CONTRACT: ID: U-2519E

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

LINE	STATION	PLAN	PROFILE	XSECTS
-L-	39+40-49+80	4-7	16-18	40-61
-COL1-	40+75.5-41+07.873	5	19	-
-COL2-	39+40-49+03.337	4, 6-7	20-23	40-46
-RPIBD-	40+00-44+23.808	5-6	24-25	-
-CDR-	44+43.287-49+51.660	6-7	26	47-61
-RP2B-	12+40-15+19.180	4	27	-
-RP2D-	10+00-14+55.335	5-6	28-29	-
-LP2B-	10+00-14+25.685	4	30-31	-
-LP2D-	10+00-13+55.607	5	32	-
-SPUR2B-	10+00-11+12.477	4	33	-
-SPUR2D-	10+00-10+89.519	5	33	-
-Y2-	7+70-24+60	4,5,8-11	-	62-79
-Y3-	10+00-12+69.369	5,10	34	-
-Y4-	10+00-12+02.396	5	35	-
-Y5-	15+96.183-24+59.769	12-15	36-37	80-88
-TT6-	18+40-22+18.350	4	38	-
-TT7-	10+00-14+09.933	6-7	39	-

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

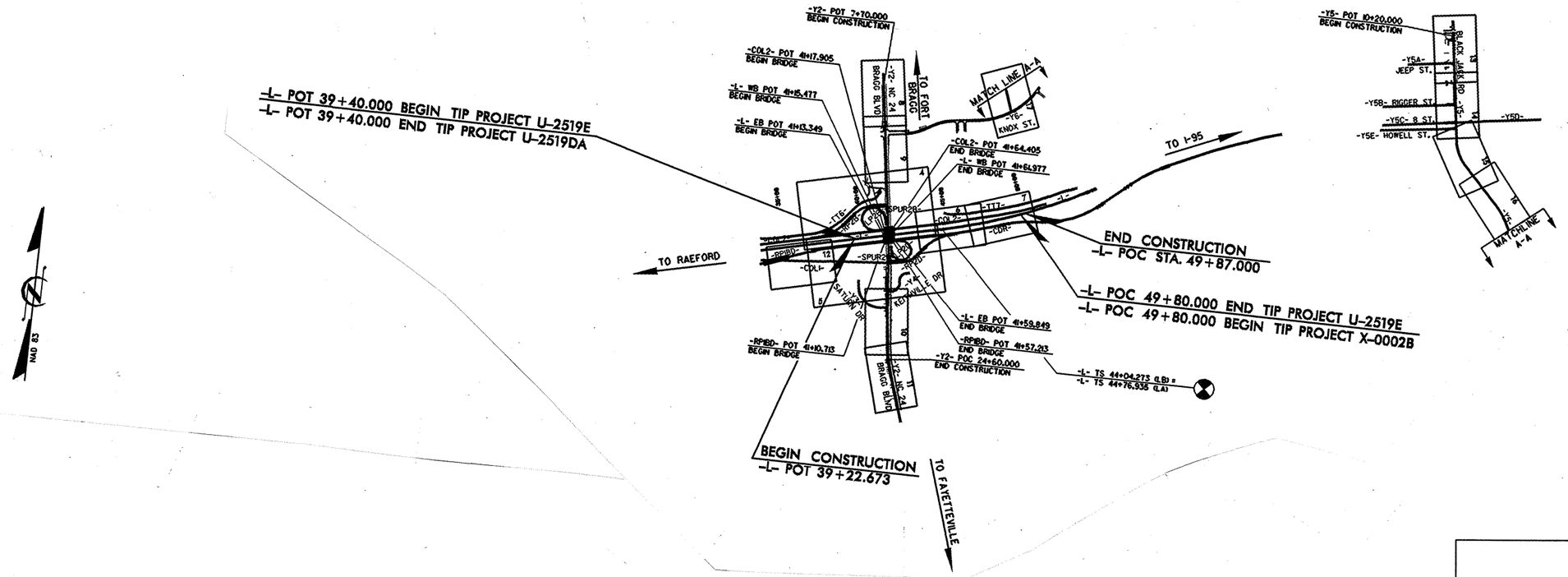
ROADWAY SUBSURFACE INVESTIGATION

STATE PROJ. 34817.1.2 I.D. U-2519E F.A. PROJ. NHF-DPR-0100(1)

COUNTY CUMBERLAND

PROJECT DESCRIPTION FAYETTEVILLE OUTER LOOP FROM WEST OF NC 24 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-2519E	1	88

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
35196.3.15		CONST

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

NORTH CAROLINA LICENSED GEOLOGIST SEAL 1959 CHERYL A. YOUNGBLOOD 5/29/07

DRAWN BY: T.T. WALKER, C.A. YOUNGBLOOD, C.D. CZAJKA

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ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
U-2519E	34817.1.2	2	88

METRIC

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

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	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2	A-4, A-5	
CLASS.	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6	A-3	A-6, A-7	
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	6 MX		N.P.	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PLASTIC INDEX				10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
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
	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
- 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
- [ ] CME-45C
- [X] CME-550
- [ ] PORTABLE HOIST
- [ ] OTHER _____
- [ ] OTHER _____

ADVANCING TOOLS:
- [X] 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 TEETH
- [ ] TRICONE _____ mm TUNG.-CARB.
- [ ] CORE BIT
- [ ] OTHER _____

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

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

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

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 GEOLOGISTS 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 GEOLOGISTS 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 GEOLOGISTS 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 ELEVATION: XXX

NOTES:

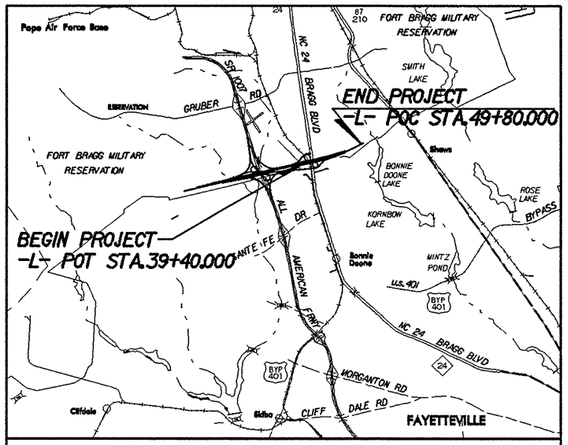
REVISED 09/15/00

TIP PROJECT: U-2519E

PROJECT: 34817.2.4

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

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 WEST OF NC 24 TO EAST OF NC 24 (BRAGG BOULEVARD)*

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

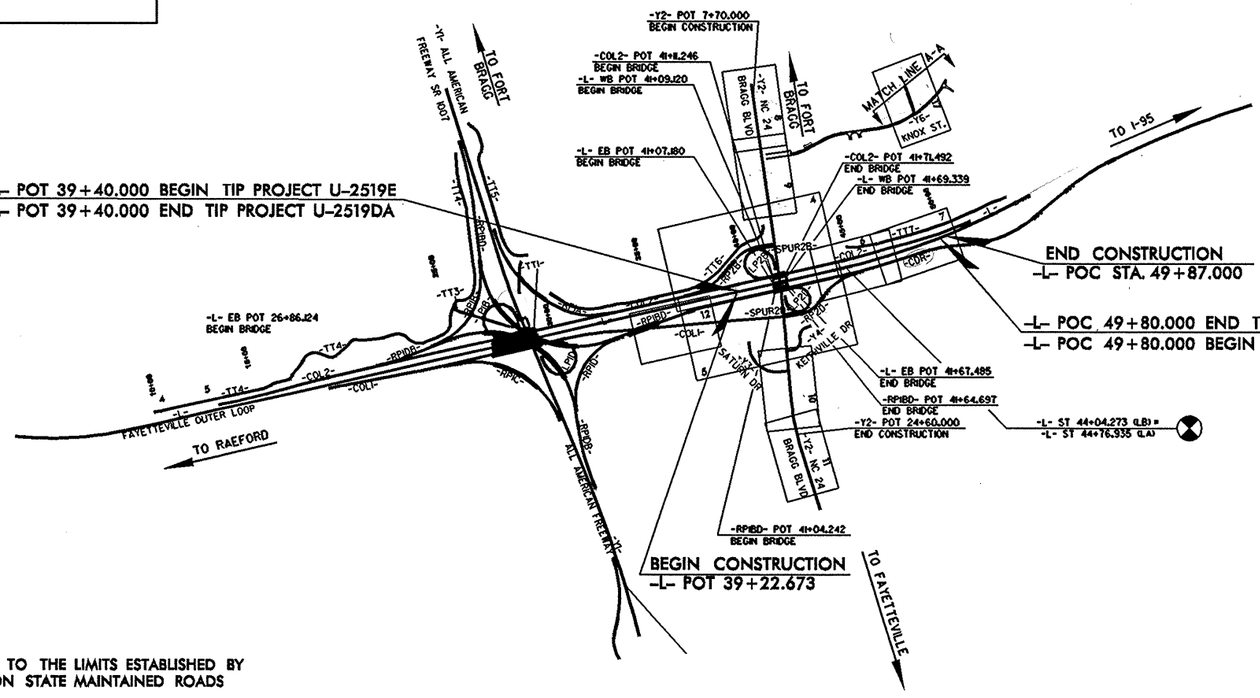
METRIC

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-2519E	2A	88

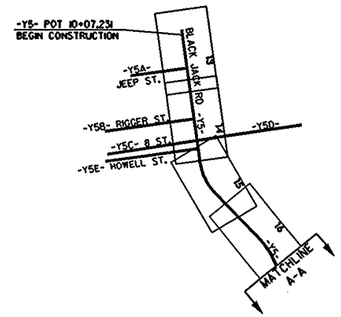
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34817.1.2	NHF-DPR-0100(001)	P.E.
34817.2.4	NHF-100(9)	R/W and Utilities

-L- POT 39+40.000 BEGIN TIP PROJECT U-2519E
-L- POT 39+40.000 END TIP PROJECT U-2519DA



END CONSTRUCTION
-L- POC STA. 49+87.000

-L- POC 49+80.000 END TIP PROJECT U-2519E
-L- POC 49+80.000 BEGIN TIP PROJECT X-0002B



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

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-2519E	0.980	KM.
LENGTH STRUCTURES TIP PROJECT U-2519E	0.060	KM.
TOTAL LENGTH TIP PROJECT U-2519E	1.040	KM.

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

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

PREPARED FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE 26, 2006

LETTING DATE: NOV 18, 2008

NCDOT CONTACT: CATHY S. HOUSER, P.E.
DESIGN SERVICES - 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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

May 31, 2007

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

DESCRIPTION: Fayetteville Outer Loop from west of NC 24 to east 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 west of NC 24 and extends east for 1.04 kilometers to east of NC 24 (Bragg Blvd.)

A geotechnical investigation was originally conducted in August, September and October, 1998 and additional borings were performed in November and December, 2005. Borings were advanced utilizing an ATV-mounted CME-550 drill machine with automatic hammer 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-	39+40 to 49+80
-COL1-	40+75.5 to 41+07.873
-COL2-	39+40 to 49+03.337
-RP1BD-	40+00 to 44+03.808
-CDR-	44+43.287 to 49+51.660
-RP2B-	12+40 to 15+19.180
-RP2D-	10+00 to 14+55.335

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

Line	Station (±)
-LP2B-	10+00 to 14+25.685
-LP2D-	10+00 to 13+55.607
-SPUR2B-	10+00 to 11+12.477
-SPUR2D-	10+00 to 10+89.519
-Y2-	7+70 to 24+60
-Y3-	10+15 to 12+69.369
-Y4-	10+00 to 12+02.396
-Y5-	15+96.183 to 24+59.769
-TT6-	18+40 to 22+18.350
-TT7-	10+00 to 14+09.933

Areas of Special Geotechnical Interest

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

Line	Station (±)
-L-	46+00 to 46+60
-COL2-	40+50 to 41+90
-COL2-	44+95 to 45+40
-CDR-	46+53 to 46+78
-Y2-	11+90 to 12+90
-Y3-	10+15 to 10+40
-Y3-	11+50 to 12+08
-Y5-	20+21 to 21+85
-TT6-	20+85 to 22+06

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-	46+00 to 46+60
-COL2-	44+95 to 45+40
-CDR-	46+53 to 46+78
-CDR-	47+74 to 48+17
-Y2-	13+46 to 14+30
-Y5-	20+21 to 21+85

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-	46+00 to 46+60
-COL2-	44+95 to 45+40
-CDR-	46+53 to 46+78
-CDR-	47+74 to 48+17
-Y2-	13+46 to 14+30

4) Water Wells: Water wells within or in close proximity of the right of way or construction easement were noted at the following locations.

Line	Station (±) and Offset m.(±)
-Y2-	22+00, 18.0m Rt.
-Y3-	10+35, 40.0m Lt.

The water wells may be abandoned and water levels could not be determined. Other wells may be present along the project corridor that were not detected

5) Springs and Seeps: A spring and/or seep was encountered at the following location.

Line	Station (±) and Offset m.(±)
-CDR-	47+80, 16m Rt.

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 homes, commercial businesses 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 transgress and regress of sea level. Soils are derived from coastal plain sediments. Little Cross Creek, which is within the Cape Fear River Basin, drains the project into Bonnie Doone Lake.

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 NC 24 (Bragg Blvd.). These soils primarily consist of tan, dry to moist, loose to medium dense, silty sand (A-2-4).

Alluvial deposits are located within Cross Creek and unnamed tributaries and wetland areas that traverse the project. These soils are primarily black, moist to wet, very soft, sandy silt, (A-4) and silty clay (A-7-6) with high plasticity and 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 plasticity 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 single 2.4m x 2.1m RCBC with beveled headwall will be constructed at -L- Sta. 46+47. The new culvert will direct the flow of Little Cross Creek, a tributary of Bonnie Doone Lake, across the project at a skew of 40 degrees. Six standard penetration test borings were performed on or near the culvert alignment. Alluvial soils were encountered consisting of black, wet, very soft, sandy silt and silty clay, highly organic and brown and gray, dry to moist, loose, fine sand. Coastal Plain soil underlies the alluvial soils and consist of gray, tan and red, dry to saturated, loose to medium dense, coarse, silty sand of the Middendorf Formation.

Prepared by,

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-, 41+04.0, CL	7.16-7.77	Unconfined Compression

EARTHWORK BALANCE SHEET

Project: U-2519E

County: CUMBERLAND

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- 39+40.000 TO 41+14.413 (BRIDGE)	4,373	4,373				144,442	144,442		180,552	176,179	0		0
-Y2- 7+70.000 TO -Y2- 10+80.000 (RT)	296	296				32	32		40	0	256		0
-Y2- 7+70.000 TO -Y2- 10+80.000 (LT)	1,656	1,656				49	49		61	0	1,595		0
-Y2- 10+80.000 TO -Y2- 18+60.000 (RT)	10,098	10,098			1,150	4,219	4,219		5,274	0	4,824		1,150
-Y2- 10+80.000 TO -Y2- 18+60.000 (LT)	4,008	4,008			1,803	6,873	6,873		8,592	4,584	0		1,803
-Y2- 18+60.000 TO -Y2- 24+60.000 (RT)	2,226	2,226				1,640	1,640		2,050	0	176		0
-Y2- 18+60.000 TO -Y2- 24+60.000 (LT)	499	499				1,431	1,431		1,788	1,289	0		0
-COL1- 35+30.000 TO -COL1- 40+75.500	24,174	24,174				2,287	2,287		2,859	0	21,315		0
-RP2B- 12+40.000 TO -RP2B- 14+92.733	500	500				7,936	7,936		9,920	9,420	0		0
-LP2B- 10+80.956 TO -LP2B- 13+66.450	32,327	32,327				13,082	13,082		16,353	0	15,974		0
-Y3- 10+10.000 TO -Y3- 12+59.307	256	256				1,118	1,118		1,398	1,142	0		0
-Y4- 10+39.472 TO -Y4- 12+02.396	1,317	1,317				724	724		905	0	412		0
SUBTOTAL: SUMMARY #1	81,730	81,730	0	0	2,953	183,833	183,833	0	229,792	192,614	44,552	0	2,953
SUMMARY #2													
-L- 41+60.913 (BRIDGE) TO -L- 49+80.000	761	761			7,693	595,254	595,254		744,067	743,306	0		7,693
-RP2D- 10+87.938 TO -RP2D- 14+37.317	0	0				49,188	49,188		61,484	61,484	0		0
-LP2D- 10+66.993 TO -LP2D- 13+07.546	0	0				33,163	33,163		41,453	41,453	0		0
Y5- 15+96.183 TO -Y5- 24+59.769	5,803	3,053		2,750	1,606	9,210	9,210		11,513	8,460	0		4,356
-TT7- 10+00.000 TO -TT7- 14+09.933	0	0				368	368		460	460	0		0
SUBTOTAL: SUMMARY #2	6,564	3,814	0	2,750	9,299	687,183	687,183	0	858,977	855,163	0	0	12,049

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.

8/26/2008

EARTHWORK BALANCE SHEET

Project: U-2519E

County: CUMBERLAND

STATION	UNCLASSIFIED EXCAVATION				UNDERCUT EXCAV.	EMBANKMENT			TOTAL EMB. + 25%	BORROW	WASTE		
	TOTAL	SUITABLE EARTH	ROCK	UNSUITABLE		TOTAL	EARTH	ROCK			SUITABLE EARTH	ROCK	UNSUIT.
SUBTOTAL (SUMMARIES 1-2)	88,294	85,544	0	2,750	12,252	871,016	871,016	0	1,088,769	1,047,777	44,552	0	15,002
SHOULDER MATERIAL						9,300	9,300		11,625	11,625			
LOSS DUE TO CLEARING & GRUBBING	(14,000)	(14,000)								14,000			
WASTE TO BE USED IN LIEU OF BORROW										(44,552)	(44,552)		
GRADE POINT UNDERCUT					350	350	350		438	438			350
ADDITIONAL UNDERCUT EXCAVATION					250	250	250		313	313			250
SHALLOW UNDERCUT					100								100
PROJECT TOTAL	74,294	71,544	0	2,750	12,952	880,916	880,916	0	1,101,145	1,029,601	0	0	15,702
ESTIMATE 5% TO REPLACE TOPSOIL IN BORROW PITS										51,480			
GRAND TOTAL	74,294	71,544	0	2,750	12,952	880,916	880,916	0	1,101,145	1,081,081	0	0	15,702
SAY	74,300				13,000					1,081,100			
DRAINAGE DITCH EXCAVATION		3,880											
SELECT GRANULAR MATERIAL		10,700											
PAVEMENT STRUCTURE VOLUME = 5310 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: 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: FLORENCE & HUTCHESON, INC. GEOTECHNICAL ENGINEERING 444 EDWARDS FERRY RD NW SUITE 101 LAWRENCEVILLE, GA 30043

METRIC

PROJECT REFERENCE NO. U-2519B
SHEET NO. 4
R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS NOT FOR CONSTRUCTION INCOMPLETE PLANS

CONTRACT:

RW WK.

LEGEND	SYMBOLS	SYMBOLS	SYMBOLS
BOUNDARIES	2-3" FOR -L- PROFILE	2-3" FOR -L- PROFILE	
STREAMS	2-3" FOR -RP2B- PROFILE		
WETLANDS	66' FOR -RP2B- PROFILE		
BUILDINGS	66' FOR -L- PROFILE		
RAILROADS	66' FOR -RP2B- PROFILE		
ROADWAYS	36-INFOR -TT6- PROFILE		
	42-IN FOR PROP. -TT6- PROFILE		
	4-3 FOR BRIDGE SECTIONS		

MATCH LINE -Y2- 13+40.00 SEE SHEET 9

ALLUVIAL

COASTAL PLAIN

-TT6- POT 92+93.796

-TT6- PT 92+43.369

-TT6- PAC 21+27.457

-SPUR2B- PT 10+15.000

-RP2B- PT 14+74.789

-TT6- PT 84+00.000

-RP2B- 12+40 END U-2519DA
BEGIN U-2519E

-TT6- 18+40 END U-2519DA
BEGIN U-2519E

-COL2- 39+40 END U-2519DA
BEGIN U-2519E

-L- 39+40 END U-2519DA
BEGIN U-2519E

-TT6- PT 84+00.000

-RP2B- POT 4+08.808 = -COL2- POT 0+00.000 (SKEW)

-COL2- POT 4+08.808 = -RP2B- POT 12+40.000 (SKEW)

-L- POT Sta 4+37.685 = -L2- POC Sta.16+99.419

-L- POT Sta.4+08.220

-L- POT Sta.4+08.246

-L- POT Sta.4+11.485

-L- POT Sta.4+11.200

-L- POT Sta.4+11.502

-L2- POT 15+07.056 = -RP2B- POT 15+54.260

-TT6- POT 84+05.684 = -SPUR2B- POT 9+21.771

-L2- POC 15+37.259 = -RP2B- POT 14+25.260 (SKEW)

-L2- PC 15+19.256

-L2- POT 15+19.256

14+00

15+00

16+00

42+00 -L-

43+00 -L-

A

B

COASTAL PLAIN

FORT BRAGG MILITARY RESERVATION

GRADING ONLY

-L- FAYETTEVILLE OUTER LOOP

MATCH LINE -Y2- 16+99.419 SEE SHEET 5

MATCH LINE -Y2- 16+99.419 SEE SHEET 7

MATCH LINE -L- 43+70.00 SEE SHEET 6

CURVE DATA FOR -TT6-

CURVE DATA FOR -L2B-

CURVE DATA FOR -RP2B-

CURVE DATA FOR -SPUR2B-

BEGIN BRIDGE -COL2- POT Sta.4+12.46

BEGIN APPROACH SLAB -L- POT Sta.4+10.246

END BRIDGE -COL2- POT Sta.4+11.485

END APPROACH SLAB -L- POT Sta.4+11.200

END APPROACH SLAB -COL2- POT Sta.4+11.502

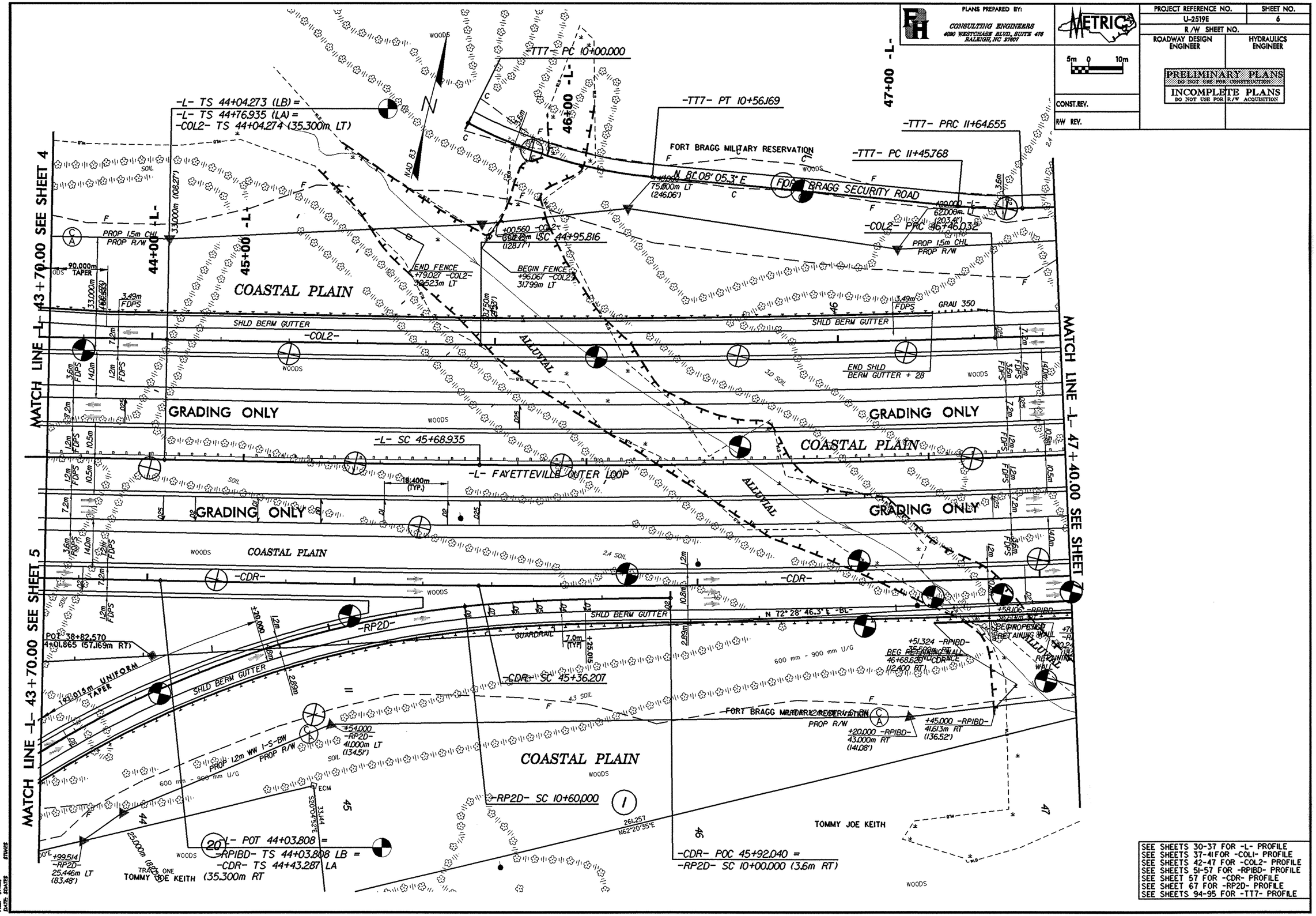
LOCATION: FAYETTEVILLE OUTER LOOP FROM EAST OF SR 1415 TO EAST OF NC 24 (BRAGG BLVD.)

TIP NO.: U-2519B COUNTY: CUMBERLAND

DESIGNED BY: DATE:

CHECKED BY: DATE:

-L- 39+40 END U-2519DA
BEGIN U-2519E
-L- FAYETTEVILLE OUTTER LOOP
MATCH LINE -Y2- 22+23.565 SEE SHEET 4
GRADING ONLY
COASTAL PLAIN
-RPIBD- 40+00 END U-2519DA
BEGIN U-2519E
FORT BRAGG MILITARY RESERVATION
-RPIBD- SC 36+93.380
-RPIBD- CS 37+56.774
-RPIBD- ST 38+02.774
BEGIN BRIDGE
-L- POT Sta.41+08.220
BEGIN APPROACH SLAB
-L- POT Sta.40+98.772
BEGIN BRIDGE
-RPIBD- POT Sta.41+04.242
BEGIN APPROACH SLAB
-RPIBD- POT Sta.40+95.784
END BRIDGE
-L- POT Sta.41+68.564
END APPROACH SLAB
-L- POT Sta.41+74.989
END BRIDGE
-RPIBD- POT Sta.41+64.697
-L- POT Sta.41+37.865 =
-Y2- POC Sta.16+95.419
END APPROACH SLAB
-RPIBD- POT Sta.41+72.564
END APPROACH SLAB
-LP2D- POT Sta.10+03.514
C
D
-RPIBD- POT 41+69.049 =
-LP2D- TS 10+00.000 (3.600m RT)
-LP2D- SC 10+72.000
-Y2- POC 17+63.813 =
-LP2D- ST 13+55.601 (6.300m LT)
-LP2D- CS 12+95.601
18+00
-RP2D- CS 11+96.156
END RETAINING WALL
-COLI- 40+75.5 END U-2519DA
BEGIN U-2519E
-COLI- POT 40+75.500
END GRADING
BEGIN PAVING
-SPUR2D-
BEGIN CONSTRUCTION
-Y3- POT 10+00.000
-Y3- PC 10+30.863
-Y2- PT 20+51.201
-Y2- POC 20+43.040 =
-Y4- POT 10+00.000
-SPUR2D- ST 10+42.000
19+00
-LP2D- POC 12+05.629 =
-SPUR2D- CS 10+00.000
-RP2D- PT 13+92.905
-RP2D- SC 13+10.190
SR 1447 KEITHVILLE DR
END CONSTRUCTION
-Y4- POT 12+02.396
-Y4- PRC 11+05.442
20+00
WOODS
MATCH LINE -Y2- 20+60.00 SEE SHEET 10
MATCH LINE -L- 43+70.00 SEE SHEET 6
37+00
38+00
39+00
40+00
41+00
42+00
43+00
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


PLANS PREPARED BY:
CONSULTING ENGINEERS
4030 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
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.
MATCH LINE -L- 43+70.00 SEE SHEET 4
MATCH LINE -L- 43+70.00 SEE SHEET 5
MATCH LINE -L- 47+40.00 SEE SHEET 7
-L- TS 44+04.273 (LB) =
-L- TS 44+76.935 (LA) =
-COL2- TS 44+04.274 (35.300m LT)
-TT7- PC 10+00.000
-TT7- PT 10+56.169
-TT7- PRC 11+64.655
-TT7- PC 11+45.768
FORT BRAGG MILITARY RESERVATION
FORT BRAGG SECURITY ROAD
N 81° 08' 05.3" E
-COL2- PRC 46+46.032
SC 44+95.816
END FENCE
BEGIN FENCE
COASTAL PLAIN
SHLD BERM GUTTER
GRADING ONLY
-L- SC 45+68.935
-L- FAYETTEVILLE OUTER LOOP
ALLUVIAL
-CDR-
-RP2D-
N 72° 28' 46.3" E -BL-
-CDR- SC 45+36.207
-RP2D- SC 10+60.000
-L- POT 44+03.808 =
-RPIBD- TS 44+03.808 LB =
-CDR- TS 44+43.287 LA
(35.300m RT
-CDR- POC 45+92.040 =
-RP2D- SC 10+00.000 (3.6m RT)
TOMMY JOE KEITH
TRACT ONE
WOODS
SOIL
GRAU 350
PROP 1.5m CHL
PROP R/W
PROP 1.2m WW 1-S-BW
600 mm - 900 mm U/G
ECM
N62°20'35"E
261.257
SEE SHEETS 30-37 FOR -L- PROFILE
SEE SHEETS 37-41 FOR -COL1- PROFILE
SEE SHEETS 42-47 FOR -COL2- PROFILE
SEE SHEETS 51-57 FOR -RPIBD- PROFILE
SEE SHEET 57 FOR -CDR- PROFILE
SEE SHEET 67 FOR -RP2D- PROFILE
SEE SHEETS 94-95 FOR -TT7- PROFILE

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

METRIC

5m 0 10m

CONST.REV.

R/W REV. 1

PROJECT REFERENCE NO.	SHEET NO.
U-2519E	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

MATCH LINE -L- 47+40.00 SEE SHEET 6

NAD 83

48+00 -L-

49+00 -L-

SOD CONC

SOD CONC

SLUICE GATE

-TT7- PRC 12+92.672

DRY POND

49+80.000 -L- END TIP PROJECT U-2519E
END CONSTRUCTION -L- POC 49+80.000
END CONSTRUCTION -COL2- POC 49+03.443
END CONSTRUCTION -TT7- POC 14+09.933
END CONSTRUCTION -CDR- POC 49+51.581

WOODS

FUTURE CONSTRUCTION

FORT BRAGG SECURITY ROAD

+80.000 -L- 63.000m LT (206.69')

+40.000 -L- 55.000m LT (180.45')

-TT7-

FORT BRAGG MILITARY RESERVATION

PROP 1.5m CHL

PROP R/W

-COL2- PRC 47+67.379

-L- POC 48+61.977

END GRADING, BEGIN PAVING

+80.000 -L- 55.000m LT (180.45')

+80.000 -L- 40.000m LT (131.23')

+60.000 -L- 39.500m LT (129.59')

PROP 1.5m CHL

COASTAL PLAIN

SPECIAL V-DITCH

-COL2-

FUTURE CONSTRUCTION

GRADING ONLY

CABLE GUIDERAIL

-L- FAYETTEVILLE OUTER LOOP

COASTAL PLAIN

COASTAL PLAIN

GRADING ONLY

GRADING ONLY

FUTURE CONSTRUCTION

-CDR-

N 71° 58' 21.9" E

14.546m (TYP)

-CDR- CS 49+81.567

N 72° 28' 46.3" E -BL-

N 71° 43' 53.

PROPOSED RETAINING WALL

-CDR- PRC 48+07.810

-CDR- TS 48+52.816

ALLUVIAL

PROP 1.2m WW 1-S-BW

PROP R/W

END RETAINING WALL 48+80.000 -L- (112.400m RT) 55.000m RT (180.45')

EST. 1.8 TONS CL-B RIP RAP EST. 5.9 SM FILTER FABRIC

OUTLET DITCH

BRAGG MILITARY RESERVATION

COASTAL PLAIN

END SHLD BERM GUTTER +51.581

-CDR- SC 49+12.816

FUTURE CONSTRUCTION

PROP 1.2m WW 1-S-BW

PROP R/W

BL27 POT 44+39.466 -L- 50+24.312 (49.465m RT)

600 mm - 900 mm U/G

+72.424 -RPIBD- 38.500m RT (126.31')

TOMMY JOE KEITH
DB 2441 PG 104

HISTORICAL PROPERTY

240.994

N78°53'31"E

ECM

SEE SHEETS 30-37 FOR -L- PROFILE
SEE SHEETS 42-47 FOR -COL2- PROFILE
SEE SHEET 57 FOR -CDR- PROFILE
SEE SHEETS 94-95 FOR -TT7- PROFILE

R.E. SEALS
DATE: SEALED STAMPS

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

METRIC

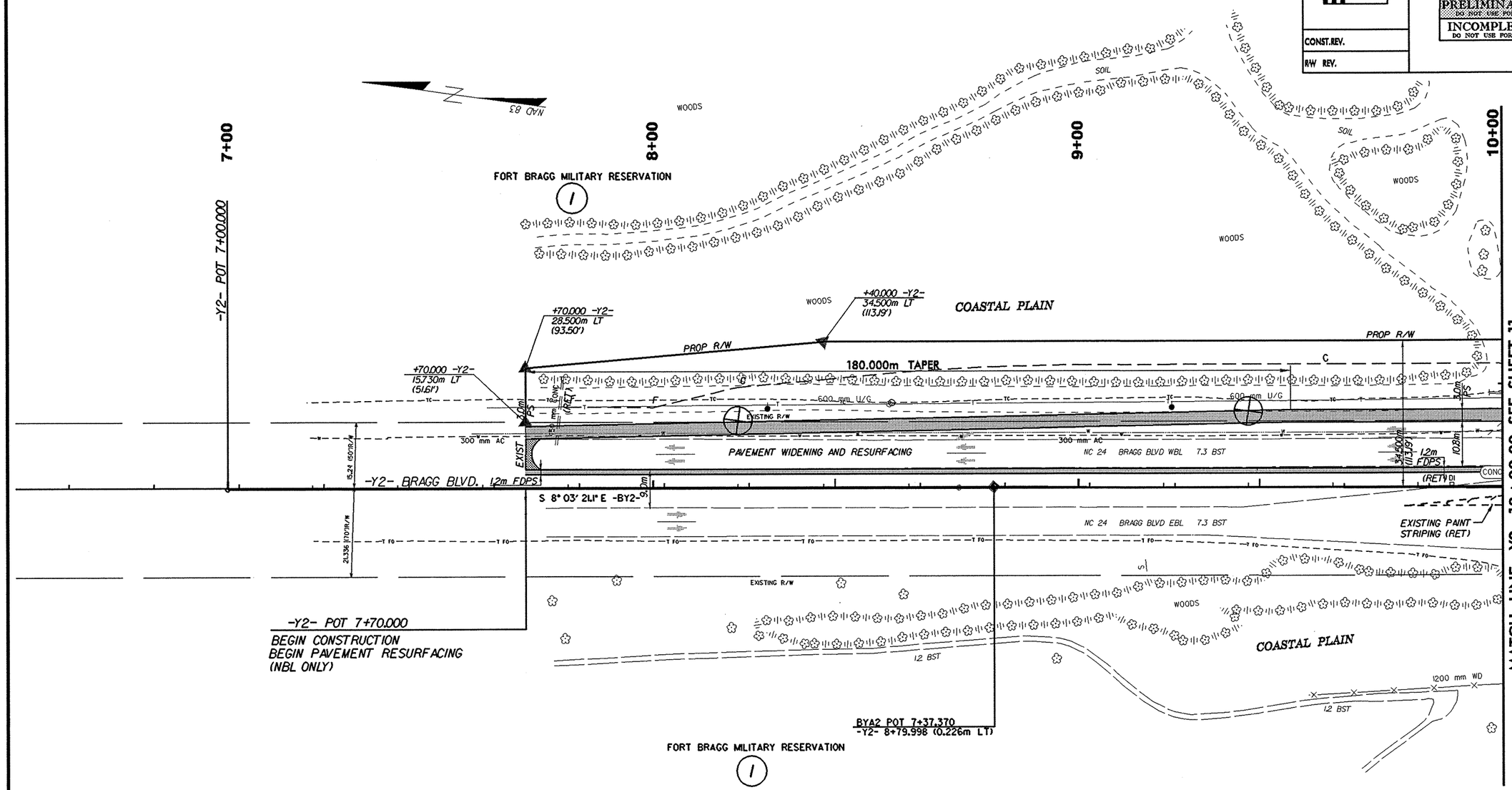
PROJECT REFERENCE NO.	SHEET NO.
U-2519E	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5m 0 10m

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

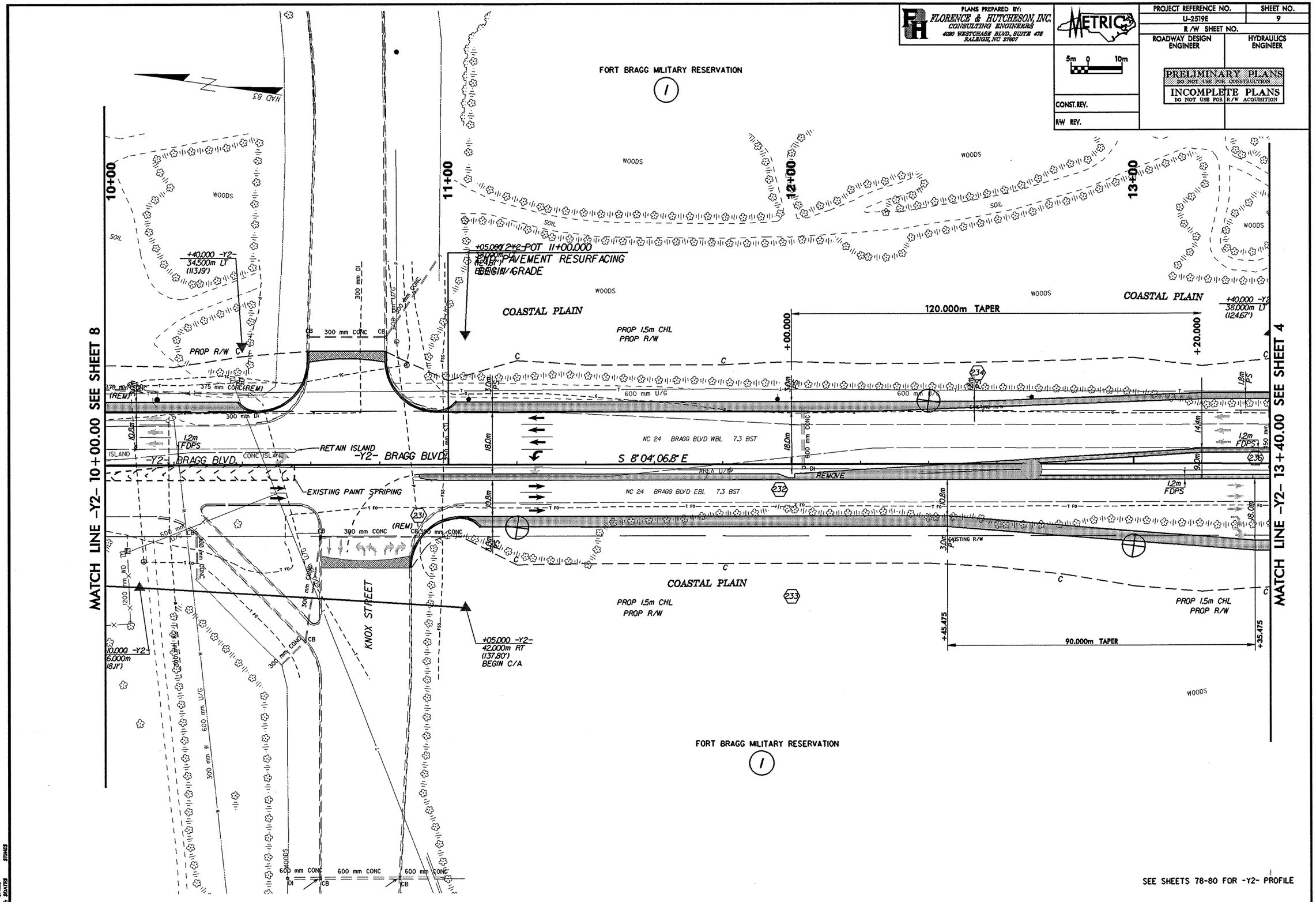
CONST.REV.

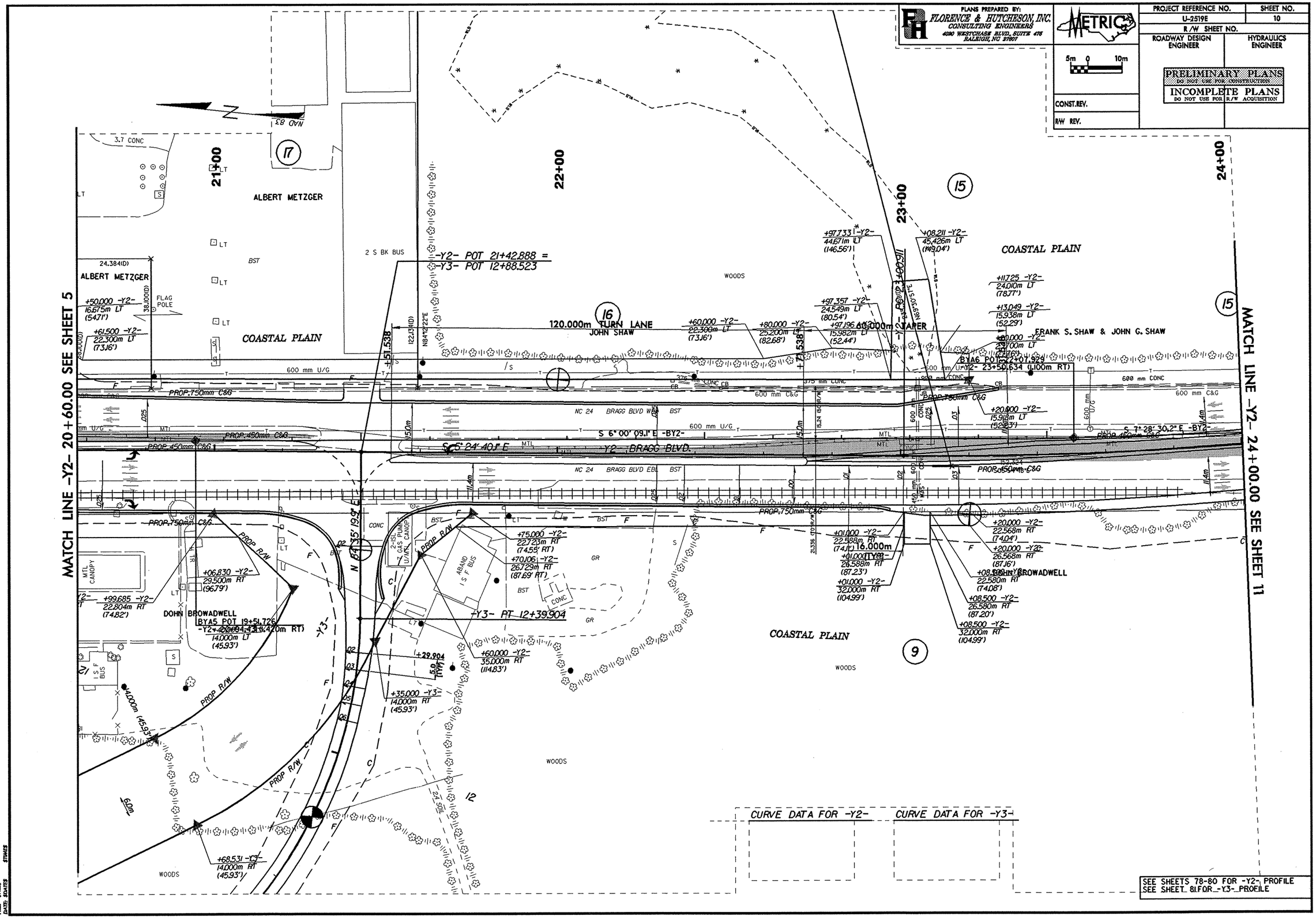
R/W REV.



SEE SHEETS 78-80 FOR -Y2- PROFILE

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


PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
9
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.
5m 0 10m
FORT BRAGG MILITARY RESERVATION
1
NAD 83
MATCH LINE -Y2- 10+00.00 SEE SHEET 8
MATCH LINE -Y2- 13+40.00 SEE SHEET 4
10+00
11+00
12+00
13+00
WOODS
SOIL
+40.000 -Y2-
34.500m LT
(113.19')
+05.000 -Y2- POT 11+00.000
END PAVEMENT RESURFACING
BEGIN GRADE
COASTAL PLAIN
PROP 1.5m CHL
PROP R/W
120.000m TAPER
+00.000
+20.000
+40.000 -Y2-
38.000m LT
(124.67')
PROP R/W
300 mm CONC
375 mm CONC (REM)
600 mm U/G
300 mm DI
RETAIN ISLAND
-Y2- BRAGG BLVD.
CONC ISLAND
NC 24 BRAGG BLVD WBL 7.3 BST
S 8°04'06.8" E
REMOVE
EXISTING PAINT STRIPING
NC 24 BRAGG BLVD EBL 7.3 BST
EXISTING R/W
KNOX STREET
+05.000 -Y2-
42.000m RT
(137.80')
BEGIN C/A
+45.475
+35.475
90.000m TAPER
10.000 -Y2-
6.000m
(18.11')
600 mm CONC
FORT BRAGG MILITARY RESERVATION
1
SEE SHEETS 78-80 FOR -Y2- PROFILE


PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
10
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.
5m 0 10m
MATCH LINE -Y2- 20+60.00 SEE SHEET 5
MATCH LINE -Y2- 24+00.00 SEE SHEET 11
21+00
22+00
23+00
24+00
ALBERT METZGER
COASTAL PLAIN
WOODS
FRANK S. SHAW & JOHN G. SHAW
120.000m TURN LANE
JOHN SHAW
-Y2- POT 21+42.888 =
-Y3- POT 12+88.523
-Y3- PT 12+39.904
DOHN BROWADWELL
BYA5 POT 19+51.726
BYA6 POT 22+07.929
-Y2- 23+50.634 (1.100m RT)
NC 24 BRAGG BLVD WBL BST
NC 24 BRAGG BLVD EBL BST
S 6° 00' 09.1" E -BY2-
S 7° 28' 30.2" E -BY2-
S 5° 24' 40.1" E
-Y2- BRAGG BLVD.
PROP.750mm C&G
PROP.450mm C&G
PROP R/W
600 mm U/G
600 mm C&G
600 mm CONC
375 mm CONC
2 S BK BUS
FLAG POLE
MTL CANOPY
ABAND I S F BUS
CURVE DATA FOR -Y2-
CURVE DATA FOR -Y3-
SEE SHEETS 78-80 FOR -Y2- PROFILE
SEE SHEET 81 FOR -Y3- PROFILE

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

METRIC

5m 0 10m

CONST.REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
U-2519E	11
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

CURVE DATA FOR -Y2-

NAD 83

25+00

26+00

270.2(20)

N12°05'38"E
27.639

-Y2- PT 25+54.252

279.03(10)
N12°03'09"E

WOODS

FRANK S. SHAW & JOHN G. SHAW
DB 2524 PG 10

MARIE SHAW DEE
DB 2795 PG 231

COASTAL PLAIN

COASTAL

FENCE CORNER

600 mm U/G
450 mm CONC
600 mm C&G
750 mm C&G
PROP.750mm C&G
PROP.450mm C&G
600 mm U/G
MTL
515 mm CONC
S 11° 50' 32.6" E
S 16° 12' 05.4" E -BY2-
S 17° 41' 55.7" E -BY2-
S 17° 30' 26.2" E
NC 24 BRAGG BLVD WBL
NC 24 BRAGG BLVD EBL
BST
CL OLD FT BRAGG RD
CAPE FEAR RR
SOIL
600 mm IRON RAIL
IRON RAIL
16.000m (TYP)
+97.505
97.000m LANE TAPER
W/LT
LT
84' WD
48' MTL
105'
11.4m

MATCH LINE -Y2- 24+00.00 SEE SHEET 10

END CONSTRUCTION
-Y2- POT 24+60.000

DOHN BROWADWELL
DB 2586 PG 497

SARA SHAW RANKIN
DB 2031 PG 317
SOIL & GR

BYA7 POT 22+99.334
-Y2- 24+41.935 (1.87lm RT)

BYA8 POT 23+28.548
-Y2- 24+71.079 (2.013m RT)

BYA9 POT 24+19.95
-Y2- 25+62.363 (1.793m RT)

BYA10 POT 24+50.618
-Y2- 25+93.031 (1.690m RT)

I S F BUS

SEE SHEETS 78-80 FOR -Y2- PROFILE

FILE: STAGE
DATE: 2/24/15
STAMES

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

METRIC

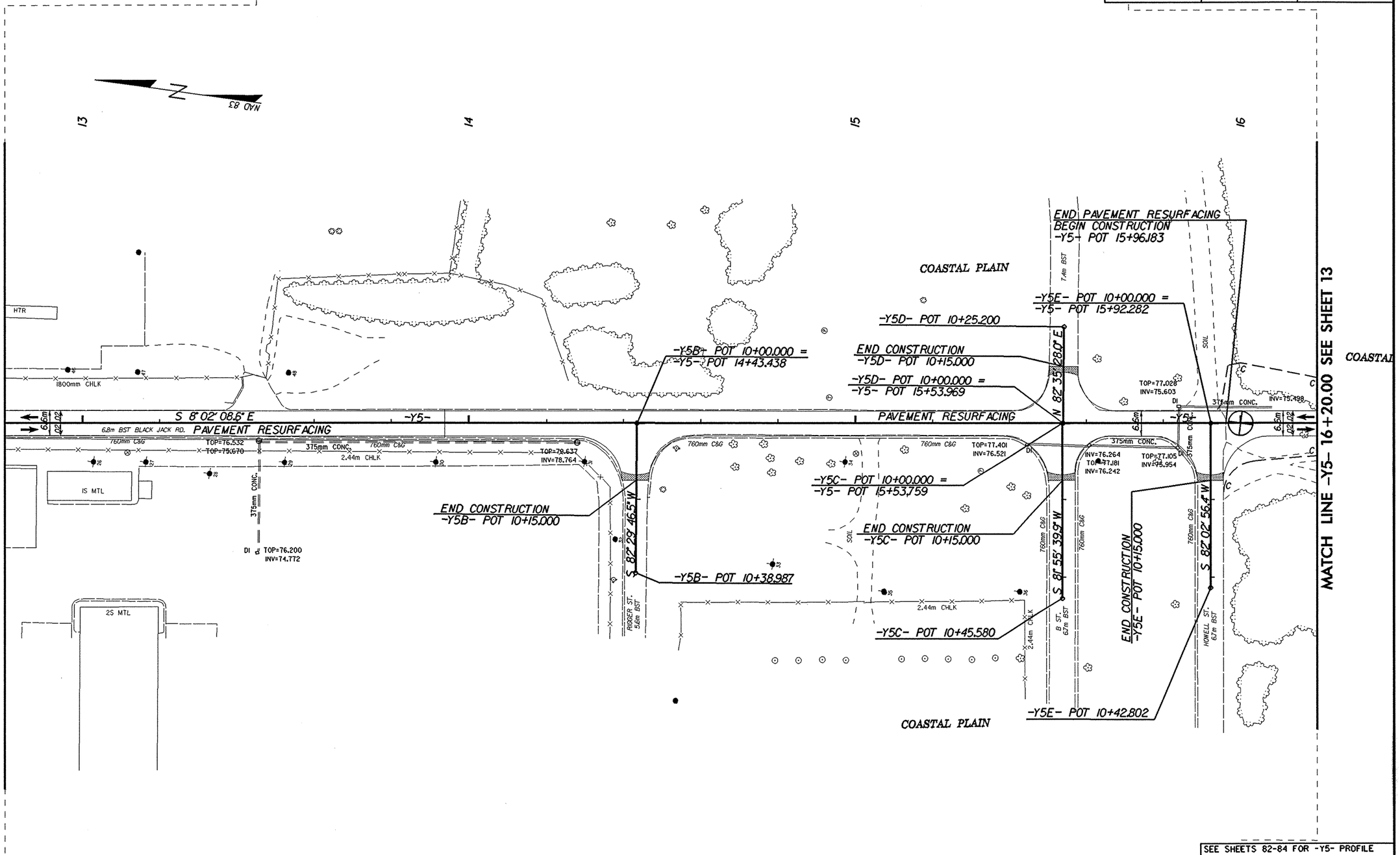
PROJECT REFERENCE NO.	SHEET NO.
U-2519E	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5m 0 10m

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

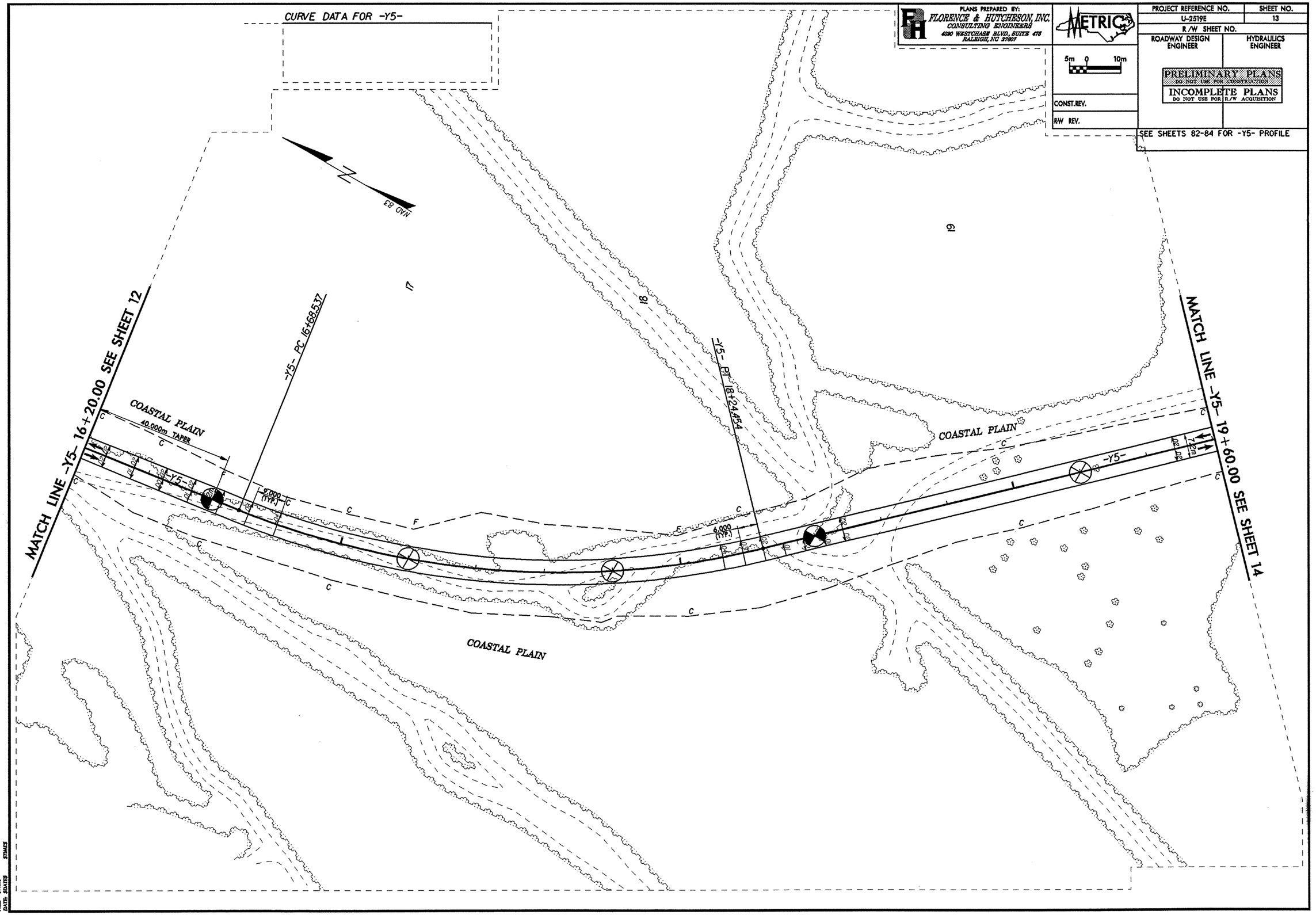
CONST. REV.

R/W REV.

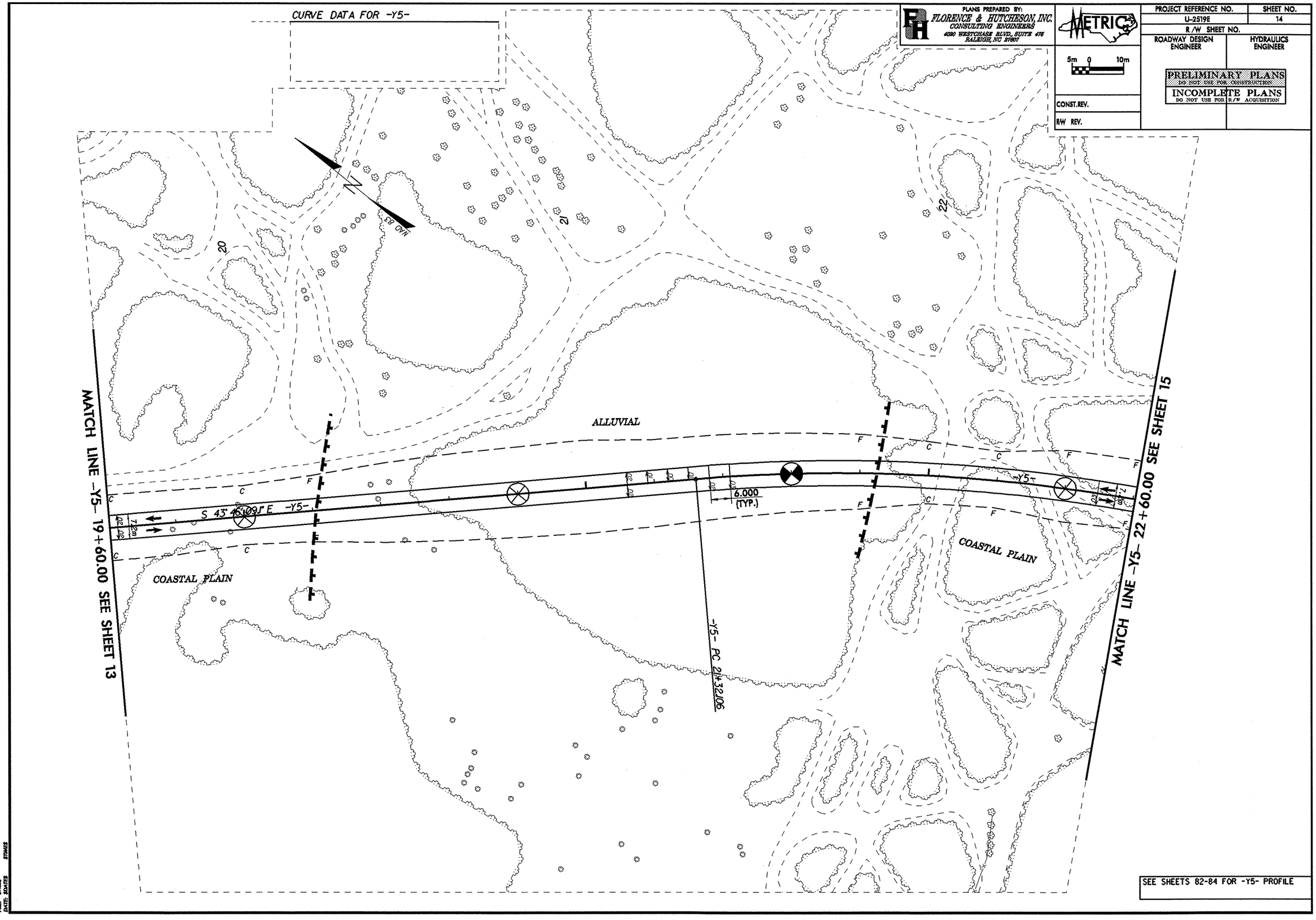


SEE SHEETS 82-84 FOR -Y5- PROFILE

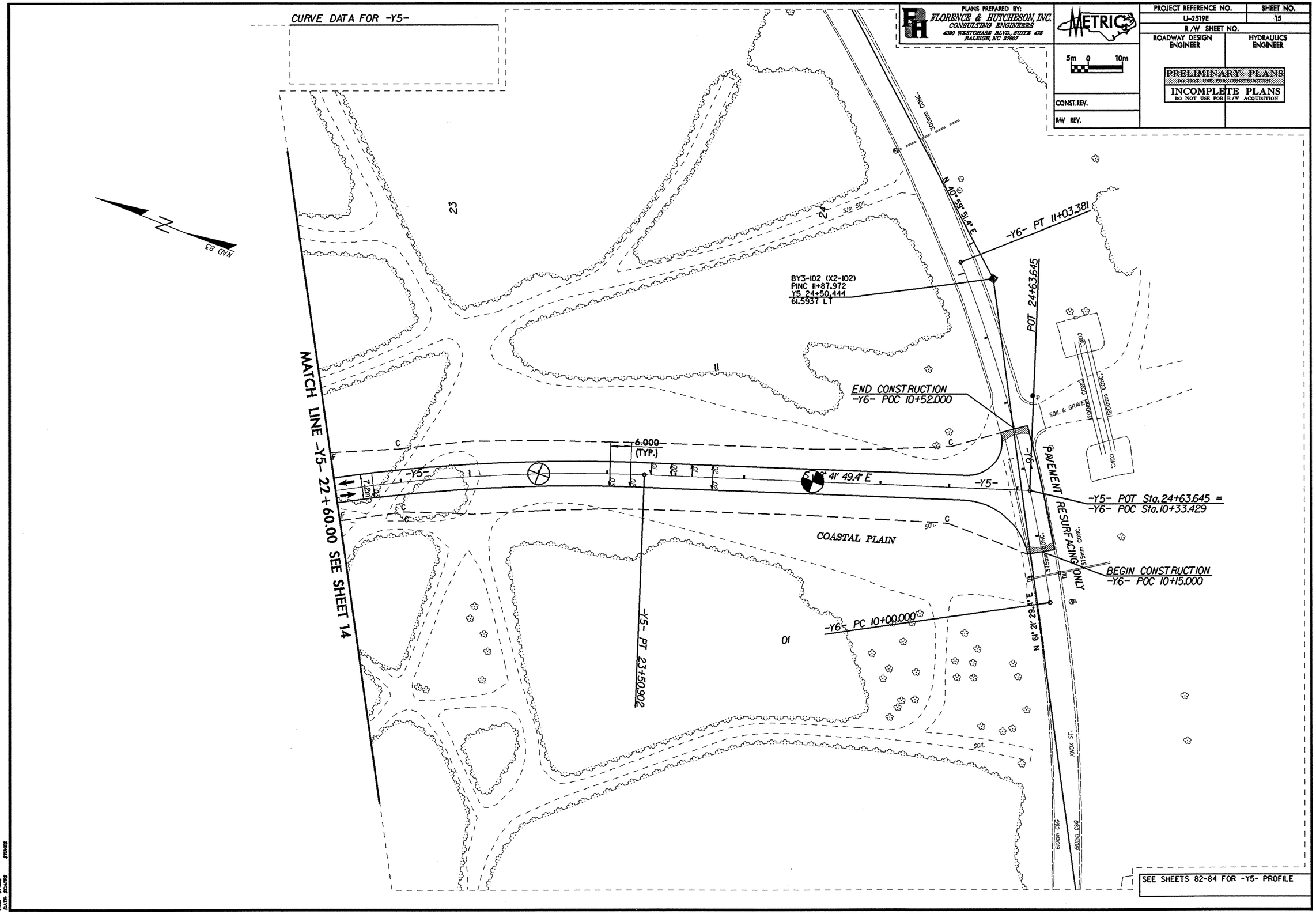
FILE: $FILES
DATE: $DATE$ $TIME$



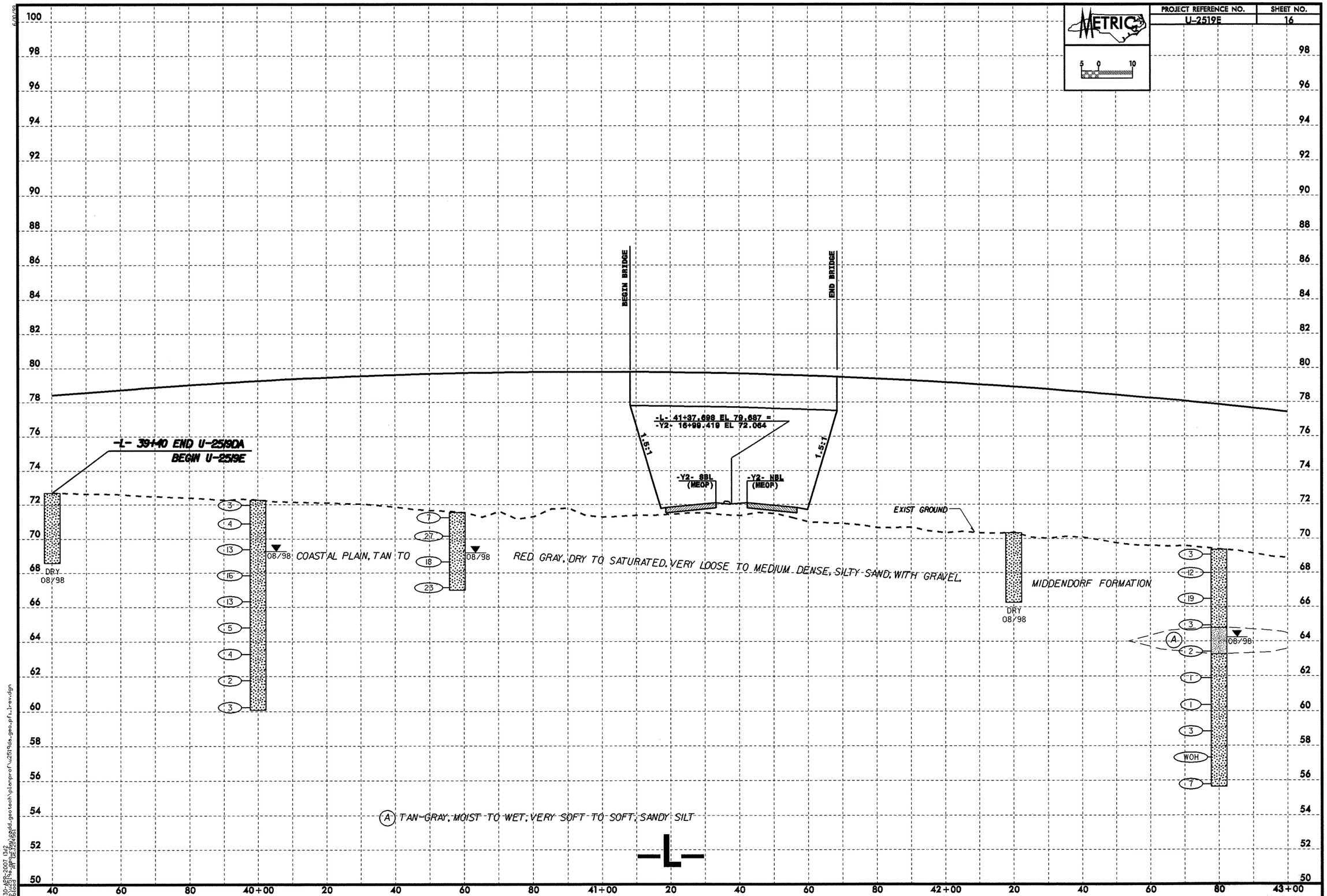
CURVE DATA FOR -Y5-
PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
13
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
CONST.REV.
R/W REV.
SEE SHEETS 82-84 FOR -Y5- PROFILE
5m 0 10m
NAD 83
MATCH LINE -Y5- 16+20.00 SEE SHEET 12
MATCH LINE -Y5- 19+60.00 SEE SHEET 14
-Y5- PC 16+68.537
-Y5- PT 18+24.454
COASTAL PLAIN
40.000m TAPER
9.000 (TYP.)
6.000 (TYP.)
17
18
19
-Y5-



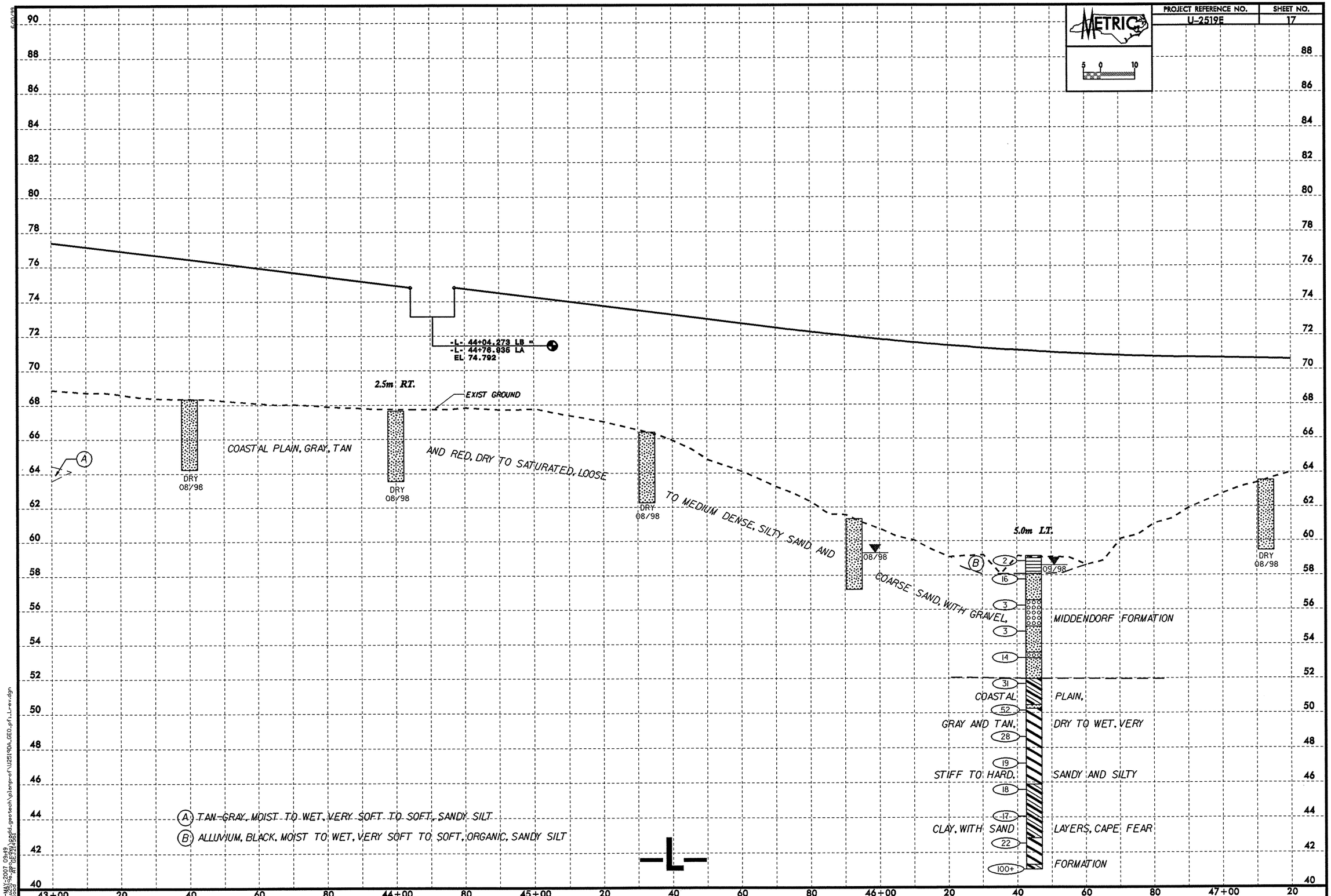
CURVE DATA FOR -Y5-
PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607
METRIC
5m 0 10m
CONST.REV.
R/W REV.
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
14
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
N
NAD 83
20
21
22
ALLUVIAL
COASTAL PLAIN
COASTAL PLAIN
S 43° 46' 09.1" E -Y5-
-Y5-
6.000
(TYP.)
-Y5- PC 21+32.06
MATCH LINE -Y5- 19+60.00 SEE SHEET 13
MATCH LINE -Y5- 22+60.00 SEE SHEET 15
SEE SHEETS 82-84 FOR -Y5- PROFILE



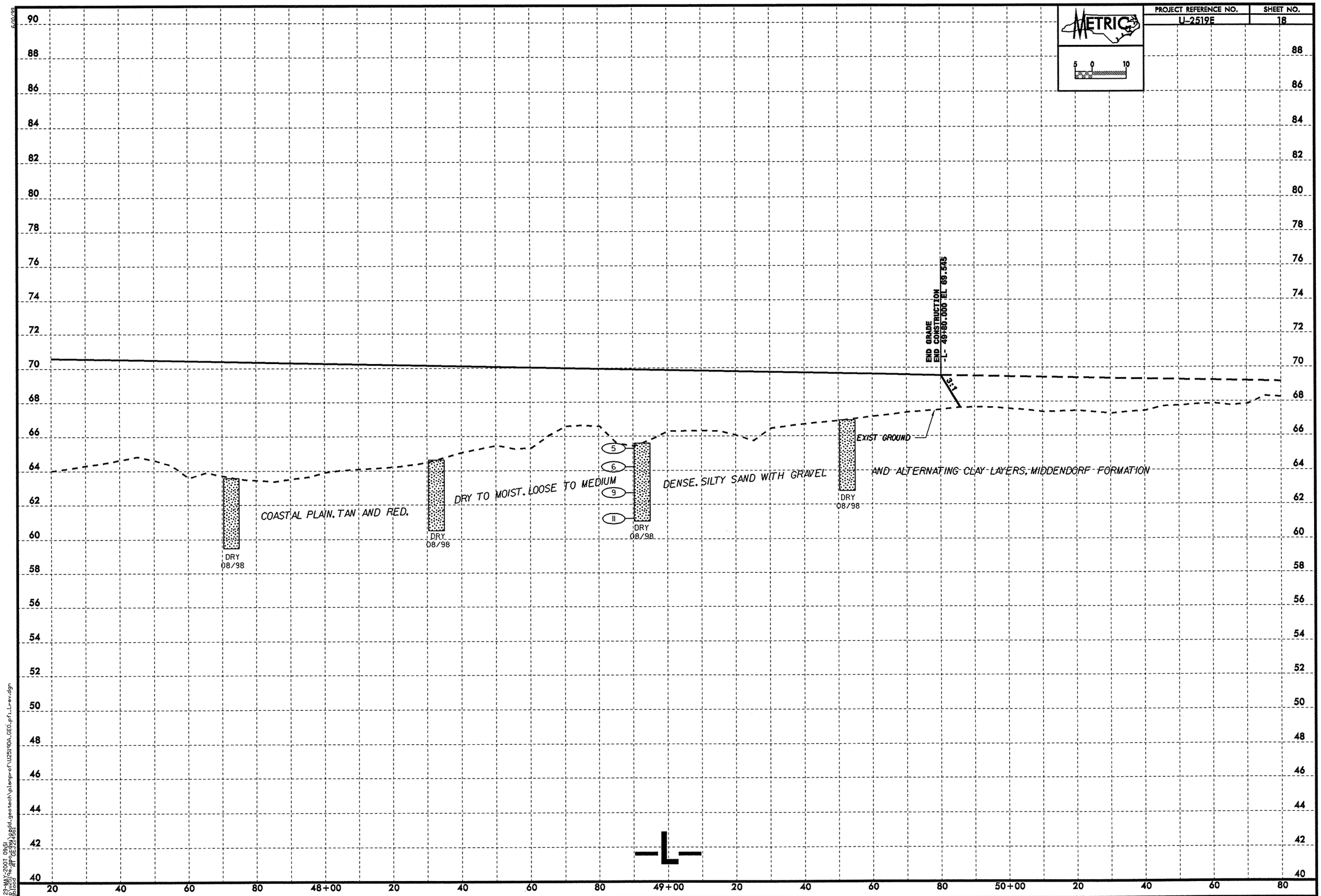
PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
15
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
CONST.REV.
R/W REV.
5m 0 10m
CURVE DATA FOR -Y5-
NAD 83
MATCH LINE -Y5- 22+60.00 SEE SHEET 14
23
24
11
01
N 40° 59' 51.4" E
-Y6- PT 11+03.381
BY3-102 (X2-102)
PINC 11+87.972
Y5 24+50.444
61.5937 LT
POT 24+63.645
END CONSTRUCTION
-Y6- POC 10+52.000
6.000
(TYP.)
-Y5-
41' 49.4" E
-Y5- POT Sta.24+63.645 =
-Y6- POC Sta.10+33.429
PAVEMENT RESURFACING ONLY
COASTAL PLAIN
BEGIN CONSTRUCTION
-Y6- POC 10+15.000
-Y6- PC 10+00.000
-Y5- PT 23+50.902
N 61° 21' 29.4" E
KNOX ST.
SOIL & GRAVEL
SOIL
300mm CONC.
1200mm CONC.
375mm CONC.
610mm C&G
SEE SHEETS 82-84 FOR -Y5- PROFILE



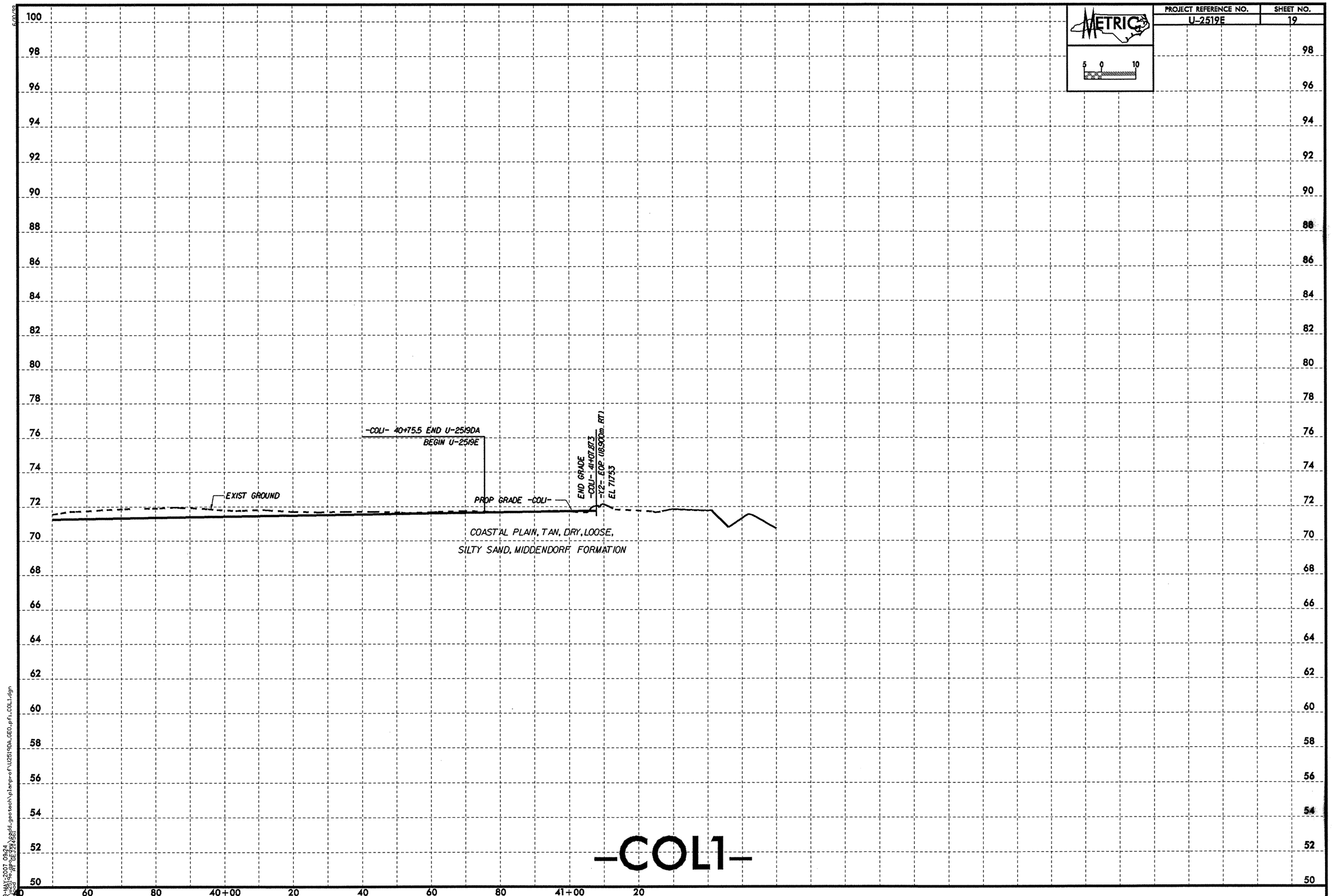
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
16
METRIC
5 0 10
BEGIN BRIDGE
END BRIDGE
-L- 41+37.698 EL 79.687 =
-Y2- 16+99.419 EL 72.064
1.5:1
1.5:1
-Y2- SBL (MEOP)
-Y2- NBL (MEOP)
-L- 39+40 END U-2519DA
BEGIN U-2519E
EXIST GROUND
DRY 08/98
08/98
COASTAL PLAIN, TAN TO RED GRAY, DRY TO SATURATED, VERY LOOSE TO MEDIUM DENSE, SILTY SAND, WITH GRAVEL.
MIDDENDORF FORMATION
A TAN-GRAY, MOIST TO WET, VERY SOFT TO SOFT, SANDY SILT
-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
40
60
80
40+00
20
41+00
42+00
43+00



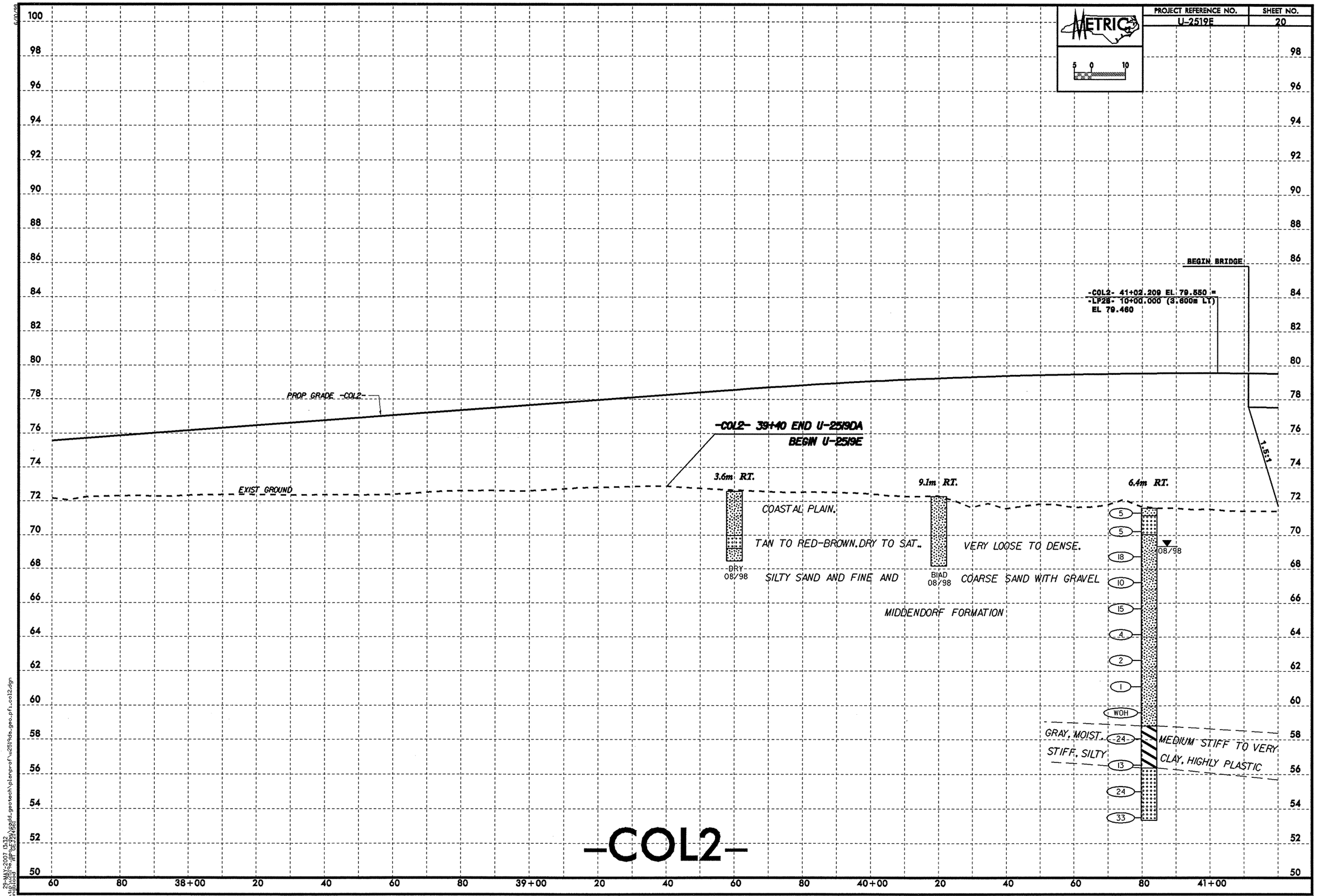
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
17
-L- 44+04.273 LB =
-L- 44+76.935 LA
EL 74.792
2.5m RT.
EXIST GROUND
COASTAL PLAIN, GRAY, TAN
AND RED, DRY TO SATURATED, LOOSE
TO MEDIUM DENSE, SILTY SAND AND
COARSE SAND, WITH GRAVEL,
MIDDENDORF FORMATION
5.0m LT.
COASTAL PLAIN,
GRAY AND TAN, DRY TO WET, VERY
STIFF TO HARD, SANDY AND SILTY
CLAY, WITH SAND LAYERS, CAPE FEAR
FORMATION
DRY 08/98
A TAN-GRAY, MOIST TO WET, VERY SOFT TO SOFT, SANDY SILT
B ALLUVIUM, BLACK, MOIST TO WET, VERY SOFT TO SOFT, ORGANIC, SANDY SILT
-L-



METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
18
5 0 10
END GRADE
END CONSTRUCTION
-L- 49+80.000 EL 69.545
3:1
EXIST GROUND
COASTAL PLAIN. TAN AND RED.
DRY TO MOIST. LOOSE TO MEDIUM
DENSE. SILTY SAND WITH GRAVEL
AND ALTERNATING CLAY LAYERS, MIDDENDORF FORMATION
5
6
9
11
DRY
08/98
-L-
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
48+00
49+00
50+00



PROJECT REFERENCE NO.
U-2519E
SHEET NO.
19
METRIC
5 0 10
-COL1- 40+75.5 END U-2519DA
BEGIN U-2519E
EXIST GROUND
PROP GRADE -COL1-
END GRADE
-COL1- 41+07.873
-Y2- EOP (18.900m RT)
EL 71.753
COASTAL PLAIN, TAN, DRY, LOOSE,
SILTY SAND, MIDDENDORF FORMATION
-COL1-
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
60
80
40+00
20
40
60
80
41+00
20



METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
20
BEGIN BRIDGE
-COL2- 41+02.209 EL 79.550 =
-LP2B- 10+00.000 (3.600m LT)
EL 79.460
PROP GRADE -COL2-
-COL2- 39+40 END U-2519DA
BEGIN U-2519E
1.5:1
EXIST GROUND
3.6m RT.
9.1m RT.
6.4m RT.
COASTAL PLAIN.
TAN TO RED-BROWN, DRY TO SAT.
VERY LOOSE TO DENSE.
DRY 08/98
BIAD 08/98
SILTY SAND AND FINE AND
COARSE SAND WITH GRAVEL
MIDDENDORF FORMATION
08/98
GRAY, MOIST,
STIFF, SILTY
MEDIUM STIFF TO VERY
CLAY, HIGHLY PLASTIC
-COL2-

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

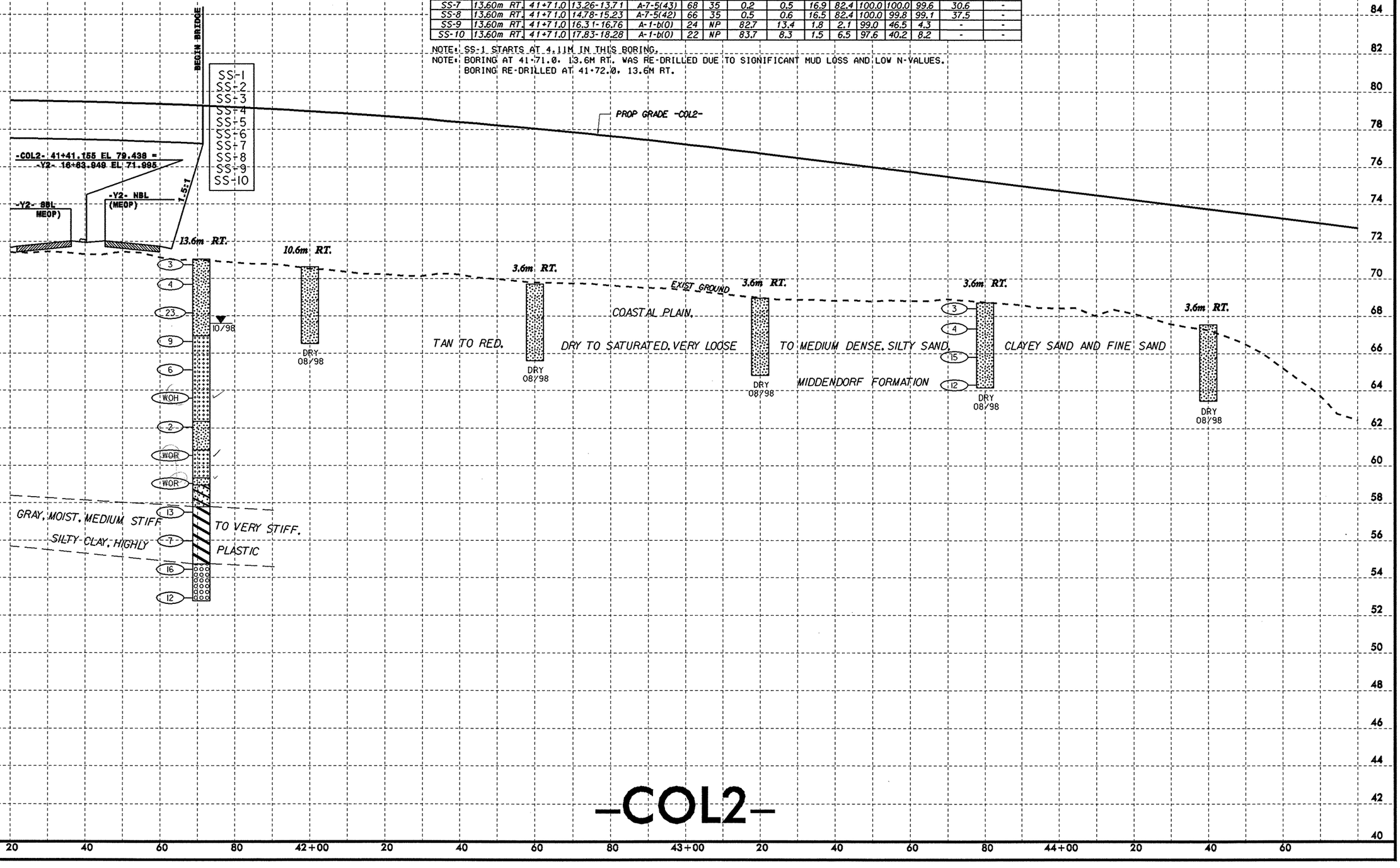
METRIC

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-1	13.60m RT.	41+71.0	4.11-4.56	A-3(0)	19	NP	61.4	33.6	0.8	4.2	98.2	52.7	5.5	-	-
SS-2	13.60m RT.	41+71.0	5.64-6.09	A-3(0)	19	NP	30.1	64.2	1.5	4.2	100.0	77.1	8.4	-	-
SS-3	13.60m RT.	41+71.0	7.16-7.61	A-3(0)	24	NP	60.2	30.3	5.4	4.1	96.5	52.6	10.3	-	-
SS-4	13.60m RT.	41+71.0	8.69-9.14	A-2-4(0)	24	NP	48.9	30.0	6.1	15.0	88.7	55.8	20.7	16.9	-
SS-5	13.60m RT.	41+71.0	10.21-10.66	A-3(0)	21	NP	57.5	33.2	3.0	6.3	99.0	74.7	9.7	-	-
SS-6	13.60m RT.	41+71.0	11.73-12.12	A-2-4(0)	24	3	26.3	47.0	0.4	26.3	99.2	89.8	32.7	27.3	-
SS-7	13.60m RT.	41+71.0	13.26-13.71	A-7-5(43)	68	35	0.2	0.5	16.9	82.4	100.0	100.0	99.6	30.6	-
SS-8	13.60m RT.	41+71.0	14.78-15.23	A-7-5(42)	66	35	0.5	0.6	16.5	82.4	100.0	99.8	99.1	37.5	-
SS-9	13.60m RT.	41+71.0	16.31-16.76	A-1-b(0)	24	NP	82.7	13.4	1.8	2.1	99.0	46.5	4.3	-	-
SS-10	13.60m RT.	41+71.0	17.83-18.28	A-1-b(0)	22	NP	83.7	8.3	1.5	6.5	97.6	40.2	8.2	-	-

NOTE: SS-1 STARTS AT 4.11M IN THIS BORING.
NOTE: BORING AT 41+71.0, 13.6M RT. WAS RE-DRILLED DUE TO SIGNIFICANT MUD LOSS AND LOW N-VALUES.
BORING RE-DRILLED AT 41+72.0, 13.6M RT.



