
VERY STIFF TO HARD,
MEDIUM DENSE,
CAPE FEAR FORMATION
-COL1-
22+00
23+00
24+00
25+00


METRIC
5 0 10
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
30
PROPOSED GRADE
COASTAL PLAIN, TO MEDIUM
RED-BROWN, AND TAN, DRY TO DENSE, SILTY SAND AND CLAYEY
SATURATED, VERY LOOSE SAND, MIDDENDORF FORMATION
DRY 07/98
BIAD 07/98
EXIST GROUND
ALLUVIAL
A
A ROADWAY EMBANKMENT, WHITE, TAN AND RED, DRY TO MOIST, LOOSE TO MEDIUM DENSE, SILTY SAND AND CLAYEY SAND AND MEDIUM STIFF, SILTY CLAY
90
88
86
84
82
80
78
76
74
72
70
68
66
64
62
60
58
56
54
52
50
48
46
44
42
40
20
40
60
80
26+00
20
40
60
80
27+00
20
40
60
80
28+00
20
40
60
-COL1-

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	31

METRIC

5 0 10



SOIL TEST RESULTS

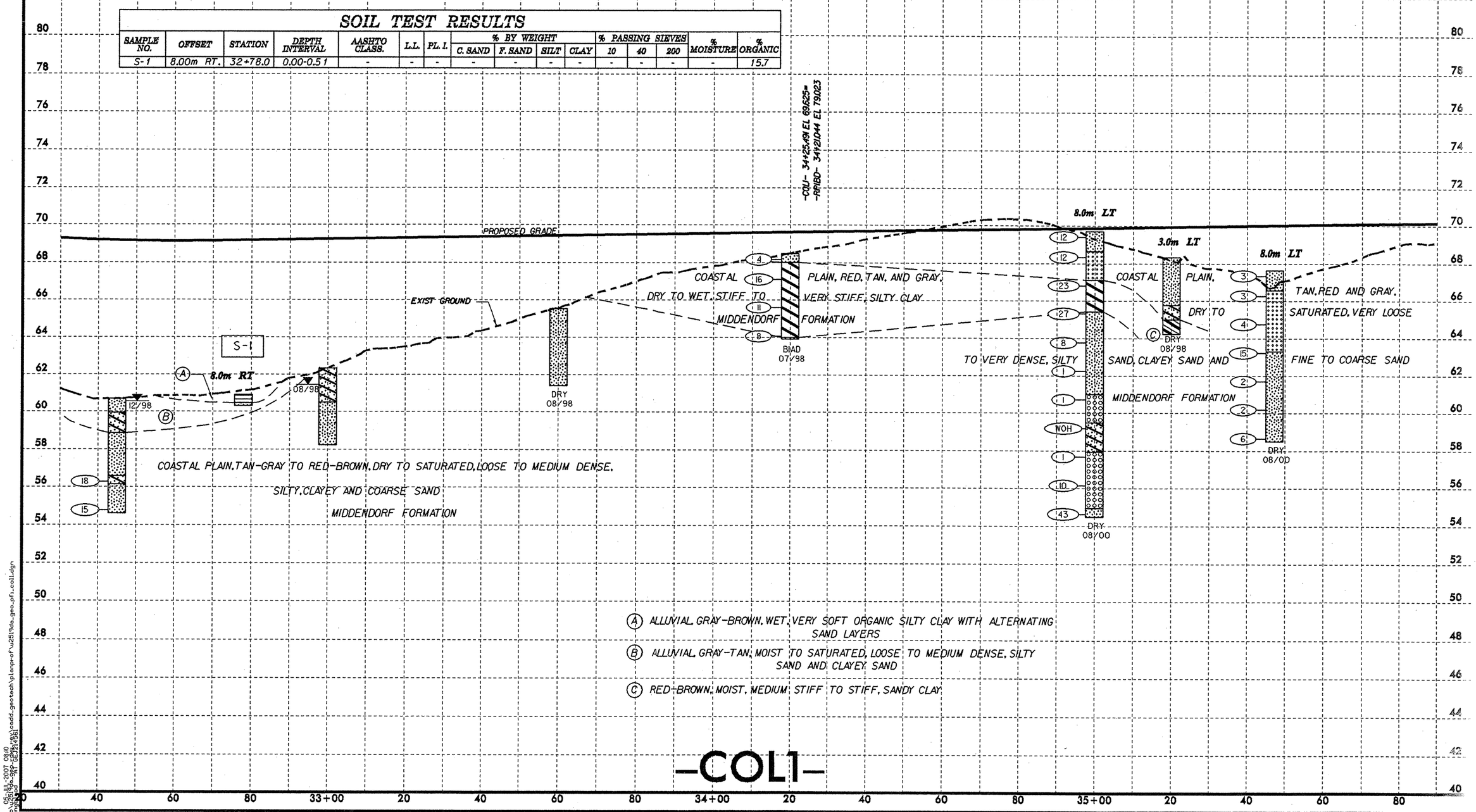
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING SIEVES 10	% PASSING SIEVES 40	% PASSING SIEVES 200	% MOISTURE	% ORGANIC
SS-2	49.00m LT.	29+06.0	1.07-1.52	A-6(3)	39	19	41.5	23.3	6.6	28.6	100.0	75.7	38.1	-	-
SS-3	49.00m LT.	29+06.0	2.59-3.04	A-3(0)	26	NP	58.9	35.2	4.3	1.6	100.0	79.3	6.4	-	-
SS-4	49.00m LT.	29+06.0	4.11-4.56	A-2-4(0)	27	8	46.6	30.3	6.2	16.9	99.4	72.2	24.4	-	-
SS-5	49.00m LT.	29+06.0	5.64-6.09	A-1-b(0)	25	NP	76.7	16.6	1.2	5.5	97.1	49.9	6.7	-	-
SS-6	49.00m LT.	29+06.0	7.16-7.61	A-1-b(0)	25	NP	79.7	13.3	3.6	3.4	100.0	40.5	7.4	-	-
SS-7	49.00m LT.	29+06.0	8.69-9.14	A-7-6(13)	46	25	8.3	34.2	10.9	46.6	100.0	97.4	62.6	-	-
SS-8	49.00m LT.	29+06.0	10.21-10.66	A-2-7(1)	44	23	56.7	14.0	1.6	27.7	99.4	61.7	30.1	-	-
SS-9	49.00m LT.	29+06.0	11.73-12.18	A-7-6(11)	41	25	26.7	18.3	8.7	46.3	100.0	83.5	58.0	-	-
SS-10	49.00m LT.	29+06.0	13.26-13.71	A-7-6(4)	47	29	52.0	11.6	1.6	34.8	98.2	65.8	36.5	-	-
SS-11	49.00m LT.	29+06.0	14.78-15.23	A-7-6(24)	49	29	6.6	16.3	14.9	62.2	100.0	96.1	80.5	-	-
SS-12	49.00m LT.	29+06.0	16.31-16.76	A-6(2)	32	18	40.9	24.8	11.7	22.6	99.4	76.6	36.8	-	-
SS-13	49.00m LT.	29+06.0	17.83-18.28	A-7-6(30)	56	41	10.4	18.7	10.7	60.2	99.8	94.6	74.7	-	-

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	32

METRIC

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-1	8.00m RT.	32+78.0	0.00-0.51	-	-	-	-	-	-	-	-	-	-	-	15.7

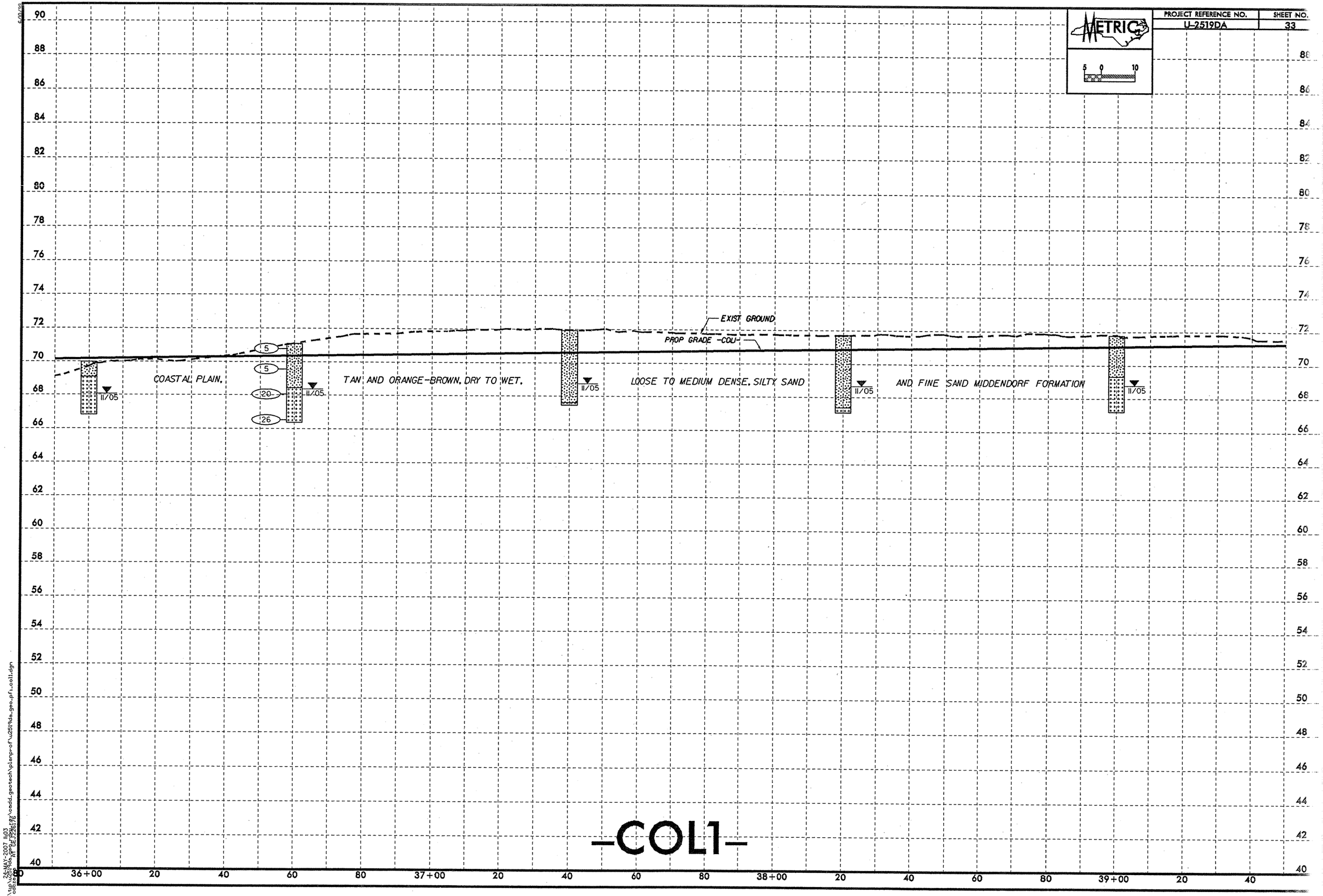


(A) ALLUVIAL, GRAY-BROWN, WET, VERY SOFT ORGANIC SILTY CLAY WITH ALTERNATING SAND LAYERS

(B) ALLUVIAL, GRAY-TAN, MOIST TO SATURATED, LOOSE TO MEDIUM DENSE, SILTY SAND AND CLAYEY SAND

(C) RED-BROWN, MOIST, MEDIUM STIFF TO STIFF, SANDY CLAY

-COL1-


METRIC
5 0 10
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
33
EXIST GROUND
PROP GRADE -COL1-
COASTAL PLAIN.
TAN AND ORANGE-BROWN, DRY TO WET.
LOOSE TO MEDIUM DENSE, SILTY SAND
AND FINE SAND MIDDENDORF FORMATION
5
5
20
26
11/05
-COL1-
36+00
37+00
38+00
39+00

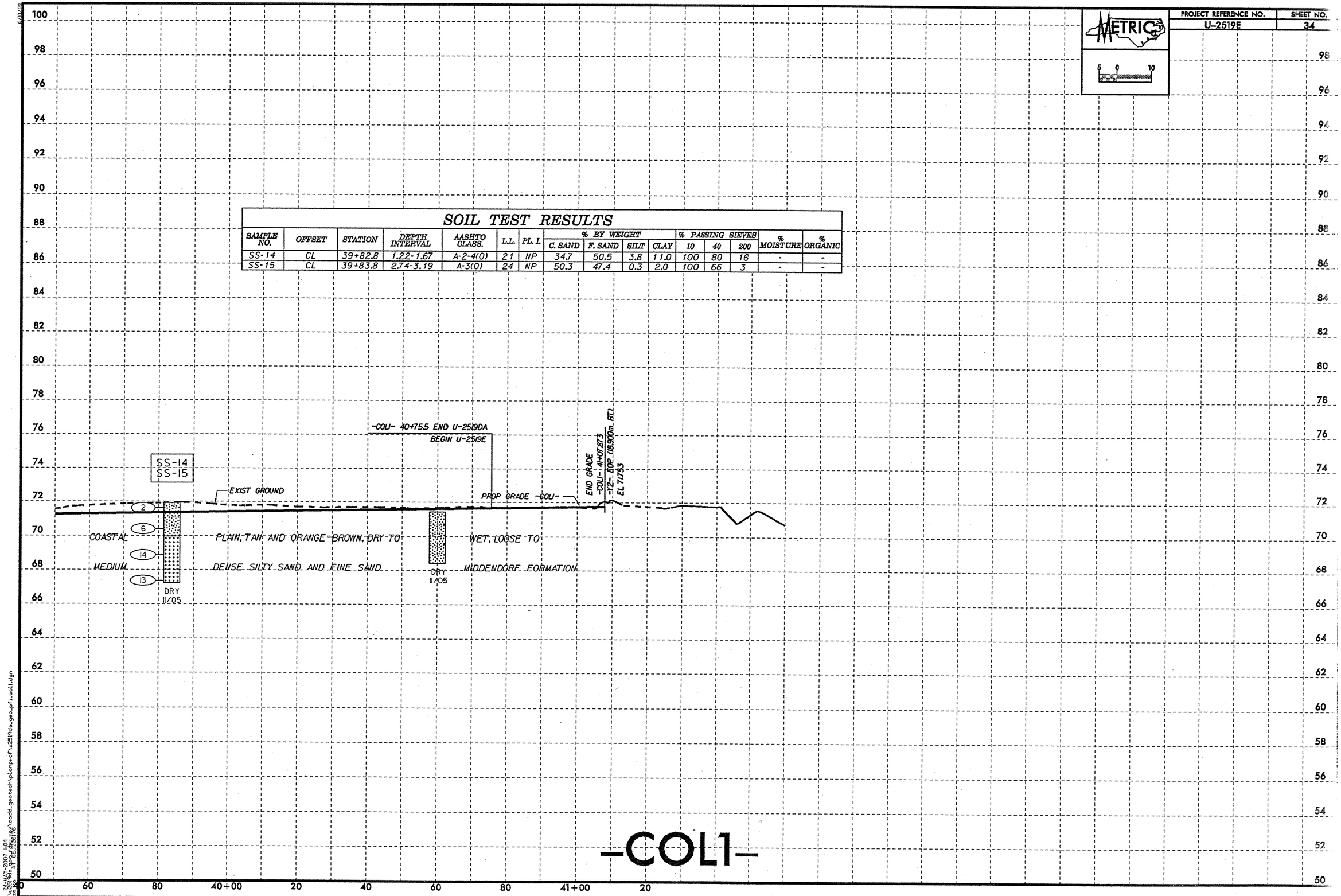
PROJECT REFERENCE NO.	SHEET NO.
U-2519E	34

METRIC

5 0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-14	CL	39+82.8	1.22-1.67	A-2-4(0)	21	NP	34.7	50.5	3.8	11.0	100	80	16	-	-
SS-15	CL	39+83.8	2.74-3.19	A-3(0)	24	NP	50.3	47.4	0.3	2.0	100	66	3	-	-



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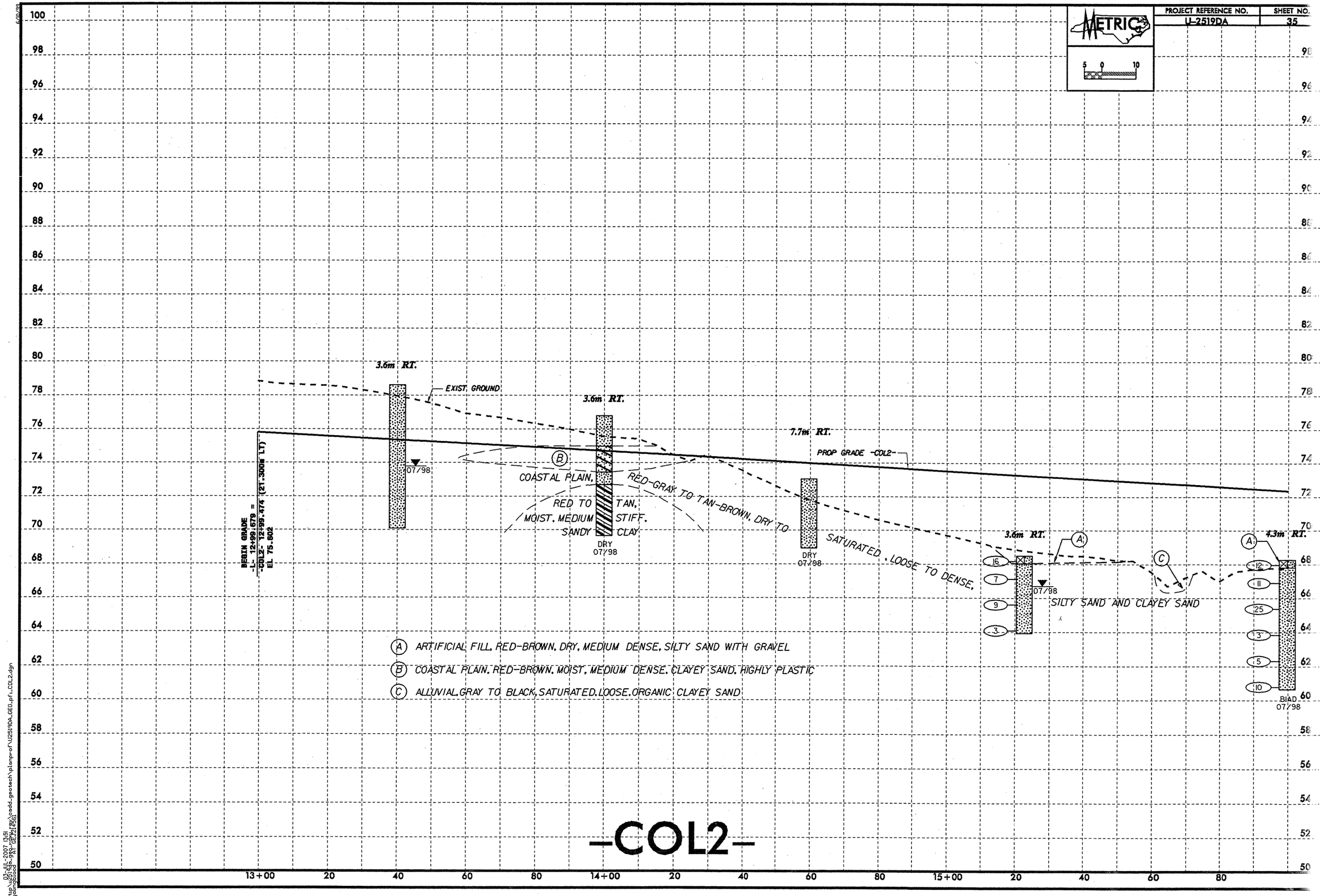
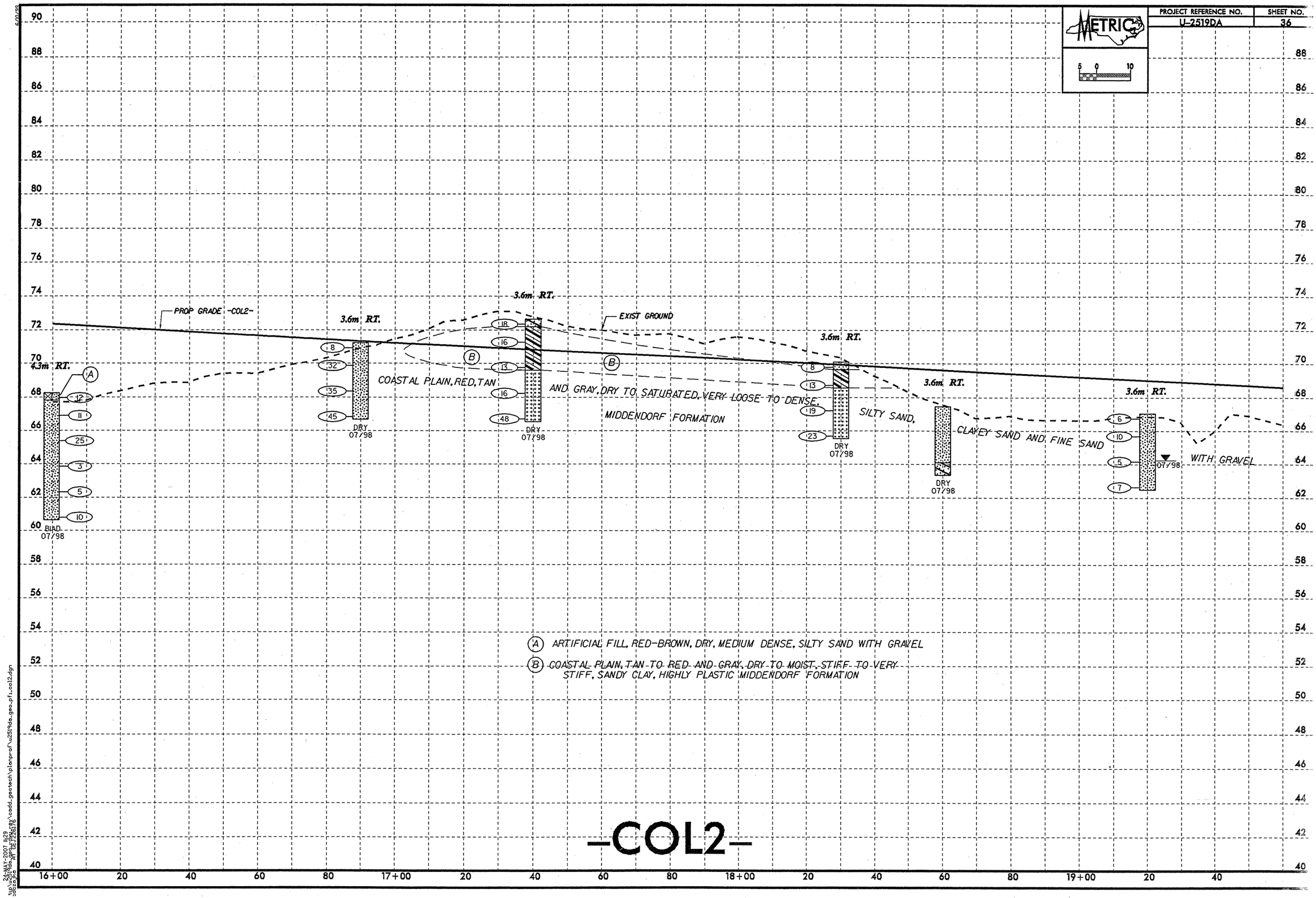
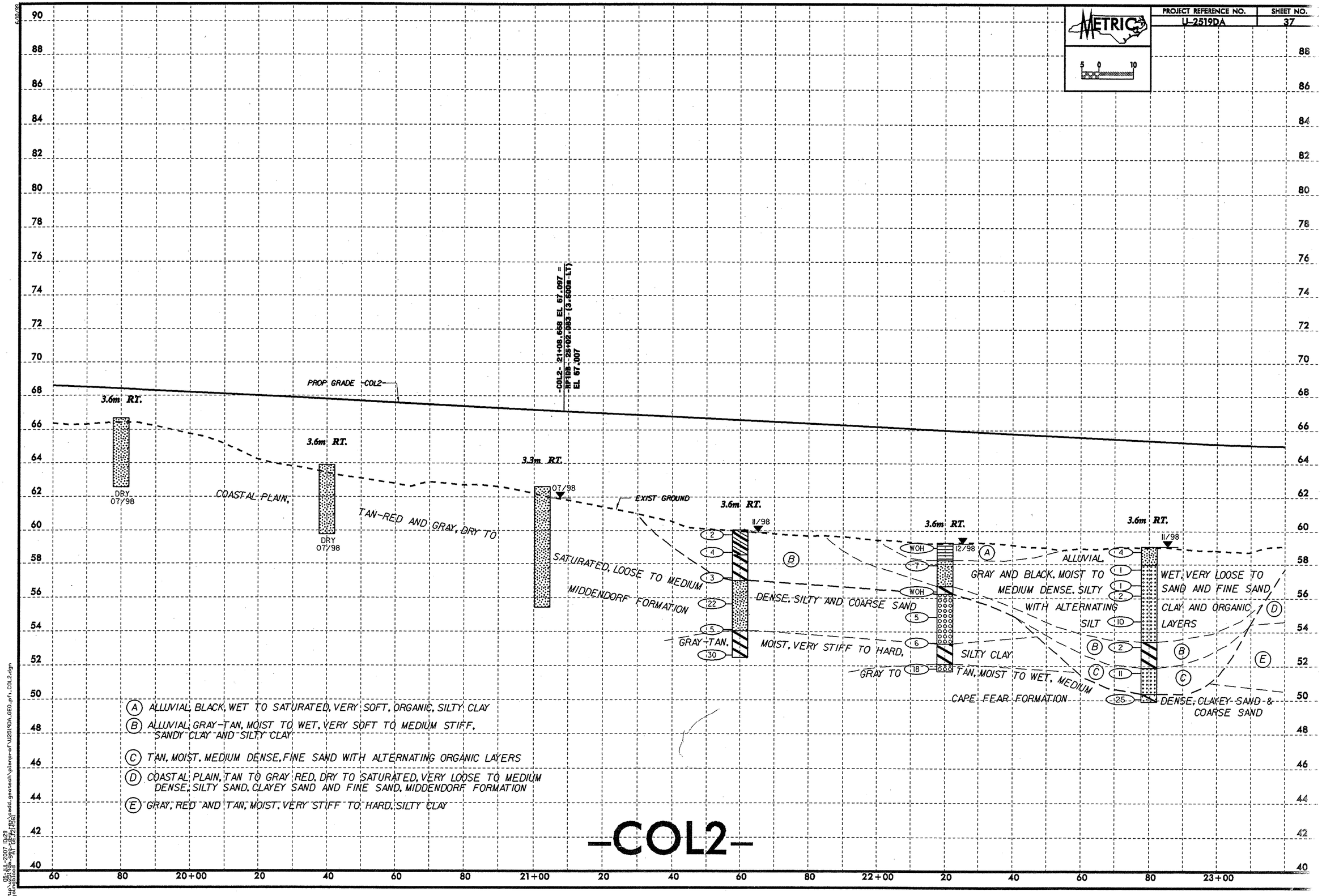
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	35

METRIC

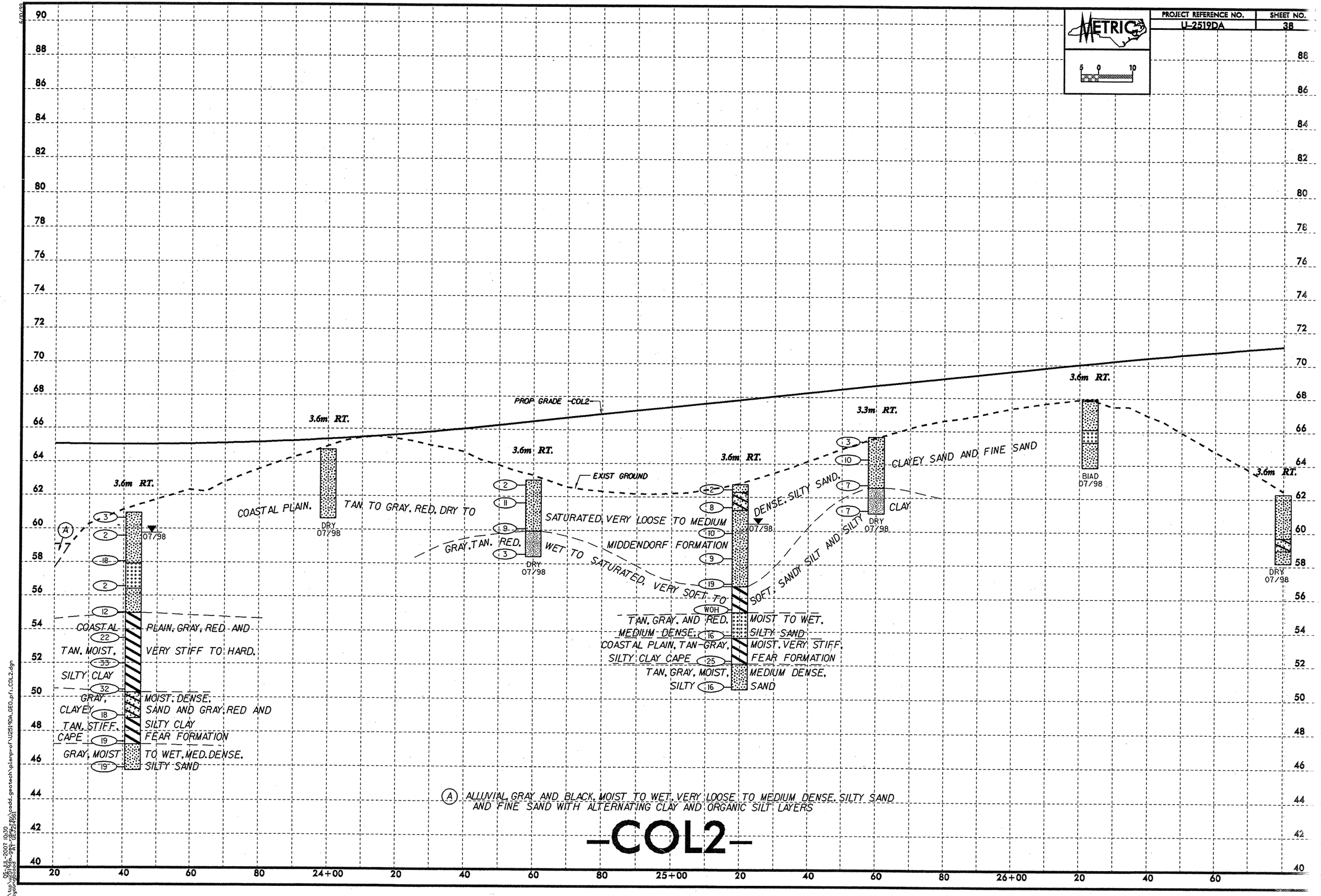
5 0 10




METRIC
5 0 10
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
36
PROP GRADE -COL2-
EXIST GROUND
4.3m RT.
3.6m RT.
3.6m RT.
3.6m RT.
3.6m RT.
3.6m RT.
A
B
B
12
11
25
3
5
10
BIAD
07/98
8
32
35
45
DRY
07/98
18
16
13
16
48
DRY
07/98
8
13
19
23
DRY
07/98
DRY
07/98
6
10
5
7
07/98
COASTAL PLAIN, RED, TAN AND GRAY, DRY TO SATURATED, VERY LOOSE TO DENSE,
MIDDENDORF FORMATION
SILTY SAND,
CLAYEY SAND AND FINE SAND
WITH GRAVEL
A ARTIFICIAL FILL, RED-BROWN, DRY, MEDIUM DENSE, SILTY SAND WITH GRAVEL
B COASTAL PLAIN, TAN TO RED AND GRAY, DRY TO MOIST, STIFF TO VERY STIFF, SANDY CLAY, HIGHLY PLASTIC MIDDENDORF FORMATION
-COL2-
90
88
86
84
82
80
78
76
74
72
70
68
66
64
62
60
58
56
54
52
50
48
46
44
42
40
16+00
20
40
60
80
17+00
20
40
60
80
18+00
20
40
60
80
19+00
20
40

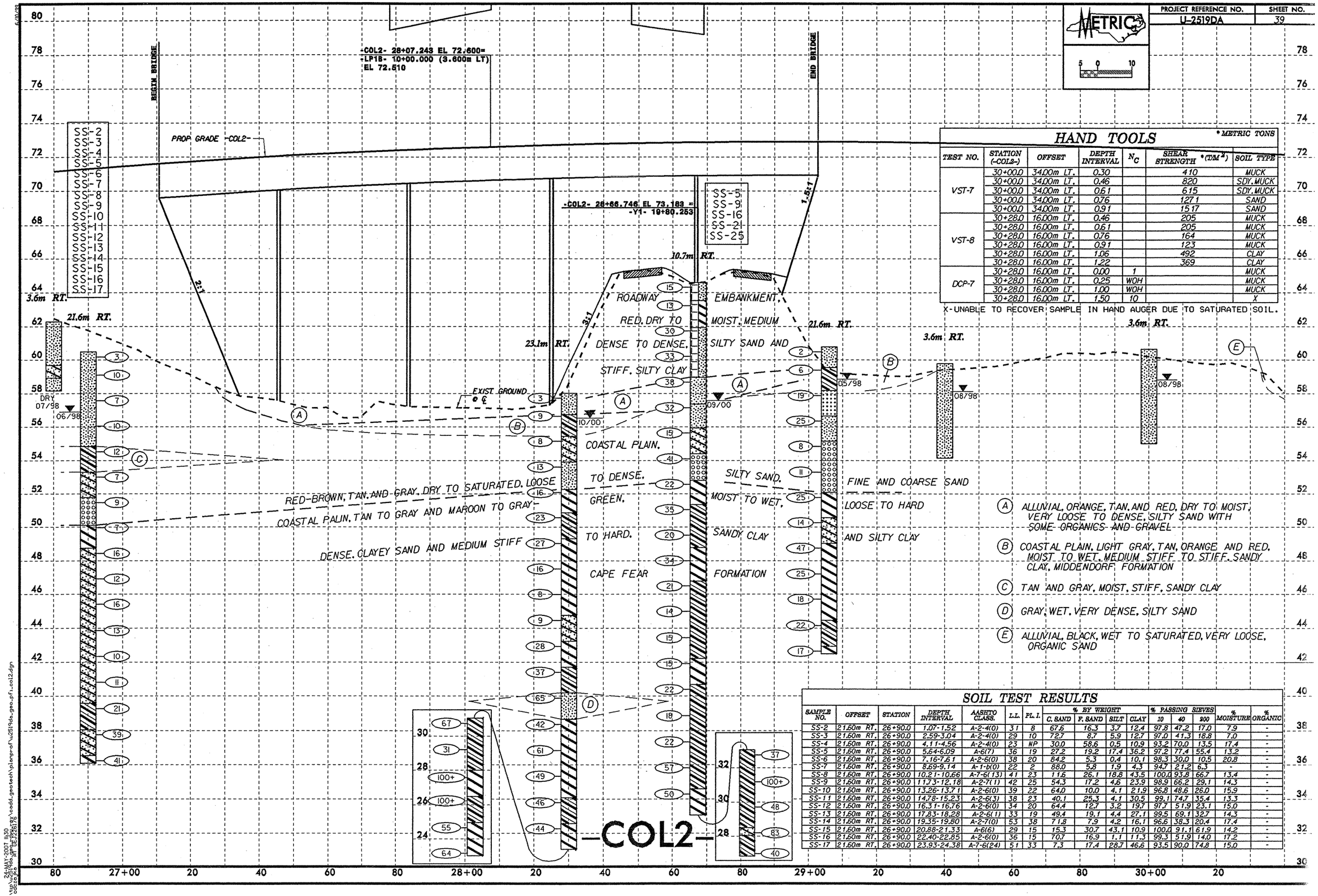


METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
37
5 0 10
-COL2- 21+08.668 EL 67.097 =
-RP1DB- 25+02.083 (3.600m LT)
EL 67.007
PROP GRADE -COL2-
EXIST GROUND
3.6m RT.
3.6m RT.
3.3m RT.
3.6m RT.
3.6m RT.
3.6m RT.
DRY 07/98
DRY 07/98
07/98
11/98
12/98
11/98
COASTAL PLAIN,
TAN-RED AND GRAY, DRY TO
SATURATED, LOOSE TO MEDIUM
MIDDENDORF FORMATION
DENSE, SILTY AND COARSE SAND
GRAY-TAN,
MOIST, VERY STIFF TO HARD,
GRAY TO
SILTY CLAY
TAN, MOIST TO WET, MEDIUM
CAPE FEAR FORMATION
ALLUVIAL,
GRAY AND BLACK, MOIST TO
MEDIUM DENSE, SILTY
WITH ALTERNATING
SILT
WET, VERY LOOSE TO
SAND AND FINE SAND
CLAY AND ORGANIC
LAYERS
DENSE, CLAYEY SAND &
COARSE SAND
(A) ALLUVIAL, BLACK, WET TO SATURATED, VERY SOFT, ORGANIC, SILTY CLAY
(B) ALLUVIAL, GRAY-TAN, MOIST TO WET, VERY SOFT TO MEDIUM STIFF, SANDY CLAY AND SILTY CLAY
(C) TAN, MOIST, MEDIUM DENSE, FINE SAND WITH ALTERNATING ORGANIC LAYERS
(D) COASTAL PLAIN, TAN TO GRAY RED, DRY TO SATURATED, VERY LOOSE TO MEDIUM DENSE, SILTY SAND, CLAYEY SAND AND FINE SAND, MIDDENDORF FORMATION
(E) GRAY, RED AND TAN, MOIST, VERY STIFF TO HARD, SILTY CLAY
-COL2-


METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
38
PROP. GRADE -COL2-
3.6m RT.
3.3m RT.
EXIST GROUND
COASTAL PLAIN. TAN TO GRAY, RED, DRY TO
GRAY, TAN, RED, WET TO SATURATED, VERY SOFT TO
SATURATED, VERY LOOSE TO MEDIUM
MIDDENDORF FORMATION
DENSE, SILTY SAND,
SOFT, SANDY SILT AND SILTY CLAY
CLAYEY SAND AND FINE SAND
COASTAL PLAIN, GRAY, RED AND
TAN, MOIST, VERY STIFF TO HARD,
SILTY CLAY
GRAY, MOIST, DENSE,
CLAYEY SAND AND GRAY, RED AND
TAN, STIFF, SILTY CLAY
CAPE FEAR FORMATION
GRAY, MOIST TO WET, MED. DENSE,
SILTY SAND
TAN, GRAY, AND RED, MOIST TO WET,
MEDIUM DENSE, SILTY SAND
COASTAL PLAIN, TAN-GRAY, MOIST, VERY STIFF,
SILTY CLAY CAPE FEAR FORMATION
TAN, GRAY, MOIST, MEDIUM DENSE,
SILTY SAND
(A) ALLUVIAL, GRAY AND BLACK, MOIST TO WET, VERY LOOSE TO MEDIUM DENSE, SILTY SAND AND FINE SAND WITH ALTERNATING CLAY AND ORGANIC SILT LAYERS
07/98
DRY 07/98
BIAD 07/98
-COL2-
24+00
25+00
26+00

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	39

METRIC



HAND TOOLS

*METRIC TONS

TEST NO.	STATION (-COL2-)	OFFSET	DEPTH INTERVAL	N_C	SHEAR STRENGTH *(T/M²)	SOIL TYPE
VST-7	30+00.0	34.00m LT.	0.30		410	MUCK
	30+00.0	34.00m LT.	0.46		820	SDY. MUCK
	30+00.0	34.00m LT.	0.61		615	SDY. MUCK
	30+00.0	34.00m LT.	0.76		127.1	SAND
	30+00.0	34.00m LT.	0.91		151.7	SAND
VST-8	30+28.0	16.00m LT.	0.46		205	MUCK
	30+28.0	16.00m LT.	0.61		205	MUCK
	30+28.0	16.00m LT.	0.76		164	MUCK
	30+28.0	16.00m LT.	0.91		123	MUCK
	30+28.0	16.00m LT.	1.06		492	CLAY
	30+28.0	16.00m LT.	1.22		369	CLAY
DCP-7	30+28.0	16.00m LT.	0.00	1		MUCK
	30+28.0	16.00m LT.	0.25	WOH		MUCK
	30+28.0	16.00m LT.	1.00	WOH		MUCK
	30+28.0	16.00m LT.	1.50	10		X

X-UNABLE TO RECOVER SAMPLE IN HAND AUGER DUE TO SATURATED SOIL.

(A) ALLUVIAL, ORANGE, TAN, AND RED, DRY TO MOIST, VERY LOOSE TO DENSE, SILTY SAND WITH ~~SOME ORGANICS AND GRAVEL~~

(B) COASTAL PLAIN, LIGHT GRAY, TAN, ORANGE AND RED, MOIST TO WET, MEDIUM STIFF TO STIFF, SANDY CLAY, MIDDENDORF FORMATION

(C) TAN AND GRAY, MOIST, STIFF, SANDY CLAY

(D) GRAY, WET, VERY DENSE, SILTY SAND

(E) ALLUVIAL, BLACK, WET TO SATURATED, VERY LOOSE, ORGANIC SAND

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-2	21.60m RT.	26+90.0	1.07-1.52	A-2-4(0)	31	8	67.6	16.3	3.7	12.4	97.8	47.2	17.0	7.9	-
SS-3	21.60m RT.	26+90.0	2.59-3.04	A-2-4(0)	29	10	72.7	8.7	5.9	12.7	97.0	41.3	18.8	7.0	-
SS-4	21.60m RT.	26+90.0	4.11-4.56	A-2-4(0)	23	NP	30.0	58.6	0.5	10.9	93.2	70.0	13.5	17.4	-
SS-5	21.60m RT.	26+90.0	5.64-6.09	A-6(7)	36	19	27.2	19.2	17.4	36.2	97.2	77.4	55.4	13.2	-
SS-6	21.60m RT.	26+90.0	7.16-7.61	A-2-6(0)	38	20	84.2	5.3	0.4	10.1	98.3	30.0	10.5	20.8	-
SS-7	21.60m RT.	26+90.0	8.69-9.14	A-1-b(0)	22	2	88.0	5.8	1.9	4.3	94.7	21.2	6.3	-	-
SS-8	21.60m RT.	26+90.0	10.21-10.66	A-7-6(13)	41	23	11.6	26.1	18.8	43.5	100.0	93.8	66.7	13.4	-
SS-9	21.60m RT.	26+90.0	11.73-12.18	A-2-7(1)	42	25	54.3	17.2	4.6	23.9	98.9	66.2	29.1	14.3	-
SS-10	21.60m RT.	26+90.0	13.26-13.71	A-2-6(0)	39	22	64.0	10.0	4.1	21.9	96.8	48.6	26.0	15.9	-
SS-11	21.60m RT.	26+90.0	14.78-15.23	A-2-6(3)	38	23	40.1	25.3	4.1	30.5	99.1	74.7	35.4	13.3	-
SS-12	21.60m RT.	26+90.0	16.31-16.76	A-2-6(0)	34	20	64.4	12.7	3.2	19.7	97.7	51.9	23.1	15.0	-
SS-13	21.60m RT.	26+90.0	17.83-18.28	A-2-6(1)	33	19	49.4	19.1	4.4	27.1	99.5	69.1	32.7	14.3	-
SS-14	21.60m RT.	26+90.0	19.35-19.80	A-2-7(0)	53	38	71.8	7.9	4.2	16.1	96.6	38.3	20.4	17.4	-
SS-15	21.60m RT.	26+90.0	20.88-21.33	A-6(6)	29	15	15.3	30.7	43.1	10.9	100.0	91.1	61.9	14.2	-
SS-16	21.60m RT.	26+90.0	22.40-22.85	A-2-6(0)	36	15	70.7	16.9	1.1	11.3	99.3	51.9	14.0	17.2	-
SS-17	21.60m RT.	26+90.0	23.93-24.38	A-7-6(24)	51	33	7.3	17.4	28.7	46.6	93.5	90.0	74.8	15.0	-

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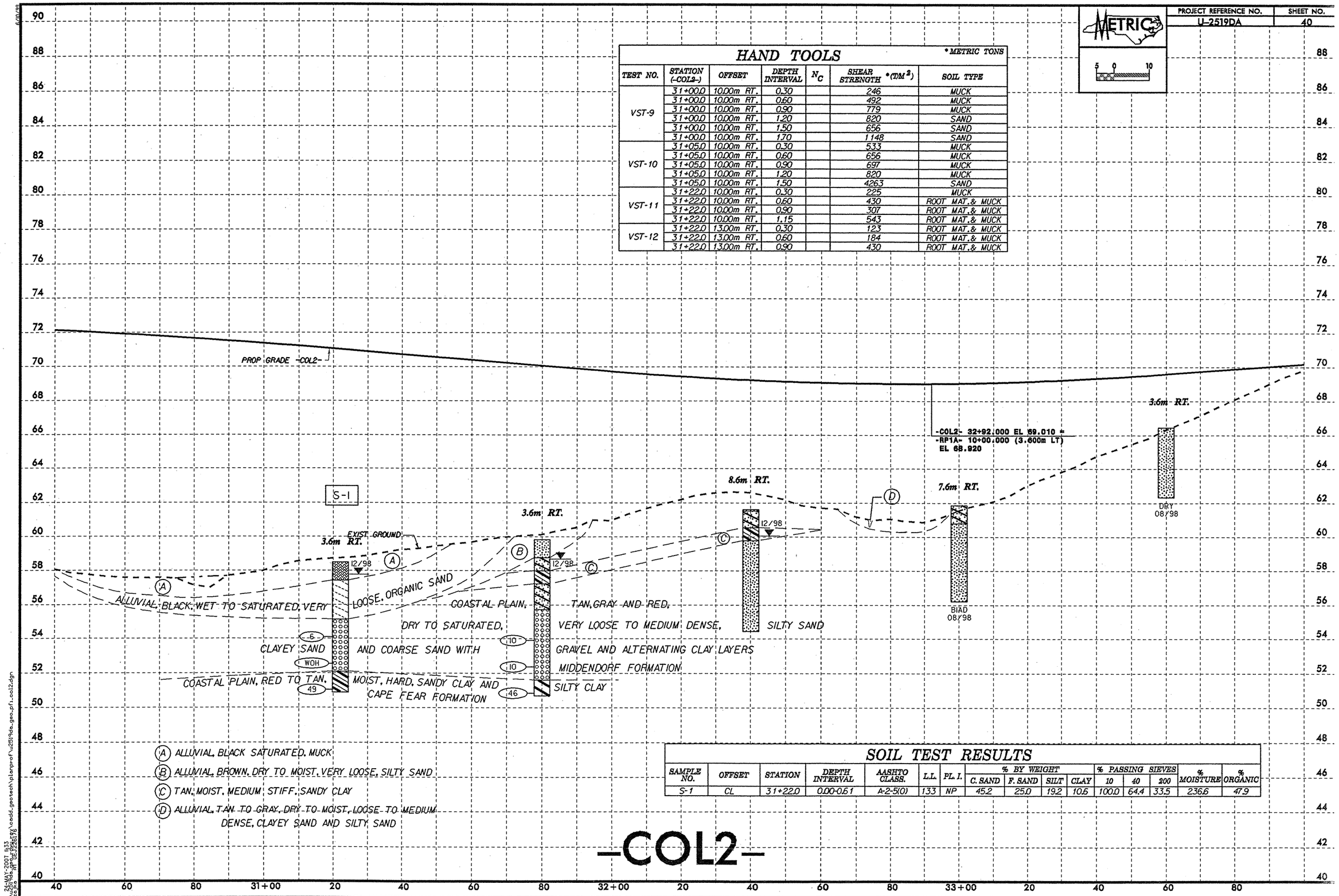
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	40

METRIC 5 0 10

HAND TOOLS

*METRIC TONS

TEST NO.	STATION (-COL2-)	OFFSET	DEPTH INTERVAL	N_C	SHEAR STRENGTH *(TM²)	SOIL TYPE
VST-9	31+00.0	10.00m RT.	0.30		246	MUCK
	31+00.0	10.00m RT.	0.60		492	MUCK
	31+00.0	10.00m RT.	0.90		779	MUCK
	31+00.0	10.00m RT.	1.20		820	SAND
	31+00.0	10.00m RT.	1.50		656	SAND
	31+00.0	10.00m RT.	1.70		1148	SAND
VST-10	31+05.0	10.00m RT.	0.30		533	MUCK
	31+05.0	10.00m RT.	0.60		656	MUCK
	31+05.0	10.00m RT.	0.90		697	MUCK
	31+05.0	10.00m RT.	1.20		820	MUCK
	31+05.0	10.00m RT.	1.50		4263	SAND
VST-11	31+22.0	10.00m RT.	0.30		225	MUCK
	31+22.0	10.00m RT.	0.60		430	ROOT MAT.& MUCK
	31+22.0	10.00m RT.	0.90		307	ROOT MAT.& MUCK
	31+22.0	10.00m RT.	1.15		543	ROOT MAT.& MUCK
VST-12	31+22.0	13.00m RT.	0.30		123	ROOT MAT.& MUCK
	31+22.0	13.00m RT.	0.60		184	ROOT MAT.& MUCK
	31+22.0	13.00m RT.	0.90		430	ROOT MAT.& MUCK



(A) ALLUVIAL, BLACK SATURATED, MUCK

(B) ALLUVIAL, BROWN, DRY TO MOIST, VERY LOOSE, SILTY SAND

(C) TAN, MOIST, MEDIUM STIFF, SANDY CLAY

(D) ALLUVIAL, TAN TO GRAY, DRY TO MOIST, LOOSE TO MEDIUM DENSE, CLAYEY SAND AND SILTY SAND

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-1	CL	31+22.0	0.00-0.61	A-2-5(0)	133	NP	45.2	25.0	19.2	10.6	100.0	64.4	33.5	236.6	47.9

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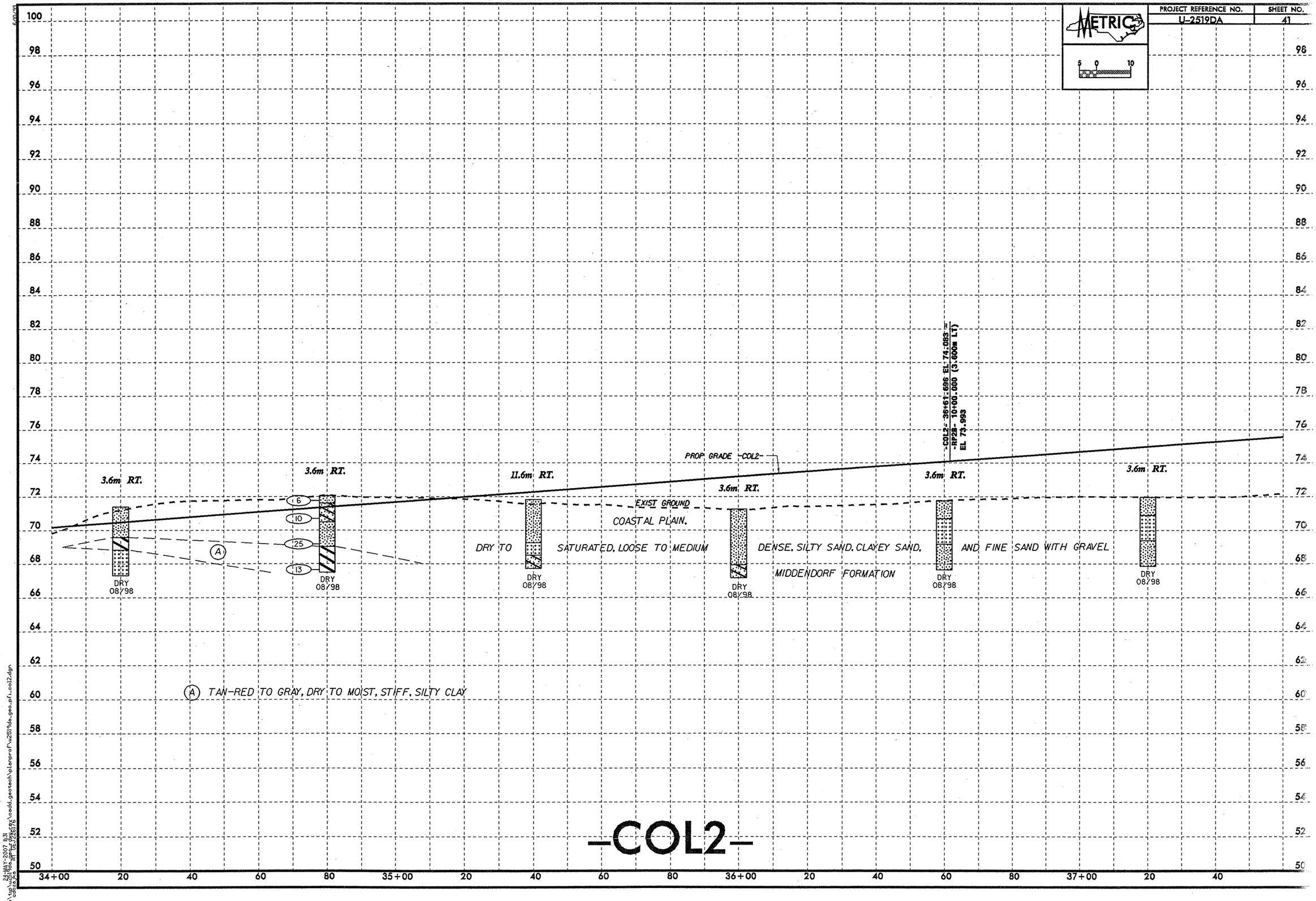
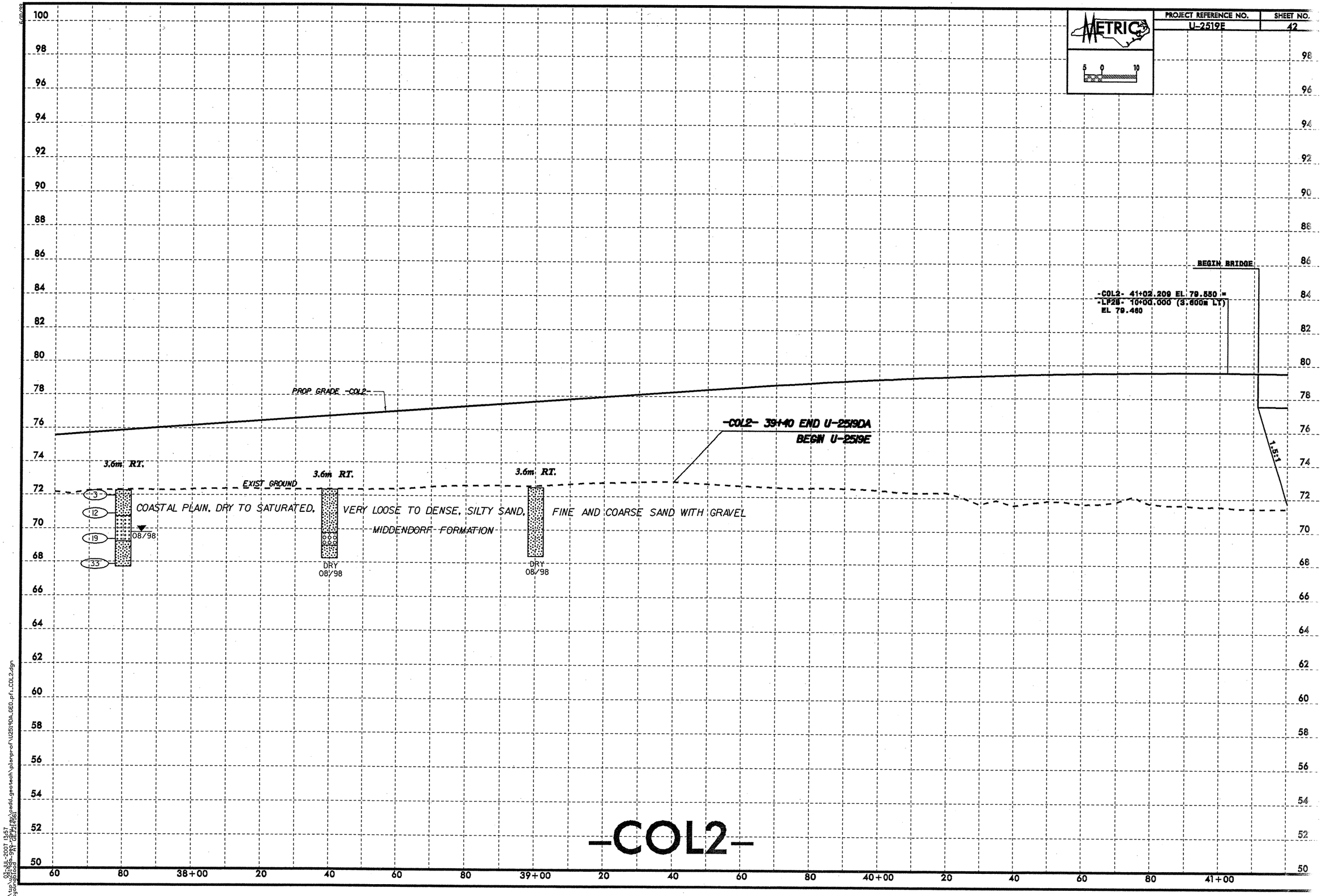

METRIC
5 0 10
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
41
PROP GRADE -COL2-
-COL2- 36+61.696 EL 74.083
-RP23- 10+00.000 (3.600m LT)
EL 73.993
EXIST GROUND
3.6m RT.
11.6m RT.
6
10
25
13
A
DRY
08/98
COASTAL PLAIN.
DRY TO SATURATED, LOOSE TO MEDIUM DENSE, SILTY SAND, CLAYEY SAND, AND FINE SAND WITH GRAVEL
MIDDENDORF FORMATION
A TAN-RED TO GRAY, DRY TO MOIST, STIFF, SILTY CLAY
-COL2-
100
98
96
94
92
90
88
86
84
82
80
78
76
74
72
70
68
66
64
62
60
58
56
54
52
50
34+00
20
40
60
80
35+00
36+00
37+00


METRIC
5 0 10
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
42
BEGIN BRIDGE
-COL2- 41+02.209 EL 79.550 =
-LP2B- 10+00.000 (3.600m LT)
EL 79.460
1.5:1
PROP GRADE -COL2-
-COL2- 39+40 END U-2519DA
BEGIN U-2519E
EXIST GROUND
3.6m RT.
3.6m RT.
3.6m RT.
3
12
19
33
08/98
COASTAL PLAIN, DRY TO SATURATED, VERY LOOSE TO DENSE, SILTY SAND, FINE AND COARSE SAND WITH GRAVEL
MIDDENDORF FORMATION
DRY
08/98
DRY
08/98
-COL2-
100
98
96
94
92
90
88
86
84
82
80
78
76
74
72
70
68
66
64
62
60
58
56
54
52
50
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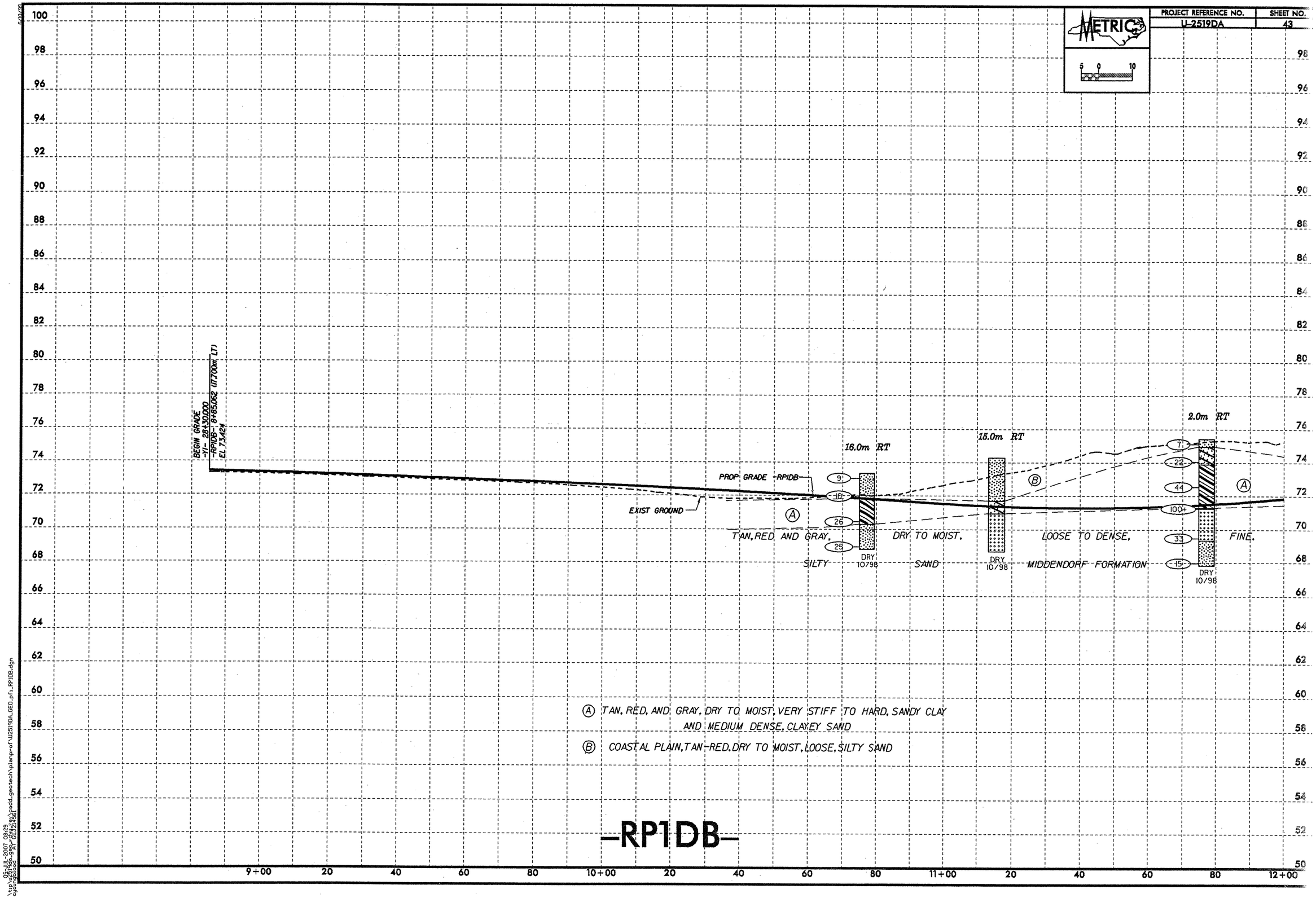
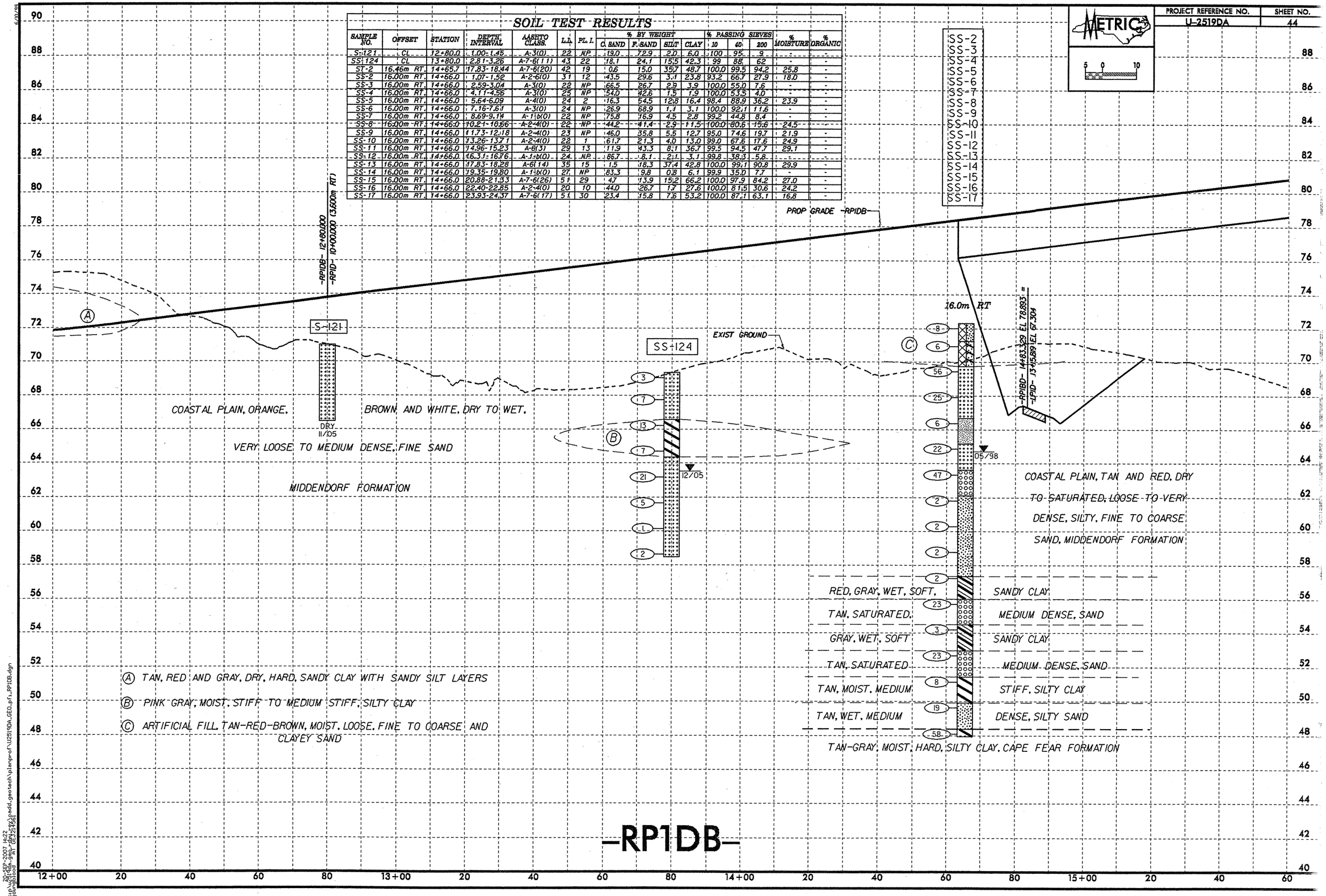

METRIC
5 0 10
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
43
BEGIN GRADE
-Y- 28+30.000
-RPIDB- 8+85.062 (17.700m LT)
EL 73.424
PROP GRADE -RPIDB-
EXIST GROUND
16.0m RT
15.0m RT
2.0m RT
9
10
26
25
7
22
44
100+
33
15
DRY 10/98
TAN, RED AND GRAY, SILTY
DRY TO MOIST, SAND
LOOSE TO DENSE, MIDDENDORF FORMATION
FINE.
A
B
A TAN, RED, AND GRAY, DRY TO MOIST, VERY STIFF TO HARD, SANDY CLAY AND MEDIUM DENSE, CLAYEY SAND
B COASTAL PLAIN, TAN-RED, DRY TO MOIST, LOOSE, SILTY SAND
-RP1DB-
100
98
96
94
92
90
88
86
84
82
80
78
76
74
72
70
68
66
64
62
60
58
56
54
52
50
9+00
20
40
60
80
10+00
20
40
60
80
11+00
20
40
60
80
12+00

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	44

METRIC 5 0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-121	CL	12+80.0	1.00-1.45	A-3(0)	22	NP	19.0	72.9	2.0	6.0	100	95	9	-	-
SS-124	CL	13+80.0	2.81-3.26	A-7-6(11)	43	22	18.1	24.1	15.5	42.3	99	88	62	-	-
ST-2	16.46m RT.	14+65.7	17.83-18.44	A-7-6(20)	42	19	0.6	15.0	35.7	48.7	100.0	99.5	94.2	25.8	-
SS-2	16.00m RT.	14+66.0	1.07-1.52	A-2-6(0)	31	12	43.5	29.6	3.1	23.8	93.2	66.7	27.9	18.0	-
SS-3	16.00m RT.	14+66.0	2.59-3.04	A-3(0)	22	NP	66.5	26.7	2.9	3.9	100.0	55.0	7.6	-	-
SS-4	16.00m RT.	14+66.0	4.11-4.56	A-3(0)	25	NP	54.0	42.6	1.5	1.9	100.0	53.5	4.0	-	-
SS-5	16.00m RT.	14+66.0	5.64-6.09	A-4(0)	24	2	16.3	54.5	12.8	16.4	98.4	88.9	36.2	23.9	-
SS-6	16.00m RT.	14+66.0	7.16-7.61	A-3(0)	24	NP	26.9	68.9	1.1	3.1	100.0	92.1	11.6	-	-
SS-7	16.00m RT.	14+66.0	8.69-9.14	A-1-b(0)	22	NP	75.8	16.9	4.5	2.8	99.2	44.8	8.4	-	-
SS-8	16.00m RT.	14+66.0	10.21-10.66	A-2-4(0)	22	NP	44.2	41.4	2.9	11.5	100.0	80.6	15.6	24.5	-
SS-9	16.00m RT.	14+66.0	11.73-12.18	A-2-4(0)	23	NP	46.0	35.8	5.5	12.7	95.0	74.6	19.7	21.9	-
SS-10	16.00m RT.	14+66.0	13.26-13.71	A-2-4(0)	22	1	61.7	21.3	4.0	13.0	99.0	67.6	17.6	24.9	-
SS-11	16.00m RT.	14+66.0	14.96-15.23	A-6(3)	29	13	11.9	43.3	8.1	36.7	99.5	94.5	47.7	29.1	-
SS-12	16.00m RT.	14+66.0	16.31-16.76	A-1-b(0)	24	NP	86.7	8.1	2.1	3.1	99.8	38.3	5.8	-	-
SS-13	16.00m RT.	14+66.0	17.83-18.28	A-6(14)	35	15	1.5	18.3	37.4	42.8	100.0	99.1	90.8	29.9	-
SS-14	16.00m RT.	14+66.0	19.35-19.80	A-1-b(0)	27	NP	83.3	9.8	0.8	6.1	99.9	35.0	7.7	-	-
SS-15	16.00m RT.	14+66.0	20.88-21.33	A-7-6(26)	51	29	4.7	13.9	15.2	66.2	100.0	97.9	84.2	27.0	-
SS-16	16.00m RT.	14+66.0	22.40-22.85	A-2-4(0)	20	10	44.0	26.7	1.7	27.6	100.0	81.5	30.6	24.2	-
SS-17	16.00m RT.	14+66.0	23.93-24.37	A-7-6(17)	51	30	23.4	15.8	7.6	53.2	100.0	87.1	63.1	16.8	-



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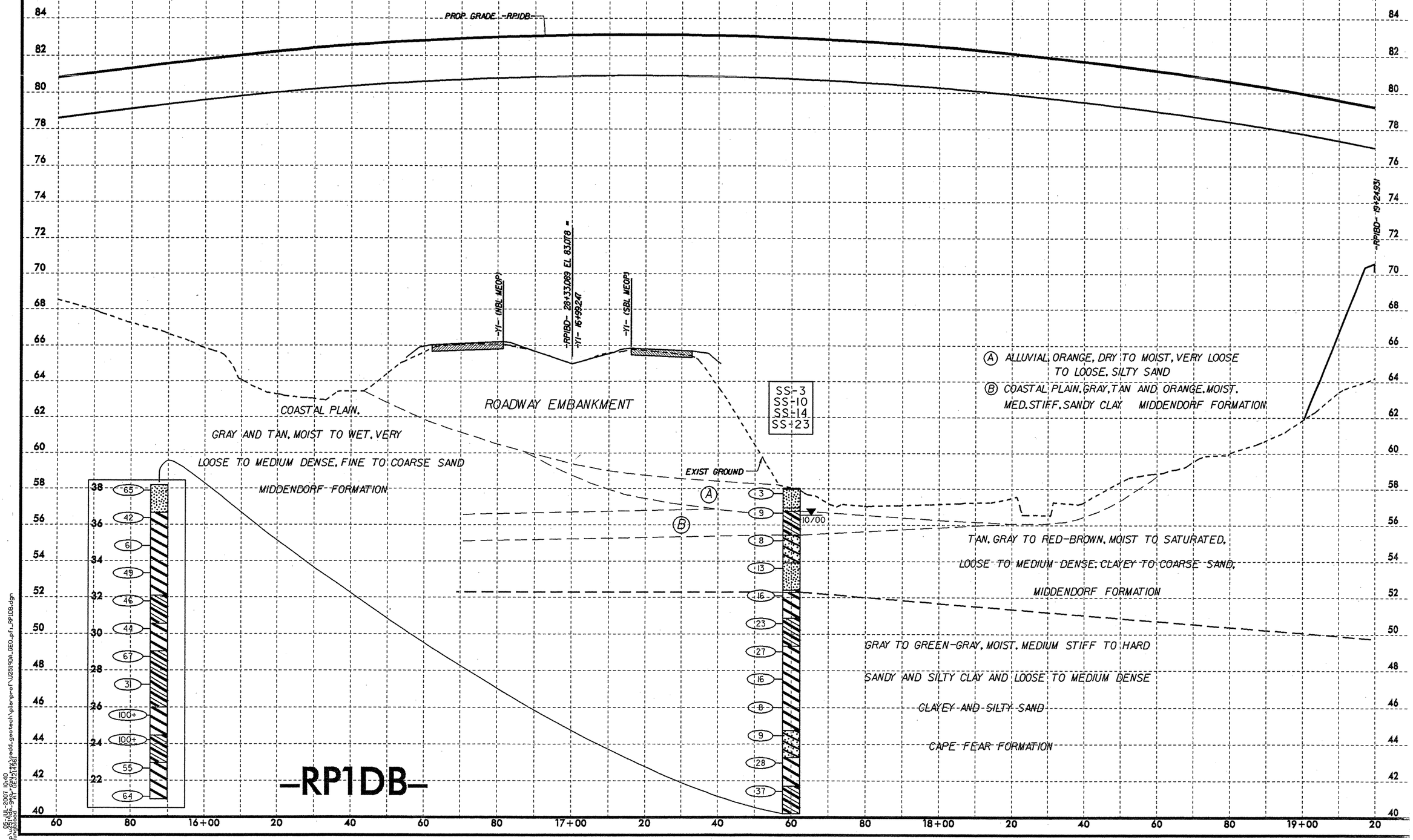
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	45

METRIC

5 0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-3	CL	17+60.0	2.59-3.04	A-2-6(0)	37	16	69.1	8.3	5.2	17.4	99.8	46.6	22.7	19.9	-
SS-10	CL	17+60.0	13.26-13.71	A-2-6(0)	39	14	68.9	6.8	6.7	17.6	99.4	46.2	24.3	17.5	-
SS-14	CL	17+60.0	19.35-19.80	A-7-6(23)	48	16	9.4	15.9	36.1	38.6	100.0	94.8	76.2	18.9	-
SS-23	CL	17+60.0	33.07-33.52	A-7-6(3)	42	20	24.4	41.6	24.4	9.5	100.0	87.4	36.7	20.7	-



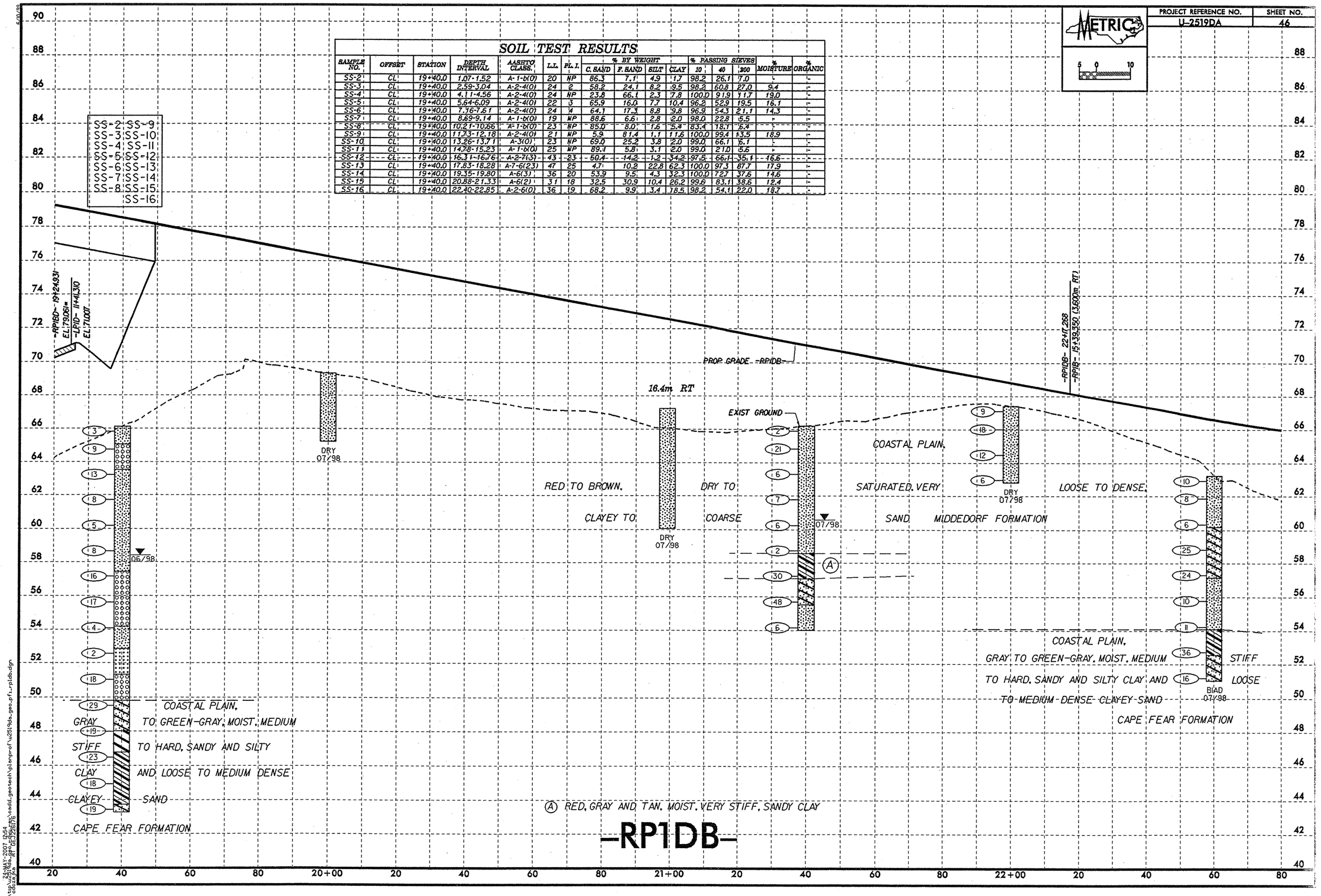
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	46

METRIC

5 0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-2	CL	19+40.0	1.07-1.52	A-1-b(0)	20	NP	86.3	7.1	4.9	1.7	98.2	26.1	7.0	-	-
SS-3	CL	19+40.0	2.59-3.04	A-2-4(0)	24	2	58.2	24.1	8.2	9.5	98.2	60.8	27.0	9.4	-
SS-4	CL	19+40.0	4.11-4.56	A-2-4(0)	24	NP	23.8	66.1	2.3	7.8	100.0	91.9	11.7	19.0	-
SS-5	CL	19+40.0	5.64-6.09	A-2-4(0)	22	3	65.9	16.0	7.7	10.4	96.2	52.9	19.5	16.1	-
SS-6	CL	19+40.0	7.16-7.61	A-2-4(0)	24	4	64.1	17.3	8.8	9.8	96.9	54.3	21.1	14.3	-
SS-7	CL	19+40.0	8.69-9.14	A-1-b(0)	19	NP	88.6	6.6	2.8	2.0	98.0	22.8	5.5	-	-
SS-8	CL	19+40.0	10.21-10.66	A-1-b(0)	23	NP	85.0	8.0	1.6	5.4	83.4	18.1	6.4	-	-
SS-9	CL	19+40.0	11.73-12.18	A-2-4(0)	21	NP	5.9	81.4	1.1	11.6	100.0	99.4	13.5	18.9	-
SS-10	CL	19+40.0	13.26-13.71	A-3(0)	23	NP	69.0	25.2	3.8	2.0	99.0	66.1	6.1	-	-
SS-11	CL	19+40.0	14.78-15.23	A-1-b(0)	25	NP	89.1	5.8	3.1	2.0	99.0	21.0	5.6	-	-
SS-12	CL	19+40.0	16.31-16.76	A-2-7(3)	43	23	50.4	14.2	1.2	34.2	97.5	66.1	35.1	16.6	-
SS-13	CL	19+40.0	17.83-18.28	A-7-6(23)	47	25	4.7	10.2	22.8	62.3	100.0	97.3	87.7	17.9	-
SS-14	CL	19+40.0	19.35-19.80	A-6(3)	36	20	53.9	9.5	4.3	32.3	100.0	72.7	37.6	14.6	-
SS-15	CL	19+40.0	20.88-21.33	A-6(2)	31	18	32.5	30.9	10.4	26.2	99.6	83.1	38.6	12.4	-
SS-16	CL	19+40.0	22.40-22.85	A-2-6(0)	36	19	68.2	9.9	3.4	18.5	98.2	54.1	22.0	18.7	-



METRIC 5 0 10

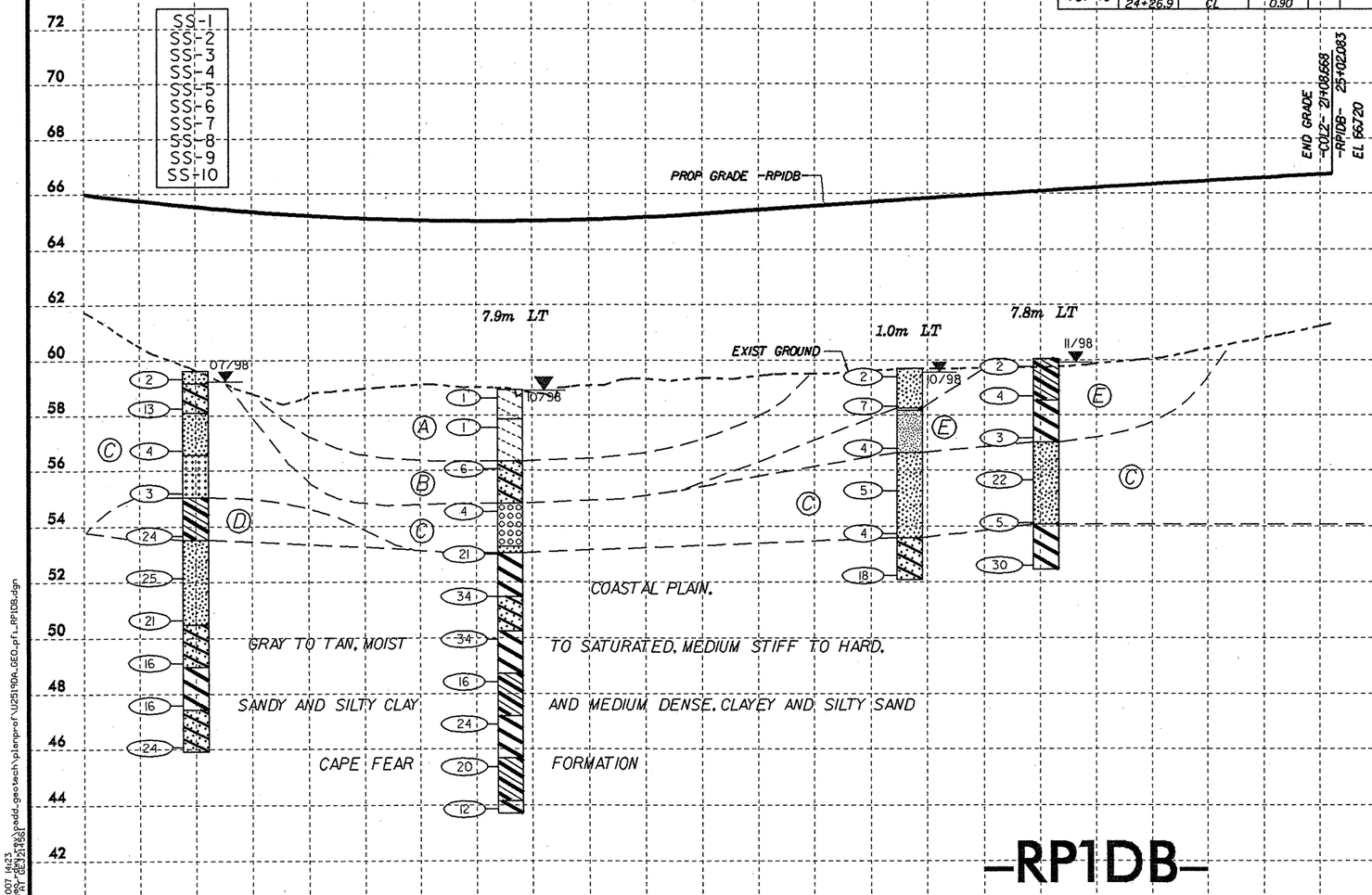
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-1	CL	23+00.0	0.00-0.45	A-2-4(0)	17	NP	48.7	34.7	8.3	8.3	93.5	62.6	18.8	10.8	-
SS-2	CL	23+00.0	1.07-1.52	A-2-7(0)	47	25	63.8	8.0	4.9	23.3	97.8	45.9	27.3	12.1	-
SS-3	CL	23+00.0	2.59-3.04	A-2-4(0)	20	NP	23.8	64.8	4.7	6.7	99.7	92.9	14.2	25.4	-
SS-4	CL	23+00.0	4.11-4.56	A-3(0)	23	NP	77.0	17.4	3.3	2.3	99.2	64.1	6.0	-	-
SS-5	CL	23+00.0	5.64-6.09	A-6(10)	37	21	0.8	43.2	18.0	38.0	100.0	99.8	62.6	17.5	-
SS-6	CL	23+00.0	7.16-7.61	A-2-4(0)	28	10	34.3	36.2	17.6	11.9	100.0	80.3	32.6	14.4	-
SS-7	CL	23+00.0	8.69-9.14	A-2-4(0)	21	2	49.1	28.0	10.6	12.3	98.9	64.3	26.4	16.2	-
SS-8	CL	23+00.0	10.21-10.66	A-2-6(0)	30	13	44.8	24.5	5.0	25.7	100.0	84.9	31.5	16.4	-
SS-9	CL	23+00.0	11.73-12.18	A-7-6(28)	51	32	7.2	12.0	31.1	49.7	100.0	95.7	83.7	20.3	-
SS-10	CL	23+00.0	13.26-13.71	A-2-6(0)	29	13	47.9	22.6	20.0	9.5	98.9	67.1	31.5	11.6	-
ST-2	1.50m RT.	23+68.0	0.00-0.60	A-2-4(0)	24	NP	48.7	33.5	11.7	6.1	100.0	76.0	20.0	-	-
ST-3(1)	9.00m LT.	23+77.0	0.00-0.60	A-2-4(0)	24	1	36.1	33.2	22.7	8.1	100.0	83.0	35.0	-	-
ST-3(2)	9.00m LT.	23+77.0	0.00-0.60	A-7-5(25)	61	28	12.5	9.9	35.3	42.3	100.0	93.0	79.0	-	-
ST-3(3)	9.00m LT.	23+77.0	0.00-0.60	A-6(2)	28	12	30.8	29.0	20.0	20.1	100.0	85.0	44.0	-	-
ST-1	23.00m RT.	24+09.0	0.00-0.60	A-4(0)	22	5	30.1	36.2	15.6	18.2	99.0	85.0	37.0	-	-

HAND TOOLS

*METRIC TONS

TEST NO.	STATION (-L-)	OFFSET	DEPTH INTERVAL	N_C	SHEAR STRENGTH *(TSF)	SOIL TYPE
VST-16	23+55.0	2.13m LT.	0.30		1558	CLAY
	23+55.0	2.13m LT.	0.60		902	CLAY
	23+55.0	2.13m LT.	0.90		902	CLAY
	23+55.0	2.13m LT.	1.20		738	CLAY
	23+55.0	2.13m LT.	1.50		1394	CLAY
	23+55.0	2.13m LT.	1.80		2337	CLAY
	23+55.0	2.13m LT.	2.10		1640	CLAY
	23+55.0	2.13m LT.	2.40		3689	SAND
VST-17	24+03.0	10.40m RT.	0.60		1845	CLAY
	24+03.0	10.40m RT.	0.90		1312	CLAY
	24+03.0	10.40m RT.	1.20		2542	CLAY
	24+03.0	10.40m RT.	1.50		3443	SAND
VST-18	24+18.0	28.00m RT.	0.30		492	CLAY
	24+18.0	28.00m RT.	0.60		574	CLAY
	24+18.0	28.00m RT.	0.90		902	SDY. CLAY
	24+18.0	28.00m RT.	1.20		1640	SDY. CLAY
	24+18.0	28.00m RT.	1.50		2214	SAND
VST-19	24+26.9	CL	0.60		2542	SDY. CLAY
	24+26.9	CL	0.90		4427	SDY. CLAY



(A) ALLUVIAL, BLACK AND GRAY, SATURATED, VERY SOFT, HIGHLY ORGANIC, SILTY CLAY

(B) ALLUVIAL, RED-TAN, MOIST TO SATURATED, LOOSE, CLAYEY AND SILTY SAND

(C) COASTAL PLAIN, RED TO BROWN, DRY TO WET, VERY LOOSE TO MEDIUM DENSE, CLAYEY TO COARSE SAND MIDDENDORF FORMATION

(D) RED-GRAY, MOIST TO WET, VERY STIFF, SANDY CLAY

(E) ALLUVIAL, GRAY-TAN, MOIST TO WET, SOFT TO MEDIUM STIFF, SANDY SILT, SANDY AND SILTY CLAY

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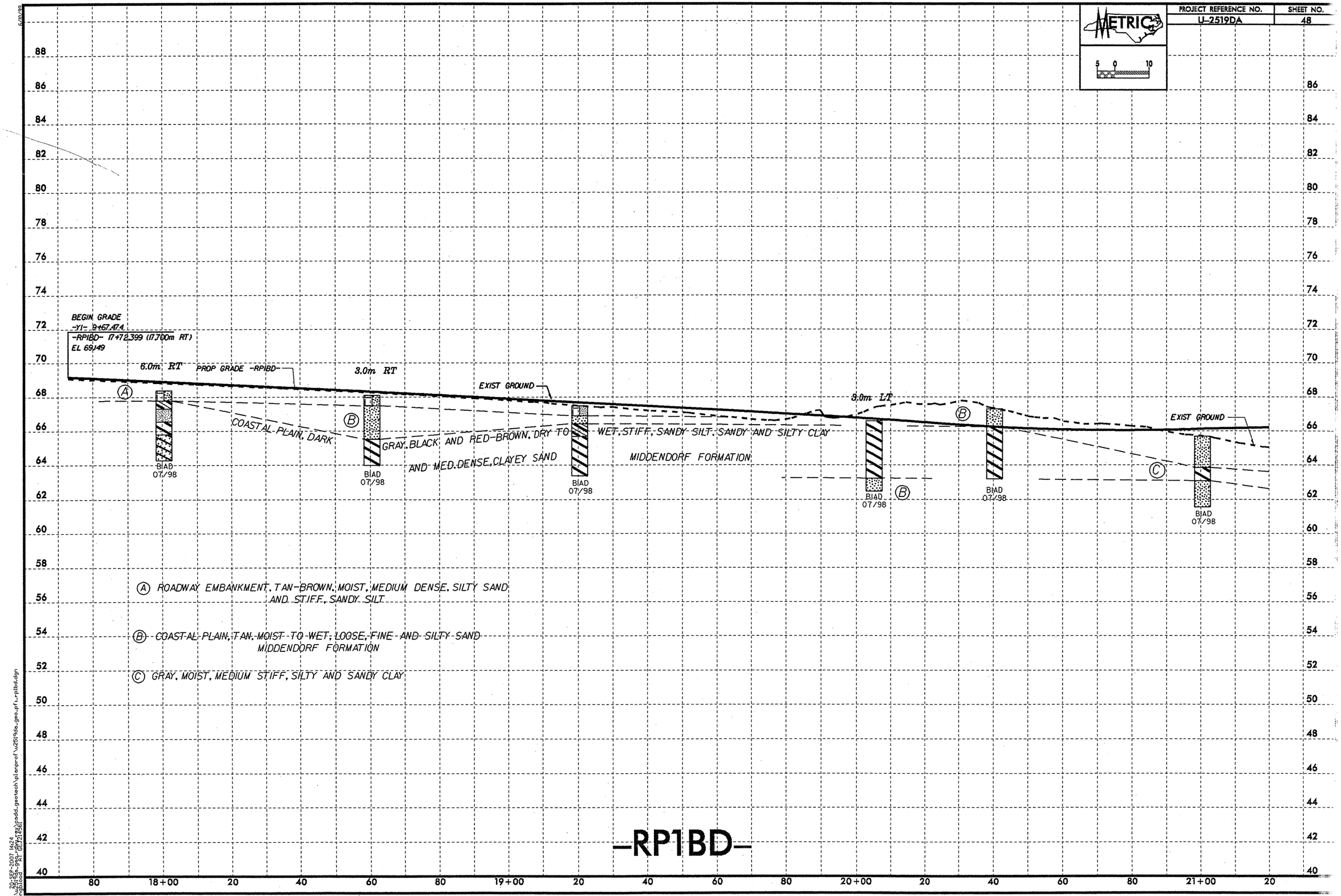
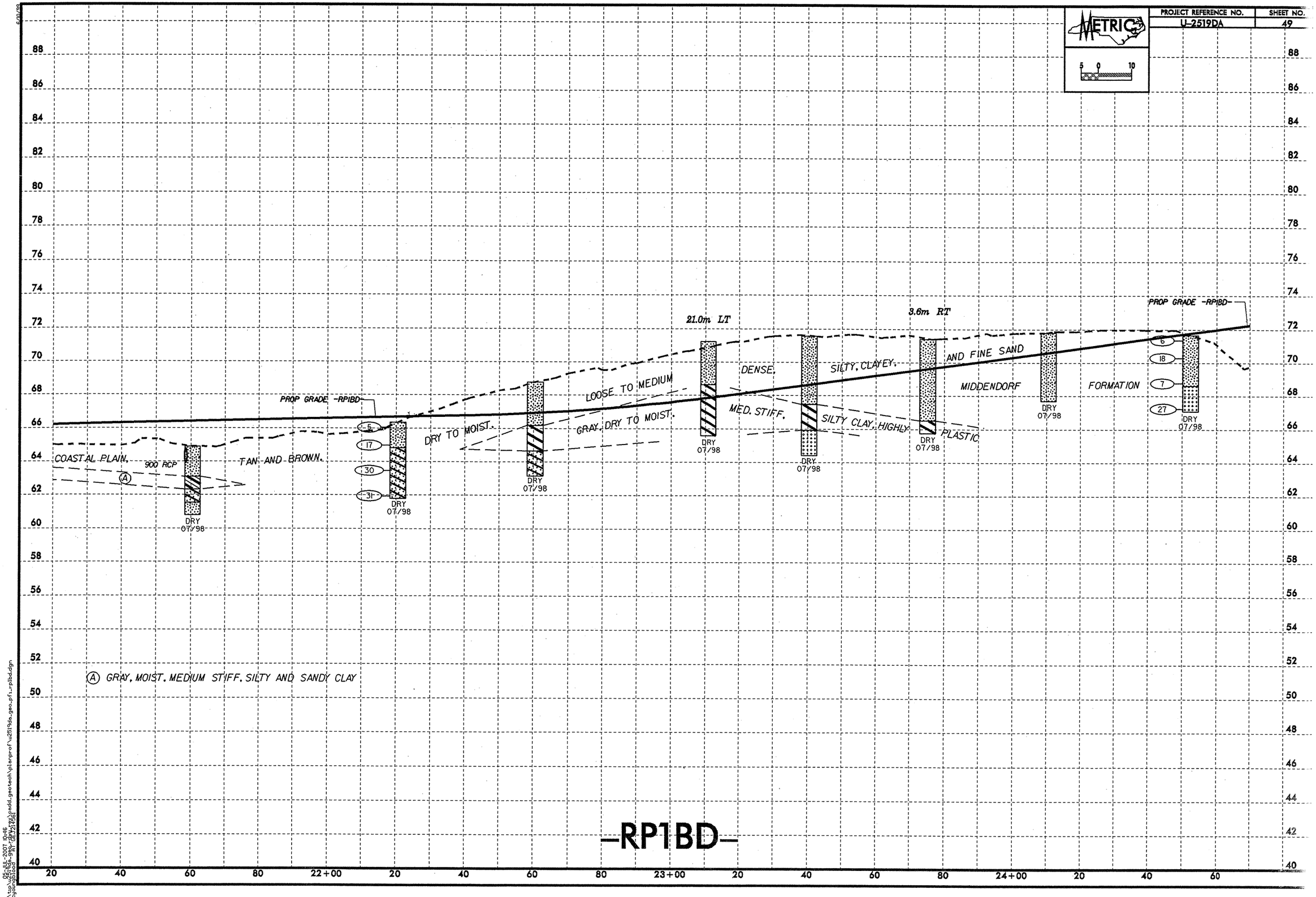

