CONTRACT: C202914

ID: R-2414B

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

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PLAN SHEETS

LINE	STATION	PLAN	PROFILE
-L-	45+68 TO 93+92	4-17	19-32
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

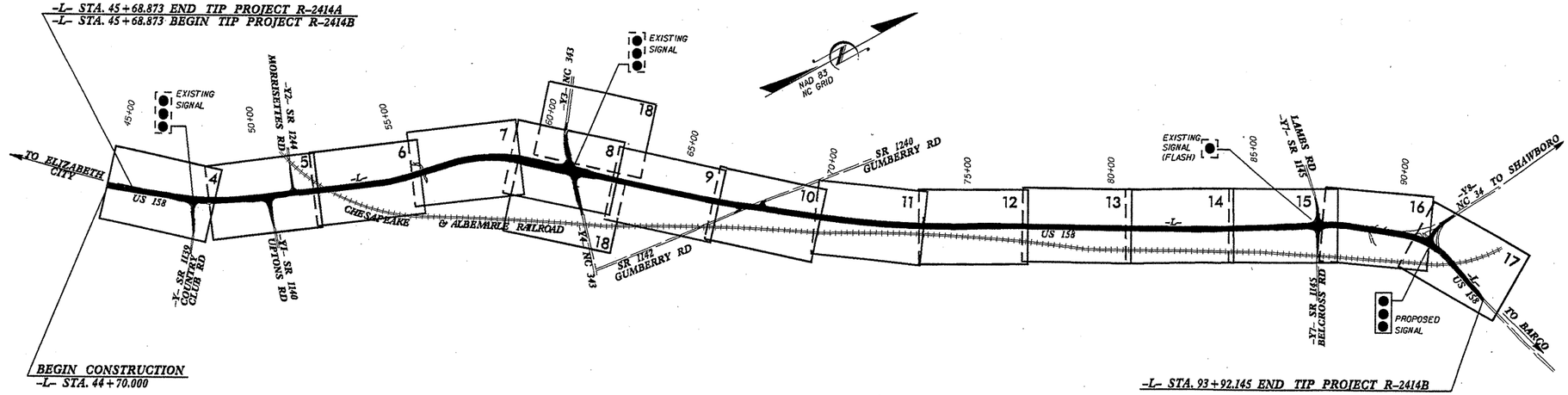
ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. *34430.1.1 (R-2414B)* F.A. PROJ. *STP-158(2)*

COUNTY *CAMDEN*

PROJECT DESCRIPTION *US 158-NC 34 FROM SOUTH OF SR 1257 TO EAST OF NC 34 IN BELCROSS*

INVENTORY - REVISED



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2414B	1	146

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34430.1.1	STP-158(2)	PE
34430.2.5		ROW & UTILITIES
34430.3.3		CONST.

ALL DIMENSIONS IN THESE PLANS ARE IN METERS UNLESS OTHERWISE SHOWN

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

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SUBMITTED BY *D. N. ARGENBRIGHT*

DATE *JULY, 2008*

DRAWN BY: *C. P. TURNER, C.R. SUMNER*

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 LICENSED SEAL 1050 GEOLOGIST D. N. ARGENBRIGHT

7-20-08

PROJECT REFERENCE NO.	SHEET NO.
34430.1.1 (R-2414B)	2 OF 146

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

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7 (A-7-5, A-7-6)	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							
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		NP	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

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	- 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, 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	OTHER MATERIAL	
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	20 - 35%
HIGHLY ORGANIC	>10%	>20%	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 DHT 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
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, FRACTURES
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B-___
- [ ] BK-51
- [X] CME-45C
- [ ] CME-550
- [ ] CME-850
- [X] CME-458
- [ ] _____

ADVANCING TOOLS:
- [X] CLAY BITS
- [X] 152mm CONTINUOUS FLIGHT AUGER
- [ ] 203mm HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [X] TRICONE 75 mm STEEL TEETH
- [ ] TRICONE _____ mm TUNG.-CARB.
- [ ] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

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

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [X] HAND AUGER
- [X] SOUNDING ROD
- [X] 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:

ELEVATION: M

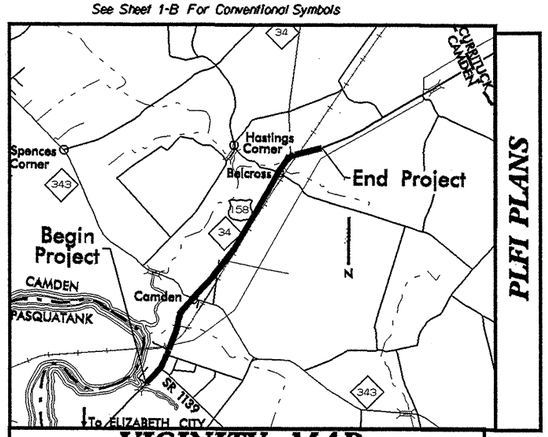
NOTES:

APPROXIMATE LIMITS OF ORGANIC SOILS

REVISED 02/23/06

CONTRACT: TIP PROJECT: R-2414B

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



VICINITY MAP

PLFI PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CAMDEN COUNTY

LOCATION: US 158–NC 34 FROM NORTH OF SR 1257 TO EAST OF NC 34 IN BELCROSS

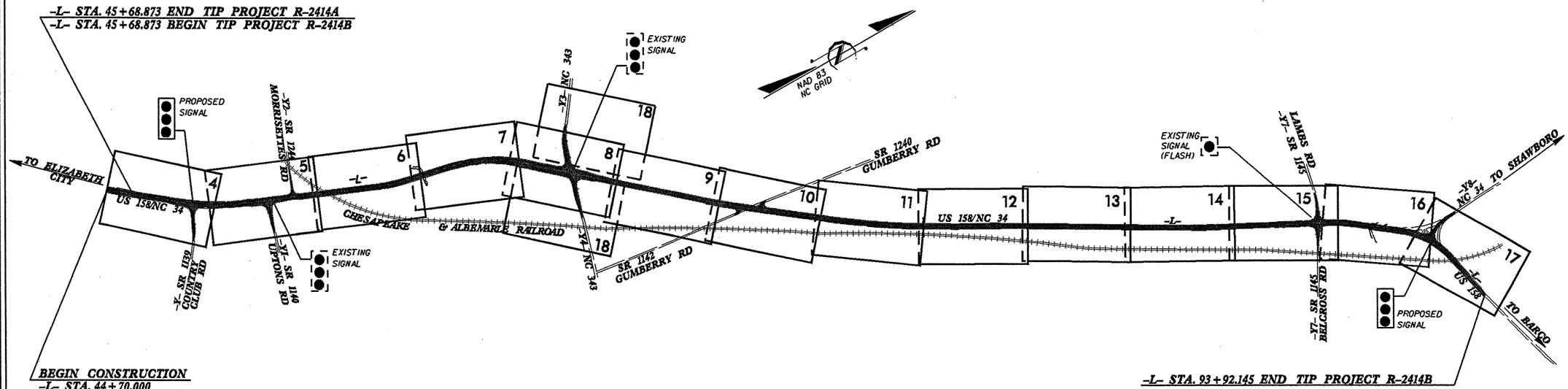
TYPE OF WORK: GRADING, DRAINAGE, PAVING, CURB & GUTTER, CULVERTS & SIGNALS

METRIC

ALL DIMENSIONS IN THESE PLANS ARE IN METERS UNLESS OTHERWISE SHOWN

STATE	STATE PROJECT REFERENCE NO.		SHEET NO.	TOTAL SHEETS
N.C.	R-2414B		2A	146
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION		
34430.1.1	STP-158(2)	PE		
34430.2.5		ROW & UTILITIES		

-L- STA. 45+68.873 END TIP PROJECT R-2414A
-L- STA. 45+68.873 BEGIN TIP PROJECT R-2414B



BEGIN CONSTRUCTION
-L- STA. 44+70.000

-L- STA. 93+92.145 END TIP PROJECT R-2414B

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

PLANS 5 0 10

PROFILE (HORIZONTAL) 5 0 10

PROFILE (VERTICAL) 1 0 2

DESIGN DATA

ADT (2009) = 26,000
ADT (2029) = 41,500
DHV = 12%
D = 60%
T = 6% *
V = 80 km/h

* (TTST 2%+ DUAL 4%)

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2414B = 4.823 Km
TOTAL LENGTH TIP PROJECT R-2414B = 4.823 Km

Prepared In the Office of:
WETHERILL ENGINEERING
559 JONES FRANKLIN ROAD SUITE 104 Raleigh, N.C. 27606 Phone: 919 851 9277 Fax: 919 851 9107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION
For The North Carolina Department Of Transportation

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 15, 2006

LETTING DATE:
NOVEMBER 17, 2009

EDWARD G. WETHERILL, PE
PROJECT ENGINEER

BOB A. MAY, PE
PROJECT DESIGN ENGINEER

NCDOT CONTACT: B. DOUG TAYLOR, PE
ROADWAY DESIGN PROJECT 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.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

July 29, 2008

STATE PROJECT: 34430.1.1 R-2414B
F.A. PROJECT: STP-158(2)
COUNTY: Camden
DESCRIPTION: US 158 – NC 34 from South of SR 1257 to East of NC 34 in Belcross

SUBJECT: Geotechnical Report – Inventory-Revised

Project Description

The project consists of upgrading the existing two to three lane highway to a five lane curb and gutter facility. The project begins in the vicinity of SR 1139 (Country Club Road) and proceeds 4.8± kilometers to a point approximately 280 meters northeast of the NC 34 and US 158 intersection. The southern terminus of the project ties in with a future roadway project (R-2414A) and the northern terminus ties in with existing US 158. The investigation of subsurface conditions was confined to the corridor of proposed new construction.

The following base lines were investigated for this project:

Line	Station
-L-	45+68 to 93+92
-Y-	10+00 to 11+30
-Y1-	10+00 to 11+15
-Y2-	10+12 to 11+14
-Y3-	10+00 to 11+69
-Y4-	10+00 to 11+63
-Y7-	10+10 to 12+12
-Y8-	11+00 to 12+36

MAILING ADDRESS:
N C Department of Transportation
GEOTECHNICAL ENGINEERING UNIT
1589 MAIL SERVICE CENTER
RALEIGH NC 27699-1589

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

WEBSITE: WWW.NCDOT.ORG/DOH

LOCATION:
Century Center Complex
Entrance B-2
120 BIRCH RIDGE DRIVE
RALEIGH, NC 27610

Areas of Special Geotechnical Interest

1) The following sections contain relatively soft organic soils which have potential for settlement and stability problems:

Line	Station (±)
-L-	55+33 to 56+34
-L-	62+72 to 62+96
-L-	72+50 to 74+12
-L-	88+55 to 89+18

The approximate limits of surficial organic soils are shown on the accompanying plan view sheets.

2) The entire project contains surficial cohesive sediments of A-4, A-6 or A-7 AASHTO Classification with moderate to high percentage passing the number 200 sieve and/or relatively high moisture contents and may have the potential to cause subgrade failure:

3) Several sites were identified as potentially hazardous waste sites by the GeoEnvironmental Section in their report dated October 26, 1993.

4) The entire project was found to exhibit a high water table, seasonal high ground water or the potential for ground water related construction problems.

Physiography and Geology

The project is located in the Lower Coastal Plain Physiographic Province. The geology of the area basically consists of Quaternary age undivided Coastal Plain surficial sediments and Recent alluvial deposits. Topography along the corridor is nearly flat. Elevations range from 0.5 meters along the flood plain segments to 4 meters along upland areas. The majority of the project lies between an elevation of 2 to 3 meters above sea level.

The project lies within the Pasquotank River drainage system. Drainage is provided by man-made ditches and several tributaries which eventually flow into the Pasquotank River. Surface drainage is generally fair to poor due to the relatively flat terrain.

Ground Water

Ground water data was collected primarily from February, 2001 to March, 2001 during below average rainfall conditions. The water table along much of the project is high due to the relatively flat terrain. During our investigation, ground water was generally encountered between 1 and 2 meters of the existing roadway shoulder and along the upland areas. During wet seasons

or after heavy precipitation, water may be within 0.5 to 1 meter of the natural ground. In flood plain and adjacent low lying areas, water is at or near the natural ground surface.

Soils

Soils encountered during this investigation are separated into three major categories based on origin and occurrence. These categories are alluvial soils, surficial soils and embankment soils.

Alluvial soils encountered in the flood plains in the vicinity of -L- stations 55+60±, 62+80±, 73+40± and 89+00± generally consist of 0.5 to 6 meters of organic soils. Organic contents of tested samples range from 4.7 to 21.8 percent and moisture contents range from 33 to 193 percent. Vane Shear Tests performed in the organic alluvial sediments generally range from < 2.4 to 26.6 kPa. Loose to medium dense fine sand and sandy silt (A-2-4, A-4) underlies the organic soils. Typically, the alluvial sediments exhibit poor engineering properties and undercutting or other methods of stabilizing the subgrade may be required.

Surficial soils from the beginning of the project to station 62+70± generally consist of 6 or more feet of clayey sandy silt (A-4) and silty sandy clay (A-6, A-7-6). Engineering properties of the silt-clay soils range from fair to poor with tests showing 50 percent or more passing the 75μm sieve, plasticity indices of 11 to 34 and/or relatively high moisture contents. The consistency of these soils will typically vary seasonally. During relatively dry seasons, the cohesive material will more likely have a medium stiff consistency. During wet seasons, the same soils will be relatively soft. From station 62+70± to the end of the project, surficial upland soils consist of medium stiff to stiff sandy silt (A-4) and silty sand (A-2-4) which exhibit fair to good engineering properties. The majority of the silt/clay soils will require undercutting to stabilize the subgrade.

Embankments are man-made fills built during construction of existing roadways. The fill material generally consists of loose to medium dense fine to coarse sand and sandy silt (A-2-4, A-4). Thickness of the fill material ranges from 0.5 to 2 meters and has good to excellent engineering properties. This material was primarily encountered along existing US 158/NC 34 and associated -Y- lines.

Undisturbed Samples

Undisturbed (Shelby Tube) samples were taken in the organic and silt soils at the following locations and submitted for testing:

Sample No.	Station	Depth(m)	Test
ST-1	55+60, 11.5m Rt.	0.45 - 1.05	Consolidation
ST-1	88+80, 1.0m Lt.	8.00 - 8.60	Consolidation
ST-2	73+20, 11.5m Lt.	0.30 - 0.95	Consolidation
ST-3	89+09, 7.0m Rt.	0.15 - 0.75	Consolidation
ST-4	88+70, 10.0m Rt.	1.40 - 2.00	Consolidation
ST-5	55+62, 2.5m Rt.	8.53 - 9.14	Triaxial CU
ST-6	55+62, 2.5m Rt.	10.67 - 11.28	Consolidation

Sample No.	Station	Depth(m)	Test
ST-7	88+80, 15m Rt.	9.24 - 9.85	Triaxial CU
ST-8	73+18, 2.5m Rt.	7.10 – 7.61	Consolidation
ST-9	73+18, 2.5m Rt.	10.15 – 10.76	Triaxial CU

Culvert at -L- Station 55+81

A 2.4 m x 1.8 m RCBC is proposed at -L- Station 55+81. Standard Penetration Test and hand auger borings made in the immediate vicinity show 3.5 to 5.5 meters of very soft organic silt and muck underlain by 12 to 15 meters of very loose to medium dense sand (A-2-4) and very soft to medium stiff sandy silt (A-4) and silty clay (A-7-6) at the site. Approximately 5 to 7 meters of medium dense to very dense sand (A-3, A-2-4) was encountered below an elevation of -18 meters. Medium stiff to very stiff sandy silt (A-4) underlies the granular soils. Ground water was measured at an elevation of sea level to 0.4 meters.

Culvert at -L- Station 73+49

A dual 1.8 m x 1.5 m RCBC is proposed at -L- Station 73+49. Standard Penetration Test and hand auger borings made in the immediate vicinity show 1.5 to 4.5 meters of very soft muck underlain by 9± meters of loose to medium dense sand (A-2-4) and very soft to medium stiff sandy silt (A-4) and silty clay (A-7-6) at the site. Approximately 9± meters of interlayered loose to medium dense gray sand (A-2-4, A-1-b), very soft to very stiff sandy silt (A-4) and soft to very stiff sandy and silty clay (A-6, A-7-6). Medium dense to very dense sand (A-3, A-1-b) was encountered below an elevation of -22 meters. Ground water was measured at an elevation of sea level to 0.5 meters.

Culvert at -L- Station 89+05

A 3.0 m x 1.5 m RCBC is proposed at -L- Station 89+05. Standard Penetration Test and hand auger borings made in the immediate vicinity show 1.0 to 2.5 meters of very soft organic clay and muck underlain by 3 to 4.5 meters of very loose to loose sand (A-2-4) and very stiff sandy silt (A-4). Very soft to hard sandy silt (A-4) and sandy silty clay (A-6, A-7-6), 15 to 17 meters thick, underlies the granular soils. Approximately 4.5 to 7.5 meters of medium dense to very dense sand (A-3, A-2-4) was encountered below an elevation of -19 to -22 meters. Stiff to very stiff sandy silt (A-4) and clay (A-6) underlies the granular soils. Ground water was measured at an elevation of 0.3 to 0.7 meters.

Prepared by,

Dean N. Argenbright
Regional Geological Engineer

NWW/DNA

CAMDEN

EARTHWORK BALANCE SHEET

Volumes in Cubic Meters

PROJECT **IP # R-2414B** CAMDEN DATE 12/28/2011 SHEET **1** OF **3** SHEETS

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	UNDERCUT EXCAV.	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	EARTH EMB.	EMBANK. 30%	BORROW	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
PHASE I													
SUMMARY #1													
L LT	45+68.873	52+40.000	912		912		2559	2559	3327	3327		912	912
Y2	10+12.000	11+05.232	2		2		454	454	590	590		2	2
SUMMARY #1 SUBTOTAL			914		914	0	3013	3013	3917	3917		914	914
SUMMARY #2													
L RT	52+60.000	58+80.000	99	1297	99		7598	7598	9877	9877		1396	1396
L RT SURCHARGE	55+33.000	56+34.000					1502	1502	1953	1953			
L RT SURCHARGE REM.	55+33.000	56+34.000	1365			1365					1365		1365
SUMMARY #2 SUBTOTAL			1464	1297	99	1365	9100	9100	11830	11830	1365	1396	2761
SUMMARY #3													
L LT	58+80.000	68+80.000	128	130	128		6709	6709	8722	8722		258	258
Y3	9+48.03	11+55.955	128		128		614	614	798	798		128	128
SUMMARY #3 SUBTOTAL			256	130	256	0	7323	7323	9520	9520		386	386
SUMMARY #4													
L LT	68+80.000	78+80.000	299	705	299		5964	5964	7753	7753		1004	1004
L LT SURCHARGE	72+50.000	73+80.000					2100	2100	2730	2730			
L LT SURCHARGE REM.	72+50.000	73+80.000	1909			1909					1909		1909
SUMMARY #4 SUBTOTAL			2208	705	299	1909	8064	8064	10483	10483	1909	1004	2913
SUMMARY #5													
L LT	78+80.000	87+60.000	178		178		3733	3733	4853	4853		178	178
Y7	10+00.000	11+04.067	218		218		623	623	810	810		218	218
SUMMARY #5 SUBTOTAL			396		396	0	4356	4356	5663	5663		396	396
SUMMARY #6													
L RT	87+60.000	93+92.145	1125	1677	1125		3209	3209	4172	4172		2802	2802
L RT SURCHARGE	88+55.000	89+18.000					801	801	1041	1041			
L RT SURCHARGE REM.	88+55.000	89+18.000	728			728					728		728
SUMMARY #6 SUBTOTAL			1853	1677	1125	728	4010	4010	5213	5213	728	2802	3530
SHEET TOTAL			7091	3809	3089	4002	35866	35866	46626	46626	4002	6898	10900

*** 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 **IP # R-2414B** CAMDEN DATE 12/28/2011 SHEET 2 OF 3 SHEETS

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	UNDERCUT EXCAV.	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	EARTH EMB.	EMBANK. 30%	BORROW	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
PHASE II													
SUMMARY #7 SUBTOTAL													
L RT	45+68.873	52+60.000	202		202		3021	3021	3927	3927		202	202
Y	10+09.600	11+30.000	878		878		371	371	482	482		878	878
Y1	10+00.000	11+05.780	336		336		174	174	226	226		336	336
SUMMARY #7 SUBTOTAL			1416		1416	0	3566	3566	4635	4635		1416	1416
SUMMARY #8													
L LT	52+40.000	58+80.000	302	1364	302		5431	5431	7060	7060		1666	1666
L LT SURCHARGE	55+33.000	56+34.000					1949	1949	2534	2534			
L LT SURCHARGE REM.	55+33.000	56+34.000	1771			1771					1771		1771
SUMMARY #8 SUBTOTAL			2073	1364	302	1771	7380	7380	9594	9594	1771	1666	3437
SUMMARY #9													
L RT	58+80.000	68+80.000	50		50		6610	6610	8593	8593		50	50
Y4	10+12.483	11+63.200	77		77		288	288	374	374		77	77
SUMMARY #9 SUBTOTAL			127		127	0	6898	6898	8967	8967		127	127
SUMMARY #10													
L RT	68+80.000	78+80.000	256	1566	256		5267	5267	6847	6847		1822	1822
L RT SURCHARGE	72+50.000	73+80.000					2491	2491	3238	3238			
L RT SURCHARGE REM.	72+50.000	73+80.000	2264			2264					2264		2264
SUMMARY #10 SUBTOTAL			2520	1566	256	2264	7758	7758	10085	10085	2264	1822	4086
SUMMARY #11													
L RT	78+80.000	87+60.000	395		395		2873	2873	3735	3735		395	395
Y7	11+23.273	12+12.000	348		348		897	897	1166	1166		348	348
SUMMARY #11 SUBTOTAL			743		743	0	3770	3770	4901	4901		743	743
SUMMARY #12													
L LT	87+60.000	93+92.145	245	4554	245		9543	9543	12406	12406		4799	4799
Y8	11+00.000	12+27.393	21		21		1235	1235	1606	1606		21	21
L LT SURCHARGE	88+55.000	89+18.000					1232	1232	1602	1602			
L LT SURCHARGE REM.	88+55.000	89+18.000	1120			1120					1120		1120
SUMMARY #12 SUBTOTAL			1386	4554	266	1120	12010	12010	15614	15614	1120	4820	5940
SHEET TOTAL			8265	7484	3110	5155	41382	41382	53796	53796	5155	10594	15749

*** 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 **IP # R-2414B** CAMDEN DATE 12/28/2011 SHEET **3** OF **3** SHEETS

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	UNDERCUT EXCAV.	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	EARTH EMB.	EMBANK. 30%	BORROW	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
SHEET 1 TOTAL (PHASE I)			7091	3809	3089	4002	35866	35866	46626	46626	4002	6898	10900
SHEET 2 TOTAL (PHASE II)			8265	7484	3110	5155	41382	41382	53796	53796	5155	10594	15749
PROJECT SUBTOTAL			15356	11293	6199	9157	77248	77248	100422	100422	9157	17492	26649
SHOULDER CONSTRUCTION							410	410	533	533			
LOSS DUE TO CLEARING AND GRUBBING			-1000			-1000				1000		-1000	-1000
SELECT GRANULAR MATERIAL, CLASS III, IN LIEU OF BACKFILL FOR UNDERCUT							-6361	-6361	-8269	-8269			
WASTE IN LIEU OF BORROW										-4002	-4002		-4002
* FOAMED CONC. IN LIEU OF BORROW							-6352	-6352	-8258	-8258			
* FOAMED CONC. IN LIEU OF BACKFILL FOR UNDERCUT							-4932	-4932	-6412	-6412			
ADDITIONAL UNDERCUT				2000			2000	2000	2600	2600		2000	2000
PROJECT TOTAL			14356	13293	6199	8157	62013	62013	80616	77614	5155	18492	23647
EST 5% TO REPLACE TOP SOIL ON BORROW PIT										3881			
GRAND TOTAL			14356							81495			
SAY			**14500**							**86000**			

FABRIC FOR SOIL STABILIZATION = 70,400 SQ METERS & 2000 SQ METERS CONTINGENCY (GEOTECH MEMO OF 8/16/11)

CL IV SUBGRADE STABILIZATION MATERIAL = EST. 72,500 MTN COMPUTED & 2,500 MTN CONTINGENCY (GEOTECH MEMO OF 8/16/11)

SHALLOW UNDERCUT = EST. 19,400CM COMPUTED & 2,500CM CONTINGENCY (GEOTECH MEMO OF 8/16/11)

SELECT GRANULAR MATERIAL, CL 'III'= EST. 2,000 CU. METERS CONTINGENCY (GEOTECH MEMO OF 8/16/11)

*** FOAMED CONCRETE = 11,284 CM (GEOTECH MEMO OF 8/9/11)**

TREATED TIMBER PILE = 19,118 M (PER GEOTECH MEMO OF 11/29/11)

WELDED WIRE FABRIC FOR FOAMED CONCRETE = 17,488 SM (PER GEOTECH MEMO OF 8/9/11)

PDA TESTING = 8 EACH (GEOTECH MEMO OF 8/9/11)

PDA ASSISTANCE = 8 EACH (GEOTECH MEMO OF 8/9/11)

EMBANKMENT STABILIZATION FABRIC = 7,505 SM (PER GEOTECH MEMO OF 11/29/11)

EMBANKMENT SETTLEMENT GAUGES = 6 EACH (PER GEOTECH MEMO OF 8/9/11)

150mm PERFORATED SUBDRAIN PIPE = EST. 9,600LM COMPUTED & 2,000LM CONTINGENCY (GEOTECH MEMO OF 8/16/11)

*** 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.**

REVISIONS
R/W REVISION - REVISED R/W ALONG -L- & -Y- TO SHOW BEING ACQUIRED UNDER NCDOT PROJECT R-2414A. BAM

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

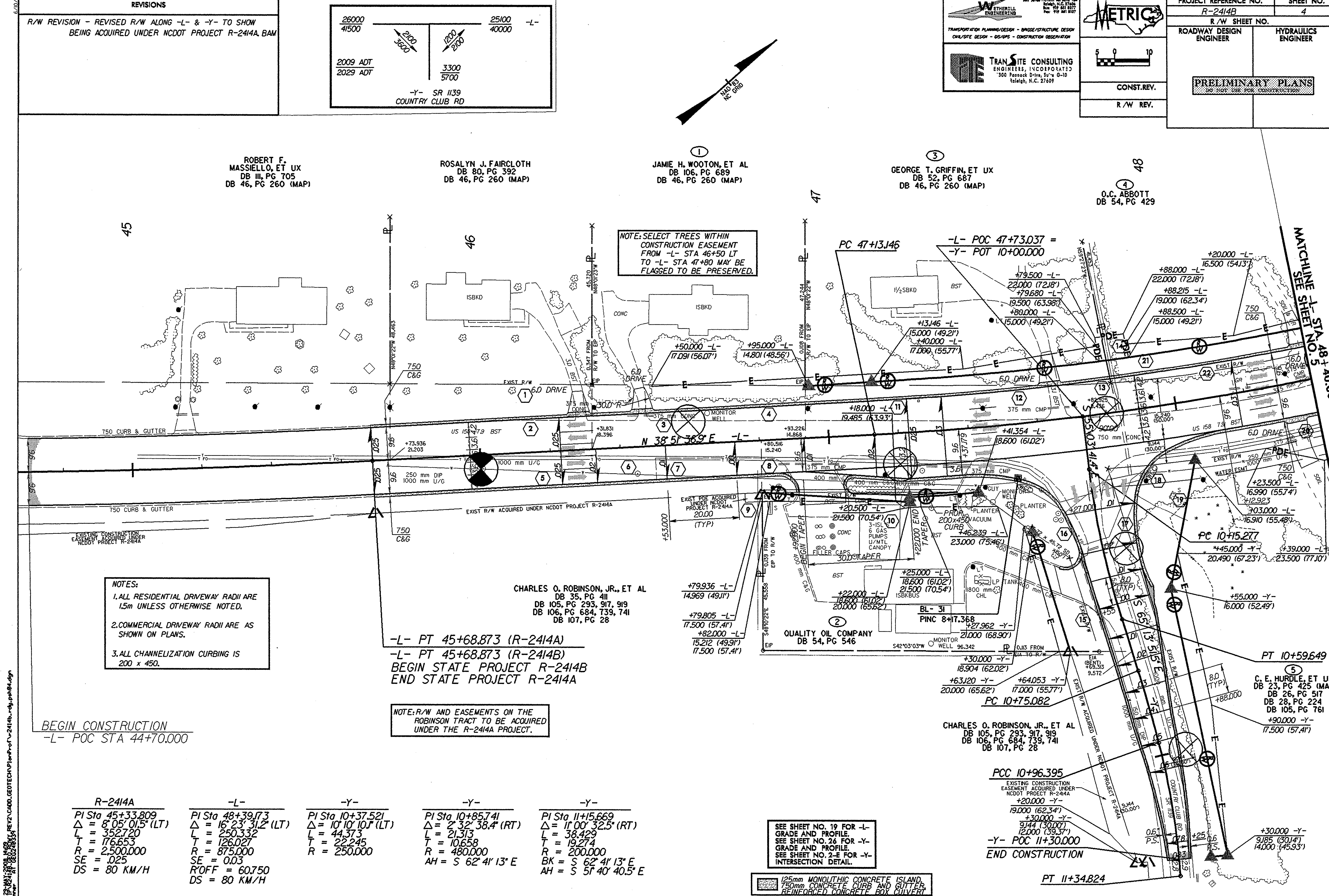
METRIC

CONST.REV.

R/W REV.

WETHERILL ENGINEERING
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TRANSITE CONSULTING ENGINEERS, INCORPORATED
Raleigh, N.C. 27609



NOTES:

1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.
2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.
3. ALL CHANNELIZATION CURBING IS 200 x 450.

R-2414A	-L-	-Y-	-Y-	-Y-
PI Sta 45+33.809	PI Sta 48+39.173	PI Sta 10+37.521	PI Sta 10+85.741	PI Sta 11+15.669
Δ = 8° 05' 01.5" (LT)	Δ = 16° 23' 31.2" (LT)	Δ = 10° 10' 10.1" (LT)	Δ = 2° 32' 38.4" (RT)	Δ = 11° 00' 32.5" (RT)
L = 352.720	L = 250.332	L = 44.373	L = 21.313	L = 38.429
T = 176.653	T = 126.027	T = 22.245	T = 10.658	T = 19.274
R = 2,500.000	R = 875.000	R = 250.000	R = 480.000	R = 200.000
SE = .025	SE = 0.03		AH = S 62° 41' 13" E	BK = S 62° 41' 13" E
DS = 80 KM/H	R'OFF = 60.750			AH = S 51° 40' 40.5" E
	DS = 80 KM/H			

SEE SHEET NO. 19 FOR -L- GRADE AND PROFILE.
SEE SHEET NO. 26 FOR -Y- GRADE AND PROFILE.
SEE SHEET NO. 2-E FOR -Y- INTERSECTION DETAIL.

125mm MONOLITHIC CONCRETE ISLAND, 750mm CONCRETE CURB AND GUTTER, REINFORCED CONCRETE BOX CULVERT

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

METRIC

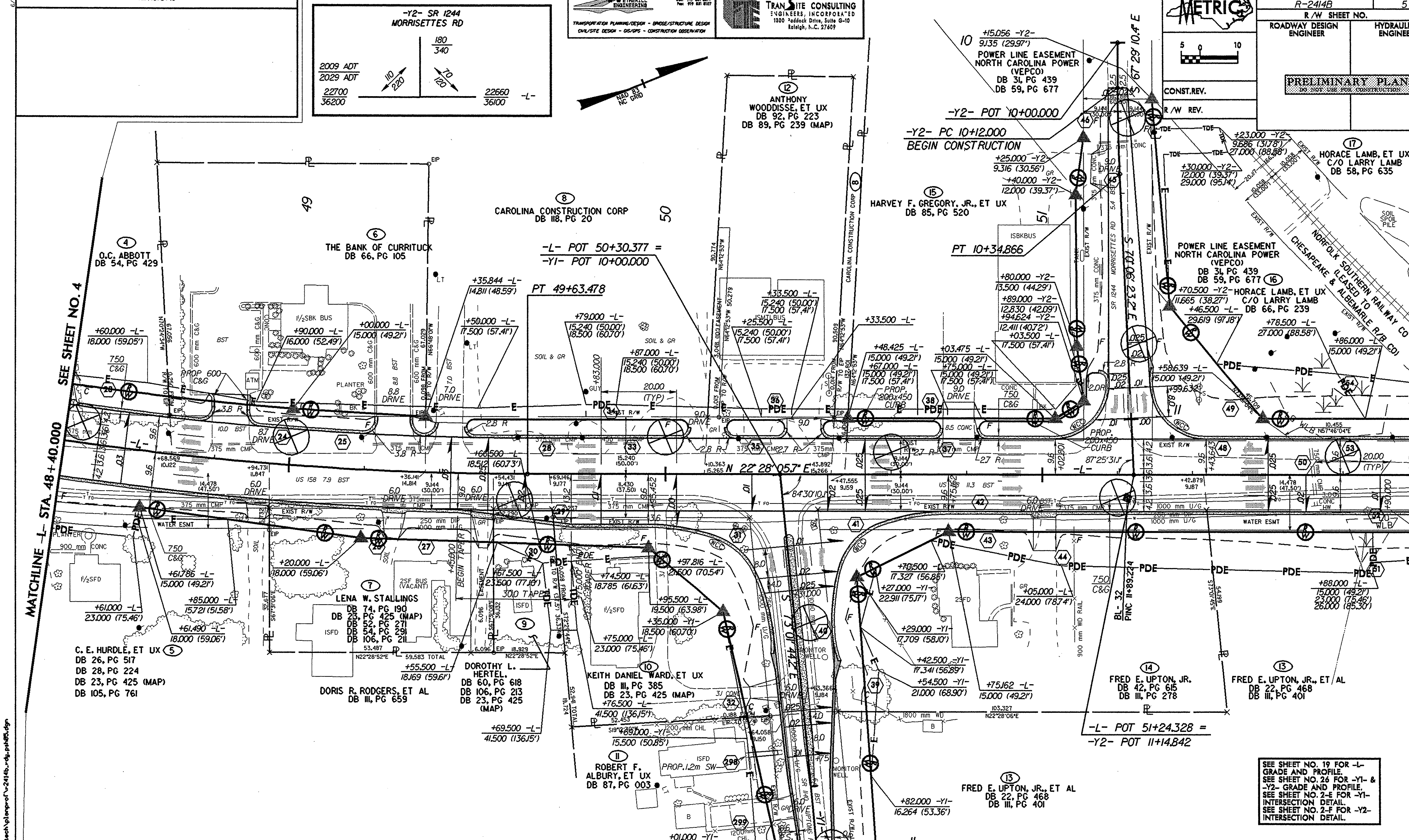
REVISIONS

CONST. REV.

R/W REV.

WETHERILL ENGINEERING — TRANSPORTATION PLANNING/DESIGN · BRIDGE/STRUCTURE DESIGN · CIVIL/SITE DESIGN · GIS/GPS · CONSTRUCTION OBSERVATION

TRANSITE CONSULTING ENGINEERS, INCORPORATED, 1300 Paddock Drive, Suite G-10, Raleigh, N.C. 27609



SEE SHEET NO. 19 FOR -L- GRADE AND PROFILE.
SEE SHEET NO. 26 FOR -Y1- & -Y2- GRADE AND PROFILE.
SEE SHEET NO. 2-E FOR -Y1- INTERSECTION DETAIL.
SEE SHEET NO. 2-F FOR -Y2- INTERSECTION DETAIL.

-L-	-Y2-
PI Sta 48+39.173	PI Sta 10+23.435
Δ = 16° 23' 31.2" (LT)	Δ = 2° 37' 12.8" (LT)
L = 250.332	L = 22.866
T = 126.027	T = 11.435
R = 875.000	R = 500.000
SE = 0.03	SE = EX.
R'OFF = 60.750	
DS = 80 KM/H	

NOTES:

1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.
2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.
3. ALL CHANNELIZATION CURBING IS 200 x 450.