-COL2-

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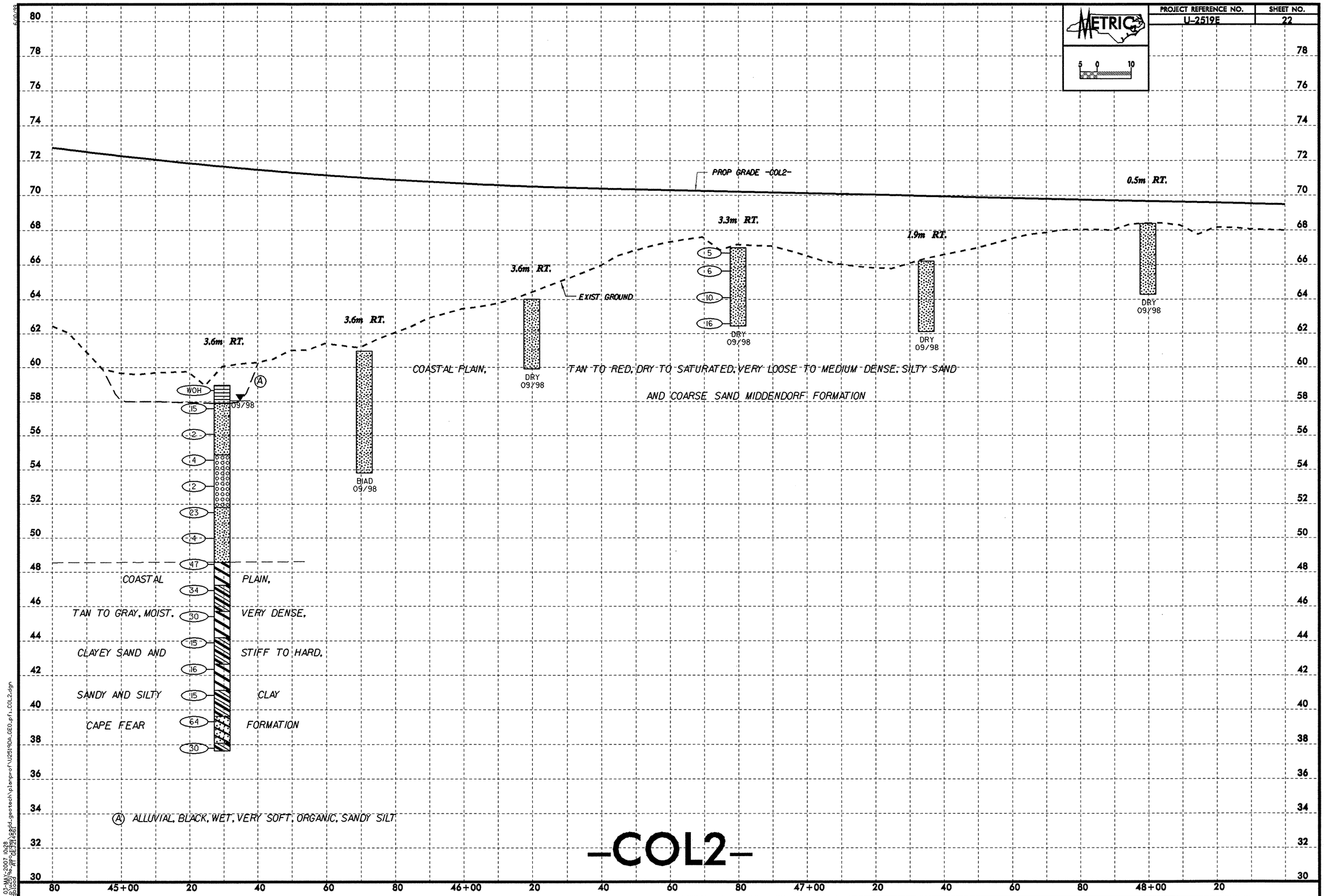
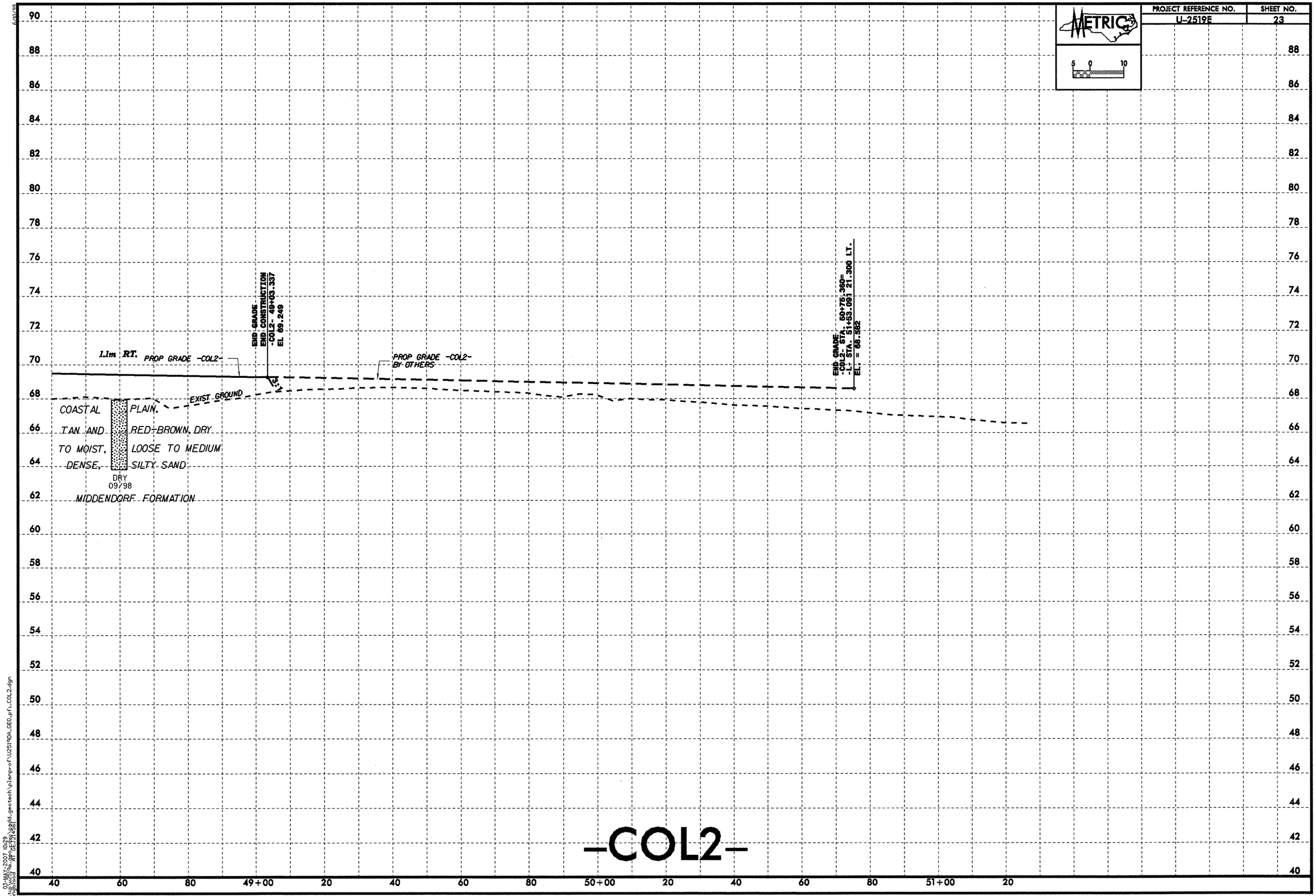


METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
22
PROP GRADE -COL2-
EXIST GROUND
3.6m RT.
3.6m RT.
3.6m RT.
3.3m RT.
1.9m RT.
0.5m RT.
WOH
15
2
4
2
23
4
47
34
30
15
16
15
64
30
09/98
BIAD
09/98
DRY
09/98
5
6
10
16
DRY
09/98
DRY
09/98
DRY
09/98
COASTAL PLAIN, TAN TO RED, DRY TO SATURATED, VERY LOOSE TO MEDIUM DENSE, SILTY SAND AND COARSE SAND MIDDENDORF FORMATION
COASTAL PLAIN, TAN TO GRAY, MOIST, VERY DENSE, CLAYEY SAND AND STIFF TO HARD, SANDY AND SILTY CLAY CAPE FEAR FORMATION
A ALLUVIAL, BLACK, WET, VERY SOFT, ORGANIC, SANDY SILT
-COL2-
45+00
46+00
47+00
48+00



METRIC
5 0 10
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
23
1.1m RT.
PROP GRADE -COL2-
END GRADE
END CONSTRUCTION
-COL2- 49+03.337
EL 69.249
3:1
PROP GRADE -COL2-
BY OTHERS
END GRADE
-COL2- STA. 50+75.360=
-L- STA. 51+53.091 21.300 LT.
EL. = 68.582
EXIST GROUND
COASTAL PLAIN,
TAN AND RED-BROWN, DRY
TO MOIST, LOOSE TO MEDIUM
DENSE, SILTY SAND
DRY
09/98
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
40
60
80
49+00
20
40
60
80
50+00
20
40
60
80
51+00
20

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

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		
ST-1	CL	41+04.0	7.16-7.77	A-7-6(21)	51	30	11.9	16.4	10.8	60.9	96.3	88.1	72.6	42.9	-

-RP1BD- 41+69.049 EL 79.205 =
-LP2D- 10+00.000 (3.600m RT)
EL 79.133

PROP GRADE -RP1BD-

-RP1BD- 41+49.427=
-LP2D- 10+00.000

-RP1BD- 40+00 END U-2519DA
BEGIN U-2519E

ST-1

EXIST GROUND

COASTAL PLAIN, TAN, RED AND BROWN,

DRY TO WET, LOOSE TO MEDIUM DENSE, SILTY AND CLAYEY SAND

MIDDENDORF FORMATION

06/98

DRY
08/98

5	
4	
15	
18	
6	
2	ST-1: 7.16m-7.77m SOFT, SILTY CLAY
2	
3	
4	
8	
28	
20	
34	
40	

RED TO GRAY, WET,

LIGHT GRAY, SATURATED,

VERY LOOSE, SILTY SAND

GRAY, WET TO SATURATED,

MEDIUM STIFF, SILTY CLAY

TAN, RED AND GRAY,

SATURATED, MEDIUM DENSE

TO DENSE, SILTY

TO COARSE SAND

-RP1BD-

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 39+00 20 40 60 80 40+00 20 40 60 80 41+00 20 40 60 80 42+00 20

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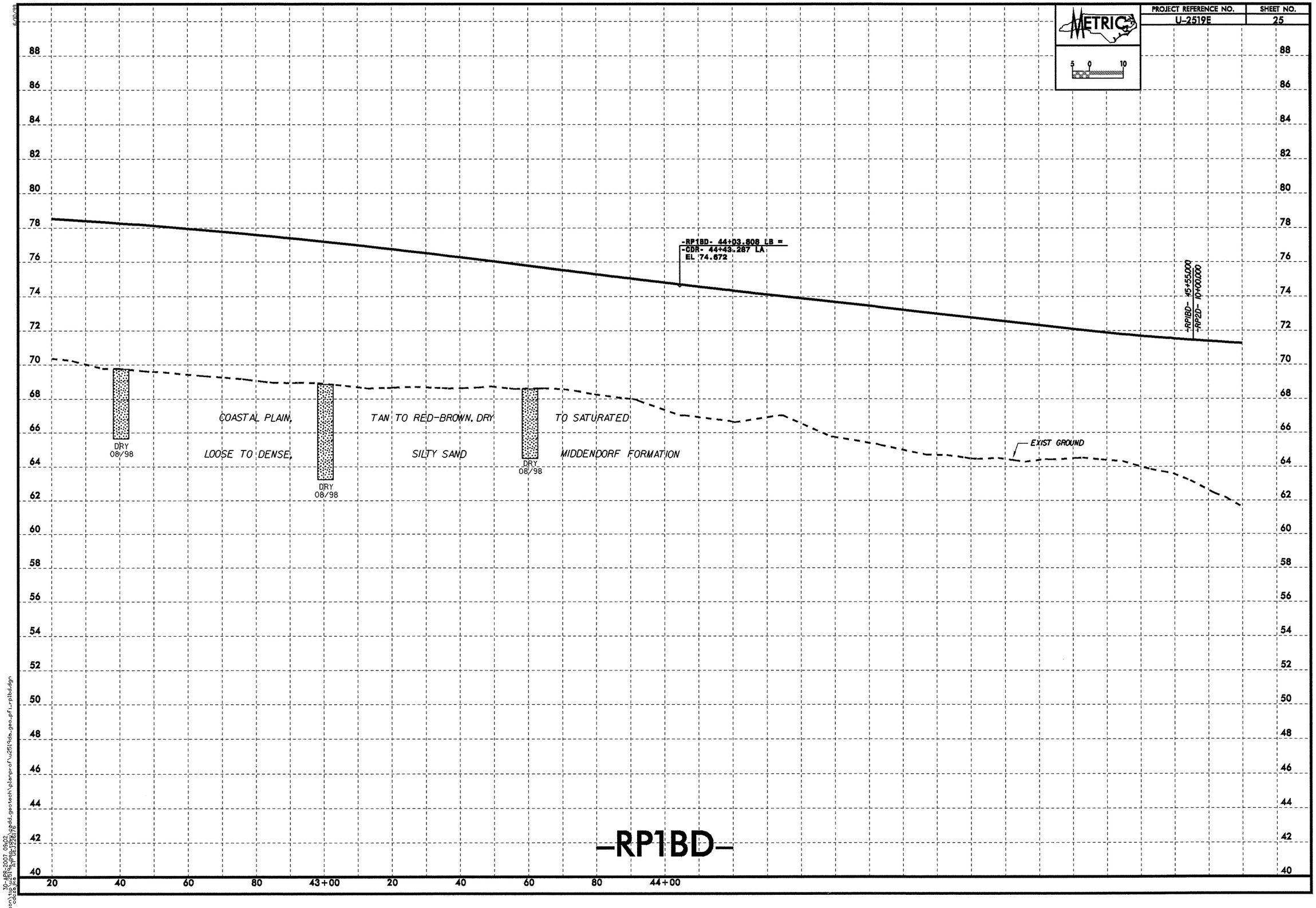
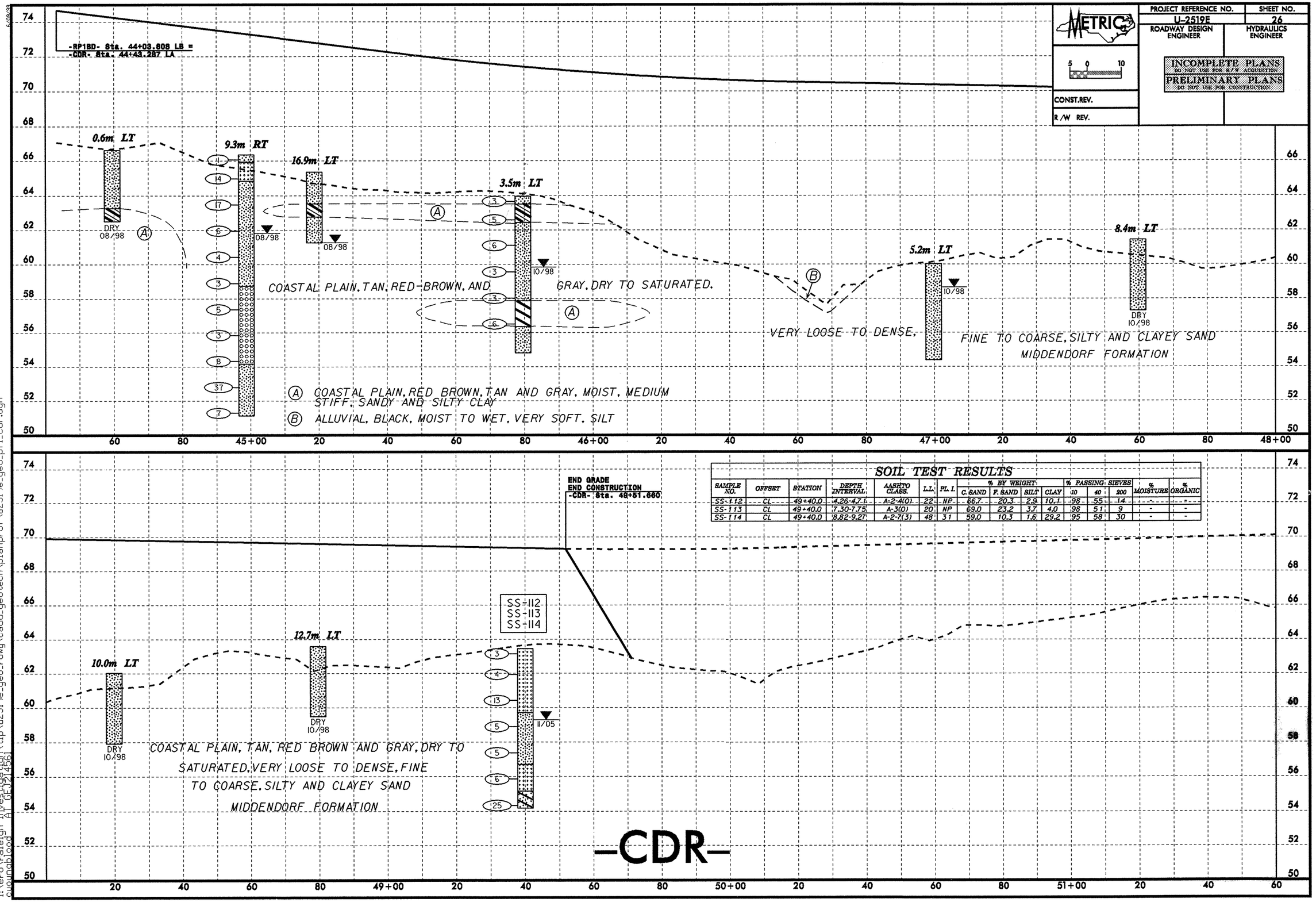


METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
25
5 0 10
-RP1BD- 44+03.808 LB =
-CDR- 44+43.287 LA
EL 74.672
-RP1BD- 45+55.000
-RP2D- 10+00.000
COASTAL PLAIN,
LOOSE TO DENSE,
TAN TO RED-BROWN, DRY
SILTY SAND
TO SATURATED
MIDDENDORF FORMATION
DRY
08/98
DRY
08/98
DRY
08/98
EXIST GROUND
-RP1BD-
88
86
84
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
43+00
20
40
60
80
44+00



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-112	CL	49+40.0	4.26-4.71	A-2-4(0)	22	NP	66.7	20.3	2.9	10.1	98	55	14	-	-
SS-113	CL	49+40.0	7.30-7.75	A-3(0)	20	NP	69.0	23.2	3.7	4.0	98	51	9	-	-
SS-114	CL	49+40.0	8.82-9.27	A-2-7(3)	48	31	59.0	10.3	1.6	29.2	95	58	30	-	-

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cuoungblood AT GEJ214561

METRIC

5 0 10

BEGIN GRADE EL 73.993
-RP2B- 10+00.000 (3.600m LT) =
-COL2- 36+61.696

-RP2B- 12+40 END U-2519DA
BEGIN U-2519E
2.1m RT.

PROP GRADE -RP2B-

EXIST GROUND

COASTAL PLAIN, TAN AND RED-BROWN, DRY. VERY LOOSE TO DENSE, SILTY SAND, MIDDENDORF FORMATION

DRY 08/98

10+00 20 40 60 80 11+00 20 40 60 80 12+00 20 40 60 80 13+00 20

3.3m RT.

3.5m RT.

PROP GRADE -RP2B-

3.4m RT.

EXIST GROUND

END GRADE
-RP2B- 15+19.180 EL 70.138
(EB EOT 15:300m RT)

-Y2- 15+07.082
EL 70.408 (4.500m RT)

-Y2- ℄

D25 D25

TAN AND RED-BROWN, DRY TO MOIST, LOOSE TO DENSE, SILTY SAND AND CLAYEY SAND MIDDENDORF FORMATION

DRY 08/98

DRY 08/98

4
37
49

08/98 MOIST, SOFT, RED, TAN, GRAY, SILTY CLAY

2 RED-GRAY, SAT. VERY LOOSE SILTY SAND

WOR TAN-GRAY, MOIST, SILTY CLAY WITH ALTERNATING SAND LAYERS

3

20 40 60 80 14+00 20 40 60 80 15+00 20

-RP2B-

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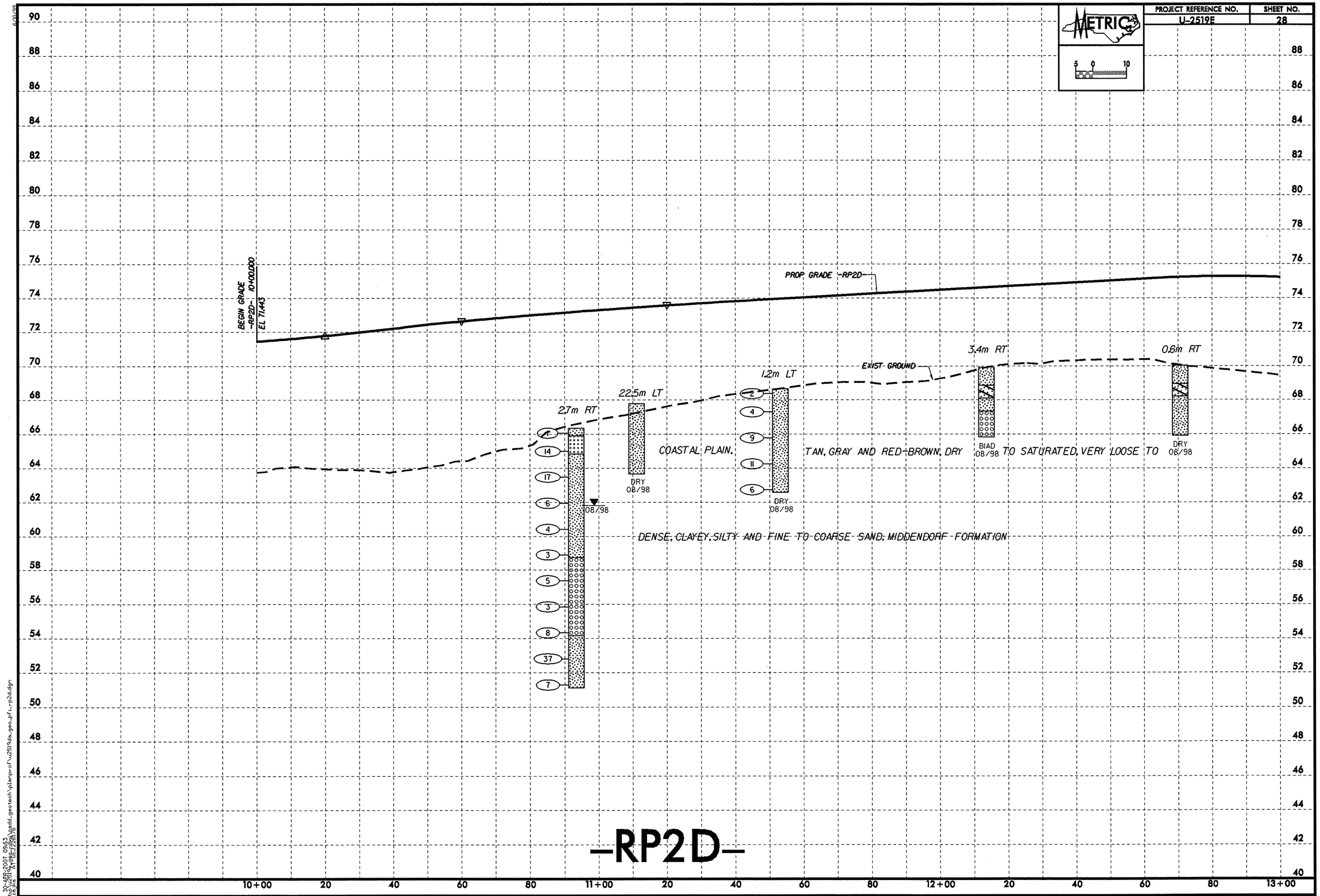
cwoumblood AT GEJ1456



METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
28
BEGIN GRADE -RP2D- 10+00.000 EL 71.443
PROP GRADE -RP2D-
EXIST GROUND
2.7m RT
22.5m LT
1.2m LT
3.4m RT
0.6m RT
COASTAL PLAIN.
TAN, GRAY AND RED-BROWN, DRY TO SATURATED, VERY LOOSE TO
DENSE, CLAYEY, SILTY AND FINE TO COARSE SAND, MIDDENDORF FORMATION
DRY 08/98
BIAD 08/98
08/98
-RP2D-

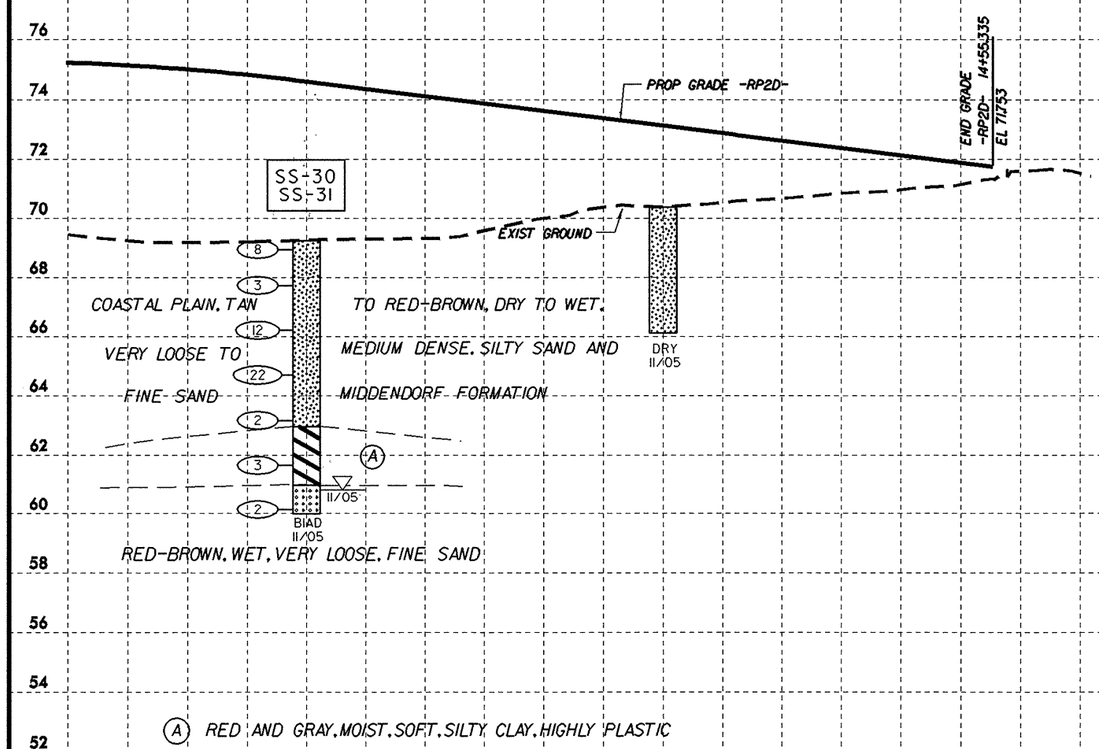
PROJECT REFERENCE NO.	SHEET NO.
U-2519E	29

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-30	CL	13+40.0	5.78-6.23	A-2-4(0)	24	NP	20.9	67.3	2.7	9.0	96	83	15	-	-
SS-31	CL	13+40.0	7.30-7.75	A-7-6(5)	48	27	42.9	18.0	3.0	36.1	97	74	40	-	-



(A) RED AND GRAY, MOIST, SOFT, SILTY CLAY, HIGHLY PLASTIC

-RP2D-

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

13+00 20 40 60 80 14+00 20 40 60

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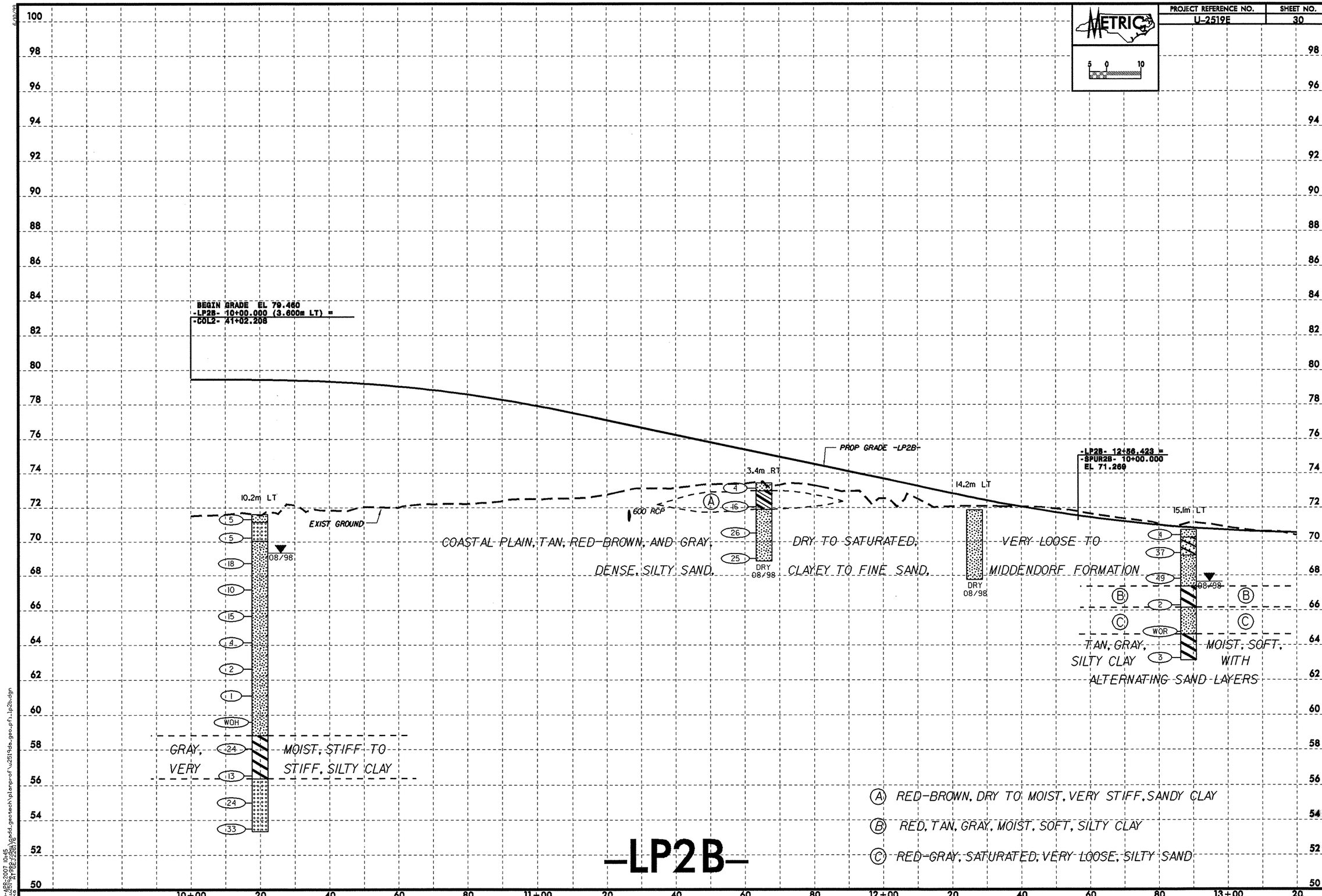
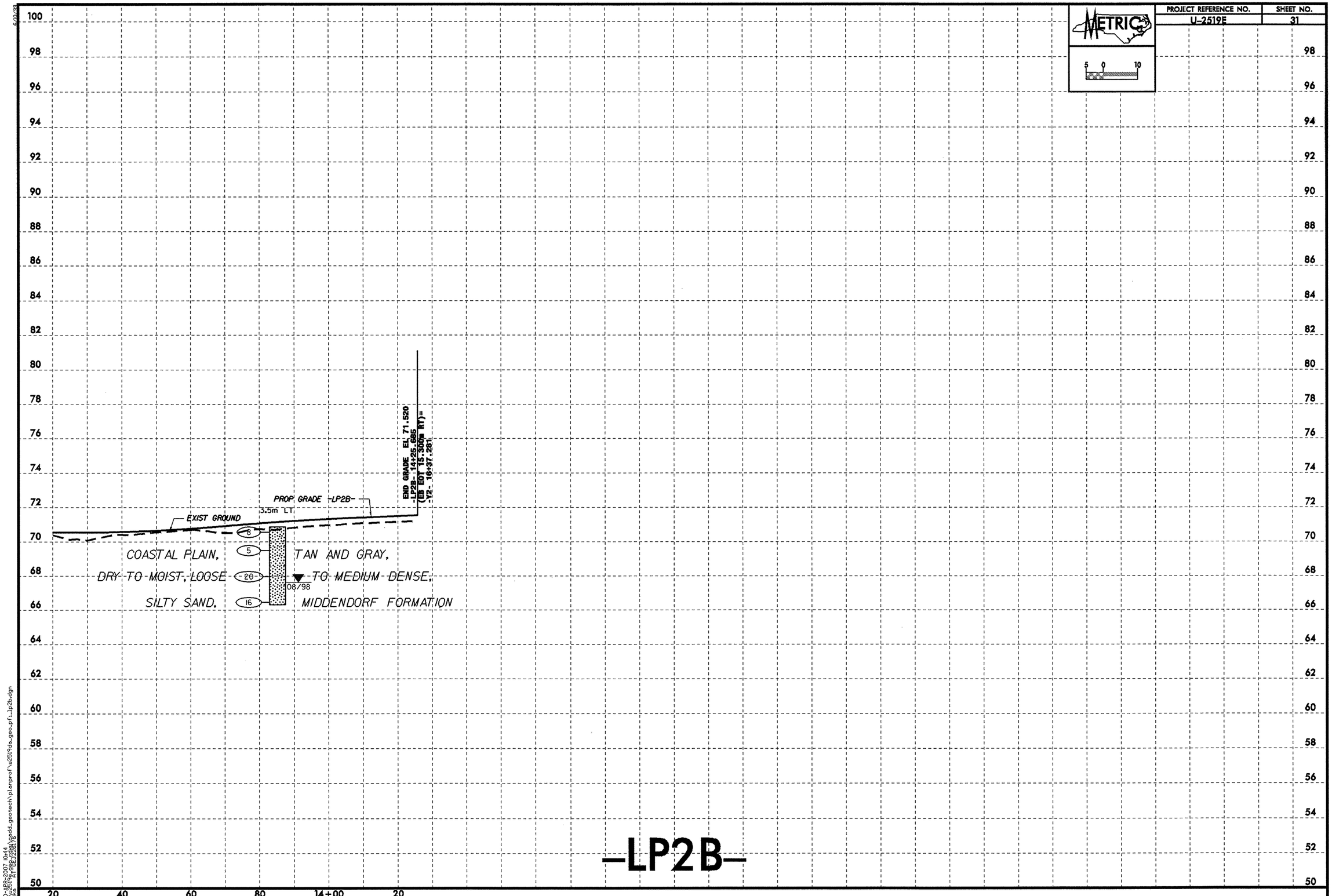


METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
30
BEGIN GRADE EL 79.460
-LP2B- 10+00.000 (3.600m LT) =
-COL2- 41+02.208
PROP GRADE -LP2B-
-LP2B- 12+56.423 =
-SPUR2B- 10+00.000
EL 71.269
10.2m LT
3.4m RT
14.2m LT
15.1m LT
EXIST GROUND
600 RCP
08/98
DRY 08/98
COASTAL PLAIN, TAN, RED-BROWN, AND GRAY, DENSE, SILTY SAND,
DRY TO SATURATED, CLAYEY TO FINE SAND,
VERY LOOSE TO MIDDENDORF FORMATION
TAN, GRAY, SILTY CLAY
MOIST, SOFT, WITH ALTERNATING SAND LAYERS
GRAY, VERY
MOIST, STIFF TO STIFF, SILTY CLAY
(A) RED-BROWN, DRY TO MOIST, VERY STIFF, SANDY CLAY
(B) RED, TAN, GRAY, MOIST, SOFT, SILTY CLAY
(C) RED-GRAY, SATURATED, VERY LOOSE, SILTY SAND
-LP2B-

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



-LP2B-

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

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-9	CL	10+80.0	5.78-6.23	A-6(9)	38	18	3.0	49.5	11.4	36.1	100	98	62	-	-
SS-10	CL	10+80.0	7.30-7.75	A-3(0)	20	NP	59.6	32.1	2.3	6.0	99	78	9	-	-
S-8	CL	11+67.6	6.80-7.25	A-2-4(0)	23	NP	2.6	79.8	5.6	12.0	100	98	9	-	-

BEGIN GRADE EL 79.133
-LP2D- 10+00.000 (3.600m LT) =
-RP1BD- 41+69.049

-LP2D- 12+05.629 =
-SPUR2D- 10+00.000
EL 73.191

PROP GRADE -LP2D-

END GRADE EL 71.634
-LP2D- 13+55.607
(NB EOT 15.300m LT) =
-Y2- 17+83.814

PROP GRADE -LP2D-
4.5m LT

SS-9
SS-10

3.7m LT

EXIST GROUND

S-8

EXIST GROUND

DRY
08/98

2
6
8
3
3
3
8
3
7

11/05

DRY
11/05

12
4
14

DRY
11/05

DRY
08/06

COASTAL PLAIN, TAN, RED, WET, VERY LOOSE TO FINE SAND

ORANGE AND WHITE, DRY TO MEDIUM DENSE, SILTY SAND AND MIDDENDORF FORMATION

Ⓐ GRAY AND RED, WET, SOFT, SANDY CLAY

-LP2D-

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

10+00 20 40 60 80 11+00 20 40 60 80 12+00 20 40 60 80 13+00 20 40

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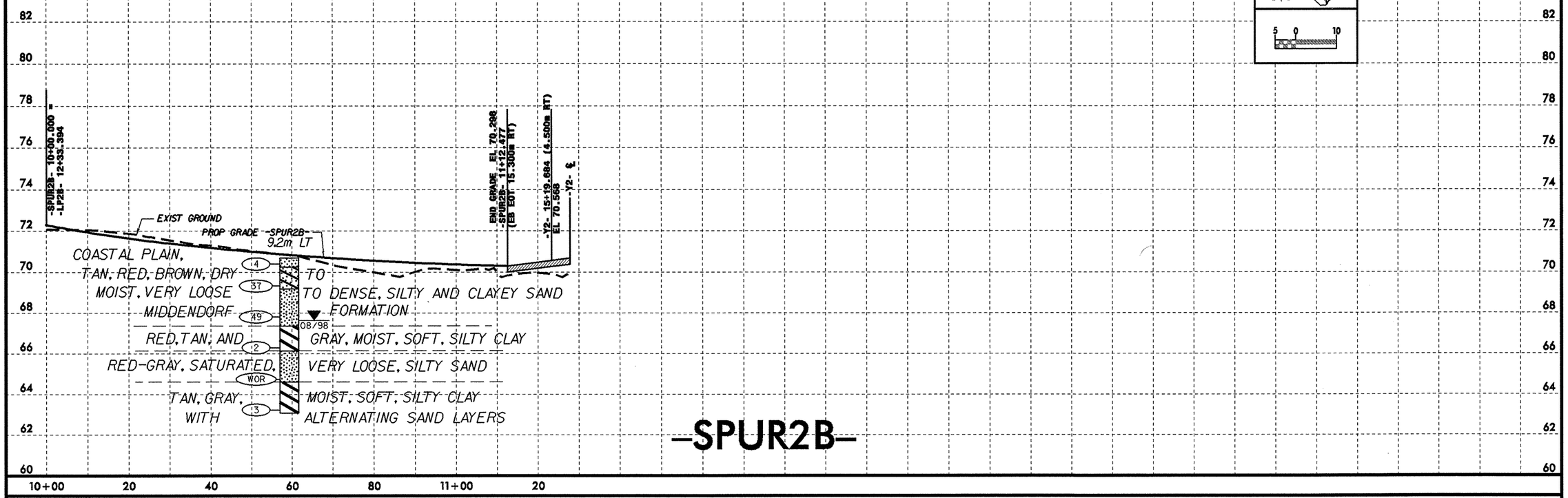
A1 DEFAULT

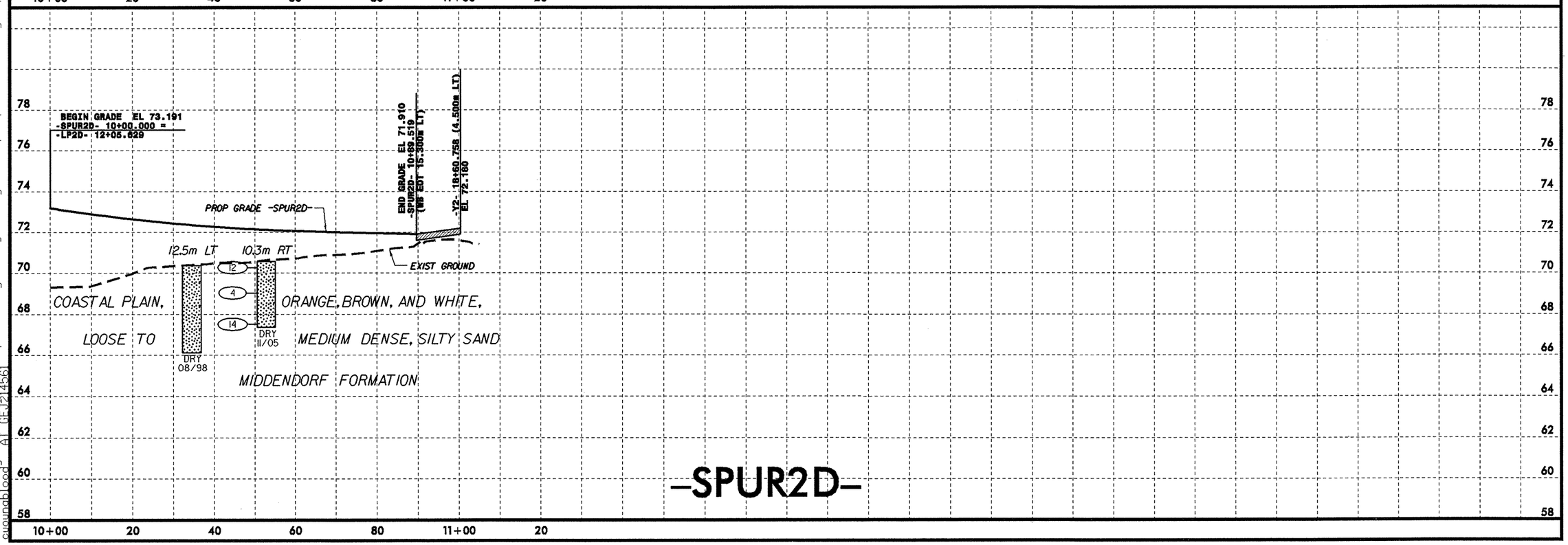
PROJECT REFERENCE NO.	SHEET NO.
U-2519E	33

METRIC

5 0 10



-SPUR2B-



-SPUR2D-

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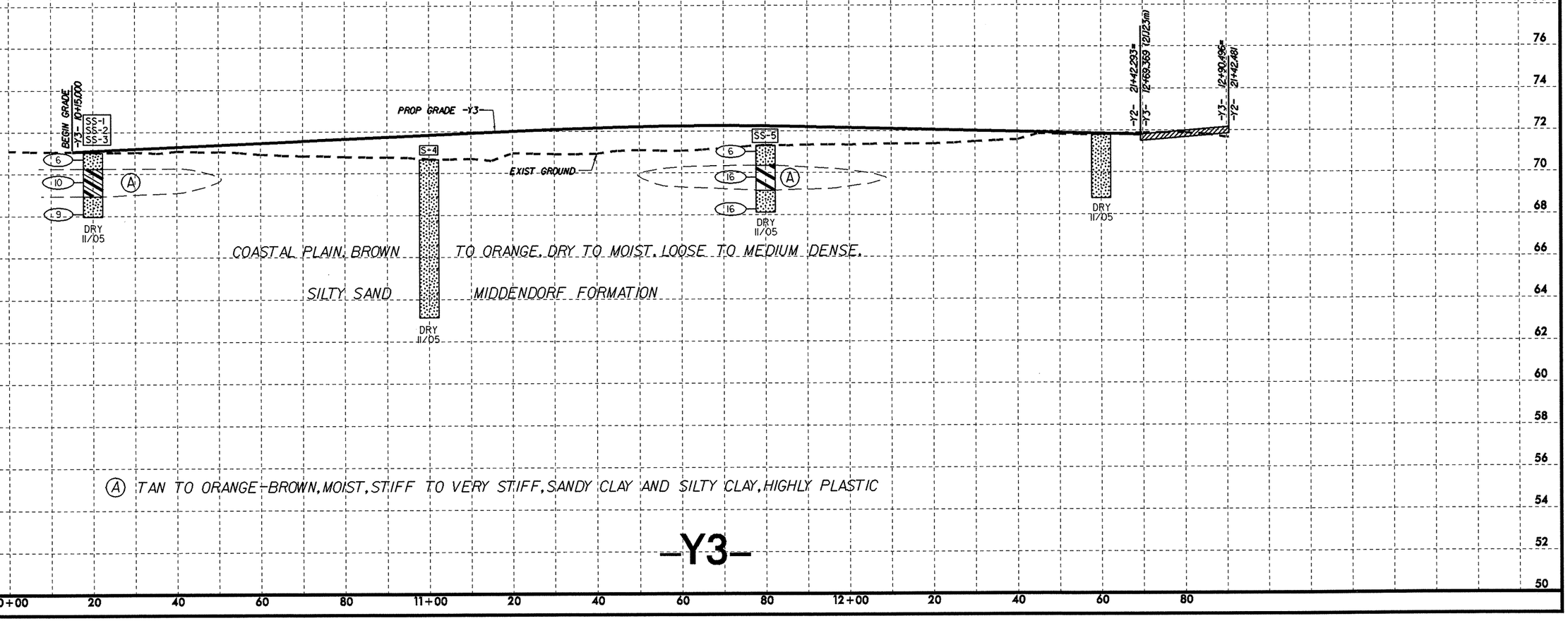
cuoungblood AT GEJ214561

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-1	CL	10+20.0	0.00-0.45	A-2-4(0)	16	NP	41.9	44.9	6.2	7.0	100	80	17	-	-
SS-2	CL	10+20.0	1.07-1.52	A-6(3)	36	20	27.9	37.2	5.9	29.1	100	86	37	-	-
SS-3	CL	10+20.0	2.59-3.04	A-2-4(0)	22	NP	11.6	77.7	1.7	9.0	100	98	12	-	-
S-4	CL	11+00.0	2.40-2.85	A-2-4(0)	26	8	55.9	25.7	2.4	16.0	100	68	19	-	-
SS-5	CL	11+80.0	1.22-1.67	A-7-6(16)	56	35	24.6	20.2	9.0	46.1	100	87	56	-	-



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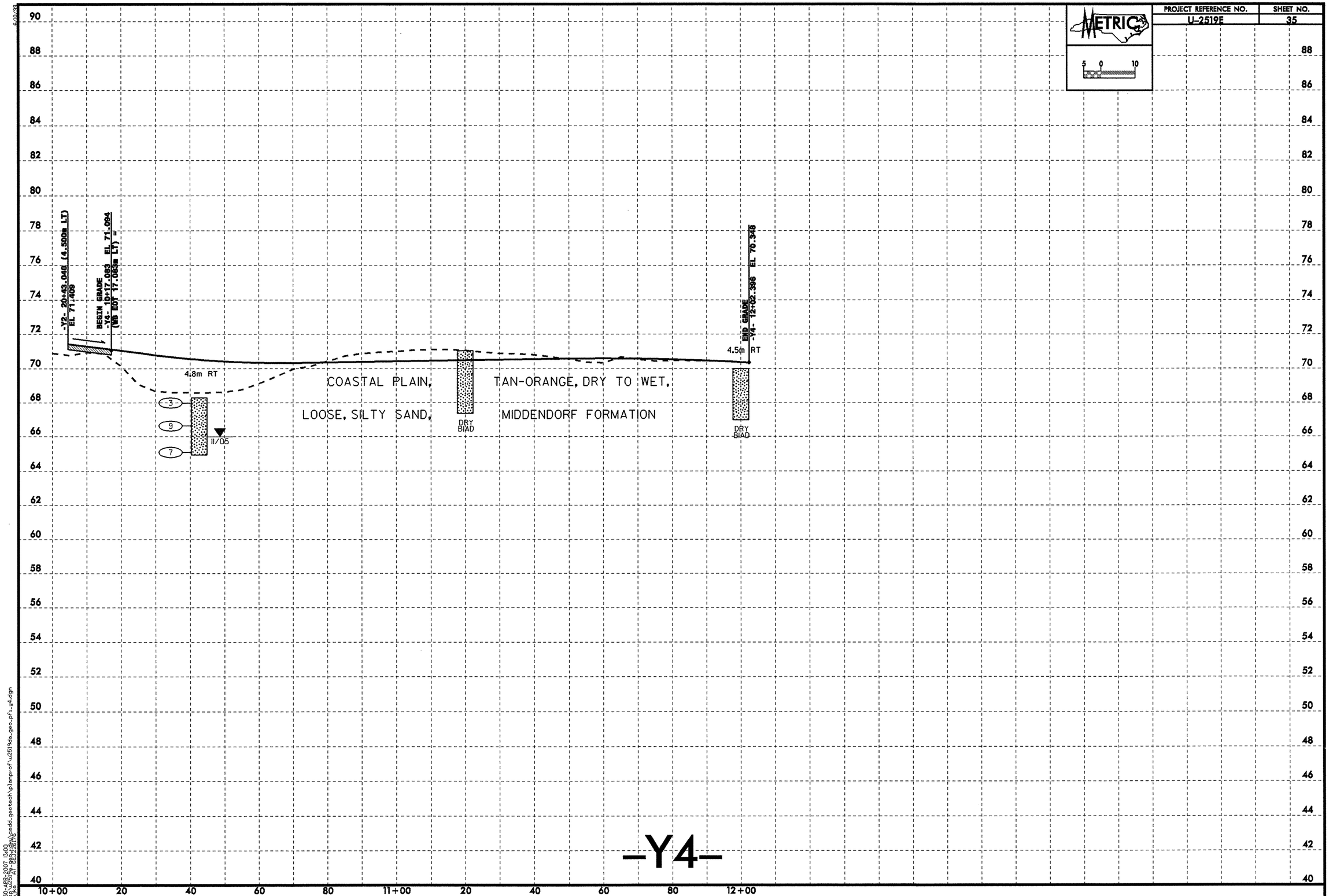

PROJECT REFERENCE NO.
U-2519E
SHEET NO.
35
METRIC
5 0 10
-Y2- 20+43.040 (4.500m LT)
EL 71.409
BEGIN GRADE
-Y4- 10+17.083 EL 71.094
(WB EOT 17.083m LT) =
END GRADE
-Y4- 12+02.396 EL 70.348
4.8m RT
4.5m RT
COASTAL PLAIN, TAN-ORANGE, DRY TO WET,
LOOSE, SILTY SAND, MIDDENDORF FORMATION
-3-
9
7
11/05
DRY BIAD
DRY BIAD
-Y4-
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
10+00
20
40
60
80
11+00
20
40
60
80
12+00

PROJECT REFERENCE NO.	SHEET NO.
U-2519E	36

METRIC

5 0 10

END PAVEMENT RESURFACING
BEGIN GRADE
-Y5- Sta. 15+96.183

DRY
II/05

14
20
13

DRY
II/05

DRY
II/05

DRY
II/05

4
16
13
12
15

DRY
II/05

DRY
II/05

COASTAL PLAIN, ORANGE AND TAN, MOIST MEDIUM DENSE, FINE SAND

MIDDENDORF FORMATION

Ⓑ COASTAL PLAIN, TAN-ORANGE, DRY TO MOIST, MED. DENSE, CLAYEY SAND, HIGHLY PLASTIC MIDDENDORF FORMATION

Ⓒ COASTAL PLAIN, TAN, DRY, LOOSE, FINE SAND MIDDENDORF FORMATION

84 82 80 78 76 74 72 70 68 66 64 62 60

80 16+00 20 40 60 80 17+00 20 40 60 80 18+00 20 40 60 80 19+00 20 40

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-111	CL	21+60.0	0.00-0.45	A-7-5(32)	92	23	8.7	8.7	48.5	34.2	100	95	84	-	30.6

SS-III

1
16
17

DRY
II/05

DRY
II/05

DRY
II/05

DRY
II/05

ORANGE, BROWN AND TAN, DRY TO MOIST, LOOSE TO MEDIUM DENSE, FINE SAND

MIDDENDORF FORMATION

Ⓐ ALLUVIUM, GRAY TO BLACK, DRY, VERY SOFT, MUCK

-Y5-

84 82 80 78 76 74 72 70 68 66 64 62 60

40 60 80 20+00 20 40 60 80 21+00 20 40 60 80 22+00 20 40 60 80 23+00

6/09/88

11-MAY-2007 08:06
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groundblood
Al 0K (21406)

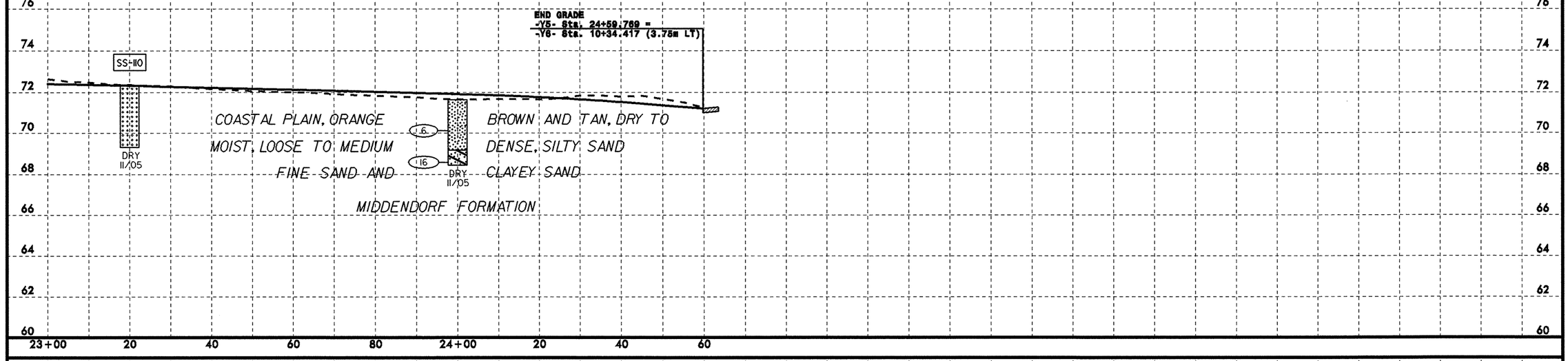
PROJECT REFERENCE NO.	SHEET NO.
U-2519E	37

METRIC

5 0 10

SOIL TEST RESULTS

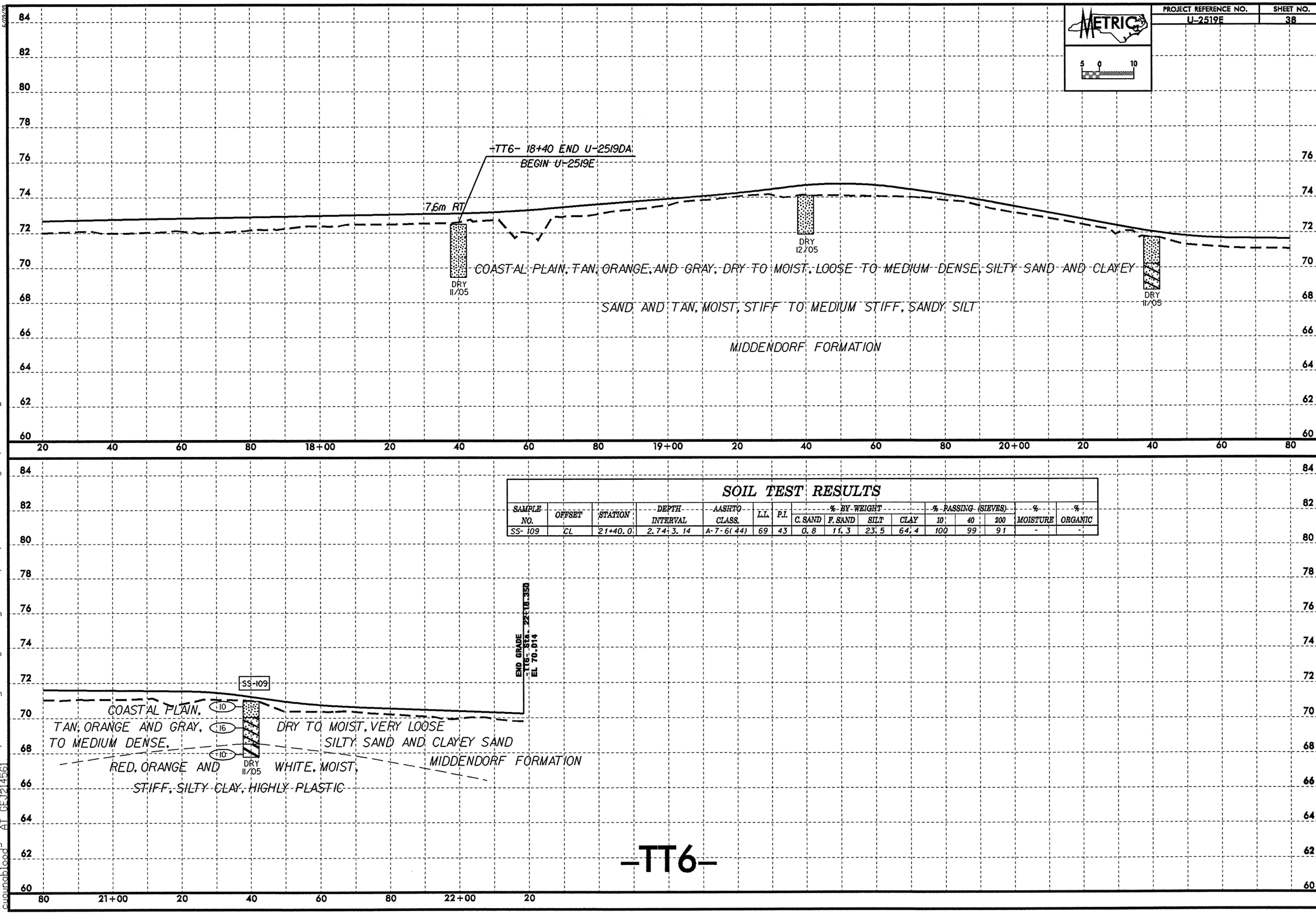
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-110	CL	23+20.0	1.20-1.65	A-3(0)	19	NP	76.4	15.5	4.1	4.0	99	53	10	-	-



-Y5-

30-APR-2007 13:05
l:\ero\raleigh investigation\tip\u2519e_geo_rdwy\cadd_geotech\planprof\u2519da_geo_pfi_y5.dgn
cdczalka AT GEJ226176

PROJECT REFERENCE NO.	SHEET NO.
U-2519E	38



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-109	CL	21+40.0	2.74-3.14	A-7-6(44)	69	43	0.8	11.3	23.5	64.4	100	99	91	-	-

29-MAY-2007 10:00
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cuoungblood AT GEJ214561

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

METRIC

5 0 10

BEGIN GRADE -TT7- Sta. 10+00.00

DRY
II/05

2
5
13

DRY
II/05

DRY
II/05

DRY
II/05

DRY
II/05

COASTAL PLAIN, TAN TO ORANGE-BROWN, DRY TO WET, VERY LOOSE TO MEDIUM DENSE, FINE SAND
MIDDENDORF FORMATION

END CONSTRUCTION
-TT7- POC STA 14+09.933

9
5
5

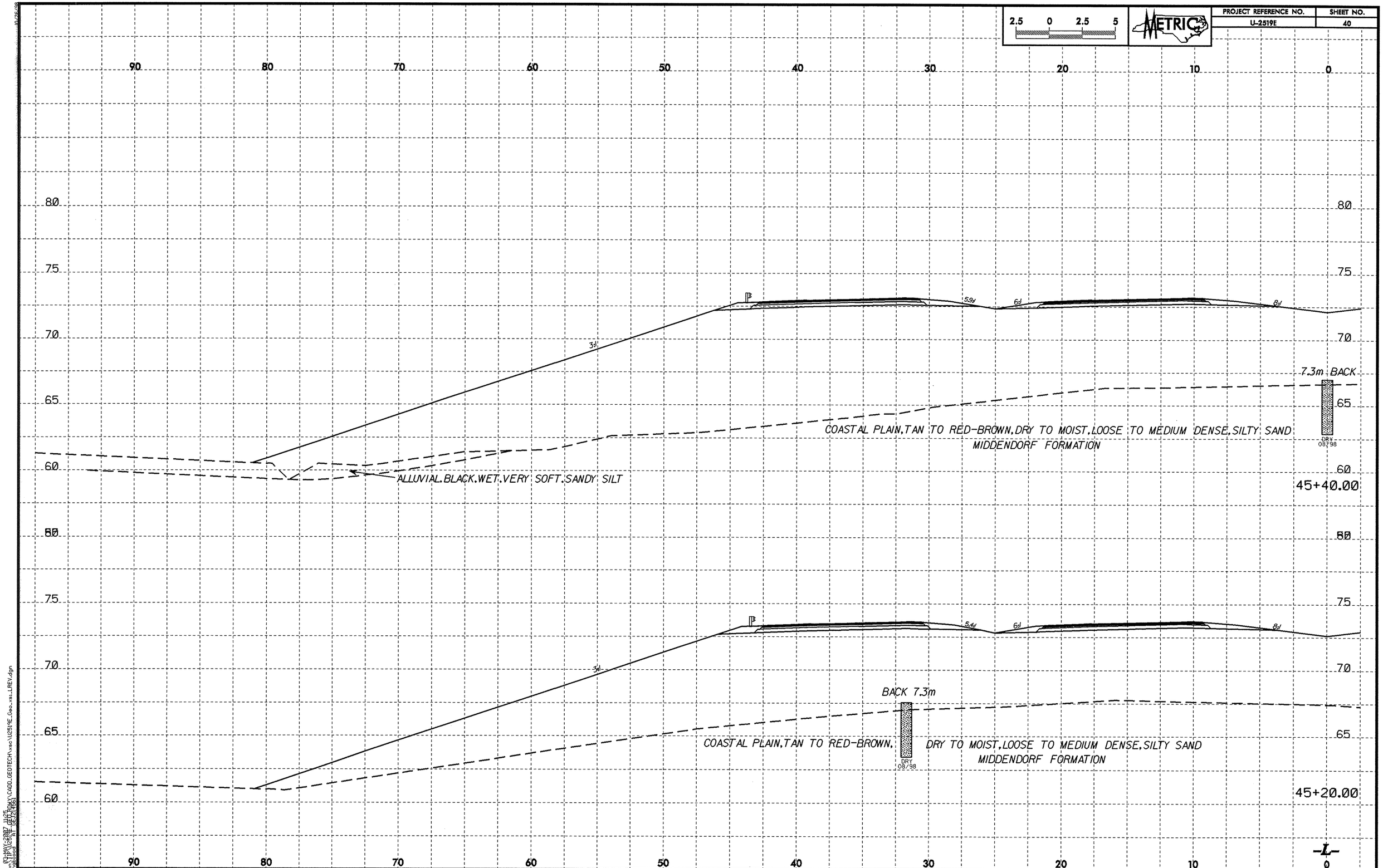
DRY
II/05

COASTAL PLAIN, TAN TO ORANGE-BROWN, DRY TO WET, VERY LOOSE TO MEDIUM DENSE, FINE SAND
MIDDENDORF FORMATION

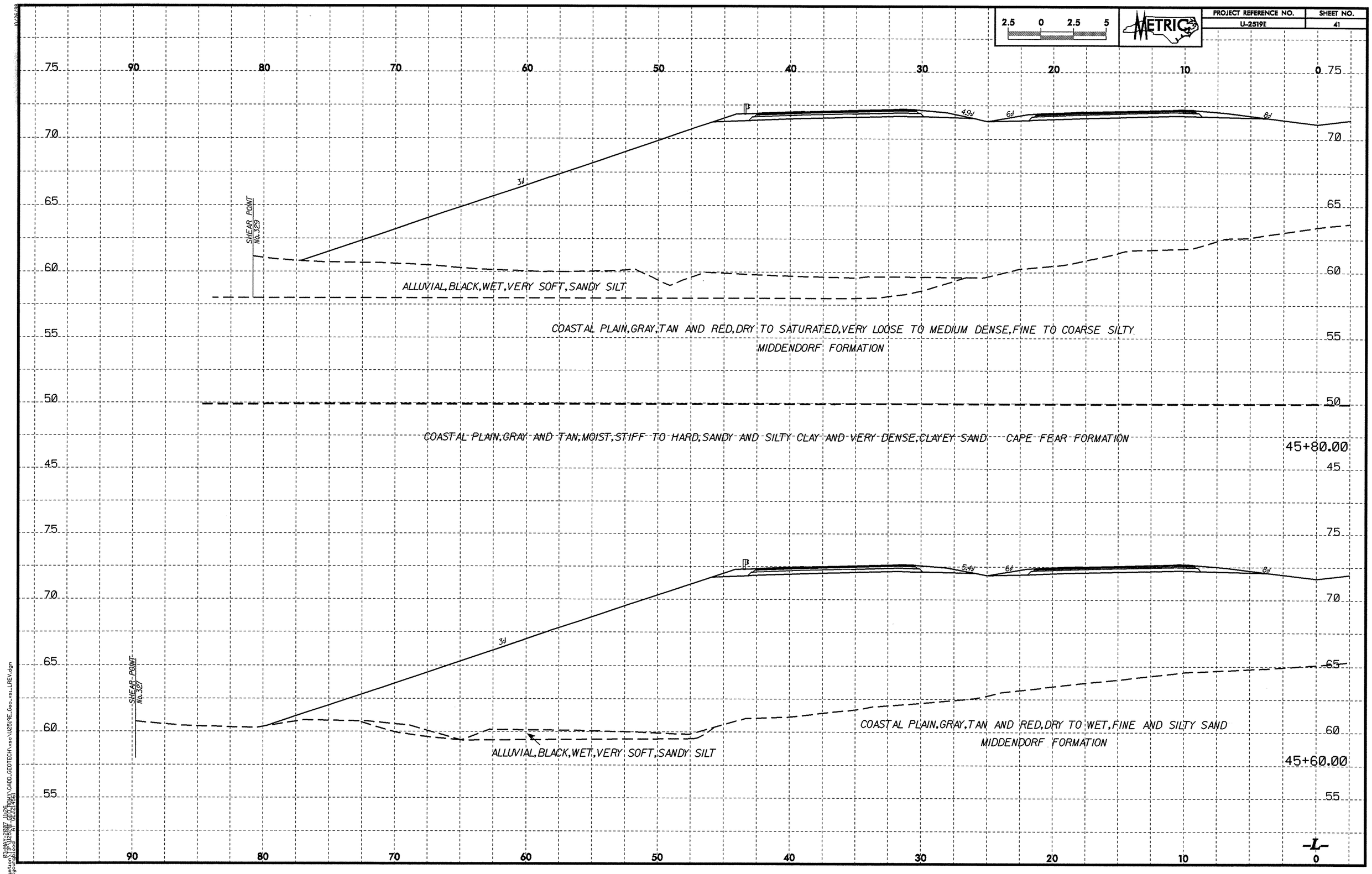
-TT7-

6/09/08

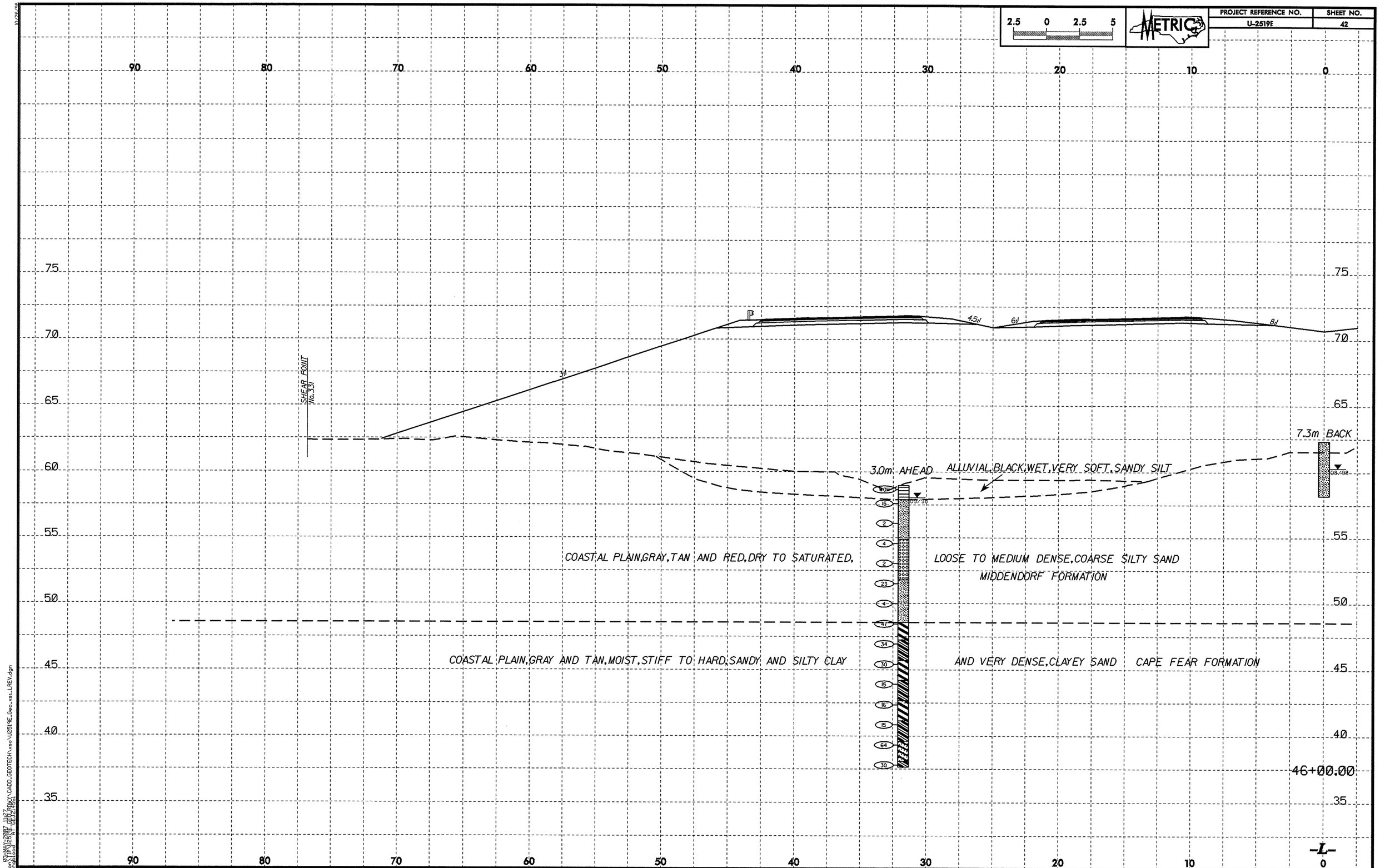
30-APR-2007 14:42
I:\ero\raleigh investigation\tip\u2519e_geo_rdwy\cadd_geotech\planprof\u2519da_geo_pf1_tt7.dgn
cdczalka AT GEJ22676



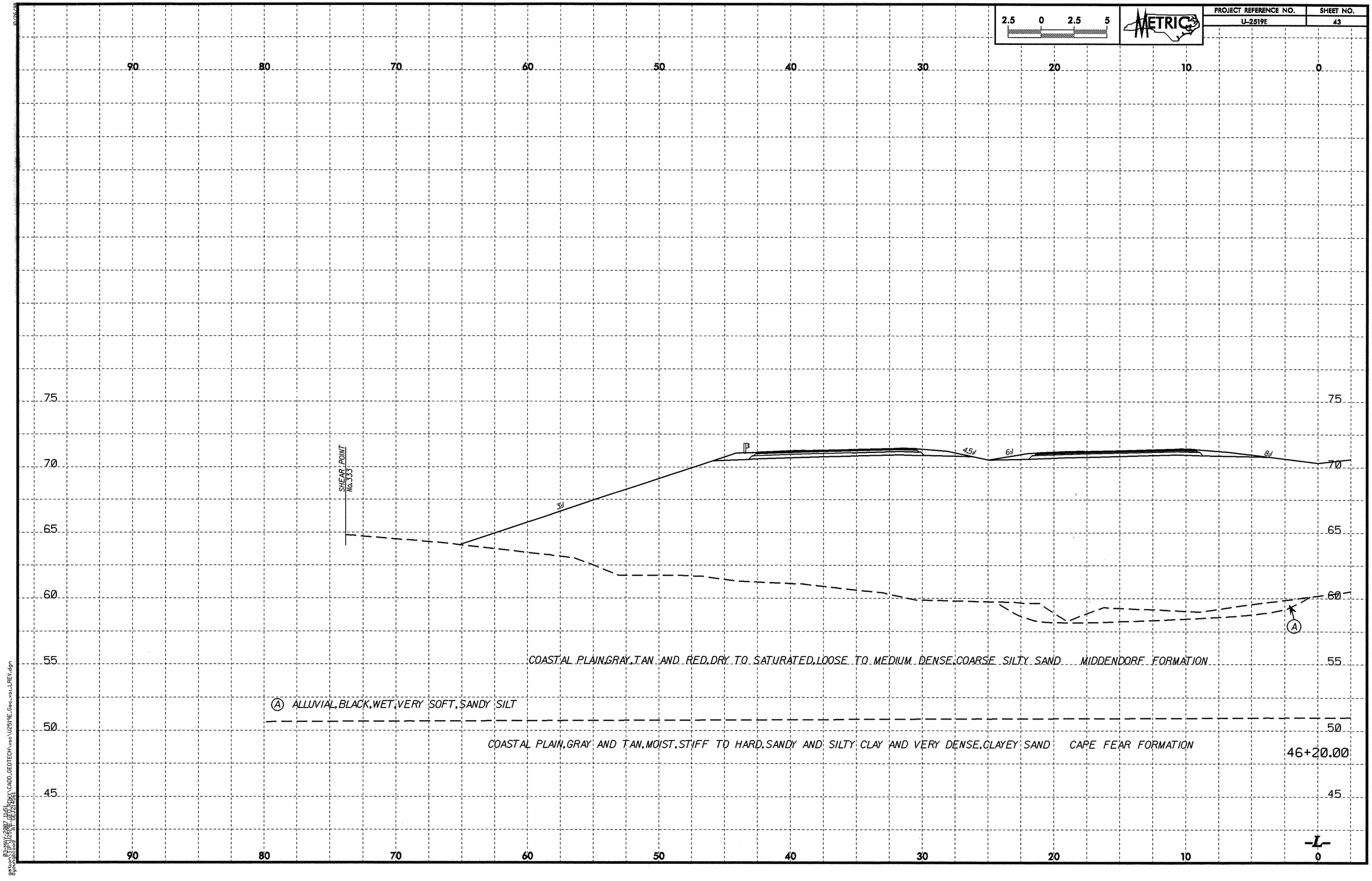
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
40
90 80 70 60 50 40 30 20 10 0
80 75 70 65 60
3:1
5.9:1
6:1
8:1
7.3m BACK
DRY 08/98
COASTAL PLAIN,TAN TO RED-BROWN,DRY TO MOIST,LOOSE TO MEDIUM DENSE,SILTY SAND
MIDDENDORF FORMATION
ALLUVIAL,BLACK,WET,VERY SOFT,SANDY SILT
45+40.00
5.4:1
BACK 7.3m
COASTAL PLAIN,TAN TO RED-BROWN, DRY TO MOIST,LOOSE TO MEDIUM DENSE,SILTY SAND
MIDDENDORF FORMATION
45+20.00
-L-



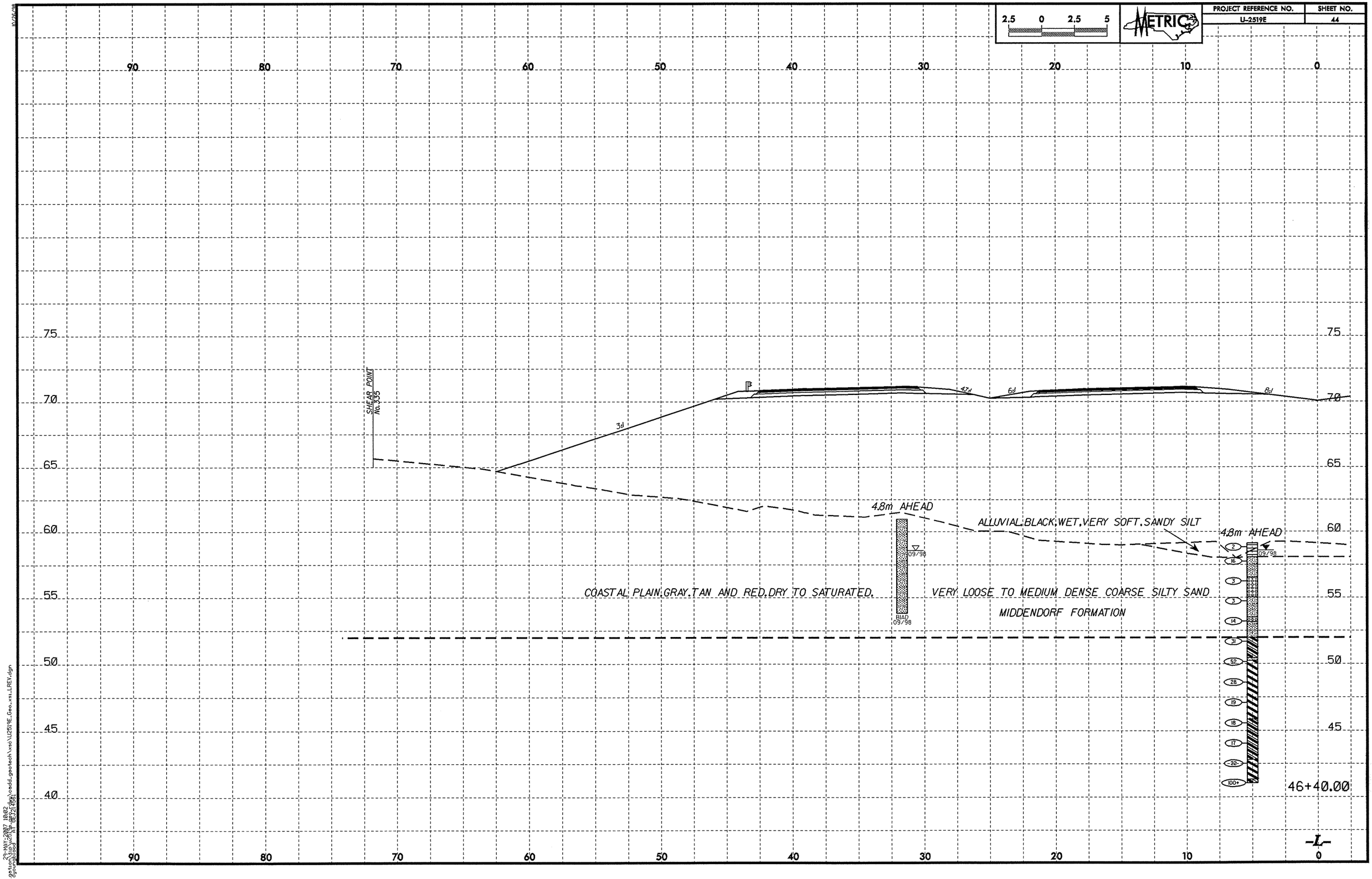
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
41
90 80 70 60 50 40 30 20 10 0
75 70 65 60 55 50 45
SHEAR POINT No.329
3:1
4.9:1
6:1
8:1
ALLUVIAL,BLACK,WET,VERY SOFT,SANDY SILT
COASTAL PLAIN,GRAY,TAN AND RED,DRY TO SATURATED,VERY LOOSE TO MEDIUM DENSE,FINE TO COARSE SILTY
MIDDENDORF FORMATION
COASTAL PLAIN,GRAY AND TAN,MOIST,STIFF TO HARD,SANDY AND SILTY CLAY AND VERY DENSE,CLAYEY SAND CAPE FEAR FORMATION
45+80.00
SHEAR POINT No.327
3:1
5.4:1
6:1
8:1
COASTAL PLAIN,GRAY,TAN AND RED,DRY TO WET,FINE AND SILTY SAND
MIDDENDORF FORMATION
ALLUVIAL,BLACK,WET,VERY SOFT,SANDY SILT
45+60.00
-L-



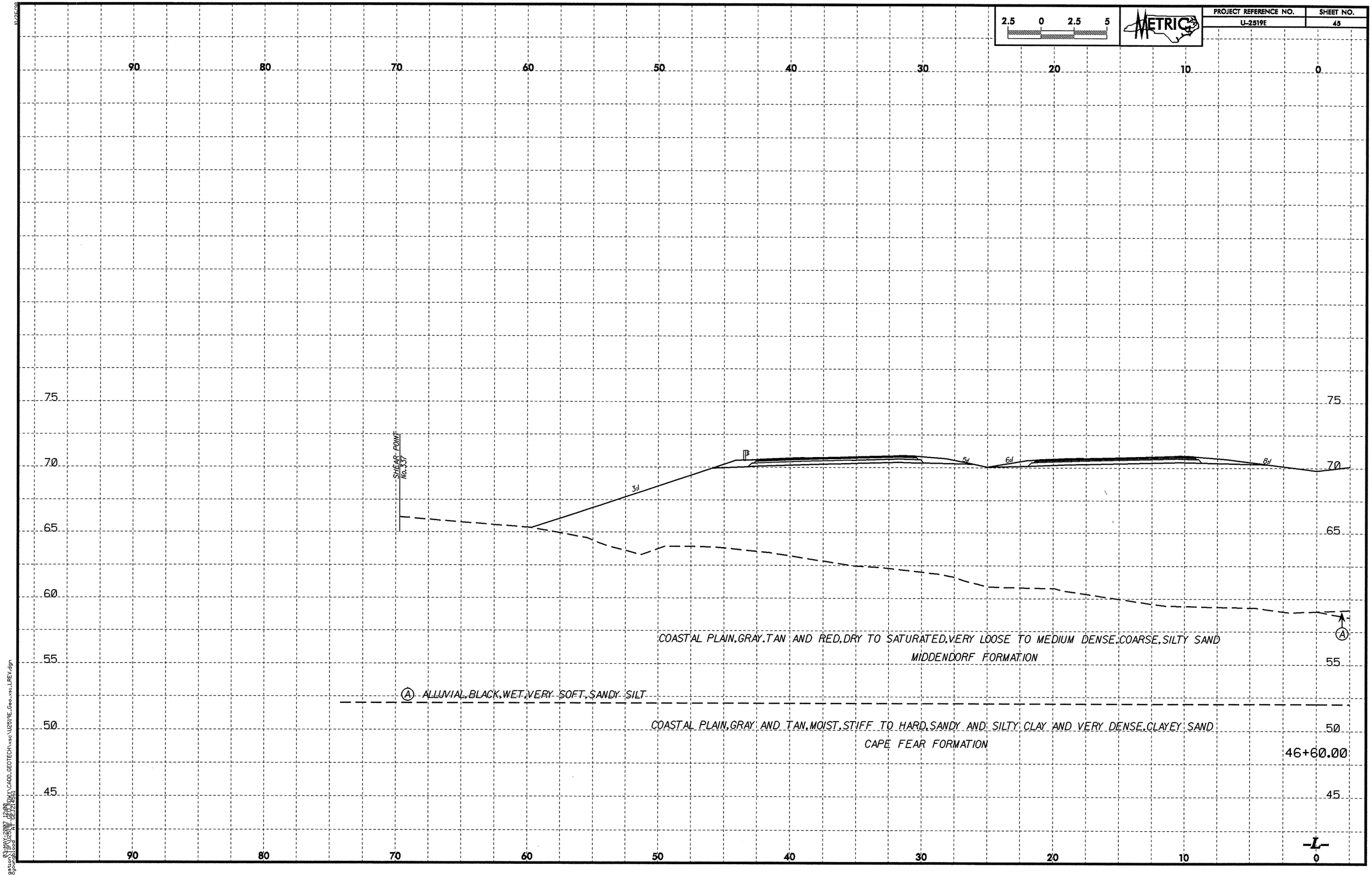
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
42
90 80 70 60 50 40 30 20 10 0
75 70 65 60 55 50 45 40 35
SHEAR POINT No. 331
3:1
4.5:1
6:1
8:1
7.3m BACK
3.0m AHEAD
ALLUVIAL, BLACK, WET, VERY SOFT, SANDY SILT
COASTAL PLAIN, GRAY, TAN AND RED, DRY TO SATURATED, LOOSE TO MEDIUM DENSE, COARSE SILTY SAND
MIDDENDORF FORMATION
COASTAL PLAIN, GRAY AND TAN, MOIST, STIFF TO HARD, SANDY AND SILTY CLAY AND VERY DENSE, CLAYEY SAND CAPE FEAR FORMATION
46+00.00
-L-