METRIC
5 0 10
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
48
BEGIN GRADE
-Y1- 9+67.474
-RPIBD- 17+72.399 (17.700m RT)
EL 69.149
6.0m RT
PROP GRADE -RPIBD-
3.0m RT
EXIST GROUND
3.0m LT
EXIST GROUND
COASTAL PLAIN, DARK GRAY, BLACK AND RED-BROWN, DRY TO WET, STIFF, SANDY SILT, SANDY AND SILTY CLAY
AND MED. DENSE, CLAYEY SAND
MIDDENDORF FORMATION
BIAD 07/98
BIAD 07/98
BIAD 07/98
BIAD 07/98
BIAD 07/98
BIAD 07/98
A ROADWAY EMBANKMENT, TAN-BROWN, MOIST, MEDIUM DENSE, SILTY SAND AND STIFF, SANDY SILT
B COASTAL PLAIN, TAN, MOIST TO WET, LOOSE, FINE AND SILTY SAND MIDDENDORF FORMATION
C GRAY, MOIST, MEDIUM STIFF, SILTY AND SANDY CLAY
-RP1BD-
88
86
84
82
80
78
76
74
72
70
68
66
64
62
60
58
56
54
52
50
48
46
44
42
40
80
18+00
20
40
60
80
19+00
20
40
60
80
20+00
20
40
60
80
21+00
20


METRIC
5 0 10
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
49
PROP GRADE -RPIBD-
21.0m LT
3.6m RT
COASTAL PLAIN,
900 RCP
TAN AND BROWN,
DRY TO MOIST,
LOOSE TO MEDIUM
GRAY, DRY TO MOIST,
DENSE,
MED. STIFF,
SILTY, CLAYEY,
SILTY CLAY, HIGHLY
PLASTIC
AND FINE SAND
MIDDENDORF
FORMATION
DRY
07/98
5
17
30
31
6
18
7
27
A
A GRAY, MOIST, MEDIUM STIFF, SILTY AND SANDY CLAY
-RP1BD-
88
86
84
82
80
78
76
74
72
70
68
66
64
62
60
58
56
54
52
50
48
46
44
42
40
20
40
60
80
22+00
23+00
24+00

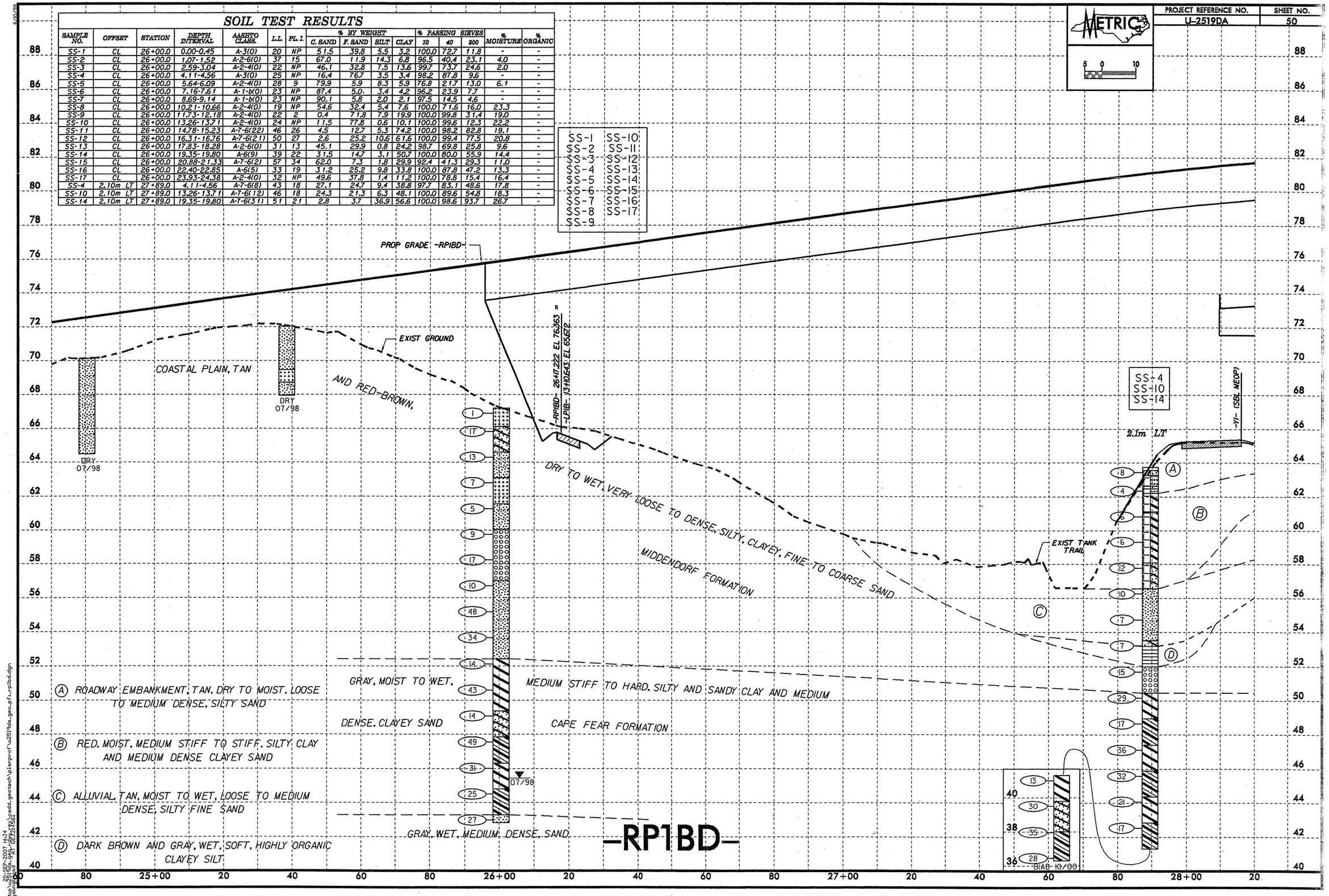
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	50

METRIC

5 0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-1	CL	26+00.0	0.00-0.45	A-3(0)	20	NP	51.5	39.8	5.5	3.2	100.0	72.7	11.8	-	-
SS-2	CL	26+00.0	1.07-1.52	A-2-6(0)	37	15	67.0	11.9	14.3	6.8	96.5	40.4	23.1	4.0	-
SS-3	CL	26+00.0	2.59-3.04	A-2-4(0)	22	NP	46.1	32.8	7.5	13.6	99.7	73.7	24.6	2.0	-
SS-4	CL	26+00.0	4.11-4.56	A-3(0)	25	NP	16.4	76.7	3.5	3.4	98.2	87.8	9.6	-	-
SS-5	CL	26+00.0	5.64-6.09	A-2-4(0)	28	9	79.9	5.9	8.3	5.9	76.8	21.7	13.0	6.1	-
SS-6	CL	26+00.0	7.16-7.61	A-1-b(0)	23	NP	87.4	5.0	3.4	4.2	96.2	23.9	7.7	-	-
SS-7	CL	26+00.0	8.69-9.14	A-1-b(0)	23	NP	90.1	5.8	2.0	2.1	97.5	14.5	4.6	-	-
SS-8	CL	26+00.0	10.21-10.66	A-2-4(0)	19	NP	54.6	32.4	5.4	7.6	100.0	71.6	16.0	23.3	-
SS-9	CL	26+00.0	11.73-12.18	A-2-4(0)	22	2	0.4	71.8	7.9	19.9	100.0	99.8	31.4	19.0	-
SS-10	CL	26+00.0	13.26-13.71	A-2-4(0)	24	NP	11.5	77.8	0.6	10.1	100.0	99.6	12.3	22.2	-
SS-11	CL	26+00.0	14.78-15.23	A-7-6(22)	46	26	4.5	12.7	5.3	74.2	100.0	98.2	82.8	19.1	-
SS-12	CL	26+00.0	16.31-16.76	A-7-6(21)	50	27	2.6	25.2	10.6	61.6	100.0	99.4	77.5	20.8	-
SS-13	CL	26+00.0	17.83-18.28	A-2-6(0)	31	13	45.1	29.9	0.8	24.2	98.7	69.8	25.8	9.6	-
SS-14	CL	26+00.0	19.35-19.80	A-6(9)	39	22	31.5	14.7	3.1	50.7	100.0	80.0	55.9	14.4	-
SS-15	CL	26+00.0	20.88-21.33	A-7-6(2)	57	34	62.0	7.3	1.8	29.9	92.4	41.3	29.3	11.0	-
SS-16	CL	26+00.0	22.40-22.85	A-6(5)	33	19	31.2	25.2	9.8	33.8	100.0	87.8	47.2	13.3	-
SS-17	CL	26+00.0	23.93-24.38	A-2-4(0)	32	NP	49.6	37.8	1.4	11.2	100.0	78.8	15.4	16.4	-
SS-4	2.10m LT	27+89.0	4.11-4.56	A-7-6(8)	43	18	27.1	24.7	9.4	38.8	97.7	83.1	48.6	17.8	-
SS-10	2.10m LT	27+89.0	13.26-13.71	A-7-6(12)	46	18	24.3	21.3	6.3	48.1	100.0	89.6	54.8	18.3	-
SS-14	2.10m LT	27+89.0	19.35-19.80	A-7-6(31)	51	21	2.8	3.7	36.9	56.6	100.0	98.6	93.7	26.7	-



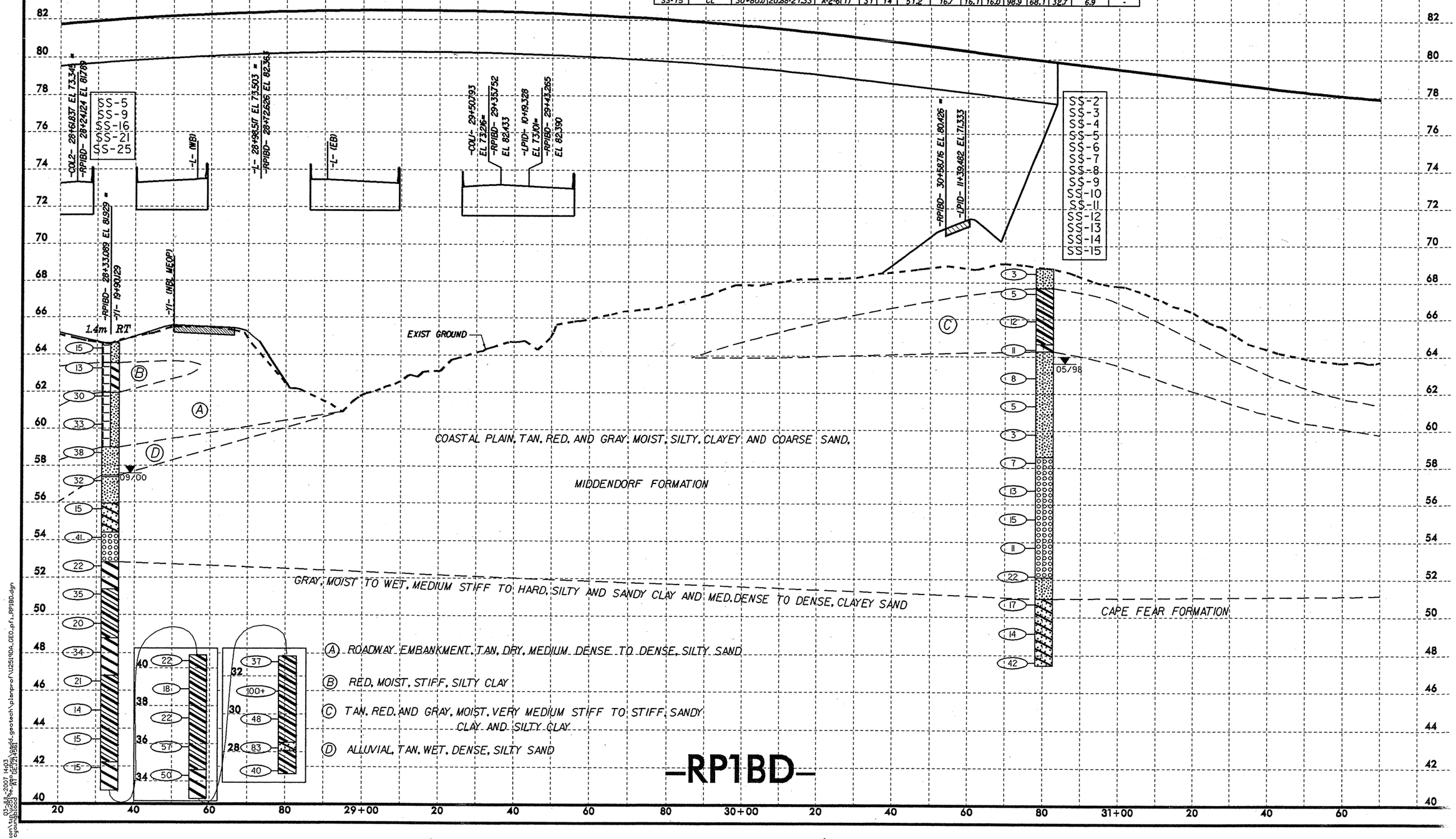
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	51

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-5	1.4m RT.	28+33.0	5.64-6.09	A-2-4(0)	28	20	70.6	9.6	5.5	14.3	96.8	44.2	19.4	9.1	-
SS-9	1.4m RT.	28+33.0	11.73-12.18	A-7-6(31)	57	22	4.2	12.4	20.4	63.0	100.0	97.9	83.8	20.2	-
SS-16	1.4m RT.	28+33.0	22.40-22.85	A-7-6(20)	65	25	9.0	7.9	13.4	69.7	100.0	94.3	83.6	25.9	-
SS-21	1.4m RT.	28+33.0	30.02-30.47	A-7-6(15)	57	27	20.1	25.9	32.6	21.4	100.0	88.4	56.7	24.2	-
SS-25	1.4m RT.	28+33.0	36.11-36.56	A-2-6(0)	30	15	45.0	30.0	21.2	3.8	99.6	72.4	26.6	11.6	-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-2	CL	30+80.0	1.07-1.52	A-6(3)	34	16	35.4	26.0	13.8	24.8	99.1	78.1	42.2	10.7	-
SS-3	CL	30+80.0	2.59-3.04	A-6(3)	33	13	30.1	29.6	15.2	25.1	100.0	86.4	45.1	16.1	-
SS-4	CL	30+80.0	4.11-4.56	A-7-6(15)	44	20	11.5	24.1	23.2	41.2	100.0	92.2	74.4	31.2	-
SS-5	CL	30+80.0	5.64-6.09	A-2-4(0)	23	NP	44.5	41.3	5.7	21.4	99.0	70.5	17.5	17.6	-
SS-6	CL	30+80.0	7.16-7.61	A-2-4(0)	25	NP	39.5	39.2	10.3	3.8	94.9	78.1	22.7	19.7	-
SS-7	CL	30+80.0	8.69-9.14	A-2-4(0)	24	3	44.0	31.4	8.3	14.3	99.3	85.2	26.6	27.8	-
SS-8	CL	30+80.0	10.21-10.66	A-1-b(0)	25	NP	84.1	7.3	3.7	63.0	87.0	23.1	8.1	-	-
SS-9	CL	30+80.0	11.73-12.18	A-1-b(0)	20	NP	83.1	8.1	2.2	69.7	98.8	44.2	9.3	-	-
SS-10	CL	30+80.0	13.26-13.71	A-1-b(0)	21	3	84.2	7.9	1.1	21.4	85.7	20.0	7.4	-	-
SS-11	CL	30+80.0	14.78-15.23	A-1-b(0)	20	NP	77.0	13.7	2.2	3.8	99.0	41.5	10.1	-	-
SS-12	CL	30+80.0	16.61-16.76	A-2-4(0)	22	5	64.7	14.9	6.5	14.3	97.0	50.5	21.6	16.7	-
SS-13	CL	30+80.0	17.83-18.28	A-2-6(0)	32	12	44.6	25.2	17.7	63.0	100.0	78.9	31.1	5.7	-
SS-14	CL	30+80.0	19.35-19.80	A-2-6(1)	38	20	64.0	11.6	10.0	69.7	99.2	54.0	25.2	12.6	-
SS-15	CL	30+80.0	20.88-21.33	A-2-6(1)	31	14	51.2	16.7	16.1	16.0	98.9	68.1	32.7	6.9	-



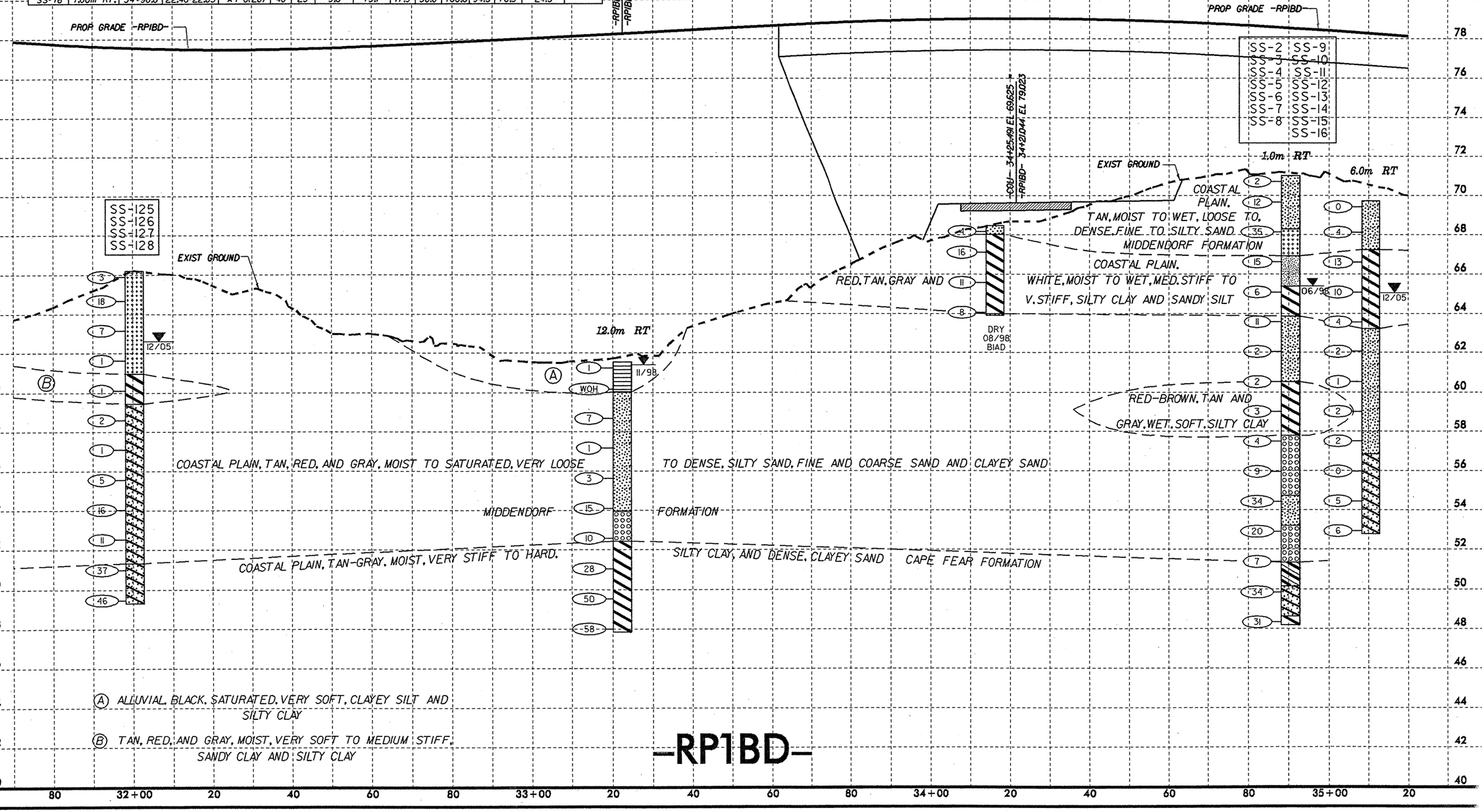
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	52

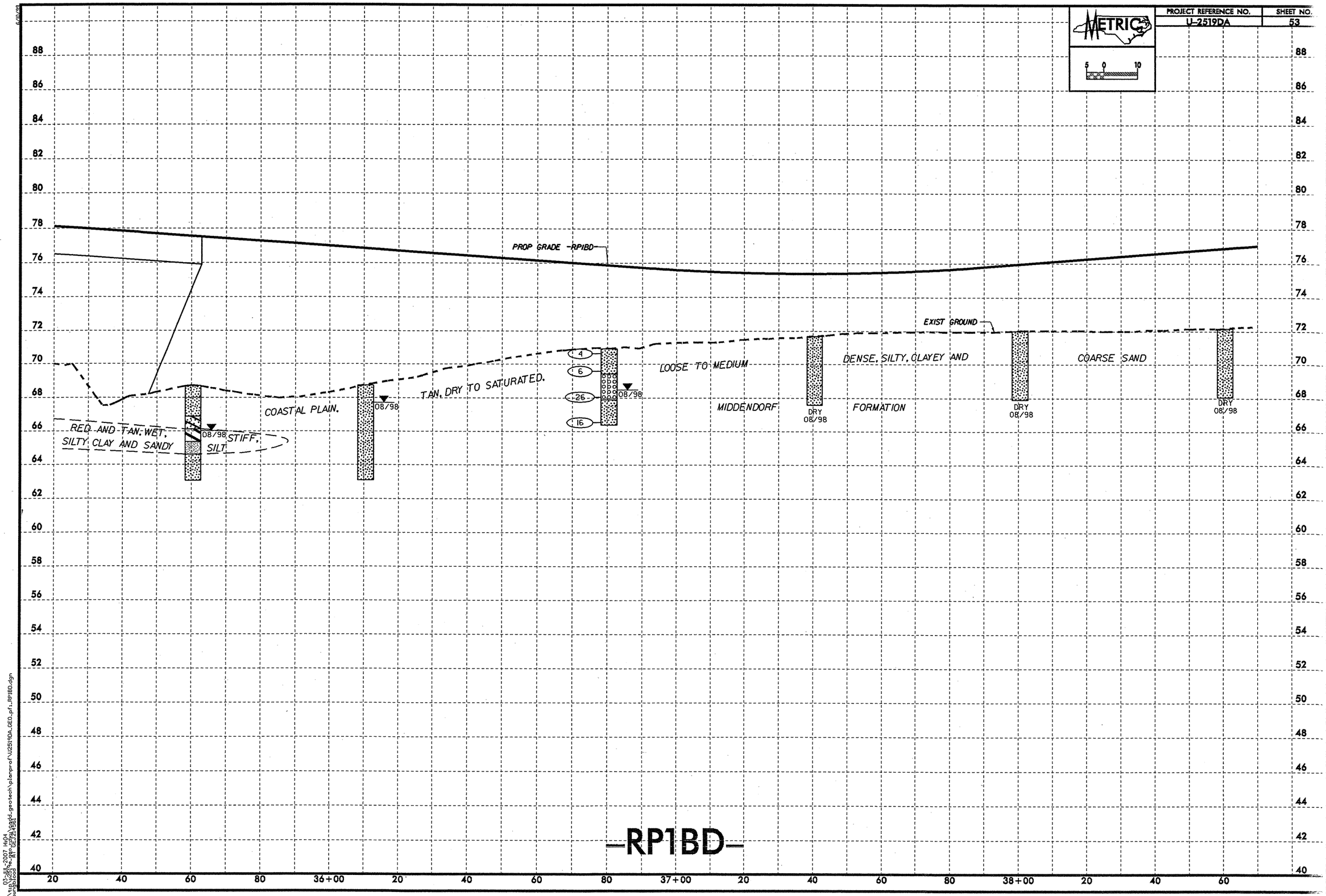
METRIC

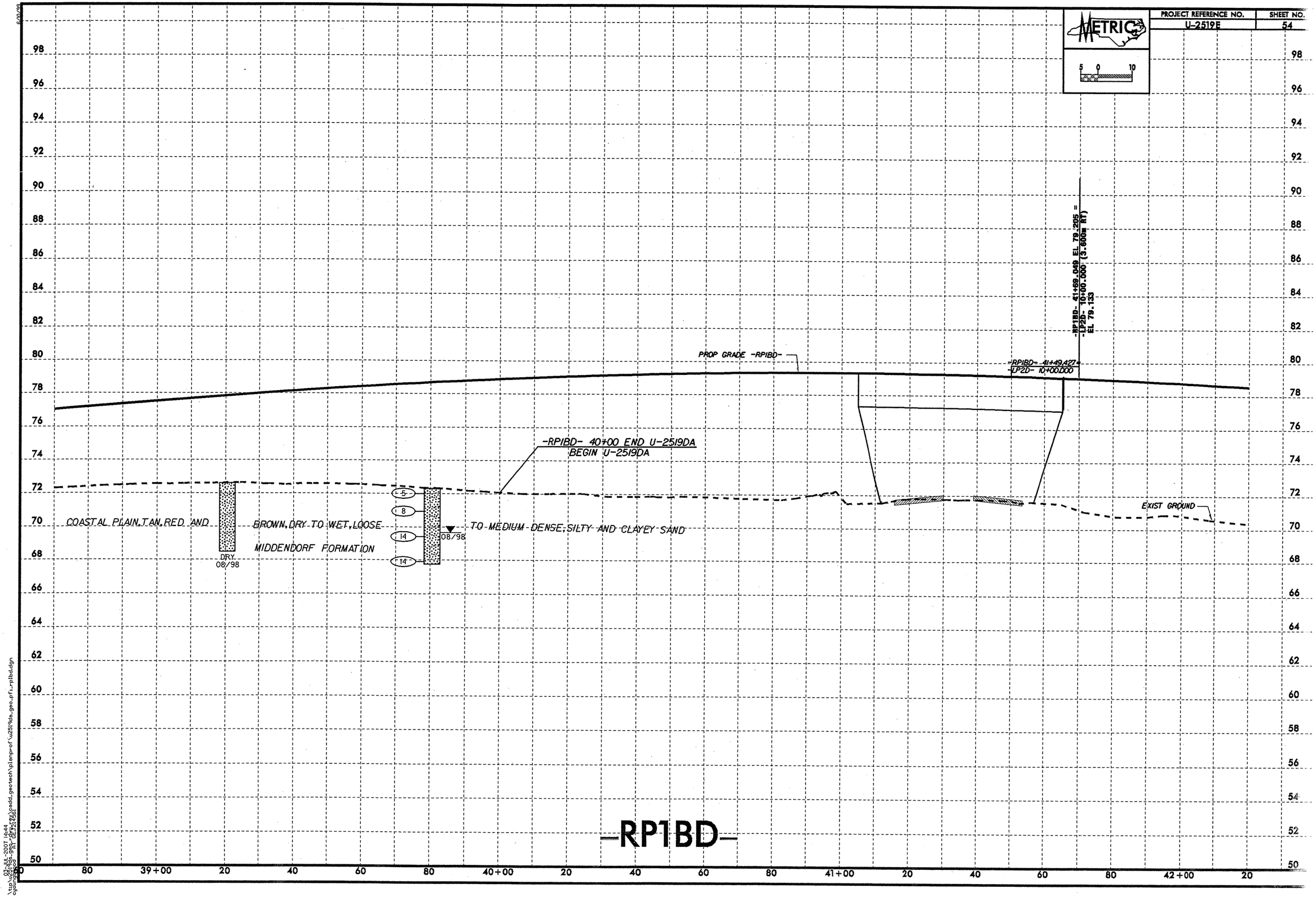
5 0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-125	CL	32+00.0	5.78-6.23	A-7-6(15)	43	23	4.6	38.2	24.9	32.2	100.0	98.0	72.0	-	-
SS-126	CL	32+00.0	7.30-7.75	A-2-6(0)	31	12	49.1	26.6	10.3	14.1	98.0	63.0	28.0	-	-
SS-127	CL	32+00.0	8.82-9.27	A-2-6(0)	21	6	81.5	5.0	5.4	8.0	78.0	23.0	11.0	-	-
SS-128	CL	32+00.0	14.90-15.35	A-2-6(0)	29	14	48.7	26.6	6.6	18.1	100.0	68.0	26.0	-	-
SS-2	1.00m RT.	34+90.0	1.07-1.52	A-2-4(0)	26	NP	45.6	36.0	0.6	17.8	99.0	74.5	18.9	8.2	-
SS-3	1.00m RT.	34+90.0	2.74-3.04	A-3(0)	24	NP	51.5	40.0	3.1	5.4	94.3	55.9	8.9	-	-
SS-4	1.00m RT.	34+90.0	4.11-4.56	A-4(1)	31	5	9.9	48.5	19.1	22.5	100.0	96.4	52.2	24.9	-
SS-5	1.00m RT.	34+90.0	5.64-6.09	A-7-5(5.1)	79	47	3.2	5.4	7.8	83.6	100.0	98.4	91.9	47.7	-
SS-6	1.00m RT.	34+90.0	7.16-7.61	A-2-4(0)	22	NP	38.5	50.6	3.8	7.1	100.0	86.9	14.7	25.3	-
SS-7	1.00m RT.	34+90.0	8.69-9.14	A-2-4(0)	20	NP	49.7	40.0	2.1	8.2	99.2	79.0	10.8	25.3	-
SS-8	1.00m RT.	34+90.0	10.51-10.66	A-7-6(9)	41	18	20.2	23.2	21.2	35.4	99.3	89.1	61.7	26.5	-
SS-9	1.00m RT.	34+90.0	11.73-12.18	A-2-4(0)	28	10	66.5	12.9	5.4	15.2	99.2	50.8	21.3	26.3	-
SS-10	1.00m RT.	34+90.0	13.26-13.71	A-1-b(0)	27	NP	84.3	7.3	0.6	7.8	90.6	29.1	7.9	-	-
SS-11	1.00m RT.	34+90.0	14.78-15.23	A-1-b(0)	22	NP	81.2	11.2	0.9	6.7	83.7	31.4	7.0	-	-
SS-12	1.00m RT.	34+90.0	16.31-16.76	A-2-4(0)	22	NP	65.2	21.6	0.2	13.0	100.0	66.4	14.0	21.3	-
SS-13	1.00m RT.	34+90.0	17.83-18.28	A-1-b(0)	21	NP	77.2	7.4	3.0	12.4	91.6	26.8	14.9	-	-
SS-14	1.00m RT.	34+90.0	19.68-19.80	A-6(11)	37	16	8.8	23.3	18.7	49.2	98.1	92.4	73.4	29.2	-
SS-15	1.00m RT.	34+90.0	20.88-21.33	A-2-7(3)	55	30	62.8	5.6	0.4	31.2	98.6	50.5	31.8	17.9	-
SS-16	1.00m RT.	34+90.0	22.40-22.85	A-7-6(20)	46	25	9.8	15.7	17.9	56.6	100.0	94.3	78.9	24.3	-




METRIC
5 0 10
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
53
PROP GRADE -RP1BD-
EXIST GROUND
RED AND TAN, WET, SILTY CLAY AND SANDY
08/98
STIFF, SILT
COASTAL PLAIN.
08/98
TAN, DRY TO SATURATED.
4
6
26
16
08/98
LOOSE TO MEDIUM
MIDDENDORF
DRY 08/98
DENSE, SILTY, CLAYEY AND
FORMATION
DRY 08/98
COARSE SAND
DRY 08/98
88
86
84
82
80
78
76
74
72
70
68
66
64
62
60
58
56
54
52
50
48
46
44
42
40
20
40
60
80
36+00
20
40
60
80
37+00
20
40
60
80
38+00
20
40
60
-RP1BD-

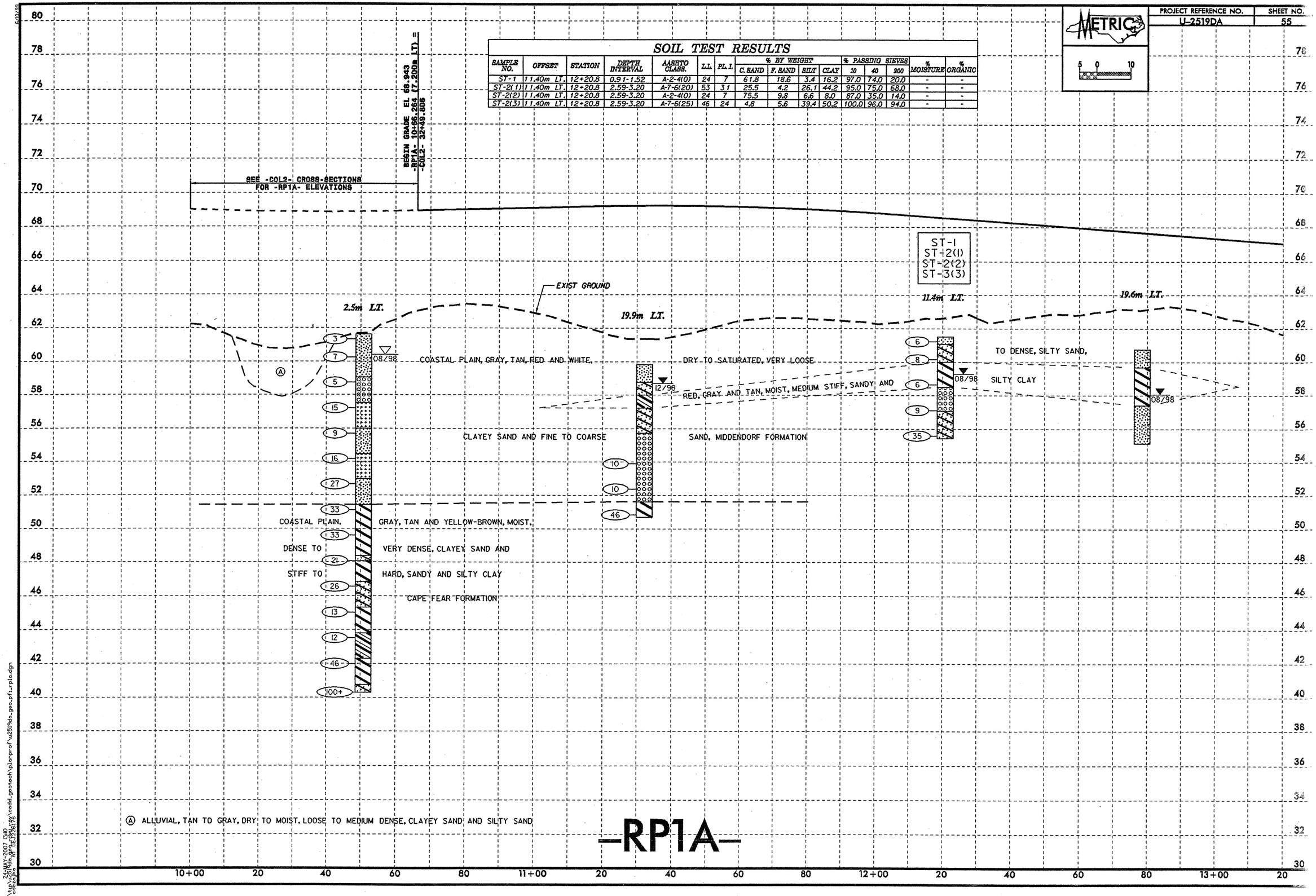

METRIC
5 0 10
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
54
98
96
94
92
90
88
86
84
82
80
78
76
74
72
70
68
66
64
62
60
58
56
54
52
50
-RP1BD- 41+69.049 EL 79.205 =
-LP2D- 10+00.000 (3.600m RT)
EL 79.133
-RP1BD- 41+49.427=
-LP2D- 10+00.000
PROP GRADE -RP1BD-
-RP1BD- 40+00 END U-2519DA
BEGIN U-2519DA
EXIST GROUND
COASTAL PLAIN, TAN, RED AND
BROWN, DRY TO WET, LOOSE
TO MEDIUM-DENSE, SILTY AND CLAYEY SAND
MIDDENDORF FORMATION
DRY
08/98
5
8
14
14
08/98
-RP1BD-
80
39+00
20
40
60
80
40+00
20
40
60
80
41+00
20
40
60
80
42+00
20

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	55

METRIC 5 0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
ST-1	11.40m LT.	12+20.8	0.91-1.52	A-2-4(0)	24	7	61.8	18.6	3.4	16.2	97.0	74.0	20.0	-	-
ST-2(1)	11.40m LT.	12+20.8	2.59-3.20	A-7-6(20)	53	31	25.5	4.2	26.1	44.2	95.0	75.0	68.0	-	-
ST-2(2)	11.40m LT.	12+20.8	2.59-3.20	A-2-4(0)	24	7	75.5	9.8	6.6	8.0	87.0	35.0	14.0	-	-
ST-2(3)	11.40m LT.	12+20.8	2.59-3.20	A-7-6(25)	46	24	4.8	5.6	39.4	50.2	100.0	96.0	94.0	-	-

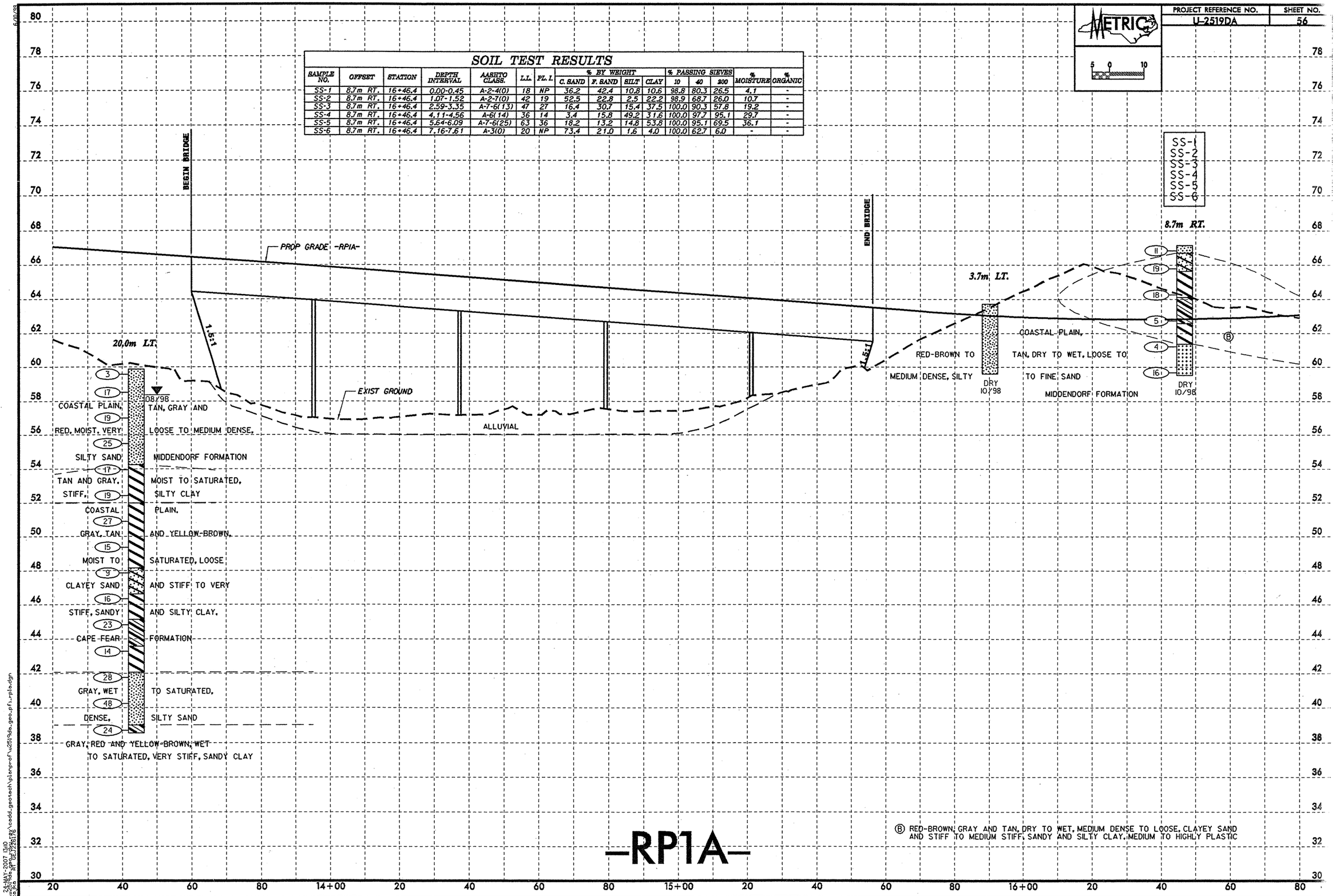


PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	56

METRIC

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-1	8.7m RT.	16+46.4	0.00-0.45	A-2-4(0)	18	NP	36.2	42.4	10.8	10.6	98.8	80.3	26.5	4.1	-
SS-2	8.7m RT.	16+46.4	1.07-1.52	A-2-7(0)	42	19	52.5	22.8	2.5	22.2	98.9	68.7	26.0	10.7	-
SS-3	8.7m RT.	16+46.4	2.59-3.35	A-7-6(13)	47	27	16.4	30.7	15.4	37.5	100.0	90.3	57.8	19.2	-
SS-4	8.7m RT.	16+46.4	4.11-4.56	A-6(14)	36	14	3.4	15.8	49.2	31.6	100.0	97.7	95.1	29.7	-
SS-5	8.7m RT.	16+46.4	5.64-6.09	A-7-6(25)	63	36	18.2	13.2	14.8	53.8	100.0	95.1	69.5	36.1	-
SS-6	8.7m RT.	16+46.4	7.16-7.61	A-3(0)	20	NP	73.4	21.0	1.6	4.0	100.0	62.7	6.0	-	-



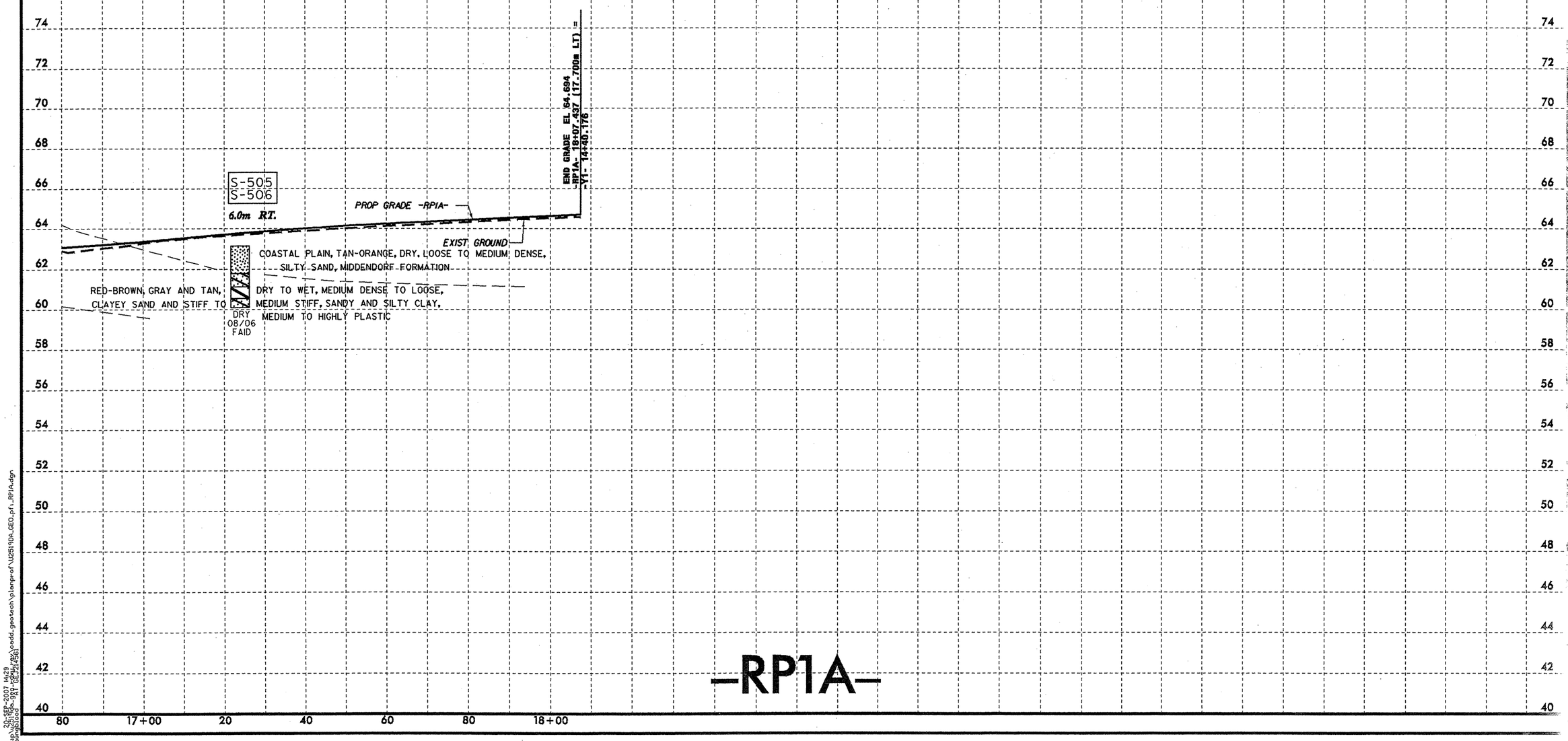
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	57

METRIC

5 0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-505	6.00m RT.	17+24.0	1.10-1.70	A-2-7(2)	42	23	56.0	18.0	3.8	22.2	93.0	56.0	27.0	-	-
S-506	6.00m RT.	17+24.0	2.10-2.40	A-7-6(10)	42	22	28.9	18.0	18.8	34.3	100.0	78.0	58.0	-	-



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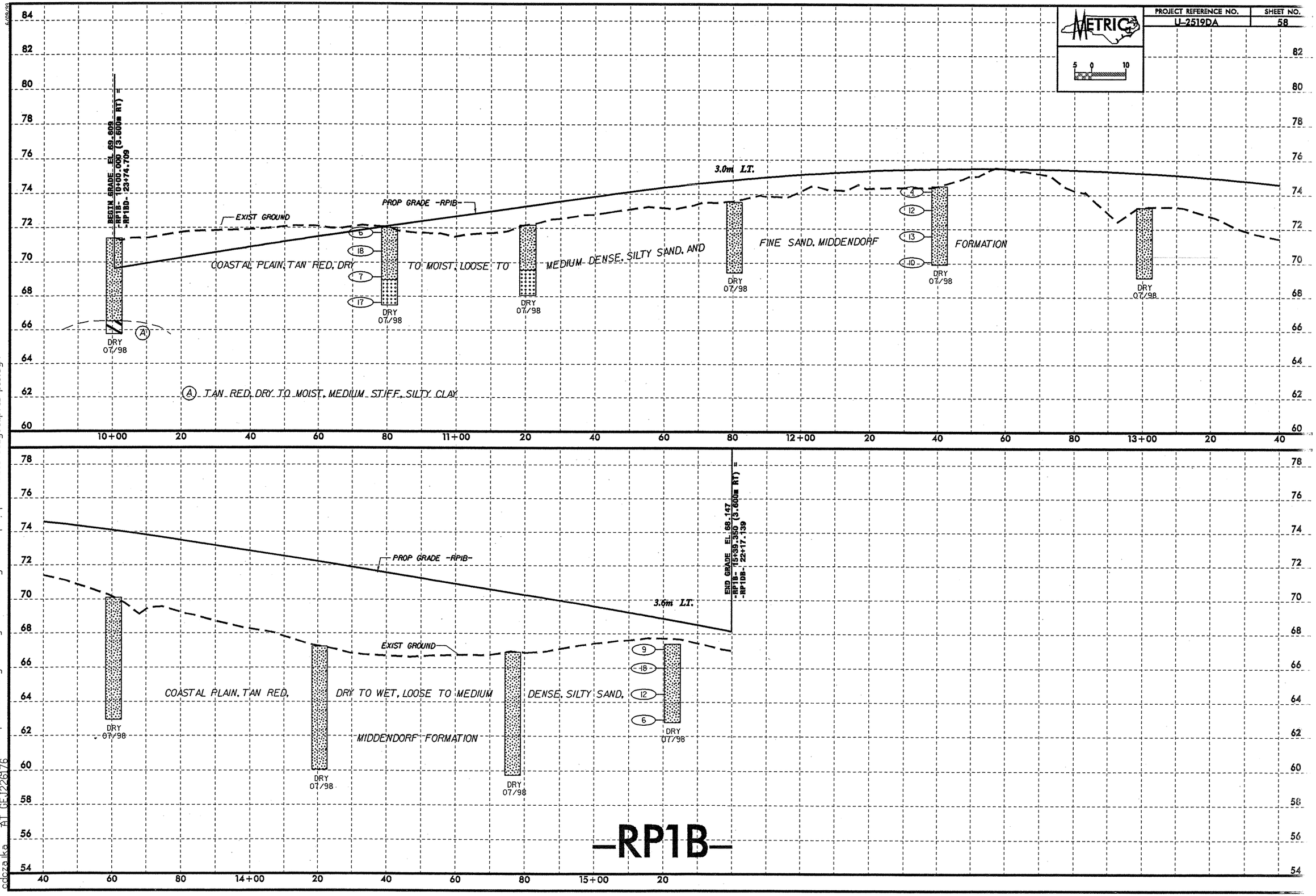

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cdczalka AT GEJ226176

METRIC 5 0 10

SS-2
SS-3
SS-4
SS-5
SS-6
SS-7
SS-8
SS-9
SS-10
SS-11
SS-12
SS-13
SS-14
SS-15
SS-16
SS-17

BEGIN BRIDGE

BEGIN GRADE EL 65.509
-RP1C- 10+00.000 (3.600m RT) =
-COL1- 24+28.347

PROP GRADE -RP1C-

1.5:1

5.0m LT.

EXIST GROUND

07/98

COASTAL PLAIN, GRAY TO GRAY TO RED TAN, DRY TO MOIST, MEDIUM DENSE SAND AND VERY STIFF TO HARD, SILTY CLAY, TO DENSE, CLAYEY CAPE FEAR FORMATION

1.6m RT.

07/98

TAN, RED, DRY TO SATURATED, VERY LOOSE TO MEDIUM DENSE, SILTY SAND, CLAYEY SAND, AND FINE TO COARSE SAND, MIDDENDORF FORMATION

2.6m LT.

DRY
07/98

3.3m RT.

07/98

TAN, WET, VERY SOFT, SANDY CLAY

COASTAL PLAIN, GRAY TO TAN AND RED, DRY TO MOIST, STIFF TO HARD, SANDY AND SILTY CLAY, LOW TO HIGH PLASTICITY CAPE FEAR FORMATION

EXIST GROUND

ALLUVIAL

(A) GRAY, MOIST TO WET, VERY STIFF, SANDY CLAY
(B) GRAY-YELLOW, DRY TO MOIST, DENSE, SILTY SAND

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
ST-2	3.8m RT.	12.40.4	7.68-8.29	A-6(6)	31	14	18.6	26.0	10.5	44.9	99.9	89.3	59.9	22.4	-
ST-1	3.3m RT.	12.41.2	7.16-7.77	A-7-6(19)	46	26	5.6	22.5	17.2	54.7	100.0	97.3	76.0	18.3	-
SS-2	3.3m RT.	12+41.4	1.07-1.52	A-1-b(0)	20	NP	74.5	16.3	3.6	5.6	96.5	49.5	9.6	-	-
SS-3	3.3m RT.	12+41.4	2.59-3.04	A-2-4(0)	21	NP	59.7	28.4	1.8	10.1	100.0	86.4	12.5	20.8	-
SS-4	3.3m RT.	12+41.4	4.11-4.56	A-3(0)	23	NP	71.8	24.8	0.5	2.9	99.4	70.4	4.0	-	-
SS-5	3.3m RT.	12+41.4	5.64-6.09	A-1-b(0)	24	4	74.4	6.5	1.4	17.7	84.1	30.6	16.7	-	-
SS-6	3.3m RT.	12+41.4	7.16-7.61	A-6(11)	38	20	12.3	25.3	17.8	44.6	100.0	92.8	67.0	20.4	-
SS-7	3.3m RT.	12+41.4	8.69-9.14	A-2-6(1)	33	17	22.6	43.2	2.6	31.6	100.0	94.4	35.4	18.1	-
SS-8	3.3m RT.	12+41.4	10.21-10.66	A-7-6(38)	62	37	3.7	5.9	13.0	77.4	100.0	98.0	91.8	22.7	-
SS-9	3.3m RT.	12+41.4	11.73-12.18	A-7-6(7)	43	26	36.8	18.7	0.7	43.8	100.0	91.6	45.1	14.8	-
SS-10	3.3m RT.	12+41.4	13.26-13.71	A-6(13)	37	26	13.2	29.8	13.6	43.4	100.0	93.3	62.5	15.1	-
SS-11	3.3m RT.	12+41.4	14.78-15.23	A-6(4)	28	17	33.5	22.8	11.9	31.8	99.0	78.5	46.4	13.9	-
SS-12	3.3m RT.	12+41.4	16.31-16.76	A-7-6(50)	72	51	2.8	9.3	14.9	73.0	100.0	99.0	89.7	25.8	-
SS-13	3.3m RT.	12+41.4	17.83-18.28	A-6(4)	31	15	26.0	30.8	12.3	30.9	99.9	86.1	47.7	10.8	-
SS-14	3.3m RT.	12+41.4	19.35-19.80	A-7-6(4)	48	23	49.4	13.2	14.1	23.3	99.8	65.4	39.1	14.2	-
SS-15	3.3m RT.	12+41.4	20.88-21.33	A-7-6(22)	60	31	14.2	20.4	23.2	42.2	100.0	92.1	69.4	21.6	-
SS-16	3.3m RT.	12+41.4	22.40-22.85	A-7-6(5)	45	23	43.5	16.8	11.3	28.4	100.0	74.1	41.5	14.2	-
SS-17	3.3m RT.	12+41.4	23.93-24.38	A-2-4(0)	40	9	20.0	53.7	12.6	13.7	100.0	98.2	31.0	22.9	-

-RP1C-

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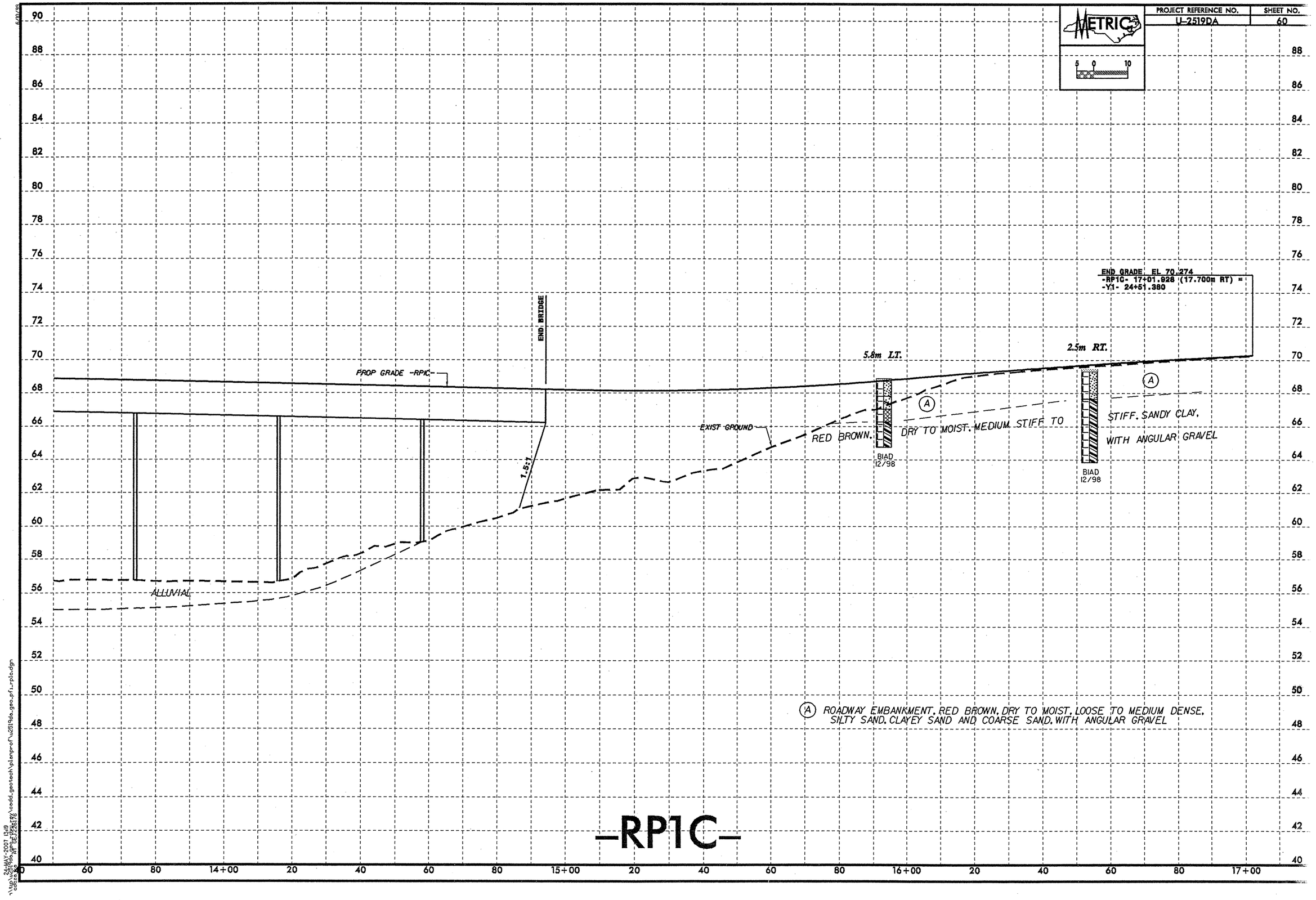
METRIC
5 0 10
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
60
END GRADE EL 70.274
-RP1C- 17+01.928 (17.700m RT) =
-Y1- 24+51.380
END BRIDGE
PROP GRADE -RPIC-
5.8m LT.
2.5m RT.
EXIST GROUND
RED BROWN, DRY TO MOIST, MEDIUM STIFF TO
STIFF, SANDY CLAY,
WITH ANGULAR GRAVEL
BIAD
12/98
BIAD
12/98
1.5:1
ALLUVIAL
A ROADWAY EMBANKMENT, RED BROWN, DRY TO MOIST, LOOSE TO MEDIUM DENSE, SILTY SAND, CLAYEY SAND AND COARSE SAND, WITH ANGULAR GRAVEL
-RP1C-
90
88
86
84
82
80
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72
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52
50
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80
14+00
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80
15+00
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40
60
80
16+00
20
40
60
80
17+00

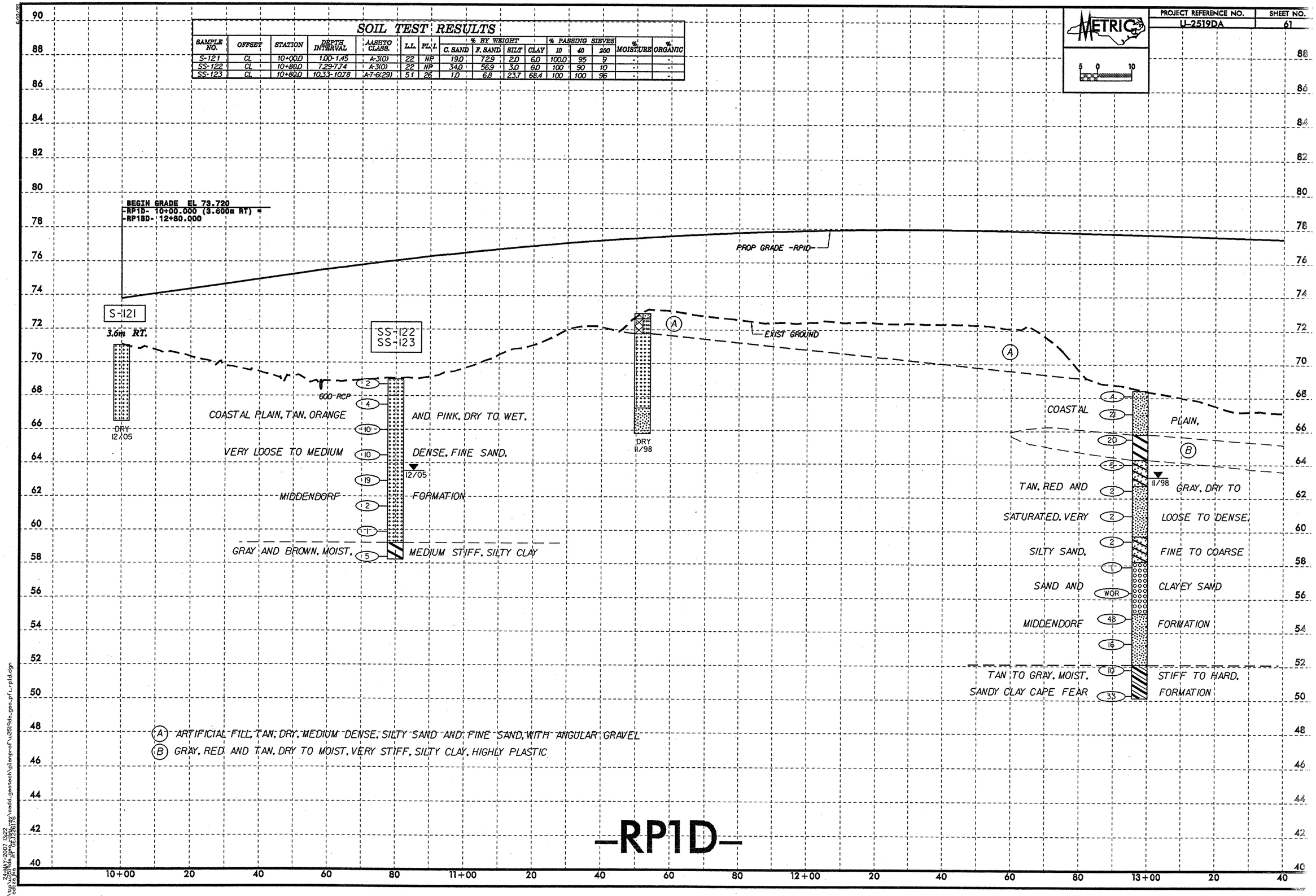
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	61

METRIC

5 0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-121	CL	10+00.0	1.00-1.45	A-3(0)	22	NP		19.0	72.9	2.0	6.0	100.0	95	9	-	-
SS-122	CL	10+80.0	7.29-7.74	A-3(0)	22	NP		34.0	56.9	3.0	6.0	100	90	10	-	-
SS-123	CL	10+80.0	10.33-10.78	A-7-6(29)	51	26		1.0	6.8	23.7	68.4	100	100	96	-	-



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PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	62

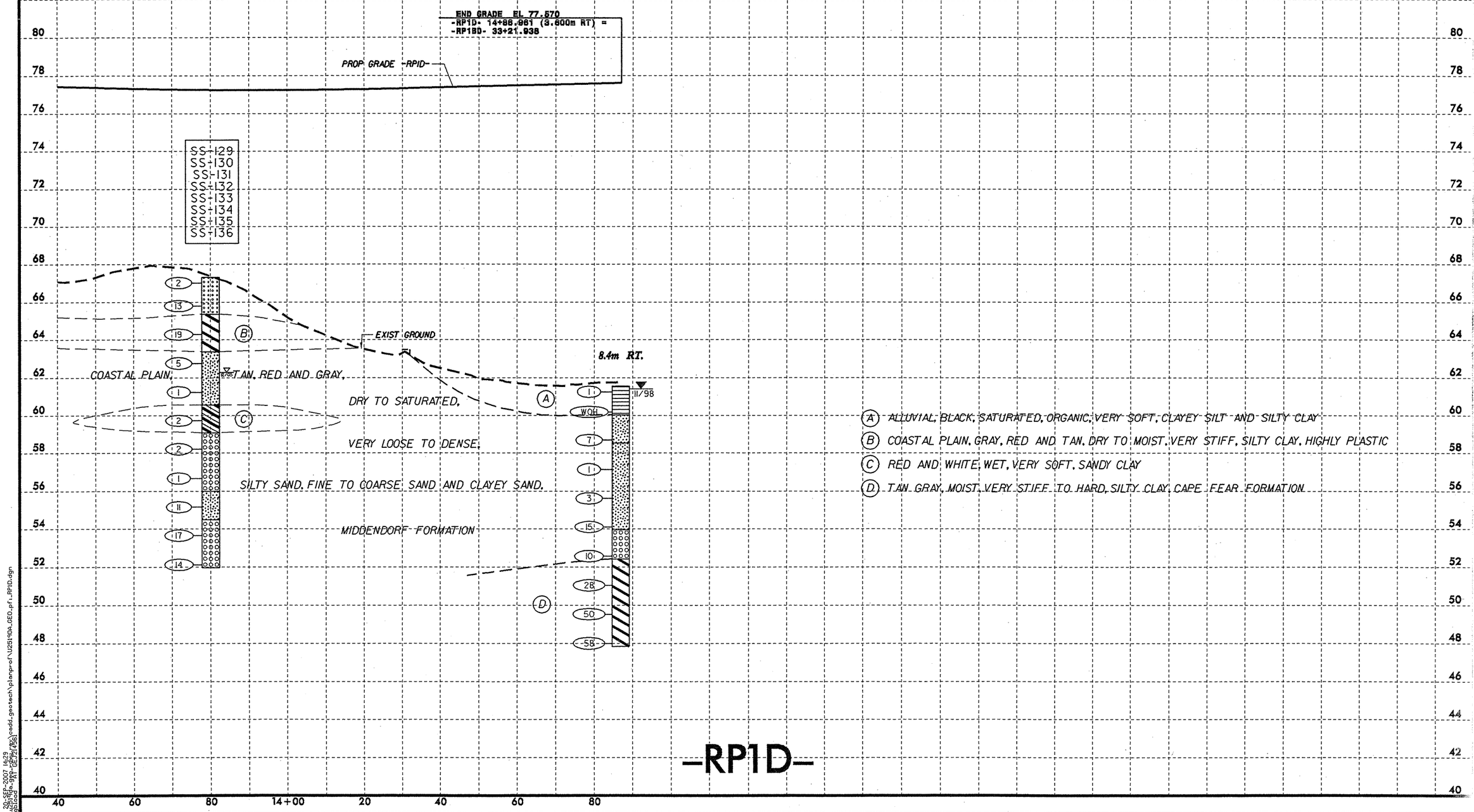
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-129	CL	13+80.0	2.74-3.19	A-7-6(34)	66	40	13.1	14.5	10.1	62.4	100	92	80	-	-
SS-130	CL	13+80.0	4.26-4.71	A-2-4(0)	22	NP	44.5	46.1	0.3	9.1	100	79	12	-	-
SS-131	CL	13+80.0	5.78-6.23	A-2-4(0)	20	NP	49.5	40.2	0.2	10.1	98	77	11	-	-
SS-132	CL	13+80.0	7.30-7.75	A-6(6)	32	13	14.9	35.0	11.9	38.2	99	92	61	-	-
SS-133	CL	13+80.0	8.82-9.27	A-1-b(0)	22	NP	80.9	9.4	0.6	9.1	96	36	10	-	-
SS-134	CL	13+80.0	10.34-10.79	A-2-6(0)	24	14	84.7	5.5	0.7	9.1	85	23	9	-	-
SS-135	CL	13+80.0	11.86-12.31	A-2-4(0)	22	NP	67.2	18.5	0.2	14.1	99	71	15	-	-
SS-136	CL	13+80.0	13.38-13.83	A-1-b(0)	20	NP	89.7	5.1	0.1	5.0	100	36	5	-	-

HAND TOOLS

*METRIC TONS

TEST NO.	STATION (RPID)	OFFSET	DEPTH INTERVAL	N_C	SHEAR STRENGTH *(T/M^2)	SOIL TYPE
VST-14	14+55.0	12.00m LT.	0.30		287	MUCK
	14+55.0	12.00m LT.	0.46		41	MUCK
	14+55.0	12.00m LT.	0.61		123	MUCK
	14+55.0	12.00m LT.	0.76		451	CLAY
	14+55.0	12.00m LT.	0.91		410	CLAY
	14+55.0	12.00m LT.	1.06		1066	SAND
VST-15	14+82.0	20.00m RT.	0.30		41	MUCK
	14+82.0	20.00m RT.	0.46		328	MUCK
	14+82.0	20.00m RT.	0.61		635	SDY. MUCK
	14+82.0	20.00m RT.	0.76		1066	SAND
	14+82.0	20.00m RT.	0.91		922	SDY. CLAY
	14+82.0	20.00m RT.	1.06		1045	SAND
	14+82.0	20.00m RT.	1.22		1394	SAND



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pgolden

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	63

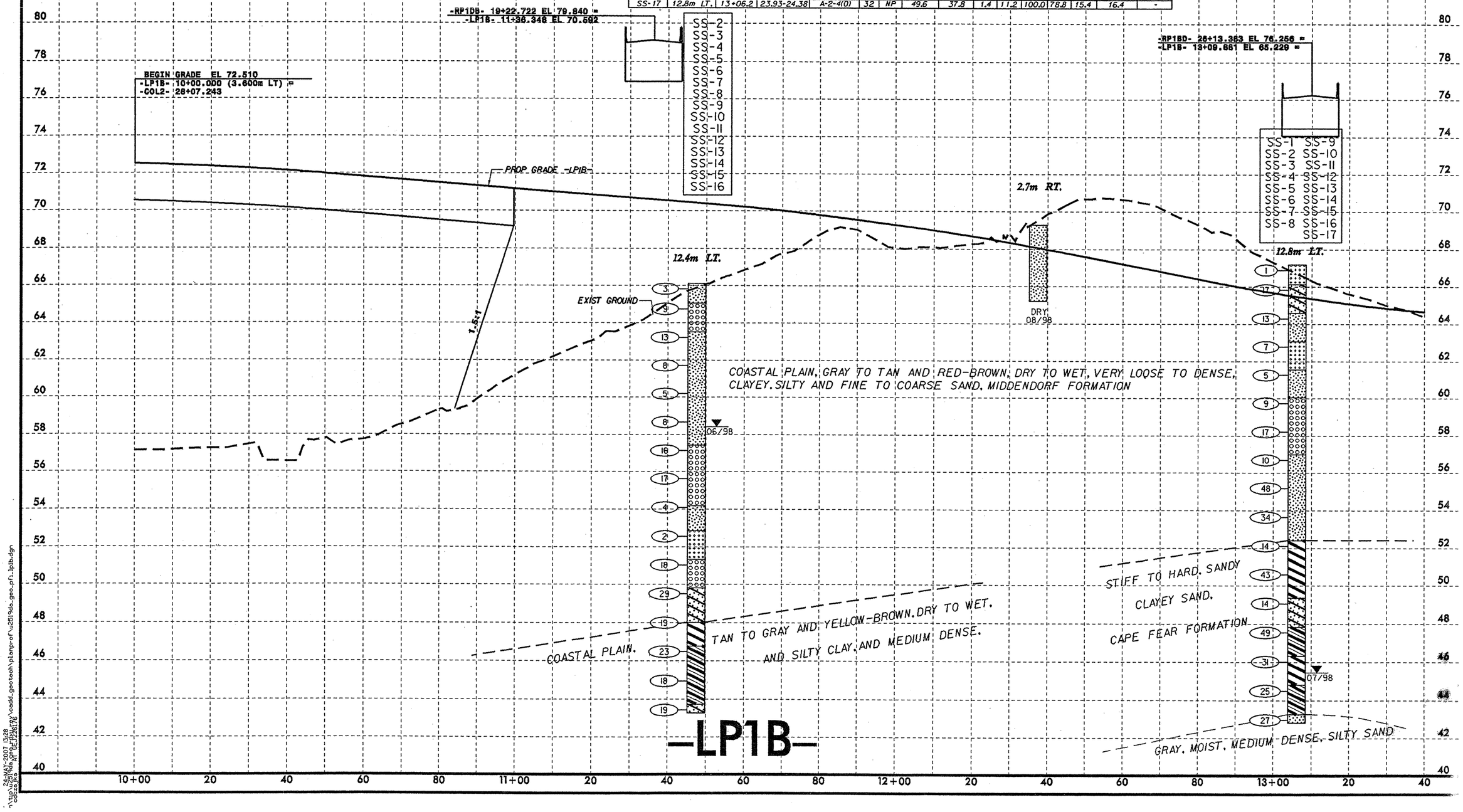
METRIC 5 0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-2	12.4m LT.	11+47.6	1.07-1.52	A-1-b(0)	20	NP	86.3	7.1	4.9	1.7	98.2	26.1	7.0	-	-
SS-3	12.4m LT.	11+47.6	2.59-3.04	A-2-4(0)	24	2	58.2	24.1	8.2	9.5	98.2	60.8	27.0	9.4	-
SS-4	12.4m LT.	11+47.6	4.11-4.56	A-2-4(0)	24	NP	23.8	66.1	2.3	7.8	100.0	91.9	11.7	19.0	-
SS-5	12.4m LT.	11+47.6	5.64-6.09	A-2-4(0)	22	3	65.9	16.0	7.7	10.4	96.2	52.9	19.5	16.1	-
SS-6	12.4m LT.	11+47.6	7.16-7.61	A-2-4(0)	24	4	64.1	17.3	8.8	9.8	96.9	54.3	21.1	14.3	-
SS-7	12.4m LT.	11+47.6	8.69-9.14	A-1-b(0)	19	NP	88.6	6.6	2.8	2.0	98.0	22.8	5.5	-	-
SS-8	12.4m LT.	11+47.6	10.21-10.66	A-1-b(0)	23	NP	85.0	8.0	1.6	5.4	83.4	18.1	6.4	-	-
SS-9	12.4m LT.	11+47.6	11.73-12.18	A-2-4(0)	21	NP	5.9	81.4	1.1	11.6	100.0	99.4	13.5	18.9	-
SS-10	12.4m LT.	11+47.6	13.26-13.71	A-3(0)	23	NP	69.0	25.2	3.8	2.0	99.0	66.1	6.1	-	-
SS-11	12.4m LT.	11+47.6	14.78-15.23	A-1-b(0)	25	NP	89.1	5.8	3.1	2.0	99.0	21.0	5.6	-	-
SS-12	12.4m LT.	11+47.6	16.31-16.76	A-2-7(3)	43	23	50.4	14.2	1.2	34.2	97.5	66.1	35.1	16.6	-
SS-13	12.4m LT.	11+47.6	17.83-18.28	A-7-6(23)	47	25	4.7	10.2	22.8	62.3	100.0	97.3	87.7	17.9	-
SS-14	12.4m LT.	11+47.6	19.35-19.80	A-6(3)	36	20	53.9	9.5	4.3	32.3	100.0	72.7	37.6	14.6	-
SS-15	12.4m LT.	11+47.6	20.88-21.33	A-6(2)	31	18	32.5	30.9	10.4	26.2	99.6	83.1	38.6	12.4	-
SS-16	12.4m LT.	11+47.6	22.40-22.85	A-2-6(0)	36	19	68.2	9.9	3.4	18.5	98.2	54.1	22.0	18.7	-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-1	12.8m LT.	13+06.2	0.00-0.45	A-3(0)	20	NP	51.5	39.8	5.5	3.2	100.0	72.7	11.8	-	-
SS-2	12.8m LT.	13+06.2	1.07-1.52	A-2-6(0)	37	15	67.0	11.9	14.3	6.8	96.5	40.4	23.1	4.0	-
SS-3	12.8m LT.	13+06.2	2.59-3.04	A-2-4(0)	22	NP	46.1	32.8	7.5	13.6	99.7	73.7	24.6	2.0	-
SS-4	12.8m LT.	13+06.2	4.11-4.56	A-3(0)	25	NP	16.4	76.7	3.5	3.4	98.2	87.8	9.6	-	-
SS-5	12.8m LT.	13+06.2	5.64-6.09	A-2-4(0)	28	9	79.9	5.9	8.3	5.9	76.8	21.7	13.0	6.1	-
SS-6	12.8m LT.	13+06.2	7.16-7.61	A-1-b(0)	23	NP	87.4	5.0	3.4	4.2	96.2	23.9	7.7	-	-
SS-7	12.8m LT.	13+06.2	8.69-9.14	A-1-b(0)	23	NP	90.1	5.8	2.0	2.1	97.5	14.5	4.6	-	-
SS-8	12.8m LT.	13+06.2	10.21-10.66	A-2-4(0)	19	NP	54.6	32.4	5.4	7.6	100.0	71.6	16.0	23.3	-
SS-9	12.8m LT.	13+06.2	11.73-12.18	A-2-4(0)	22	2	0.4	71.8	7.9	19.9	100.0	99.8	31.4	19.0	-
SS-10	12.8m LT.	13+06.2	13.26-13.71	A-2-4(0)	24	NP	11.5	77.8	0.6	10.1	100.0	99.6	12.3	22.2	-
SS-11	12.8m LT.	13+06.2	14.78-15.23	A-7-6(22)	46	26	4.5	12.7	5.3	74.2	100.0	98.2	82.8	19.1	-
SS-12	12.8m LT.	13+06.2	16.31-16.76	A-7-6(21)	50	27	2.6	25.2	10.6	61.6	100.0	99.4	77.5	20.8	-
SS-13	12.8m LT.	13+06.2	17.83-18.28	A-2-6(0)	31	13	45.1	29.9	0.8	24.2	98.7	69.8	25.8	9.6	-
SS-14	12.8m LT.	13+06.2	19.35-19.80	A-6(9)	39	22	31.5	14.7	3.1	50.7	100.0	80.0	55.9	14.4	-
SS-15	12.8m LT.	13+06.2	20.88-21.33	A-7-6(2)	57	34	62.0	7.3	1.8	29.9	92.4	41.3	29.3	11.0	-
SS-16	12.8m LT.	13+06.2	22.40-22.85	A-6(5)	33	19	31.2	25.2	9.8	33.8	100.0	87.8	47.2	13.3	-
SS-17	12.8m LT.	13+06.2	23.93-24.38	A-2-4(0)	32	NP	49.6	37.8	1.4	11.2	100.0	78.8	15.4	16.4	-



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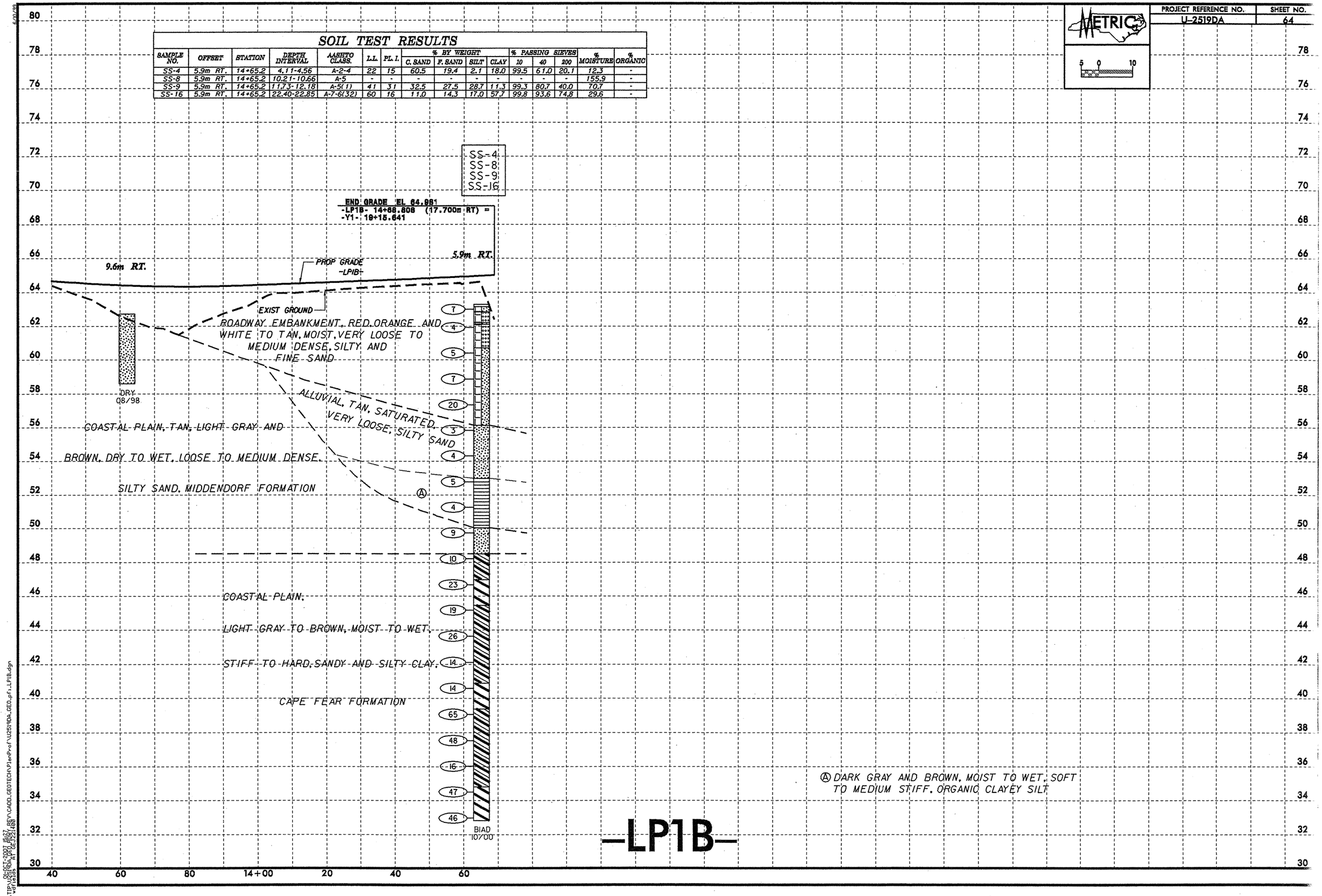
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	64

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-4	5.9m RT.	14+65.2	4.11-4.56	A-2-4	22	15	60.5	19.4	2.1	18.0	99.5	61.0	20.1	12.3	-
SS-8	5.9m RT.	14+65.2	10.21-10.66	A-5	-	-	-	-	-	-	-	-	-	155.9	-
SS-9	5.9m RT.	14+65.2	11.73-12.18	A-5(1)	41	31	32.5	27.5	28.7	11.3	99.3	80.7	40.0	70.7	-
SS-16	5.9m RT.	14+65.2	22.40-22.85	A-7-6(32)	60	16	11.0	14.3	17.0	57.7	99.8	93.6	74.8	29.6	-



PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	65

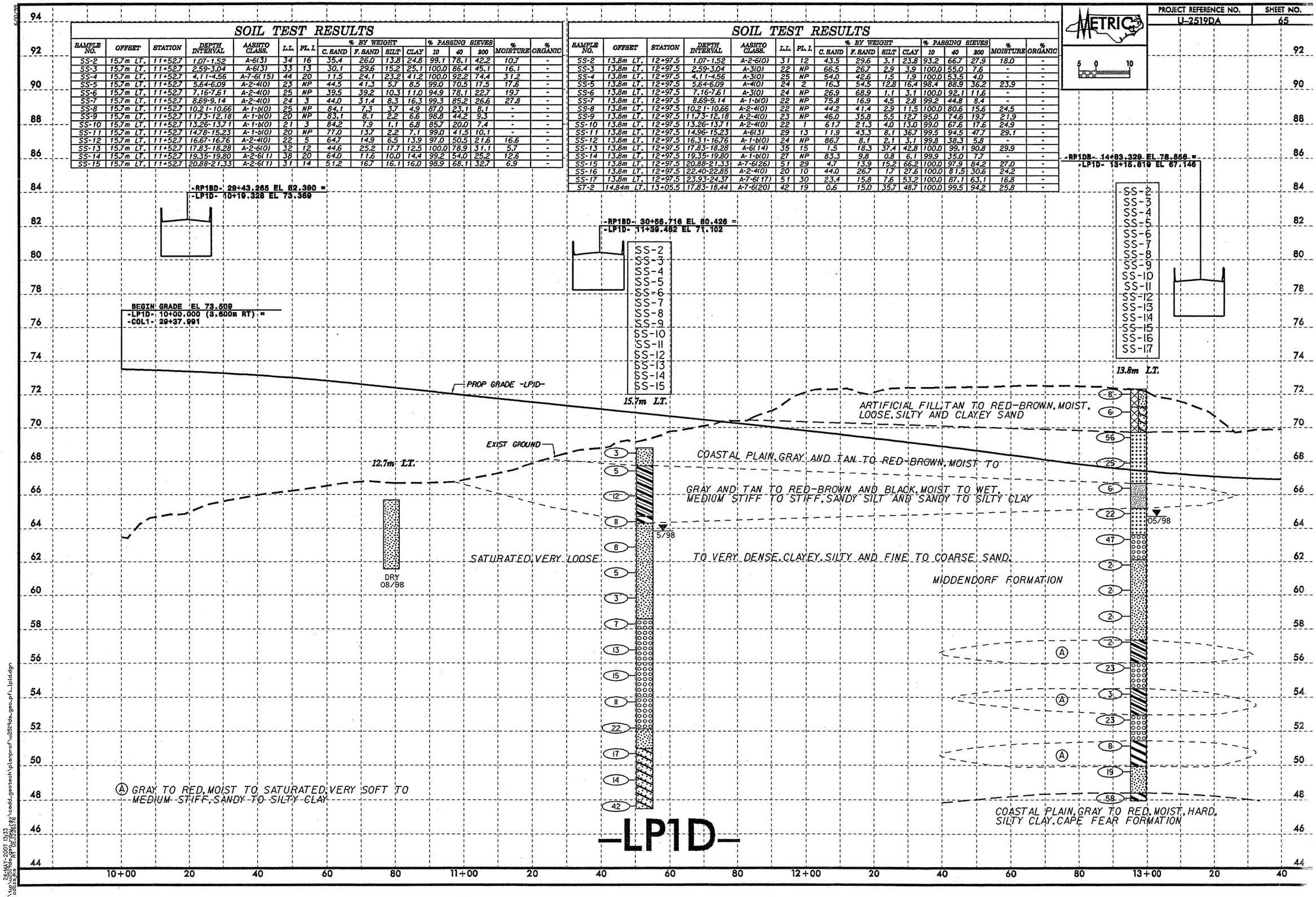
METRIC 5 0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-2	15.7m LT.	11+52.7	1.07-1.52	A-6(3)	34	16	35.4	26.0	13.8	24.8	99.1	78.1	42.2	10.7	-
SS-3	15.7m LT.	11+52.7	2.59-3.04	A-6(3)	33	13	30.1	29.6	15.2	25.1	100.0	86.4	45.1	16.1	-
SS-4	15.7m LT.	11+52.7	4.11-4.56	A-7-6(15)	44	20	11.5	24.1	23.2	41.2	100.0	92.2	74.4	31.2	-
SS-5	15.7m LT.	11+52.7	5.64-6.09	A-2-4(0)	23	NP	44.5	41.3	5.7	8.5	99.0	70.5	17.5	17.6	-
SS-6	15.7m LT.	11+52.7	7.16-7.61	A-2-4(0)	25	NP	39.5	39.2	10.3	11.0	94.9	78.1	22.7	19.7	-
SS-7	15.7m LT.	11+52.7	8.69-9.14	A-2-4(0)	24	3	44.0	31.4	8.3	16.3	99.3	85.2	26.6	27.8	-
SS-8	15.7m LT.	11+52.7	10.21-10.66	A-1-b(0)	25	NP	84.1	7.3	3.7	4.9	87.0	23.1	8.1	-	-
SS-9	15.7m LT.	11+52.7	11.73-12.18	A-1-b(0)	20	NP	83.1	8.1	2.2	6.6	98.8	44.2	9.3	-	-
SS-10	15.7m LT.	11+52.7	13.26-13.71	A-1-b(0)	21	3	84.2	7.9	1.1	6.8	85.7	20.0	7.4	-	-
SS-11	15.7m LT.	11+52.7	14.78-15.23	A-1-b(0)	20	NP	77.0	13.7	2.2	7.1	99.0	41.5	10.1	-	-
SS-12	15.7m LT.	11+52.7	16.67-16.76	A-2-4(0)	22	5	64.7	14.9	6.5	13.9	97.0	50.5	21.6	16.6	-
SS-13	15.7m LT.	11+52.7	17.83-18.28	A-2-6(0)	32	12	44.6	25.2	17.7	12.5	100.0	78.9	31.1	5.7	-
SS-14	15.7m LT.	11+52.7	19.35-19.80	A-2-6(1)	38	20	64.0	11.6	10.0	14.4	99.2	54.0	25.2	12.6	-
SS-15	15.7m LT.	11+52.7	20.88-21.33	A-2-6(1)	31	14	51.2	16.7	16.1	16.0	98.9	68.1	32.7	6.9	-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-2	13.8m LT.	12+97.5	1.07-1.52	A-2-6(0)	31	12	43.5	29.6	3.1	23.8	93.2	66.7	27.9	18.0	-
SS-3	13.8m LT.	12+97.5	2.59-3.04	A-3(0)	22	NP	66.5	26.7	2.9	3.9	100.0	55.0	7.6	-	-
SS-4	13.8m LT.	12+97.5	4.11-4.56	A-3(0)	25	NP	54.0	42.6	1.5	1.9	100.0	53.5	4.0	-	-
SS-5	13.8m LT.	12+97.5	5.64-6.09	A-4(0)	24	2	16.3	54.5	12.8	16.4	98.4	88.9	36.2	23.9	-
SS-6	13.8m LT.	12+97.5	7.16-7.61	A-3(0)	24	NP	26.9	68.9	1.1	3.1	100.0	92.1	11.6	-	-
SS-7	13.8m LT.	12+97.5	8.69-9.14	A-1-b(0)	22	NP	75.8	16.9	4.5	2.8	99.2	44.8	8.4	-	-
SS-8	13.8m LT.	12+97.5	10.21-10.66	A-2-4(0)	22	NP	44.2	41.4	2.9	11.5	100.0	80.6	15.6	24.5	-
SS-9	13.8m LT.	12+97.5	11.73-12.18	A-2-4(0)	23	NP	46.0	35.8	5.5	12.7	95.0	74.6	19.7	21.9	-
SS-10	13.8m LT.	12+97.5	13.26-13.71	A-2-4(0)	22	1	61.7	21.3	4.0	13.0	99.0	67.6	17.6	24.9	-
SS-11	13.8m LT.	12+97.5	14.96-15.23	A-6(3)	29	13	11.9	43.3	8.1	36.7	99.5	94.5	47.7	29.1	-
SS-12	13.8m LT.	12+97.5	16.31-16.76	A-1-b(0)	24	NP	86.7	8.1	2.1	3.1	99.8	38.3	5.8	-	-
SS-13	13.8m LT.	12+97.5	17.83-18.28	A-6(14)	35	15	1.5	18.3	37.4	42.8	100.0	99.1	90.8	29.9	-
SS-14	13.8m LT.	12+97.5	19.35-19.80	A-1-b(0)	27	NP	83.3	9.8	0.8	6.1	99.9	35.0	7.7	-	-
SS-15	13.8m LT.	12+97.5	20.88-21.33	A-7-6(26)	51	29	4.7	13.9	15.2	66.2	100.0	97.9	84.2	27.0	-
SS-16	13.8m LT.	12+97.5	22.40-22.85	A-2-4(0)	20	10	44.0	26.7	1.7	27.6	100.0	81.5	30.6	24.2	-
SS-17	13.8m LT.	12+97.5	23.93-24.37	A-7-6(17)	51	30	23.4	15.8	7.6	53.2	100.0	87.1	63.1	16.8	-
ST-2	14.84m LT.	13+05.5	17.83-18.44	A-7-6(20)	42	19	0.6	15.0	35.7	48.7	100.0	99.5	94.2	25.8	-