125mm MONOLITHIC CONCRETE ISLAND, 750mm CONCRETE CURB AND GUTTER, REINFORCED CONCRETE BOX CULVERT

-Y1- SR 1140 UPTONS RD — 2009 ADT / 2029 ADT: 25100 / 40000; 22700 / 36200 -L-; 3200 / 5100; 800 / 1300; 4000 / 6400

REVISIONS
11/07/06 - REVISED ROW AND TCE ON PARCEL 22.(ABP)

TRANSITE CONSULTING ENGINEERS, INCORPORATED 1300 Paddock Drive, Suite G-10 Raleigh, N.C. 27609

WETHERILL ENGINEERING — TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

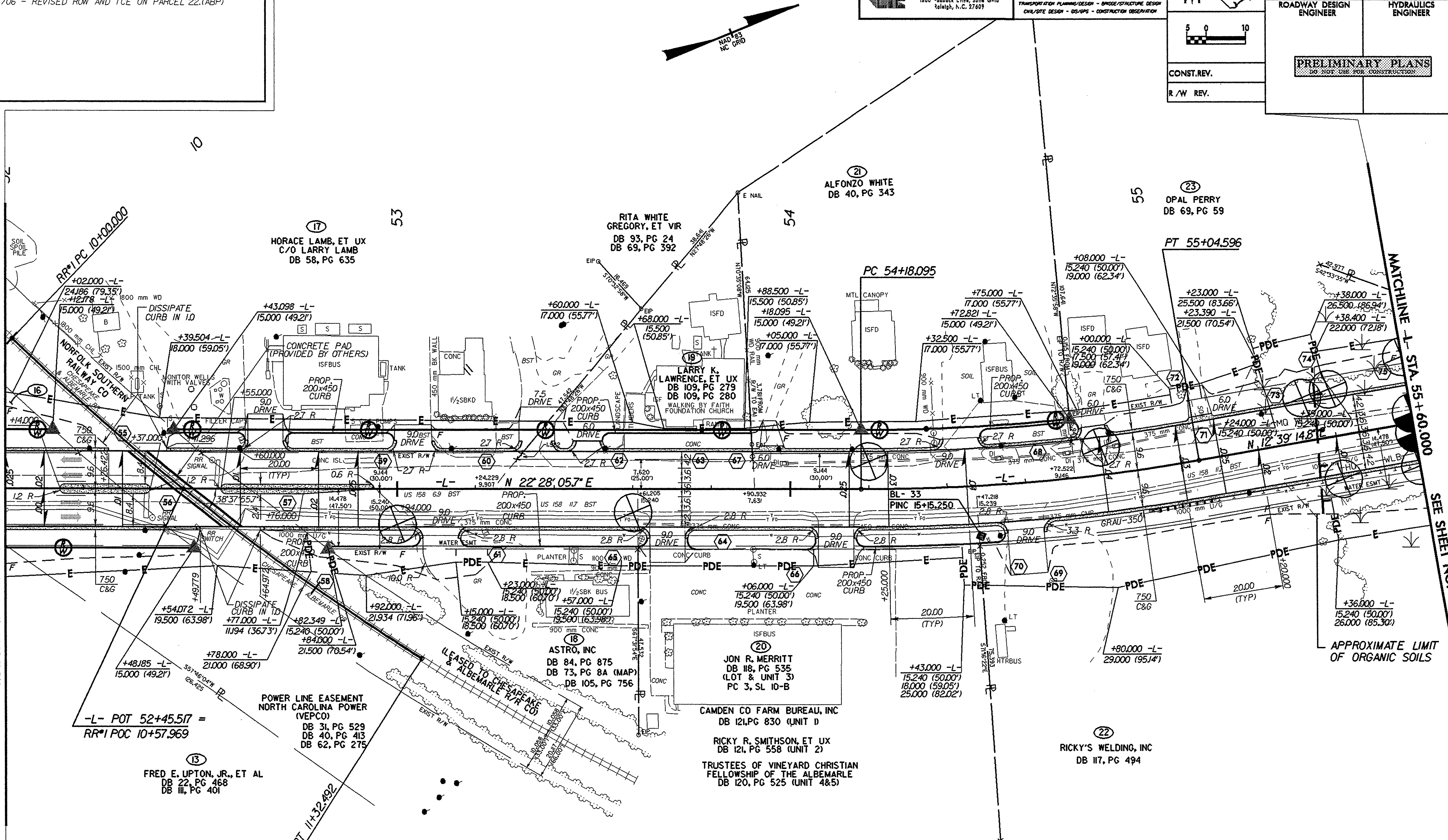
METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



NOTES:

1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.
2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.
3. ALL CHANNELIZATION CURBING IS 200 x 450.

RR *1

PI Sta 10+66.452
Δ = 11° 02' 25.1" (LT)
L = 132.492
T = 66.452
R = 687.593

125mm MONOLITHIC CONCRETE ISLAND, 750mm CONCRETE CURB AND GUTTER, REINFORCED CONCRETE BOX CULVERT

-L-

PI Sta 54+61.452
Δ = 9° 48' 50.9" (LT)
L = 86.501
T = 43.357
R = 505.000
SE = 0.04
R'OFF = 81.000
DS = 80 KM/H

SEE SHEET NO. 20 FOR -L- GRADE AND PROFILE.

6/10/99

REVISIONS
11/07/06 - REVISED ROW,TCE & PDE ON PARCEL 25.(ABP)

WETHERILL ENGINEERING
889 James Franklin Rd. Suite 164
Raleigh, N.C. 27606
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TRANSITE CONSULTING ENGINEERS, INCORPORATED
300 Peacock Drive, Suite G-10
Raleigh, N.C. 27609

METRIC

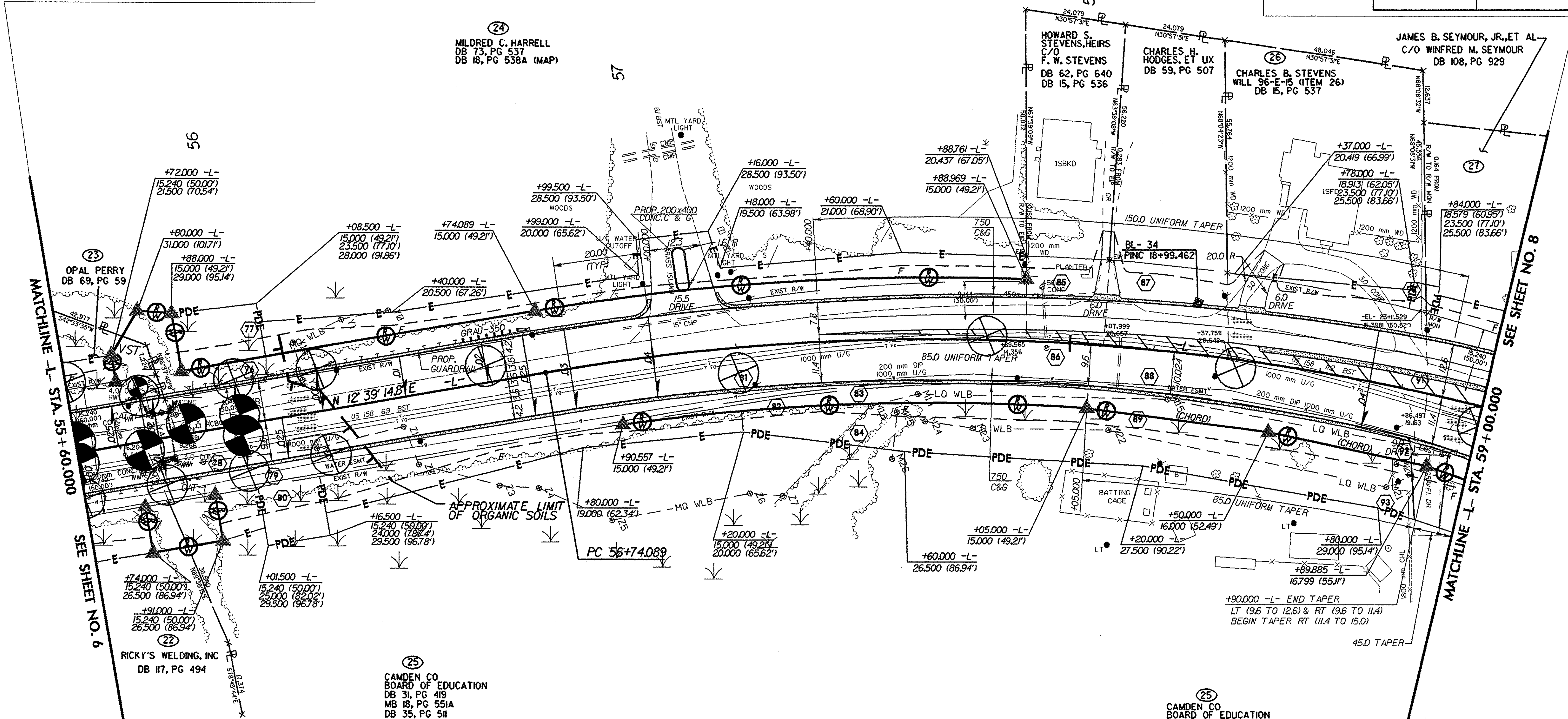
5 0 10

CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-L-
PI Sta 58+15.159
Δ = 28° 46' 17.6" (RT)
L = 276.187
T = 141.071
R = 550.000
SE = 0.04
R'OFF = 81.000
DS = 80 KM/H

125mm MONOLITHIC CONCRETE ISLAND,
750mm CONCRETE CURB AND GUTTER,
REINFORCED CONCRETE BOX CULVERT

NOTES:

1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.

2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.

3. ALL CHANNELIZATION CURBING IS 200 x 450.

SEE SHEET NO. 20 FOR -L- FOR GRADE AND PROFILE.

18-JUL-2008 09:54
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PROJECT REFERENCE NO.	SHEET NO.
R-2414B	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

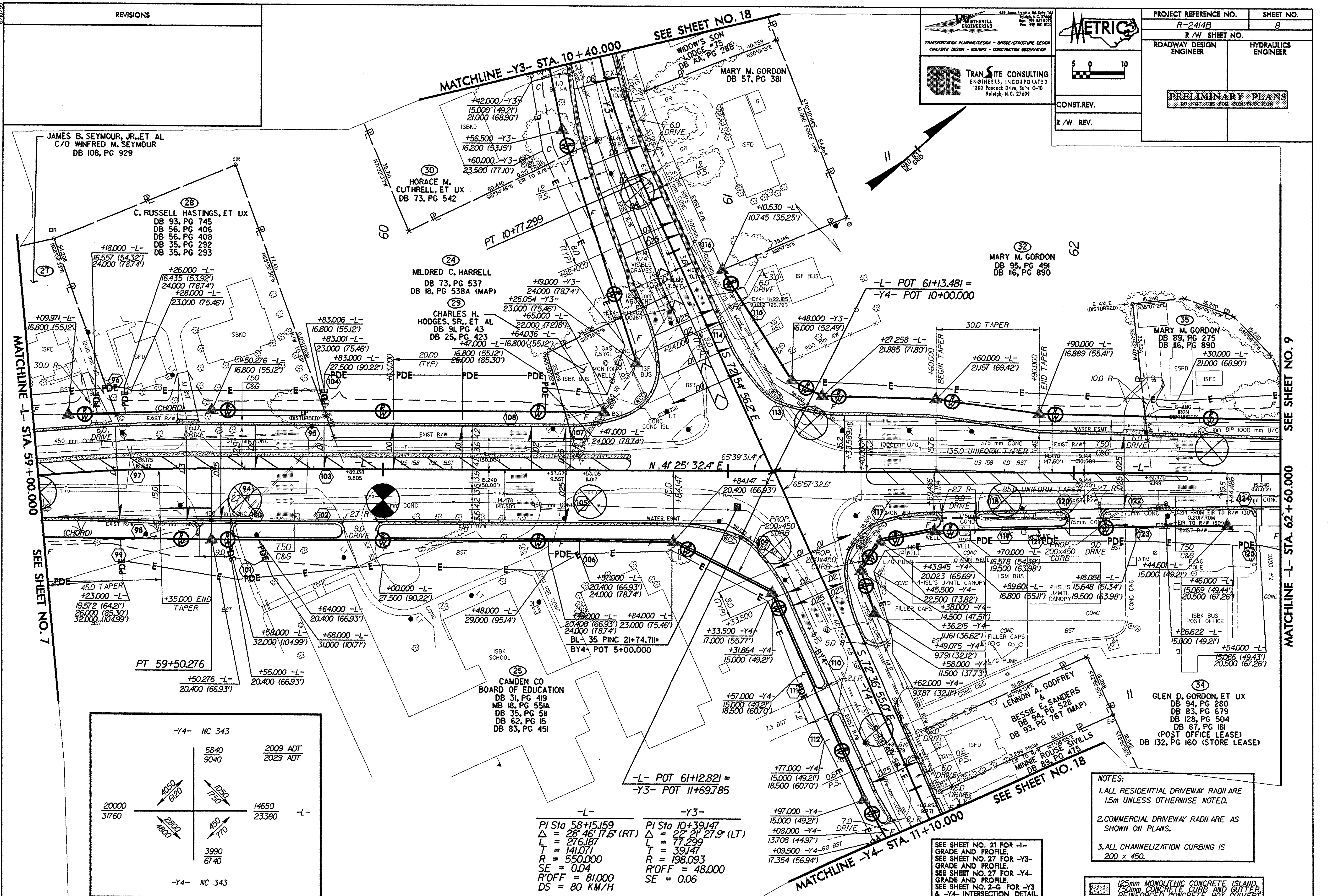
CONST. REV.

R/W REV.

WETHERILL ENGINEERING
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TRANSITE CONSULTING ENGINEERS, INCORPORATED
300 Pennock Drive, Suite G-10
Raleigh, N.C. 27609

METRIC



-L-	-Y3-
PI Sta 58+15.159	PI Sta 10+39.147
Δ = 28° 46' 17.6" (RT)	Δ = 22° 21' 27.9" (LT)
L = 276.187	L = 77.299
T = 141.071	T = 39.147
R = 550.000	R = 198.093
SE = 0.04	SE = 0.06
R'OFF = 81.000	R'OFF = 48.000
DS = 80 KM/H	

-Y4- NC 343		
	5840 / 9040	2009 ADT / 2029 ADT
20000 / 31760	4050/6120, 1050/1750, 2800/4800, 450/770	14650 / 23360 -L-
	3990 / 6740	
-Y4- NC 343		

SEE SHEET NO. 21 FOR -L- GRADE AND PROFILE.
SEE SHEET NO. 27 FOR -Y3- GRADE AND PROFILE.
SEE SHEET NO. 27 FOR -Y4- GRADE AND PROFILE.
SEE SHEET NO. 2-G FOR -Y3 & -Y4- INTERSECTION DETAIL.

NOTES:

1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.
2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.
3. ALL CHANNELIZATION CURBING IS 200 x 450.

125mm MONOLITHIC CONCRETE ISLAND, 750mm CONCRETE CURB AND GUTTER, REINFORCED CONCRETE BOX CULVERT

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

METRIC

WETHERILL ENGINEERING — TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN - CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

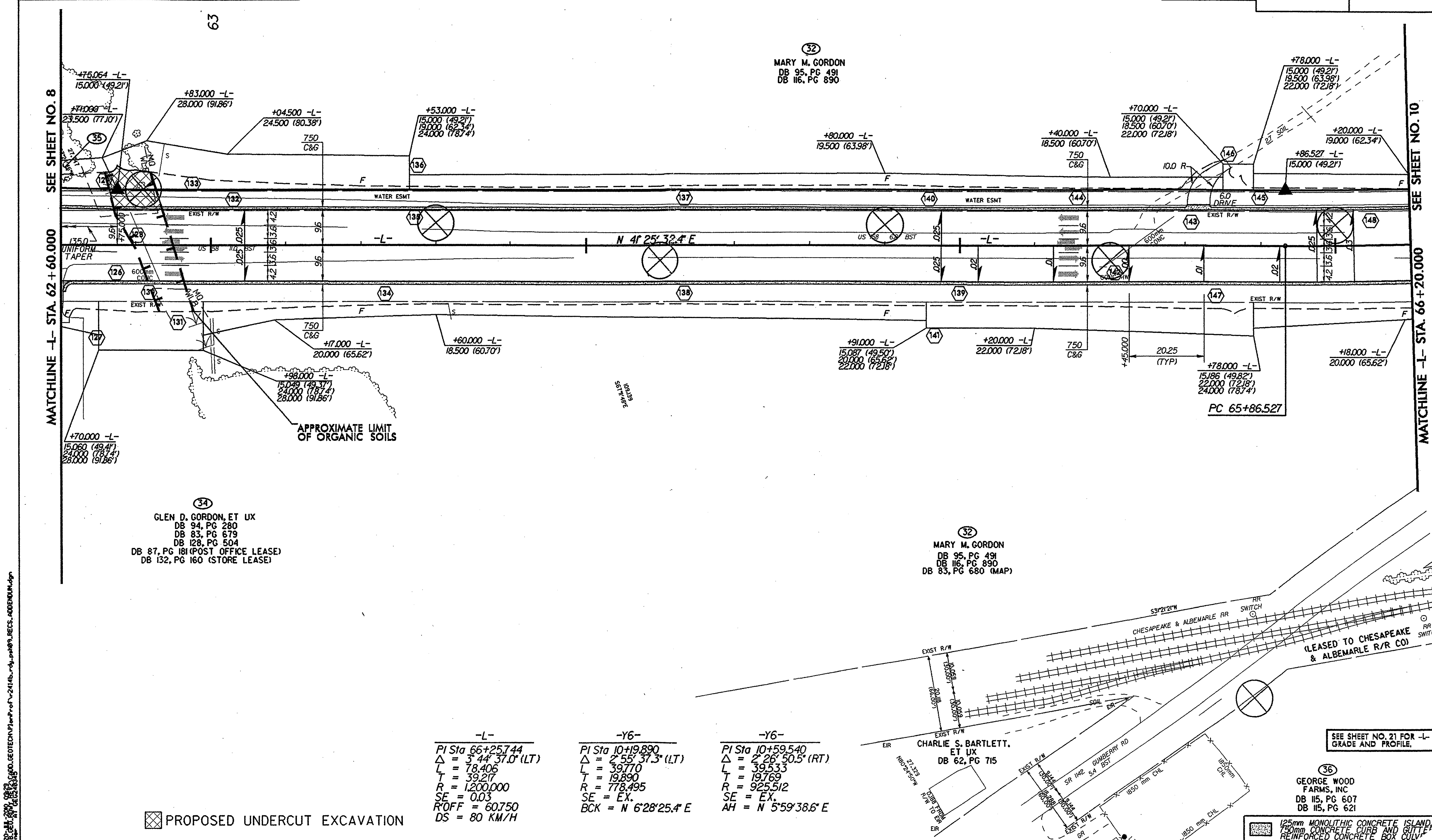
TRANSITE CONSULTING ENGINEERS, INCORPORATED, 1300 Paragon Drive, Suite G-10, Raleigh, N.C. 27609

CONST. REV.

R/W REV.

REVISIONS

NOTES:
1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.
2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.
3. ALL CHANNELIZATION CURBING IS 200 x 450.



-L-	-Y6-	-Y6-
PI Sta 66+25.744	PI Sta 10+19.890	PI Sta 10+59.540
Δ = 3° 44' 37.0" (LT)	Δ = 2° 55' 37.3" (LT)	Δ = 2° 26' 50.5" (RT)
L = 78.406	L = 39.770	L = 39.533
T = 39.217	T = 19.890	T = 19.769
R = 1,200.000	R = 778.495	R = 925.512
SE = 0.03	SE = EX.	SE = EX.
R'OFF = 60.750	BCK = N 6°28'25.4" E	AH = N 5°59'38.6" E
DS = 80 KM/H		

SEE SHEET NO. 21 FOR -L- GRADE AND PROFILE.

PROPOSED UNDERCUT EXCAVATION

125mm MONOLITHIC CONCRETE ISLAND, 750mm CONCRETE CURB AND GUTTER, REINFORCED CONCRETE BOX CULVERT

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

METRIC

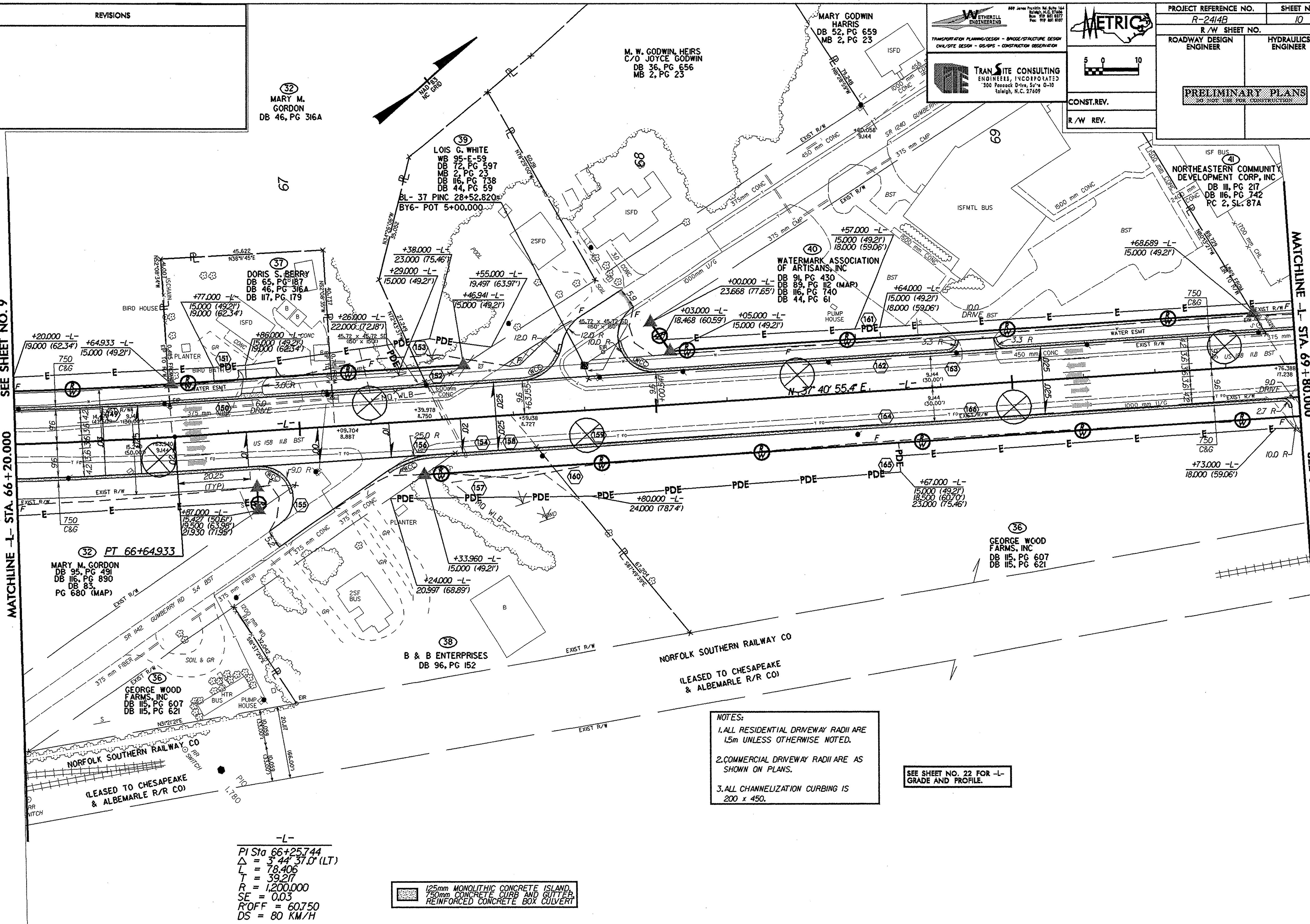
WETHERILL ENGINEERING
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TRANSITE CONSULTING ENGINEERS, INCORPORATED
300 Peacock Drive, Suite G-10
Raleigh, N.C. 27609

REVISIONS

CONST. REV.

R/W REV.



-L-
PI Sta 66+25.744
Δ = 3° 44' 37.0" (LT)
L = 78.406
T = 39.217
R = 1,200.000
SE = 0.03
R'OFF = 60.750
DS = 80 KM/H

125mm MONOLITHIC CONCRETE ISLAND, 750mm CONCRETE CURB AND GUTTER, REINFORCED CONCRETE BOX CULVERT

NOTES:
1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.
2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.
3. ALL CHANNELIZATION CURBING IS 200 x 450.

SEE SHEET NO. 22 FOR -L- GRADE AND PROFILE.

REVISIONS
11/07/06 - REVISED ROW,TCE & PDE ON PARCEL 36.(ABP)

NOTES:

1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.
2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.
3. ALL CHANNELIZATION CURBING IS 200 x 450.

NAD 83 NC GRID

WETHERILL ENGINEERING

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TRANSITE CONSULTING ENGINEERS, INCORPORATED 300 Peacock Drive, Suite G-10 Raleigh, N.C. 27609

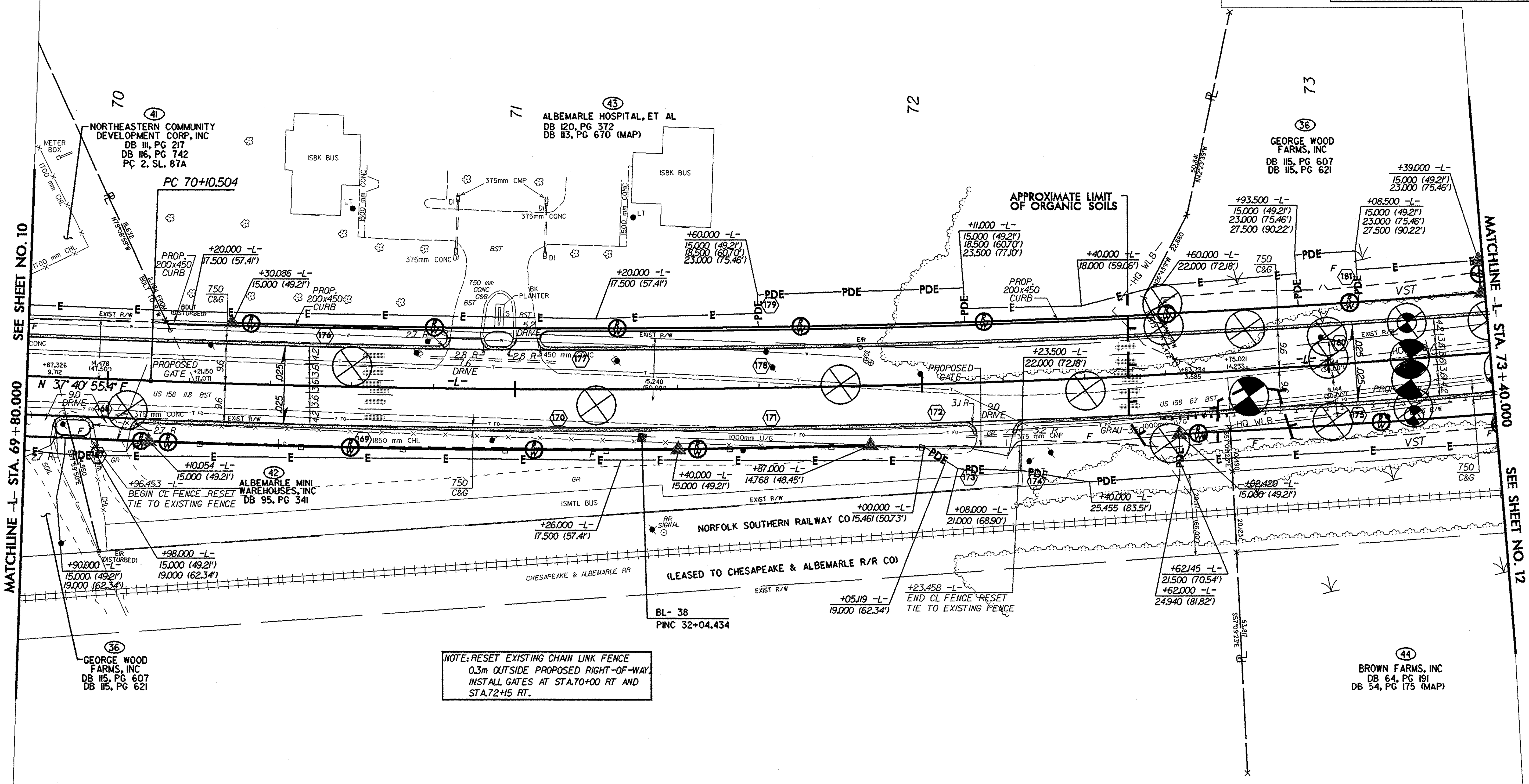
METRIC

CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-L-
PI Sta 72+27.319
Δ = 8° 51' 20.1" (LT)
L = 432.766
T = 216.815
R = 2,800.000
SE = NC
DS = 80 KM/H

125mm MONOLITHIC CONCRETE ISLAND, 750mm CONCRETE CURB AND GUTTER, REINFORCED CONCRETE BOX CULVERT

SEE SHEET NO. 22 FOR -L- GRADE AND PROFILE.

6/10/99

REVISIONS

R/W REVISION - REVISED PDE & TCE ON PARCEL NO.36.(BAM)

NOTES:

1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.
2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.
3. ALL CHANNELIZATION CURBING IS 200 x 450.

WETHERILL ENGINEERING

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TRANSITE CONSULTING ENGINEERS, INCORPORATED 3300 Paragon Drive, Suite G-10 Raleigh, N.C. 27609

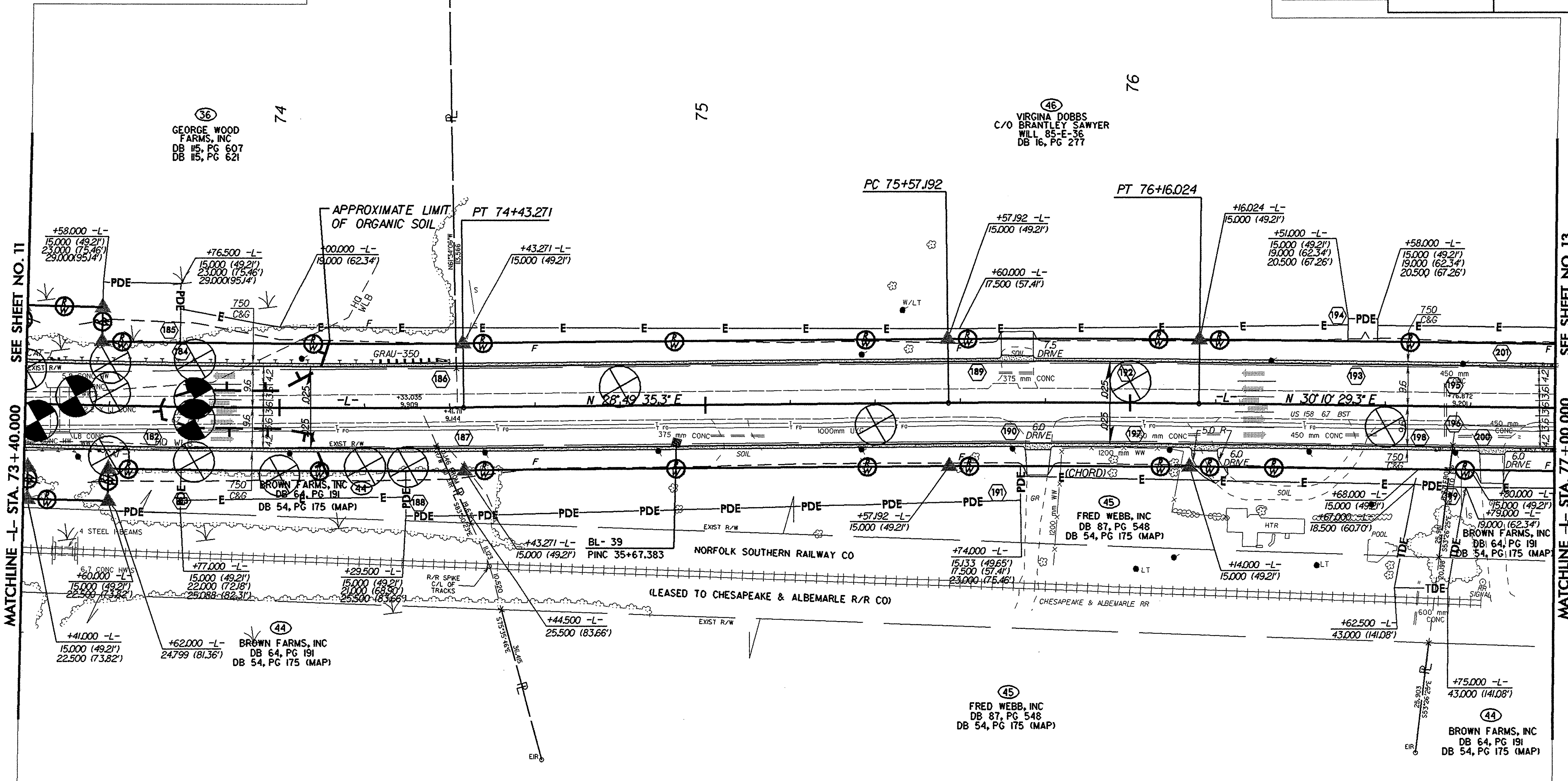
METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST.REV.

R/W REV.

PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION



-L-	-L-
PI Sta 72+27.319	PI Sta 75+86.610
Δ = 8°51' 20.1" (LT)	Δ = 1°20' 54.0" (RT)
L = 432.766	L = 58.832
T = 216.815	T = 29.418
R = 2,800.000	R = 2,500.000
SE = NC	SE = NC
DS = 80 KM/H	DS = 80 KM/H

125mm MONOLITHIC CONCRETE ISLAND,
750mm CONCRETE CURB AND GUTTER,
REINFORCED CONCRETE BOX CULVERT

SEE SHEET NO. 23 FOR -L- GRADE AND PROFILE.

23-MAY-2008 14:
r2414b_rdy_psh12.dgn

REVISIONS

NOTES:

1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.
2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.
3. ALL CHANNELIZATION CURBING IS 200 x 450.

WETHERILL ENGINEERING

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TRANSITE CONSULTING ENGINEERS, INCORPORATED
Raleigh, N.C. 27609

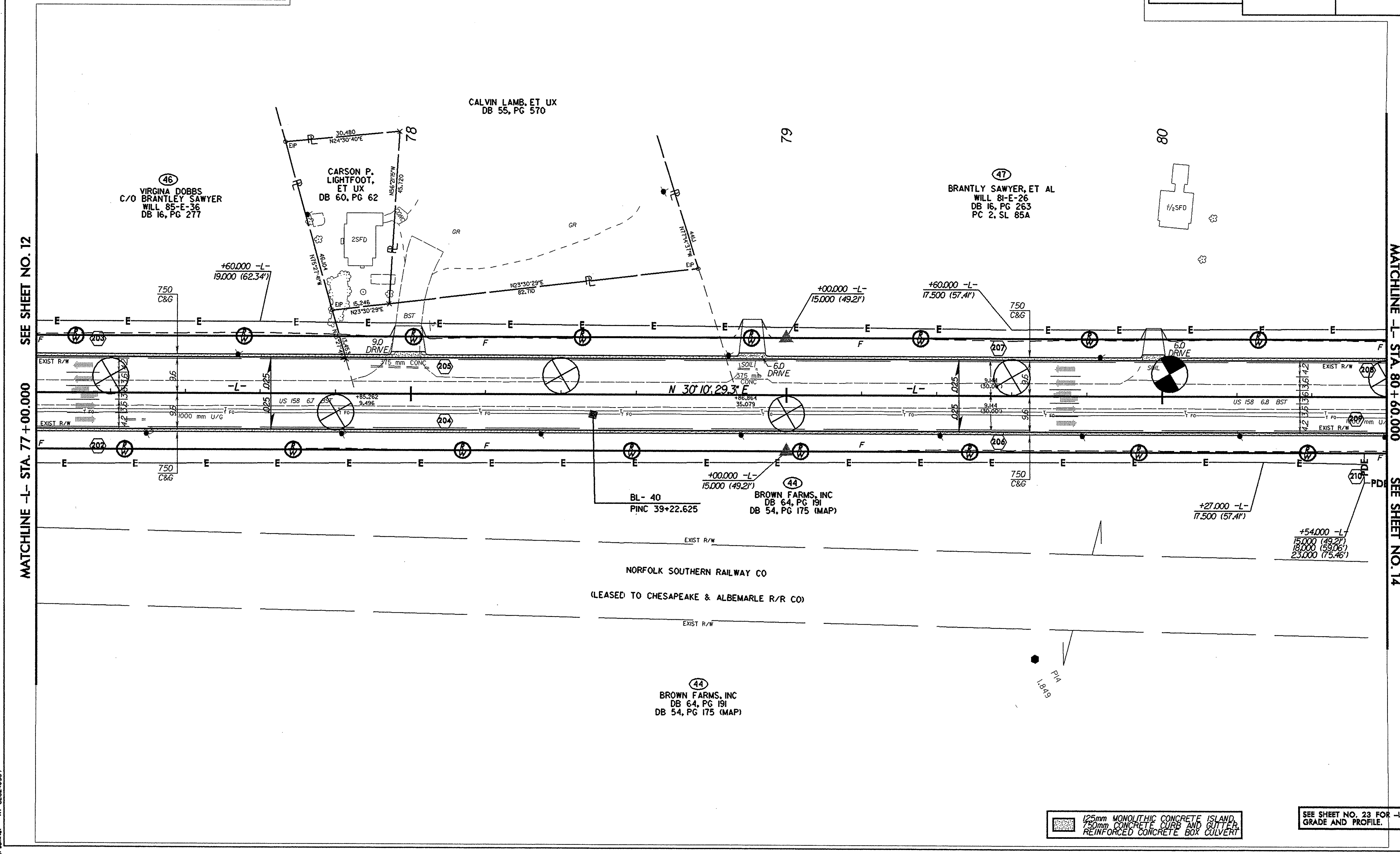
METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET NO. 23 FOR -L- GRADE AND PROFILE.

REVISIONS

NOTES:
1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.
2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.
3. ALL CHANNELIZATION CURBING IS 200 x 450.