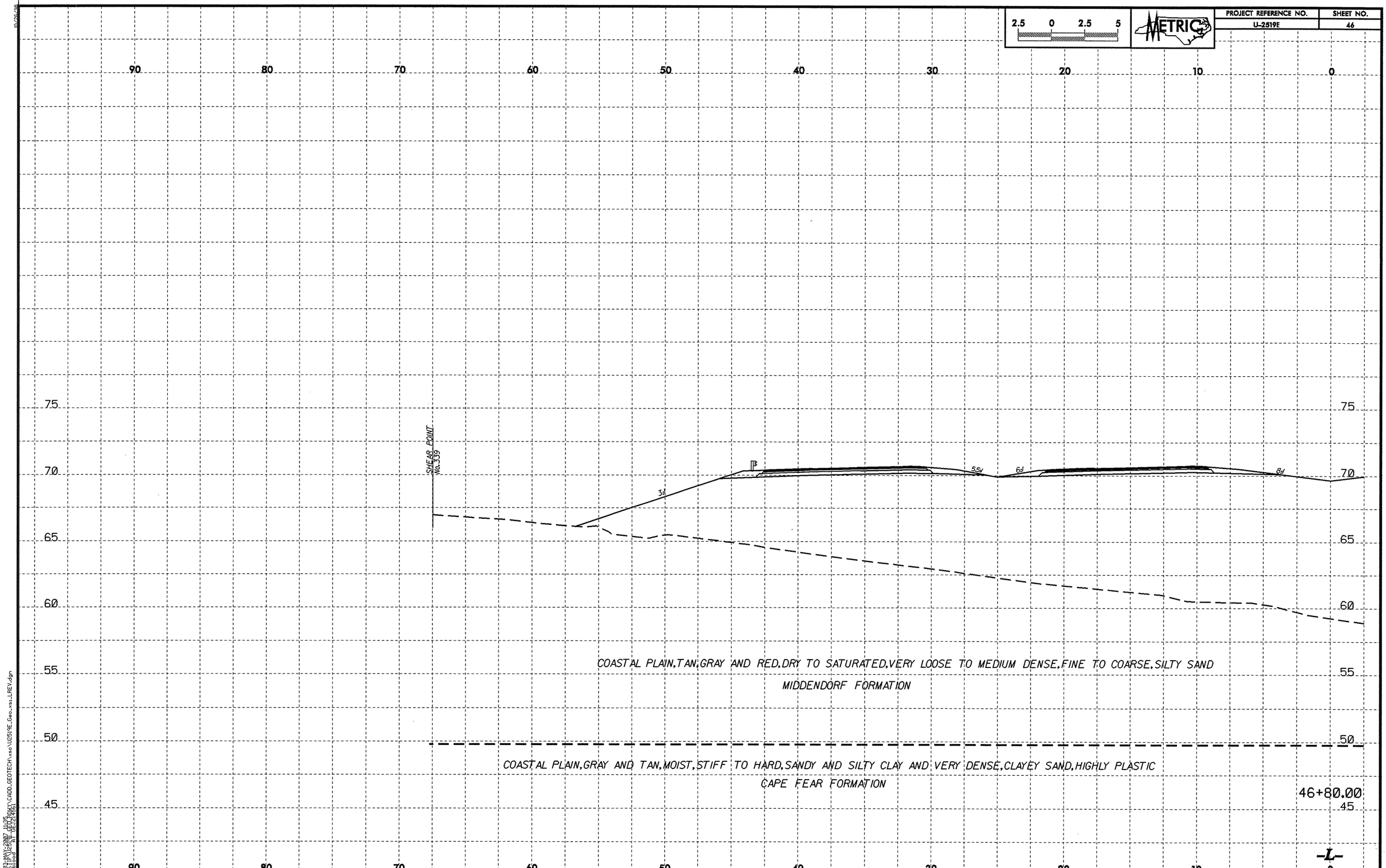
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
43
90 80 70 60 50 40 30 20 10 0
75 70 65 60 55 50 45
SHEAR POINT No.333
3:1
4.5:1
6:1
8:1
A
COASTAL PLAIN,GRAY,TAN AND RED,DRY TO SATURATED,LOOSE TO MEDIUM DENSE,COARSE SILTY SAND MIDDENDORF FORMATION
A ALLUVIAL,BLACK,WET,VERY SOFT,SANDY SILT
COASTAL PLAIN,GRAY AND TAN,MOIST,STIFF TO HARD,SANDY AND SILTY CLAY AND VERY DENSE,CLAYEY SAND CAPE FEAR FORMATION
46+20.00
-L-



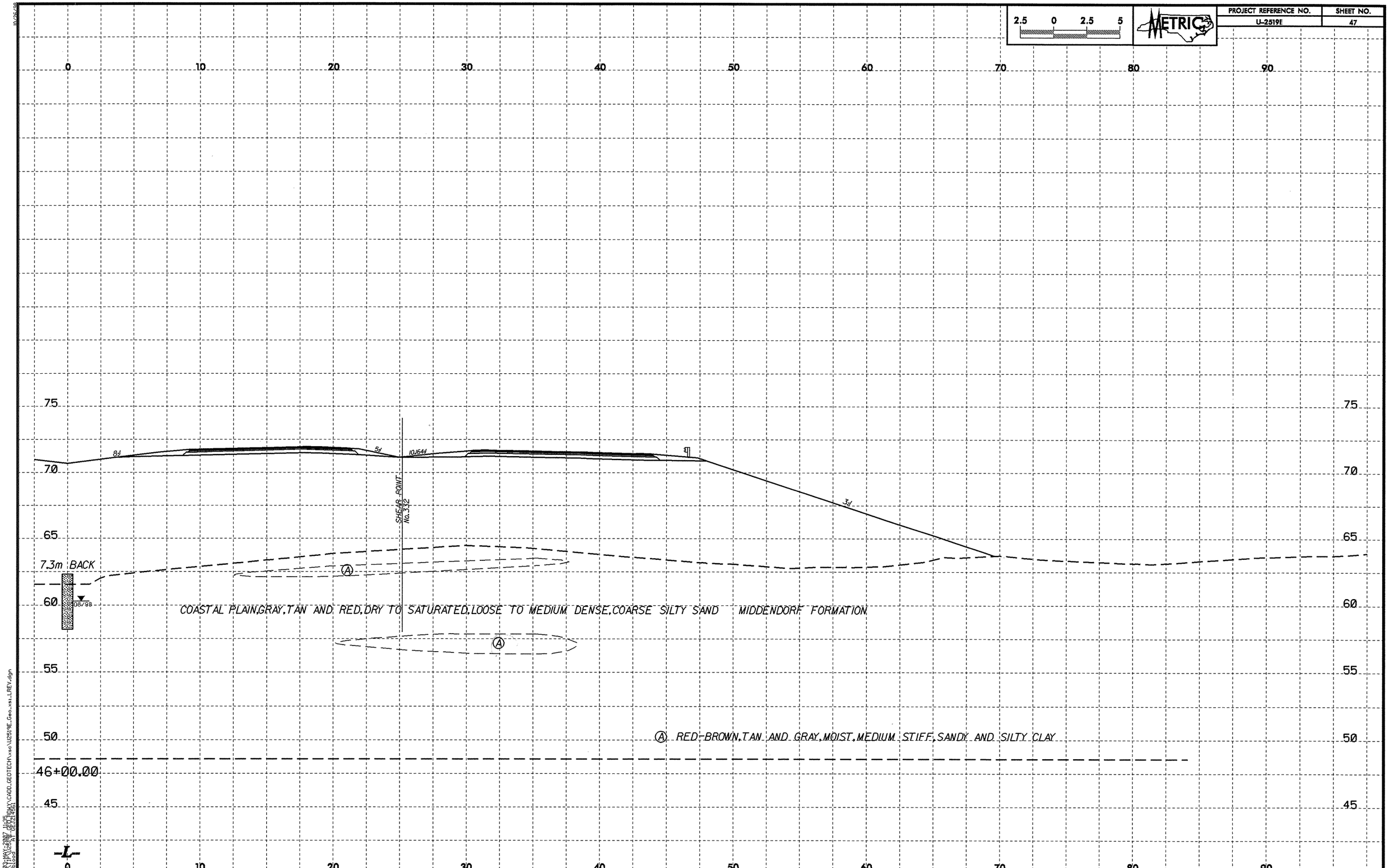
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
44
METRIC
2.5 0 2.5 5
90 80 70 60 50 40 30 20 10 0
75 70 65 60 55 50 45 40
SHEAR POINT No.335
3:1
4.7:1
6:1
8:1
4.8m AHEAD
ALLUVIAL,BLACK,WET,VERY SOFT,SANDY SILT
4.8m AHEAD
09/98
BIAD 09/98
COASTAL PLAIN,GRAY,TAN AND RED,DRY TO SATURATED,
VERY LOOSE TO MEDIUM DENSE COARSE SILTY SAND
MIDDENDORF FORMATION
2
16
3
3
14
31
52
28
19
18
17
22
100+
46+40.00
-L-



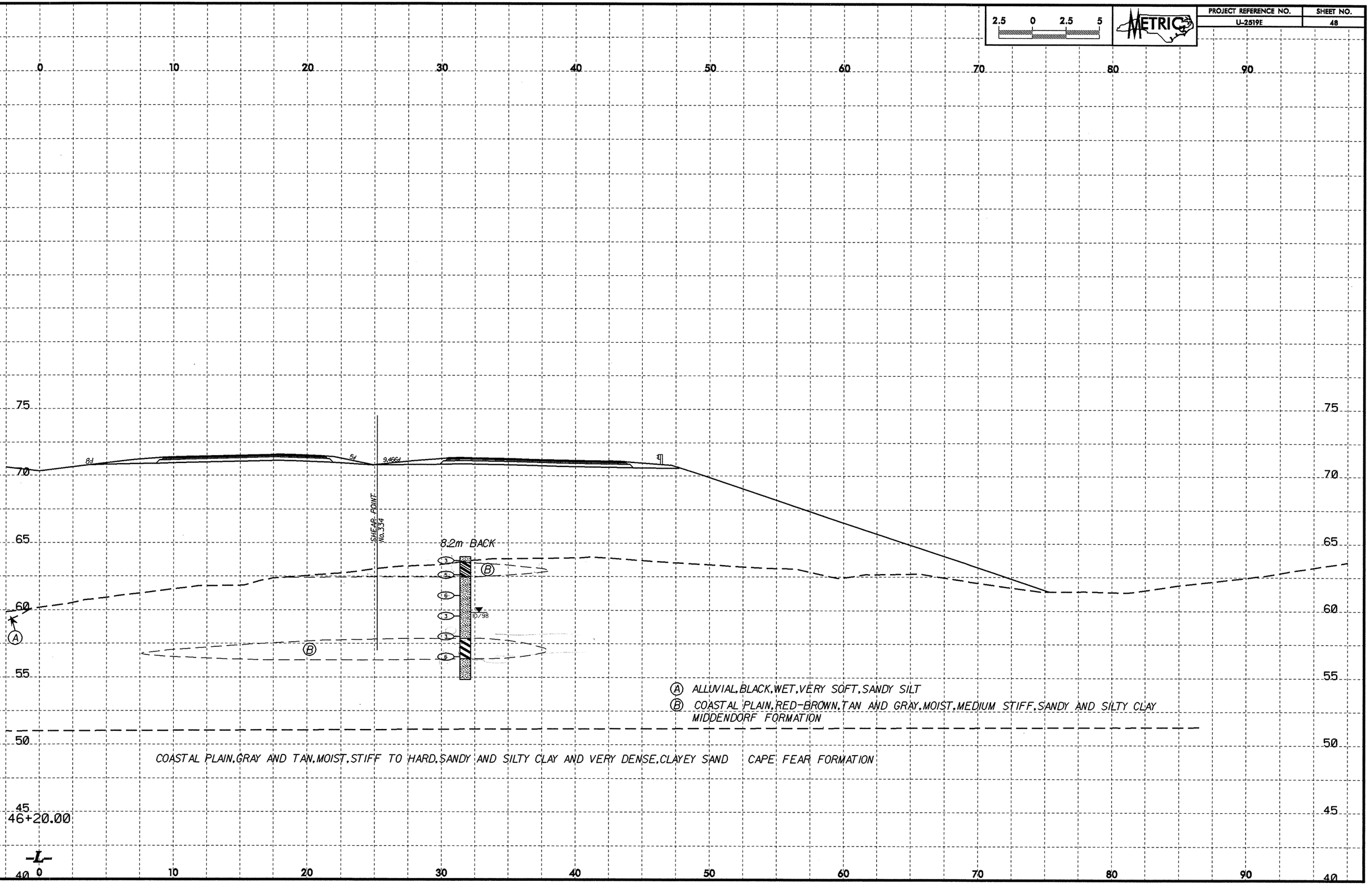
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
45
90 80 70 60 50 40 30 20 10 0
75
70
65
60
55
50
45
SHEAR POINT No.337
3:1
5:1
6:1
8:1
COASTAL PLAIN,GRAY,TAN AND RED,DRY TO SATURATED,VERY LOOSE TO MEDIUM DENSE,COARSE,SILTY SAND
MIDDENDORF FORMATION
A ALLUVIAL,BLACK,WET,VERY SOFT,SANDY SILT
COASTAL PLAIN,GRAY AND TAN,MOIST,STIFF TO HARD,SANDY AND SILTY CLAY AND VERY DENSE,CLAYEY SAND
CAPE FEAR FORMATION
46+60.00
-L-



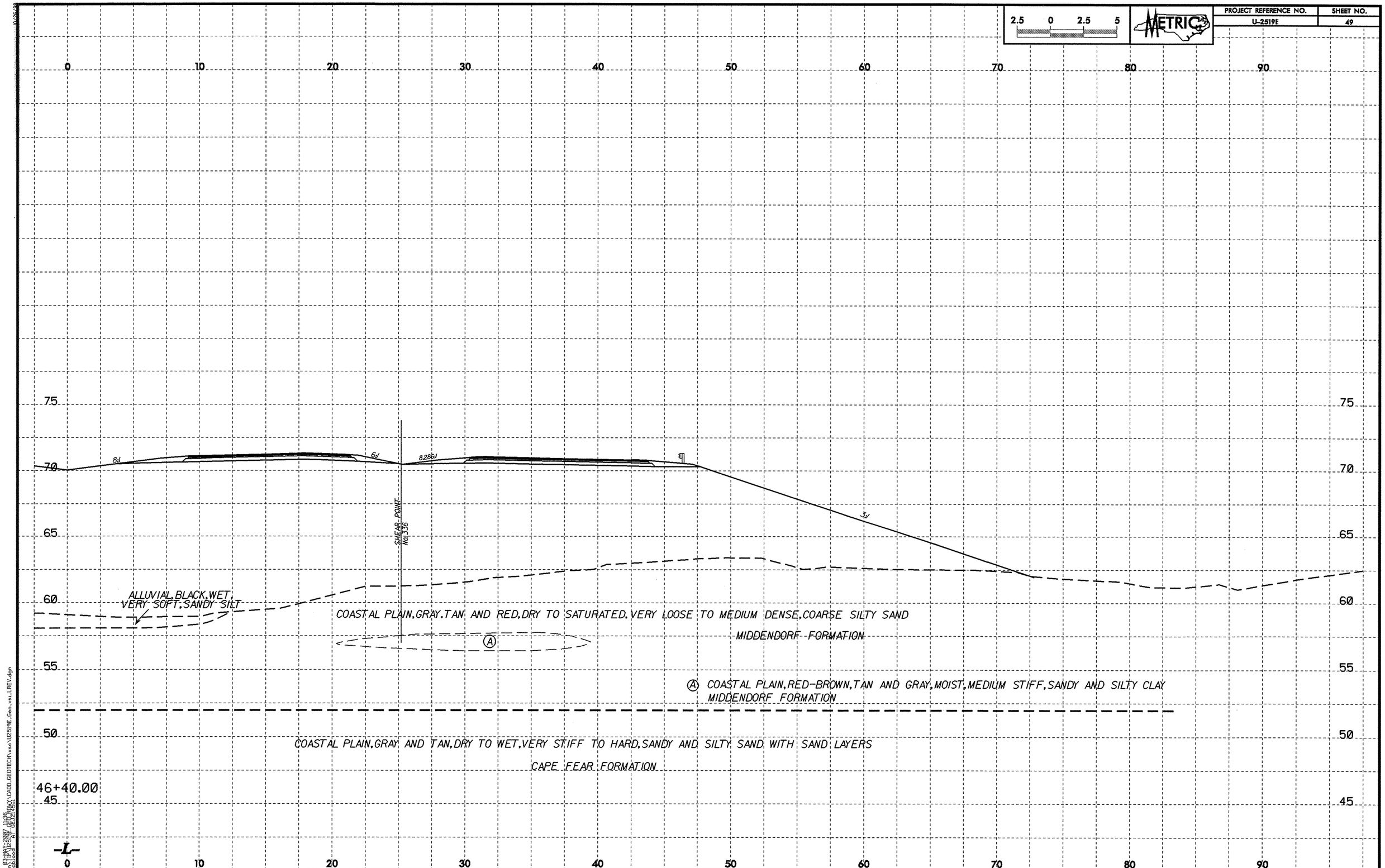
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
46
90 80 70 60 50 40 30 20 10 0
75
70
65
60
55
50
45
SHEAR POINT No.339
3:1
5.5:1
6:1
8:1
COASTAL PLAIN,TAN,GRAY AND RED,DRY TO SATURATED,VERY LOOSE TO MEDIUM DENSE,FINE TO COARSE,SILTY SAND
MIDDENDORF FORMATION
COASTAL PLAIN,GRAY AND TAN,MOIST,STIFF TO HARD,SANDY AND SILTY CLAY AND VERY DENSE,CLAYEY SAND,HIGHLY PLASTIC
CAPE FEAR FORMATION
46+80.00
-L-



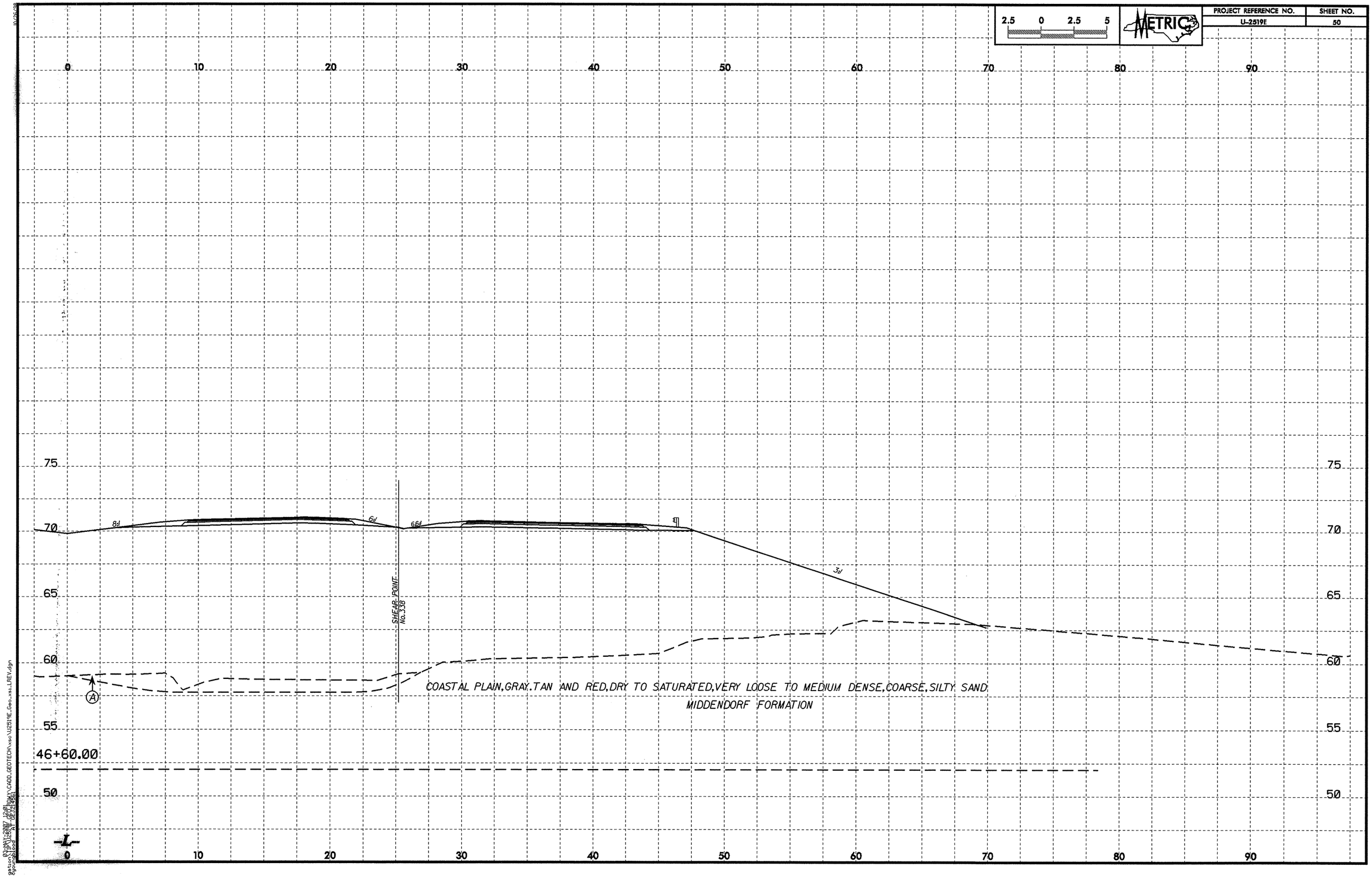
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
47
0 10 20 30 40 50 60 70 80 90
75
70
65
60
55
50
45
8:1
5:1
10/64:1
3:1
SHEAR POINT No.332
7.3m BACK
08/98
COASTAL PLAIN,GRAY,TAN AND RED,DRY TO SATURATED,LOOSE TO MEDIUM DENSE,COARSE SILTY SAND MIDDENDORF FORMATION
Ⓐ RED-BROWN,TAN AND GRAY,MOIST,MEDIUM STIFF,SANDY AND SILTY CLAY
46+00.00
-L-



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
48
0 10 20 30 40 50 60 70 80 90
75
70
65
60
55
50
45
40
8:1
5:1
9.466:1
SHEAR POINT No.334
8.2m BACK
10/98
A
B
Ⓐ ALLUVIAL, BLACK, WET, VERY SOFT, SANDY SILT
Ⓑ COASTAL PLAIN, RED-BROWN, TAN AND GRAY, MOIST, MEDIUM STIFF, SANDY AND SILTY CLAY MIDDENDORF FORMATION
COASTAL PLAIN, GRAY AND TAN, MOIST, STIFF TO HARD, SANDY AND SILTY CLAY AND VERY DENSE, CLAYEY SAND CAPE FEAR FORMATION
46+20.00
-L-



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
49
0 10 20 30 40 50 60 70 80 90
75
70
65
60
55
50
45
8:1
6:1
8.286:1
3:1
SHEAR POINT No. 336
ALLUVIAL, BLACK, WET, VERY SOFT, SANDY SILT
COASTAL PLAIN, GRAY, TAN AND RED, DRY TO SATURATED, VERY LOOSE TO MEDIUM DENSE, COARSE SILTY SAND
MIDDENDORF FORMATION
A
A COASTAL PLAIN, RED-BROWN, TAN AND GRAY, MOIST, MEDIUM STIFF, SANDY AND SILTY CLAY
MIDDENDORF FORMATION
COASTAL PLAIN, GRAY AND TAN, DRY TO WET, VERY STIFF TO HARD, SANDY AND SILTY SAND WITH SAND LAYERS
CAPE FEAR FORMATION
46+40.00
-L-



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
50
0 10 20 30 40 50 60 70 80 90
75
70
65
60
55
50
8:1
6:1
6:6:1
3:1
SHEAR POINT No.338
A
COASTAL PLAIN,GRAY.TAN AND RED,DRY TO SATURATED,VERY LOOSE TO MEDIUM DENSE,COARSE,SILTY SAND
MIDDENDORF FORMATION
46+60.00
-L-

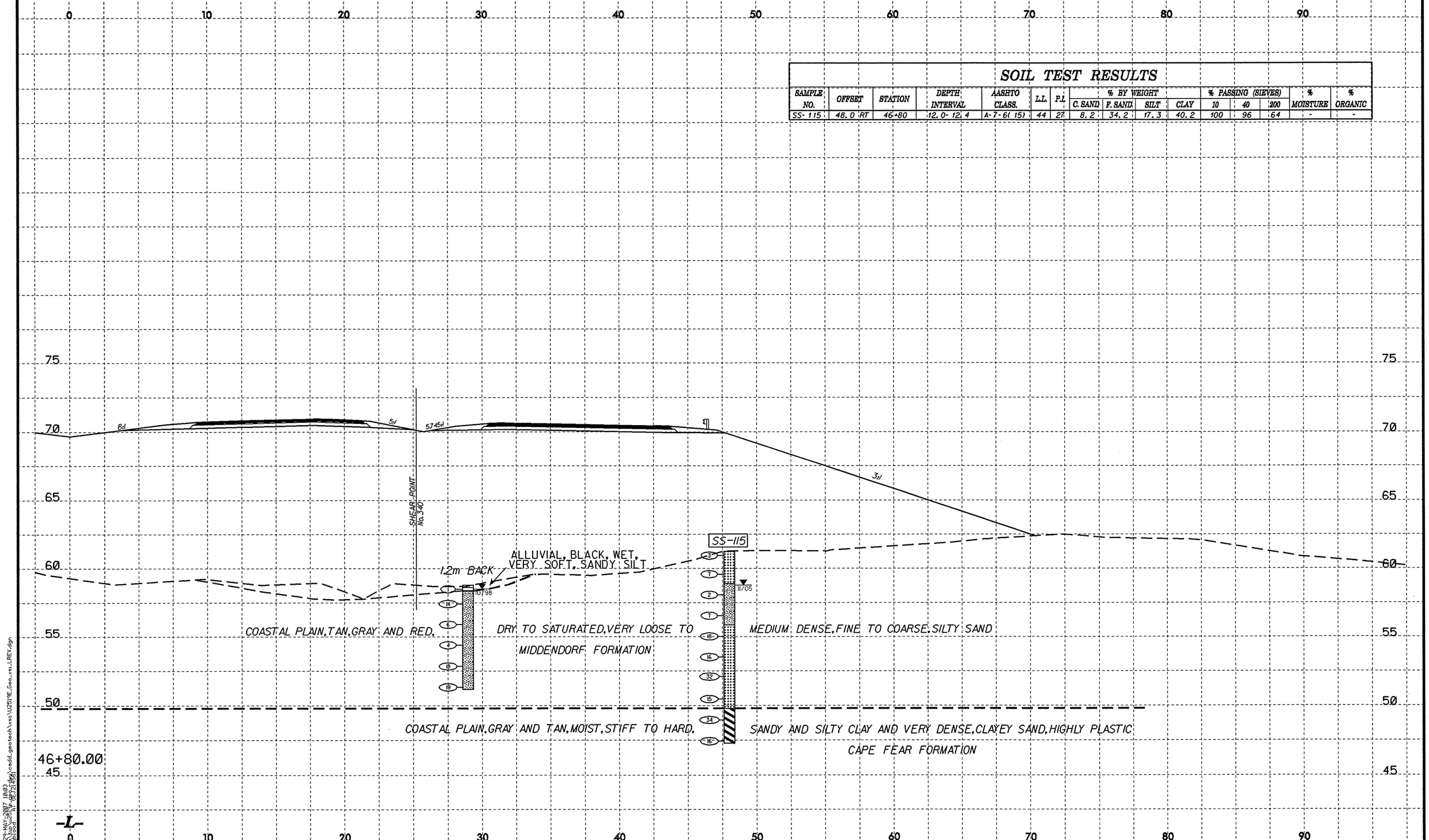
PROJECT REFERENCE NO.	SHEET NO.
U-2519E	51

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-115	48.0 RT	46+80	12.0-12.4	A-7-6(15)	44	27	8.2	34.2	17.3	40.2	100	96	64	-	-



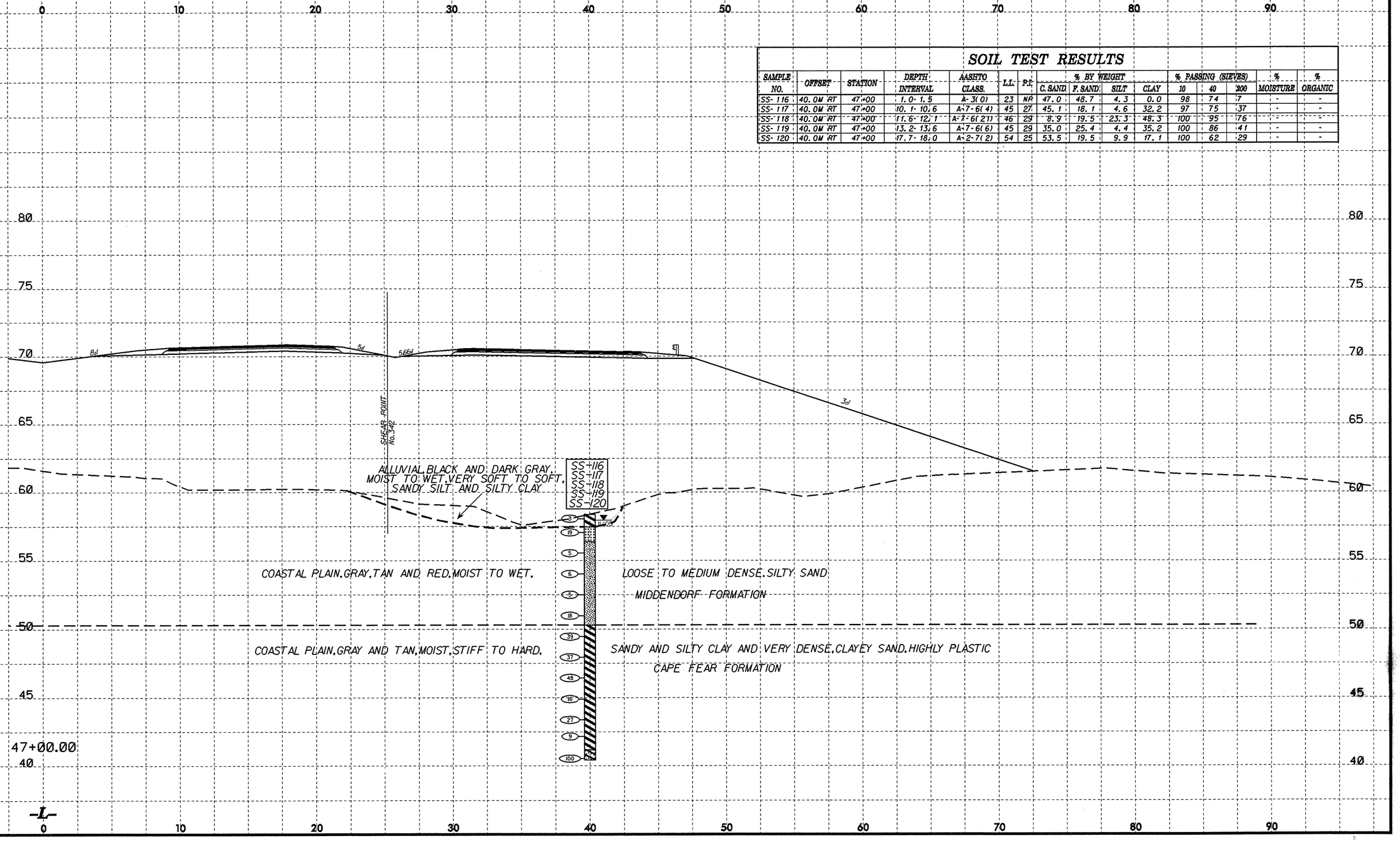
PROJECT REFERENCE NO.	SHEET NO.
U-2519E	52

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-116	40.0M RT	47+00	1.0-1.5	A-3(0)	23	NP	47.0	48.7	4.3	0.0	98	74	7	-	-
SS-117	40.0M RT	47+00	10.1-10.6	A-7-6(4)	45	27	45.1	18.1	4.6	32.2	97	75	37	-	-
SS-118	40.0M RT	47+00	11.6-12.1	A-7-6(21)	46	29	8.9	19.5	23.3	48.3	100	95	76	-	-
SS-119	40.0M RT	47+00	13.2-13.6	A-7-6(6)	45	29	35.0	25.4	4.4	35.2	100	86	41	-	-
SS-120	40.0M RT	47+00	17.7-18.0	A-2-7(2)	54	25	53.5	19.5	9.9	17.1	100	62	29	-	-



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10/26/98

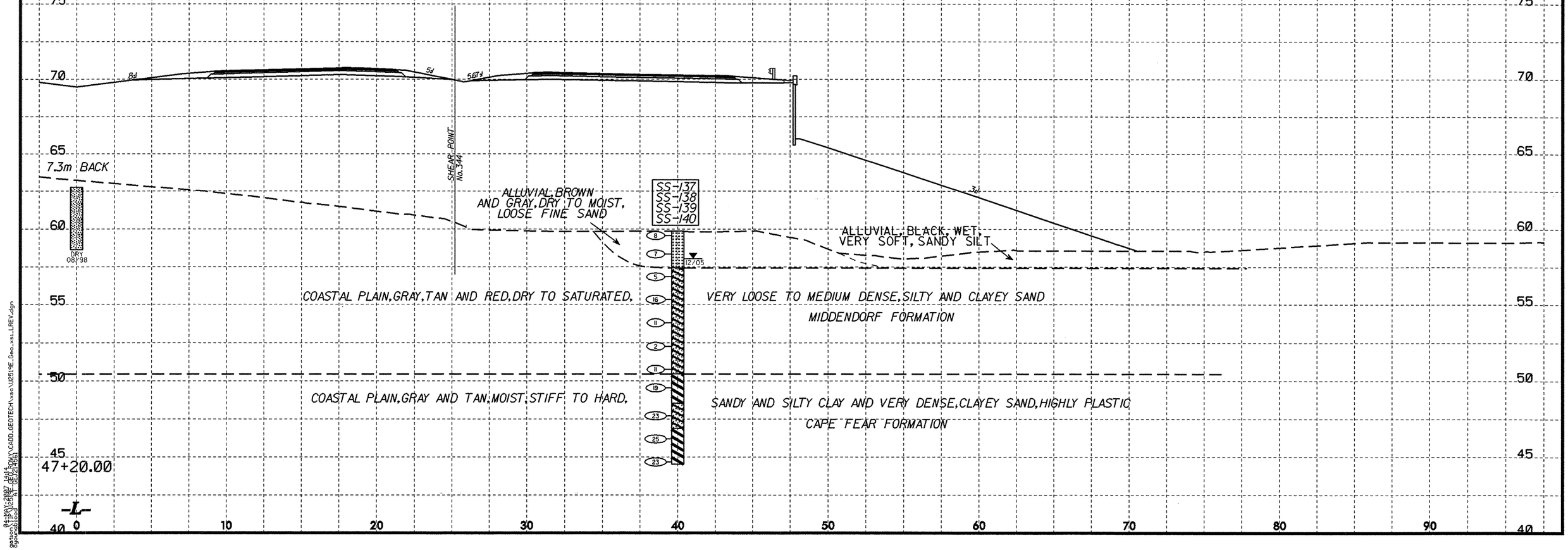
2.5 0 2.5 5

METRIC

PROJECT REFERENCE NO.	SHEET NO.
U-2519E	53

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-137	40M RT	47+20	0.0-0.5	A-3(0)	17	NP	37.7	54.9	0.4	7.0	95	77	10	-	-
SS-138	40M RT	47+20	10.3-10.8	A-7-6(24)	51	32	11.7	14.9	5.0	68.4	100	94	77	-	-
SS-139	40M RT	47+20	11.9-12.3	A-2-6(2)	38	20	50.6	17.4	0.9	31.1	100	63	34	-	-
SS-140	40M RT	47+20	13.4-13.8	A-7-6(23)	49	32	12.4	16.5	8.8	62.2	100	94	75	-	-



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gjones

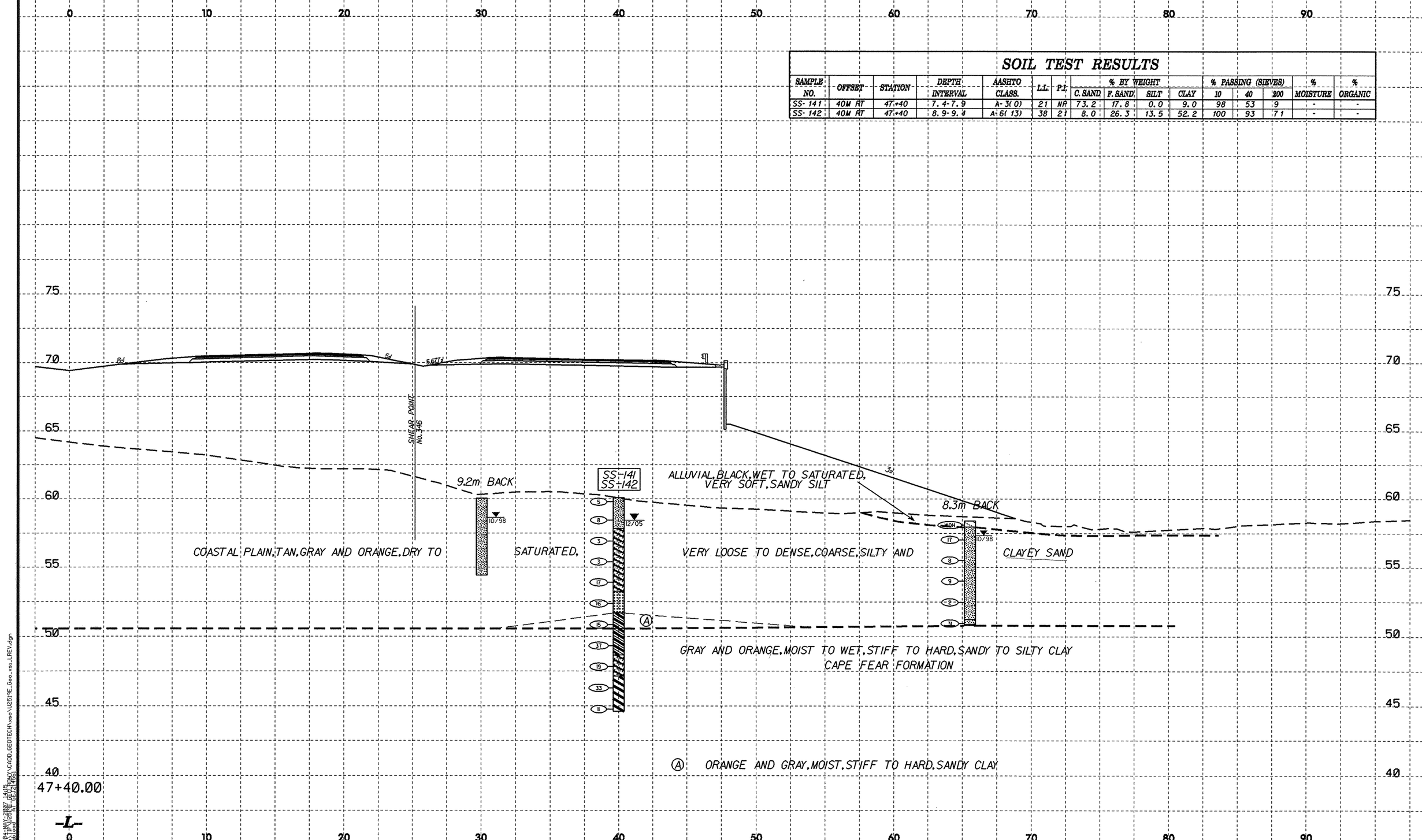
PROJECT REFERENCE NO.	SHEET NO.
U-2519E	54

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-141	40M RT	47+40	7.4-7.9	A-3(0)	21	NP	73.2	17.8	0.0	9.0	98	53	9	-	-
SS-142	40M RT	47+40	8.9-9.4	A-6(13)	38	21	8.0	26.3	13.5	52.2	100	93	71	-	-



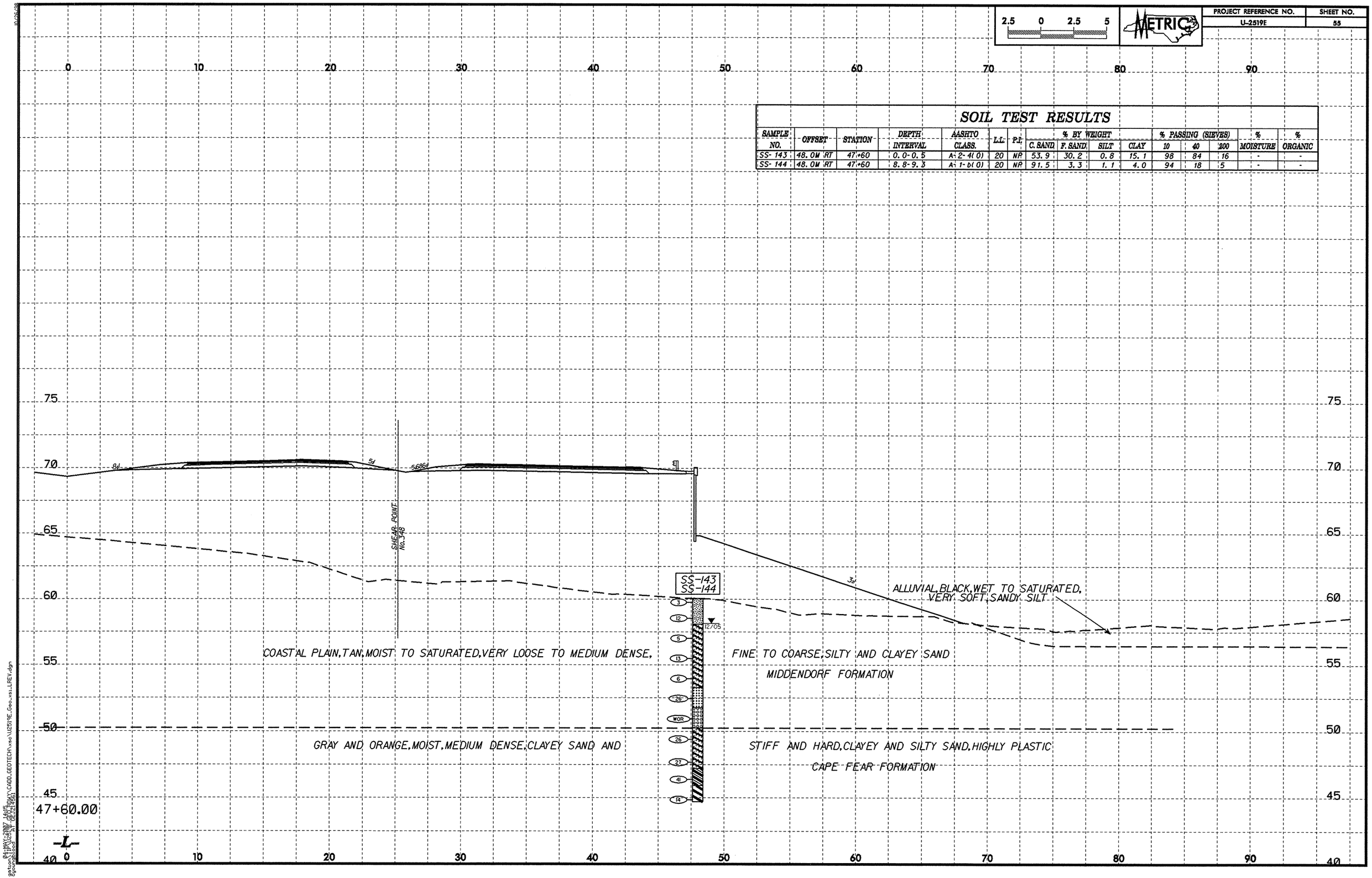
PROJECT REFERENCE NO.	SHEET NO.
U-2519E	55

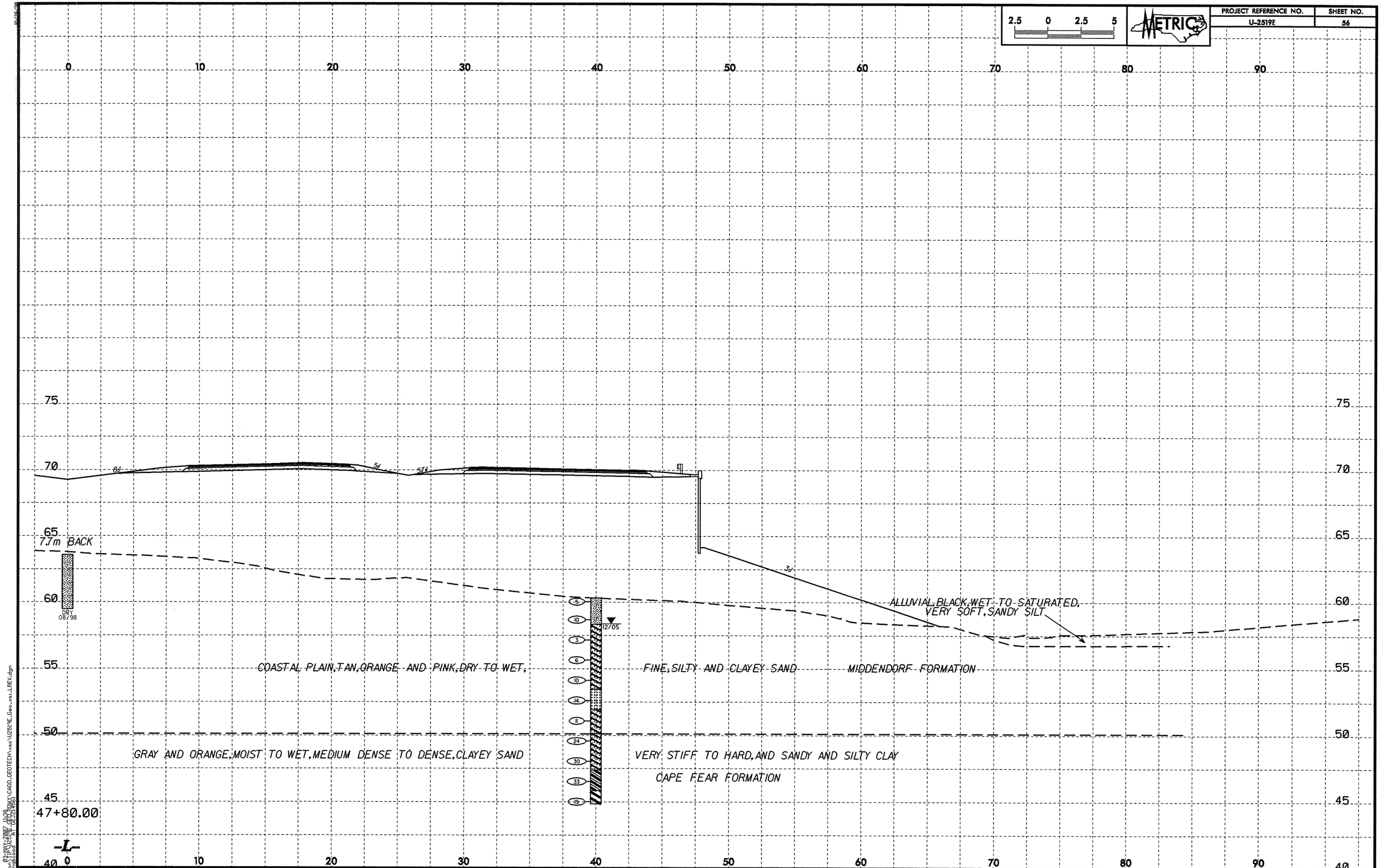
METRIC

2.5 0 2.5 5

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-143	48.0M RT	47+60	0.0-0.5	A-2-4(0)	20	NP	53.9	30.2	0.8	15.1	98	84	16	-	-
SS-144	48.0M RT	47+60	8.8-9.3	A-1-b(0)	20	NP	91.5	3.3	1.1	4.0	94	18	5	-	-





2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
56
0 10 20 30 40 50 60 70 80 90
75
70
65
60
55
50
45
40
7.7m BACK
DRY
08/98
12/05
ALLUVIAL, BLACK, WET TO SATURATED, VERY SOFT, SANDY SILT
COASTAL PLAIN, TAN, ORANGE AND PINK, DRY TO WET, FINE, SILTY AND CLAYEY SAND
MIDDENDORF FORMATION
GRAY AND ORANGE, MOIST TO WET, MEDIUM DENSE TO DENSE, CLAYEY SAND
VERY STIFF TO HARD, AND SANDY AND SILTY CLAY
CAPE FEAR FORMATION
47+80.00
-L-

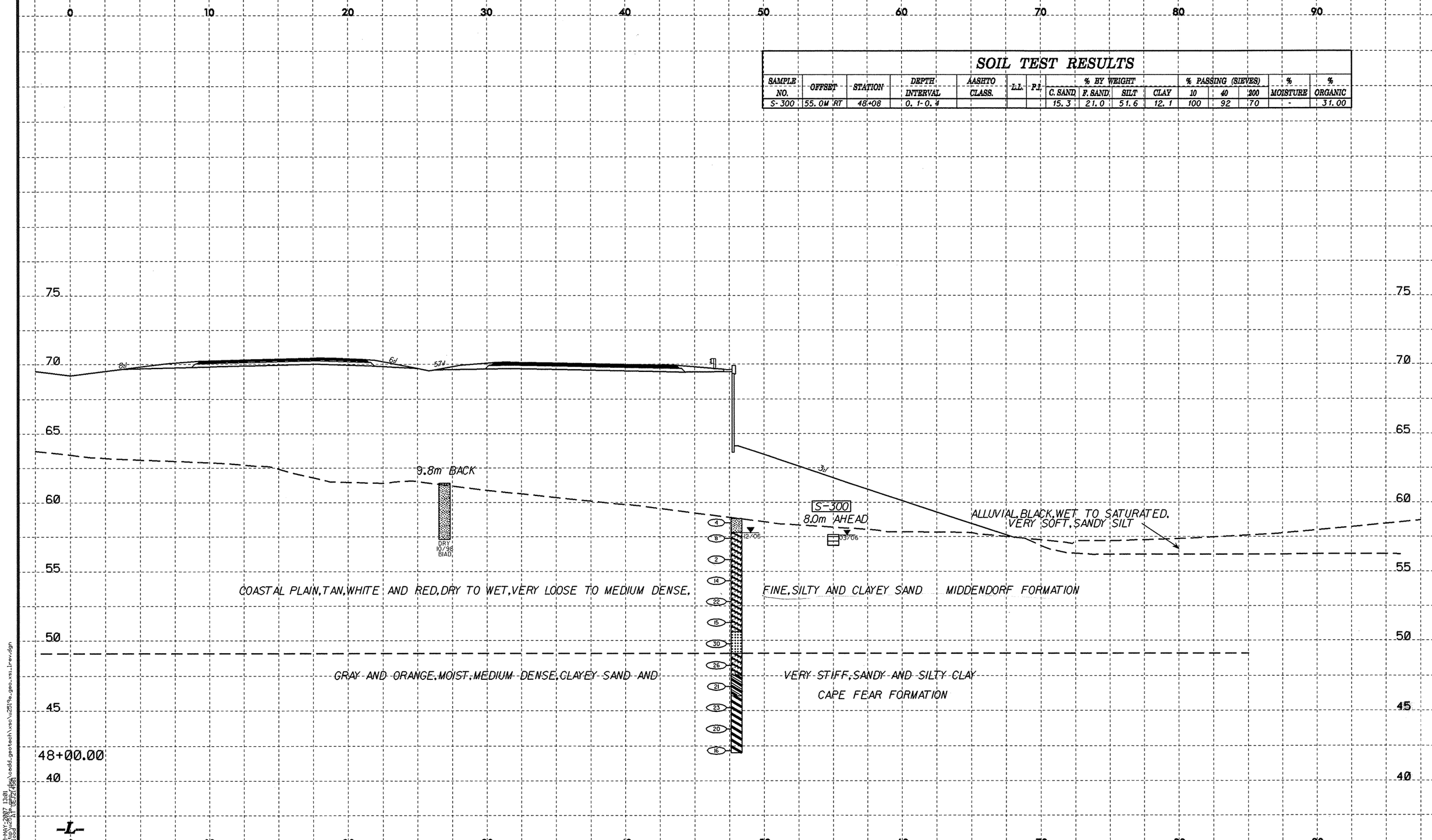
PROJECT REFERENCE NO.	SHEET NO.
U-2519E	57

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
S-300	55.0M RT	48+08	0.1-0.4				15.3	21.0	51.6	12.1	100	92	70	-	31.00



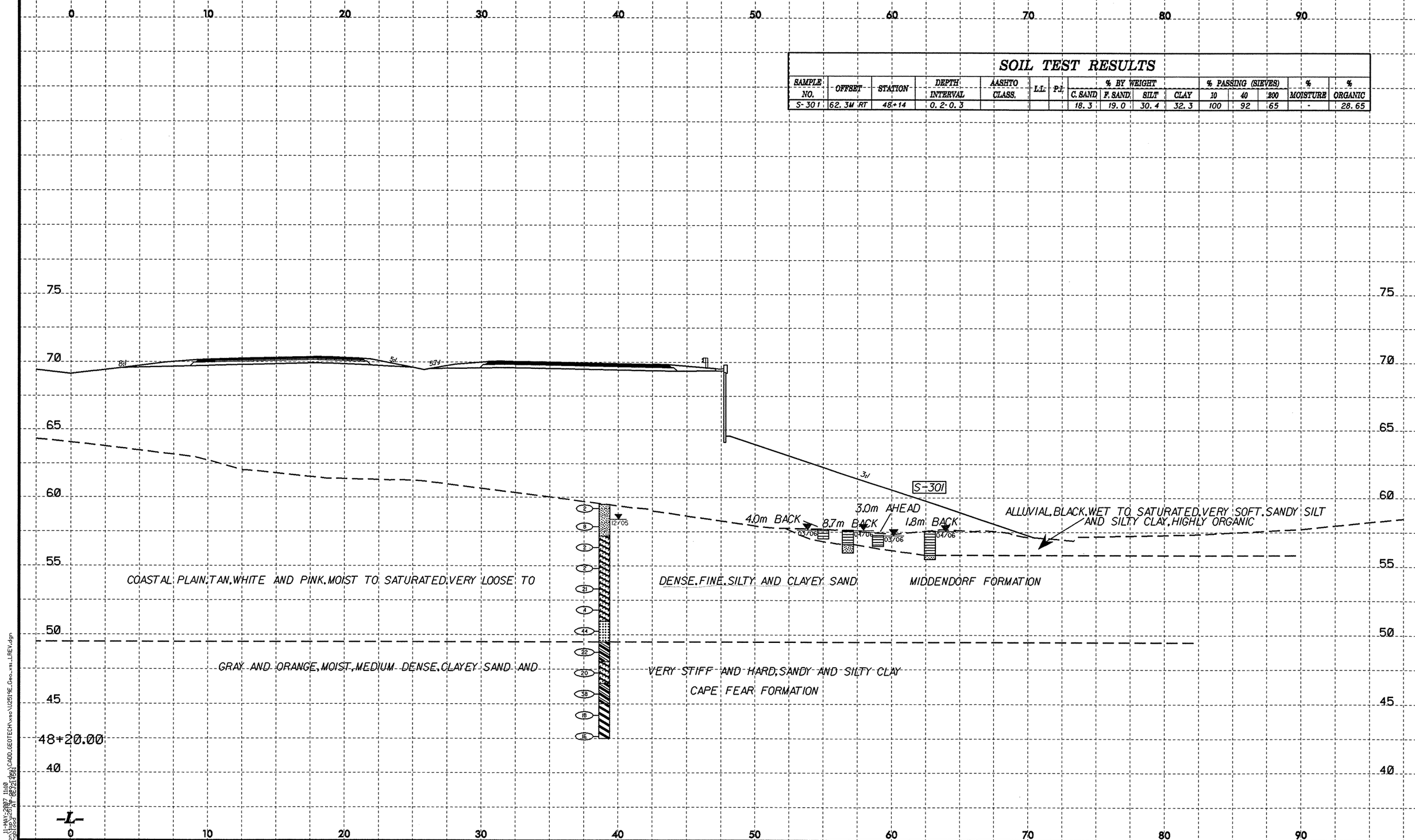
PROJECT REFERENCE NO.	SHEET NO.
U-2519E	58

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
S-301	62.3M RT	48+14	0.2-0.3				18.3	19.0	30.4	32.3	100	92	65	-	28.65



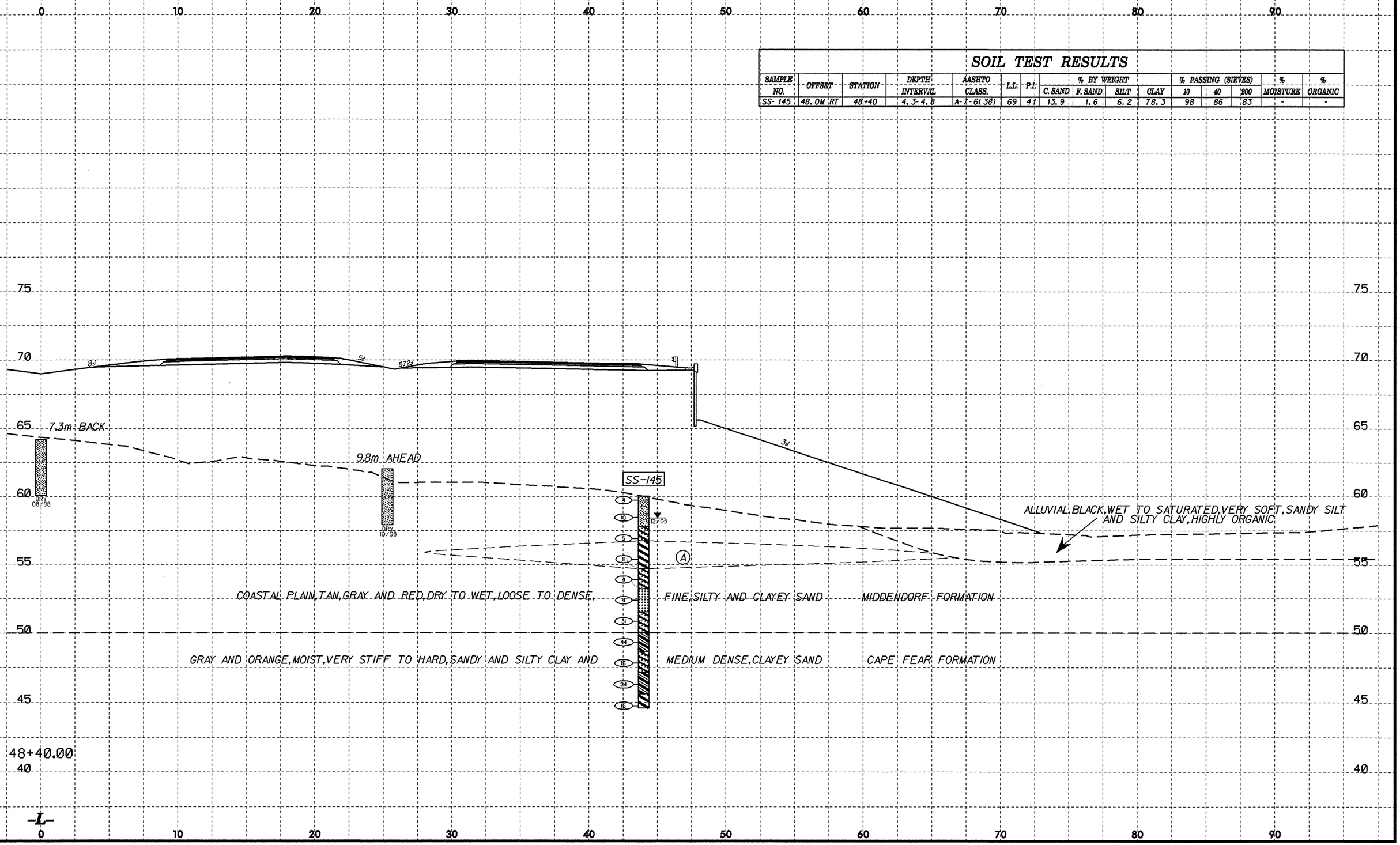
PROJECT REFERENCE NO.	SHEET NO.
U-2519E	59

2.5 0 2.5 5

METRIC

SOIL TEST RESULTS

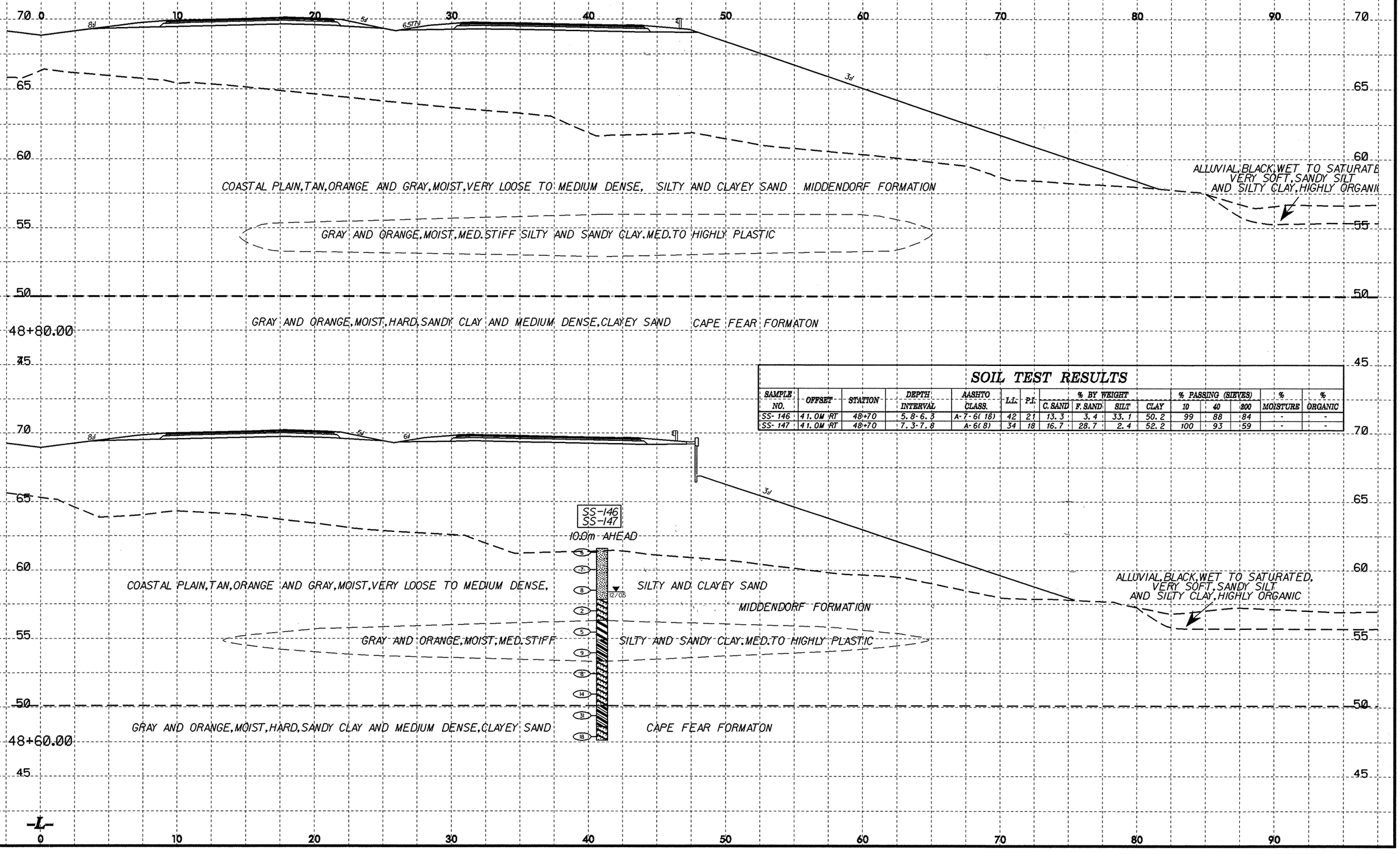
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-145	48.0M RT	48+40	4.3-4.8	A-7-6(38)	69	41	13.9	1.6	6.2	78.3	98	86	83	-	-



PROJECT REFERENCE NO.	SHEET NO.
U-2519E	60

2.5 0 2.5 5

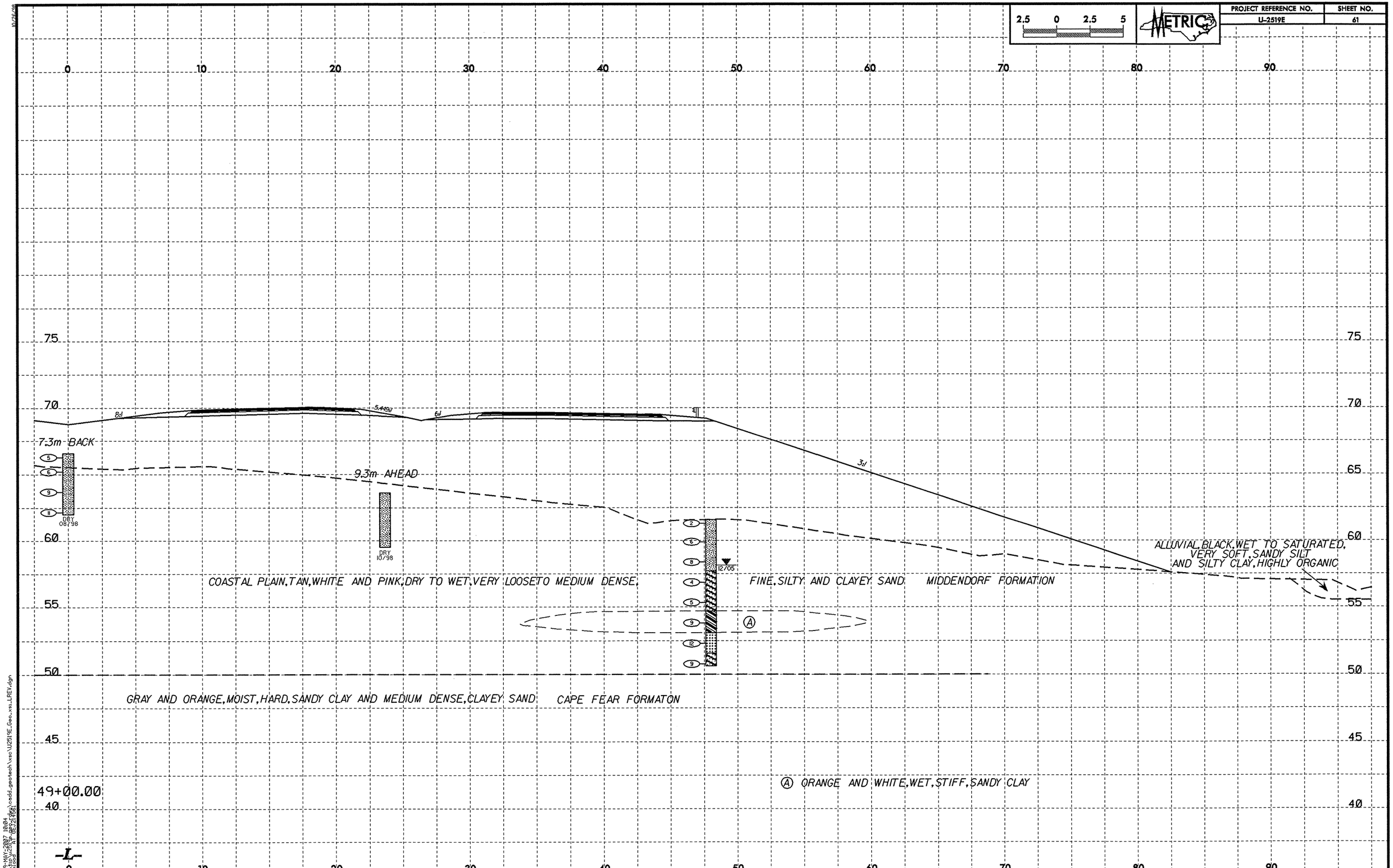
METRIC



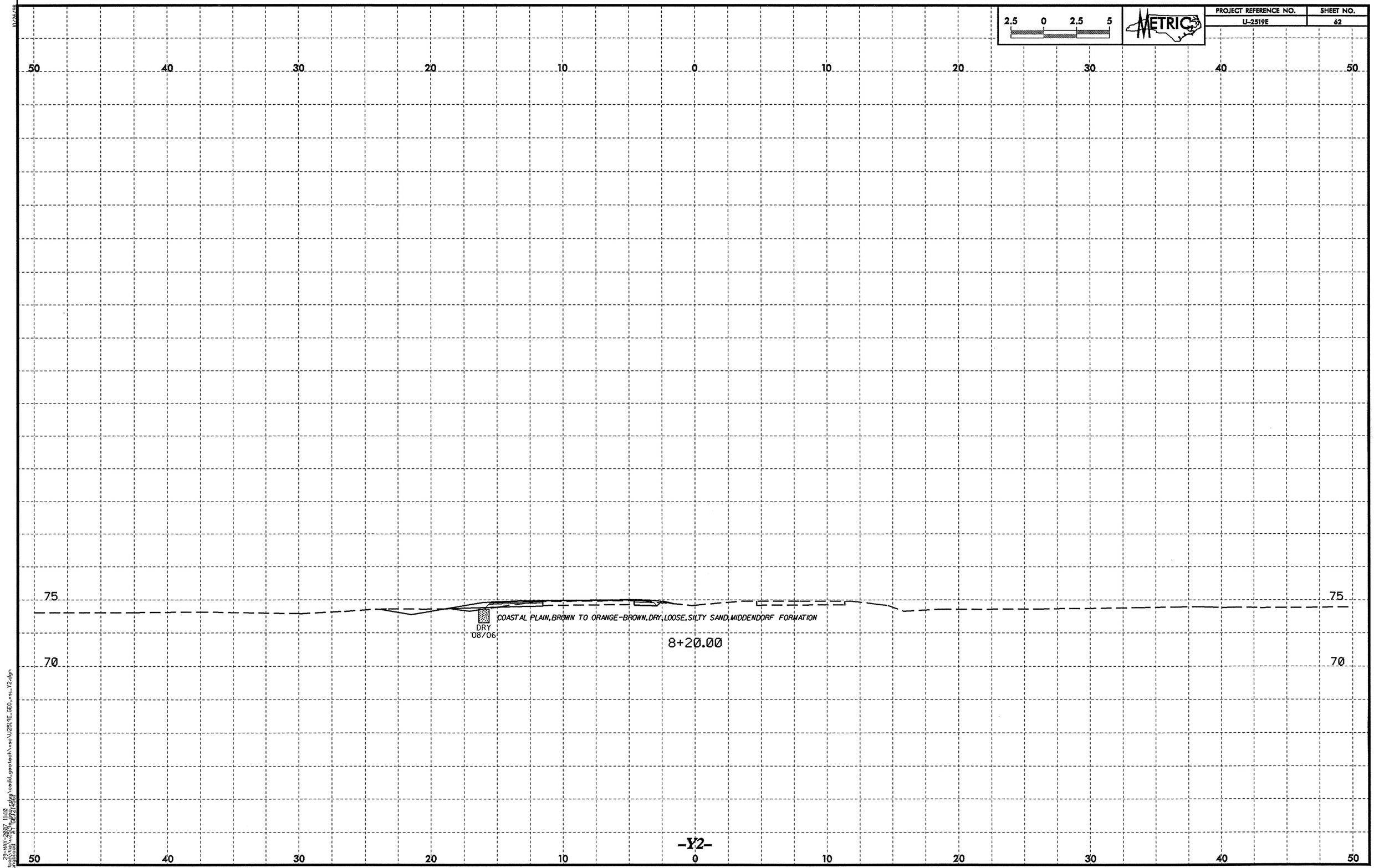
SOIL TEST RESULTS

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-146	41.0M RT	48+70	5.8-6.3	A-7-6(18)	42	21	13.3	3.4	33.1	50.2	99	88	84	-	-
SS-147	41.0M RT	48+70	7.3-7.8	A-6(8)	34	18	16.7	28.7	2.4	52.2	100	93	59	-	-

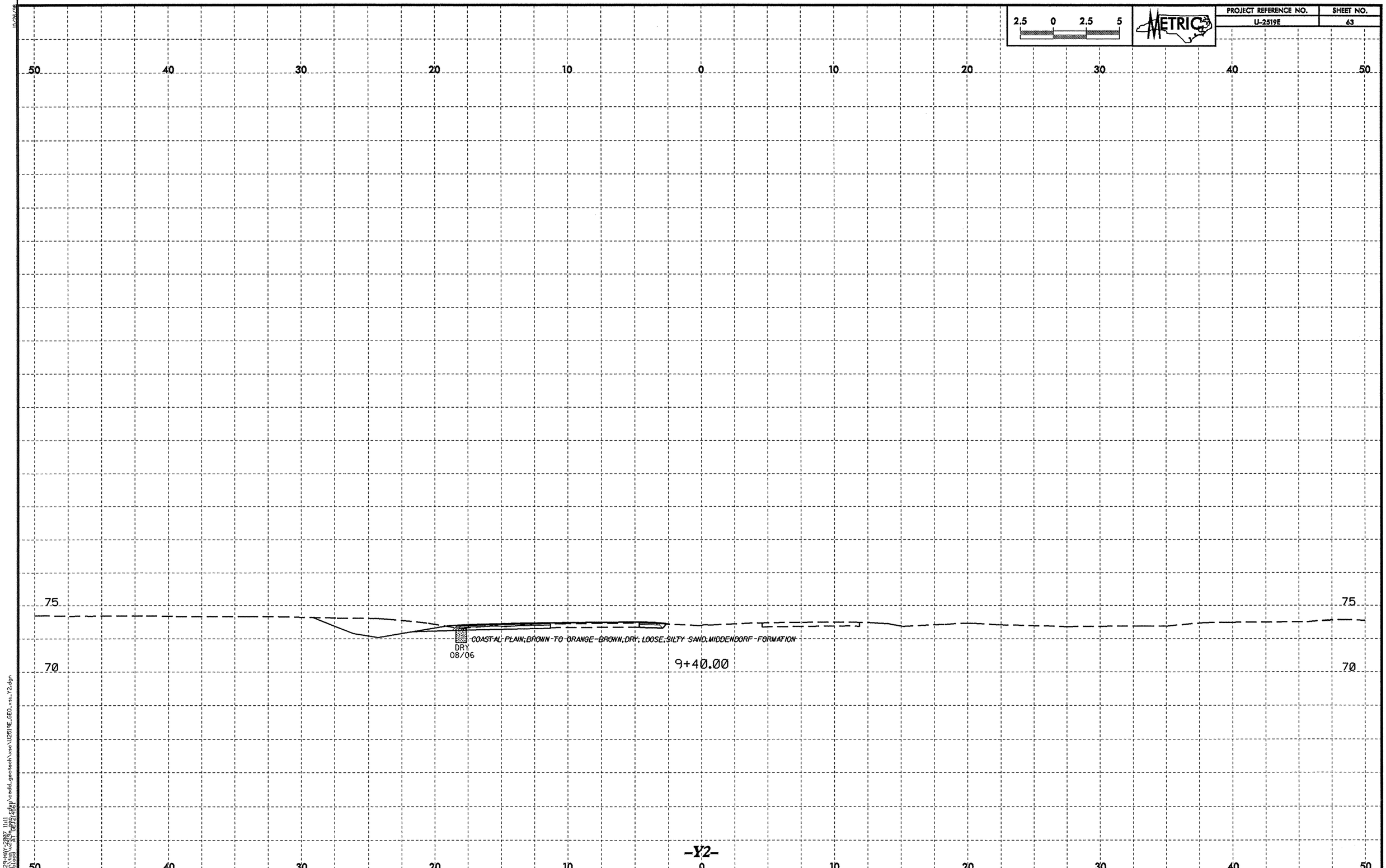
10/26/98
gatson 04:19:51 2007 (406)
gpowell loc:(DEV21456)
C:\PROJ\DOT\CADD.GEOTECH\xsc\U2519E_Geo_xs1_LREV.dgn



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
61
0 10 20 30 40 50 60 70 80 90
75
70
65
60
55
50
45
40
8:1
5.449:1
6:1
3:1
7.3m BACK
9.3m AHEAD
DRY 08/98
DRY 10/98
12/05
ALLUVIAL, BLACK, WET TO SATURATED, VERY SOFT, SANDY SILT AND SILTY CLAY, HIGHLY ORGANIC
COASTAL PLAIN, TAN, WHITE AND PINK, DRY TO WET, VERY LOOSE TO MEDIUM DENSE, FINE, SILTY AND CLAYEY SAND MIDDENDORF FORMATION
GRAY AND ORANGE, MOIST, HARD, SANDY CLAY AND MEDIUM DENSE, CLAYEY SAND CAPE FEAR FORMATON
Ⓐ ORANGE AND WHITE, WET, STIFF, SANDY CLAY
49+00.00
-L-

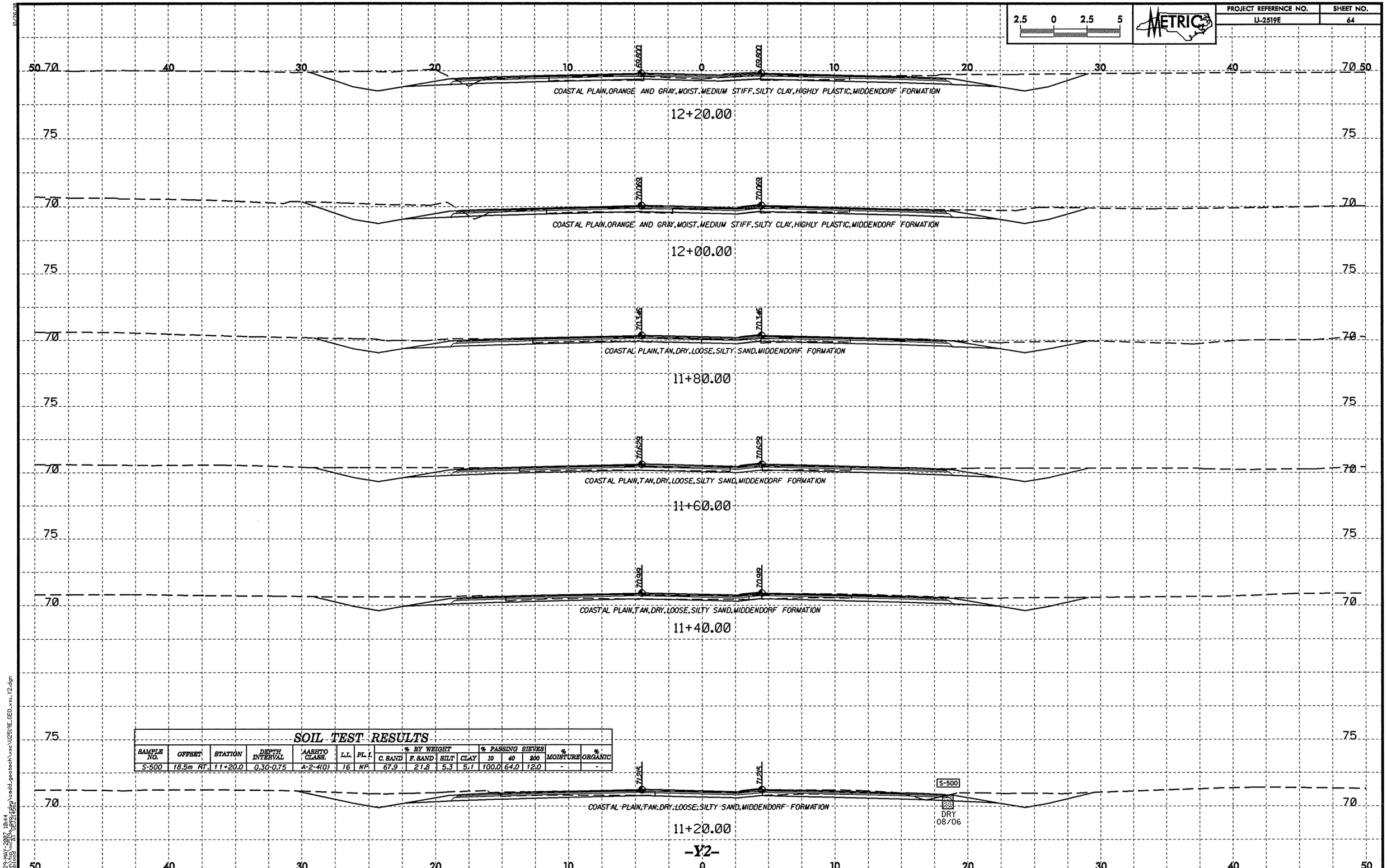


2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
62
50 40 30 20 10 0 10 20 30 40 50
75
70
COASTAL PLAIN, BROWN TO ORANGE-BROWN, DRY, LOOSE, SILTY SAND, MIDDENDORF FORMATION
DRY
08/06
8+20.00
-Y2-



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
63
50 40 30 20 10 0 10 20 30 40 50
75
70
COASTAL PLAIN, BROWN TO ORANGE-BROWN, DRY, LOOSE, SILTY SAND, MIDDENDORF FORMATION
DRY
08/06
9+40.00
-Y2-

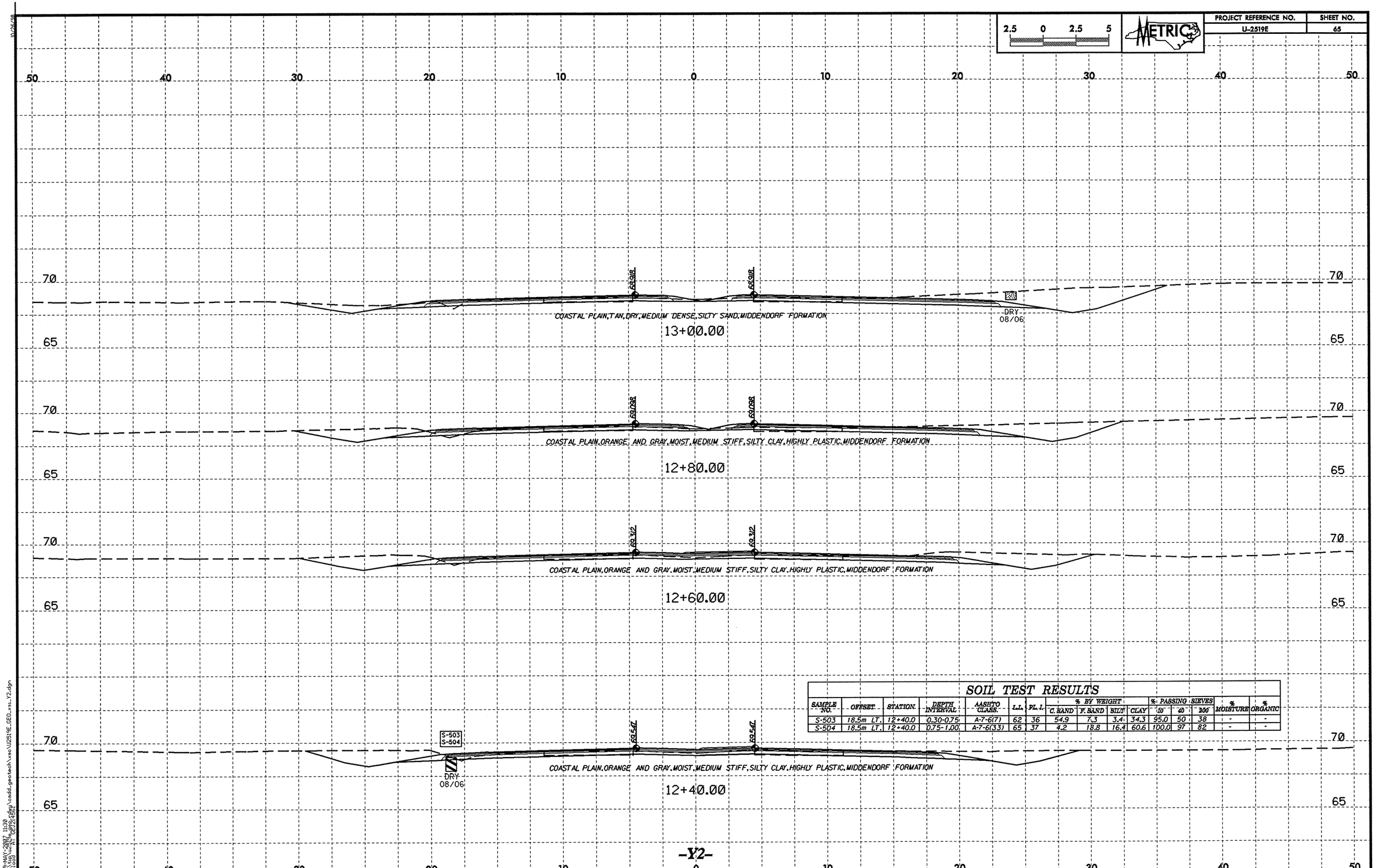
PROJECT REFERENCE NO.	SHEET NO.
U-2519E	64



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-500	18.5m RT.	11+20.0	0.30-0.75	A-2-4(0)	16	NP	67.9	21.8	5.3	5.1	100.0	64.0	12.0	-	-

29-MAY-2007 10:44
tigation\tip\u2519e_geo_rdwy\cadd_geotech\xsc\U2519E_GEO_xsi_Y2.dgn
cgoungblood AT GEO2(4561



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-503	18.5m LT.	12+40.0	0.30-0.75	A-7-6(7)	62	36	54.9	7.3	3.4	34.3	95.0	50	38	-	-
S-504	18.5m LT.	12+40.0	0.75-1.00	A-7-6(33)	65	37	4.2	18.8	16.4	60.6	100.0	97	82	-	-