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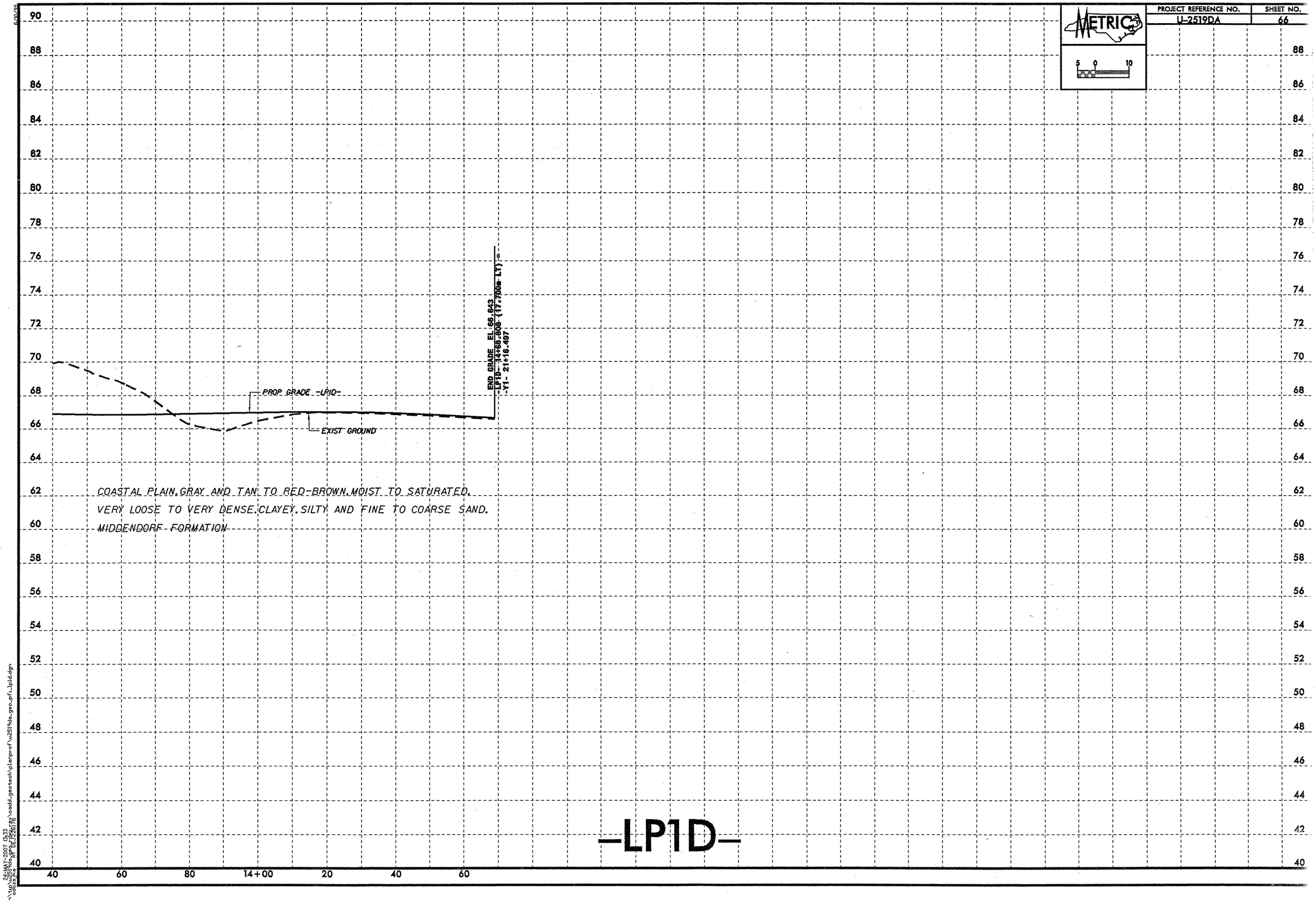

PROJECT REFERENCE NO.
U-2519DA
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END GRADE EL 66.643
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-Y1- 21+16.497
PROP GRADE -LP1D-
EXIST GROUND
COASTAL PLAIN, GRAY AND TAN TO RED-BROWN, MOIST TO SATURATED,
VERY LOOSE TO VERY DENSE, CLAYEY, SILTY AND FINE TO COARSE SAND.
MIDDENDORF FORMATION
-LP1D-
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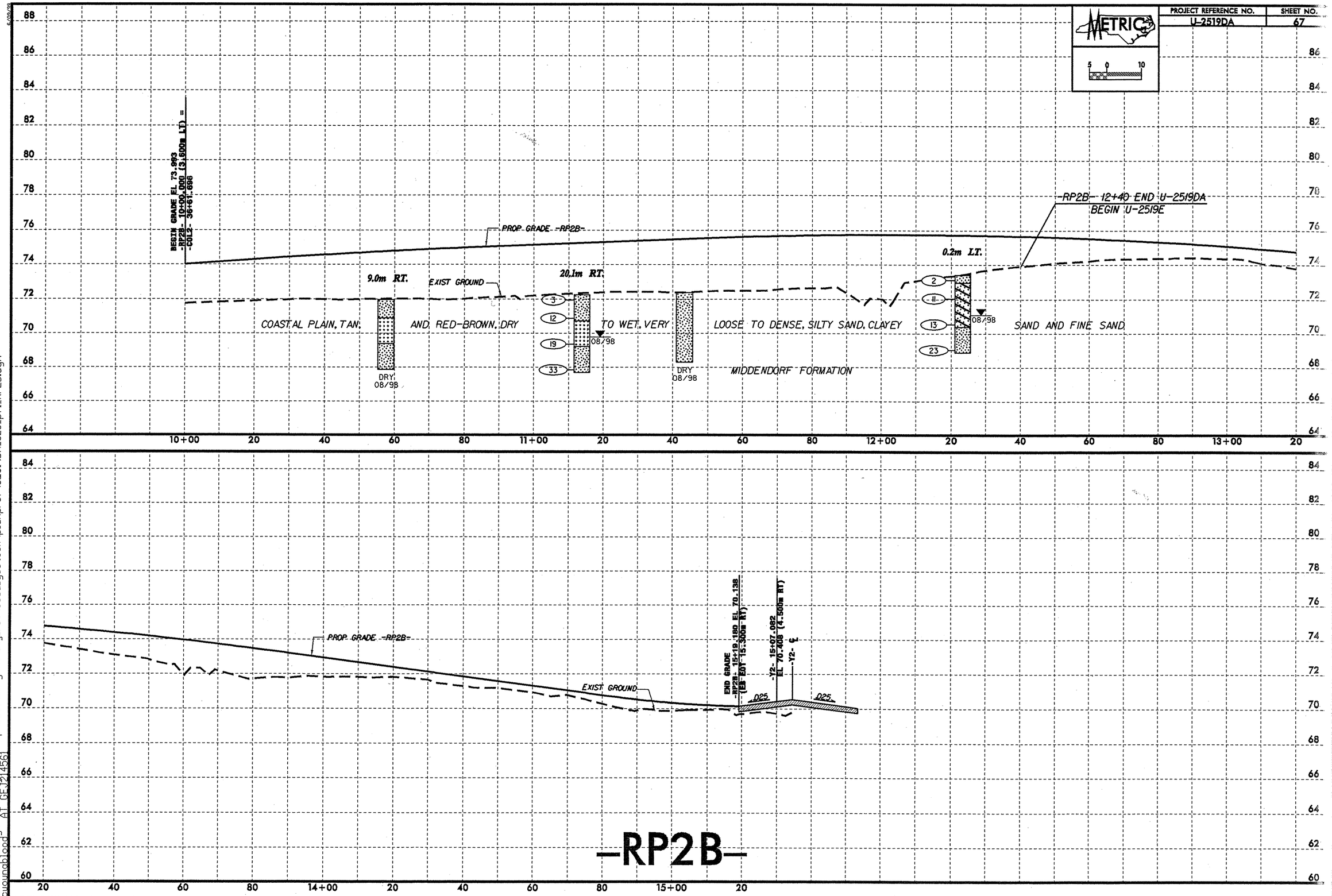

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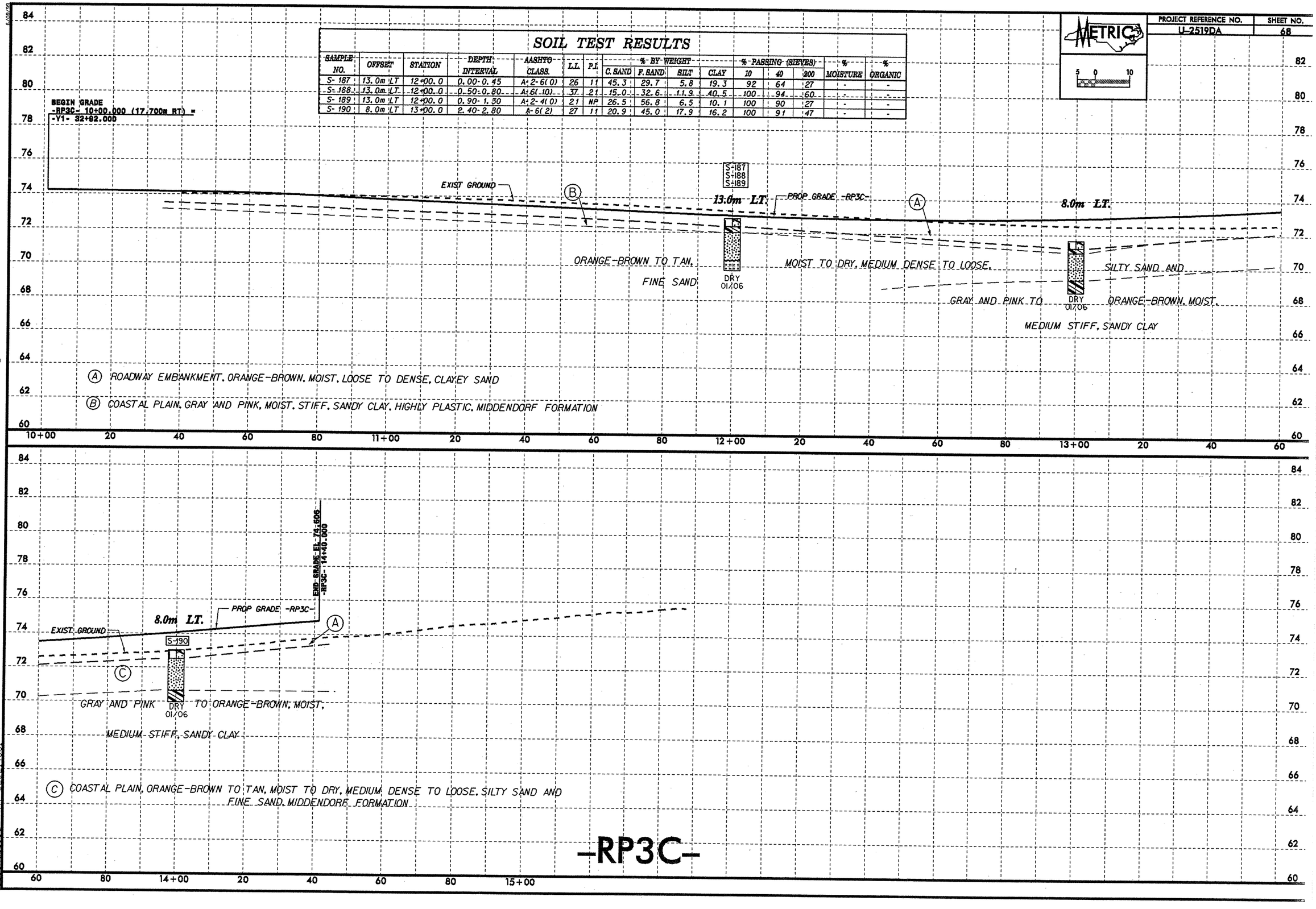
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	68

METRIC 5 0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-187	13.0m LT	12+00.0	0.00-0.45	A-2-6(0)	26	11	45.3	29.7	5.8	19.3	92	64	27	-	-
S-188	13.0m LT	12+00.0	0.50-0.80	A-6(10)	37	21	15.0	32.6	11.9	40.5	100	94	60	-	-
S-189	13.0m LT	12+00.0	0.90-1.30	A-2-4(0)	21	NP	26.5	56.8	6.5	10.1	100	90	27	-	-
S-190	8.0m LT	13+00.0	2.40-2.80	A-6(2)	27	11	20.9	45.0	17.9	16.2	100	91	47	-	-



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cuoundblood AT GEU21456

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	69

METRIC

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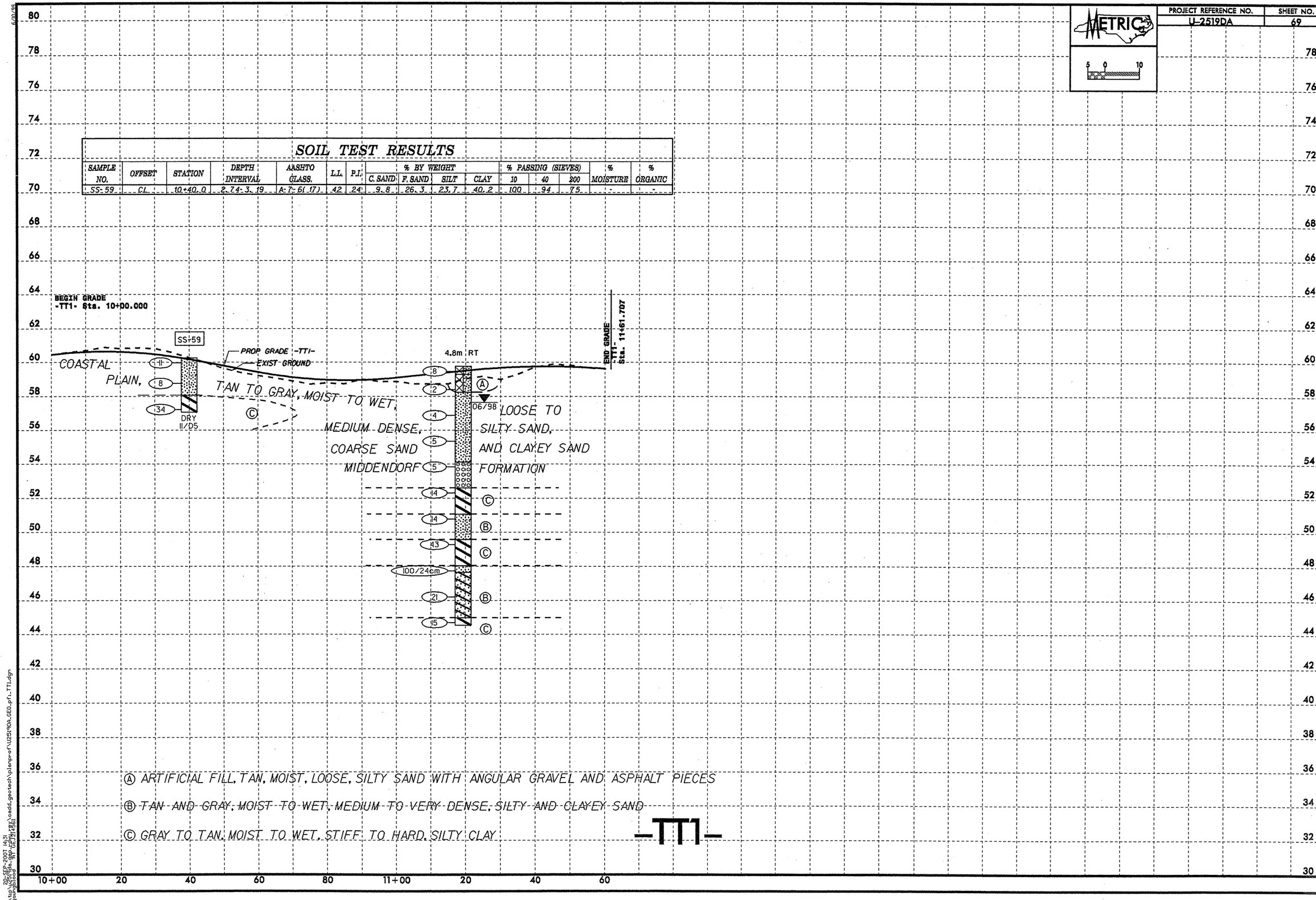
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-59	CL	10+40.0	2.74-3.19	A-7-6(17)	42	24	9.8	26.3	23.7	40.2	100	94	75	-	-



PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	70

METRIC

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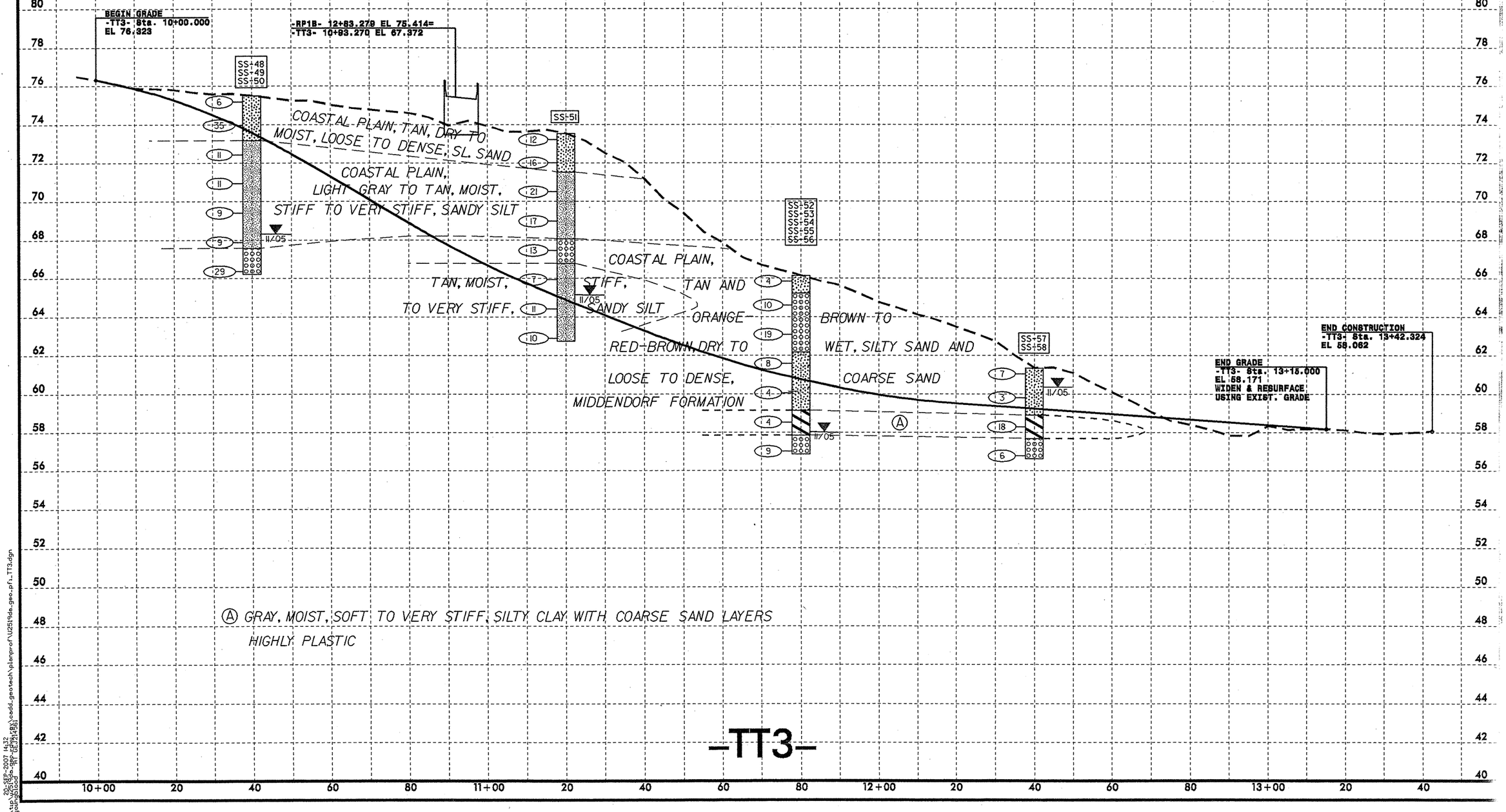
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-48	CL	10+40.0	1.22-1.67	A-2-4(0)	27	6	44.9	36.7	2.3	16.1	99	77	21	-	-
SS-49	CL	10+40.0	2.74-3.19	A-4(0)	26	5	7.2	58.6	12.0	22.1	100	97	48	-	-
SS-50	CL	10+40.0	8.82-9.27	A-1-b(0)	23	NP	64.7	29.6	2.7	3.0	91	37	7	-	-
SS-51	CL	11+20.0	5.79-6.23	A-4(0)	29	7	26.9	48.4	10.6	14.1	99	78	37	-	-
SS-52	CL	11+80.0	1.22-1.67	A-1-b(0)	22	NP	87.4	7.0	0.5	5.0	89	20	6	-	-
SS-53	CL	11+80.0	4.26-4.71	A-2-4(0)	12	NP	40.9	46.0	4.1	9.0	100	84	16	-	-
SS-54	CL	11+80.0	5.78-6.23	A-2-4(0)	22	NP	26.7	58.5	4.7	10.0	97	85	18	-	-
SS-55	CL	11+80.0	7.30-7.75	A-7-5(30)	58	27	6.8	1.0	27.9	64.3	100	94	93	-	-
SS-56	CL	11+80.0	8.82-9.27	A-1-b(0)	21	NP	84.6	8.6	0.7	6.0	98	22	7	-	-
SS-57	CL	12+40.0	1.22-1.67	A-2-4(0)	17	NP	45.7	39.4	4.9	10.0	95	69	20	-	-
SS-58	CL	12+40.0	2.74-3.19	A-7-6(12)	41	22	1.6	36.9	15.3	46.2	100	100	66	-	-



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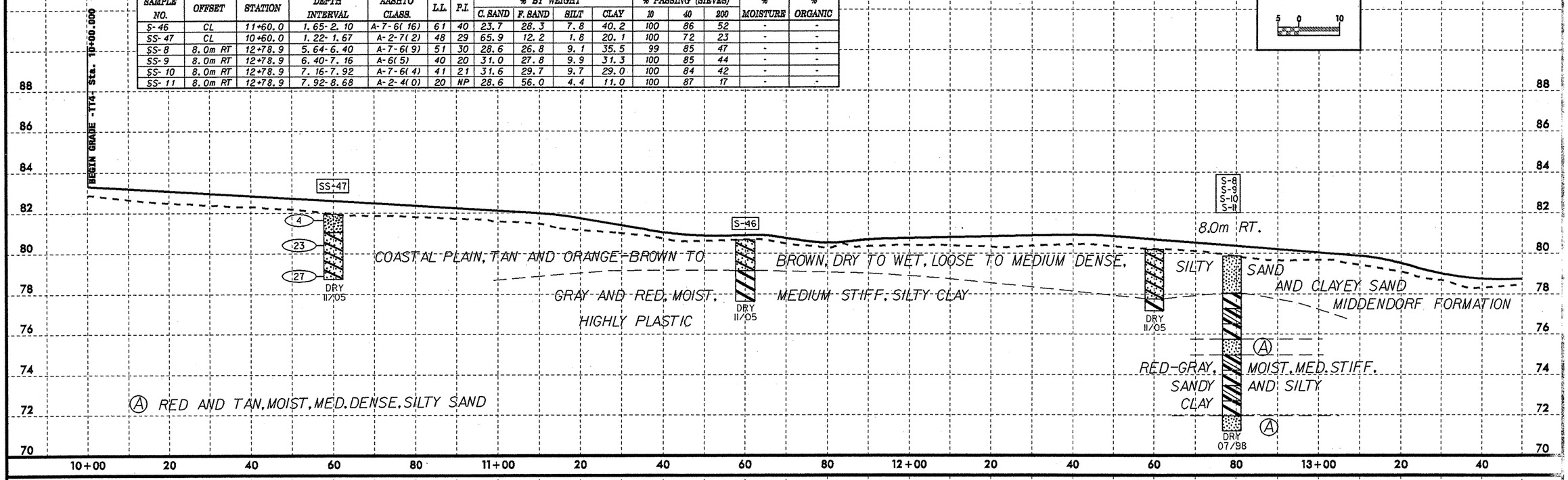
METRIC 5 0 10

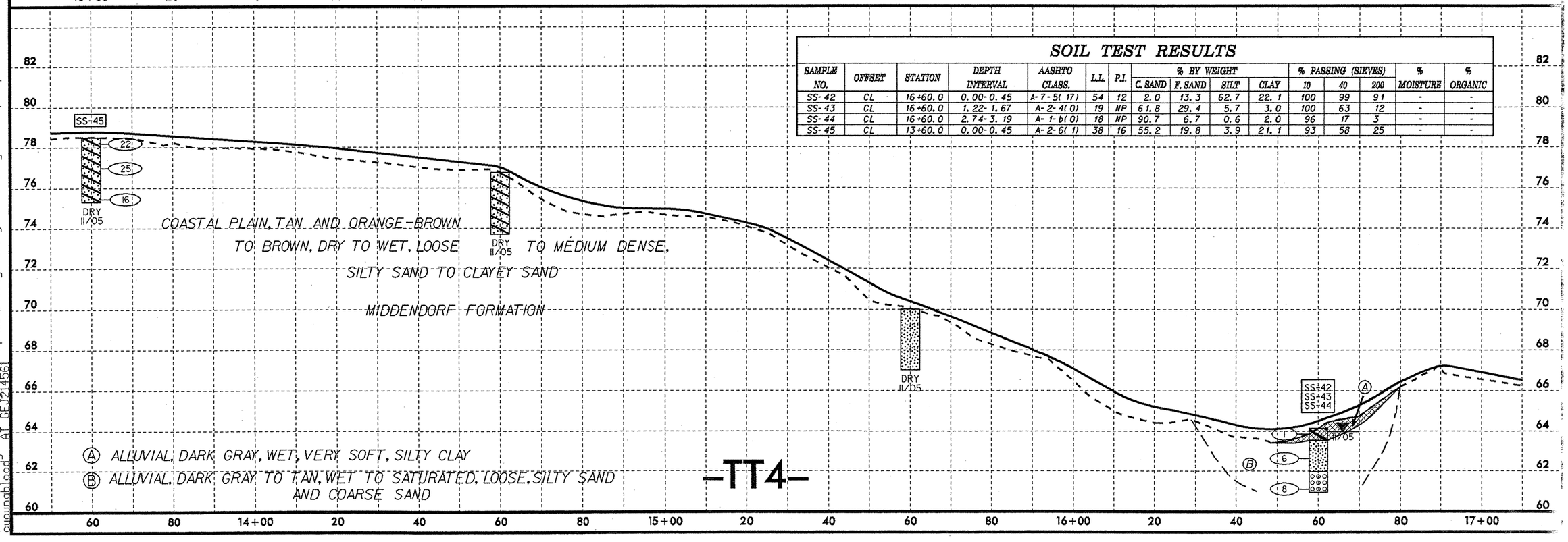
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-46	CL	11+60.0	1.65-2.10	A-7-6(16)	61	40	23.7	28.3	7.8	40.2	100	86	52	-	-
SS-47	CL	10+60.0	1.22-1.67	A-2-7(2)	48	29	65.9	12.2	1.8	20.1	100	72	23	-	-
SS-8	8.0m RT	12+78.9	5.64-6.40	A-7-6(9)	51	30	28.6	26.8	9.1	35.5	99	85	47	-	-
SS-9	8.0m RT	12+78.9	6.40-7.16	A-6(5)	40	20	31.0	27.8	9.9	31.3	100	85	44	-	-
SS-10	8.0m RT	12+78.9	7.16-7.92	A-7-6(4)	41	21	31.6	29.7	9.7	29.0	100	84	42	-	-
SS-11	8.0m RT	12+78.9	7.92-8.68	A-2-4(0)	20	NP	28.6	56.0	4.4	11.0	100	87	17	-	-



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-42	CL	16+60.0	0.00-0.45	A-7-5(17)	54	12	2.0	13.3	62.7	22.1	100	99	91	-	-
SS-43	CL	16+60.0	1.22-1.67	A-2-4(0)	19	NP	61.8	29.4	5.7	3.0	100	63	12	-	-
SS-44	CL	16+60.0	2.74-3.19	A-1-b(0)	18	NP	90.7	6.7	0.6	2.0	96	17	3	-	-
SS-45	CL	13+60.0	0.00-0.45	A-2-6(1)	38	16	55.2	19.8	3.9	21.1	93	58	25	-	-



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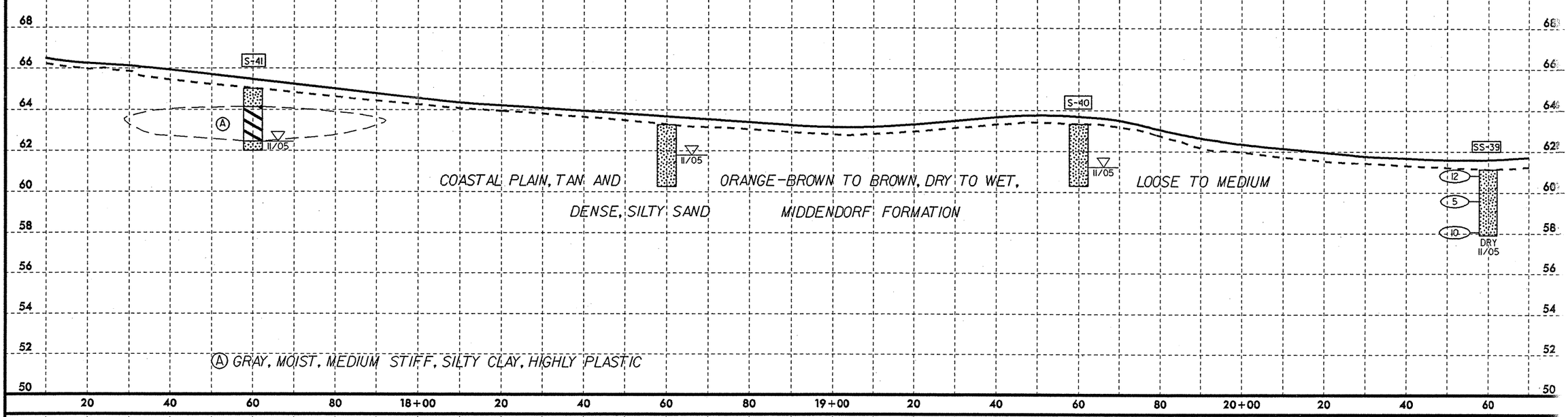
cuoungblood AT GEO214561

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	72

METRIC 5 0 10

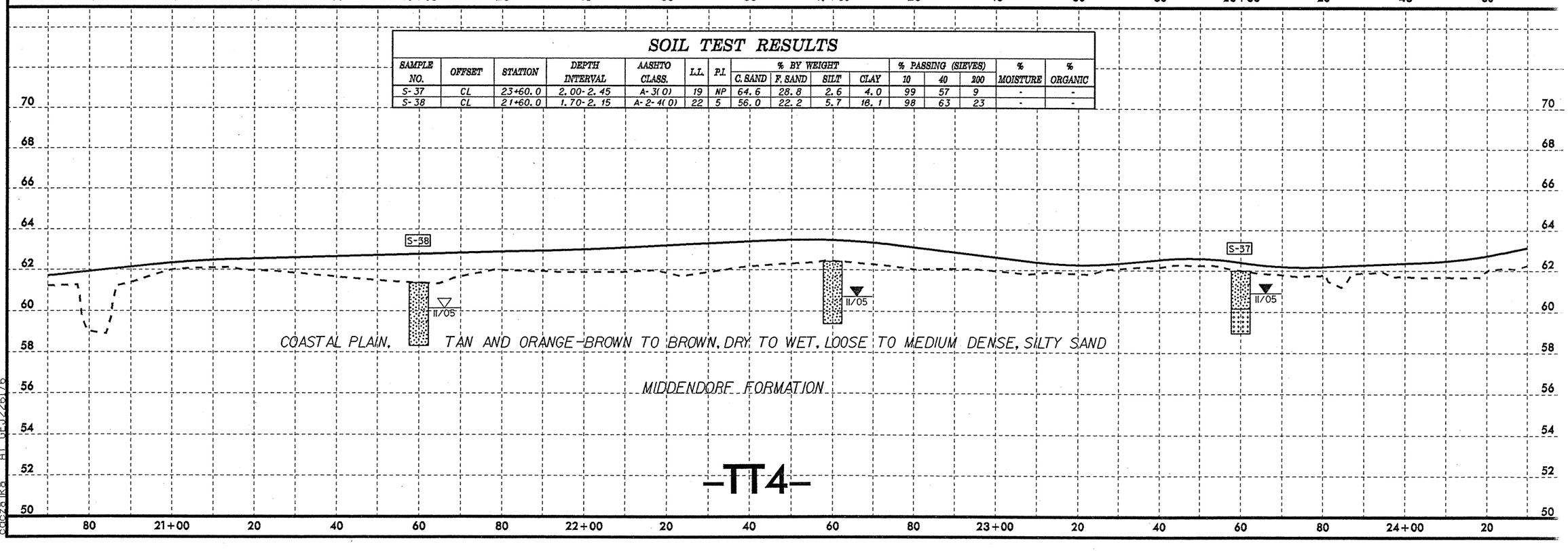
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-39	CL	20+60.0	1.22-1.67	A-2-4(0)	22	NP	52.5	36.5	4.9	6.0	100	70	16	-	-
S-40	CL	19+60.0	2.42-2.97	A-2-4(0)	24	5	40.5	39.3	4.2	16.1	100	73	23	-	-
S-41	CL	17+60.0	1.00-1.45	A-7-6(11)	41	22	18.1	26.5	17.3	38.2	99	88	61	-	-



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-37	CL	23+60.0	2.00-2.45	A-3(0)	19	NP	64.6	28.8	2.6	4.0	99	57	9	-	-
S-38	CL	21+60.0	1.70-2.15	A-2-4(0)	22	5	56.0	22.2	5.7	18.1	98	63	23	-	-



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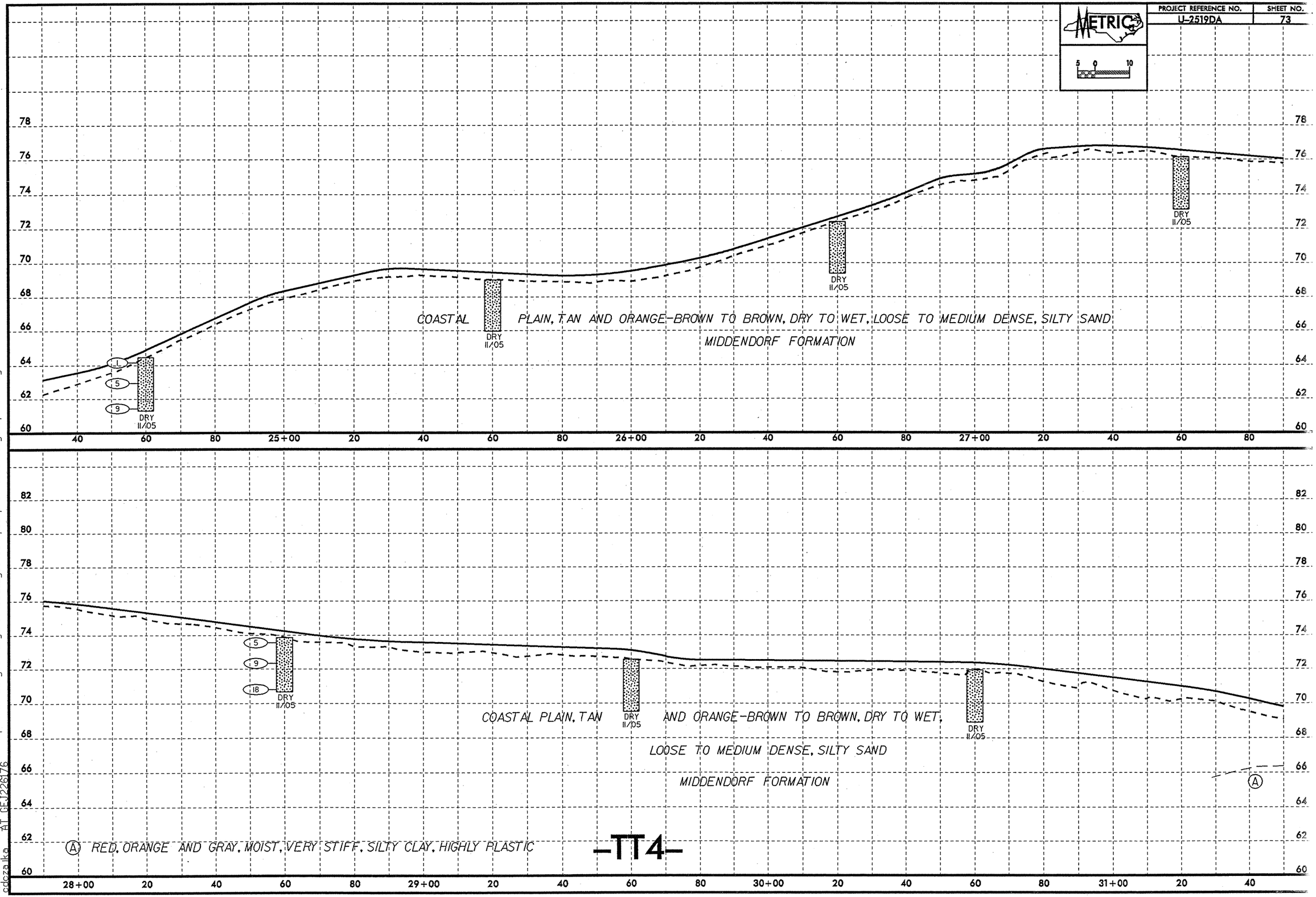

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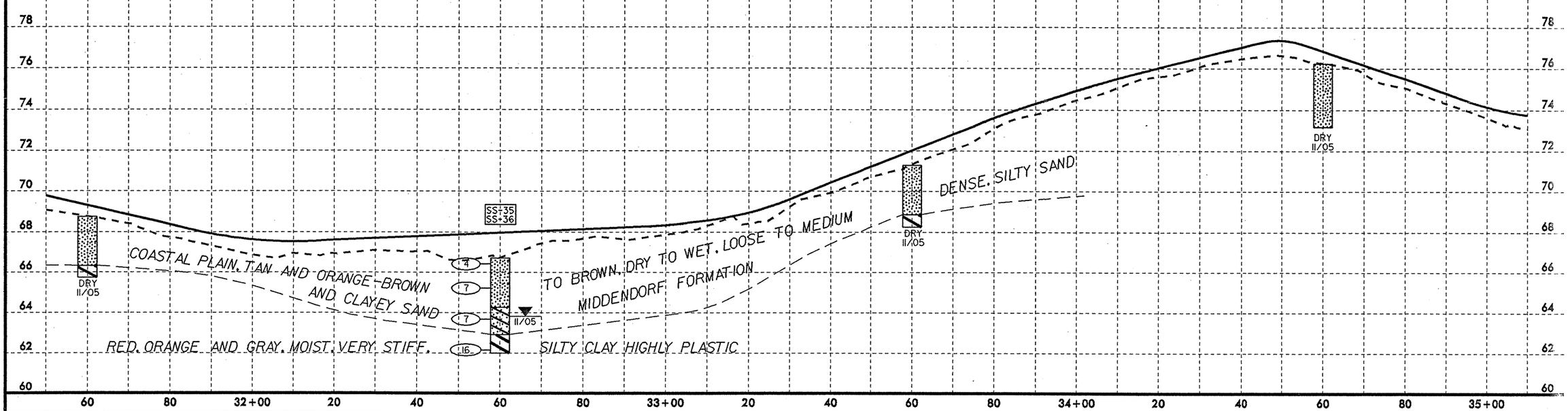
cdczalko

METRIC 5 0 10

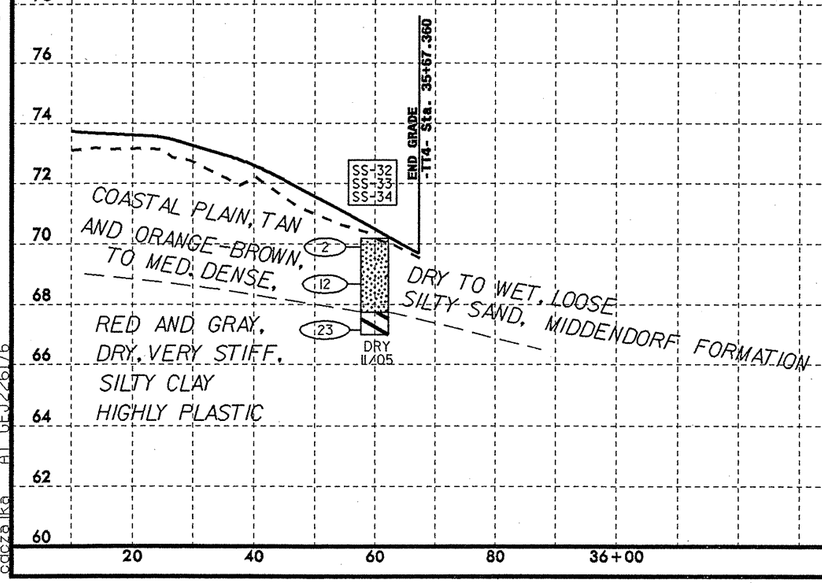
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-35	CL	32+60.0	2.74-3.19	A-2-6(2)	39	21	47.2	22.3	10.4	20.1	100	69	34	-	-
SS-36	CL	32+60.0	4.26-4.71	A-7-6(64)	82	56	0.4	4.0	27.3	68.3	100	100	98	-	-



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-32	CL	35+60.0	0.00-0.45	A-2-4(0)	19	NP	35.9	55.1	5.0	4.0	100	87	14	-	-
SS-33	CL	35+60.0	1.22-1.67	A-2-4(0)	23	5	41.5	37.2	3.3	18.0	98	78	25	-	-
SS-34	CL	35+60.0	2.74-3.19	A-7-6(27)	51	29	0.4	19.0	20.4	60.1	100	100	88	-	-



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PT 06/22/06
6/09/06

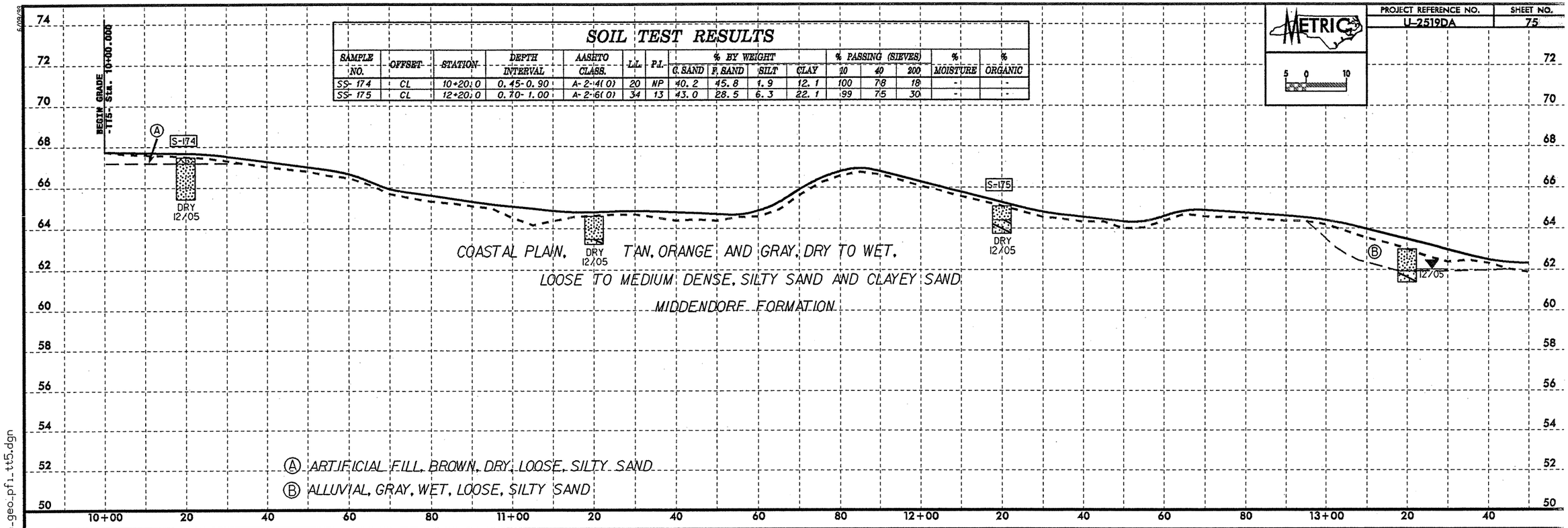
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	75

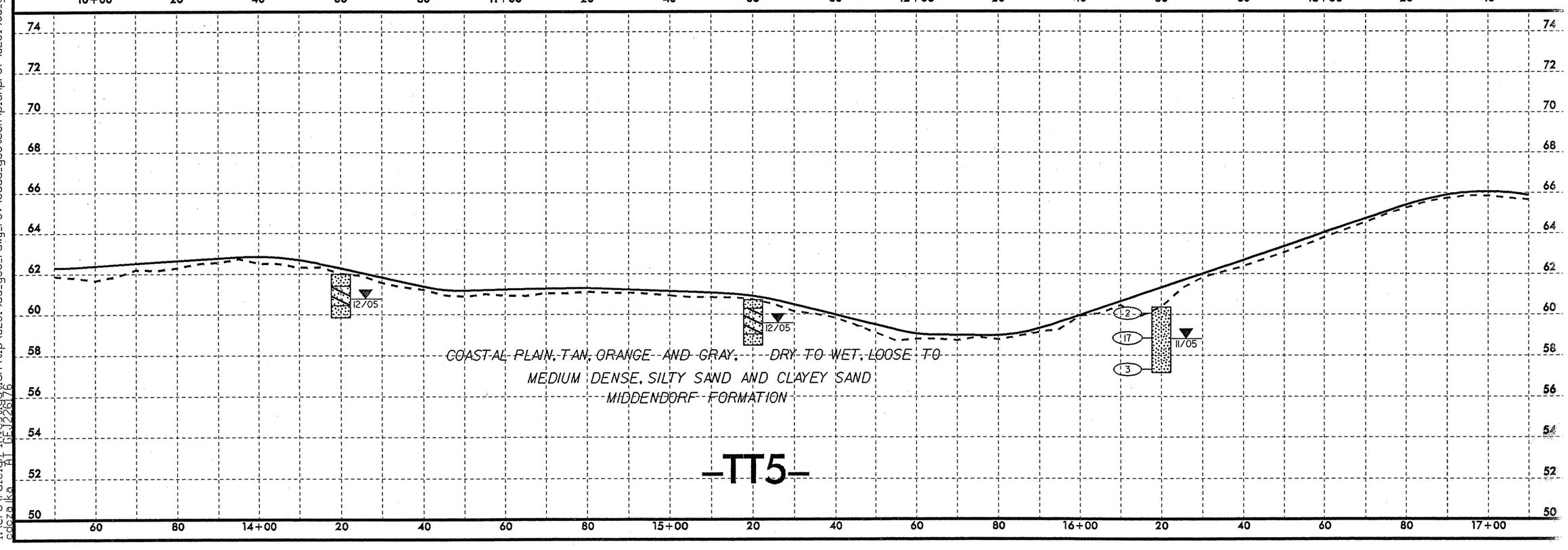
METRIC

5 0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-174	CL	10+20.0	0.45-0.90	A-2-4(0)	20	NP	40.2	45.8	1.9	12.1	100	78	18	-	-
SS-175	CL	12+20.0	0.70-1.00	A-2-6(0)	34	13	43.0	28.5	6.3	22.1	99	75	30	-	-





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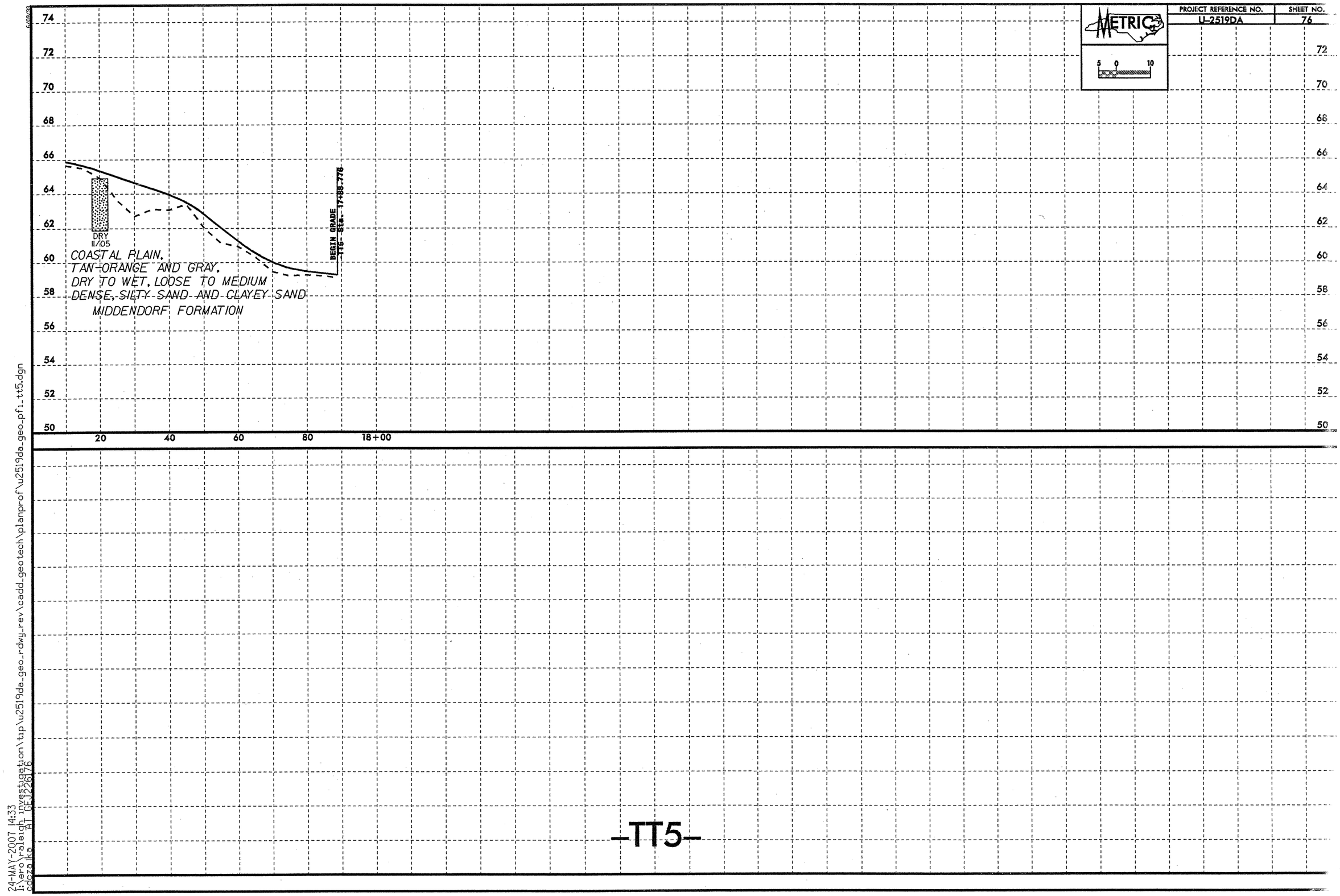

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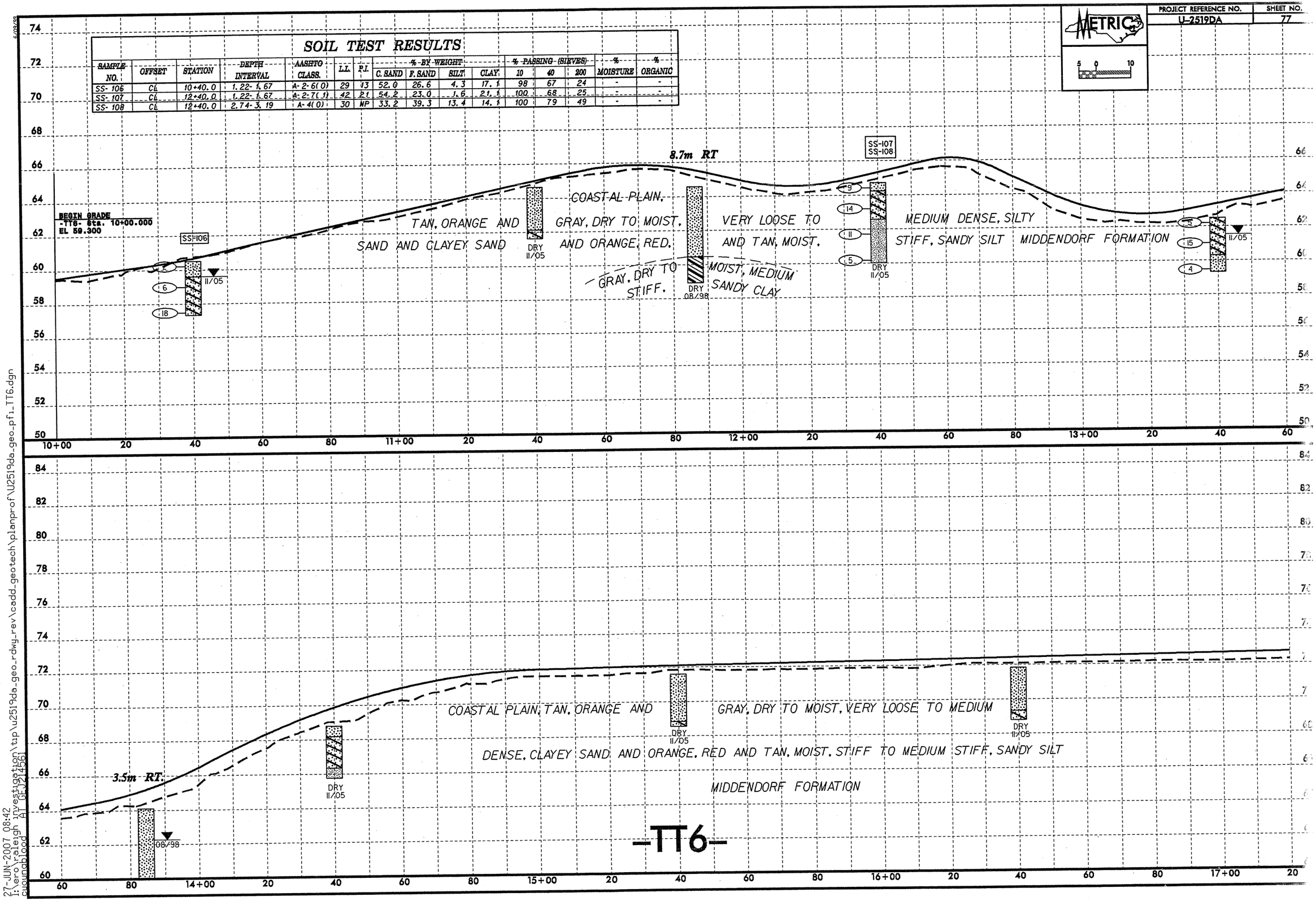
cdczalka AT GEJ226176

METRIC 5 0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-106	CL	10+40.0	1.22-1.67	A-2-6(0)	29	13	52.0	26.6	4.3	17.1	98	67	24	-	-
SS-107	CL	12+40.0	1.22-1.67	A-2-7(1)	42	21	54.2	23.0	1.6	21.1	100	68	25	-	-
SS-108	CL	12+40.0	2.74-3.19	A-4(0)	30	NP	33.2	39.3	13.4	14.1	100	79	49	-	-



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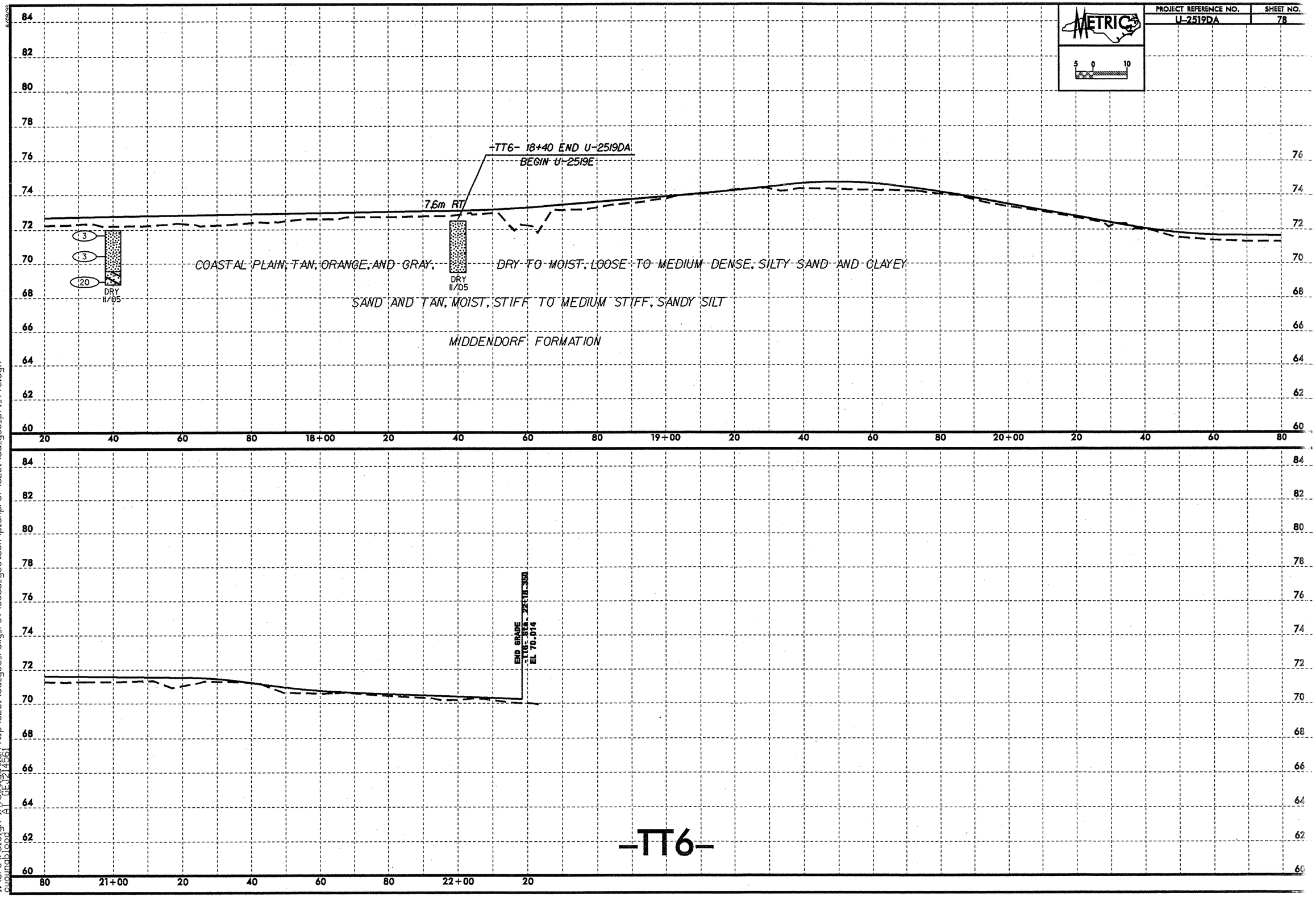
6/19/98



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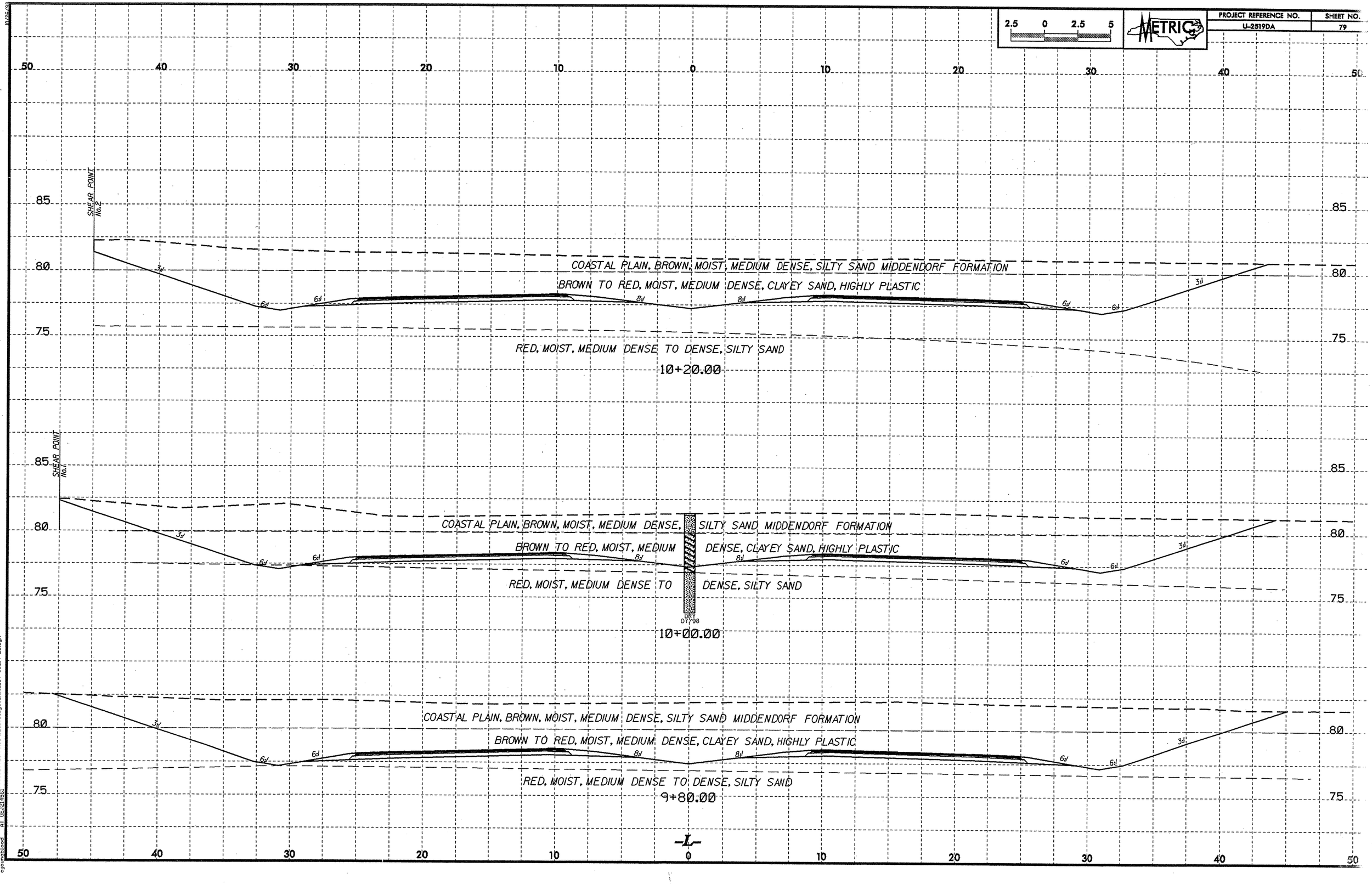
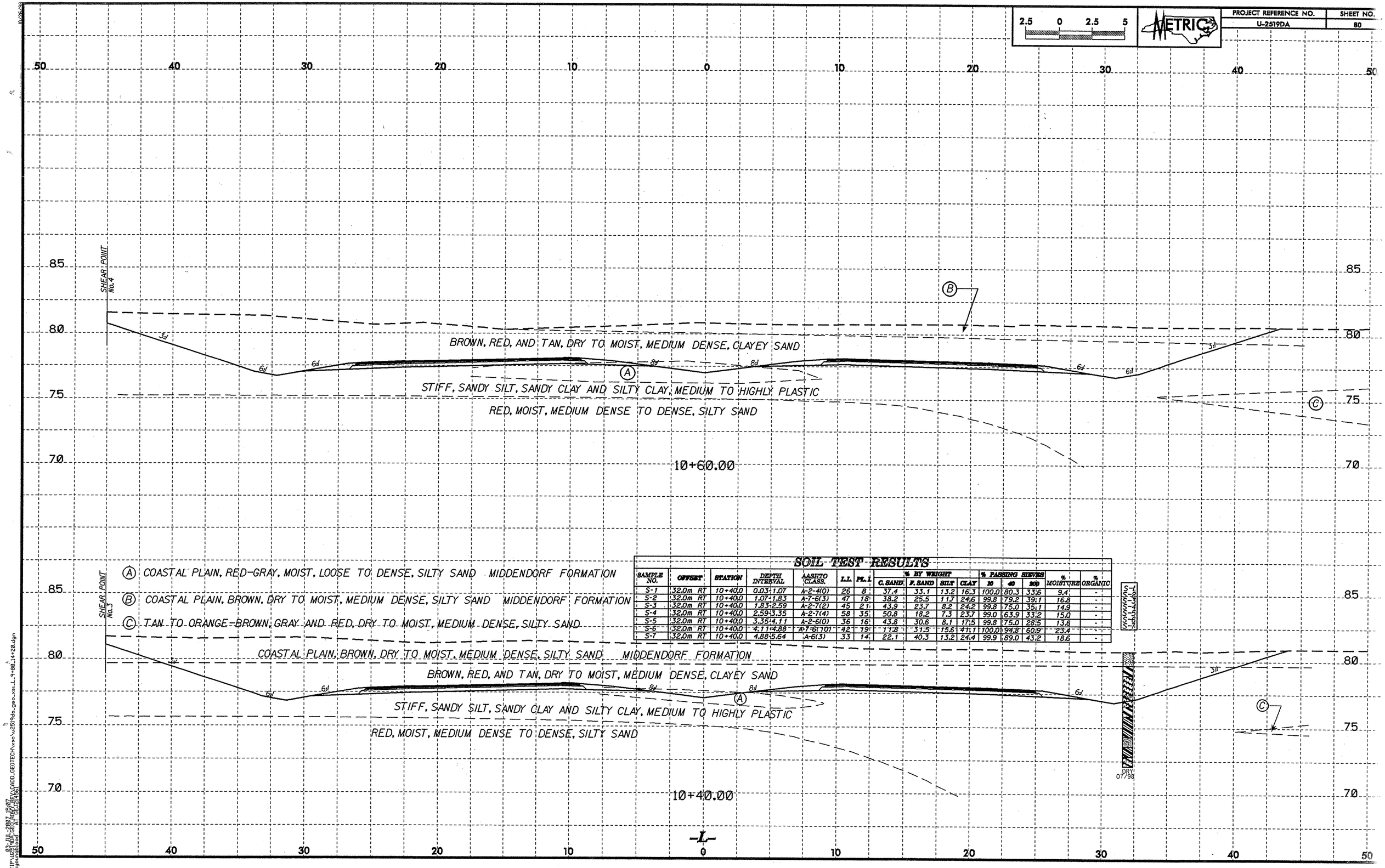

2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
79
50 40 30 20 10 0 10 20 30 40 50
85
80
75
SHEAR POINT No.2
COASTAL PLAIN, BROWN, MOIST, MEDIUM DENSE, SILTY SAND MIDDENDORF FORMATION
BROWN TO RED, MOIST, MEDIUM DENSE, CLAYEY SAND, HIGHLY PLASTIC
RED, MOIST, MEDIUM DENSE TO DENSE, SILTY SAND
10+20.00
SHEAR POINT No.1
COASTAL PLAIN, BROWN, MOIST, MEDIUM DENSE, SILTY SAND MIDDENDORF FORMATION
BROWN TO RED, MOIST, MEDIUM DENSE, CLAYEY SAND, HIGHLY PLASTIC
RED, MOIST, MEDIUM DENSE TO DENSE, SILTY SAND
DRY 07/98
10+00.00
COASTAL PLAIN, BROWN, MOIST, MEDIUM DENSE, SILTY SAND MIDDENDORF FORMATION
BROWN TO RED, MOIST, MEDIUM DENSE, CLAYEY SAND, HIGHLY PLASTIC
RED, MOIST, MEDIUM DENSE TO DENSE, SILTY SAND
9+80.00
-L-
3d
6d
8d

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	80

2.5 0 2.5 5

METRIC



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-1	32.0m RT	10+40.0	0.03-1.07	A-2-4(0)	26	8	37.4	33.1	13.2	16.3	100.0	80.3	33.6	9.4	-
S-2	32.0m RT	10+40.0	1.07-1.83	A-7-6(3)	47	18	38.2	25.5	11.7	24.6	99.8	79.2	39.1	16.8	-
S-3	32.0m RT	10+40.0	1.83-2.59	A-2-7(2)	45	21	43.9	23.7	8.2	24.2	99.8	75.0	35.1	14.9	-
S-4	32.0m RT	10+40.0	2.59-3.35	A-2-7(4)	58	35	50.8	18.2	7.3	23.7	99.0	63.9	33.2	15.0	-
S-5	32.0m RT	10+40.0	3.35-4.11	A-2-6(0)	36	16	43.8	30.6	8.1	17.5	99.8	75.0	28.5	13.8	-
S-6	32.0m RT	10+40.0	4.11-4.88	A-7-6(10)	42	19	11.8	31.5	15.6	41.1	100.0	94.8	60.9	23.4	-
S-7	32.0m RT	10+40.0	4.88-5.64	A-6(3)	33	14	22.1	40.3	13.2	24.4	99.9	89.0	43.2	18.6	-

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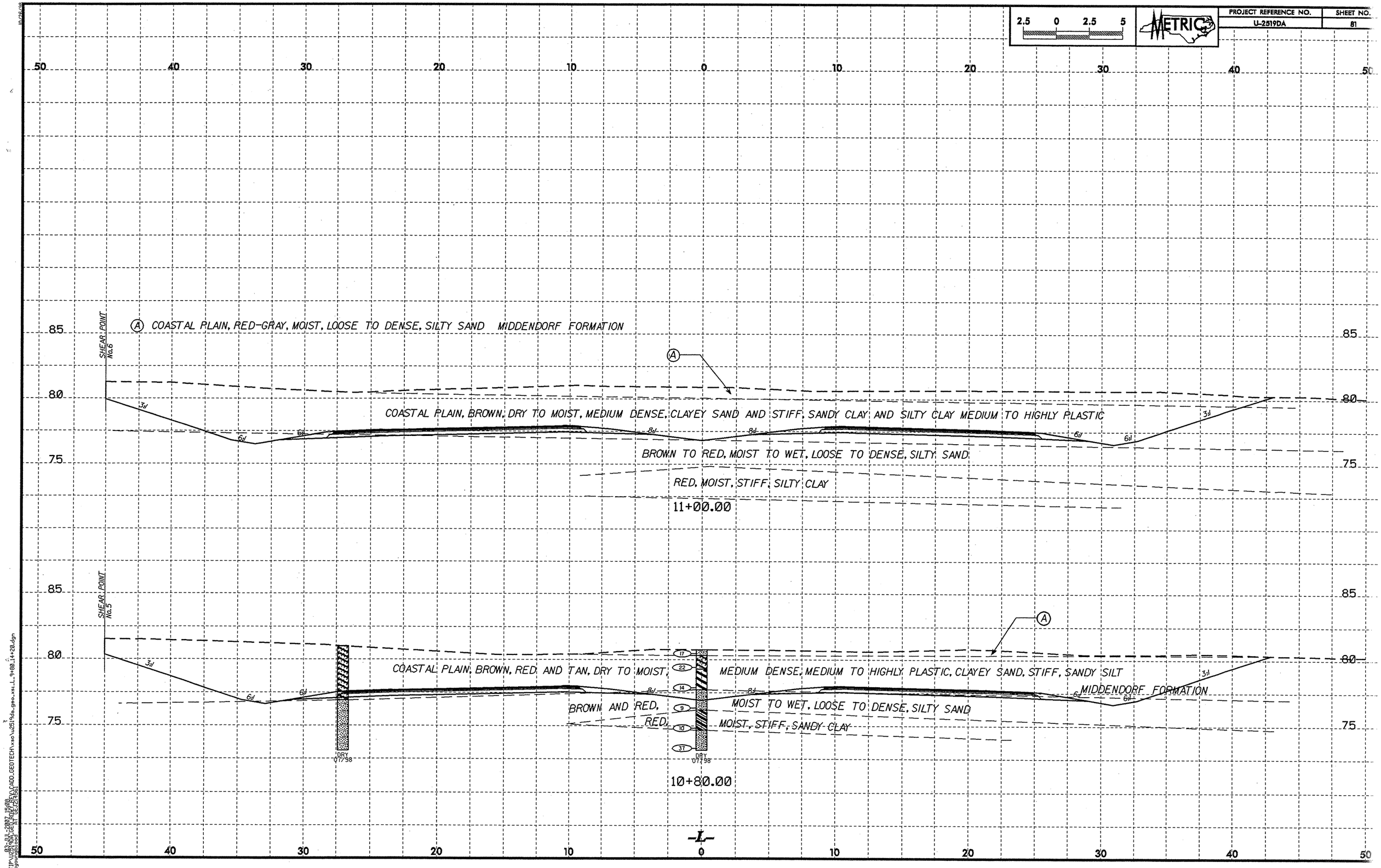
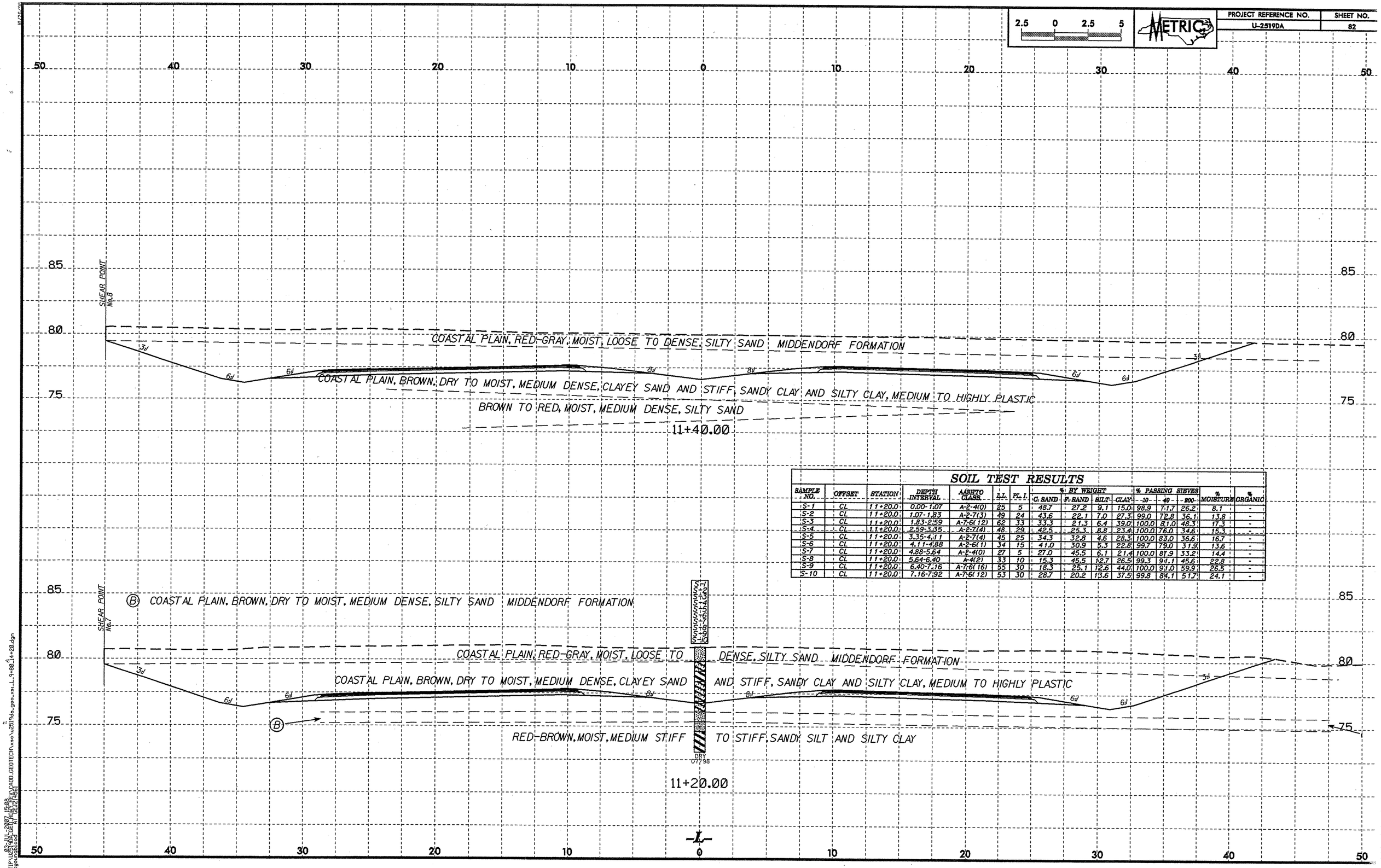


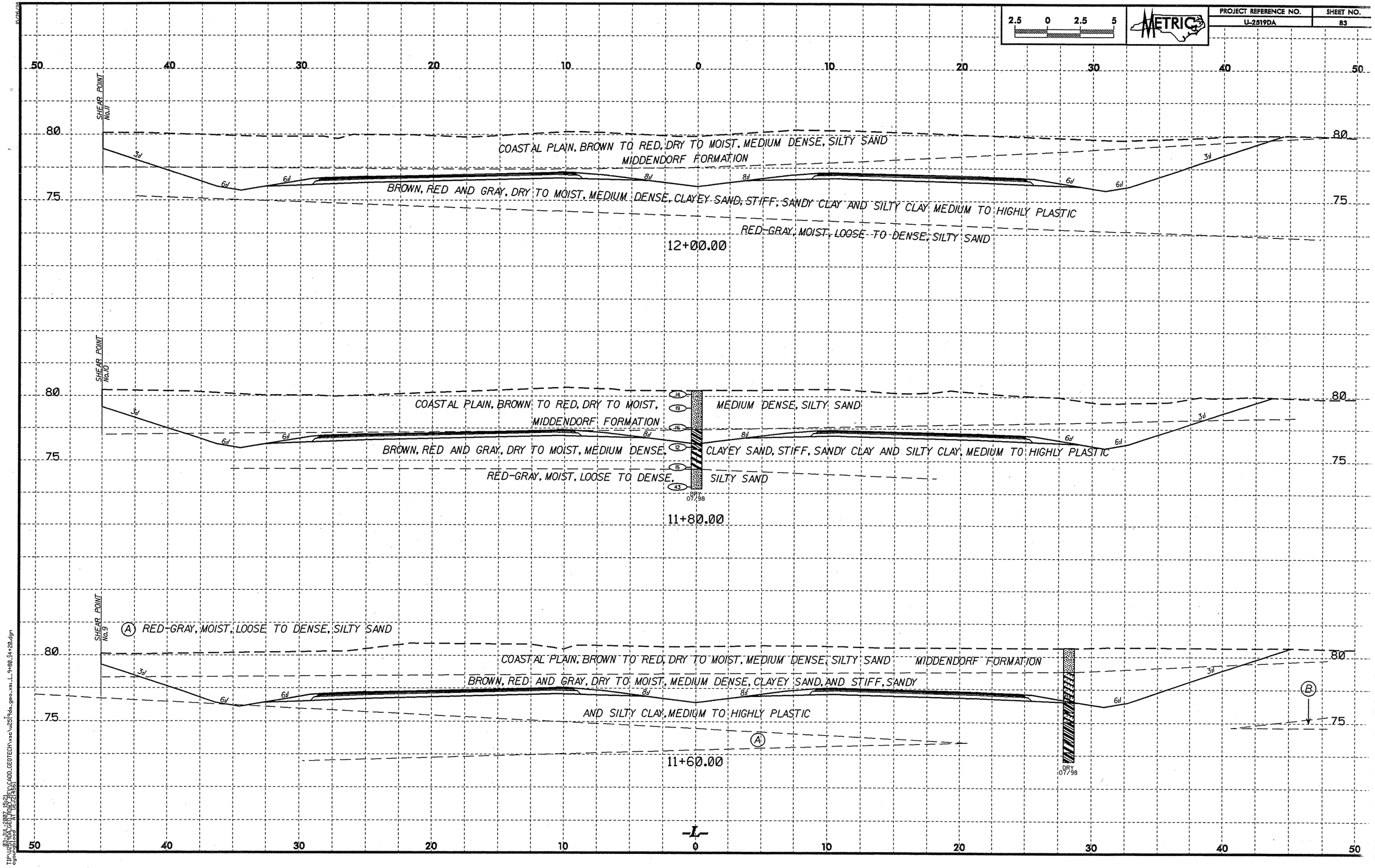
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
81
50 40 30 20 10 0 10 20 30 40 50
85
80
75
SHEAR POINT No.6
Ⓐ COASTAL PLAIN, RED-GRAY, MOIST, LOOSE TO DENSE, SILTY SAND MIDDENDORF FORMATION
COASTAL PLAIN, BROWN, DRY TO MOIST, MEDIUM DENSE, CLAYEY SAND AND STIFF, SANDY CLAY AND SILTY CLAY MEDIUM TO HIGHLY PLASTIC
BROWN TO RED, MOIST TO WET, LOOSE TO DENSE, SILTY SAND
RED, MOIST, STIFF, SILTY CLAY
11+00.00
SHEAR POINT No.5
COASTAL PLAIN, BROWN, RED AND TAN, DRY TO MOIST, MEDIUM DENSE, MEDIUM TO HIGHLY PLASTIC, CLAYEY SAND, STIFF, SANDY SILT
MIDDENDORF FORMATION
BROWN AND RED, MOIST TO WET, LOOSE TO DENSE, SILTY SAND
RED, MOIST, STIFF, SANDY CLAY
DRY 07/98
10+80.00
-L-

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	82

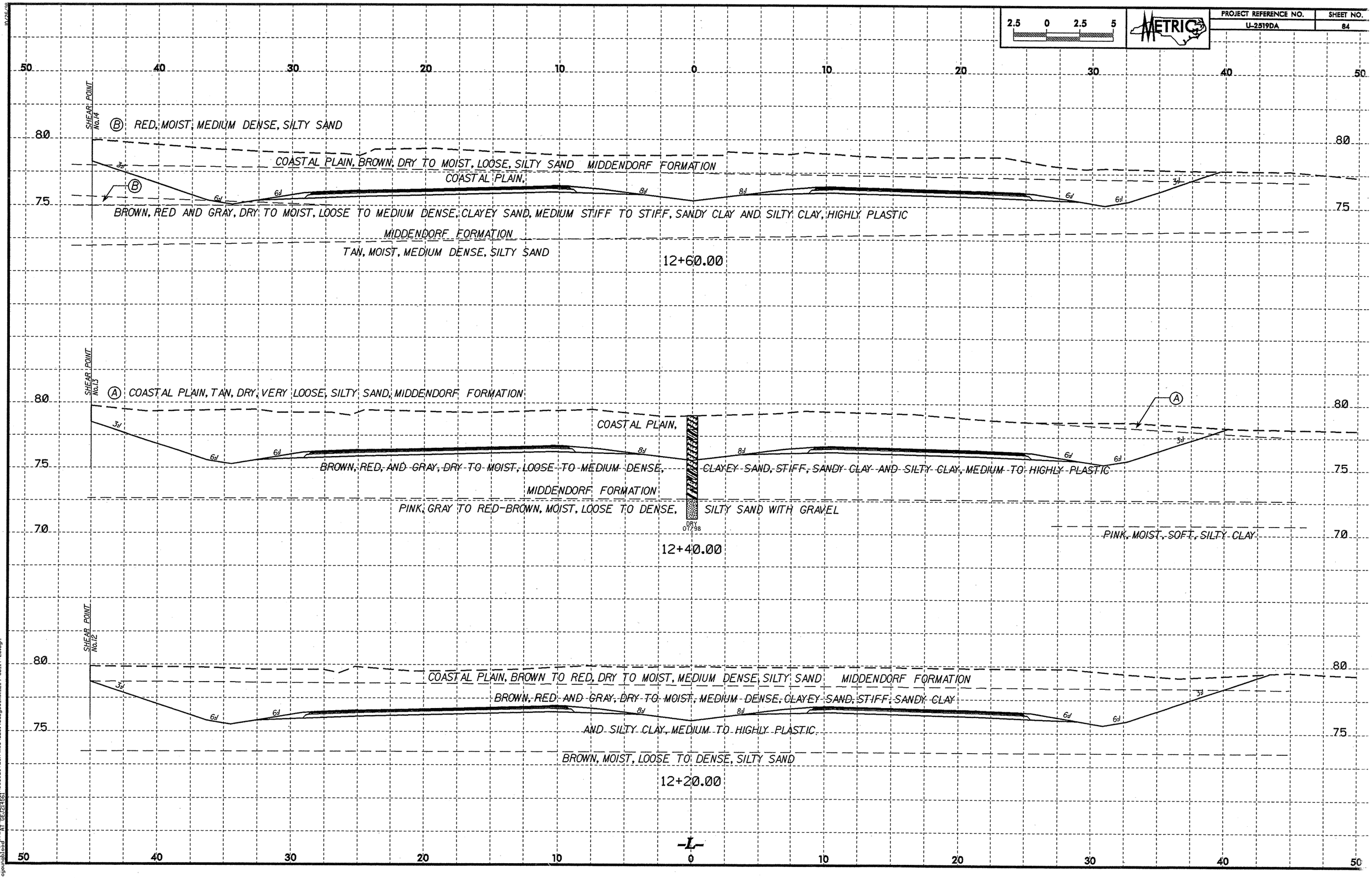


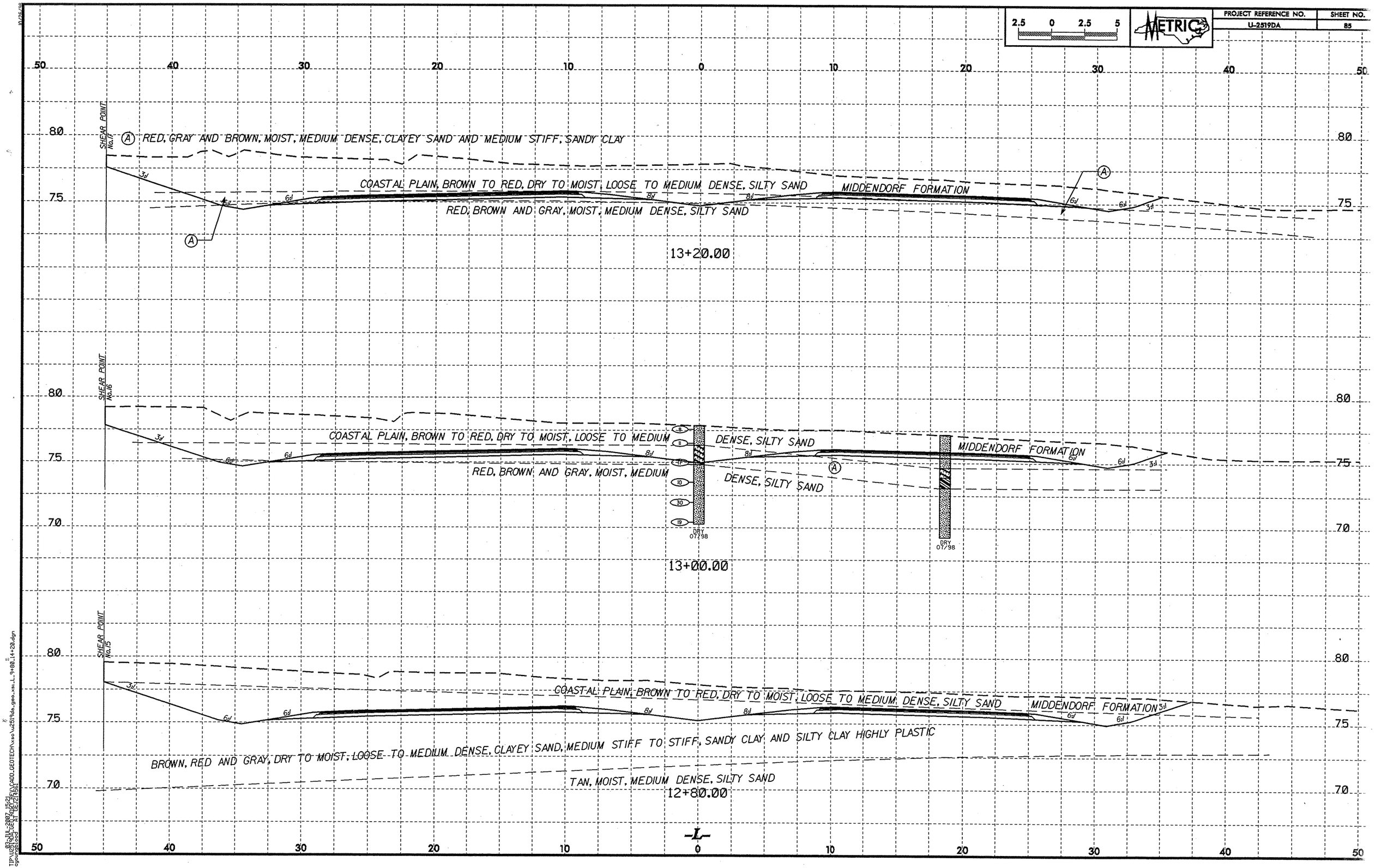
SOIL TEST RESULTS

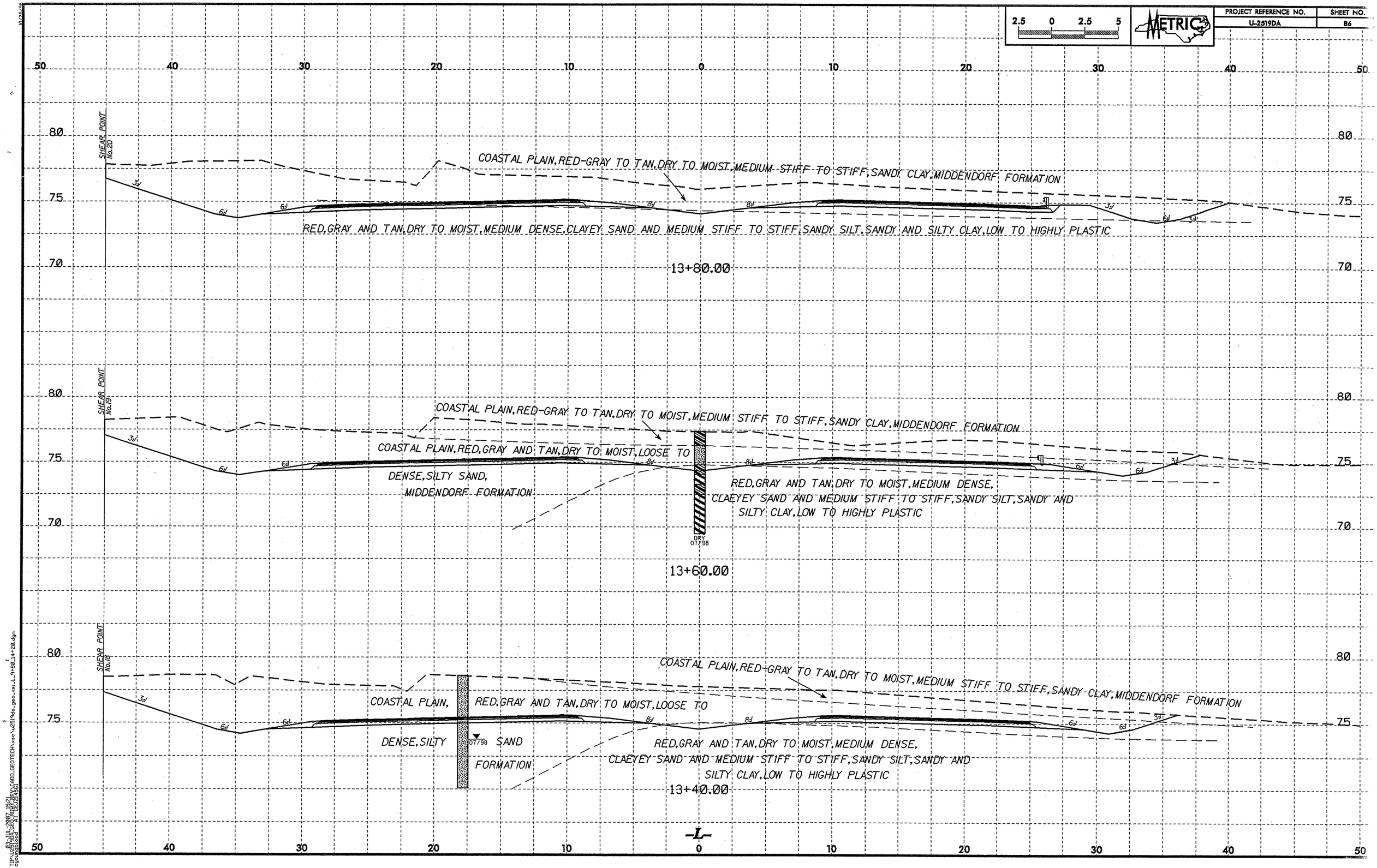
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING SIEVES -10-	% PASSING SIEVES -40-	% PASSING SIEVES -200-	% MOISTURE	% ORGANIC
S-1	CL	11+20.0	0.00-1.07	A-2-4(0)	25	5	48.7	27.2	9.1	15.0	98.9	71.7	26.2	8.1	-
S-2	CL	11+20.0	1.07-1.83	A-2-7(3)	49	24	43.6	22.1	7.0	27.3	99.0	72.8	36.1	13.8	-
S-3	CL	11+20.0	1.83-2.59	A-7-6(12)	62	33	33.3	21.3	6.4	39.0	100.0	81.0	48.3	17.3	-
S-4	CL	11+20.0	2.59-3.35	A-2-7(4)	48	29	42.5	25.3	8.8	23.4	100.0	76.0	34.6	15.3	-
S-5	CL	11+20.0	3.35-4.11	A-2-7(4)	45	25	34.3	32.8	4.6	28.3	100.0	83.0	36.6	16.7	-
S-6	CL	11+20.0	4.11-4.88	A-2-6(1)	34	15	41.0	30.9	5.3	22.8	99.7	79.0	31.9	13.6	-
S-7	CL	11+20.0	4.88-5.64	A-2-4(0)	27	5	27.0	45.5	6.1	21.4	100.0	87.9	33.2	14.4	-
S-8	CL	11+20.0	5.64-6.40	A-4(2)	33	10	15.3	45.5	12.7	26.5	99.3	91.1	45.6	22.8	-
S-9	CL	11+20.0	6.40-7.16	A-7-6(16)	55	30	18.3	25.1	12.6	44.0	100.0	91.0	59.9	26.5	-
S-10	CL	11+20.0	7.16-7.92	A-7-6(12)	53	30	28.7	20.2	13.6	37.5	99.8	84.1	51.7	24.1	-