WETHERILL ENGINEERING
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TRANSITE CONSULTING ENGINEERS, INCORPORATED
Raleigh, N.C. 27609

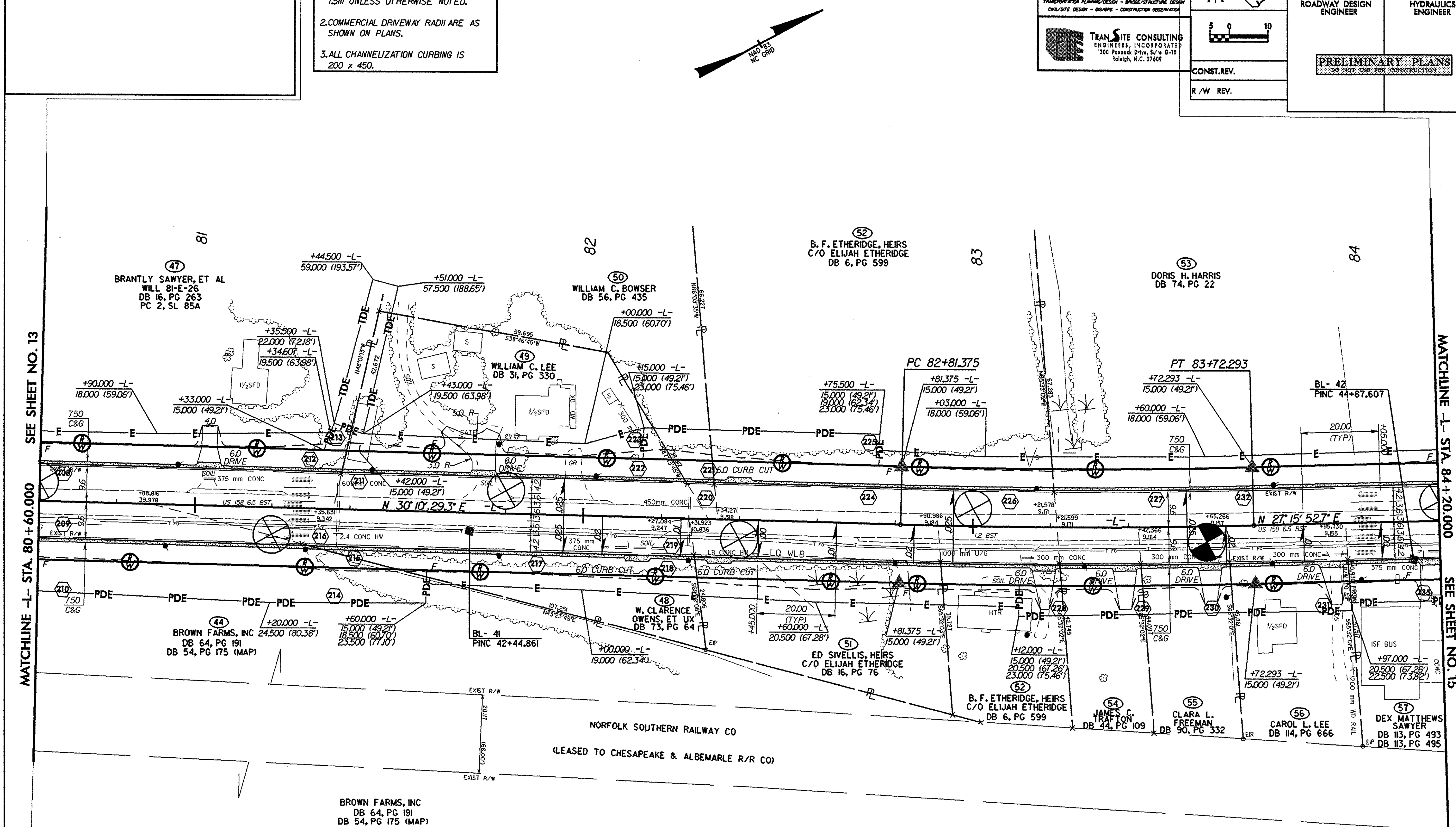
METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R/W REV.



-L-
PI Sta 83+26.844
Δ = 2°54'36.6" (LT)
L = 90.918
T = 45.469
R = 1,790.000
SE = 0.025
R'OFF = 50.625
DS = 80 KM/H

125mm MONOLITHIC CONCRETE ISLAND, 750mm CONCRETE CURB AND GUTTER, REINFORCED CONCRETE BOX CULVERT

SEE SHEET NO. 24 FOR -L- GRADE AND PROFILE.

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	15
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

METRIC

CONST. REV.
R/W REV.

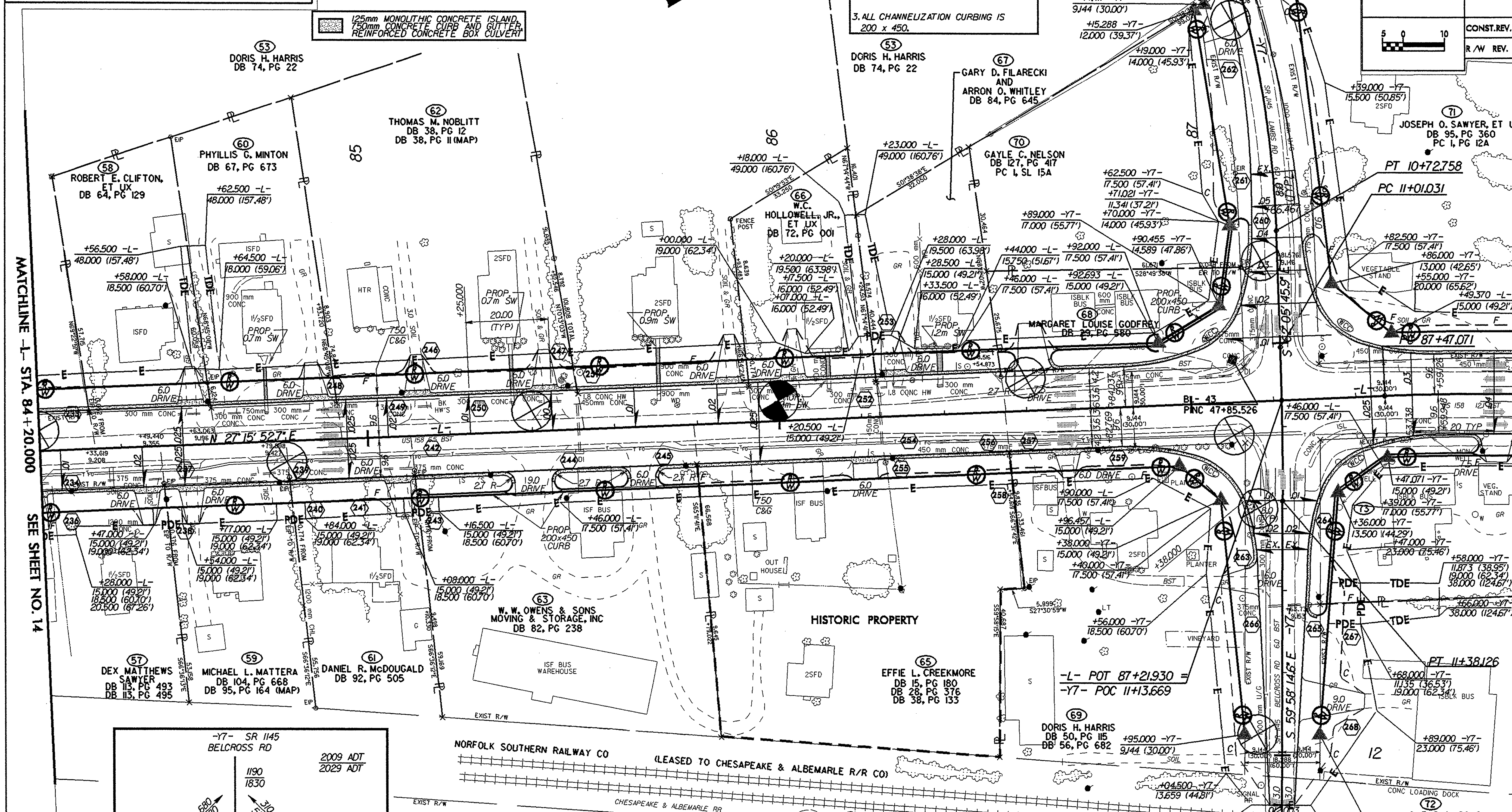
REVISIONS

TranSite Consulting Engineers, Incorporated
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609

Wetherill Engineering
Transportation Planning/Design - Bridge/Structure Design
Civil/Site Design - GIS/GPS - Construction Observation

NOTES:
1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.
2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.
3. ALL CHANNELIZATION CURBING IS 200 x 450.

125mm MONOLITHIC CONCRETE ISLAND, 750mm CONCRETE CURB AND GUTTER, REINFORCED CONCRETE BOX CULVERT



-L-	-Y7-	-Y7-
PI Sta 88+00.038	PI Sta 10+36.638	PI Sta 11+19.581
Δ = 11° 00' 05.6" (RT)	Δ = 16° 40' 29.6" (RT)	Δ = 2° 07' 31.3" (RT)
L = 105.607	L = 72.758	L = 37.094
T = 52.967	T = 36.638	T = 18.549
R = 550.000	R = 250.000	R = 1,000.000
SE = 0.04		
R'OFF = 50.625		
DS = 80 KM/H		

SEE SHEET NO. 24 FOR -L- GRADE AND PROFILE.
SEE SHEET NO. 28 FOR -Y7- GRADE AND PROFILE.
SEE SHEET NO. 2-H FOR -Y7- INTERSECTION DETAIL.

6/00/99

REVISIONS

R/W REVISION- REVISED ROW,PDE & TCE ON PARCEL NOS. 71,74,75,76 & 77. REVISED FLAGGING DUE TO THE ELIMINATION OF EQUATUTY.(BAM)

NOTES:
1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.
2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.
3. ALL CHANNELIZATION CURBING IS 200 x 450.

WETHERILL ENGINEERING
889 James Franklin Rd. Suite 164
Raleigh, N.C. 27606
Bus: 919 851 8577
Fax: 919 851 8127
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TRANSITE CONSULTING ENGINEERS, INCORPORATED
7300 Pesnack Drive, Ste'a G-10
Raleigh, N.C. 27609

METRIC
5 0 10

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.
R/W REV.

NAD 83 NC GRID

MATCHLINE -L- STA. 87+80.000
SEE SHEET NO. 15

MATCHLINE -L- STA. 90+80.000
SEE SHEET NO. 17

KENNETH R. BRITT, ET UX
DB 110, PG 732

(75) LINDA S. DEMUTH, ET AL
DB 119, PG 930

(71) JOSEPH O. SAWYER, ET UX
DB 95, PG 360
PC 1, PG 12A

(76) HORACE MELVILLE CUTHRELL, JR., ET UX
DB 78, PG 809
PC 1, 163A

(73) DORIS H. HARRIS
DB 33, PG 604
PC 1, SL 15A

(74) VINCENT R. RAGAN, ET UX
DB 88, PG 812

(72) W. W. OWENS & SONS MOVING & STORAGE, INC
DB 81, PG 700

(77) WALLACE G. CAHOON
DB 79, PG 413
PC 1, SL 1A

PT 88+52.679

PCSta. 90+20.913

PROP. G'RAIL

PROP. 200x450 CURB

APPROXIMATE LIMIT OF ORGANIC SOILS

-L-	-L-
PI Sta 88+00.038	PI Sta 91+26.866
Δ = 11° 00' 05.6" (RT)	Δ = 41° 56' 30.2" (RT)
L = 105.607	L = 204.966
T = 52.967	T = 107.319
R = 550.000	R = 280.000
SE = 0.04	SE = 0.04
R'OFF = 50.625	R'OFF = 81.000
DS = 80 KM/H	DS = 80 KM/H

NORFOLK SOUTHERN RAILWAY CO
(LEASED TO CHESAPEAKE & ALBEMARLE R/R CO)

SEE SHEET NO. 25 FOR -L- GRADE AND PROFILE.

125mm MONOLITHIC CONCRETE ISLAND, 750mm CONCRETE CURB AND GUTTER, REINFORCED CONCRETE BOX CULVERT

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

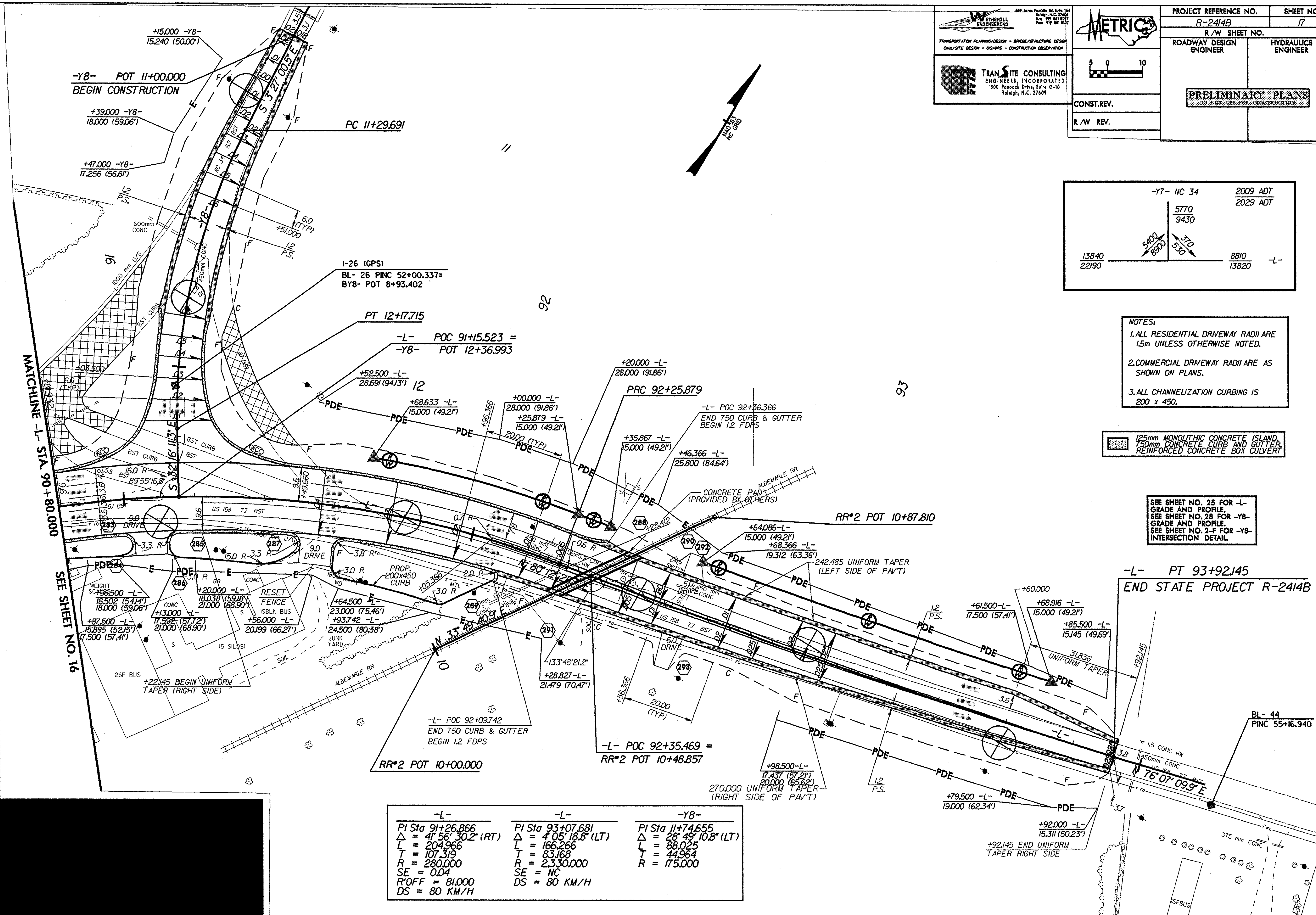
METRIC

CONST. REV.

R/W REV.

WETHERILL ENGINEERING
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TRANSITE CONSULTING ENGINEERS, INCORPORATED
300 Peacock Drive, Suite G-10
Raleigh, N.C. 27609



-Y7- NC 34		2009 ADT / 2029 ADT
5770 / 9430		
13840 / 22190	5400 / 8900 ; 370 / 530	8810 / 13820 -L-

NOTES:

1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.
2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.
3. ALL CHANNELIZATION CURBING IS 200 x 450.

125mm MONOLITHIC CONCRETE ISLAND, 750mm CONCRETE CURB AND GUTTER, REINFORCED CONCRETE BOX CULVERT

SEE SHEET NO. 25 FOR -L- GRADE AND PROFILE.
SEE SHEET NO. 28 FOR -Y8- GRADE AND PROFILE.
SEE SHEET NO. 2-F FOR -Y8- INTERSECTION DETAIL.

-L-	-L-	-Y8-
PI Sta 91+26.866	PI Sta 93+07.681	PI Sta 11+74.655
Δ = 41° 56' 30.2" (RT)	Δ = 4° 05' 18.8" (LT)	Δ = 28° 49' 10.8" (LT)
L = 204.966	L = 166.266	L = 88.025
T = 107.319	T = 83.168	T = 44.964
R = 280.000	R = 2,330.000	R = 175.000
SE = 0.04	SE = NC	
R'OFF = 81.000	DS = 80 KM/H	
DS = 80 KM/H		

[redacted]

REVISIONS

NOTES:

1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.
2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.
3. ALL CHANNELIZATION CURBING IS 200 x 450.

WETHERILL ENGINEERING — 559 Jones Franklin Rd. Suite 164, Raleigh, N.C. 27606 — TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN - CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TRANSITE CONSULTING ENGINEERS, INCORPORATED — 3300 Paddock Drive, Suite G-10, Raleigh, N.C. 27609

METRIC

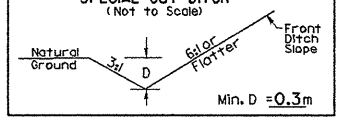
PROJECT REFERENCE NO.	SHEET NO.
R-2414B	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST. REV.

R/W REV.

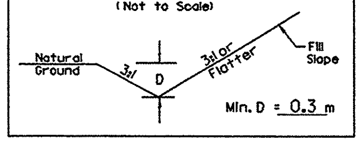
PRELIMINARY PLANS — DO NOT USE FOR CONSTRUCTION

DETAIL D
SPECIAL CUT DITCH (Not to Scale)

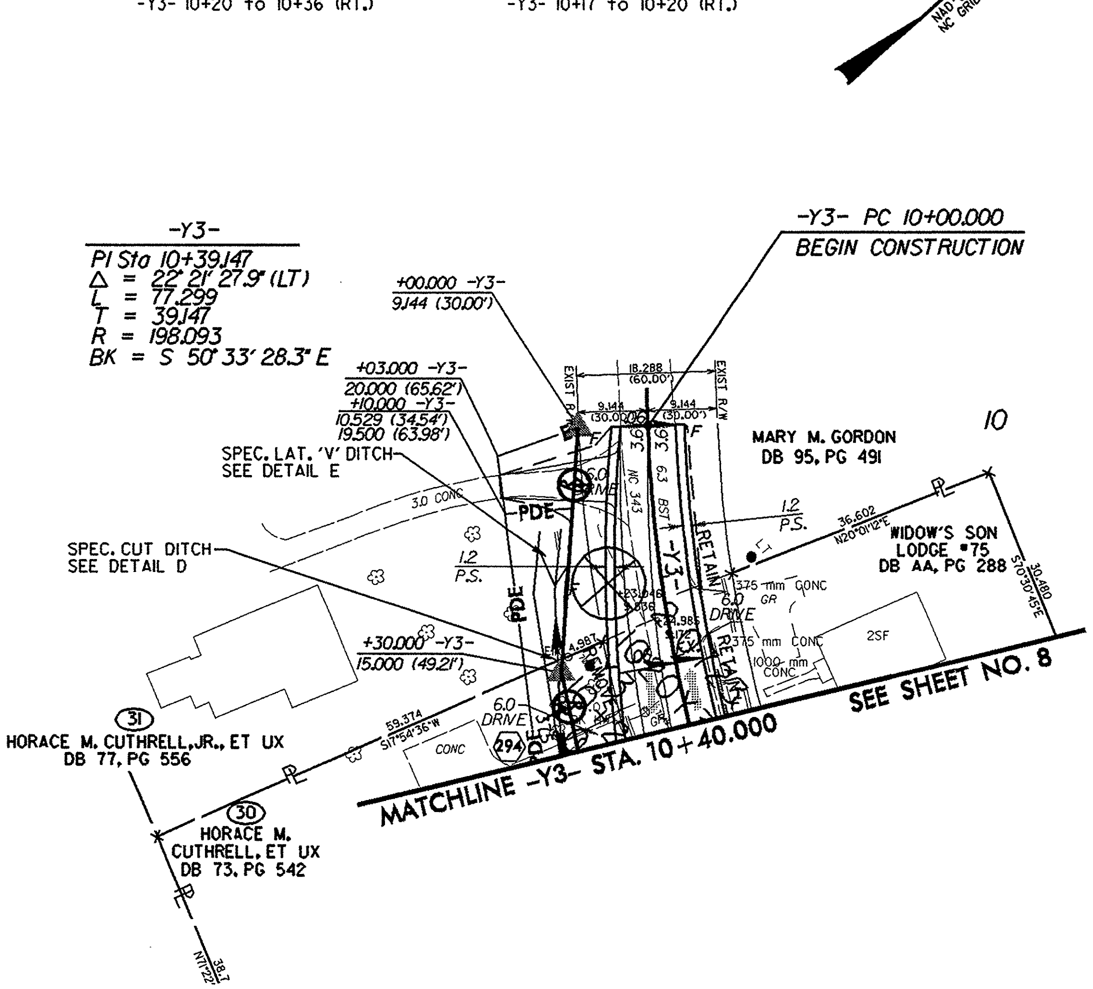


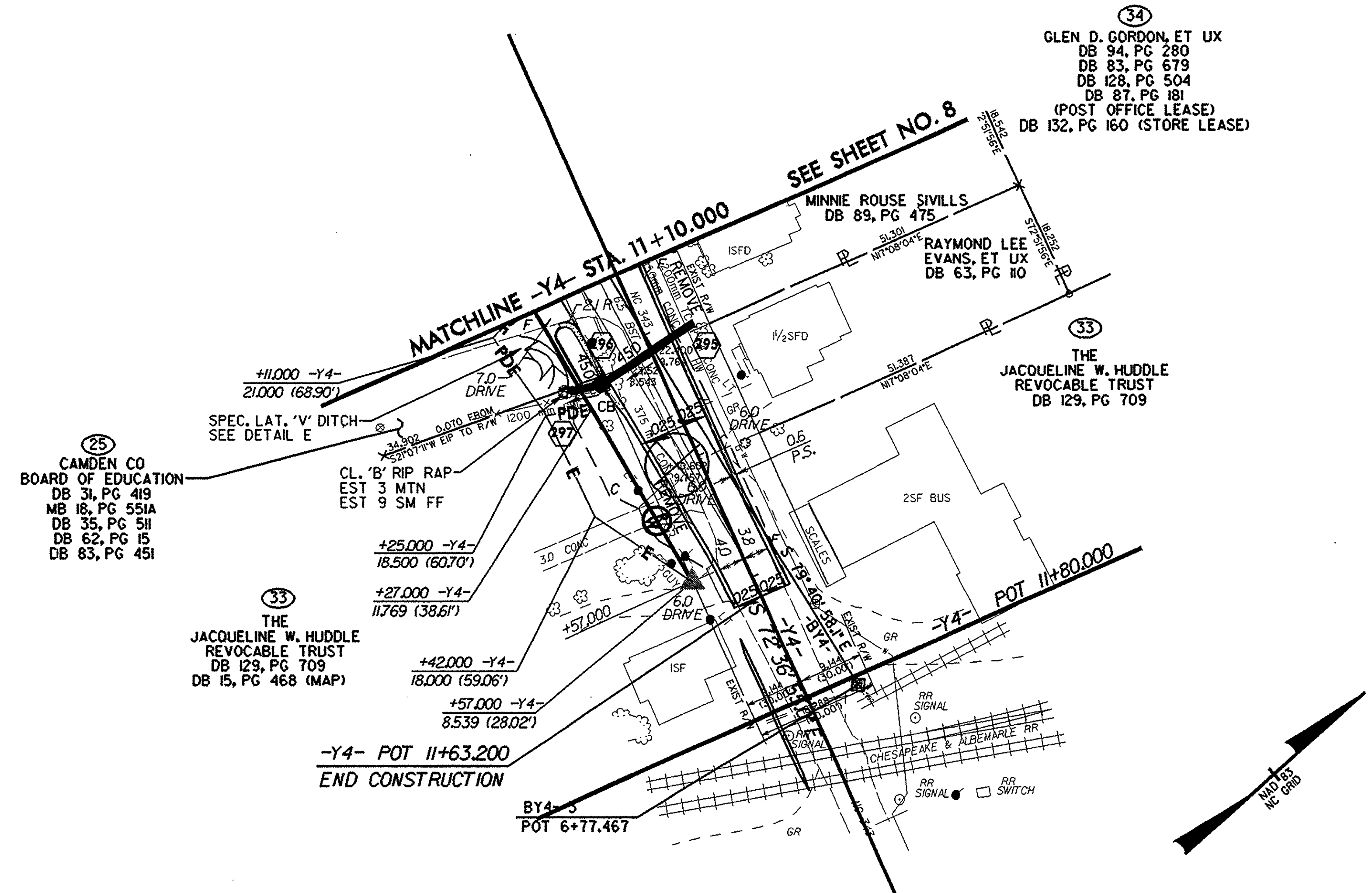
-Y3- 10+20 to 10+36 (RT.)

DETAIL E
SPECIAL LATERAL 'V' DITCH (Not to Scale)

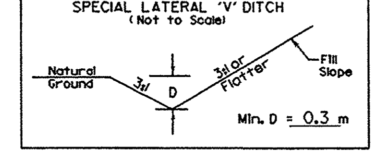


-Y3- 10+17 to 10+20 (RT.)





DETAIL E
SPECIAL LATERAL 'V' DITCH (Not to Scale)



-Y4- 11+13 to 11+23 (RT.)

125mm MONOLITHIC CONCRETE ISLAND, 750mm CONCRETE CURB AND GUTTER, REINFORCED CONCRETE BOX CULVERT

SEE SHEET NO. 27 FOR -Y3- GRADE AND PROFILE.
SEE SHEET NO. 27 FOR -Y4- GRADE AND PROFILE.
SEE SHEET NO. 2-G FOR -Y3- & -Y4- INTERSECTION DETAIL.

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

CONST. REV.

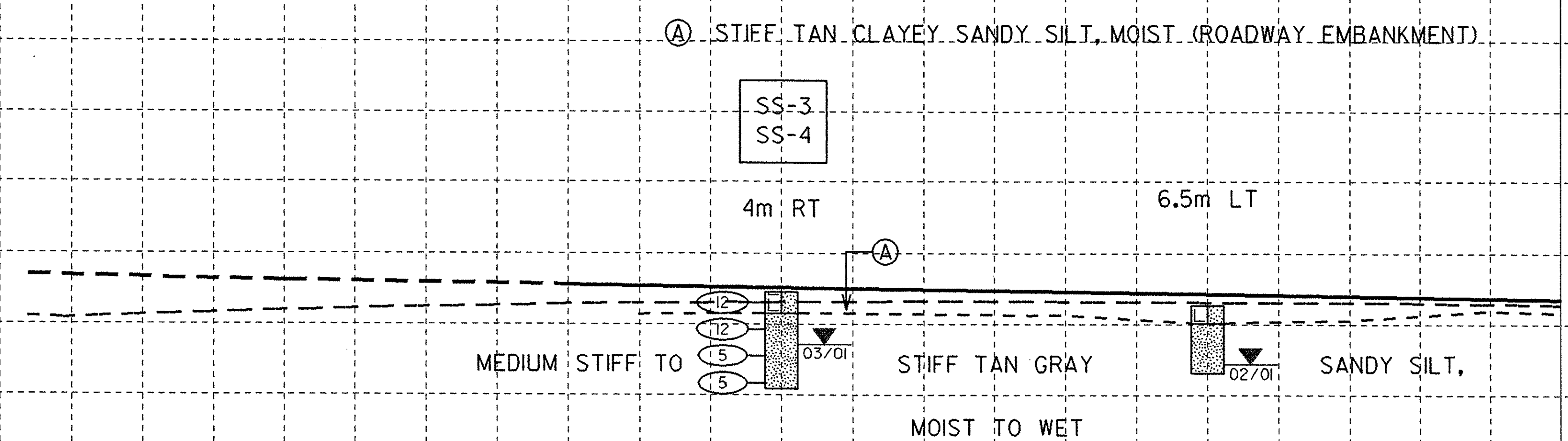
R/W REV.

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	2.00	425	75		
SS-3	4M RT	46+00	0.00-0.45	A-4(6)	28	8	4.2	21.8	49.8	24.2	100	98	89	19.4	
SS-4	4M RT	46+00	2.29-2.74	A-4(0)	24	NP	8.9	56.6	24.5	10.1	100	98	76		



-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

CONST.REV.

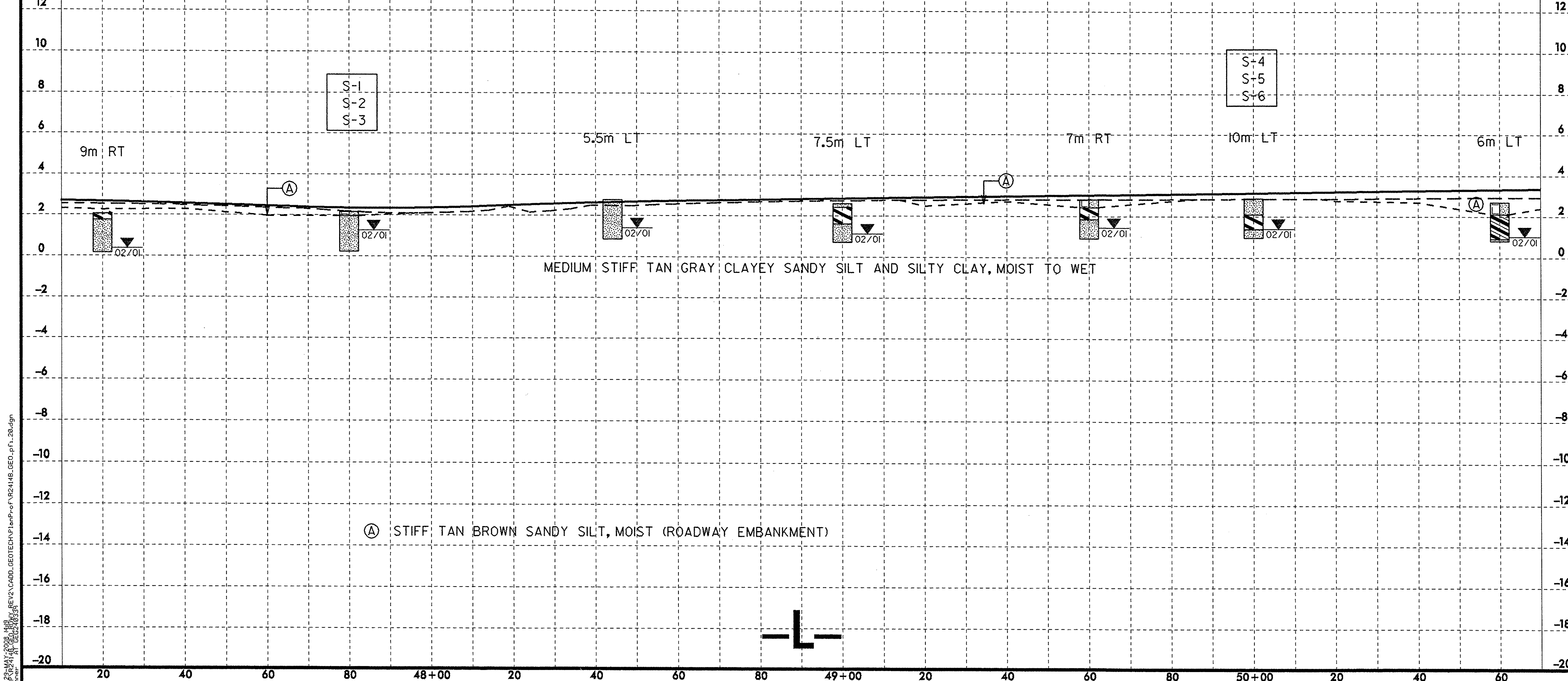
R/W REV.

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	2.00	425	75		
S-1	6M LT	47+80	0.00-0.90	A-4(3)	25	5	3.6	32.1	36.1	28.2	100	98	86	25.5	
S-2	6M LT	47+80	0.90-1.70	A-4(0)	23	NP	2.0	37.7	42.1	18.1	100	99	89		
S-3	6M LT	47+80	1.70-1.93	A-4(6)	27	7	0.6	24.8	46.4	28.2	100	100	95	33.5	
S-4	10M LT	50+00	0.00-0.80	A-4(0)	21	2	1.4	26.4	46.0	26.2	100	100	90		
S-5	10M LT	50+00	0.80-1.50	A-7-6(24)	41	26	0.2	30.0	31.5	38.3	100	100	92	33.1	
S-6	10M LT	50+00	1.50-1.93	A-4(0)	26	NP	0.6	67.5	15.7	16.1	100	100	82		



METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	21

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

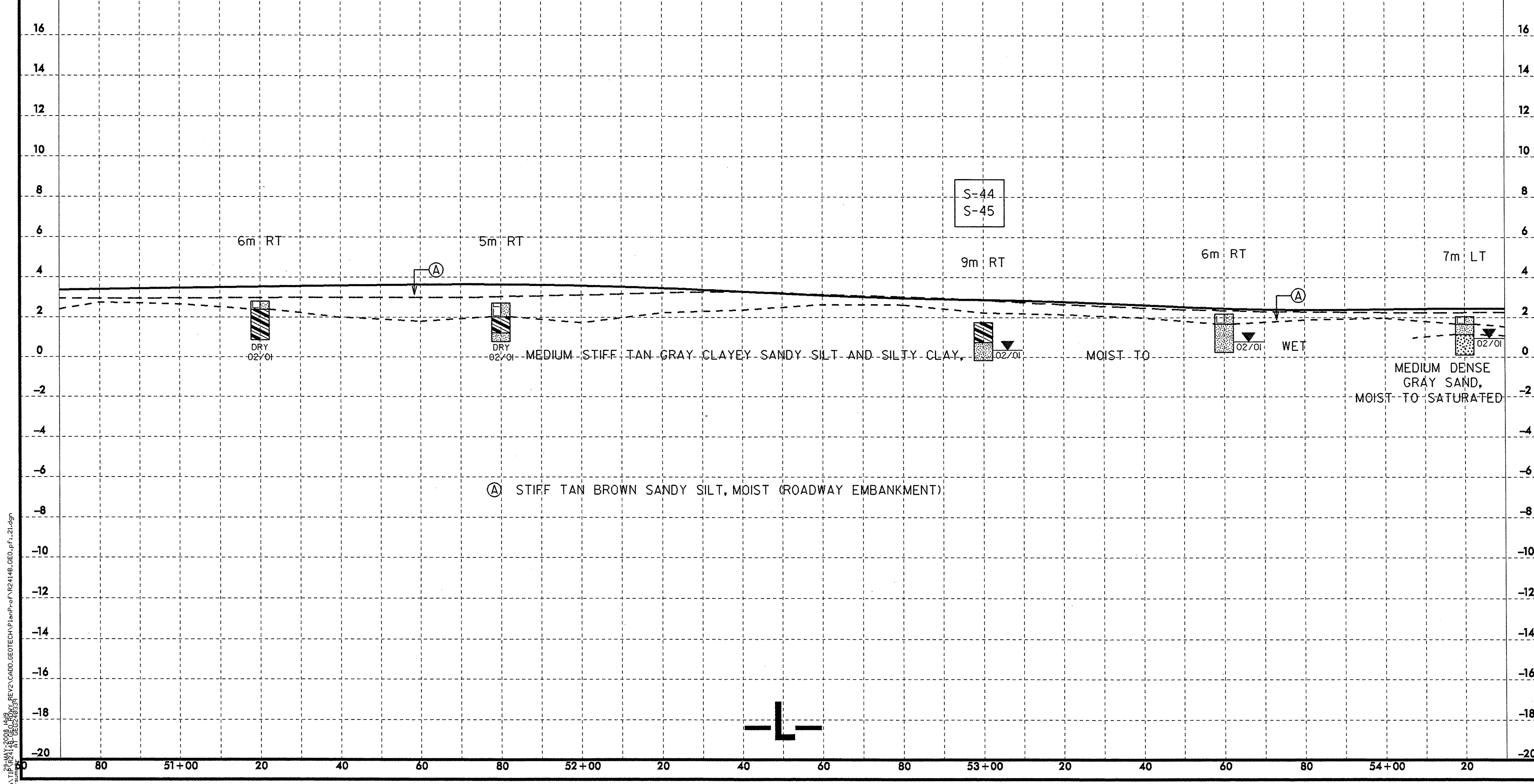
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.

R/W REV.