PROJECT REFERENCE NO.	SHEET NO.
U-2519E	66

2.5 0 2.5 5 METRIC

50 40 30 20 10 0 10 20 30 40 50

70 65 60

ALLUVIAL, BROWN, TAN AND GRAY, DRY TO MOIST, VERY LOOSE TO LOOSE, SILTY AND CLAYEY SANDY AND VERY SOFT SANDY CLAY

ROADWAY EMBANKMENT

COASTAL PLAIN, GRAY, MOIST TO WET, VERY SOFT, SANDY SILT, MIDDENDORF FORMATION

14+00.00

70 65

ROADWAY EMBANKMENT

ALLUVIAL, DARK GRAY TO BLACK, MOIST TO WET, LOOSE, SILTY SAND

COASTAL PLAIN, GRAY, MOIST TO WET, VERY SOFT, SANDY SILT, MIDDENDORF FORMATION

13+80.00

70 65 60 55

6.8m AHEAD

ROADWAY EMBANKMENT, TAN, DRY TO MOIST, LOOSE TO MEDIUM DENSE, SILTY SAND

S-501
S-502

ALLUVIAL, DARK GRAY, MOIST, SOFT, SILTY CLAY, LITTLE ORGANIC MATTER

08/06

ALLUVIAL, DARK GRAY TO BLACK, MOIST TO WET, LOOSE, SILTY SAND

COASTAL PLAIN, GRAY, MOIST TO WET, VERY SOFT, SANDY SILT, MIDDENDORF FORMATION

WOH WOH 2 1 7 9 35

GRAY, TAN AND RED, MOIST TO SATURATED, VERY LOOSE TO LOOSE, SILTY AND FINE SAND

12/98

TAN, GRAY AND RED, DRY TO MOIST, HARD, SILTY CLAY

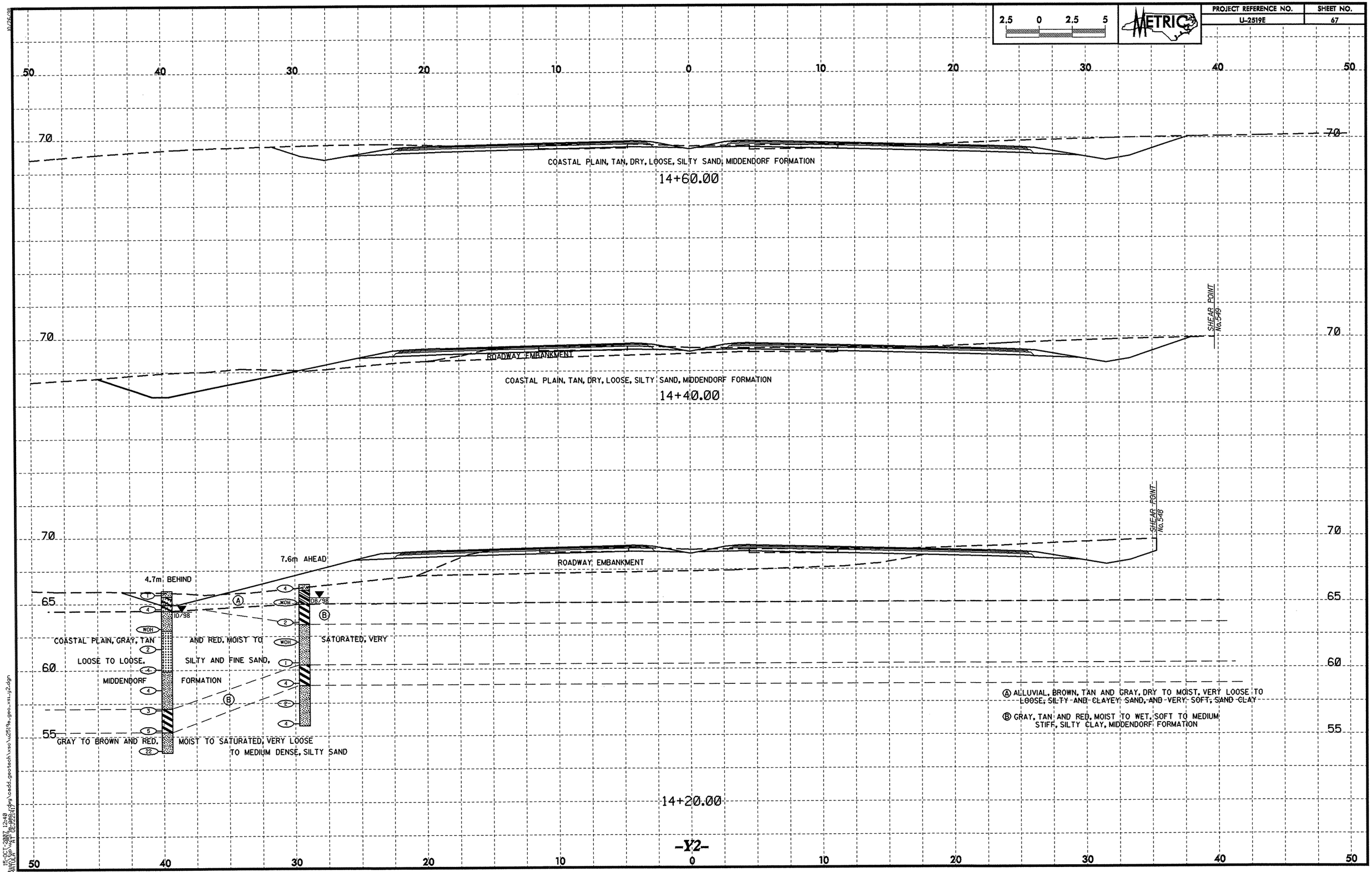
13+60.00

SOIL TEST RESULTS

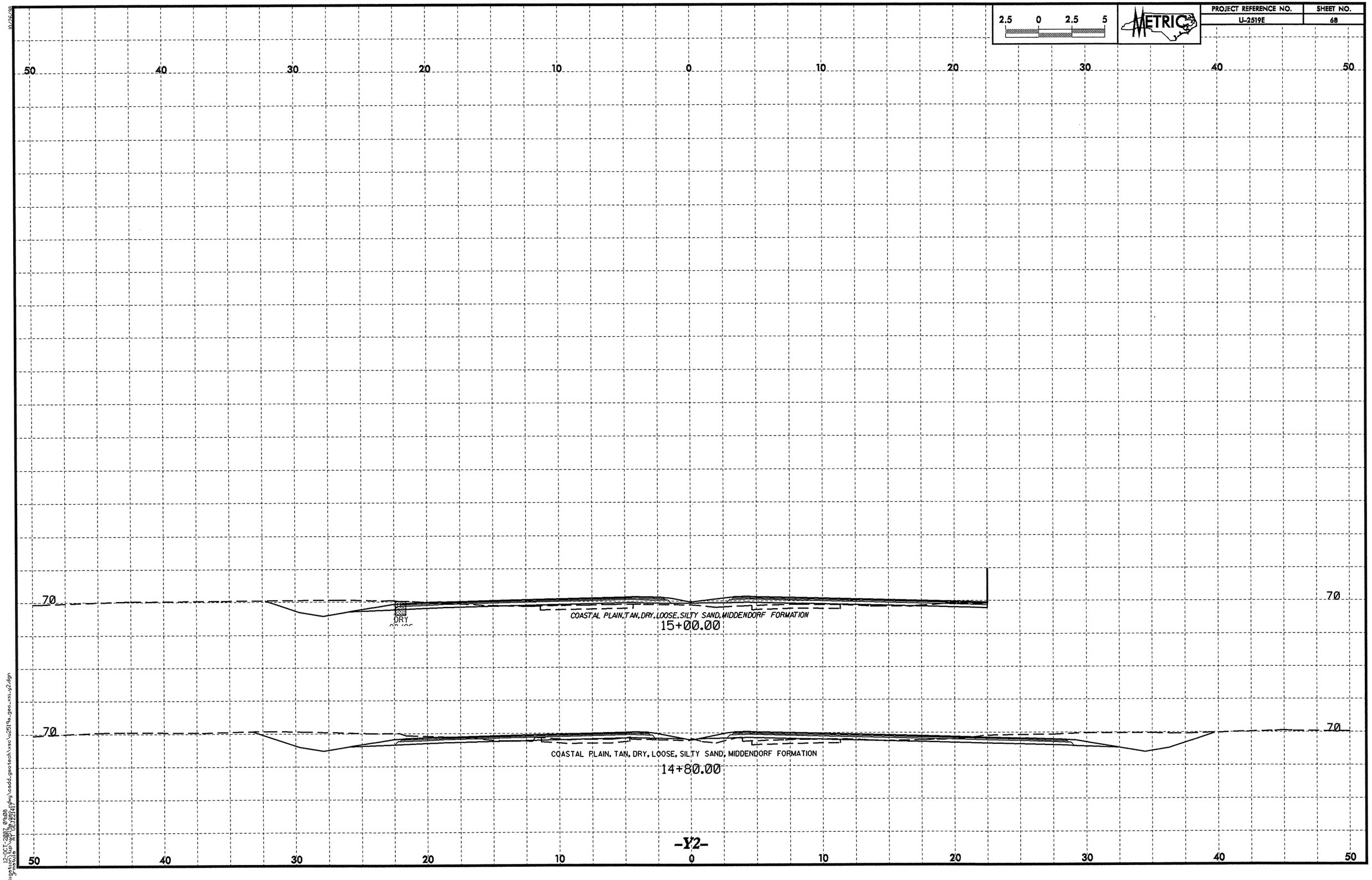
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES #10	#40	#200	% MOISTURE	% ORGANIC
S-501	26.0m RT.	13+60.0	0.30-0.75	A-7-5(5)	46	13	28.9	21.4	23.4	26.3	100.0	83.0	53.0	-	8.5
S-502	26.0m RT.	13+60.0	1.00-1.18	A-2-4(0)	22	NP	58.7	32.3	3.9	5.1	97.0	53.0	12.0	-	-

-Y2-

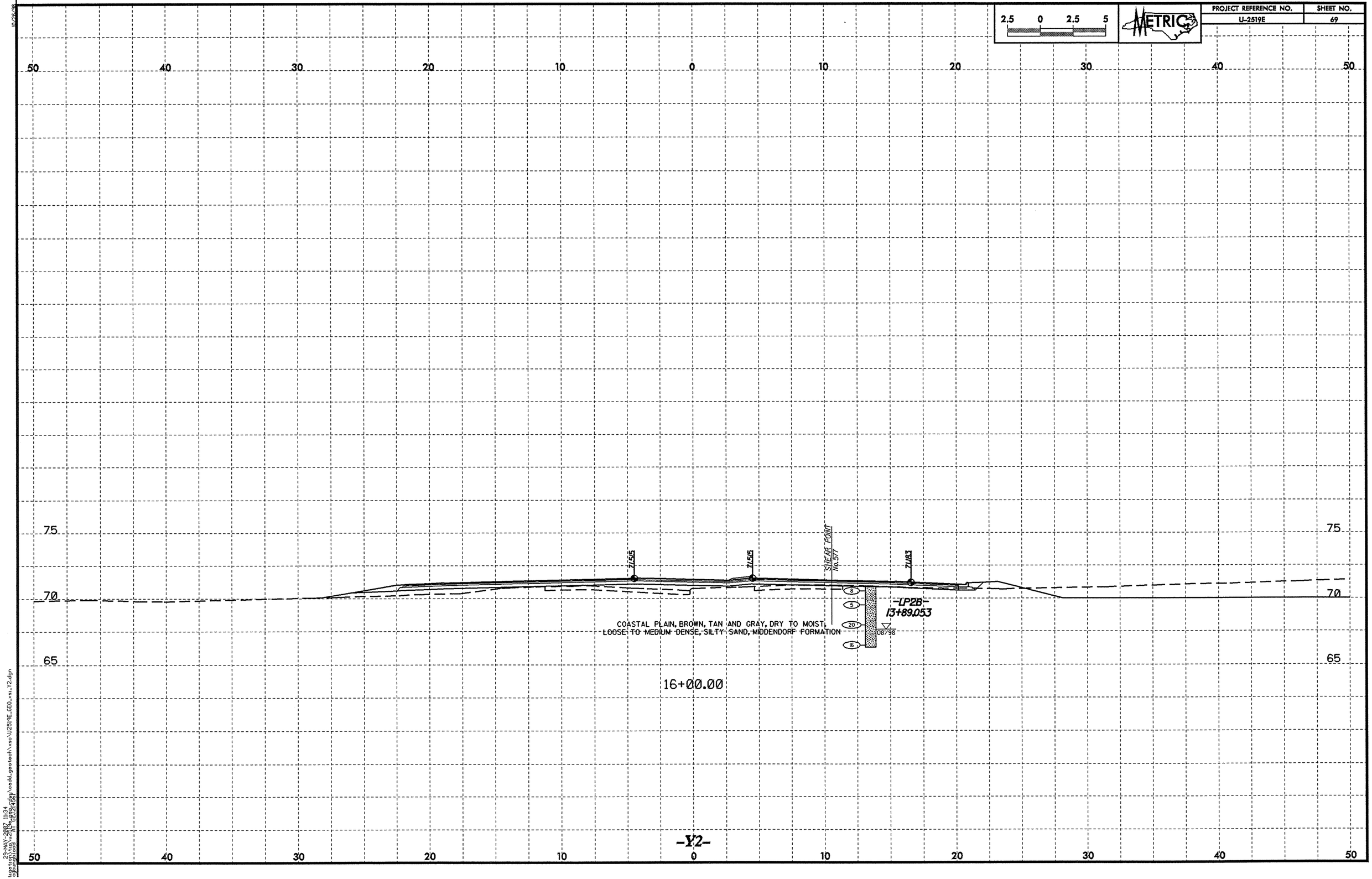
15-OCT-2007 12:39
\\ranmain\projects\Roadway\Projects\U-2519E\roadd_geotech\xsc\u2519e_geo_xss_y2.dgn



PROJECT REFERENCE NO.
U-2519E
SHEET NO.
67
METRIC
2.5 0 2.5 5
50 40 30 20 10 0 10 20 30 40 50
70
COASTAL PLAIN, TAN, DRY, LOOSE, SILTY SAND, MIDDENDORF FORMATION
14+60.00
SHEAR POINT No.549
ROADWAY EMBANKMENT
COASTAL PLAIN, TAN, DRY, LOOSE, SILTY SAND, MIDDENDORF FORMATION
14+40.00
SHEAR POINT No.548
7.6m AHEAD
ROADWAY EMBANKMENT
4.7m BEHIND
65
60
55
10/98
08/98
WOH
COASTAL PLAIN, GRAY, TAN AND RED, MOIST TO SATURATED, VERY LOOSE TO LOOSE, SILTY AND FINE SAND, MIDDENDORF FORMATION
GRAY TO BROWN AND RED, MOIST TO SATURATED, VERY LOOSE TO MEDIUM DENSE, SILTY SAND
Ⓐ ALLUVIAL, BROWN, TAN AND GRAY, DRY TO MOIST, VERY LOOSE TO LOOSE, SILTY AND CLAYEY SAND, AND VERY SOFT, SAND CLAY
Ⓑ GRAY, TAN AND RED, MOIST TO WET, SOFT TO MEDIUM STIFF, SILTY CLAY, MIDDENDORF FORMATION
14+20.00
-Y2-



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
68
50 40 30 20 10 0 10 20 30 40 50
70
DRY
COASTAL PLAIN, TAN, DRY, LOOSE, SILTY SAND, MIDDENDORF FORMATION
15+00.00
70
COASTAL PLAIN, TAN, DRY, LOOSE, SILTY SAND, MIDDENDORF FORMATION
14+80.00
-Y2-



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
69
50 40 30 20 10 0 10 20 30 40 50
75
70
65
71.5/5
71.5/5
SHEAR POINT No.577
71.1/83
-LP2B-
13+89.053
8
5
20
16
08/98
COASTAL PLAIN, BROWN, TAN AND GRAY, DRY TO MOIST, LOOSE TO MEDIUM DENSE, SILTY SAND, MIDDENDORF FORMATION
16+00.00
-Y2-

U-2519E

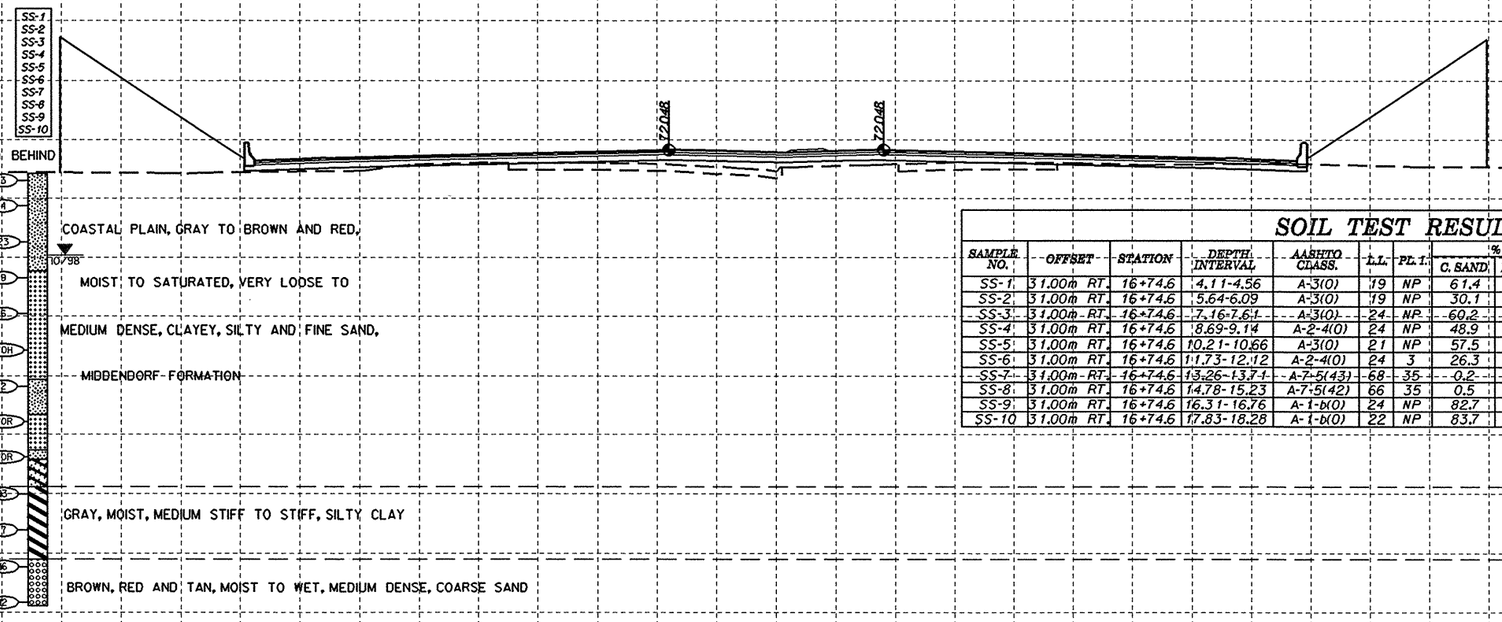
2.5 0 2.5 5

METRIC

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

50 40 30 20 10 0 10 20 30 40 50

75 70 65 60 55



16+80.00

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	31.00m RT.	16+74.6	4.11-4.56	A-3(0)	19	NP	61.4	33.6	0.8	4.2	98.2	52.7	5.5	-	-
SS-2	31.00m RT.	16+74.6	5.64-6.09	A-3(0)	19	NP	30.1	64.2	1.5	4.2	100.0	77.1	8.4	-	-
SS-3	31.00m RT.	16+74.6	7.16-7.61	A-3(0)	24	NP	60.2	30.3	5.4	4.1	96.5	52.6	10.3	-	-
SS-4	31.00m RT.	16+74.6	8.69-9.14	A-2-4(0)	24	NP	48.9	30.0	6.1	15.0	88.7	55.8	20.7	16.9	-
SS-5	31.00m RT.	16+74.6	10.21-10.66	A-3(0)	21	NP	57.5	33.2	3.0	6.3	99.0	74.7	9.7	-	-
SS-6	31.00m RT.	16+74.6	11.73-12.12	A-2-4(0)	24	3	26.3	47.0	0.4	26.3	99.2	89.8	32.7	27.3	-
SS-7	31.00m RT.	16+74.6	13.26-13.71	A-7-5(43)	68	35	0.2	0.5	16.9	82.4	100.0	100.0	99.6	30.6	-
SS-8	31.00m RT.	16+74.6	14.78-15.23	A-7-5(42)	66	35	0.5	0.6	16.5	82.4	100.0	99.8	99.1	37.5	-
SS-9	31.00m RT.	16+74.6	16.31-16.76	A-1-b(0)	24	NP	82.7	13.4	1.8	2.1	99.0	46.5	4.3	-	-
SS-10	31.00m RT.	16+74.6	17.83-18.28	A-1-b(0)	22	NP	83.7	8.3	1.5	6.5	97.6	40.2	8.2	-	-

-Y2-

23-MAY-2002 10:18
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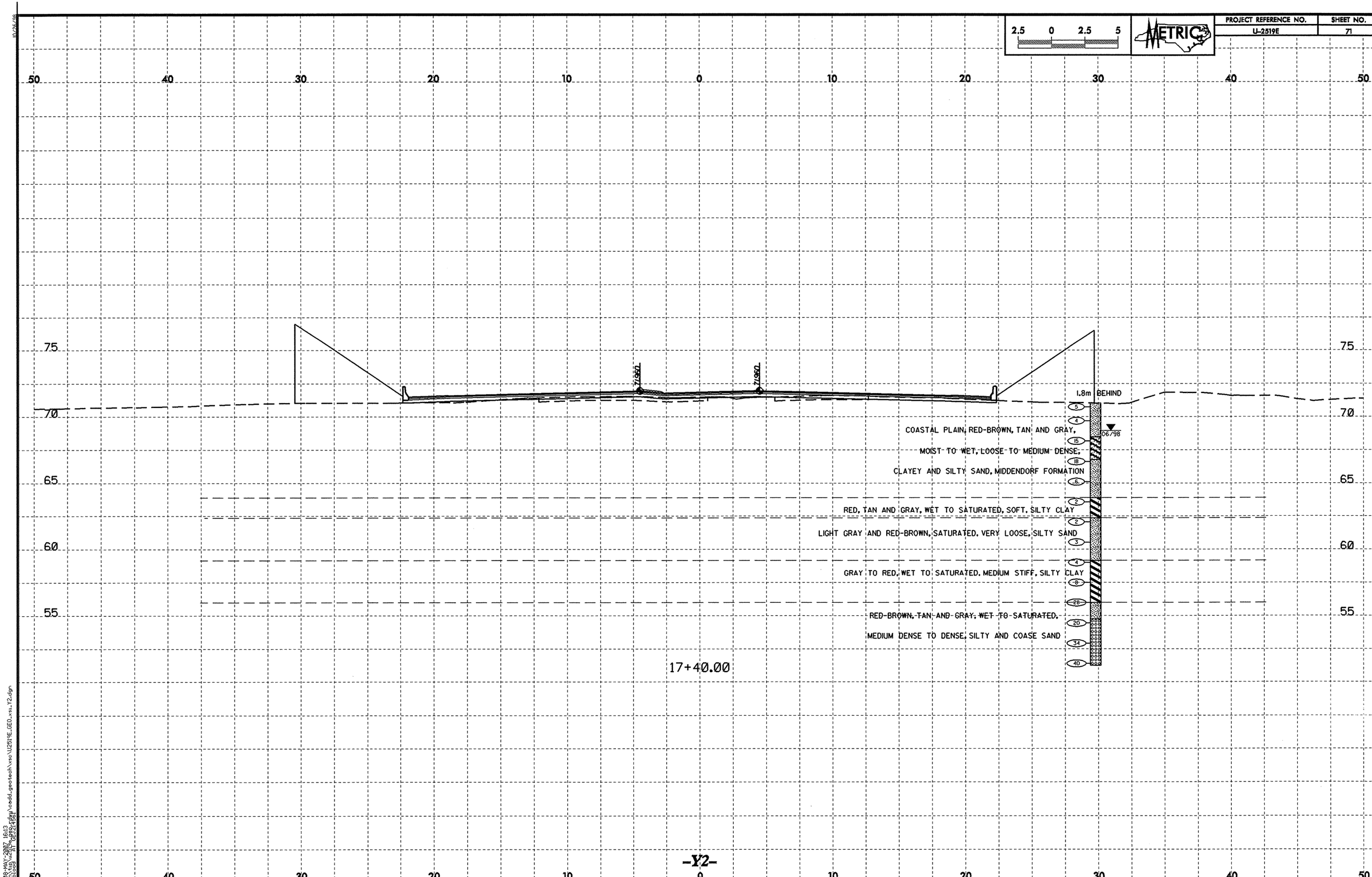
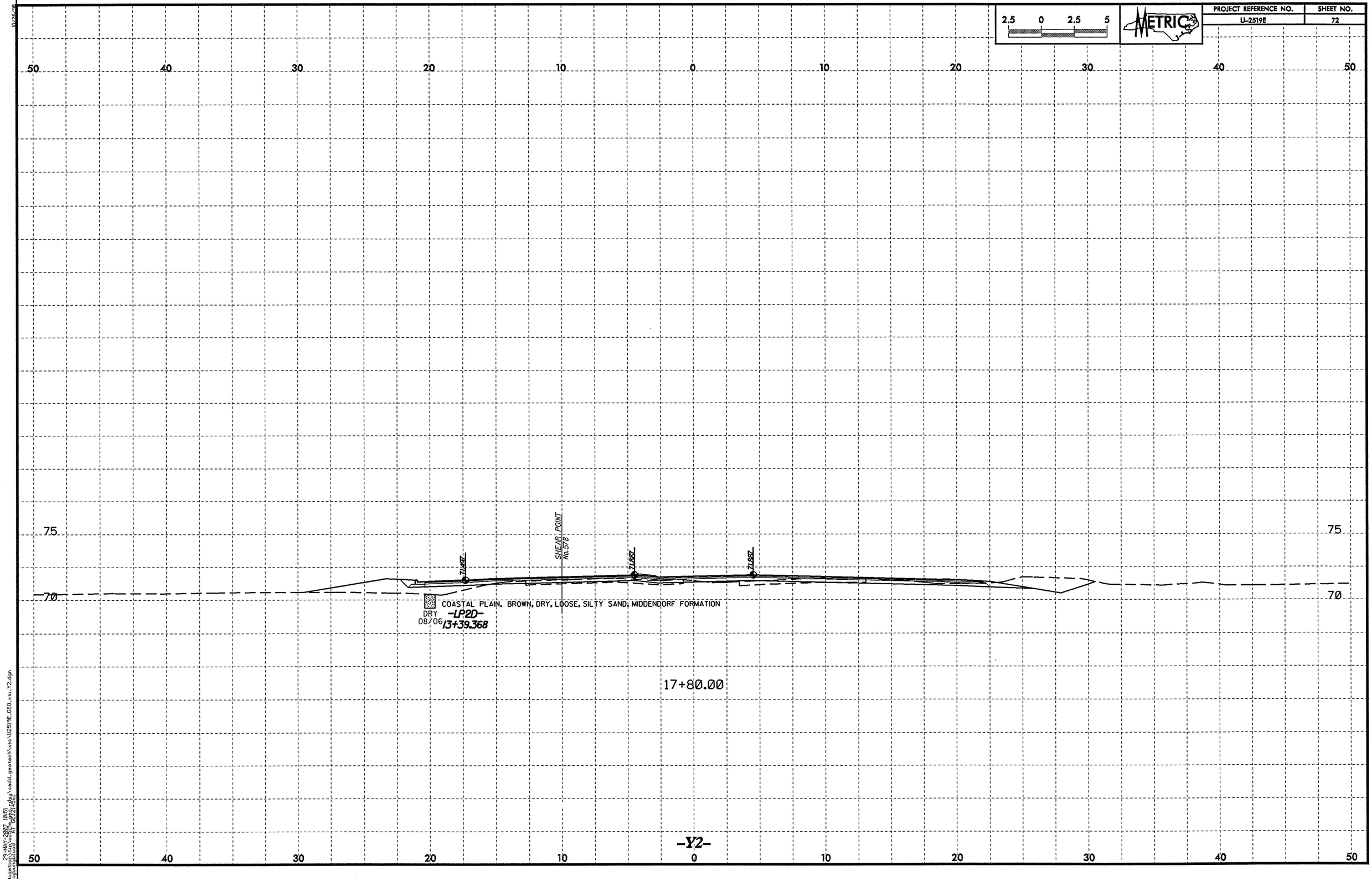
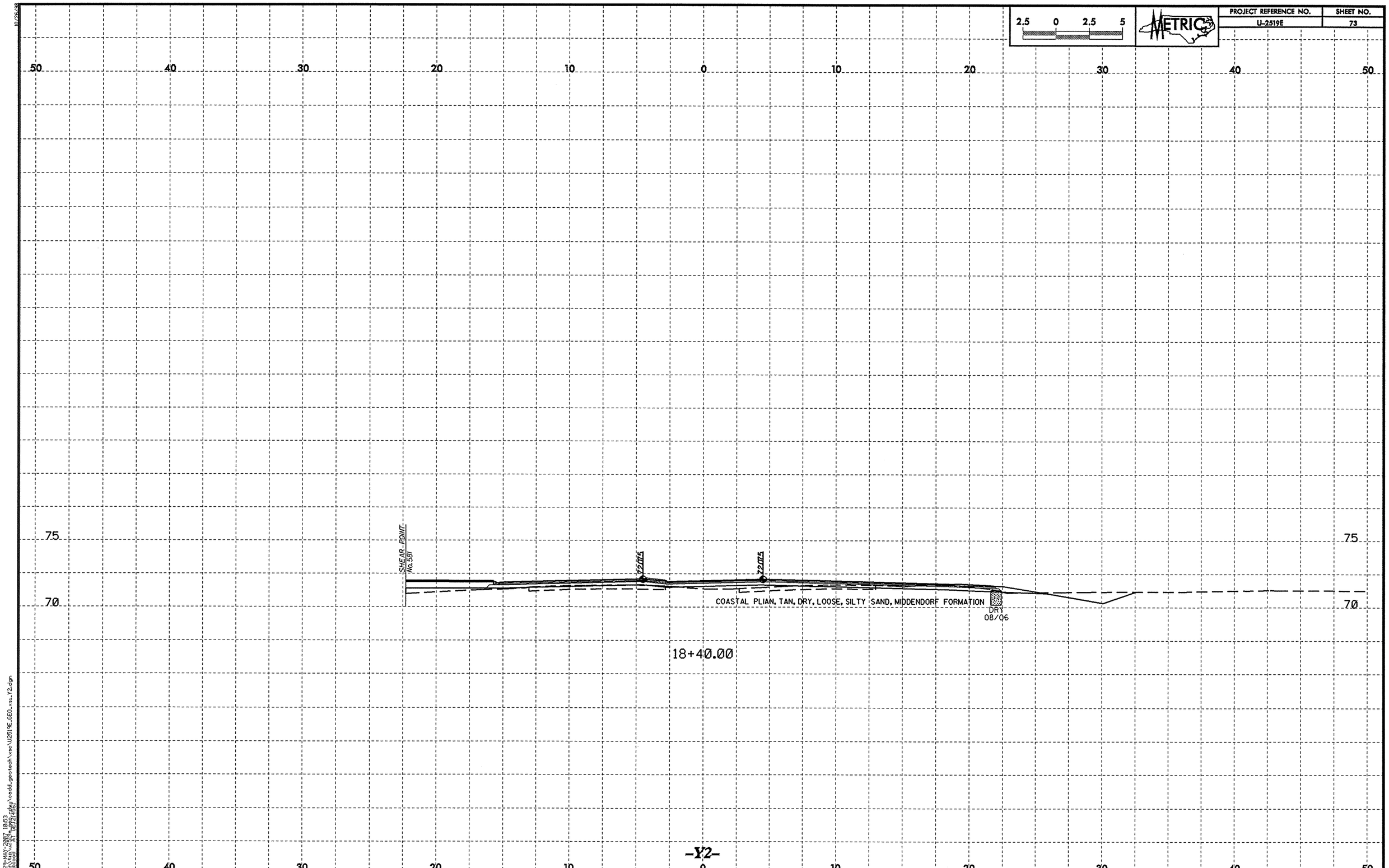


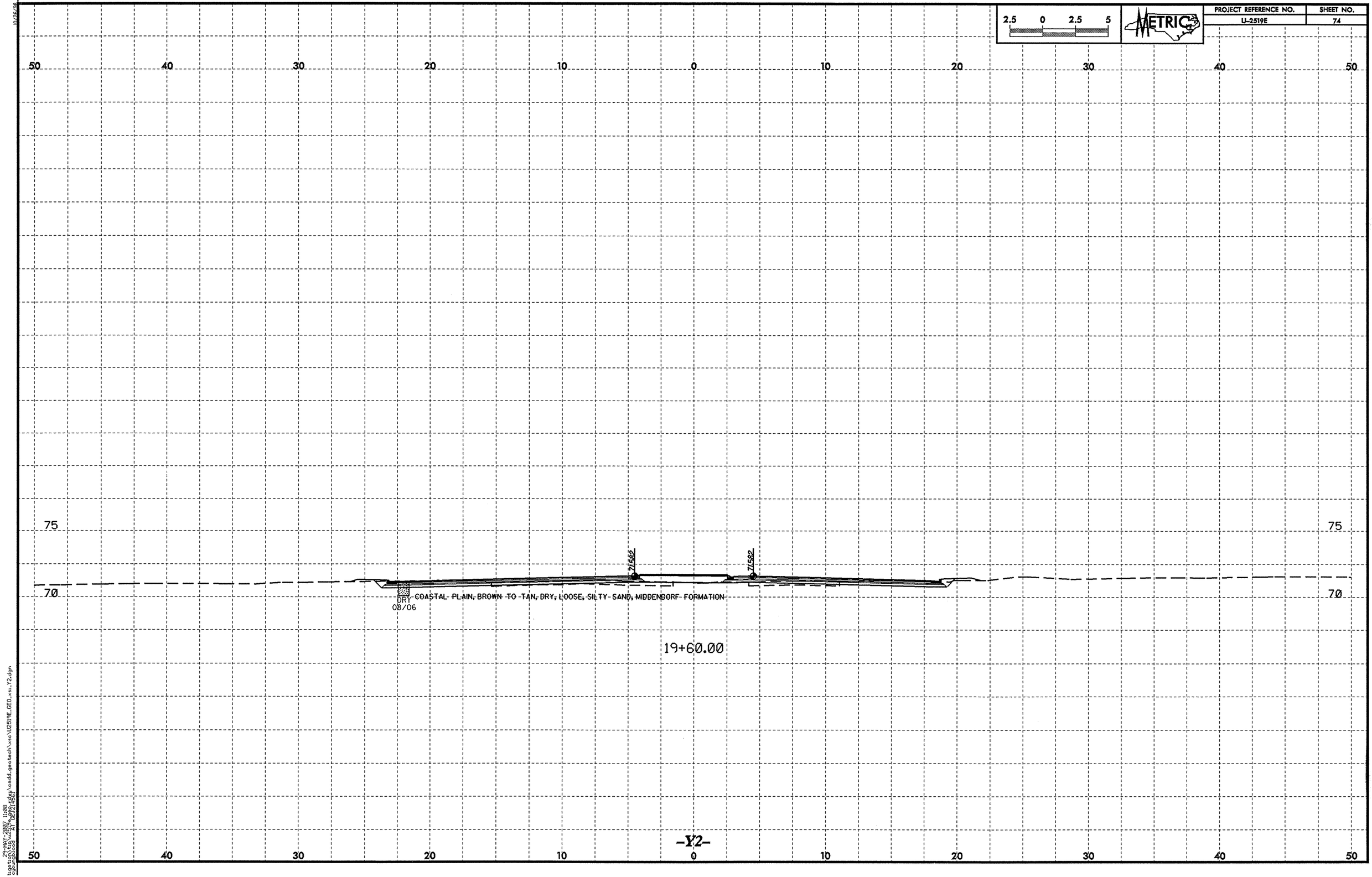
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
71
50 40 30 20 10 0 10 20 30 40 50
75
70
65
60
55
71960
71960
1.8m BEHIND
5
4
15
18
6
2
2
3
4
8
28
20
34
40
06/98
COASTAL PLAIN, RED-BROWN, TAN AND GRAY,
MOIST TO WET, LOOSE TO MEDIUM DENSE,
CLAYEY AND SILTY SAND, MIDDENDORF FORMATION
RED, TAN AND GRAY, WET TO SATURATED, SOFT, SILTY CLAY
LIGHT GRAY AND RED-BROWN, SATURATED, VERY LOOSE, SILTY SAND
GRAY TO RED, WET TO SATURATED, MEDIUM STIFF, SILTY CLAY
RED-BROWN, TAN AND GRAY, WET TO SATURATED,
MEDIUM DENSE TO DENSE, SILTY AND COASE SAND
17+40.00
-Y2-



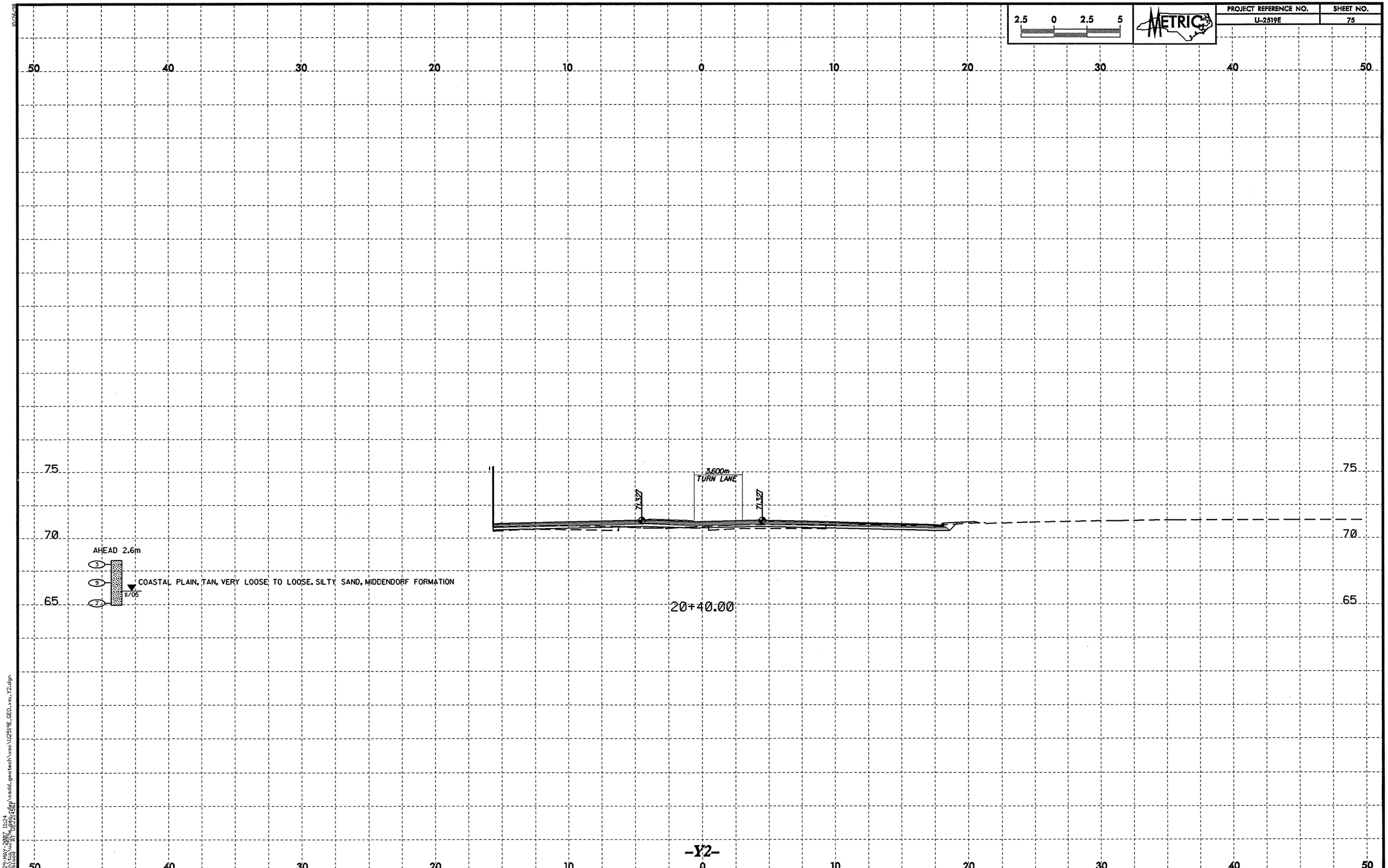
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
72
50 40 30 20 10 0 10 20 30 40 50
75
70
SHEAR POINT No.578
71.497
71.887
71.887
COASTAL PLAIN, BROWN, DRY, LOOSE, SILTY SAND, MIDDENDORF FORMATION
DRY
08/06
-LP2D-
13+39.368
17+80.00
-Y2-



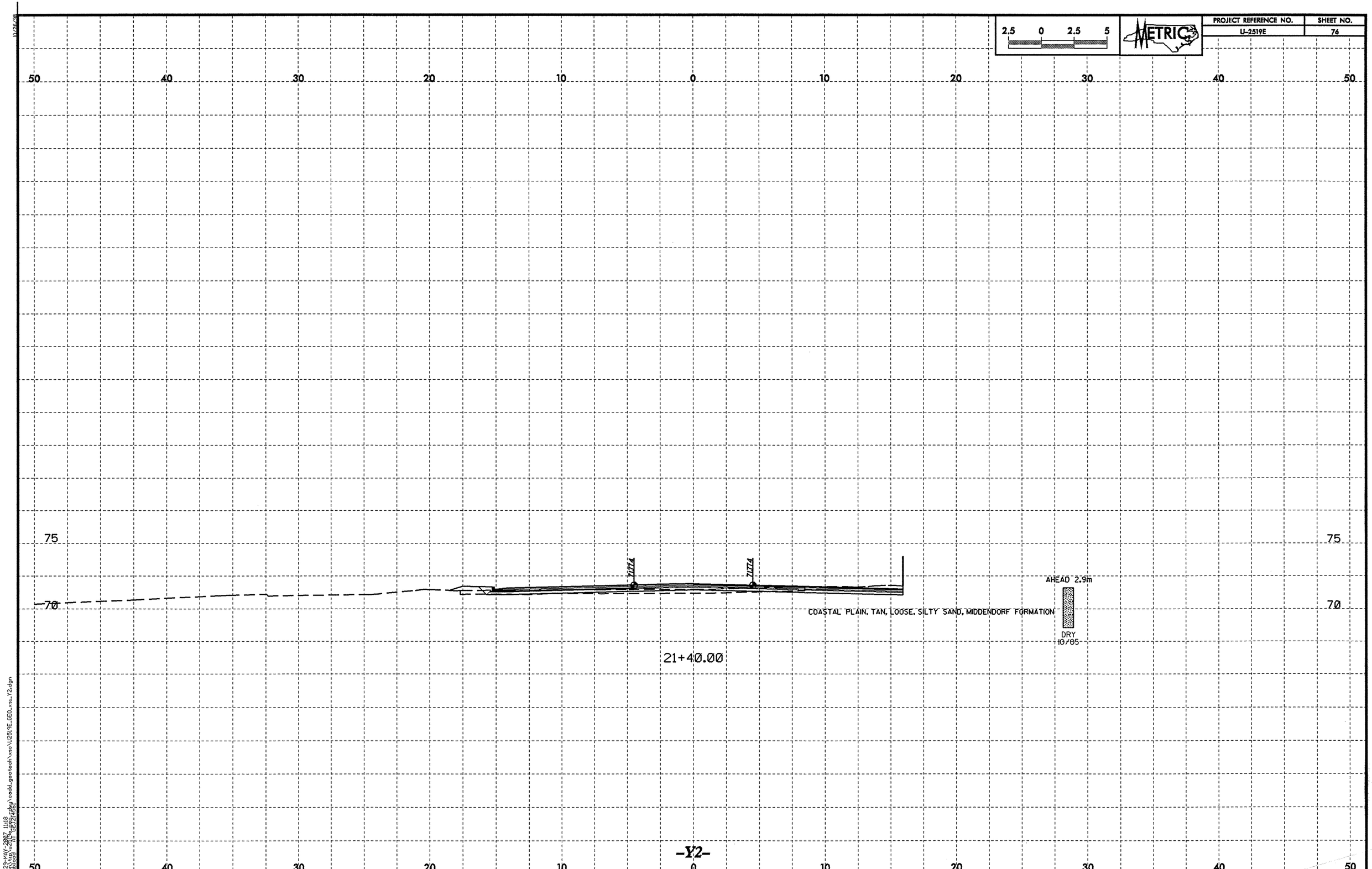
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
73
50 40 30 20 10 0 10 20 30 40 50
75
70
SHEAR POINT No.581
72.075
72.075
COASTAL PLIAN, TAN, DRY, LOOSE, SILTY SAND, MIDDENDORF FORMATION
DRY 08/06
18+40.00
-Y2-



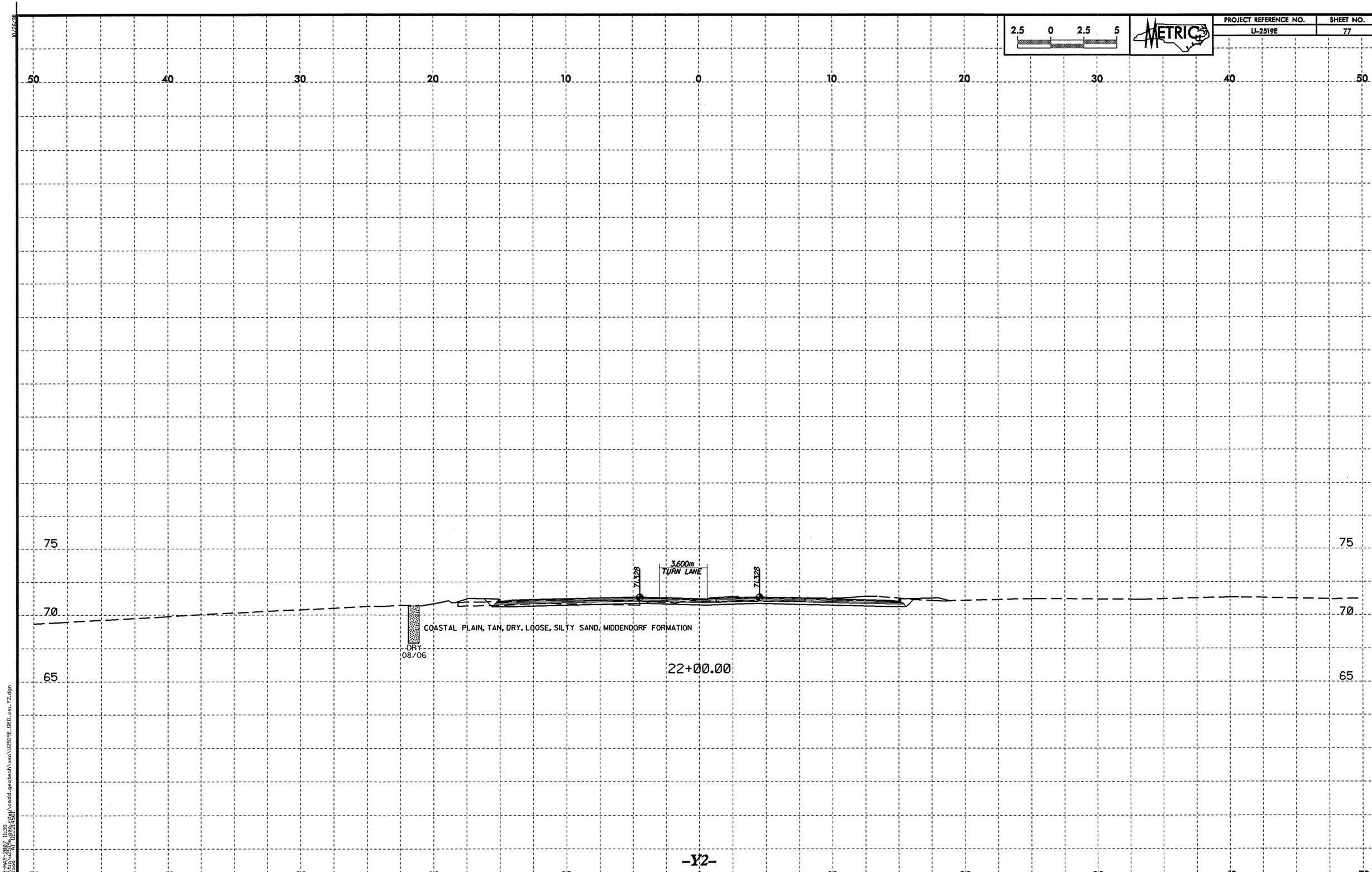
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
74
50 40 30 20 10 0 10 20 30 40 50
75
70
7/582
7/582
DRY
08/06
COASTAL PLAIN, BROWN TO TAN, DRY, LOOSE, SILTY SAND, MIDDENDORF FORMATION
19+60.00
-Y2-



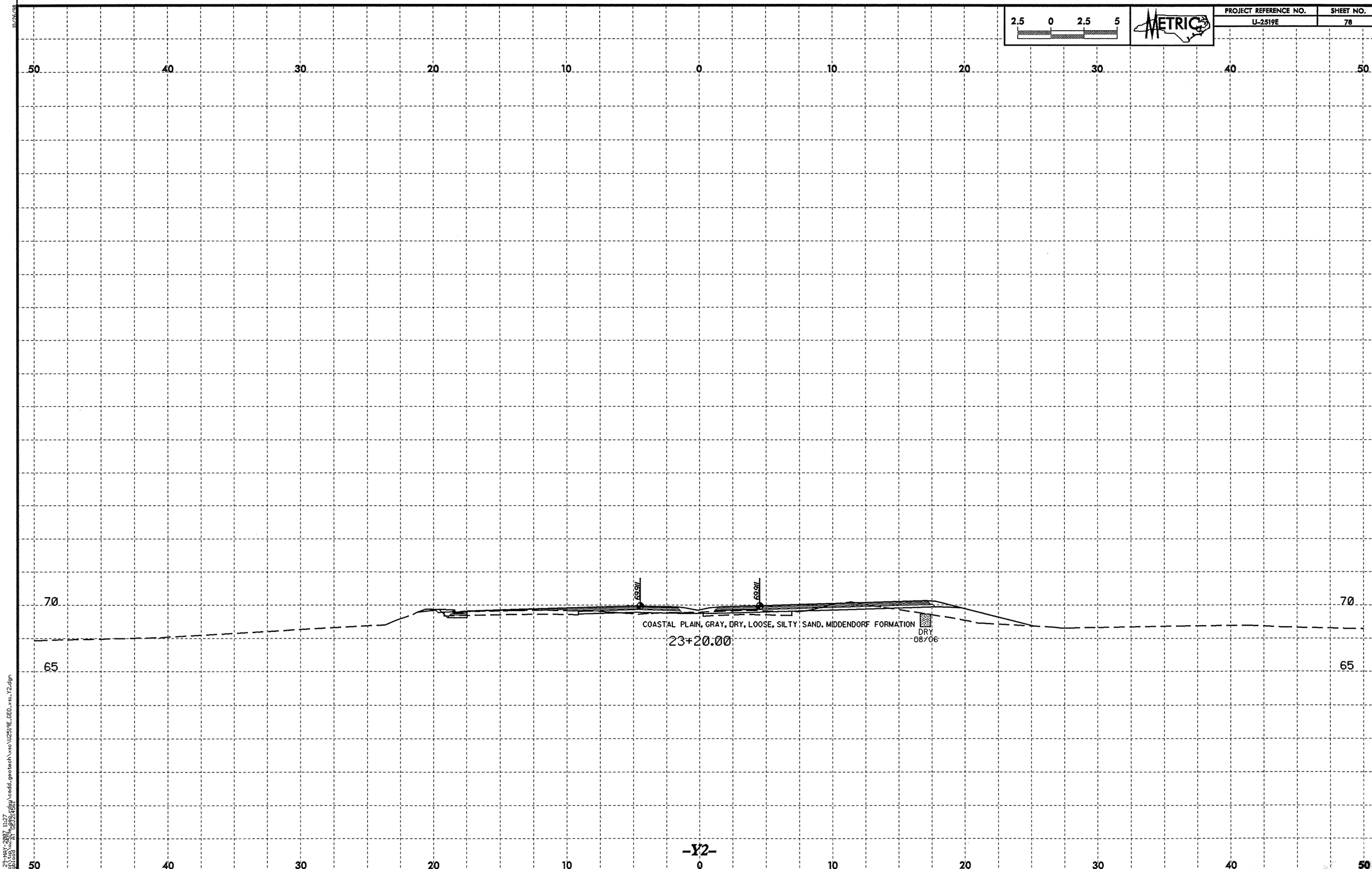
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
75
50 40 30 20 10 0 10 20 30 40 50
75
70
65
3.600m
TURN LANE
71.327
71.327
AHEAD 2.6m
3
9
7
COASTAL PLAIN, TAN, VERY LOOSE TO LOOSE, SILTY SAND, MIDDENDORF FORMATION
11/05
20+40.00
-Y2-



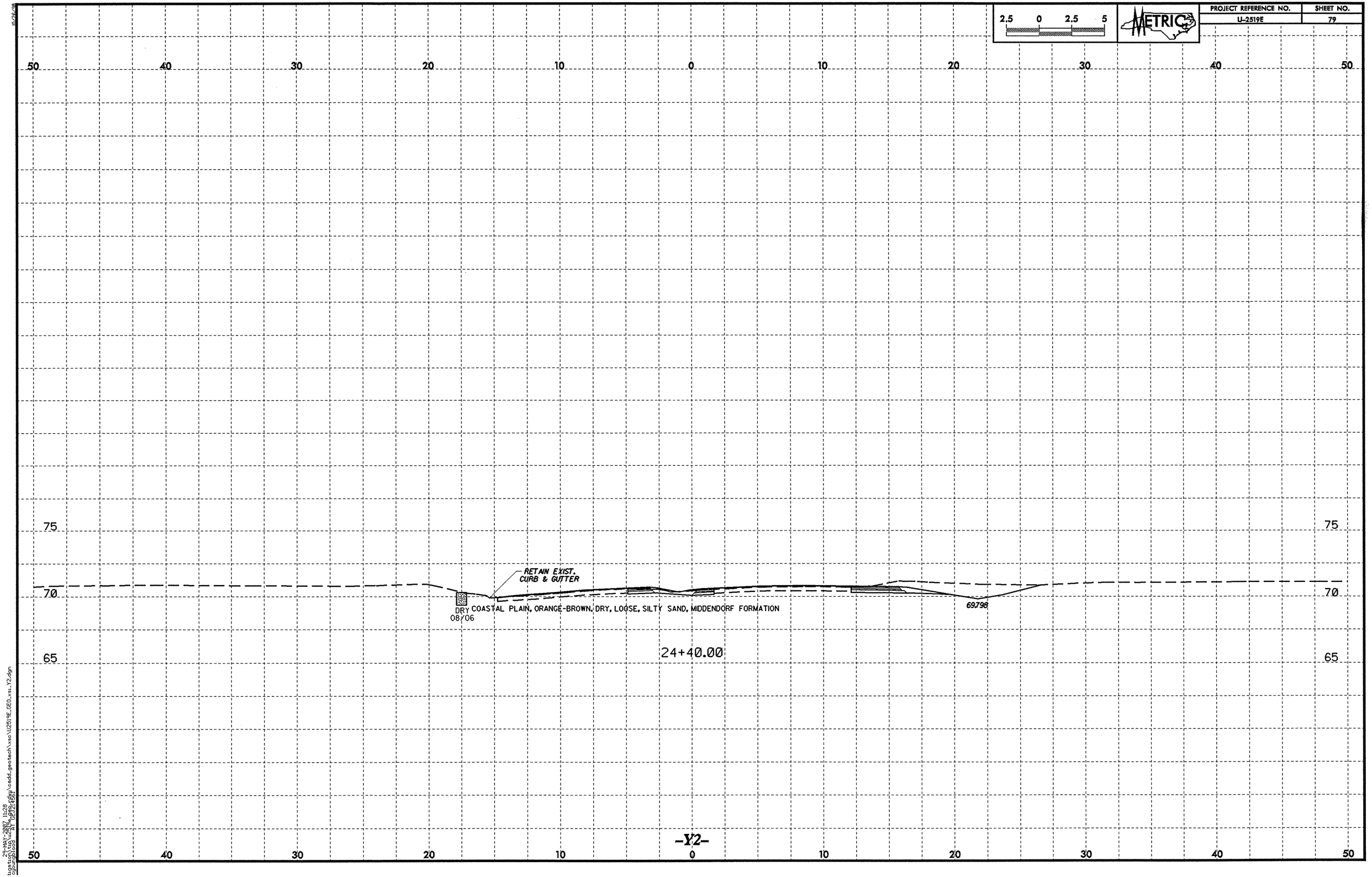
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
76
50 40 30 20 10 0 10 20 30 40 50
75
70
71774
71774
AHEAD 2.9m
COASTAL PLAIN, TAN, LOOSE, SILTY SAND, MIDDENDORF FORMATION
DRY
10/05
21+40.00
-Y2-



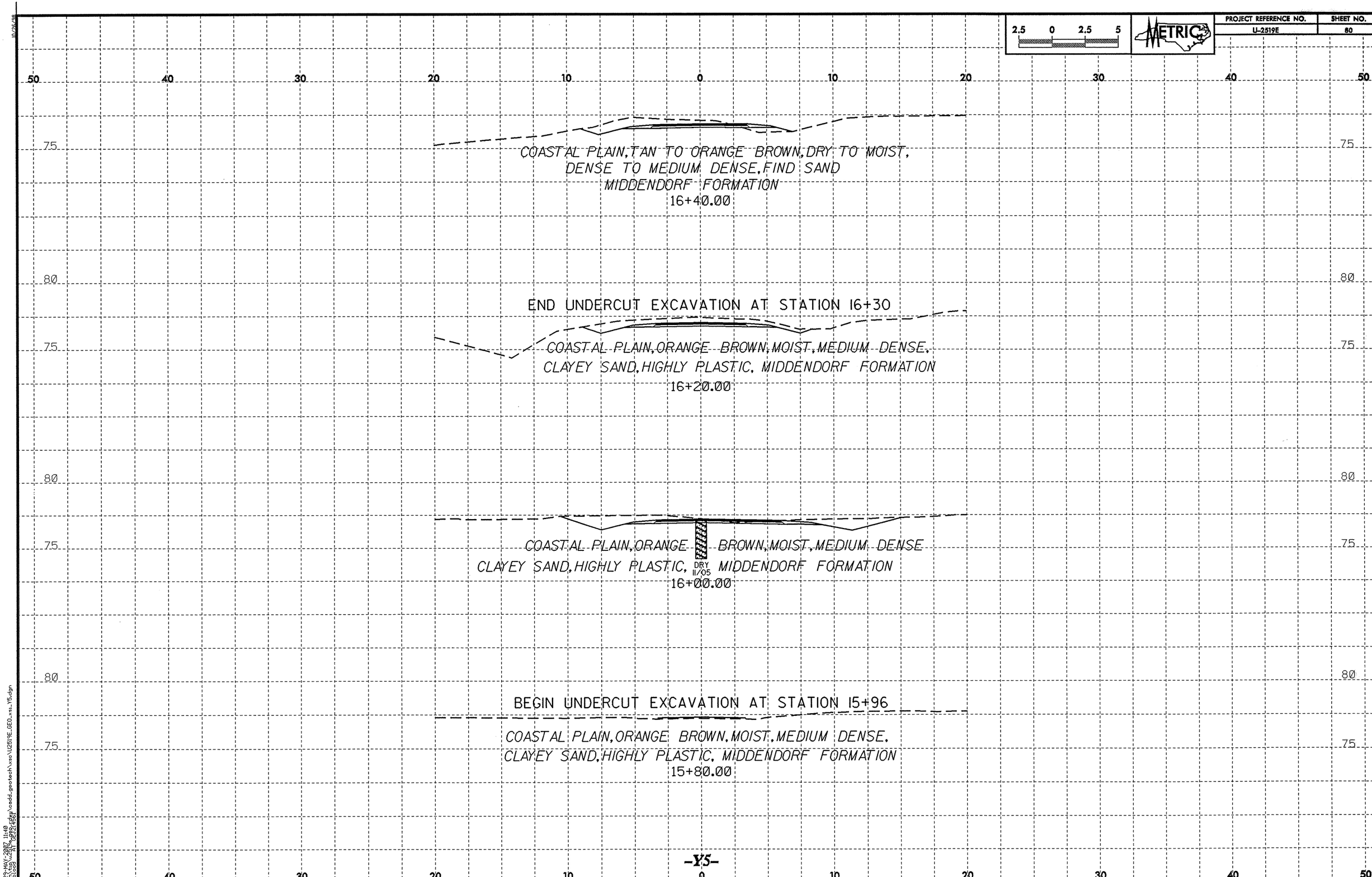
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
77
50 40 30 20 10 0 10 20 30 40 50
75
70
65
3.600m
TURN LANE
71.328
71.328
COASTAL PLAIN, TAN, DRY, LOOSE, SILTY SAND, MIDDENDORF FORMATION
DRY
08/06
22+00.00
-Y2-



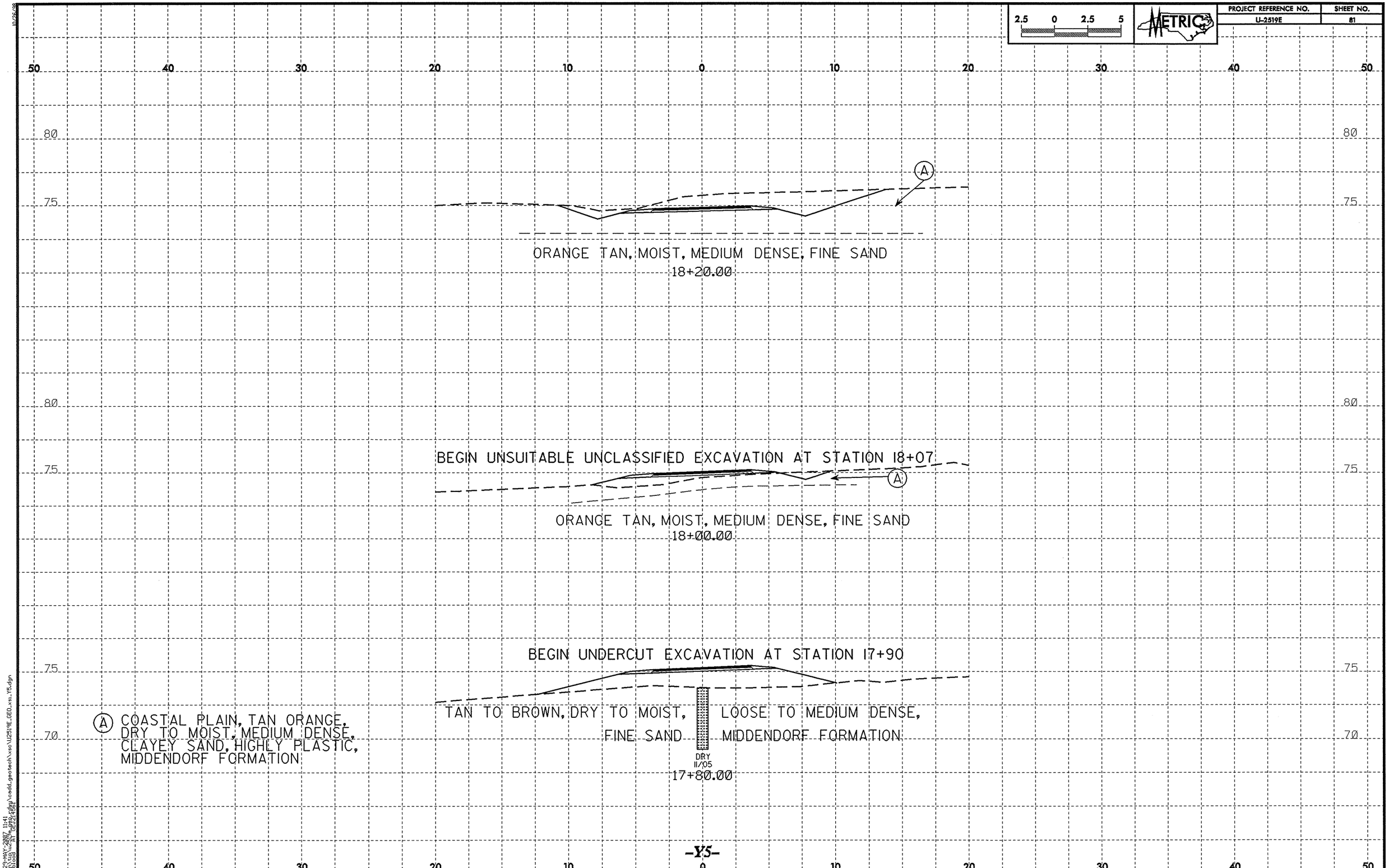
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
78
50 40 30 20 10 0 10 20 30 40 50
70
65
69911
69911
COASTAL PLAIN, GRAY, DRY, LOOSE, SILTY SAND, MIDDENDORF FORMATION
DRY
08/06
23+20.00
-Y2-



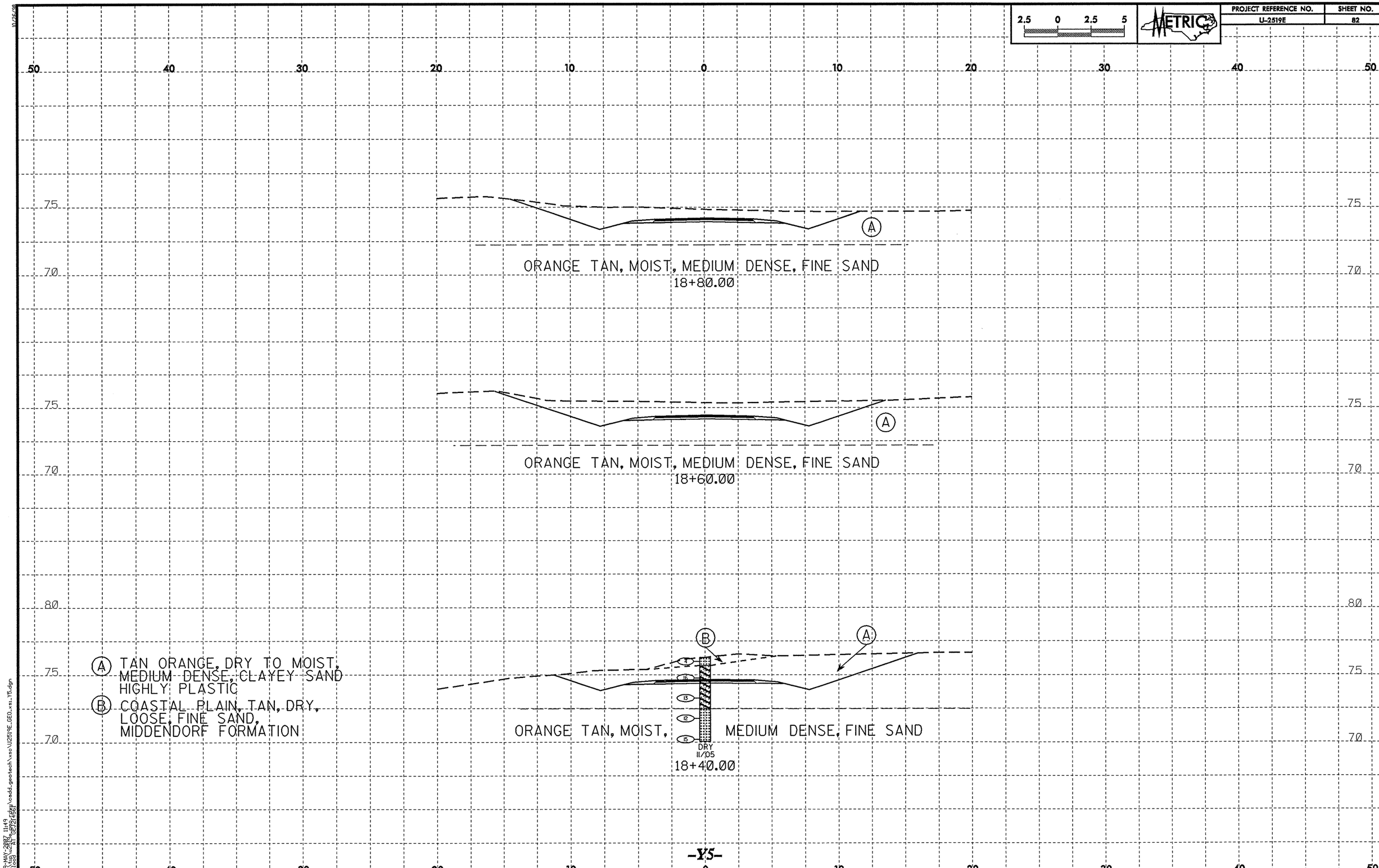
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
79
50 40 30 20 10 0 10 20 30 40 50
75
70
65
RETAIN EXIST. CURB & GUTTER
DRY
08/06
COASTAL PLAIN, ORANGE-BROWN, DRY, LOOSE, SILTY SAND, MIDDENDORF FORMATION
69.798
24+40.00
-Y2-



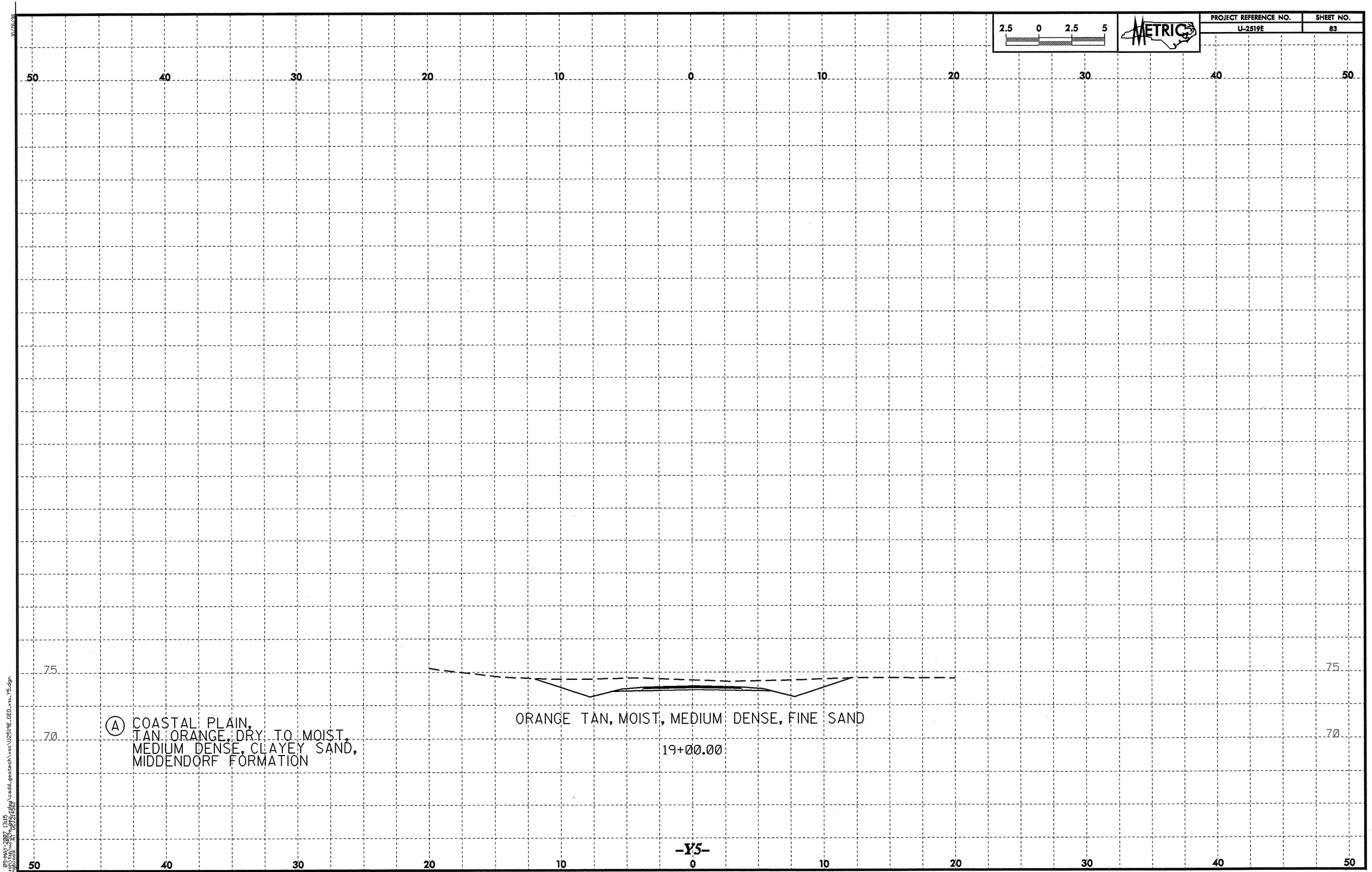
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
80
50 40 30 20 10 0 10 20 30 40 50
75
80
COASTAL PLAIN, TAN TO ORANGE BROWN, DRY TO MOIST,
DENSE TO MEDIUM DENSE, FIND SAND
MIDDENDORF FORMATION
16+40.00
END UNDERCUT EXCAVATION AT STATION 16+30
COASTAL PLAIN, ORANGE BROWN, MOIST, MEDIUM DENSE,
CLAYEY SAND, HIGHLY PLASTIC, MIDDENDORF FORMATION
16+20.00
COASTAL PLAIN, ORANGE BROWN, MOIST, MEDIUM DENSE
CLAYEY SAND, HIGHLY PLASTIC, DRY 11/05 MIDDENDORF FORMATION
16+00.00
BEGIN UNDERCUT EXCAVATION AT STATION 15+96
COASTAL PLAIN, ORANGE BROWN, MOIST, MEDIUM DENSE,
CLAYEY SAND, HIGHLY PLASTIC, MIDDENDORF FORMATION
15+80.00
-Y5-



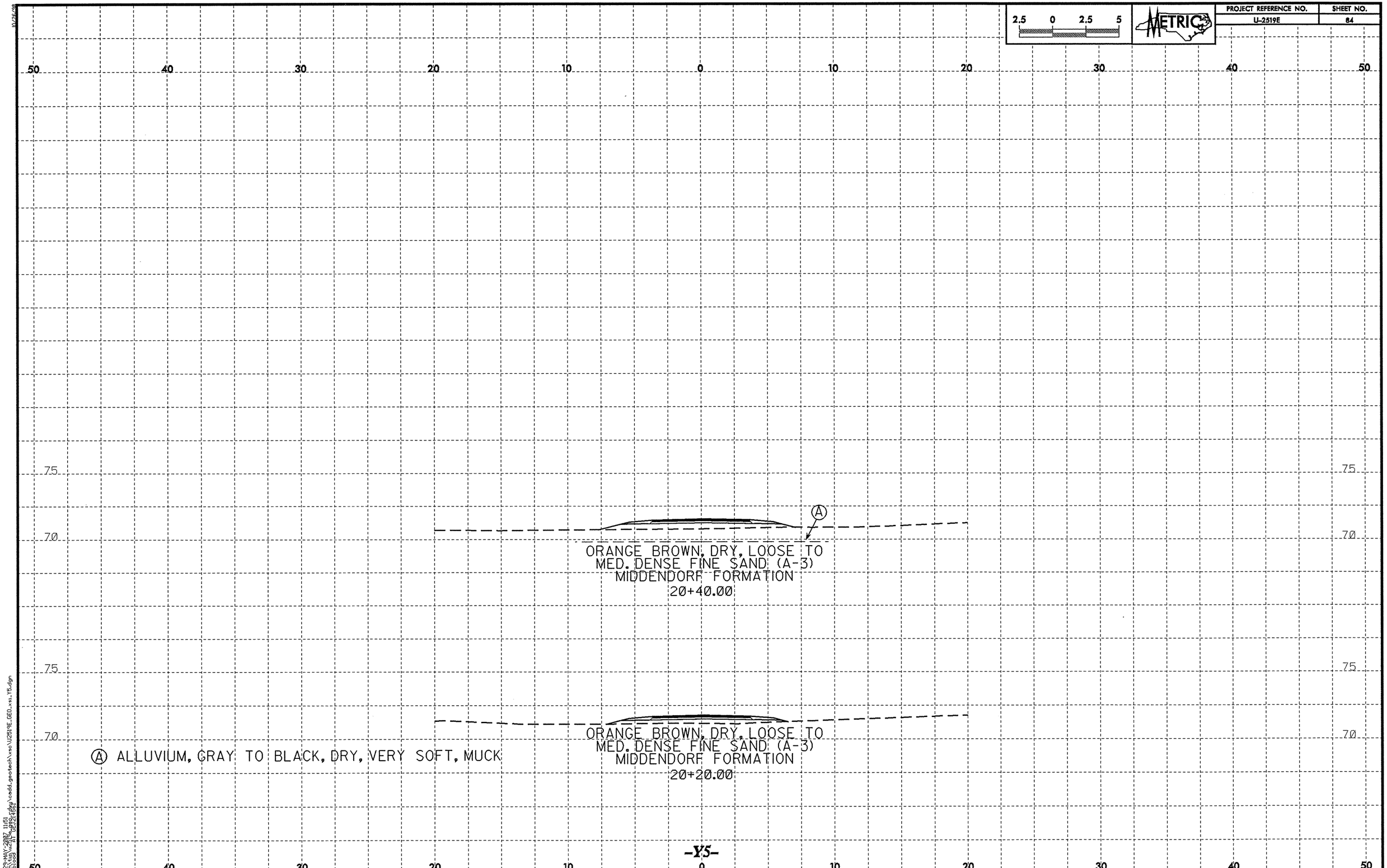
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
81
50 40 30 20 10 0 10 20 30 40 50
80
75
A
ORANGE TAN, MOIST, MEDIUM DENSE, FINE SAND
18+20.00
BEGIN UNSUITABLE UNCLASSIFIED EXCAVATION AT STATION 18+07
ORANGE TAN, MOIST, MEDIUM DENSE, FINE SAND
18+00.00
BEGIN UNDERCUT EXCAVATION AT STATION 17+90
TAN TO BROWN, DRY TO MOIST, LOOSE TO MEDIUM DENSE,
FINE SAND MIDDENDORF FORMATION
DRY
11/05
17+80.00
70
A COASTAL PLAIN, TAN ORANGE, DRY TO MOIST, MEDIUM DENSE, CLAYEY SAND, HIGHLY PLASTIC, MIDDENDORF FORMATION
-Y5-



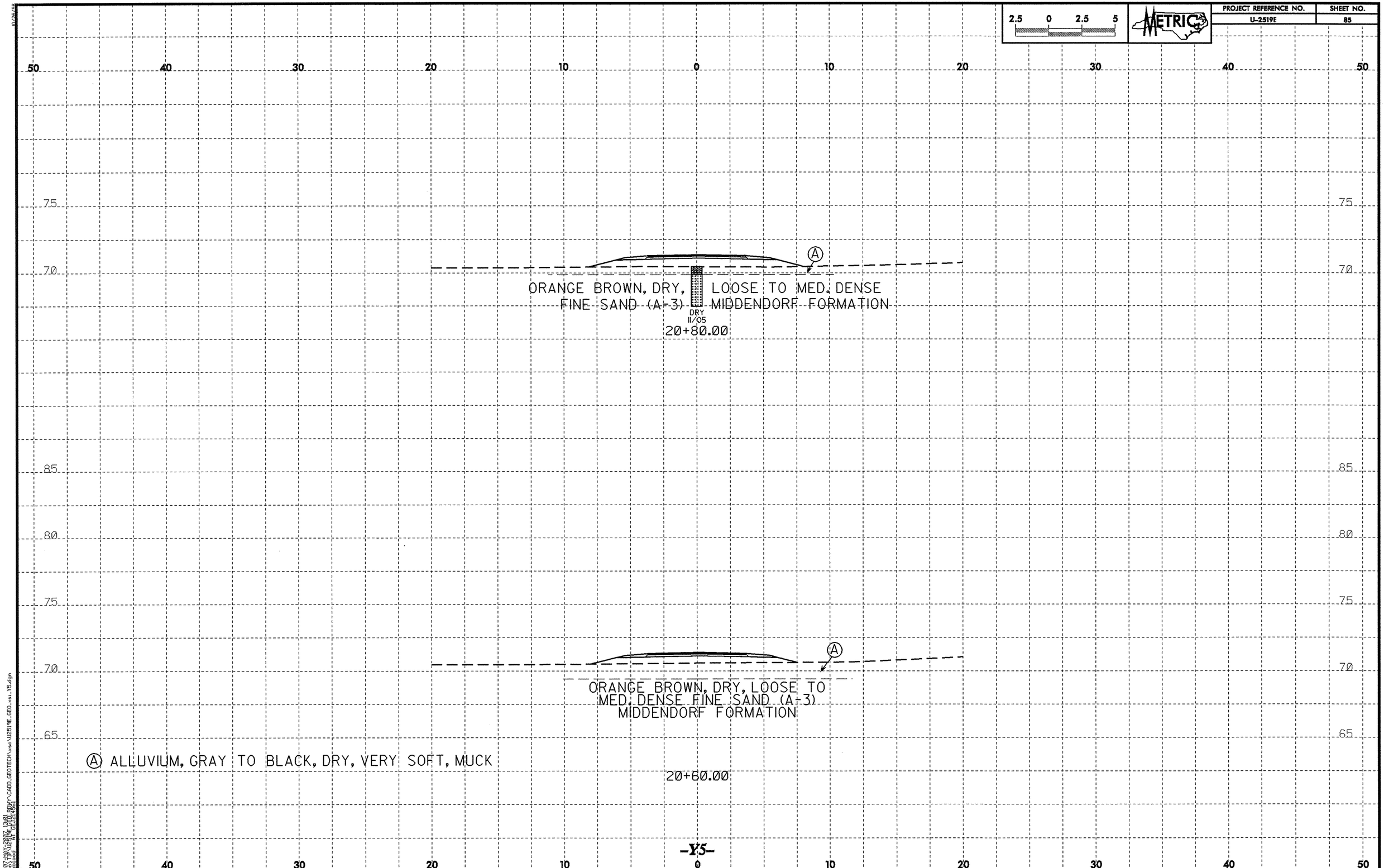
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
82
50 40 30 20 10 0 10 20 30 40 50
75
70
A
ORANGE TAN, MOIST, MEDIUM DENSE, FINE SAND
18+80.00
75
70
A
ORANGE TAN, MOIST, MEDIUM DENSE, FINE SAND
18+60.00
80
75
70
B
A
A TAN ORANGE, DRY TO MOIST, MEDIUM DENSE, CLAYEY SAND HIGHLY PLASTIC
B COASTAL PLAIN, TAN, DRY, LOOSE, FINE SAND, MIDDENDORF FORMATION
ORANGE TAN, MOIST, MEDIUM DENSE, FINE SAND
DRY
11/05
18+40.00
-Y5-



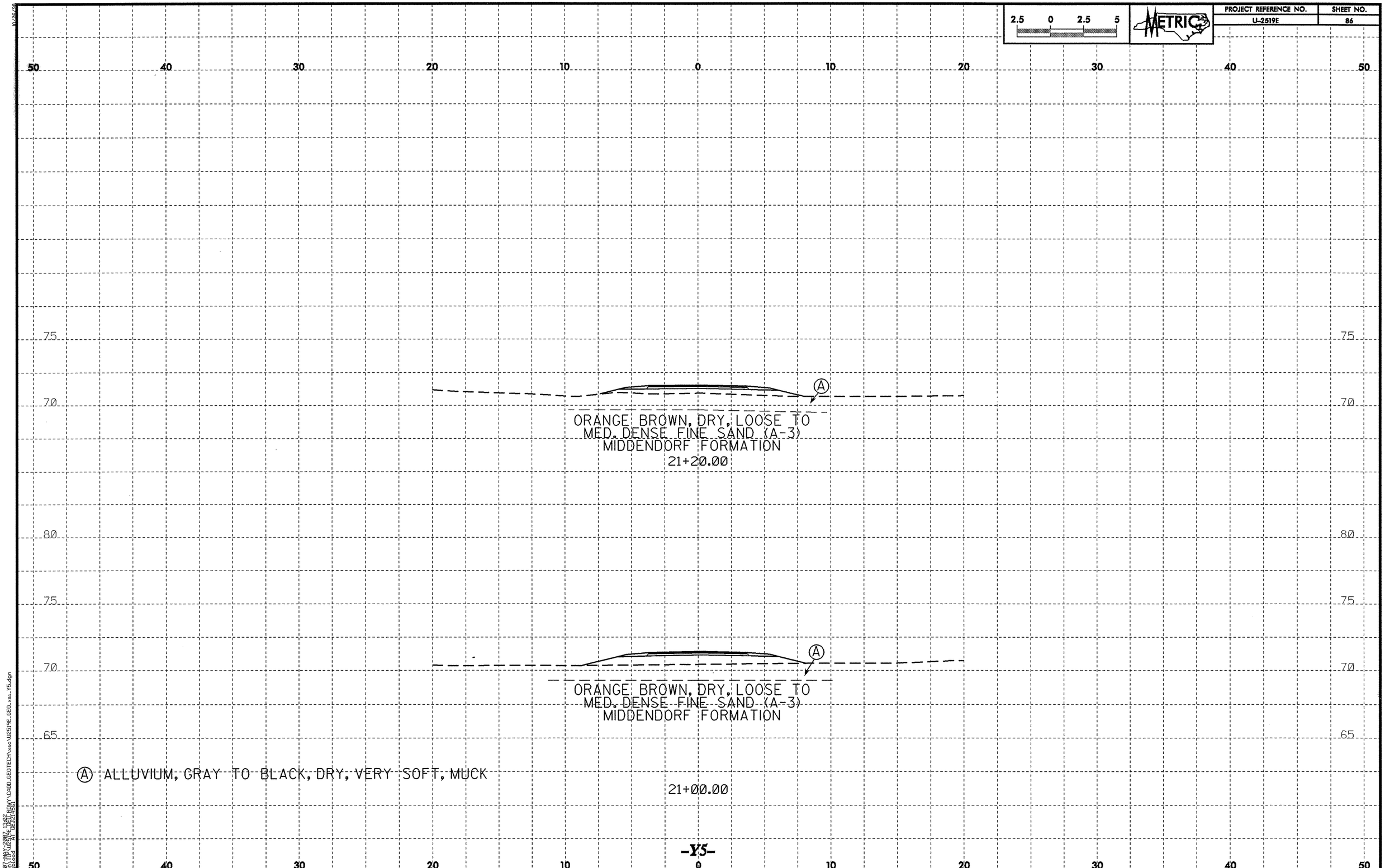
2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
83
50 40 30 20 10 0 10 20 30 40 50
75
70
(A) COASTAL PLAIN,
TAN ORANGE, DRY TO MOIST,
MEDIUM DENSE, CLAYEY SAND,
MIDDENDORF FORMATION
ORANGE TAN, MOIST, MEDIUM DENSE, FINE SAND
19+00.00
-Y5-



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
84
50 40 30 20 10 0 10 20 30 40 50
75
70
A
ORANGE BROWN, DRY, LOOSE TO
MED. DENSE FINE SAND (A-3)
MIDDENDORF FORMATION
20+40.00
75
70
ORANGE BROWN, DRY, LOOSE TO
MED. DENSE FINE SAND (A-3)
MIDDENDORF FORMATION
20+20.00
A ALLUVIUM, GRAY TO BLACK, DRY, VERY SOFT, MUCK
-Y5-



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
85
50 40 30 20 10 0 10 20 30 40 50
75
70
85
80
75
70
65
A
ORANGE BROWN, DRY, LOOSE TO MED. DENSE
FINE SAND (A-3) MIDDENDORF FORMATION
DRY
11/05
20+80.00
A
ORANGE BROWN, DRY, LOOSE TO
MED. DENSE FINE SAND (A-3)
MIDDENDORF FORMATION
A ALLUVIUM, GRAY TO BLACK, DRY, VERY SOFT, MUCK
20+60.00
-Y5-



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
U-2519E
SHEET NO.
86
50 40 30 20 10 0 10 20 30 40 50
75
70
80
75
70
65
A
ORANGE BROWN, DRY, LOOSE TO
MED. DENSE FINE SAND (A-3)
MIDDENDORF FORMATION
21+20.00
A
ORANGE BROWN, DRY, LOOSE TO
MED. DENSE FINE SAND (A-3)
MIDDENDORF FORMATION
A ALLUVIUM, GRAY TO BLACK, DRY, VERY SOFT, MUCK
21+00.00
-Y5-

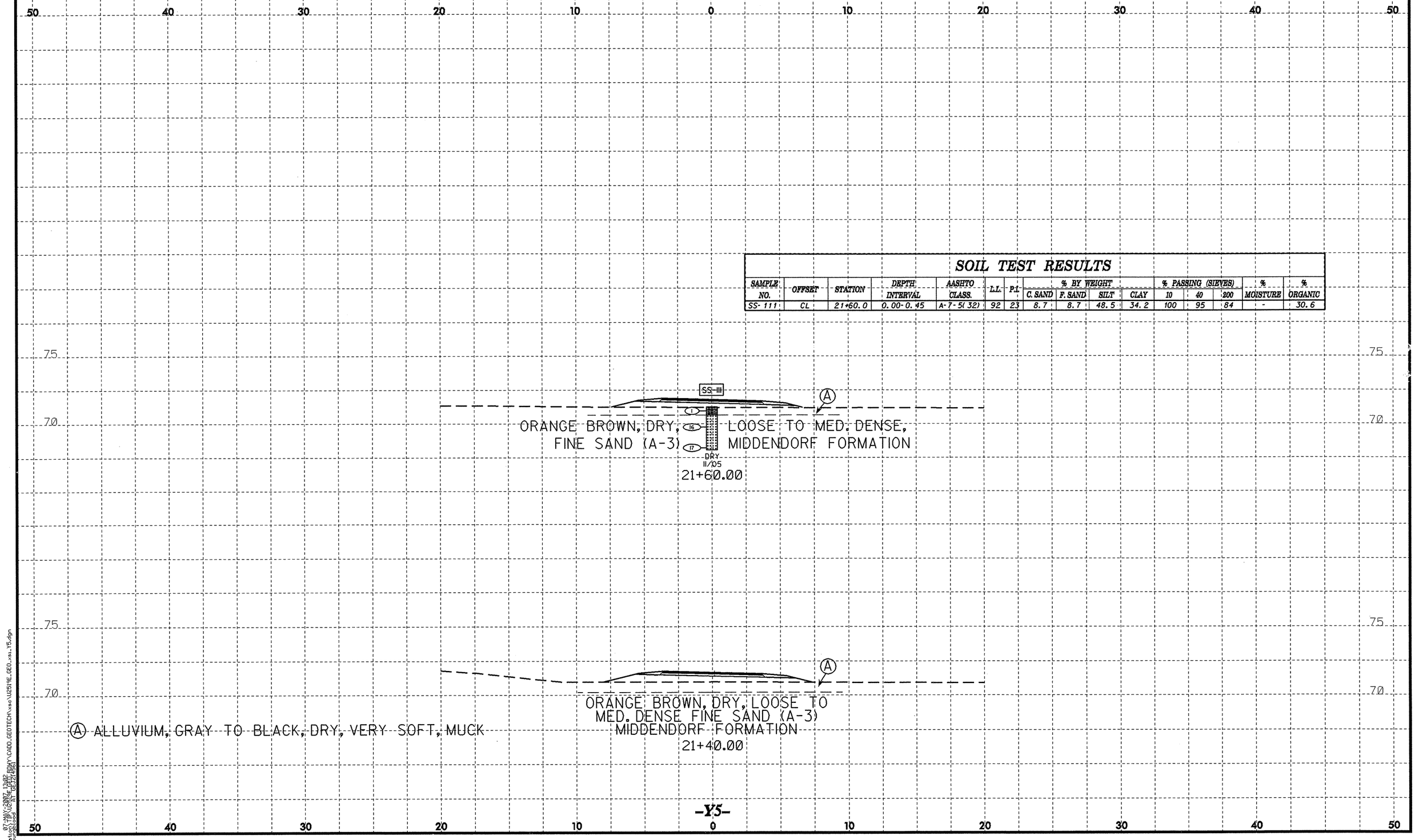
PROJECT REFERENCE NO.	SHEET NO.
U-2519E	87

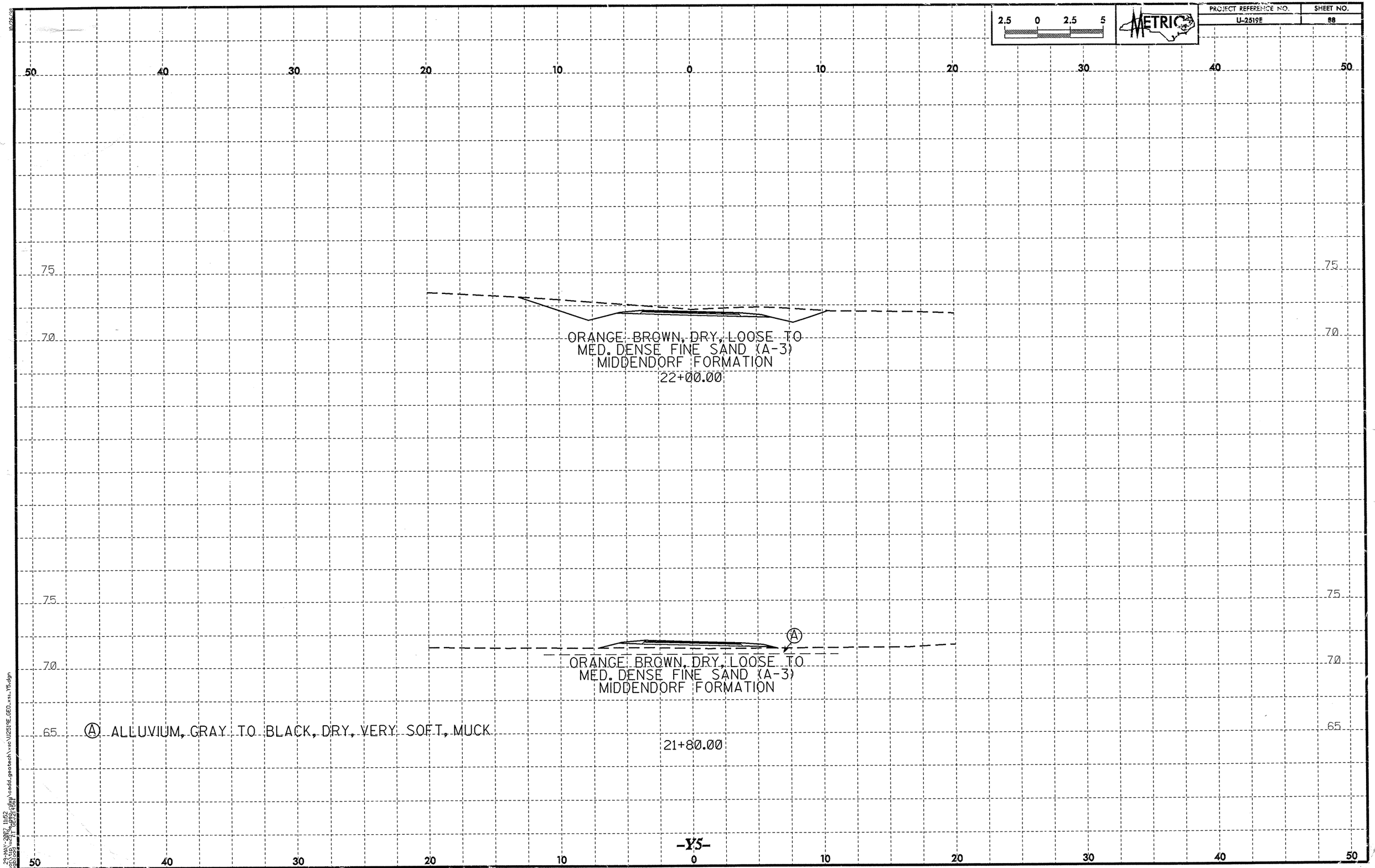
2.5 0 2.5 5

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-111	CL	21+60.0	0.00-0.45	A-7-5(32)	92	23	8.7	8.7	48.5	34.2	100	95	84	-	30.6





PROJECT REFERENCE NO.
U-2519E
SHEET NO.
88
METRIC
2.5 0 2.5 5
50 40 30 20 10 0 10 20 30 40 50
75
70
65
ORANGE BROWN, DRY, LOOSE TO
MED. DENSE FINE SAND (A-3)
MIDDENDORF FORMATION
22+00.00
A
ORANGE BROWN, DRY, LOOSE TO
MED. DENSE FINE SAND (A-3)
MIDDENDORF FORMATION
A ALLUVIUM, GRAY TO BLACK, DRY, VERY SOFT, MUCK
21+80.00
-Y5-

ID: X-0002B

CONTRACT: C201977

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

CONTENTS

LINE	STATION	PLAN	PROFILE	XSECT
-L-	49+80-74+80	4-11	25-32	
-L-	74+80-76+20	11	32	71-76
-L-	76+20-83+40	11-13	32-34	
-COL 2-	49+03-51+40	4	65	
-CDR-	49+52-71+85	4-10	42-48	
-RPCDR-	10+00-17+22	4-7	49-50	
-FLYOVER-	10+00-31+83	5-8, 15-16	59-64	
-SPUR B-	11+94-18+10	7-8, 16	54	
-RPB-	10+00-15+67	7-8	52-53	
-LPB-	10+00-13+13	8	53	
-RPC-	10+60-15+72	7-8	55-56	
-LPC-	10+00-13+66	8	57-58	
-Y1-	15+87-29+80	8, 14-16	35-37	
-Y1-	29+80-30+40	8	37	77-80
-Y1-	30+40-35+09	8, 17	37	
-Y2-	10+00-34+98	18-24	38-41	
-TT7-	14+10-39+02	4-8, 14-16	66-70	

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

ROADWAY SUBSURFACE INVESTIGATION

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.	X-0002B	1	80

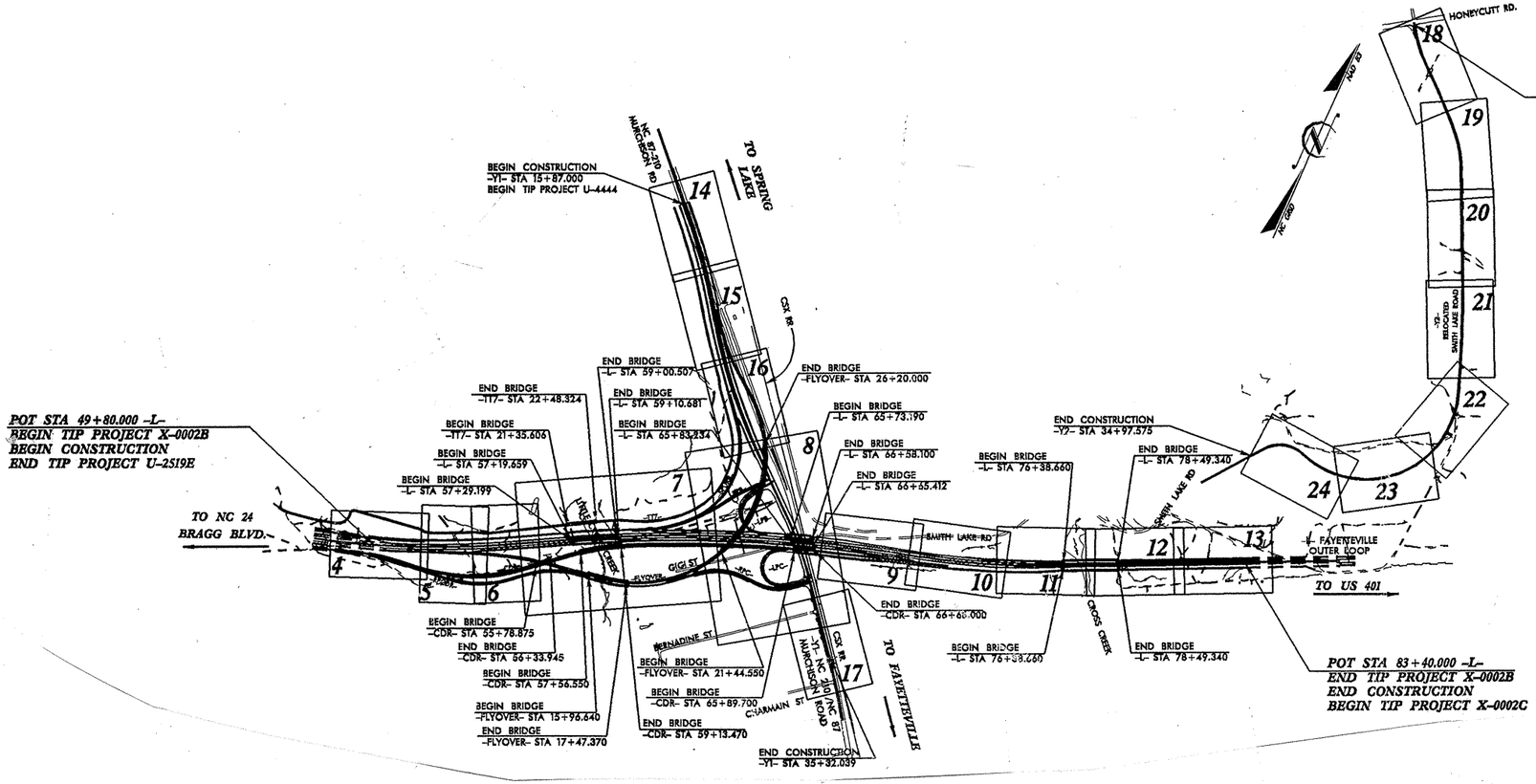
WBS NO.	F.A. PROJ. NO.	DESCRIPTION
35196.1.3	NHF-DPR-0100(002)	PE
35196.2.3		ROW; Util
35196.3.15		CONSTRUCTION

PROJ. REFERENCE NO. *35196.1.3 (X-0002B)* F.A. PROJ. *NHF-DPR0100 (002)*

COUNTY *CUMBERLAND*

PROJECT DESCRIPTION *NC 24 EXTENSION (FAYETTEVILLE OUTER LOOP) FROM NC 24 TO 1.3 MILES EAST OF NC 87 - 210*

INVENTORY



CAUTION NOTICE

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

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

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON 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.