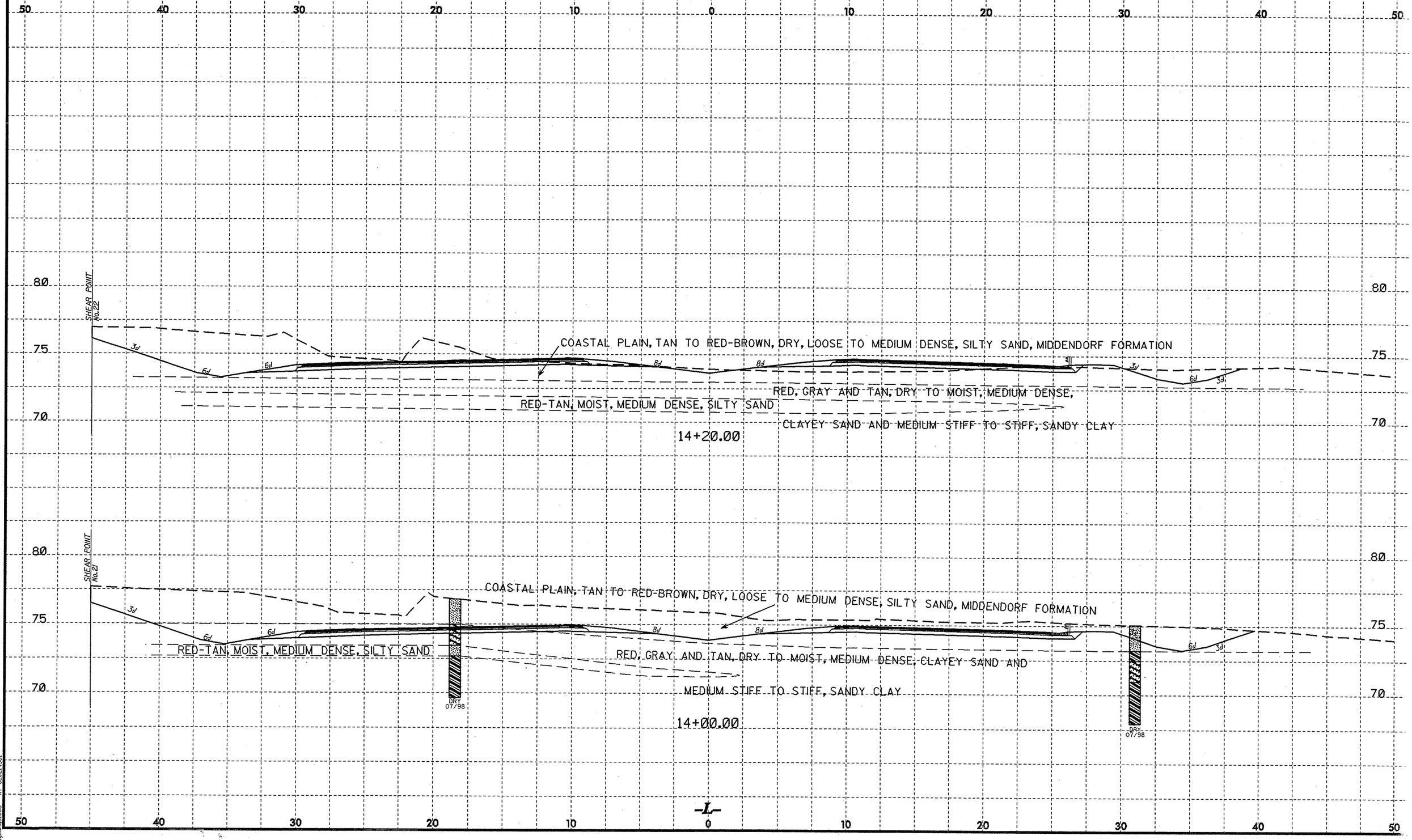


PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
83
METRIC
2.5 0 2.5 5
SHEAR POINT No.11
COASTAL PLAIN, BROWN TO RED, DRY TO MOIST, MEDIUM DENSE, SILTY SAND
MIDDENDORF FORMATION
BROWN, RED AND GRAY, DRY TO MOIST, MEDIUM DENSE, CLAYEY SAND, STIFF, SANDY CLAY AND SILTY CLAY MEDIUM TO HIGHLY PLASTIC
RED-GRAY, MOIST, LOOSE TO DENSE, SILTY SAND
12+00.00
SHEAR POINT No.10
COASTAL PLAIN, BROWN TO RED, DRY TO MOIST, MEDIUM DENSE, SILTY SAND
MIDDENDORF FORMATION
BROWN, RED AND GRAY, DRY TO MOIST, MEDIUM DENSE, CLAYEY SAND, STIFF, SANDY CLAY AND SILTY CLAY, MEDIUM TO HIGHLY PLASTIC
RED-GRAY, MOIST, LOOSE TO DENSE, SILTY SAND
DRY 07/98
11+80.00
SHEAR POINT No.9
A RED-GRAY, MOIST, LOOSE TO DENSE, SILTY SAND
COASTAL PLAIN, BROWN TO RED, DRY TO MOIST, MEDIUM DENSE, SILTY SAND
MIDDENDORF FORMATION
BROWN, RED AND GRAY, DRY TO MOIST, MEDIUM DENSE, CLAYEY SAND, AND STIFF, SANDY
AND SILTY CLAY, MEDIUM TO HIGHLY PLASTIC
B
A
11+60.00
DRY 07/98
-L-


2.5 0 2.5 5
METRIC
50 40 30 20 10 0 10 20 30 40 50
80
75
70
SHEAR POINT No.14
(B) RED, MOIST, MEDIUM DENSE, SILTY SAND
COASTAL PLAIN, BROWN, DRY TO MOIST, LOOSE, SILTY SAND MIDDENDORF FORMATION
COASTAL PLAIN,
BROWN, RED AND GRAY, DRY TO MOIST, LOOSE TO MEDIUM DENSE, CLAYEY SAND, MEDIUM STIFF TO STIFF, SANDY CLAY AND SILTY CLAY, HIGHLY PLASTIC
MIDDENDORF FORMATION
TAN, MOIST, MEDIUM DENSE, SILTY SAND
12+60.00
SHEAR POINT No.13
(A) COASTAL PLAIN, TAN, DRY, VERY LOOSE, SILTY SAND, MIDDENDORF FORMATION
COASTAL PLAIN,
BROWN, RED, AND GRAY, DRY TO MOIST, LOOSE TO MEDIUM DENSE, CLAYEY SAND, STIFF, SANDY CLAY AND SILTY CLAY, MEDIUM TO HIGHLY PLASTIC
MIDDENDORF FORMATION
PINK, GRAY TO RED-BROWN, MOIST, LOOSE TO DENSE, SILTY SAND WITH GRAVEL
DRY 07/98
PINK, MOIST, SOFT, SILTY CLAY
12+40.00
SHEAR POINT No.12
COASTAL PLAIN, BROWN TO RED, DRY TO MOIST, MEDIUM DENSE, SILTY SAND MIDDENDORF FORMATION
BROWN, RED AND GRAY, DRY TO MOIST, MEDIUM DENSE, CLAYEY SAND, STIFF, SANDY CLAY
AND SILTY CLAY, MEDIUM TO HIGHLY PLASTIC
BROWN, MOIST, LOOSE TO DENSE, SILTY SAND
12+20.00
-L-


2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
85
SHEAR POINT No.17
RED, GRAY AND BROWN, MOIST, MEDIUM DENSE, CLAYEY SAND AND MEDIUM STIFF, SANDY CLAY
COASTAL PLAIN, BROWN TO RED, DRY TO MOIST, LOOSE TO MEDIUM DENSE, SILTY SAND
MIDDENDORF FORMATION
RED, BROWN AND GRAY, MOIST, MEDIUM DENSE, SILTY SAND
13+20.00
SHEAR POINT No.16
COASTAL PLAIN, BROWN TO RED, DRY TO MOIST, LOOSE TO MEDIUM DENSE, SILTY SAND
MIDDENDORF FORMATION
RED, BROWN AND GRAY, MOIST, MEDIUM DENSE, SILTY SAND
DRY 07/98
13+00.00
SHEAR POINT No.15
COASTAL PLAIN, BROWN TO RED, DRY TO MOIST, LOOSE TO MEDIUM DENSE, SILTY SAND
MIDDENDORF FORMATION
BROWN, RED AND GRAY, DRY TO MOIST, LOOSE TO MEDIUM DENSE, CLAYEY SAND, MEDIUM STIFF TO STIFF, SANDY CLAY AND SILTY CLAY HIGHLY PLASTIC
TAN, MOIST, MEDIUM DENSE, SILTY SAND
12+80.00
-L-


2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
86
50 40 30 20 10 0 10 20 30 40 50
80
75
70
SHEAR POINT No.20
COASTAL PLAIN, RED-GRAY TO TAN, DRY TO MOIST, MEDIUM STIFF TO STIFF, SANDY CLAY, MIDDENDORF FORMATION
RED, GRAY AND TAN, DRY TO MOIST, MEDIUM DENSE, CLAYEY SAND AND MEDIUM STIFF TO STIFF, SANDY SILT, SANDY AND SILTY CLAY, LOW TO HIGHLY PLASTIC
13+80.00
SHEAR POINT No.19
COASTAL PLAIN, RED-GRAY TO TAN, DRY TO MOIST, MEDIUM STIFF TO STIFF, SANDY CLAY, MIDDENDORF FORMATION
COASTAL PLAIN, RED, GRAY AND TAN, DRY TO MOIST, LOOSE TO DENSE, SILTY SAND, MIDDENDORF FORMATION
RED, GRAY AND TAN, DRY TO MOIST, MEDIUM DENSE, CLAEYEY SAND AND MEDIUM STIFF TO STIFF, SANDY SILT, SANDY AND SILTY CLAY, LOW TO HIGHLY PLASTIC
DRY 07/98
13+60.00
SHEAR POINT No.18
COASTAL PLAIN, RED-GRAY TO TAN, DRY TO MOIST, MEDIUM STIFF TO STIFF, SANDY CLAY, MIDDENDORF FORMATION
COASTAL PLAIN, DENSE, SILTY
RED, GRAY AND TAN, DRY TO MOIST, LOOSE TO
07/98
SAND FORMATION
RED, GRAY AND TAN, DRY TO MOIST, MEDIUM DENSE, CLAEYEY SAND AND MEDIUM STIFF TO STIFF, SANDY SILT, SANDY AND SILTY CLAY, LOW TO HIGHLY PLASTIC
13+40.00
-L-

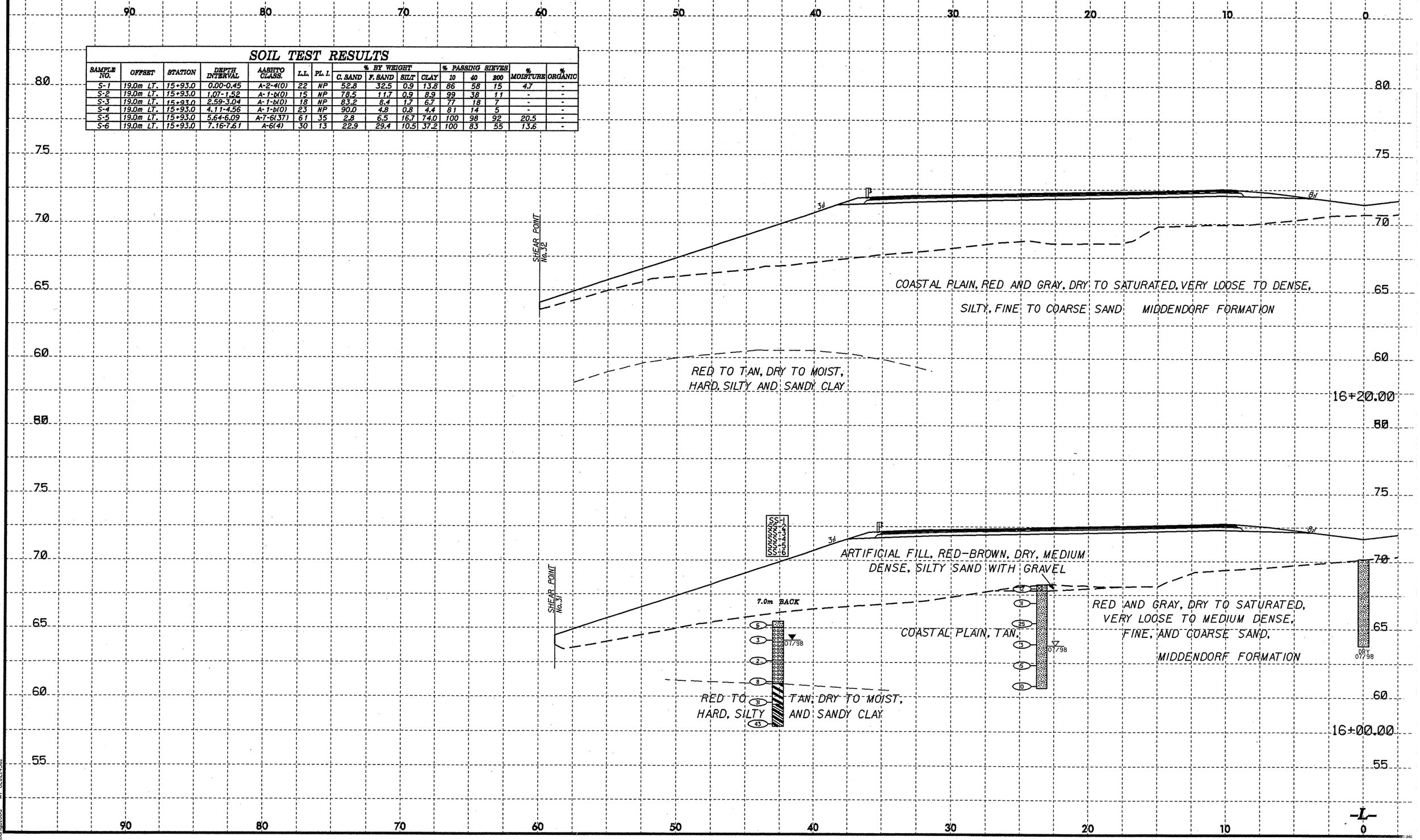


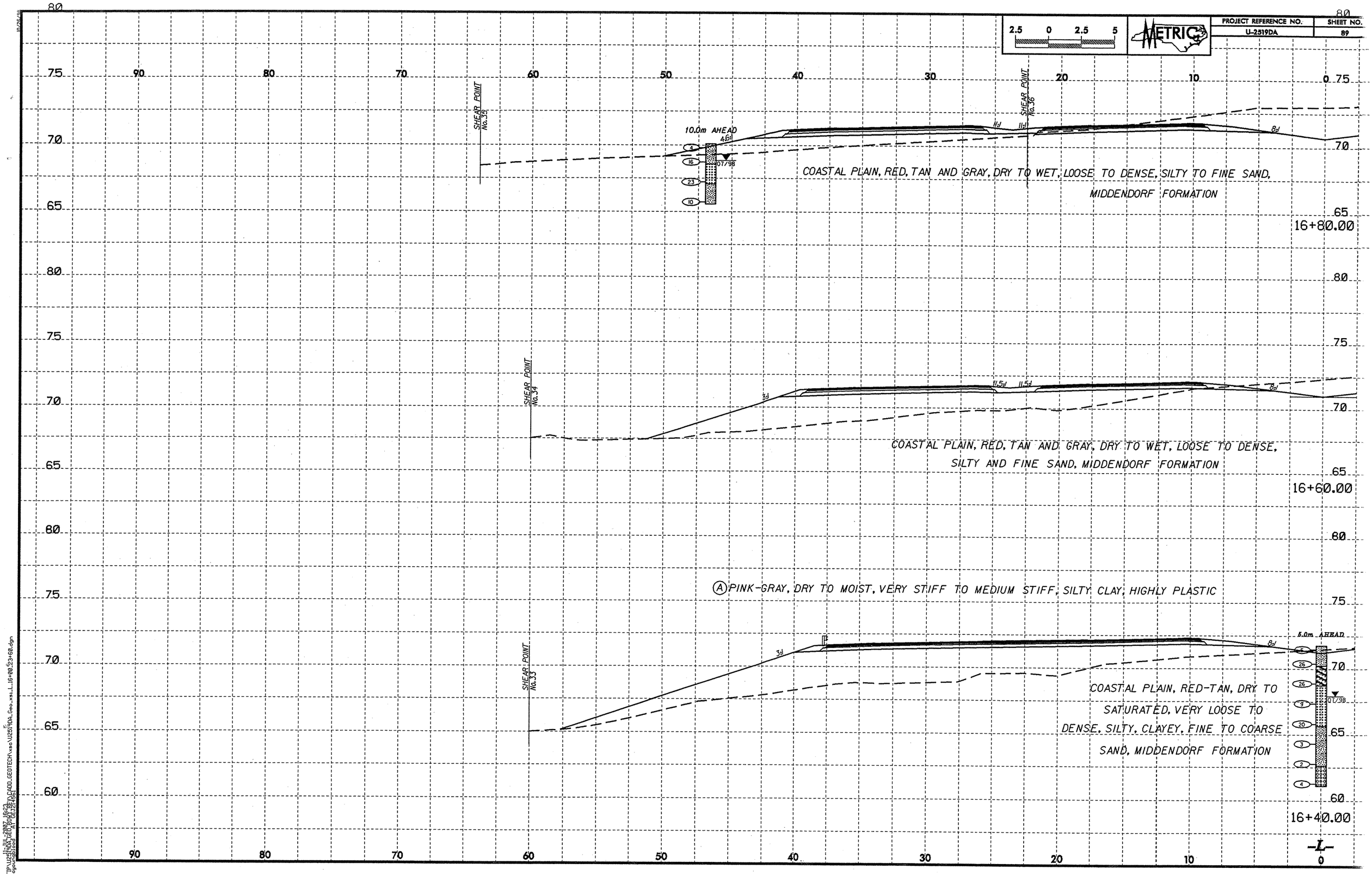
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
87
50 40 30 20 10 0 10 20 30 40 50
80
75
70
SHEAR POINT No.22
COASTAL PLAIN, TAN TO RED-BROWN, DRY, LOOSE TO MEDIUM DENSE, SILTY SAND, MIDDENDORF FORMATION
RED, GRAY AND TAN, DRY TO MOIST, MEDIUM DENSE,
RED-TAN, MOIST, MEDIUM DENSE, SILTY SAND
CLAYEY SAND AND MEDIUM STIFF TO STIFF, SANDY CLAY
14+20.00
SHEAR POINT No.21
COASTAL PLAIN, TAN TO RED-BROWN, DRY, LOOSE TO MEDIUM DENSE, SILTY SAND, MIDDENDORF FORMATION
RED-TAN, MOIST, MEDIUM DENSE, SILTY SAND
RED, GRAY AND TAN, DRY TO MOIST, MEDIUM DENSE, CLAYEY SAND AND
MEDIUM STIFF TO STIFF, SANDY CLAY
DRY 07/98
DRY 07/98
14+00.00
-L-

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	88

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-1	19.0m LT.	15+93.0	0.00-0.45	A-2-4(0)	22	NP	52.8	32.5	0.9	13.8	86	58	15	4.7	-
S-2	19.0m LT.	15+93.0	1.07-1.52	A-1-b(0)	15	NP	78.5	11.7	0.9	8.9	99	38	11	-	-
S-3	19.0m LT.	15+93.0	2.59-3.04	A-1-b(0)	18	NP	83.2	8.4	1.7	6.7	77	18	7	-	-
S-4	19.0m LT.	15+93.0	4.11-4.56	A-1-b(0)	23	NP	90.0	4.8	0.8	4.4	81	14	5	-	-
S-5	19.0m LT.	15+93.0	5.64-6.09	A-7-6(37)	61	35	2.8	6.5	16.7	74.0	100	98	92	20.5	-
S-6	19.0m LT.	15+93.0	7.16-7.61	A-6(4)	30	13	22.9	29.4	10.5	37.2	100	83	55	13.6	-

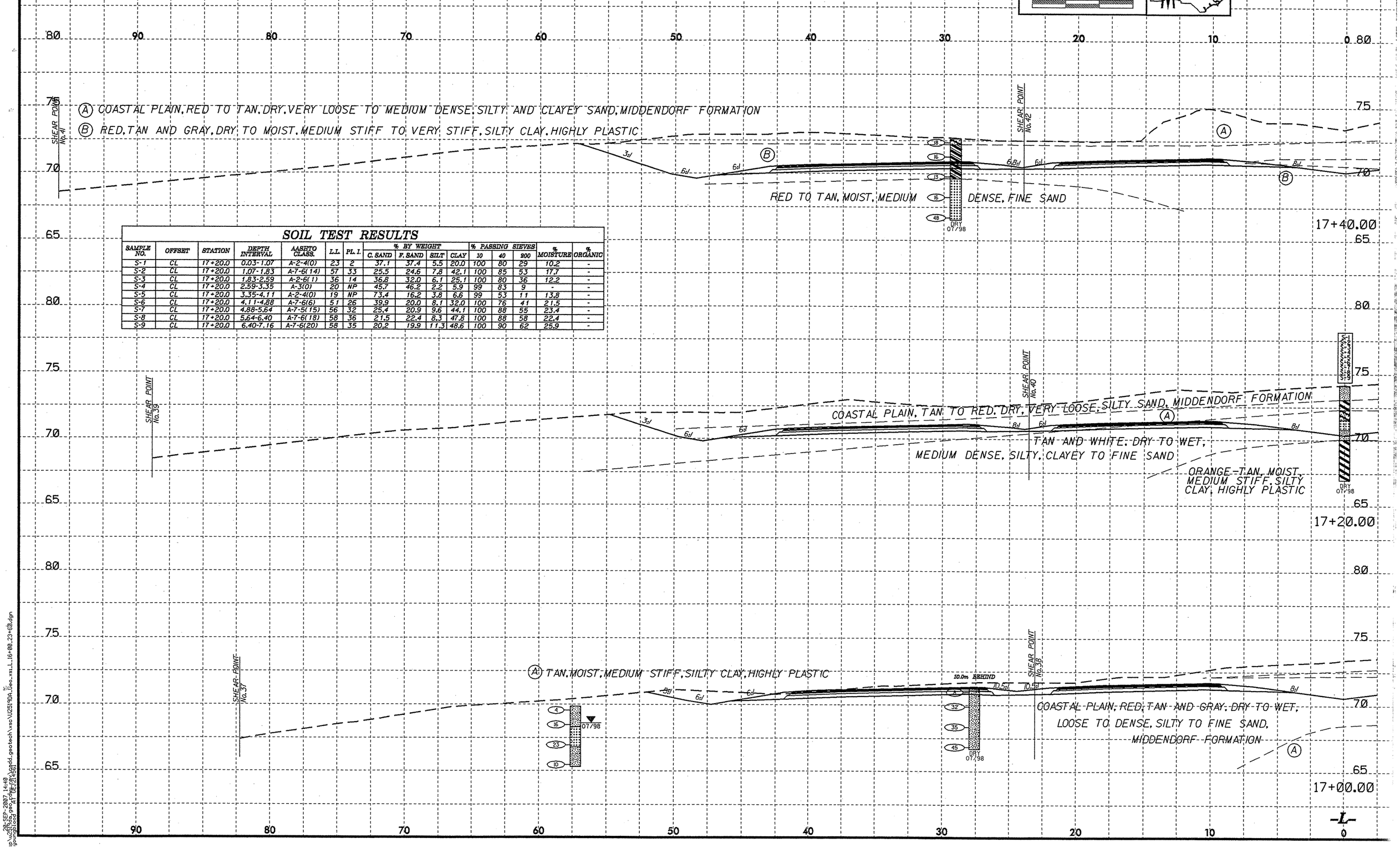




PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
89
METRIC
2.5 0 2.5 5
SHEAR POINT No.35
SHEAR POINT No.36
10.0m AHEAD
4.6:1
11:1
11:1
8:1
4
16
23
10
07/98
COASTAL PLAIN, RED, TAN AND GRAY, DRY TO WET, LOOSE TO DENSE, SILTY TO FINE SAND, MIDDENDORF FORMATION
16+80.00
SHEAR POINT No.34
3:1
11.5:1
11.5:1
8:1
COASTAL PLAIN, RED, TAN AND GRAY, DRY TO WET, LOOSE TO DENSE, SILTY AND FINE SAND, MIDDENDORF FORMATION
16+60.00
Ⓐ PINK-GRAY, DRY TO MOIST, VERY STIFF TO MEDIUM STIFF, SILTY CLAY, HIGHLY PLASTIC
SHEAR POINT No.33
3:1
8:1
5.0m AHEAD
6
26
26
9
20
3
2
4
07/98
COASTAL PLAIN, RED-TAN, DRY TO SATURATED, VERY LOOSE TO DENSE, SILTY, CLAYEY, FINE TO COARSE SAND, MIDDENDORF FORMATION
16+40.00
-L-
90 80 70 60 50 40 30 20 10 0
80 75 70 65 60

2.5 0 2.5 5

METRIC



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-1	CL	17+20.0	0.03-1.07	A-2-4(0)	23	2	37.1	37.4	5.5	20.0	100	80	29	10.2	-
S-2	CL	17+20.0	1.07-1.83	A-7-6(14)	57	33	25.5	24.6	7.8	42.1	100	85	53	17.7	-
S-3	CL	17+20.0	1.83-2.59	A-2-6(1)	36	14	36.8	32.0	6.1	25.1	100	80	36	12.2	-
S-4	CL	17+20.0	2.59-3.35	A-3(0)	20	NP	45.7	46.2	2.2	5.9	99	83	9	-	-
S-5	CL	17+20.0	3.35-4.11	A-2-4(0)	19	NP	73.4	16.2	3.8	6.6	99	53	11	13.8	-
S-6	CL	17+20.0	4.11-4.88	A-7-6(6)	51	26	39.9	20.0	8.1	32.0	100	76	41	21.5	-
S-7	CL	17+20.0	4.88-5.64	A-7-5(15)	56	32	25.4	20.9	9.6	44.1	100	88	55	23.4	-
S-8	CL	17+20.0	5.64-6.40	A-7-6(18)	58	36	21.5	22.4	8.3	47.8	100	88	58	22.4	-
S-9	CL	17+20.0	6.40-7.16	A-7-6(20)	58	35	20.2	19.9	11.3	48.6	100	90	62	25.9	-

20-SEP-2007 14:49
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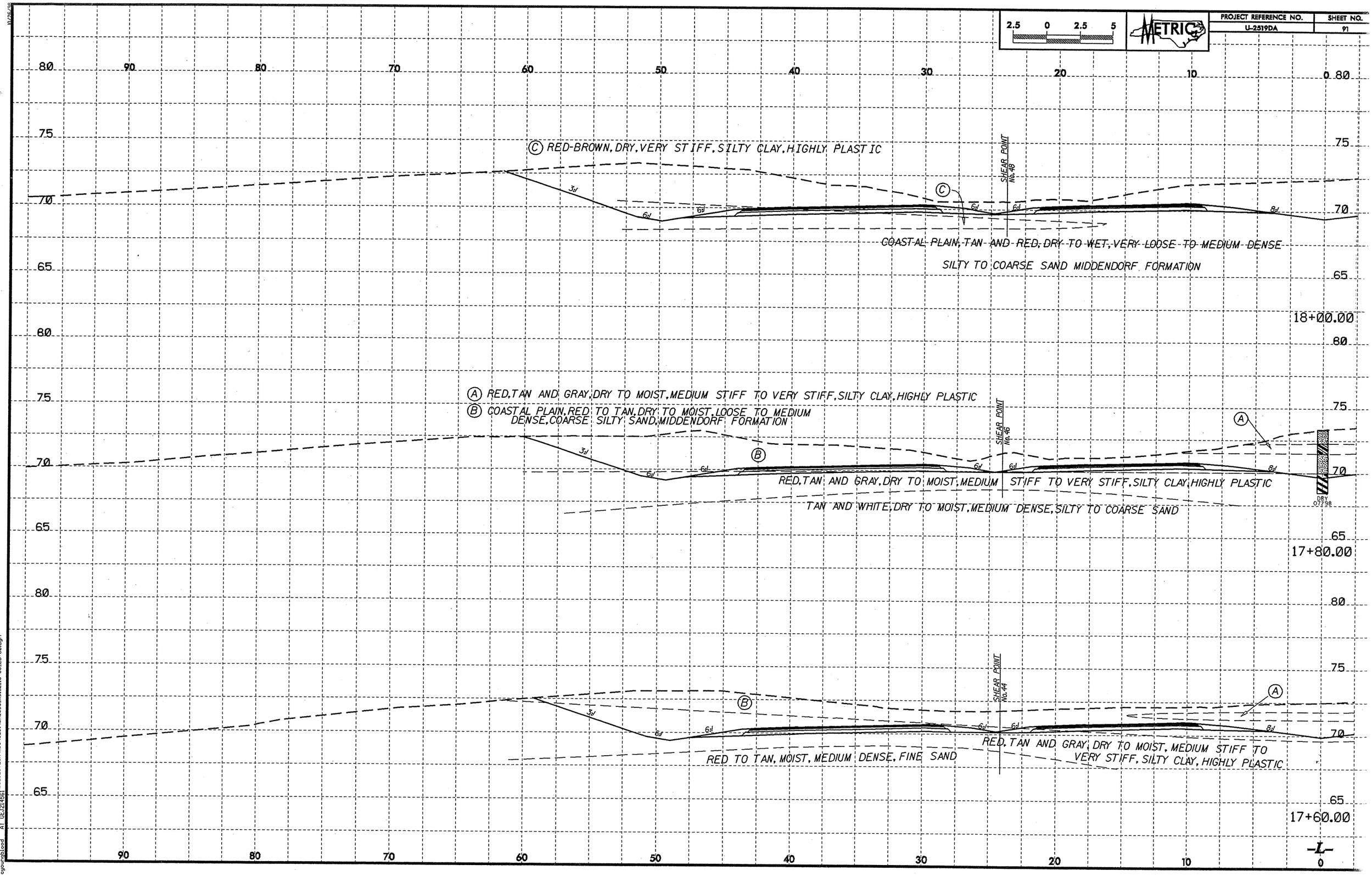
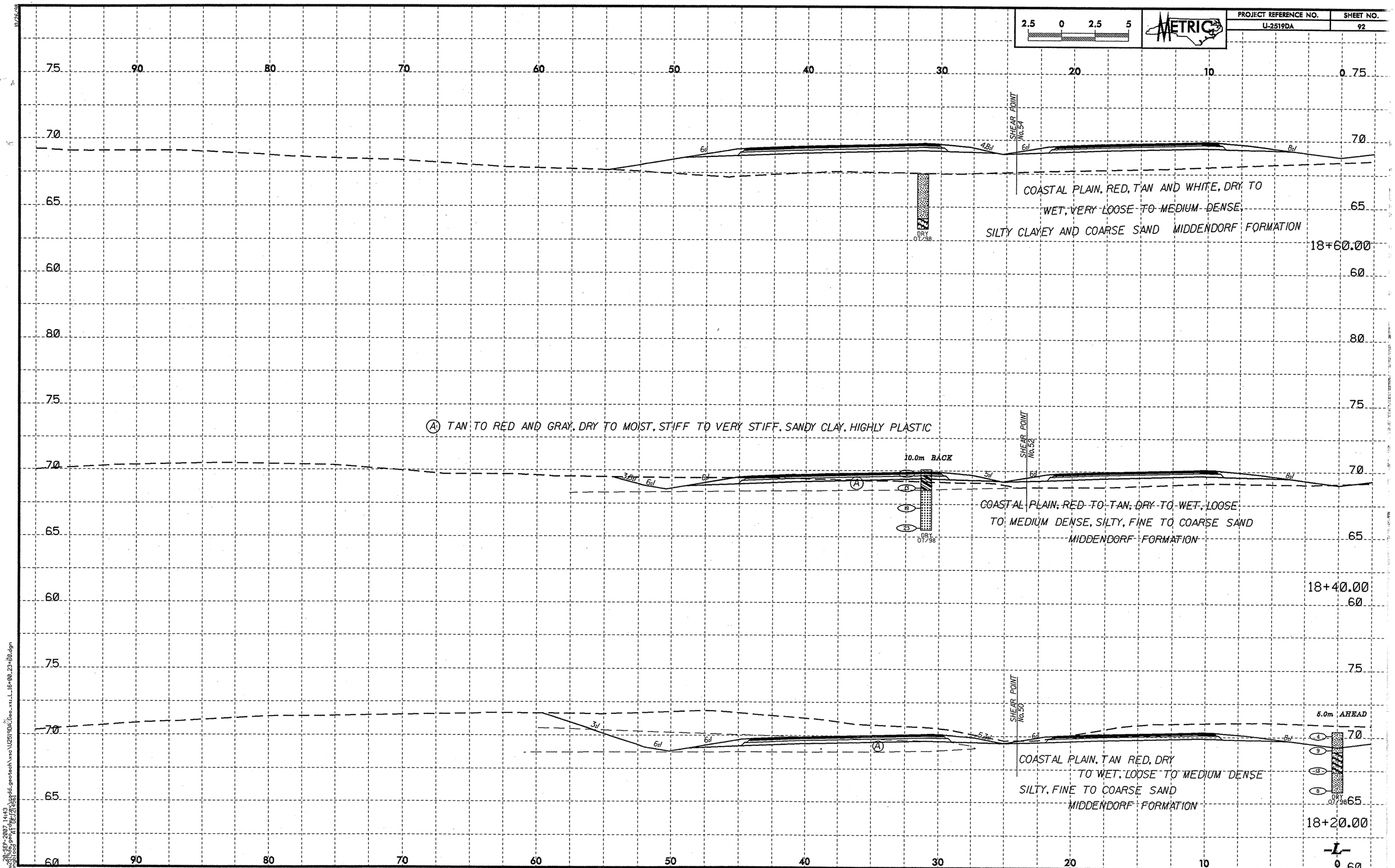
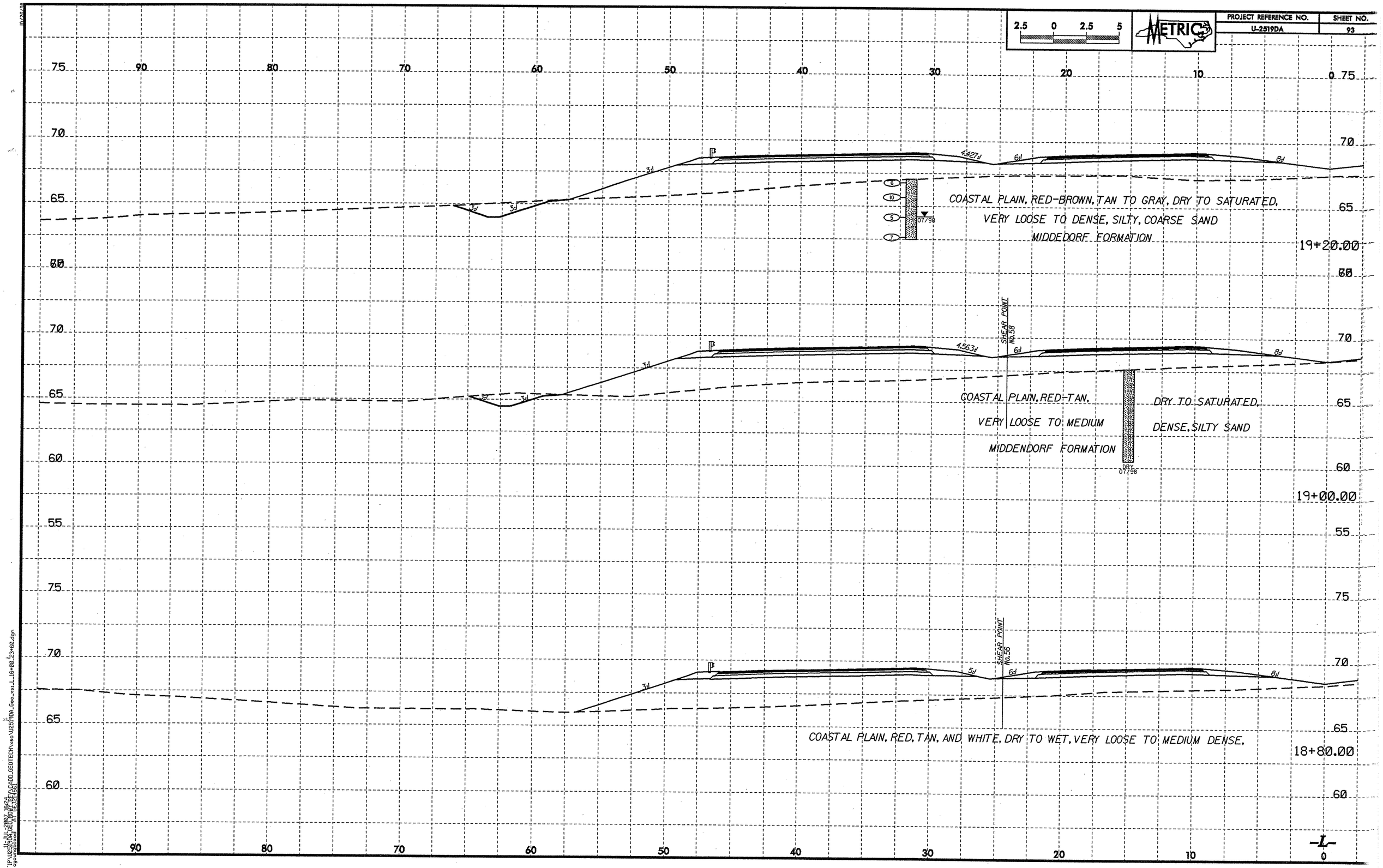
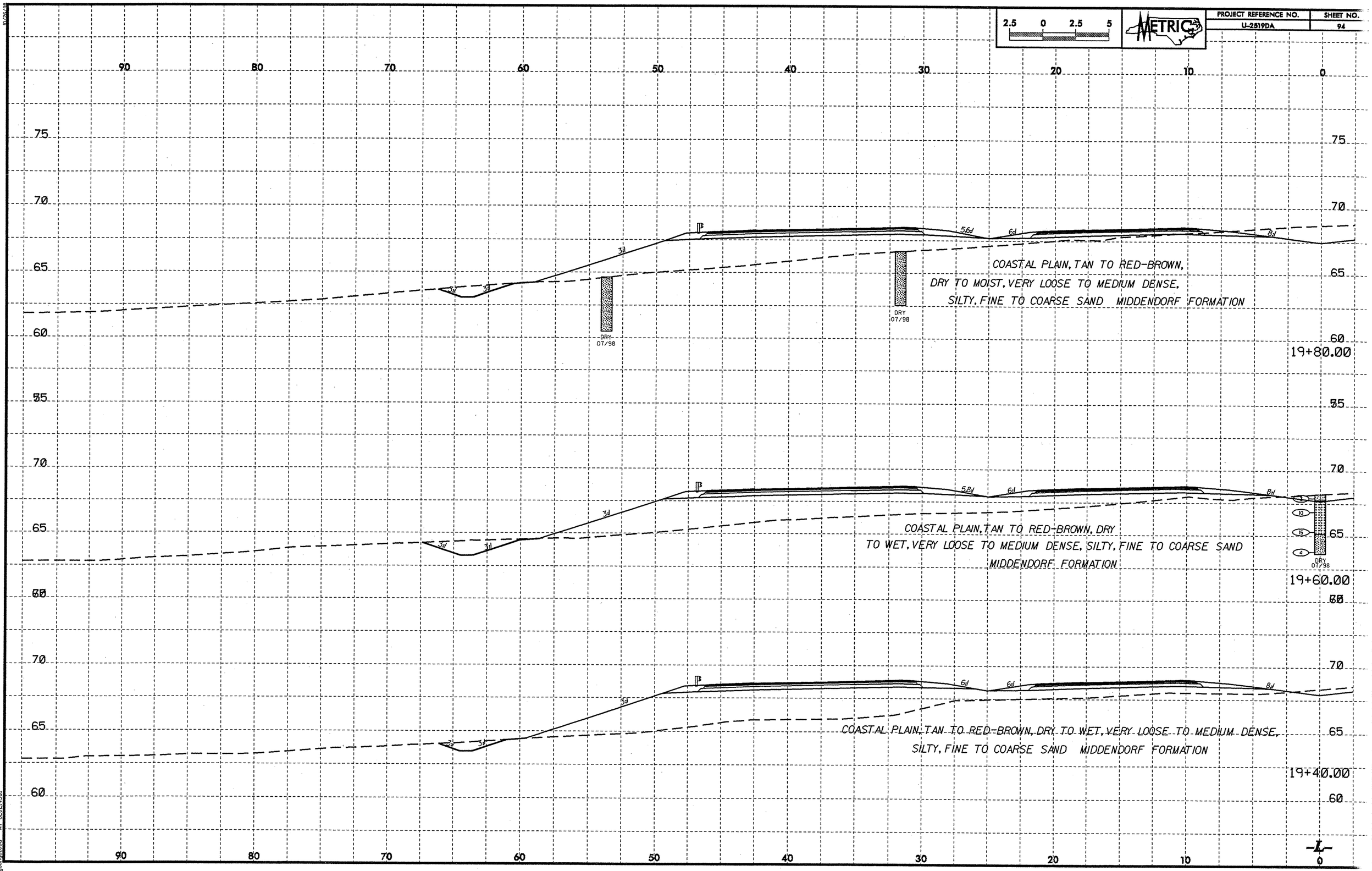
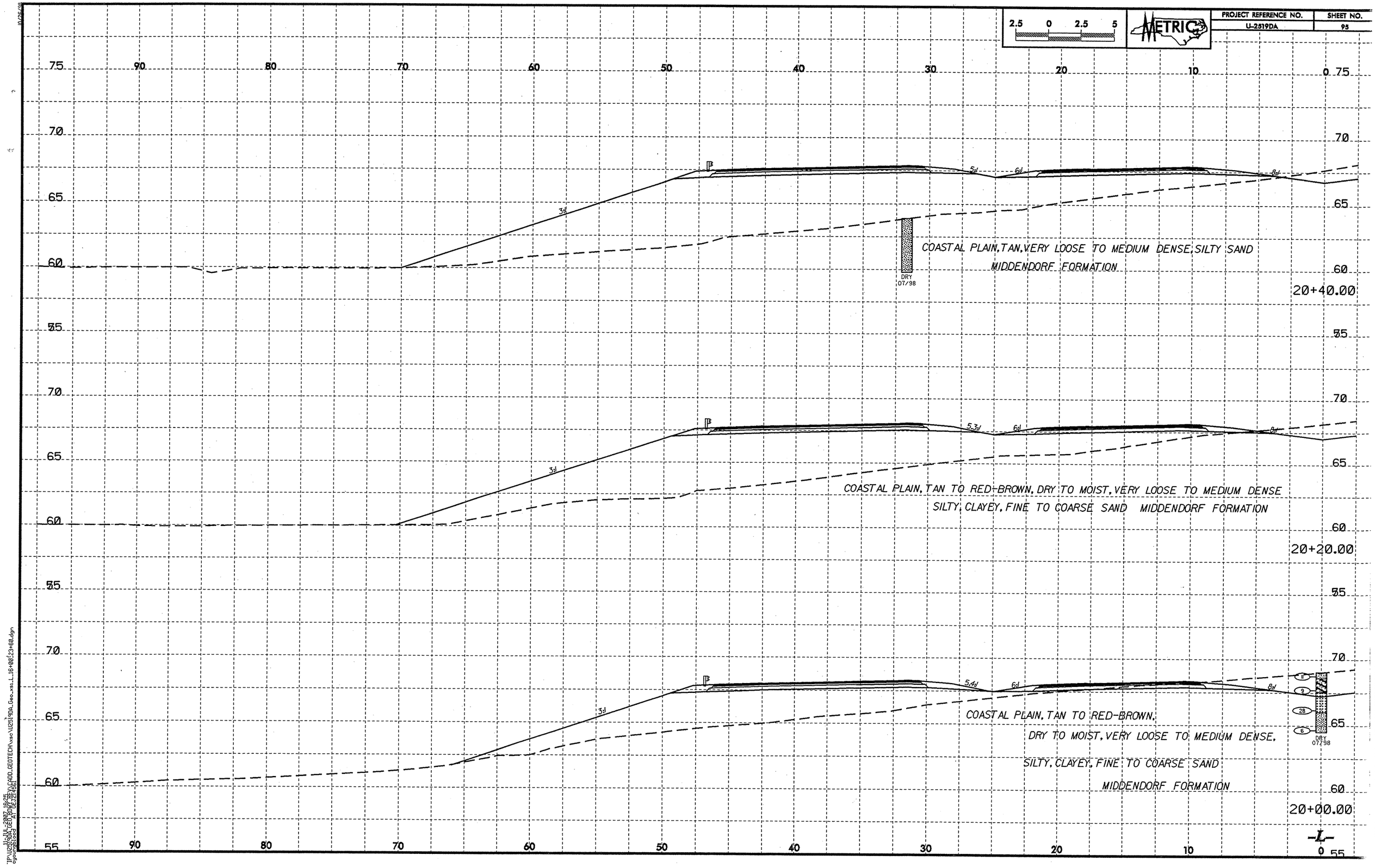

2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
91
C RED-BROWN, DRY, VERY STIFF, SILTY CLAY, HIGHLY PLASTIC
SHEAR POINT No.48
COASTAL PLAIN, TAN AND RED, DRY TO WET, VERY LOOSE TO MEDIUM DENSE
SILTY TO COARSE SAND MIDDENDORF FORMATION
18+00.00
A RED, TAN AND GRAY, DRY TO MOIST, MEDIUM STIFF TO VERY STIFF, SILTY CLAY, HIGHLY PLASTIC
B COASTAL PLAIN, RED TO TAN, DRY TO MOIST, LOOSE TO MEDIUM DENSE, COARSE SILTY SAND, MIDDENDORF FORMATION
SHEAR POINT No.46
RED, TAN AND GRAY, DRY TO MOIST, MEDIUM STIFF TO VERY STIFF, SILTY CLAY, HIGHLY PLASTIC
TAN AND WHITE, DRY TO MOIST, MEDIUM DENSE, SILTY TO COARSE SAND
DRY 07/98
17+80.00
SHEAR POINT No.44
RED, TAN AND GRAY, DRY TO MOIST, MEDIUM STIFF TO VERY STIFF, SILTY CLAY, HIGHLY PLASTIC
RED TO TAN, MOIST, MEDIUM DENSE, FINE SAND
17+60.00
-L-



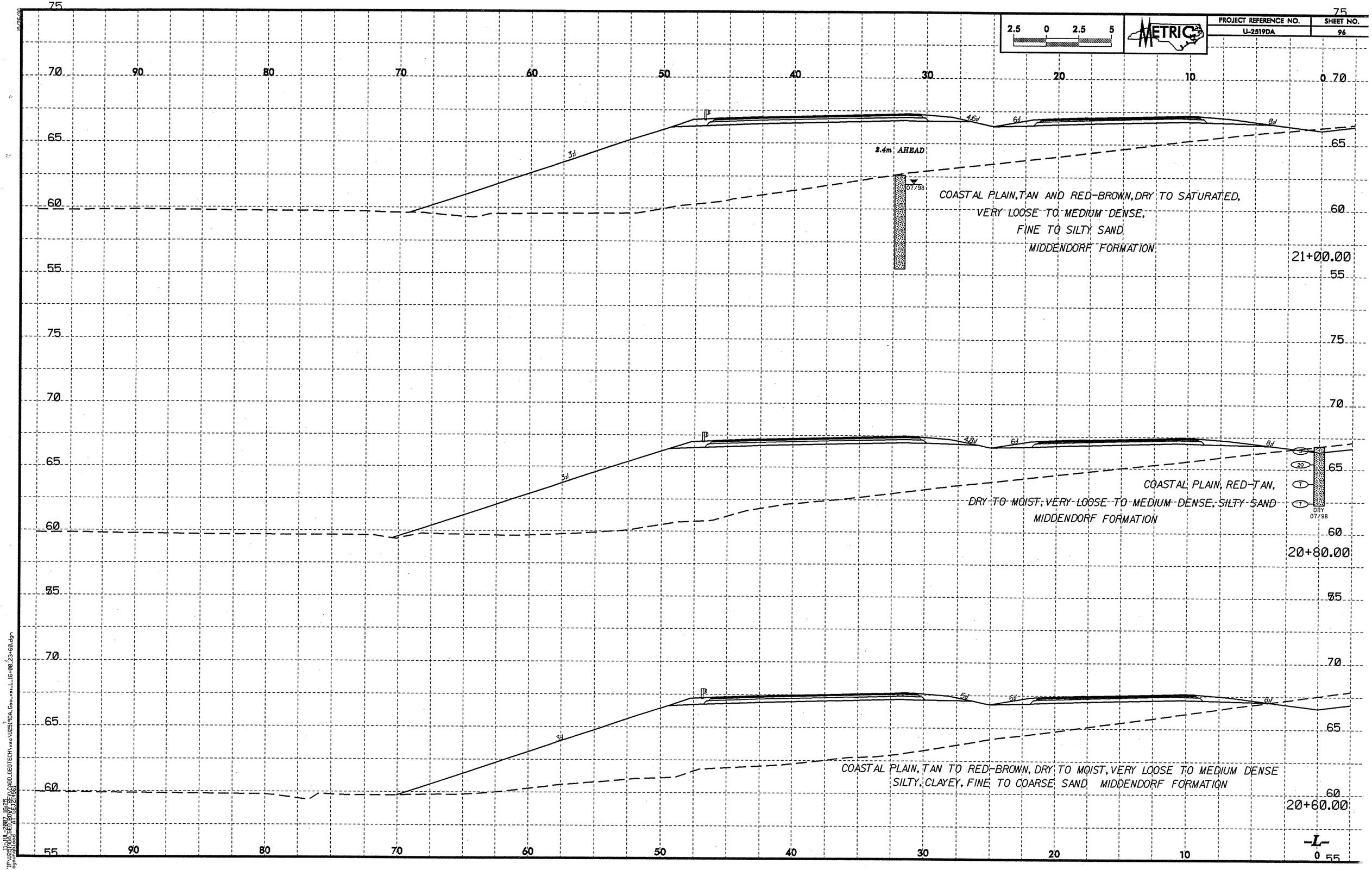
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
92
SHEAR POINT No.54
COASTAL PLAIN, RED, TAN AND WHITE, DRY TO WET, VERY LOOSE TO MEDIUM DENSE, SILTY CLAYEY AND COARSE SAND MIDDENDORF FORMATION
DRY 07/98
18+60.00
(A) TAN TO RED AND GRAY, DRY TO MOIST, STIFF TO VERY STIFF, SANDY CLAY, HIGHLY PLASTIC
SHEAR POINT No.52
10.0m BACK
COASTAL PLAIN, RED TO TAN, DRY TO WET, LOOSE TO MEDIUM DENSE, SILTY, FINE TO COARSE SAND MIDDENDORF FORMATION
DRY 07/98
18+40.00
SHEAR POINT No.50
5.0m AHEAD
COASTAL PLAIN, TAN RED, DRY TO WET, LOOSE TO MEDIUM DENSE SILTY, FINE TO COARSE SAND MIDDENDORF FORMATION
DRY 07/98
18+20.00
-L-

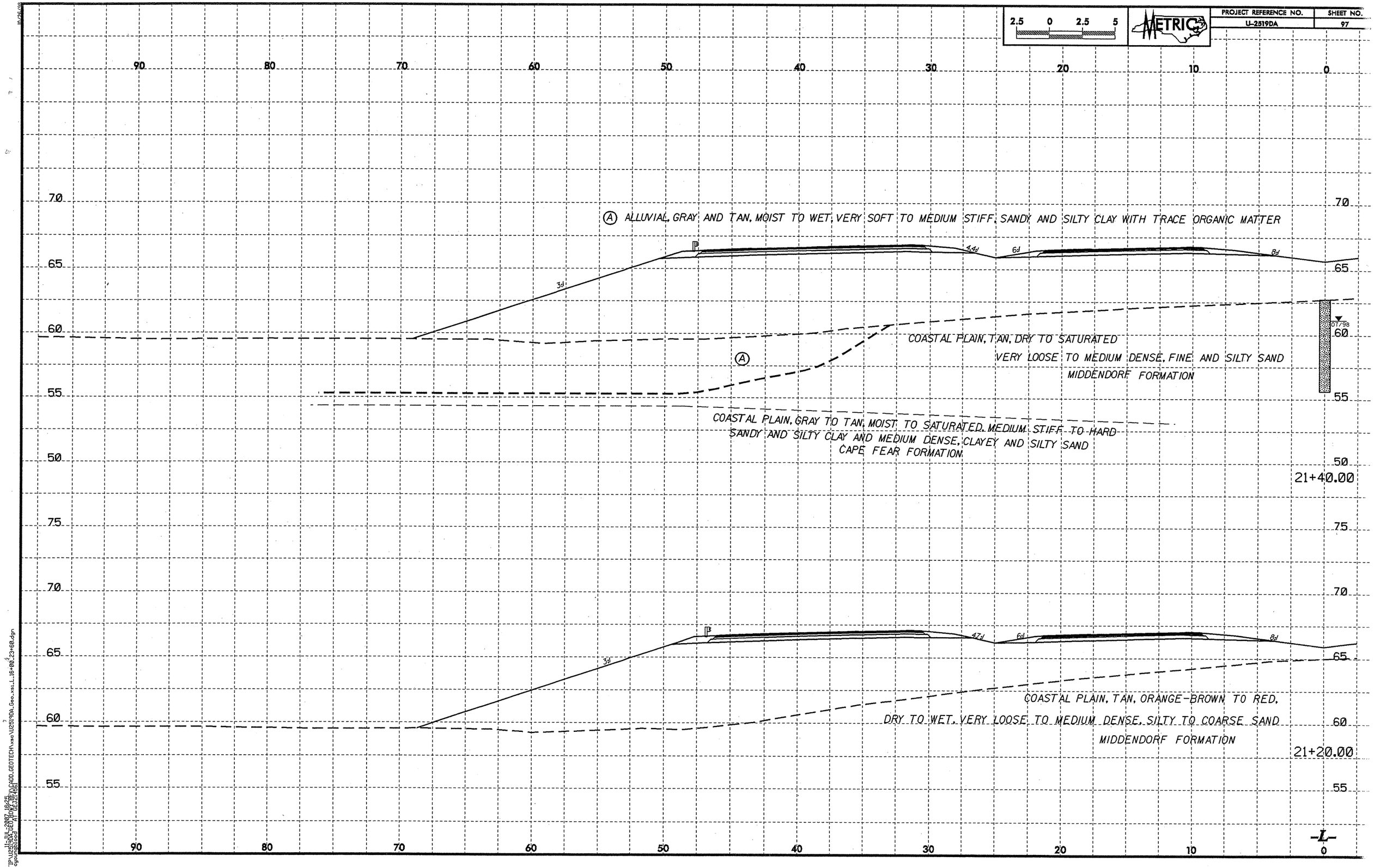

2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
93
19+20.00
COASTAL PLAIN, RED-BROWN, TAN TO GRAY, DRY TO SATURATED,
VERY LOOSE TO DENSE, SILTY, COARSE SAND
MIDDEDORF FORMATION
07/98
19+00.00
SHEAR POINT No.58
COASTAL PLAIN, RED-TAN,
VERY LOOSE TO MEDIUM
MIDDENDORF FORMATION
DRY TO SATURATED,
DENSE, SILTY SAND
DRY 07/98
18+80.00
SHEAR POINT No.56
COASTAL PLAIN, RED, TAN, AND WHITE, DRY TO WET, VERY LOOSE TO MEDIUM DENSE,
-L-


2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
94
90 80 70 60 50 40 30 20 10 0
75
70
65
60
55
5.6d
6d
8d
3d
DRY
07/98
COASTAL PLAIN, TAN TO RED-BROWN,
DRY TO MOIST, VERY LOOSE TO MEDIUM DENSE,
SILTY, FINE TO COARSE SAND MIDDENDORF FORMATION
19+80.00
5.8d
10
15
4
COASTAL PLAIN, TAN TO RED-BROWN, DRY
TO WET, VERY LOOSE TO MEDIUM DENSE, SILTY, FINE TO COARSE SAND
MIDDENDORF FORMATION
19+60.00
COASTAL PLAIN, TAN TO RED-BROWN, DRY TO WET, VERY LOOSE TO MEDIUM DENSE,
SILTY, FINE TO COARSE SAND MIDDENDORF FORMATION
19+40.00
-L-

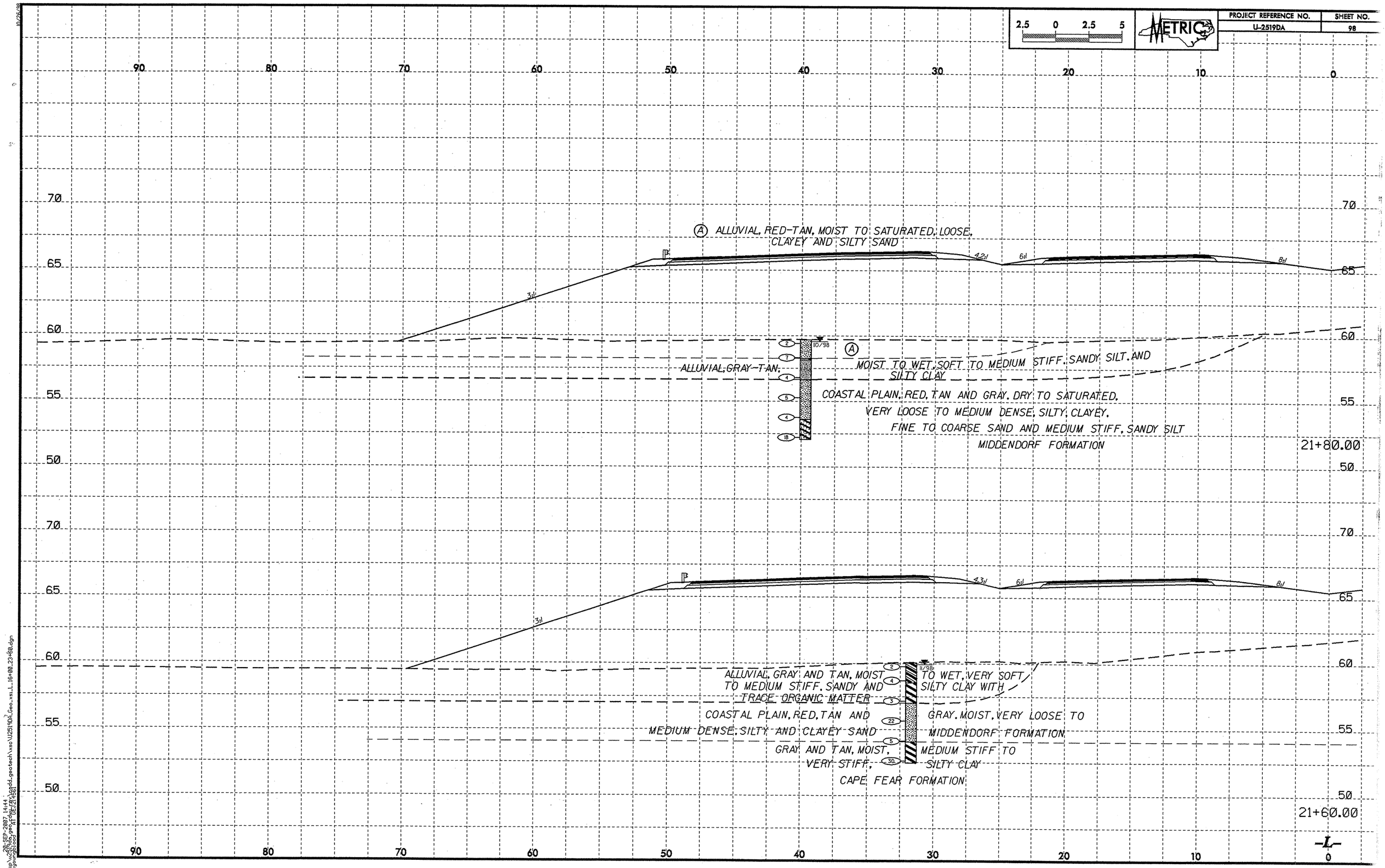


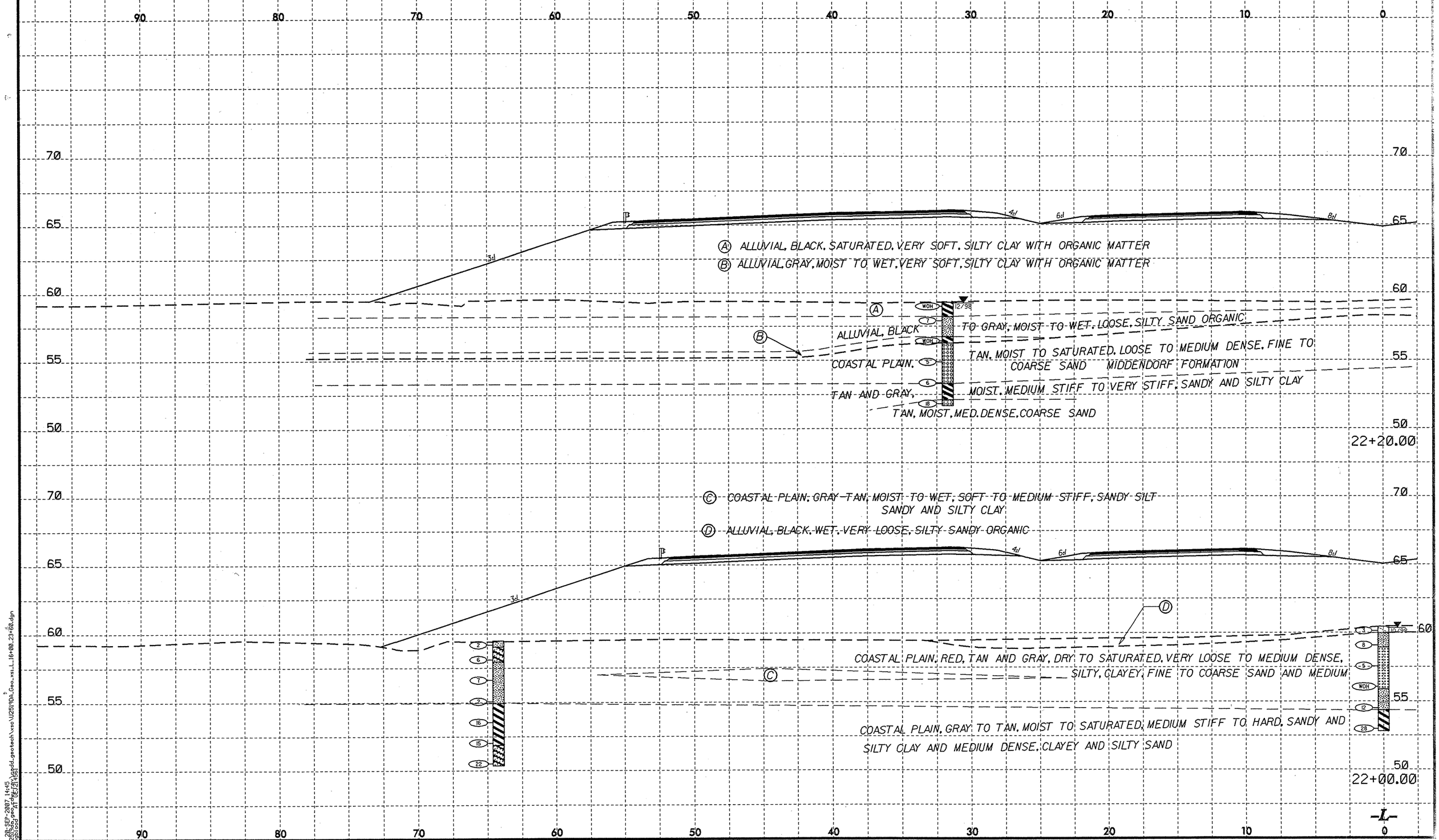
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
95
COASTAL PLAIN, TAN, VERY LOOSE TO MEDIUM DENSE, SILTY SAND
MIDDENDORF FORMATION
DRY 07/98
20+40.00
COASTAL PLAIN, TAN TO RED-BROWN, DRY TO MOIST, VERY LOOSE TO MEDIUM DENSE
SILTY, CLAYEY, FINE TO COARSE SAND MIDDENDORF FORMATION
20+20.00
COASTAL PLAIN, TAN TO RED-BROWN,
DRY TO MOIST, VERY LOOSE TO MEDIUM DENSE,
SILTY, CLAYEY, FINE TO COARSE SAND
MIDDENDORF FORMATION
DRY 07/98
20+00.00
-L-


2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
96
2.4m AHEAD
07/98
COASTAL PLAIN, TAN AND RED-BROWN, DRY TO SATURATED,
VERY LOOSE TO MEDIUM DENSE,
FINE TO SILTY SAND
MIDDENDORF FORMATION
21+00.00
COASTAL PLAIN, RED-TAN,
DRY TO MOIST, VERY LOOSE TO MEDIUM DENSE, SILTY SAND
MIDDENDORF FORMATION
DRY
07/98
20+80.00
COASTAL PLAIN, TAN TO RED-BROWN, DRY TO MOIST, VERY LOOSE TO MEDIUM DENSE
SILTY, CLAYEY, FINE TO COARSE SAND MIDDENDORF FORMATION
20+60.00
-L-



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
97
90 80 70 60 50 40 30 20 10 0
70 65 60 55 50 75 70 65 60 55
Ⓐ ALLUVIAL, GRAY AND TAN, MOIST TO WET, VERY SOFT TO MEDIUM STIFF, SANDY AND SILTY CLAY WITH TRACE ORGANIC MATTER
3:1
4.4:1
6:1
8:1
COASTAL PLAIN, TAN, DRY TO SATURATED
VERY LOOSE TO MEDIUM DENSE, FINE AND SILTY SAND
MIDDENDORF FORMATION
Ⓐ
COASTAL PLAIN, GRAY TO TAN, MOIST TO SATURATED, MEDIUM STIFF TO HARD
SANDY AND SILTY CLAY AND MEDIUM DENSE, CLAYEY AND SILTY SAND
CAPE FEAR FORMATION
21+40.00
3:1
4.7:1
6:1
8:1
COASTAL PLAIN, TAN, ORANGE-BROWN TO RED,
DRY TO WET, VERY LOOSE TO MEDIUM DENSE, SILTY TO COARSE SAND
MIDDENDORF FORMATION
21+20.00
-L-

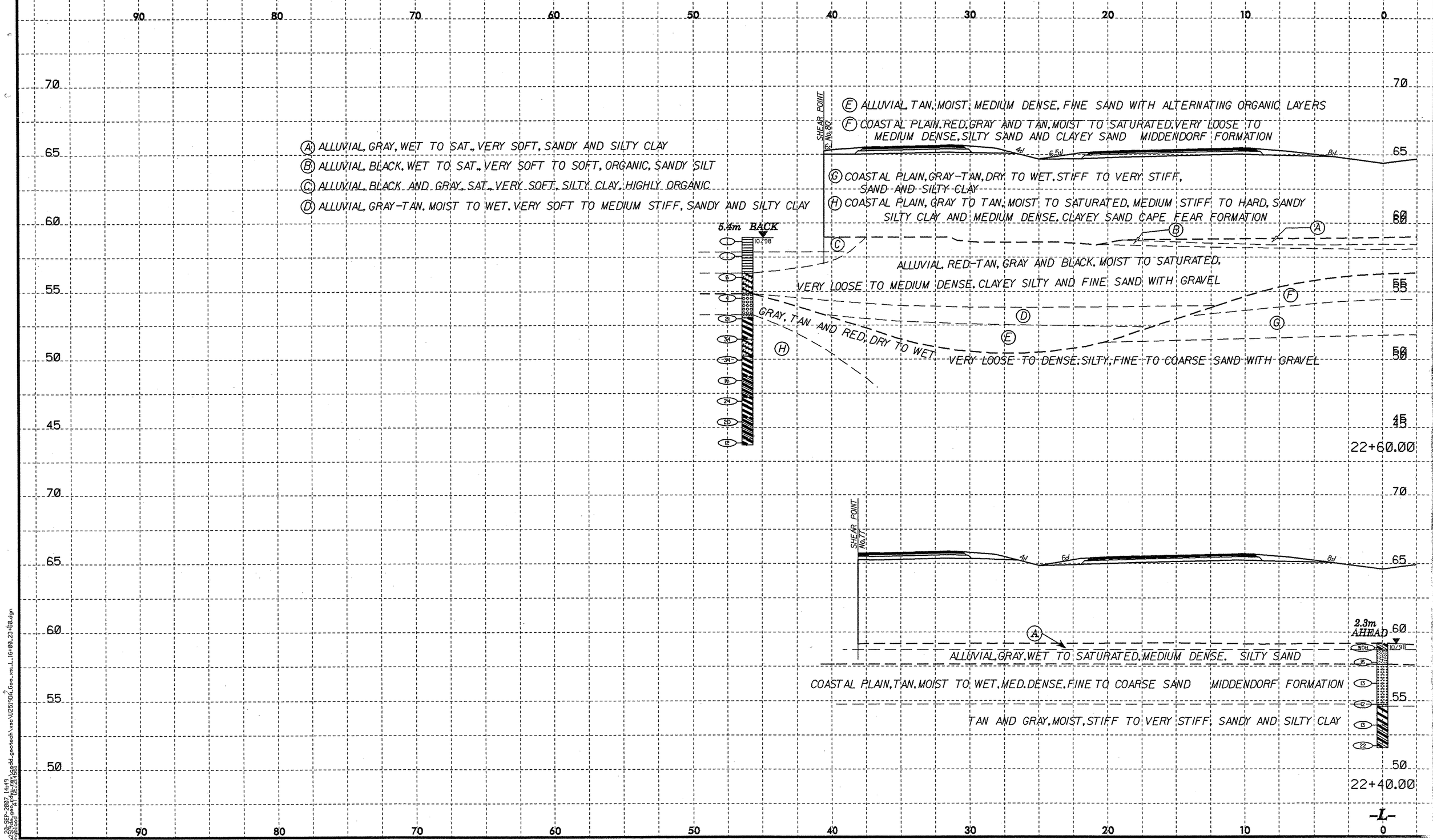

2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
98
90 80 70 60 50 40 30 20 10 0
70 65 60 55 50
(A) ALLUVIAL, RED-TAN, MOIST TO SATURATED, LOOSE, CLAYEY AND SILTY SAND
3:1
4.2:1
6:1
8:1
10/98
(A)
ALLUVIAL, GRAY-TAN,
MOIST TO WET, SOFT TO MEDIUM STIFF, SANDY SILT AND SILTY CLAY
COASTAL PLAIN, RED, TAN AND GRAY, DRY TO SATURATED, VERY LOOSE TO MEDIUM DENSE, SILTY, CLAYEY, FINE TO COARSE SAND AND MEDIUM STIFF, SANDY SILT
MIDDENDORF FORMATION
2 7 4 5 4 18
21+80.00
11/98
ALLUVIAL, GRAY AND TAN, MOIST TO MEDIUM STIFF, SANDY AND TRACE ORGANIC MATTER
TO WET, VERY SOFT SILTY CLAY WITH
COASTAL PLAIN, RED, TAN AND MEDIUM DENSE, SILTY AND CLAYEY SAND
GRAY, MOIST, VERY LOOSE TO MIDDENDORF FORMATION
GRAY AND TAN, MOIST, VERY STIFF, CAPE FEAR FORMATION
MEDIUM STIFF TO SILTY CLAY
2 4 3 22 5 30
21+60.00
-L-



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
99
90 80 70 60 50 40 30 20 10 0
70 65 60 55 50
3:1
4:1
6:1
8:1
Ⓐ ALLUVIAL, BLACK, SATURATED, VERY SOFT, SILTY CLAY WITH ORGANIC MATTER
Ⓑ ALLUVIAL, GRAY, MOIST TO WET, VERY SOFT, SILTY CLAY WITH ORGANIC MATTER
WOH
12/98
ALLUVIAL, BLACK TO GRAY, MOIST TO WET, LOOSE, SILTY SAND ORGANIC
COASTAL PLAIN, TAN, MOIST TO SATURATED, LOOSE TO MEDIUM DENSE, FINE TO COARSE SAND MIDDENDORF FORMATION
TAN AND GRAY, MOIST, MEDIUM STIFF TO VERY STIFF, SANDY AND SILTY CLAY
TAN, MOIST, MED. DENSE, COARSE SAND
22+20.00
Ⓒ COASTAL PLAIN, GRAY-TAN, MOIST TO WET, SOFT TO MEDIUM STIFF, SANDY SILT SANDY AND SILTY CLAY
Ⓓ ALLUVIAL, BLACK, WET, VERY LOOSE, SILTY SANDY ORGANIC
COASTAL PLAIN, RED, TAN AND GRAY, DRY TO SATURATED, VERY LOOSE TO MEDIUM DENSE, SILTY, CLAYEY, FINE TO COARSE SAND AND MEDIUM
COASTAL PLAIN, GRAY TO TAN, MOIST TO SATURATED, MEDIUM STIFF TO HARD, SANDY AND SILTY CLAY AND MEDIUM DENSE, CLAYEY AND SILTY SAND
22+00.00
-L-

2.5 0 2.5 5

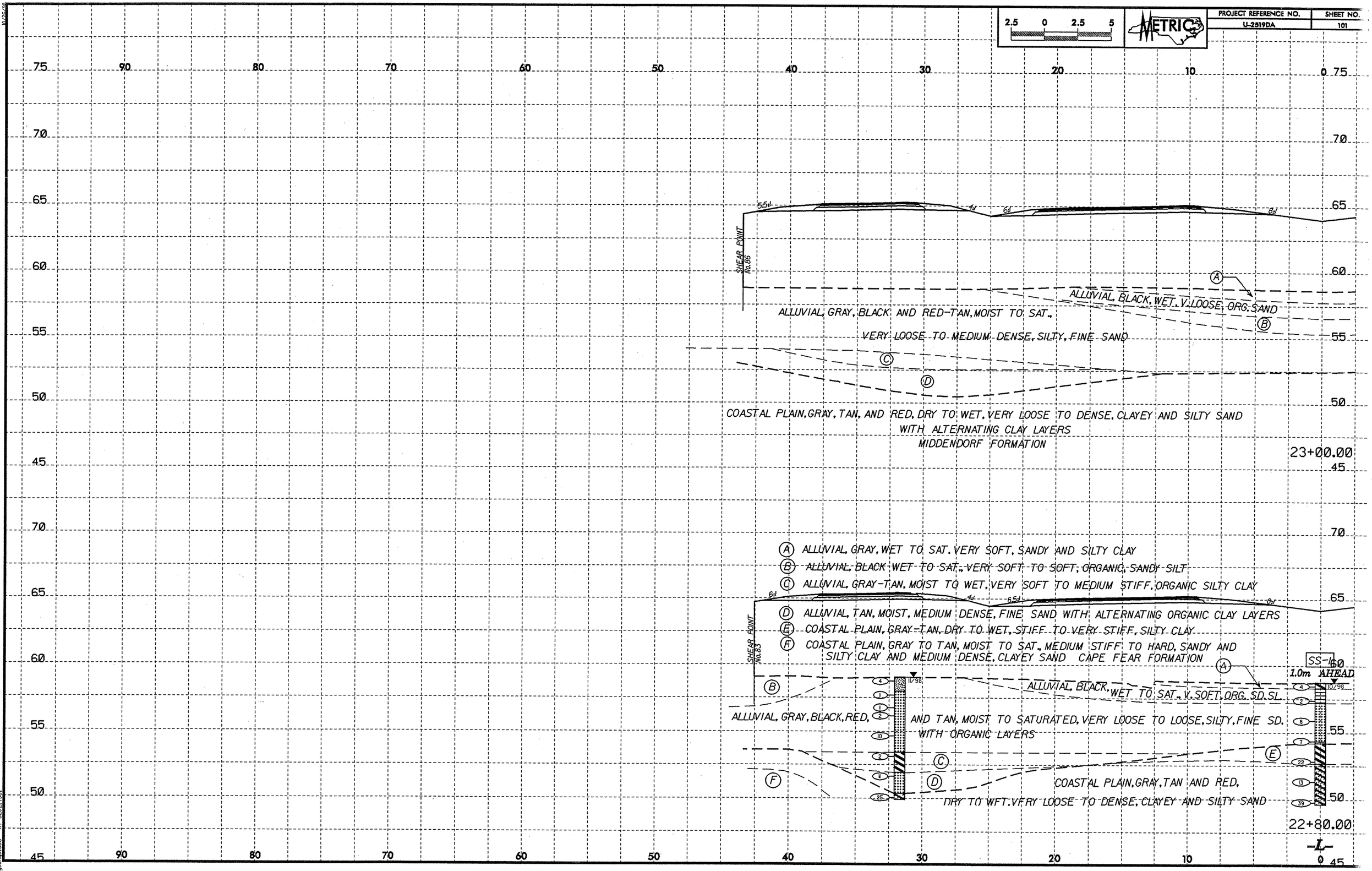
METRIC

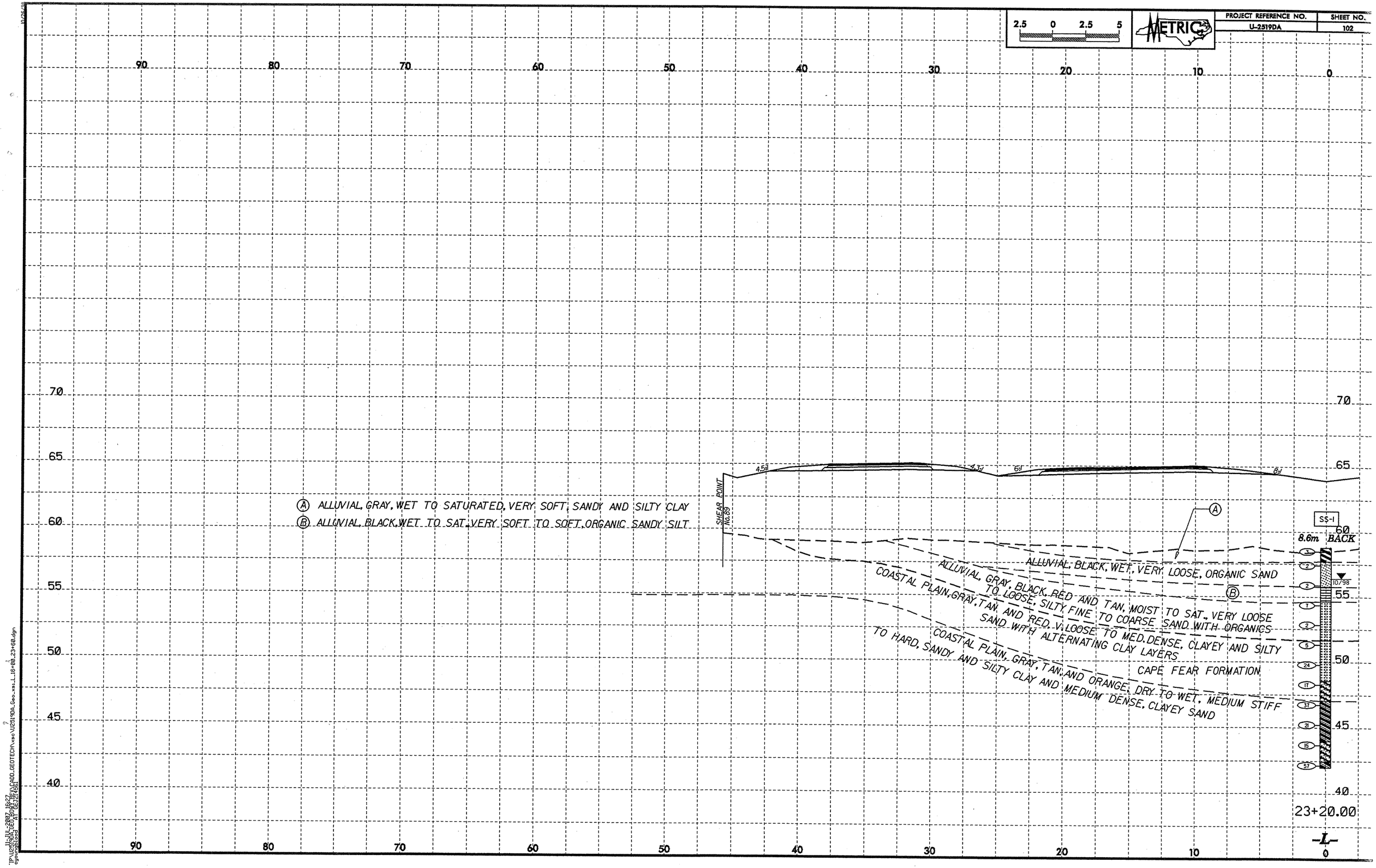


PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	101

2.5 0 2.5 5

METRIC

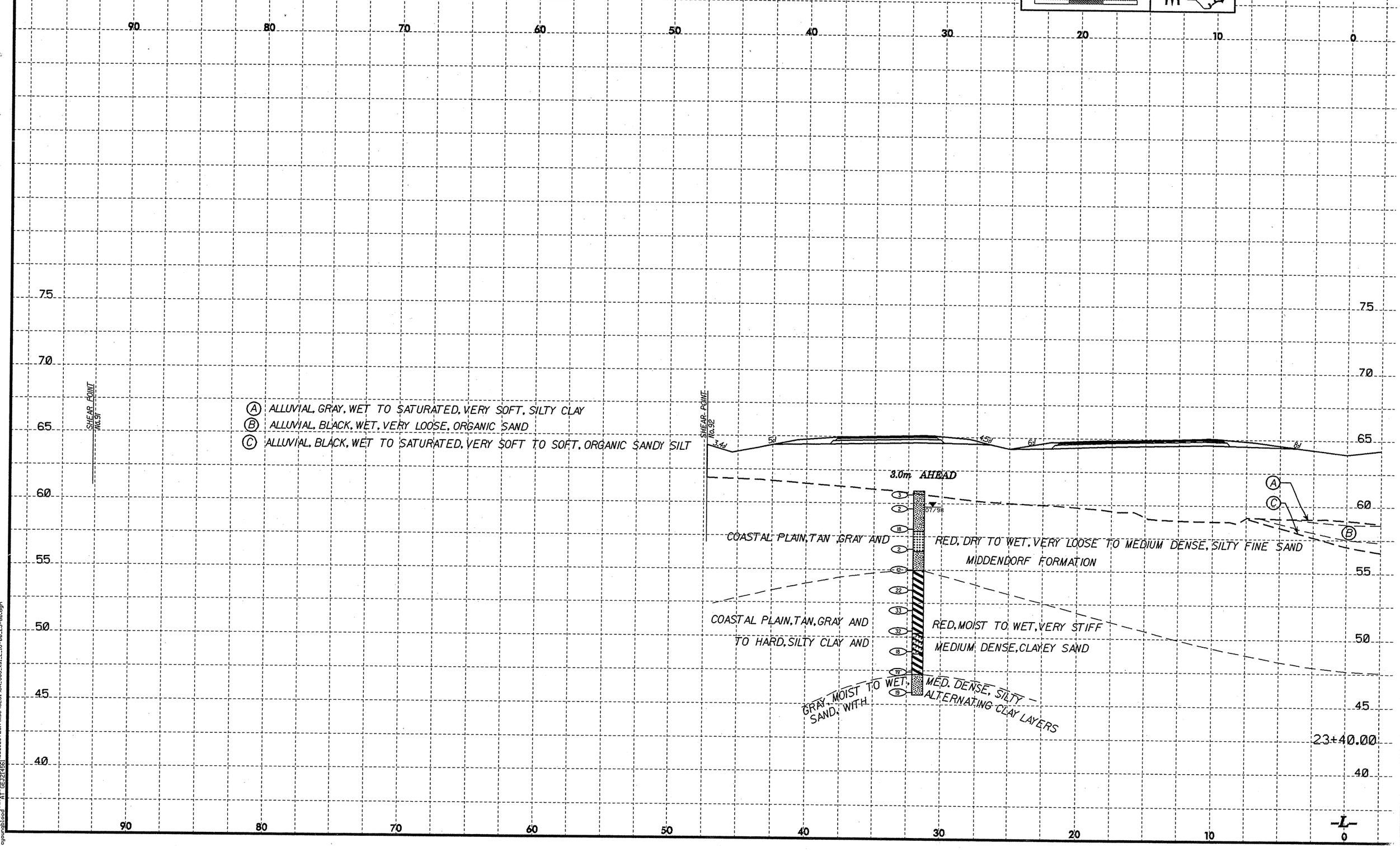


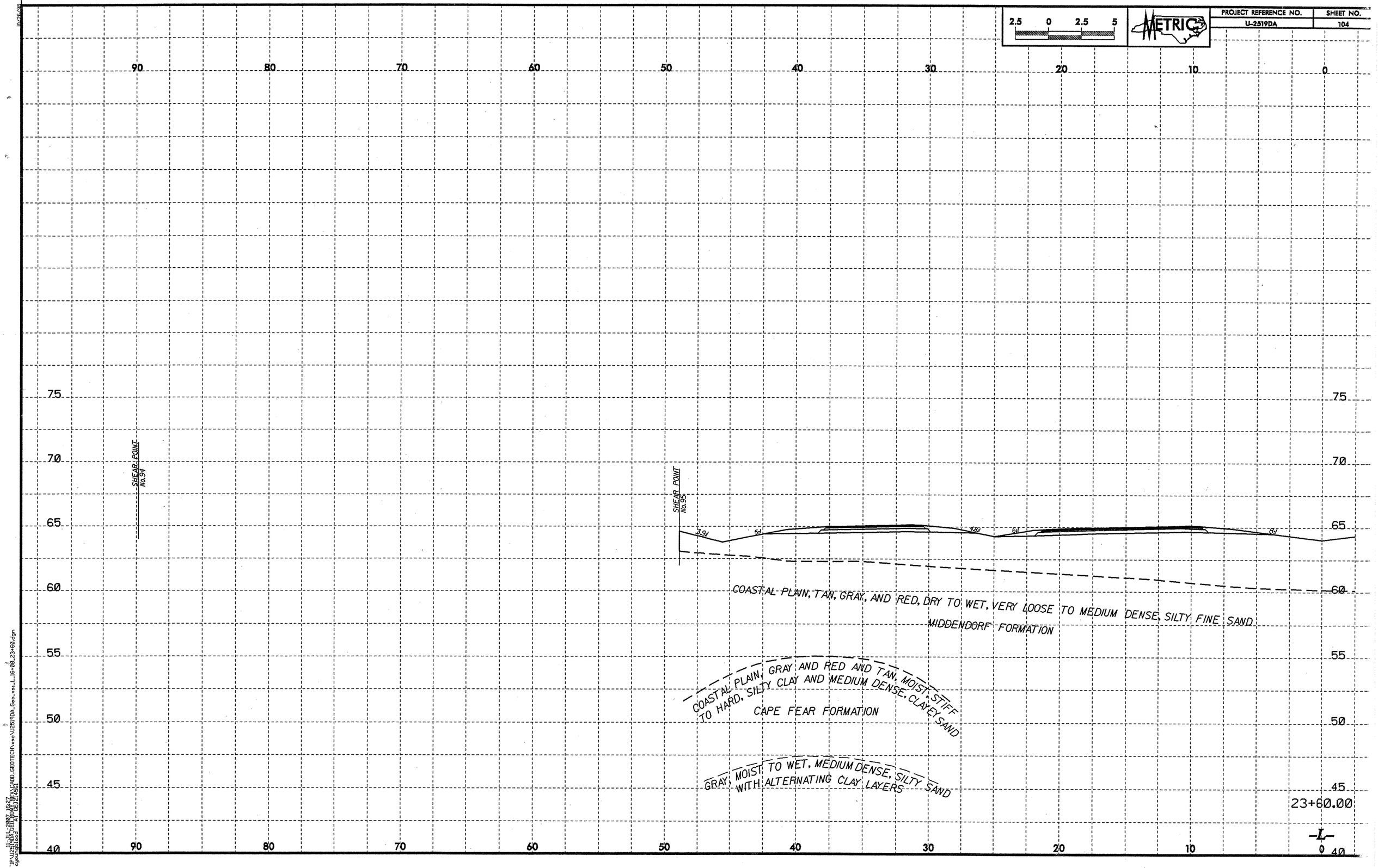


2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
102
90 80 70 60 50 40 30 20 10 0
70 65 60 55 50 45 40
Ⓐ ALLUVIAL, GRAY, WET TO SATURATED, VERY SOFT, SANDY AND SILTY CLAY
Ⓑ ALLUVIAL, BLACK, WET TO SAT., VERY SOFT TO SOFT, ORGANIC SANDY SILT
SHEAR POINT No.89
4.5:1
4.3:1
6:1
8:1
SS-1
8.6m BACK
10/98
ALLUVIAL, BLACK, WET, VERY LOOSE, ORGANIC SAND
ALLUVIAL, GRAY, BLACK, RED AND TAN, MOIST TO SAT., VERY LOOSE TO LOOSE, SILTY FINE TO COARSE SAND WITH ORGANICS
COASTAL PLAIN, GRAY, TAN AND RED, V. LOOSE TO MED. DENSE, CLAYEY AND SILTY SAND WITH ALTERNATING CLAY LAYERS
CAPE FEAR FORMATION
COASTAL PLAIN, GRAY, TAN, AND ORANGE, DRY TO WET, MEDIUM STIFF TO HARD, SANDY AND SILTY CLAY AND MEDIUM DENSE, CLAYEY SAND
23+20.00
-L-