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 2.00	% PASSING (SIEVES) 425	% PASSING (SIEVES) 75	% MOISTURE	% ORGANIC
S-44	9M RT	53+00	0.00-1.00	A-6(12)	33	15	4.2	35.4	26.1	34.2	100	99	84	26.6	
S-45	9M RT	53+00	1.00-1.93	A-4(0)	22	NP	7.9	75.3	8.8	8.1	96	95	53		



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	22

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

METRIC

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

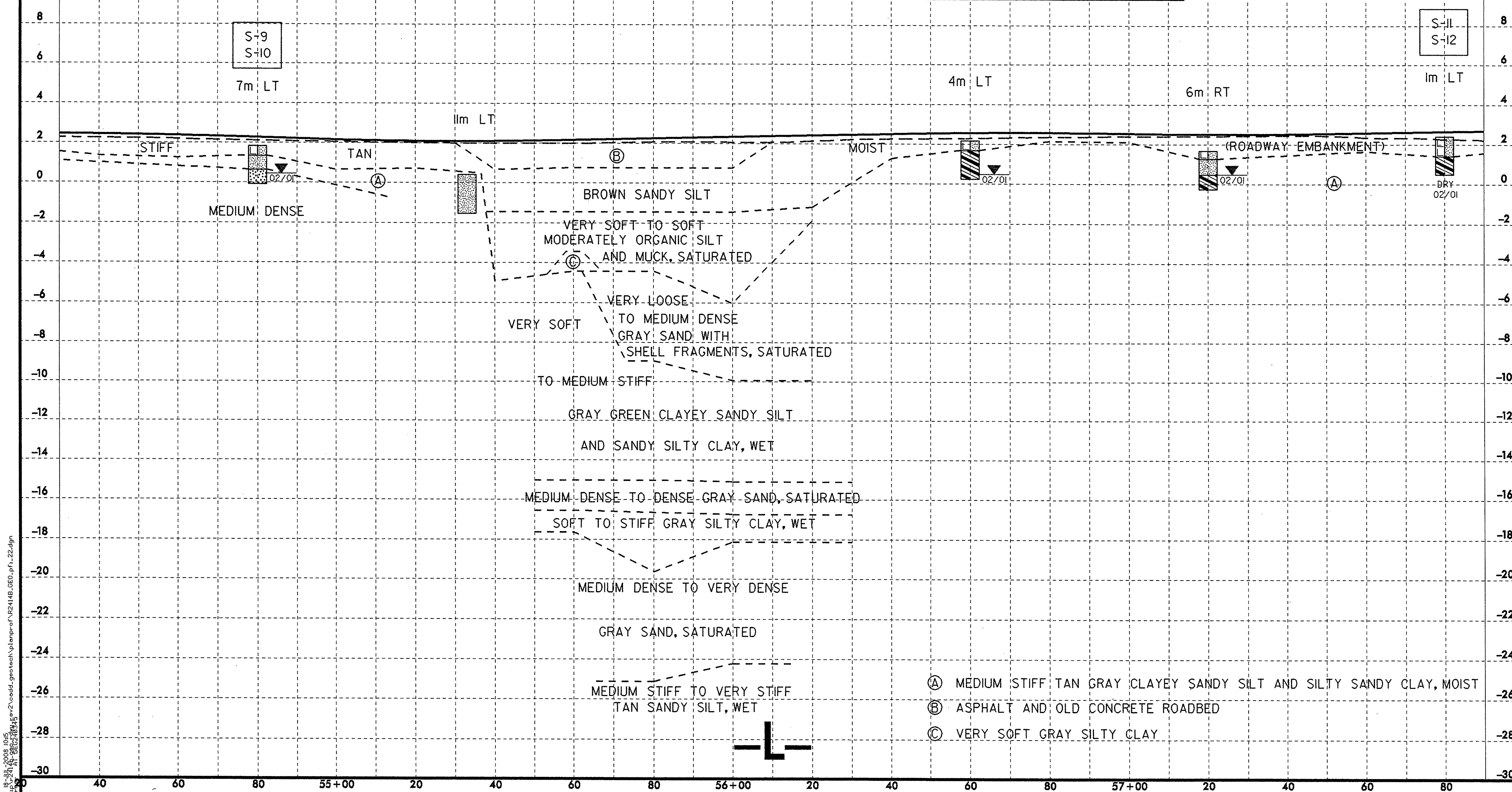
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 2.00	% PASSING (SIEVES) 425	% PASSING (SIEVES) 75	% MOISTURE	% ORGANIC
S-9	7M RT	54+80	0.00-1.10	A-4(0)	23	2	5.2	50.2	24.4	20.2	100	99	72		
S-10	7M RT	54+80	1.10-1.93	A-2-4(0)	17	NP	11.1	74.6	2.2	12.1	100	99	19		
S-11	1M LT	57+80	0.00-1.00	A-4(0)	16	NP	8.5	61.7	13.7	16.1	100	99	58		
S-12	1M LT	57+80	1.00-1.93	A-6(13)	34	16	2.0	39.3	22.4	36.3	100	99	87	27.3	

VANE SHEAR TESTS

STATION	OFFSET	DEPTH	S (kPa)	SR (kPa)
55+77	13m LT	0.2	13.3	
55+77	13m LT	0.6	19.5	
55+77	13m LT	0.8	14.6	
55+77	13m LT	1.0	10.6	
55+77	13m LT	1.2	13.7	
55+77	13m LT	1.4	10.2	
55+77	13m LT	1.6	11.5	
55+77	13m LT	1.8	15.9	
55+77	13m LT	2.0	13.7	
55+77	13m LT	2.2	20.4	
55+77	13m LT	2.8	19.5	
55+77	13m LT	3.2	26.6	



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PROJECT REFERENCE NO.	SHEET NO.
R-2414B	23

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

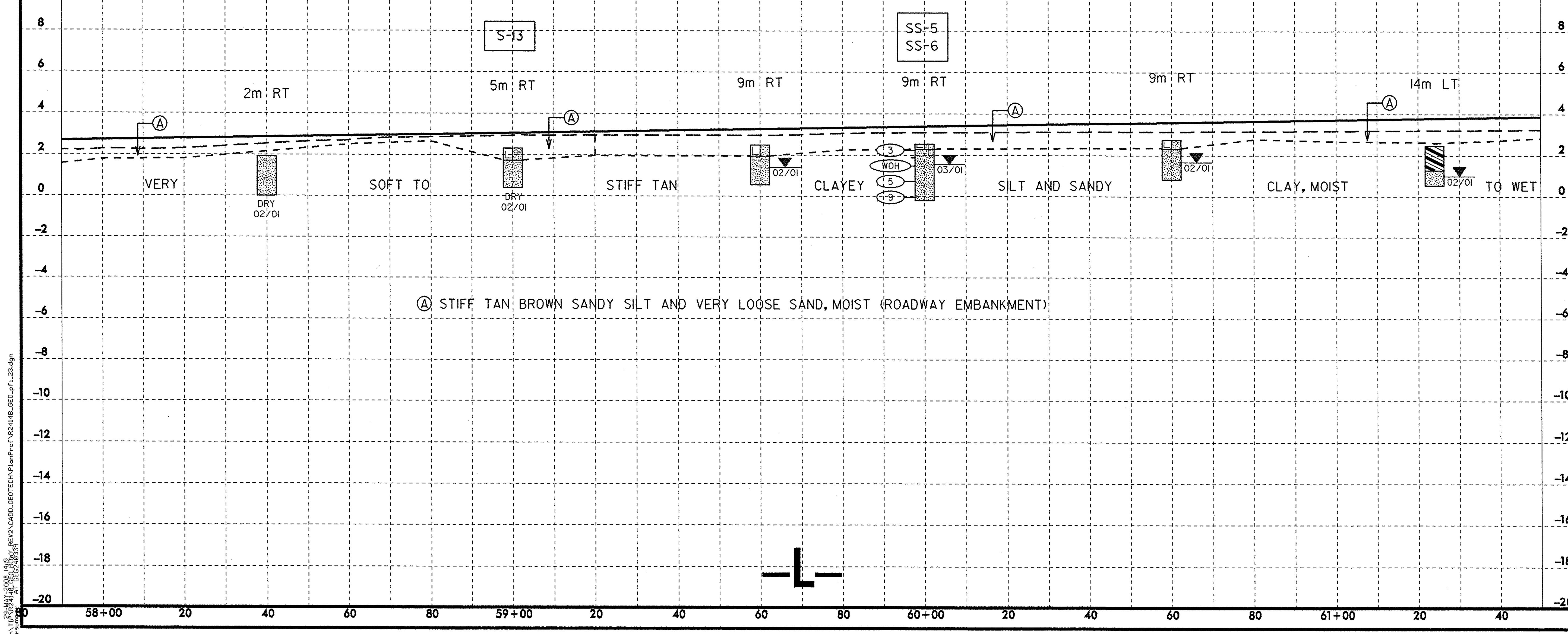
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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) 2.00	425	75	% MOISTURE	% ORGANIC
SS-5	9M RT	60+00	0.0-0.45	A-2-4(0)	18	2	33.6	42.7	9.6	14.1	87	71	30		
SS-6	9M RT	60+00	0.76-1.21	A-4(4)	26	9	3.4	51.6	20.8	24.2	99	98	69	26.8	
S-13	4.5M RT	59+00	0.00-1.93	A-4(0)	21	NP	3.0	58.7	24.2	14.1	100	99	74		



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	24

METRIC

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

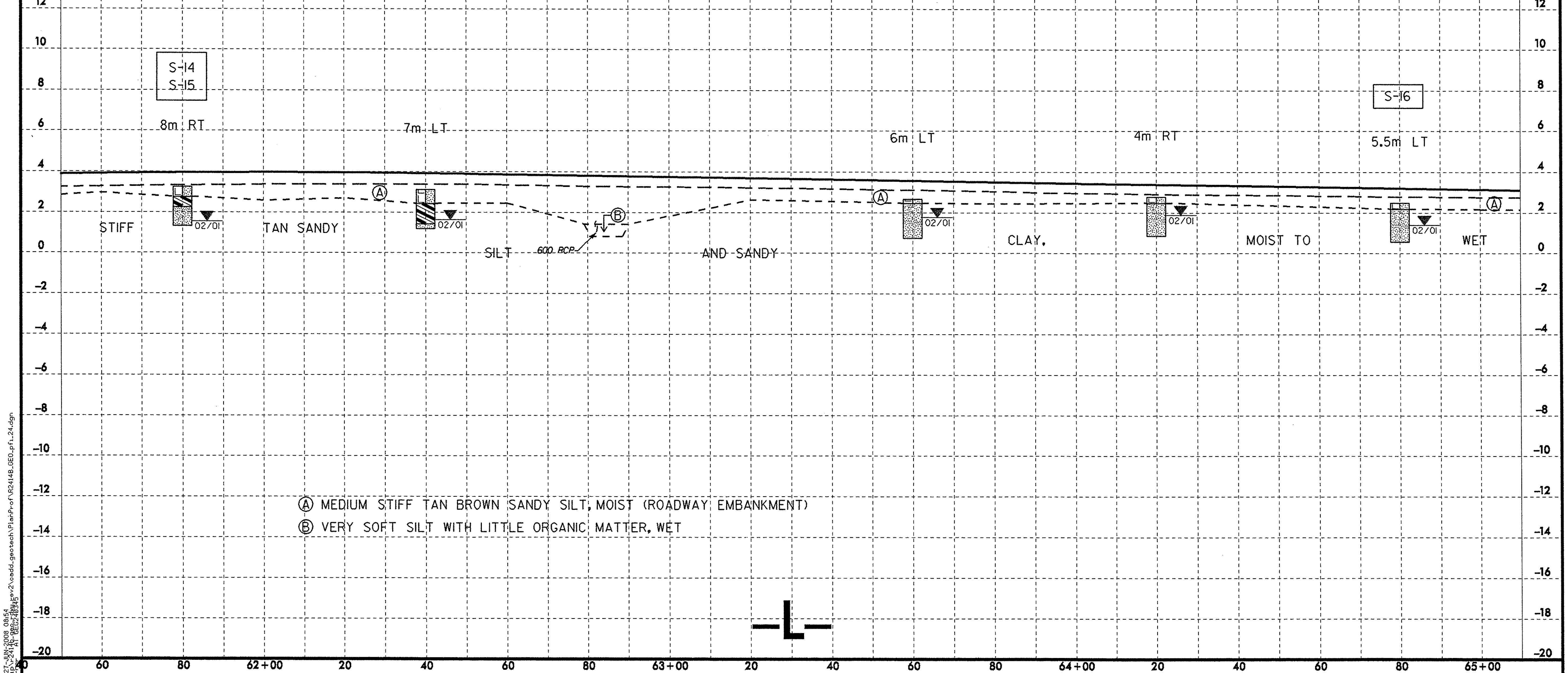
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.

R/W REV.

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	2.00	425	75		
S-14	8M RT	61+80	0.50-1.00	A-6(9)	31	12	1.4	44.0	22.4	32.3	100	100	86		
S-15	8M RT	61+80	1.00-1.93	A-4(0)	28	NP	7.1	76.8	10.1	6.0	100	99	62		
S-16	5.5M LT	64+80	0.30-1.93	A-4(0)	20	4	20.6	49.6	11.7	18.1	100	94	40		



PROJECT REFERENCE NO. R-2414B | SHEET NO. 25

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

METRIC

CONST. REV.

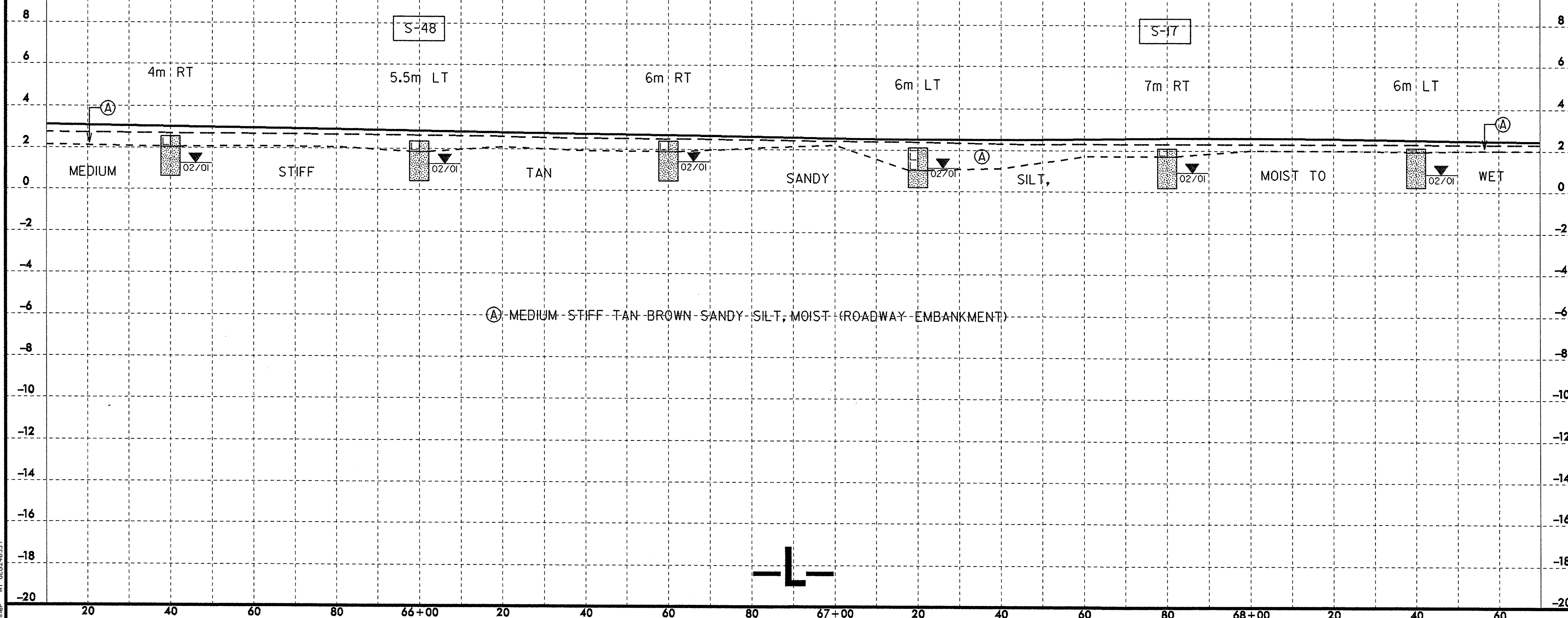
R/W REV.

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	2.00	425	75		
S-48	5.5M LT	66+00	0.00-1.93	A-4(0)	16	NP	14.9	54.8	16.2	14.1	100	97	46		
S-17	7M RT	67+80	0.00-1.93	A-4(0)	22	3	9.7	61.7	16.5	12.1	100	98	59		



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	26

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

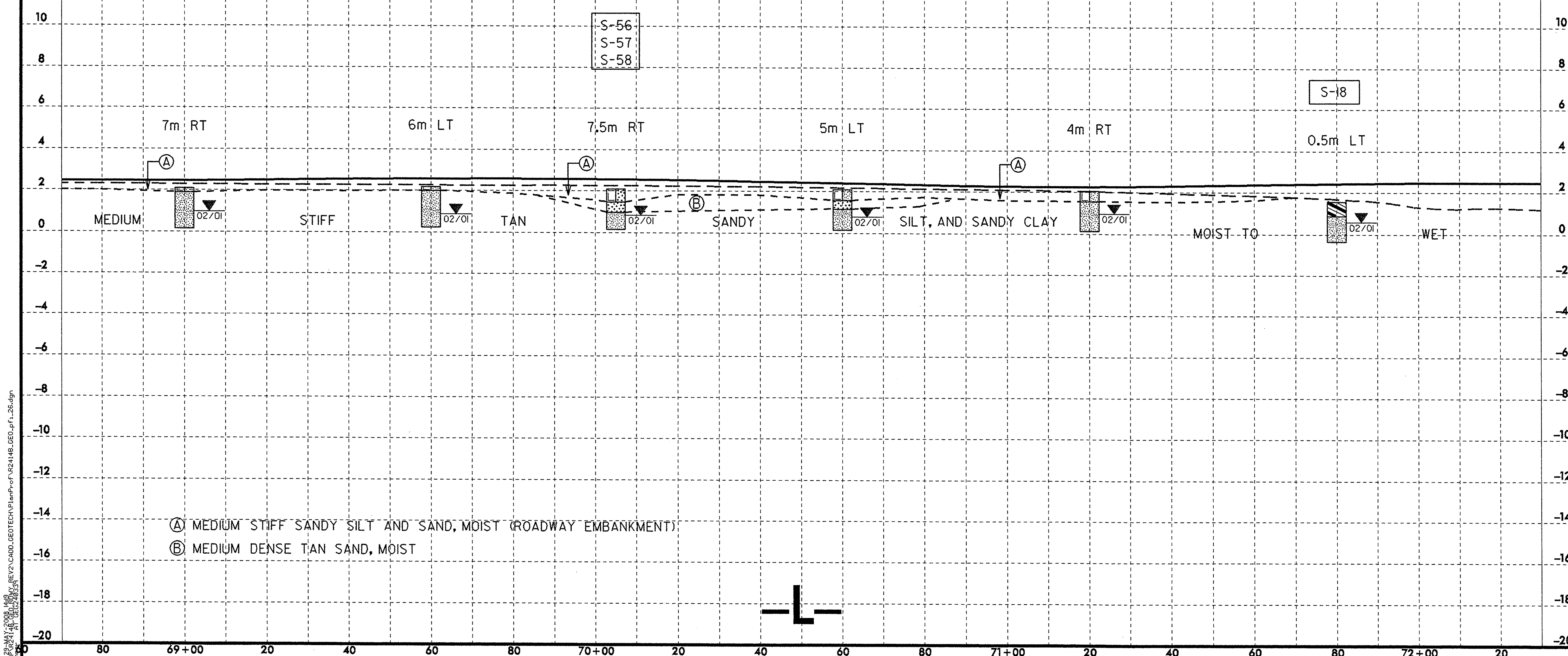
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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) 2.00	.425	.75	% MOISTURE	% ORGANIC
S-56	7.5M RT	70+05	0.00-0.60	A-2-4(0)	21	NP	30.3	46.1	12.5	11.1	83	74	25		
S-57	7.5M RT	70+05	0.60-1.10	A-2-4(0)	22	5	21.1	52.8	18.0	8.1	100	96	35		
S-58	7.5M RT	70+05	1.10-1.93	A-4(3)	26	6	7.0	52.2	20.6	20.1	100	99	79		
S-18	0.5M LT	71+80	0.00-0.70	A-6(3)	27	11	16.9	39.3	15.5	28.2	100	96	54	20.5	



Ⓐ MEDIUM STIFF SANDY SILT AND SAND, MOIST (ROADWAY EMBANKMENT)

Ⓑ MEDIUM DENSE TAN SAND, MOIST

-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	27
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.

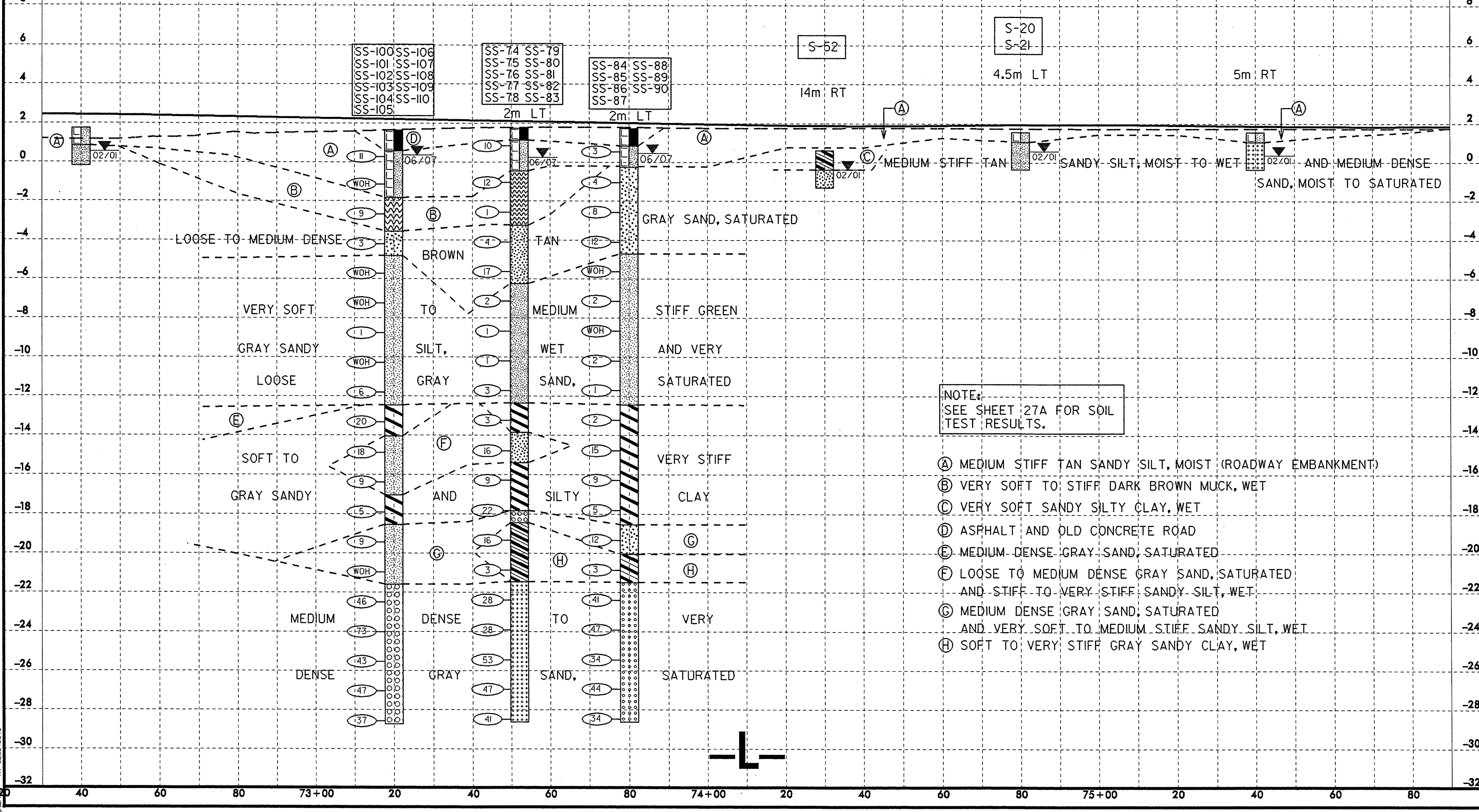
R/W REV.

VANE SHEAR TESTS

STATION	OFFSET	DEPTH	S (kPa)	SR (kPa)
73+20	14m RT	0.0	<2.4	
73+20	14m RT	0.5	6.2	
73+20	14m RT	0.7	10.6	
73+20	14m RT	0.9	14.2	
73+20	14m RT	1.1	7.9	
73+20	14m RT	1.3	14.2	
73+20	14m RT	1.5	11.1	
73+20	14m RT	1.9	18.6	
73+20	14m RT	2.1	22.2	
73+20	14m RT	2.3	21.3	
73+20	14m RT	2.5	20.4	

VANE SHEAR TESTS

STATION	OFFSET	DEPTH	S (kPa)	SR (kPa)
73+20	9m LT	0.4	9.8	
73+20	9m LT	0.6	5.3	
73+20	9m LT	0.8	4.5	
73+20	9m LT	1.0	<2.4	
73+20	9m LT	1.2	<2.4	
73+20	9m LT	1.4	5.3	
73+20	9m LT	1.6	2.7	
73+20	9m LT	1.8	5.3	
73+20	9m LT	2.2	11.5	
73+20	9m LT	2.4	9.8	
73+20	9m LT	2.6	16.9	
73+20	9m LT	3.0	15.9	
73+20	9m LT	3.2	16.9	



NOTE:
SEE SHEET 27A FOR SOIL TEST RESULTS.

- (A) MEDIUM STIFF TAN SANDY SILT, MOIST (ROADWAY EMBANKMENT)
- (B) VERY SOFT TO STIFF DARK BROWN MUCK, WET
- (C) VERY SOFT SANDY SILTY CLAY, WET
- (D) ASPHALT AND OLD CONCRETE ROAD
- (E) MEDIUM DENSE GRAY SAND, SATURATED
- (F) LOOSE TO MEDIUM DENSE GRAY SAND, SATURATED AND STIFF TO VERY STIFF SANDY SILT, WET
- (G) MEDIUM DENSE GRAY SAND, SATURATED AND VERY SOFT TO MEDIUM STIFF SANDY SILT, WET
- (H) SOFT TO VERY STIFF GRAY SANDY CLAY, WET

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	27-A

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) 2.00	425	75	% MOISTURE	% ORGANIC
SS-100	5M LT	73+20	1.07-1.52	A-4(0)	20	NP	11.6	57.4	18.9	12.2	100	97	68	–	–
SS-101	5M LT	73+20	5.55-6.00	A-2-4(0)	24	NP	17.4	76.8	5.8	0.0	100	100	11	–	–
SS-102	5M LT	73+20	7.07-7.52	A-4(0)	25	2	0.6	68.5	16.7	14.2	100	100	43	–	–
SS-103	5M LT	73+20	11.64-12.09	A-4(0)	23	1	1.0	70.5	14.3	14.2	100	100	42	–	–
SS-104	5M LT	73+20	14.69-15.14	A-7-6(29)	53	35	0.8	25.1	37.6	36.5	100	100	82	–	–
SS-105	5M LT	73+20	16.21-16.66	A-4(0)	24	6	1.2	64.2	16.3	18.2	100	100	37	–	–
SS-106	5M LT	73+20	19.26-19.71	A-7-6(54)	76	49	2.0	7.3	29.9	60.8	100	99	95	–	–
SS-107	5M LT	73+20	20.79-21.24	A-4(0)	21	1	10.7	54.9	20.2	14.2	100	99	48	–	–
SS-108	5M LT	73+20	22.31-22.76	A-4(6)	28	10	1.6	34.7	37.4	26.3	100	100	77	–	–
SS-109	5M LT	73+20	23.84-24.29	A-1-b(0)	21	NP	74.6	19.8	3.6	2.0	90	44	6	–	–
SS-110	5M LT	73+20	29.93-30.38	A-1-b(0)	20	NP	76.7	18.0	3.2	2.0	88	47	6	–	–
SS-74	2M LT	73+52	4.02-4.49	MATERIAL	NOT	ENOU	27.2	3.2	65.5	4.1	95	71	66	–	–
SS-75	2M LT	73+52	5.55-6.00	A-2-4(0)	28	NP	11.0	75.1	11.9	2.0	100	100	26	–	–
SS-76	2M LT	73+52	8.60-9.05	A-4(0)	24	NP	0.8	72.5	14.5	12.2	100	99	36	–	–
SS-77	2M LT	73+52	13.17-13.62	A-7-6(23)	44	25	0.6	18.9	50.1	30.5	100	100	90	–	–
SS-78	2M LT	73+52	14.69-15.14	A-7-6(19)	43	22	0.9	20.8	40.2	38.1	100	100	85	–	–
SS-79	2M LT	73+52	16.22-16.67	A-2-4(0)	22	1	3.7	68.2	13.8	14.3	100	100	31	–	–
SS-80	2M LT	73+52	17.74-18.19	A-7-6(23)	54	31	12.5	14.7	29.5	43.2	100	97	75	–	–
SS-81	2M LT	73+52	19.27-19.72	A-1-b(0)	17	NP	83.7	9.3	5.0	2.0	100	38	8	–	–
SS-82	2M LT	73+52	22.31-22.76	A-6(14)	38	19	1.0	29.2	39.3	30.5	100	100	80	–	–
SS-83	2M LT	73+52	23.80-24.19	A-3(0)	20	NP	67.4	24.8	5.8	2.0	95	54	9	–	–
SS-84	2M LT	73+80	0.91-1.36	A-4(0)	19	4	17.5	39.4	22.8	20.3	100	96	58	–	–
SS-85	2M LT	73+80	2.50-2.95	A-2-4(0)	19	NP	25.8	63.1	11.1	0.0	100	95	25	–	–
SS-86	2M LT	73+80	7.07-7.52	A-4(0)	23	1	3.0	66.6	18.2	12.2	100	99	42	–	–
SS-87	2M LT	73+80	14.69-15.14	A-7-6(32)	53	32	0.6	14.6	38.1	46.7	100	100	91	–	–
SS-88	2M LT	73+80	19.27-19.72	A-7-6(43)	69	46	2.4	18.5	28.3	50.8	100	99	86	–	–
SS-89	2M LT	73+80	20.79-21.24	A-2-4(0)	25	NP	4.5	74.6	12.9	8.1	100	98	34	–	–
SS-90	2M LT	73+80	22.31-22.76	A-6(14)	38	19	1.4	30.2	40.0	28.4	100	100	80	–	–
S-52	14M RT	74+30	0.00-1.00	A-6(12)	36	15	8.1	21.8	27.9	42.3	100	97	81	41.1	
S-20	4.5M LT	74+80	0.00-0.50	A-4(0)	19	3	23.4	45.0	19.6	12.1	100	95	49		
S-21	4.5M LT	74+80	0.50-1.93	A-4(0)	22	3	17.1	49.4	19.4	14.1	100	94	56		

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	28

METRIC

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

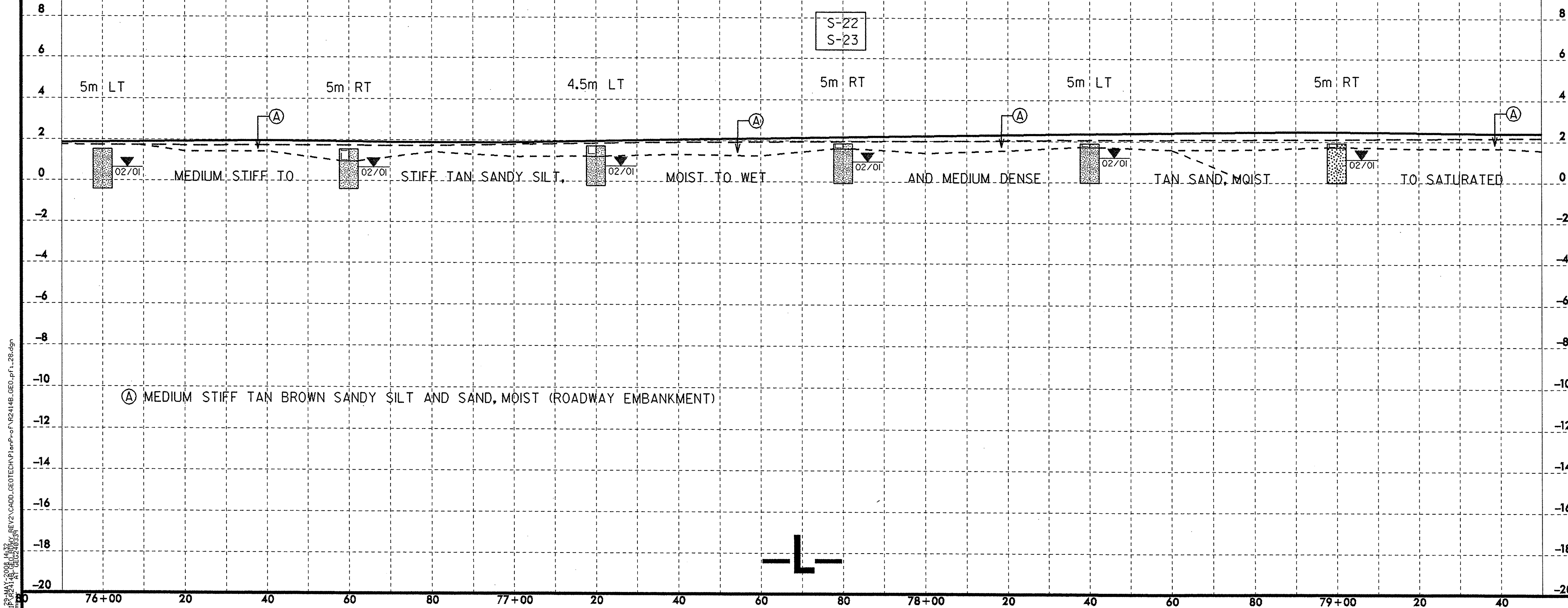
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.

R/W REV.

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 2.00	% PASSING (SIEVES) 425	% PASSING (SIEVES) 75	% MOISTURE	% ORGANIC
S-22	5M RT	77+80	0.00-1.50	A-4(2)	22	8	14.5	38.9	24.4	22.2	100	96	59		
S-23	5M RT	77+80	1.50-1.93	A-4(1)	23	5	9.9	47.8	22.2	20.2	100	98	60		



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	29

METRIC

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

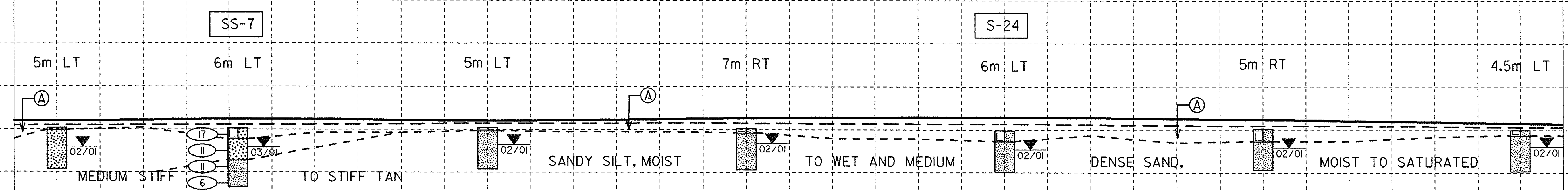
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.

R/W REV.

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 2.00	% PASSING (SIEVES) 425	% PASSING (SIEVES) 75	% MOISTURE	% ORGANIC
SS-7	6M LT	80+00	0.76-1.21	A-2-4(0)	19	NP	36.0	53.3	6.7	4.0	100	88	23		
S-24	6M LT	81+80	0.00-1.93	A-4(0)	15	NP	23.8	46.2	15.9	14.1	100	94	44		



(A) MEDIUM DENSE TAN BROWN SAND AND MEDIUM STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)

Elevations: 28, 26, 24, 22, 20, 18, 16, 14, 12, 10, 8, 6, 4, 2, 0, -2, -4, -6, -8, -10, -12, -14, -16, -18, -20

Stations: 40, 60, 80, 80+00, 20, 40, 60, 80, 81+00, 20, 40, 60, 80, 82+00, 20, 40, 60, 80, 83+00

-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

CONST. REV.

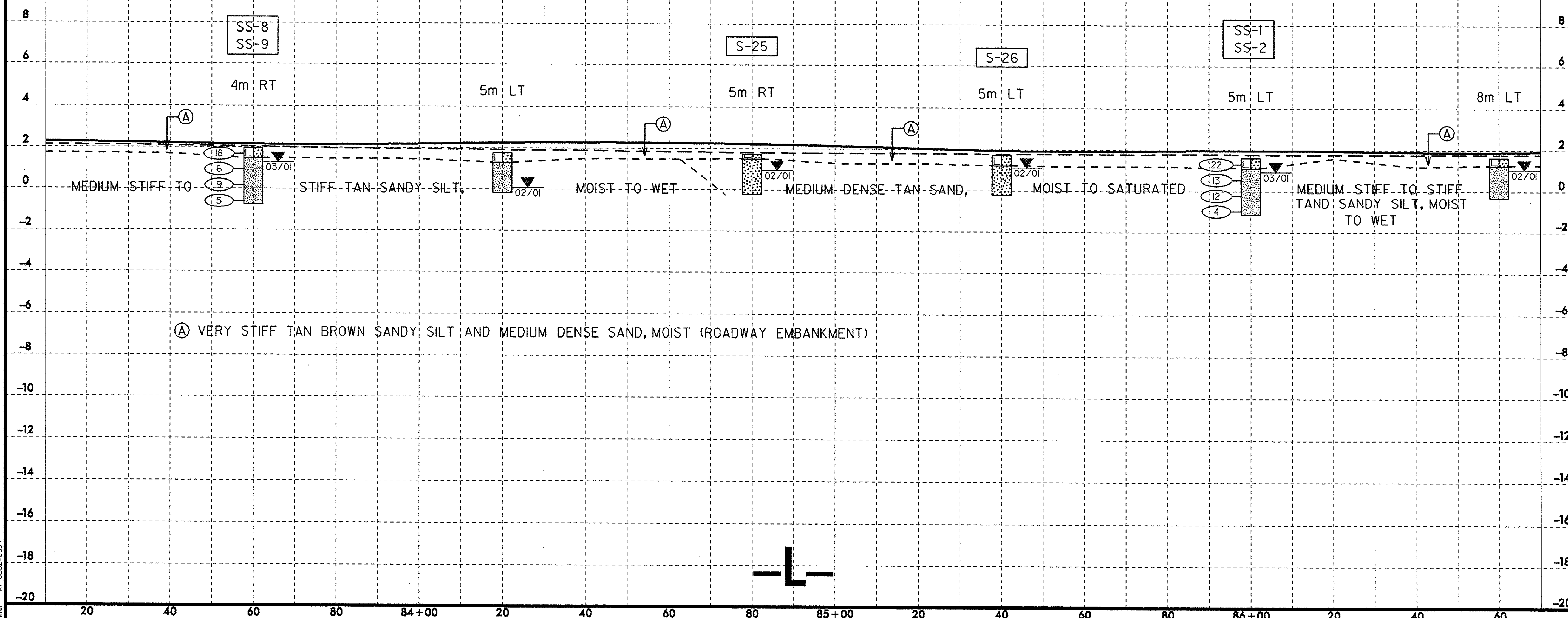
R/W REV.