PERSONNEL

J. I. MILKOVITS, JR.

J. L. PEDRO

M. L. REEDER

CONSULTANTS:

MACTEC

S&ME

INVESTIGATED BY *J. I. MILKOVITS, JR.*

CHECKED BY *N. T. ROBERSON*

SUBMITTED BY *N. T. ROBERSON*

DATE *FEBRUARY, 2007*

NORTH CAROLINA LICENSED SEAL 1912 GEOLOGIST NEIL T. ROBERSON

2/17/07

DRAWN BY: *W.D. FIELDS*

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

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.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

PROJECT REFERENCE NO.	SHEET NO.
35196.1.3 (X-0002B)	2

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD 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. 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, SATY 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 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
LIQUID LIMIT PLASTIC INDEX	6 MX		NP	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

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 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	<4	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<25
	SOFT	2 TO 4	25 TO 50
	MEDIUM STIFF	4 TO 8	50 TO 100
	STIFF	8 TO 15	100 TO 200
	VERY STIFF	15 TO 30	200 TO 400
	HARD	>30	>400

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	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
	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 SL — SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
	- 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, YELLOW-BROWN, 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 IS 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 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 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 SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- 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 - CALIFORNIA BEARING RATIO SAMPLE

ABBREVIATIONS

AR - AUGER REFUSAL	HI. - HIGHLY	w - MOISTURE CONTENT
BT - BORING TERMINATED	MED. - MEDIUM	V - VERY
CL. - CLAY	MICA. - MICACEOUS	VST - VANE SHEAR TEST
CPT - CONE PENETRATION TEST	MOD. - MODERATELY	WEA. - WEATHERED
CSE. - COARSE	NP - NON PLASTIC	γ - UNIT WEIGHT
DMT - DILATOMETER TEST	ORG. - ORGANIC	γ_d - DRY UNIT WEIGHT
DPT - DYNAMIC PENETRATION TEST	PMT - PRESSUREMETER TEST	
e - VOID RATIO	SAP. - SAPROLITIC	
F - FINE	SD. - SAND, SANDY	
FOSS. - FOSSILIFEROUS	SL. - SILT, SILTY	
FRAC. - FRACTURED, FRACTURES	SLI. - SLIGHTLY	
FRAGS. - FRAGMENTS	TCR - TRICONE REFUSAL	

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [X] MOBILE B- 57
- [X] BK-51
- [ ] CME-45C
- [X] CME-550
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

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

HAMMER TYPE:
- [ ] AUTOMATIC [X] MANUAL

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

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF 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 3 CM PER 60 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 FOLLOWS:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER 30 CM IF TESTED.
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 1 INCH. 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 ROCK 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 13 MM DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 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 INCHES 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	3 TO 10 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 THAT 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 IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT 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 (FP) - 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 (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

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

SAPROLITE (SAP.) - RESIDUAL SOIL THAT 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, THAT 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 M REQUIRED TO PRODUCE A PENETRATION OF 30 CM INTO SOIL WITH A 5 CM OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 3 CM PER 60 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 (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CM DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: N/A

ELEVATION: N/A

NOTES:

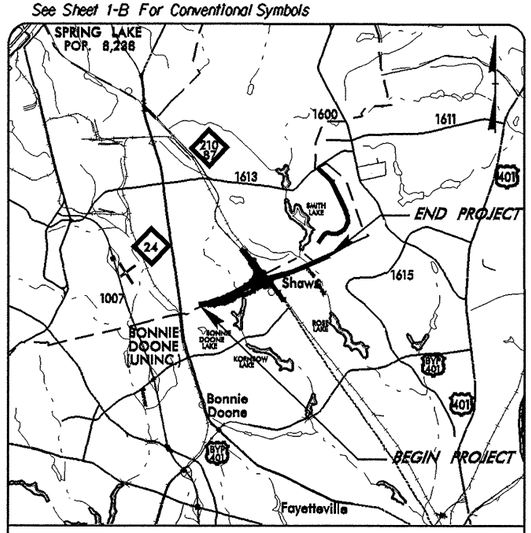
REVISED 02/23/06

9/09/99

TIP PROJECT: X-002B

CONTRACT: TIP

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



— FORT BRAGG BOUNDARY

VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN AND PROFILE OF PROPOSED
STATE HIGHWAY

METRIC

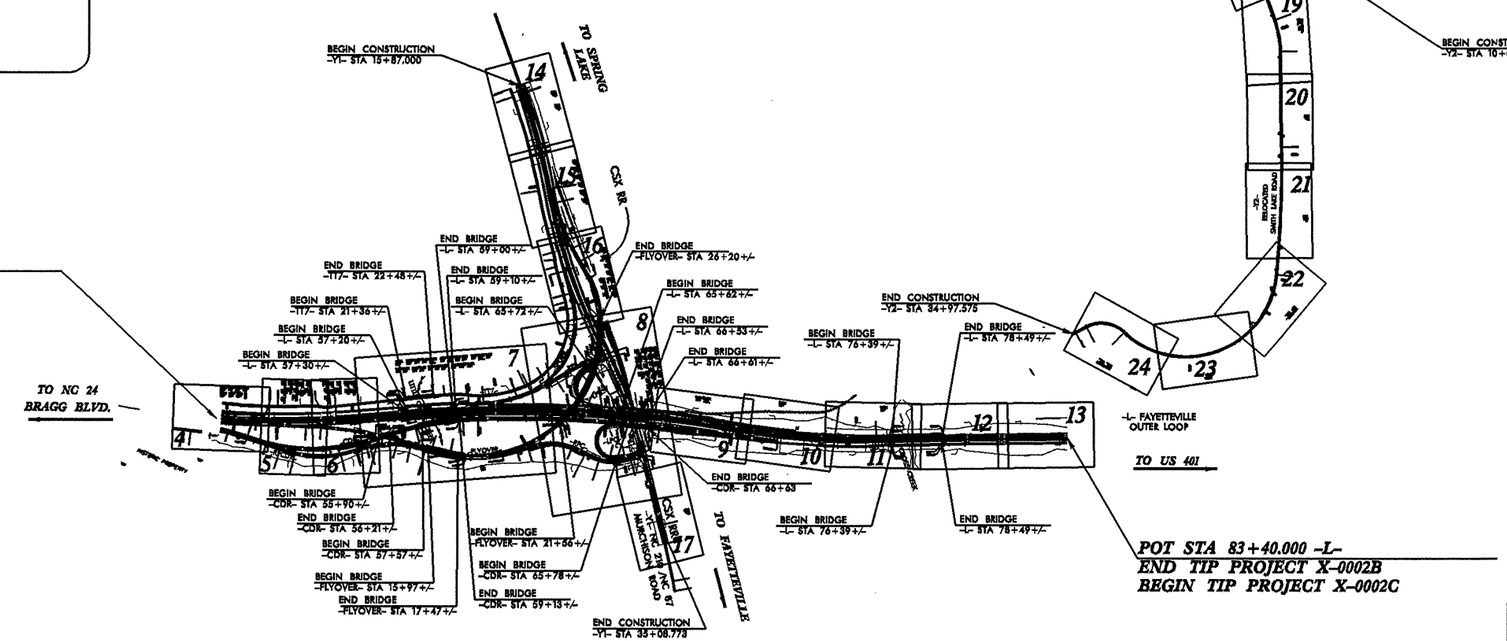
ALL DIMENSIONS IN THESE PLANS ARE IN METERS AND/OR MILLIMETERS UNLESS OTHERWISE SHOWN

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	X-0002B	2A	80
WBS NO.	F.A. PROJ. NO.	DESCRIPTION	
35196.1.3	NHF-DPR-0100(002)	P.E.	

CUMBERLAND COUNTY

LOCATION: ***FAYETTEVILLE OUTER LOOP FROM EAST OF NC 24 (BRAGG BLVD.) TO 1.74 km EAST OF NC 87 /NC 210 (MURCHISON RD.)***

TYPE OF WORK: ***GRADING, STRUCTURES, PAVING, GUARDRAIL, CURB AND GUTTER, DRAINAGE, SIGNALS, AND SIGNING***



CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

NOTE: THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS LIMITED TO INTERCHANGES

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

GRAPHIC SCALE

5 0 10
PLANS
5 0 10
PROFILE (HORIZONTAL)
1 0 2
PROFILE (VERTICAL)

DESIGN DATA

ADT 2008 = 57,500
ADT 2030 = 74,300
DHV = 9 %
D = 55 %
T = 12 % *
V = 110 km/h
* TTST 4% + DUAL 8%
FUNC. CLASS = INTERSTATE

THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF FAYETTEVILLE

PROJECT LENGTH

LENGTH OF ROADWAY, TIP PROJECT X-0002B = 2.879 km

LENGTH OF STRUCTURES, TIP PROJECT X-0002B = 0.481 km

TOTAL LENGTH, TIP PROJECT X-0002B = 3.360 km

*NOTE: LENGTH BASED ON WBL BRIDGES

Prepared In the Office of:
Ralph Whitehead Associates, Inc.
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: *May, 2006*

LETTING DATE: *June 17, 2008*

JOHN E. ALFORD, P.E.
PROJECT ENGINEER

GERALD M. BARBOUR
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

15-FEB-2007 13:42
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Michael F. Easley
GOVERNOR

P.O. BOX 25201, RALEIGH, N.C. 27611-5201

Lyndo Tippett
SECRETARY

March 22, 2007

STATE PROJECT: 35196.1.3 (X-0002B)
FEDERAL PROJECT: NHF-DPR-0100 (002)
COUNTY: Cumberland

DESCRIPTION: NC 24 Extension (Fayetteville Outer Loop) from NC 24 to 1.3 miles east of NC 87/210

SUBJECT: Geotechnical Report - Inventory

Project Description

This project consists of the construction on new location of NC 24, Fayetteville Outer Loop (-L-), along with several -Y- lines. The proposed facility will consist of a four to five-lane, divided roadway and the interchange and tie-in with existing NC 87/210, Murchison Road. Bridges are to be constructed over Little Cross Creek (see plan sheet No. 7), Cross Creek (see plan sheet No.11) and NC 87/210 (see plan sheet No. 8).

A geotechnical investigation was conducted during May - July 2006. ATV-mounted B-57, BK 51 and CME-550 drill machines with manual hammers were used during the investigation. Standard Penetration Tests were performed at selected locations and additional borings were advanced using continuous flight augers or using rotary with bentonite drilling fluid. 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. The following alignments were investigated.

-L-	49+80.000 to 83+40.000
-COL2-	49+03.337 to 51+40.000
-CDR-	49+51.881 to 71+85.206
-RPCDR-	10+36.408 to 17+21.946
-FLYOVER-	10+00.000 to 31+83.011
-SPURB-	11+93.738 to 18+10.466
-RPB-	10+00.000 to 15+66.870
-LPB-	10+00.000 to 13+13.158
-RPC-	10+60.000 to 15+71.878
-LPC-	10+00.000 to 13+65.804
-Y1-	15+87.000 to 35+08.773
-Y2-	10+00.000 to 34+97.575
-TT7-	14+09.933 to 39+02.001

Areas of Special Geotechnical Interest

1) Highly Plastic Clays: Highly plastic clays were encountered on the project at the following intervals:

Line	Stations
-L-	57+00 to 59+20
-L-	70+40 to 72+80
-L-	74+50 to 76+15
-L-	76+30 to 78+60
-L-	80+80 to 81+20
-Y1-	23+80 to 24+20
-Y1-	29+90 to 30+40
-CDR-	58+80 to 59+40
-CDR-	65+50 to 66+00
-CDR-	68+20 to 71+85
-SPURB-	15+60 to 16+20
-SPURB-	17+20 to 17+60
-RPC-	11+40 to 13+40
-LPC-	10+00 to 10+90
-RPD-	10+45 to 12+40
-FLYOVER-	10+40 to 11+20
-FLYOVER-	14+00 to 15+40
-FLYOVER-	20+30 to 21+80
-COL2-	48+40 to 50+40
-TT7-	22+00 to 22+80
-TT7-	38+00 to 39+00

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

Line	Station	Offset (m)
-TT7-	35+74 +/-	CL

3) Lakes and Ponds: Pond within or in close proximity of right of way is noted at the following location.

Line	Station	Offset (m)
-L-	71+60 to 72+40+/-	CL

Physiography and Geology

The project is located in the Coastal Plain Physiographic Province. Land use along the project corridor consists of a combination of wooded land, wetlands, homes and businesses. Geologically, the site is located within the Middendorf Formation underlain by the Cape Fear Formation.

Soil Properties

Soils encountered during this investigation consist of roadway embankment, alluvial, Coastal Plain, and artificial fill soils.

Roadway Embankment soils were encountered in small amounts associated with several existing roadways on the project. These soils are similar to and derived from the Coastal Plain soils encountered elsewhere on the project.

Alluvial soils are present in the floodplains of the Little Cross Creek and Cross Creek, that crosses the project corridor. These soils consist primarily of tan to tan-gray and orange, saturated, loose, fine and silty sand (A-3, A-2-4).

Coastal Plain soils were encountered in the Middendorf and the Cape Fear Formations. Middendorf Formation soils consist primarily of orange-brown to tan-orange, tan and gray, moist to saturated, very loose to very dense, coarse and fine sand, silty and clayey sand (A-1-b, A-3, A-2-4, A-2-6, A-2-7). Red-brown to tan-brown and gray, moist, soft to very stiff, highly plastic, sandy and silty clay (A-6, A-7) are also present.

Artificial Fill soils consist of gray and red, moist, loose to medium dense, silty sand (A-2-4). Asphalt is present in the artificial fill located along the proposed -CDR- between Sta. 68+50 and Sta. 69+70+/- and ranges from surface to a depth of 9.00 meters.

BULK SAMPLES

The following bulk samples were taken for tests to determine the engineering properties of the soil.

Sample No.	Location	Depth (m)	Test
CBR-1	52+20, 5m RT, -CDR-	0.30 - 2.13 m	California Bearing Ratio
CBR-2	54+20, CL, -L-	0.30 - 2.00 m	California Bearing Ratio
CBR-3	12+80, 10m LT, -LPB-	0.00 - 3.00 m	California Bearing Ratio
CBR-500	81+60, CL, -L-	9.00 - 13.39 m	California Bearing Ratio
CBR-505	20+80, CL, -Y1-	0.00 – 3.00 m	California Bearing Ratio

Prepared by,

Joseph I. Milkovits, Jr.
Project Engineering Geologist

EARTHWORK BALANCE SHEET

Volumes in Cubic Meters

PROJECT **TIP #** X-0002B COUNTY Cumberland DATE 3/18/2009 SHEET 38 OF 80 SHEETS

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT EXCAV.	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	EARTH EMB.	EMBANK. +25'%'	BORROW	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
-L-	49+80.00	57+20.00	6371				6371	55119	0	55119	68899	62528			0
-COL2-	49+03.337	50+75.36													
-FLYOVER-	10+00.00	11+57.64	INCLUDED IN -L- VOLUMES (SEE XSC'S)										INCLUDED IN -L- VOLUMES		
-TT7-	14+09.933	21+22.865													
-CDR-	49+50.00	53+80.000	284				284	112345	0	112345	140431	140147			0
-RPCDR-	10+00.00	13+26.854	INCLUDED IN -CDR- VOLUMES (SEE XSC'S)										INCLUDED IN -CDR- VOLUMES		
-FLYOVER-	11+57.64	15+50.556	1075				1075	9479	0	9479	11849	10774			0
-RPCDR-	13+26.854	17+20.00	1239				1239	31717	0	31717	39646	38407			0
-FLYOVER-	15+50.556	15+90.833	INCLUDED IN -RPCDR- VOLUMES (SEE XSC'S)								0		INCLUDED IN -L- VOLUMES		
125mm EXTRA MATERIAL FROM GRADING								4733		4733	5916	5916			
SUBTOTAL SUMMARY NO. 1			8969	0	0	0	8969	213393	0	213393	266741	257772	0	0	0
-L-	59+20.000	65+60.00	8089				8089	350961	0	350961	438701	430612			0
-CDR-	59+19.033	65+45.522													
-LPB-	10+00.00	10+25.102													
-LPC-	10+00.00	10+30.978	INCLUDED IN -L- VOLUMES (SEE XSC'S)										INCLUDED IN -L- VOLUMES		
-RPB-	10+00.00	11+00.694													
-TT7-	22+63.991	24+87.237													
-FLYOVER	17+60.00	21+40.00	0				0	175916	0	175916	219895	219895			0
-RPC-	10+00.00	11+01.962	INCLUDED IN -FLYOVER- VOLUMES (SEE XSC'S)										INCLUDED IN -FLYOVER- VOLUME		
-LPB-	10+25.102	12+77.76	24195				24195	35179	0	35179	43974	19779			0
-RPB-	15+12.231	15+52.391	INCLUDED IN -LPB- VOLUMES (SEE XSC'S)										INCLUDED IN -LPB- VOLUMES		
-LPC-	10+30.978	12+56.018	710				710	76801	0	76801	96001	95291			0
-RPB-	11+00.694	15+12.231	3023				3023	11980	0	11980	14975	11952			0
-SPURB-	11+93.738	12+80.00	INCLUDED IN -RPB- VOLUMES (SEE XSC'S)					NCLUDED IN -RPB- VOLUMES (SEE XSC'S					INCLUDED IN -RPB- VOLUMES		
-TT7-	24+87.237	26+68.866													
-RPC-	11+01.962	15+33.04	4884				4884	247207	0	247207	309009	304125			0
-LPC-	12+56.818	13+54.012	INCLUDED IN -RPC- VOLUMES (SEE XSC'S)										INCLUDED IN -RPC- VOLUMES		
-SPURB-	12+80.00	16+56.613	2606				2606	32394	0	32394	40493	37887			0
-TT7-	26+68.866	29+84.971	INCLUDED IN -SPURB- VOLUMES (SEE XSC'S)										INCLUDED IN -SPURB- VOLUMES		
125mm EXTRA MATERIAL FROM GRADING								6305		6305	7881	7881			
SUBTOTAL SUMMARY NO. 2			43507	0	0	0	43507	936743	0	936743	1170929	1127422	0	0	0

*** 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.**

EARTHWORK BALANCE SHEET

Volumes in Cubic Meters

PROJECT **TIP #** X-0002B COUNTY Cumberland DATE 3/18/2009 SHEET 30 OF 80 SHEETS

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT EXCAV.	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	EARTH EMB.	EMBANK. +'25%'	BORROW	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
-Y1-	16+00.00	25+00.00	28050				28050	38658	0	38658	48323	20273			0
-FLYOVER-	29+97.600	31+83.011													
-SPURB-	16+56.613	18+10.466	INCLUDED IN -L- VOLUMES (SEE XSC'S)										INCLUDED IN -L- VOLUMES		
-TT7-	29+84.971	38+89.002													
-FLYOVER-	26+32.828	29+97.600	1968				1968	38311	0	38311	47889	45921			
125mm EXTRA MATERIAL FROM GRADING								372		372	465	465			
SUBTOTAL SUMMARY NO. 3			30018	0	0	0	30018	77341	0	77341	96677	66659	0	0	0
-Y1-	25+00.00	35+00.00	29050		2560		29050	40687	0	40687	50859	21809		2560	2560
SUBTOTAL SUMMARY NO. 4			29050	0	2560	0	29050	40687	0	40687	50859	21809	0	2560	2560
PROJECT SUBTOTAL			111544	0	2560	0	111544	1268164	0	1268164	1585206	1473662	0	2560	2560
ADDITIONAL UNDERCUT					2500			2500		2500	3125	3125		2500	2500
WASTE IN LIEU OF BORROW												0	0		0
EST. SHOULDER MATERIAL								3404		3404	4255	4255			
LOSS DUE TO CLEARING & GRUBBING			-4700				-4700					4700			
PROJECT TOTAL			106844	0	5060	0	106844	1274068	0	1274068	1592586	1485742	0	5060	5060
EST 5% TO REPLACE TOP SOIL ON BORROW PIT												74287			
GRAND TOTAL			106844	0	5060	0	106844	1274068	0	1274068	1592586	1560029	0	5060	5060
SAY			**107000**								**1593000**	**1561000**	**0**	**6000**	**6000**
PAVEMENT STRUCTURE VOLUME = 6,750 CM															

*** 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.**

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR GPS MONUMENT "X2D8" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 154807.5364(m) EASTING: 625333.9514(m)
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- POC STATION 49+80.000 IS
S 73° 54' 20.62" W 11,931.171 (m)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

END TIP PROJECT U-2519DA
BEGIN TIP PROJECT X-0002B
BEGIN CONSTRUCTION -L- POC Sta. 49+80.000
BEGIN CONSTRUCTION -COL2- POC Sta. 49+03.337
BEGIN CONSTRUCTION -TT7- POC Sta. 14+09.933
BEGIN CONSTRUCTION -CDR- POC Sta. 49+51.881

-CDR-
PI Sta 46+72.084
Δ = 14° 24' 28.8" (LT)
L = 271.601
T = 135.867
R = 3,530.300
SE = .RC

PIs Sta 48+86.159
Θs = 3° 16' 26.6"
Ls = 80.000
LT = 53.342
ST = 26.675

PI Sta 49+47.221
Δ = 5° 37' 39.2" (RT)
L = 68.754
T = 34.404
R = 700.000
SE = .06
RUNOFF = 80.000

PIs Sta 50+08.245
Θs = 3° 16' 26.6"
Ls = 80.000
LT = 53.342
ST = 26.675

-TT7-
PI Sta 14+62.371
Δ = 9° 52' 59.7" (LT)
L = 338.556
T = 169.699
R = 1,962.700
SE = 0.00

-COL2-
PI Sta 49+55.070
Δ = 9° 52' 59.7" (LT)
L = 344.990
T = 172.924
R = 2,000.000
SE = .NC

-L-
PI Sta 50+03.492
Δ = 14° 10' 30.7" (LT)
L = 864.676
T = 434.557
R = 3,495.000
SE = .RC

METRIC
5 0 10

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	4
R /W SHEET NO.	4
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.

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 36434
CHARLOTTE, NORTH CAROLINA 28236

NC GRID NAD 83

-TT7- 15+00

-L- 50+00

-TT7-

-COL2-

-CDR-

-CDR- 50+00

-CDR- SRS Sta.50+61.571

-RPCDR-

-RRCDR- POT Sta.10+00.000=
-CDR- SRS Sta.50+61.571
3.600 RT.

-CDR- PT Sta.48+07.817

-CDR- TS Sta.48+32.817

-CDR- SG Sta.49+12.817

-CDR- CS Sta.49+43.571

BL 27
POT 44+39.466
-L- 50+24.312, 49.465 RT

BL 28
POT 45+30.889
-L- 51+14.205, 55.293 RT

+14.151 BEGIN PAVED SHOULDER TAPER

+33.405

N 71° 52' 16.3" E

N 72° 28' 46.3" E -BL-

N 71° 43' 53.8" E -BL-

N 84° 02' 48.6" E

13.333 TYP.

15.346 TYP.

ROADWAY EMBANKMENT

COASTAL PLAIN

THE GUARDRAIL TO PROPOSED GUARDRAIL ON PROJECT U-2519DA

48" WW FENCE

600 mm - 900 mm U/G

WOODS

RETAINING WALL

24 SOIL

3.6 FDPS

1.2 FDPS

10.5

7.2

SEE SHEET NO.5 -TT7- STA.15+80.000

SEE SHEET NO.5 -L- STA.54+50.000

SEE SHEET NO.5 -CDR- STA.51+30.000

FOR -L- PROFILE SEE SHEET 25
FOR -CDR- PROFILE SEE SHEET 30
FOR -RPCDR- SEE SHEET 34
FOR -TT7- PROFILE SEE SHEET 51
FOR -COL2- PROFILE SEE SHEET 41

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NAD 83 + NC GRID

SEE SHEET NO.6 -TT7- STA.18+00.000

SEE SHEET NO.6 -L- STA.53+80.000

SEE SHEET NO.6 -FLYOVER- STA.11+80.000

SEE SHEET NO.6 -CDR- STA.53+60.000

SEE SHEET NO.6 -RPCDR- STA.12+80.000

-L- +73.137
51.720 LT
(169.686')

-TT7- PRC Sta.17+97.099

-L- +60.000
60.960 LT
(200.000')

-TT7- PRC Sta.17+66.332

-L- +42.126
61.496 LT
(201.758')

-L- +42.126
55.000 LT
(180.446')

-FLYOVER-

PIs Sta 11+50.321
Θs = 1° 13' 40.0"
Ls = 60.000
LT = 40.001
ST = 20.001

PI Sta 12+94.904
Δ = 10° 10' 14.10" (RT)
L = 248.514
T = 124.584
R = 1,400.000
SE = 0.025
RUNOFF = 60.000

-L-

PI Sta 50+03.492
Δ = 14° 10' 30.7" (LT)
L = 864.676
T = 434.557
R = 3,495.000
SE = RC

-COL2-

PI Sta 49+21.674
Δ = 8° 49' 22.8" (LT)
L = 307.981
T = 154.295
R = 2,000.000

-CDR-

PIs Sta 50+08.245
Θs = 3° 16' 26.6"
Ls = 80.000
LT = 53.342
ST = 26.675

PIs Sta 51+14.913
Θs = 3° 16' 26.6"
Ls = 80.000
LT = 53.342
ST = 26.675

PI Sta 53+22.973
Δ = 29° 03' 24.5" (LT)
L = 354.996
T = 181.403
R = 700.000
SE = 0.06
RUNOFF = 80.000

-L- +63.000
62.789 LT
(206.000')

-L- +55.000
72.542 LT
(238.000')

-RPCDR-

PIs Sta 11+80.012
Θs = 4° 17' 49.9"
Ls = 60.000
LT = 40.012
ST = 20.011

PI Sta 12+92.553
Δ = 26° 04' 59.4" (LT)
L = 182.095
T = 92.653
R = 400.000
SE = .07
RUNOFF = 60.000

-L- +50.000
69.494 LT
(228.000')

-L- +50.000
62.484 LT
(205.000')

-TT7-

PI Sta 14+62.371
Δ = 9° 52' 59.65" (LT)
L = 338.556
T = 169.699
R = 1,962.700
SE = 0.00

PI Sta 16+98.789
Δ = 2° 15' 00.92" (LT)
L = 136.104
T = 67.561
R = 3,440.000
SE = 0.00

PI Sta 17+81.770
Δ = 31° 45' 07.45" (RT)
L = 30.767
T = 15.438
R = 150.000
SE = 0.00

-TT7- PCC Sta.16+31.228

-L- +04.862
55.000 LT
(180.446')

-COL2- PCC Sta.50+75.360=
+L- POC Sta.51+53.091,21.300 LT.

-L- +60.000
62.484 LT
(205.000')

-FLYOVER- SC Sta.11+70.320

-FLYOVER- TS Sta.11+10.320

-FLYOVER- POT Sta.10+00.000=
-L- POC Sta.52+03.700,17.700 RT.

END PAVED SHOULDER TAPER

BL 30
POT 47+22.730
-L- 53+02.943, 54.359 RT

BL 29
POT 46+31.269
-L- 52+12.971, 57.456 RT

N 58° 30' 37.8" E -BL-

N 63° 02' 35.1" E -BL-

N 63° 14' 04.2" E

N 67° 45' 55.9" E -BL-

N 84° 02' 48.6" E

-RPCDR-

-CDR-

-RPCDR- +40.000
45.720 RT
(150.000')

-RPCDR- +00.000
35.052 RT
(115.000')

-RPCDR- SC Sta.12+00.000

-RPCDR- +40.000
41.148 RT
(135.000')

-RPCDR- TS Sta.11+40.000

-CDR- SC Sta.51+41.521

48" WW FENCE

COASTAL PLAIN

COASTAL

WOODS

SEE SHEET NO.4 -TT7- STA.15+80.000

SEE SHEET NO.4 -L- STA.51+50.000

SEE SHEET NO.4 -CDR- STA.51+30.000

FOR -L- PROFILE SEE SHEET 25
FPR -CDR- PROFILE SEE SHEET 30
FOR -RPCDR- SEE SHEET 34
FOR - FLYOVER- PROFILE SEE SHEET 35
FOR -TT7- PROFILE SEE SHEET 51

METRIC

5 0 10

CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	5
R /W SHEET NO.	5

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

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

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

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PROJECT REFERENCE NO.	SHEET NO.
X-0002B	6
R /W SHEET NO.	6

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.

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35434
CHARLOTTE, NORTH CAROLINA 28235

NAD 83 + NC GRID

SEE SHEET NO.7 -TT7- STA.20+00.000

SEE SHEET NO.7 -L- STA.55+80.000

SEE SHEET NO.7 -FLYOVER- STA.13+80.000

SEE SHEET NO.7 -CDR- STA.55+60.000

SEE SHEET NO.7 -RPCDR STA.15+00.000

-CDR- ST Sta.55+56.567

-CDR- CS Sta.54+96.567

-RPCDR- SRS Sta.14+42.095

-RPCDR- CS Sta.13+82.095

-L- ST Sta.55+25.611

-L- CS Sta.54+33.611

-TT7- PT Sta.18+38.302

48" WW FENCE

COASTAL PLAIN

N 59° 37' 02.0" E

N 61° 20' 59.7" E

-TT7-

PI Sta 17+81.770
Δ = 11° 45' 07.45" (RT)
L = 30.767
T = 15.438
R = 150.000
SE = 0.00

PI Sta 18+17.831
Δ = 15° 44' 19.08" (LT)
L = 41.204
T = 20.732
R = 150.000
SE = 0.00

-L-

PI Sta 50+03.492
Δ = 14° 10' 30.7" (LT)
L = 864.676
T = 434.557
R = 3,495.000
SE = RC

PIs Sta 54+64.278
θs = 0° 45' 14.8"
Ls = 92.000
LT = 61.334
ST = 30.667

-FLYOVER-

PIs Sta 11+50.321
θs = 1° 13' 40.0"
Ls = 60.000
LT = 40.001
ST = 20.001

PI Sta 12+94.904
Δ = 10° 10' 14.10" (RT)
L = 248.514
T = 124.584
R = 1,400.000
SE = 0.025
RUNOFF = 60.000

-CDR-

PI Sta 53+22.973
Δ = 29° 03' 24.5" (LT)
L = 354.996
T = 181.403
R = 700.000
SE = 0.06
RUNOFF = 60.000

PIs Sta 55+16.570
θs = 2° 27' 19.9"
Ls = 60.000
LT = 40.004
ST = 20.003

-RPCDR-

PI Sta 12+92.653
Δ = 26° 04' 59.4" (LT)
L = 182.095
T = 92.653
R = 400.000
SE = .07
RUNOFF = 60.000

PIs Sta 14+02.106
θs = 4° 17' 49.9"
Ls = 60.000
LT = 40.012
ST = 20.011

PIs Sta 14+82.107
θs = 4° 17' 49.9"
Ls = 60.000
LT = 40.012
ST = 20.011

+13.000 BEGIN RETAINING WALL

+30.000 BEGIN RETAINING WALL

+46.661 BEGIN EXPRESSWAY GUTTER

BL 32
POT 49+06.084
-L- 54+83.625, 34.637 RT

BL 31
POT 48+15.318
-L- 53+93.874, 46.304 RT

FOR -L- PROFILE SEE SHEETS 25 & 26
FOR -CDR- PROFILE SEE SHEETS 30 & 31
FOR -RPCDR- PROFILE SEE SHEET 34
FOR -FLYOVER- PROFILE SEE SHEET 35
FOR -TT7- PROFILE SEE SHEET 51

SEE SHEET NO.5 -TT7- STA.18+00.000

SEE SHEET NO.5 -L- STA.53+80.000

SEE SHEET NO.5 -FLYOVER- STA.11+80.000

SEE SHEET NO.5 -CDR- STA.53+60.000

SEE SHEET NO.5 -RPCDR- STA.12+80.000

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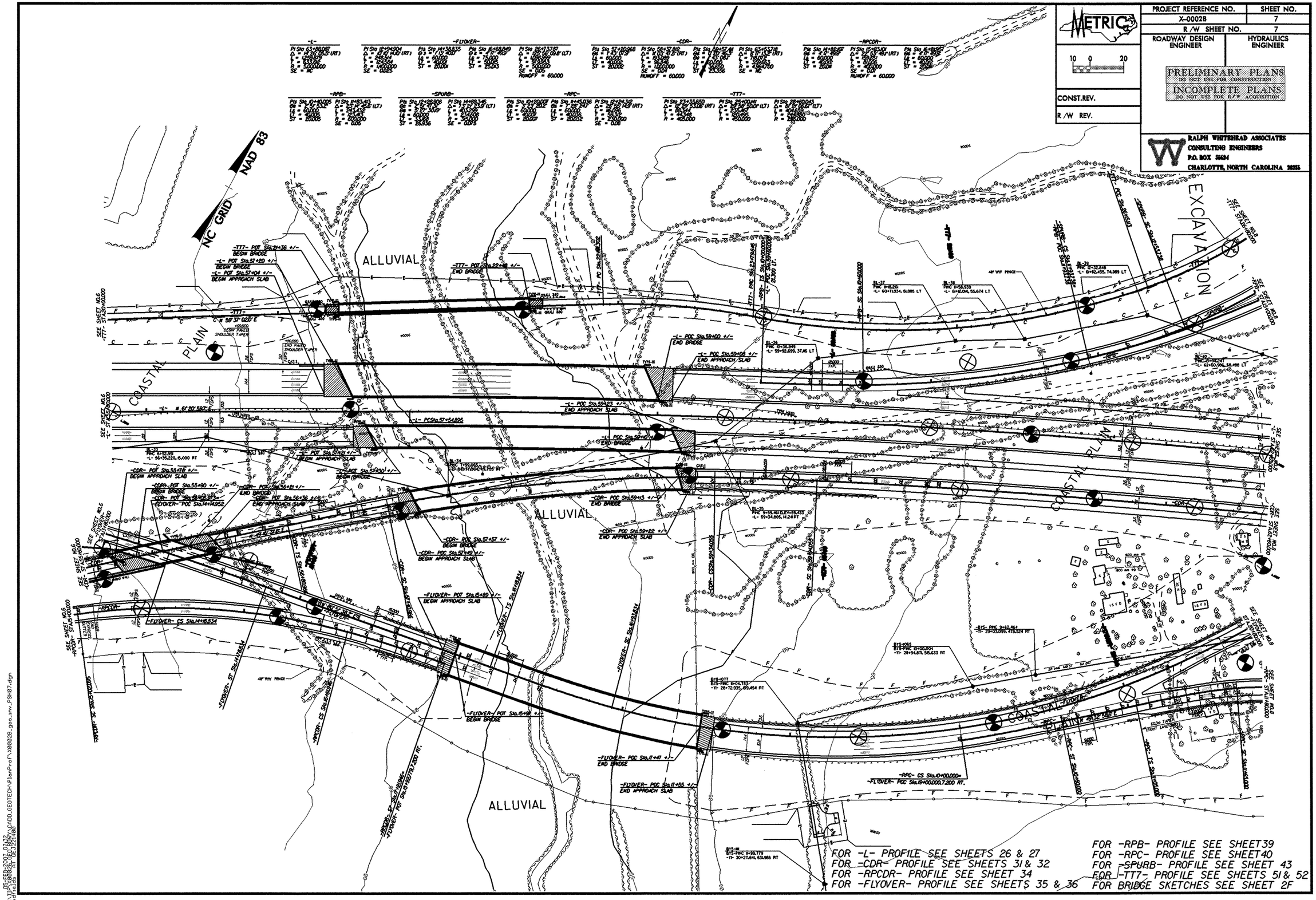


METRIC
10 0 20
CONST.REV.
R/W REV.
PROJECT REFERENCE NO.
X-0002B
SHEET NO.
7
R/W SHEET NO.
7
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 36694
CHARLOTTE, NORTH CAROLINA 28256
NC GRID NAD 83
ALLUVIAL
COASTAL PLAIN
EXCAVATION
FOR -L- PROFILE SEE SHEETS 26 & 27
FOR -CDR- PROFILE SEE SHEETS 31 & 32
FOR -RPCDR- PROFILE SEE SHEET 34
FOR -FLYOVER- PROFILE SEE SHEETS 35 & 36
FOR -RPB- PROFILE SEE SHEET39
FOR -RPC- PROFILE SEE SHEET40
FOR -SPURB- PROFILE SEE SHEET 43
FOR -TT7- PROFILE SEE SHEETS 51 & 52
FOR BRIDGE SKETCHES SEE SHEET 2F

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	8
R /W SHEET NO.	8
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.

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35434
CHARLOTTE, NORTH CAROLINA 28235

NAD 83 / NC GRID

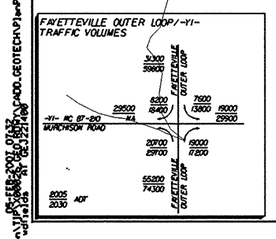
B

C

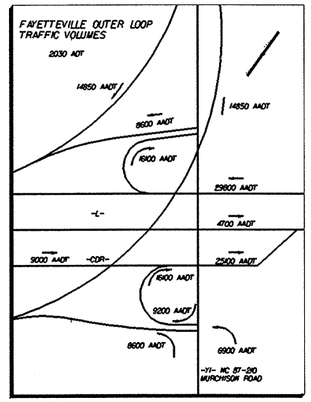
COASTAL PLAIN

COASTAL PLAIN

FAYETTEVILLE OUTER LOOP/-Y1- TRAFFIC VOLUMES



FAYETTEVILLE OUTER LOOP TRAFFIC VOLUMES



UNDERCUT EXCAVATION

FOR -L- PROFILE SEE SHEET 27
FOR -CDR- PROFILE SEE SHEET 32
FOR -FLYOVER- PROFILE SEE SHEETS 36 & 37
FOR -RPB- SEE SHEET 39
FOR -RPC- SEE SHEET 40
FOR -LPB- SEE SHEET 41
FOR -LPC- SEE SHEET 42
FOR -SPURB- PROFILE SEE SHEET 43
FOR Y1- PROFILE SEE SHEETS 45 & 46
FOR -TT7- PROFILE SEE SHEETS 52 & 53
FOR BRIDGE SKETCHES SEE SHEET 21

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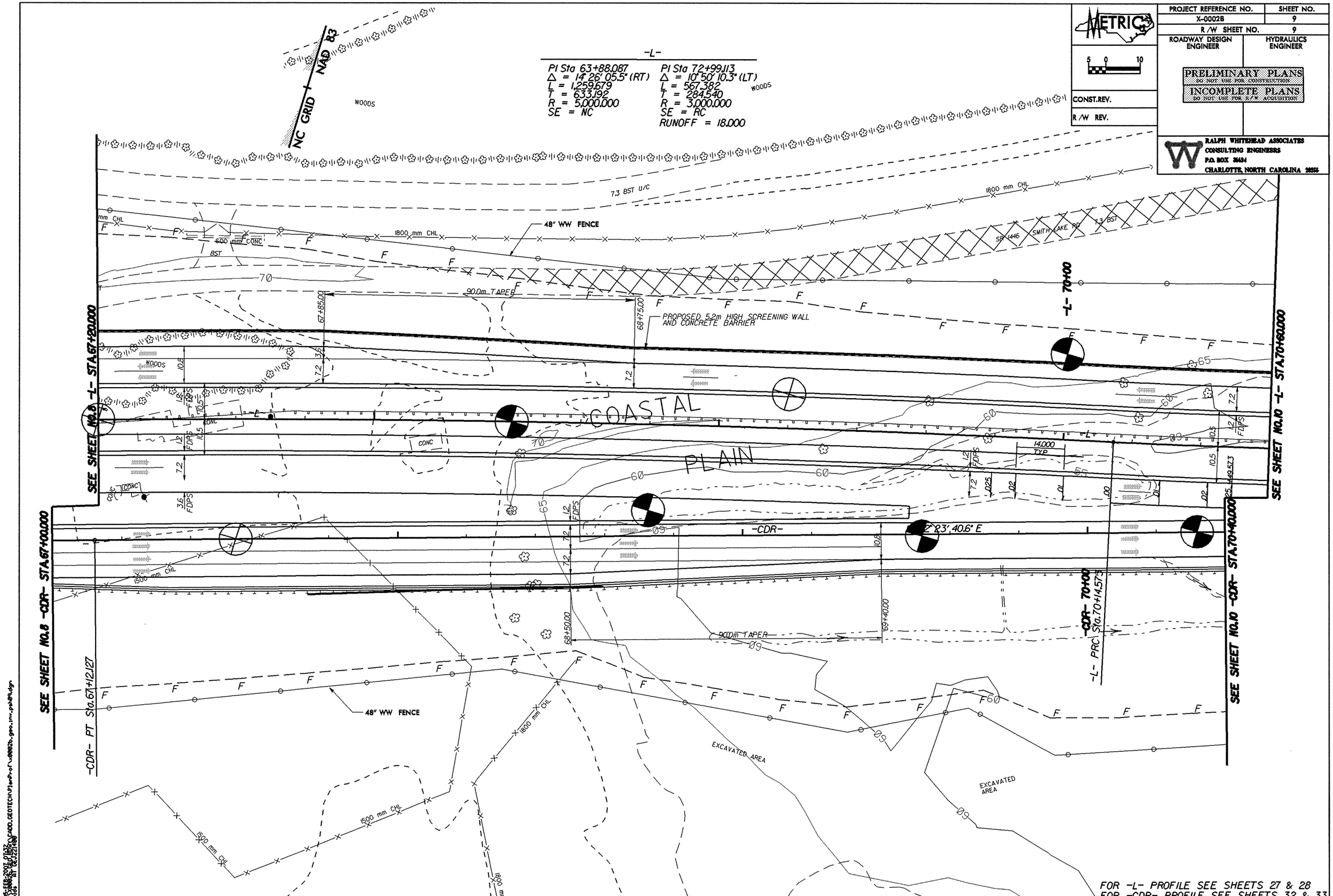

METRIC
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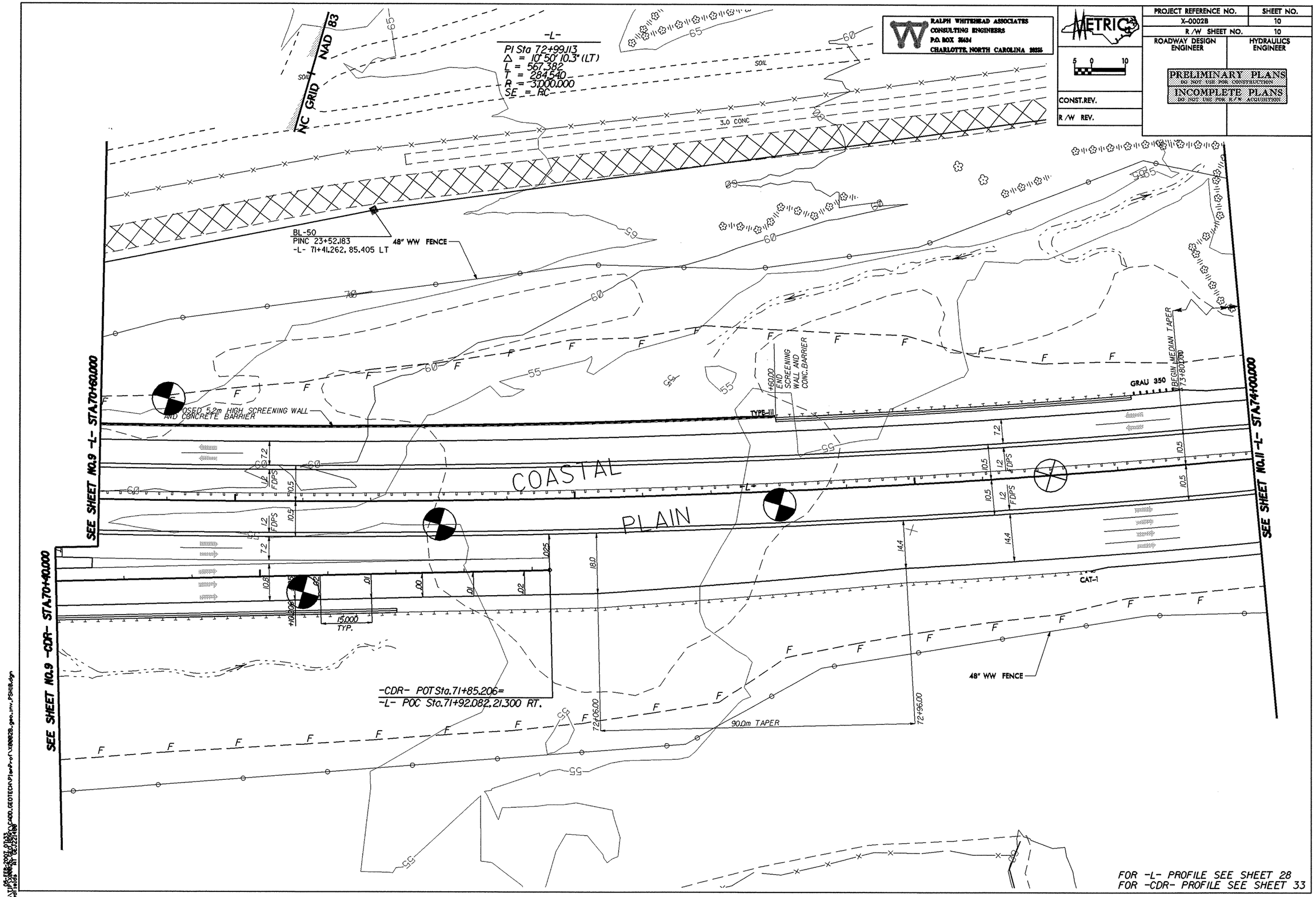
CONST.REV.
R/W REV.
PROJECT REFERENCE NO.
X-0002B
SHEET NO.
9
R/W SHEET NO.
9
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 36434
CHARLOTTE, NORTH CAROLINA 28235
-L-
PI Sta 63+88.087
Δ = 14° 26' 05.5" (RT)
L = 1,259.679
T = 633.192
R = 5,000.000
SE = NC
PI Sta 72+99.113
Δ = 10° 50' 10.3" (LT)
L = 567.382
T = 284.540
R = 3,000.000
SE = RC
RUNOFF = 18.000
NC GRID NAD 83
WOODS
7.3 BST U/C
1800 mm CHL
48" WW FENCE
600 mm CONC
BST
SR 1446 SMITH LAKE RD
90.0m TAPER
PROPOSED 5.2m HIGH SCREENING WALL AND CONCRETE BARRIER
67+85.00
68+75.00
-L- 70+00
COASTAL
PLAIN
CONC
14.000 TYP
-CDR-
2° 23' 40.6" E
1500 mm CHL
68+50.00
69+40.00
-CDR- 70+00
-L- PRC Sta.70+14.573
-CDR- PT Sta.67+12.127
SEE SHEET NO.8 -L- STA.67+20.000
SEE SHEET NO.8 -CDR- STA.67+00.000
SEE SHEET NO.10 -L- STA.70+60.000
SEE SHEET NO.10 -CDR- STA.70+40.000
EXCAVATED AREA
FOR -L- PROFILE SEE SHEETS 27 & 28
FOR -CDR- PROFILE SEE SHEETS 32 & 33



RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235
METRIC
PROJECT REFERENCE NO.
X-0002B
SHEET NO.
10
R/W SHEET NO.
10
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.
-L-
PI Sta 72+99.113
Δ = 10° 50' 10.3" (LT)
L = 567.382
T = 284.540
R = 3,000.000
SE = RC
NC GRID NAD 83
SOIL
3.0 CONC
BL-50
PINC 23+52.183
-L- 71+41.262, 85.405 LT
48" WW FENCE
OSED 5.2m HIGH SCREENING WALL AND CONCRETE BARRIER
+60.00 END SCREENING WALL AND CONC. BARRIER
TYPE-III
GRAU 350
BEGIN MEDIAN TAPER 73+80.000
COASTAL
PLAIN
SEE SHEET NO.9 -L- STA.70+60.000
SEE SHEET NO.9 -CDR- STA.70+40.000
SEE SHEET NO.11 -L- STA.74+00.000
15.000 TYP.
CAT-1
-CDR- POT Sta.71+85.206=
-L- POC Sta.71+92.082, 21.300 RT.
72+06.00
72+96.00
90.0m TAPER
48" WW FENCE
FOR -L- PROFILE SEE SHEET 28
FOR -CDR- PROFILE SEE SHEET 33

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	11
R /W SHEET NO.	11

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

METRIC 5 0 10

CONST.REV.

R /W REV.

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

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 26534
CHARLOTTE, NORTH CAROLINA 28226

-L-
PI Sta 72+99.113
Δ = 10° 50' 10.3" (LT)
L = 567.382
T = 284.540
R = 3,000.000
SE = RC

NC GRID (NAD 83)

-L- 75+00

-L- POT Sta.75+81.956

-L- POT Sta.76+31 +/-
BEGIN APPROACH SLAB

-L- POT Sta.76+39 +/-
BEGIN BRIDGE

SEE SHEET NO.10 -L- STA.74+00.000

SEE SHEET NO.12 -L- STA.77+40.000

COASTAL PLAIN

ALLUVIAL

N 64° 56' 54.8" E

-L-

WOODS

37 SOIL

SOIL

EXCAVATED AREA

CAT-1

TYPE III

TYPE M350

GRAU 350

14.000 TYP.

170.956

-L- POT Sta.76+39 +/-
BEGIN BRIDGE
-L- POT Sta.76+31 +/-
BEGIN APPROACH SLAB

FOR -L- PROFILE SEE SHEETS 28 & 29
FOR BRIDGE SKETCHES SEE SHEET 2F

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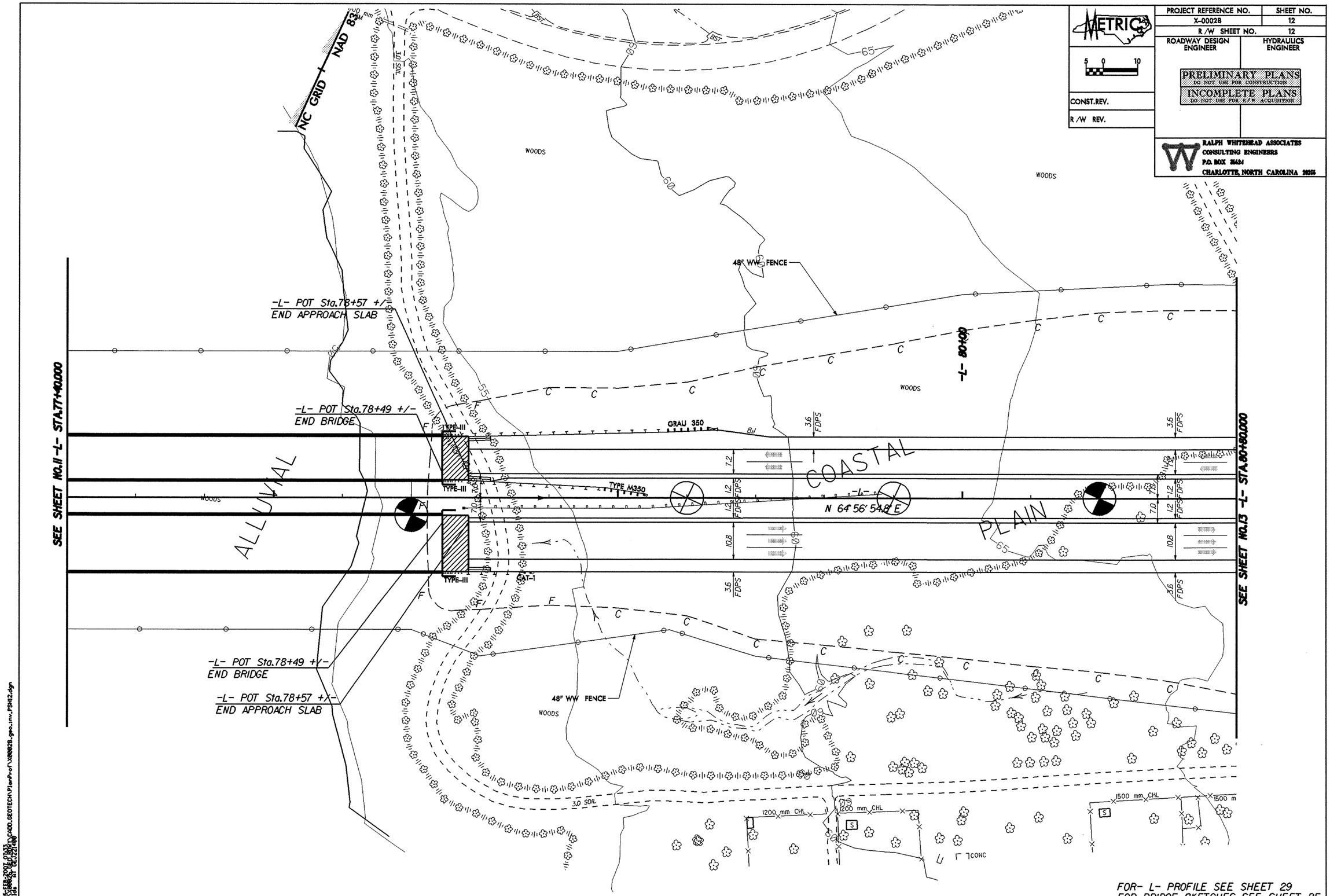


PROJECT REFERENCE NO.	SHEET NO.
X-0002B	12
R/W SHEET NO.	12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST.REV.

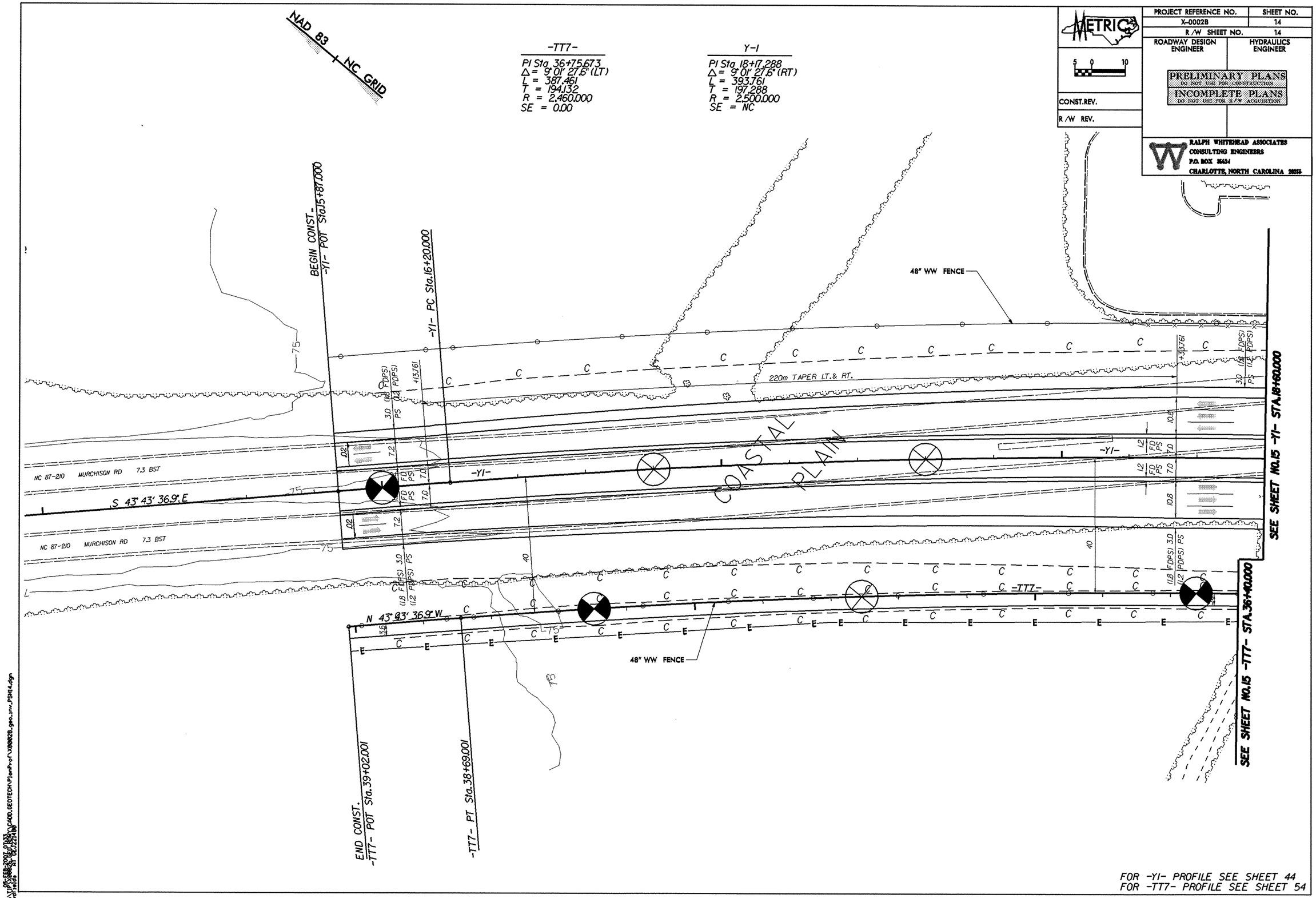
R/W REV.

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

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 36424
CHARLOTTE, NORTH CAROLINA 28236

FOR- L- PROFILE SEE SHEET 29
FOR BRIDGE SKETCHES SEE SHEET 2F

PROJECT REFERENCE NO.
X-0002B
SHEET NO.
13
R/W SHEET NO.
13
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
METRIC
5 0 10
CONST.REV.
R/W REV.
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235
NC GRID NAD 83
END TIP PROJECT X-0002B
END CONSTRUCTION -L- POT Sta.83+40.000
SEE SHEET NO.12 -L- STA.80+80.000
COASTAL PLAIN
-L-
N 64° 56′ 54.8″ E
48″ WW FENCE
U/G GAS LINE
3.0 SOIL
SOIL
WOODS
GRAU 350
600 mm CM
1200 mm CHL
1800 mm CHL
1500 mm CHL
1800 mm WD
CONC
FDPS
FOR -L- PROFILE SEE SHEET 29



NAD 83 NC GRID
-TT7-
PI Sta 36+75.673
Δ = 9° 01' 27.6" (LT)
L = 387.461
T = 194.132
R = 2,460.000
SE = 0.00
Y-1
PI Sta 18+17.288
Δ = 9° 01' 27.6" (RT)
L = 393.761
T = 197.288
R = 2,500.000
SE = NC
METRIC
5 0 10
CONST.REV.
R/W REV.
PROJECT REFERENCE NO.
X-0002B
SHEET NO.
14
R/W SHEET NO.
14
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35424
CHARLOTTE, NORTH CAROLINA 28235
BEGIN CONST.
-Y1- POT Sta.15+87.000
-Y1- PC Sta.16+20.000
48" WW FENCE
220m TAPER LT.& RT.
COASTAL PLAIN
NC 87-210 MURCHISON RD 7.3 BST
S 43° 43' 36.9" E
N 43° 43' 36.9" W
-Y1-
-TT7-
SEE SHEET NO.15 -Y1- STA.18+60.000
SEE SHEET NO.15 -TT7- STA.36+40.000
END CONST.
-TT7- POT Sta.39+02.001
-TT7- PT Sta.38+69.001
FOR -Y1- PROFILE SEE SHEET 44
FOR -TT7- PROFILE SEE SHEET 54

-Y-1	-FLYOVER-	-TT7-
PI Sta 18+17.288 Δ = 9° 01' 27.6" (RT) L = 393.761 T = 197.288 R = 2,500.000 SE = NC	PI Sta 23+20.072 Δ = 13° 58' 14.3" (LT) L = 609.584 T = 306.311 R = 2,500.000 SE = NC RUNOFF = 60.000	PI Sta 30+25.909 Δ = 13° 58' 42.8" (RT) L = 195.178 T = 98.076 R = 800.000 SE = 0.04	Pls Sta 31+47.886 Θs = 0° 41' 29.0" Θs = 2° 08' 55.2" Ls = 60.000 LT = 35.137 ST = 24.875	PI Sta 36+75.673 Δ = 9° 01' 27.59" (LT) L = 387.461 T = 194.132 R = 2,460.000 SE = 0.00	PI Sta 33+54.526 Δ = 5° 44' 06.22" (RT) L = 254.243 T = 127.228 R = 2,540.000 SE = 0.00

METRIC

5 0 10

CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	15
R /W SHEET NO.	15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 36434
CHARLOTTE, NORTH CAROLINA 28236

NAD 83 + NC GRID

-Y1- 20+00

FLYOVER ST Sta.31+83.011= -Y1- PRC Sta.20+13.761N 42.00D RT.

FLYOVER CS Sta.31+23.011

48" WW FENCE

-FLYOVER- 30+00

NC 87-210 MURCHISON RD 7.3 BST

104.296 BEGIN MEDIAN TAPER LT.

-FLYOVER-

-Y1-

-TT7-

-TT7- 35+00

-TT7- PRC Sta.34+81.541

COASTAL PLAIN

SEE SHEET NO.14 -Y1- STA.18+60.000

SEE SHEET NO.14 -TT7- STA.36+40.000

SEE SHEET NO.16 -Y1- STA.22+20.000

SEE SHEET NO.16 -TT7- STA.32+80.000

FOR -FLYOVER- PROFILE SEE SHEETS 37 & 38
FOR -Y1- PROFILE SEE SHEETS 44
FOR -TT7- PROFILE SEE SHEETS 53 & 54

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PROJECT REFERENCE NO.	SHEET NO.
X-0002B	16
R /W SHEET NO.	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST.REV.

R /W REV.

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

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35654
CHARLOTTE, NORTH CAROLINA 28235

-YI-
PI Sta 23+20.072
Δ = 13° 58' 14.3" (LT)
L = 609.584
T = 306.311
R = 2,500.000
SE = NC

-FLYOVER-
PI Sta 26+73.787
Δ = 125° 56' 09.8" (LT)
L = 1,098.999
T = 979.953
R = 500.000
SE = 0.05
RUNOFF = 75.000

PIs Sta 28+17.847
Os = 4° 17' 49.9"
Ls = 75.000
LT = 50.015
ST = 25.013

PIs Sta 29+07.836
Os = 2° 08' 54.9"
Ls = 60.000
LT = 40.003
ST = 20.003

PI Sta 30+25.909
Δ = 13° 58' 42.8" (RT)
L = 195.178
T = 98.076
R = 800.000
SE = 0.04
RUNOFF = 60.000

-SPURB-
PI Sta 14+88.346
Δ = 73° 21' 23.9" (LT)
L = 403.299
T = 234.608
R = 315.000
SE = 0.075
RUNOFF = 60.000

PIs Sta 16+77.054
Os = 5° 27' 24.3"
Ls = 60.000
LT = 40.019
ST = 20.017

-TT7-
PI Sta 33+54.526
Δ = 5° 44' 06.22" (RT)
L = 254.243
T = 127.228
R = 2,540.000
SE = 0.00

PI Sta 32+11.535
Δ = 12° 05' 12.94" (LT)
L = 31.644
T = 15.881
R = 150.000
SE = 0.00

PI Sta 31+81.473
Δ = 10° 51' 59.04" (RT)
L = 28.448
T = 14.267
R = 150.000
SE = 0.00

NAD 83 + NC GRID

-FLYOVER- SRS Sta.28+16.833

-FLYOVER- CS Sta.27+92.833

-FLYOVER- SC Sta.29+27.833

48" WW FENCE

PROPOSED 5.2m HIGH SCREENING WALL & CONCRETE BARRIER

SCREENING WALL END

NC 87-210 MURCHISON RD 7.3 BST

NC 87-210 MURCHISON RD 8.5 BST

WOODS

3.0 CONC

2.7 CONC

CAT-1

TYPE-III

15.0m (TYP.)

135.0m TAPER

+47.296 PCC LT.EOP & BEGIN MEDIAN TAPER RT.

-FLYOVER- POC Sta.26+28 +/-
END APPROACH SLAB

2650.000m RADIUS ON LT.EOP

450mm C & G

+94.230
15.353

+91.577

3.0 (1.8 FDPS)
PS (1.2 PDPS)

(1.8 FDPS) 3.0
(1.2 PDPS) FDPS

GRAU 350

N 39° 04' 13.8" W

N 39° 13' 01.6" W

-TT7- C

10.909 (TYP.)

-SPURB-

-TT7- PRC Sta.32+27.298

-TT7- PRC Sta.31+95.554

-TT7- IPC Sta.31+67.206

-SPURB- POT Sta.18+10.466=
-YI- POC Sta.23+48.511, 17.800 RT.

-SPURB- SC Sta.17+81.037

-TT7- PT Sta.30+19.772

-TT7- 30+00

-SPURB- CS Sta.16+57.037

SEE SHEET NO.15 -YI- STA.22+20.000

SEE SHEET NO.15 -TT7- STA.32+80.000

SEE SHEET NO.8 -YI- STA.25+20.000

SEE SHEET NO.8 -FLYOVER- STA.28+20.000

SEE SHEET NO.8 -TT7- STA.29+20.000

SEE SHEET NO.8 -SPURB- STA.15+80.000

COASTAL PLAIN

FOR -FLYOVER- PROFILE SEE SHEET 37
FOR -SPURB- PROFILE SEE SHEET 43
FOR -YI- PROFILE SEE SHEET 45
FOR -TT7- PROFILE SEE SHEET 53
FOR BRIDGE SKETCHES SEE SHEET 2F

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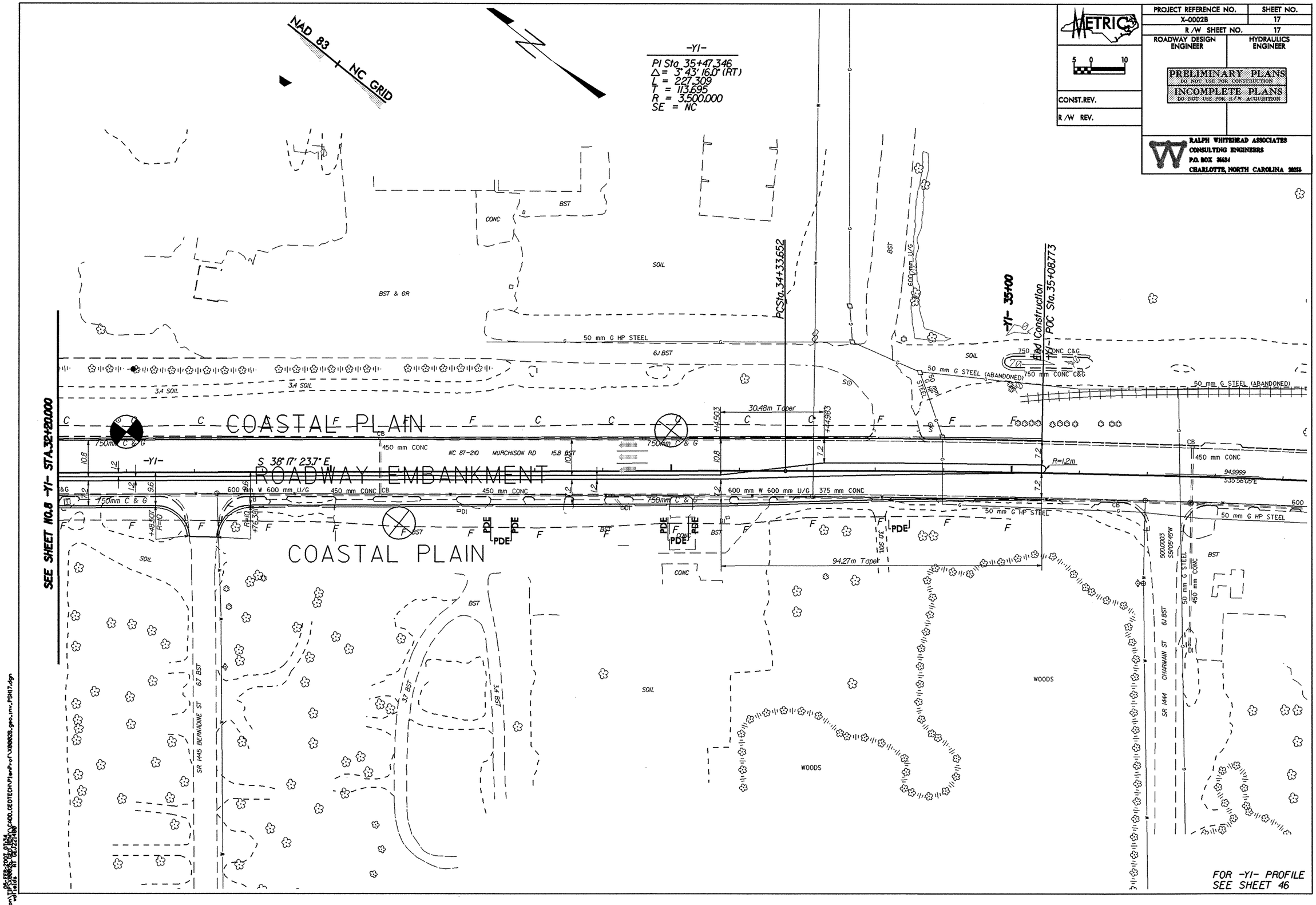


METRIC

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	17
R/W SHEET NO.	17
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.

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 36424
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	18
R/W SHEET NO.	18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST.REV.

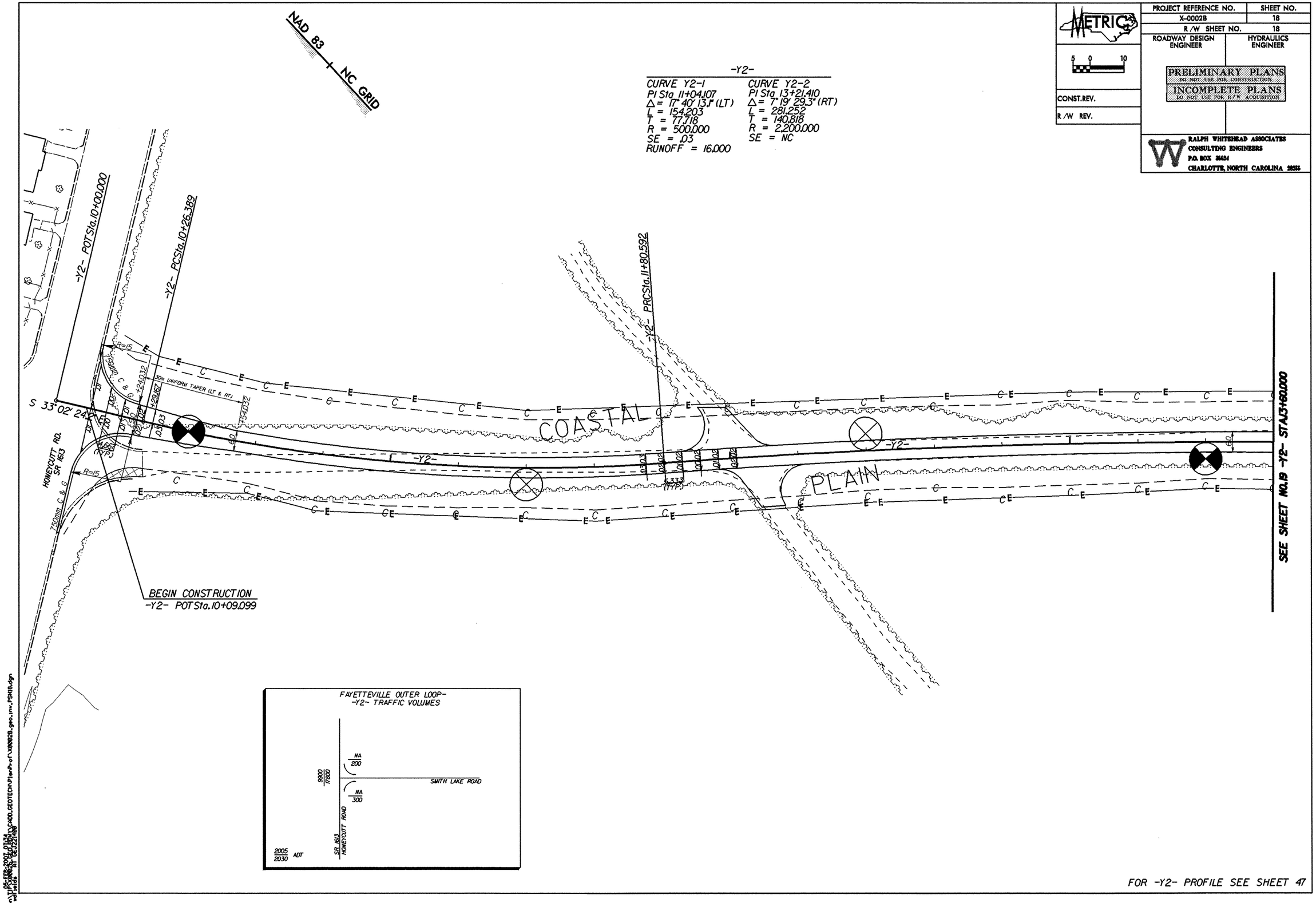
R/W REV.

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

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

-Y2-

CURVE Y2-1	CURVE Y2-2
PI Sta 11+04.107	PI Sta 13+21.410
Δ= 17° 40' 13.1" (LT)	Δ= 7° 19' 29.3" (RT)
L = 154.203	L = 281.252
T = 77.718	T = 140.818
R = 500.000	R = 2,200.000
SE = .03	SE = NC
RUNOFF = 16.000	



FOR -Y2- PROFILE SEE SHEET 47

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	19
R/W SHEET NO.	19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

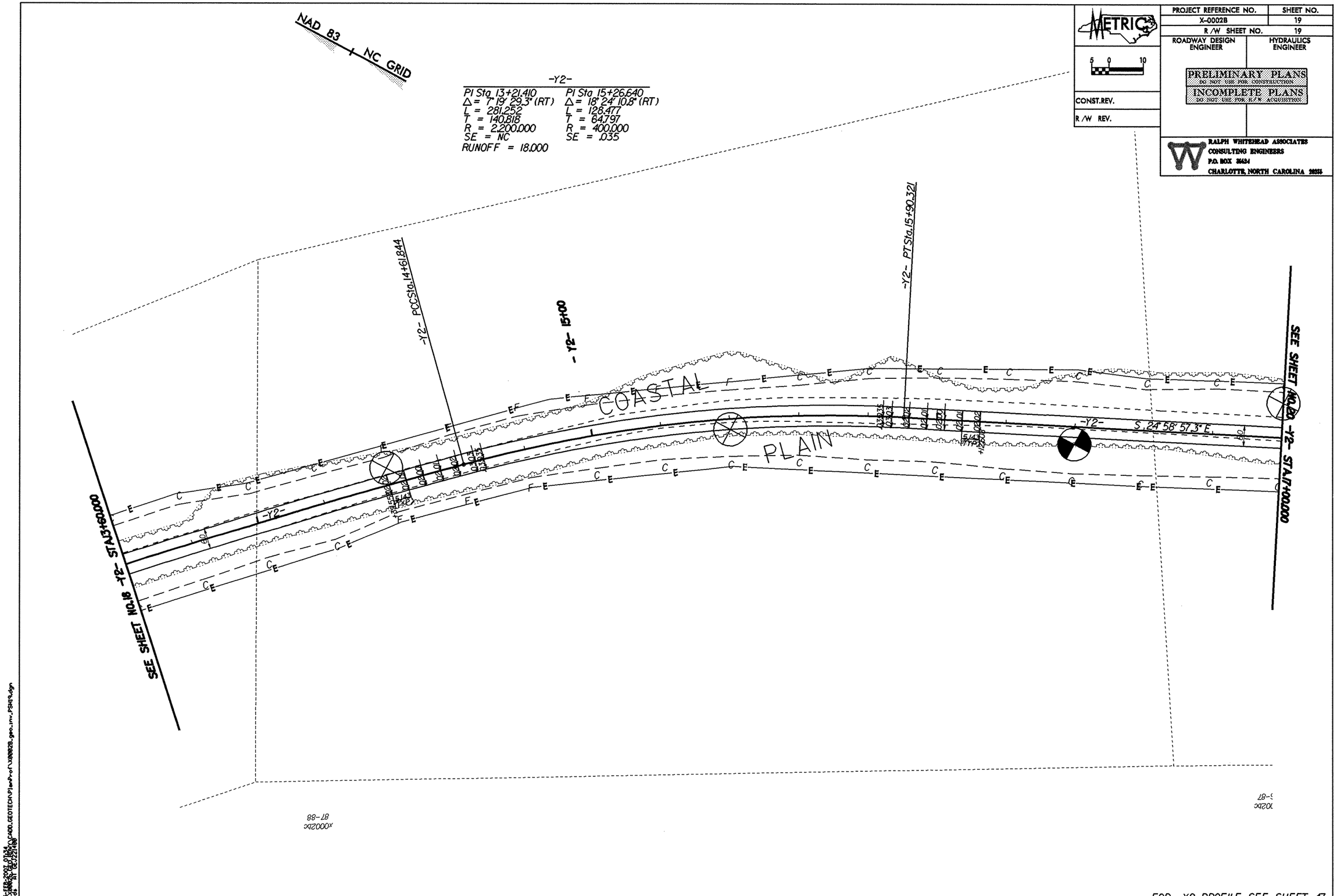
5 0 10

CONST.REV.

R/W REV.