2.5 0 2.5 5

METRIC





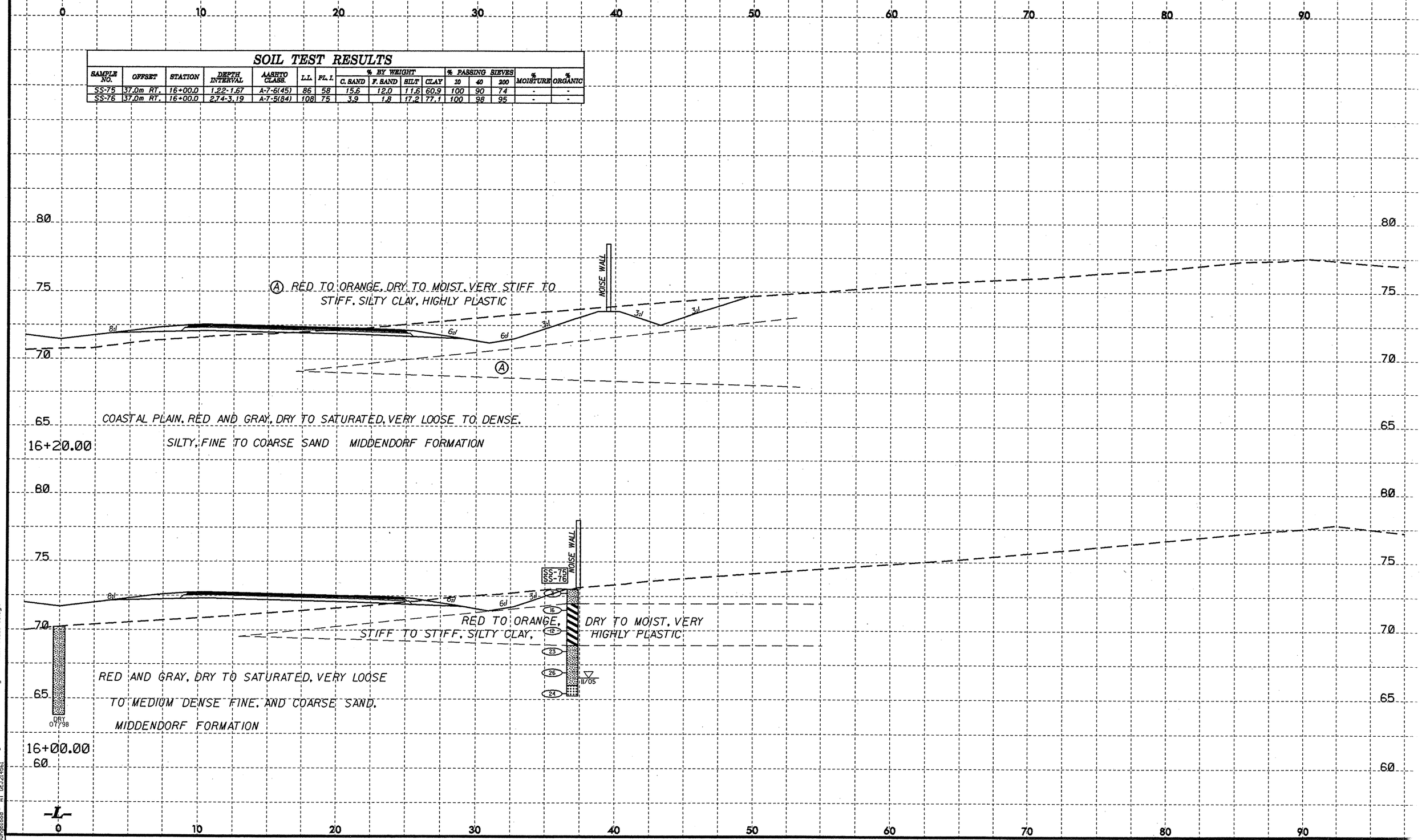
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
104
90 80 70 60 50 40 30 20 10 0
75 70 65 60 55 50 45 40
SHEAR POINT No.94
SHEAR POINT No.95
COASTAL PLAIN, TAN, GRAY, AND RED, DRY TO WET, VERY LOOSE TO MEDIUM DENSE, SILTY FINE SAND
MIDDENDORF FORMATION
COASTAL PLAIN, GRAY AND RED AND TAN, MOIST, STIFF TO HARD, SILTY CLAY AND MEDIUM DENSE, CLAYEY SAND
CAPE FEAR FORMATION
GRAY, MOIST TO WET, MEDIUM DENSE, SILTY SAND WITH ALTERNATING CLAY LAYERS
23+60.00
-L-

2.5 0 2.5 5

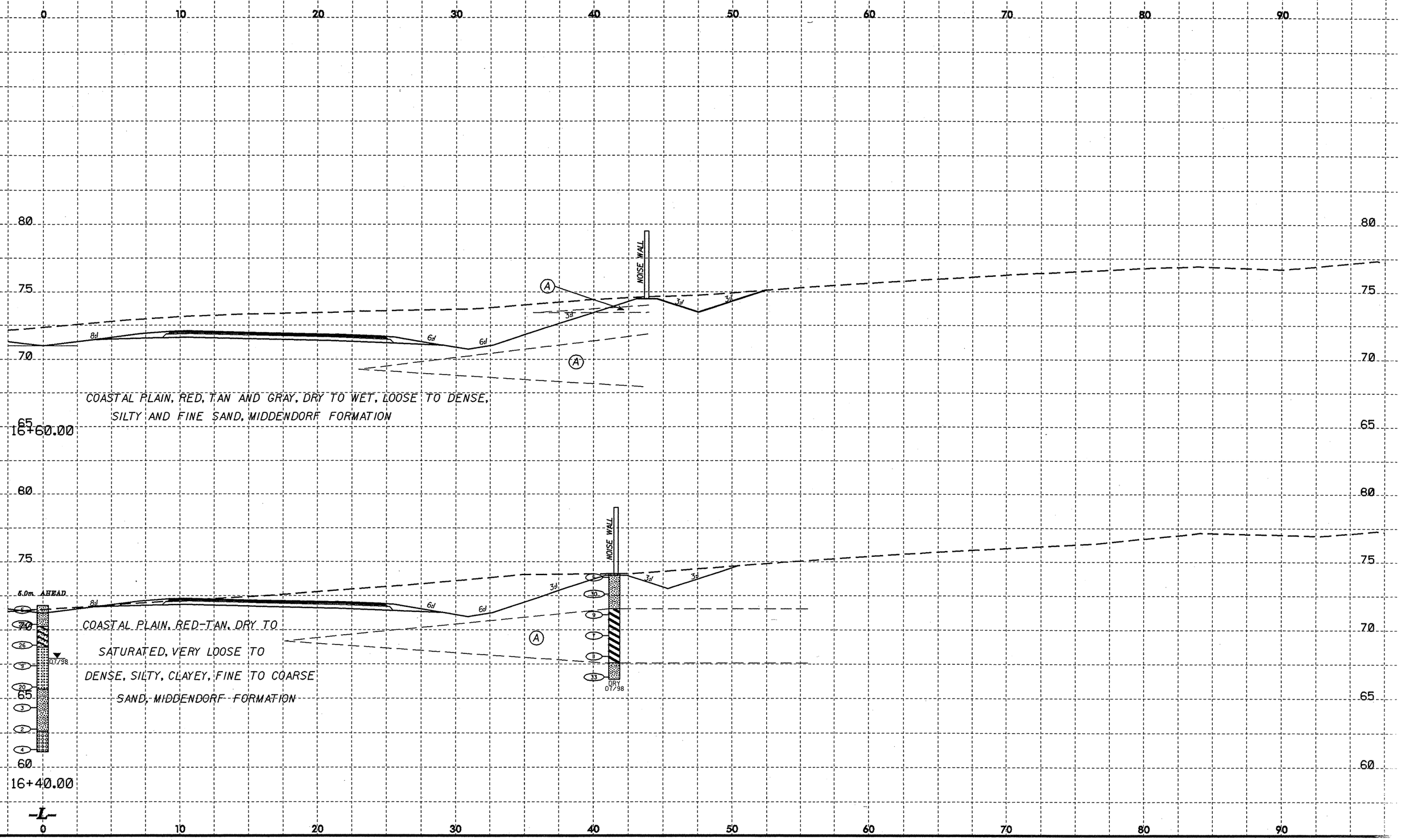
METRIC

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PI. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-75	37.0m RT.	16+00.0	1.22-1.67	A-7-6(45)	86	58	15.6	12.0	11.6	60.9	100	90	74	-	-
SS-76	37.0m RT.	16+00.0	2.74-3.19	A-7-5(84)	108	75	3.9	1.8	17.2	77.1	100	98	95	-	-



PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	106



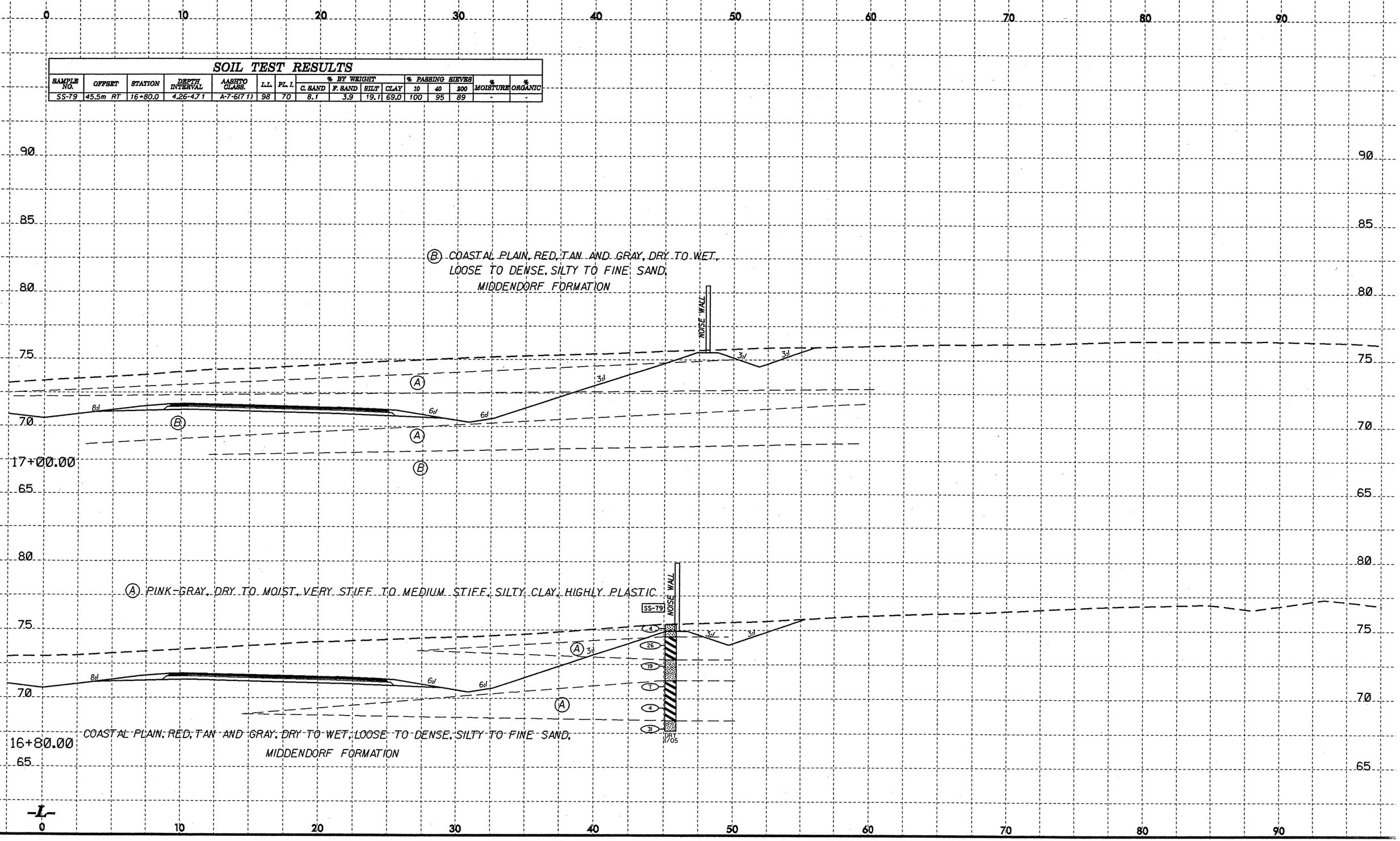
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	107

METRIC

2.5 0 2.5 5

SOIL TEST RESULTS

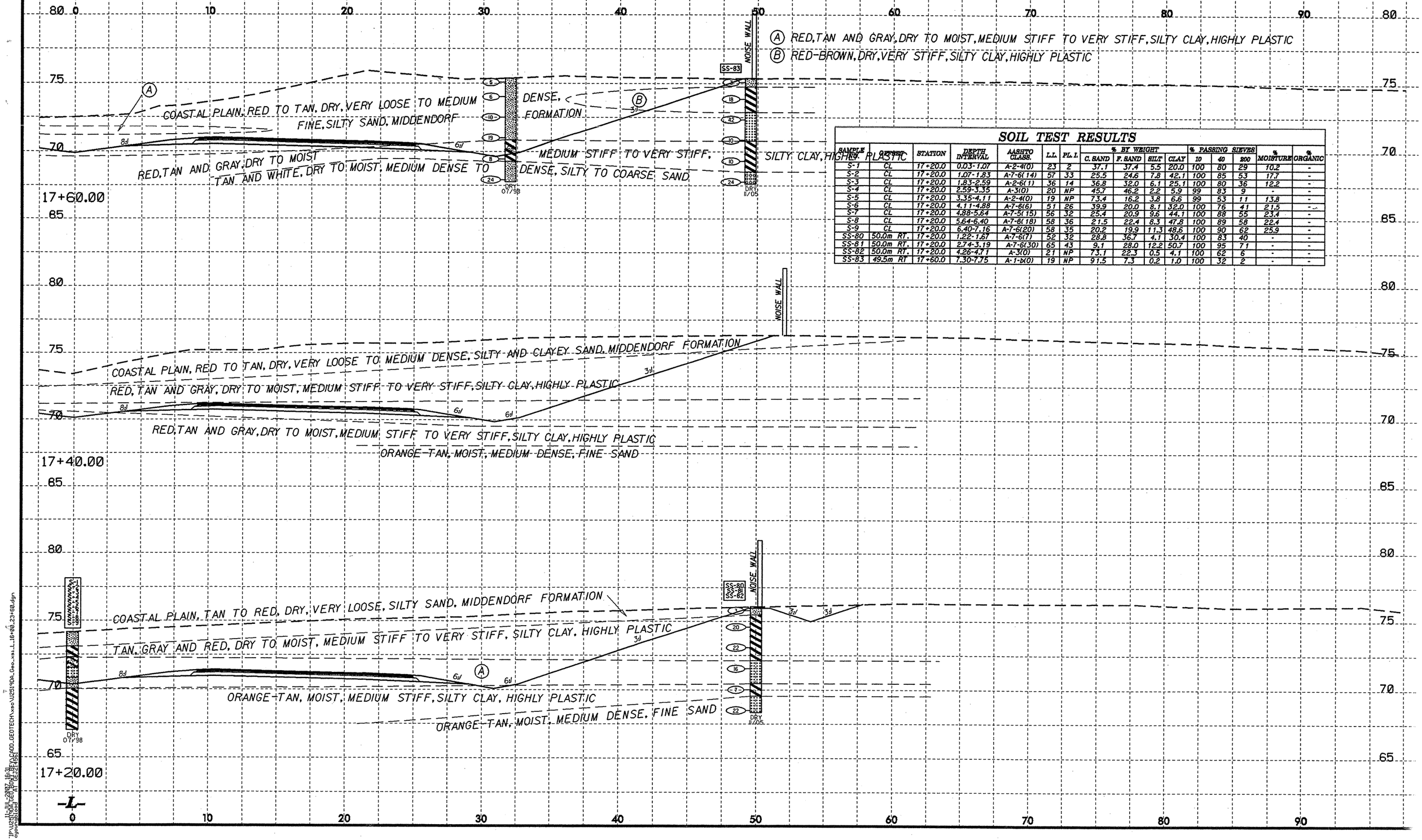
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING SIEVES 10	% PASSING SIEVES 40	% PASSING SIEVES 200	% MOISTURE	% ORGANIC
SS-79	45.5m RT	16+80.0	4.26-4.71	A-7-6(7.1)	98	70	8.1	3.9	19.1	69.0	100	95	89	-	-



PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	108

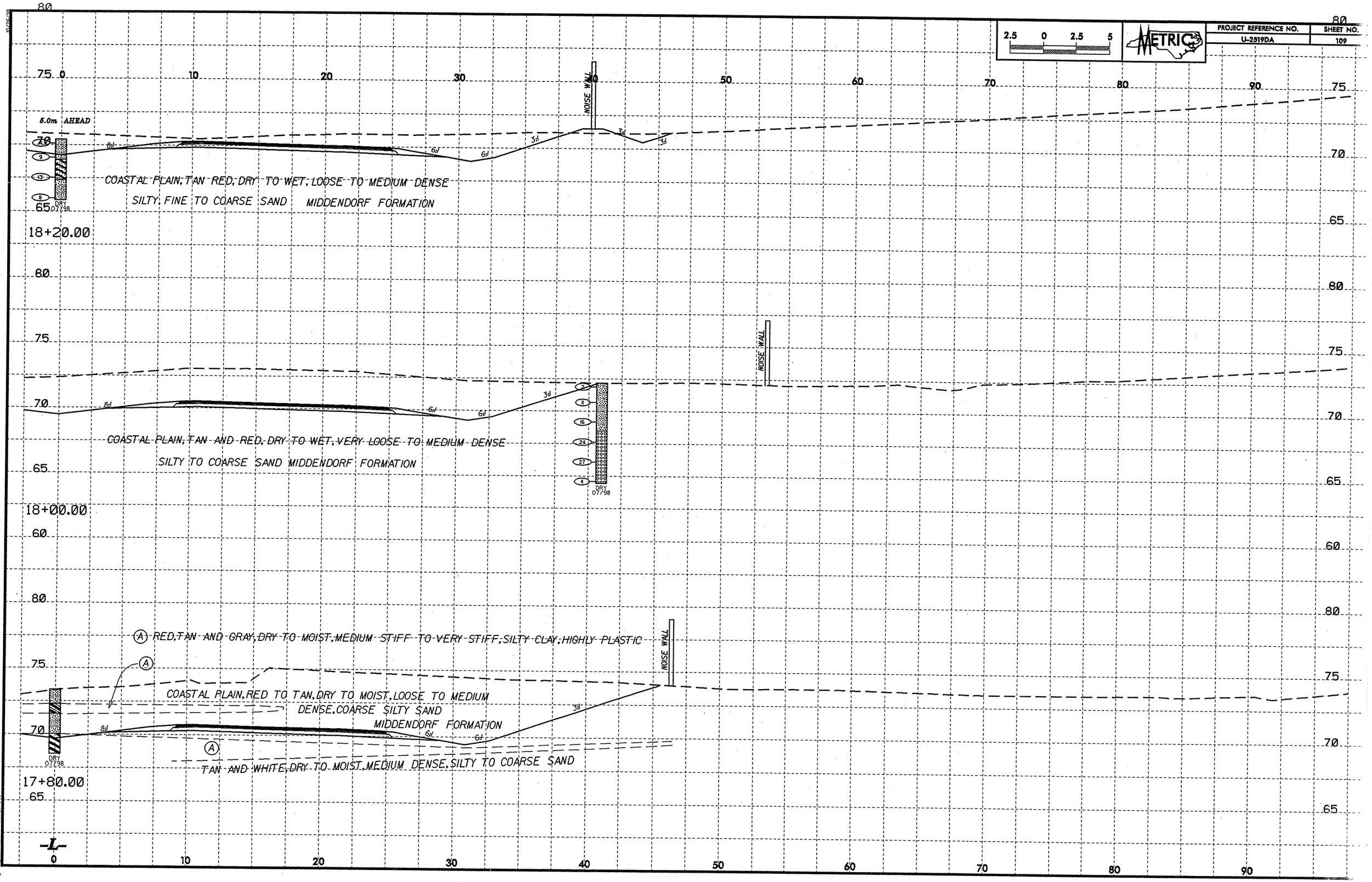
2.5 0 2.5 5

METRIC



SOIL TEST RESULTS

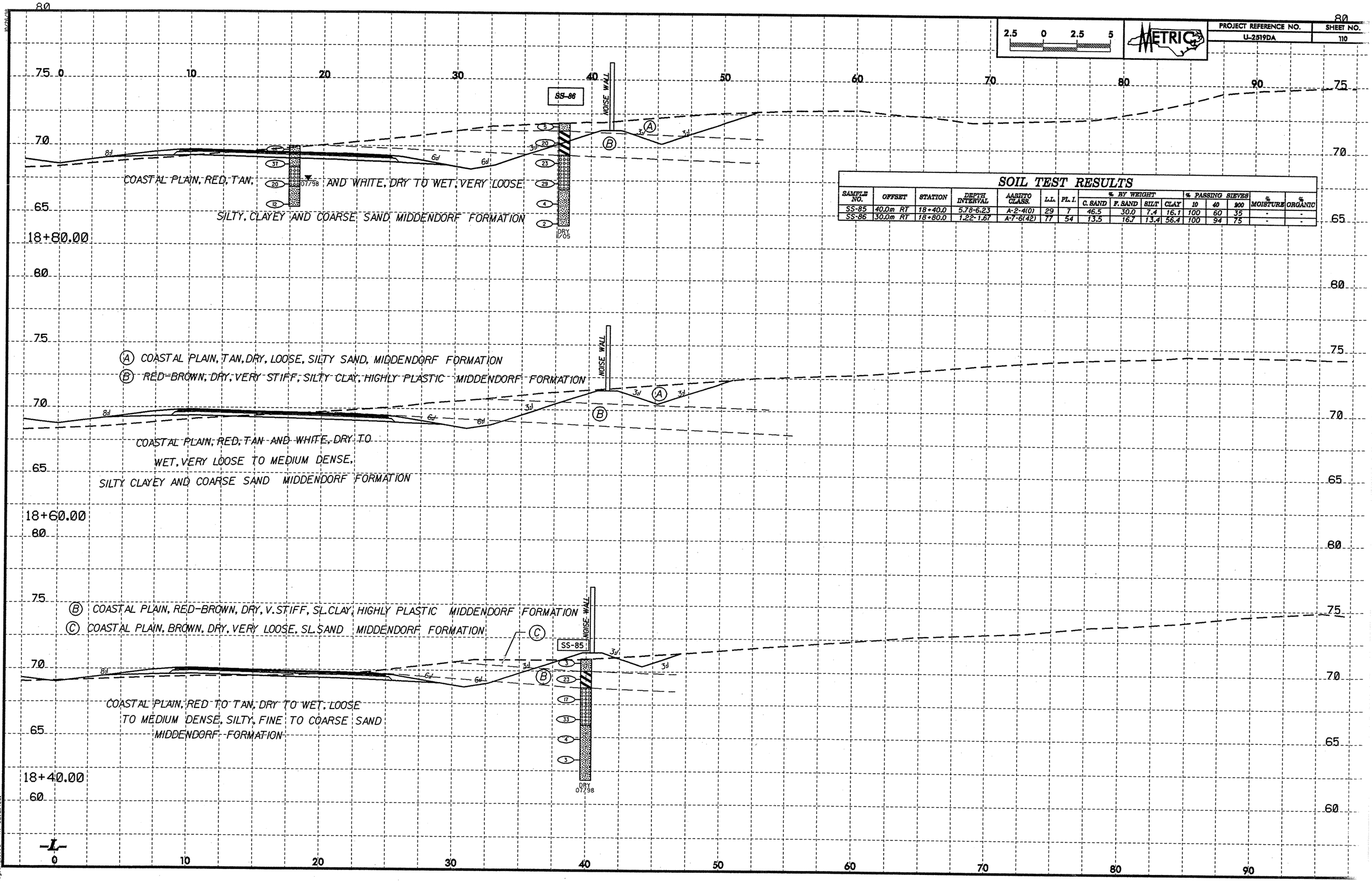
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-1	CL	17+20.0	0.03-1.07	A-2-4(0)	23	2	37.1	37.4	5.5	20.0	100	80	29	10.2	-
S-2	CL	17+20.0	1.07-1.83	A-7-6(14)	57	33	25.5	24.6	7.8	42.1	100	85	53	17.7	-
S-3	CL	17+20.0	1.83-2.59	A-2-6(1)	36	14	36.8	32.0	6.1	25.1	100	80	36	12.2	-
S-4	CL	17+20.0	2.59-3.35	A-3(0)	20	NP	45.7	46.2	2.2	5.9	99	83	9	-	-
S-5	CL	17+20.0	3.35-4.11	A-2-4(0)	19	NP	73.4	16.2	3.8	6.6	99	53	11	13.8	-
S-6	CL	17+20.0	4.11-4.88	A-7-6(6)	51	26	39.9	20.0	8.1	32.0	100	76	41	21.5	-
S-7	CL	17+20.0	4.88-5.64	A-7-5(15)	56	32	25.4	20.9	9.6	44.1	100	88	55	23.4	-
S-8	CL	17+20.0	5.64-6.40	A-7-6(18)	58	36	21.5	22.4	8.3	47.8	100	89	58	22.4	-
S-9	CL	17+20.0	6.40-7.16	A-7-6(20)	58	35	20.2	19.9	11.3	48.6	100	90	62	25.9	-
SS-80	50.0m RT.	17+20.0	1.22-1.67	A-7-6(7)	52	32	28.8	36.7	4.1	30.4	100	83	40	-	-
SS-81	50.0m RT.	17+20.0	2.74-3.19	A-7-6(30)	65	43	9.1	28.0	12.2	50.7	100	95	71	-	-
SS-82	50.0m RT.	17+20.0	4.26-4.71	A-3(0)	21	NP	73.1	22.3	0.5	4.1	100	62	6	-	-
SS-83	49.5m RT	17+60.0	7.30-7.75	A-1-b(0)	19	NP	91.5	7.3	0.2	1.0	100	32	2	-	-


2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
109
5.0m AHEAD
NOISE WALL
COASTAL PLAIN, TAN RED, DRY TO WET, LOOSE TO MEDIUM DENSE
SILTY, FINE TO COARSE SAND MIDDENDORF FORMATION
DRY 07/98
18+20.00
COASTAL PLAIN, TAN AND RED, DRY TO WET, VERY LOOSE TO MEDIUM DENSE
SILTY TO COARSE SAND MIDDENDORF FORMATION
18+00.00
A RED, TAN AND GRAY, DRY TO MOIST, MEDIUM STIFF TO VERY STIFF, SILTY CLAY, HIGHLY PLASTIC
COASTAL PLAIN, RED TO TAN, DRY TO MOIST, LOOSE TO MEDIUM DENSE, COARSE SILTY SAND
MIDDENDORF FORMATION
TAN AND WHITE, DRY TO MOIST, MEDIUM DENSE, SILTY TO COARSE SAND
17+80.00
-L-

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	110

2.5 0 2.5 5

METRIC



SOIL TEST RESULTS

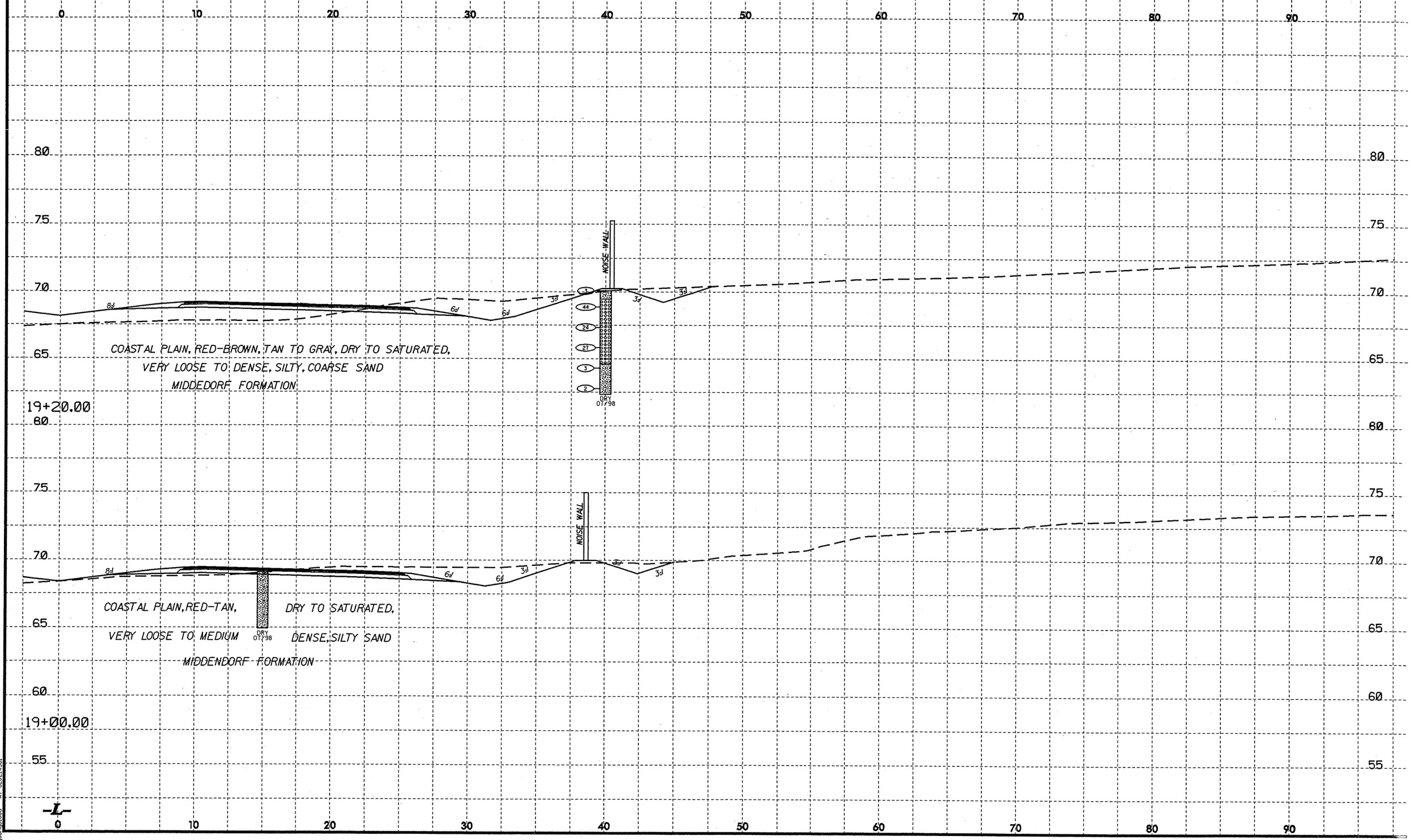
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-85	40.0m RT	18+40.0	5.78-6.23	A-2-4(0)	29	7	46.5	30.0	7.4	16.1	100	60	35	-	-
SS-86	30.0m RT	18+80.0	1.22-1.67	A-7-6(42)	77	54	13.5	16.7	13.4	56.4	100	94	75	-	-

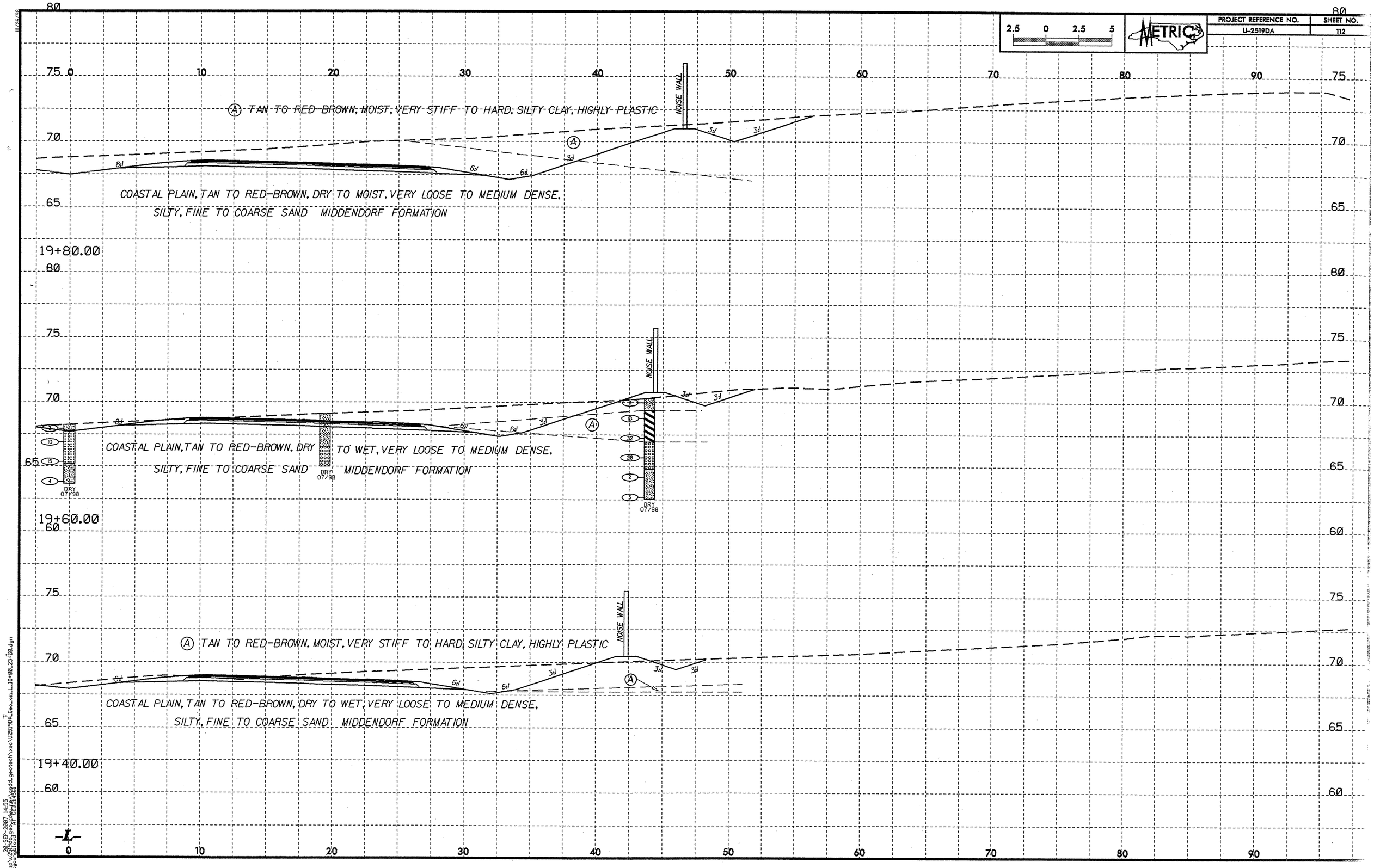
10/29/98
JUL 2007 16:32
U2519DA_GEOTECH.dgn
U2519DA_GEOTECH.xsc
U2519DA_Geo_xs_L_16+00_23+60.dgn
dgnuser.cfg
41 GE12 [4.95]

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	111

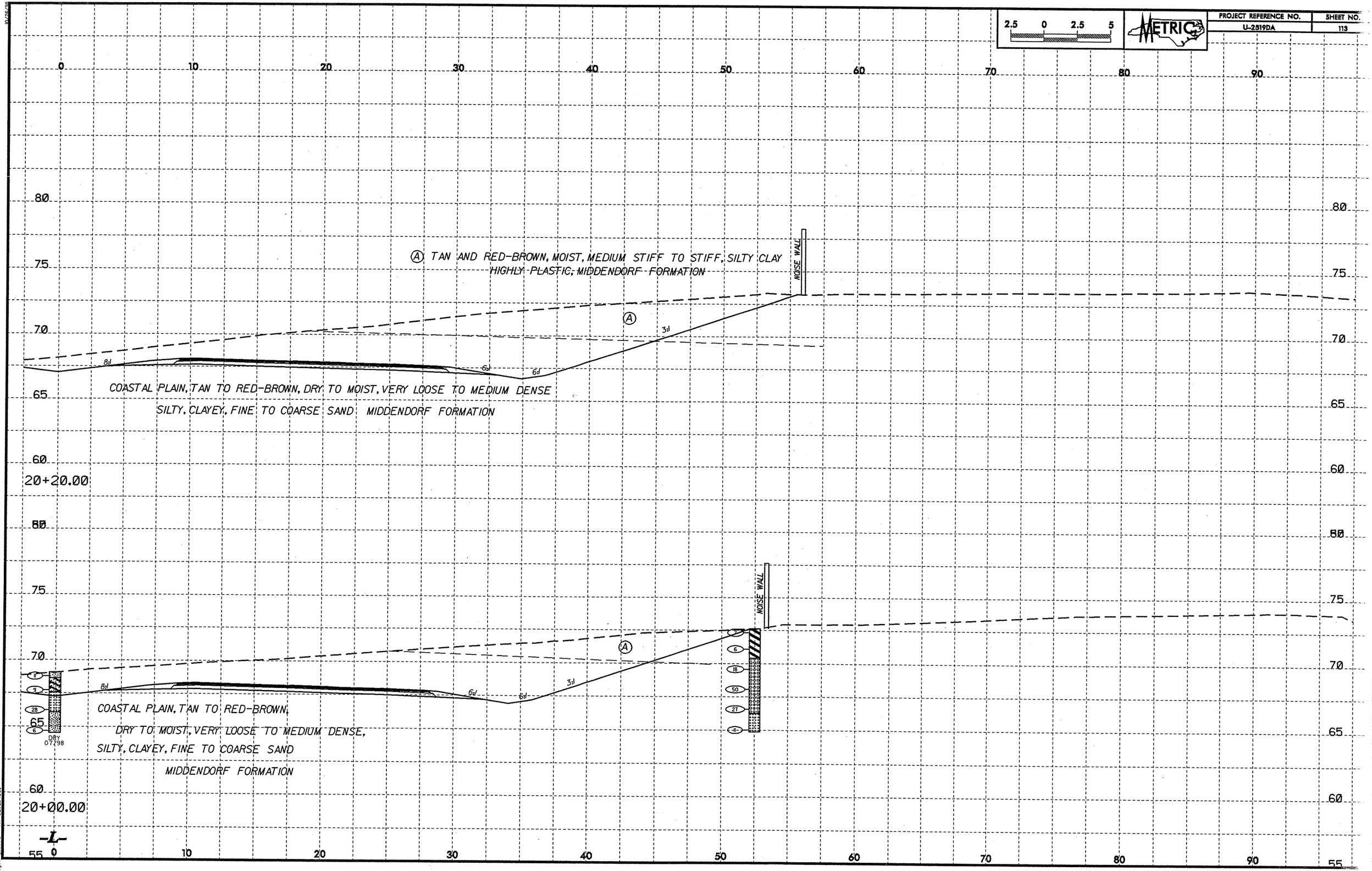
2.5 0 2.5 5

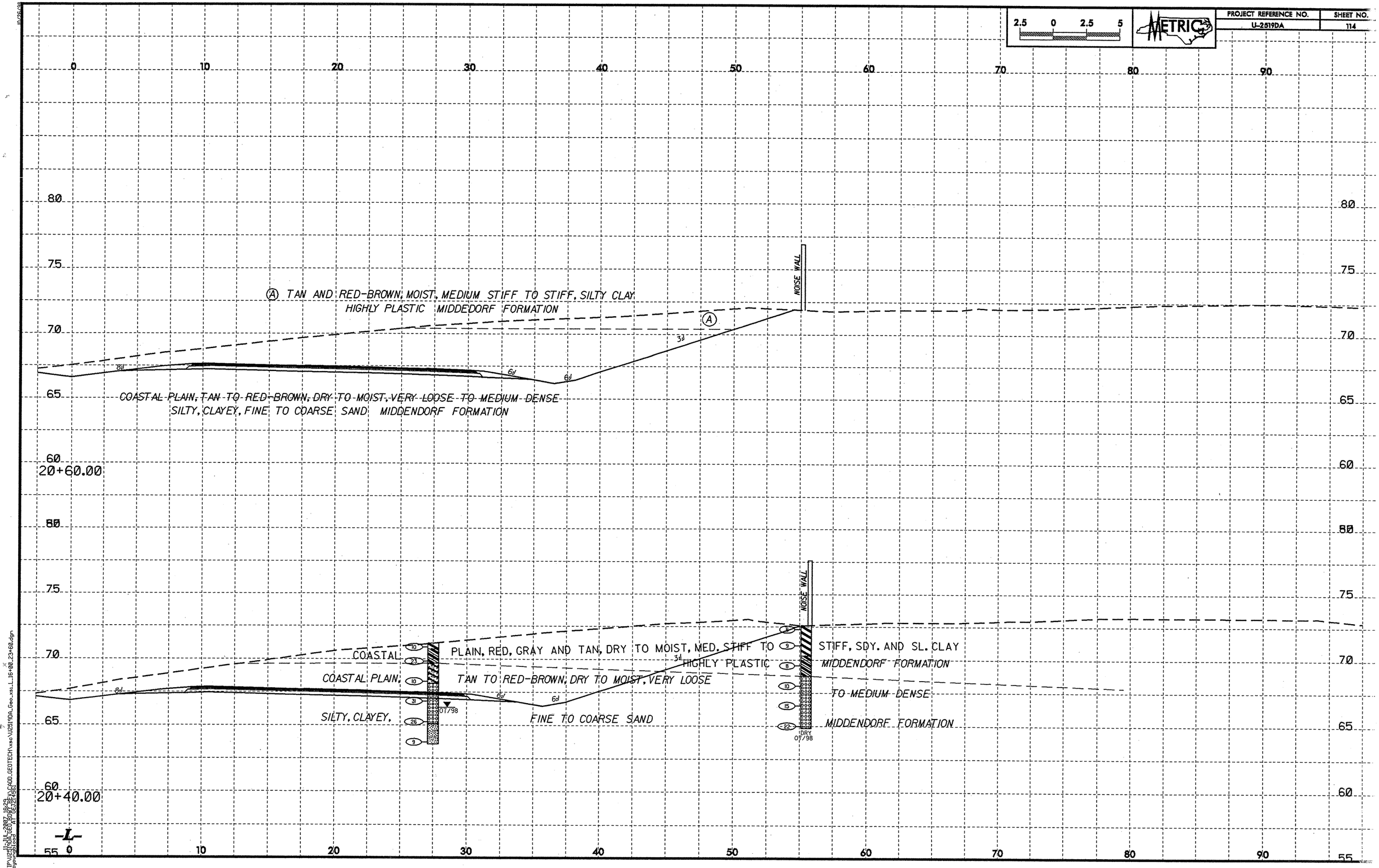
METRIC



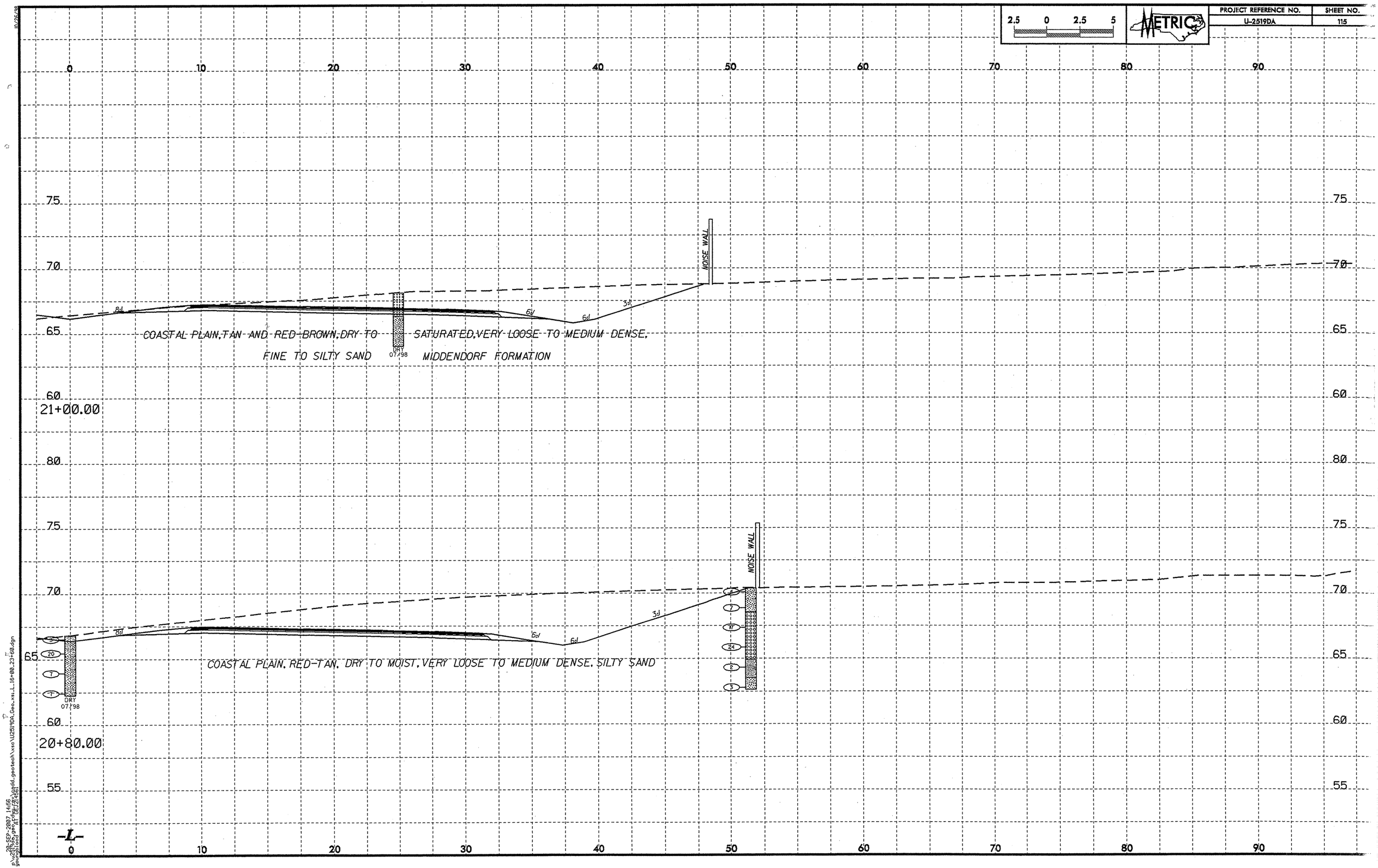

2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
112
19+80.00
TAN TO RED-BROWN, MOIST, VERY STIFF TO HARD, SILTY CLAY, HIGHLY PLASTIC
COASTAL PLAIN, TAN TO RED-BROWN, DRY TO MOIST, VERY LOOSE TO MEDIUM DENSE, SILTY, FINE TO COARSE SAND MIDDENDORF FORMATION
NOISE WALL
19+60.00
COASTAL PLAIN, TAN TO RED-BROWN, DRY TO WET, VERY LOOSE TO MEDIUM DENSE, SILTY, FINE TO COARSE SAND MIDDENDORF FORMATION
DRY 07/98
19+40.00
TAN TO RED-BROWN, MOIST, VERY STIFF TO HARD, SILTY CLAY, HIGHLY PLASTIC
COASTAL PLAIN, TAN TO RED-BROWN, DRY TO WET, VERY LOOSE TO MEDIUM DENSE, SILTY, FINE TO COARSE SAND MIDDENDORF FORMATION
-L-

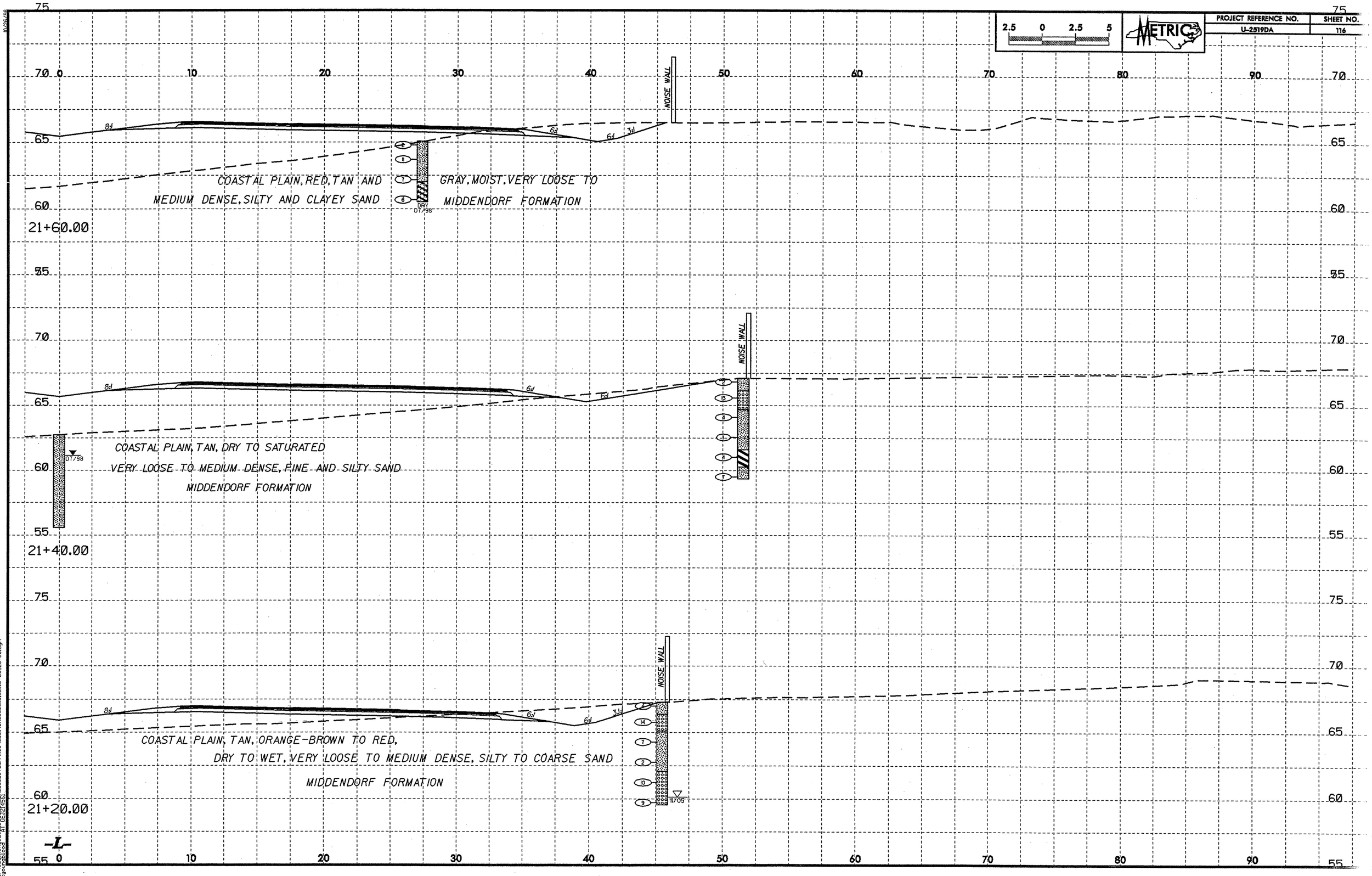
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	113

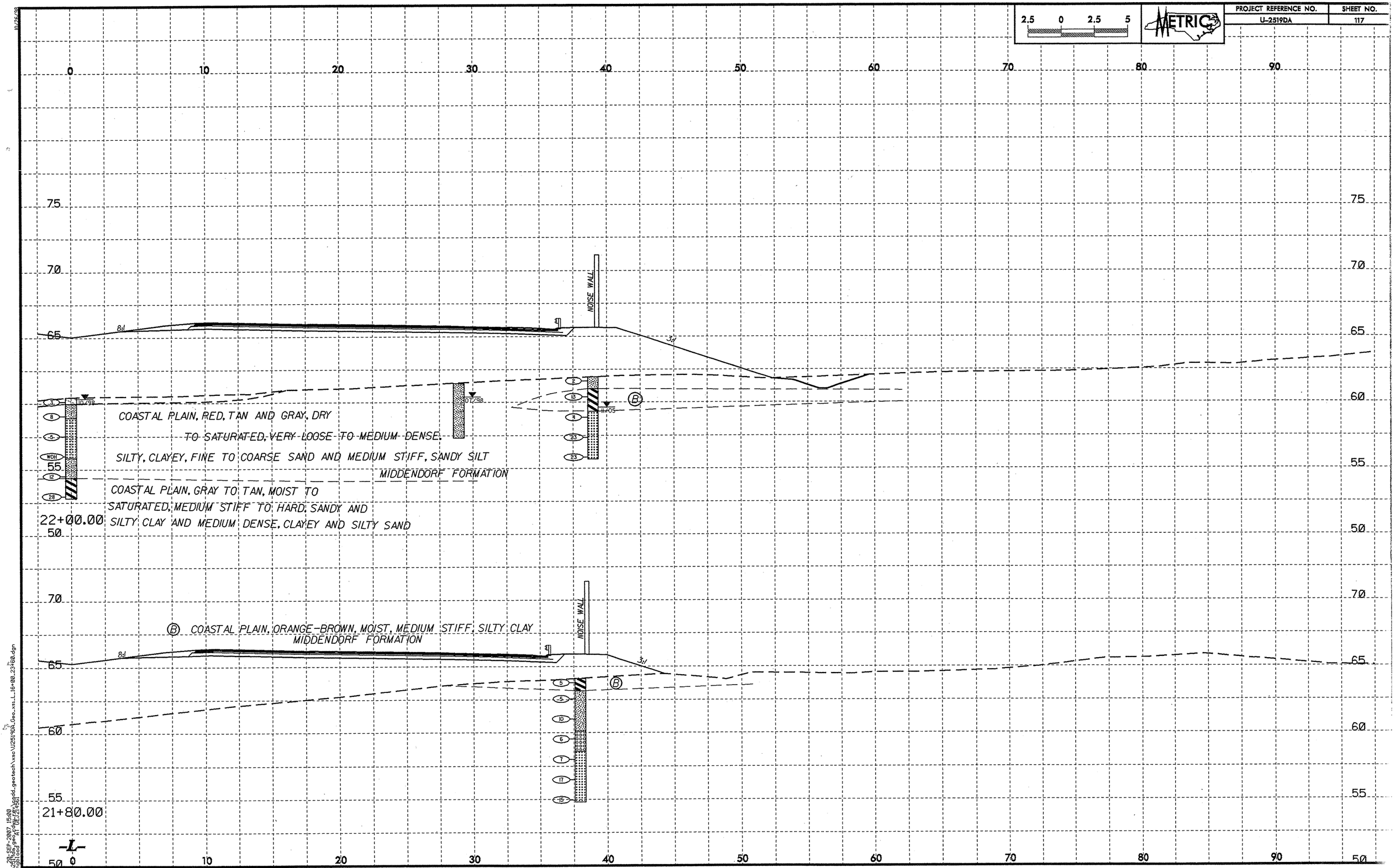



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
114
0 10 20 30 40 50 60 70 80 90
80
75
70
65
60
20+60.00
80
75
70
65
60
20+40.00
55
Ⓐ TAN AND RED-BROWN, MOIST, MEDIUM STIFF TO STIFF, SILTY CLAY
HIGHLY PLASTIC MIDDEDORF FORMATION
NOISE WALL
3d
8d
6d
6d
COASTAL PLAIN, TAN TO RED-BROWN, DRY TO MOIST, VERY LOOSE TO MEDIUM DENSE
SILTY, CLAYEY, FINE TO COARSE SAND MIDDENDORF FORMATION
NOISE WALL
COASTAL PLAIN, RED, GRAY AND TAN, DRY TO MOIST, MED. STIFF TO STIFF, SDY. AND SL. CLAY
HIGHLY PLASTIC MIDDENDORF FORMATION
COASTAL PLAIN, TAN TO RED-BROWN, DRY TO MOIST, VERY LOOSE TO MEDIUM DENSE
SILTY, CLAYEY, FINE TO COARSE SAND MIDDENDORF FORMATION
10
23
10
31
26
9
07/98
5
9
8
10
15
22
DRY
07/98
3d
8d
6d
6d
-L-

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	115




PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
116
METRIC
2.5 0 2.5 5
NOISE WALL
COASTAL PLAIN, RED, TAN AND
MEDIUM DENSE, SILTY AND CLAYEY SAND
GRAY, MOIST, VERY LOOSE TO
MIDDENDORF FORMATION
DRY 01/98
21+60.00
COASTAL PLAIN, TAN, DRY TO SATURATED
VERY LOOSE TO MEDIUM DENSE, FINE AND SILTY SAND
MIDDENDORF FORMATION
01/98
21+40.00
COASTAL PLAIN, TAN, ORANGE-BROWN TO RED,
DRY TO WET, VERY LOOSE TO MEDIUM DENSE, SILTY TO COARSE SAND
MIDDENDORF FORMATION
11/05
21+20.00
-L-



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
117
0 10 20 30 40 50 60 70 80 90
75
70
65
60
55
50
NOISE WALL
8:1
3:1
COASTAL PLAIN, RED, TAN AND GRAY, DRY
TO SATURATED, VERY LOOSE TO MEDIUM DENSE,
SILTY, CLAYEY, FINE TO COARSE SAND AND MEDIUM STIFF, SANDY SILT
MIDDENDORF FORMATION
COASTAL PLAIN, GRAY TO TAN, MOIST TO
SATURATED, MEDIUM STIFF TO HARD, SANDY AND
SILTY CLAY AND MEDIUM DENSE, CLAYEY AND SILTY SAND
22+00.00
B COASTAL PLAIN, ORANGE-BROWN, MOIST, MEDIUM STIFF, SILTY CLAY
MIDDENDORF FORMATION
21+80.00
-L-

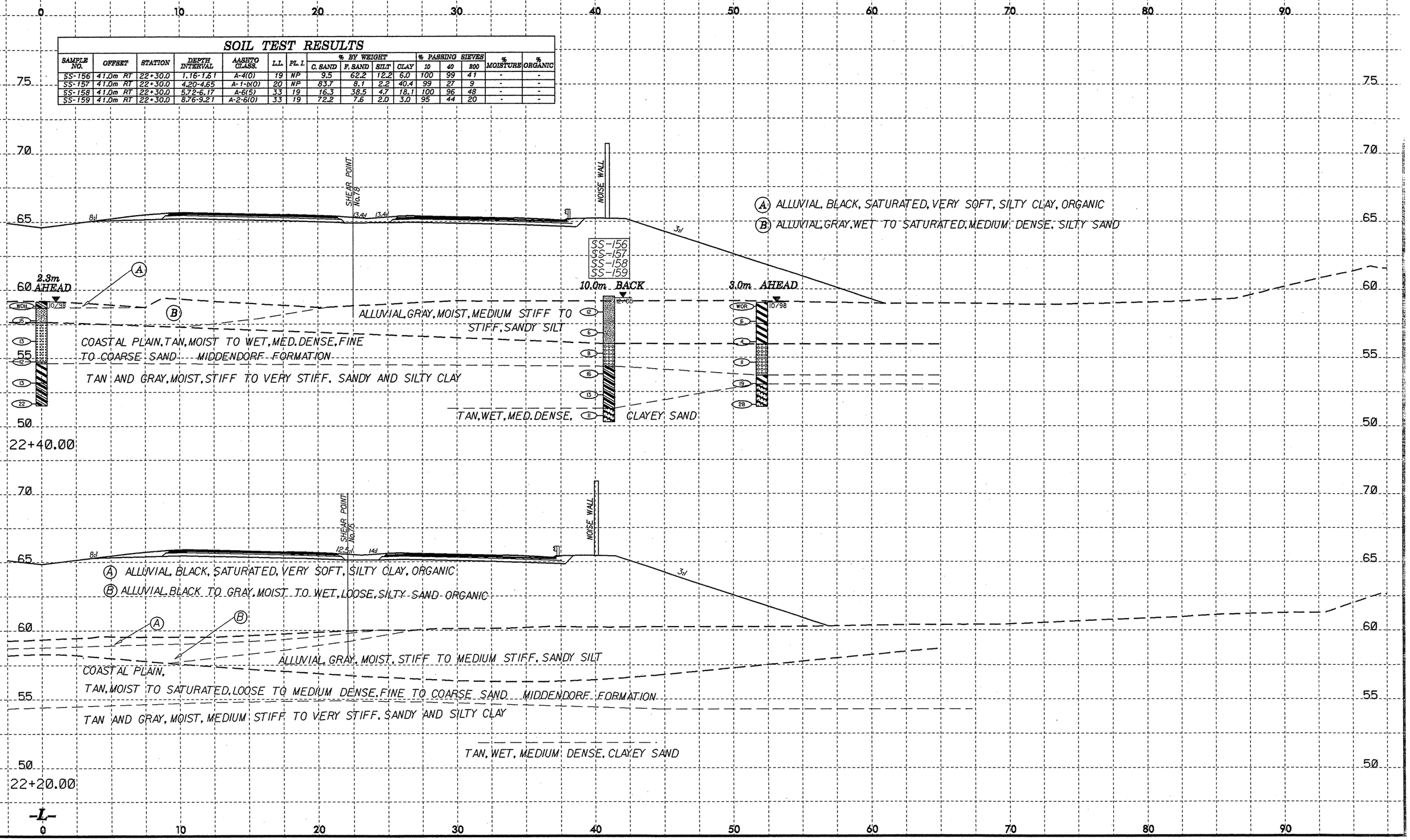
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	118

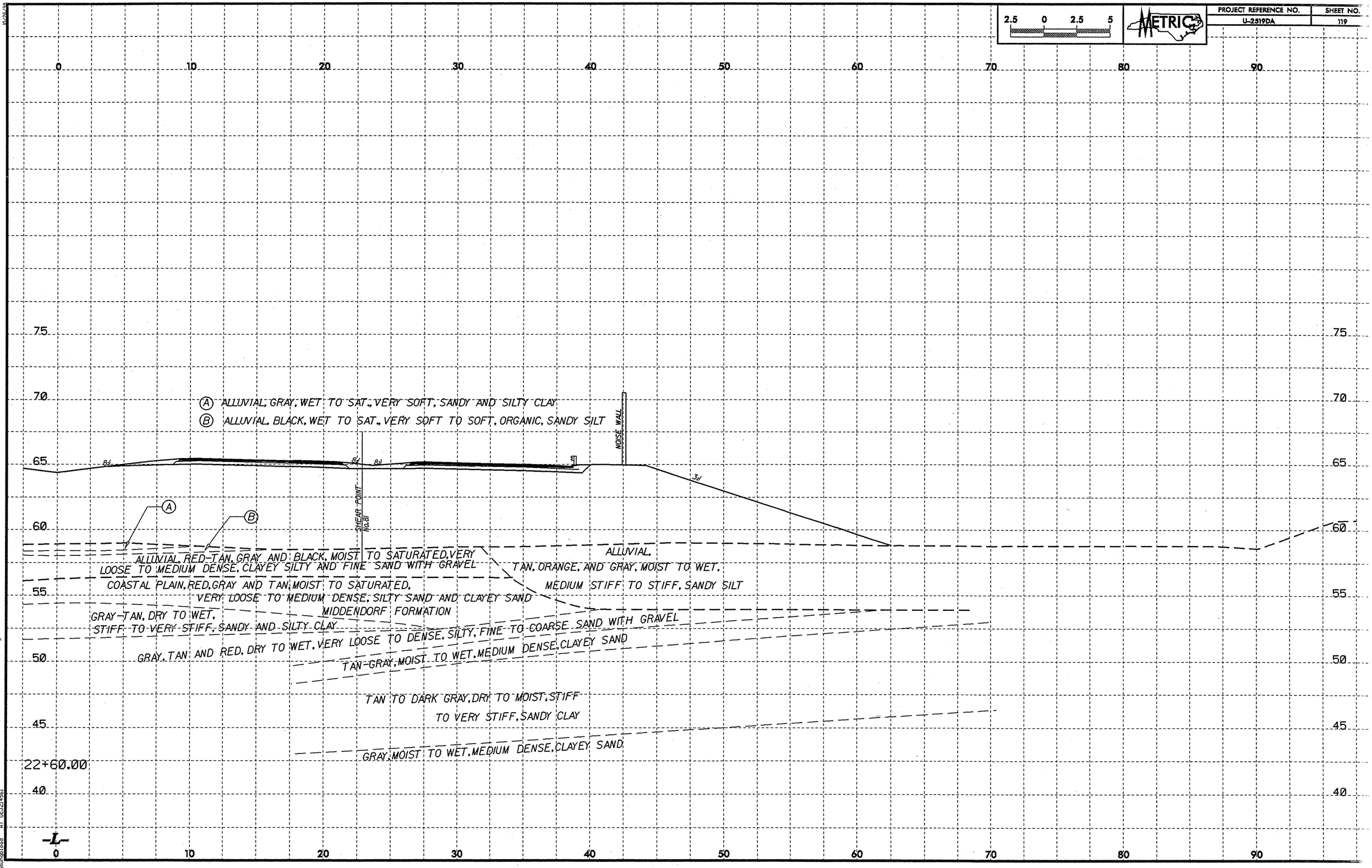
2.5 0 2.5 5

METRIC

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-156	41.0m RT	22+30.0	1.16-1.61	A-4(0)	19	NP	9.5	62.2	12.2	6.0	100	99	41	-	-
SS-157	41.0m RT	22+30.0	4.20-4.65	A-1-b(0)	20	NP	83.7	8.1	2.2	40.4	99	27	9	-	-
SS-158	41.0m RT	22+30.0	5.72-6.17	A-6(5)	33	19	16.3	38.5	4.7	18.1	100	96	48	-	-
SS-159	41.0m RT	22+30.0	8.76-9.21	A-2-6(0)	33	19	72.2	7.6	2.0	3.0	95	44	20	-	-




2.5 0 2.5 5
METRIC
0 10 20 30 40 50 60 70 80 90
75
70
65
60
55
50
45
40
Ⓐ ALLUVIAL, GRAY, WET TO SAT., VERY SOFT, SANDY AND SILTY CLAY
Ⓑ ALLUVIAL, BLACK, WET TO SAT., VERY SOFT TO SOFT, ORGANIC, SANDY SILT
NOISE WALL
SHEAR POINT No.81
8:1
3:1
ALLUVIAL, RED-TAN, GRAY AND BLACK, MOIST TO SATURATED, VERY LOOSE TO MEDIUM DENSE, CLAYEY SILTY AND FINE SAND WITH GRAVEL
ALLUVIAL, TAN, ORANGE, AND GRAY, MOIST TO WET, MEDIUM STIFF TO STIFF, SANDY SILT
COASTAL PLAIN, RED, GRAY AND TAN, MOIST TO SATURATED, VERY LOOSE TO MEDIUM DENSE, SILTY SAND AND CLAYEY SAND
MIDDENDORF FORMATION
GRAY-TAN, DRY TO WET, STIFF TO VERY STIFF, SANDY AND SILTY CLAY
GRAY, TAN AND RED, DRY TO WET, VERY LOOSE TO DENSE, SILTY, FINE TO COARSE SAND WITH GRAVEL
TAN-GRAY, MOIST TO WET, MEDIUM DENSE, CLAYEY SAND
TAN TO DARK GRAY, DRY TO MOIST, STIFF TO VERY STIFF, SANDY CLAY
GRAY, MOIST TO WET, MEDIUM DENSE, CLAYEY SAND
22+60.00
-L-

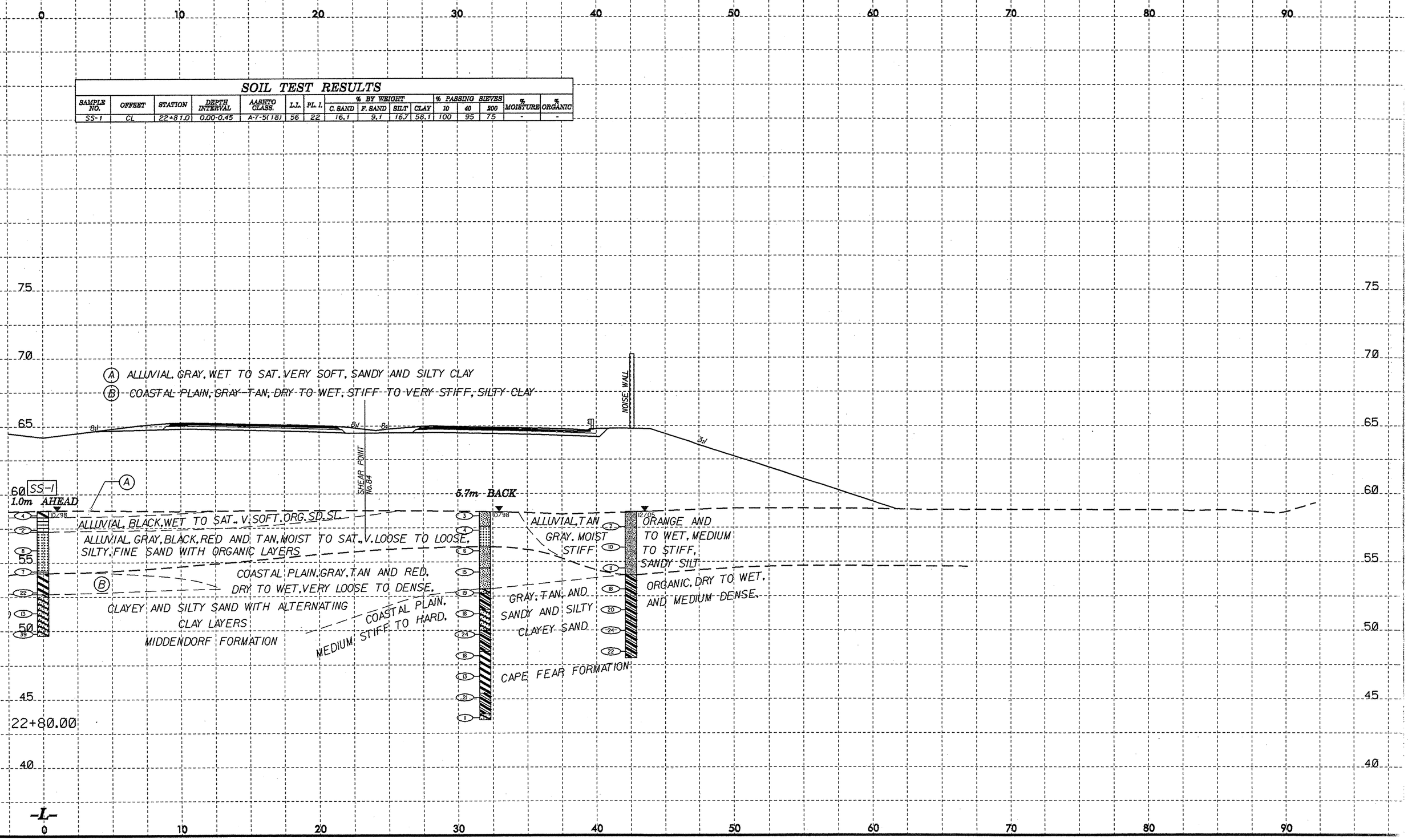
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	120

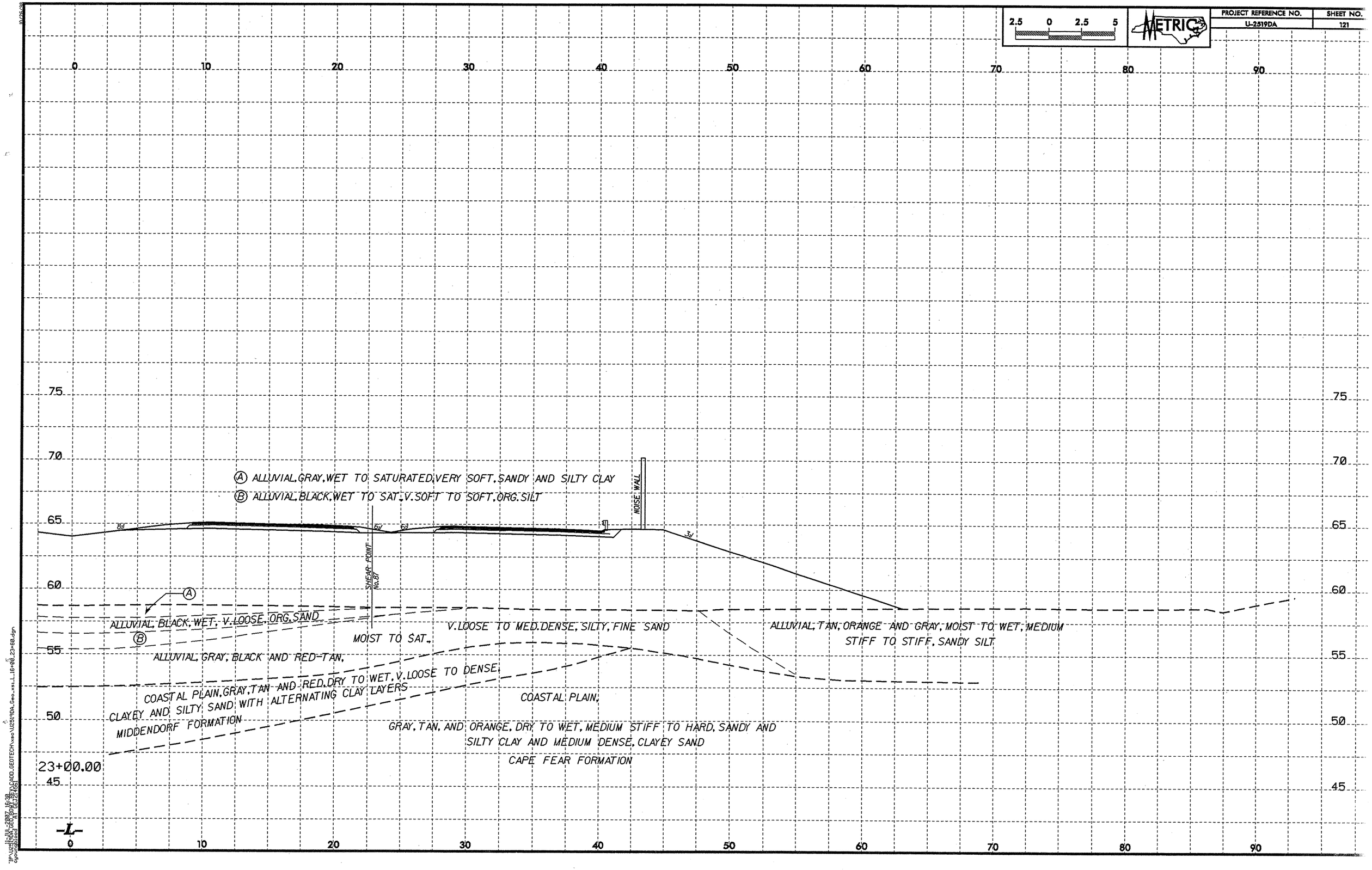
2.5 0 2.5 5

METRIC

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-1	CL	22+81.0	0.00-0.45	A-7-5(18)	56	22	16.1	9.1	16.7	58.1	100	95	75	-	-

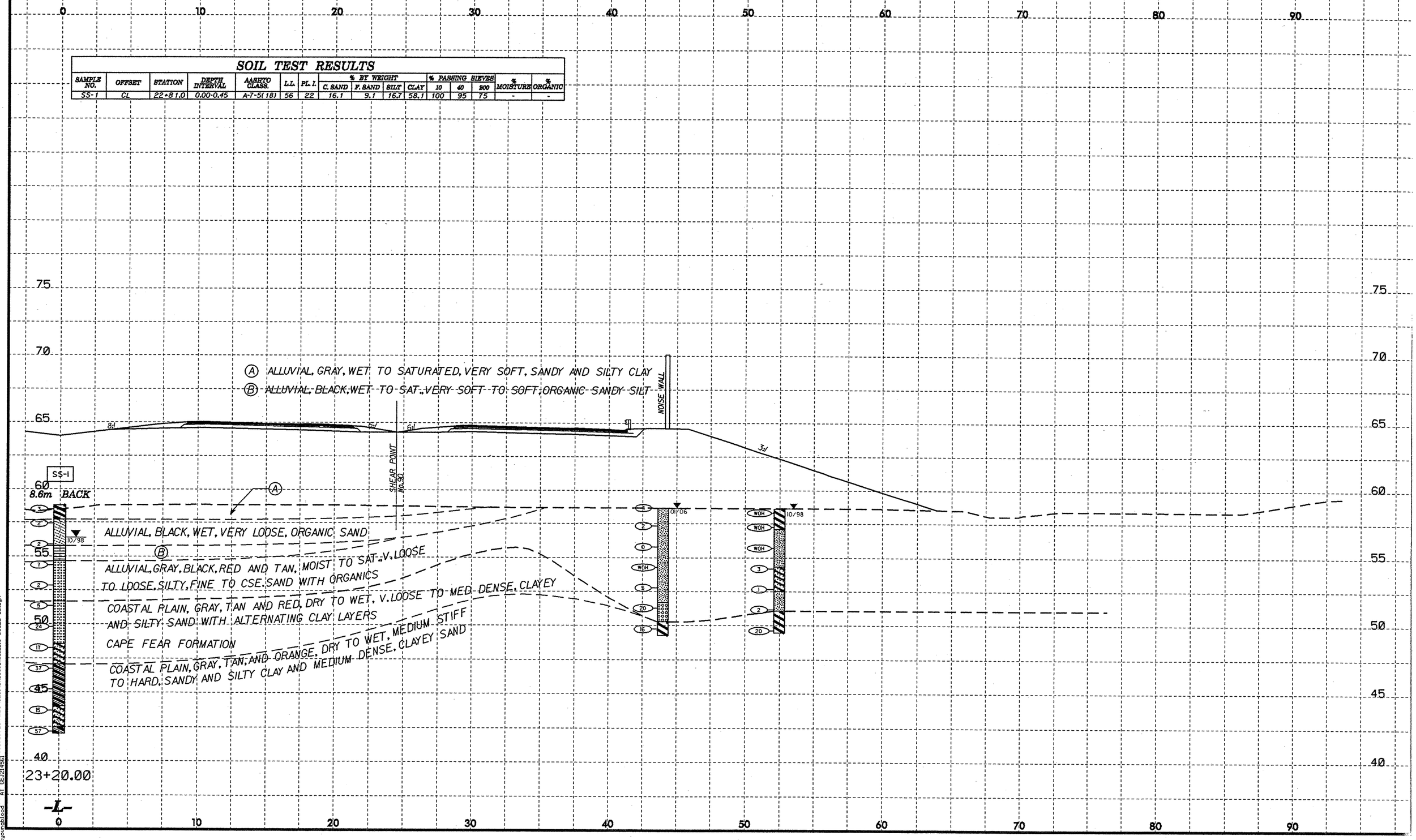



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
121
0 10 20 30 40 50 60 70 80 90
75
70
65
60
55
50
45
Ⓐ ALLUVIAL, GRAY, WET TO SATURATED, VERY SOFT, SANDY AND SILTY CLAY
Ⓑ ALLUVIAL, BLACK, WET TO SAT., V. SOFT TO SOFT, ORG. SILT
NOISE WALL
SHEAR POINT No. 87
ALLUVIAL, BLACK, WET, V. LOOSE, ORG. SAND
MOIST TO SAT.
V. LOOSE TO MED. DENSE, SILTY, FINE SAND
ALLUVIAL, TAN, ORANGE AND GRAY, MOIST TO WET, MEDIUM STIFF TO STIFF, SANDY SILT
ALLUVIAL, GRAY, BLACK AND RED-TAN,
COASTAL PLAIN, GRAY, TAN AND RED, DRY TO WET, V. LOOSE TO DENSE, CLAYEY AND SILTY SAND WITH ALTERNATING CLAY LAYERS
MIDDENDORF FORMATION
COASTAL PLAIN,
GRAY, TAN, AND ORANGE, DRY TO WET, MEDIUM STIFF TO HARD, SANDY AND SILTY CLAY AND MEDIUM DENSE, CLAYEY SAND
CAPE FEAR FORMATION
23+00.00
-L-

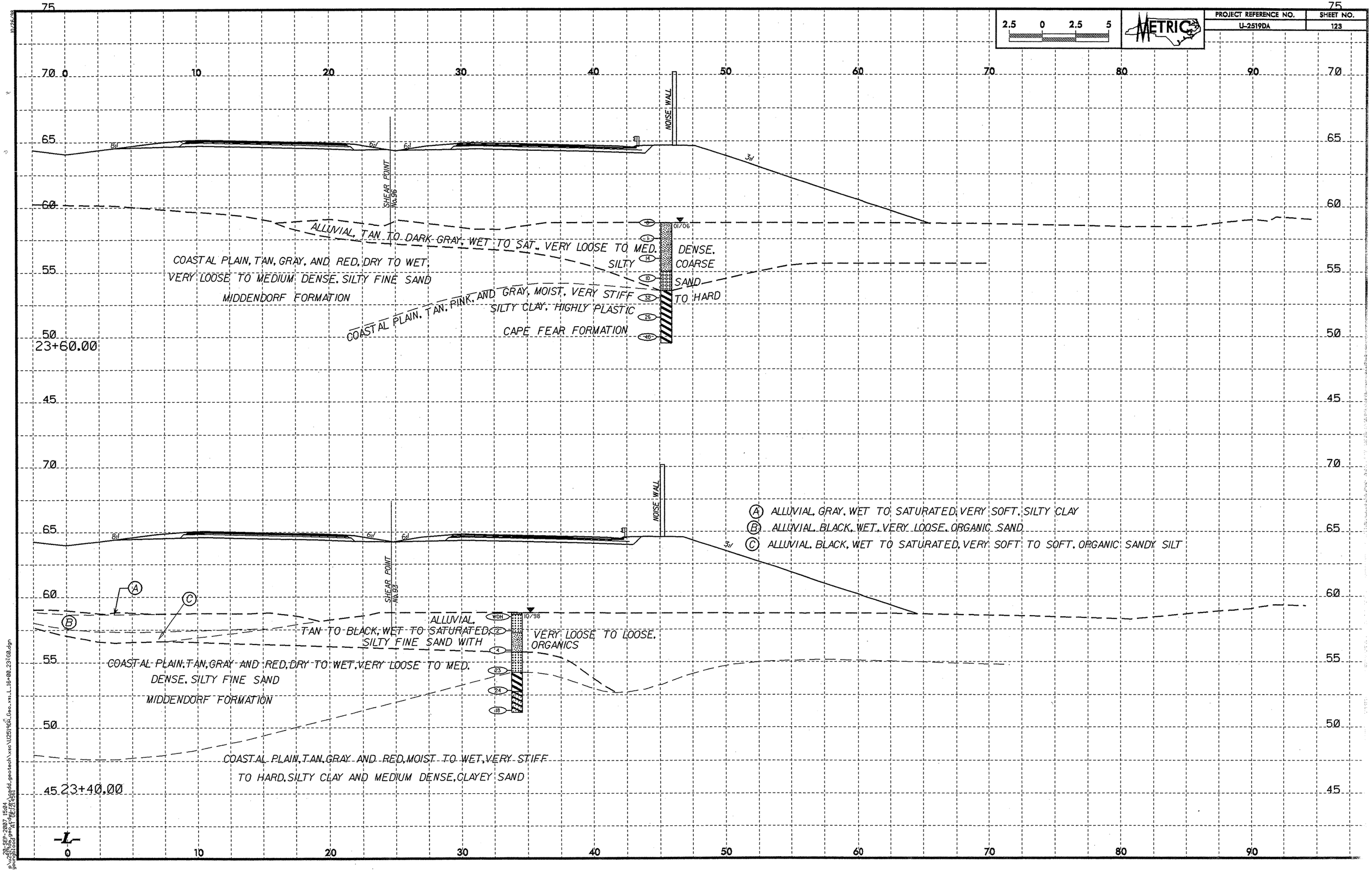
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	122

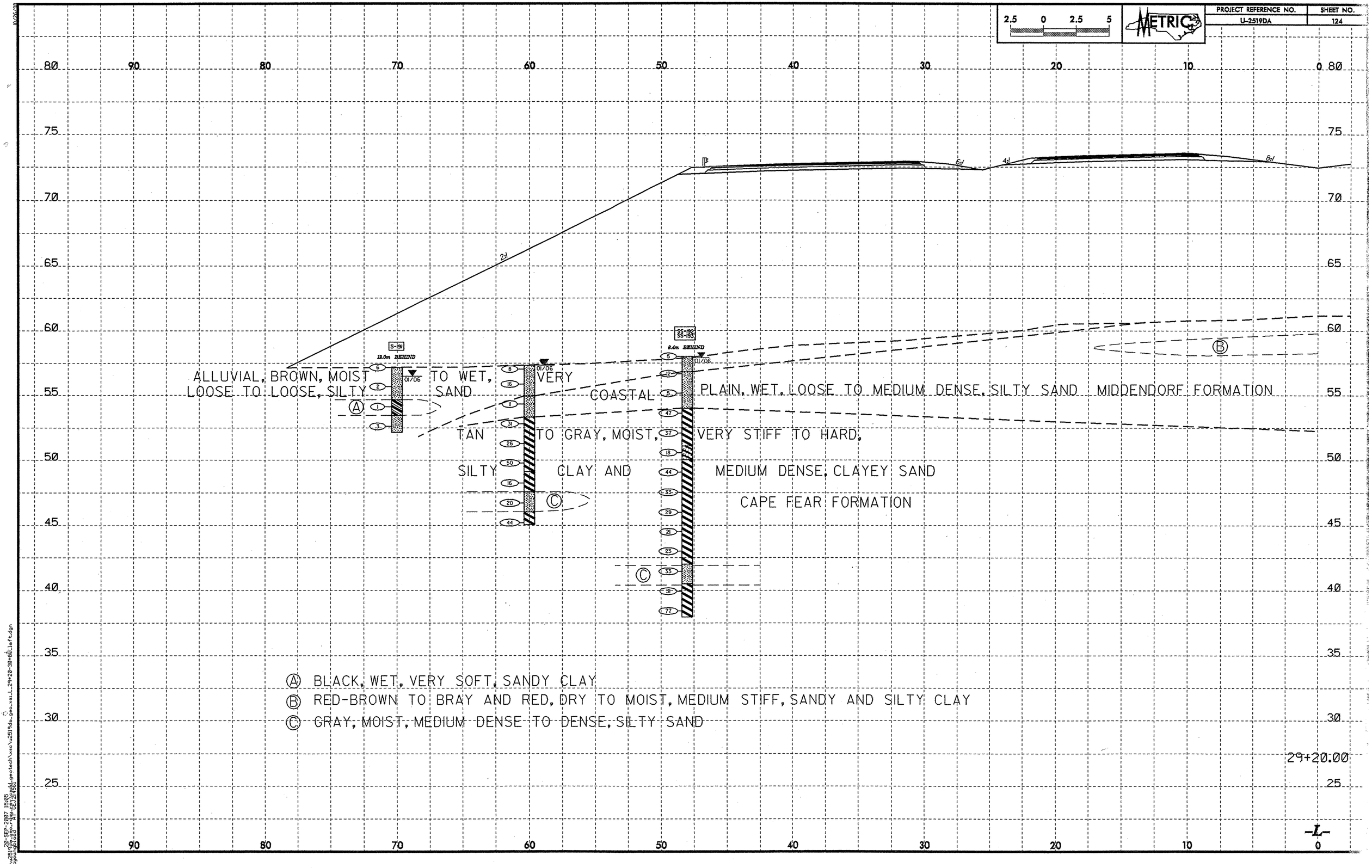
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-1	CL	22+81.0	0.00-0.45	A-7-5(18)	56	22	16.1	9.1	16.7	58.1	100	95	75	-	-

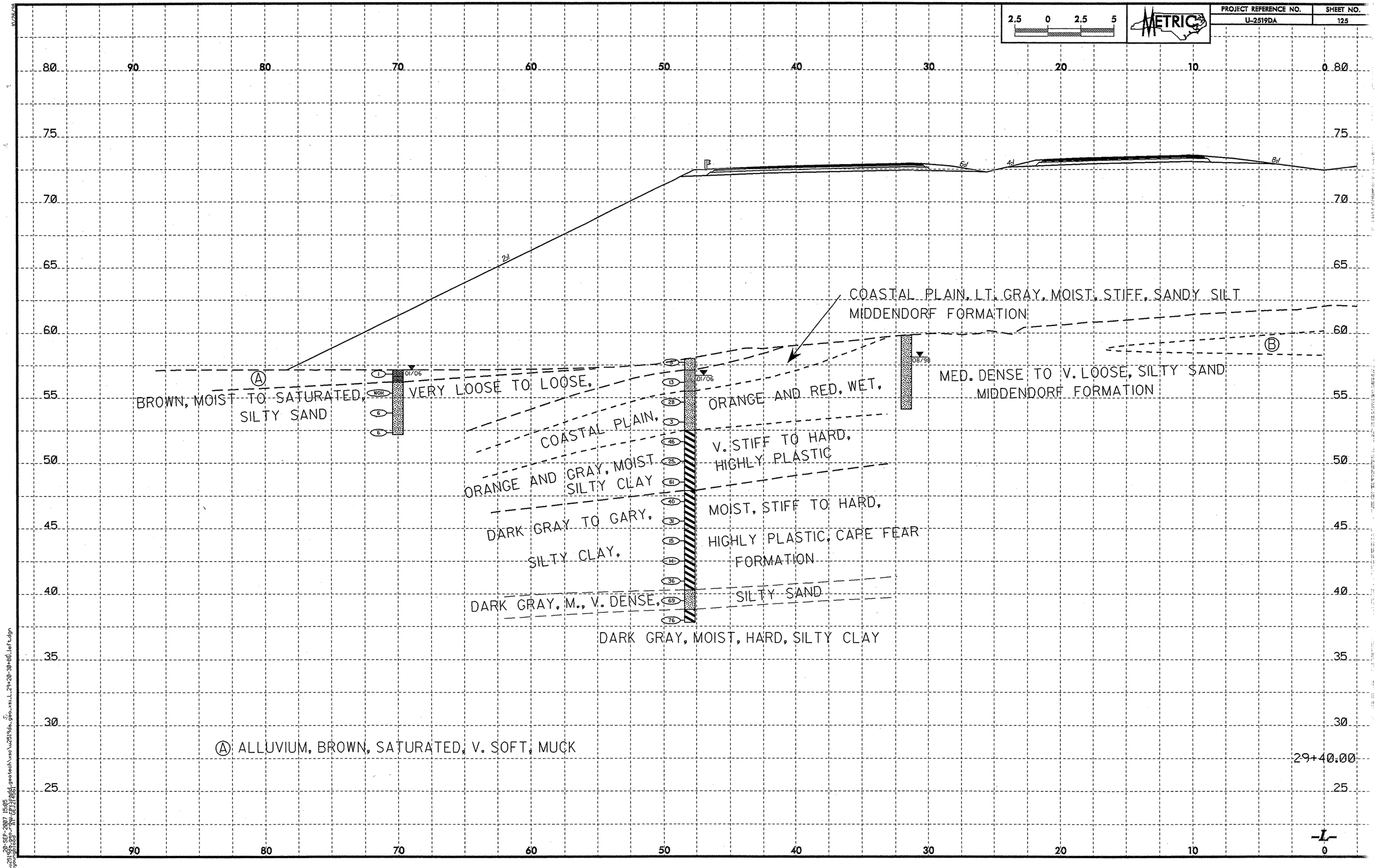


PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	123



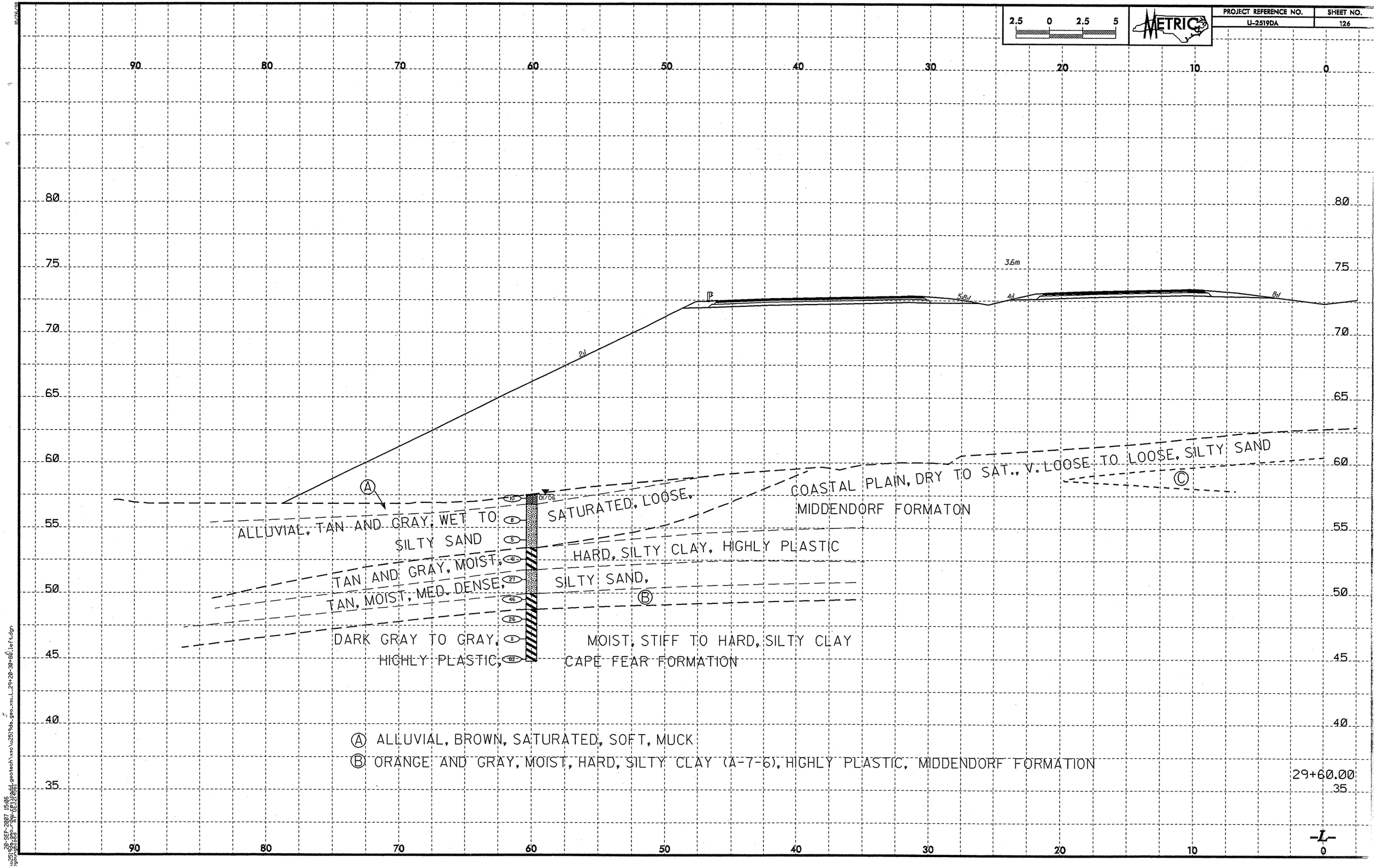


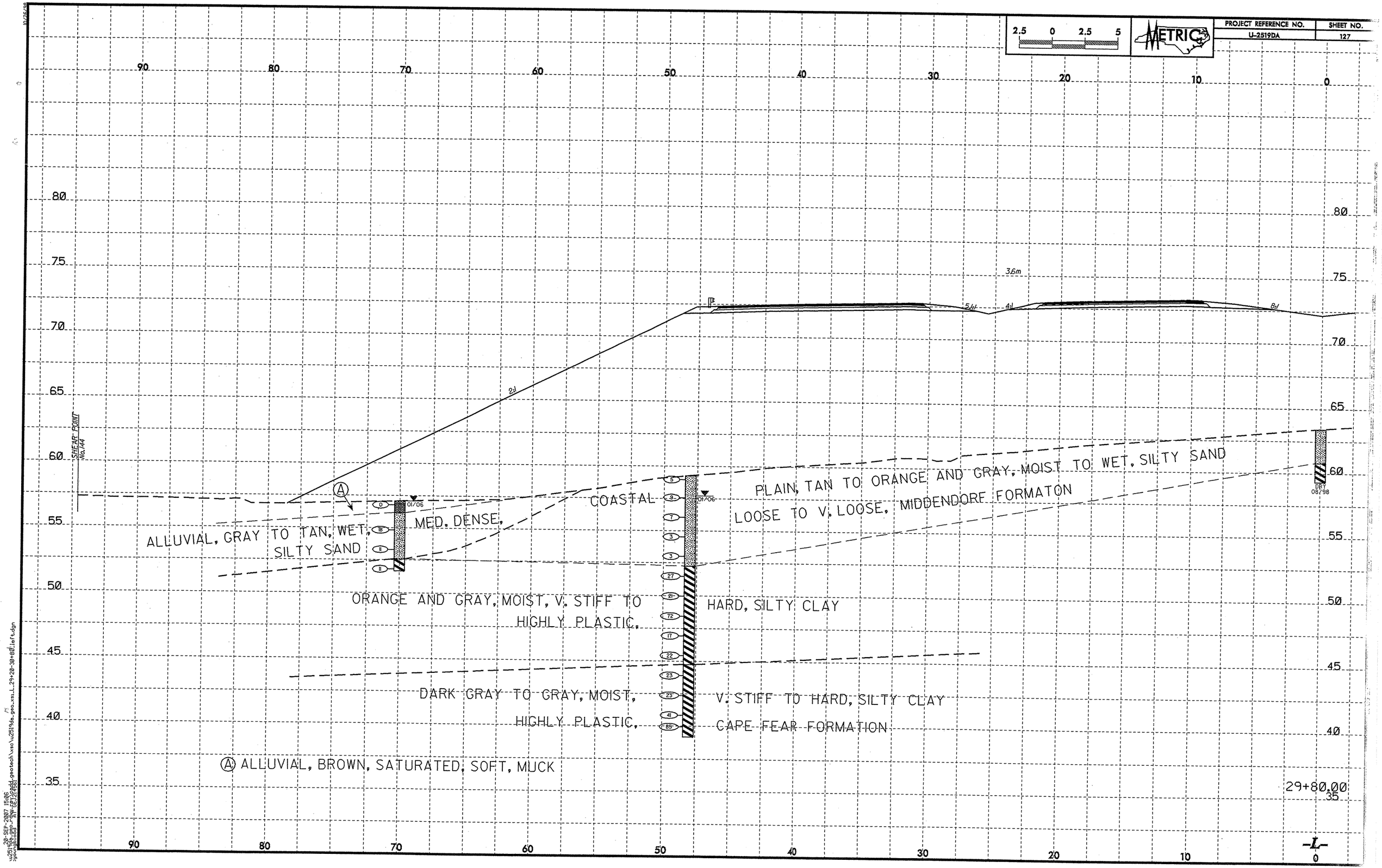
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
124
METRIC
2.5 0 2.5 5
S-191
12.0m BEHIND
SS-192
SS-193
8.4m BEHIND
01/06
ALLUVIAL, BROWN, MOIST TO WET, VERY
LOOSE TO LOOSE, SILTY SAND
COASTAL PLAIN, WET, LOOSE TO MEDIUM DENSE, SILTY SAND MIDDENDORF FORMATION
TAN TO GRAY, MOIST, VERY STIFF TO HARD,
SILTY CLAY AND MEDIUM DENSE, CLAYEY SAND
CAPE FEAR FORMATION
Ⓐ BLACK, WET, VERY SOFT, SANDY CLAY
Ⓑ RED-BROWN TO BRAY AND RED, DRY TO MOIST, MEDIUM STIFF, SANDY AND SILTY CLAY
Ⓒ GRAY, MOIST, MEDIUM DENSE TO DENSE, SILTY SAND
29+20.00
-L-



PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
125
METRIC
2.5 0 2.5 5
COASTAL PLAIN, LT. GRAY, MOIST, STIFF, SANDY SILT
MIDDENDORF FORMATION
MED. DENSE TO V. LOOSE, SILTY SAND
MIDDENDORF FORMATION
BROWN, MOIST TO SATURATED,
SILTY SAND
VERY LOOSE TO LOOSE,
ORANGE AND RED, WET,
COASTAL PLAIN,
V. STIFF TO HARD,
HIGHLY PLASTIC
ORANGE AND GRAY, MOIST
SILTY CLAY
MOIST, STIFF TO HARD,
HIGHLY PLASTIC, CAPE FEAR
FORMATION
DARK GRAY TO GARY,
SILTY CLAY,
SILTY SAND
DARK GRAY, M., V. DENSE,
DARK GRAY, MOIST, HARD, SILTY CLAY
Ⓐ ALLUVIUM, BROWN, SATURATED, V. SOFT, MUCK
29+40.00
-L-

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	126

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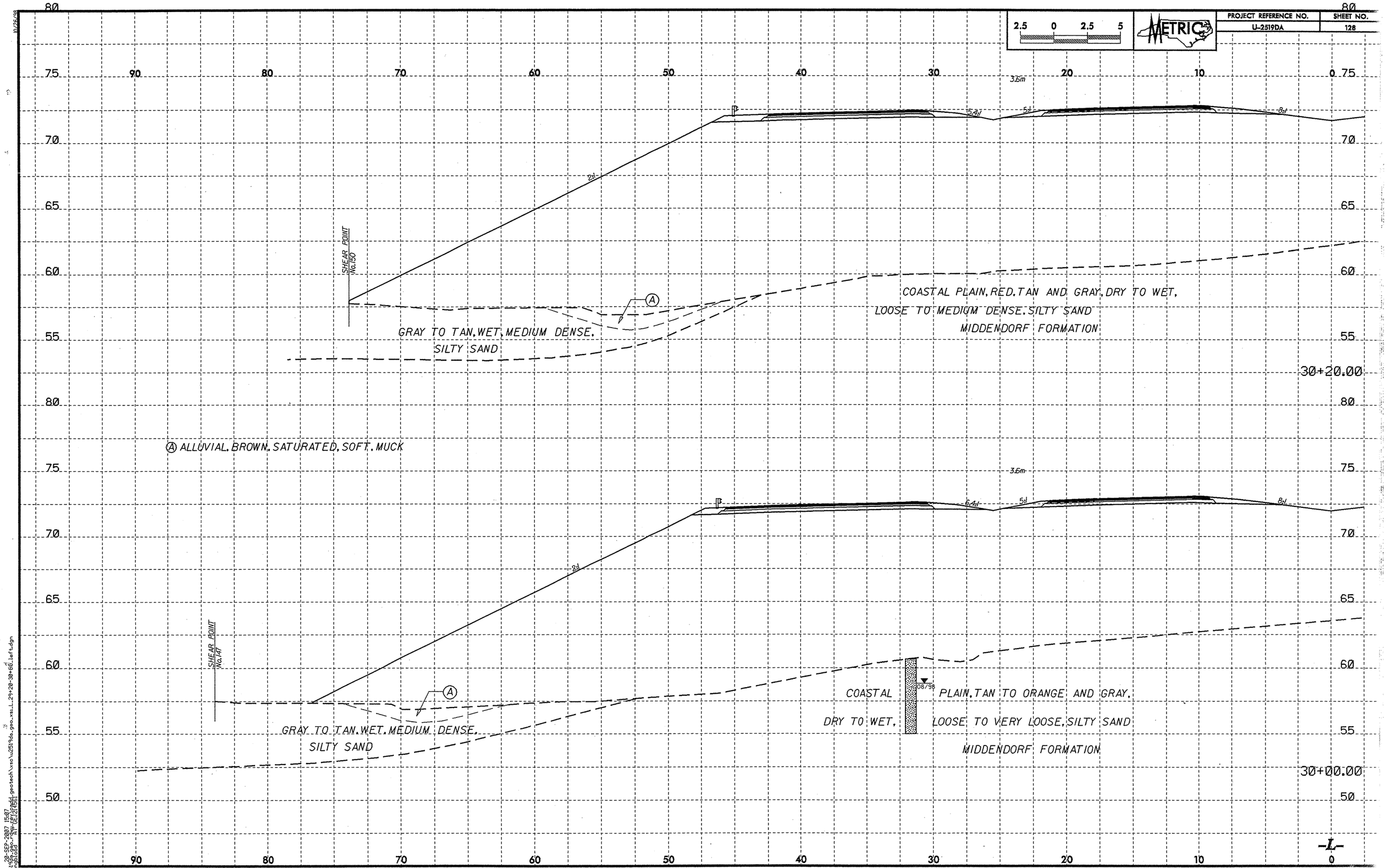
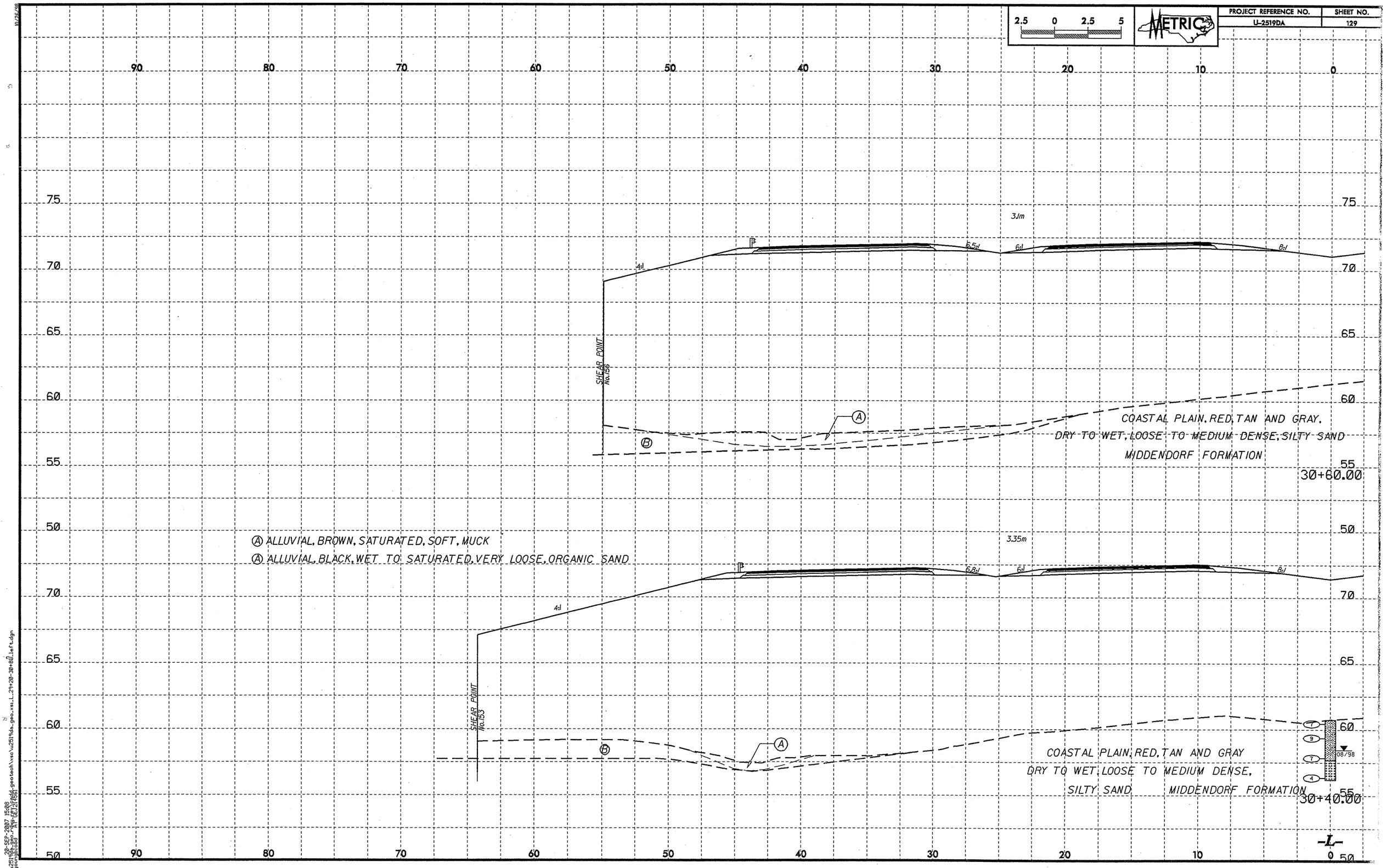
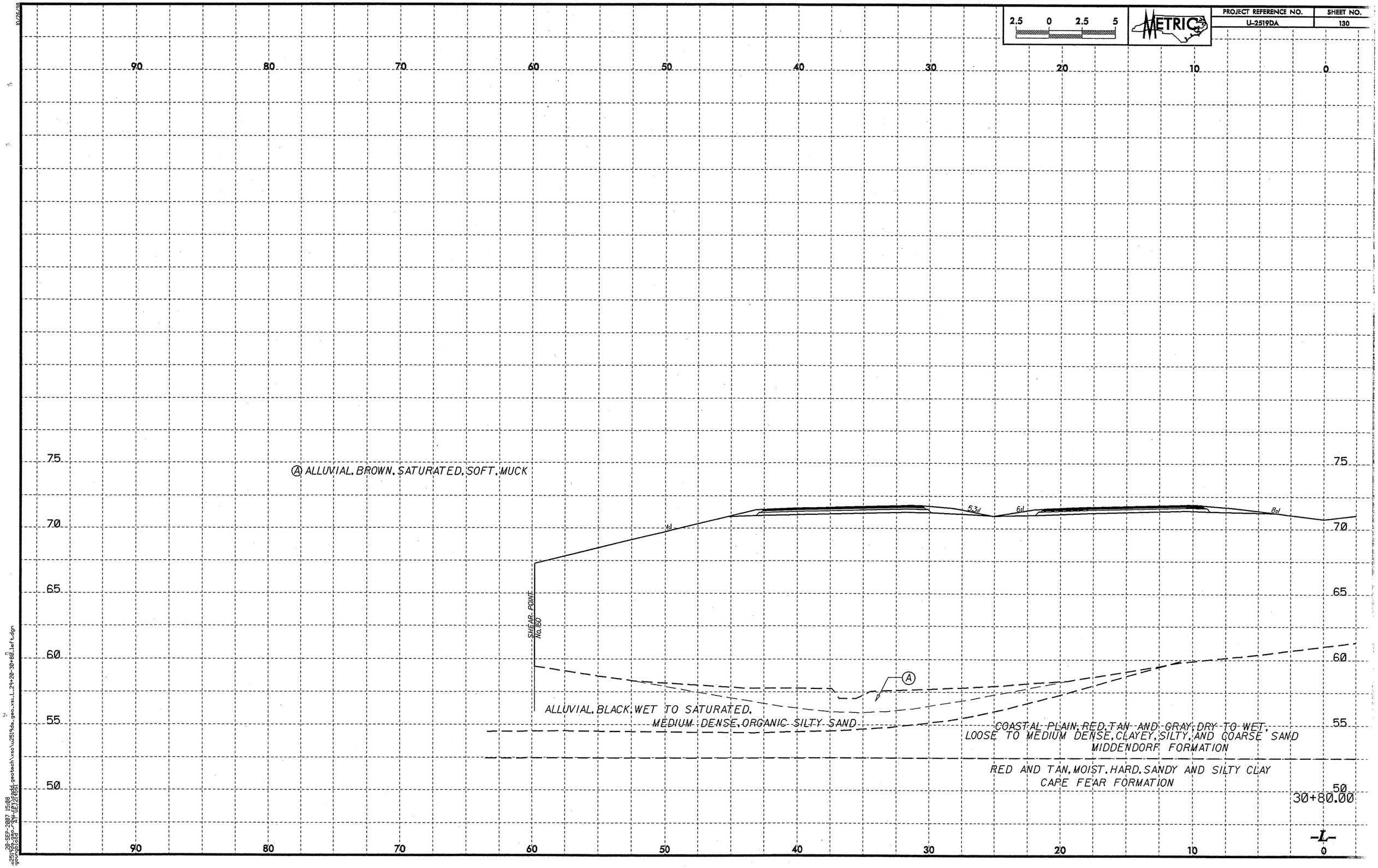
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
127
90 80 70 60 50 40 30 20 10 0
80 75 70 65 60 55 50 45 40 35
3.6m
5:1
4:1
8:1
2:1
SHEAR POINT No.144
A
01/06
ALLUVIAL, GRAY TO TAN, WET, SILTY SAND
MED. DENSE,
COASTAL PLAIN, TAN TO ORANGE AND GRAY, MOIST TO WET, SILTY SAND
LOOSE TO V. LOOSE, MIDDENDORF FORMATON
ORANGE AND GRAY, MOIST, V. STIFF TO HIGHLY PLASTIC,
HARD, SILTY CLAY
DARK GRAY TO GRAY, MOIST, HIGHLY PLASTIC,
V. STIFF TO HARD, SILTY CLAY
CAPE FEAR FORMATION
A ALLUVIAL, BROWN, SATURATED, SOFT, MUCK
DRY 08/98
29+80.00
-L-


2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
128
3.6m
15.4:1
5:1
8:1
2:1
SHEAR POINT No.150
A
GRAY TO TAN, WET, MEDIUM DENSE, SILTY SAND
COASTAL PLAIN, RED, TAN AND GRAY, DRY TO WET, LOOSE TO MEDIUM DENSE, SILTY SAND
MIDDENDORF FORMATION
30+20.00
A ALLUVIAL, BROWN, SATURATED, SOFT, MUCK
3.6m
6.4:1
5:1
8:1
2:1
SHEAR POINT No.147
A
GRAY TO TAN, WET, MEDIUM DENSE, SILTY SAND
08/98
COASTAL PLAIN, TAN TO ORANGE AND GRAY, DRY TO WET, LOOSE TO VERY LOOSE, SILTY SAND
MIDDENDORF FORMATION
30+00.00
-L-

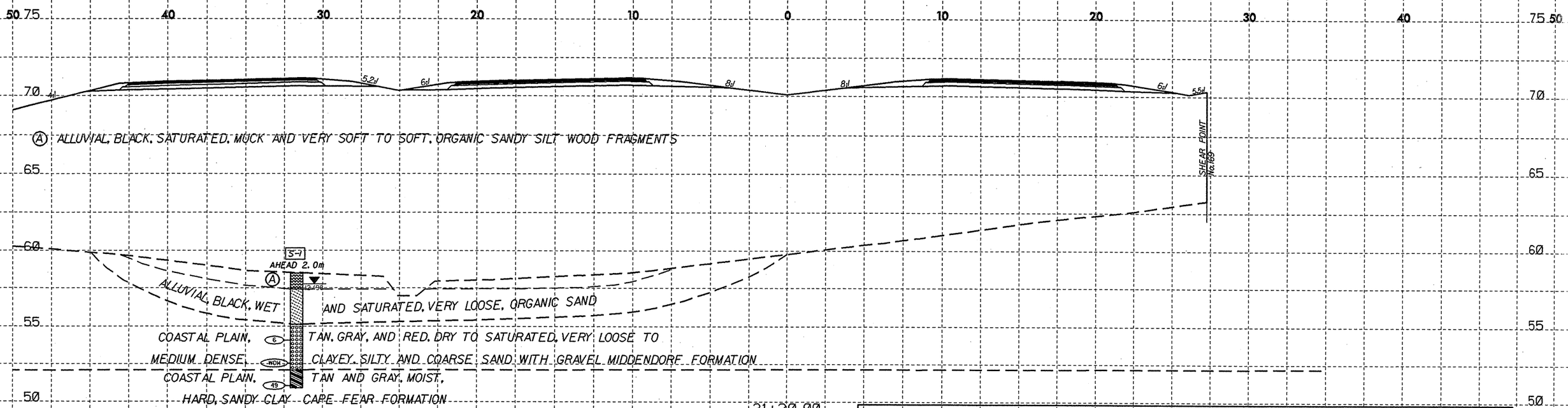
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	129





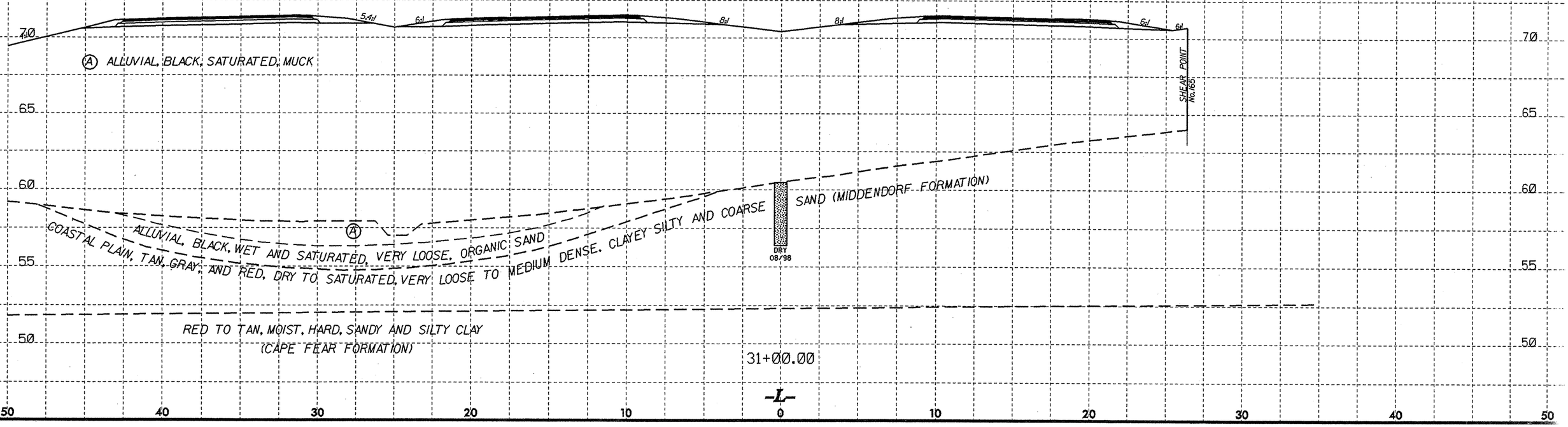
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
130
90 80 70 60 50 40 30 20 10 0
75 70 65 60 55 50
Ⓐ ALLUVIAL, BROWN, SATURATED, SOFT, MUCK
4:1
5.3:1
6:1
8:1
SHEAR POINT No.160
Ⓐ
ALLUVIAL, BLACK, WET TO SATURATED, MEDIUM DENSE, ORGANIC SILTY SAND
COASTAL PLAIN, RED, TAN AND GRAY, DRY TO WET, LOOSE TO MEDIUM DENSE, CLAYEY, SILTY, AND COARSE SAND
MIDDENDORF FORMATION
RED AND TAN, MOIST, HARD, SANDY AND SILTY CLAY
CAPE FEAR FORMATION
30+80.00
-L-

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	131

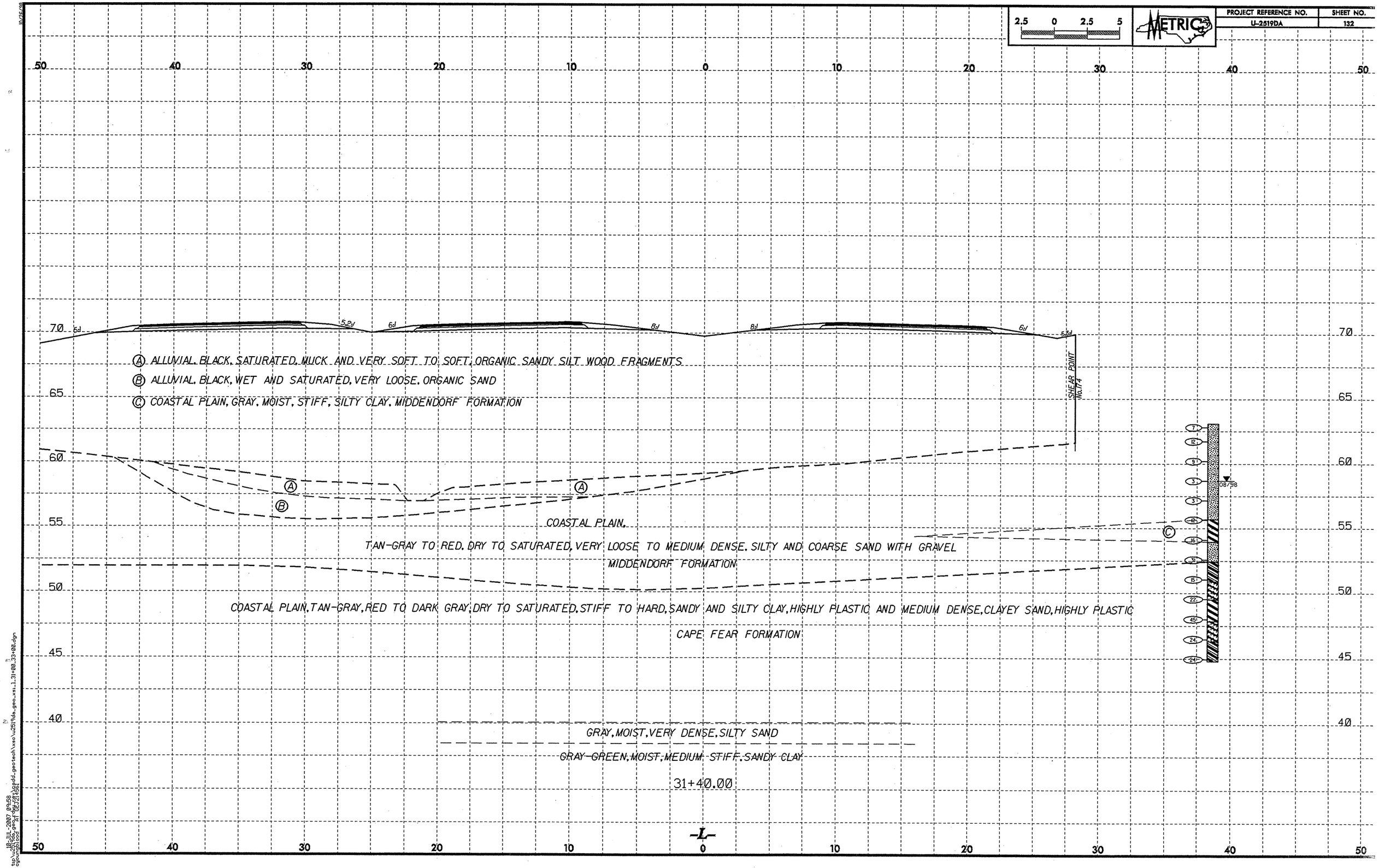


SOIL TEST RESULTS

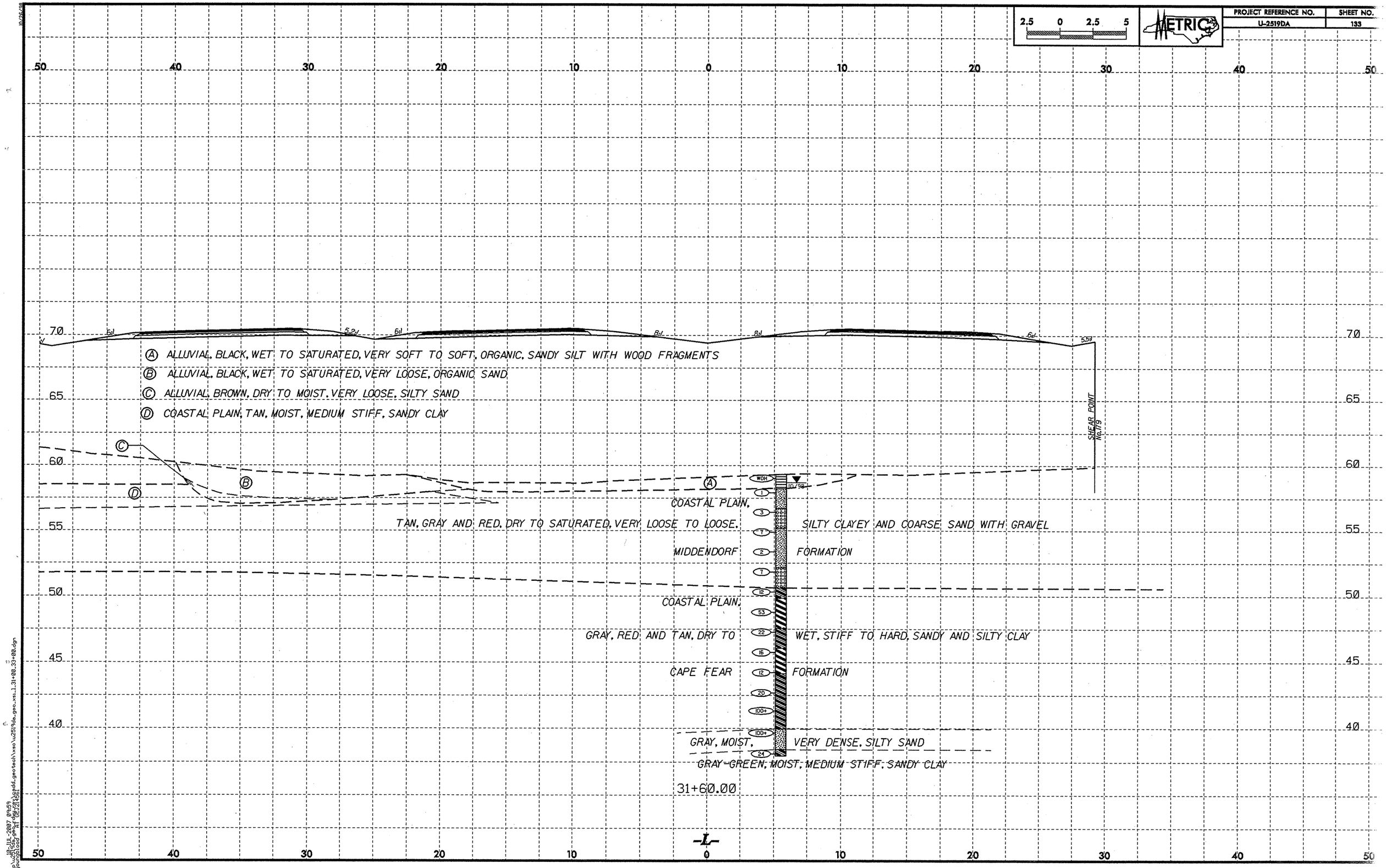
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-1	31.7m LT	31+22.0	0.00-0.61	A-2-5(0)	133	NP	45.2	25.0	19.2	10.6	100	64	34	-	-

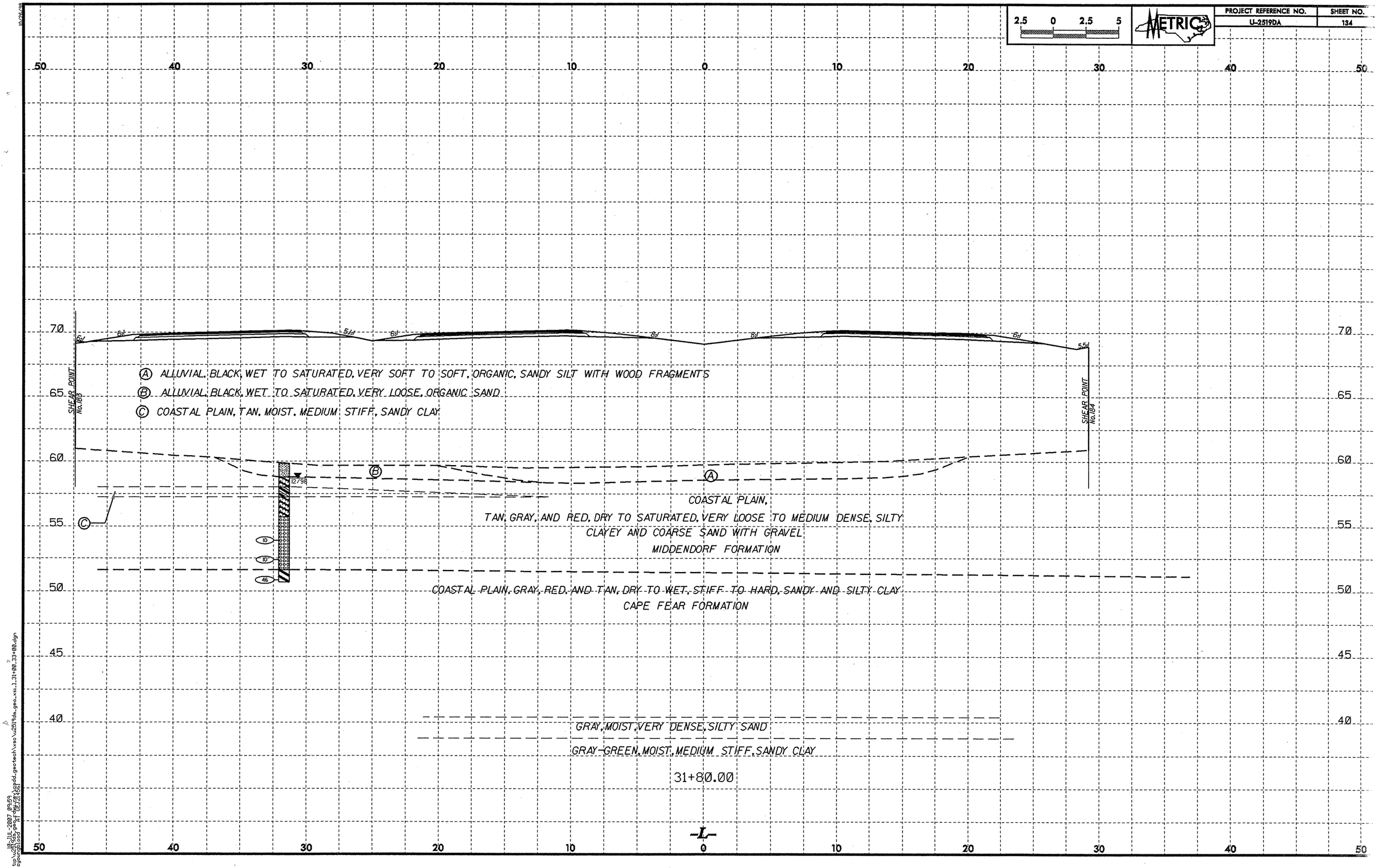


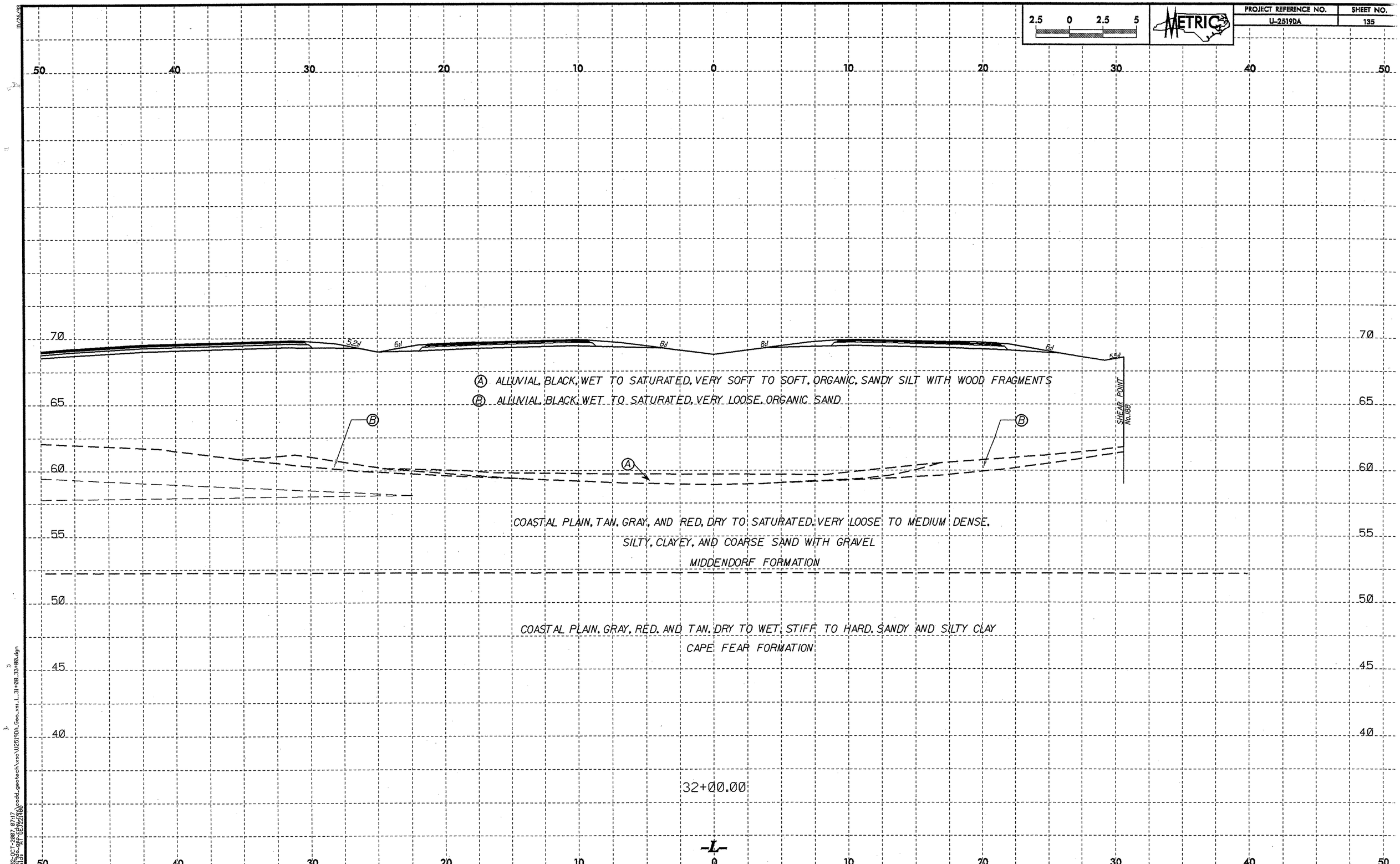
10/26/98
tsb\u2519da_geotech\xsc\u2519da_geo_xs_1_31+00_33+00.dgn
18-JUL-2007 09:58
cjoumblad
$$$$ PAGE21458


2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
132
50 40 30 20 10 0 10 20 30 40 50
70
65
60
55
50
45
40
6d
5.2d
8d
SHEAR POINT NO.14
Ⓐ ALLUVIAL, BLACK, SATURATED, MUCK AND VERY SOFT TO SOFT, ORGANIC SANDY SILT WOOD FRAGMENTS
Ⓑ ALLUVIAL, BLACK, WET AND SATURATED, VERY LOOSE, ORGANIC SAND
Ⓒ COASTAL PLAIN, GRAY, MOIST, STIFF, SILTY CLAY, MIDDENDORF FORMATION
7
12
9
3
3
18
16
31
15
22
45
24
24
08/98
COASTAL PLAIN,
TAN-GRAY TO RED, DRY TO SATURATED, VERY LOOSE TO MEDIUM DENSE, SILTY AND COARSE SAND WITH GRAVEL
MIDDENDORF FORMATION
COASTAL PLAIN, TAN-GRAY, RED TO DARK GRAY, DRY TO SATURATED, STIFF TO HARD, SANDY AND SILTY CLAY, HIGHLY PLASTIC AND MEDIUM DENSE, CLAYEY SAND, HIGHLY PLASTIC
CAPE FEAR FORMATION
GRAY, MOIST, VERY DENSE, SILTY SAND
GRAY-GREEN, MOIST, MEDIUM STIFF, SANDY CLAY
31+40.00
-L-

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	133



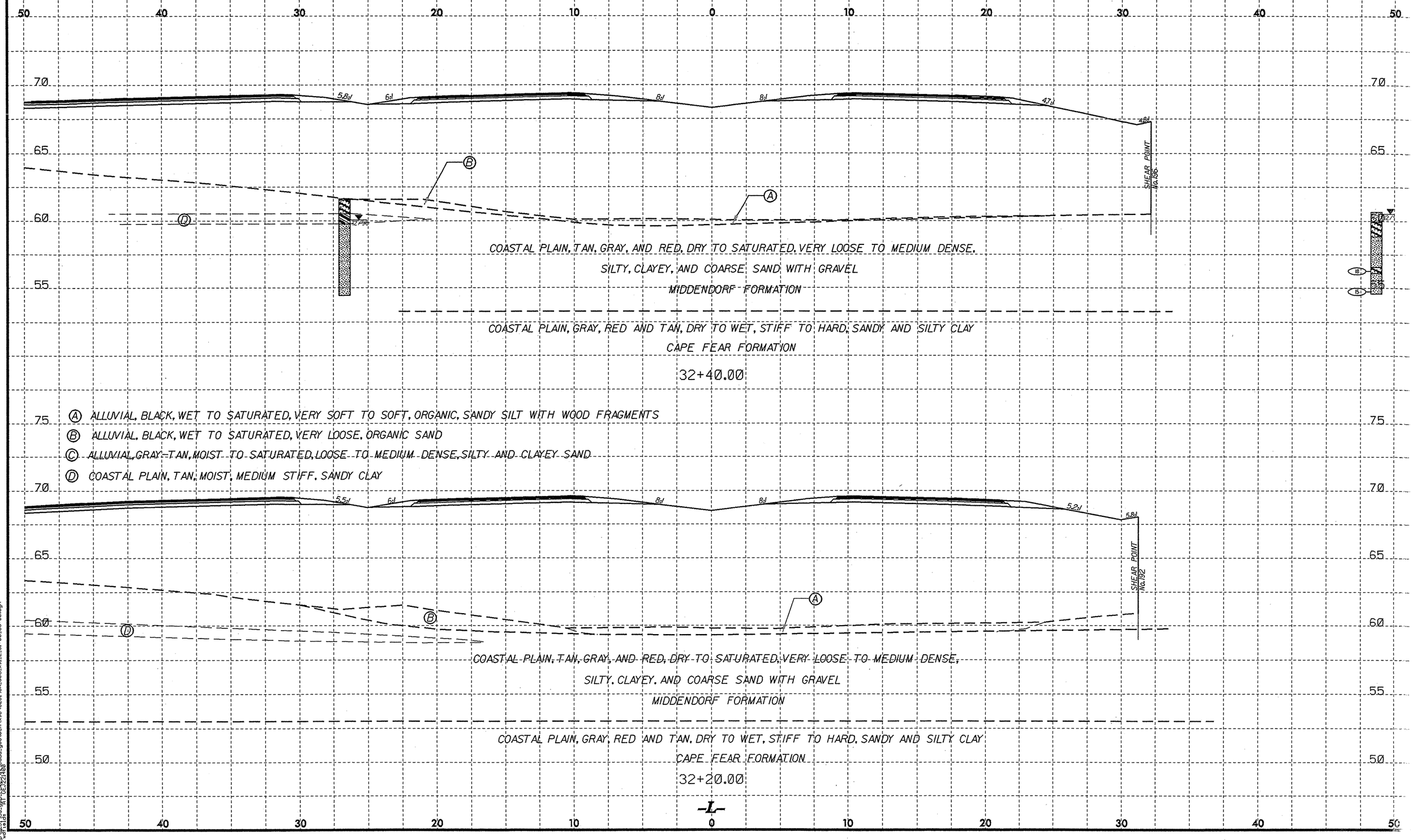

2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
134
50 40 30 20 10 0 10 20 30 40 50
70
65
60
55
50
45
40
6.1
6.1
5.1
6.1
8.1
8.1
6.1
5.5
SHEAR POINT No.183
SHEAR POINT No.184
Ⓐ ALLUVIAL, BLACK, WET TO SATURATED, VERY SOFT TO SOFT, ORGANIC, SANDY SILT WITH WOOD FRAGMENTS
Ⓑ ALLUVIAL, BLACK, WET TO SATURATED, VERY LOOSE, ORGANIC SAND
Ⓒ COASTAL PLAIN, TAN, MOIST, MEDIUM STIFF, SANDY CLAY
12/98
10
10
46
COASTAL PLAIN,
TAN, GRAY, AND RED, DRY TO SATURATED, VERY LOOSE TO MEDIUM DENSE, SILTY
CLAYEY AND COARSE SAND WITH GRAVEL
MIDDENDORF FORMATION
COASTAL PLAIN, GRAY, RED, AND TAN, DRY TO WET, STIFF TO HARD, SANDY AND SILTY CLAY
CAPE FEAR FORMATION
GRAY, MOIST, VERY DENSE, SILTY SAND
GRAY-GREEN, MOIST, MEDIUM STIFF, SANDY CLAY
31+80.00
-L-



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
135
50 40 30 20 10 0 10 20 30 40 50
70
65
60
55
50
45
40
5.2:1
6:1
8:1
8:1
6:1
5.5:1
Ⓐ ALLUVIAL, BLACK, WET TO SATURATED, VERY SOFT TO SOFT, ORGANIC, SANDY SILT WITH WOOD FRAGMENTS
Ⓑ ALLUVIAL, BLACK, WET TO SATURATED, VERY LOOSE, ORGANIC SAND
SHEAR POINT No.188
COASTAL PLAIN, TAN, GRAY, AND RED, DRY TO SATURATED, VERY LOOSE TO MEDIUM DENSE, SILTY, CLAYEY, AND COARSE SAND WITH GRAVEL
MIDDENDORF FORMATION
COASTAL PLAIN, GRAY, RED, AND TAN, DRY TO WET, STIFF TO HARD, SANDY AND SILTY CLAY
CAPE FEAR FORMATION
32+00.00
-L-

2.5 0 2.5 5

METRIC



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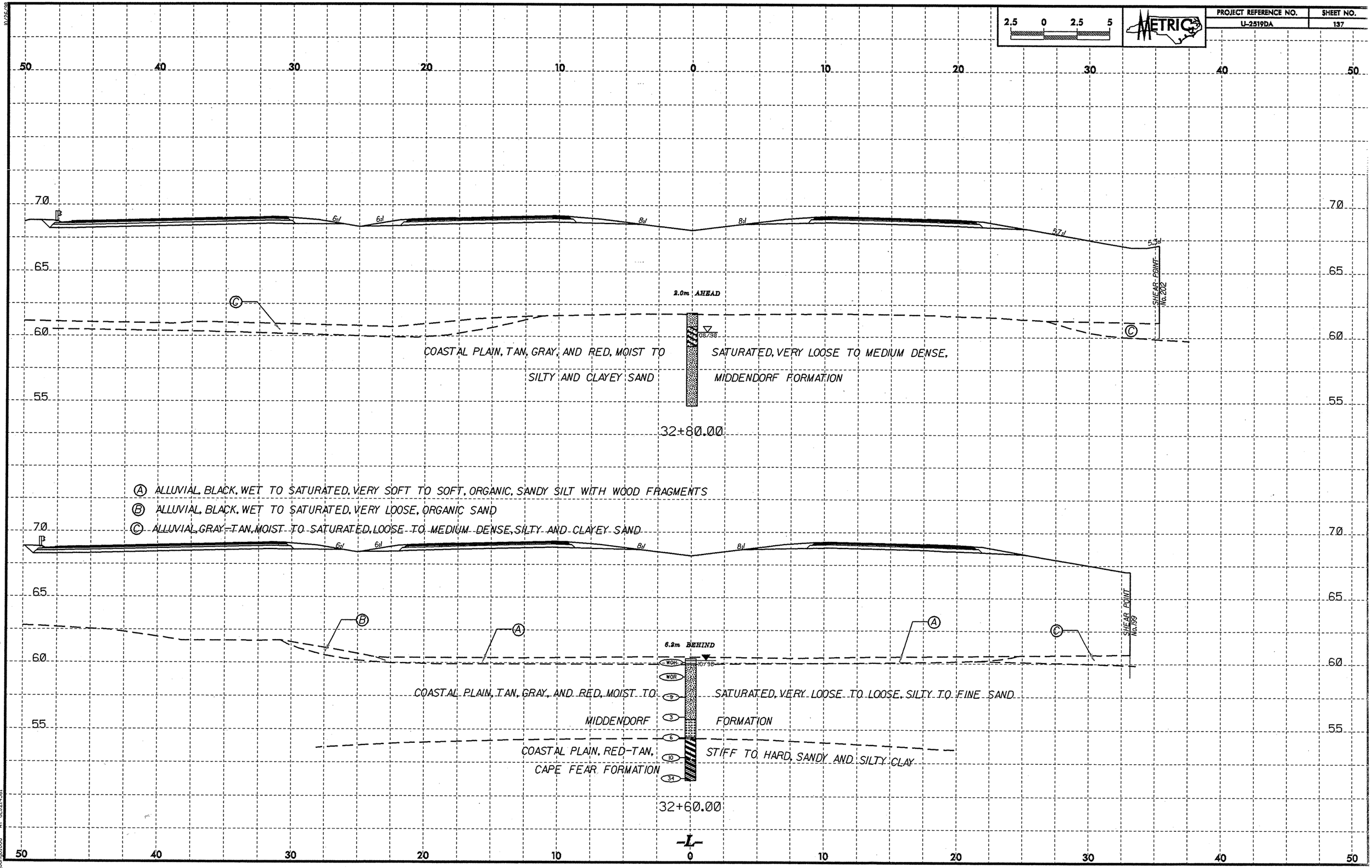


2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
137
50 40 30 20 10 0 10 20 30 40 50
70
65
60
55
6:1
6:1
8:1
8:1
5.7:1
5.3:1
SHEAR POINT No.202
2.0m AHEAD
08/98
COASTAL PLAIN, TAN, GRAY, AND RED, MOIST TO SATURATED, VERY LOOSE TO MEDIUM DENSE, SILTY AND CLAYEY SAND MIDDENDORF FORMATION
32+80.00
Ⓐ ALLUVIAL, BLACK, WET TO SATURATED, VERY SOFT TO SOFT, ORGANIC, SANDY SILT WITH WOOD FRAGMENTS
Ⓑ ALLUVIAL, BLACK, WET TO SATURATED, VERY LOOSE, ORGANIC SAND
Ⓒ ALLUVIAL, GRAY-TAN, MOIST TO SATURATED, LOOSE TO MEDIUM DENSE, SILTY AND CLAYEY SAND
SHEAR POINT No.199
6.2m BEHIND
10/98
WOH
WOR
9
3
6
10
34
COASTAL PLAIN, TAN, GRAY, AND RED, MOIST TO SATURATED, VERY LOOSE TO LOOSE, SILTY TO FINE SAND MIDDENDORF FORMATION
COASTAL PLAIN, RED-TAN, STIFF TO HARD, SANDY AND SILTY CLAY CAPE FEAR FORMATION
32+60.00
-L-

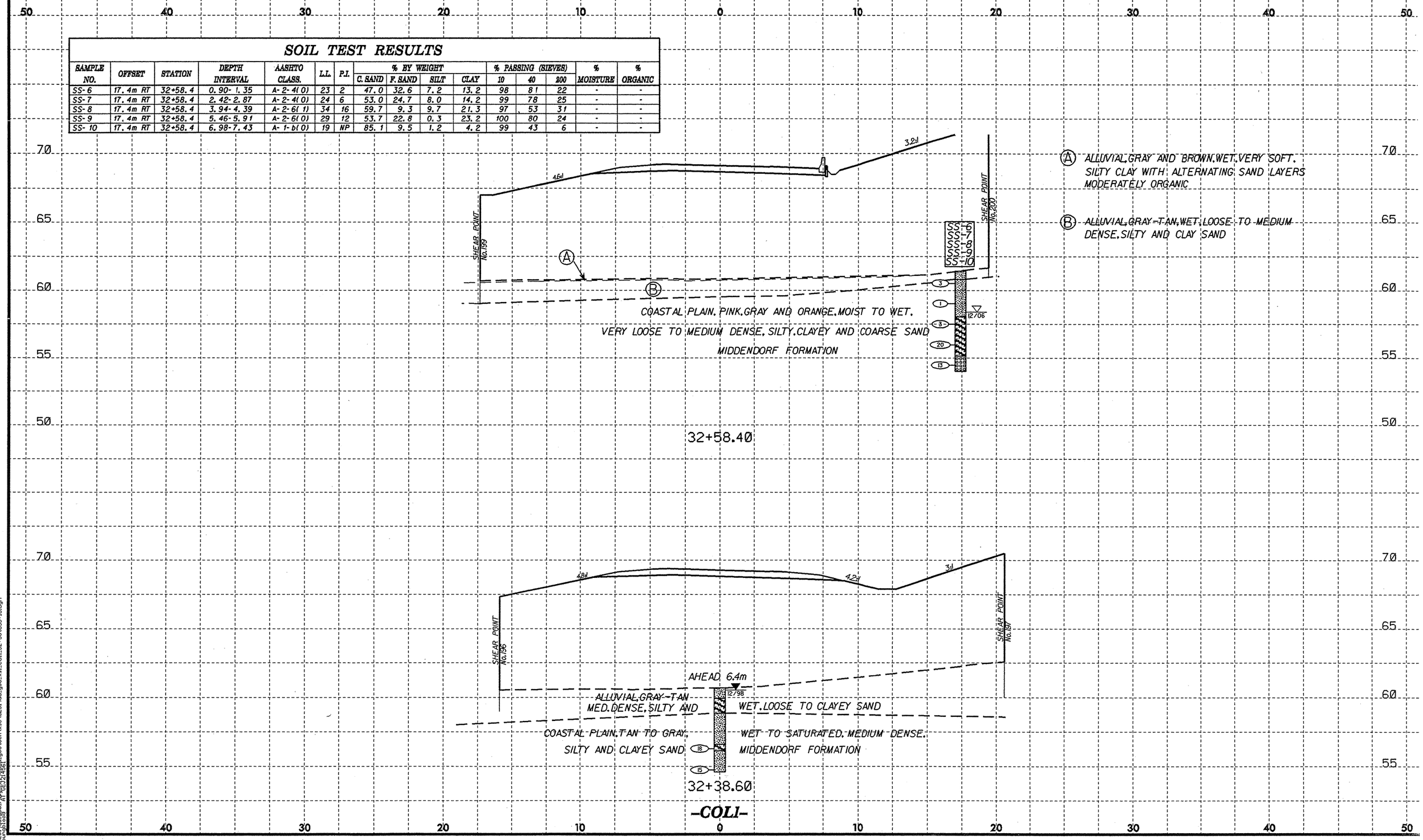
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	138

2.5 0 2.5 5

METRIC

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-6	17.4m RT	32+58.4	0.90-1.35	A-2-4(0)	23	2	47.0	32.6	7.2	13.2	98	81	22	-	-
SS-7	17.4m RT	32+58.4	2.42-2.87	A-2-4(0)	24	6	53.0	24.7	8.0	14.2	99	78	25	-	-
SS-8	17.4m RT	32+58.4	3.94-4.39	A-2-6(1)	34	16	59.7	9.3	9.7	21.3	97	53	31	-	-
SS-9	17.4m RT	32+58.4	5.46-5.91	A-2-6(0)	29	12	53.7	22.8	0.3	23.2	100	80	24	-	-
SS-10	17.4m RT	32+58.4	6.98-7.43	A-1-b(0)	19	NP	85.1	9.5	1.2	4.2	99	43	6	-	-



(A) ALLUVIAL, GRAY AND BROWN, WET, VERY SOFT, SILTY CLAY WITH ALTERNATING SAND LAYERS MODERATELY ORGANIC

(B) ALLUVIAL, GRAY-TAN, WET, LOOSE TO MEDIUM DENSE, SILTY AND CLAY SAND

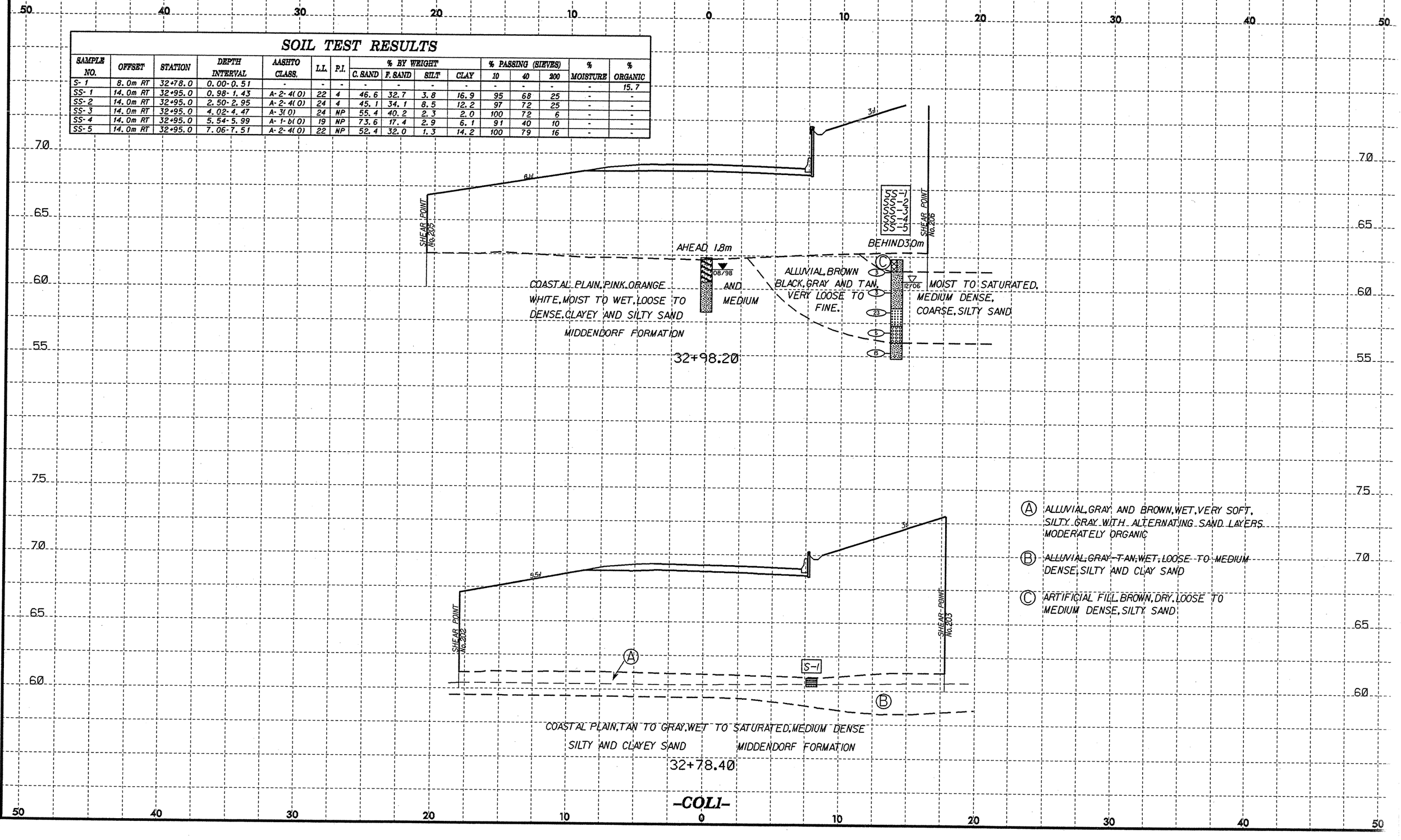
-COL1-

10/26/98

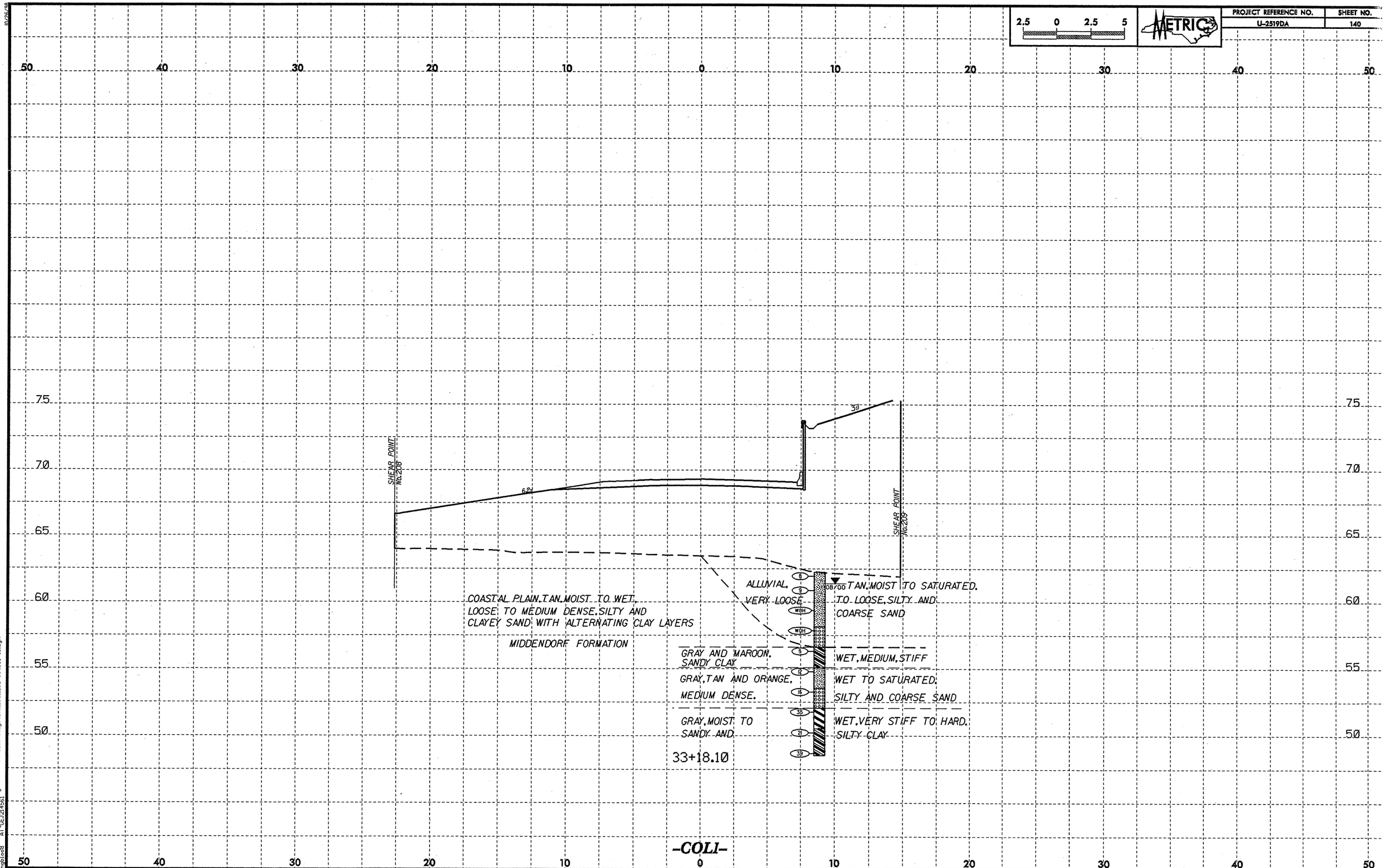
10-JUL-2007 10:43
a:\u2519da_geo_rdwy_rev\geodd_geotech\xsc\u2519da_geo_xsi_coll_32+38to33+18.dgn
ayoungblood AT GEO2145S1

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-1	8.0m RT	32+78.0	0.00-0.51	-	-	-	-	-	-	-	-	-	-	-	15.7
SS-1	14.0m RT	32+95.0	0.98-1.43	A-2-4(0)	22	4	46.6	32.7	3.8	16.9	95	68	25	-	-
SS-2	14.0m RT	32+95.0	2.50-2.95	A-2-4(0)	24	4	45.1	34.1	8.5	12.2	97	72	25	-	-
SS-3	14.0m RT	32+95.0	4.02-4.47	A-3(0)	24	NP	55.4	40.2	2.3	2.0	100	72	6	-	-
SS-4	14.0m RT	32+95.0	5.54-5.99	A-1-b(0)	19	NP	73.6	17.4	2.9	6.1	91	40	10	-	-
SS-5	14.0m RT	32+95.0	7.06-7.51	A-2-4(0)	22	NP	52.4	32.0	1.3	14.2	100	79	16	-	-

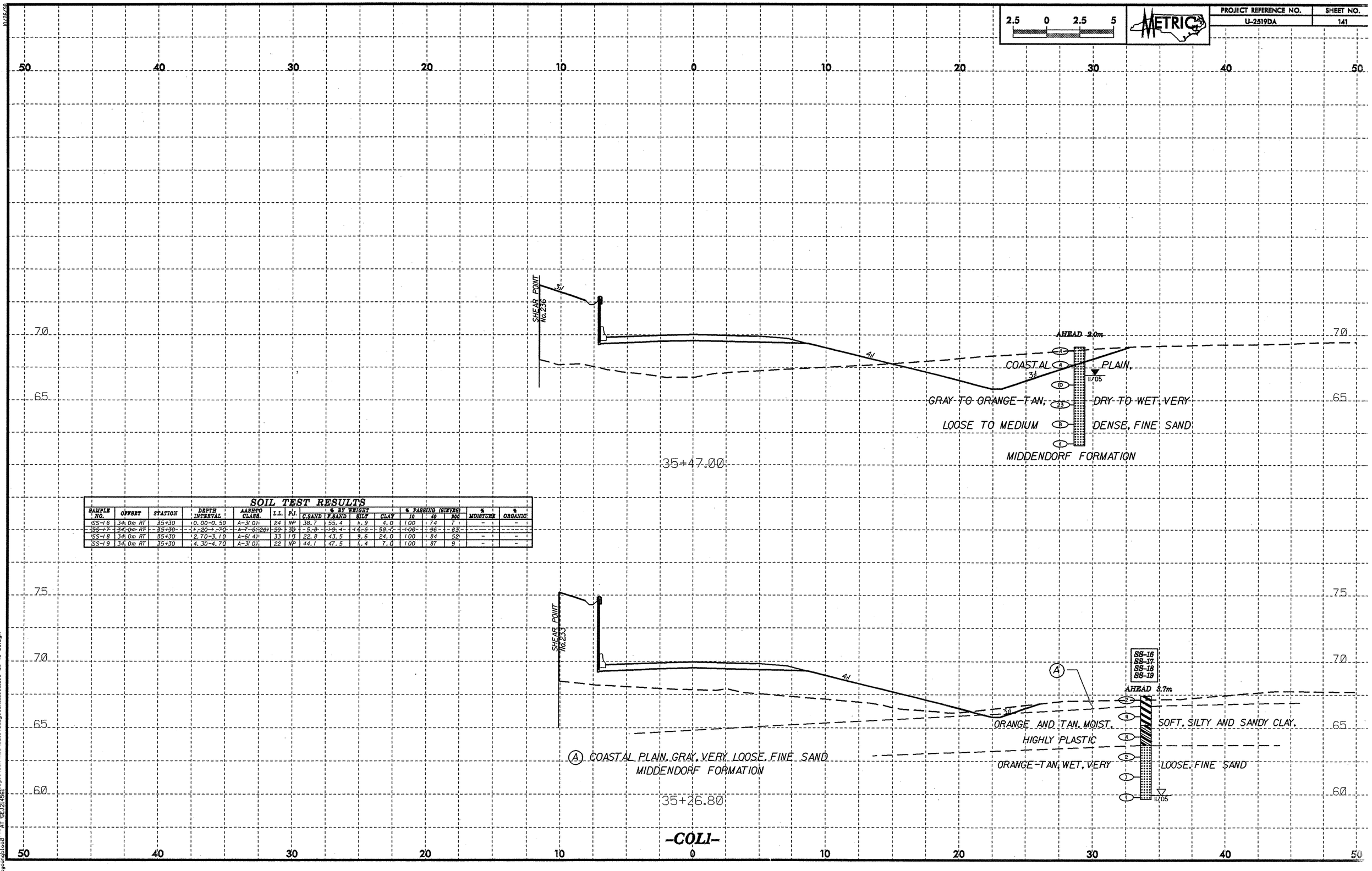


-COL1-



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
140
50 40 30 20 10 0 10 20 30 40 50
75
70
65
60
55
50
SHEAR POINT No.208
SHEAR POINT No.209
3:1
6:1
COASTAL PLAIN, TAN, MOIST TO WET, LOOSE TO MEDIUM DENSE, SILTY AND CLAYEY SAND WITH ALTERNATING CLAY LAYERS
MIDDENDORF FORMATION
ALLUVIAL, VERY LOOSE
08/00
TAN, MOIST TO SATURATED, TO LOOSE, SILTY AND COARSE SAND
GRAY AND MAROON, SANDY CLAY
WET, MEDIUM, STIFF
GRAY, TAN AND ORANGE, MEDIUM DENSE.
WET TO SATURATED, SILTY AND COARSE SAND
GRAY, MOIST TO SANDY AND
WET, VERY STIFF TO HARD, SILTY CLAY
33+18.10
-COL1-

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	141

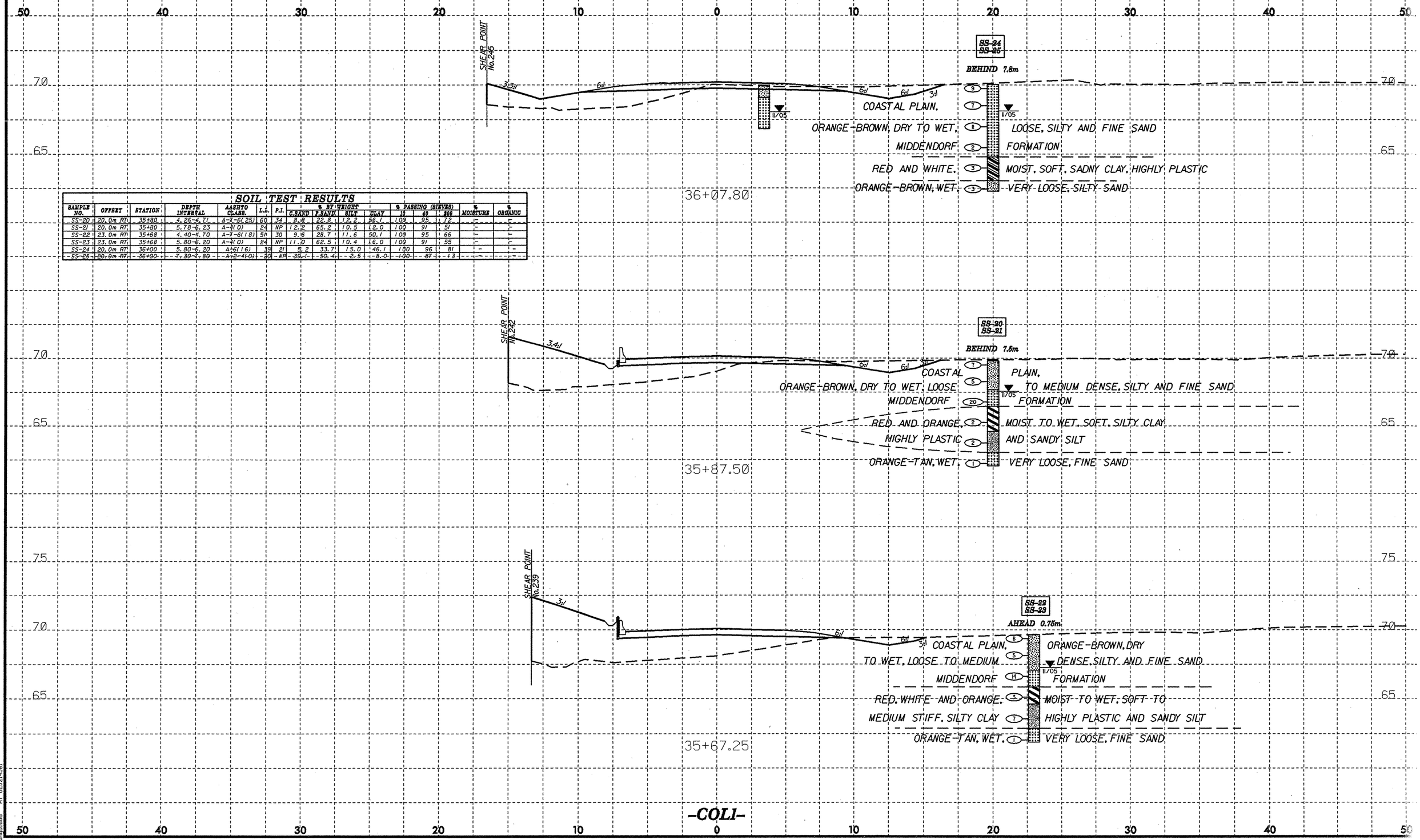


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-16	34.0m RT	35+30	0.00-0.50	A-3(0)	24	NP	38.7	55.4	1.9	4.0	100	74	7	-	-
SS-17	34.0m RT	35+30	1.20-1.70	A-7-6(20)	59	30	5.8	19.4	16.6	58.1	100	96	83	-	-
SS-18	34.0m RT	35+30	2.70-3.10	A-6(4)	33	13	22.8	43.5	9.6	24.0	100	84	52	-	-
SS-19	34.0m RT	35+30	4.30-4.70	A-3(0)	22	NP	44.1	47.5	1.4	7.0	100	87	9	-	-

2.5 0 2.5 5

METRIC



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-20	20.0m RT.	35+80	4.26-4.71	A-7-6(25)	60	34	8.8	22.8	12.2	56.1	100	95	72	-	-
SS-21	20.0m RT.	35+80	5.78-6.23	A-4(0)	24	NP	12.2	65.2	10.5	12.0	100	91	51	-	-
SS-22	23.0m RT.	35+68	4.40-4.70	A-7-6(18)	51	30	9.6	28.7	11.6	50.1	100	95	66	-	-
SS-23	23.0m RT.	35+68	5.80-6.20	A-4(0)	24	NP	11.0	62.5	10.4	16.0	100	91	55	-	-
SS-24	20.0m RT.	36+00	5.80-6.20	A-6(16)	39	21	9.2	33.7	15.0	46.1	100	96	81	-	-
SS-25	20.0m RT.	36+00	7.30-7.80	A-2-4(0)	30	NP	39.1	50.4	2.5	8.0	100	87	13	-	-

-COLI-

10-JUL-2007 10:26
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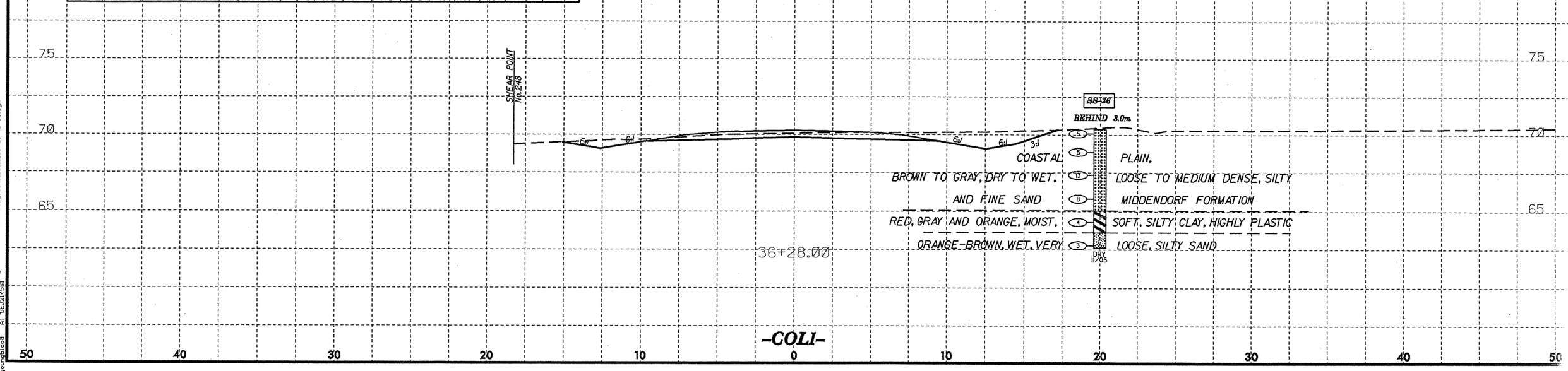
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	143

2.5 0 2.5 5

METRIC

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-26	20.0m RT	36+25	5.80-6.20	A-7-5(46)	73	42	3.2	5.4	9.2	82.2	100	98	93	-	-



-COLI-

10/26/99

10-JUL-2007 10:27
p:\u2519da_geo_rdwy_rev\cadd_geotech\xsc\u2519da_geo_xsi_coli_35+26-40+00.dgn
ayoungblood AT UE121.5561

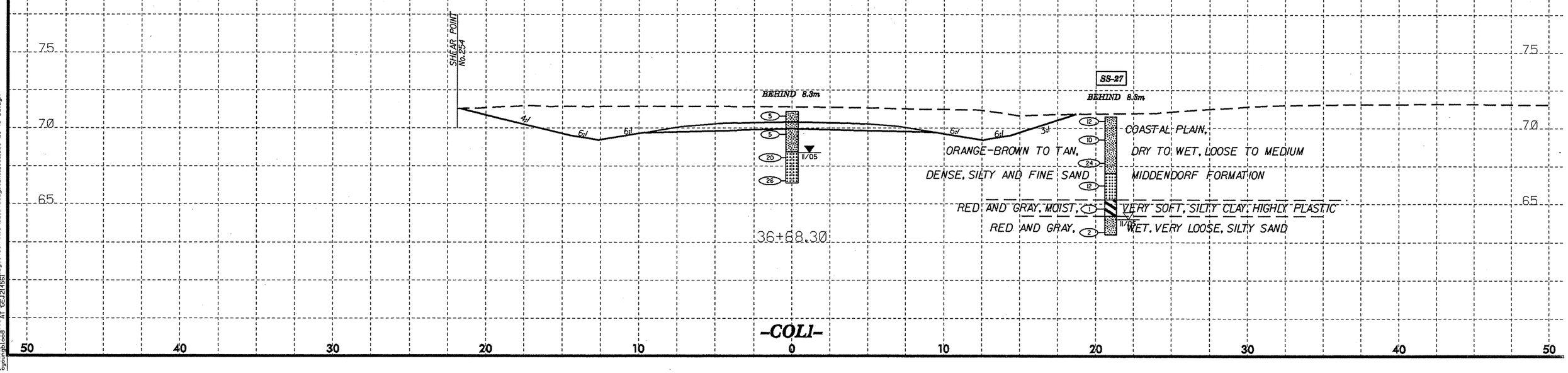
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	144

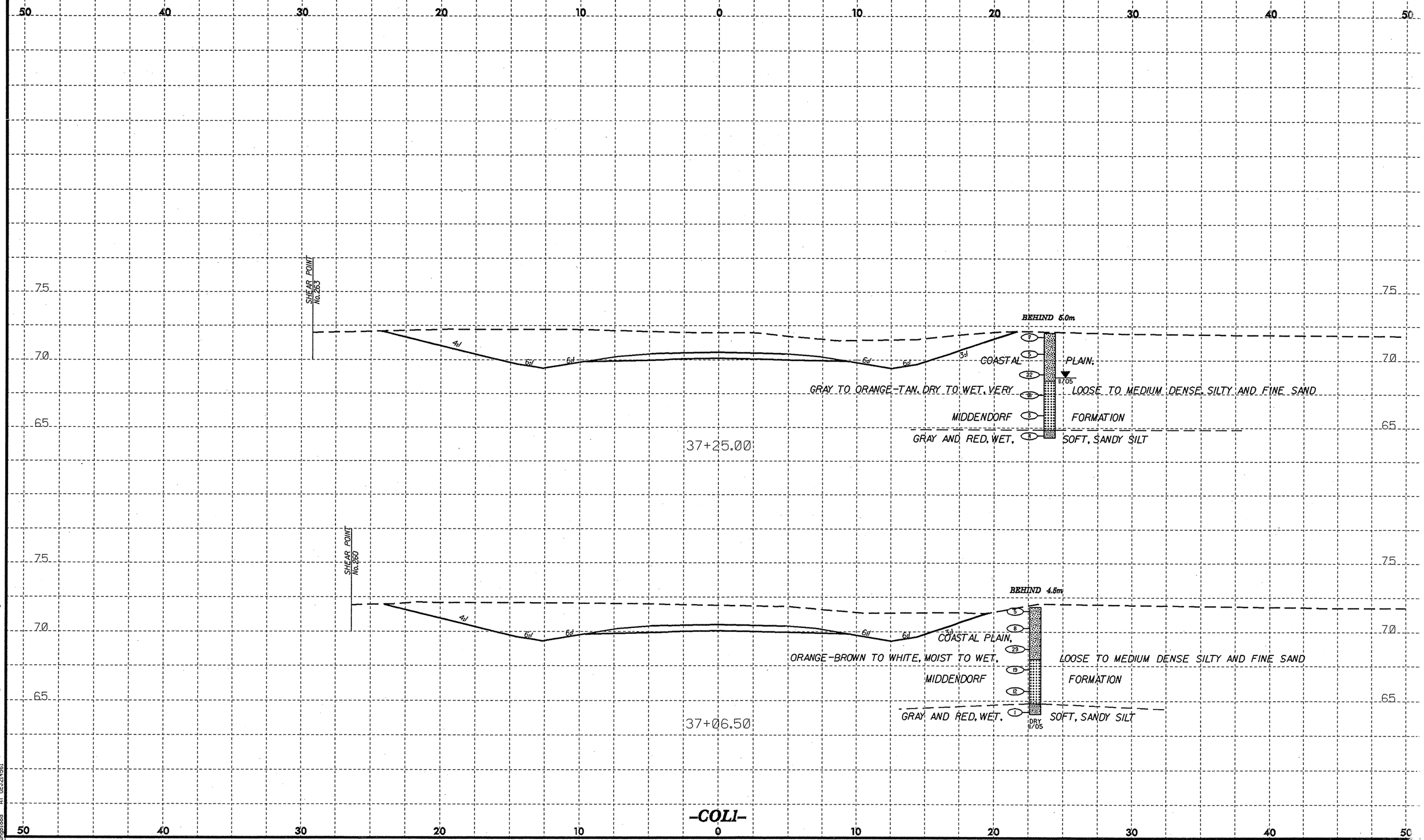
2.5 0 2.5 5

METRIC

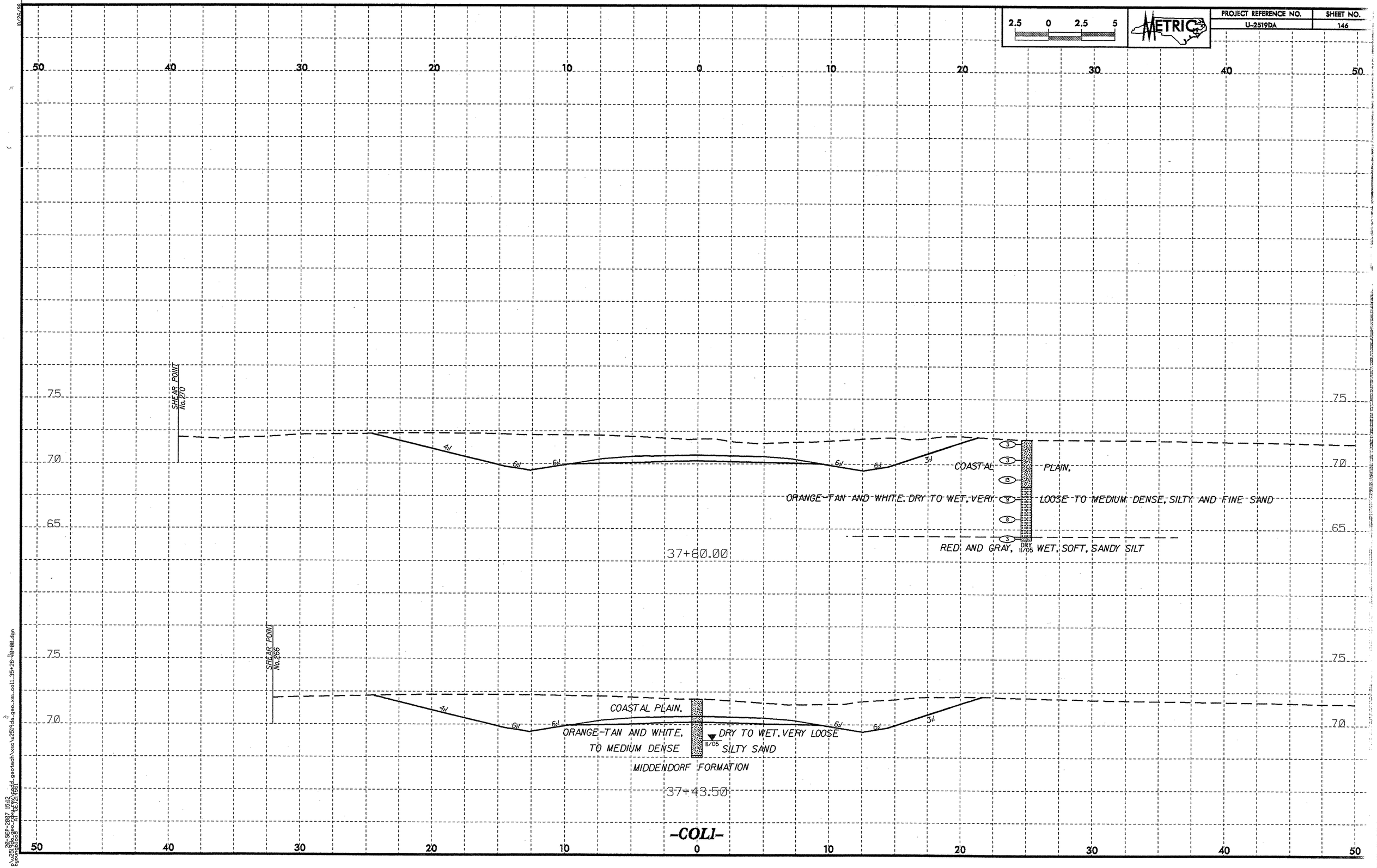
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-27	21.0m RT	36+60	5.80-6.20	A-7-6(36)	61	38	2.2	22.0	17.6	58.1	100	98	87	-	-

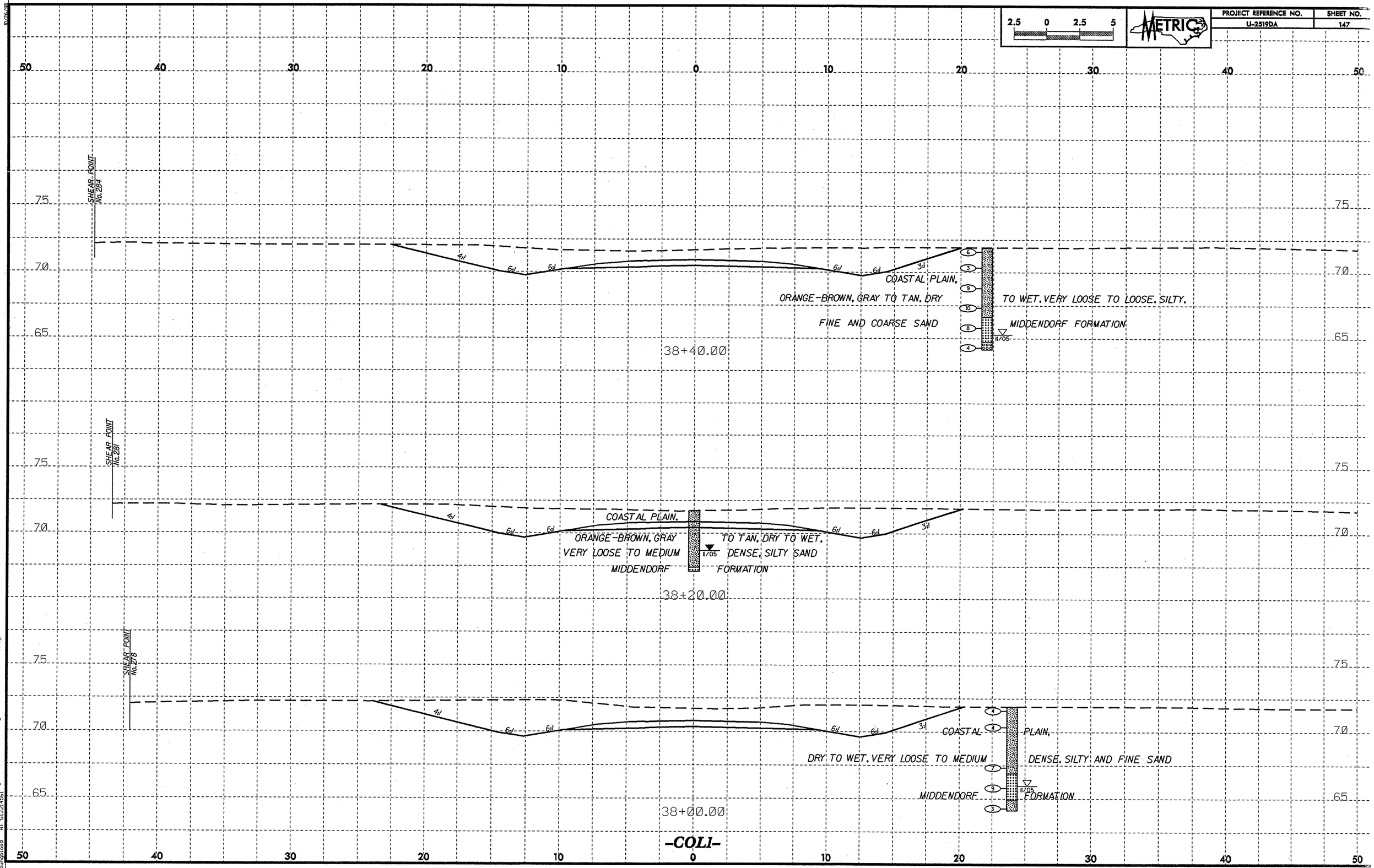




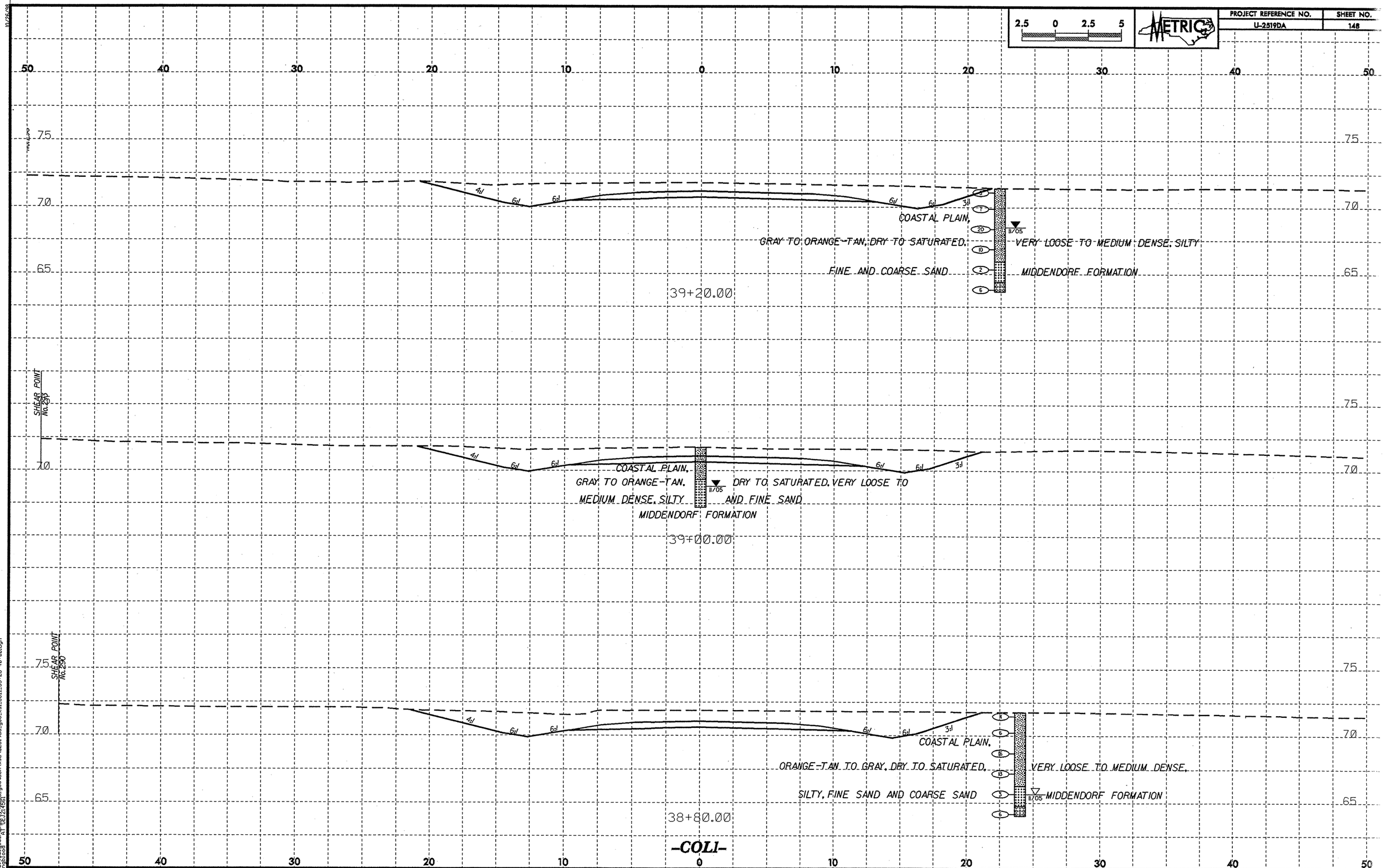
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
145
50 40 30 20 10 0 10 20 30 40 50
75
70
65
SHEAR POINT No.263
BEHIND 5.0m
4:1
6:1
6:1
6:1
6:1
3:1
COASTAL PLAIN,
GRAY TO ORANGE-TAN, DRY TO WET, VERY LOOSE TO MEDIUM DENSE, SILTY AND FINE SAND
MIDDENDORF FORMATION
GRAY AND RED, WET, SOFT, SANDY SILT
11/05
37+25.00
SHEAR POINT No.260
BEHIND 4.5m
COASTAL PLAIN,
ORANGE-BROWN TO WHITE, MOIST TO WET, LOOSE TO MEDIUM DENSE SILTY AND FINE SAND
MIDDENDORF FORMATION
GRAY AND RED, WET, SOFT, SANDY SILT
DRY 11/05
37+06.50
-COLI-