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) 2.00	425	75	% MOISTURE	% ORGANIC
SS-8	4M RT	83+60	0.00-0.45	A-2-4(0)	15	NP	45.1	36.9	12.0	6.0	81	59	20		
SS-9	4M RT	83+60	0.76-1.21	A-4(0)	18	2	24.4	48.9	14.6	12.1	100	95	44		
S-25	5M RT	84+80	0.00-1.93	A-2-4(0)	16	NP	49.4	42.3	4.2	4.0	100	90	18		
S-26	5M LT	85+40	0.00-1.93	A-2-4(0)	20	NP	41.9	37.3	12.7	8.1	100	94	25		
SS-1	5M LT	86+00	0.76-1.21	A-4(0)	16	3	41.5	34.4	10.0	14.1	100	92	36		
SS-2	5M LT	86+00	1.52-1.97	A-4(0)	23	NP	4.4	71.3	16.2	8.1	100	99	65		



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	31

METRIC

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.

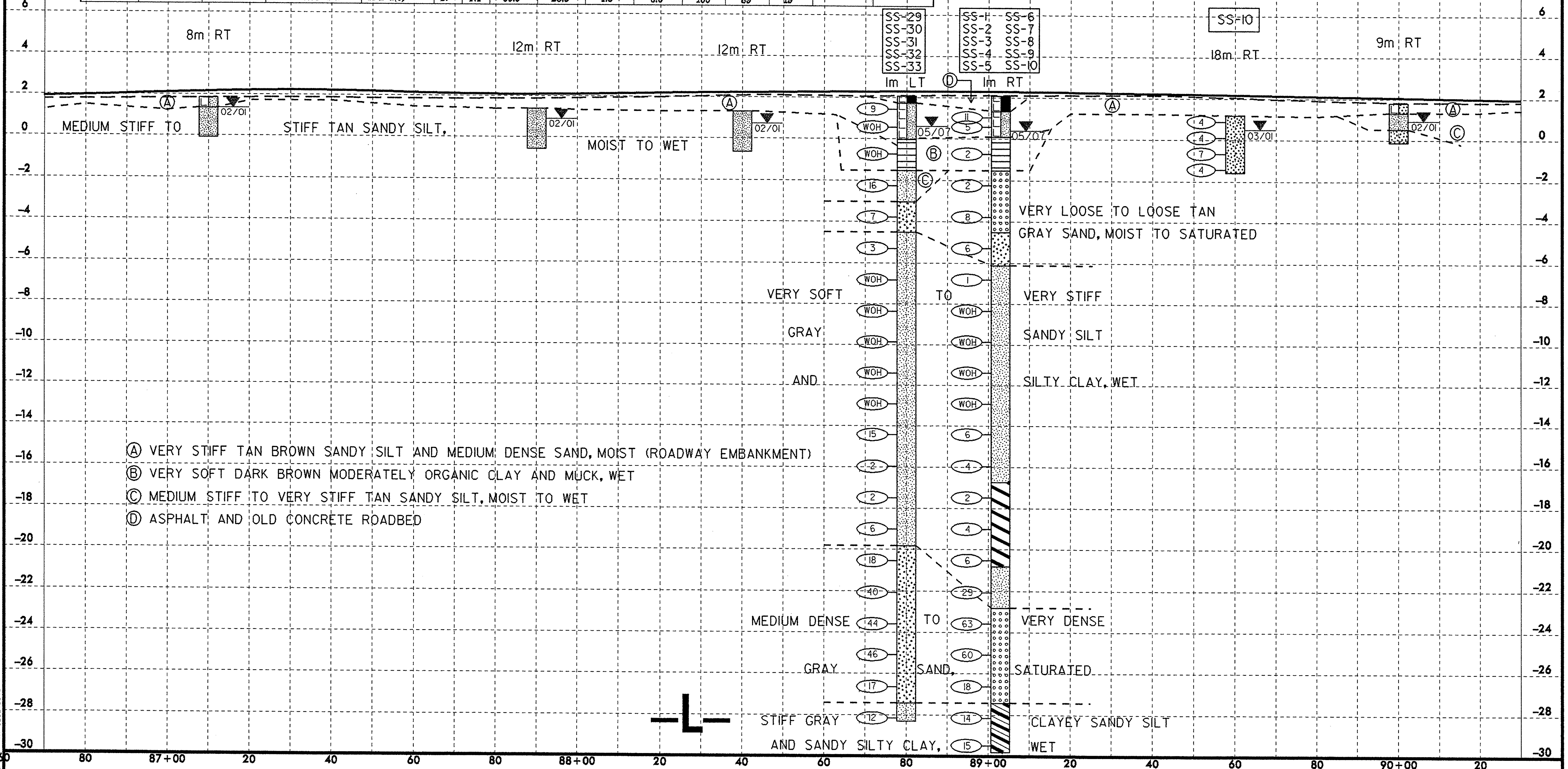
R/W REV.

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) 2.00	425	75	% MOISTURE	% ORGANIC
SS-29	1M LT	88+80	4.02-4.47	A-4(0)	17	NP	42.6	35.7	15.7	6.0	100	85	37	-	-
SS-30	1M LT	88+80	7.07-7.50	A-4(0)	24	NP	2.6	65.3	18.0	14.0	100	99	45	-	-
SS-31	1M LT	88+80	16.21-16.66	A-4(1)	26	9	10.4	44.5	21.0	24.0	100	96	49	-	-
SS-32	1M LT	88+80	17.74-18.19	A-7-6(23)	48	20	2.0	7.5	52.2	38.3	100	99	96	-	-
SS-33	1M LT	88+80	22.31-22.76	A-2-4(0)	20	NP	33.4	53.4	8.2	5.0	100	92	15	-	-
SS-1	1M RT	89+03	0.76-1.21	A-4(0)	16	NP	29.7	43.1	17.2	10.0	100	92	38	-	-
SS-2	1M RT	89+03	2.50-2.95	A-7-5(34)	79	31	7.2	15.0	33.7	44.1	100	97	84	89.5	-
SS-3	1M RT	89+03	5.55-6.00	A-3(0)	22	NP	12.3	80.8	3.9	3.0	100	99	9	-	-
SS-4	1M RT	89+03	7.07-7.52	A-2-4(0)	21	NP	22.7	66.2	5.0	6.0	99	93	13	-	-
SS-5	1M RT	89+03	8.60-9.50	A-4(0)	22	NP	0.4	67.3	18.3	14.0	100	100	45	-	-
SS-6	1M RT	89+03	13.17-13.62	A-4(0)	22	NP	1.8	68.5	17.6	12.0	100	100	42	-	-
SS-7	1M RT	89+03	19.26-19.71	A-7-6(31)	51	29	1.3	6.5	52.1	40.1	100	100	96	-	-
SS-8	1M RT	89+03	22.31-22.76	A-4(0)	22	NP	1.0	70.4	18.5	10.0	100	100	41	-	-
SS-9	1M RT	89+03	25.36-25.81	A-3(0)	19	NP	66.8	25.1	7.1	1.0	96	62	9	-	-
SS-10	1M RT	89+03	29.93-30.38	A-6(10)	31	14	0.5	28.3	45.1	26.1	100	100	80	-	-
SS-10	18M RT	89+60	0.76-1.21	A-2-4(0)	17	NP	60.9	28.5	4.5	6.0	100	89	19		

VANE SHEAR TESTS

STATION	OFFSET	DEPTH	S (kPa)	SR (kPa)
89+00	6m RT	0.2		5.3
89+00	6m RT	0.4		15.5
89+00	6m RT	0.6		10.6
89+00	6m RT	0.8		12.4
89+00	6m RT	1.0		10.6
89+00	6m RT	1.2		13.3
89+00	6m RT	1.4		15.5
89+00	6m RT	1.6		21.3
89+00	6m RT	1.8		23.0



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	32

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

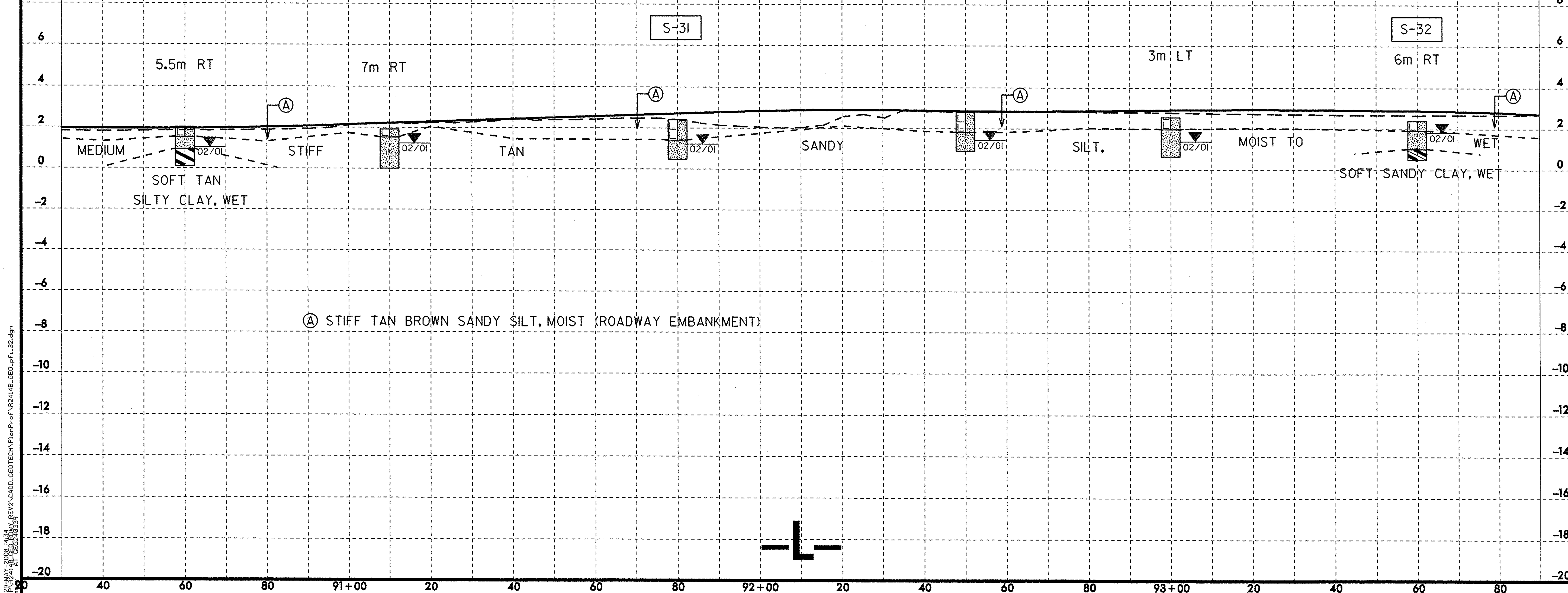
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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) 2.00	425	75	% MOISTURE	% ORGANIC
S-31	CL	91+80	0.00-1.93	A-4(0)	21	6	22.4	42.5	19.0	16.1	100	94	49		
S-32	7M RT	93+60	1.40-1.93	A-6(7)	29	12	6.0	38.5	27.3	28.2	100	99	75		



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	33

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

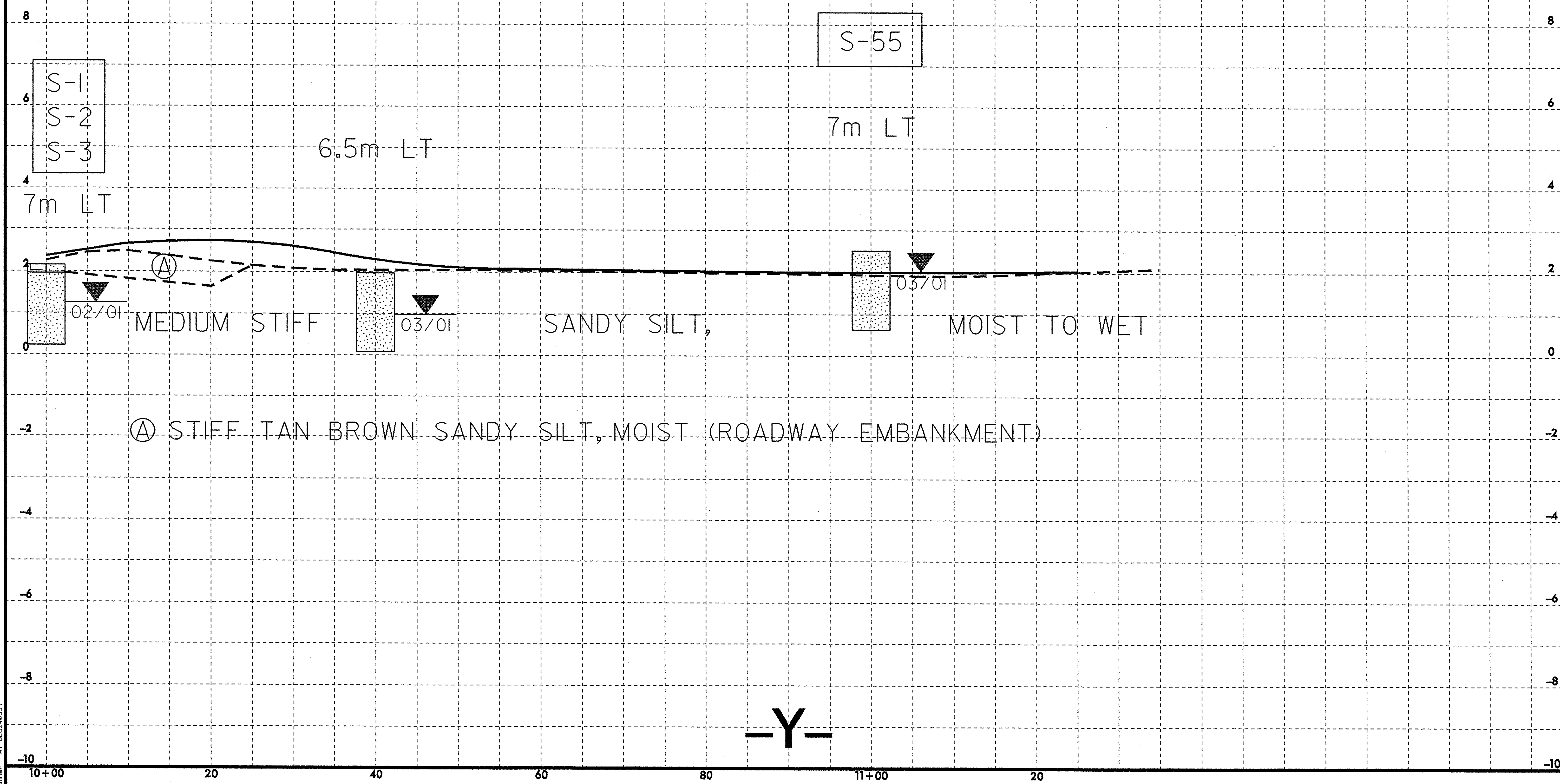
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.

R/W REV.

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 2.00	% PASSING (SIEVES) 425	% PASSING (SIEVES) 75	% MOISTURE	% ORGANIC
S-1	7M LT	10+00	0.00-0.90	A-4(3)	25	5	3.6	32.1	36.1	28.2	100	98	86	25.5	
S-2	7M LT	10+00	0.90-1.70	A-4(0)	23	NP	2.0	37.7	42.1	18.1	100	99	89		
S-3	7M LT	10+00	1.70-1.93	A-4(6)	27	7	0.6	24.8	46.4	28.2	100	100	95	33.5	
S-55	7M LT	11+00	0.00-1.93	A-4(0)	25	NP	0.6	71.7	19.6	8.1	100	100	82		



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	34

METRIC

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

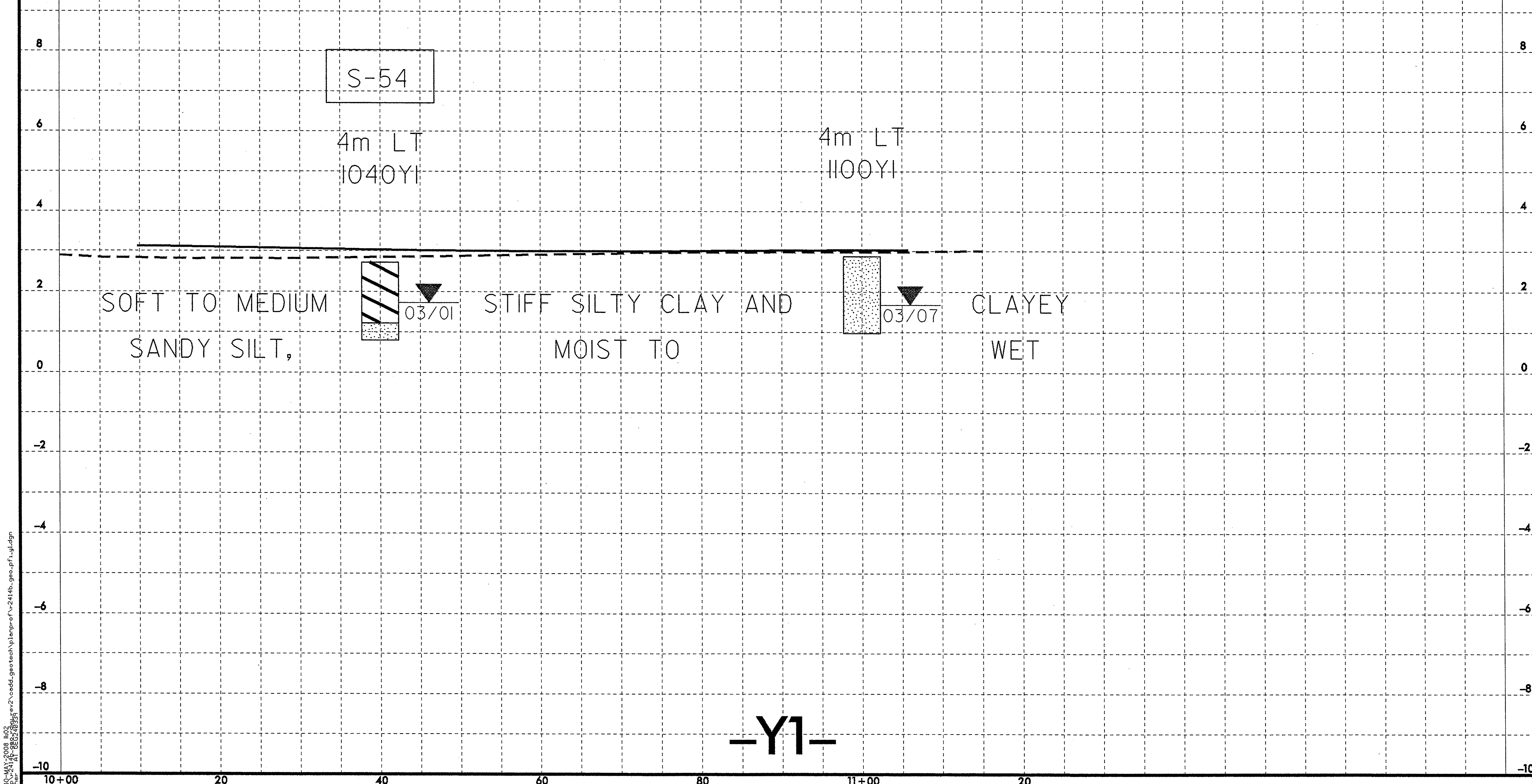
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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) 2.00	425	75	% MOISTURE	% ORGANIC
S-54	4M LT	10+40	0.00-1.50	A-7-6(20)	41	20	1.2	20.9	39.6	38.3	100	100	93	36	



-Y1-

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METRIC	PROJECT REFERENCE NO.	SHEET NO.
2.5 0 5	R-2414B	35
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	

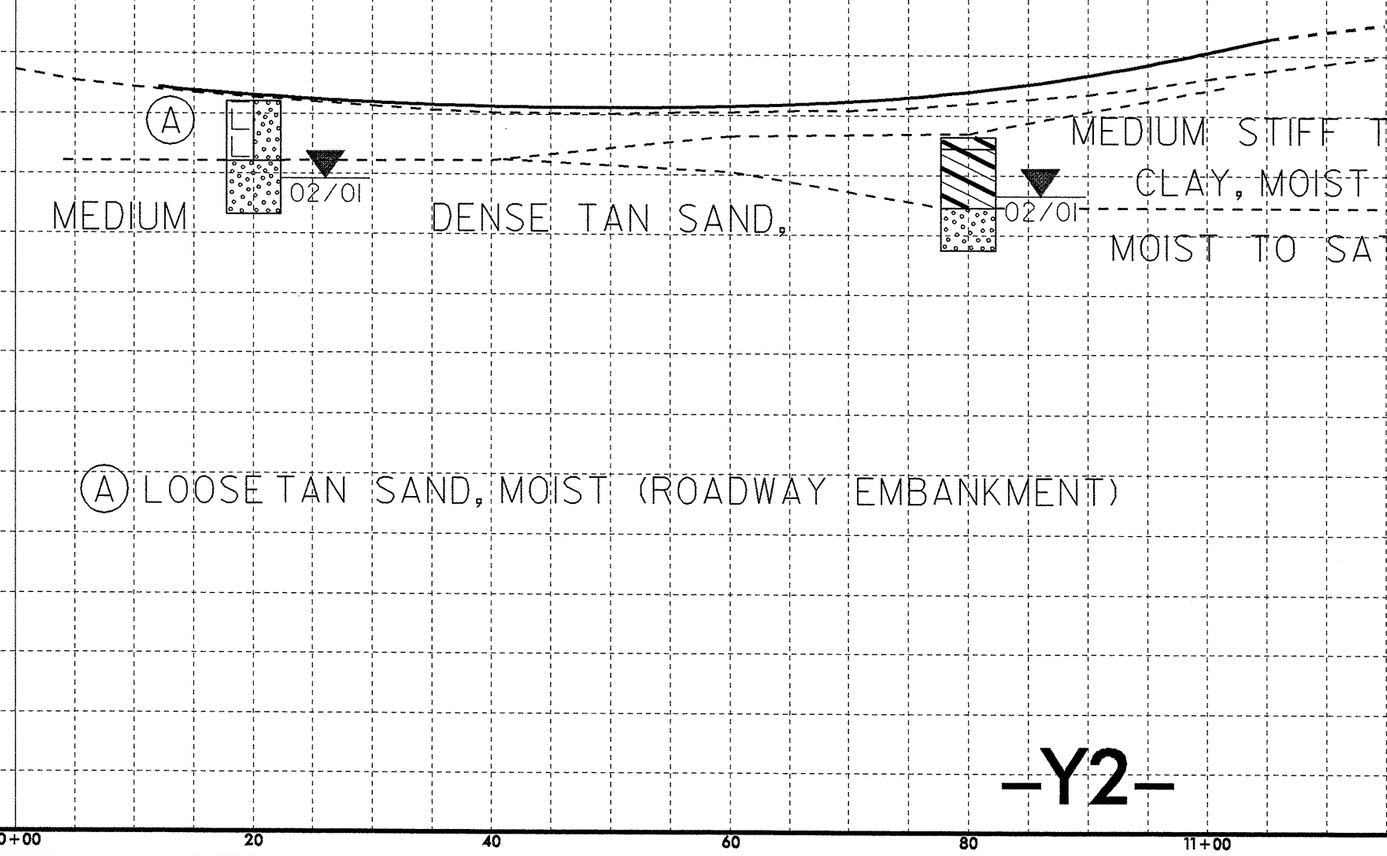
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	2.00	425	75		
S-41	3M LT	10+80	0.00-0.20	A-7-6(21)	43	25	3.6	34.4	23.7	38.3	100	99	85		
S-42	3M LT	10+80	0.20-1.20	A-6(8)	33	11	0.4	62.4	0.9	36.3	100	100	82		
S-43	3M LT	10+80	1.20-1.93	A-2-4(0)	18	NP	5.6	75.5	10.8	8.1	100	99	85		

S-41
S-42
S-43

2.5m LT

3m LT



-Y2-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	36

METRIC

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

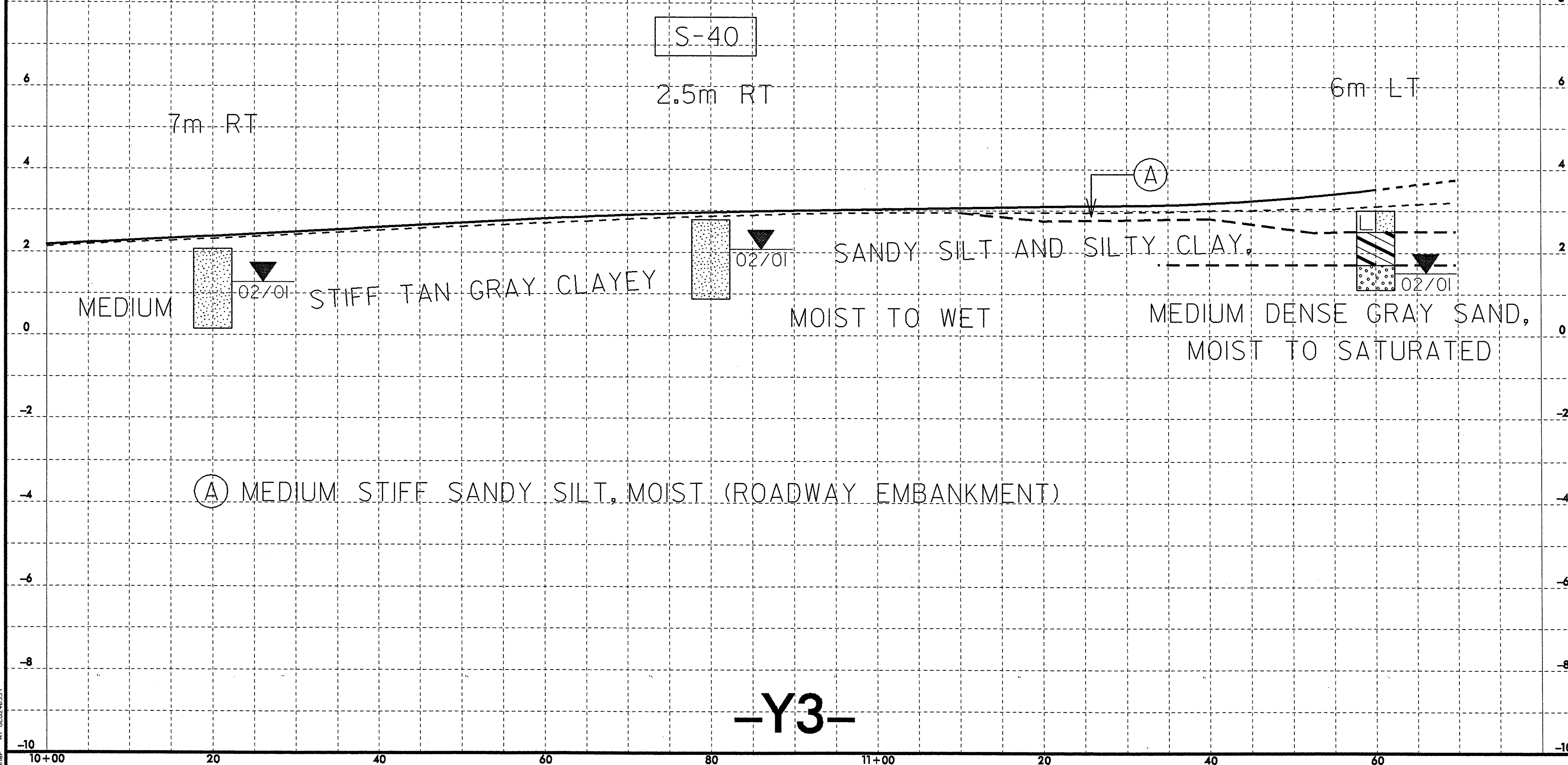
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.

R/W REV.

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 2.00	% PASSING (SIEVES) 425	% PASSING (SIEVES) 75	% MOISTURE	% ORGANIC
S-40	2.5M RT	10+80	0.00-1.93	A-4(0)	23	NP	10.5	63.4	16.0	10.1	98	92	65		



-Y3-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	37

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

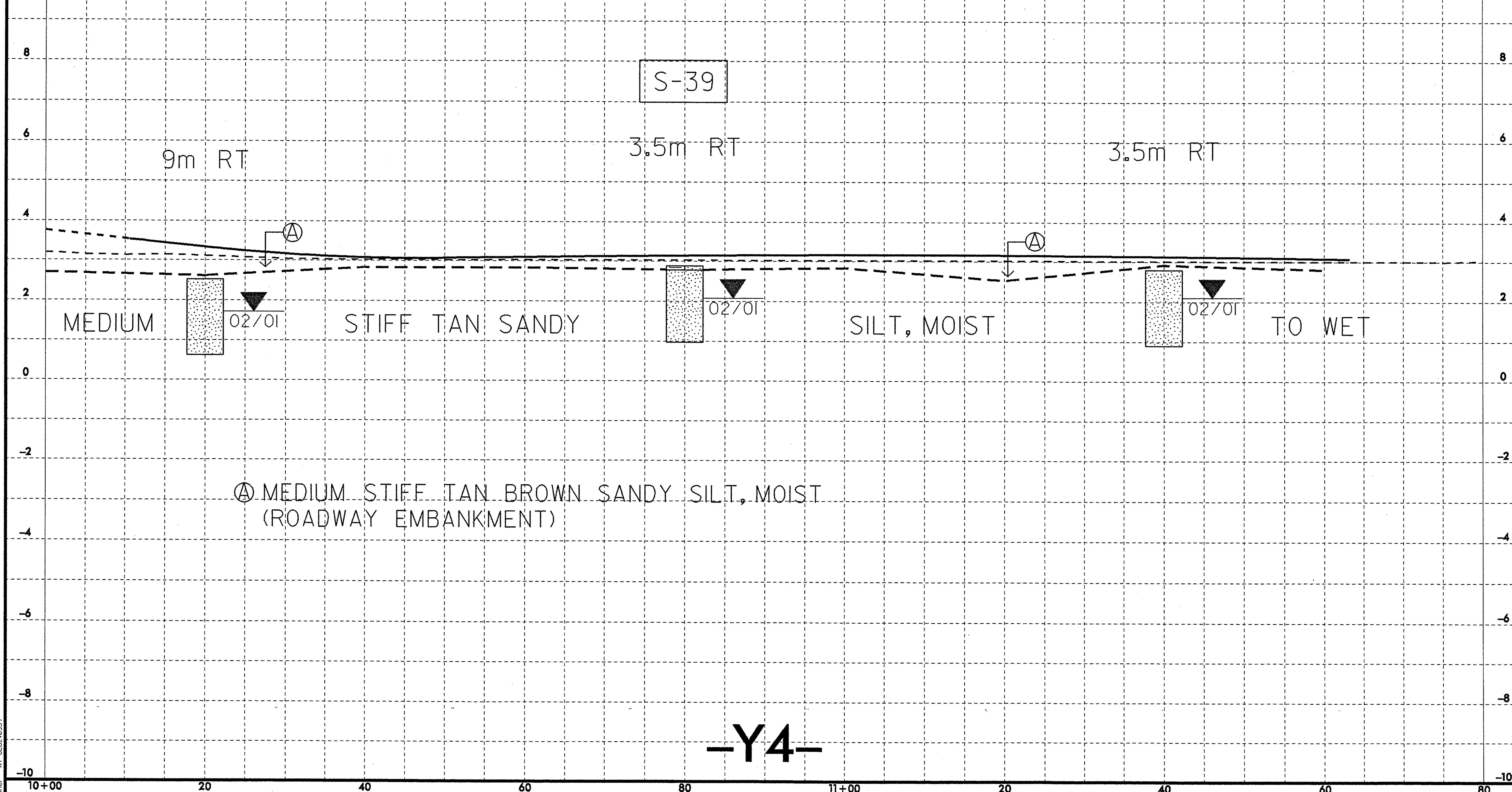
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.

R/W REV.

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	2.00	425	75		
S-39	3.5M RT	10+80	0.00-1.93	A-4(0)	22	3	2.6	61.4	17.8	18.1	100	100	70		



-Y4-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	38

METRIC

ROADWAY DESIGN ENGINEER

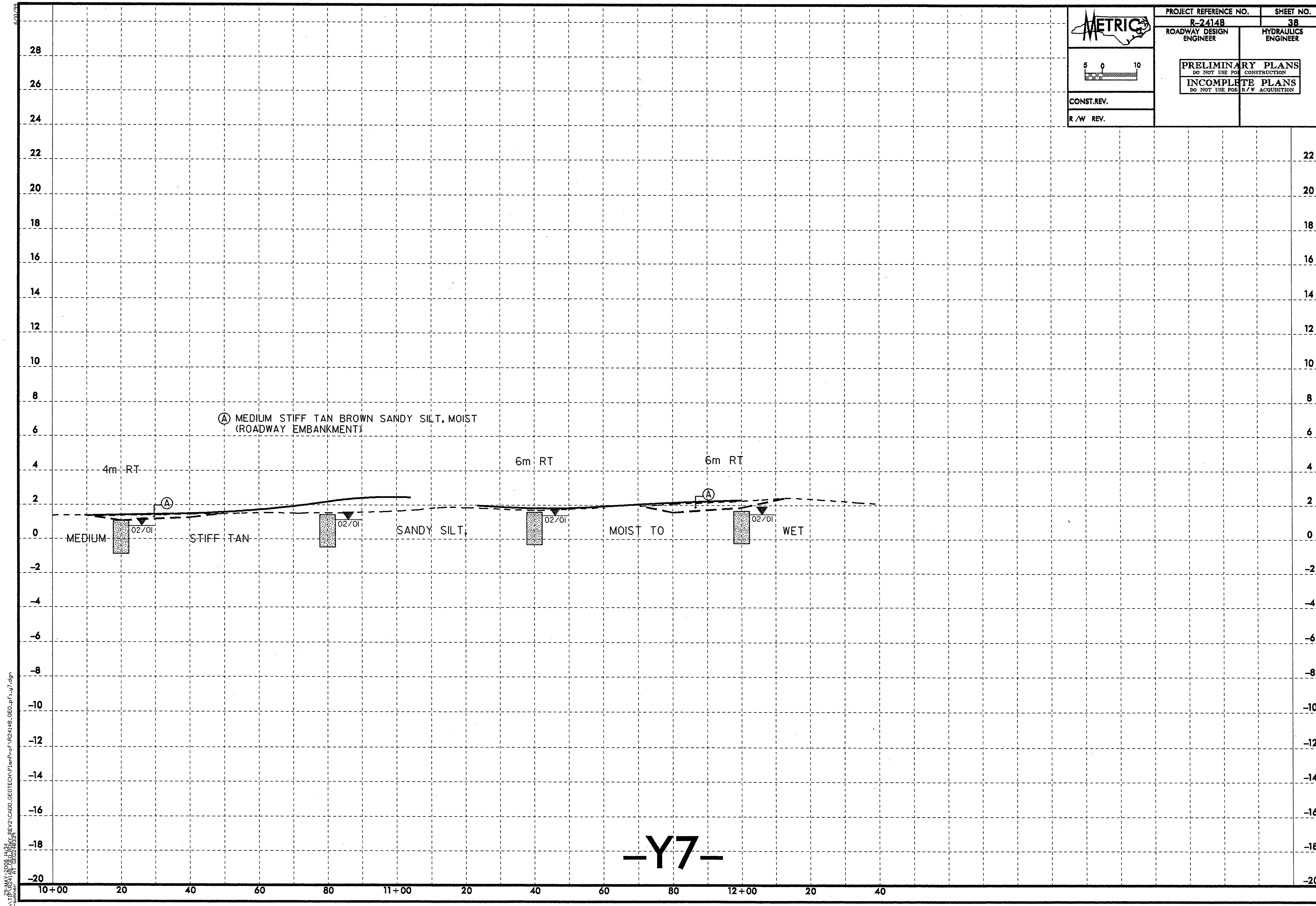
HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.

R/W REV.