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

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 36424
CHARLOTTE, NORTH CAROLINA 28235



FOR -Y2 PROFILE SEE SHEET 47

NAD 83 / NC GRID

-Y2-
PI Sta. 22+24.601
Δ = 5°47'03.6" (RT)
L = 509.825
T = 255.129
R = 5,050.000
SE = NC

METRIC
5 0 10

CONST. REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	20
R/W SHEET NO.	20

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

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

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35434
CHARLOTTE, NORTH CAROLINA 28235

-Y2- STA. 17+00.000

-Y2- PCS Sta. 19+69.412

-Y2- 20+00

-Y2- STA. 20+40.000

SEE SHEET NO. 19

SEE SHEET NO. 21

COASTAL

PLAN

-Y2-

S 24°58'57.3" E

-Y2-1

60'

PDE

FW

FO

FES

FOR -Y2- PROFILE SEE SHEETS 47 & 48

3-98
X0002

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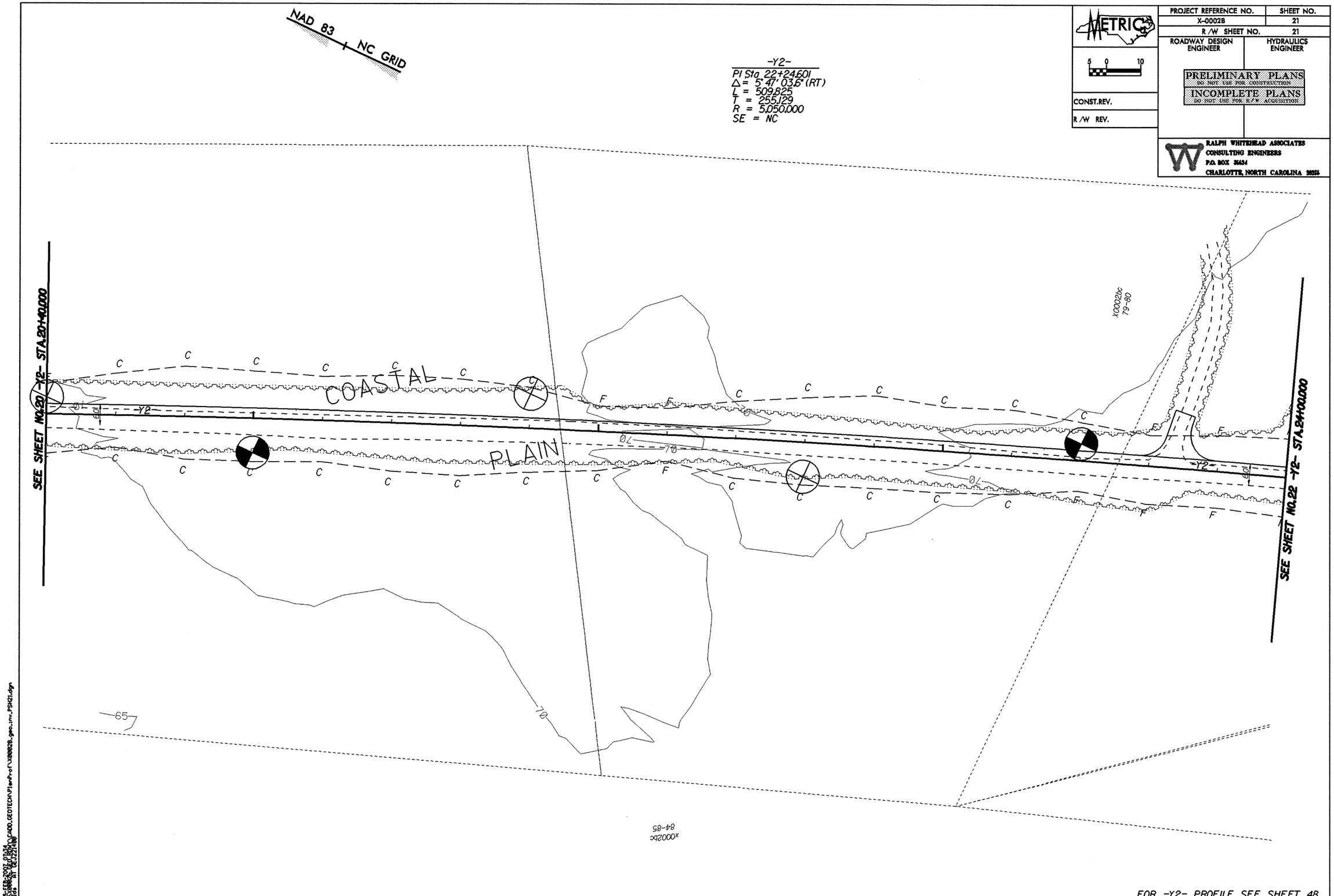
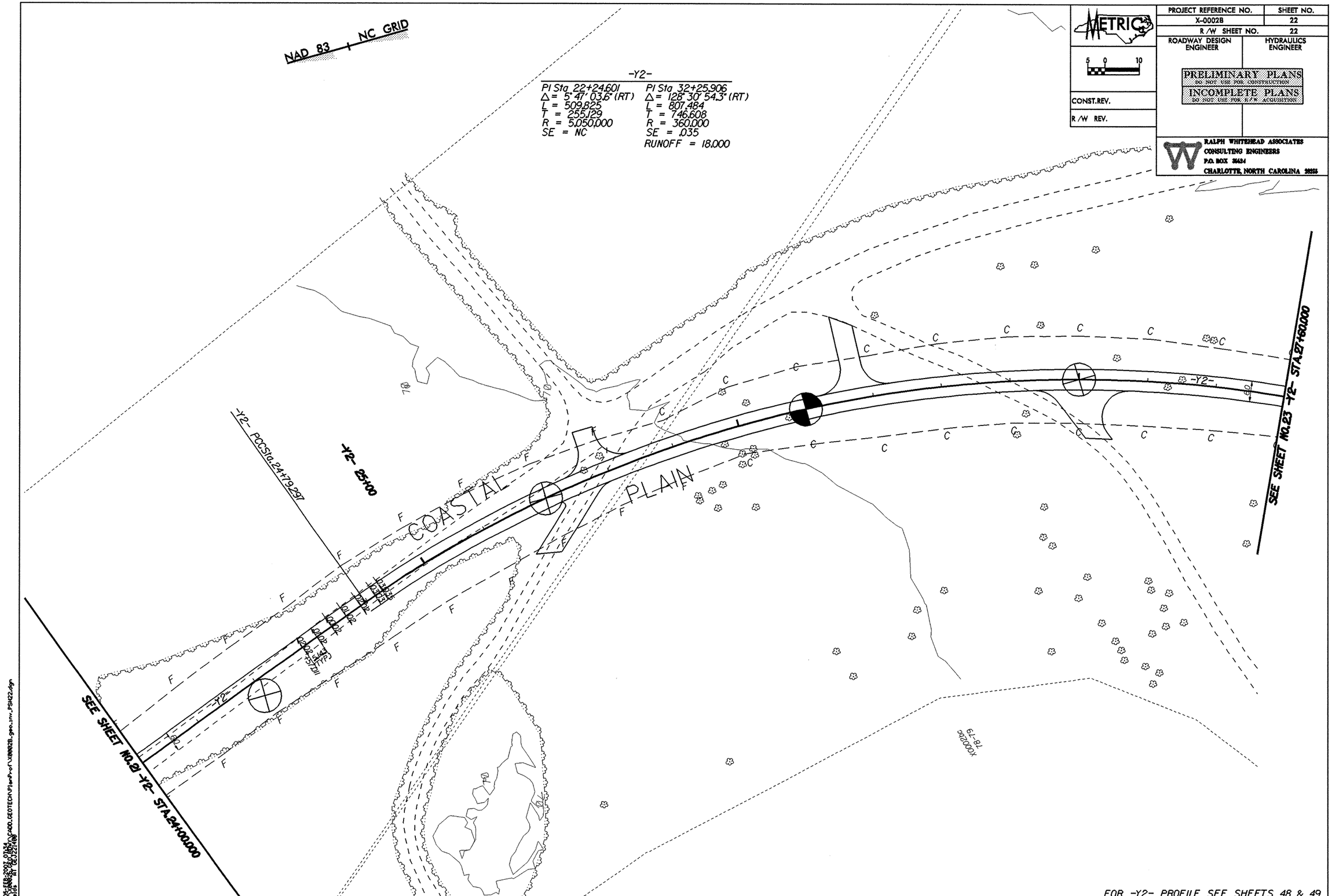
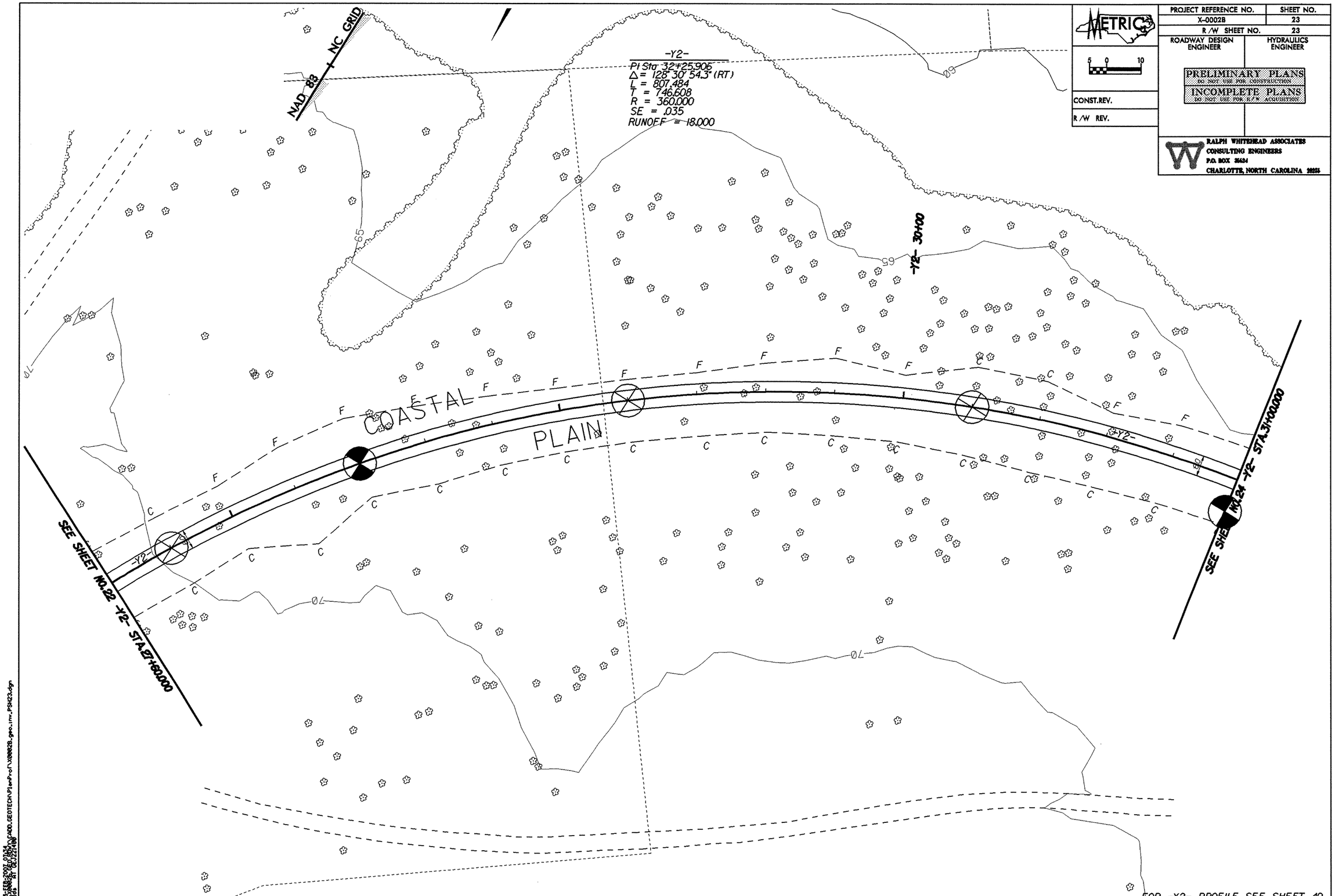

NAD 83
NC GRID
-Y2-
PI Sta 22+24.601
Δ = 5° 47' 03.6" (RT)
L = 509.825
T = 255.129
R = 5,050.000
SE = NC
METRIC
5 0 10
CONST.REV.
R/W REV.
PROJECT REFERENCE NO.
X-0002B
SHEET NO.
21
R/W SHEET NO.
21
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235
SEE SHEET NO.20 -Y2- STA.20+40.000
SEE SHEET NO.22 -Y2- STA.24+00.000
COASTAL
PLAIN
-Y2-
X0002bc
79-80
X0002bc
84-85
65
70
FOR -Y2- PROFILE SEE SHEET 48


NAD 83 NC GRID
-Y2-
PI Sta 22+24.601
Δ = 5° 47' 03.6" (RT)
L = 509.825
T = 255.129
R = 5,050.000
SE = NC
PI Sta 32+25.906
Δ = 128° 30' 54.3" (RT)
L = 807.484
T = 746.608
R = 360.000
SE = .035
RUNOFF = 18.000
-Y2- PCCSta.24+79.297
-Y2- 25+00
COASTAL PLAIN
SEE SHEET NO.21 -Y2- STA.24+00.000
SEE SHEET NO.23 -Y2- STA.27+60.000
X0002bc
78-79
METRIC
5 0 10
CONST.REV.
R/W REV.
PROJECT REFERENCE NO.
X-0002B
SHEET NO.
22
R/W SHEET NO.
22
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235
FOR -Y2- PROFILE SEE SHEETS 48 & 49



METRIC

5 0 10

CONST.REV.

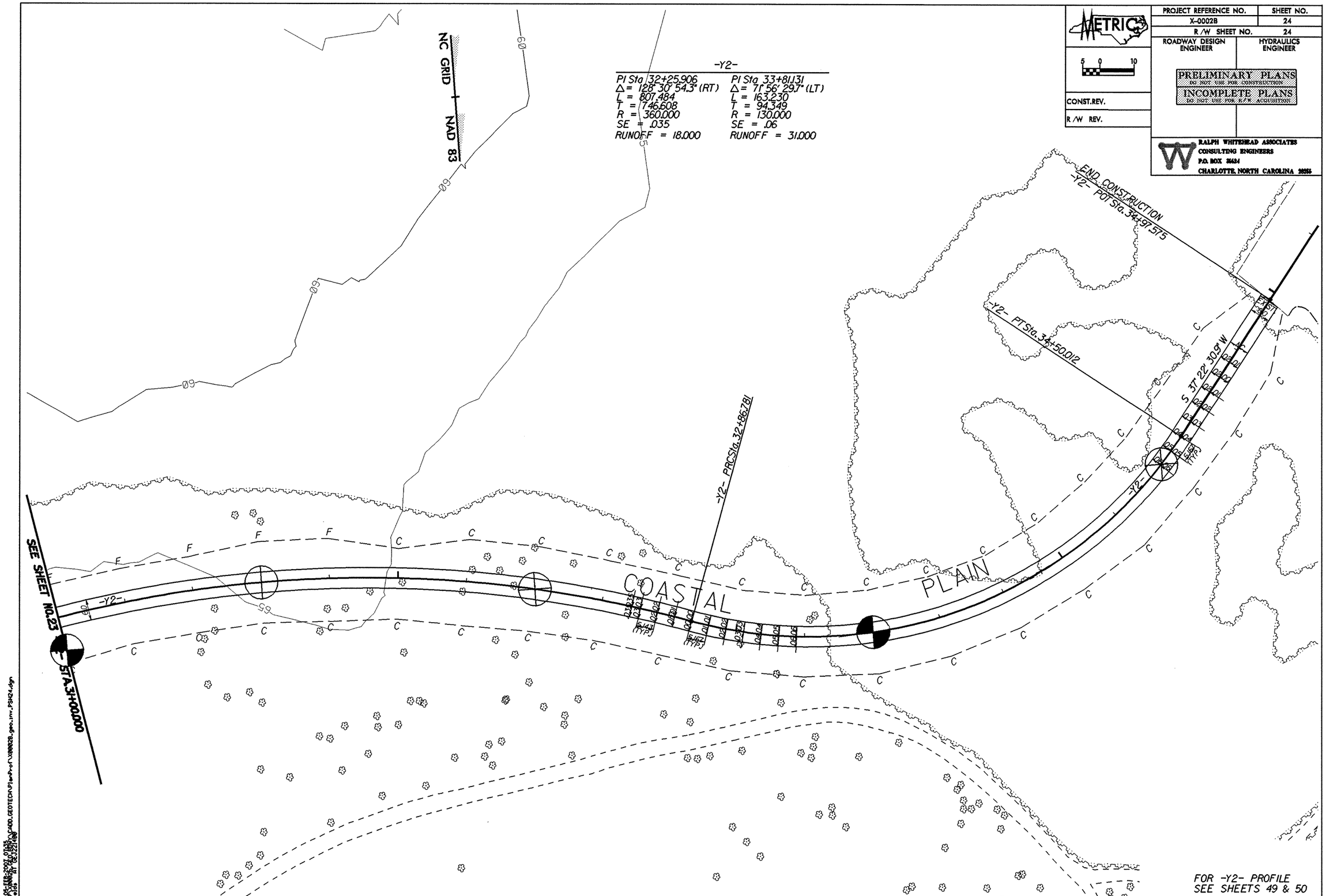
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	23
R/W SHEET NO.	23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

FOR -Y2- PROFILE SEE SHEET 49



METRIC

5 0 10

CONST. REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	24
R/W SHEET NO.	24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28255

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	25
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5 0 10

CONST.REV.

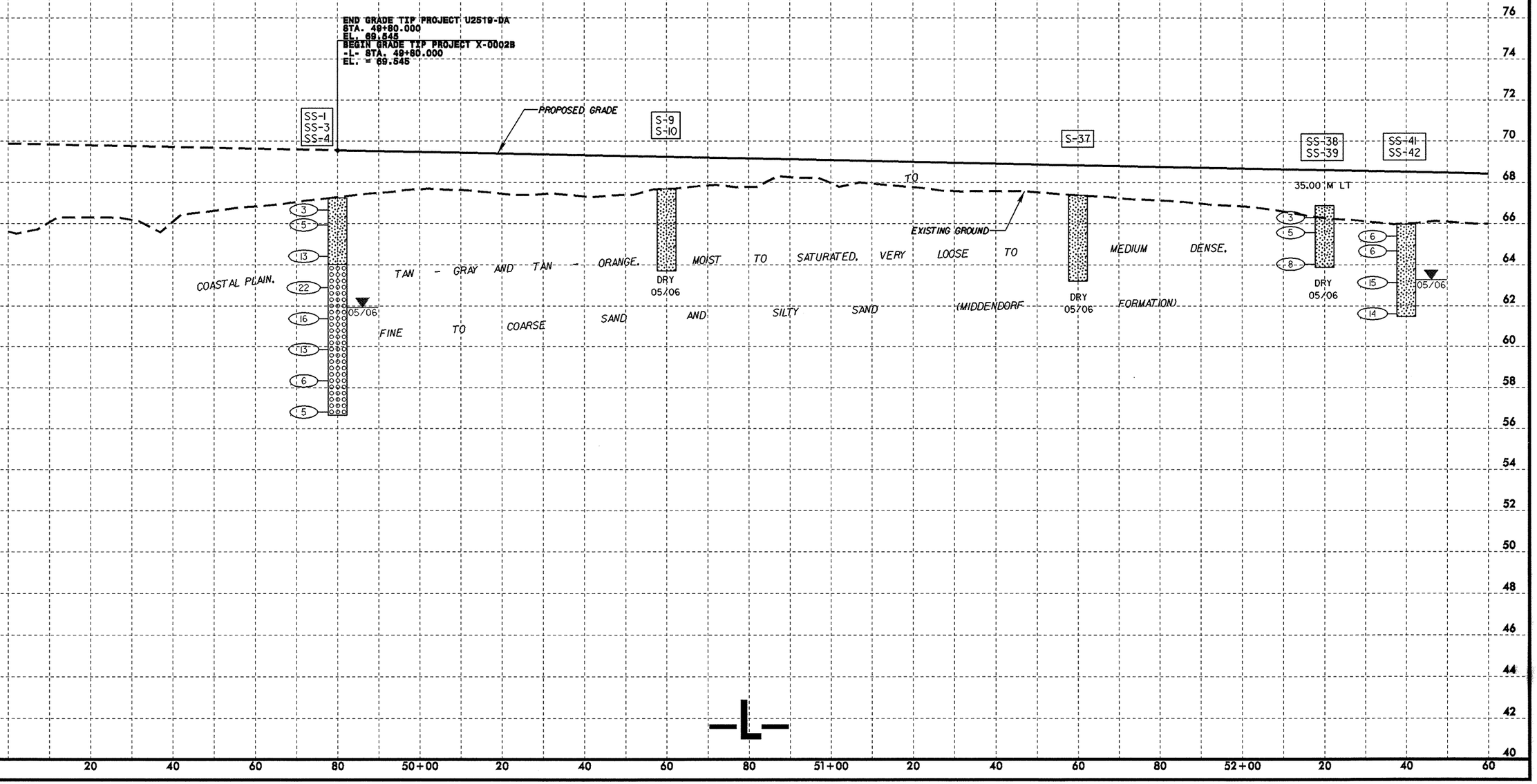
R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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-1	CL	49+80	0.3-0.8	A-2-4(0)	18	NP	31.0	58.6	0.2	10.1	100	80	12	-	-
SS-3	CL	49+80	2.6-3.0	A-2-4(0)	24	NP	3.6	78.0	2.2	16.2	100	98	20	-	-
SS-4	CL	49+80	4.1-4.5	A-1-b(0)	14	NP	58.2	33.5	2.2	6.1	73	46	7	-	-
S-9	CL	50+60	0.5-3.4	A-2-4(0)	19	NP	52.9	35.2	1.8	10.1	100	74	14	-	-
S-10	CL	50+60	3.4-4.0	A-2-4(0)	18	NP	45.3	46.7	2.0	6.1	100	73	12	-	-
S-37	CL	51+60	2.0-4.0	A-2-4(0)	23	NP	15.9	71.9	0.2	12.0	100	89	14	-	-
SS-38	35 LT	52+20	0.3-0.8	A-2-4(0)	18	NP	37.6	52.4	2.0	8.0	100	80	12	-	-
SS-39	35 LT	52+20	1.0-1.5	A-2-4(0)	19	NP	34.3	55.4	0.2	10.0	98	80	12	-	-
SS-41	CL	52+20	2.5-3.0	A-2-4(0)	26	5	21.7	56.0	0.2	22.1	97	84	25	-	-
SS-42	CL	52+40	4.1-4.5	A-2-4(0)	21	NP	40.2	47.8	2.0	10.0	100	86	13	-	-



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PROJECT REFERENCE NO.	SHEET NO.
X-0002B	26
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

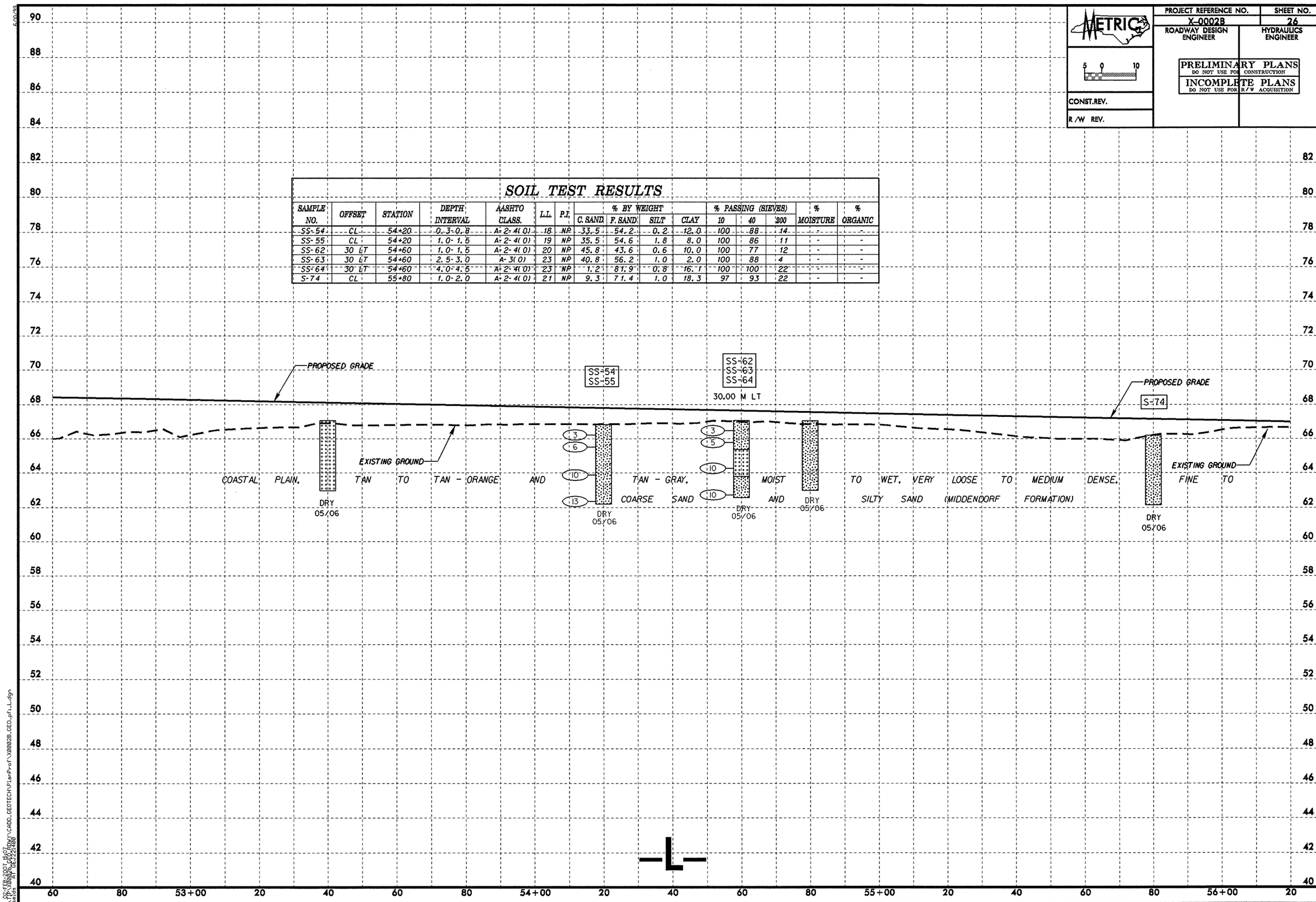
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.

R/W REV.

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-54	CL	54+20	0.3-0.8	A-2-4(0)	18	NP	33.5	54.2	0.2	12.0	100	88	14	-	-
SS-55	CL	54+20	1.0-1.5	A-2-4(0)	19	NP	35.5	54.6	1.8	8.0	100	86	11	-	-
SS-62	30 LT	54+60	1.0-1.5	A-2-4(0)	20	NP	45.8	43.6	0.6	10.0	100	77	12	-	-
SS-63	30 LT	54+60	2.5-3.0	A-3(0)	23	NP	40.8	56.2	1.0	2.0	100	88	4	-	-
SS-64	30 LT	54+60	4.0-4.5	A-2-4(0)	23	NP	1.2	81.9	0.8	16.1	100	100	22	-	-
S-74	CL	55+80	1.0-2.0	A-2-4(0)	21	NP	9.3	71.4	1.0	18.3	97	93	22	-	-



PROJECT REFERENCE NO.	SHEET NO.
X-0002B	27

METRIC

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.

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-90	35 LT	56+40	1.0-1.5	A-2-4(0)	20	NP	21.5	68.0	4.5	6.1	98	89	13	-	-
SS-91	35 LT	56+40	2.6-3.0	A-2-4(0)	21	NP	6.3	83.2	4.5	6.1	100	97	16	-	-
SS-122	1.34 LT	57+20	1.2-1.6	A-2-4(0)	20	NP	48.4	36.5	2.9	12.1	94	66	16	-	-
SS-123	1.34 LT	57+20	2.7-3.1	A-1-b(0)	21	NP	83.8	9.5	2.7	4.0	100	47	7	-	-
SS-125	1.34 LT	57+20	7.2-7.7	A-7-6(17)	41	22	8.8	17.7	27.3	46.2	100	94	80	-	-
SS-127	1.34 LT	57+20	10.3-10.7	A-2-6(1)	35	21	59.3	15.9	4.5	20.2	93	55	24	-	-
SS-128	1.34 LT	57+20	11.8-12.2	A-7-6(22)	47	33	3.2	28.9	19.5	48.4	100	99	72	-	-
SS-130	1.34 LT	57+20	14.8-15.3	A-2-6(0)	38	12	52.1	26.0	7.8	14.1	100	73	25	-	-
SS-131	1.34 LT	57+20	16.4-16.8	A-6(6)	30	16	24.4	26.6	26.9	22.0	100	86	56	-	-
SS-132	1.34 LT	57+20	17.9-18.3	A-2-4(0)	24	NP	40.2	43.6	4.1	12.0	100	87	17	-	-
SS-134	10 RT	59+00	1.3-1.7	A-2-4(0)	20	NP	46.3	44.2	3.4	6.1	100	89	12	-	-
SS-138	10 RT	59+00	8.9-9.3	A-7-6(7)	43	26	36.4	19.2	8.1	36.4	97	71	46	-	-
SS-141	10 RT	59+00	13.4-13.9	A-2-6(2)	39	19	36.2	33.3	8.3	22.2	100	88	33	-	-

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-142	10 RT	59+00	15.0-15.4	A-6(9)	31	15	10.5	23.6	37.6	28.3	100	94	76	-	-
SS-143	10 RT	59+00	16.5-16.9	A-2-7(1)	51	35	73.8	10.6	3.4	12.1	99	38	17	-	-
SS-144	10 RT	59+00	18.0-18.4	A-2-7(3)	50	30	59.9	8.8	13.1	18.2	97	49	32	-	-
SS-146	10 RT	59+00	21.0-21.5	A-7-6(16)	46	23	5.1	32.3	46.5	16.2	100	97	72	-	-
S-107	CL	59+40	0.0-2.1	A-2-4(0)	19	NP	62.5	22.5	2.8	12.2	96	51	16	-	-
S-108	CL	59+40	2.1-4.1	A-1-b(0)	20	NP	79.9	13.8	0.2	6.1	99	31	7	-	-

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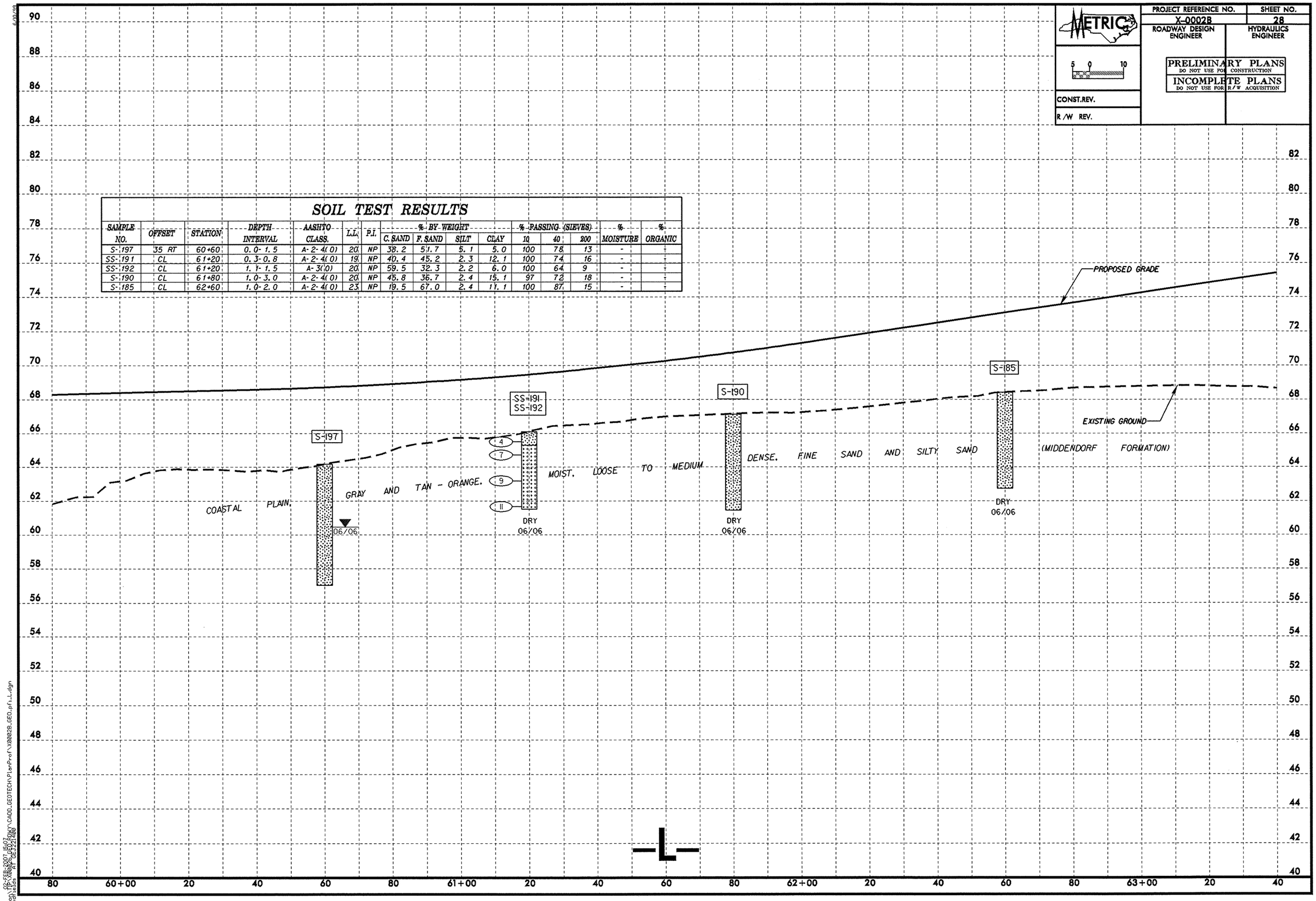
METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	X-0002B	28
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R/W REV.	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-197	35 RT	60+60	0.0-1.5	A-2-4(0)	20	NP	38.2	51.7	5.1	5.0	100	78	13	-	-
SS-191	CL	61+20	0.3-0.8	A-2-4(0)	19	NP	40.4	45.2	2.3	12.1	100	74	16	-	-
SS-192	CL	61+20	1.1-1.5	A-3(0)	20	NP	59.5	32.3	2.2	6.0	100	64	9	-	-
S-190	CL	61+80	1.0-3.0	A-2-4(0)	20	NP	45.8	36.7	2.4	15.1	97	73	18	-	-
S-185	CL	62+60	1.0-2.0	A-2-4(0)	23	NP	19.5	67.0	2.4	11.1	100	87	15	-	-



PROJECT REFERENCE NO.	SHEET NO.
X-0002B	29
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

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

CONST.REV.

R/W REV.

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-151	CL	64+20	1.0-1.5	A-1-b(0)	16	NP	70.3	1.1	22.5	6.1	100	41	10	-	-
SS-154	CL	64+20	5.6-6.1	A-2-4(0)	22	NP	27.3	61.6	3.0	8.1	97	85	14	-	-
SS-156	CL	64+20	11.7-12.1	A-2-4(0)	22	NP	15.6	65.5	6.9	12.1	95	83	26	-	-
SS-157	CL	64+20	13.2-13.7	A-2-4(0)	20	NP	23.6	54.7	9.5	12.1	100	85	27	-	-
SS-425	11.7 RT	65+64	1.3-1.7	A-3(0)	18	NP	61.2	31.7	1.0	6.1	100	55	8	-	-
SS-429	11.7 RT	65+64	7.4-7.8	A-6(9)	38	18	2.4	56.2	9.1	32.3	100	99	64	-	-
SS-430	11.7 RT	65+64	8.9-9.3	A-2-4(0)	19	NP	58.2	29.8	0.9	11.1	97	71	14	-	-
SS-432	11.7 RT	65+64	11.9-12.4	A-1-b(0)	20	NP	88.6	7.8	0.6	3.0	84	21	4	-	-
SS-433	11.7 RT	65+64	13.5-13.65	A-6(9)	37	21	2.8	43.8	10.9	42.4	100	99	59	-	-
SS-434	11.7 RT	65+64	15.0-15.4	A-3(0)	19	NP	69.6	20.6	1.7	8.1	99	65	10	-	-
SS-437	11.7 RT	65+64	19.5-20.0	A-6(9)	37	18	9.1	32.9	13.5	44.4	100	95	64	-	-
SS-635	CL	66+60	5.6-6.0	A-2-4(0)	24	NP	11.5	73.5	0.8	14.2	100	93	18	-	-

-FLYOVER- STA. 22+29.794=
-L- STA. 63+66.830

SS-151
SS-154
SS-156
SS-157

SS-425
SS-429
SS-430
SS-432
SS-433
SS-434
SS-437

11.7 M RT

SS-635

COASTAL PLAIN, RED - ORANGE TO ORANGE TAN, GRAY ORANGE AND WHITE - TAN, MOIST TO SATURATED, VERY LOOSE TO VERY DENSE, FINE TO COARSE SAND AND SILTY SAND (MIDDENDORF FORMATION)

06/06

07/06

GRAY, WET, VERY STIFF TO HARD, SANDY CLAY (CAPE FEAR FORMATION)

(A) ORANGE AND GRAY, WET TO SATURATED, STIFF TO HARD, SANDY 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

40 60 80 64+00 20 40 60 80 65+00 20 40 60 80 66+00 20 40 60 80 67+00

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4/21/2008

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	X-0002B	30
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R/W REV.	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

PROPOSED GRADE

EXISTING GROUND

SS-625
SS-626
SS-627
SS-628

18
7
10
34
60
15
24

DRY
06/06

S-629

10.0 M LT

DRY
06/06

SS-636
SS-637
SS-638
SS-639
SS-640

25.0 M LT

25
11
11
36
15
27
24
35
43
33
27
73
62

06/06

COASTAL PLAIN, TAN - BROWN, ORANGE - TAN TO GRAY - ORANGE, MOIST TO WET.

(MIDDENDORF FORMATION)

LOOSE TO VERY DENSE, FINE TO COARSE SAND AND SILTY SAND

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-625	CL	68+40	0.0-0.5	A-3(0)	20	NP	53.2	40.3	0.4	6.1	100	71	8	-	-
SS-626	CL	68+40	1.3-1.7	A-2-4(0)	19	NP	49.6	40.7	1.6	8.1	100	74	11	-	-
SS-627	CL	68+40	5.8-6.3	A-1-b(0)	23	NP	80.0	14.2	1.7	4.0	100	40	7	-	-
SS-628	CL	68+40	8.9-9.3	A-3(0)	21	NP	42.1	48.7	3.1	6.0	90	72	9	-	-
S-629	10.0 LT	69+20	0.0-4.5	A-2-4(0)	23	NP	42.1	40.7	7.1	10.1	98	74	19	-	-
SS-636	25.0 LT	70+00	4.1-4.5	A-3(0)	22	NP	75.3	15.6	1.0	8.1	100	51	10	-	-
SS-637	25.0 LT	70+00	5.6-6.0	A-2-4(0)	26	NP	9.7	81.8	0.4	8.1	100	95	11	-	-
SS-638	25.0 LT	70+00	7.1-7.6	A-3(0)	22	NP	50.8	42.7	2.5	4.0	95	72	8	-	-
SS-639	25.0 LT	70+00	13.2-13.6	A-3(0)	25	NP	52.0	45.3	2.7	0.0	97	74	4	-	-
SS-640	25.0 LT	70+00	16.2-16.7	A-1-b(0)	18	3	68.8	16.8	4.3	10.1	95	46	16	-	-

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

67+00 20 40 60 80 68+00 20 40 60 80 69+00 20 40 60 80 70+00 20 40 60

6/20/23
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PROJECT REFERENCE NO.	SHEET NO.
X-0002B	31
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5 0 10

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

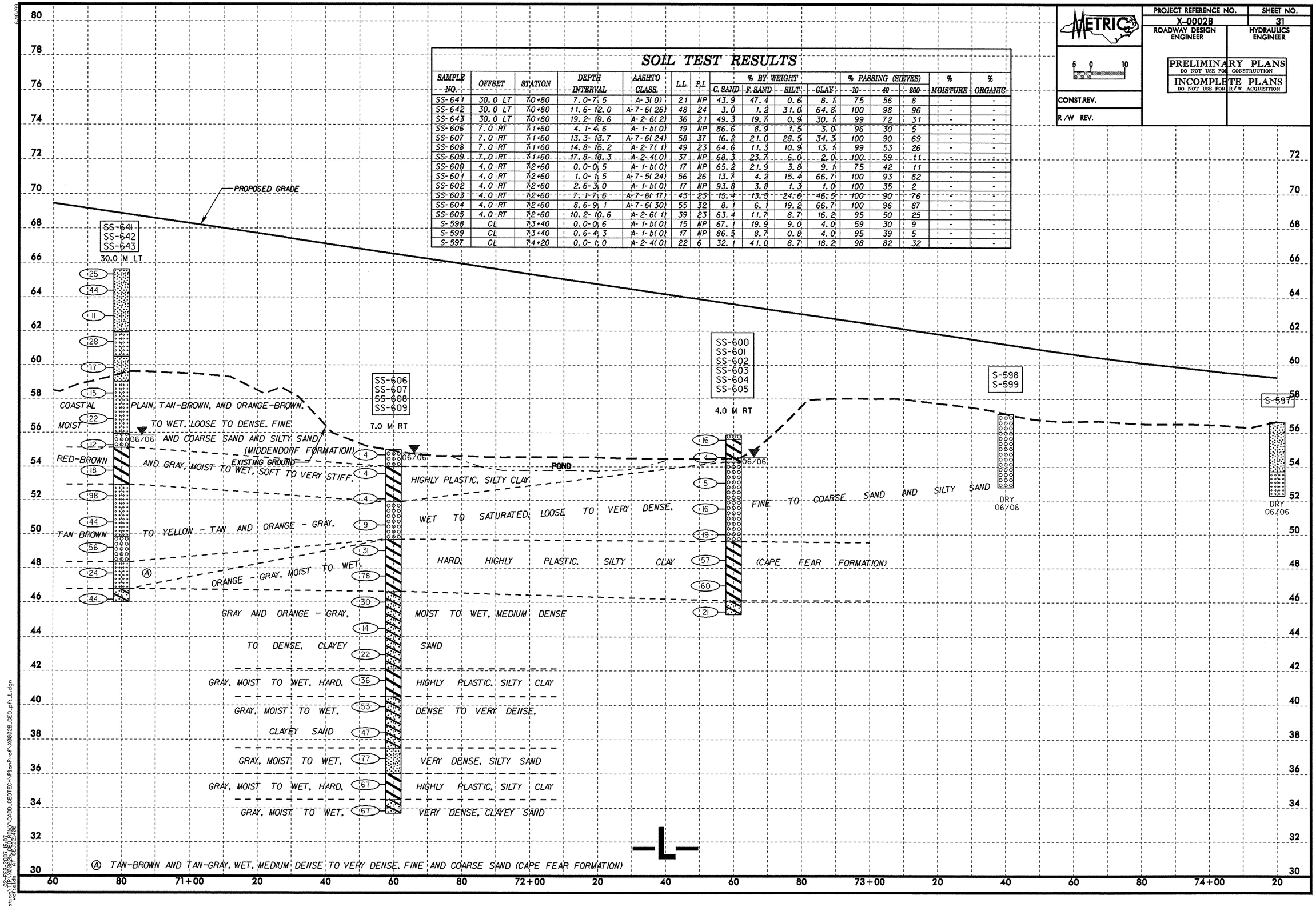
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.

R/W REV.

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	#40	#200	% MOISTURE	% ORGANIC
SS-641	30.0 LT	70+80	7.0-7.5	A-3(0)	21	NP	43.9	47.4	0.6	8.1	75	56	8	-	-
SS-642	30.0 LT	70+80	11.6-12.0	A-7-6(26)	48	24	3.0	1.2	31.0	64.8	100	98	96	-	-
SS-643	30.0 LT	70+80	19.2-19.6	A-2-6(2)	36	21	49.3	19.7	0.9	30.1	99	72	31	-	-
SS-606	7.0 RT	71+60	4.1-4.6	A-1-b(0)	19	NP	86.6	8.9	1.5	3.0	96	30	5	-	-
SS-607	7.0 RT	71+60	13.3-13.7	A-7-6(24)	58	37	16.2	21.0	28.5	34.3	100	90	69	-	-
SS-608	7.0 RT	71+60	14.8-15.2	A-2-7(1)	49	23	64.6	11.3	10.9	13.1	99	53	26	-	-
SS-609	7.0 RT	71+60	17.8-18.3	A-2-4(0)	37	NP	68.3	23.7	6.0	2.0	100	59	11	-	-
SS-600	4.0 RT	72+60	0.0-0.5	A-1-b(0)	17	NP	65.2	21.9	3.8	9.1	75	42	11	-	-
SS-601	4.0 RT	72+60	1.0-1.5	A-7-5(24)	56	26	13.7	4.2	15.4	66.7	100	93	82	-	-
SS-602	4.0 RT	72+60	2.6-3.0	A-1-b(0)	17	NP	93.8	3.8	1.3	1.0	100	35	2	-	-
SS-603	4.0 RT	72+60	7.1-7.6	A-7-6(17)	43	23	15.4	13.5	24.6	46.5	100	90	76	-	-
SS-604	4.0 RT	72+60	8.6-9.1	A-7-6(30)	55	32	8.1	6.1	19.2	66.7	100	96	87	-	-
SS-605	4.0 RT	72+60	10.2-10.6	A-2-6(1)	39	23	63.4	11.7	8.7	16.2	95	50	25	-	-
S-598	CL	73+40	0.0-0.6	A-1-b(0)	15	NP	67.1	19.9	9.0	4.0	59	30	9	-	-
S-599	CL	73+40	0.6-4.3	A-1-b(0)	17	NP	86.5	8.7	0.8	4.0	95	39	5	-	-
S-597	CL	74+20	0.0-1.0	A-2-4(0)	22	6	32.1	41.0	8.7	18.2	98	82	32	-	-



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PROJECT REFERENCE NO.	SHEET NO.
X-0002B	32
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5 0 10

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

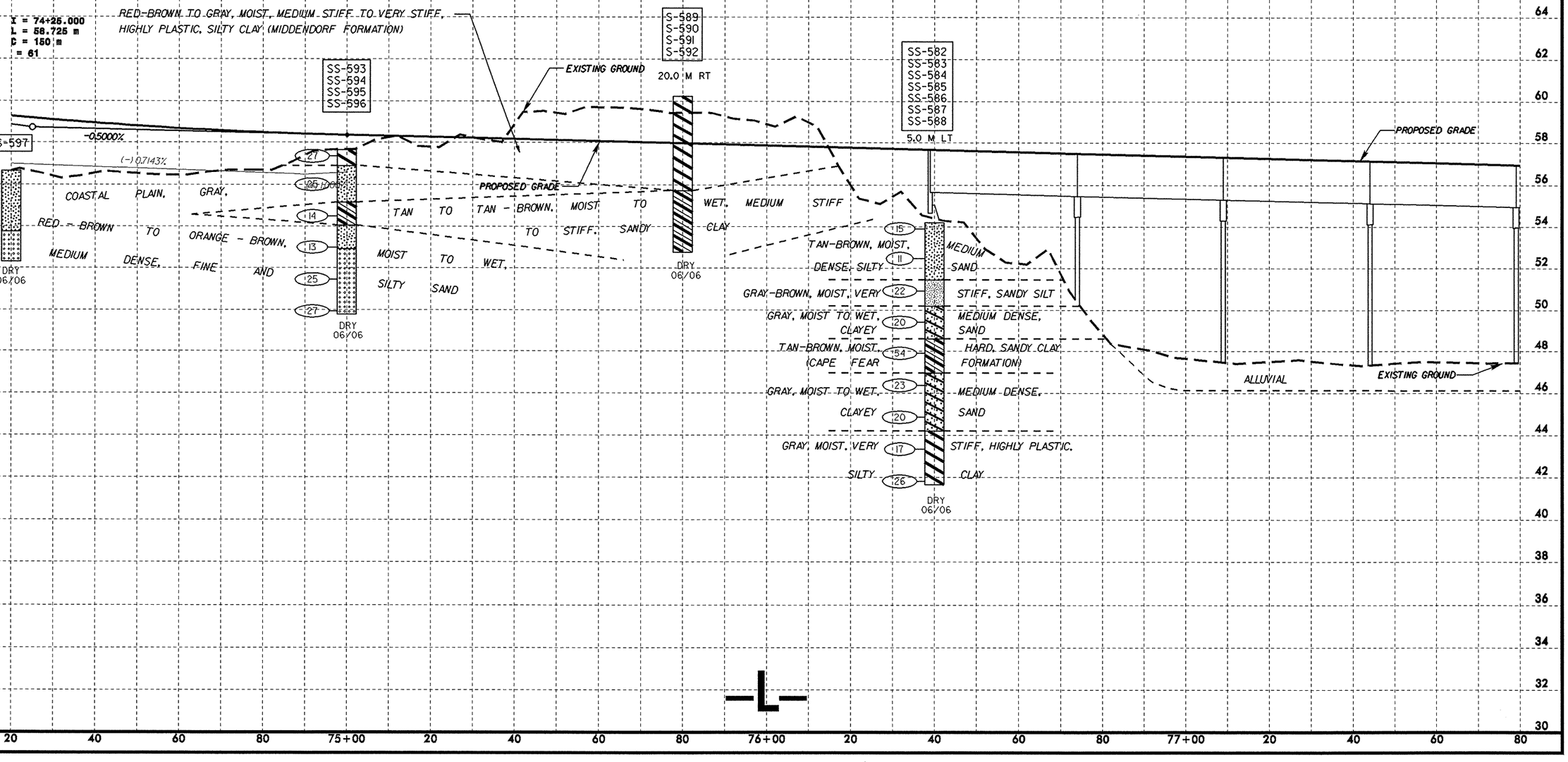
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.

R/W REV.

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-597	CL	74+20	0.0- 1.0	A-2-4(0)	22	6	32.1	41.0	8.7	18.2	98	82	32	-	-
SS-593	CL	75+00	1.3- 1.8	A-2-4(0)	23	4	2.2	75.8	5.9	16.2	100	99	30	-	-
SS-594	CL	75+00	2.9- 3.3	A-6(2)	39	19	32.7	35.4	5.7	26.3	100	82	37	-	-
SS-595	CL	75+00	4.4- 4.8	A-2-4(0)	21	NP	43.4	43.4	5.1	8.1	100	77	17	-	-
SS-596	CL	75+00	5.9- 6.4	A-3(0)	21	NP	61.8	30.9	5.3	2.0	100	61	8	-	-
S-589	20.0 RT	75+80	0.0- 0.8	A-7-6(11)	46	27	21.0	30.7	11.9	36.4	97	87	54	-	-
S-590	20.0 RT	75+80	0.8- 3.0	A-7-6(17)	48	29	10.5	32.5	16.6	40.4	100	96	65	-	-
S-591	20.0 RT	75+80	3.0- 4.5	A-7-6(37)	71	45	8.7	17.4	11.3	62.6	100	97	78	-	-
S-592	20.0 RT	75+80	4.5- 7.5	A-6(6)	31	15	6.1	46.5	19.2	28.3	100	98	60	-	-
SS-582	5.0 LT	76+40	0.0- 0.5	A-2-4(0)	20	1	42.6	39.2	6.1	12.1	94	72	21	-	-
SS-583	5.0 LT	76+40	1.5- 1.9	A-2-4(0)	17	NP	49.9	35.8	6.3	8.1	96	69	18	-	-
SS-584	5.0 LT	76+40	3.0- 3.4	A-4(0)	22	4	8.1	59.6	16.2	16.2	100	99	44	-	-
SS-585	5.0 LT	76+40	4.5- 4.9	A-2-7(3)	43	27	46.5	19.2	4.0	30.3	97	72	34	-	-
SS-586	5.0 LT	76+40	6.0- 6.5	A-6(15)	38	19	4.6	19.0	23.8	52.5	100	98	83	-	-
SS-587	5.0 LT	76+40	7.5- 8.0	A-2-6(0)	31	14	48.9	24.0	4.8	22.2	94	68	27	-	-
SS-588	5.0 LT	76+40	10.6- 11.0	A-7-6(28)	51	32	5.1	16.8	23.6	54.5	100	97	84	-	-



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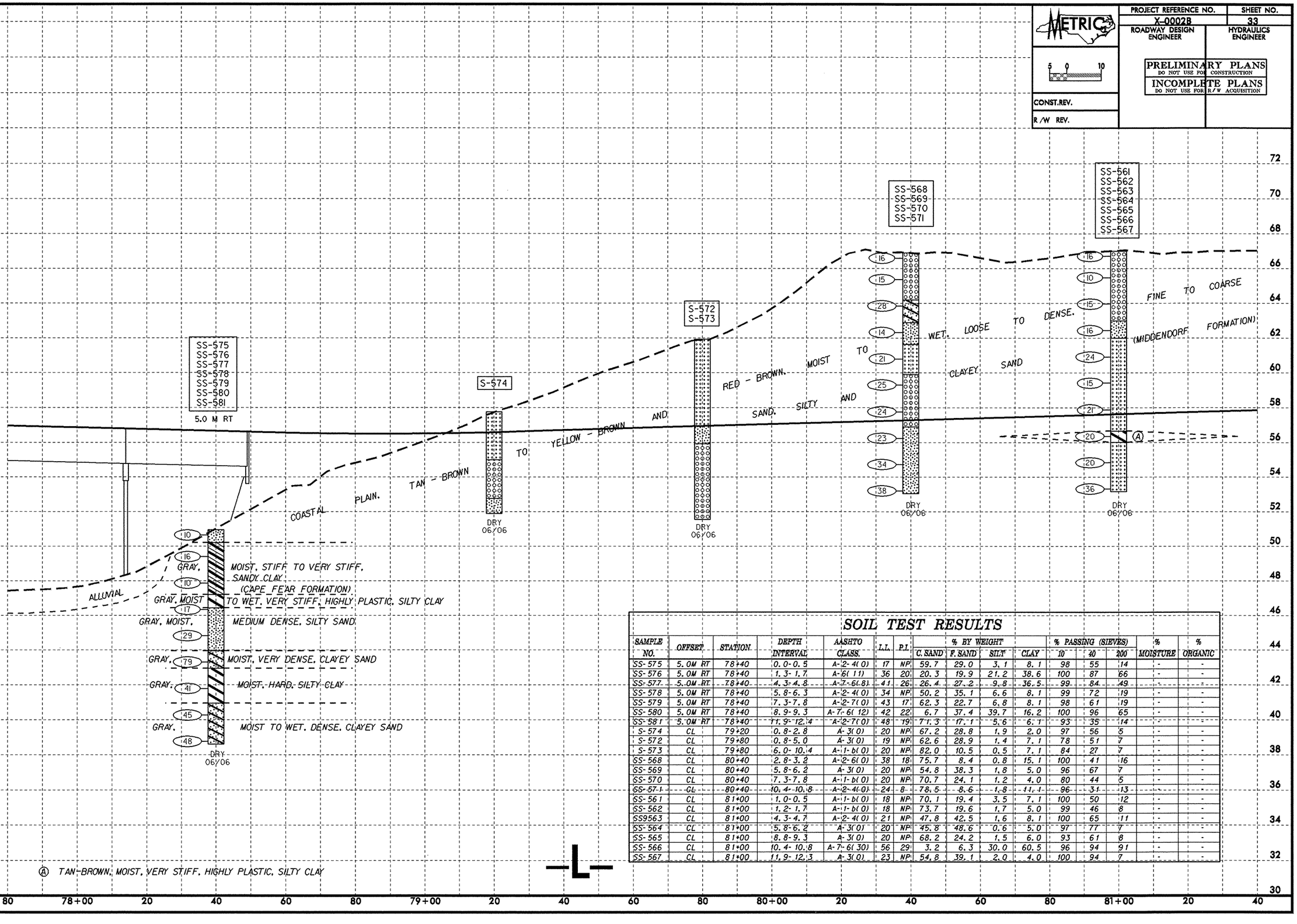

SOIL TEST RESULTS

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-575	5.0M RT	78+40	0.0-0.5	A-2-4(0)	17	NP	59.7	29.0	3.1	8.1	98	55	14	-	-
SS-576	5.0M RT	78+40	1.3-1.7	A-6(11)	36	20	20.3	19.9	21.2	38.6	100	87	66	-	-
SS-577	5.0M RT	78+40	4.3-4.8	A-7-6(8)	41	26	26.4	27.2	9.8	36.5	99	84	49	-	-
SS-578	5.0M RT	78+40	5.8-6.3	A-2-4(0)	34	NP	50.2	35.1	6.6	8.1	99	72	19	-	-
SS-579	5.0M RT	78+40	7.3-7.8	A-2-7(0)	43	17	62.3	22.7	6.8	8.1	98	61	19	-	-
SS-580	5.0M RT	78+40	8.9-9.3	A-7-6(12)	42	22	6.7	37.4	39.7	16.2	100	96	65	-	-
SS-581	5.0M RT	78+40	11.9-12.4	A-2-7(0)	48	19	71.3	17.1	5.6	6.1	93	35	14	-	-
S-574	CL	79+20	0.8-2.8	A-3(0)	20	NP	67.2	28.8	1.9	2.0	97	56	5	-	-
S-572	CL	79+80	0.8-5.0	A-3(0)	19	NP	62.6	28.9	1.4	7.1	78	51	7	-	-
S-573	CL	79+80	6.0-10.4	A-1-b(0)	20	NP	82.0	10.5	0.5	7.1	84	27	7	-	-
SS-568	CL	80+40	2.8-3.2	A-2-6(0)	38	18	75.7	8.4	0.8	15.1	100	41	16	-	-
SS-569	CL	80+40	5.8-6.2	A-3(0)	20	NP	54.8	38.3	1.8	5.0	96	67	7	-	-
SS-570	CL	80+40	7.3-7.8	A-1-b(0)	20	NP	70.7	24.1	1.2	4.0	80	44	5	-	-
SS-571	CL	80+40	10.4-10.8	A-2-4(0)	24	8	78.5	8.6	1.8	11.1	96	31	13	-	-
SS-561	CL	81+00	1.0-0.5	A-1-b(0)	18	NP	70.1	19.4	3.5	7.1	100	50	12	-	-
SS-562	CL	81+00	1.2-1.7	A-1-b(0)	18	NP	73.7	19.6	1.7	5.0	99	46	8	-	-
SS9563	CL	81+00	4.3-4.7	A-2-4(0)	21	NP	47.8	42.5	1.6	8.1	100	65	11	-	-
SS-564	CL	81+00	5.8-6.2	A-3(0)	20	NP	45.8	48.6	0.6	5.0	97	77	7	-	-
SS-565	CL	81+00	8.8-9.3	A-3(0)	20	NP	68.2	24.2	1.5	6.0	93	61	8	-	-
SS-566	CL	81+00	10.4-10.8	A-7-6(30)	56	29	3.2	6.3	30.0	60.5	96	94	91	-	-
SS-567	CL	81+00	11.9-12.3	A-3(0)	23	NP	54.8	39.1	2.0	4.0	100	94	7	-	-

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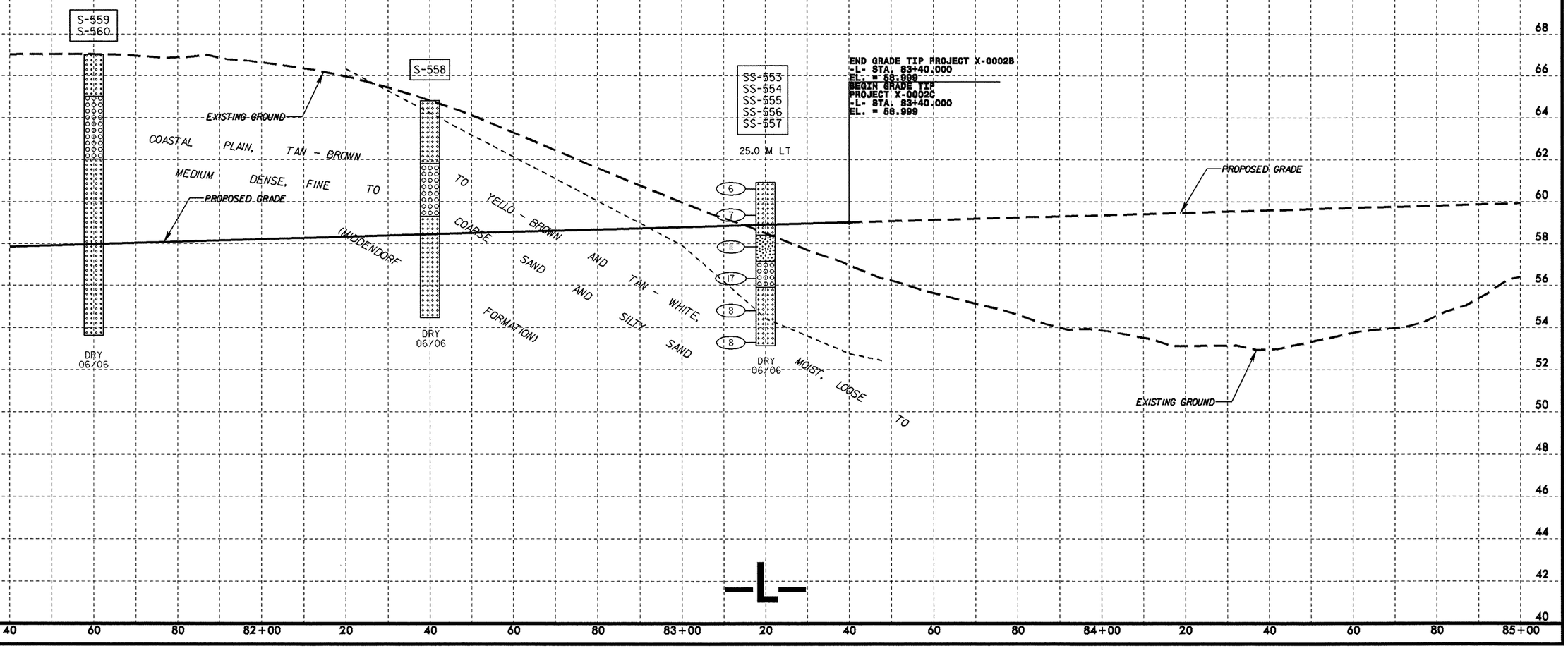
$$$$Plotted At 06/21/2007

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	X-0002B	34
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R /W REV.	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

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
S-559	CL	81+60	5.0-9.0	A-3(0)	19	NP	45.8	47.3	1.9	5.0	99	78	8	-	-
S-560	CL	81+60	9.0-13.4	A-3(0)	21	NP	68.6	21.6	1.7	8.1	94	54	10	-	-
S-558	CL	82+40	5.5-10.3	A-3(0)	21	NP	63.8	28.0	1.1	7.1	92	61	8	-	-
SS-553	25.0 LT	83+20	0.0-0.5	A-3(0)	19	NP	54.0	37.1	3.8	5.0	100	64	10	-	-
SS-554	25.0 LT	83+20	1.2-1.7	A-3(0)	20	NP	52.7	40.8	1.4	5.0	95	64	7	-	-
SS-555	25.0 LT	83+20	2.8-3.2	A-2-4(0)	21	NP	55.5	31.7	0.7	12.1	99	79	13	-	-
SS-556	25.0 LT	83+20	4.3-4.7	A-1-b(0)	21	NP	76.4	14.5	0.1	9.0	95	46	9	-	-
SS-557	25.0 LT	83+20	5.8-6.3	A-3(0)	23	NP	16.3	78.2	1.4	4.0	100	96	6	-	-



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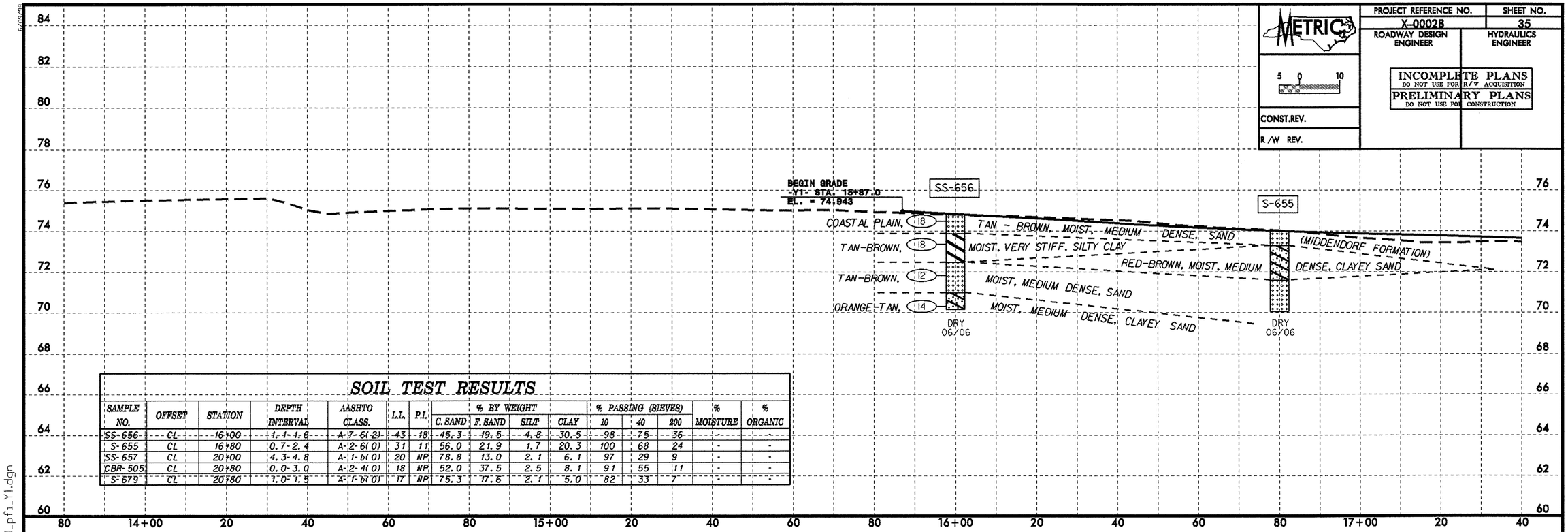
PROJECT REFERENCE NO.	SHEET NO.
X-0002B	35
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

CONST.REV.

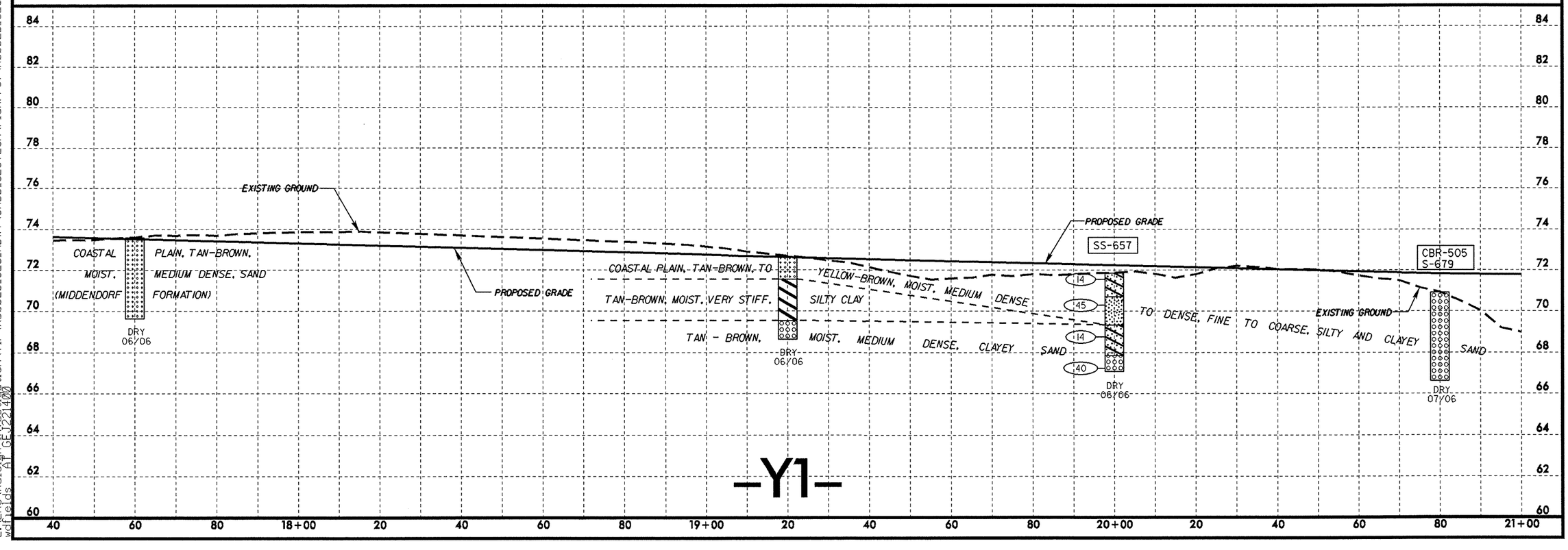
R/W REV.

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-656	CL	16+00	1.1-1.6	A-7-6(2)	43	18	45.3	19.5	4.8	30.5	98	75	36	-	-
S-655	CL	16+80	0.7-2.4	A-2-6(0)	31	11	56.0	21.9	1.7	20.3	100	68	24	-	-
SS-657	CL	20+00	4.3-4.8	A-1-b(0)	20	NP	78.8	13.0	2.1	6.1	97	29	9	-	-
CBR-505	CL	20+80	0.0-3.0	A-2-4(0)	18	NP	52.0	37.5	2.5	8.1	91	55	11	-	-
S-679	CL	20+80	1.0-1.5	A-1-b(0)	17	NP	75.3	17.6	2.1	5.0	82	33	7	-	-



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PROJECT REFERENCE NO.	SHEET NO.
X-0002B	36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

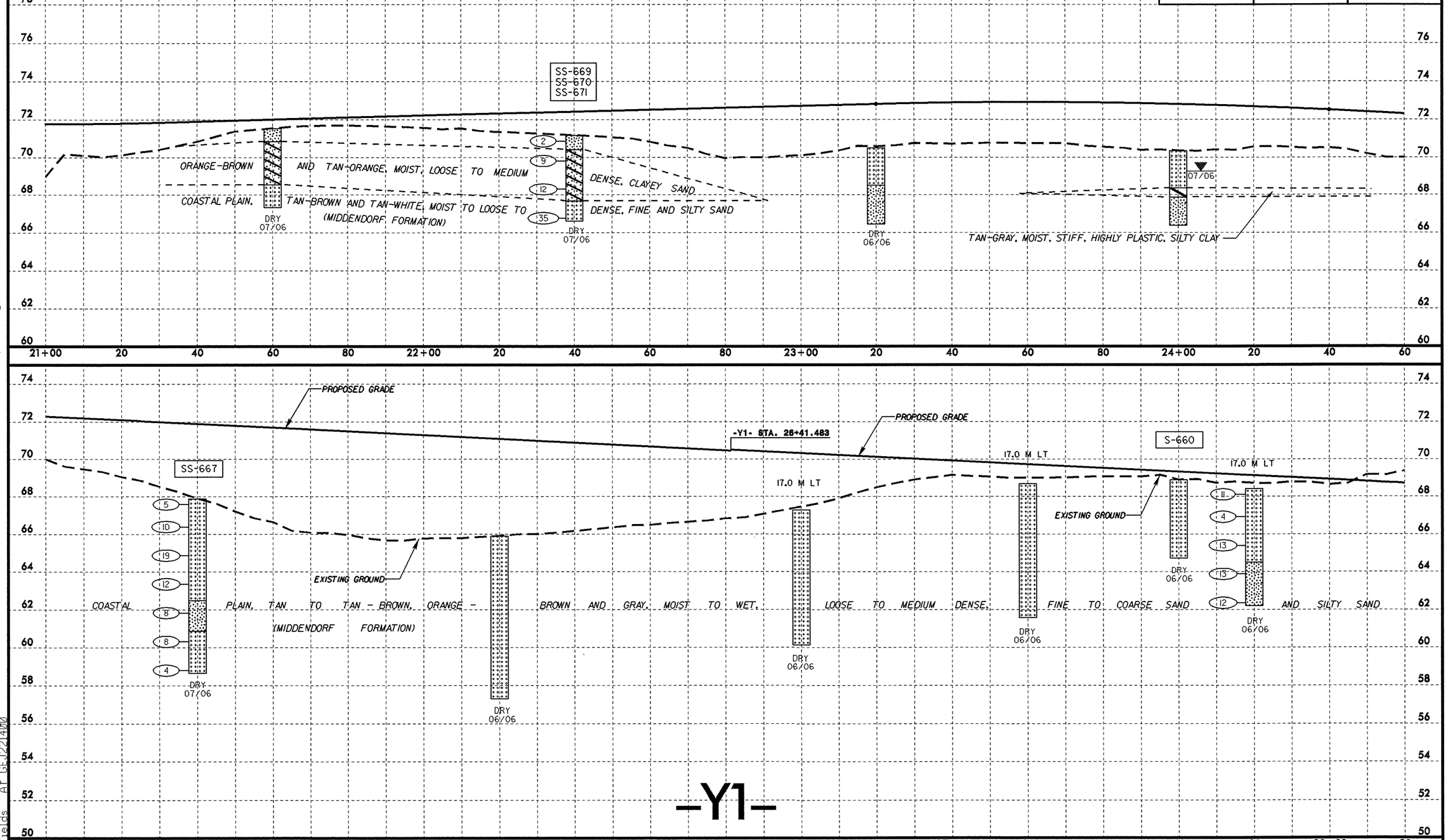
CONST.REV.

R/W REV.

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

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-669	CL	22+40	0.0-0.5	A-2-4(0)	14	NP	55.9	31.4	5.6	7.0	100	72	16	-	-
SS-670	CL	22+40	1.1-1.5	A-2-6(0)	32	13	52.0	23.0	1.8	23.1	99	72	27	-	-
SS-671	CL	22+40	4.1-4.5	A-3(0)	24	NP	50.6	44.5	0.9	4.0	99	58	7	-	-
SS-667	CL	25+00	5.8-6.2	A-2-4(0)	22	NP	39.4	49.5	2.9	8.1	98	87	12	-	-
S-660	CL	27+60	2.5-4.2	A-3(0)	21	NP	58.3	38.8	0.9	2.0	100	68	3	-	-



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wdfields AT GEJ221400

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	37
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

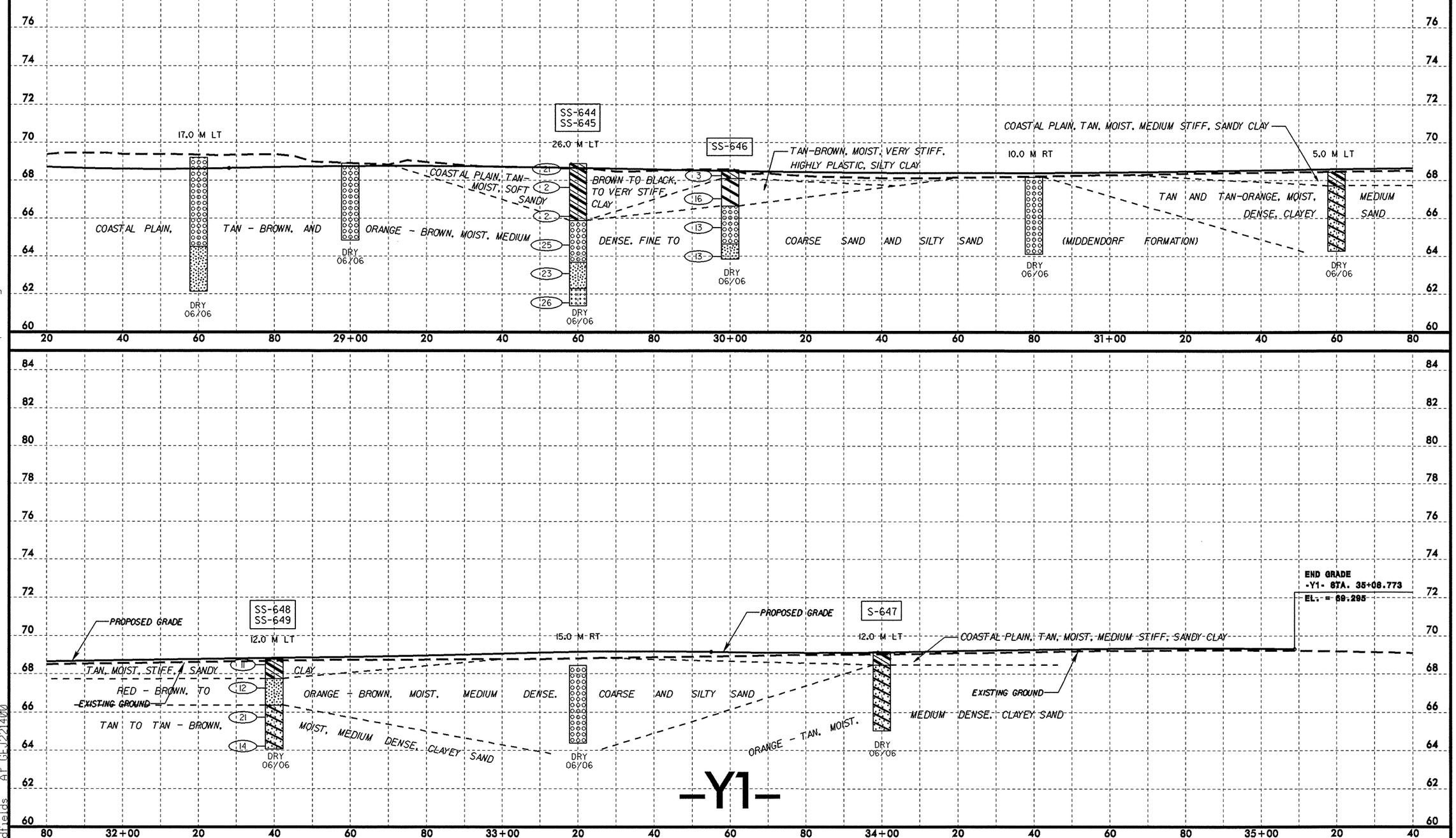
CONST.REV.

R/W REV.

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

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-644	26.0 LT	29+60	0.0-0.5	A-6(3)	34	17	43.1	17.0	7.5	32.4	97	69	42	-	-
SS-645	26.0 LT	29+60	4.0-4.5	A-1-b(0)	19	NP	81.6	13.2	1.1	4.0	99	41	5	-	-
SS-646	CL	30+00	1.2-1.7	A-7-6(9)	58	34	35.8	23.1	2.6	38.5	98	73	42	-	-
SS-648	12.0 LT	32+40	1.2-1.6	A-2-4(0)	26	9	37.6	35.5	6.6	20.3	99	77	32	-	-
SS-649	12.0 LT	32+40	2.7-3.2	A-2-7(0)	43	22	79.8	8.1	1.9	10.2	100	30	13	-	-
S-647	12.0 LT	34+00	0.0-0.7	A-6(1)	32	12	42.6	21.1	7.8	28.4	98	70	39	-	-



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wdfields AT GEJ221400

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	38
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

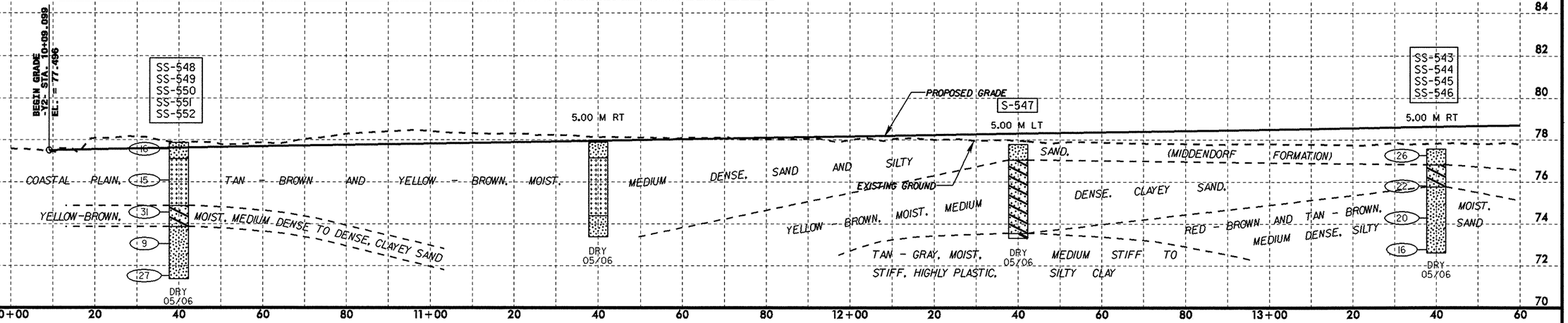
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

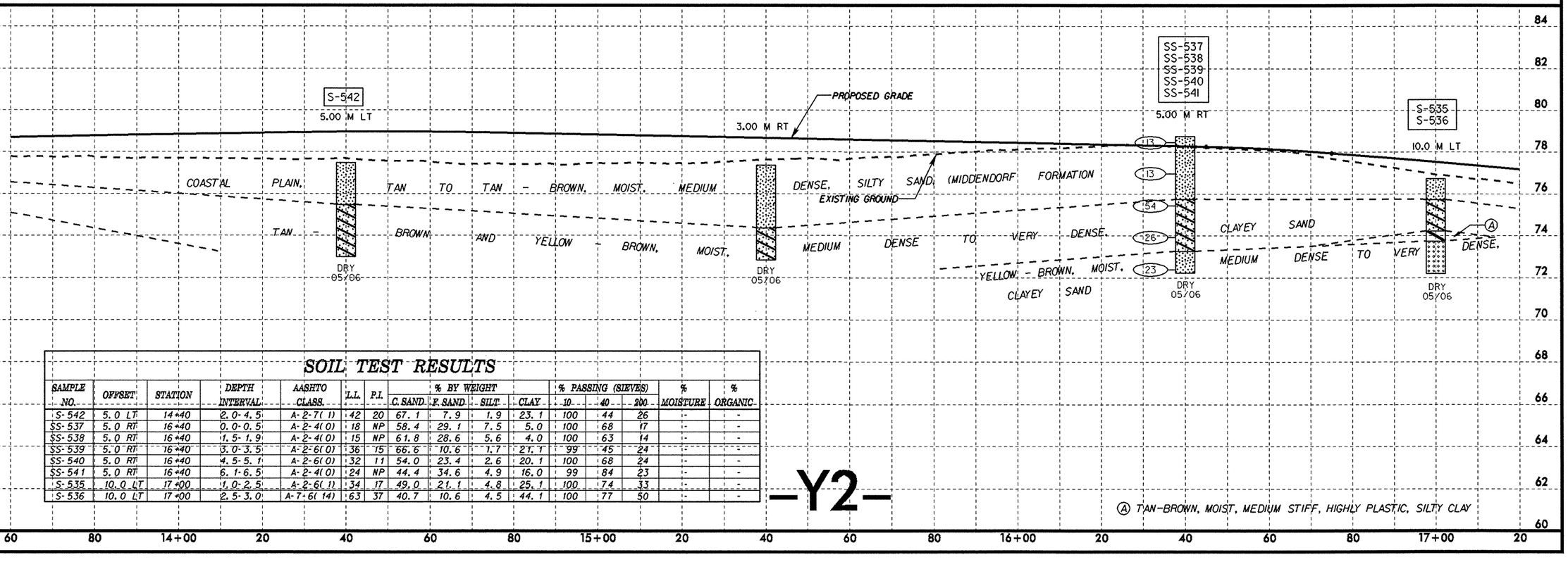
CONST.REV.

R/W REV.

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-548	CL	10+40	0.0-0.5	A-2-4(0)	17	NP	63.4	25.3	3.3	8.0	100	64	13	-	-
SS-549	CL	10+40	1.5-1.9	A-3(0)	17	NP	62.3	31.6	3.1	3.0	99	66	9	-	-
SS-550	CL	10+40	3.0-3.5	A-2-6(0)	30	11	65.0	13.8	1.1	20.1	100	63	22	-	-
SS-551	CL	10+40	4.5-5.0	A-2-4(0)	25	NP	30.3	48.4	2.2	19.1	100	84	22	-	-
SS-552	CL	10+40	6.0-6.5	A-2-4(0)	21	NP	66.9	20.3	1.8	11.0	100	62	14	-	-
S-547	5.0	LT 12+40	4.3-4.5	A-7-6(14)	55	31	34.7	10.4	6.7	48.1	99	79	55	-	-
SS-543	5.0	RT 13+40	0.0-0.5	A-2-4(0)	17	NP	61.8	27.1	5.1	6.0	99	65	13	-	-
SS-544	5.0	RT 13+40	1.5-1.9	A-2-6(1)	35	15	52.3	18.7	2.0	27.1	95	63	29	-	-
SS-545	5.0	RT 13+40	3.0-3.4	A-2-4(0)	31	10	73.8	9.7	1.4	15.0	99	42	17	-	-
SS-546	5.0	RT 13+40	4.5-4.9	A-2-4(0)	29	10	60.0	19.6	2.4	18.1	94	52	22	-	-





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-542	5.0	LT 14+40	2.0-4.5	A-2-7(1)	42	20	67.1	7.9	1.9	23.1	100	44	26	-	-
SS-537	5.0	RT 16+40	0.0-0.5	A-2-4(0)	18	NP	58.4	29.1	7.5	5.0	100	68	17	-	-
SS-538	5.0	RT 16+40	1.5-1.9	A-2-4(0)	15	NP	61.8	28.6	5.6	4.0	100	63	14	-	-
SS-539	5.0	RT 16+40	3.0-3.5	A-2-6(0)	36	15	66.6	10.6	1.7	21.1	99	45	24	-	-
SS-540	5.0	RT 16+40	4.5-5.1	A-2-6(0)	32	11	54.0	23.4	2.6	20.1	100	68	24	-	-
SS-541	5.0	RT 16+40	6.1-6.5	A-2-4(0)	24	NP	44.4	34.6	4.9	16.0	99	84	23	-	-
S-535	10.0	LT 17+00	1.0-2.5	A-2-6(1)	34	17	49.0	21.1	4.8	25.1	100	74	33	-	-
S-536	10.0	LT 17+00	2.5-3.0	A-7-6(14)	63	37	40.7	10.6	4.5	44.1	100	77	50	-	-

-Y2-

Ⓐ TAN-BROWN, MOIST, MEDIUM STIFF, HIGHLY PLASTIC, SILTY CLAY

5.03.03

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wdfields AT GJ21400

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	39
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

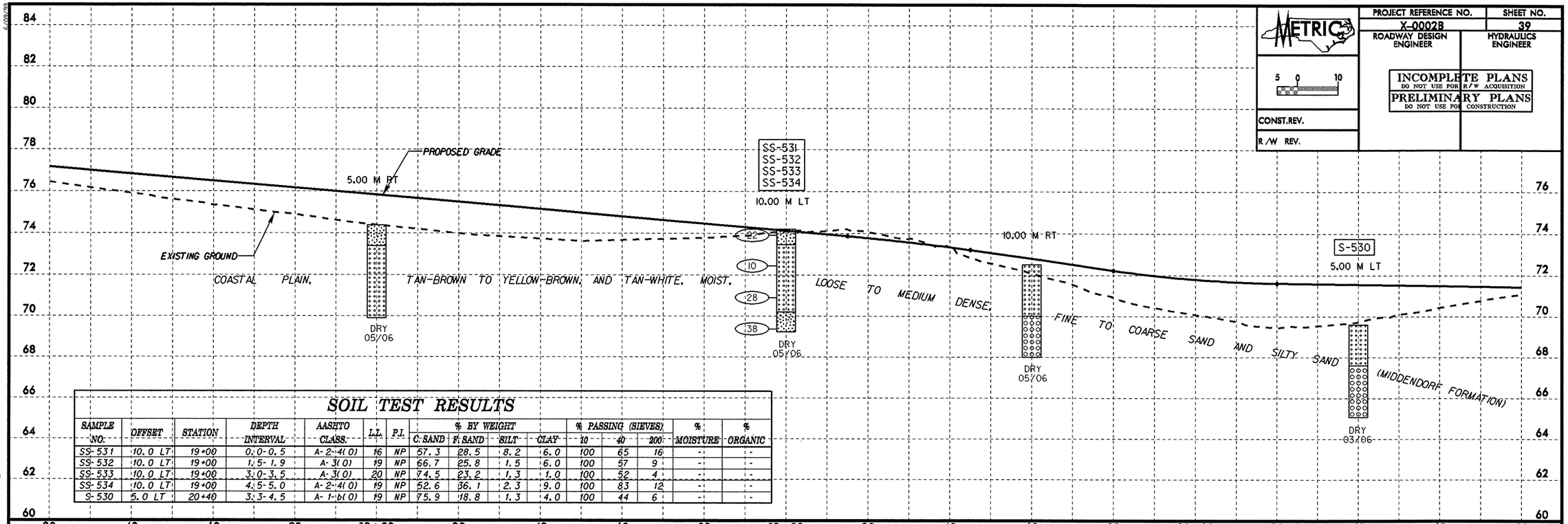
METRIC

5 0 10

CONST.REV.

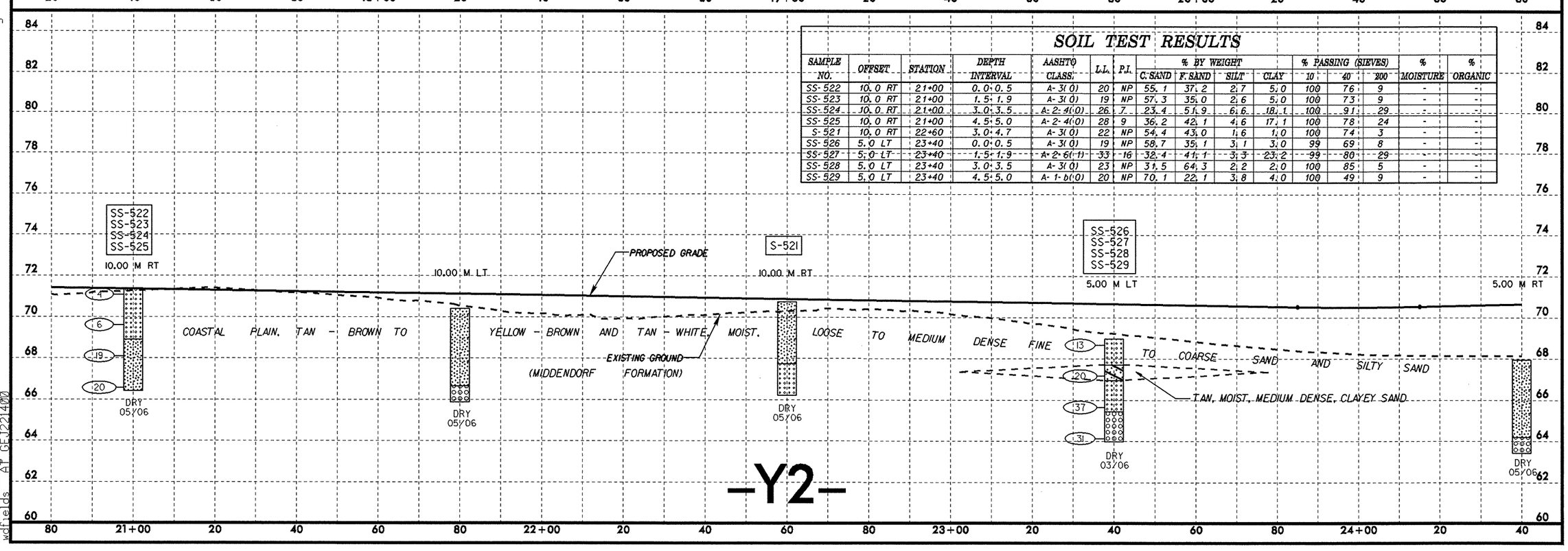
R /W REV.

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



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-531	10.0 LT	19+00	0.0-0.5	A-2-4(0)	16	NP	57.3	28.5	8.2	6.0	100	65	16	-	-
SS-532	10.0 LT	19+00	1.5-1.9	A-3(0)	19	NP	66.7	25.8	1.5	6.0	100	57	9	-	-
SS-533	10.0 LT	19+00	3.0-3.5	A-3(0)	20	NP	74.5	23.2	1.3	1.0	100	52	4	-	-
SS-534	10.0 LT	19+00	4.5-5.0	A-2-4(0)	19	NP	52.6	36.1	2.3	9.0	100	83	12	-	-
S-530	5.0 LT	20+40	3.3-4.5	A-1-b(0)	19	NP	75.9	18.8	1.3	4.0	100	44	6	-	-



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-522	10.0 RT	21+00	0.0-0.5	A-3(0)	20	NP	55.1	37.2	2.7	5.0	100	76	9	-	-
SS-523	10.0 RT	21+00	1.5-1.9	A-3(0)	19	NP	57.3	35.0	2.6	5.0	100	73	9	-	-
SS-524	10.0 RT	21+00	3.0-3.5	A-2-4(0)	26	7	23.4	51.9	6.6	18.1	100	91	29	-	-
SS-525	10.0 RT	21+00	4.5-5.0	A-2-4(0)	28	9	36.2	42.1	4.6	17.1	100	78	24	-	-
S-521	10.0 RT	22+60	3.0-4.7	A-3(0)	22	NP	54.4	43.0	1.6	1.0	100	74	3	-	-
SS-526	5.0 LT	23+40	0.0-0.5	A-3(0)	19	NP	58.7	35.1	3.1	3.0	99	69	8	-	-
SS-527	5.0 LT	23+40	1.5-1.9	A-2-6(1)	33	16	32.4	41.1	3.3	23.2	99	80	29	-	-
SS-528	5.0 LT	23+40	3.0-3.5	A-3(0)	23	NP	31.5	64.3	2.2	2.0	100	85	5	-	-
SS-529	5.0 LT	23+40	4.5-5.0	A-1-b(0)	20	NP	70.1	22.1	3.8	4.0	100	49	9	-	-

-Y2-

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wdfields AT GEJ22140

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	40
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

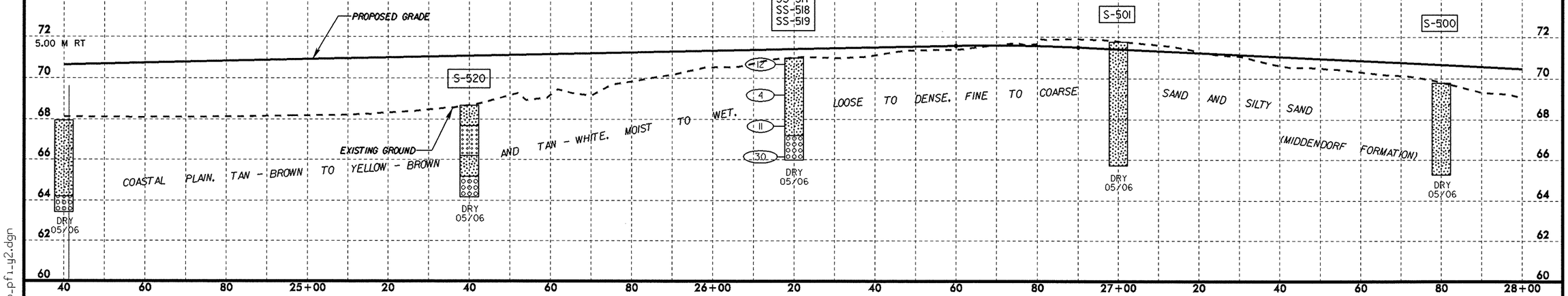
CONST.REV.