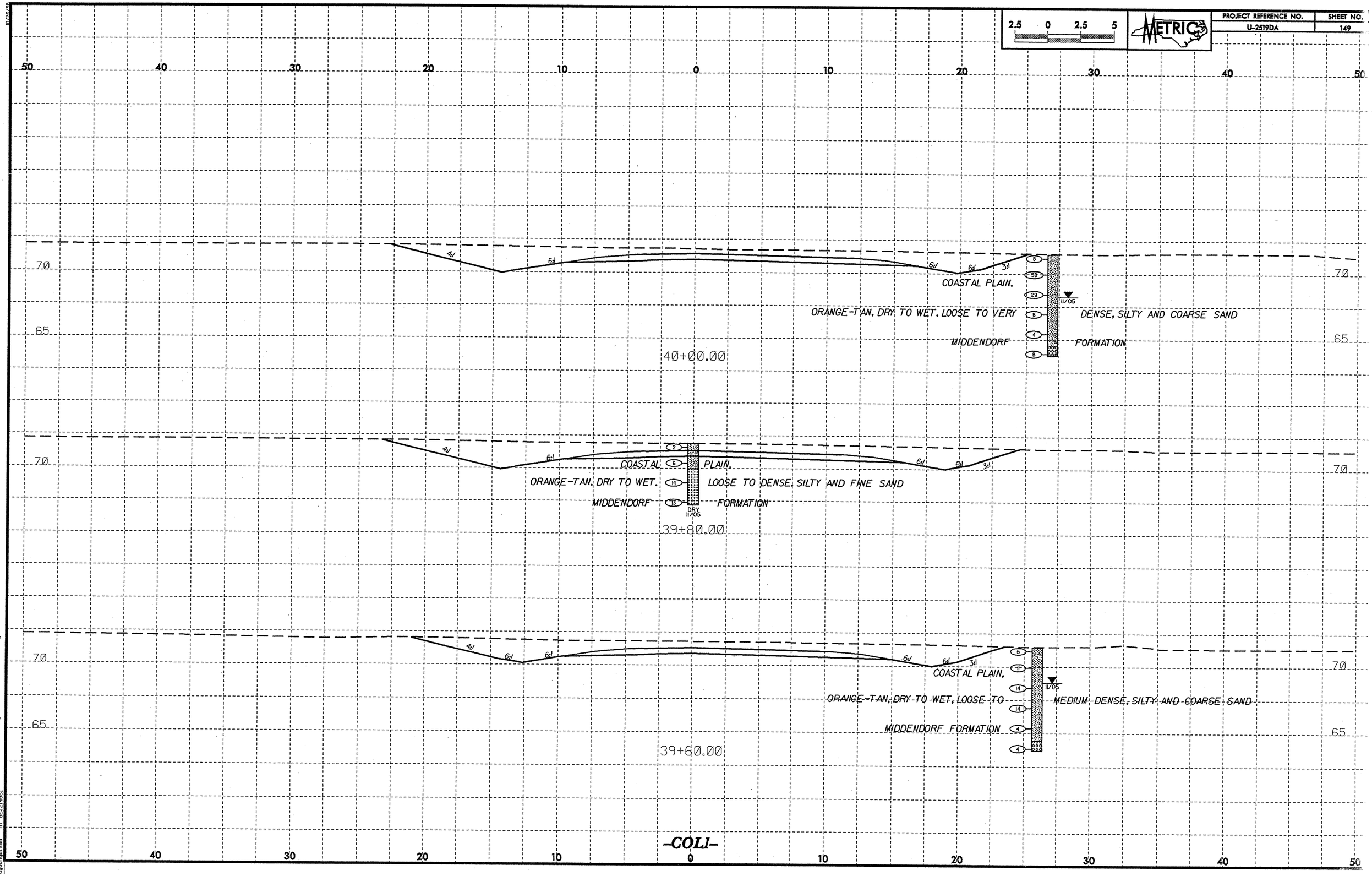
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
146
50 40 30 20 10 0 10 20 30 40 50
75
70
65
SHEAR POINT No.270
4:1
6:1
6:1
6:1
6:1
3:1
COASTAL PLAIN,
ORANGE-TAN AND WHITE, DRY TO WET, VERY LOOSE TO MEDIUM DENSE, SILTY AND FINE SAND
RED AND GRAY, DRY 11/05 WET, SOFT, SANDY SILT
37+60.00
SHEAR POINT No.266
COASTAL PLAIN,
ORANGE-TAN AND WHITE, TO MEDIUM DENSE
DRY TO WET, VERY LOOSE
11/05
SILTY SAND
MIDDENDORF FORMATION
37+43.50
-COLI-



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
147
50 40 30 20 10 0 10 20 30 40 50
75
70
65
SHEAR POINT No.284
4:1
6:1
6:1
6:1
6:1
3:1
COASTAL PLAIN,
ORANGE-BROWN, GRAY TO TAN, DRY TO WET, VERY LOOSE TO LOOSE, SILTY,
FINE AND COARSE SAND MIDDENDORF FORMATION
11/05
38+40.00
SHEAR POINT No.281
COASTAL PLAIN,
ORANGE-BROWN, GRAY TO TAN, DRY TO WET,
VERY LOOSE TO MEDIUM DENSE, SILTY SAND
MIDDENDORF FORMATION
11/05
38+20.00
SHEAR POINT No.278
COASTAL PLAIN,
DRY TO WET, VERY LOOSE TO MEDIUM DENSE, SILTY AND FINE SAND
MIDDENDORF FORMATION
11/05
38+00.00
-COL1-



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
148
50 40 30 20 10 0 10 20 30 40 50
75
70
65
4:1
6:1
6:1
6:1
6:1
3:1
COASTAL PLAIN,
GRAY TO ORANGE-TAN, DRY TO SATURATED,
VERY LOOSE TO MEDIUM DENSE, SILTY
FINE AND COARSE SAND
MIDDENDORF FORMATION
11/05
39+20.00
SHEAR POINT No.293
COASTAL PLAIN,
GRAY TO ORANGE-TAN,
DRY TO SATURATED, VERY LOOSE TO
MEDIUM DENSE, SILTY
AND FINE SAND
MIDDENDORF FORMATION
39+00.00
SHEAR POINT No.290
COASTAL PLAIN,
ORANGE-TAN TO GRAY, DRY TO SATURATED,
VERY LOOSE TO MEDIUM DENSE,
SILTY, FINE SAND AND COARSE SAND
MIDDENDORF FORMATION
38+80.00
-COL1-

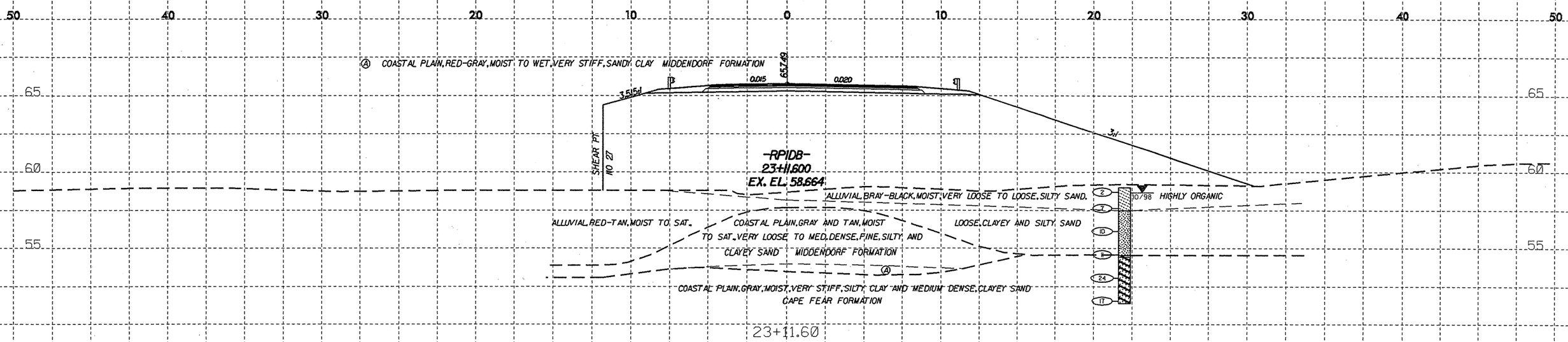


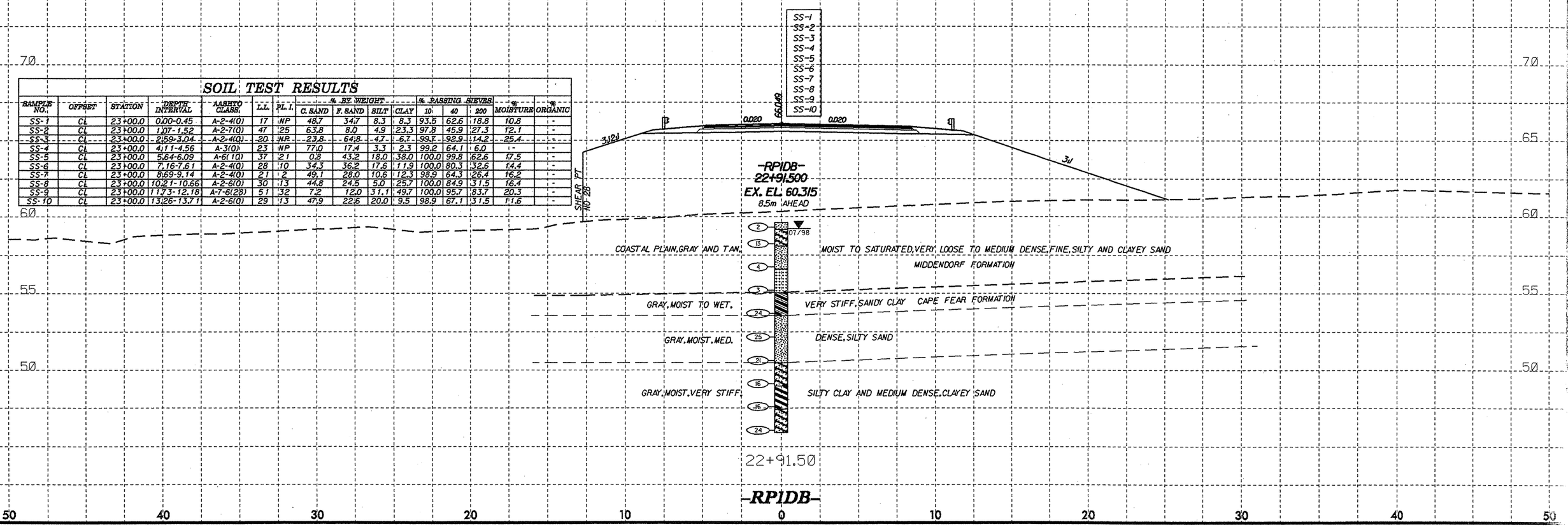
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
149
50 40 30 20 10 0 10 20 30 40 50
70
65
4:1
6:1
3:1
COASTAL PLAIN,
ORANGE-TAN, DRY TO WET, LOOSE TO VERY DENSE, SILTY AND COARSE SAND
MIDDENDORF FORMATION
11/05
40+00.00
COASTAL PLAIN,
ORANGE-TAN, DRY TO WET, LOOSE TO DENSE, SILTY AND FINE SAND
MIDDENDORF FORMATION
DRY 11/05
39+80.00
COASTAL PLAIN,
ORANGE-TAN, DRY TO WET, LOOSE TO MEDIUM DENSE, SILTY AND COARSE SAND
MIDDENDORF FORMATION
39+60.00
-COL1-

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	150

2.5 0 2.5 5

METRIC





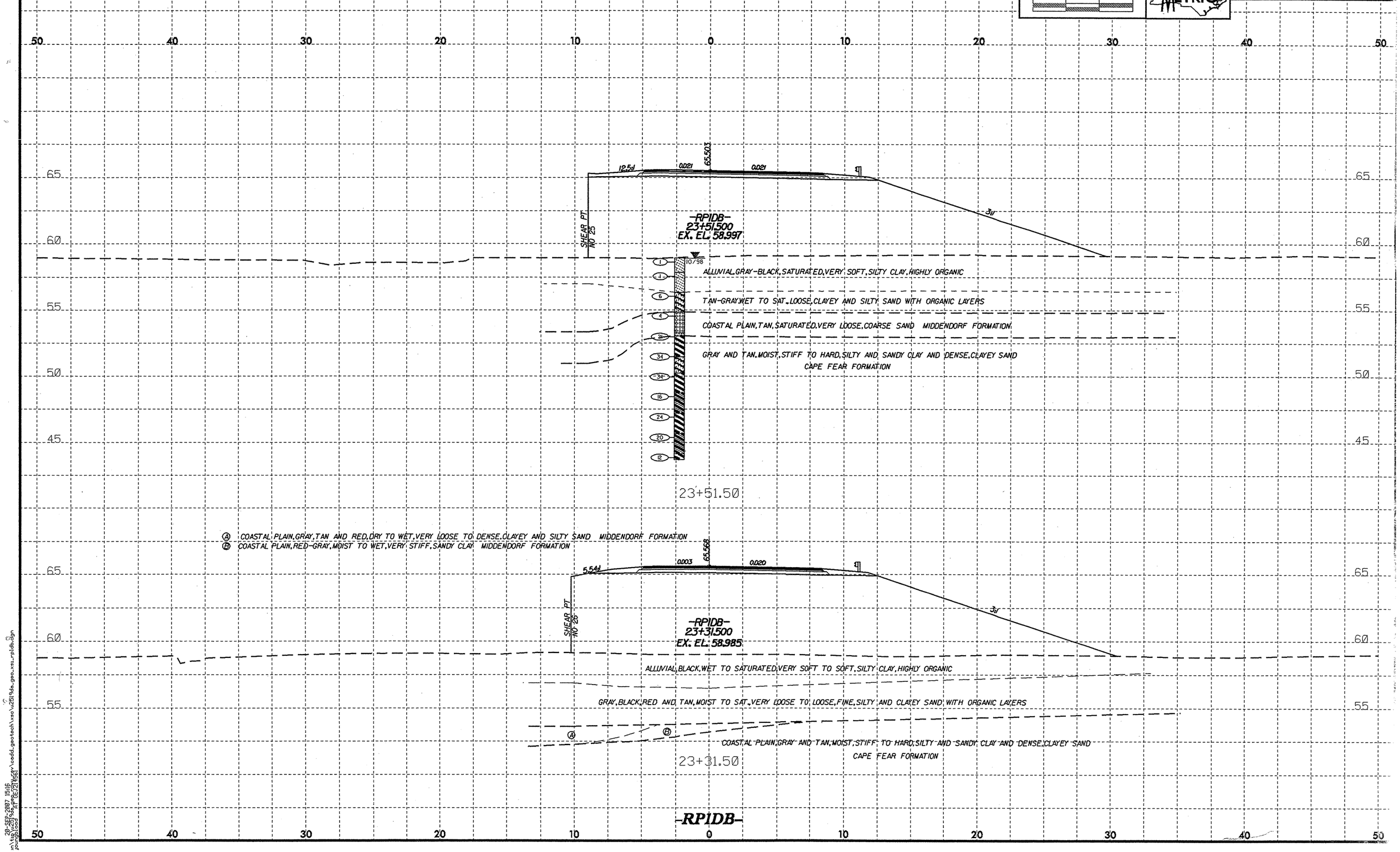
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-1	CL	23+00.0	0.00-0.45	A-2-4(0)	17	NP	48.7	34.7	8.3	8.3	93.5	62.6	18.8	10.8	-
SS-2	CL	23+00.0	1.07-1.52	A-2-7(0)	47	25	63.8	8.0	4.9	23.3	97.8	45.9	27.3	12.1	-
SS-3	CL	23+00.0	2.59-3.04	A-2-4(0)	20	NP	23.8	64.8	4.7	6.7	99.7	92.9	14.2	25.4	-
SS-4	CL	23+00.0	4.11-4.56	A-3(0)	23	NP	77.0	17.4	3.3	2.3	99.2	64.1	6.0	-	-
SS-5	CL	23+00.0	5.64-6.09	A-6(10)	37	21	0.8	43.2	18.0	38.0	100.0	99.8	62.6	17.5	-
SS-6	CL	23+00.0	7.16-7.61	A-2-4(0)	28	10	34.3	36.2	17.6	11.9	100.0	80.3	32.6	14.4	-
SS-7	CL	23+00.0	8.69-9.14	A-2-4(0)	21	2	49.1	28.0	10.6	12.3	98.9	64.3	26.4	16.2	-
SS-8	CL	23+00.0	10.21-10.66	A-2-6(0)	30	13	44.8	24.5	5.0	25.7	100.0	84.9	31.5	16.4	-
SS-9	CL	23+00.0	11.73-12.18	A-7-6(28)	51	32	7.2	12.0	31.1	49.7	100.0	95.7	83.7	20.3	-
SS-10	CL	23+00.0	13.26-13.71	A-2-6(0)	29	13	47.9	22.6	20.0	9.5	98.9	67.1	31.5	11.6	-

20-SEP-2007 15:15
pgn\tip\ps\ps\pgn\ddd_geotech\xsec\u2519da_geo_xsl_rp1db.dgn
$$$$ 06/29/1956
ground:blood

2.5 0 2.5 5

METRIC



10/26/98
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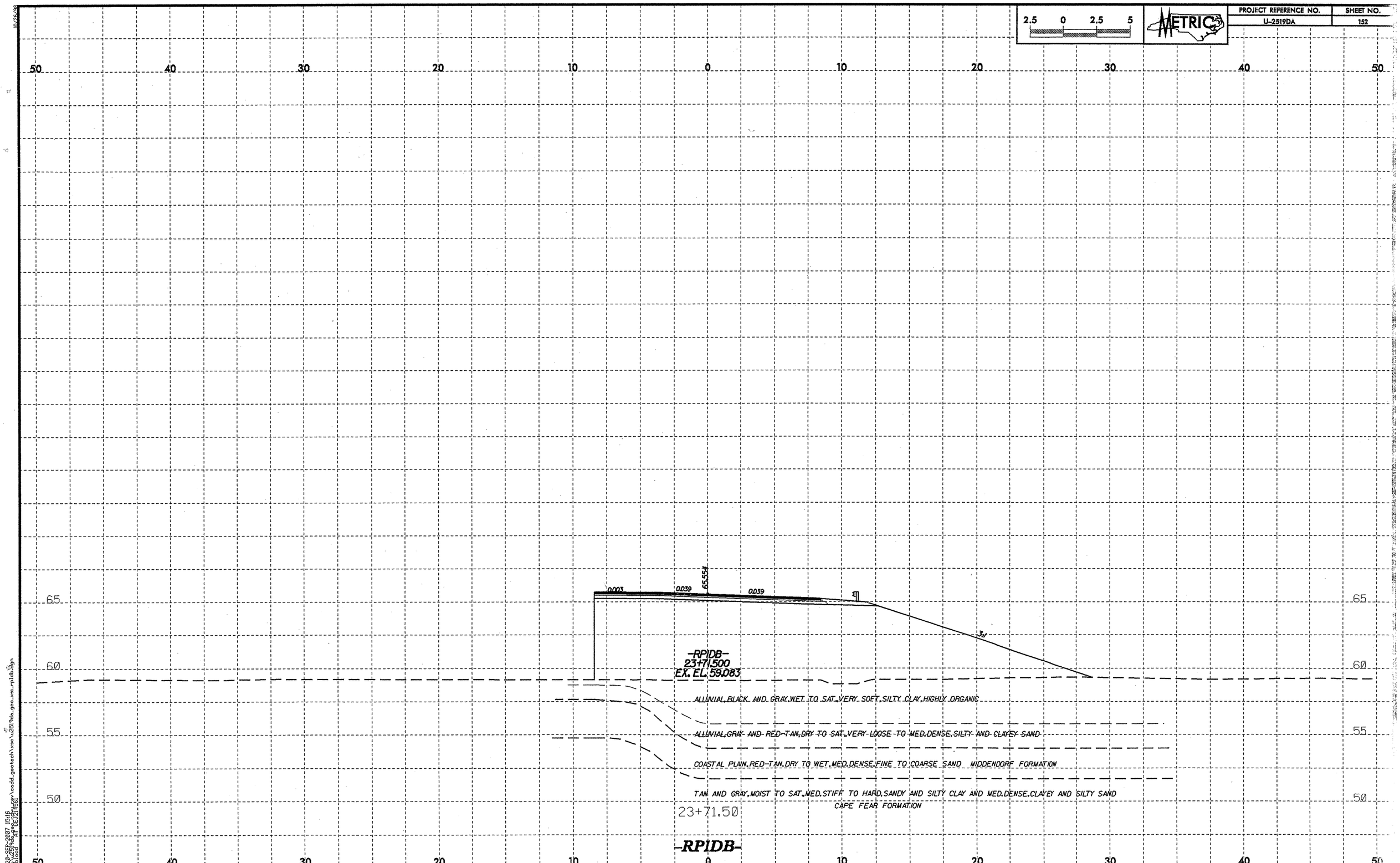
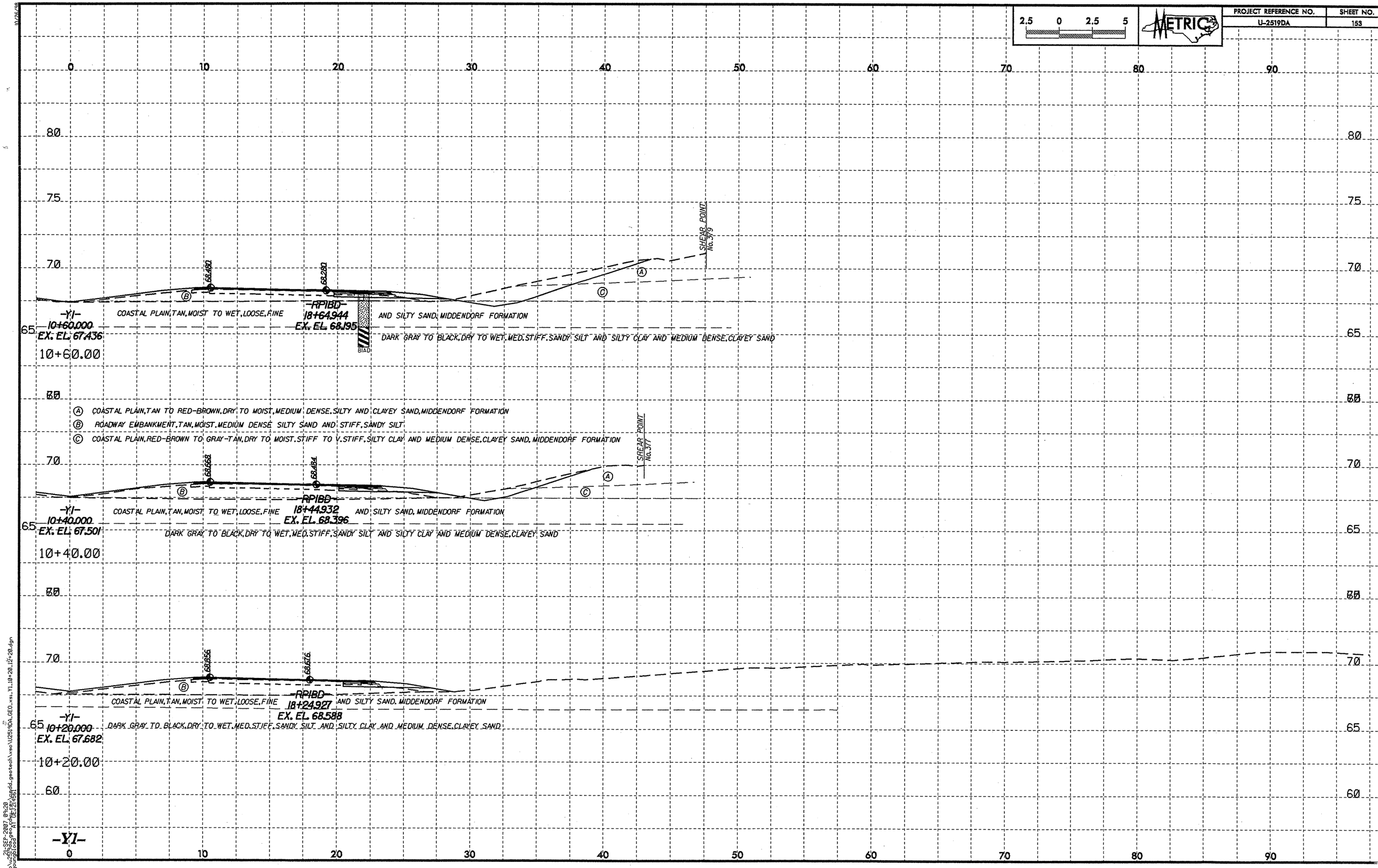
pw:\\tsg\u2519da_pw$$$$\cadd_geotech\xsa\u2519da_geo_xsa_rpidb.dgn


2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
152
50 40 30 20 10 0 10 20 30 40 50
65
60
55
50
0.003
0.039
65.554
0.039
4
3
-RP1DB-
23+71.500
EX. EL. 59.083
ALLUVIAL, BLACK AND GRAY, WET TO SAT., VERY SOFT, SILTY CLAY, HIGHLY ORGANIC
ALLUVIAL, GRAY AND RED-TAN, DRY TO SAT., VERY LOOSE TO MED. DENSE, SILTY AND CLAYEY SAND
COASTAL PLAIN, RED-TAN, DRY TO WET, MED. DENSE, FINE TO COARSE SAND MIDDENDORF FORMATION
TAN AND GRAY, MOIST TO SAT., MED. STIFF TO HARD, SANDY AND SILTY CLAY AND MED. DENSE, CLAYEY AND SILTY SAND
CAPE FEAR FORMATION
23+71.50
-RP1DB-

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	153

2.5 0 2.5 5

METRIC



10/26/98

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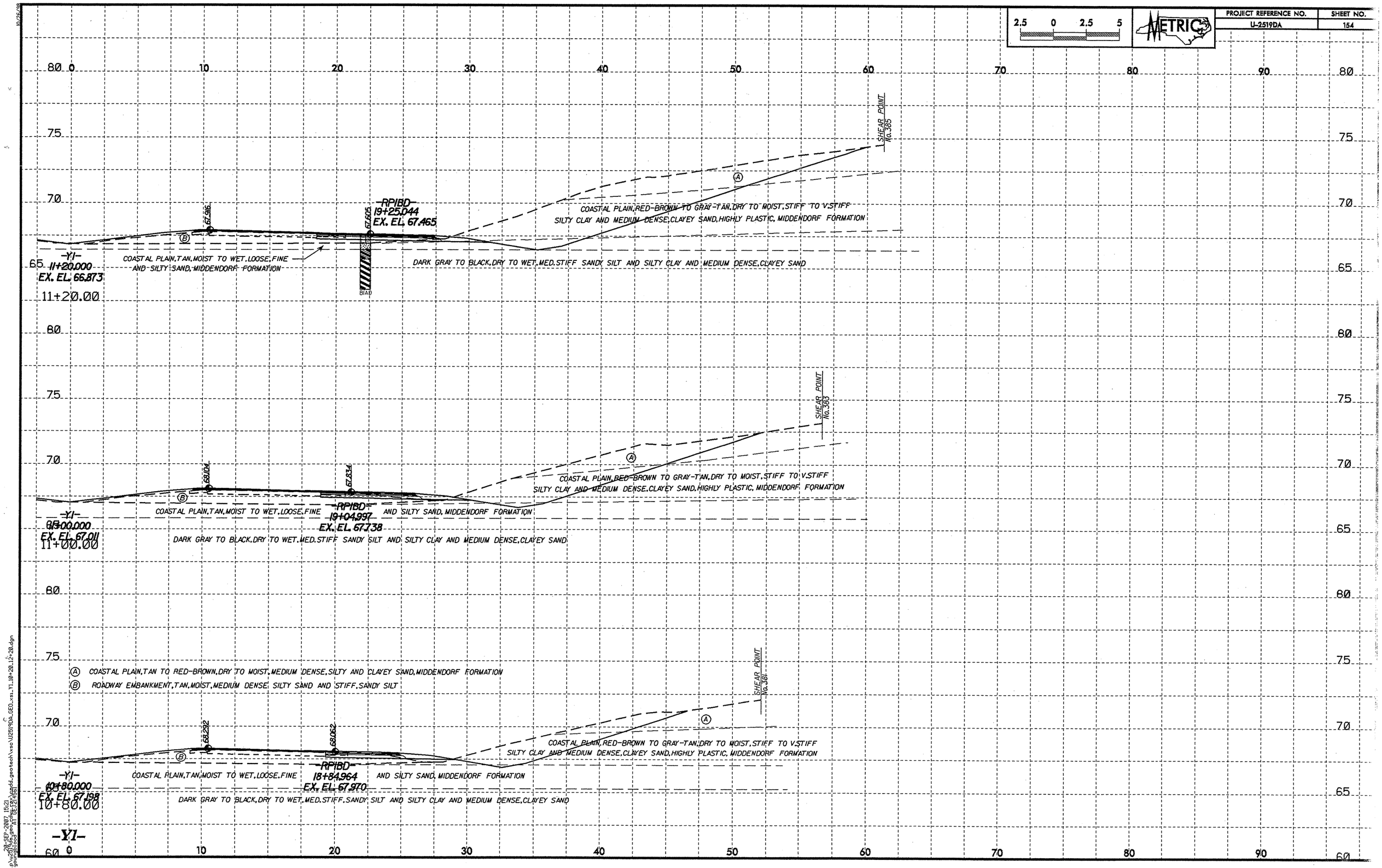
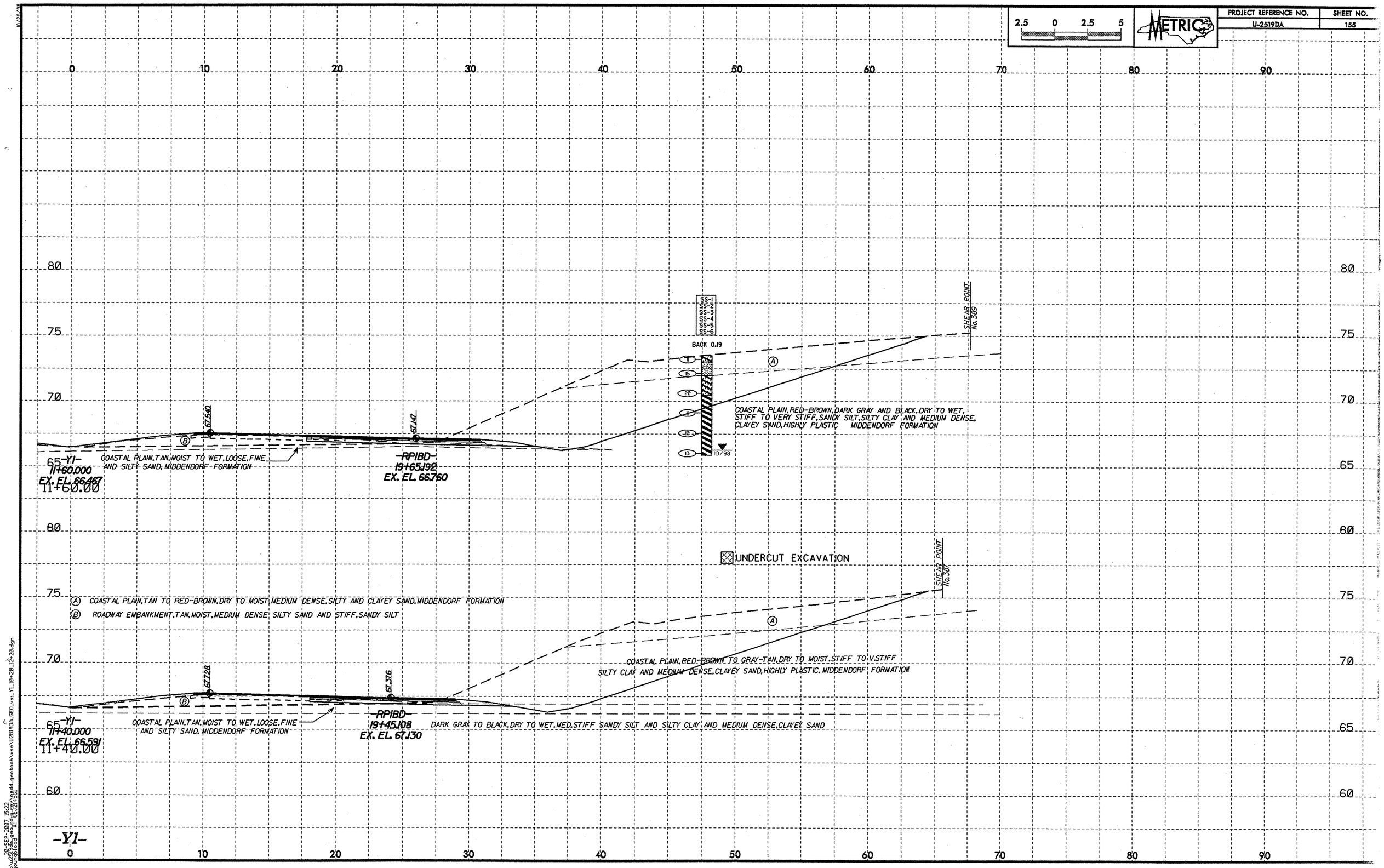
pgonzalez
H:\DEF\PROJECT\


2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
154
-Y1-
11+20.000
EX. EL. 66.873
11+20.00
67.916
67.605
-RP1BD-
19+25.044
EX. EL. 67.465
BIAD
COASTAL PLAIN, TAN, MOIST TO WET, LOOSE, FINE AND SILTY SAND, MIDDENDORF FORMATION
DARK GRAY TO BLACK, DRY TO WET, MED. STIFF SANDY SILT AND SILTY CLAY AND MEDIUM DENSE, CLAYEY SAND
COASTAL PLAIN, RED-BROWN TO GRAY-TAN, DRY TO MOIST, STIFF TO V. STIFF SILTY CLAY AND MEDIUM DENSE, CLAYEY SAND, HIGHLY PLASTIC, MIDDENDORF FORMATION
SHEAR POINT No. 385
-Y1-
11+00.000
EX. EL. 67.011
11+00.00
68.104
67.834
-RP1BD-
19+04.997
EX. EL. 67.738
COASTAL PLAIN, TAN, MOIST TO WET, LOOSE, FINE AND SILTY SAND, MIDDENDORF FORMATION
DARK GRAY TO BLACK, DRY TO WET, MED. STIFF SANDY SILT AND SILTY CLAY AND MEDIUM DENSE, CLAYEY SAND
COASTAL PLAIN, RED-BROWN TO GRAY-TAN, DRY TO MOIST, STIFF TO V. STIFF SILTY CLAY AND MEDIUM DENSE, CLAYEY SAND, HIGHLY PLASTIC, MIDDENDORF FORMATION
SHEAR POINT No. 383
Ⓐ COASTAL PLAIN, TAN TO RED-BROWN, DRY TO MOIST, MEDIUM DENSE, SILTY AND CLAYEY SAND, MIDDENDORF FORMATION
Ⓑ ROADWAY EMBANKMENT, TAN, MOIST, MEDIUM DENSE, SILTY SAND AND STIFF, SANDY SILT
-Y1-
10+80.000
EX. EL. 67.198
10+80.00
68.292
68.062
-RP1BD-
18+84.964
EX. EL. 67.970
COASTAL PLAIN, TAN, MOIST TO WET, LOOSE, FINE AND SILTY SAND, MIDDENDORF FORMATION
DARK GRAY TO BLACK, DRY TO WET, MED. STIFF, SANDY SILT AND SILTY CLAY AND MEDIUM DENSE, CLAYEY SAND
COASTAL PLAIN, RED-BROWN TO GRAY-TAN, DRY TO MOIST, STIFF TO V. STIFF SILTY CLAY AND MEDIUM DENSE, CLAYEY SAND, HIGHLY PLASTIC, MIDDENDORF FORMATION
SHEAR POINT No. 381
-Y1-



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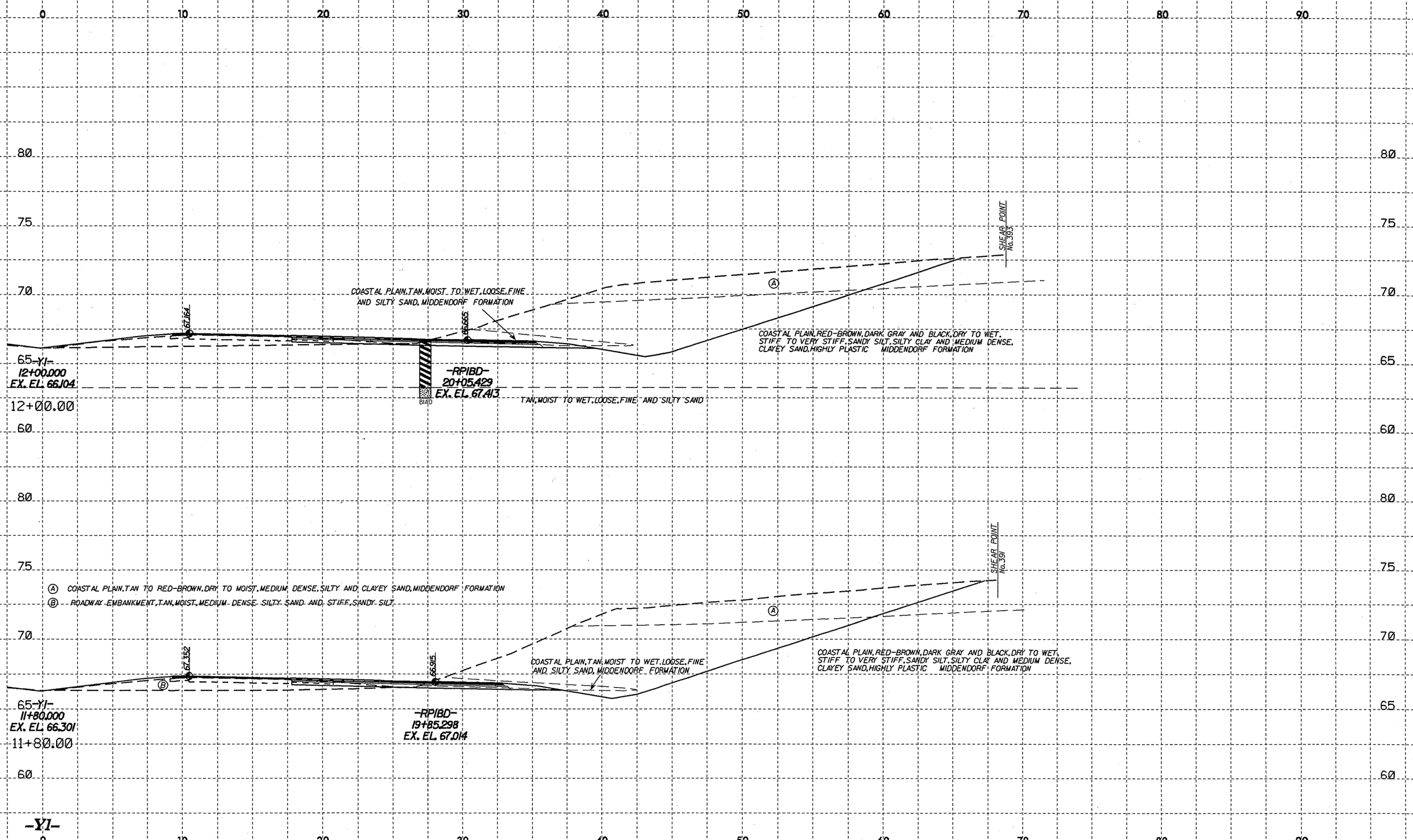
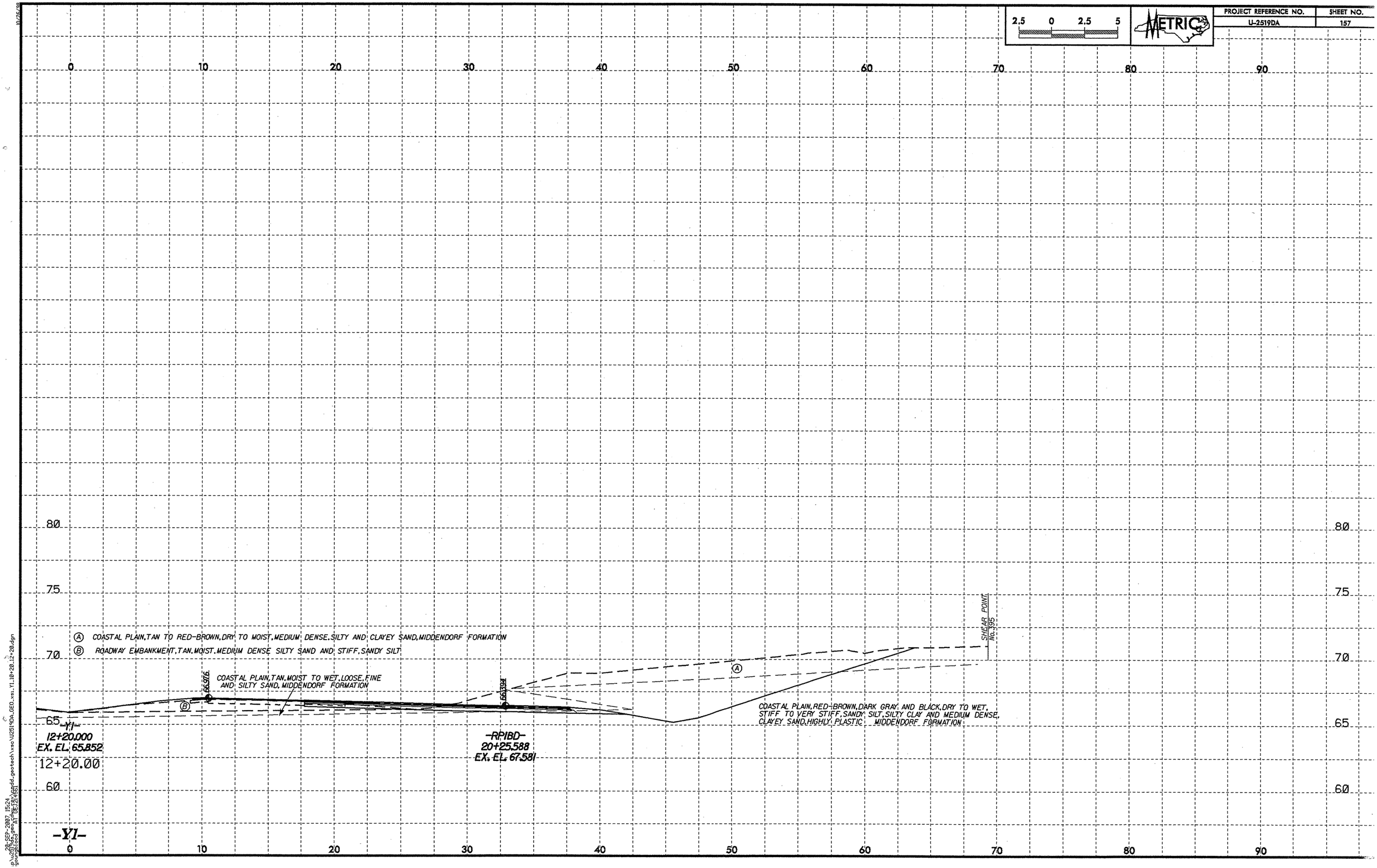
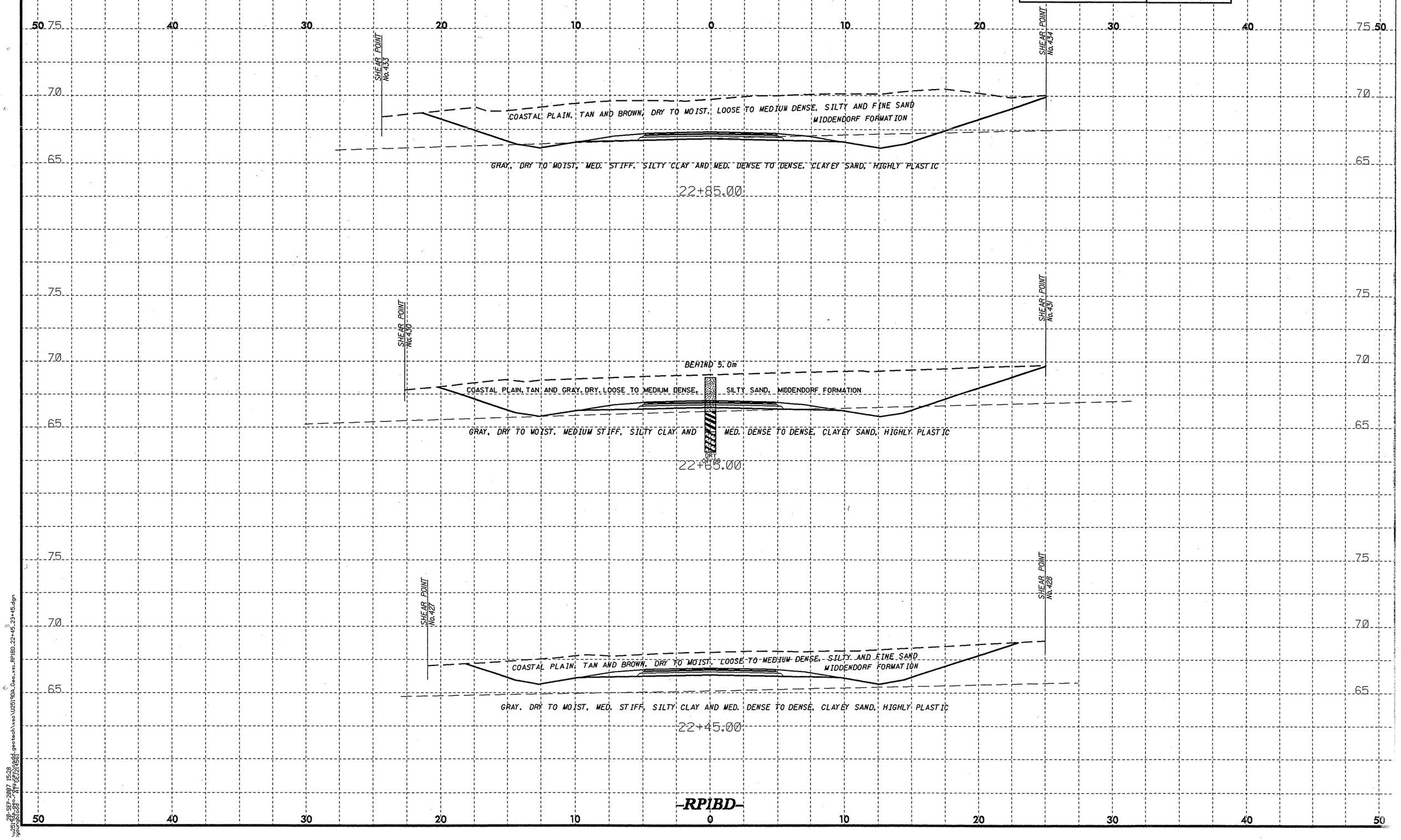


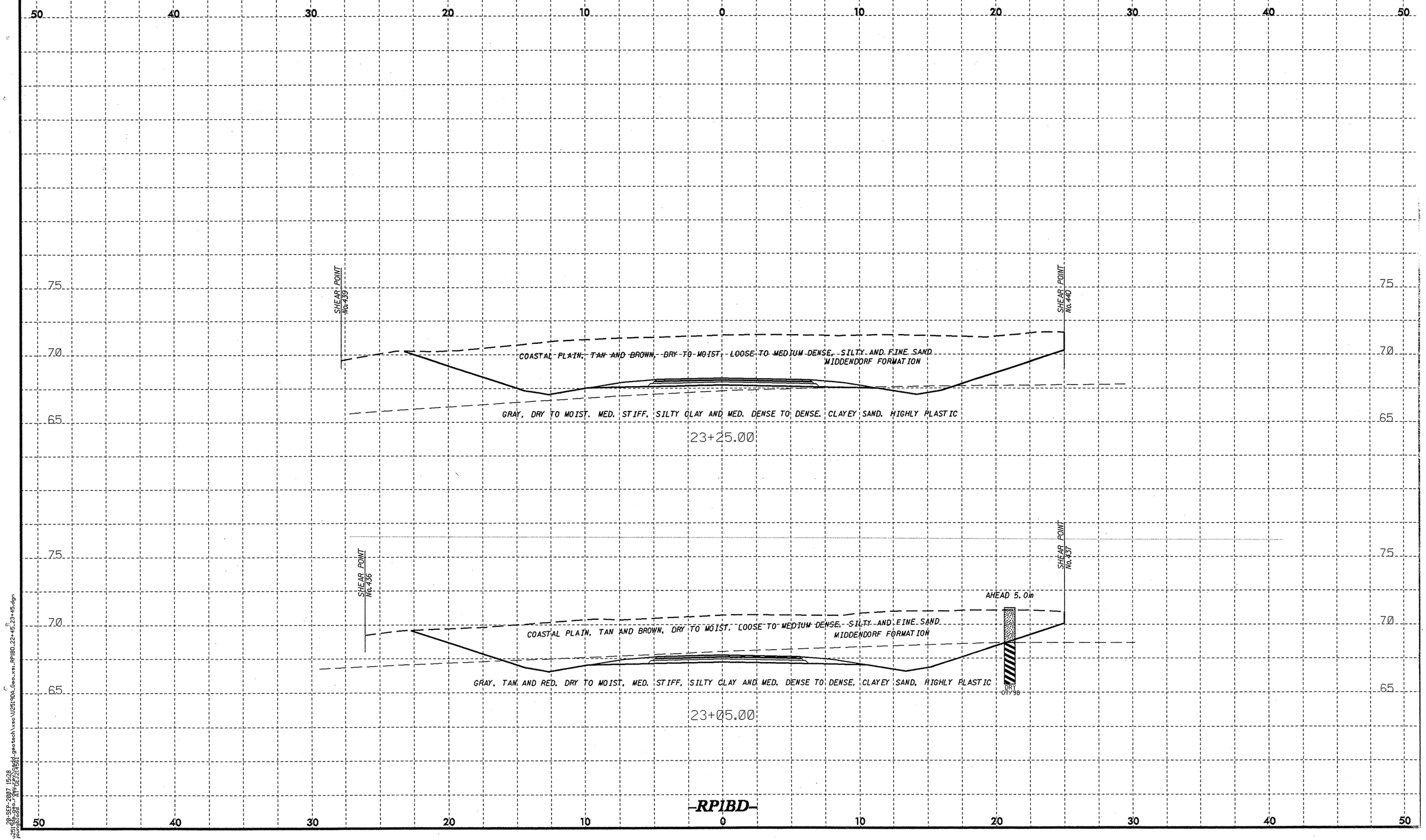
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
156
0 10 20 30 40 50 60 70 80 90
80
75
70
65
60
-Y1-
12+00.000
EX. EL. 66.104
12+00.00
67.164
66.665
COASTAL PLAIN, TAN, MOIST TO WET, LOOSE, FINE AND SILTY SAND, MIDDENDORF FORMATION
-RPIBD-
20+05.429
EX. EL. 67.413
BIAD
TAN, MOIST TO WET, LOOSE, FINE AND SILTY SAND
COASTAL PLAIN, RED-BROWN, DARK GRAY AND BLACK, DRY TO WET, STIFF TO VERY STIFF, SANDY SILT, SILTY CLAY AND MEDIUM DENSE, CLAYEY SAND, HIGHLY PLASTIC MIDDENDORF FORMATION
SHEAR POINT No. 393
Ⓐ
Ⓐ COASTAL PLAIN, TAN TO RED-BROWN, DRY TO MOIST, MEDIUM DENSE, SILTY AND CLAYEY SAND, MIDDENDORF FORMATION
Ⓑ ROADWAY EMBANKMENT, TAN, MOIST, MEDIUM DENSE SILTY SAND AND STIFF, SANDY SILT
67.352
66.915
COASTAL PLAIN, TAN, MOIST TO WET, LOOSE, FINE AND SILTY SAND, MIDDENDORF FORMATION
COASTAL PLAIN, RED-BROWN, DARK GRAY AND BLACK, DRY TO WET, STIFF TO VERY STIFF, SANDY SILT, SILTY CLAY AND MEDIUM DENSE, CLAYEY SAND, HIGHLY PLASTIC MIDDENDORF FORMATION
SHEAR POINT No. 391
-Y1-
11+80.000
EX. EL. 66.301
11+80.00
-RPIBD-
19+85.298
EX. EL. 67.014
-Y1-



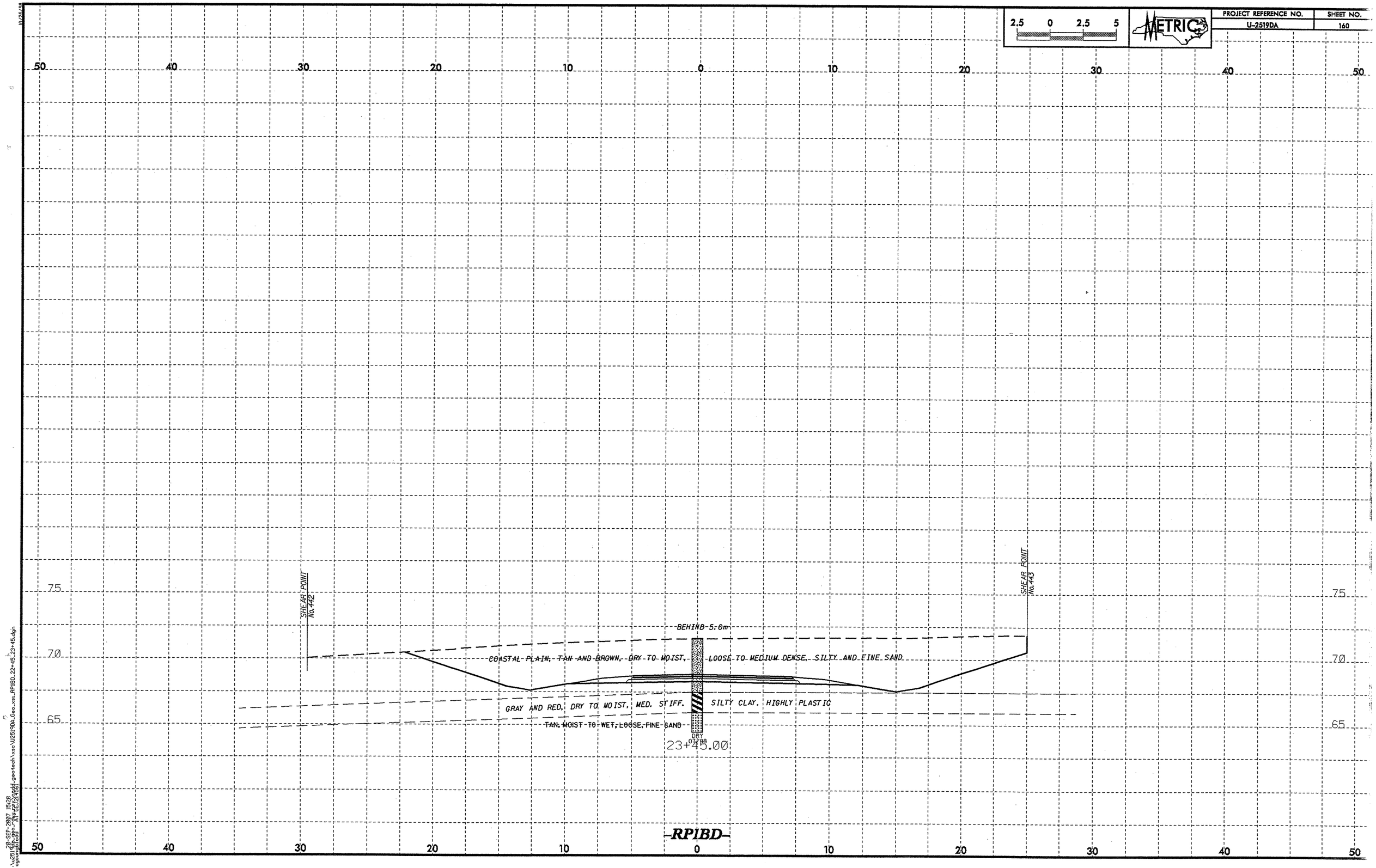
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
157
0 10 20 30 40 50 60 70 80 90
80
75
70
65
60
Ⓐ COASTAL PLAIN, TAN TO RED-BROWN, DRY TO MOIST, MEDIUM DENSE, SILTY AND CLAYEY SAND, MIDDENDORF FORMATION
Ⓑ ROADWAY EMBANKMENT, TAN, MOIST, MEDIUM DENSE SILTY SAND AND STIFF, SANDY SILT
66.976
COASTAL PLAIN, TAN, MOIST TO WET, LOOSE, FINE AND SILTY SAND, MIDDENDORF FORMATION
66.394
SHEAR POINT No. 395
COASTAL PLAIN, RED-BROWN, DARK GRAY AND BLACK, DRY TO WET, STIFF TO VERY STIFF, SANDY SILT, SILTY CLAY AND MEDIUM DENSE, CLAYEY SAND, HIGHLY PLASTIC MIDDENDORF FORMATION
-Y1-
12+20.000
EX. EL. 65.852
12+20.00
-RPIBD-
20+25.588
EX. EL. 67.581
-Y1-



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
158
SHEAR POINT No.433
SHEAR POINT No.434
COASTAL PLAIN, TAN AND BROWN, DRY TO MOIST, LOOSE TO MEDIUM DENSE, SILTY AND FINE SAND
MIDDENDORF FORMATION
GRAY, DRY TO MOIST, MED. STIFF, SILTY CLAY AND MED. DENSE TO DENSE, CLAYEY SAND, HIGHLY PLASTIC
22+85.00
SHEAR POINT No.430
SHEAR POINT No.431
BEHIND 5.0m
COASTAL PLAIN, TAN AND GRAY, DRY, LOOSE TO MEDIUM DENSE, SILTY SAND, MIDDENDORF FORMATION
GRAY, DRY TO MOIST, MEDIUM STIFF, SILTY CLAY AND MED. DENSE TO DENSE, CLAYEY SAND, HIGHLY PLASTIC
DRY
22+65.00
SHEAR POINT No.427
SHEAR POINT No.428
COASTAL PLAIN, TAN AND BROWN, DRY TO MOIST, LOOSE TO MEDIUM DENSE, SILTY AND FINE SAND
MIDDENDORF FORMATION
GRAY, DRY TO MOIST, MED. STIFF, SILTY CLAY AND MED. DENSE TO DENSE, CLAYEY SAND, HIGHLY PLASTIC
22+45.00
-RP1BD-



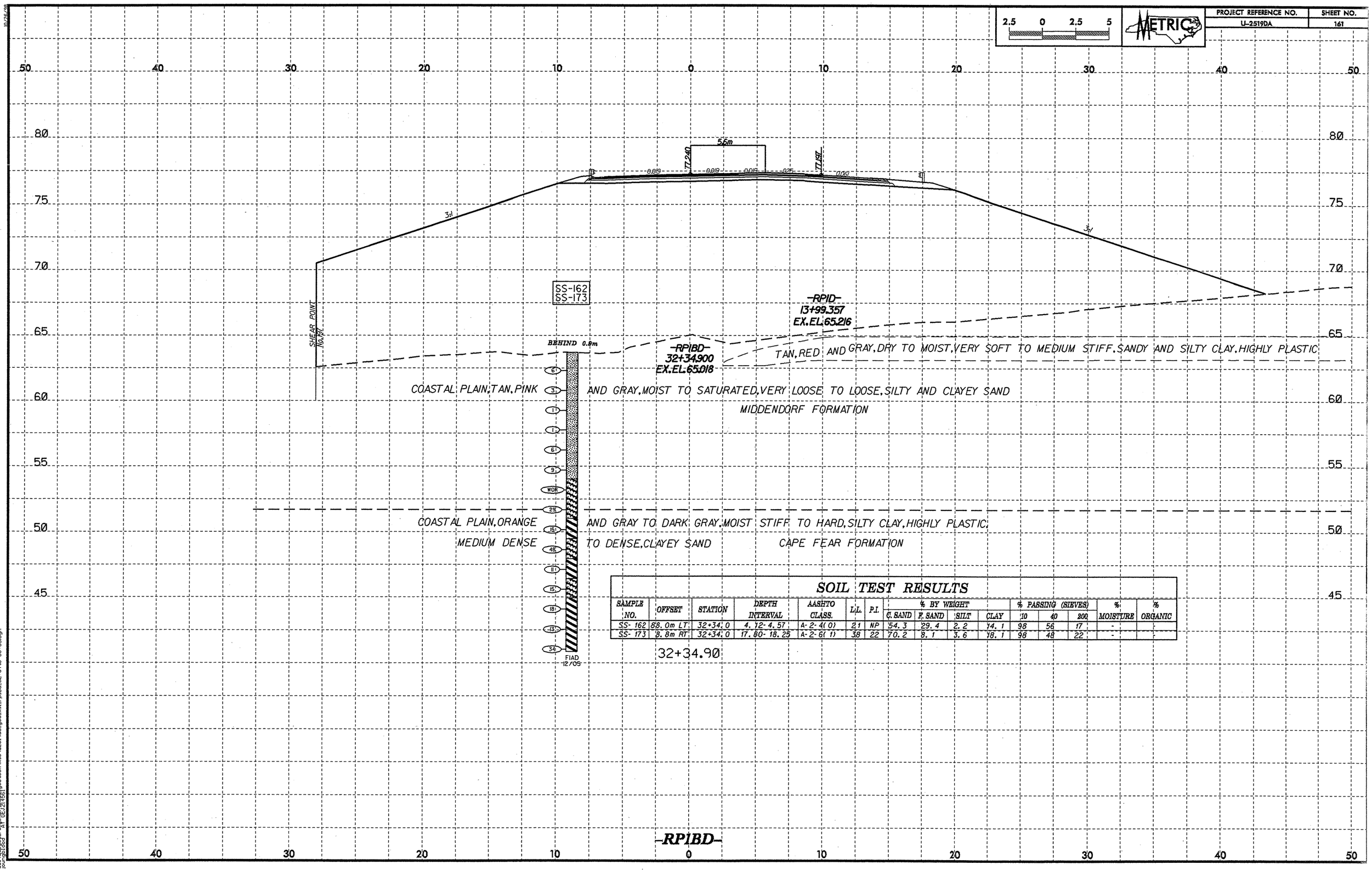
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
159
50 40 30 20 10 0 10 20 30 40 50
75
70
65
SHEAR POINT No.439
SHEAR POINT No.440
COASTAL PLAIN, TAN AND BROWN, DRY TO MOIST, LOOSE TO MEDIUM DENSE, SILTY AND FINE SAND
MIDDENDORF FORMATION
GRAY, DRY TO MOIST, MED. STIFF, SILTY CLAY AND MED. DENSE TO DENSE, CLAYEY SAND, HIGHLY PLASTIC
23+25.00
SHEAR POINT No.436
SHEAR POINT No.437
AHEAD 5.0m
COASTAL PLAIN, TAN AND BROWN, DRY TO MOIST, LOOSE TO MEDIUM DENSE, SILTY AND FINE SAND
MIDDENDORF FORMATION
GRAY, TAN AND RED, DRY TO MOIST, MED. STIFF, SILTY CLAY AND MED. DENSE TO DENSE, CLAYEY SAND, HIGHLY PLASTIC
DRY 07/98
23+05.00
-RP1BD-


2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
160
50 40 30 20 10 0 10 20 30 40 50
75
70
65
SHEAR POINT No.442
SHEAR POINT No.443
BEHIND 5.0m
COASTAL PLAIN, TAN AND BROWN, DRY TO MOIST, LOOSE TO MEDIUM DENSE, SILTY AND FINE SAND
GRAY AND RED, DRY TO MOIST, MED. STIFF. SILTY CLAY. HIGHLY PLASTIC
TAN, MOIST TO WET, LOOSE, FINE SAND
DRY
01/08
23+45.00
-RP1BD-

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	161

2.5 0 2.5 5

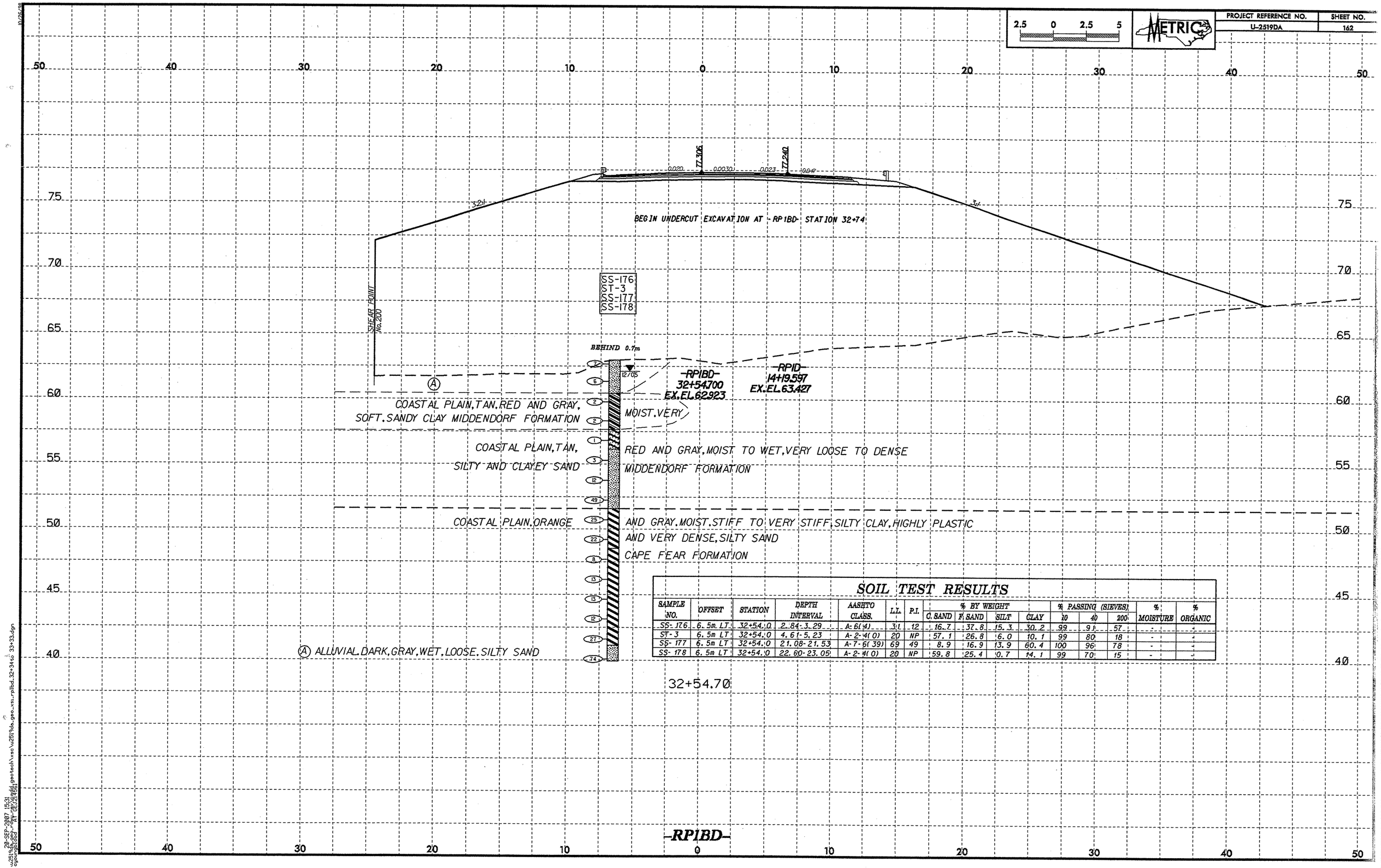
METRIC



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-162	88.0m LT	32+34.0	4.12-4.57	A-2-4(0)	21	NP	54.3	29.4	2.2	14.1	98	56	17	-	-
SS-173	8.8m RT	32+34.0	17.80-18.25	A-2-6(1)	38	22	70.2	8.1	3.6	18.1	98	48	22	-	-

20-SEP-2007 15:07
2519da_geo_rgn_rev\rpibd_geotech\xsc\u2519da_geo_xsi_rpibd_32+34to 33+33.dgn
jonsgu1203 41 (DEV219SI)



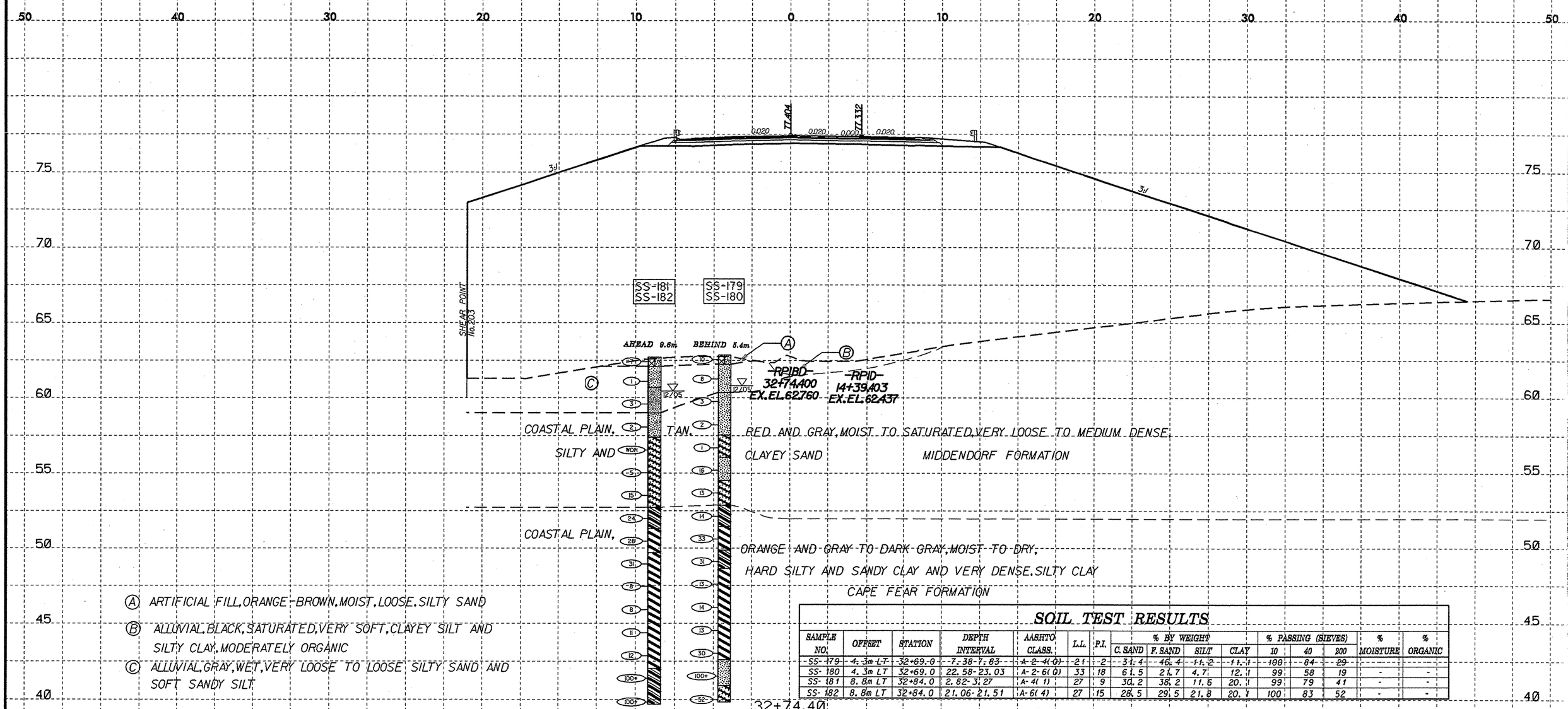
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-176	6.5m LT	32+54.0	2.84-3.29	A-6(4)	31	12	16.7	37.8	15.3	30.2	99	91	57	-	-
ST-3	6.5m LT	32+54.0	4.61-5.23	A-2-4(0)	20	NP	57.1	26.8	6.0	10.1	99	80	18	-	-
SS-177	6.5m LT	32+54.0	21.08-21.53	A-7-6(39)	69	49	8.9	16.9	13.9	60.4	100	96	78	-	-
SS-178	6.5m LT	32+54.0	22.60-23.05	A-2-4(0)	20	NP	59.8	25.4	0.7	14.1	99	70	15	-	-

10/26/98
20-SEP-2007 15:31
u2519dgd geotech\xsc\u2519da_geo_xsi_rplbd_32+34to 33+33.dgn
signoubsbed "AY" (8E/2/1955)

2.5 0 2.5 5

METRIC



Ⓐ ARTIFICIAL FILL, ORANGE-BROWN, MOIST, LOOSE, SILTY SAND

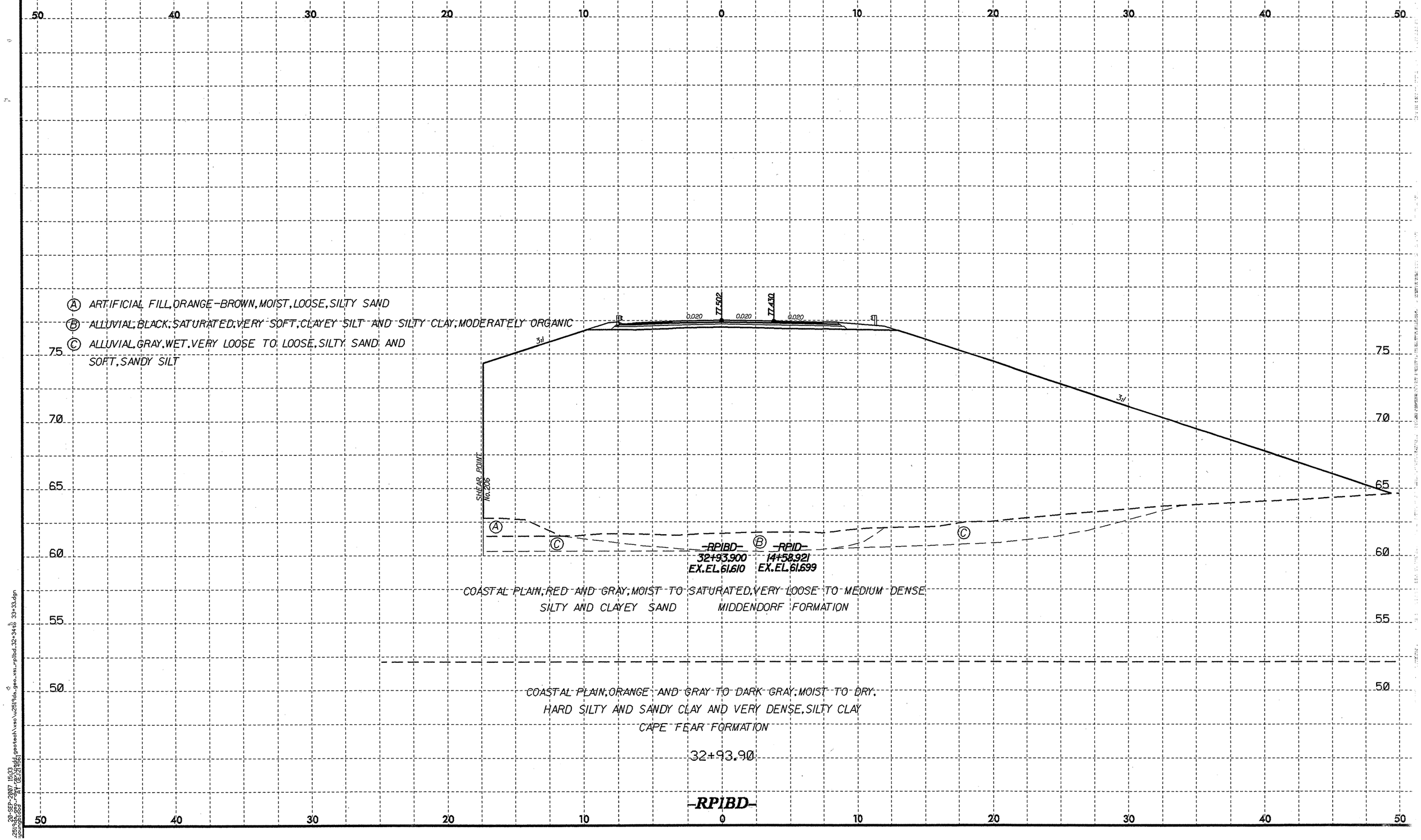
Ⓑ ALLUVIAL, BLACK, SATURATED, VERY SOFT, CLAYEY SILT AND SILTY CLAY, MODERATELY ORGANIC

Ⓒ ALLUVIAL, GRAY, WET, VERY LOOSE TO LOOSE SILTY SAND AND SOFT SANDY SILT

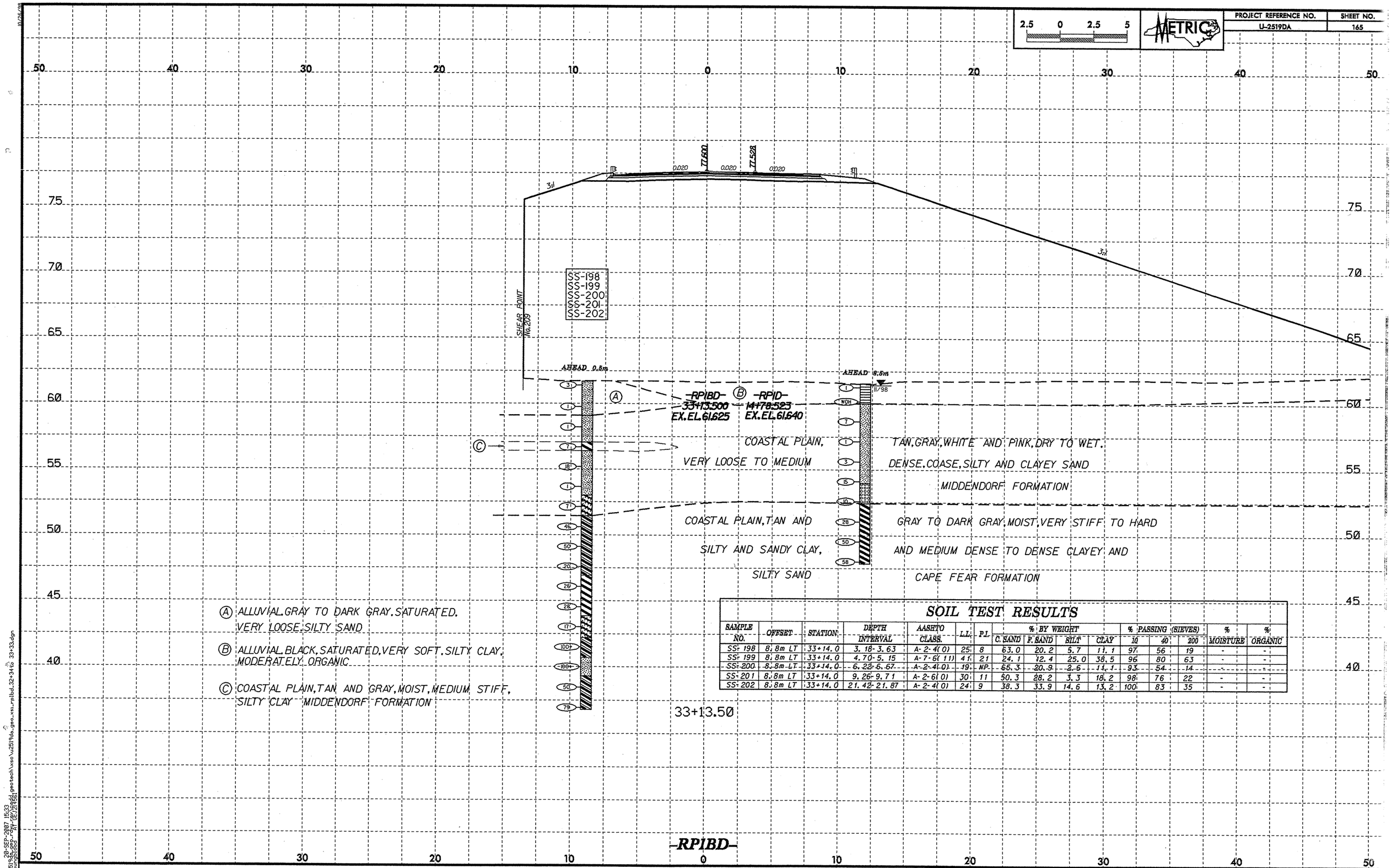
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-179	4.3m LT	32+69.0	7.38-7.83	A-2-4(0)	21	2	31.4	46.4	11.2	11.1	100	84	29	-	-
SS-180	4.3m LT	32+69.0	22.58-23.03	A-2-6(0)	33	18	61.5	21.7	4.7	12.1	99	58	19	-	-
SS-181	8.8m LT	32+84.0	2.82-3.27	A-4(1)	27	9	30.2	38.2	11.6	20.1	99	79	41	-	-
SS-182	8.8m LT	32+84.0	21.06-21.51	A-6(4)	27	15	28.5	29.5	21.8	20.1	100	83	52	-	-

10/26/98
20-SEP-2007 15:32
u2519da_geo_xsh_rpibd_32+34.dgn
cpoungsiri
PT-DEVELOPER



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
164
50 40 30 20 10 0 10 20 30 40 50
75 70 65 60 55 50
Ⓐ ARTIFICIAL FILL, ORANGE-BROWN, MOIST, LOOSE, SILTY SAND
Ⓑ ALLUVIAL, BLACK, SATURATED, VERY SOFT, CLAYEY SILT AND SILTY CLAY, MODERATELY ORGANIC
Ⓒ ALLUVIAL, GRAY, WET, VERY LOOSE TO LOOSE, SILTY SAND AND SOFT, SANDY SILT
77.502
77.430
0.020
0.020
0.020
3:1
3:1
SHEAR POINT No.206
-RPIBD-
32+93.900
EX.EL.61.610
-RPID-
14+58.921
EX.EL.61.699
COASTAL PLAIN, RED AND GRAY, MOIST TO SATURATED, VERY LOOSE TO MEDIUM DENSE
SILTY AND CLAYEY SAND MIDDENDORF FORMATION
COASTAL PLAIN, ORANGE AND GRAY TO DARK GRAY, MOIST TO DRY,
HARD SILTY AND SANDY CLAY AND VERY DENSE, SILTY CLAY
CAPE FEAR FORMATION
32+93.90
-RPIBD-



Ⓐ ALLUVIAL,GRAY TO DARK GRAY,SATURATED,
VERY LOOSE,SILTY SAND

Ⓑ ALLUVIAL,BLACK,SATURATED,VERY SOFT,SILTY CLAY,
MODERATELY ORGANIC

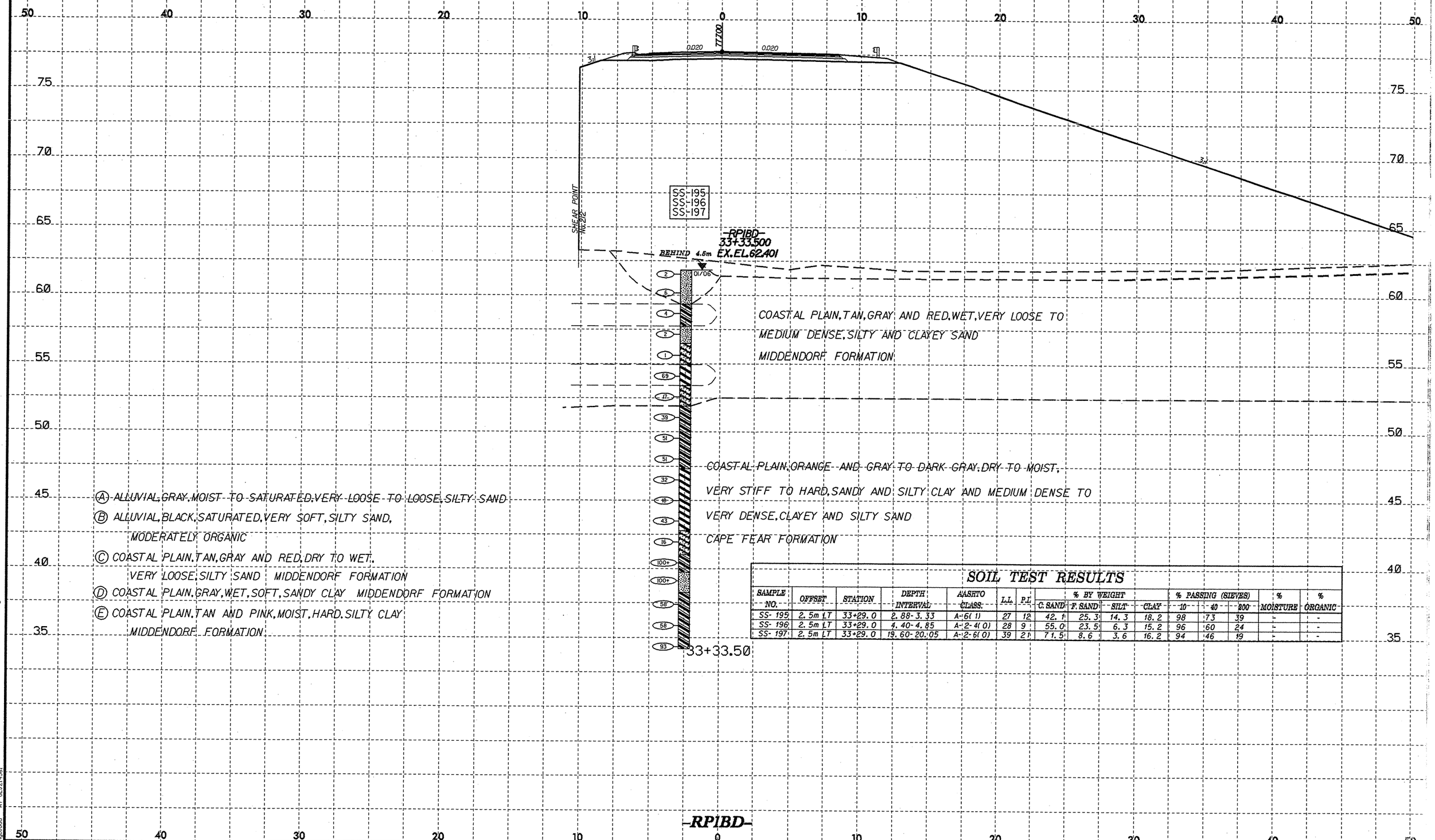
Ⓒ COASTAL PLAIN,TAN AND GRAY,MOIST,MEDIUM STIFF,
SILTY CLAY MIDDENDORF FORMATION

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-198	8.8m LT	33+14.0	3.18-3.63	A-2-4(0)	25	8	63.0	20.2	5.7	11.1	97	56	19	-	-
SS-199	8.8m LT	33+14.0	4.70-5.15	A-7-6(11)	41	21	24.1	12.4	25.0	38.5	96	80	63	-	-
SS-200	8.8m LT	33+14.0	6.22-6.67	A-2-4(0)	19	NP	65.3	20.9	2.6	11.1	93	54	14	-	-
SS-201	8.8m LT	33+14.0	9.26-9.71	A-2-6(0)	30	11	50.3	28.2	3.3	18.2	98	76	22	-	-
SS-202	8.8m LT	33+14.0	21.42-21.87	A-2-4(0)	24	9	38.3	33.9	14.6	13.2	100	83	35	-	-

20-SEP-2007 15:33
u2519da_geo_rpl.dgn
pgounds1868
r:\hwy\d0\proj\geotech\xse\u2519da_geo_xs1_rpibd_32+34%_33+33.dgn
AT 06/21/98
10/26/98

2.5 0 2.5 5 METRIC



Ⓐ ALLUVIAL, GRAY, MOIST TO SATURATED, VERY LOOSE TO LOOSE, SILTY SAND

Ⓑ ALLUVIAL, BLACK, SATURATED, VERY SOFT, SILTY SAND, MODERATELY ORGANIC

Ⓒ COASTAL PLAIN, TAN, GRAY AND RED, DRY TO WET, VERY LOOSE, SILTY SAND MIDDENDORF FORMATION

Ⓓ COASTAL PLAIN, GRAY, WET, SOFT, SANDY CLAY MIDDENDORF FORMATION

Ⓔ COASTAL PLAIN, TAN AND PINK, MOIST, HARD, SILTY CLAY MIDDENDORF FORMATION

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-195	2.5m LT	33+29.0	2.88-3.33	A-6(1)	27	12	42.1	25.3	14.3	18.2	98	73	39	-	-
SS-196	2.5m LT	33+29.0	4.40-4.85	A-2-4(0)	28	9	55.0	23.5	6.3	15.2	96	60	24	-	-
SS-197	2.5m LT	33+29.0	19.60-20.05	A-2-6(0)	39	21	71.5	8.6	3.6	16.2	94	46	19	-	-

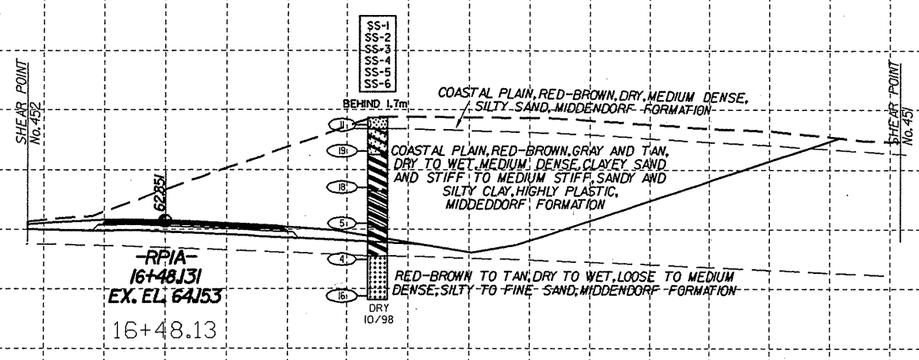
10/26/98
U2519DA_GEO_RDY_ADD_GEOTECH\xsc\u2519da_geo_xs1_rp1bd_32+34to 33+33.dgn
21-SEP-2007 08:37
epgordon0001 At DEV32\PS21

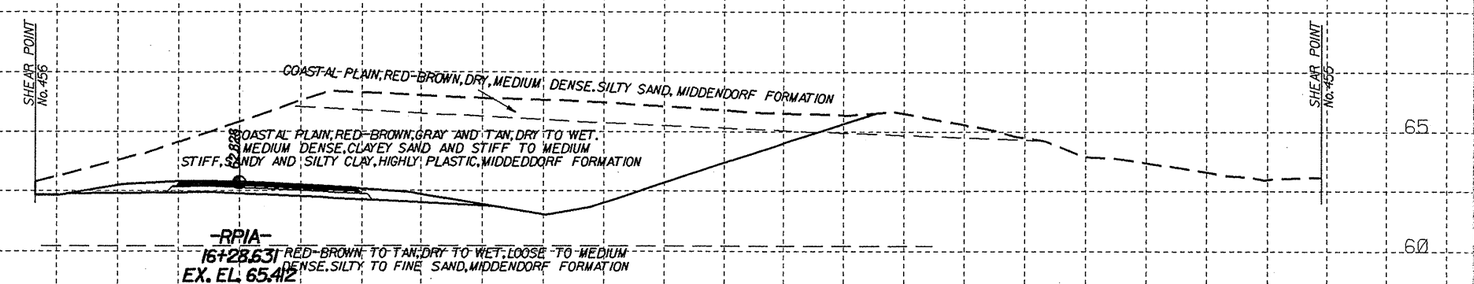
2.5 0 2.5 5

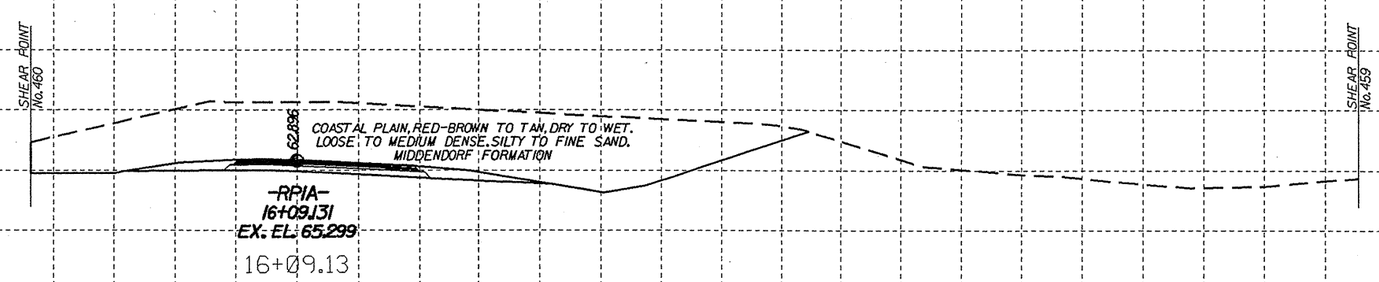
METRIC

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-1	8.7m RT.	16+46.4	0.00-0.45	A-2-4(0)	18	NP	36.2	42.4	10.8	10.6	98.8	80.3	26.5	4.1	-
SS-2	8.7m RT.	16+46.4	1.07-1.52	A-2-7(0)	42	19	52.5	22.8	2.5	22.2	98.9	68.7	26.0	10.7	-
SS-3	8.7m RT.	16+46.4	2.59-3.35	A-7-6(13)	47	27	16.4	30.7	15.4	37.5	100.0	90.3	57.8	19.2	-
SS-4	8.7m RT.	16+46.4	4.11-4.56	A-6(14)	36	14	3.4	15.8	49.2	31.6	100.0	97.7	95.1	29.7	-
SS-5	8.7m RT.	16+46.4	5.64-6.09	A-7-6(25)	63	36	18.2	13.2	14.8	53.8	100.0	96.1	69.5	36.1	-
SS-6	8.7m RT.	16+46.4	7.16-7.61	A-3(0)	20	NP	73.4	21.0	1.6	4.0	100.0	62.7	6.0	-	-