-Y7-

METRIC

2.5 0 5

CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	39

ROADWAY DESIGN ENGINEER

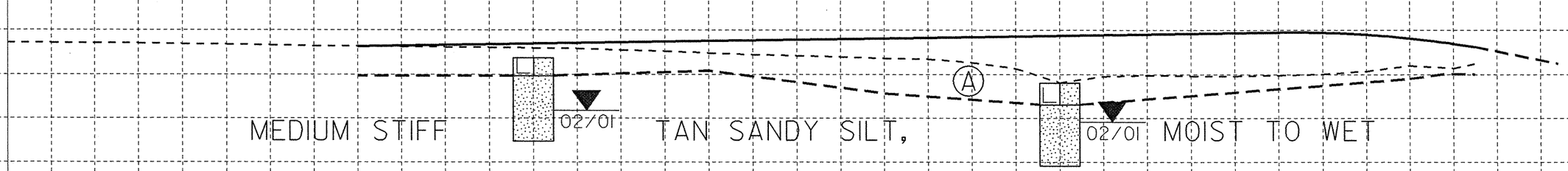
HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

12
10
8
6
4
2
0
-2
-4
-6
-8
-10

5m RT



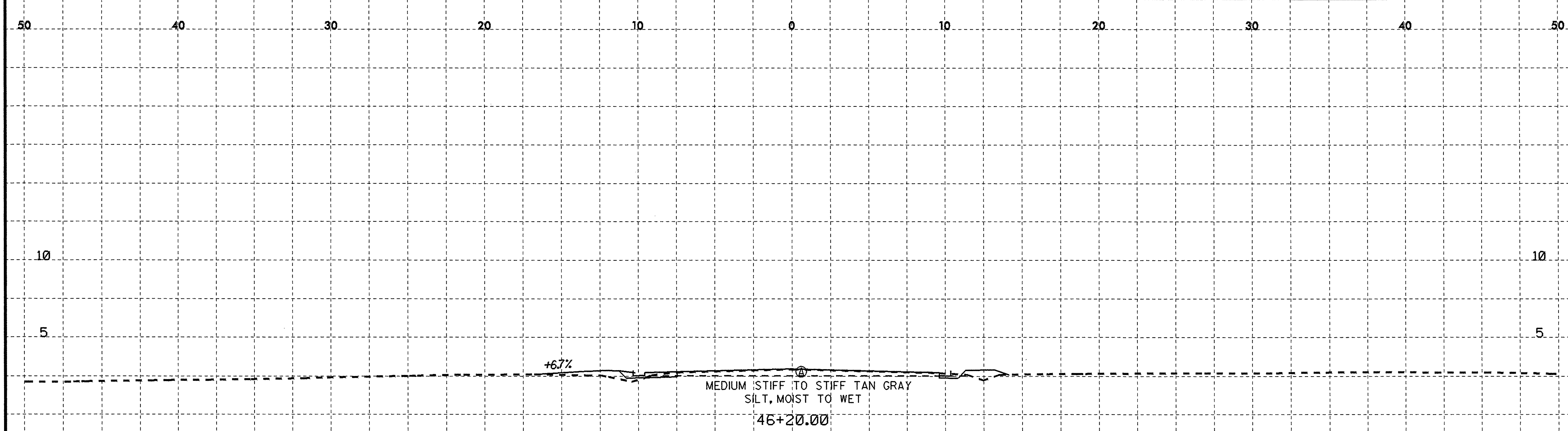
(A) STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)

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

-Y8-

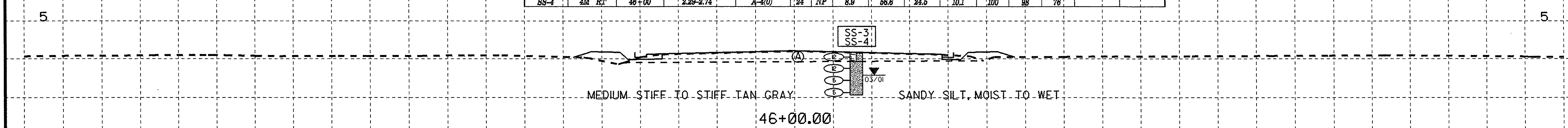
PROJECT REFERENCE NO.	SHEET NO.
R-2414B	40

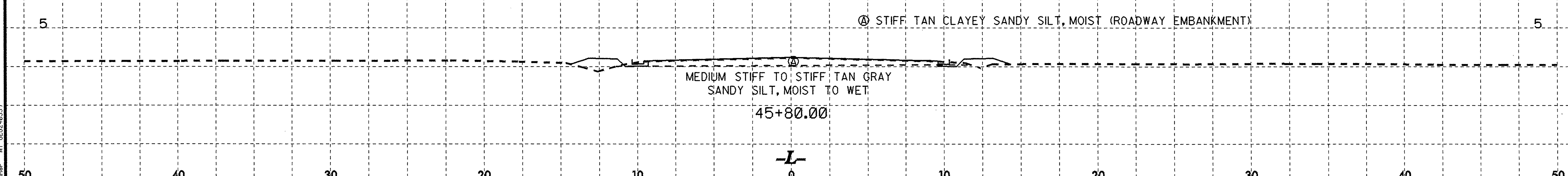
METRIC



SOIL TEST RESULTS

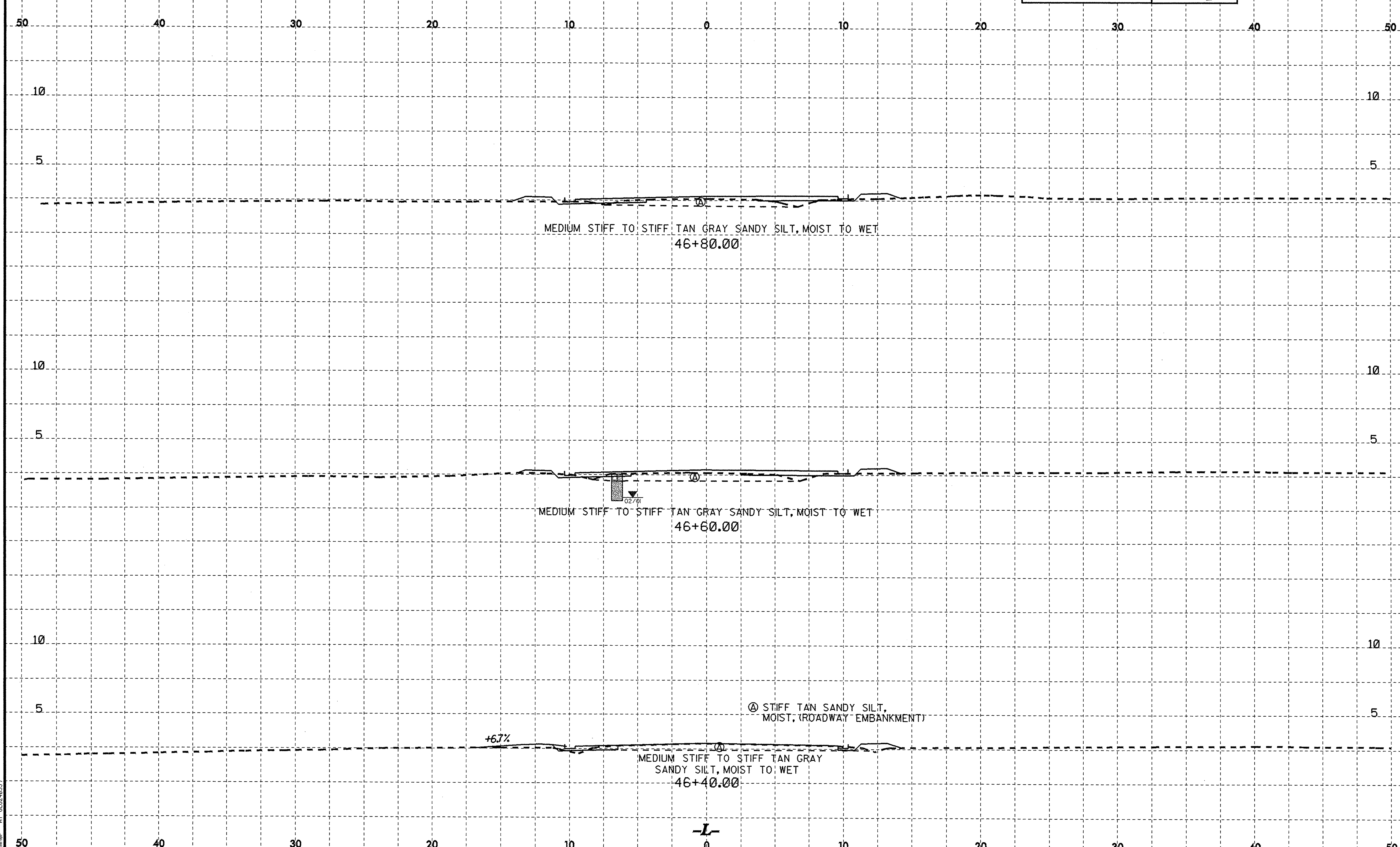
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 2.00	.425	.075	% MOISTURE	% ORGANIC
SS-3	4M RT	46+00	0.00-0.45	A-4(6)	28	8	4.2	21.8	49.8	24.2	100	98	89	19.4	
SS-4	4M RT	46+00	2.29-2.74	A-4(0)	24	NP	8.9	56.6	24.5	10.1	100	98	76		





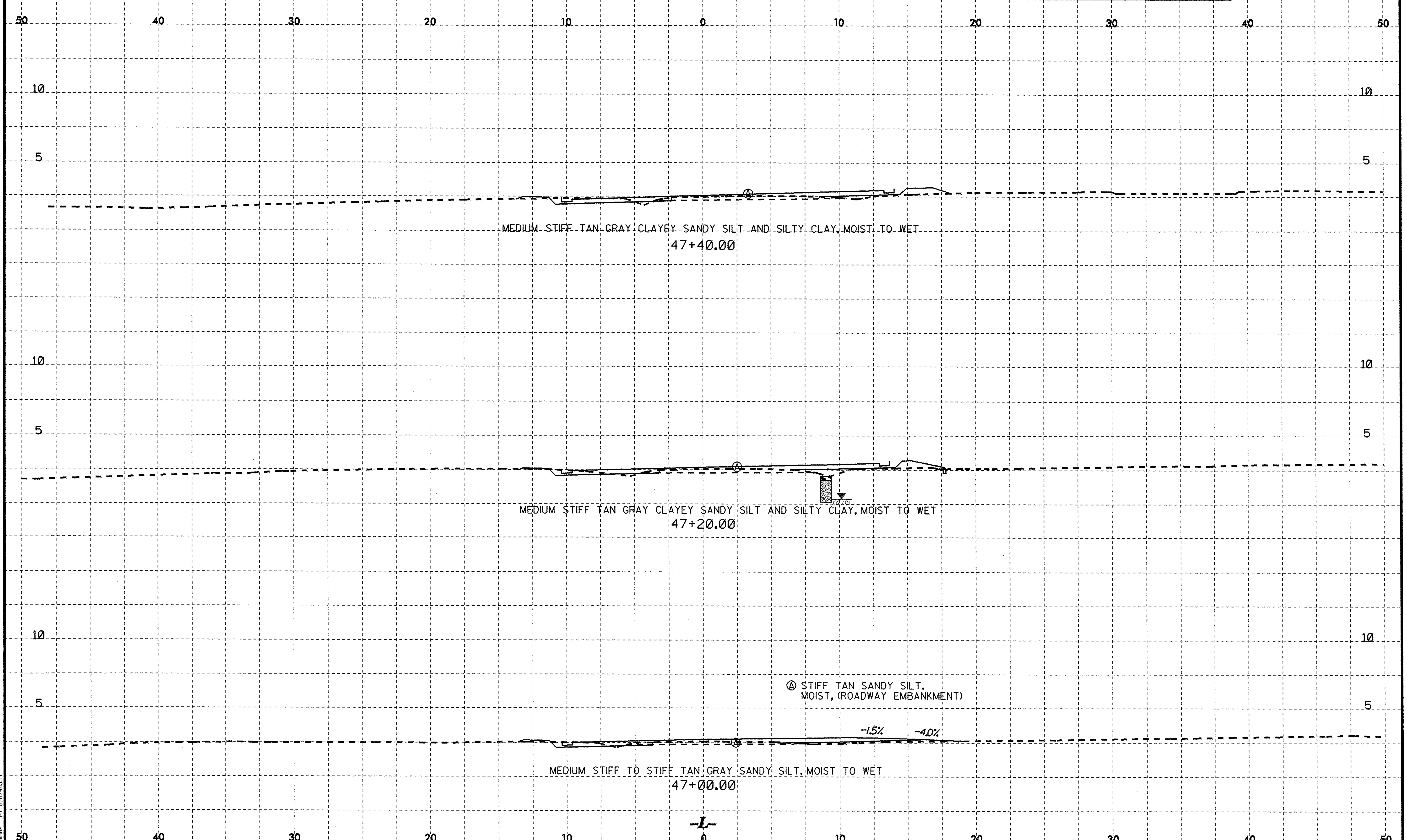
PROJECT REFERENCE NO.	SHEET NO.
R-2414B	41

METRIC



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	42

METRIC



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crsumner AT GEG2403339

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	43

2.5 0 2.5 5

METRIC

50 40 30 20 10 0 10 20 30 40 50

10

5

Ⓐ STIFF TAN SANDY SILT MOIST, (ROADWAY EMBANKMENT)

MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT, MOIST TO WET

48+00.00

10

5

02/01

MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT, MOIST TO WET

47+80.00

10

5

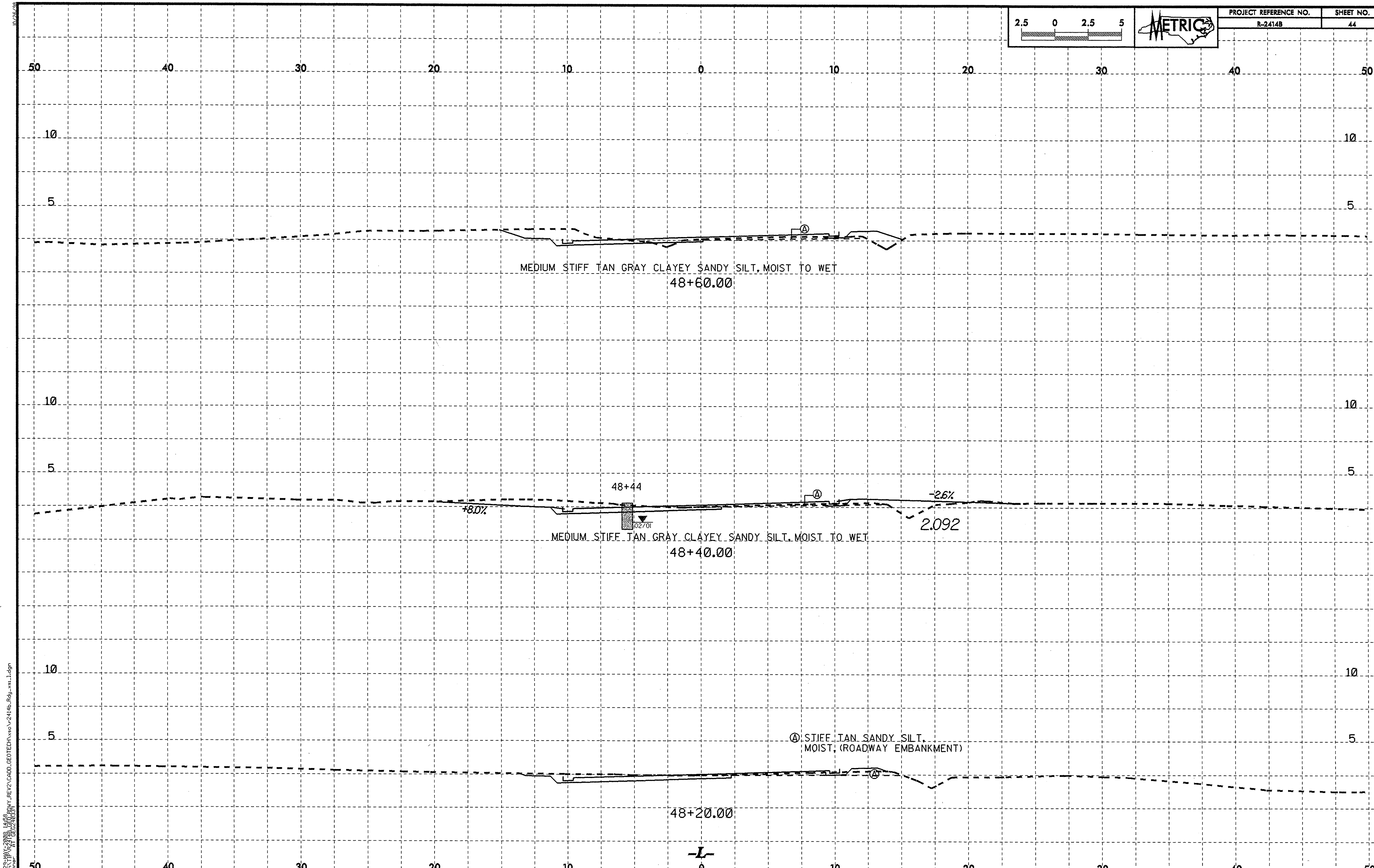
+8.0%

MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT AND SILTY CLAY, MOIST TO WET

47+60.00

-L-

50 40 30 20 10 0 10 20 30 40 50



PROJECT REFERENCE NO.
R-2414B
SHEET NO.
44
METRIC
2.5 0 2.5 5
MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT, MOIST TO WET
48+60.00
48+44
+8.0%
-2.6%
2.092
02/01
MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT, MOIST TO WET
48+40.00
Ⓐ STIFF TAN SANDY SILT, MOIST, (ROADWAY EMBANKMENT)
48+20.00
-L-

50 40 30 20 10 0 10 20 30 40 50

10

5

-4.0% -1.0% -4.0% -8.0%

MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT AND SILTY CLAY, MOIST TO WET

49+20.00

10

5

-0.6%

02/01

MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT AND SILTY CLAY, MOIST TO WET

49+00.00

10

5

Ⓐ STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)

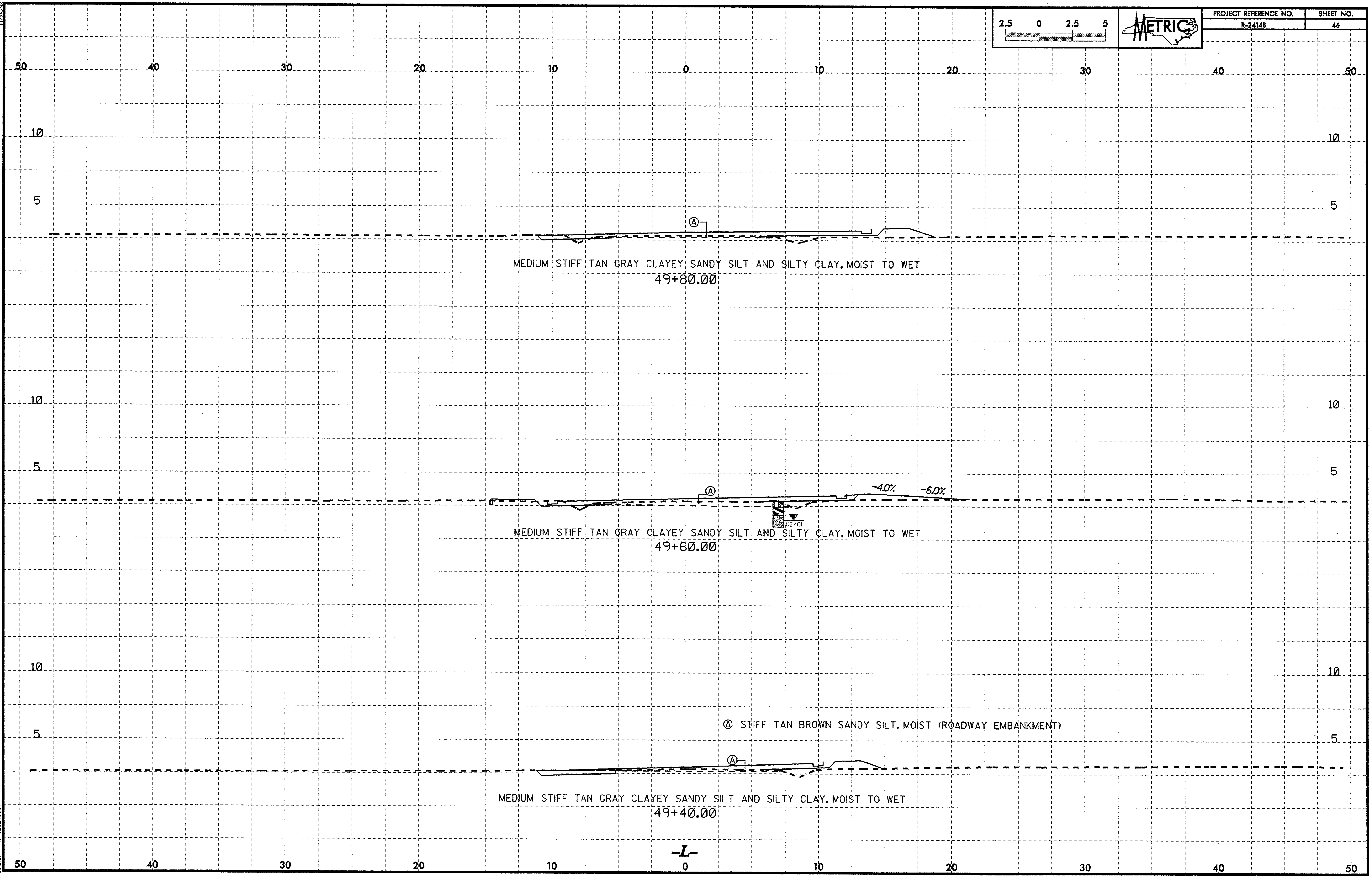
-7.6% -2.0%

MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT, MOIST TO WET

48+80.00

-L-

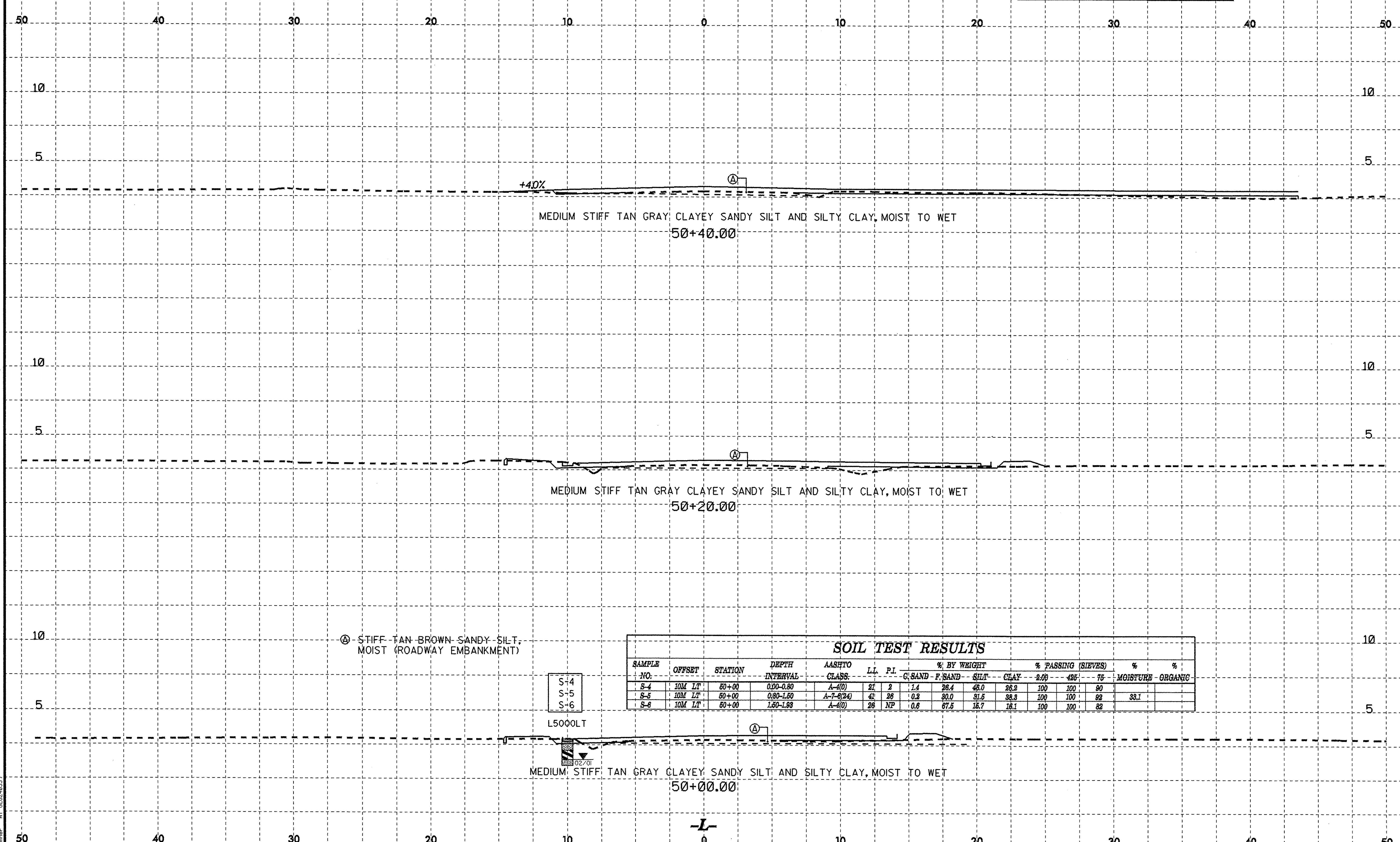
50 40 30 20 10 0 10 20 30 40 50



PROJECT REFERENCE NO.
R-2414B
SHEET NO.
46
METRIC
2.5 0 2.5 5
Ⓐ
MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT AND SILTY CLAY, MOIST TO WET
49+80.00
-4.0%
-6.0%
02/01
MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT AND SILTY CLAY, MOIST TO WET
49+60.00
Ⓐ STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)
MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT AND SILTY CLAY, MOIST TO WET
49+40.00
-L-

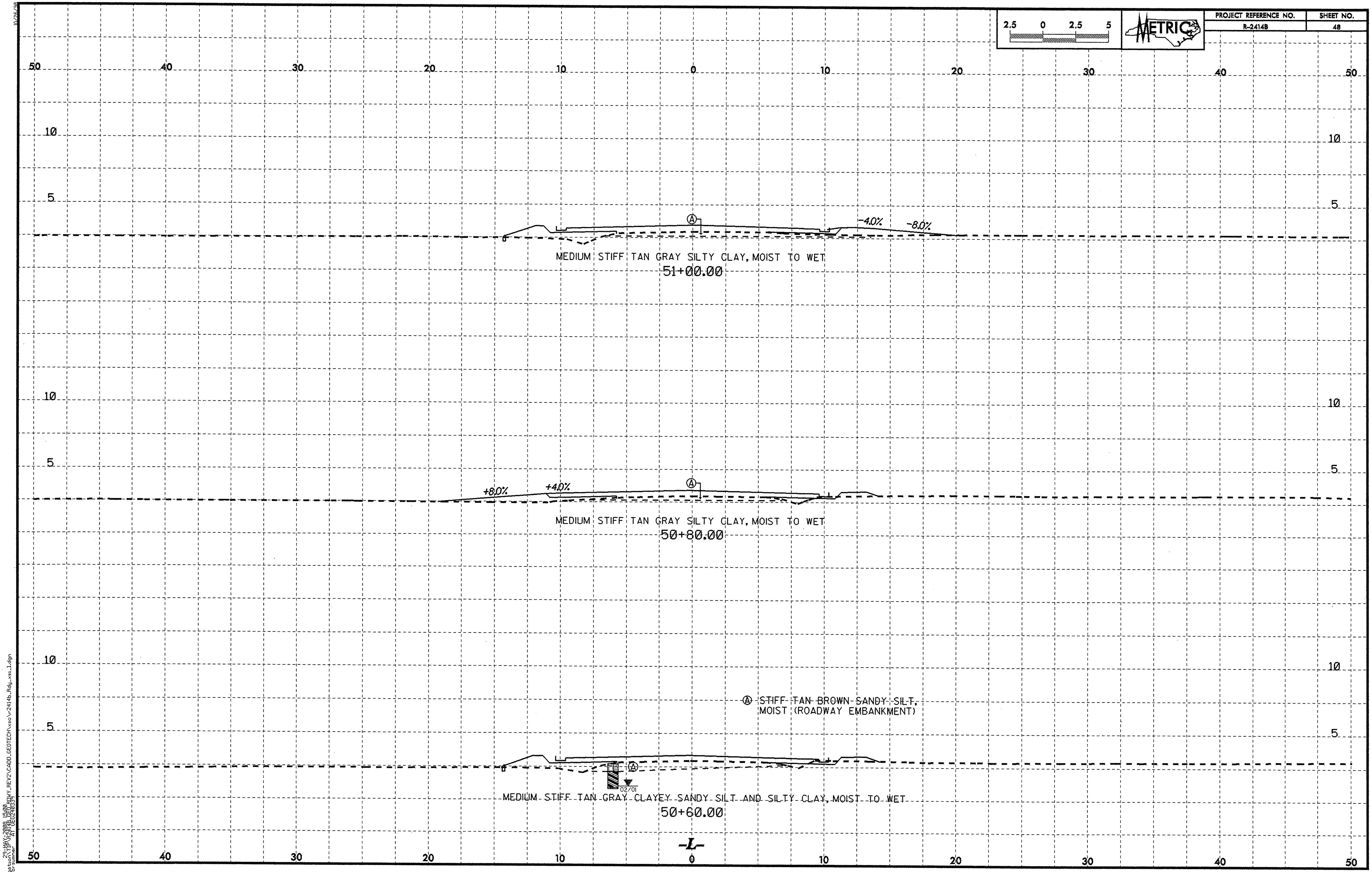
PROJECT REFERENCE NO.	SHEET NO.
R-2414B	47

METRIC

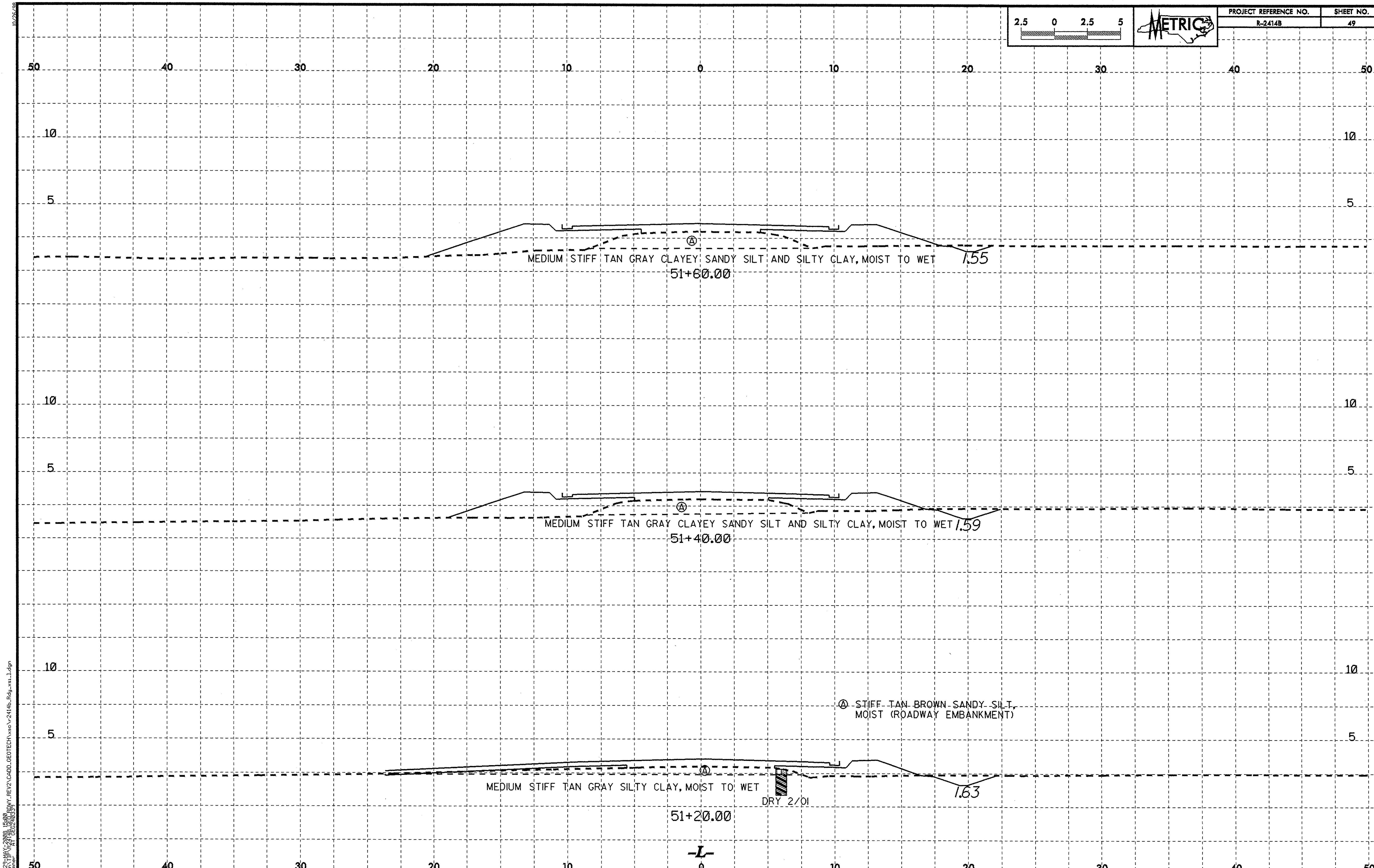


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 2.00	.425	.75	% MOISTURE	% ORGANIC
S-4	10M LT	50+00	0.00-0.80	A-4(0)	21	2	1.4	26.4	46.0	26.2	100	100	90		
S-5	10M LT	50+00	0.80-1.50	A-7-6(24)	41	26	0.2	30.0	31.5	38.3	100	100	92	33.1	
S-6	10M LT	50+00	1.50-1.93	A-4(0)	26	NP	0.6	67.5	15.7	16.1	100	100	82		


PROJECT REFERENCE NO.
R-2414B
SHEET NO.
48
METRIC
2.5 0 2.5 5
-4.0%
-8.0%
MEDIUM STIFF TAN GRAY SILTY CLAY, MOIST TO WET
51+00.00
+8.0%
+4.0%
MEDIUM STIFF TAN GRAY SILTY CLAY, MOIST TO WET
50+80.00
Ⓐ STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)
02/01
MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT AND SILTY CLAY, MOIST TO WET
50+60.00
-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	49



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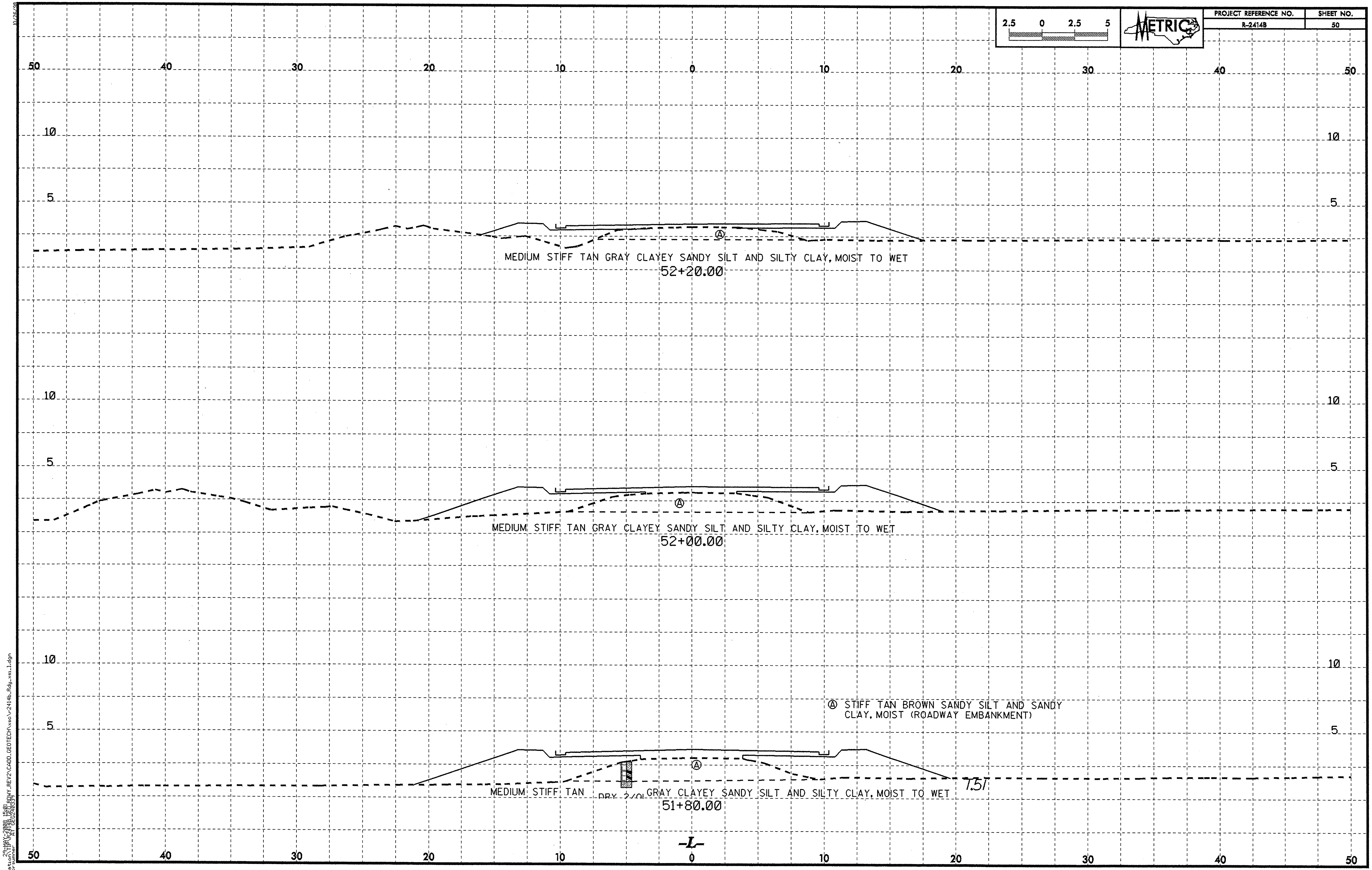
crsumner AT GEO2403339