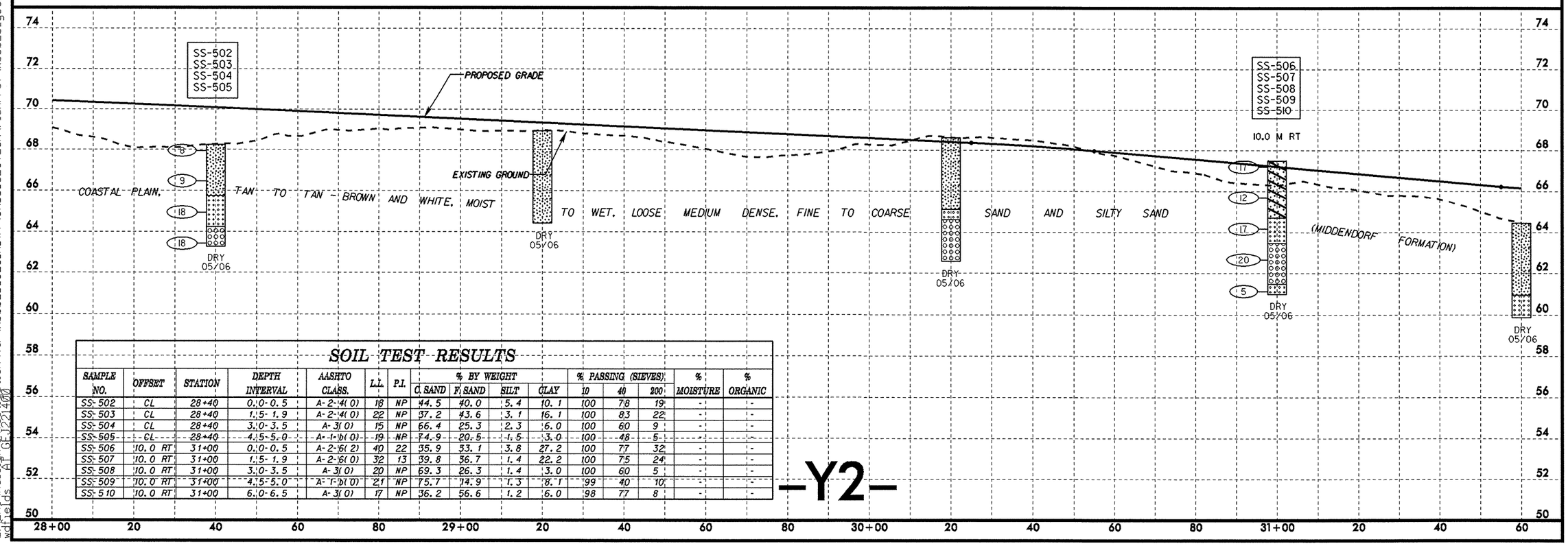
R/W REV.

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
S-520	CL	25+40	1.0-2.5	A-3(0)	18	NP	58.1	33.1	3.7	5.0	100	65	10	-	-
SS-516	CL	26+20	0.0-0.5	A-2-4(0)	19	NP	56.8	33.2	3.9	6.0	100	72	12	-	-
SS-517	CL	26+20	1.5-1.9	A-2-4(0)	18	NP	56.7	33.9	3.3	6.0	100	66	11	-	-
SS-518	CL	26+20	3.0-3.5	A-2-4(0)	20	NP	61.8	24.8	2.3	11.1	100	61	15	-	-
SS-519	CL	26+20	4.5-5.0	A-1-b(0)	19	NP	88.5	6.1	2.3	3.0	100	21	6	-	-
S-501	CL	27+00	0.6-6.0	A-2-4(0)	19	NP	50.8	40.1	3.1	6.0	100	75	11	-	-
S-500	CL	27+80	0.0-0.3	A-2-4(0)	17	NP	51.9	35.8	3.3	9.1	100	74	14	-	-





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-502	CL	28+40	0.0-0.5	A-2-4(0)	18	NP	44.5	40.0	5.4	10.1	100	78	19	-	-
SS-503	CL	28+40	1.5-1.9	A-2-4(0)	22	NP	37.2	43.6	3.1	16.1	100	83	22	-	-
SS-504	CL	28+40	3.0-3.5	A-3(0)	15	NP	66.4	25.3	2.3	6.0	100	60	9	-	-
SS-505	CL	28+40	4.5-5.0	A-1-b(0)	19	NP	74.9	20.5	1.5	3.0	100	48	5	-	-
SS-506	10.0 RT	31+00	0.0-0.5	A-2-6(2)	40	22	35.9	53.1	3.8	27.2	100	77	32	-	-
SS-507	10.0 RT	31+00	1.5-1.9	A-2-6(0)	32	13	39.8	36.7	1.4	22.2	100	75	24	-	-
SS-508	10.0 RT	31+00	3.0-3.5	A-3(0)	20	NP	69.3	26.3	1.4	3.0	100	60	5	-	-
SS-509	10.0 RT	31+00	4.5-5.0	A-1-b(0)	21	NP	75.7	14.9	1.3	8.1	99	40	10	-	-
SS-510	10.0 RT	31+00	6.0-6.5	A-3(0)	17	NP	36.2	56.6	1.2	6.0	98	77	8	-	-

-Y2-

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wdfields AT GEJ221400

6/09/99

METRIC

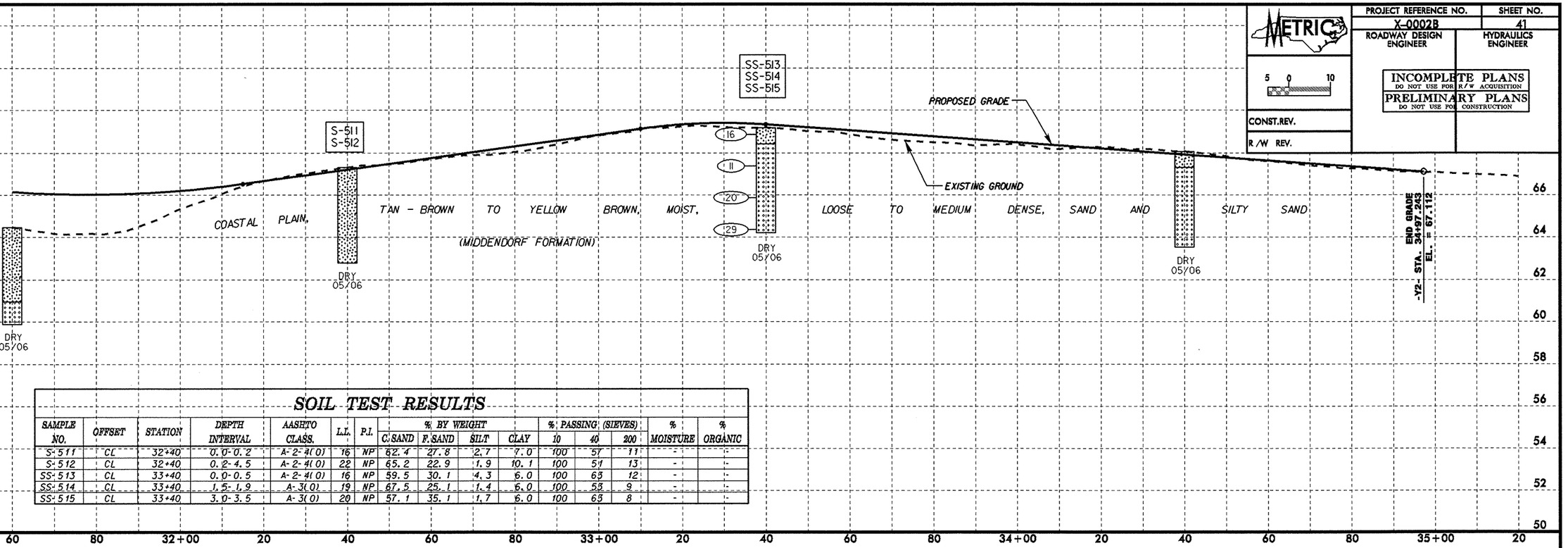
PROJECT REFERENCE NO.	SHEET NO.
X-0002B	41
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5 0 10

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

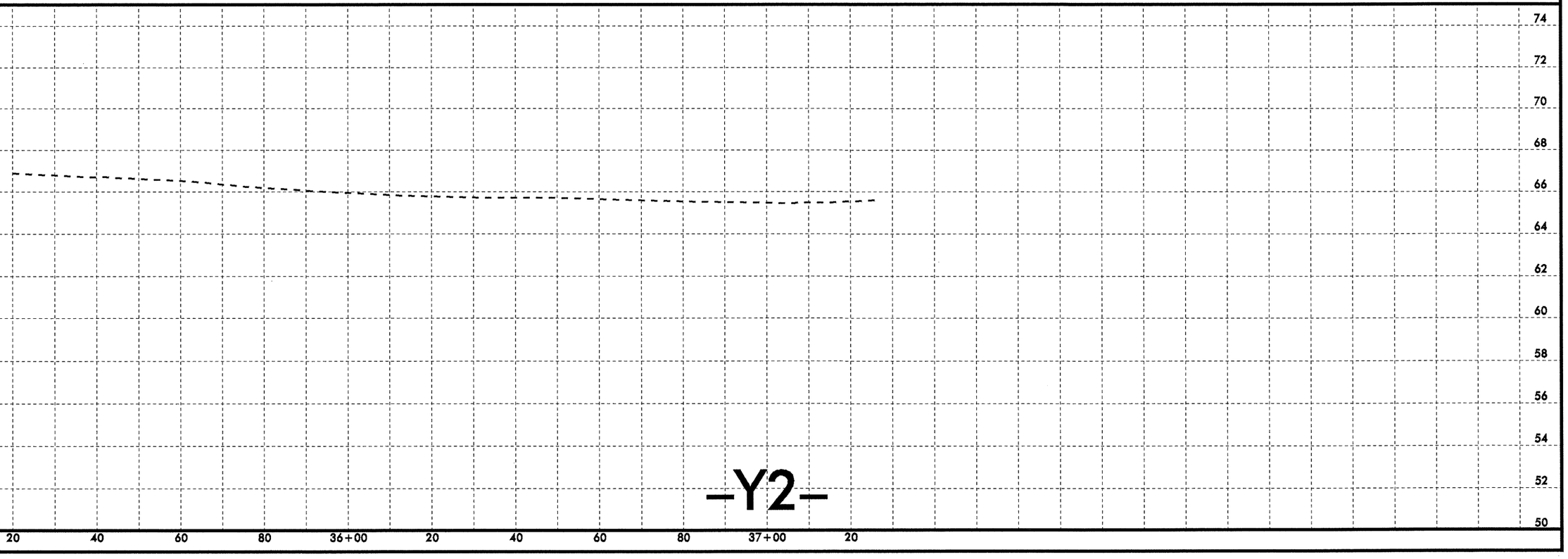
CONST.REV.

R/W REV.



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		
S-511	CL	32+40	0.0-0.2	A-2-4(0)	16	NP	62.4	27.8	2.7	7.0	100	51	11	-	-
S-512	CL	32+40	0.2-4.5	A-2-4(0)	22	NP	65.2	22.9	1.9	10.1	100	51	13	-	-
SS-513	CL	33+40	0.0-0.5	A-2-4(0)	16	NP	59.5	30.1	4.3	6.0	100	65	12	-	-
SS-514	CL	33+40	1.5-1.9	A-3(0)	19	NP	67.5	25.1	1.4	6.0	100	55	9	-	-
SS-515	CL	33+40	3.0-3.5	A-3(0)	20	NP	57.1	35.1	1.7	6.0	100	65	8	-	-



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wdfields AP GEJ221400

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	42
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST.REV.

R /W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

END GRADE TIP PROJECT U-2519DA
STA. 49+51.881
EL. 69.39
BEGIN GRADE TIP PROJECT X-0002B
-CDR- STA. 49+51.881
EL. = 69.39

PROPOSED GRADE

SS-11
SS-12
SS-15
SS-19

SS-20
SS-24

S-27

20.08 M LT

EXISTING GROUND

COASTAL PLAIN.

ORANGE TO TAN - ORANGE AND TAN - GRAY, MOIST TO SATURATED, LOOSE TO MEDIUM DENSE, FINE TO COARSE SAND AND SILTY SAND (MIDDENDORF FORMATION)

4 6 9 8 7 7 3 7 100

5 14 12 15 14 11 9

05/06

05/06

DRY
05/06

GRAY, WET, HARD, SANDY CLAY
CAPE FEAR 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-11	35 RT	50+40	0.3-0.8	A-3(0)	19	NP	44.6	48.9	0.4	6.1	100	76	10	-	-
SS-12	35 RT	50+40	1.2-1.7	A-2-4(0)	19	NP	36.8	46.1	1.0	16.2	98	79	21	-	-
SS-15	35 RT	50+40	5.8-6.2	A-1-b(0)	19	NP	80.4	13.3	0.2	6.1	95	43	6	-	-
SS-19	35 RT	50+40	11.9-12.3	A-6(15)	39	21	8.5	18.6	24.4	48.5	100	96	78	-	-
SS-20	CL	50+60	0.3-0.8	A-3(0)	17	NP	44.4	47.3	2.2	6.1	91	66	10	-	-
SS-24	CL	50+60	5.5-6.0	A-1-b(0)	17	NP	76.8	16.4	0.8	6.1	96	50	7	-	-
S-27	CL	51+40	1.5-3.0	A-2-4(0)	28	4	6.2	69.3	0.4	24.1	95	91	27	-	-

-CDR-

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

48+00 20 40 60 80 49+00 20 40 60 80 50+00 20 40 60 80 51+00 20 40 60

6/00/99
DR: FEB-2000 (P.H.)
CK: FEB-2000 (P.H.)
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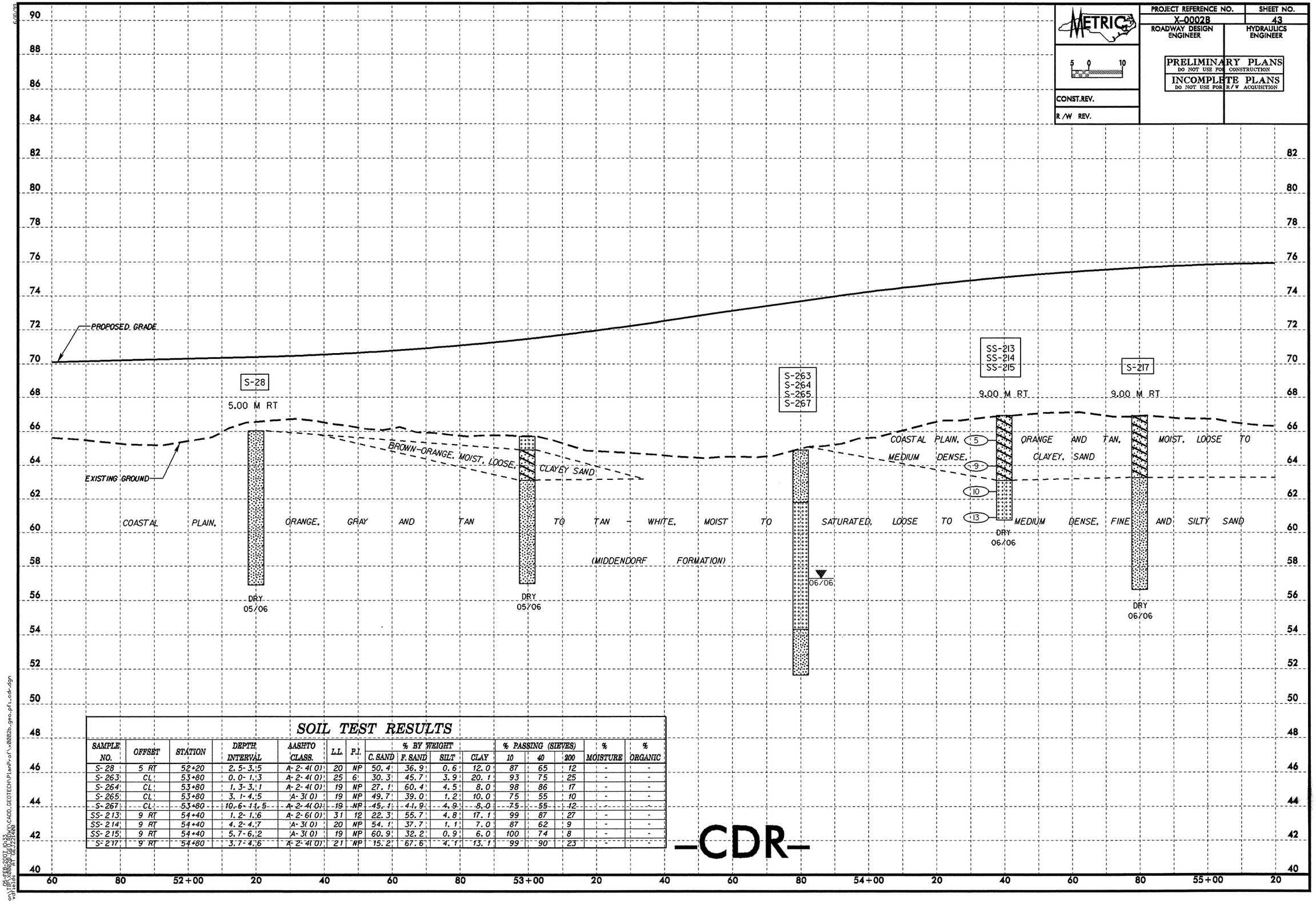
odfields
AT GE1225400

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	X-0002B	43
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R/W REV.	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-28	5 RT	52+20	2.5-3.5	A-2-4(0)	20	NP	50.4	36.9	0.6	12.0	87	65	12	-	-
S-263	CL	53+80	0.0-1.3	A-2-4(0)	25	6	30.3	45.7	3.9	20.1	93	75	25	-	-
S-264	CL	53+80	1.3-3.1	A-2-4(0)	19	NP	27.1	60.4	4.5	8.0	98	86	17	-	-
S-265	CL	53+80	3.1-4.5	A-3(0)	19	NP	49.7	39.0	1.2	10.0	75	55	10	-	-
S-267	CL	53+80	10.6-11.5	A-2-4(0)	19	NP	45.1	41.9	4.9	8.0	75	55	12	-	-
SS-213	9 RT	54+40	1.2-1.6	A-2-6(0)	31	12	22.3	55.7	4.8	17.1	99	87	27	-	-
SS-214	9 RT	54+40	4.2-4.7	A-3(0)	20	NP	54.1	37.7	1.1	7.0	87	62	9	-	-
SS-215	9 RT	54+40	5.7-6.2	A-3(0)	19	NP	60.9	32.2	0.9	6.0	100	74	8	-	-
S-217	9 RT	54+80	3.7-4.6	A-2-4(0)	21	NP	15.2	67.6	4.1	13.1	99	90	23	-	-

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PROJECT REFERENCE NO.	SHEET NO.
X-0002B	44
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

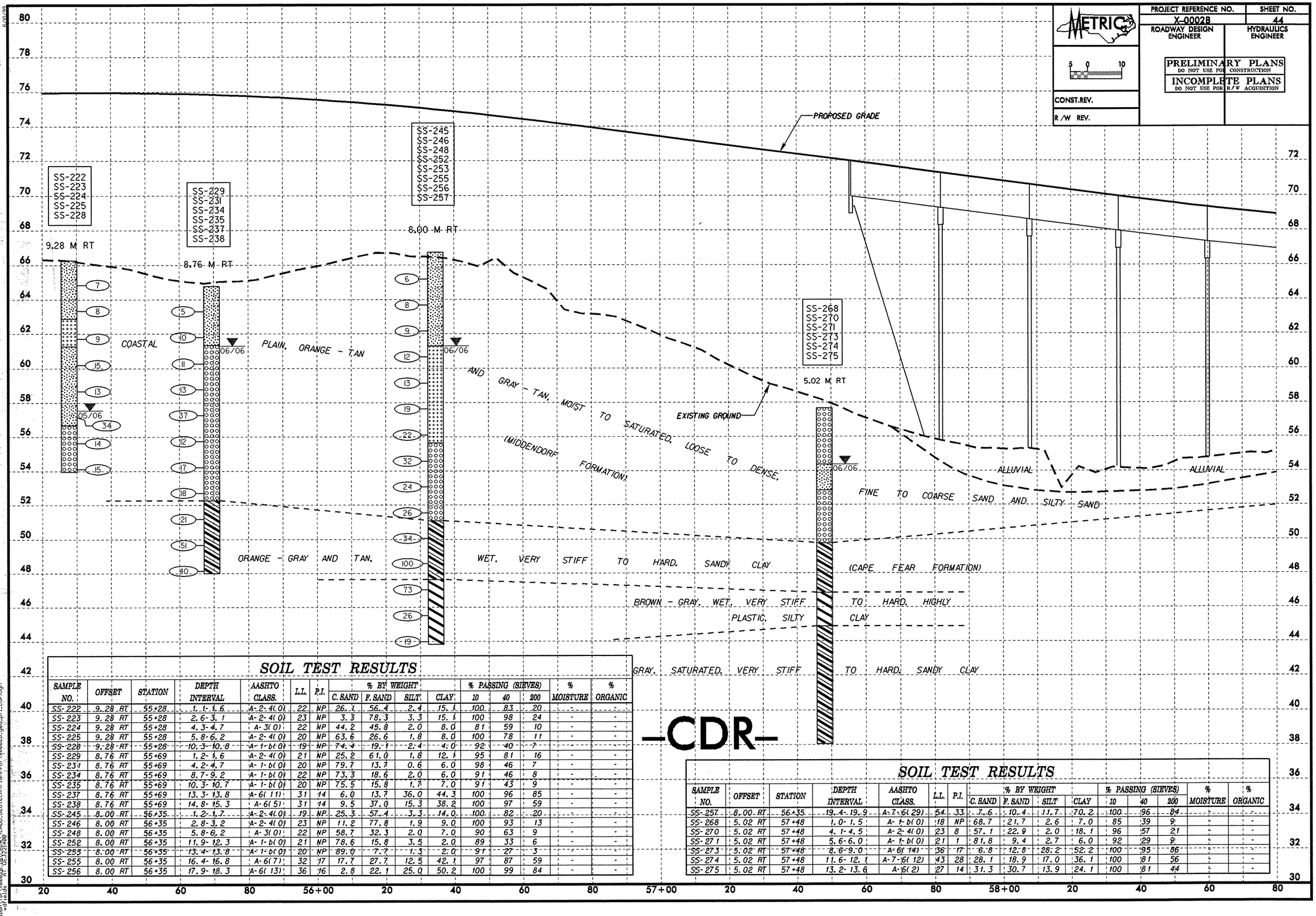
5 0 10

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



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-222	9.28 RT	55+28	1.1- 1.6	A-2-4(0)	22	NP	26.1	56.4	2.4	15.1	100	83	20	-	-
SS-223	9.28 RT	55+28	2.6- 3.1	A-2-4(0)	23	NP	3.3	78.3	3.3	15.1	100	98	24	-	-
SS-224	9.28 RT	55+28	4.3- 4.7	A-3(0)	22	NP	44.2	45.8	2.0	8.0	81	59	10	-	-
SS-225	9.28 RT	55+28	5.8- 6.2	A-2-4(0)	20	NP	63.6	26.6	1.8	8.0	100	78	11	-	-
SS-228	9.28 RT	55+28	10.3- 10.8	A-1-b(0)	19	NP	74.4	19.1	2.4	4.0	92	40	7	-	-
SS-229	8.76 RT	55+69	1.2- 1.6	A-2-4(0)	21	NP	25.2	61.0	1.8	12.1	95	81	16	-	-
SS-231	8.76 RT	55+69	4.2- 4.7	A-1-b(0)	20	NP	79.7	13.7	0.6	6.0	98	46	7	-	-
SS-234	8.76 RT	55+69	8.7- 9.2	A-1-b(0)	22	NP	73.3	18.6	2.0	6.0	91	46	8	-	-
SS-235	8.76 RT	55+69	10.3- 10.7	A-1-b(0)	20	NP	75.5	15.8	1.7	7.0	91	43	9	-	-
SS-237	8.76 RT	55+69	13.3- 13.8	A-6(11)	31	14	6.0	13.7	36.0	44.3	100	96	85	-	-
SS-238	8.76 RT	55+69	14.8- 15.3	A-6(5)	31	14	9.5	37.0	15.3	38.2	100	97	59	-	-
SS-245	8.00 RT	56+35	1.2- 1.7	A-2-4(0)	19	NP	25.3	57.4	3.3	14.0	100	82	20	-	-
SS-246	8.00 RT	56+35	2.8- 3.2	A-2-4(0)	23	NP	11.2	77.8	1.9	9.0	100	93	13	-	-
SS-248	8.00 RT	56+35	5.8- 6.2	A-3(0)	22	NP	58.7	32.3	2.0	7.0	90	63	9	-	-
SS-252	8.00 RT	56+35	11.9- 12.3	A-1-b(0)	21	NP	78.6	15.8	3.5	2.0	89	33	6	-	-
SS-253	8.00 RT	56+35	13.4- 13.8	A-1-b(0)	20	NP	89.0	7.7	1.3	2.0	91	27	3	-	-
SS-255	8.00 RT	56+35	16.4- 16.8	A-6(7)	32	17	17.7	27.7	12.5	42.1	97	87	59	-	-
SS-256	8.00 RT	56+35	17.9- 18.3	A-6(13)	36	16	2.8	22.1	25.0	50.2	100	99	84	-	-

-CDR-

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-257	8.00 RT	56+35	19.4- 19.9	A-7-6(29)	54	33	7.6	10.4	11.7	70.2	100	96	84	-	-
SS-268	5.02 RT	57+48	1.0- 1.5	A-1-b(0)	18	NP	68.7	21.7	2.6	7.0	85	39	9	-	-
SS-270	5.02 RT	57+48	4.1- 4.5	A-2-4(0)	23	8	57.1	22.9	2.0	18.1	96	57	21	-	-
SS-271	5.02 RT	57+48	5.6- 6.0	A-1-b(0)	21	1	81.8	9.4	2.7	6.0	92	29	9	-	-
SS-273	5.02 RT	57+48	8.6- 9.0	A-6(14)	36	17	6.8	12.8	28.2	52.2	100	95	86	-	-
SS-274	5.02 RT	57+48	11.6- 12.1	A-7-6(12)	43	28	28.1	18.9	17.0	36.1	100	81	56	-	-
SS-275	5.02 RT	57+48	13.2- 13.6	A-6(2)	27	14	31.3	30.7	13.9	24.1	100	81	44	-	-

6/10/93
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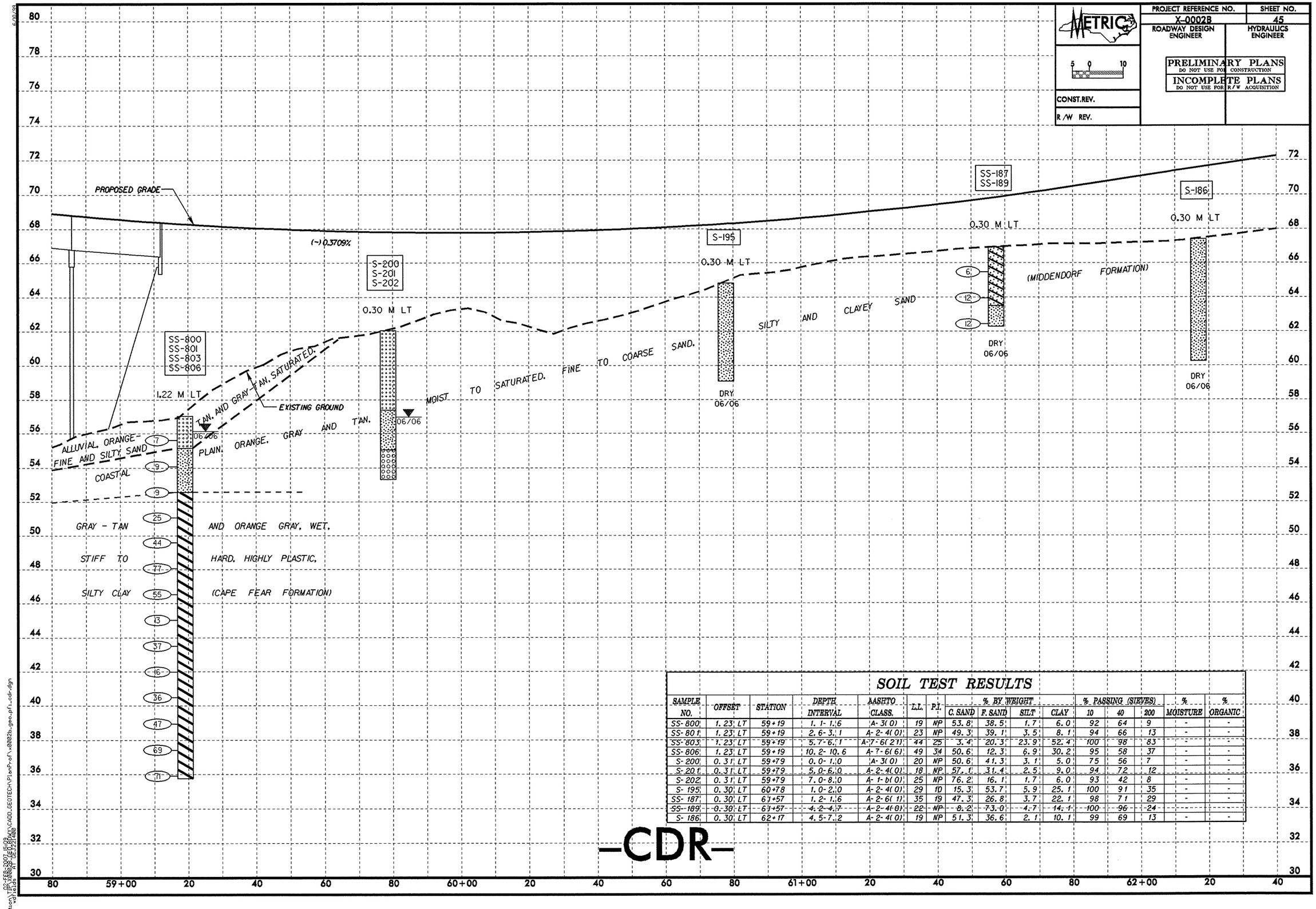
By: cdr

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	X-0002B	45
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R/W REV.	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	



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-800	1.23' LT	59+19	1.1-1.6	A-3(0)	19	NP	53.8	38.5	1.7	6.0	92	64	9	-	-
SS-801	1.23' LT	59+19	2.6-3.1	A-2-4(0)	23	NP	49.3	39.1	3.5	8.1	94	66	13	-	-
SS-803	1.23' LT	59+19	5.7-6.1	A-7-6(21)	44	25	3.4	20.3	23.9	52.4	100	98	83	-	-
SS-806	1.23' LT	59+19	10.2-10.6	A-7-6(61)	49	34	50.6	12.3	6.9	30.2	95	58	37	-	-
S-200	0.31' LT	59+79	0.0-1.0	A-3(0)	20	NP	50.6	41.3	3.1	5.0	75	56	7	-	-
S-201	0.31' LT	59+79	5.0-6.0	A-2-4(0)	18	NP	57.1	31.4	2.5	9.0	94	72	12	-	-
S-202	0.31' LT	59+79	7.0-8.0	A-1-b(0)	25	NP	76.2	16.1	1.7	6.0	93	42	8	-	-
S-195	0.30' LT	60+78	1.0-2.0	A-2-4(0)	29	10	15.3	53.7	5.9	25.1	100	91	35	-	-
SS-187	0.30' LT	61+57	1.2-1.6	A-2-6(1)	35	19	47.3	26.8	3.7	22.1	98	71	29	-	-
SS-189	0.30' LT	61+57	4.2-4.7	A-2-4(0)	22	NP	8.2	73.0	4.7	14.1	100	96	24	-	-
S-186	0.30' LT	62+17	4.5-7.2	A-2-4(0)	19	NP	51.3	36.6	2.1	10.1	99	69	13	-	-

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6/20/25
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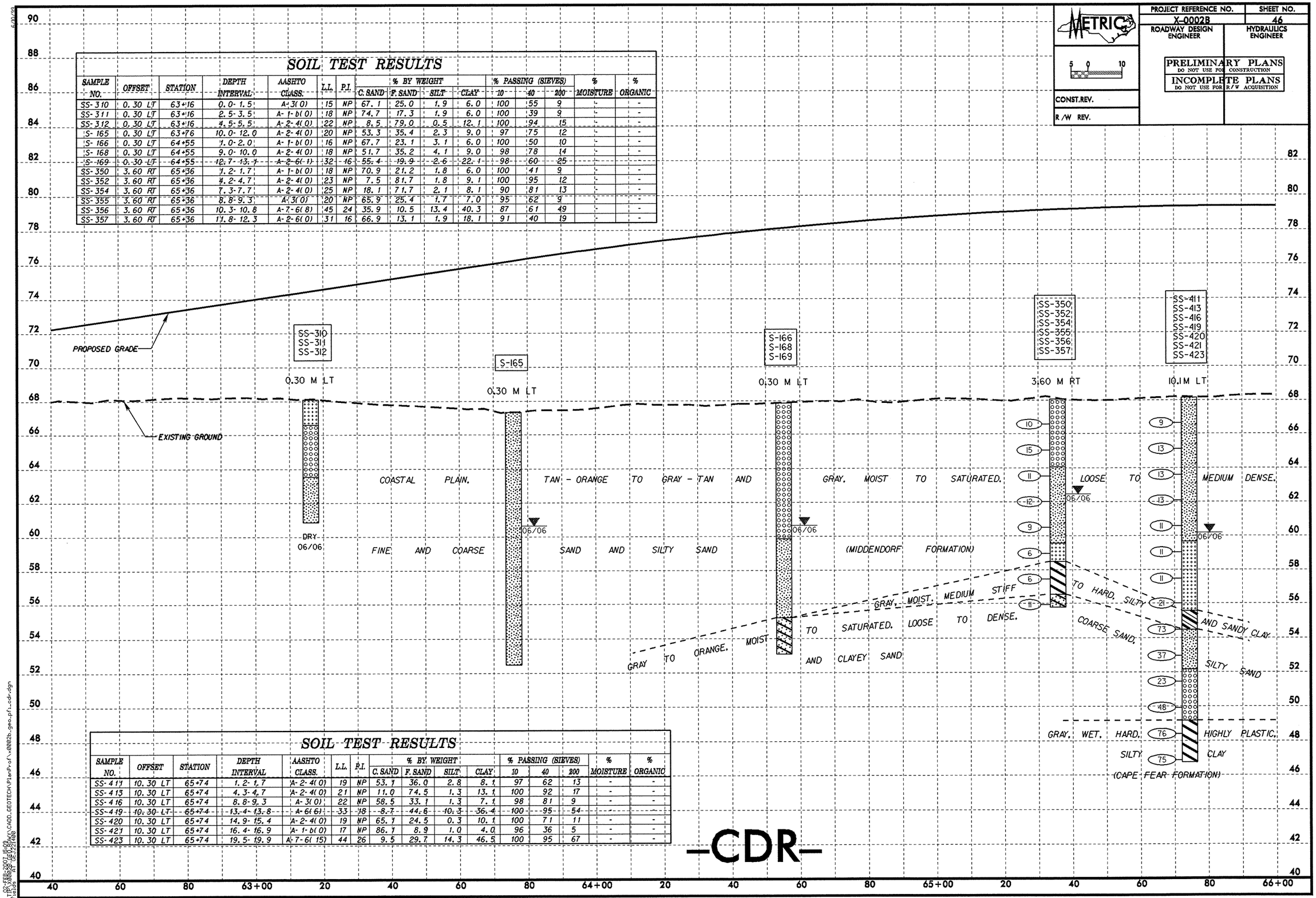
METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	X-0002B	46
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R/W REV.	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

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-310	0.30 LT	63+16	0.0- 1.5	A-3(0)	15	NP	67.1	25.0	1.9	6.0	100	55	9	-	-
SS-311	0.30 LT	63+16	2.5- 3.5	A-1-b(0)	18	NP	74.7	17.3	1.9	6.0	100	39	9	-	-
SS-312	0.30 LT	63+16	4.5- 5.5	A-2-4(0)	22	NP	8.5	79.0	0.5	12.1	100	94	15	-	-
S-165	0.30 LT	63+76	10.0- 12.0	A-2-4(0)	20	NP	53.3	35.4	2.3	9.0	97	75	12	-	-
S-166	0.30 LT	64+55	1.0- 2.0	A-1-b(0)	16	NP	67.7	23.1	3.1	6.0	100	50	10	-	-
S-168	0.30 LT	64+55	9.0- 10.0	A-2-4(0)	18	NP	51.7	35.2	4.1	9.0	98	78	14	-	-
S-169	0.30 LT	64+55	12.7- 13.7	A-2-6(1)	32	16	55.4	19.9	2.6	22.1	98	60	25	-	-
SS-350	3.60 RT	65+36	1.2- 1.7	A-1-b(0)	18	NP	70.9	21.2	1.8	6.0	100	41	9	-	-
SS-352	3.60 RT	65+36	4.2- 4.7	A-2-4(0)	23	NP	7.5	81.7	1.8	9.1	100	95	12	-	-
SS-354	3.60 RT	65+36	7.3- 7.7	A-2-4(0)	25	NP	18.1	71.7	2.1	8.1	90	81	13	-	-
SS-355	3.60 RT	65+36	8.8- 9.3	A-3(0)	20	NP	65.9	25.4	1.7	7.0	95	62	9	-	-
SS-356	3.60 RT	65+36	10.3- 10.8	A-7-6(8)	45	24	35.9	10.5	13.4	40.3	87	61	49	-	-
SS-357	3.60 RT	65+36	11.8- 12.3	A-2-6(0)	31	16	66.9	13.1	1.9	18.1	91	40	19	-	-



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-411	10.30 LT	65+74	1.2- 1.7	A-2-4(0)	19	NP	53.1	36.0	2.8	8.1	97	62	13	-	-
SS-413	10.30 LT	65+74	4.3- 4.7	A-2-4(0)	21	NP	11.0	74.5	1.3	13.1	100	92	17	-	-
SS-416	10.30 LT	65+74	8.8- 9.3	A-3(0)	22	NP	58.5	33.1	1.3	7.1	98	81	9	-	-
SS-419	10.30 LT	65+74	13.4- 13.8	A-6(6)	33	18	8.7	44.6	10.3	36.4	100	95	54	-	-
SS-420	10.30 LT	65+74	14.9- 15.4	A-2-4(0)	19	NP	65.1	24.5	0.3	10.1	100	71	11	-	-
SS-421	10.30 LT	65+74	16.4- 16.9	A-1-b(0)	17	NP	86.1	8.9	1.0	4.0	96	36	5	-	-
SS-423	10.30 LT	65+74	19.5- 19.9	A-7-6(15)	44	26	9.5	29.7	14.3	46.5	100	95	67	-	-

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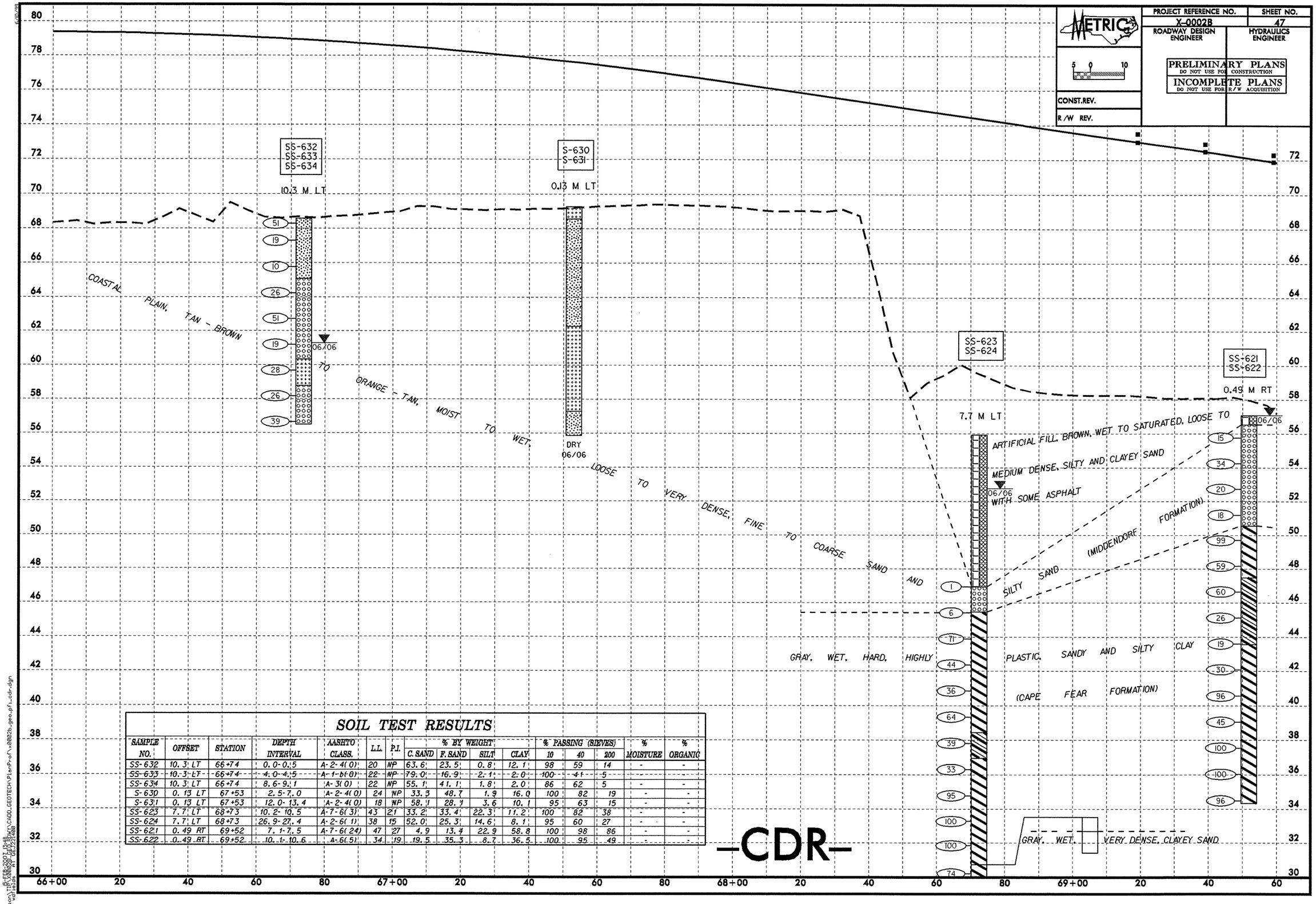

SOIL TEST RESULTS

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-632	10.3 LT	66+74	0.0-0.5	A-2-4(0)	20	NP	63.6	23.5	0.8	12.1	98	59	14	-	-
SS-633	10.3 LT	66+74	4.0-4.5	A-1-b(0)	22	NP	79.0	16.9	2.1	2.0	100	41	5	-	-
SS-634	10.3 LT	66+74	8.6-9.1	A-3(0)	22	NP	55.1	41.1	1.8	2.0	86	62	5	-	-
S-630	0.13 LT	67+53	2.5-7.0	A-2-4(0)	24	NP	33.3	48.7	1.9	16.0	100	82	19	-	-
S-631	0.13 LT	67+53	12.0-13.4	A-2-4(0)	18	NP	58.1	28.1	3.6	10.1	95	63	15	-	-
SS-623	7.7 LT	68+73	10.2-10.5	A-7-6(3)	43	21	33.2	33.4	22.3	11.2	100	82	38	-	-
SS-624	7.7 LT	68+73	26.9-27.4	A-2-6(1)	38	15	52.0	25.3	14.6	8.1	95	60	27	-	-
SS-621	0.49 RT	69+52	7.1-7.5	A-7-6(24)	47	27	4.9	13.4	22.9	58.8	100	98	86	-	-
SS-622	0.49 RT	69+52	10.1-10.6	A-6(5)	34	19	19.5	35.3	8.7	36.5	100	95	49	-	-

-CDR-

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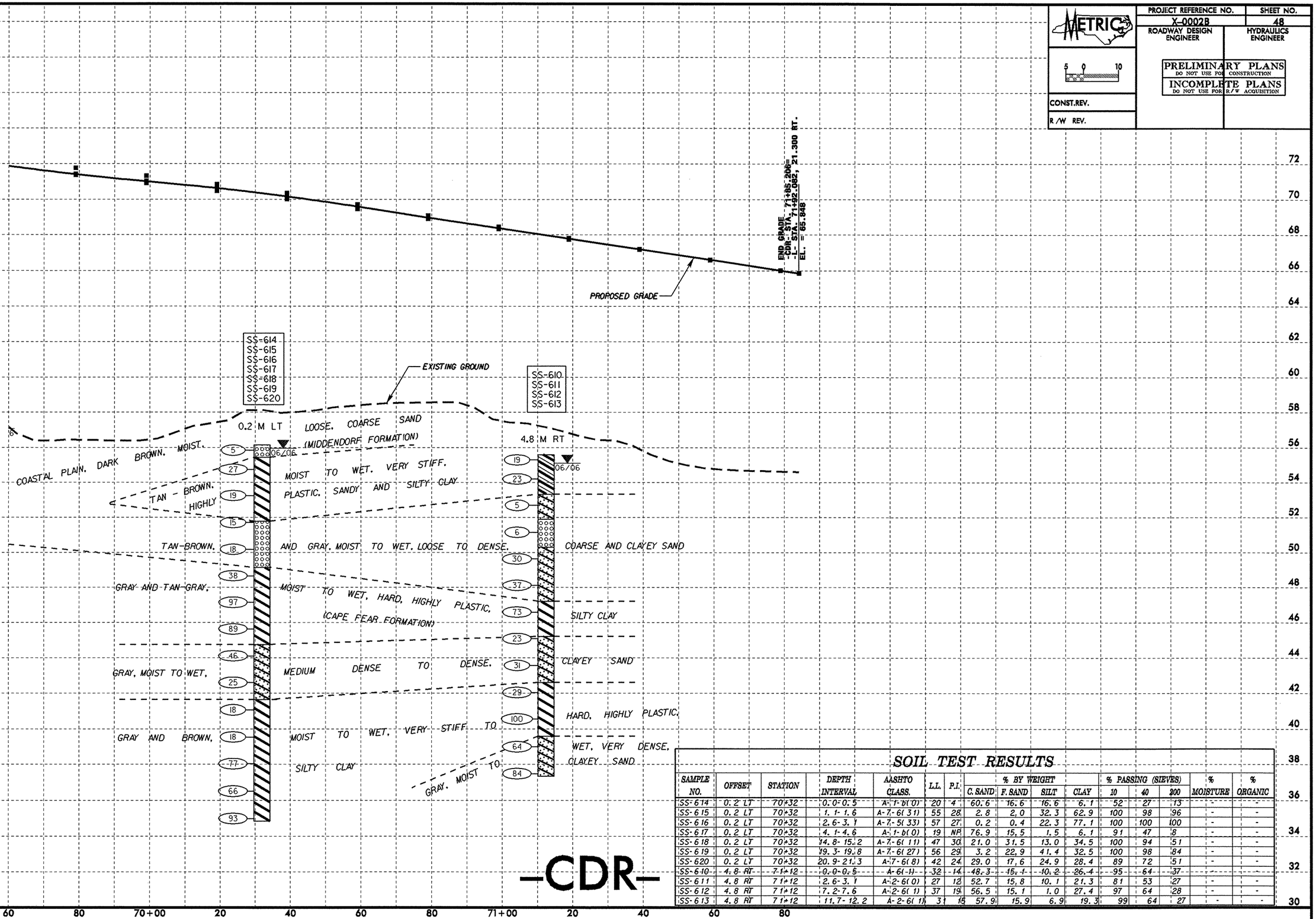
PROJECT REFERENCE NO.	SHEET NO.
X-0002B	48
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5 0 10

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

CONST.REV.

R/W REV.



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-614	0.2 LT	70+32	0.0-0.5	A-1-b(0)	20	4	60.6	16.6	16.6	6.1	52	27	13	-	-
SS-615	0.2 LT	70+32	1.1-1.6	A-7-6(31)	55	28	2.8	2.0	32.3	62.9	100	98	96	-	-
SS-616	0.2 LT	70+32	2.6-3.1	A-7-5(33)	57	27	0.2	0.4	22.3	77.1	100	100	100	-	-
SS-617	0.2 LT	70+32	4.1-4.6	A-1-b(0)	19	NP	76.9	15.5	1.5	6.1	91	47	8	-	-
SS-618	0.2 LT	70+32	14.8-15.2	A-7-6(11)	47	30	21.0	31.5	13.0	34.5	100	94	51	-	-
SS-619	0.2 LT	70+32	19.3-19.8	A-7-6(27)	56	29	3.2	22.9	41.4	32.5	100	98	84	-	-
SS-620	0.2 LT	70+32	20.9-21.3	A-7-6(8)	42	24	29.0	17.6	24.9	28.4	89	72	51	-	-
SS-610	4.8 RT	71+12	0.0-0.5	A-6(1)	32	14	48.3	15.1	10.2	26.4	95	64	37	-	-
SS-611	4.8 RT	71+12	2.6-3.1	A-2-6(0)	27	12	52.7	15.8	10.1	21.3	81	53	27	-	-
SS-612	4.8 RT	71+12	7.2-7.6	A-2-6(1)	37	19	56.5	15.1	1.0	27.4	97	64	28	-	-
SS-613	4.8 RT	71+12	11.7-12.2	A-2-6(1)	31	15	57.9	15.9	6.9	19.3	99	64	27	-	-

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PROJECT REFERENCE NO.	SHEET NO.
X-0002B	49
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

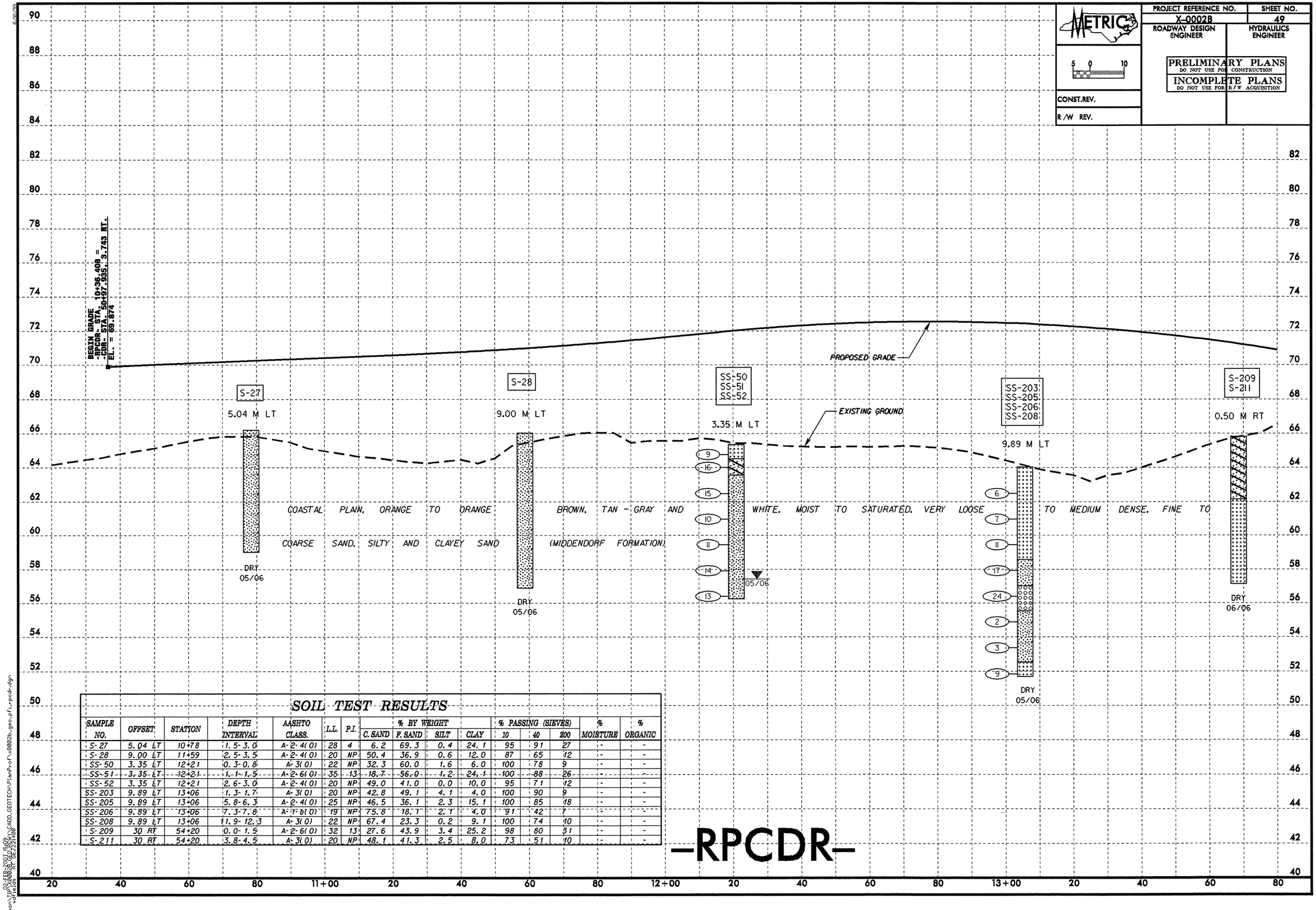
5 0 10

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



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-27	5.04 LT	10+78	1.5-3.0	A-2-4(0)	28	4	6.2	69.3	0.4	24.1	95	91	27	-	-
S-28	9.00 LT	11+59	2.5-3.5	A-2-4(0)	20	NP	50.4	36.9	0.6	12.0	87	65	12	-	-
SS-50	3.35 LT	12+21	0.3-0.8	A-3(0)	22	NP	32.3	60.0	1.6	6.0	100	78	9	-	-
SS-51	3.35 LT	12+21	1.1-1.5	A-2-6(0)	35	13	18.7	56.0	1.2	24.1	100	88	26	-	-
SS-52	3.35 LT	12+21	2.6-3.0	A-2-4(0)	20	NP	49.0	41.0	0.0	10.0	95	71	12	-	-
SS-203	9.89 LT	13+06	1.3-1.7	A-3(0)	20	NP	42.8	49.1	4.1	4.0	100	90	9	-	-
SS-205	9.89 LT	13+06	5.8-6.3	A-2-4(0)	25	NP	46.5	36.1	2.3	15.1	100	85	18	-	-
SS-206	9.89 LT	13+06	7.3-7.8	A-1-b(0)	19	NP	75.8	18.1	2.1	4.0	91	42	7	-	-
SS-208	9.89 LT	13+06	11.9-12.3	A-3(0)	22	NP	67.4	23.3	0.2	9.1	100	74	10	-	-
S-209	30 RT	54+20	0.0-1.5	A-2-6(0)	32	13	27.6	43.9	3.4	25.2	98	80	51	-	-
S-211	30 RT	54+20	3.8-4.5	A-3(0)	20	NP	48.1	41.3	2.5	8.0	73	51	10	-	-

-RPCDR-

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PROJECT REFERENCE NO.	SHEET NO.
X-0002B	50

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.

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-239	CL	15+40	0.0-2.5	A-2-4(0)	19	NP	28.2	60.5	3.3	8.0	98	80	14	-	-
S-240	CL	15+40	2.5-4.2	A-6(1)	31	13	32.8	33.2	7.8	26.2	94	76	36	-	-
SS-243	CL	16+20	1.2-1.6	A-2-6(0)	31	11	21.5	49.9	2.4	26.2	99	88	30	-	-
SS-244	CL	16+20	2.7-3.1	A-2-4(0)	27	5	6.3	70.3	1.3	22.1	100	96	26	-	-
SS-260	CL	17+00	0.0-1.0	A-2-4(0)	18	NP	54.7	33.7	2.6	9.0	92	64	13	-	-
SS-262	CL	17+00	7.2-8.0	A-1-b(0)	17	NP	80.5	10.8	2.6	6.0	97	43	9	-	-

-RPCDR-

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6/01/23

METRIC	PROJECT REFERENCE NO.	SHEET NO.
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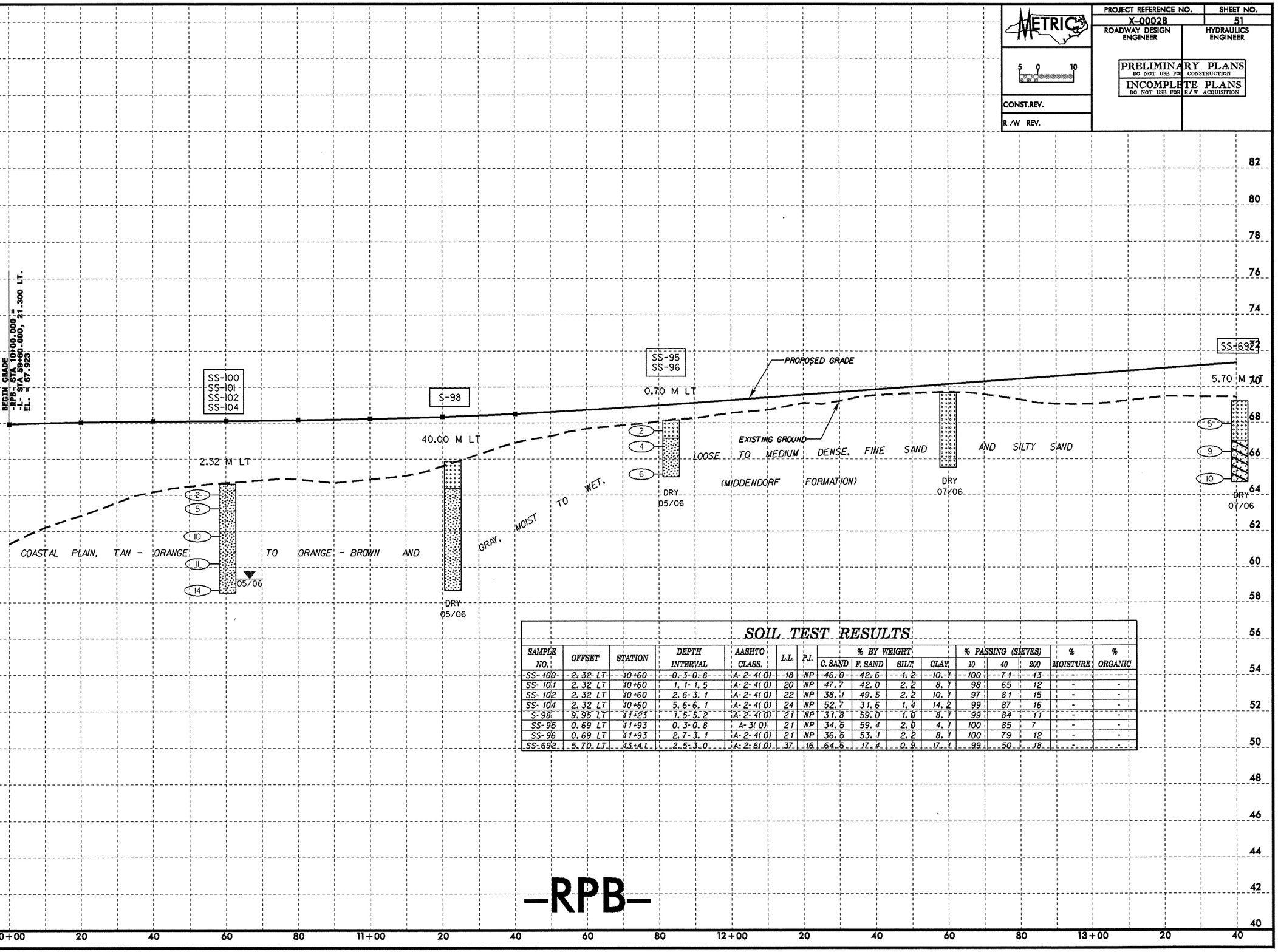
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R/W REV.	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	



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-100	2.32 LT	10+60	0.3-0.8	A-2-4(0)	18	NP	46.0	42.6	1.2	10.1	100	71	13	-	-
SS-101	2.32 LT	10+60	1.1-1.5	A-2-4(0)	20	NP	47.7	42.0	2.2	8.1	98	65	12	-	-
SS-102	2.32 LT	10+60	2.6-3.1	A-2-4(0)	22	NP	38.1	49.5	2.2	10.1	97	81	15	-	-
SS-104	2.32 LT	10+60	5.6-6.1	A-2-4(0)	24	NP	52.7	31.6	1.4	14.2	99	87	16	-	-
S-98	9.96 LT	11+23	1.5-2.2	A-2-4(0)	21	NP	31.8	59.0	1.0	8.1	99	84	11	-	-
SS-95	0.69 LT	11+93	0.3-0.8	A-3(0)	21	NP	34.5	59.4	2.0	4.1	100	85	7	-	-
SS-96	0.68 LT	11+93	2.7-3.1	A-2-4(0)	21	NP	36.5	53.1	2.2	8.1	100	79	12	-	-
SS-692	5.70 LT	13+41	2.5-3.0	A-2-6(0)	37	16	64.6	17.4	0.9	17.1	99	50	18	-	-

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METRIC	PROJECT REFERENCE NO.	SHEET NO.
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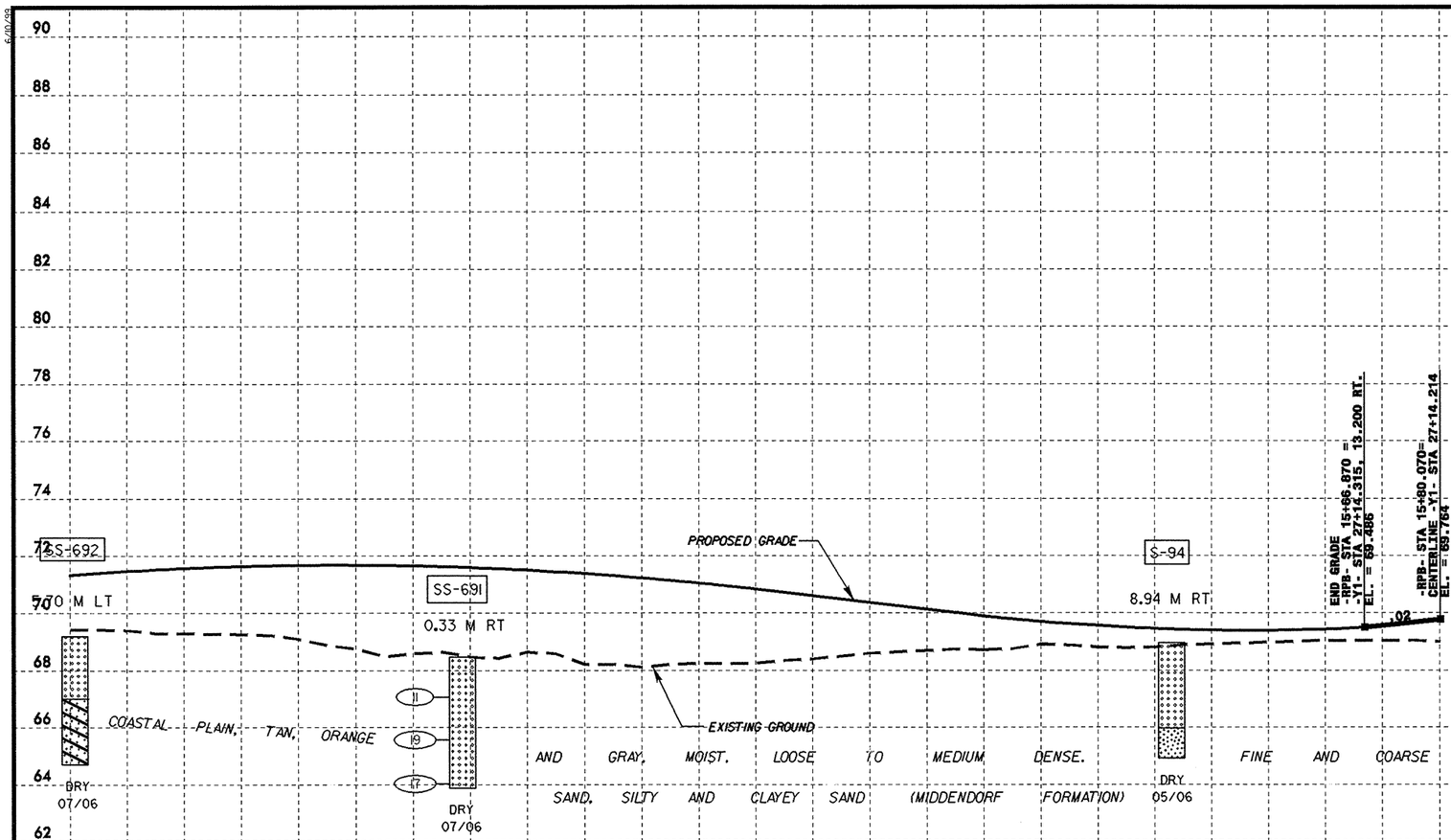
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R /W REV.	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	



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-692	5.70 LT	13+41	2.5-3.0	A-2-6(0)	37	16	64.6	17.4	0.9	17.1	99	50	18	-	-
SS-691	0.33 RT	14+09	1.1-1.6	A-3(0)	21	NP	56.9	35.6	1.4	6.0	100	65	9	-	-
S-94	8.94 RT	15+33	0.0-0.9	A-3(0)	17	NP	56.0	34.9	3.0	6.1	100	62	10	-	-

-RPB-

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BEGIN GRADE
-LPB- STA 10+00.000 =
-L- STA 64+85.000, 17.700 LT.
EL. = 78.390

PROPOSED GRADE

EXISTING GROUND

END GRADE
-LPB- STA 13+13.158 =
-Y1- STA 27+30.919, 13.200 RT.
EL. = 69.319

-LPB- STA 13+26.398 =
-Y1- STA 27+29.894
EL. = 69.605

S-170
S-171
S-172
2.70 M LT

SS-158
SS-161
SS-162
5.84 M LT

SS-181
SS-183
SS-184

S-92
S-93
15.0 M LT

S-94
10.0 M LT

COASTAL PLAIN, GRAY, TAN AND COARSE SAND AND SILTY SAND

TAN - ORANGE TO GRAY - ORANGE, MOIST TO SATURATED, LOOSE TO MEDIUM DENSE, FINE TO (MIDDENDORF FORMATION)

GRAY, WET TO SATURATED, LOOSE TO MEDIUM DENSE, CLAYEY SAND

06/06

DRY
05/06

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-170	2.71 LT	10+05	3.4-4.9	A-1-b(0)	21	NP	69.6	16.2	2.1	12.1	98	40	15	-	-
S-171	2.71 LT	10+05	5.2-6.5	A-2-4(0)	18	NP	15.9	73.7	2.4	8.0	100	90	12	-	-
S-172	2.71 LT	10+05	14.3-14.8	A-2-6(0)	31	15	61.1	16.4	1.4	21.1	97	59	22	-	-
SS-158	5.84 LT	10+87	1.2-1.6	A-2-4(0)	20	NP	51.2	38.9	2.8	7.1	100	65	12	-	-
SS-161	5.84 LT	10+87	5.7-6.2	A-2-4(0)	22	NP	16.3	70.4	3.2	10.1	98	89	17	-	-
SS-162	5.84 LT	10+87	8.8-9.2	A-3(0)	18	NP	59.2	31.2	1.5	8.1	97	67	10	-	-
SS-181	CL	11+40	1.0-1.5	A-3(0)	21	NP	41.3	52.9	1.8	4.0	100	77	7	-	-
SS-183	CL	11+40	4.1-4.5	A-2-4(0)	24	NP	19.9	64.7	4.3	11.1	98	90	17	-	-
SS-184	CL	11+40	5.6-6.0	A-2-4(0)	23	NP	9.1	76.4	3.4	11.1	100	96	19	-	-
S-92	15 LT	12+00	1.0-1.5	A-3(0)	19	NP	55.0	36.9	2.0	6.1	100	65	10	-	-
S-93	15 LT	12+00	2.5-3.5	A-2-4(0)	20	NP	54.2	35.1	2.6	8.1	100	63	12	-	-
S-94	10.00 LT	12+80	0.0-0.9	A-3(0)	17	NP	56.0	34.9	3.0	6.1	100	62	10	-	-

-LPB-

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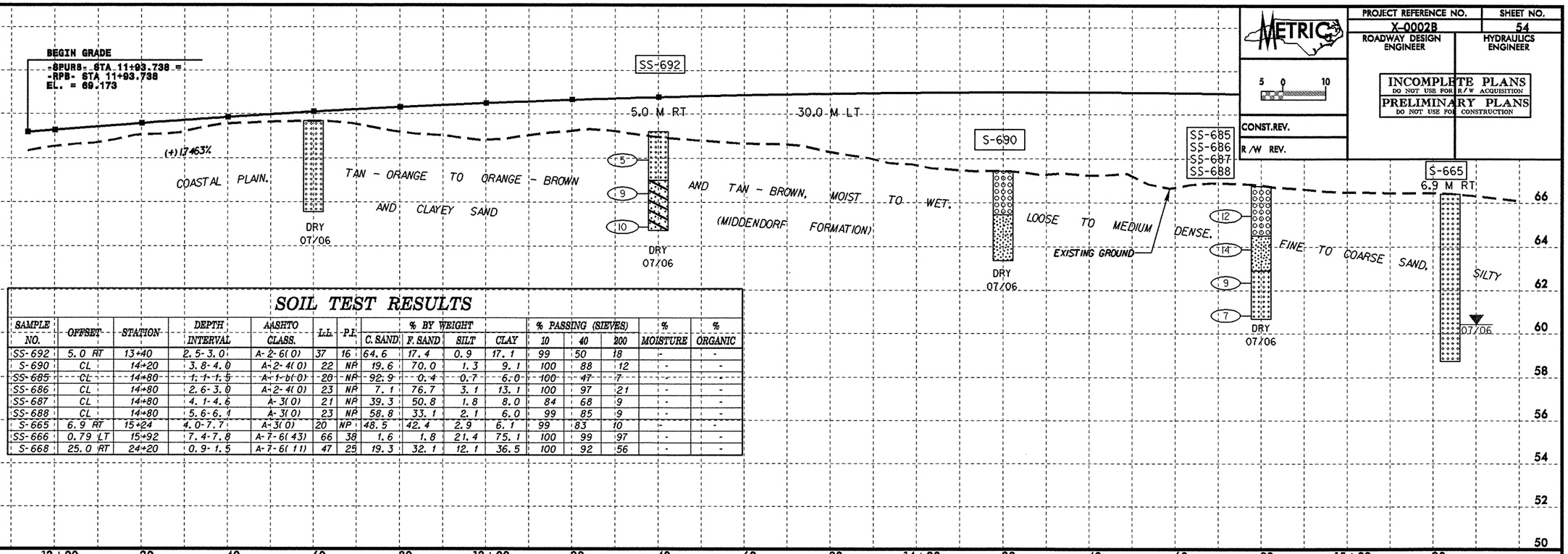
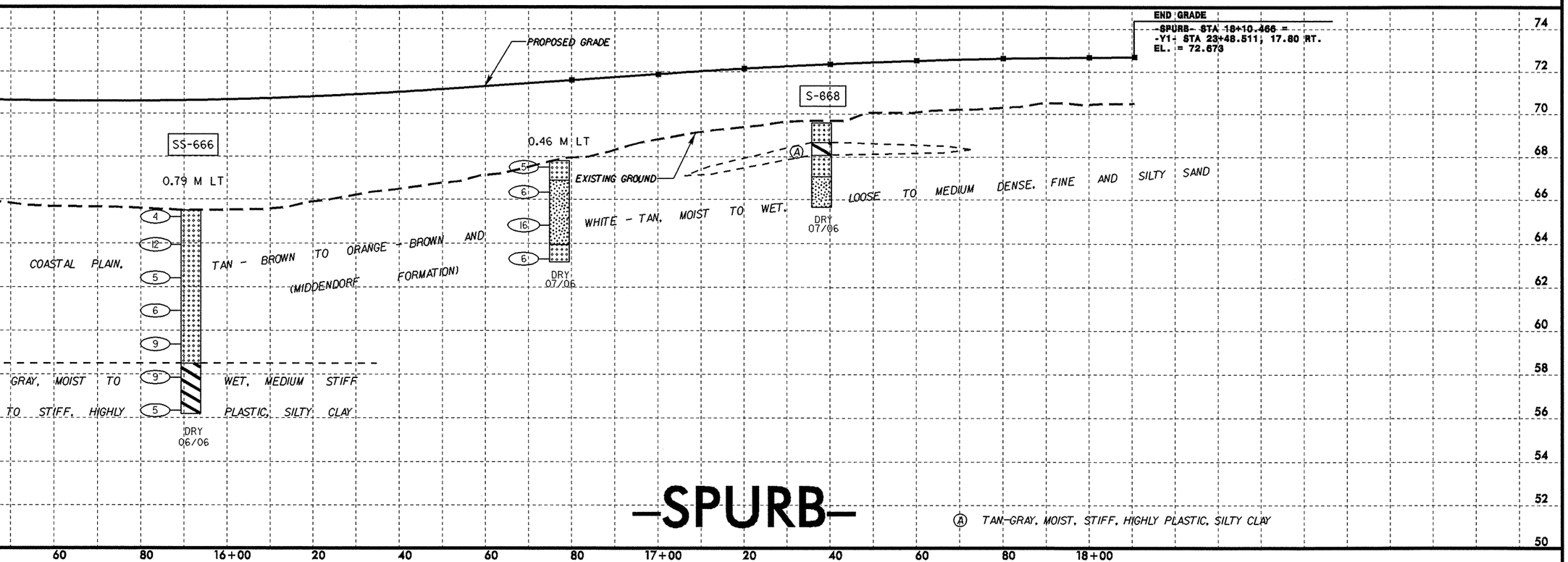


SOIL TEST RESULTS

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-692	5.0 RT	13+40	2.5-3.0	A-2-6(0)	37	16	64.6	17.4	0.9	17.1	99	50	18	-	-
S-690	CL	14+20	3.8-4.0	A-2-4(0)	22	NP	19.6	70.0	1.3	9.1	100	88	12	-	-
SS-685	CL	14+80	1.1-1.5	A-1-b(0)	20	NP	92.9	0.4	0.7	6.0	100	47	7	-	-
SS-686	CL	14+80	2.6-3.0	A-2-4(0)	23	NP	7.1	76.7	3.1	13.1	100	97	21	-	-
SS-687	CL	14+80	4.1-4.6	A-3(0)	21	NP	39.3	50.8	1.8	8.0	84	68	9	-	-
SS-688	CL	14+80	5.6-6.1	A-3(0)	23	NP	58.8	33.1	2.1	6.0	99	85	9	-	-
S-665	6.9 RT	15+24	4.0-7.7	A-3(0)	20	NP	48.5	42.4	2.9	6.1	99	83	10	-	-
SS-666	0.79 LT	15+92	7.4-7.8	A-7-6(43)	66	38	1.6	1.8	21.4	75.1	100	99	97	-	-
S-668	25.0 RT	24+20	0.9-1.5	A-7-6(11)	47	25	19.3	32.1	12.1	36.5	100	92	56	-	-



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6/10/99

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-379	4.14 RT	12+21	1.1-1.6	A-2-6(0)	32	12	24.4	46.7	2.7	26.2	100	85	31	-	-
SS-380	4.14 RT	12+21	2.6-3.1	A-3(0)	21	NP	52.6	39.1	2.3	6.0	83	60	7	-	-
SS-384	4.14 RT	12+21	8.7-9.2	A-7-6(17)	43	21	15.4	8.3	25.9	50.5	100	90	79	-	-
SS-385	4.14 RT	12+21	10.0-10.7	A-6(5)	33	15	35.4	13.7	16.6	34.3	99	76	54	-	-
SS-386	4.14 RT	12+21	11.7-12.2	A-3(0)	18	NP	66.3	26.0	1.7	6.1	100	66	10	-	-
SS-387	4.14 RT	12+21	13.3-13.7	A-7-6(20)	43	25	4.0	23.4	20.0	52.5	100	98	81	-	-
SS-390	4.14 RT	12+21	17.8-18.3	A-7-6(19)	50	32	21.4	16.6	9.5	52.5	100	89	65	-	-
SS-391	4.14 RT	12+21	19.3-19.8	A-2-6(1)	35	18	52.5	20.3	1.9	25.3	100	73	28	-	-
SS-392	4.14 RT	12+21	20.9-21.3	A-2-4(0)	25	9	37.0	37.7	6.2	19.2	100	79	30	-	-
SS-395	5.70 RT	12+95	1.2-1.6	A-2-4(0)	19	NP	60.2	29.7	2.0	8.1	100	60	11	-	-

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-396	5.70 RT	12+95	2.7-3.2	A-2-4(0)	21	NP	21.9	66.7	2.3	9.1	99	90	14	-	-
SS-399	5.70 RT	12+95	7.3-7.7	A-3(0)	18	NP	73.5	19.4	1.0	6.1	98	52	8	-	-
SS-400	5.70 RT	12+95	8.8-9.2	A-2-4(0)	23	NP	58.1	30.6	3.2	8.1	94	55	12	-	-
SS-401	5.70 RT	12+95	10.3-10.8	A-1-b(0)	20	NP	86.7	7.1	2.2	4.0	100	22	7	-	-
SS-402	5.70 RT	12+95	11.8-12.3	A-1-b(0)	18	NP	84.7	10.0	2.2	3.0	97	30	6	-	-
SS-403	5.70 RT	12+95	13.4-13.8	A-2-6(0)	36	21	84.0	3.5	0.3	12.1	100	24	13	-	-
SS-404	5.70 RT	12+95	14.9-15.3	A-2-4(0)	20	5	56.2	22.5	6.2	15.2	92	56	21	-	-
SS-405	5.70 RT	12+95	16.4-16.8	A-6(7)	39	21	35.2	18.0	10.5	36.4	99	71	50	-	-
SS-406	5.70 RT	12+95	17.9-18.4	A-7-6(26)	48	26	0.8	11.3	29.3	58.6	100	100	93	-	-
SS-407	5.70 RT	12+95	19.4-19.9	A-6(12)	24	12	31.3	30.3	10.1	28.3	100	84	44	-	-
SS-408	5.70 RT	12+95	21.0-21.4	A-2-4(0)	24	7	51.5	23.5	1.7	23.2	99	75	26	-	-
S-376	CL	13+80	0.0-12.0	A-3(0)	19	NP	65.7	25.4	4.9	4.0	100	54	10	-	-

BEGIN GRADE -RPC- STA 10+60.000 = -FLYOVER- STA 19+59.093, 8.382 RT. EL. = 77.328

PROPOSED GRADE

EXISTING GROUND

7.50 M LT

14.00 M LT

4.14 M RT

5.70 M RT

SS-379
SS-380
SS-384
SS-385
SS-386
SS-387
SS-390
SS-391
SS-392

SS-395
SS-396
SS-399
SS-400
SS-401
SS-402
SS-403
SS-404
SS-405
SS-406
SS-407
SS-408

COASTAL PLAIN, TAN TO TAN - ORANGE AND GRAY SILTY AND CLAYEY SAND

06/06

TO TAN, GRAY, MOIST TO SATURATED, LOOSE TO DENSE, (MIDDENDORF FORMATION)

07/06

FINE TO COARSE SAND,

GRAY AND BROWN, WET, STIFF TO HARD, SILTY CLAY

HIGHLY PLASTIC,

SANDY CLAY

GRAY TO ORANGE, WET, HARD, HIGHLY PLASTIC, SILTY AND (CAPE FEAR FORMATION)

GRAY, WET, DENSE, TO VERY DENSE, SILTY AND CLAYEY SAND

-RPC-

10+00 20 40 60 80 11+00 20 40 60 80 12+00 20 40 60 80 13+00 20 40 60

40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 90 88 86 84

METRIC

5 0 10

CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	55
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

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dgetz

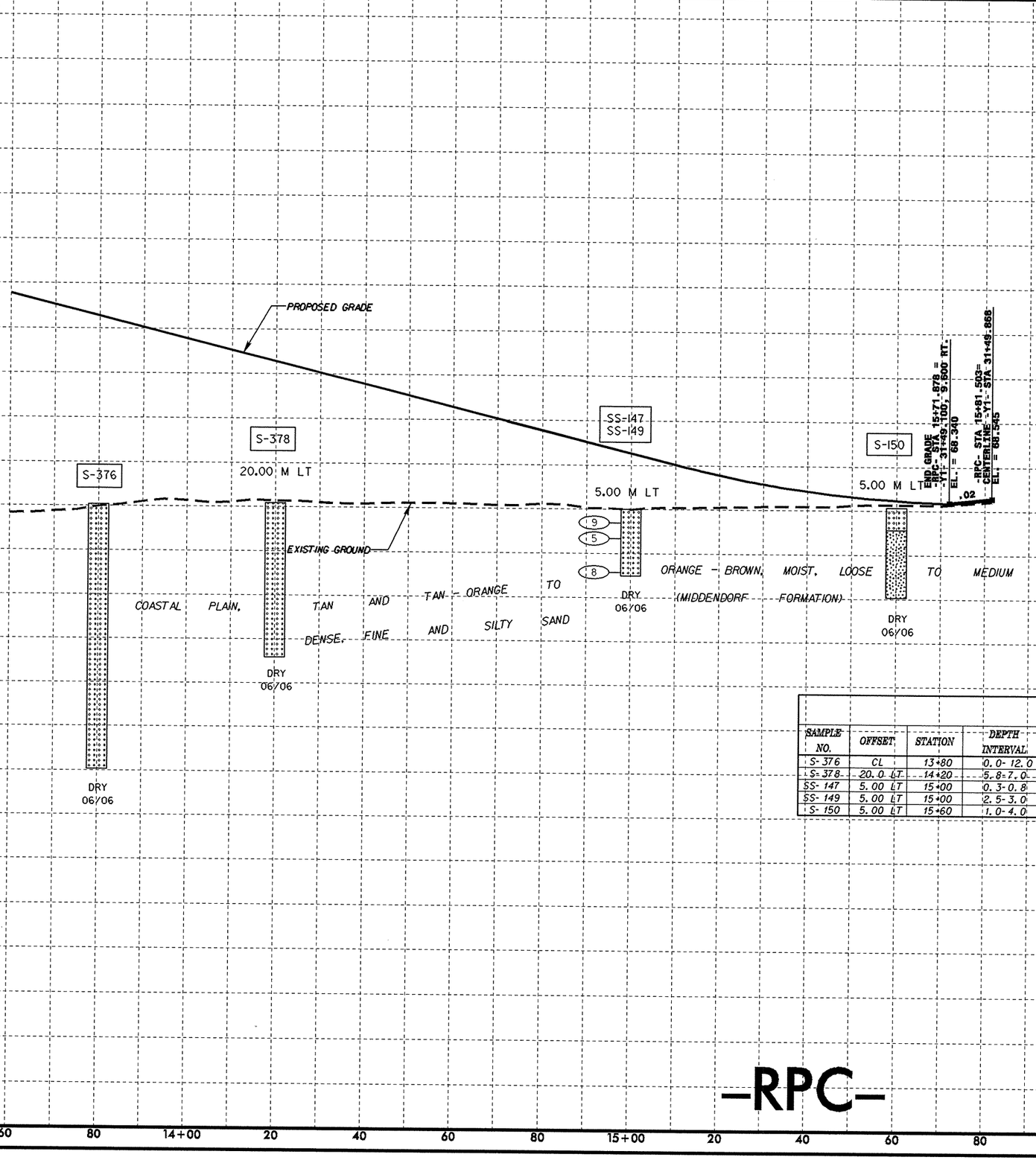
PROJECT REFERENCE NO.	SHEET NO.
X-0002B	56
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5 0 10

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

CONST.REV.

R/W REV.



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-376	CL	13+80	0.0-12.0	A-3(0)	19	NP	65.7	25.4	4.9	4.0	100	54	10	-	-
S-378	20.0 LT	14+20	5.8-7.0	A-3(0)	22	NP	43.7	47.9	1.3	7.0	100	72	9	-	-
SS-147	5.00 LT	15+00	0.3-0.8	A-3(0)	17	NP	58.2	33.6	4.1	4.0	100	61	9	-	-
SS-149	5.00 LT	15+00	2.5-3.0	A-3(0)	21	NP	61.6	28.4	1.9	8.1	100	61	10	-	-
S-150	5.00 LT	15+60	1.0-4.0	A-2-4(0)	18	NP	62.6	26.6	2.7	8.1	99	56	12	-	-

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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-173	0.92 LT	10+74	1.2-1.6	A-1-b(0)	20	NP	68.6	23.4	1.9	6.0	100	47	9	-	-
SS-175	0.92 LT	10+74	4.2-4.6	A-2-4(0)	25	NP	6.0	80.7	3.2	10.1	99	95	14	-	-
SS-177	0.92 LT	10+74	8.8-9.2	A-3(0)	20	NP	64.8	25.7	1.4	8.0	96	66	9	-	-
SS-178	0.92 LT	10+74	10.3-10.7	A-7-6(28)	55	30	12.7	1.8	25.2	60.3	99	89	85	-	-
SS-179	0.92 LT	10+74	11.8-12.2	A-1-b(0)	22	NP	78.9	10.1	3.0	8.0	91	32	11	-	-
SS-180	0.92 LT	10+74	13.3-13.8	A-6(12)	40	22	16.9	21.3	15.6	46.2	100	90	65	-	-
SS-366	5.0 RT	11+20	1.2-1.6	A-2-4(0)	31	NP	60.0	28.0	5.9	6.0	97	55	13	-	-
SS-367	5.0 RT	11+20	2.7-3.1	A-3(0)	22	NP	83.3	11.8	0.9	4.0	100	63	5	-	-
SS-371	5.0 RT	11+20	8.8-9.2	A-3(0)	22	NP	73.1	18.9	1.9	6.0	92	53	8	-	-

METRIC

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	57

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

5 0 10

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.

R/W REV.

6/10/99

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wdfields AT GEJ221400

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	58

METRIC

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.

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-150	6.03 RT	13+54	1.0-4.0	A-2-4(0)	18	NP	62.6	26.6	2.7	8.1	99	56	12	-	-

-LPC-

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wdfields AT GEJ221400

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	59
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

6/10/93

BEGIN GRADE -FLYOVER- STA. 10+50.320 = -L- STA. 52+53.691, 20.133 RT. EL. =88.691

SS-43
SS-44
SS-45
SS-46

S-75
S-76

PROPOSED GRADE

3.0 M LT

1.70 M LT

2.91M LT

2.71M LT

1.87 M RT

1.84 M LT

DRY 05/06

DRY 05/06

DRY 05/06

DRY 05/06

DRY 05/06

18
8
7
11
32

05/06

COASTAL PLAIN, TAN TO GRAY AND TAN - ORANGE TO BROWN - ORANGE, MOIST TO WET, LOOSE TO MEDIUM DENSE, FINE TO SILTY SAND (MIDDENDORF FORMATION)

EXISTING GROUND

BROWN - ORANGE, MOIST, LOOSE, CLAYEY SAND

BROWN - ORANGE, WET, STIFF, HIGHLY PLASTIC, SILTY CLAY

TAN - ORANGE, SATURATED, DENSE, SILTY SAND

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-43	1.70 LT	10+77	1.2-1.7	A-3(0)	22	NP	29.1	66.3	0.6	4.0	100	80	6	-	-
SS-44	1.70 LT	10+77	2.7-3.2	A-2-4(0)	24	NP	5.2	73.9	2.8	18.1	100	97	28	-	-
SS-45	1.70 LT	10+77	4.2-4.7	A-7-6(38)	64	37	0.6	20.3	20.9	58.2	100	100	91	-	-
SS-46	1.70 LT	10+77	5.8-6.2	A-2-4(0)	18	NP	61.0	28.9	0.0	10.0	95	70	11	-	-
S-75	1.84 LT	13+21	0.0-1.0	A-2-4(0)	20	NP	30.8	59.8	5.3	4.1	100	84	12	-	-
S-76	1.84 LT	13+21	3.5-4.0	A-2-4(0)	22	NP	18.5	67.5	3.9	10.1	97	88	17	-	-

-FLYOVER-

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

10+00 20 40 60 80 11+00 20 40 60 80 12+00 20 40 60 80 13+00 20 40 60

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PROJECT REFERENCE NO.	SHEET NO.
X-0002B	60
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST.REV.