-RP1A-

21-SEP-2007 09:38
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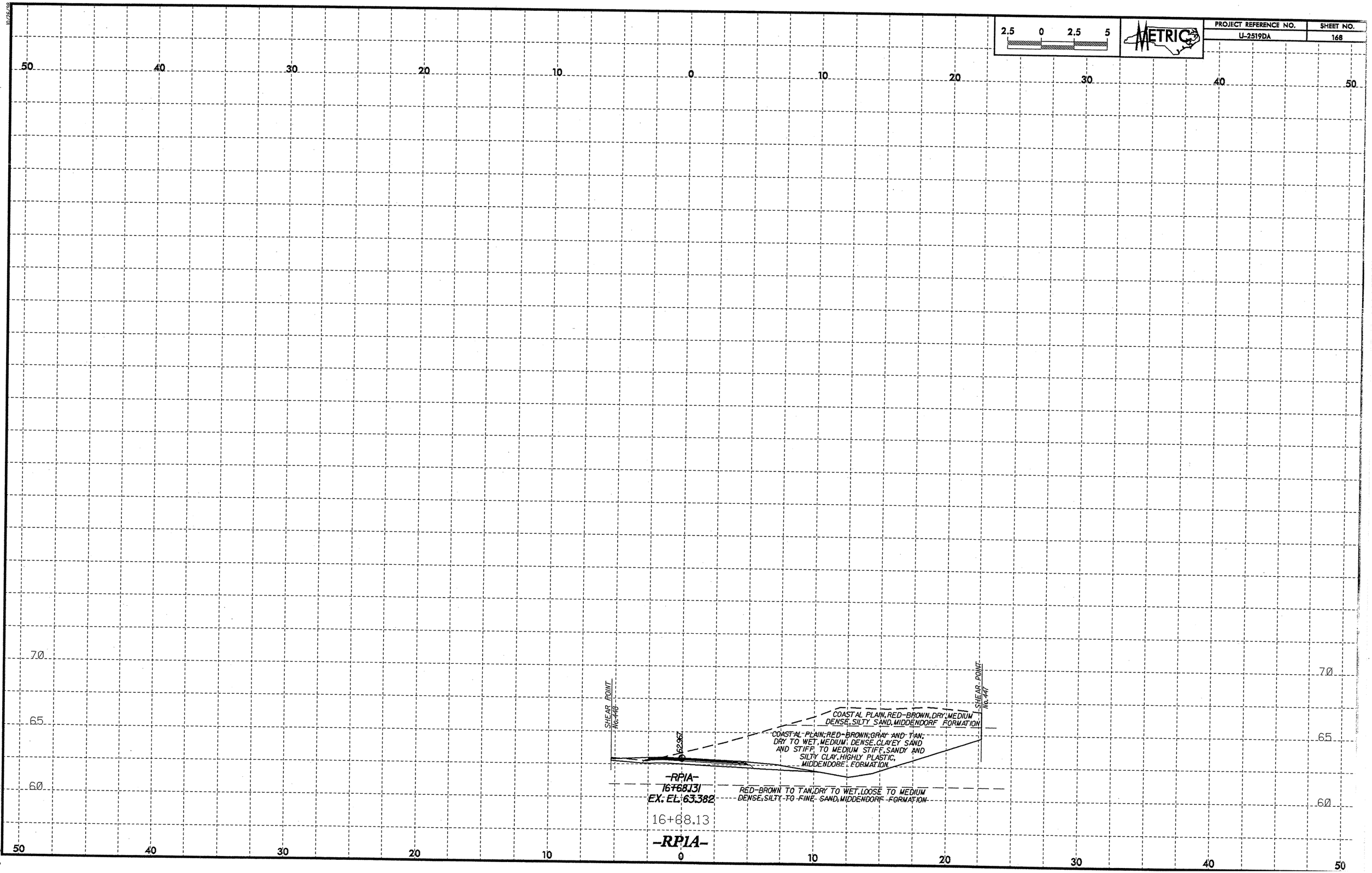
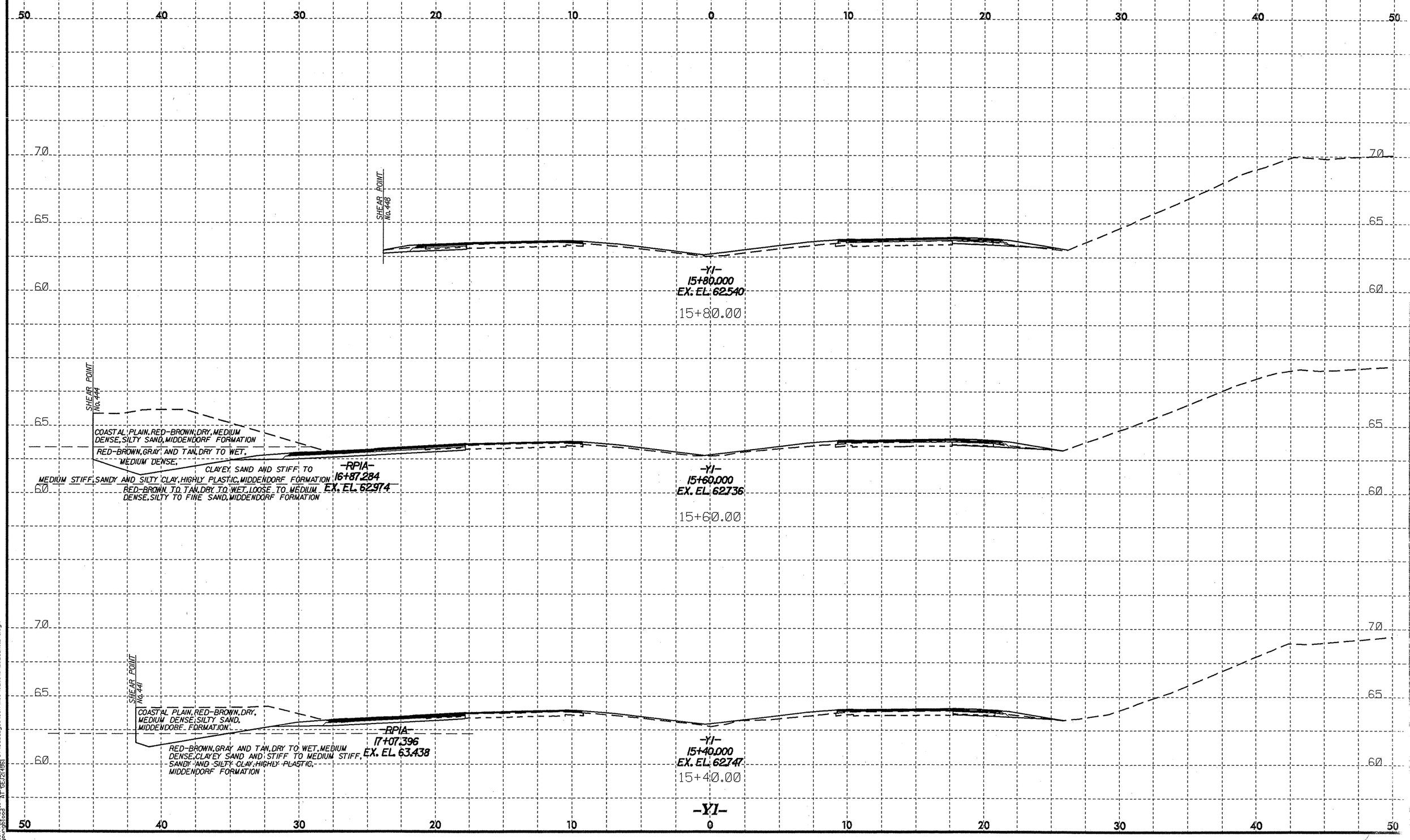
ogoucho01cad


2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
168
50
40
30
20
10
0
10
20
30
40
50
70
65
60
SHEAR POINT
No.448
62367
SHEAR POINT
No.447
COASTAL PLAIN, RED-BROWN, DRY, MEDIUM DENSE, SILTY SAND, MIDDENDORF FORMATION
COASTAL PLAIN; RED-BROWN, GRAY AND TAN; DRY TO WET, MEDIUM DENSE, CLAYEY SAND AND STIFF TO MEDIUM STIFF, SANDY AND SILTY CLAY, HIGHLY PLASTIC, MIDDENDORF FORMATION
RED-BROWN TO TAN, DRY TO WET, LOOSE TO MEDIUM DENSE, SILTY TO FINE SAND, MIDDENDORF FORMATION
-RP1A-
16+68.131
EX. EL. 63.382
16+68.13
-RP1A-



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
169
50 40 30 20 10 0 10 20 30 40 50
70
65
60
SHEAR POINT No. 448
-Y1-
15+80.000
EX. EL. 62.540
15+80.00
SHEAR POINT No. 444
COASTAL PLAIN, RED-BROWN, DRY, MEDIUM DENSE, SILTY SAND, MIDDENDORF FORMATION
RED-BROWN, GRAY AND TAN, DRY TO WET, MEDIUM DENSE, CLAYEY SAND AND STIFF TO MEDIUM STIFF, SANDY AND SILTY CLAY, HIGHLY PLASTIC, MIDDENDORF FORMATION
RED-BROWN TO TAN, DRY TO WET, LOOSE TO MEDIUM DENSE, SILTY TO FINE SAND, MIDDENDORF FORMATION
-RPIA-
16+87.284
EX. EL. 62.974
-Y1-
15+60.000
EX. EL. 62.736
15+60.00
SHEAR POINT No. 441
COASTAL PLAIN, RED-BROWN, DRY, MEDIUM DENSE, SILTY SAND, MIDDENDORF FORMATION
RED-BROWN, GRAY AND TAN, DRY TO WET, MEDIUM DENSE, CLAYEY SAND AND STIFF TO MEDIUM STIFF, SANDY AND SILTY CLAY, HIGHLY PLASTIC, MIDDENDORF FORMATION
-RPIA-
17+07.396
EX. EL. 63.438
-Y1-
15+40.000
EX. EL. 62.747
15+40.00
-Y1-

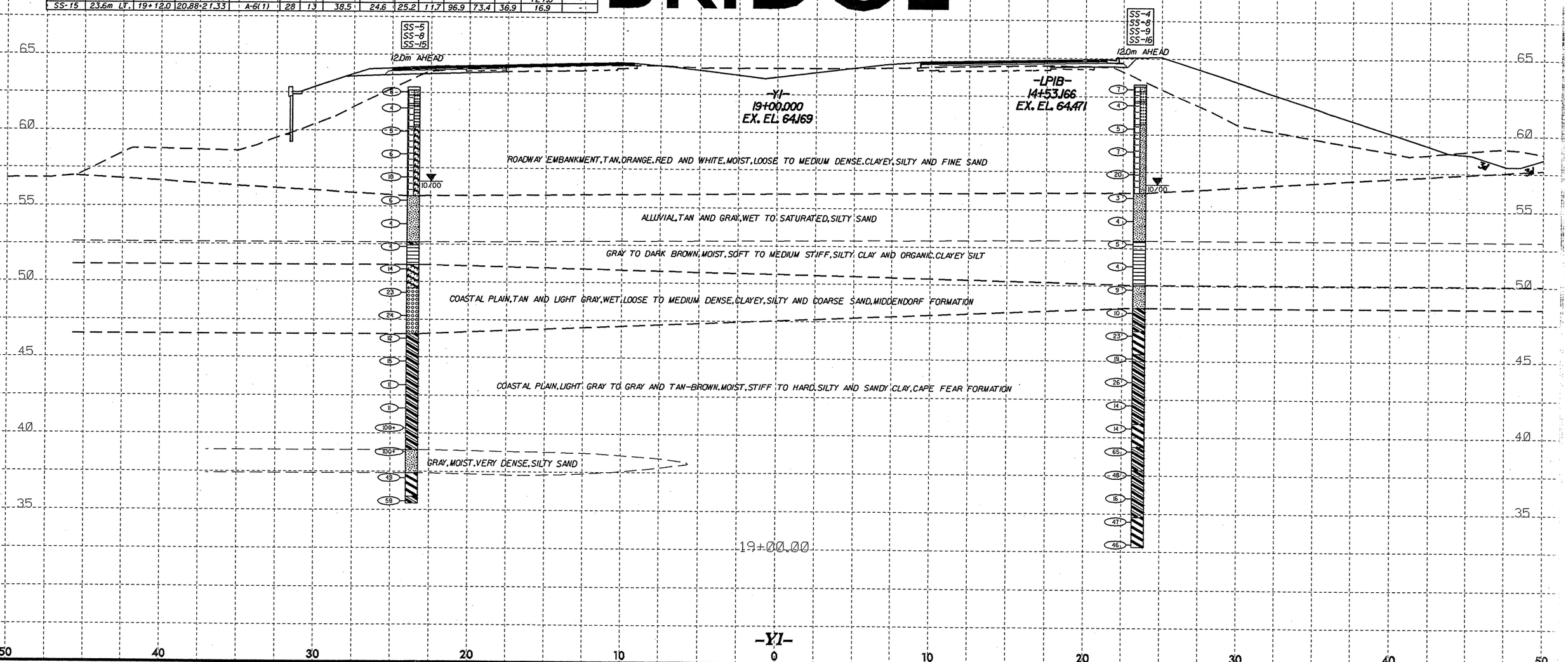
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	170

2.5 0 2.5 5 METRIC

BRIDGE

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PI.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-4	23.6m RT.	19+12.0	4.11-4.56	A-2-4	22	15	60.5	19.4	2.1	18.0	99.5	61.0	20.1	12.3	-
SS-8	23.6m RT.	19+12.0	10.21-10.66	-	-	-	-	-	-	-	-	-	-	155.9	-
SS-9	23.6m RT.	19+12.0	11.73-12.18	A-5(1)	41	31	32.5	27.5	28.7	11.3	99.3	80.7	40.0	70.7	-
SS-16	23.6m RT.	19+12.0	22.40-22.85	A-7-6(32)	60	16	11.0	14.3	17.0	57.7	99.8	93.6	74.8	29.6	-
SS-5	23.6m LT.	19+12.0	5.64-6.09	A-2-6(0)	32	18	58.0	16.6	5.6	19.8	99.1	64.3	25.4	15.7	-
SS-8	23.6m LT.	19+12.0	10.21-10.66	-	-	-	-	-	-	-	-	-	-	121.8	-
SS-15	23.6m LT.	19+12.0	20.88-21.33	A-6(1)	28	13	38.5	24.6	25.2	11.7	96.9	73.4	36.9	16.9	-



10/25/08
20-SEP-2007 15:45
ation\tip\u2519da_rev\cadd_geotech\sso\u2519da_geo_xs1_y1.dgn
ogun8106ss
AT DEP:FAHR

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	171

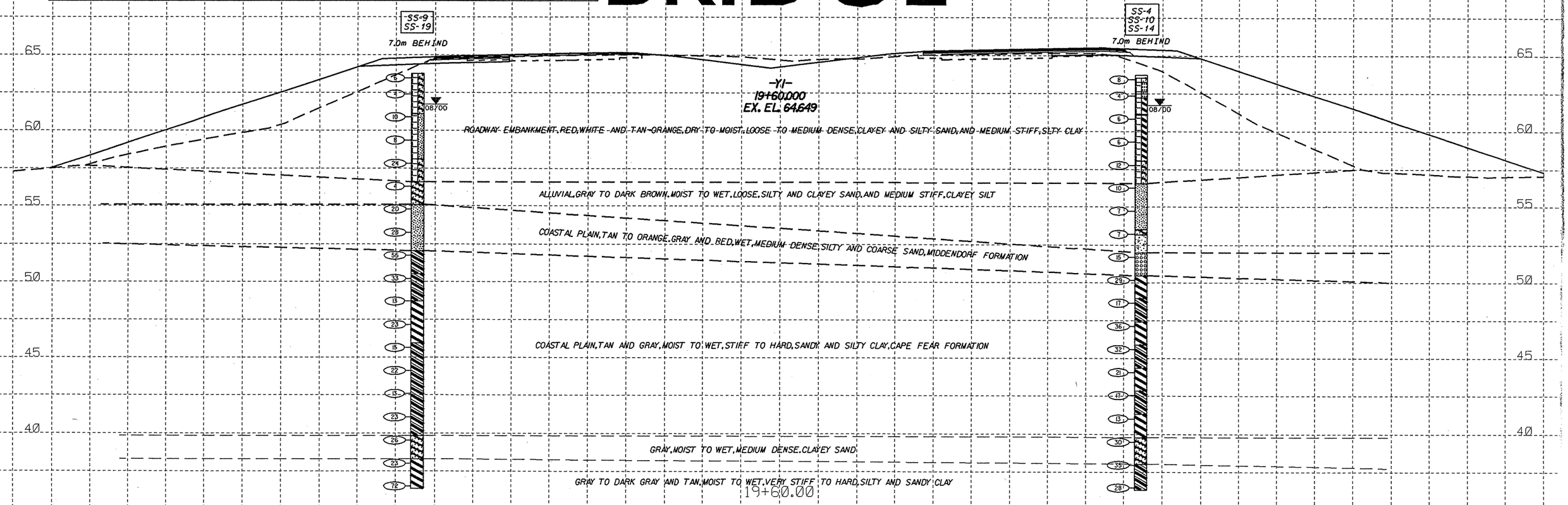
2.5 0 2.5 5

METRIC

BRIDGE

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-9	23.6m Lt.	19+53.0	11.73-12.18	A-6(13)	38	17	10.8	20.1	24.5	44.6	100.0	94.1	69.7	14.1	-
SS-19	23.6m Lt.	19+53.0	26.97-27.42	A-7-6(20)	53	27	8.6	19.9	40.8	30.7	100.0	95.4	74.1	26.1	-
SS-4	23.6m Rt.	19+53.0	4.11-4.56	A-7-6(8)	43	18	27.1	24.7	9.4	38.8	97.7	83.1	48.6	17.8	-
SS-10	23.6m Rt.	19+53.0	13.26-13.71	A-7-6(12)	46	18	24.3	21.3	6.3	48.1	100.0	89.6	54.8	18.3	-
SS-14	23.6m Rt.	19+53.0	19.35-19.80	A-7-6(31)	51	21	2.8	3.7	36.9	56.6	100.0	98.6	93.7	26.7	-



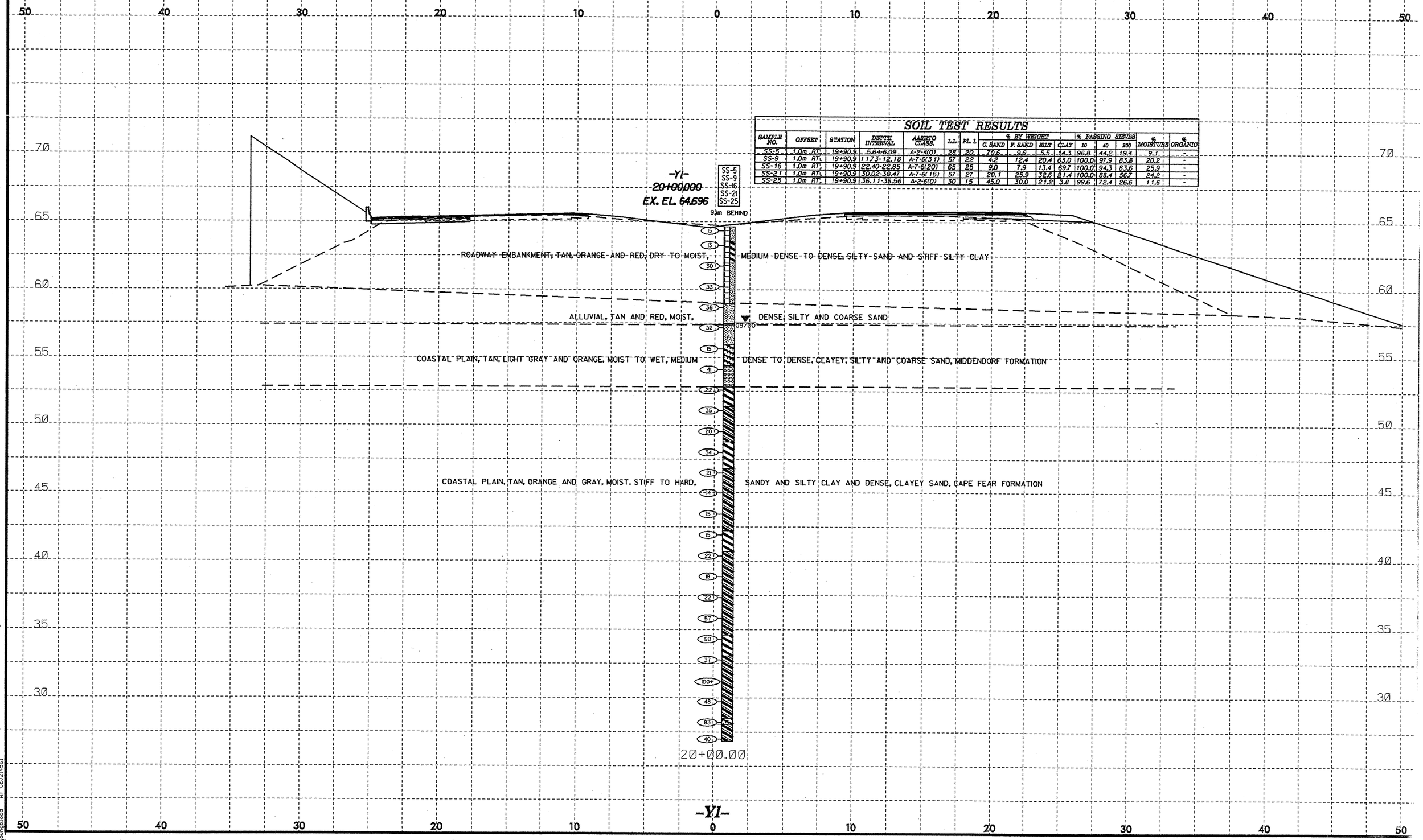
-Y1-

10/25/99
20-SEP-2007 15:49
s:\stations\U2519\DGN\U2519DA_GEO_rev\coldd_geotech\xsc\U2519DA_GEO_xs1_Y1.dgn
ygoundload AT 08/21/1961

PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	172

2.5 0 2.5 5

METRIC



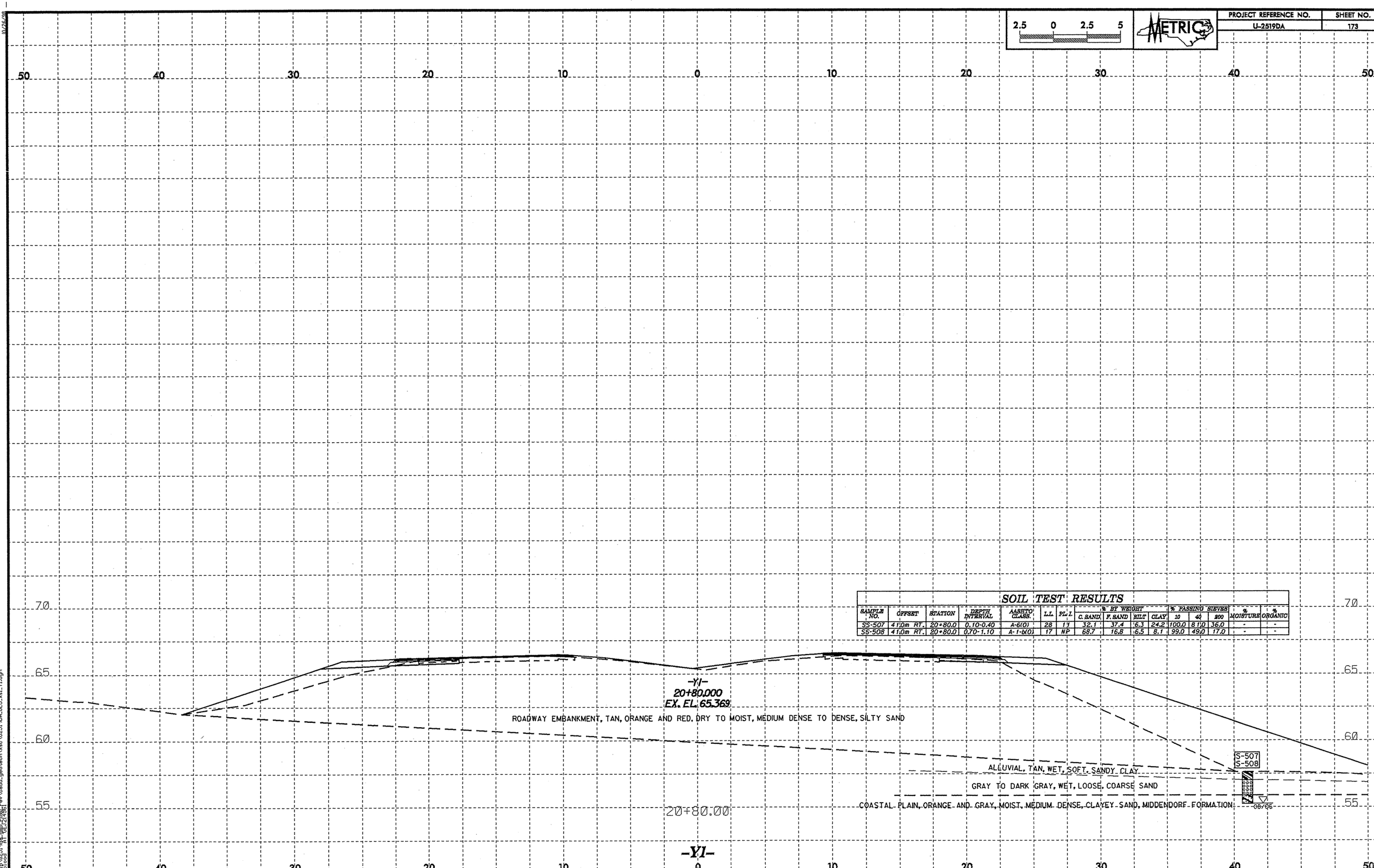
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-5	1.0m RT.	19+90.9	5.64-6.09	A-2-4(0)	28	20	70.6	9.6	5.5	14.3	96.8	44.2	19.4	9.1	-
SS-9	1.0m RT.	19+90.9	11.73-12.18	A-7-6(31)	57	22	4.2	12.4	20.4	63.0	100.0	97.9	83.8	20.2	-
SS-16	1.0m RT.	19+90.9	22.40-22.85	A-7-6(20)	65	25	9.0	7.9	13.4	69.7	100.0	94.3	83.6	25.9	-
SS-21	1.0m RT.	19+90.9	30.02-30.47	A-7-6(15)	57	27	20.1	25.9	32.6	21.4	100.0	88.4	56.7	24.2	-
SS-25	1.0m RT.	19+90.9	36.11-36.56	A-2-6(0)	30	15	45.0	30.0	21.2	3.8	99.6	72.4	26.6	11.6	-

10/26/98

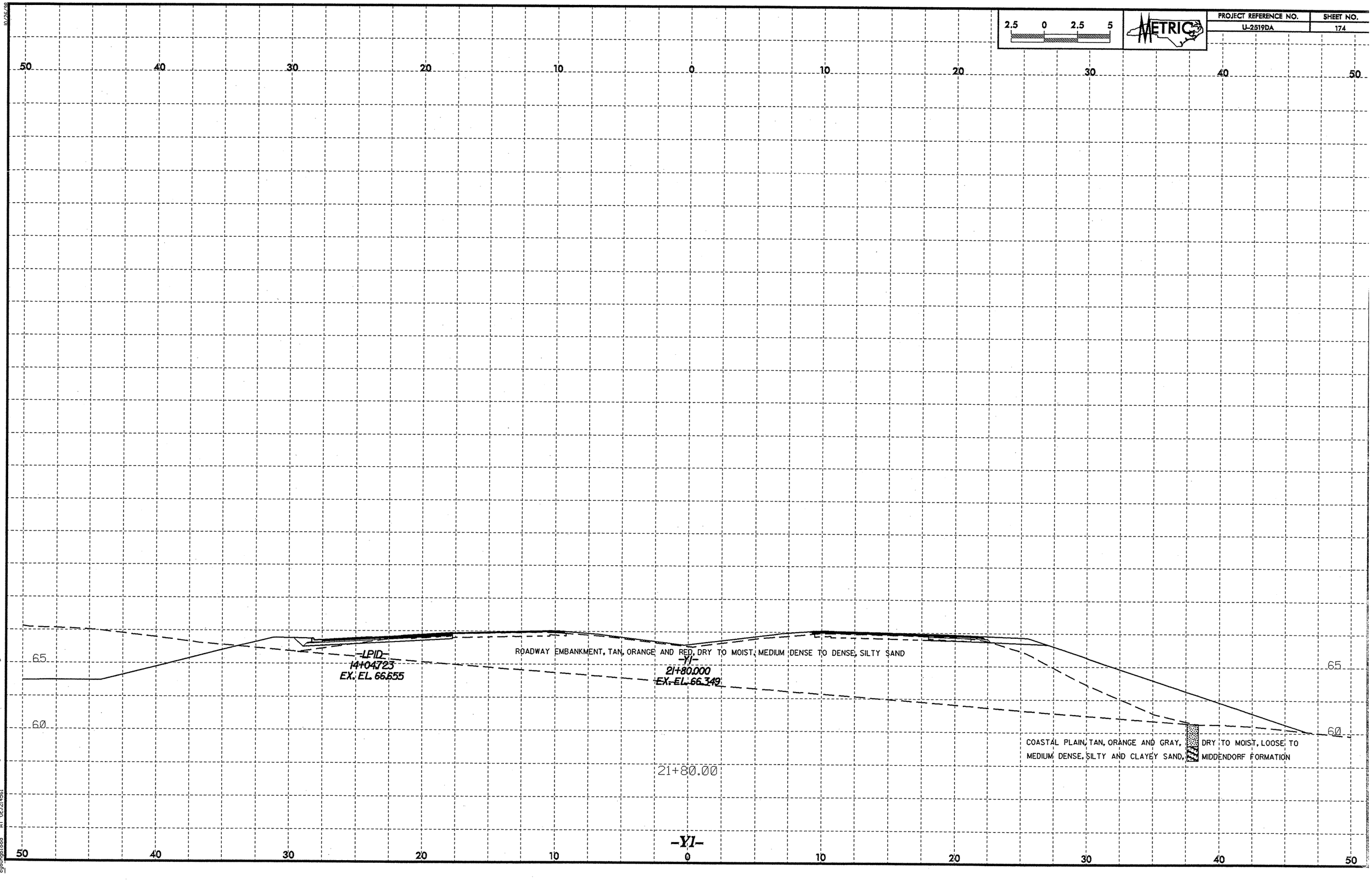
20-SEP-2007 15:49
r:\roadway\proj\u2519da_rev\coadd_geotech\sso\U2519DA_GEO_xs_Y1.dgn
jgunnsbo.dgn
A1 - 8E(12PBS)

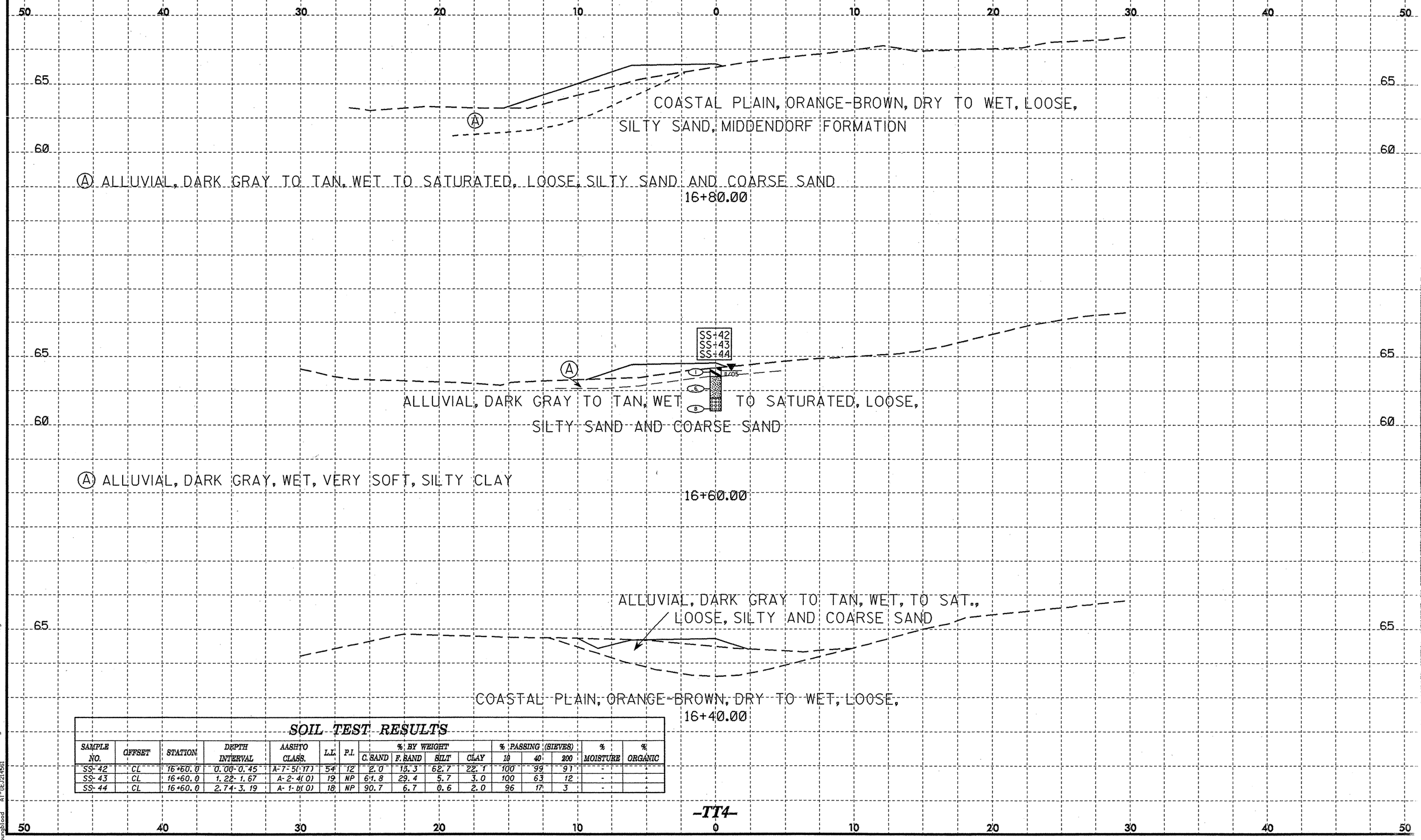
PROJECT REFERENCE NO.	SHEET NO.
U-2519DA	173



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING SIEVES 10	% PASSING SIEVES 40	% PASSING SIEVES 200	% MOISTURE	% ORGANIC
SS-507	41.0m RT.	20+80.0	0.10-0.40	A-6(0)	28	11	32.1	37.4	6.3	24.2	100.0	81.0	36.0	-	-
SS-508	41.0m RT.	20+80.0	0.70-1.10	A-1-b(0)	17	NP	68.7	16.8	6.5	8.1	99.0	49.0	17.0	-	-


2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519DA
SHEET NO.
174
50 40 30 20 10 0 10 20 30 40 50
65
60
-LPID-
14+04.723
EX. EL. 66.655
ROADWAY EMBANKMENT, TAN, ORANGE AND RED, DRY TO MOIST, MEDIUM DENSE TO DENSE, SILTY SAND
-Y1-
21+80.000
EX. EL. 66.349
COASTAL PLAIN, TAN, ORANGE AND GRAY, DRY TO MOIST, LOOSE TO MEDIUM DENSE, SILTY AND CLAYEY SAND, MIDDENDORF FORMATION
21+80.00
-Y1-



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-42	CL	16+60.0	0.00-0.45	A-7-5(17)	54	12	2.0	13.3	62.7	22.1	100	99	91	-	-
SS-43	CL	16+60.0	1.22-1.67	A-2-4(0)	19	NP	61.8	29.4	5.7	3.0	100	63	12	-	-
SS-44	CL	16+60.0	2.74-3.19	A-1-b(0)	18	NP	90.7	6.7	0.6	2.0	96	17	3	-	-

20-SEP-2007 16:06
tsen\tip\25149\
sgoundstad R:\GEOTECH\Div\odd_geotech\xso\U2519DA_GEO_xs_TT4.dgn

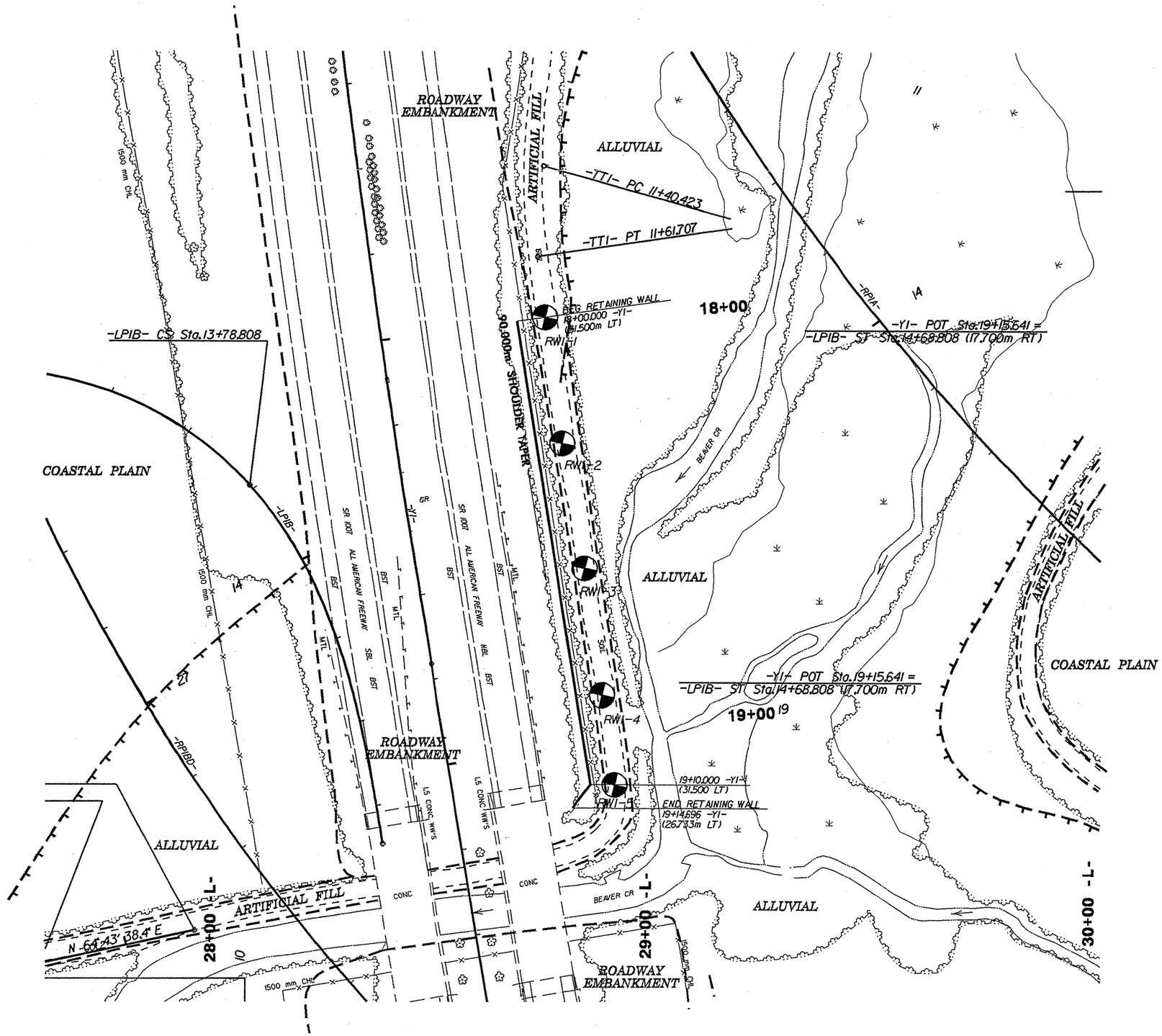
PROJECT REFERENCE NO.	SHEET
34817.1.2 (U-2519DA)	176

SITE PLAN

0 20 40

METERS

RETAINING WALL 1

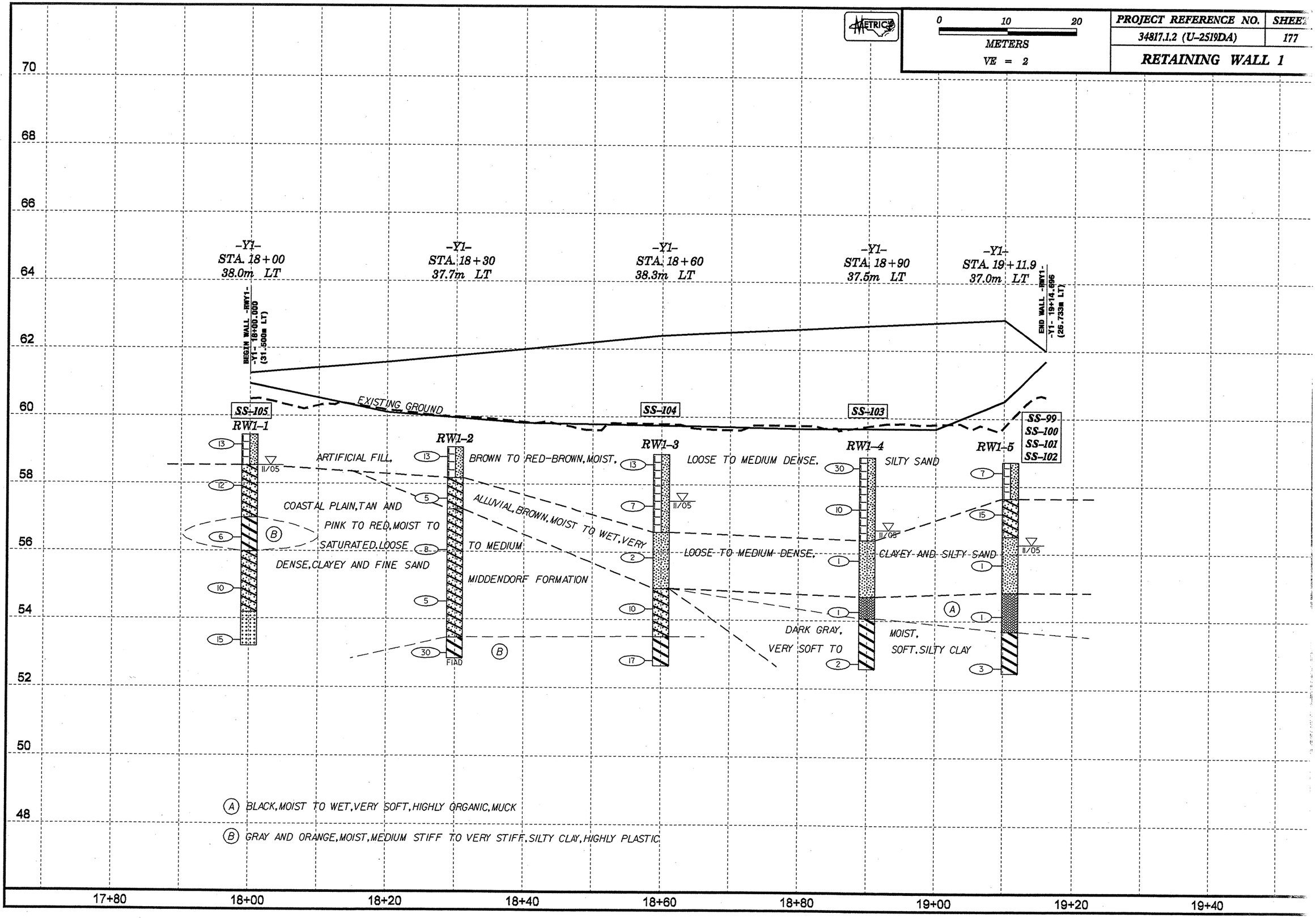


PROJECT REFERENCE NO.	SHEET
34817.1.2 (U-2519DA)	177

RETAINING WALL 1

METRIC

0 10 20
METERS
VE = 2

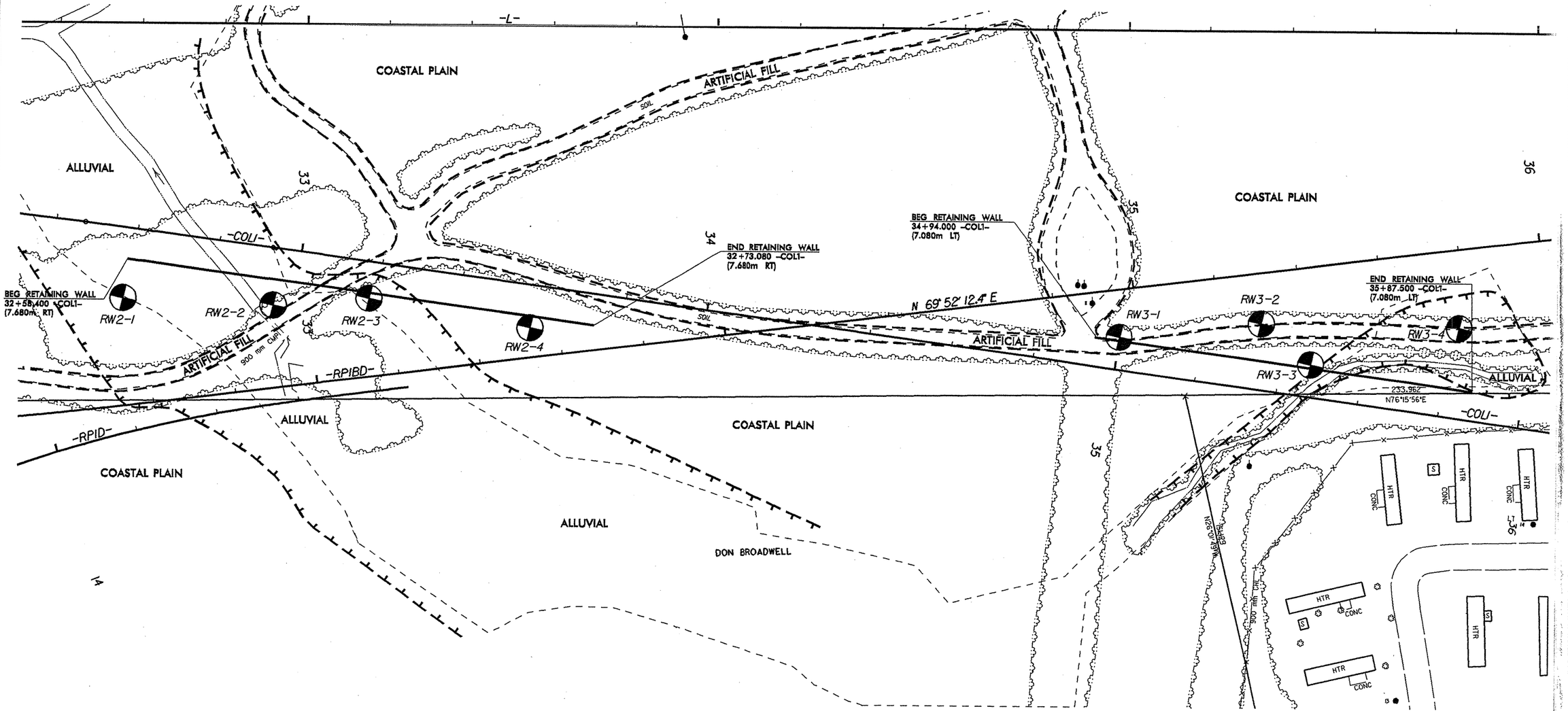


PROJECT REFERENCE NO.	SHEET
34817.1.2 (U-2519DA)	178

SITE PLAN

0 20 40
METERS

RETAINING WALL 2
RETAINING WALL 3

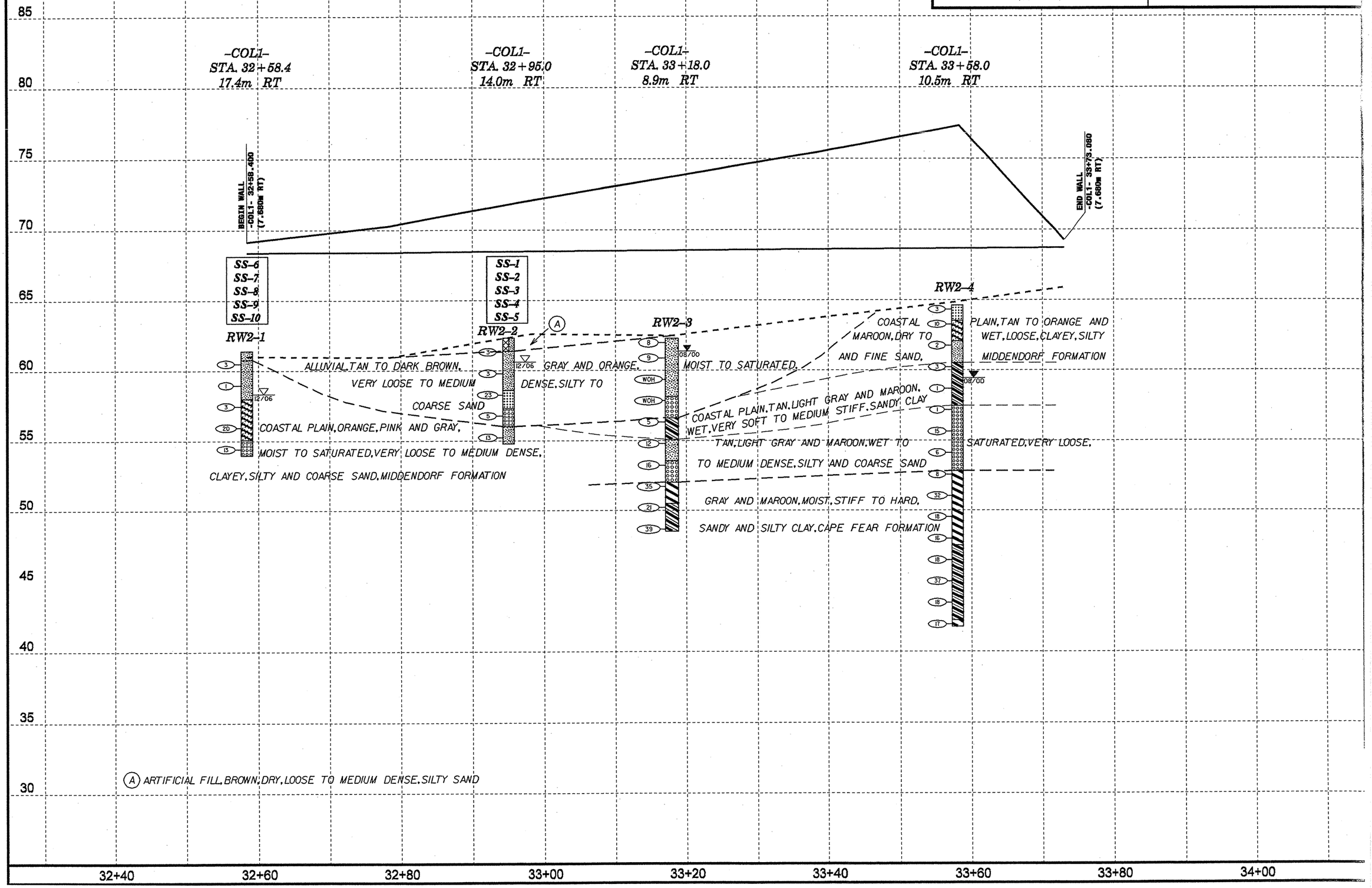


PROJECT REFERENCE NO.	SHEET
34817.1.2 (U-2519DA)	179

RETAINING WALL 2

METRIC

0 10 20
METERS
VE = 5

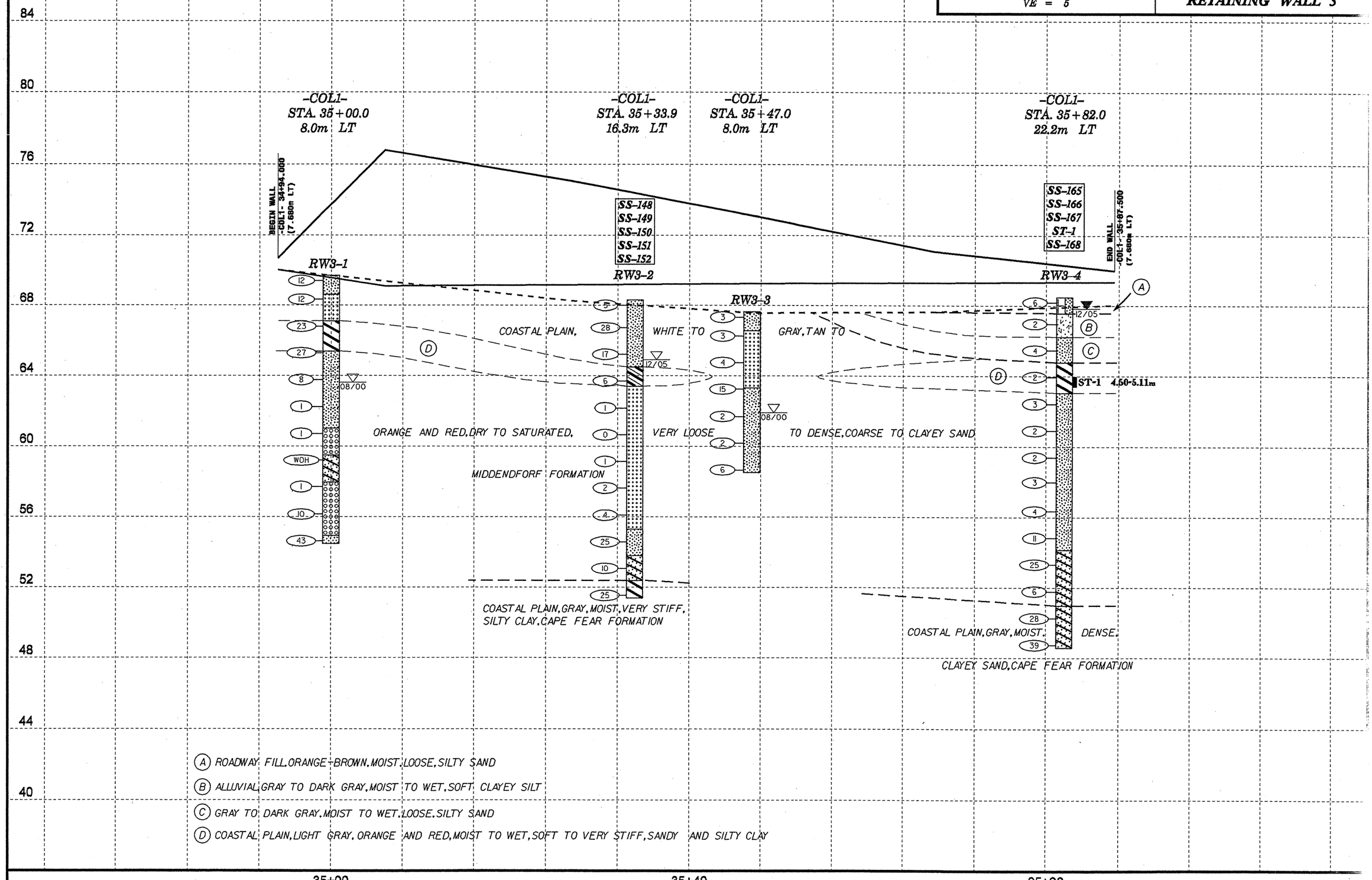


PROJECT REFERENCE NO.	SHEET
34817.1.2 (U-2519DA)	180

RETAINING WALL 3

METRIC

0 8 16
METERS
VE = 5



(A) ROADWAY FILL, ORANGE-BROWN, MOIST, LOOSE, SILTY SAND

(B) ALLUVIAL, GRAY TO DARK GRAY, MOIST TO WET, SOFT, CLAYEY SILT

(C) GRAY TO DARK GRAY, MOIST TO WET, LOOSE, SILTY SAND

(D) COASTAL PLAIN, LIGHT GRAY, ORANGE AND RED, MOIST TO WET, SOFT TO VERY STIFF, SANDY AND SILTY CLAY

NOISE WALL PLAN & PROFILE -WALL N1-

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

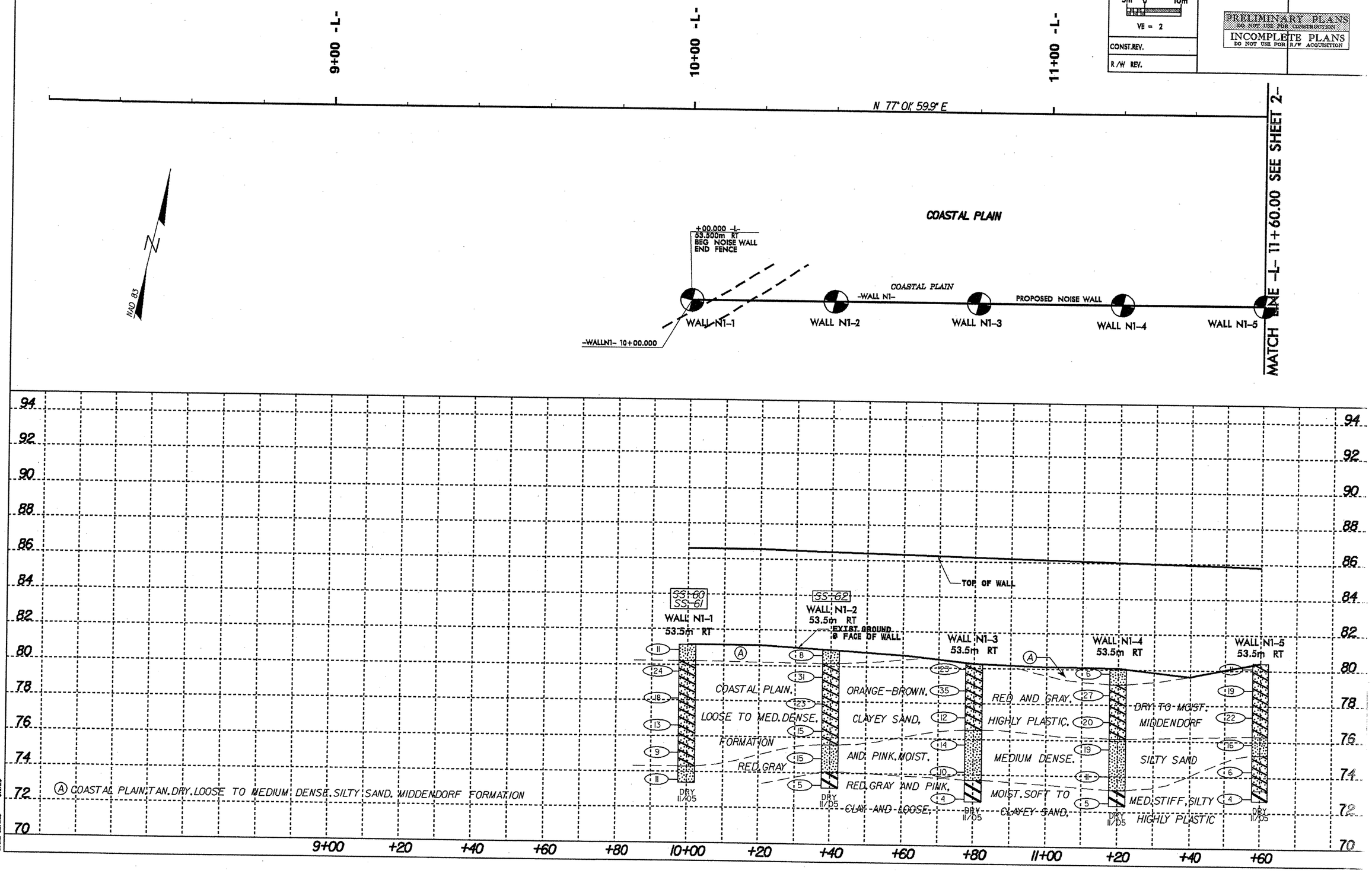
METRIC

PROJECT REFERENCE NO.	SHEET NO.
34817.1.2 (U-2519DA)	181
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5m 0 10m
VE = 2

CONST.REV.
R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



FILE: SFILES
DATE: SDATES
STIMES

NOISE WALL PLAN & PROFILE –WALL N1–

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 470
RALEIGH, NC 27607

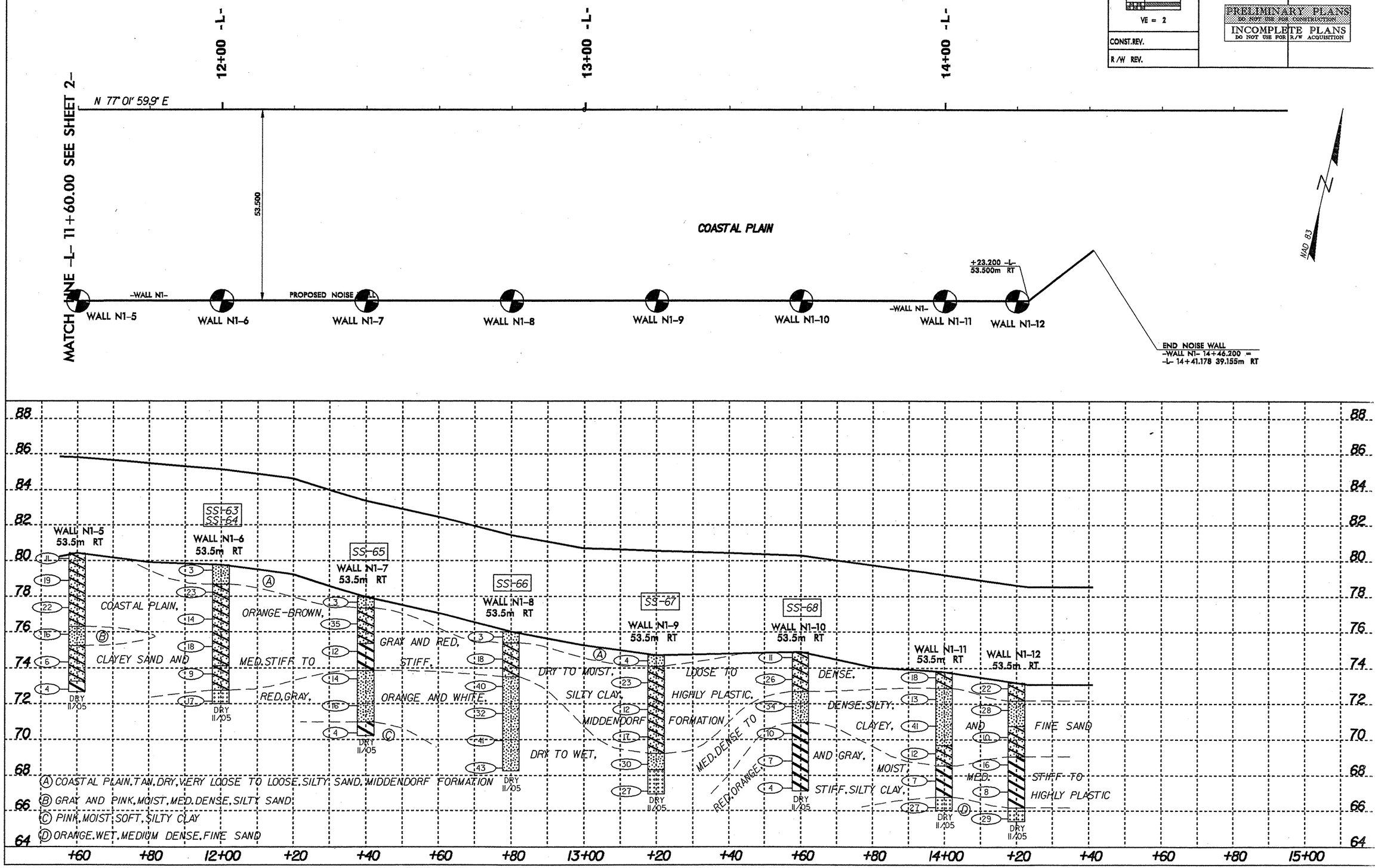
METRIC
5m 0 10m
VE = 2

PROJECT REFERENCE NO.	SHEET NO.
34817.1.2 (U-2519DA)	182
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.
R /W REV.

6/09/92



NOISE WALL PLAN & PROFILE –WALL N2–

PLANS PREPARED BY:
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 470
RALEIGH, NC 27607

METRIC

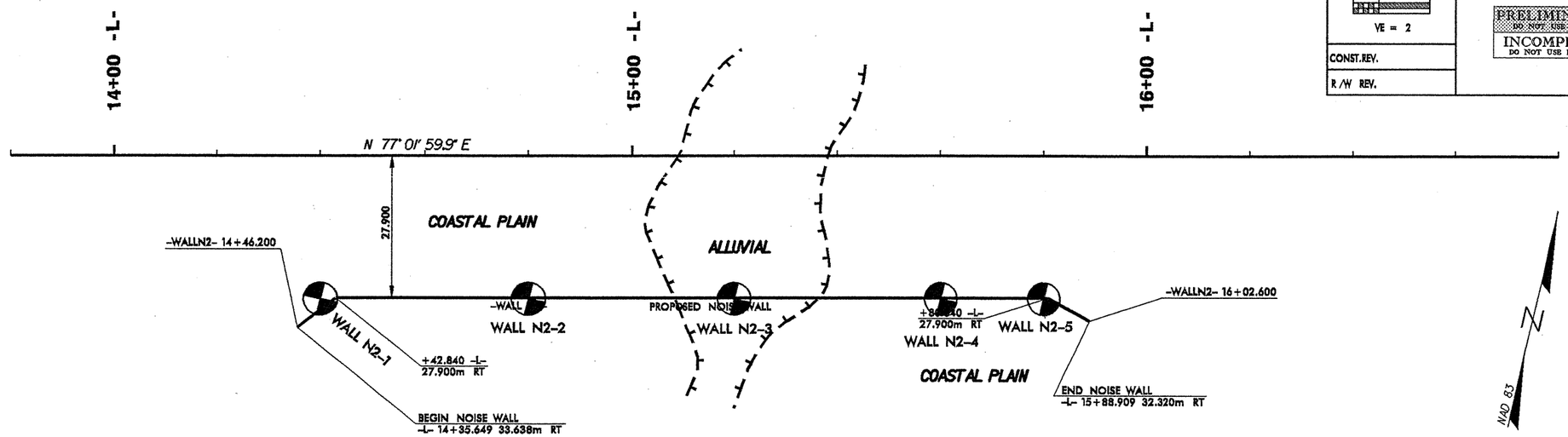
PROJECT REFERENCE NO.	SHEET NO.
34817.1.2 (U-2519DA)	183
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

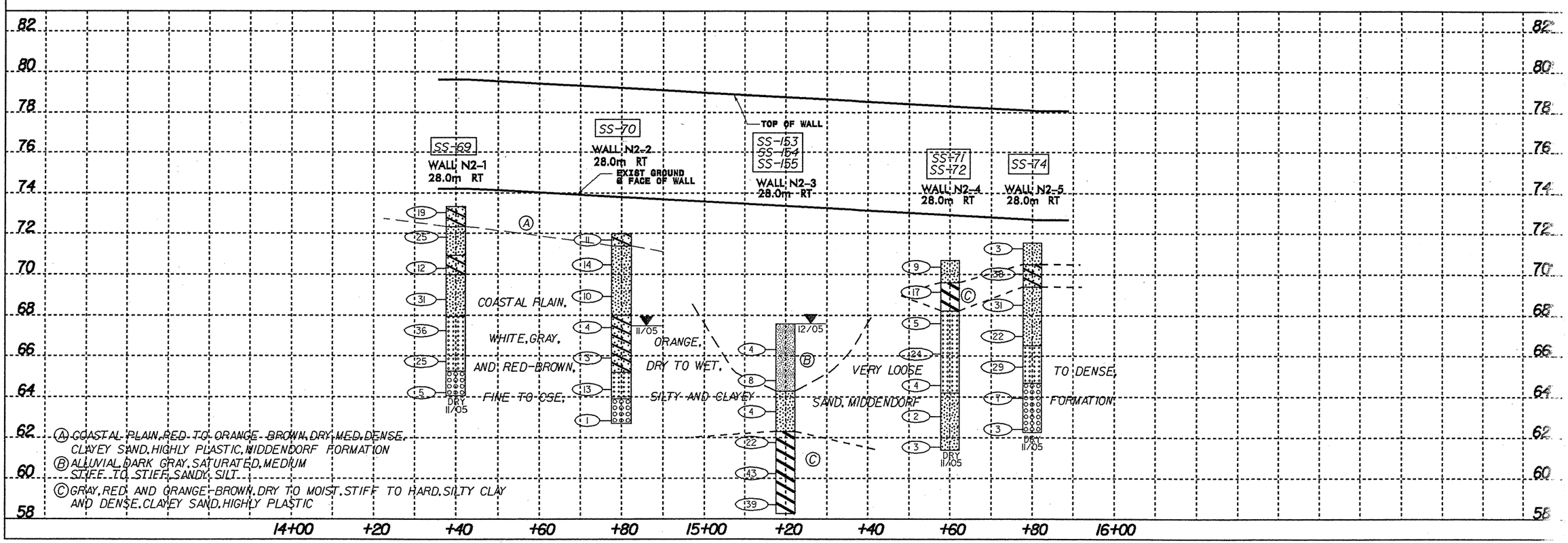
5m 0 10m
VE = 2

CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION





NOISE WALL PLAN & PROFILE -WALL N3-

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

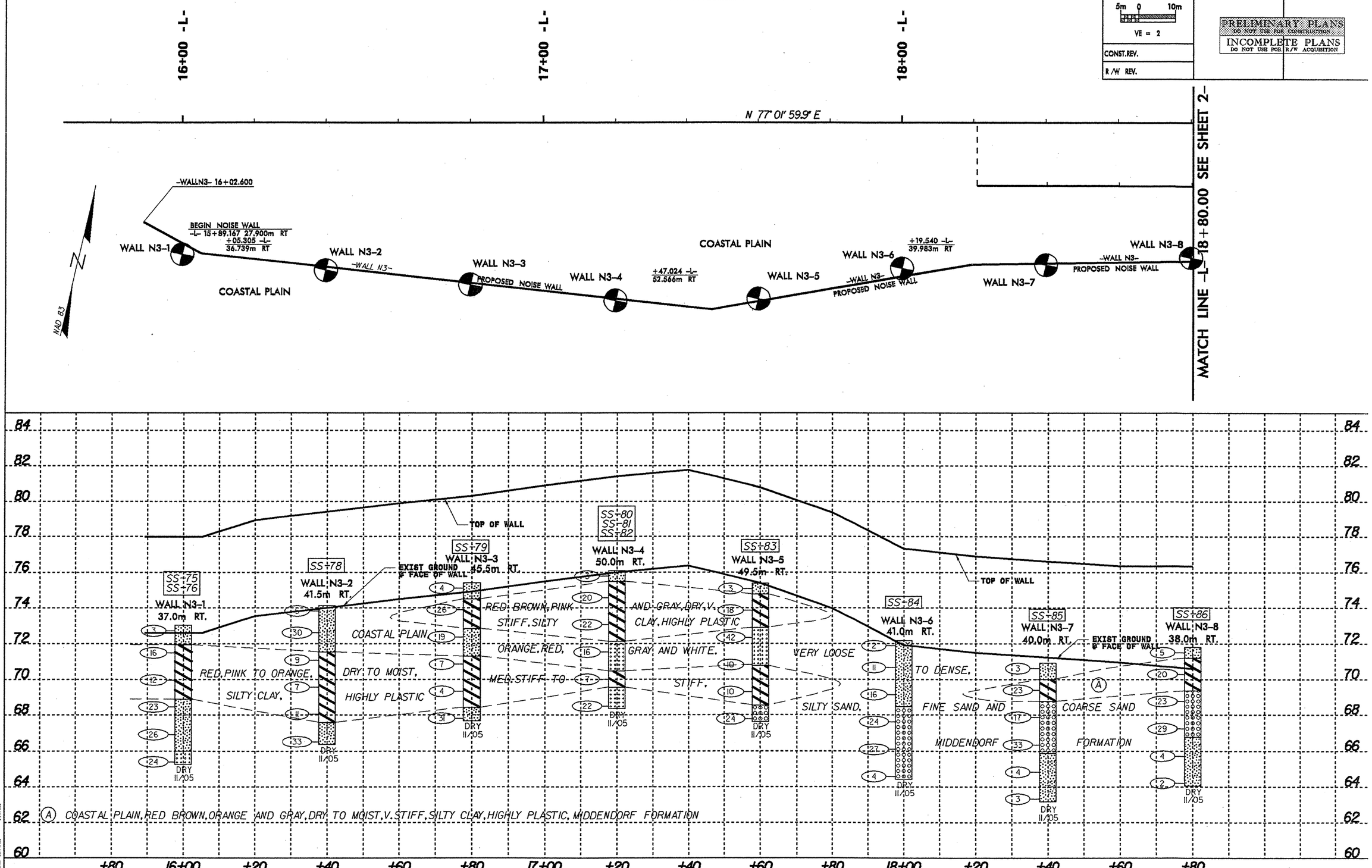
METRIC

PROJECT REFERENCE NO.	SHEET NO.
34817.1.2 (U-2519DA)	184
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5m 0 10m
VE = 2

CONST.REV.
R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



FILE: $FILES
DATE: $DATES
$TIMES

NOISE WALL PLAN & PROFILE –WALL N3–

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 478
RALEIGH, NC 27607

METRIC

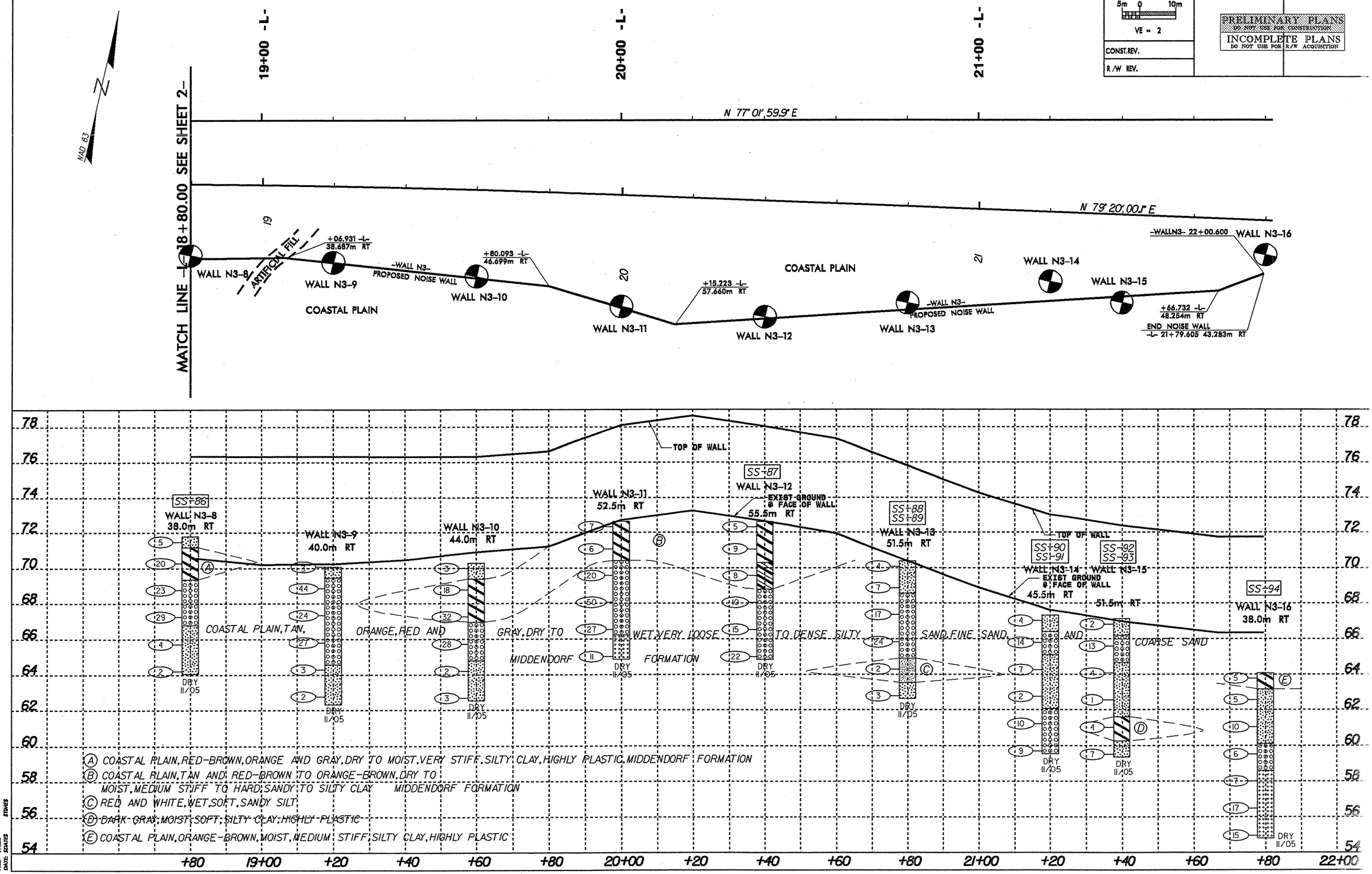
5m 0 10m
VE = 2

CONST.REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
34817.1.2 (U-2519DA)	185
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



6/09/99

FILE: SFRUS
DATE: SFRUS

NOISE WALL PLAN & PROFILE –WALL N4–

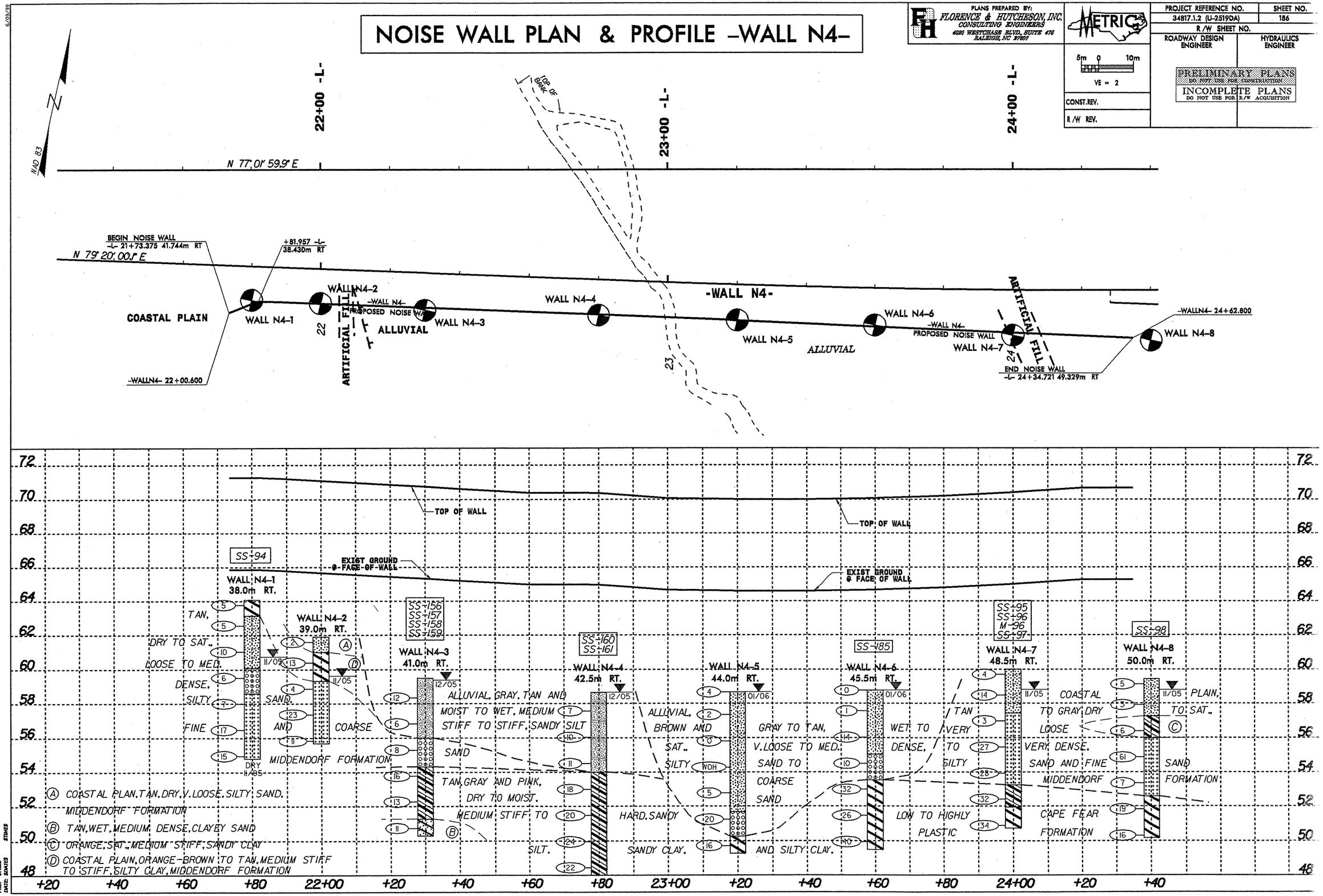
PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 470
RALEIGH, NC 27607

METRIC
5m 0 10m
VE = 2

PROJECT REFERENCE NO.	SHEET NO.
34817.1.2 (U-2519DA)	186
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST. REV.
R/W REV.



FILE: BFALES
DATE: SDATES
STIMES

RW1-1

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-105	38.0M LT	18+00	2.7-3.2	A-7-6(33)	59	31	4.6	2.8	32.2	60.4	100	96	93	-	-

RW1-3

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-104	38.3M RT	18+60	4.3-4.7	A-2-6(0)	28	15	66.7	13.7	4.5	15.1	92	47	20	-	-

RW1-4

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-103	37.5M LT	18+90	0.0-0.5	A-2-4(0)	24	10	43.1	29.9	6.9	20.1	92	68	29	-	-

RW1-5

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-99	37.0M RT	19+11.9	1.2-1.7	A-2-6(0)	28	11	58.5	23.4	3.0	15.1	94	62	19	-	-
SS-100	37.0M LT	19+11.9	2.7-3.2	A-2-4(0)	19	NP	52.5	30.8	4.6	12.1	97	68	20	-	-
SS-101	37.0M LT	19+11.9	4.3-4.7	A-7-5(31)	117	39	7.1	23.6	41.9	27.4	84	81	64	-	-
SS-102	37.0M LT	19+11.9	5.8-6.2	A-7-5(15)	49	18	4.8	27.6	33.4	34.2	100	98	75	-	-

RW2-1

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-6	17.4M RT	32+58.4	0.9-1.4	A-2-4(0)	23	2	47.0	32.6	7.2	13.2	98	81	22	-	-
SS-7	17.4M RT	32+58.4	2.4-2.9	A-2-4(0)	24	6	53.0	24.7	8.0	14.2	99	78	25	-	-
SS-8	17.4M RT	32+58.4	3.9-4.4	A-2-6(1)	34	16	59.7	9.3	9.7	21.3	97	53	31	-	-
SS-9	17.4M RT	32+58.4	5.5-5.9	A-2-6(0)	29	12	53.7	22.8	0.3	23.2	100	80	24	-	-
SS-10	17.4M RT	32+58.4	7.0-7.4	A-1-b(0)	19	NP	85.1	9.5	1.2	4.2	99	43	6	-	-

RW2-2

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-1	14.0M RT	32+95.0	1.0-1.4	A-2-4(0)	22	4	46.6	32.7	3.8	16.9	95	68	25	-	-
SS-2	14.0M RT	32+95.0	2.5-3.0	A-2-4(0)	24	4	45.1	34.1	8.5	12.2	97	72	25	-	-
SS-3	14.0M RT	32+95.0	4.0-4.5	A-3(0)	24	NP	55.4	40.2	2.3	2.0	100	72	6	-	-
SS-4	14.0M RT	32+95.0	5.5-6.0	A-1-b(0)	19	NP	73.6	17.4	2.9	6.1	91	40	10	-	-
SS-5	14.0M RT	32+95.0	7.1-7.5	A-2-4(0)	22	NP	52.4	32.0	1.3	14.2	100	79	16	-	-

RW3-2

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-148	16.3M LT	35+33.9	2.8-3.2	A-2-4(0)	21	NP	37.8	47.7	0.4	14.1	100	83	21	-	-
SS-149	16.3M LT	35+33.9	4.3-4.8	A-6(5)	30	13	21.5	34.3	4.0	40.2	100	89	59	-	-
SS-150	16.3M LT	35+33.9	5.8-6.3	A-3(0)	20	NP	40.8	50.5	0.6	8.0	100	84	10	-	-
SS-151	16.3M LT	35+33.9	13.4-13.9	A-2-4(0)	21	6	21.5	49.1	1.2	28.2	100	83	32	-	-
SS-152	16.3M LT	35+33.9	16.5-16.9	A-7-6(27)	59	37	14.5	15.9	1.4	68.3	100	90	73	-	-

RW3-4

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-165	22.2M RT	35+82.0	1.2-1.7	A-5(5)	50	10	23.0	25.4	27.3	24.2	98	83	53	-	-
SS-166	22.2M RT	35+82.0	2.7-3.2	A-2-4(0)	19	NP	44.2	38.3	1.3	16.1	97	73	23	-	-
SS-167	22.2M RT	35+82.0	4.2-4.8	A-7-6(23)	47	24	4.2	20.8	12.4	62.6	100	97	88	-	-
ST-1	22.2M RT	35+82.0	4.50-5.11	A-7-9(13)	52	26	20.5	12.0	15.0	52.4	84	71	59	-	-
SS-168	22.2M RT	35+82.0	17.9-18.4	A-2-6(0)	29	13	48.2	22.6	0.9	28.3	98	67	31	-	-

PROJ. NO. - 34817.1.2
ID NO. - U-2519DA
COUNTY - CUMBERLAND

WALLN1

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-60	53.5m RT	10+00.0	4.26-4.71	A-2-6(0)	29	11	40.6	35.1	4.2	20.1	100	76	29	-	-
SS-61	53.5m RT	10+00.0	7.30-7.75	A-2-4(0)	22	NP	50.2	34.3	3.4	12.0	100	73	21	-	-
SS-62	53.5m RT	10+40.0	7.30-7.75	A-7-6(7)	41	20	9.4	50.4	12.0	28.1	100	94	50	-	-
SS-63	53.5m LT	12+00.0	4.26-4.71	A-2-7(4)	51	33	43.5	27.6	3.6	25.4	100	74	32	-	-
SS-64	53.5m LT	12+00.0	7.30-7.75	A-3(0)	21	NP	39.6	53.8	1.5	5.1	100	80	9	-	-
SS-65	53.5m LT	12+40.0	2.74-3.19	A-7-6(24)	56	33	15.4	15.6	16.2	52.7	100	91	73	-	-
SS-66	53.5m LT	12+80.0	2.74-3.19	A-2-4(0)	21	NP	73.1	15.5	1.2	10.1	97	56	12	-	-
SS-67	53.5m LT	13+20.0	7.30-7.75	A-3(0)	24	NP	75.9	21.8	0.3	2.0	96	57	4	-	-
SS-68	53.5m LT	13+60.0	4.26-4.71	A-7-6(76)	102	73	7.1	2.8	19.1	71.0	100	95	91	-	-

WALLN2

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-69	28.0m RT	14+40.0	8.82-9.27	A-1-b(0)	24	4	61.8	24.7	4.4	9.1	95	49	20	-	-
SS-70	28.0m RT	14+80.0	4.26-4.71	A-2-6(1)	31	15	42.5	31.4	2.7	23.3	100	78	29	-	-
SS-153	28.0m RT	15+20.0	1.27-1.72	A-4(0)	32	3	31.3	37.5	17.1	14.1	98	74	37	-	-
SS-154	28.0m RT	15+20.0	4.31-4.76	A-2-4(0)	21	NP	18.2	69.4	0.3	12.1	92	82	15	-	-
SS-155	28.0m RT	15+20.0	5.83-6.28	A-7-6(36)	61	34	2.8	8.3	16.2	72.7	100	98	92	-	-
SS-71	28.0m RT	15+60.0	1.22-1.67	A-7-5(91)	111	80	2.4	2.2	12.2	83.2	100	98	96	-	-
SS-72	28.0m RT	15+60.0	7.30-7.75	A-2-4(0)	26	NP	16.0	75.3	1.6	7.1	95	84	12	-	-
SS-74	28.0m RT	15+80.0	1.22-1.67	A-2-7(5)	66	37	54.2	13.3	0.1	32.5	100	69	34	-	-

WALLN3

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-75	37.0m T	16+00.0	1.22-1.67	A-7-6(45)	86	58	15.6	12.0	11.6	60.9	100	90	74	-	-
SS-76	37.0m T	16+00.0	2.74-3.19	A-7-5(84)	108	75	3.9	1.8	17.2	77.1	100	98	95	-	-
SS-78	41.5m RT	16+40.0	4.26-4.71	A-7-6(71)	91	64	1.8	3.9	23.3	71.0	100	99	96	-	-
SS-79	45.5m RT	16+80.0	4.26-4.71	A-7-6(71)	98	70	8.1	3.9	19.1	69.0	100	95	89	-	-
SS-80	50.0m RT	17+20.0	1.22-1.67	A-7-6(7)	52	32	28.8	36.7	4.1	30.4	100	83	40	-	-
SS-81	50.0m RT	17+20.0	2.74-3.19	A-7-6(30)	65	43	9.1	28.0	12.2	50.7	100	95	71	-	-
SS-82	50.0m RT	17+20.0	4.26-4.71	A-3(0)	21	NP	73.1	22.3	0.5	4.1	100	62	6	-	-
SS-83	49.5m RT	17+60.0	7.30-7.75	A-1-b(0)	19	NP	91.5	7.3	0.2	1.0	100	32	2	-	-
SS-84	41.0m RT	18+00.0	2.74-3.19	A-2-4(0)	24	5	51.8	31.5	3.6	13.1	100	72	20	-	-
SS-85	40.0m RT	18+40.0	5.78-6.23	A-2-4(0)	29	7	46.5	30.0	7.4	16.1	100	60	35	-	-
SS-86	38.0m RT	18+80.0	1.22-1.67	A-7-6(42)	77	54	13.5	16.7	13.4	56.4	100	94	75	-	-
SS-87	55.5m RT	20+40.0	2.74-3.19	A-6(4)	34	16	13.1	51.7	11.1	24.1	100	94	47	-	-
SS-88	51.5m RT	20+80.0	5.78-6.23	A-4(5)	31	8	11.7	53.3	14.9	20.1	100	93	75	-	-
SS-89	51.5m RT	20+80.0	7.30-7.75	A-2-4(0)	23	NP	24.2	62.2	2.5	11.1	100	91	17	-	-
SS-90	45.5m RT	21+20.0	2.74-3.19	A-2-4(0)	24	NP	38.3	44.1	5.5	12.1	100	73	26	-	-
SS-91	45.5m RT	21+20.0	4.26-4.71	A-2-4(0)	23	NP	20.1	63.3	4.5	12.1	100	91	21	-	-
SS-92	51.5m RT	21+40.0	4.26-4.71	A-2-4(0)	22	NP	20.7	53.5	5.6	20.1	100	90	34	-	-
SS-93	51.5m RT	21+40.0	5.79-6.23	A-7-6(23)	55	29	18.7	6.4	18.5	56.3	100	86	77	-	-
SS-94	38.0m RT	21+80.0	4.26-4.71	A-1-b(0)	20	NP	71.4	15.4	4.1	9.1	95	50	14	-	-

WALLN4

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-94	38.0m RT	21+80.0	4.26-4.71	A-1-b(0)	20	NP	71.4	15.4	4.1	9.1	95	50	14	-	-
SS-156	41.0m RT	22+30.0	1.16-1.61	A-4(0)	19	NP	9.5	62.2	12.2	16.1	100	99	41	-	-
SS-157	41.0m RT	22+30.0	4.20-4.65	A-1-b(0)	20	NP	83.7	8.1	2.2	6.0	99	27	9	-	-
SS-158	41.0m RT	22+30.0	5.72-6.17	A-6(5)	33	19	16.3	38.5	4.7	40.4	100	96	48	-	-
SS-159	41.0m RT	22+30.0	8.76-9.21	A-2-6(0)	33	19	72.2	7.6	2.0	18.1	95	44	20	-	-
SS-160	42.5m RT	22+80.0	1.10-1.55	A-4(0)	20	NP	30.3	17.7	49.0	3.0	96	79	51	-	-
SS-161	42.5m RT	22+80.0	5.66-6.11	A-6(4)	29	14	9.1	47.0	7.6	36.3	100	93	51	-	-
SS-185	45.5m RT	23+60.0	5.78-6.23	A-7-6(41)	63	41	1.8	13.6	31.9	52.7	100	99	91	-	-
SS-95	48.5m RT	24+00.0	1.22-1.67	A-2-4(0)	21	NP	16.6	68.6	5.7	9.1	100	98	22	-	-
SS-96	48.5m LT	24+00.0	7.30-7.75	A-6(10)	34	16	0.8	35.6	25.4	38.2	100	100	75	19.6	-
SS-97	48.5m LT	24+00.0	8.82-9.27	A-7-6(18)	42	21	0.4	23.9	27.4	48.3	100	100	84	-	-
SS-98	50.0m RT	24+40.0	7.30-7.75	A-7-6(18)	44	23	4.2	23.7	21.7	50.3	100	98	78	-	-