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	50



10/26/98

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crsumner AT GEG240339

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	51

2.5 0 2.5 5

METRIC

50 40 30 20 10 0 10 20 30 40 50

10

5

Ⓐ

MEDIUM STIFF TAN GRAY SANDY SILT AND SILTY CLAY, MOIST TO WET

52+80.00

+12.0% +8.0% +4.0%

MEDIUM STIFF TAN GRAY SANDY SILT AND SILTY CLAY, MOIST TO WET

52+60.00

Ⓐ STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)

MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT AND SILTY CLAY, MOIST TO WET

52+40.00

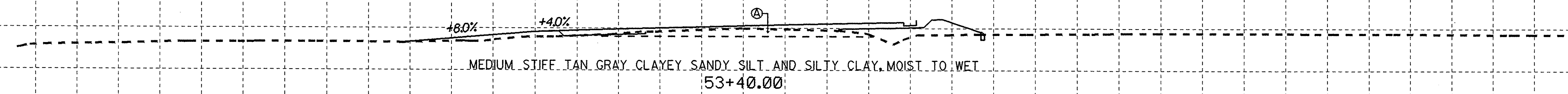
-L-

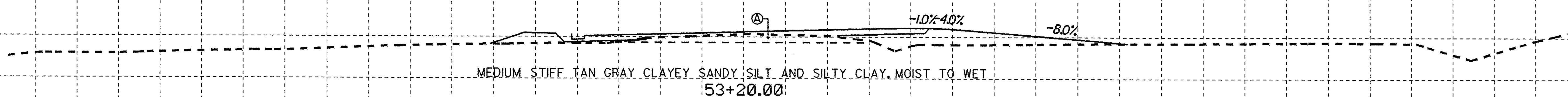
10/26/2018

29-MAY-2008 15:01
C:\TIFA\2008 ARMY REV2\CADD_GEOTECH\xsc\r-2414b_Rdy_xst_1.dgn
Projection: NC83F
Drawing: AT GEO2418339

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	52

METRIC



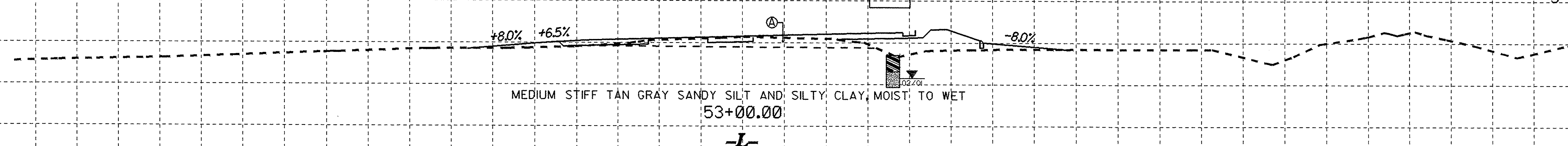


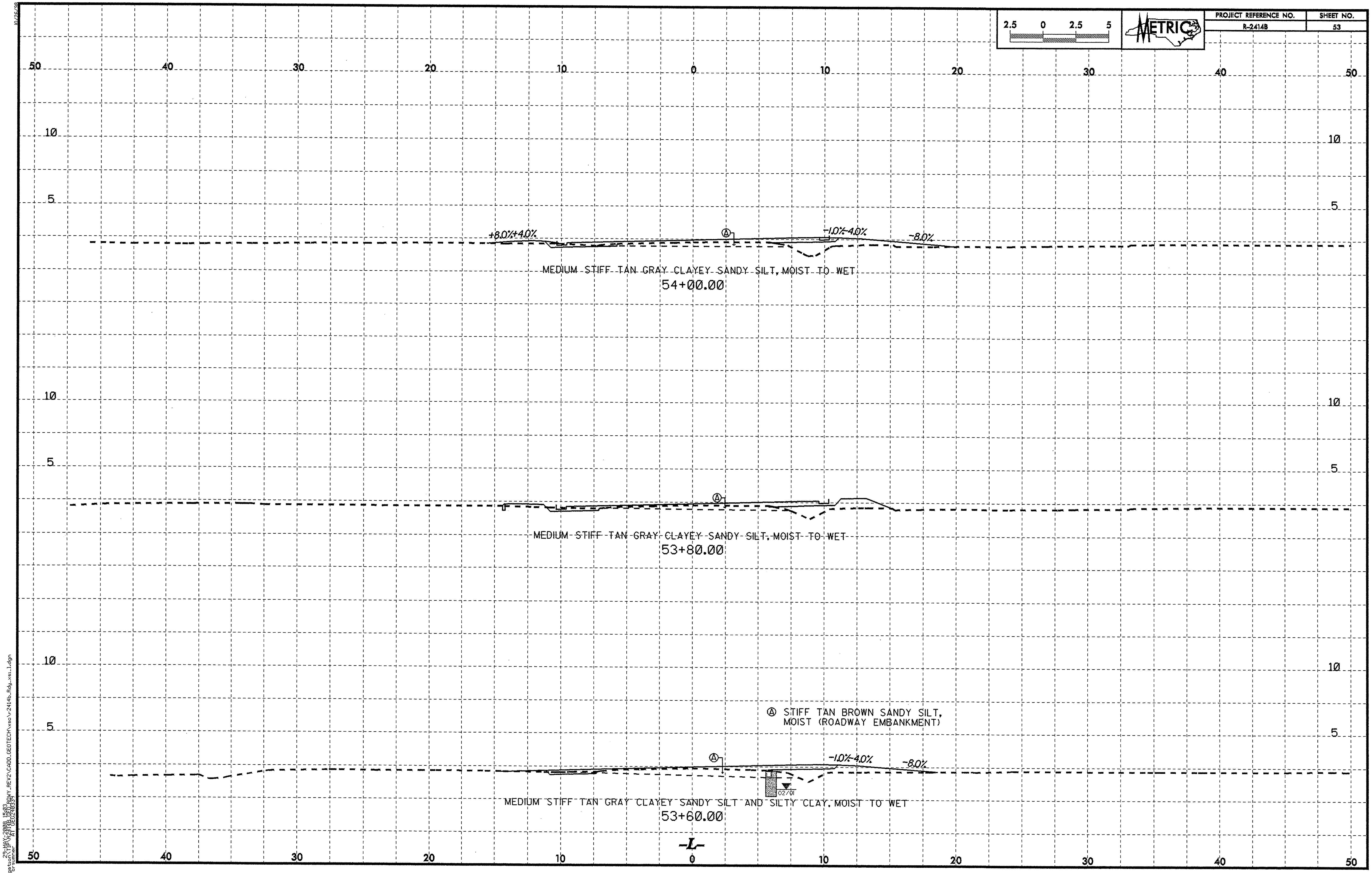
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 2.00	.425	.75	% MOISTURE	% ORGANIC
S-44	9M RT	53+00	0.00-1.00	A-6(12)	33	15	4.2	35.4	26.1	34.2	100	99	84	26.6	
S-45	9M RT	53+00	1.00-1.93	A-4(0)	22	NP	7.9	75.3	8.8	8.1	96	95	53		

S-44
S-45

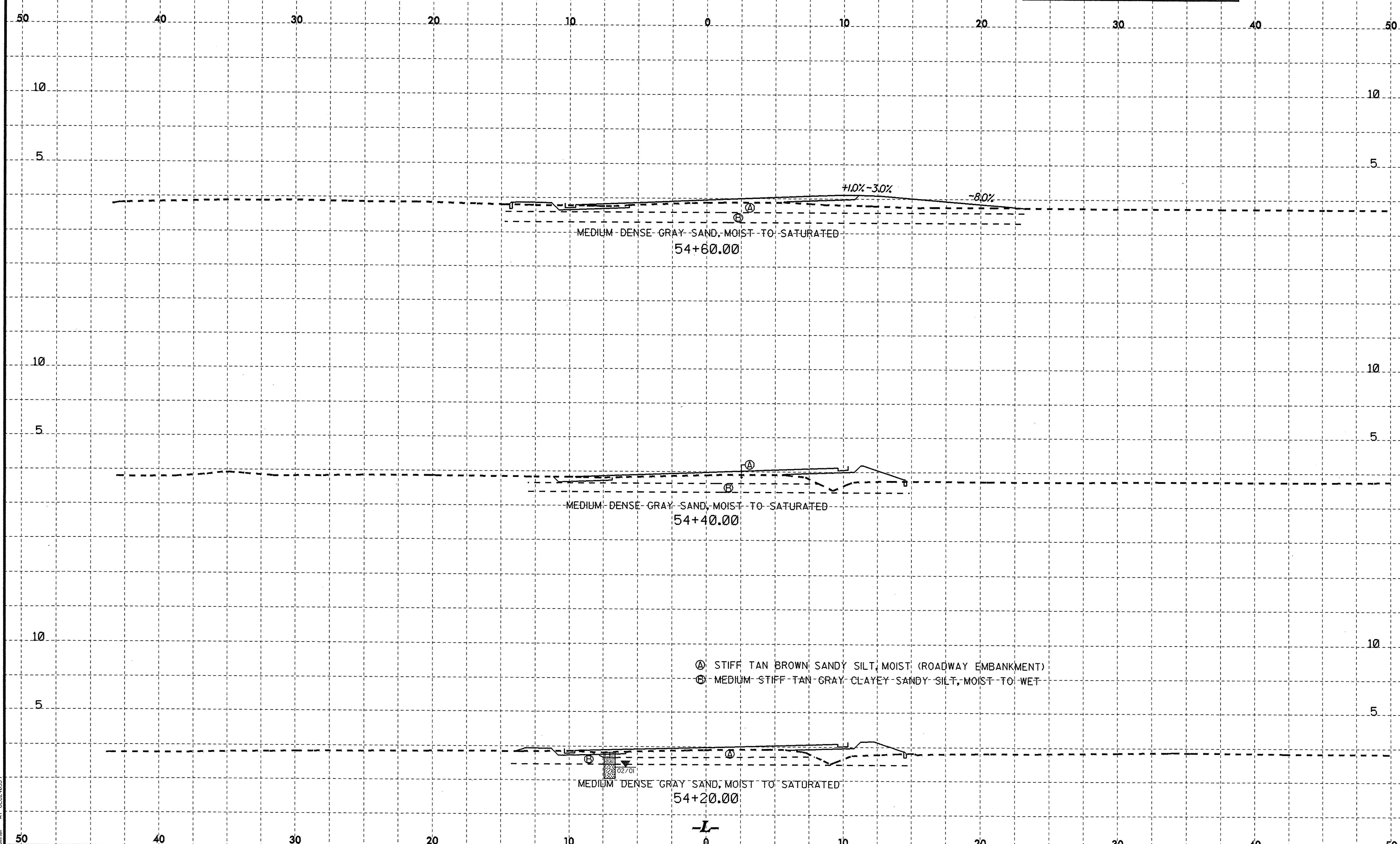
Ⓐ STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)




PROJECT REFERENCE NO.
R-2414B
SHEET NO.
53
METRIC
2.5 0 2.5 5
+8.0% +4.0%
-1.0% -4.0%
-8.0%
Ⓐ
MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT, MOIST TO WET
54+00.00
MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT, MOIST TO WET
53+80.00
Ⓐ STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)
02/01
MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT AND SILTY CLAY, MOIST TO WET
53+60.00
-L-
10/26/98
29-MAY-2008 15:03
gation\TIP\R2414B_GEO_RDWY_REV2\CADD_GEOTECH\xsc\r2414b_Rdy_xsi_1.dgn
crsummer AT GEO240339

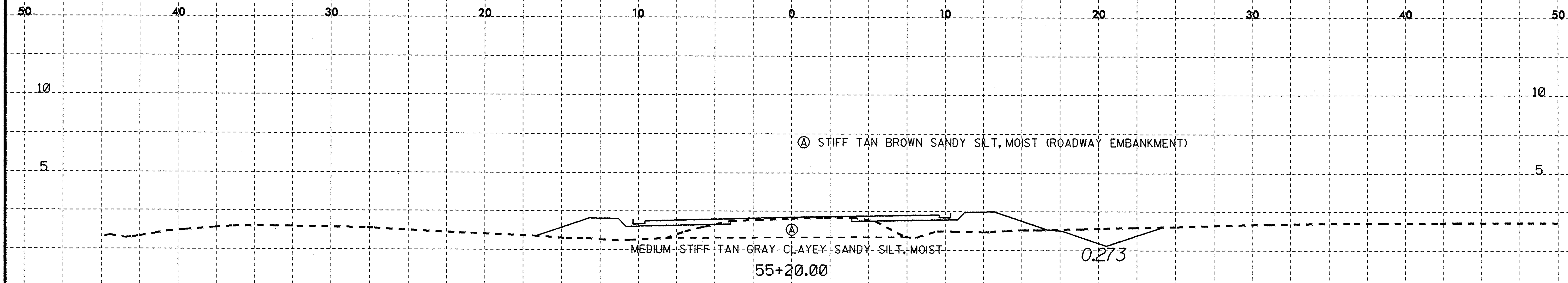
PROJECT REFERENCE NO.	SHEET NO.
R-2414B	54

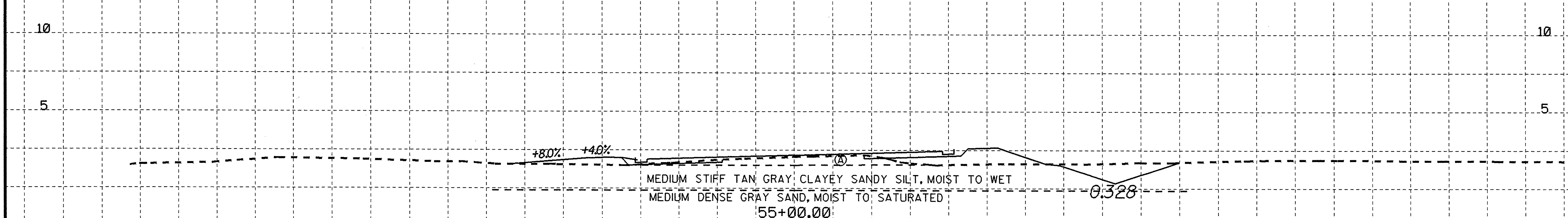
METRIC



29-MAY-2008 15:03
...gation\TIP\R2414B GEO RDWY_REV2\CADD_GEOTECH\xsc\r2414b_Rdy_xsi_1.dgn
crsumner AT GEO2403339

METRIC



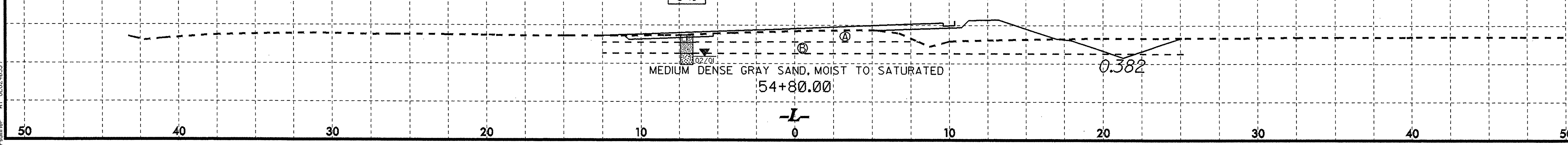


Ⓐ STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)
Ⓑ MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT, MOIST TO WET

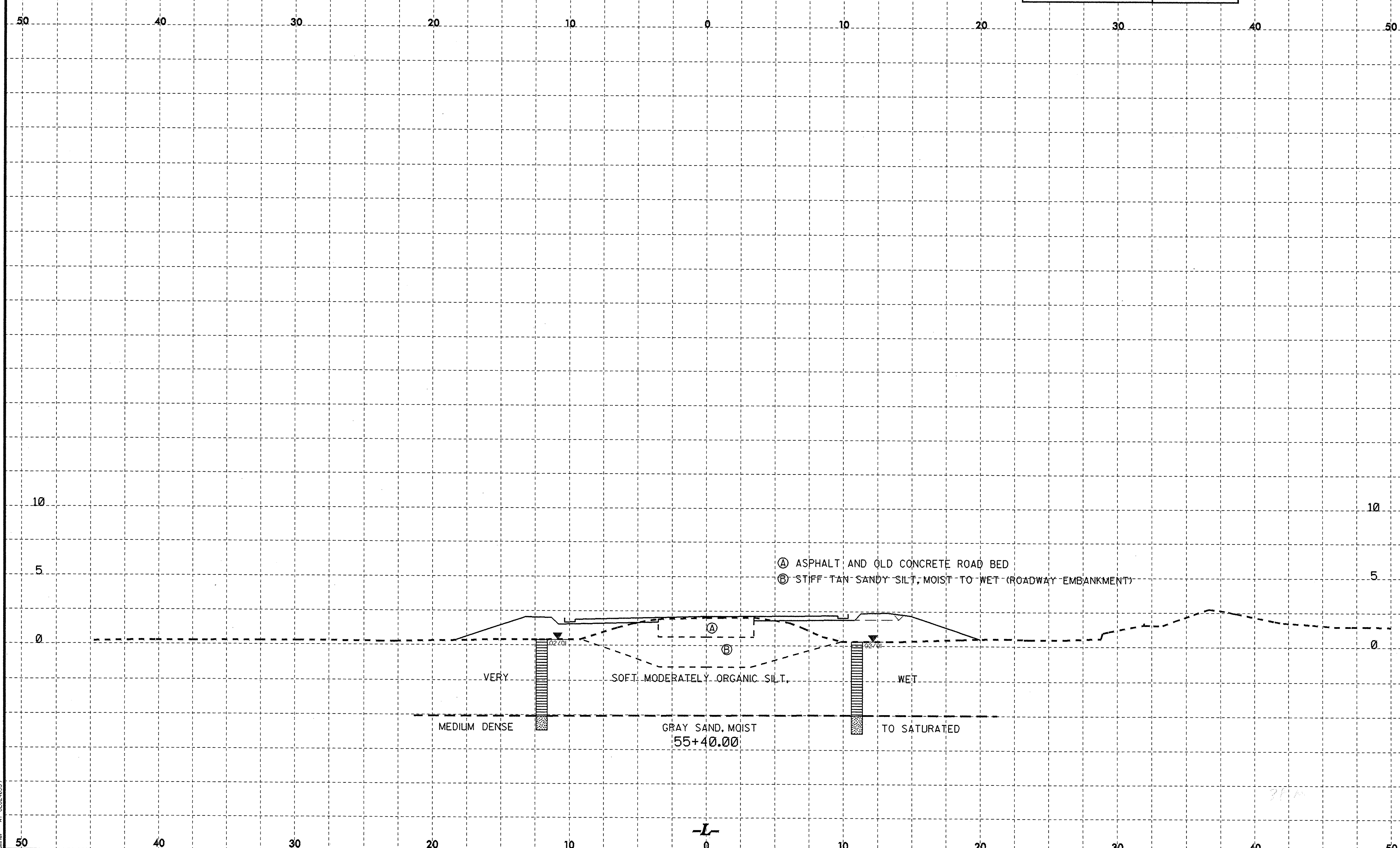
S-9
S-10

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) 2.00	425	75	% MOISTURE	% ORGANIC
S-9	7M RT	54+80	0.00-1.10	A-4(0)	23	2	5.2	50.2	24.4	20.2	100	99	72		
S-10	7M RT	54+80	1.10-1.93	A-2-4(0)	17	NP	11.1	74.6	2.2	12.1	100	99	19		



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	56



29-MAY-2008 15:03
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crsumner AT GEO2403339

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	57

METRIC

2.5 0 2.5 5

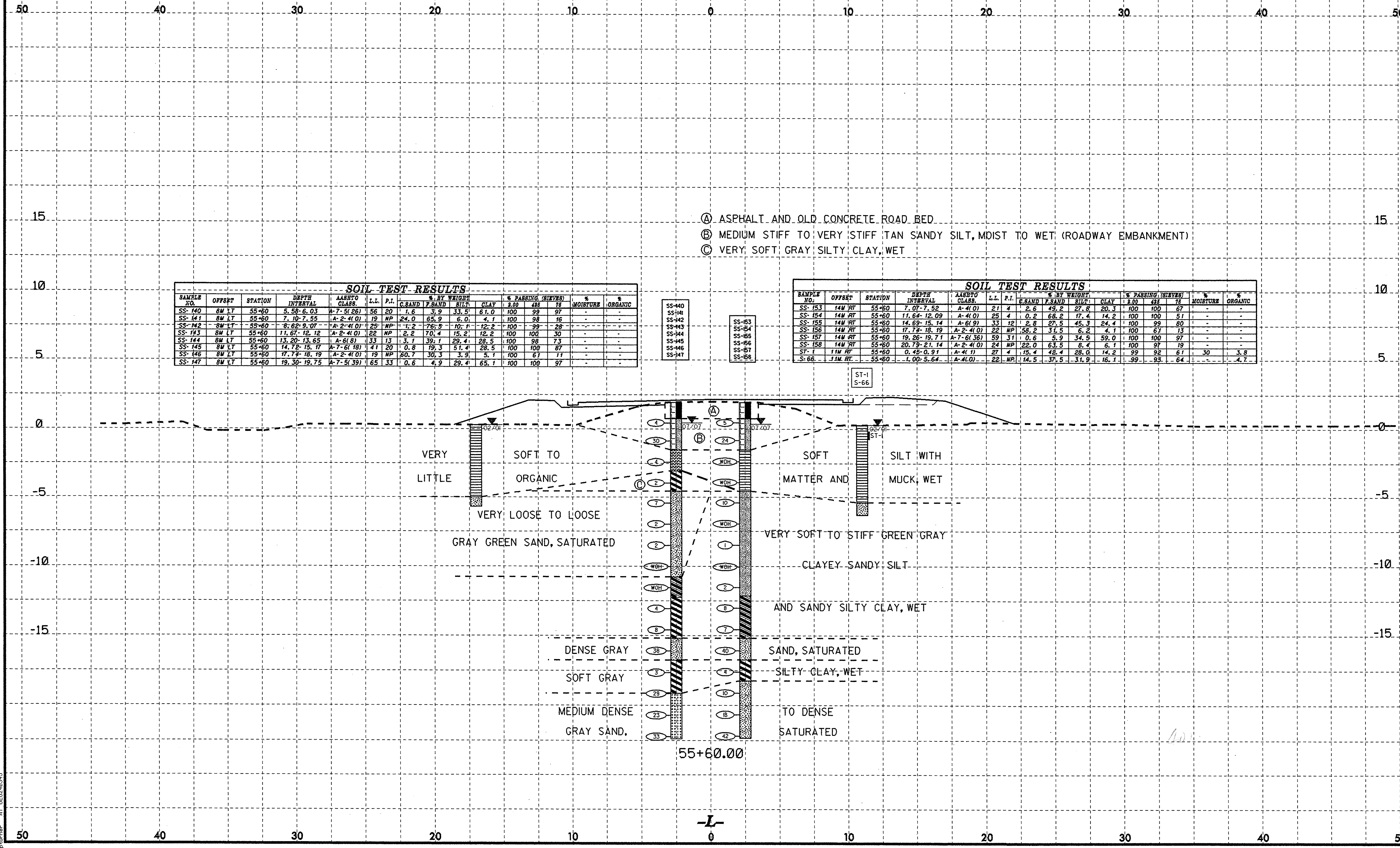
Ⓐ ASPHALT AND OLD CONCRETE ROAD BED
Ⓑ MEDIUM STIFF TO VERY STIFF TAN SANDY SILT, MOIST TO WET (ROADWAY EMBANKMENT)
Ⓒ VERY SOFT GRAY SILTY CLAY, WET

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	2.00	425	75		
SS-140	8M LT	55+60	5.58-6.03	A-7-5(26)	56	20	1.6	3.9	33.5	61.0	100	99	97	-	-
SS-141	8M LT	55+60	7.10-7.55	A-2-4(0)	19	NP	24.0	65.9	6.0	4.1	100	98	16	-	-
SS-142	8M LT	55+60	8.62-9.07	A-2-4(0)	25	NP	1.2	76.5	10.1	12.2	100	99	28	-	-
SS-143	8M LT	55+60	11.67-12.12	A-2-4(0)	22	NP	2.2	70.4	15.2	12.2	100	100	30	-	-
SS-144	8M LT	55+60	13.20-13.65	A-6(8)	33	13	3.1	39.1	29.4	28.5	100	98	73	-	-
SS-145	8M LT	55+60	14.72-15.17	A-7-6(18)	41	20	0.8	19.3	51.4	28.5	100	100	87	-	-
SS-146	8M LT	55+60	17.74-18.19	A-2-4(0)	19	NP	60.7	30.3	3.9	5.1	100	61	11	-	-
SS-147	8M LT	55+60	19.30-19.75	A-7-5(39)	65	33	0.6	4.9	29.4	65.1	100	100	97	-	-

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	2.00	425	75		
SS-153	14M RT	55+60	7.07-7.52	A-4(0)	21	4	2.6	49.2	27.8	20.3	100	100	67	-	-
SS-154	14M RT	55+60	11.64-12.09	A-4(0)	25	4	0.2	68.2	17.4	14.2	100	100	51	-	-
SS-155	14M RT	55+60	14.69-15.14	A-6(9)	33	12	2.8	27.5	45.3	24.4	100	99	80	-	-
SS-156	14M RT	55+60	17.74-18.19	A-2-4(0)	22	NP	58.2	31.5	6.2	4.1	100	61	13	-	-
SS-157	14M RT	55+60	19.26-19.71	A-7-6(36)	59	31	0.6	5.9	34.5	59.0	100	100	97	-	-
SS-158	14M RT	55+60	20.79-21.14	A-2-4(0)	24	NP	22.0	63.5	8.4	6.1	100	97	19	-	-
ST-1	11M RT	55+60	0.45-0.91	A-4(1)	27	4	15.4	42.4	28.0	14.2	99	92	61	30	3.8
S-66	11M RT	55+60	1.00-5.64	A-4(0)	22	NP	14.5	37.5	31.9	16.1	99	93	64	-	4.7



2.5 0 2.5 5

METRIC

Ⓐ ASPHALT AND OLD CONCRETE ROAD BED

Ⓑ VERY SOFT TO SOFT TAN SANDY SILT, MOIST TO WET (ROADWAY EMBANKMENT)

SOIL TEST RESULTS

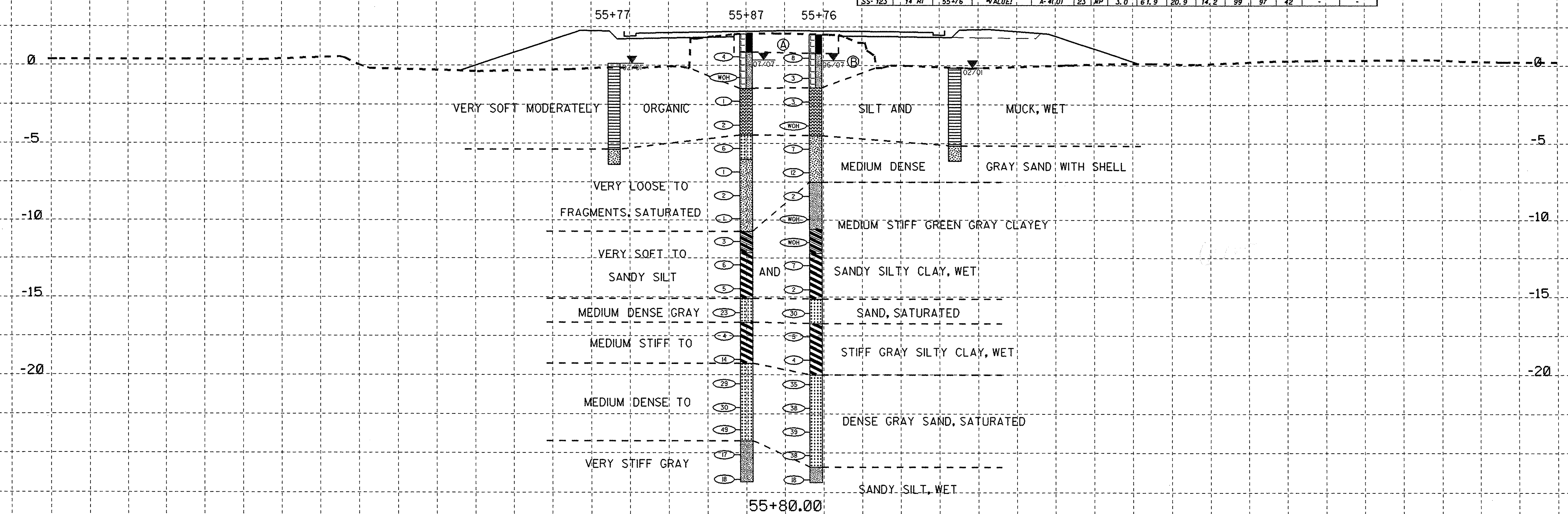
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-130	8M RT	55+87	1.19-1.64	A-4(0)	23	1	3.3	56.2	22.3	18.3	100	99	84	-	-
SS-131	8M LT	55+87	7.07-7.52	A-3(0)	21	NP	61.6	35.8	0.6	2.0	100	91	4	-	-
SS-132	8M LT	55+87	8.60-9.05	A-2-4(0)	23	NP	1.2	73.4	13.1	12.2	100	100	34	-	-
SS-133	8M LT	55+87	10.12-10.57	A-2-4(0)	24	2	1.4	69.6	14.8	14.2	100	99	31	-	-
SS-134	8M LT	55+87	13.16-13.61	A-6(5)	32	11	5.3	46.8	25.5	22.4	100	97	65	-	-
SS-135	8M LT	55+87	14.69-15.14	A-7-6(27)	51	26	4.9	7.9	52.6	34.6	100	97	92	-	-
SS-136	8M LT	55+87	17.74-18.19	A-3(0)	20	NP	62.6	30.4	4.0	3.1	100	60	9	-	-
SS-137	8M LT	55+87	19.26-19.71	A-7-6(33)	54	30	2.4	4.3	38.4	54.9	100	98	96	-	-
SS-138	8M LT	55+87	22.30-22.75	A-3(0)	20	NP	62.7	32.9	2.4	2.0	100	80	7	-	-
SS-139	8M LT	55+87	26.87-27.32	A-4(0)	21	2	2.6	60.8	22.3	14.2	100	99	48	-	-

SS-130, SS-131, SS-132, SS-133, SS-134, SS-135, SS-136, SS-137, SS-138, SS-139

SS-111, SS-112, SS-115, SS-116, SS-117, SS-118, SS-119, SS-120, SS-121, SS-122, SS-123

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	14 RT	55+76	1.22-1.67	A-4(4)	25	6	1.4	52.9	25.4	20.3	100	99	86	-	-
SS-112	14 RT	55+76	2.56-2.95	A-4(3)	25	5	3.0	54.1	22.6	20.3	100	99	83	-	-
SS-115	14 RT	55+76	7.07-7.52	A-2-4(0)	21	NP	8.5	78.3	9.1	4.1	100	100	25	-	-
SS-116	14 RT	55+76	10.12-10.57	A-4(0)	23	NP	0.6	74.4	12.9	12.2	100	100	40	-	-
SS-117	14 RT	55+76	13.17-13.62	A-6(7)	33	13	1.4	46.0	30.3	22.3	100	99	70	-	-
SS-118	14 RT	55+76	14.69-15.14	A-7-6(22)	44	24	2.6	21.1	45.9	30.4	100	99	87	-	-
SS-119	14 RT	55+76	17.74-18.19	A-3(0)	19	NP	63.6	28.6	3.7	4.1	99	62	9	-	-
SS-120	14 RT	55+76	19.26-19.71	A-7-6(37)	61	35	3.4	6.9	41.0	48.7	100	99	92	-	-
SS-121	14 RT	55+76	20.78-21.23	A-7-6(11)	41	14	1.6	37.5	32.5	28.4	100	99	76	-	-
SS-122	14 RT	55+76	22.31-22.76	A-3(0)	19	NP	70.2	25.5	2.3	2.0	100	81	6	-	-
SS-123	14 RT	55+76	#VALUE!	A-4(0)	23	NP	3.0	61.9	20.9	14.2	99	97	42	-	-



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PROJECT REFERENCE NO.	SHEET NO.
R-2414B	59

METRIC

Ⓐ ASPHALT AND OLD CONCRETE ROAD BED

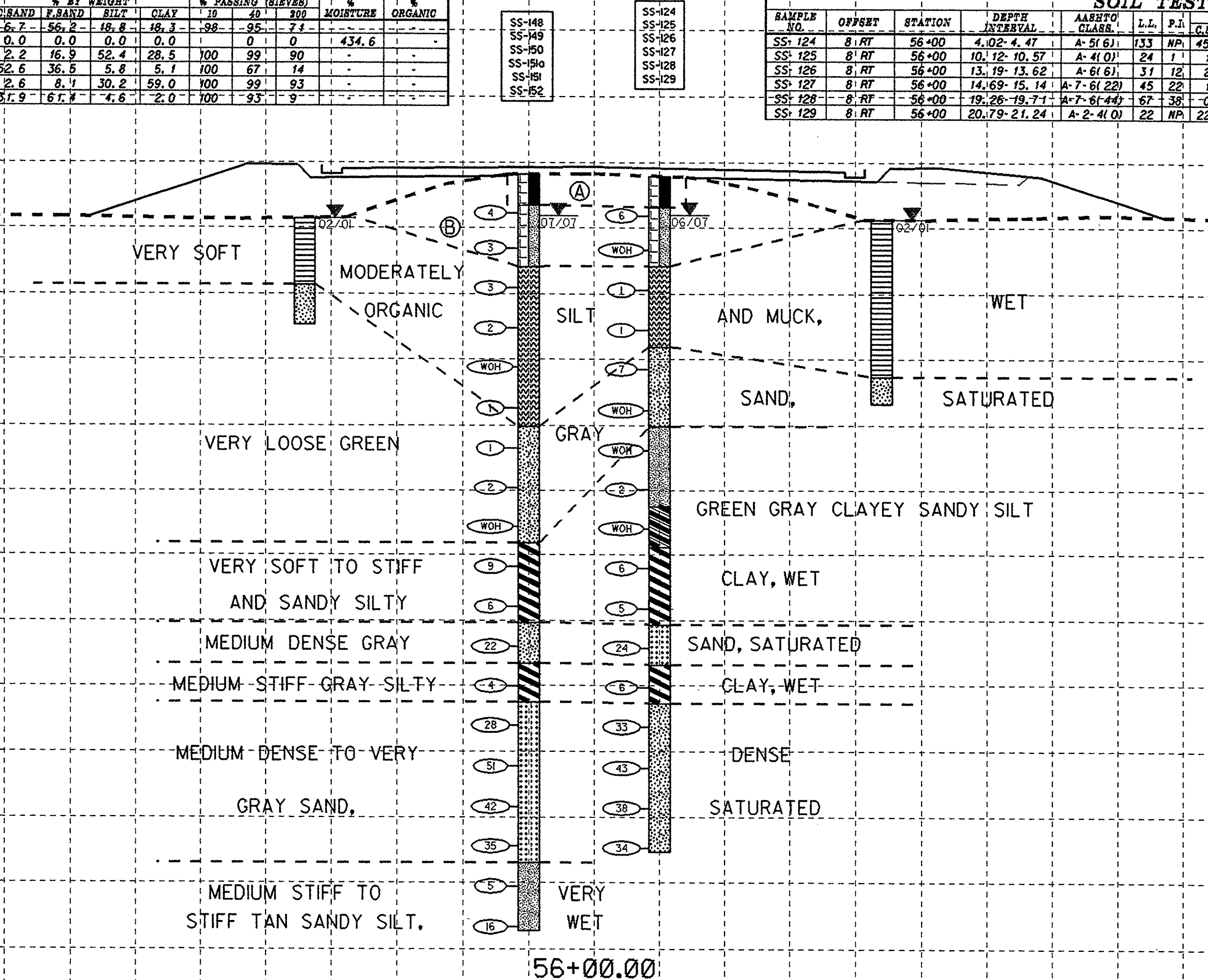
Ⓑ VERY SOFT TO SOFT TAN SANDY SILT, MOIST TO WET (ROADWAY EMBANKMENT)

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-148	8M LT	56+00	1.19-1.64	A-4(0)	23	2	6.7	56.2	18.8	18.3	98	95	71	-	-
SS-149	8M RT	56+00	4.02-4.47				0.0	0.0	0.0	0.0		0	0	434.6	-
SS-150	8M LT	56+00	14.69-15.14	A-7-6(18)	41	19	2.2	16.9	52.4	28.5	100	99	90	-	-
SS-151A	8M LT	56+00	17.74-18.19	A-2-4(0)	19	NP	52.6	36.5	5.8	5.1	100	67	14	-	-
SS-151	8M LT	56+00	19.26-19.71	A-7-6(28)	54	26	2.6	8.1	30.2	59.0	100	99	93	-	-
SS-152	8M LT	56+00	20.79-21.24	A-3(0)	17	NP	31.9	61.4	4.6	2.0	100	93	9	-	-

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-124	8 RT	56+00	4.02-4.47	A-5(6)	133	NP	45.0	6.1	40.8	8.1	97	57	49	-	53.4
SS-125	8 RT	56+00	10.12-10.57	A-4(0)	24	1	1.0	72.1	12.7	14.2	100	99	37	-	-
SS-126	8 RT	56+00	13.19-13.62	A-6(6)	31	12	2.6	47.0	28.1	22.3	100	98	67	-	-
SS-127	8 RT	56+00	14.69-15.14	A-7-6(22)	45	22	1.8	7.7	58.1	32.4	100	99	92	-	-
SS-128	8 RT	56+00	19.26-19.71	A-7-6(44)	67	38	0.8	5.9	32.5	60.8	100	100	97	-	-
SS-129	8 RT	56+00	20.79-21.24	A-2-4(0)	22	NP	22.6	68.7	6.7	2.0	100	93	12	-	-