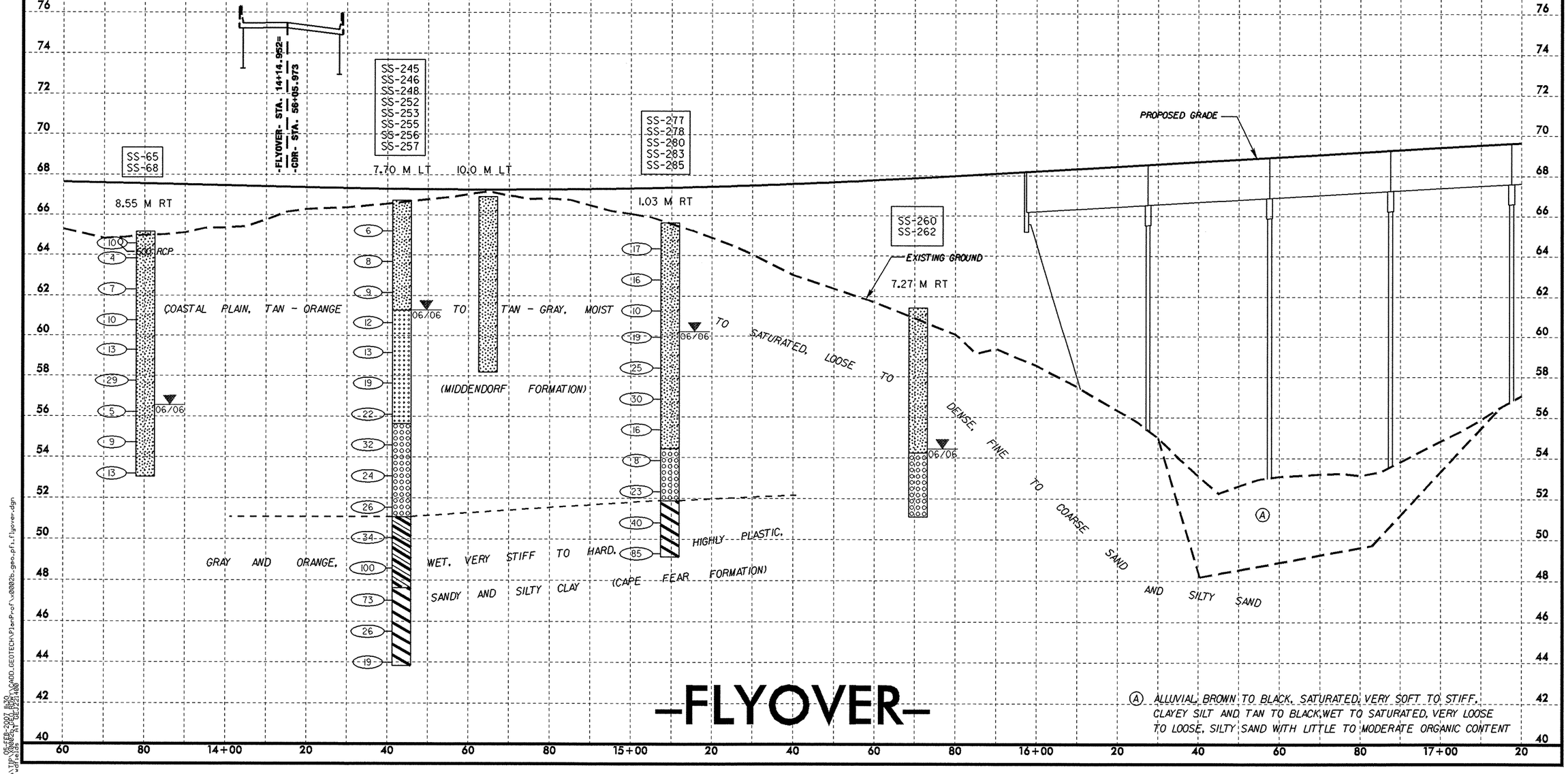
R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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-65	8.55 RT	13+80	0.3-0.8	A-2-4(0)	19	NP	26.5	62.7	2.8	8.0	100	87	13	-	-
SS-68	8.55 RT	13+80	4.1-4.5	A-2-4(0)	21	NP	61.8	24.1	2.0	12.0	90	64	14	-	-
SS-245	7.70 LT	14+44	1.2-1.7	A-2-4(0)	19	NP	25.3	57.4	3.3	14.0	100	82	20	-	-
SS-246	7.70 LT	14+44	2.8-3.2	A-2-4(0)	23	NP	11.2	77.8	1.9	9.0	100	93	13	-	-
SS-248	7.70 LT	14+44	5.8-6.2	A-3(0)	22	NP	58.7	32.3	2.0	7.0	90	63	9	-	-
SS-252	7.70 LT	14+44	11.9-12.3	A-1-b(0)	21	NP	78.6	15.8	3.5	2.0	89	33	6	-	-
SS-253	7.70 LT	14+44	13.4-13.8	A-1-b(0)	20	NP	89.0	7.7	1.3	2.0	91	27	3	-	-
SS-255	7.70 LT	14+44	16.4-16.8	A-6(7)	32	17	17.7	27.7	12.5	42.1	97	87	59	-	-
SS-256	7.70 LT	14+44	17.9-18.3	A-6(13)	36	16	2.8	22.1	25.0	50.2	100	99	84	-	-
SS-257	7.70 LT	14+44	19.4-19.9	A-7-6(29)	54	33	7.6	10.4	11.7	70.2	100	96	84	-	-
SS-277	1.03 RT	15+10	1.0-1.5	A-2-4(0)	27	8	26.4	48.7	2.7	22.2	98	82	27	-	-
SS-278	1.03 RT	15+10	2.5-3.0	A-2-4(0)	23	NP	5.8	75.7	2.3	16.1	100	97	24	-	-
SS-280	1.03 RT	15+10	5.4-5.9	A-2-4(0)	21	NP	60.1	28.0	1.8	10.1	97	70	13	-	-
SS-283	1.03 RT	15+10	11.5-11.9	A-1-b(0)	24	NP	87.4	8.6	2.0	2.0	95	25	4	-	-
SS-285	1.03 RT	15+10	14.5-15.0	A-7-6(42)	67	45	4.4	14.5	14.6	66.5	100	97	86	-	-
SS-260	7.27 RT	15+71	0.0-1.0	A-2-4(0)	18	NP	54.7	33.7	2.6	9.0	92	64	13	-	-
SS-262	7.27 RT	15+71	7.2-8.0	A-1-b(0)	17	NP	80.5	10.8	2.6	6.0	97	43	9	-	-



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SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-298	CL	17+60	1.2- 1.7	A-2-4(0)	17	NP	57.7	31.6	5.6	5.0	100	64	15	-	-
SS-299	CL	17+60	2.7- 3.2	A-6(3)	38	19	36.7	27.0	6.1	30.2	100	79	40	-	-
SS-300	CL	17+60	4.3- 4.7	A-3(0)	21	NP	36.8	58.1	1.1	4.0	100	89	8	-	-
SS-301	CL	17+60	5.8- 6.2	A-2-6(0)	29	13	59.2	20.3	4.3	16.1	99	73	21	-	-
SS-302	CL	17+60	7.3- 7.8	A-1-b(0)	17	NP	86.9	7.8	1.3	4.0	99	44	6	-	-
SS-303	CL	17+60	8.8- 9.3	A-2-6(1)	35	21	66.3	10.5	3.1	20.1	97	58	23	-	-
SS-304	CL	17+60	10.3- 10.8	A-7-6(19)	42	23	4.8	18.7	24.1	52.4	100	97	82	-	-
SS-306	CL	17+60	14.8- 15.3	A-2-6(1)	29	14	41.1	26.6	4.1	28.2	95	70	33	-	-
S-297	CL	18+40	8.0- 9.0	A-3(0)	19	NP	53.0	38.7	2.3	6.0	90	64	9	-	-
SS-290	CL	19+20	1.2- 1.6	A-2-4(0)	16	NP	62.9	25.8	2.2	9.1	100	59	13	-	-
SS-292	CL	19+20	4.2- 4.7	A-2-4(0)	23	NP	8.9	73.3	5.7	12.1	100	94	22	-	-
SS-294	CL	19+20	10.3- 10.7	A-1-b(0)	19	NP	73.7	20.4	1.8	4.0	95	47	6	-	-
S-286	5 RT	20+00	0.0- 1.0	A-2-4(0)	20	NP	47.3	36.5	4.1	12.1	100	69	18	-	-
S-287	5 RT	20+00	4.0- 5.0	A-2-4(0)	22	NP	10.3	78.3	3.3	8.1	100	94	13	-	-
SS-326	16.90 RT	20+69	1.2- 1.7	A-3(0)	18	NP	68.7	26.2	2.1	4.0	100	53	7	-	-
SS-327	16.90 RT	20+69	4.3- 4.7	A-2-4(0)	23	NP	15.7	73.5	2.7	8.1	100	91	13	-	-
SS-330	16.90 RT	20+69	8.8- 9.3	A-3(0)	21	NP	59.4	34.2	2.3	4.0	92	65	6	-	-
SS-331	16.90 RT	20+69	10.3- 10.8	A-6(2)	34	16	54.4	8.5	11.0	26.2	94	58	37	-	-
SS-332	16.90 RT	20+69	11.9- 12.3	A-7-6(24)	51	29	12.3	7.3	18.0	62.4	97	88	81	-	-
SS-335	16.90 RT	20+69	17.7- 18.2	A-6(4)	31	16	12.9	45.1	9.8	32.2	95	88	47	-	-

METRIC

5 0 10

CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	61
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PROPOSED GRADE

EXISTING GROUND

SS-298
SS-299
SS-300
SS-301
SS-302
SS-303
SS-304
SS-306

S-297

SS-290
SS-292
SS-294

S-286
S-287
5.00 M RT

SS-326
SS-327
SS-330
SS-331
SS-332
SS-335
16.90 M RT

COASTAL PLAIN, TAN, BROWN TO GRAY, MOIST, VERY STIFF, SANDY CLAY

TAN - GRAY, AND TAN - ORANGE TO DENSE, FINE TO COARSE SAND AND SILTY SAND

RED + ORANGE, MOIST TO SATURATED, LOOSE TO (MIDDENDORF FORMATION)

TAN, WET, VERY STIFF, SANDY CLAY

GRAY AND ORANGE, WET, HARD, HIGHLY PLASTIC, SILTY CLAY

BROWN-ORANGE, SATURATED, MEDIUM DENSE, CLAYEY SAND

GRAY, SATURATED, LOOSE, COARSE SAND

GRAY AND ORANGE, SATURATED, LOOSE, CLAYEY SAND

GRAY AND ORANGE, WET, HARD, SILTY CLAY (CAPE FEAR FORMATION)

GRAY, WET, VERY DENSE, CLAYEY SAND

GRAY AND ORANGE, WET, HARD, SANDY CLAY

06/06

-FLYOVER-

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6/10/99

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	62
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5 0 10

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

CONST.REV.

R/W REV.

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

PROPOSED GRADE

EXISTING GROUND

SS-313
SS-315
SS-316
SS-320
SS-321
SS-322
SS-323

15.00 M RT

SS-336
SS-338
SS-342
SS-343
SS-344
SS-345
SS-346
SS-348
SS-349

10.00 M RT

S-163

5.45 M LT

SS-158
SS-161
SS-162

5'

12 19 19 21 15 6 11 25 48 18 7 100 46 81

5 16 19 23 23 13 3 42 39 25 0 31 39 36

06/06

06/06

06/06

06/06

COASTAL PLAIN. GRAY TO GRAY - ORANGE AND ORANGE TO RED - ORANGE, MOIST TO SATURATED,

VERY LOOSE TO DENSE, FINE AND COARSE SAND, SILTY AND CLAYEY SAND (MIDDENDORF FORMATION)

GRAY, WET, VERY TO HARD, HIGHLY PLASTIC, SILTY CLAY

STIFF

TAN, GRAY AND HARD, HIGHLY AND SILTY CLAY

ORANGE, WET, PLASTIC, SANDY

(CAPE FEAR FORMATION)

-FLYOVER-

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-313	15 RT	21+20	1.2- 1.7	A-1-b(0)	16	NP	76.3	18.9	0.7	4.0	100	37	6	-	-
SS-315	15 RT	21+20	4.3-4.7	A-2-4(0)	22	NP	18.1	66.3	3.5	12.1	100	92	21	-	-
SS-316	15 RT	21+20	5.8- 6.2	A-3(0)	20	NP	51.2	41.1	1.7	6.0	82	58	8	-	-
SS-320	15 RT	21+20	11.9- 12.3	A-7-6(21)	50	31	16.2	18.0	19.4	46.5	100	91	72	-	-
SS-321	15 RT	21+20	14.7- 15.2	A-2-4(0)	20	NP	65.8	24.7	0.5	9.1	99	69	11	-	-
SS-322	15 RT	21+20	16.2- 16.7	A-2-6(2)	36	20	40.9	20.3	8.6	30.2	77	52	33	-	-
SS-323	15 RT	21+20	17.7- 18.2	A-6(20)	38	29	4.0	27.2	20.4	48.3	100	98	77	-	-
SS-336	10 RT	21+55	1.2- 1.6	A-3(0)	21	NP	59.2	32.2	0.5	8.1	100	60	10	-	-
SS-338	10 RT	21+55	4.2-4.7	A-2-4(0)	23	NP	14.9	72.6	1.4	11.1	100	90	15	-	-
SS-342	10 RT	21+55	10.3- 10.8	A-2-6(1)	36	17	62.8	9.1	3.9	24.2	93	49	27	-	-
SS-343	10 RT	21+55	11.8- 12.3	A-1-b(0)	20	NP	80.0	11.7	2.3	6.0	92	48	8	-	-
SS-344	10 RT	21+55	13.4- 13.8	A-2-6(1)	31	16	49.5	23.6	14.8	12.1	100	81	28	-	-
SS-345	10 RT	21+55	14.9- 15.3	A-1-b(0)	21	NP	76.1	13.9	1.9	8.1	100	49	11	-	-
SS-346	10 RT	21+55	16.4- 16.8	A-1-b(0)	20	NP	88.0	6.0	1.9	4.0	95	30	6	-	-
SS-348	10 RT	21+55	19.4- 19.9	A-2-6(1)	31	15	43.7	24.4	3.7	28.2	100	81	33	-	-
SS-349	10 RT	21+55	21.0- 21.4	A-7-6(28)	57	32	9.5	9.1	13.0	68.5	98	93	82	-	-
S-163	5.45 LT	22+26	0.3-6.9	A-2-4(0)	20	NP	42.2	45.7	3.0	9.0	91	65	12	-	-
SS-158	8.13 RT	22+77	1.2- 1.6	A-2-4(0)	20	NP	51.2	38.9	2.8	7.1	100	65	12	-	-
SS-161	8.13 RT	22+77	5.7- 6.2	A-2-4(0)	22	NP	16.3	70.4	3.2	10.1	98	89	17	-	-
SS-162	8.13 RT	22+77	8.8- 9.2	A-3(0)	18	NP	59.2	31.2	1.5	8.1	97	67	10	-	-

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METRIC	PROJECT REFERENCE NO.	SHEET NO.
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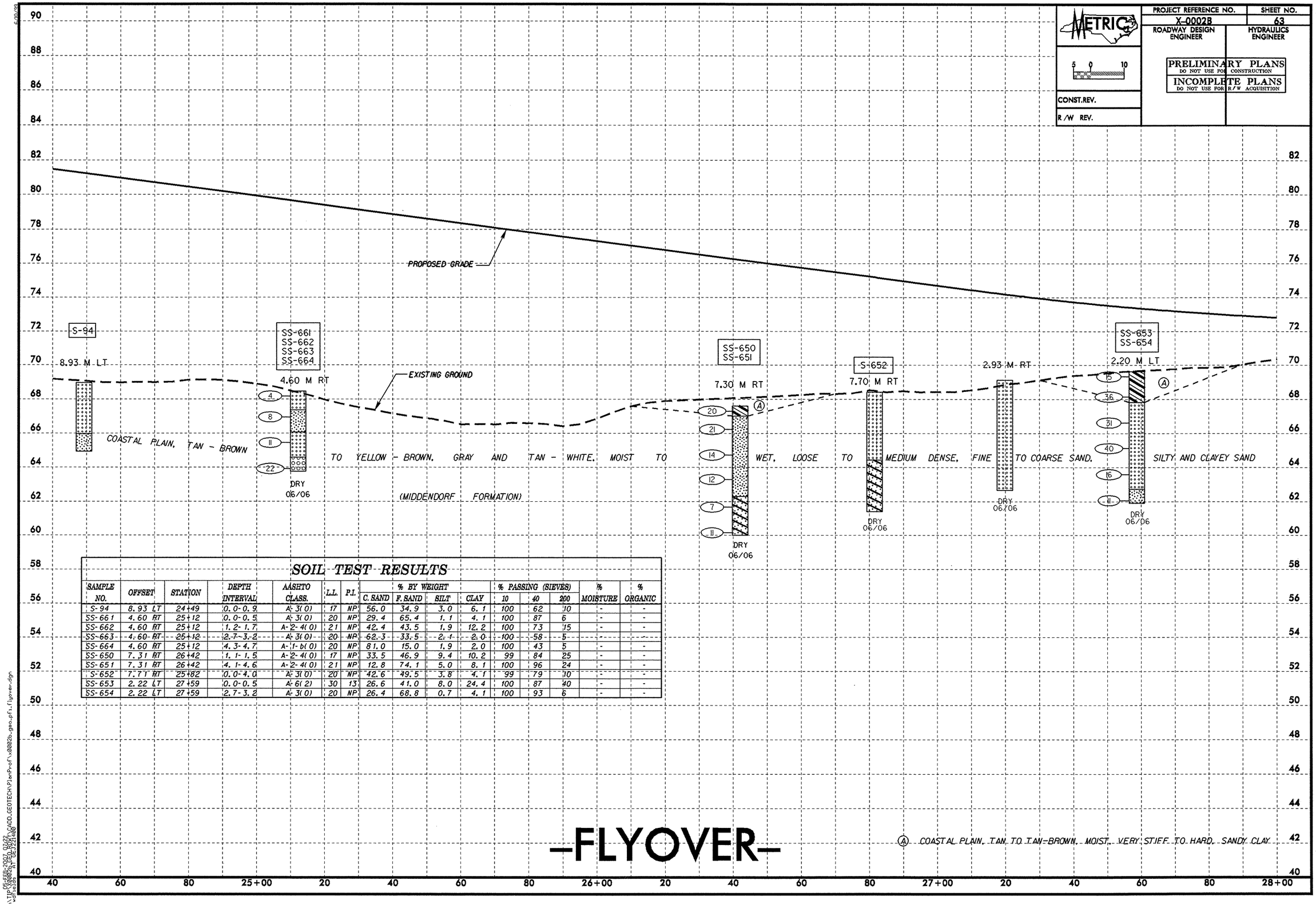
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R /W REV.	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	



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-94	8.93 LT	24+49	0.0-0.9	A-3(0)	17	NP	56.0	34.9	3.0	6.1	100	62	10	-	-
SS-661	4.60 RT	25+12	0.0-0.5	A-3(0)	20	NP	29.4	65.4	1.1	4.1	100	87	6	-	-
SS-662	4.60 RT	25+12	1.2-1.7	A-2-4(0)	21	NP	42.4	43.5	1.9	12.2	100	73	15	-	-
SS-663	4.60 RT	25+12	2.7-3.2	A-3(0)	20	NP	62.3	33.5	2.1	2.0	100	58	5	-	-
SS-664	4.60 RT	25+12	4.3-4.7	A-1-b(0)	20	NP	81.0	15.0	1.9	2.0	100	43	5	-	-
SS-650	7.31 RT	26+42	1.1-1.5	A-2-4(0)	17	NP	33.5	46.9	9.4	10.2	99	84	25	-	-
SS-651	7.31 RT	26+42	4.1-4.6	A-2-4(0)	21	NP	12.8	74.1	5.0	8.1	100	96	24	-	-
S-652	7.71 RT	25+82	0.0-4.0	A-3(0)	20	NP	42.6	49.5	3.8	4.1	99	79	10	-	-
SS-653	2.22 LT	27+59	0.0-0.5	A-6(2)	30	13	26.6	41.0	8.0	24.4	100	87	40	-	-
SS-654	2.22 LT	27+59	2.7-3.2	A-3(0)	20	NP	26.4	68.8	0.7	4.1	100	93	6	-	-

-FLYOVER-

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PROJECT REFERENCE NO.	SHEET NO.
X-0002B	64
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

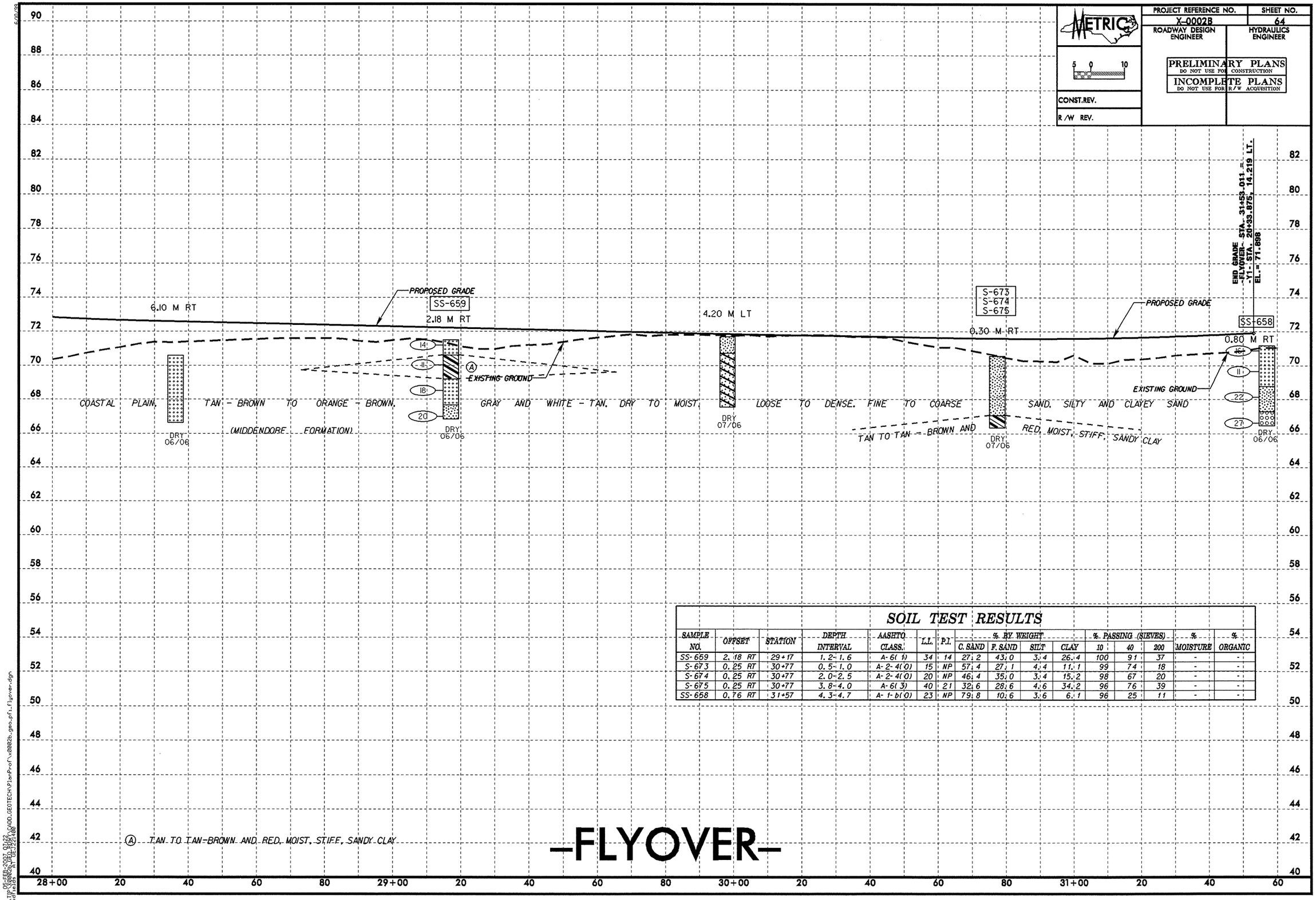
5 0 10

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.

R/W REV.



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-659	2.18 RT	29+17	1.2-1.6	A-6(1)	34	14	27.2	43.0	3.4	26.4	100	91	37	-	-
S-673	0.25 RT	30+77	0.5-1.0	A-2-4(0)	15	NP	57.4	27.1	4.4	11.1	99	74	18	-	-
S-674	0.25 RT	30+77	2.0-2.5	A-2-4(0)	20	NP	46.4	35.0	3.4	15.2	98	67	20	-	-
S-675	0.25 RT	30+77	3.8-4.0	A-6(3)	40	21	32.6	28.6	4.6	34.2	96	76	39	-	-
SS-658	0.76 RT	31+57	4.3-4.7	A-1-b(0)	23	NP	79.8	10.6	3.6	6.1	96	25	11	-	-

Ⓐ TAN TO TAN-BROWN AND RED, MOIST, STIFF, SANDY CLAY

-FLYOVER-

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PROJECT REFERENCE NO.	SHEET NO.
X-0002B	65
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

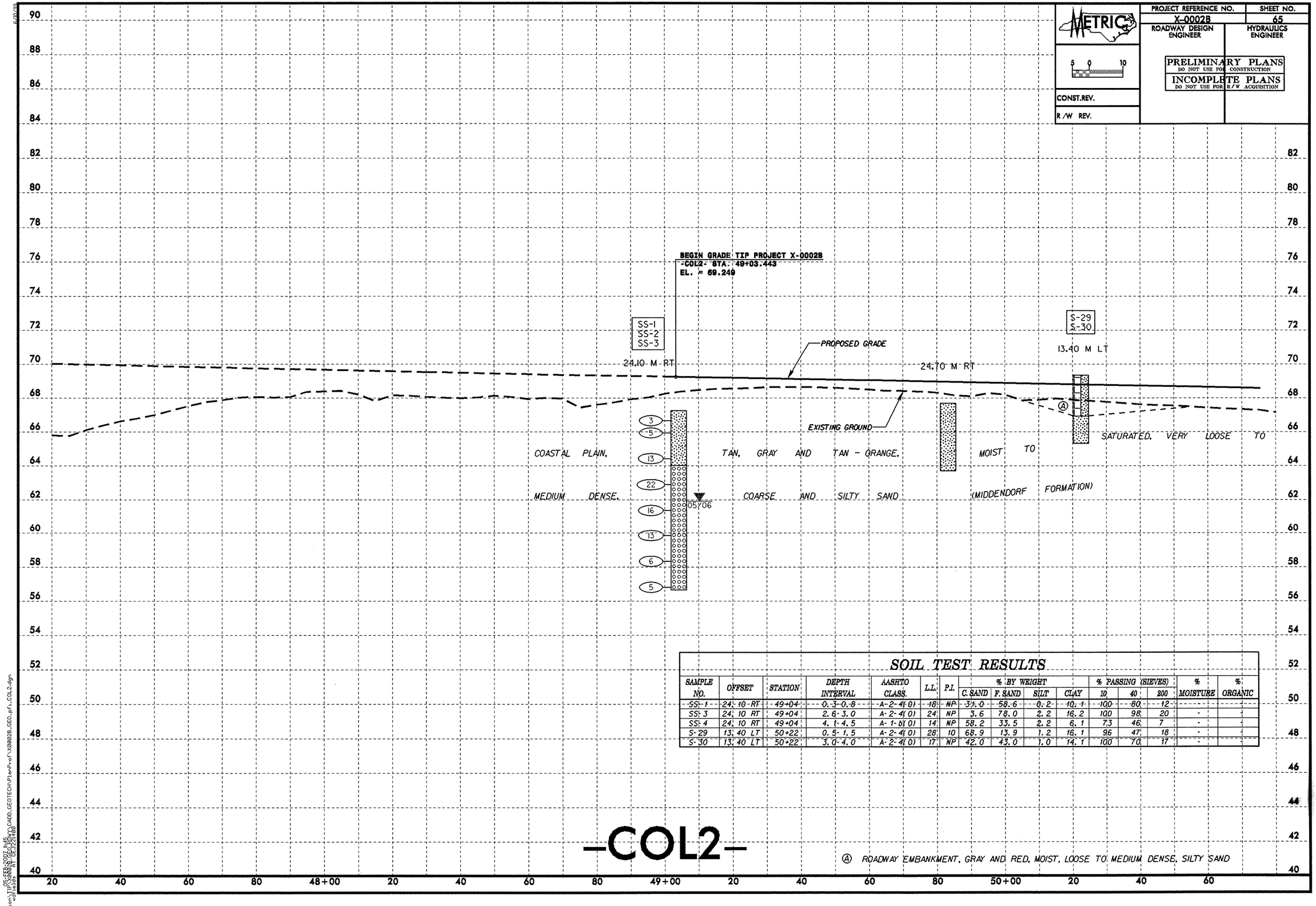
5 0 10

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



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	24.10 RT	49+04	0.3-0.8	A-2-4(0)	18	NP	31.0	58.6	0.2	10.1	100	80	12	-	-
SS-3	24.10 RT	49+04	2.8-3.0	A-2-4(0)	24	NP	3.6	78.0	2.2	16.2	100	98	20	-	-
SS-4	24.10 RT	49+04	4.1-4.5	A-1-b(0)	14	NP	58.2	33.5	2.2	6.1	73	46	7	-	-
S-29	13.40 LT	50+22	0.5-1.5	A-2-4(0)	28	10	68.9	13.9	1.2	16.1	96	47	18	-	-
S-30	13.40 LT	50+22	3.0-4.0	A-2-4(0)	17	NP	42.0	43.0	1.0	14.1	100	70	17	-	-

-COL2-

Ⓐ ROADWAY EMBANKMENT, GRAY AND RED, MOIST, LOOSE TO MEDIUM DENSE, SILTY SAND

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jdraper
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PROJECT REFERENCE NO.	SHEET NO.
X-0002B	66
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

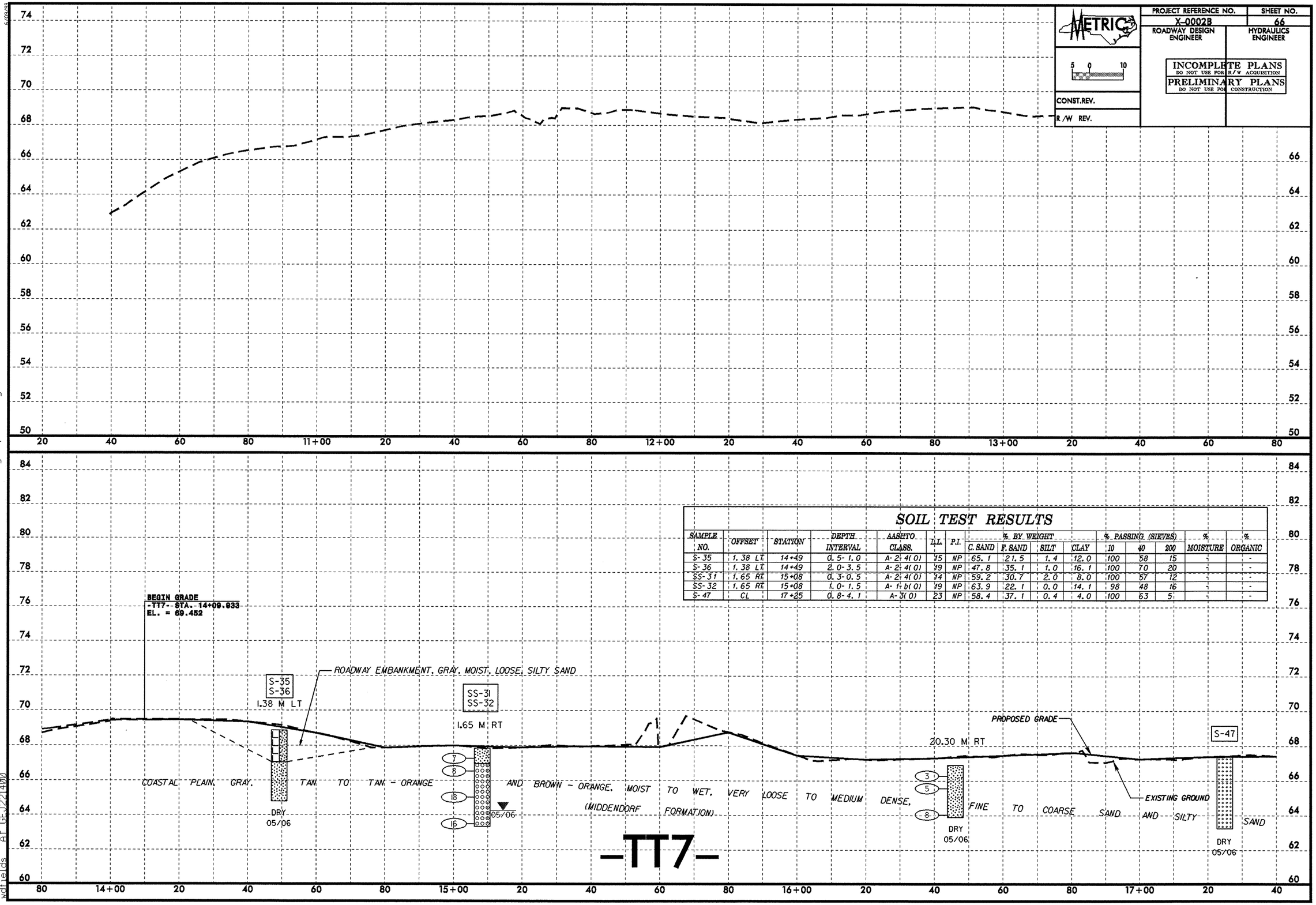
5 0 10

CONST.REV.

R/W REV.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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-35	1.38 LT.	14+49	0.5-1.0	A-2-4(0)	15	NP	65.1	21.5	1.4	12.0	100	58	15	-	-
S-36	1.38 LT.	14+49	2.0-3.5	A-2-4(0)	19	NP	47.8	35.1	1.0	16.1	100	70	20	-	-
SS-31	1.65 RT.	15+08	0.3-0.5	A-2-4(0)	14	NP	59.2	30.7	2.0	8.0	100	57	12	-	-
SS-32	1.65 RT.	15+08	1.0-1.5	A-1-b(0)	19	NP	63.9	22.1	0.0	14.1	98	48	16	-	-
S-47	CL	17+25	0.8-4.1	A-3(0)	23	NP	58.4	37.1	0.4	4.0	100	63	5	-	-

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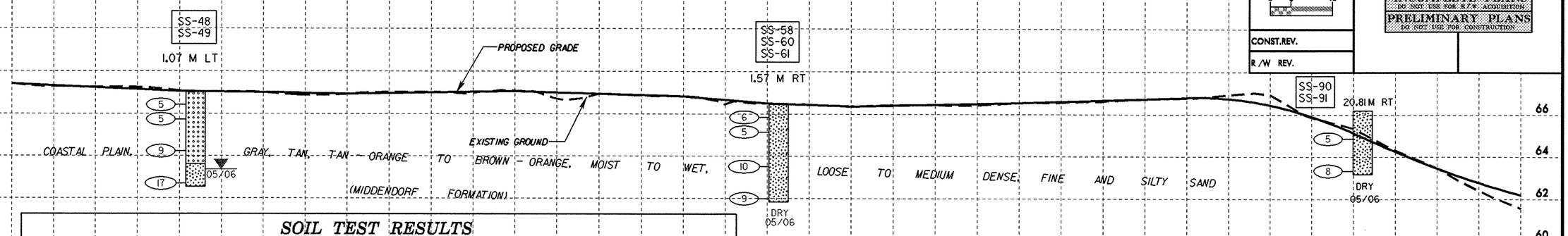

SOIL TEST RESULTS

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	1.07 LT	17+84	1.0-1.4	A-3(0)	20	NP	43.2	49.6	1.2	6.0	100	75	8	-	-
SS-49	1.07 LT	17+84	4.0-4.5	A-2-4(0)	22	NP	2.6	77.3	0.0	20.1	100	99	22	-	-
SS-58	1.57 RT	19+23	0.3-0.8	A-2-4(0)	18	NP	19.1	60.8	2.0	18.1	100	92	23	-	-
SS-60	1.57 RT	19+23	2.7-3.1	A-2-4(0)	30	9	4.2	69.7	0.0	26.1	100	98	30	-	-
SS-61	1.57 RT	19+23	4.3-4.5	A-2-4(0)	19	NP	35.7	53.0	1.2	10.0	89	74	11	-	-
SS-90	20.81 RT	20+62	1.0-1.5	A-2-4(0)	20	NP	21.5	68.0	4.5	6.1	98	89	13	-	-
SS-91	20.81 RT	20+62	2.6-3.0	A-2-4(0)	21	NP	6.3	83.2	4.5	6.1	100	97	16	-	-

-TT7-

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PROJECT REFERENCE NO.	SHEET NO.
X-0002B	68
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

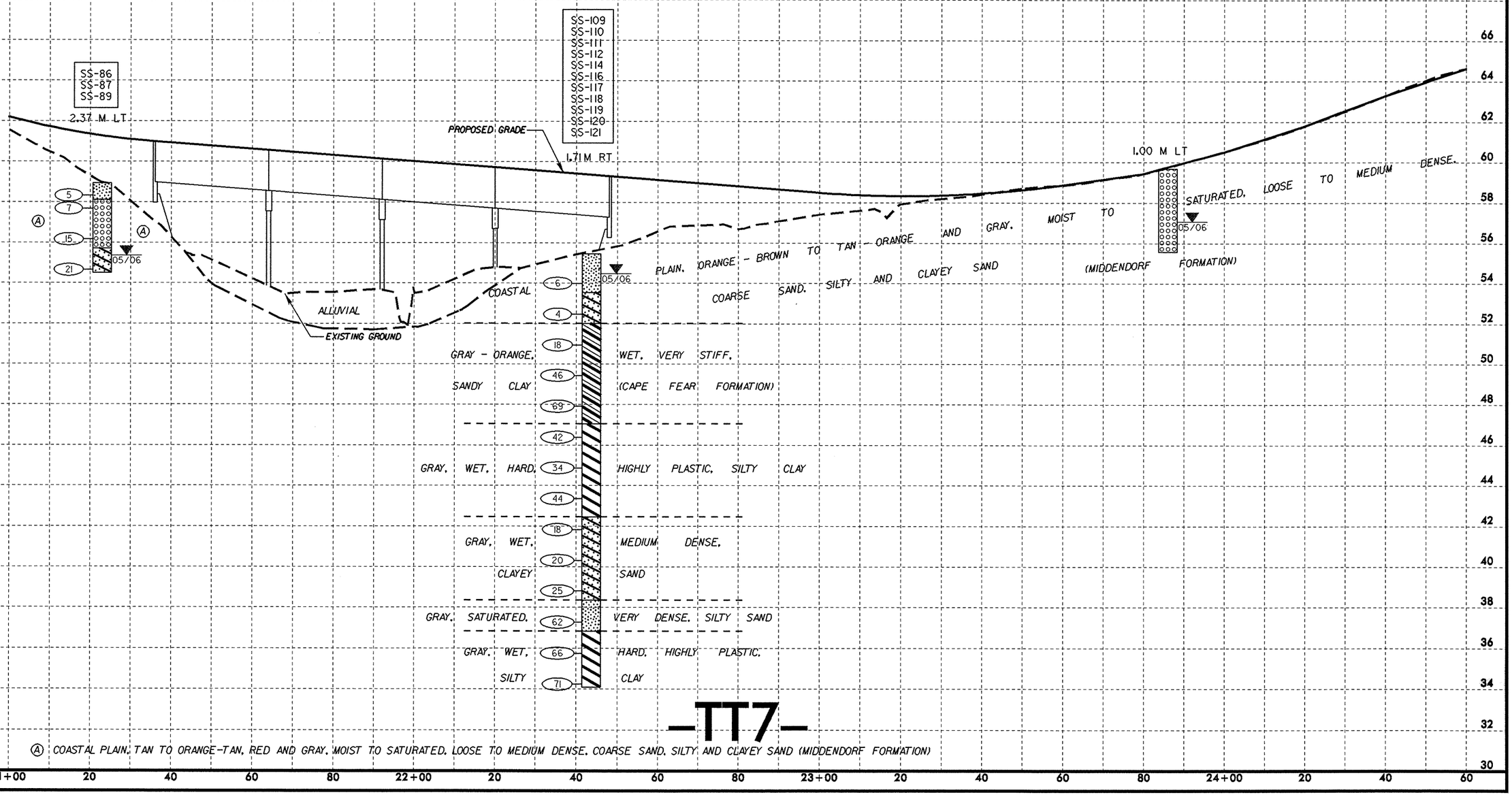
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.

R/W REV.

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-86	2.37 LT	21+23	0.3-0.8	A-2-4(0)	19	NP	40.6	44.4	2.8	12.2	87	66	15	-	-
SS-87	2.37 LT	21+23	0.9-1.4	A-1-b(0)	21	NP	75.7	12.0	4.3	8.1	93	47	12	-	-
SS-89	2.37 LT	21+23	4.0-4.4	A-2-6(0)	28	11	48.9	29.2	1.6	20.3	98	72	22	-	-
SS-109	1.71 RT	22+44	1.2-1.6	A-2-4(0)	19	NP	67.1	18.5	4.3	10.1	90	51	14	-	-
SS-110	1.71 RT	22+44	2.7-3.1	A-2-7(1)	42	22	72.2	5.7	3.9	18.3	94	34	22	-	-
SS-111	1.71 RT	22+44	4.2-4.7	A-6(6)	31	14	24.5	18.1	22.9	34.5	98	82	62	-	-
SS-112	1.71 RT	22+44	5.7-6.2	A-6(10)	31	16	7.1	25.6	29.0	38.3	100	96	75	-	-
SS-114	1.71 RT	22+44	8.8-9.2	A-7-6(23)	47	26	2.8	22.6	26.1	48.4	100	99	84	-	-
SS-116	1.71 RT	22+44	10.3-10.7	A-7-6(22)	47	27	4.6	22.2	22.7	50.5	100	98	80	-	-
SS-117	1.71 RT	22+44	13.3-13.8	A-2-6(2)	37	23	59.3	12.1	2.3	26.2	97	62	29	-	-
SS-118	1.71 RT	22+44	16.4-16.8	A-6(5)	27	14	25.2	23.0	29.6	22.2	100	86	58	-	-
SS-119	1.71 RT	22+44	17.9-18.3	A-2-4(0)	26	4	63.4	24.8	3.7	8.1	97	56	12	-	-
SS-120	1.71 RT	22+44	19.4-19.9	A-7-6(8)	61	33	44.0	15.5	8.2	32.3	99	73	41	-	-
SS-121	1.71 RT	22+44	20.9-21.4	A-7-6(17)	48	25	11.7	23.8	36.2	28.3	100	95	72	-	-



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PROJECT REFERENCE NO.	SHEET NO.
X-0002B	69
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

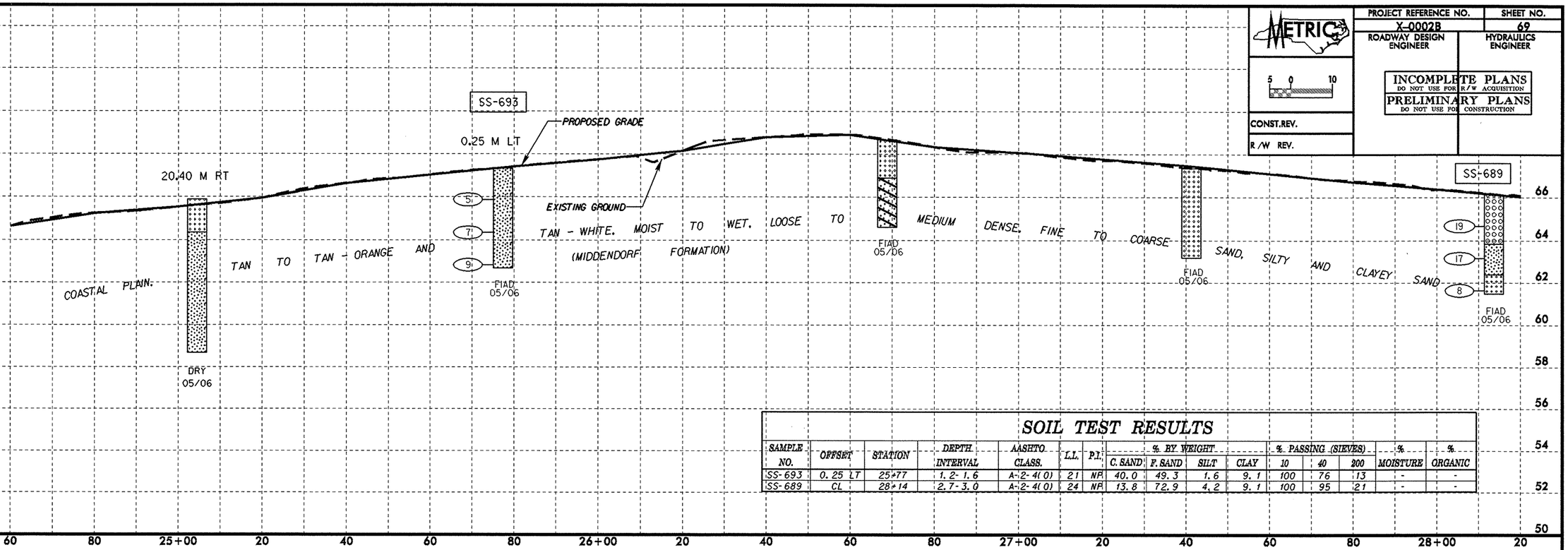
5 0 10

CONST.REV.

R /W REV.

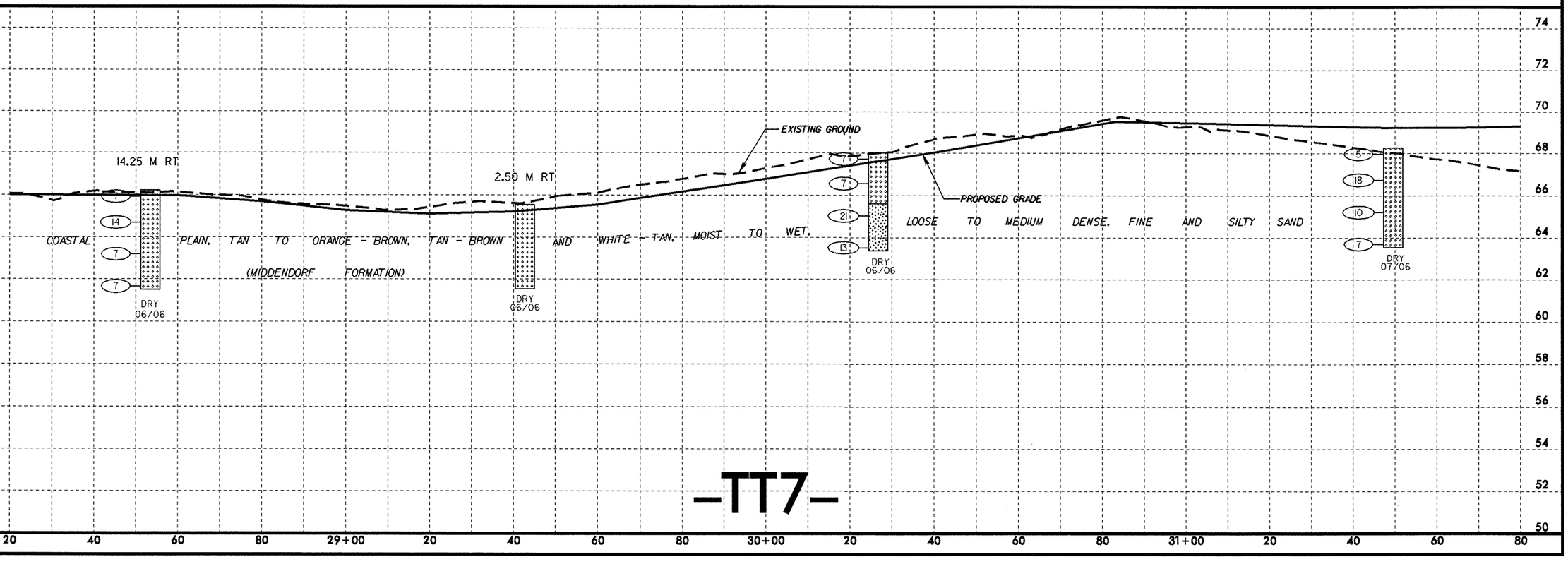
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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-693	0.25 LT	25+77	1.2-1.6	A-2-4(0)	21	NP	40.0	49.3	1.6	9.1	100	76	13	-	-
SS-689	CL	28+14	2.7-3.0	A-2-4(0)	24	NP	13.8	72.9	4.2	9.1	100	95	21	-	-



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6/09/99

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	70
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5 0 10

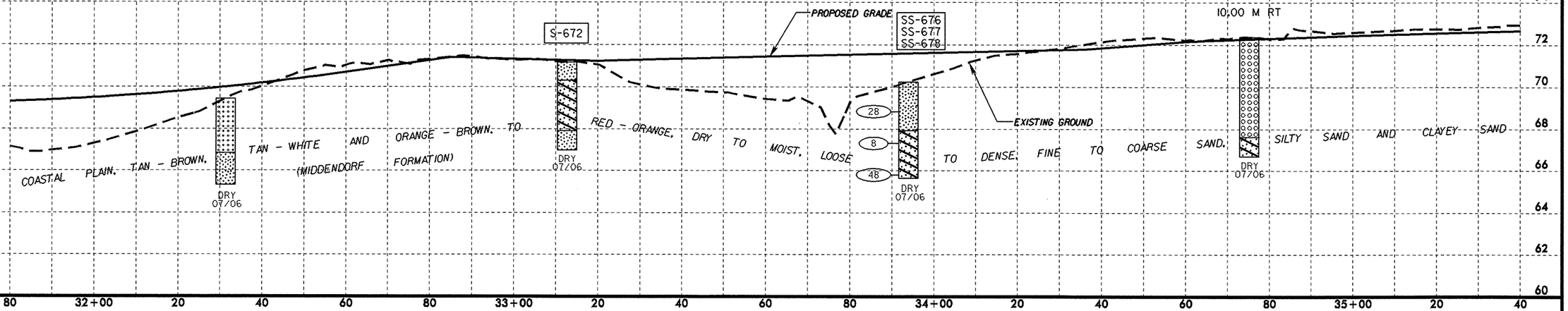
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

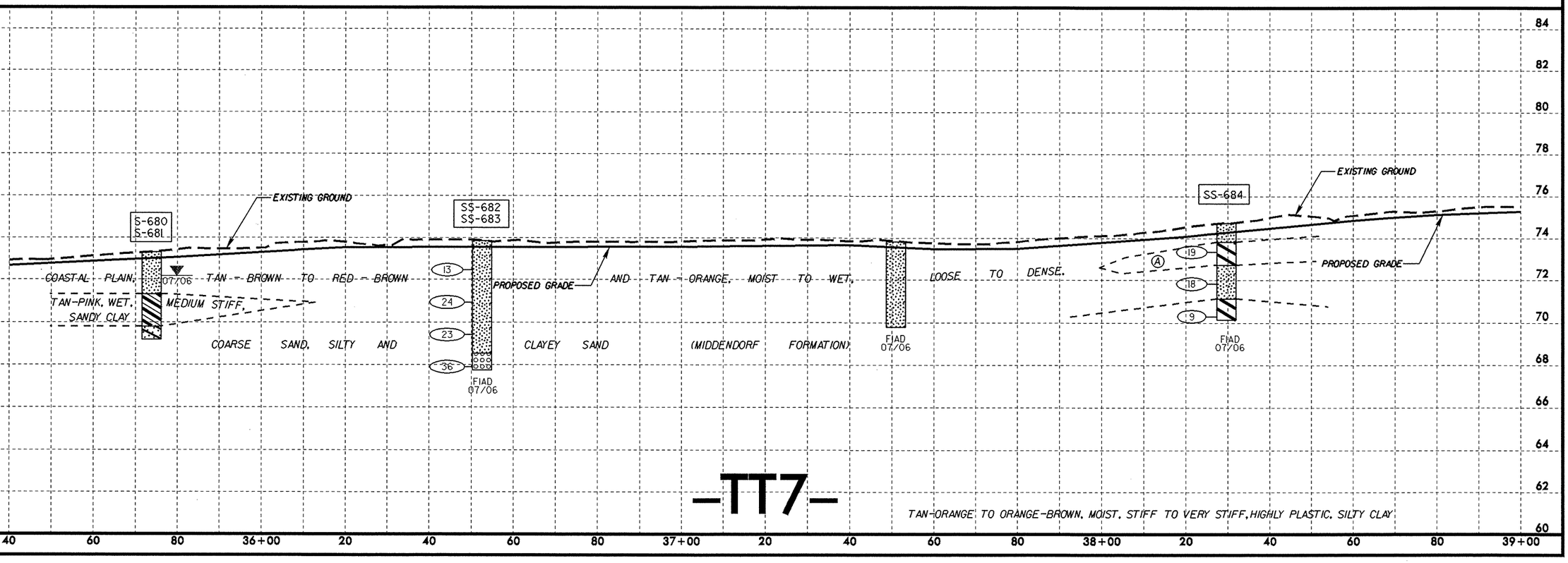
CONST.REV.

R/W REV.

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-672	CL	33+13	3.5-4.0	A-2-4(0)	22	NP	32.0	58.4	1.6	8.0	99	75	12	-	-
SS-676	CL	33+94	1.1-1.6	A-2-4(0)	25	NP	52.7	31.8	4.4	11.1	97	56	17	-	-
SS-677	CL	33+94	2.6-3.1	A-2-6(1)	39	19	44.9	26.8	1.8	26.4	96	71	28	-	-
SS-678	CL	33+94	4.1-4.6	A-2-6(0)	35	14	78.3	8.8	3.9	9.1	93	27	14	-	-
S-680	CL	35+74	0.5-1.0	A-2-4(0)	15	NP	61.5	26.2	3.3	9.1	100	64	15	-	-
S-681	CL	35+74	2.5-3.0	A-6(2)	34	18	42.5	25.6	3.8	28.2	100	78	36	-	-
SS-682	CL	36+53	1.1-1.5	A-2-4(0)	17	NP	65.6	18.3	4.0	12.1	92	55	16	-	-
SS-683	CL	36+53	5.7-6.1	A-1-b(0)	20	NP	87.1	6.3	0.5	6.0	95	16	7	-	-
SS-684	CL	38+30	1.1-1.5	A-7-5(7)	56	26	41.0	17.1	3.6	38.2	99	74	43	-	-





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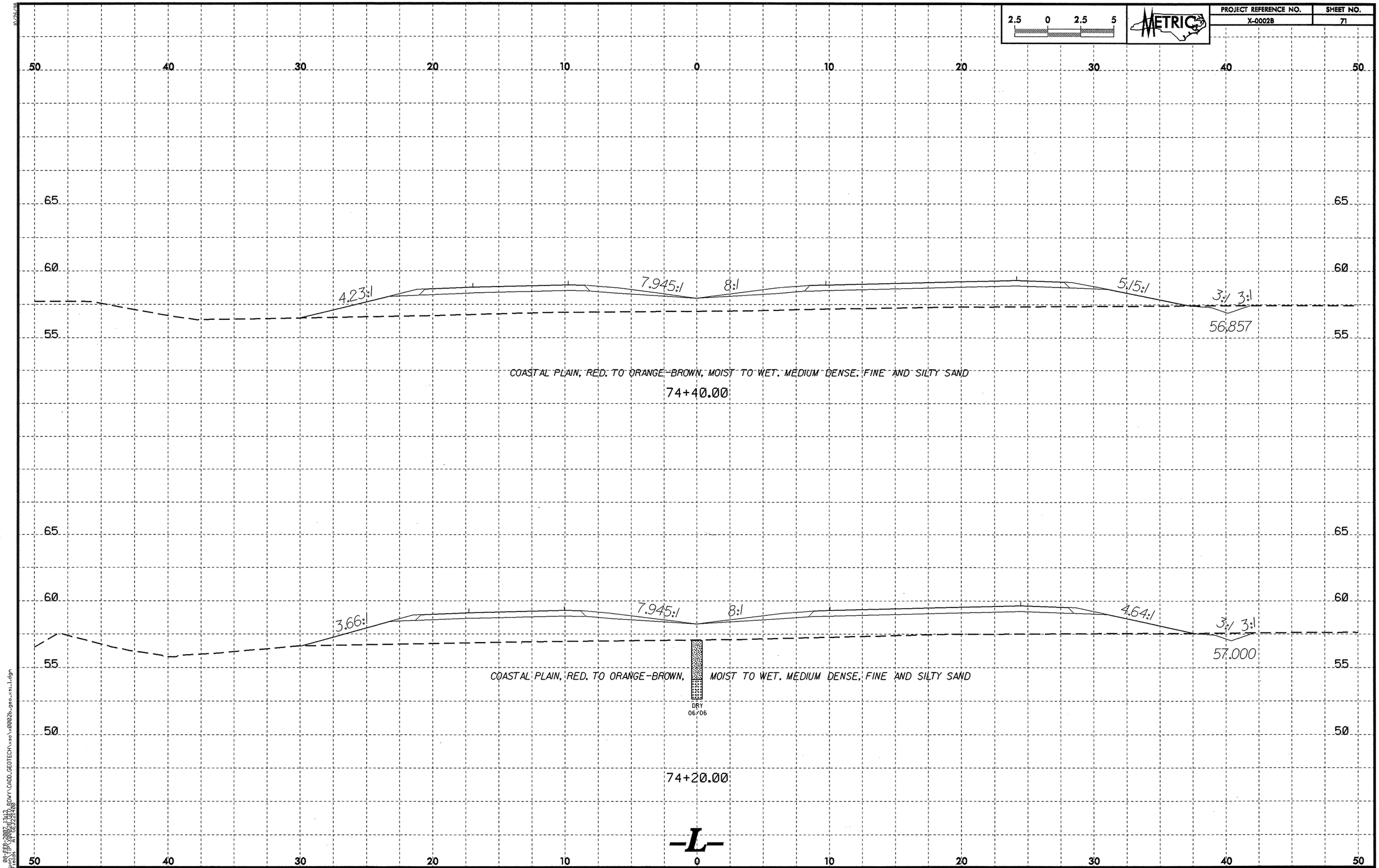

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PROJECT REFERENCE NO.
X-0002B
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74+40.00
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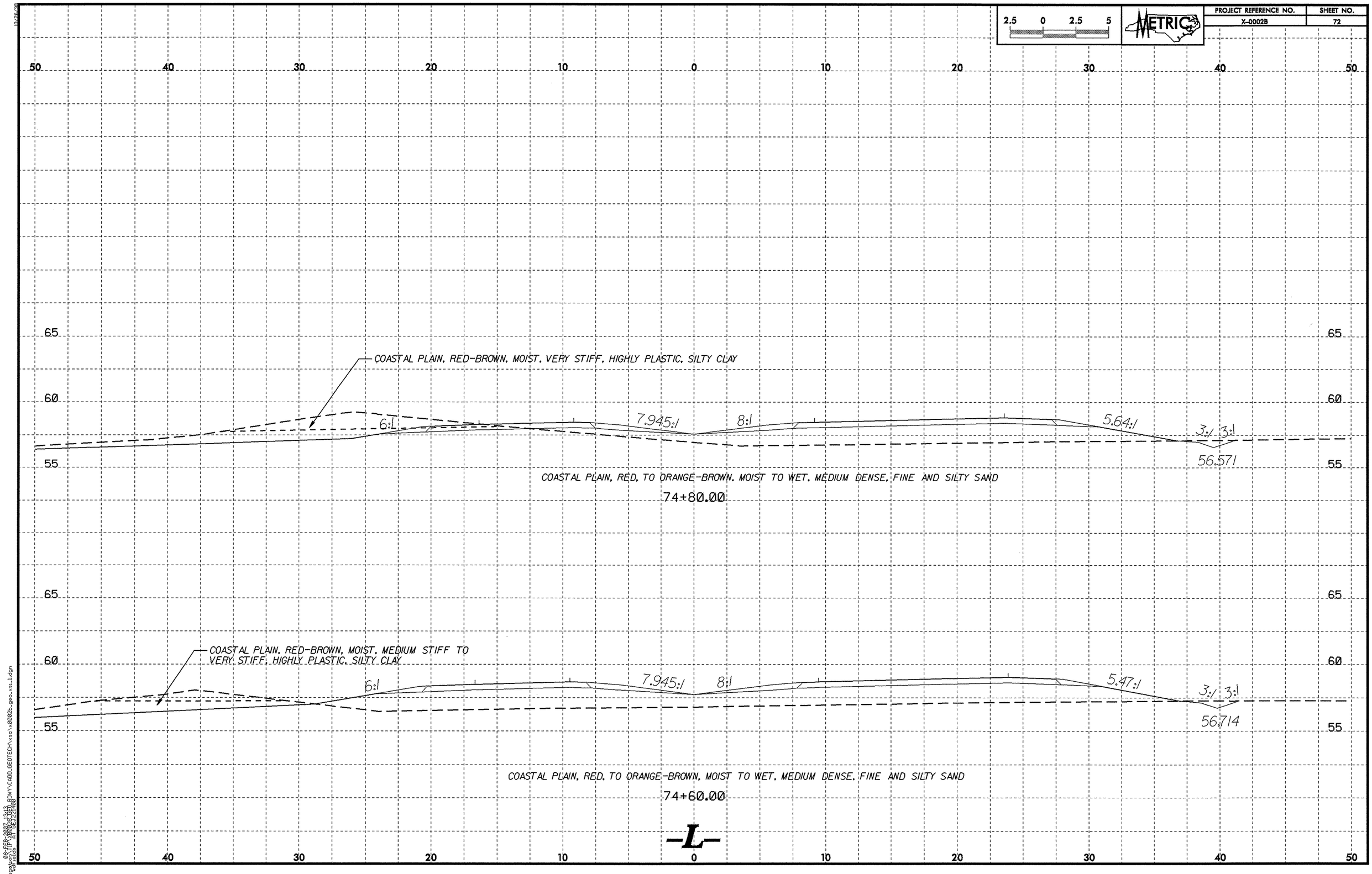
3:1 3:1
57.000
COASTAL PLAIN, RED. TO ORANGE-BROWN, MOIST TO WET. MEDIUM DENSE, FINE AND SILTY SAND
DRY
06/06
74+20.00
-L-



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
X-0002B
SHEET NO.
72
50 40 30 20 10 0 10 20 30 40 50
65
60
55
COASTAL PLAIN, RED-BROWN, MOIST, VERY STIFF, HIGHLY PLASTIC, SILTY CLAY
6:1
7.945:1
8:1
5.64:1
3:1 3:1
56.571
COASTAL PLAIN, RED, TO ORANGE-BROWN, MOIST TO WET, MEDIUM DENSE, FINE AND SILTY SAND
74+80.00
COASTAL PLAIN, RED-BROWN, MOIST, MEDIUM STIFF TO VERY STIFF, HIGHLY PLASTIC, SILTY CLAY
6:1
7.945:1
8:1
5.47:1
3:1 3:1
56.714
COASTAL PLAIN, RED, TO ORANGE-BROWN, MOIST TO WET, MEDIUM DENSE, FINE AND SILTY SAND
74+60.00
-L-

2.5 0 2.5 5

METRIC

50 40 30 20 10 0 10 20 30 40 50

70 65 60 55

COASTAL PLAIN, RED-BROWN, MOIST, VERY STIFF, HIGHLY PLASTIC, SILTY CLAY

GRAY, MOIST, MEDIUM DENSE, SILTY SAND

TAN-BROWN, MOIST, STIFF, SANDY CLAY

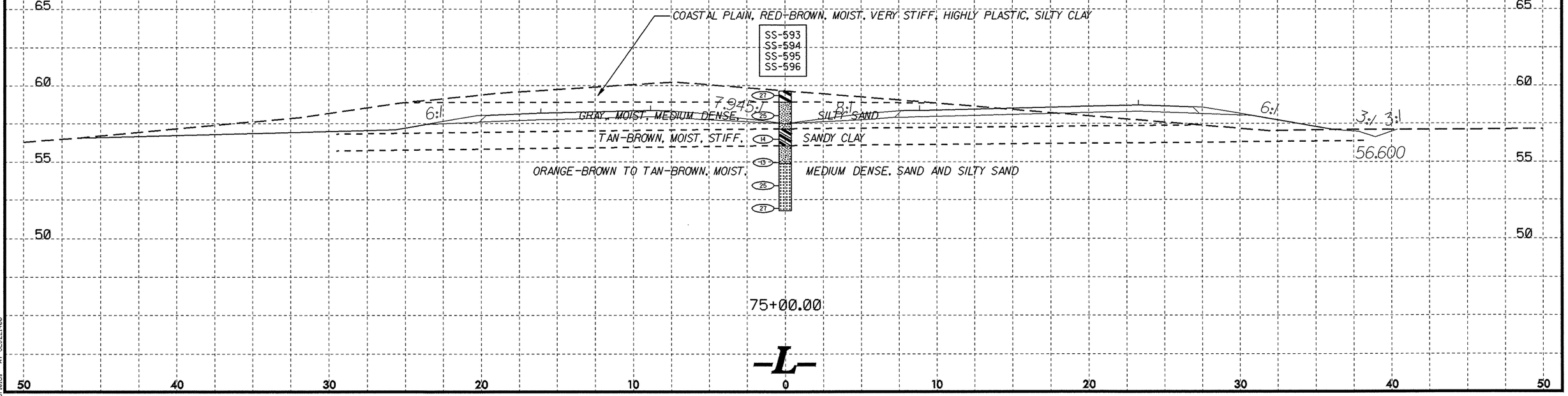
ORANGE-BROWN TO TAN-BROWN, MOIST, MEDIUM DENSE, SAND AND SILTY SAND

6:1 7.945% 8:1 6:1 3:1

75+20.00

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-593	CL	75+00	1.3-1.8	A-2-4(0)	23	4	2.2	75.8	5.9	16.2	100	99	30	-	-
SS-594	CL	75+00	2.9-3.3	A-6(2)	39	19	32.7	35.4	5.7	26.3	100	82	37	-	-
SS-595	CL	75+00	4.4-4.8	A-2-4(0)	21	NP	43.4	43.4	5.1	8.1	100	77	17	-	-
SS-596	CL	75+00	5.9-6.4	A-3(0)	21	NP	61.8	30.9	5.3	2.0	100	61	8	-	-



75+00.00

-L-

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70 65 60 55 50

10/28/98
08-JAN-2008 13:13
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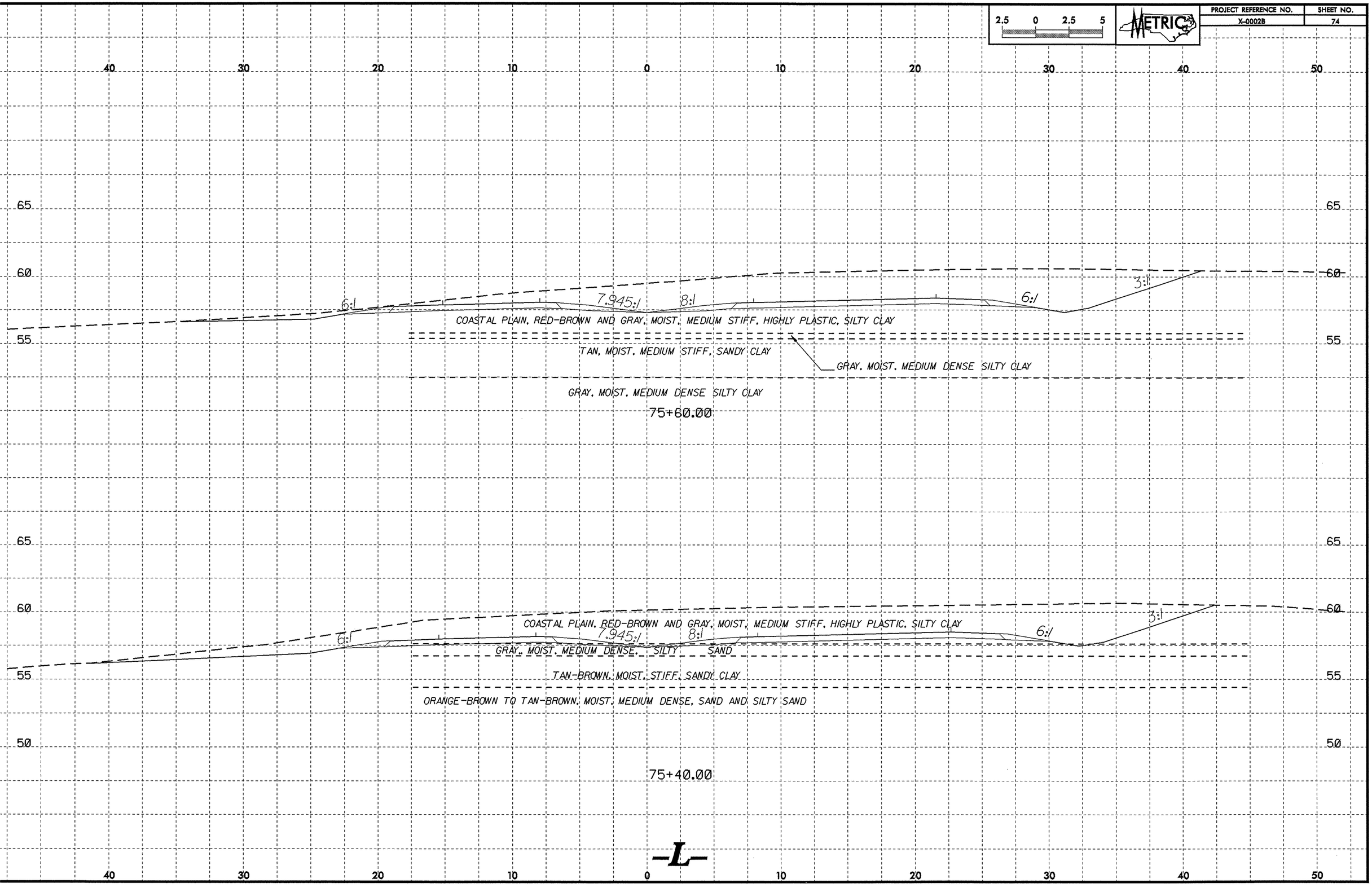

2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
X-0002B
SHEET NO.
74
40 30 20 10 0 10 20 30 40 50
65
60
55
6:1
7.945:1
8:1
6:1
3:1
COASTAL PLAIN, RED-BROWN AND GRAY, MOIST, MEDIUM STIFF, HIGHLY PLASTIC, SILTY CLAY
TAN, MOIST, MEDIUM STIFF, SANDY CLAY
GRAY, MOIST, MEDIUM DENSE SILTY CLAY
GRAY, MOIST, MEDIUM DENSE SILTY CLAY
75+60.00
65
60
55
50
COASTAL PLAIN, RED-BROWN AND GRAY, MOIST, MEDIUM STIFF, HIGHLY PLASTIC, SILTY CLAY
GRAY, MOIST, MEDIUM DENSE, SILTY SAND
TAN-BROWN, MOIST, STIFF, SANDY CLAY
ORANGE-BROWN TO TAN-BROWN, MOIST, MEDIUM DENSE, SAND AND SILTY SAND
75+40.00
-L-

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	75

2.5 0 2.5 5

METRIC

70 50 40 30 20 10 0 10 20 30 40 70

65 65

60 60

55 55

50 50

6:1 8:1 8:1 6:1 3:1

COASTAL PLAIN. RED-BROWN AND GRAY. MOIST. MEDIUM STIFF. HIGHLY PLASTIC. SILTY CLAY

TAN. MOIST. MEDIUM STIFF. SANDY CLAY

TAN. MOIST. MEDIUM DENSE. SILTY SAND

76+00.00

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-589	20.0 RT	75+80	0.0-0.8	A-7-6(11)	46	27	21.0	30.7	11.9	36.4	97	87	54	-	-
S-590	20.0 RT	75+80	0.8-3.0	A-7-6(17)	48	29	10.5	32.5	16.6	40.4	100	96	65	-	-
S-591	20.0 RT	75+80	3.0-4.5	A-7-6(37)	71	45	8.7	17.4	11.3	62.6	100	97	78	-	-
S-592	20.0 RT	75+80	4.5-7.5	A-6(6)	31	15	6.1	46.5	19.2	28.3	100	98	60	-	-

70 50 40 30 20 10 0 10 20 30 40 70

65 65

60 60

55 55

50 50

S-589
S-590
S-591
S-592

6:1 8:1 8:1 6:1 3:1

COASTAL PLAIN. RED-BROWN AND GRAY. MOIST. MEDIUM STIFF. HIGHLY PLASTIC. SILTY CLAY

TAN. MOIST. MEDIUM STIFF. SANDY CLAY

75+80.00

-L-

50 40 30 20 10 0 10 20 30 40

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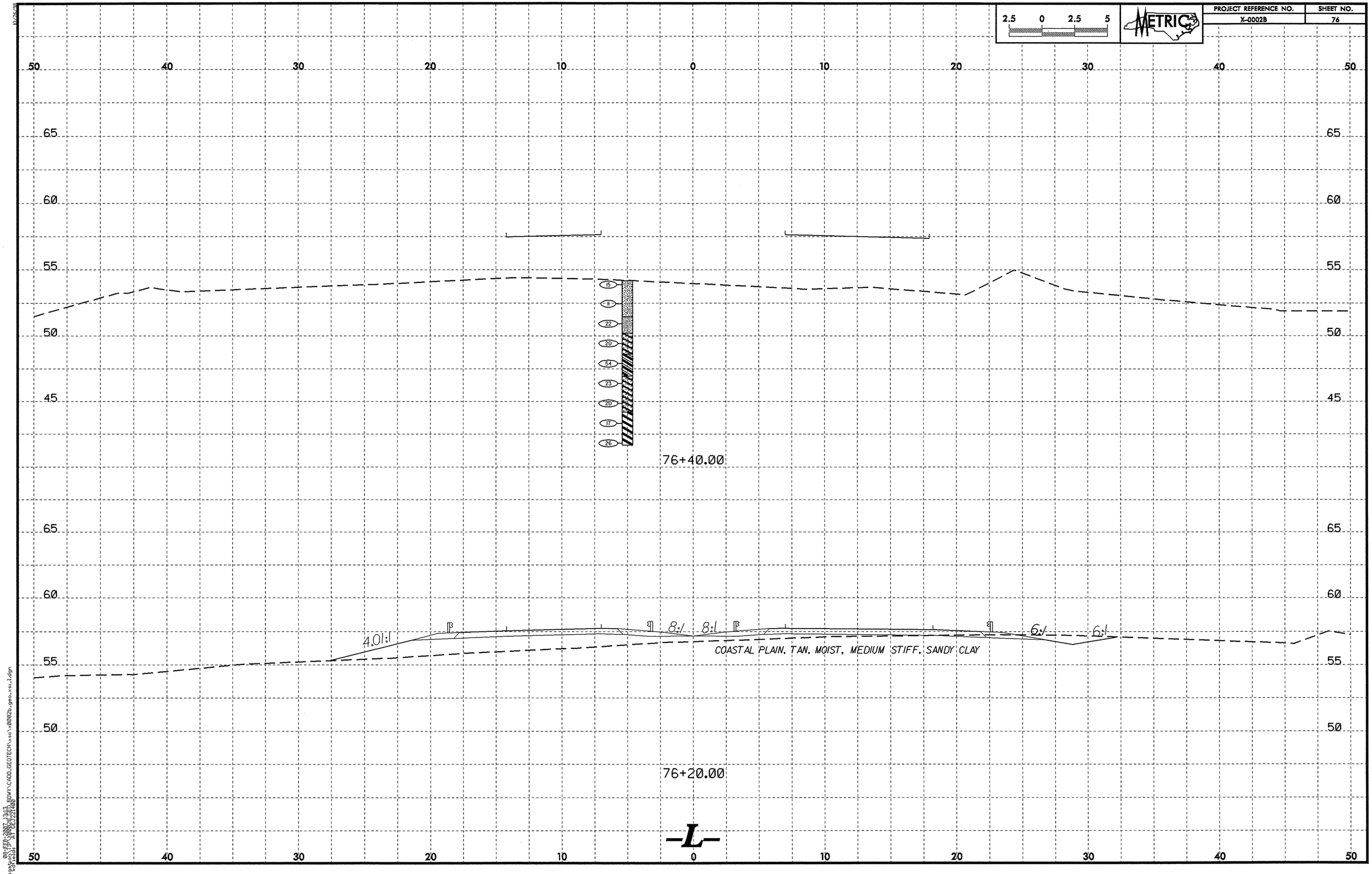

2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
X-0002B
SHEET NO.
76
50 40 30 20 10 0 10 20 30 40 50
65
60
55
50
45
15
11
22
20
54
23
20
17
26
76+40.00
4.01:1
8:1
8:1
6:1
6:1
COASTAL PLAIN, TAN, MOIST, MEDIUM STIFF, SANDY CLAY
76+20.00
-L-

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	77

10/26/98
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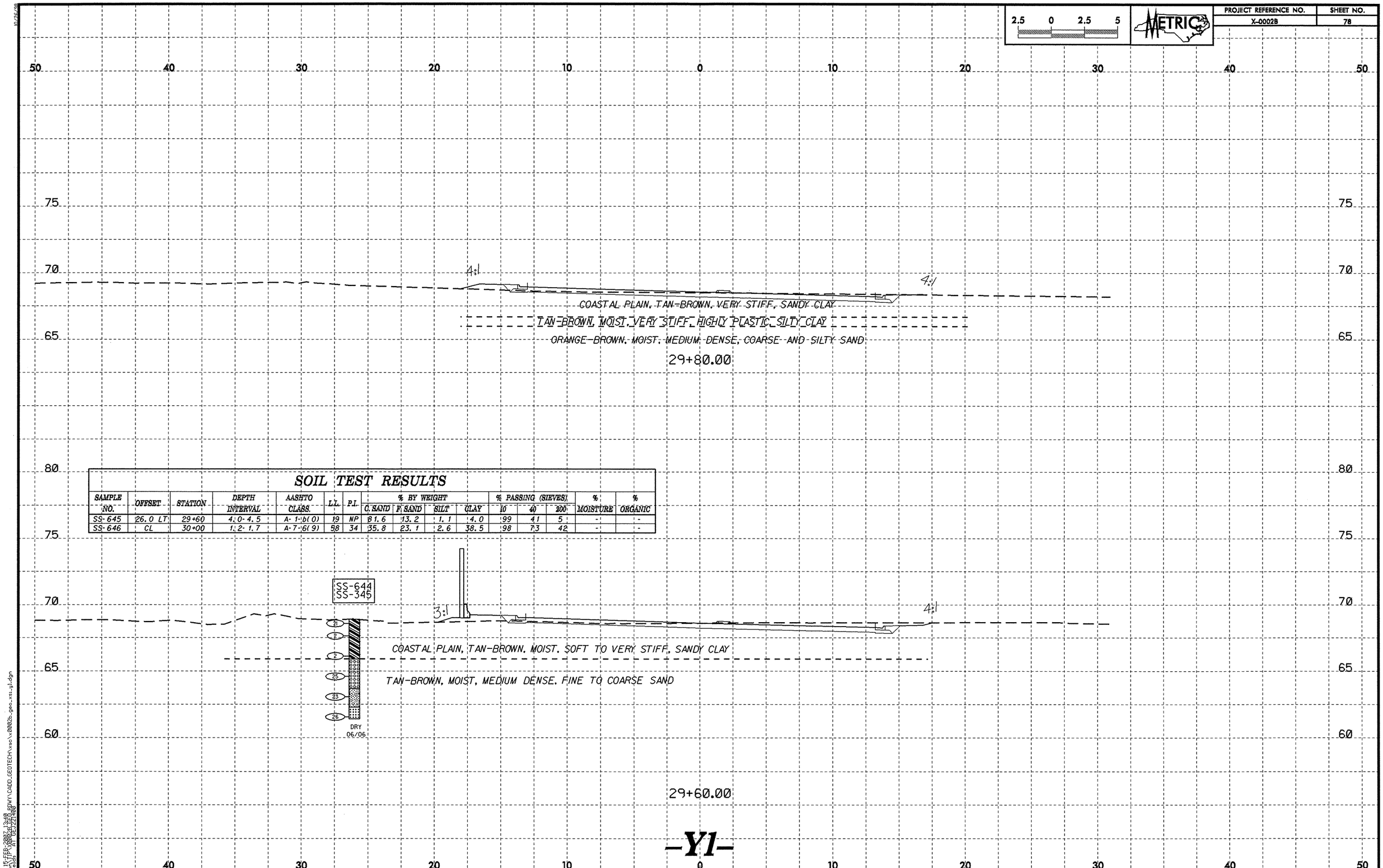
wdfields AT GEJ221400

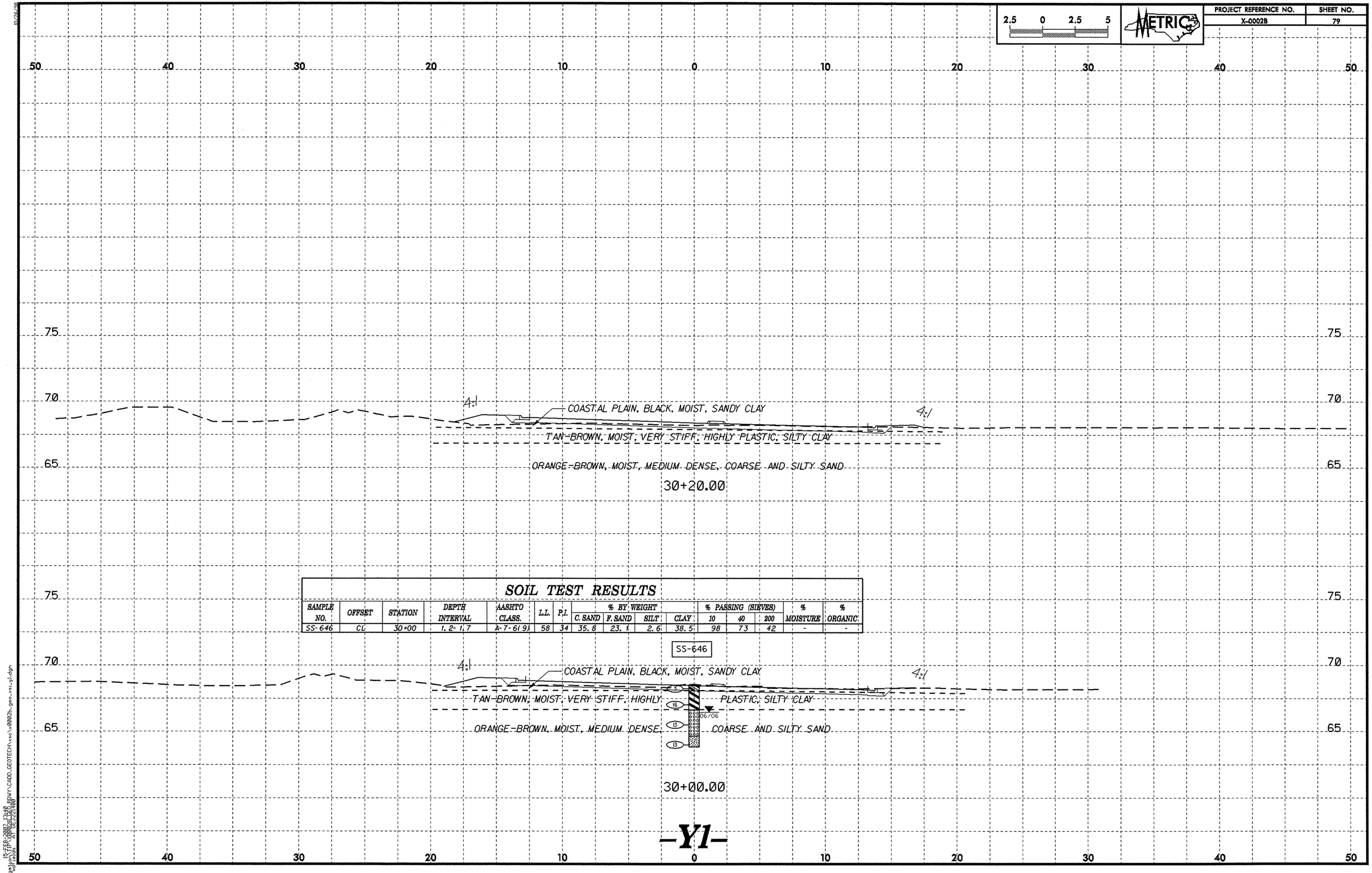
PROJECT REFERENCE NO.	SHEET NO.
X-0002B	78



SOIL TEST RESULTS

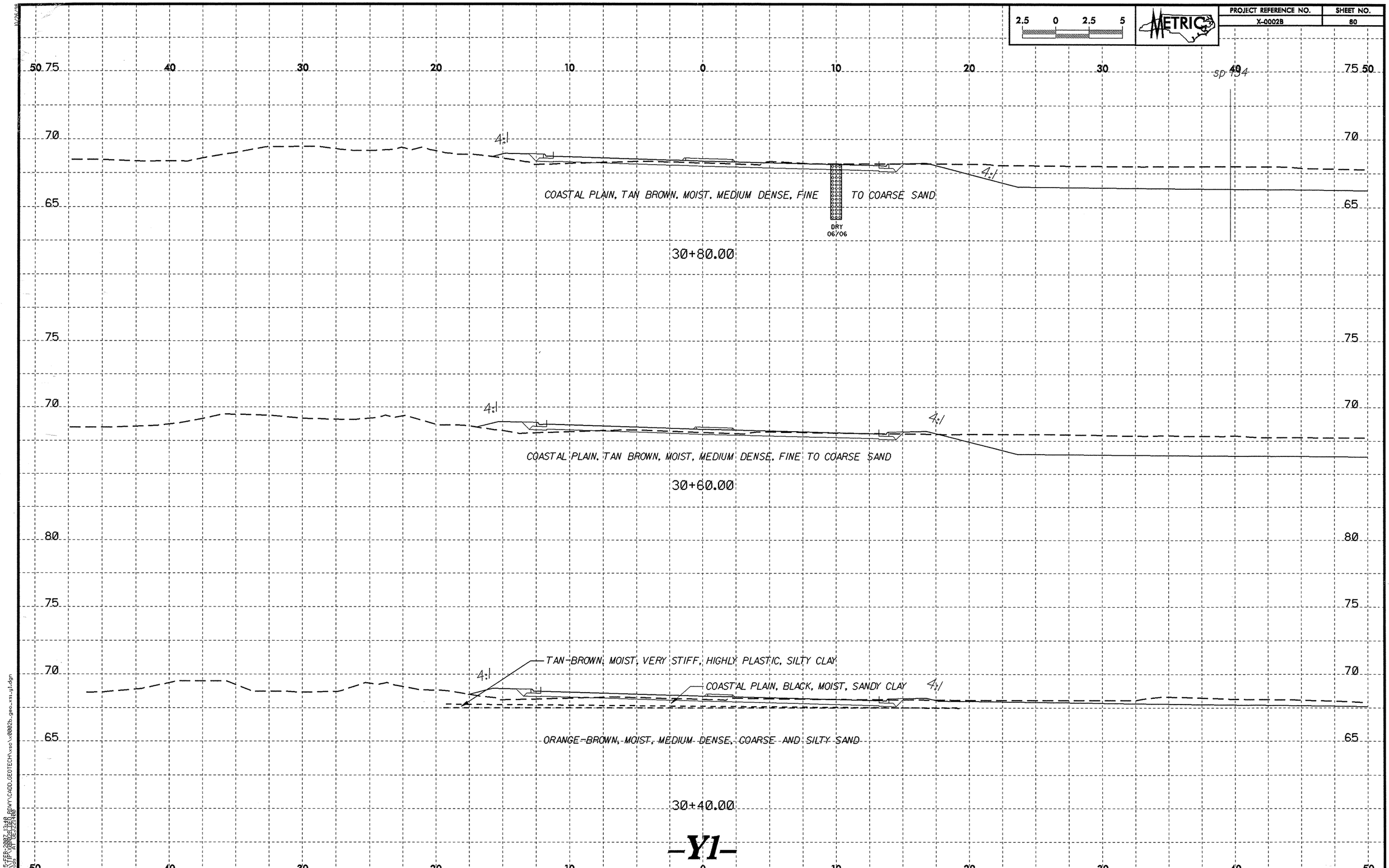
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-645	26.0 LT	29+60	4.0-4.5	A-1-b(0)	19	NP	81.6	13.2	1.1	4.0	99	41	5	-	-
SS-646	CL	30+00	1.2-1.7	A-7-6(9)	58	34	35.8	23.1	2.6	38.5	98	73	42	-	-

PROJECT REFERENCE NO.	SHEET NO.
X-0002B	79



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-646	CL	30+00	1.2-1.7	A-7-6(9)	58	34	35.8	23.1	2.6	38.5	98	73	42	-	-



PROJECT REFERENCE NO.
X-0002B
SHEET NO.
80
METRIC
2.5 0 2.5 5
sp 134
4:1
COASTAL PLAIN, TAN BROWN, MOIST, MEDIUM DENSE, FINE TO COARSE SAND
DRY
06/06
30+80.00
COASTAL PLAIN, TAN BROWN, MOIST, MEDIUM DENSE, FINE TO COARSE SAND
30+60.00
TAN-BROWN, MOIST, VERY STIFF, HIGHLY PLASTIC, SILTY CLAY
COASTAL PLAIN, BLACK, MOIST, SANDY CLAY
ORANGE-BROWN, MOIST, MEDIUM DENSE, COARSE AND SILTY SAND
30+40.00
-Y1-