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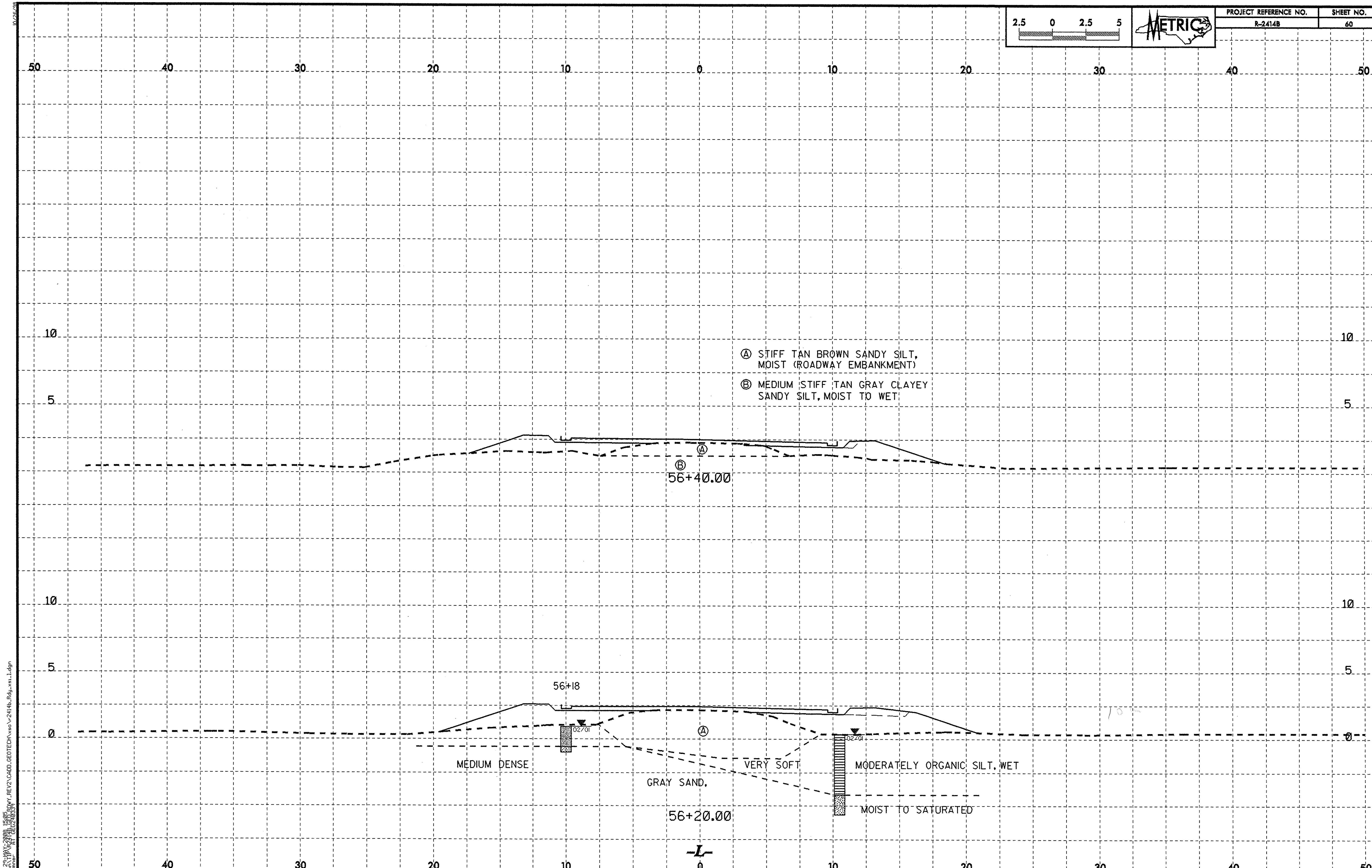
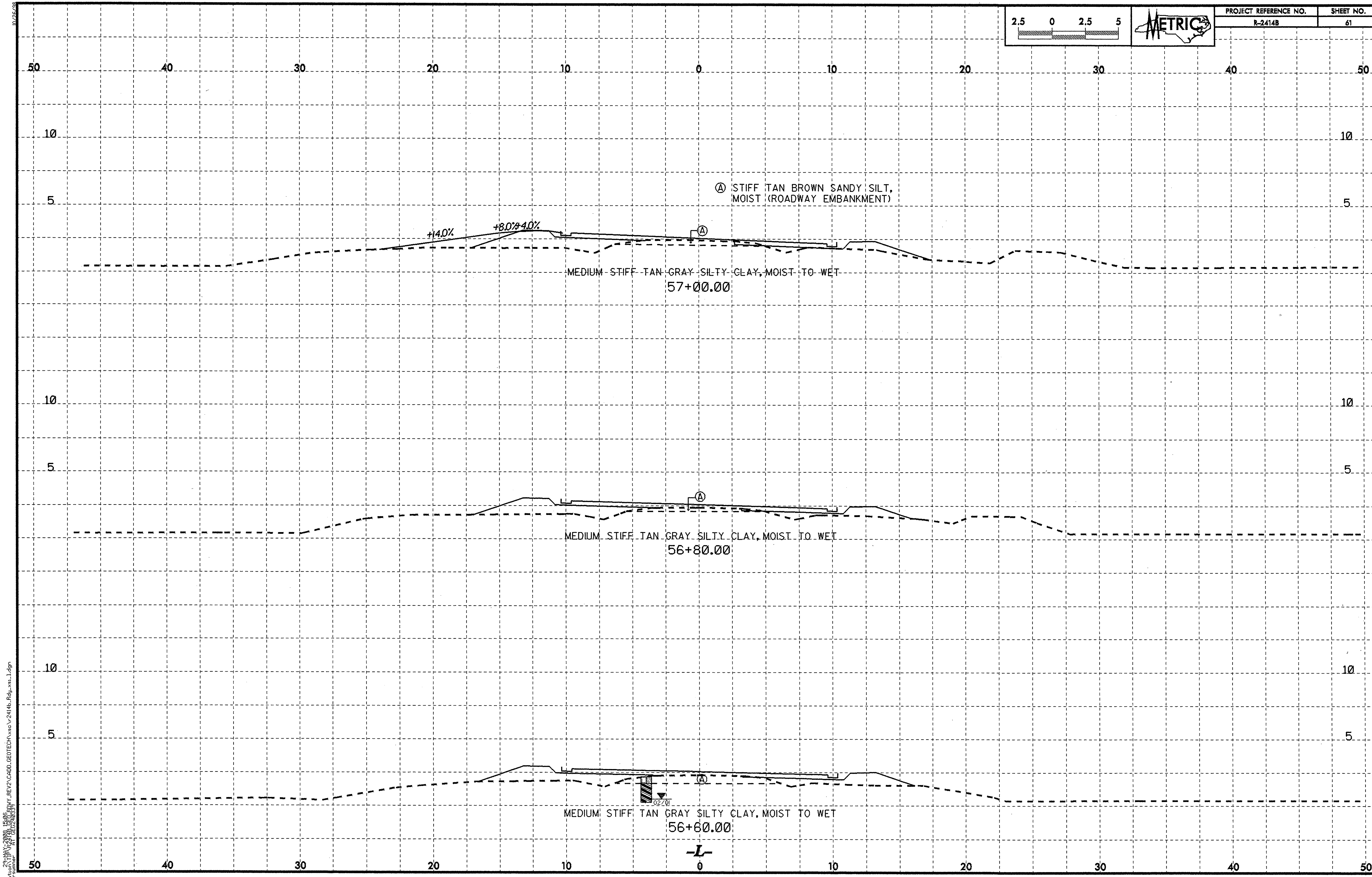

PROJECT REFERENCE NO.
R-2414B
SHEET NO.
60
METRIC
2.5 0 2.5 5
Ⓐ STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)
Ⓑ MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT, MOIST TO WET
56+40.00
56+18
MEDIUM DENSE
GRAY SAND,
VERY SOFT
MODERATELY ORGANIC SILT, WET
MOIST TO SATURATED
56+20.00
-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	61



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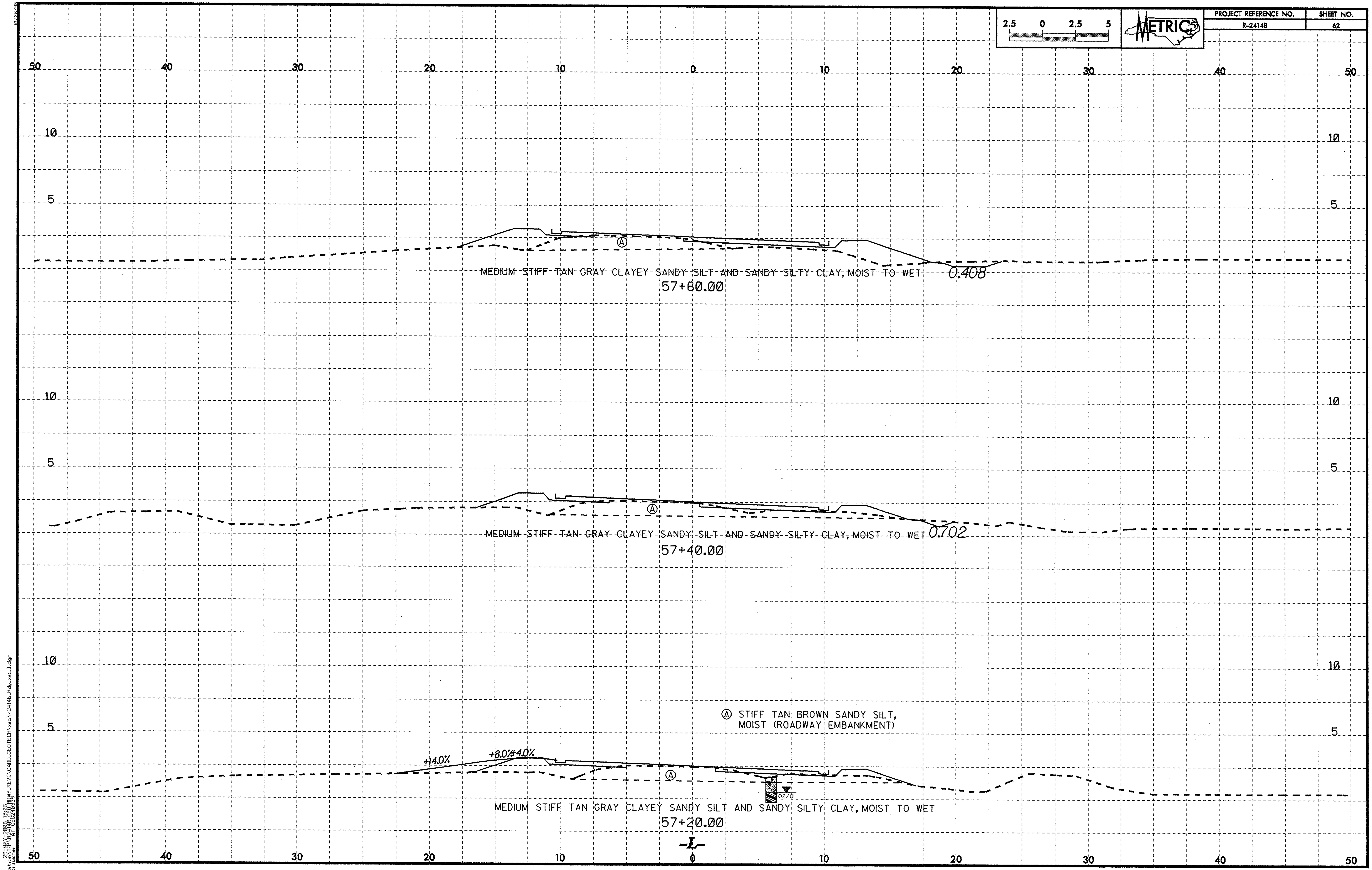
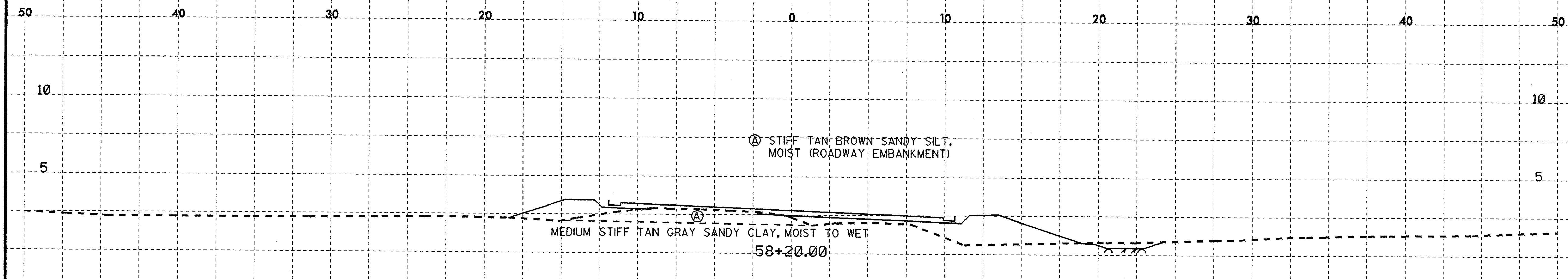
AT GEG240339
crsumner

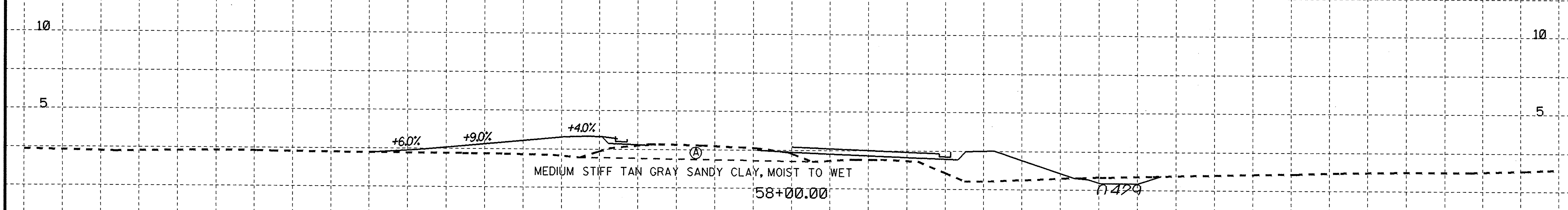


PROJECT REFERENCE NO.
R-2414B
SHEET NO.
62
METRIC
2.5 0 2.5 5
MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT AND SANDY SILTY CLAY, MOIST TO WET
0.408
57+60.00
MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT AND SANDY SILTY CLAY, MOIST TO WET
0.702
57+40.00
Ⓐ STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)
+14.0%
+8.0%
+4.0%
MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT AND SANDY SILTY CLAY, MOIST TO WET
57+20.00
-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	63

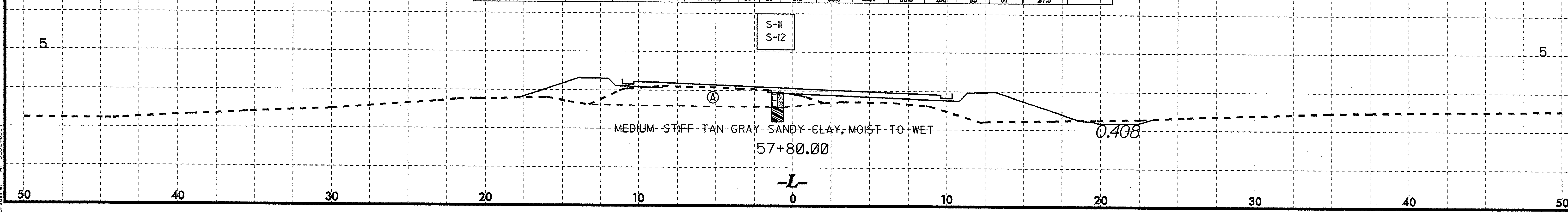
METRIC



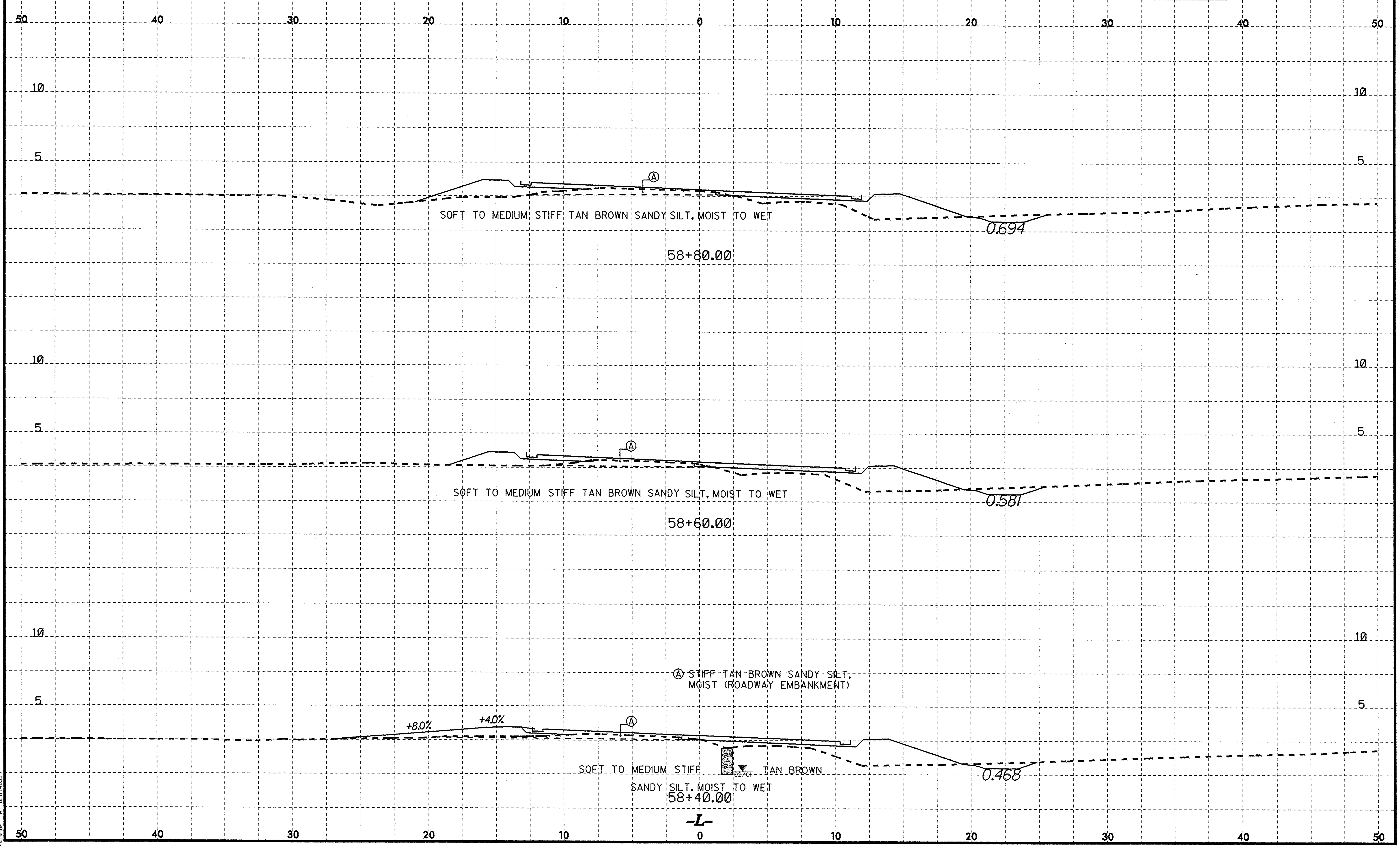


SOIL TEST RESULTS

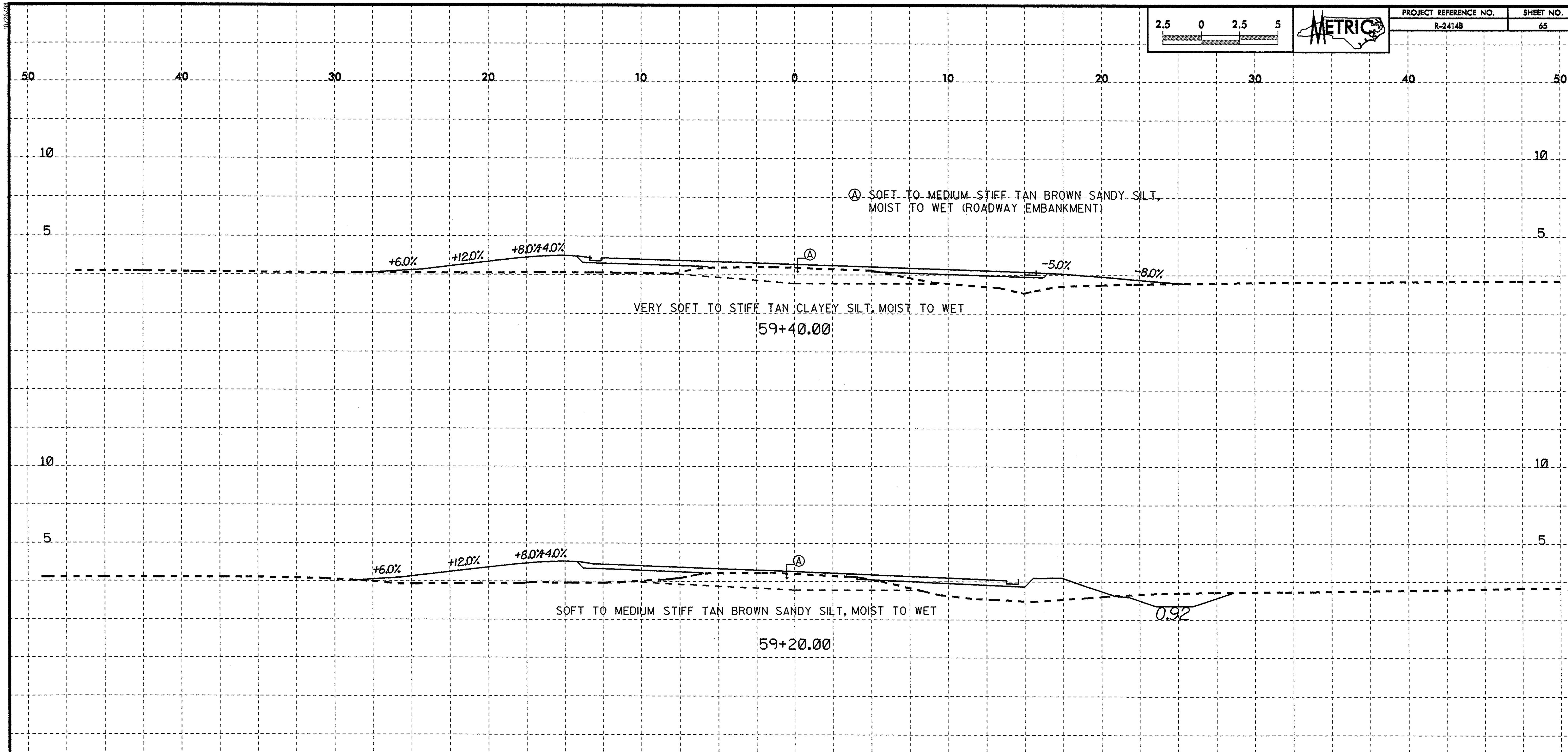
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 2.00	425	75	% MOISTURE	% ORGANIC
S-11	1M LT	57+80	0.00-1.00	A-4(0)	16	NP	8.5	61.7	13.7	16.1	100	99	58		
S-12	1M LT	57-80	1.00-1.93	A-6(13)	34	16	2.0	39.3	22.4	36.3	100	99	87	27.3	



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	64

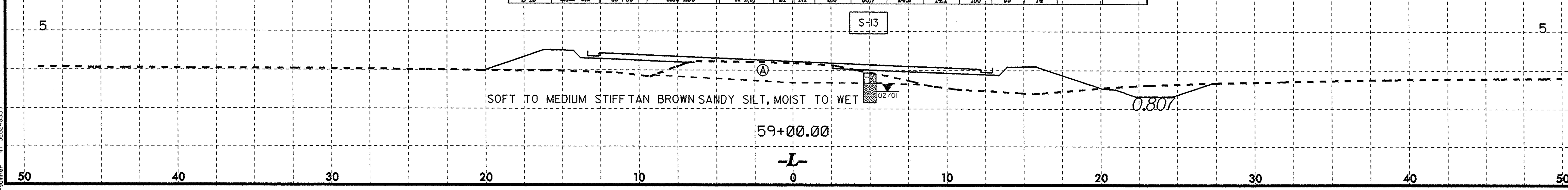


PROJECT REFERENCE NO.	SHEET NO.
R-2414B	65



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	2.00	425	75		
S-13	4.5M RT	59+00	0.00-1.93	A-4(0)	21	NP	3.0	58.7	24.2	14.1	100	99	74		



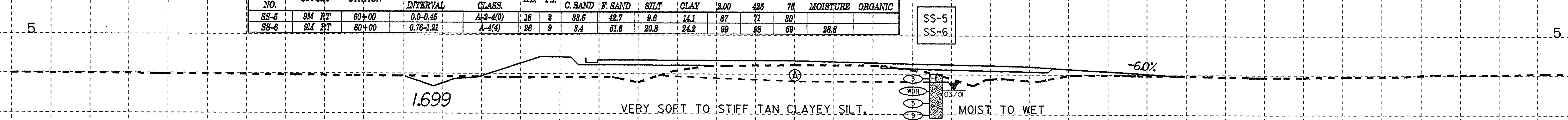
PROJECT REFERENCE NO.	SHEET NO.
R-2414B	66

METRIC

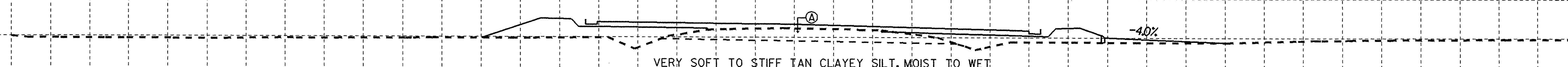
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 2.00	425	75	% MOISTURE	% ORGANIC
SS-5	9M RT	60+00	0.0-0.45	A-2-4(0)	18	2	33.6	42.7	9.6	14.1	87	71	30		
SS-6	9M RT	60+00	0.76-1.21	A-4(4)	26	9	3.4	51.6	20.8	24.2	99	98	69	26.8	

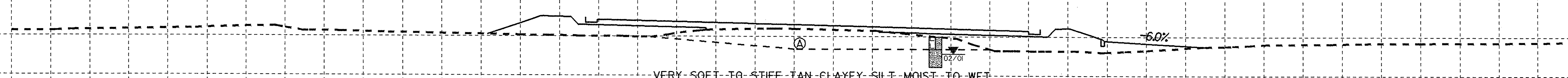
Ⓐ SOFT TO MEDIUM STIFF TAN BROWN SANDY SILT AND VERY LOOSE SAND, MOIST TO WET (ROADWAY EMBANKMENT)



60+00.00

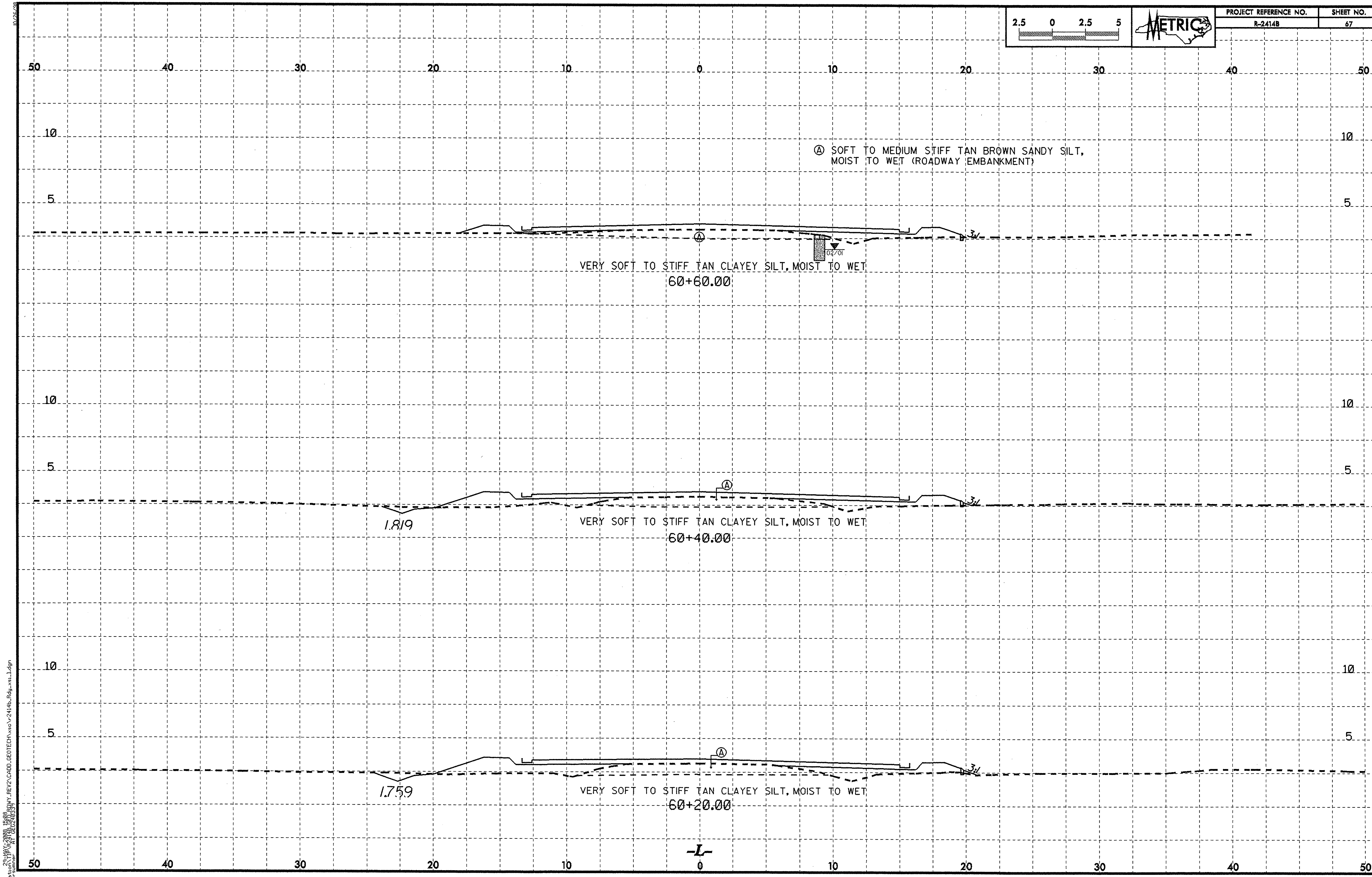


59+80.00



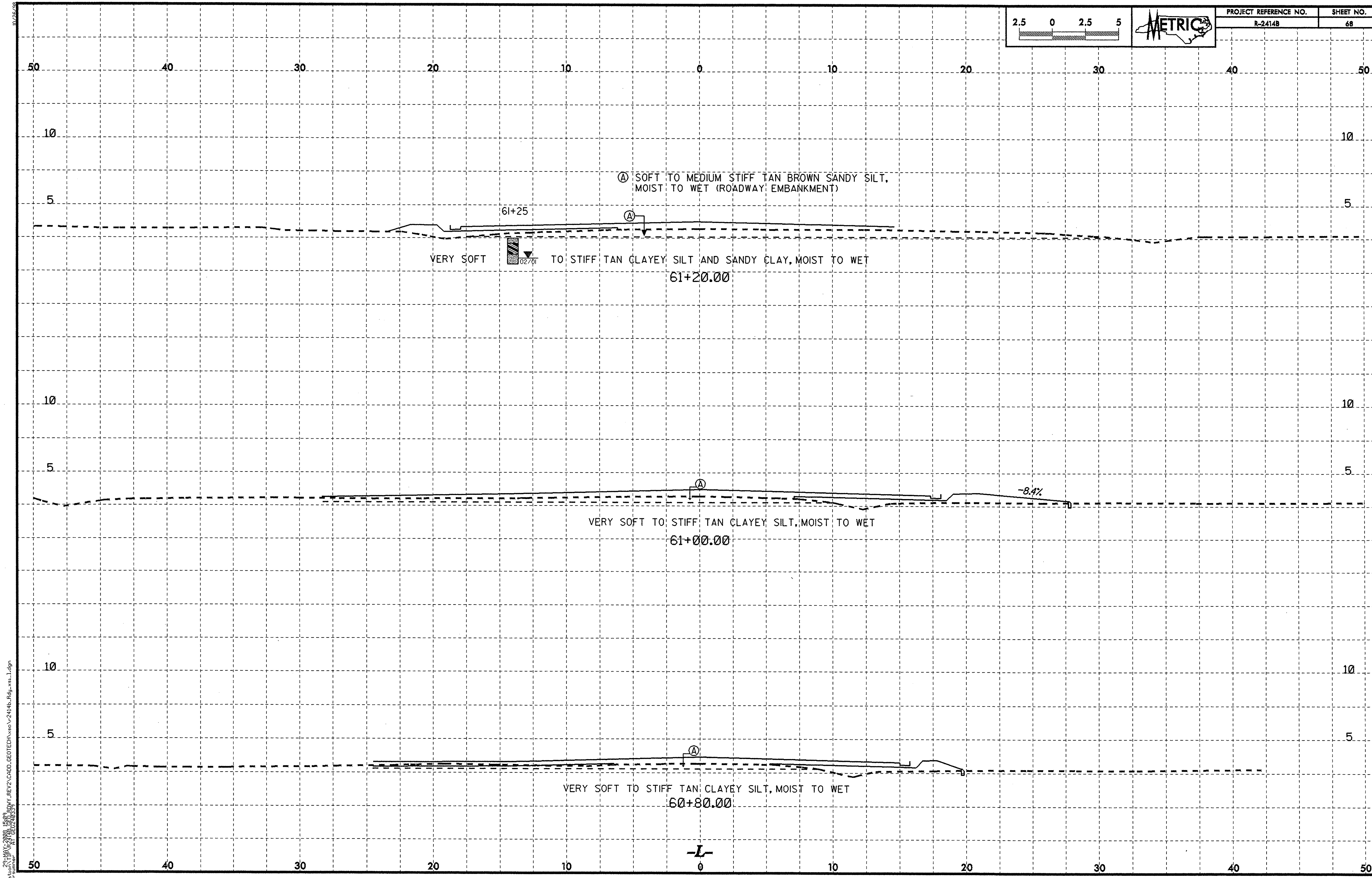
59+60.00

-L-



2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
R-2414B
SHEET NO.
67
Ⓐ SOFT TO MEDIUM STIFF TAN BROWN SANDY SILT, MOIST TO WET (ROADWAY EMBANKMENT)
VERY SOFT TO STIFF TAN CLAYEY SILT, MOIST TO WET
60+60.00
1.819
VERY SOFT TO STIFF TAN CLAYEY SILT, MOIST TO WET
60+40.00
1.759
VERY SOFT TO STIFF TAN CLAYEY SILT, MOIST TO WET
60+20.00
-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	68



29-MAY-2008 15:09
...igation\TIP\R2414B_GEO_RDWY_REV2\CADD_GEOTECH\xsc\r2414b_Rdy_xsi_1.dgn
crsumner AT GEG2403339

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	69

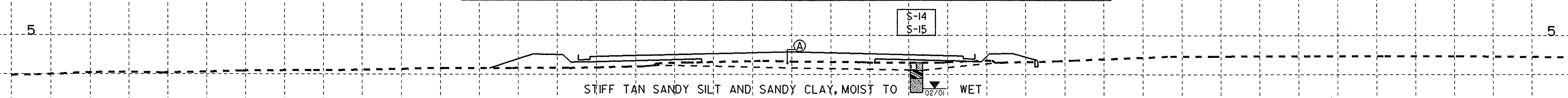
METRIC

2.5 0 2.5 5

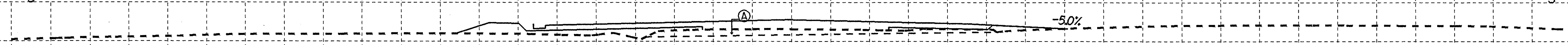
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 2.00	% PASSING (SIEVES) 425	% PASSING (SIEVES) 75	% MOISTURE	% ORGANIC
S-14	8M RT	61+80	0.50-1.00	A-6(9)	31	12	1.4	44.0	22.4	32.3	100	100	86		
S-15	8M RT	61+80	1.00-1.93	A-4(0)	28	NP	7.1	76.8	10.1	6.0	100	99	62		

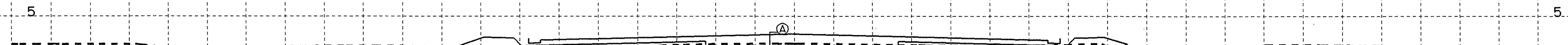
Ⓐ SOFT TO MEDIUM STIFF TAN BROWN SANDY SILT, MOIST TO WET (ROADWAY EMBANKMENT)



61+80.00



61+60.00



61+40.00

-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	70

2.5 0 2.5 5 METRIC

50 40 30 20 10 0 10 20 30 40 50

10

5

Ⓐ SOFT TO MEDIUM STIFF TAN BROWN SANDY SILT, MOIST TO WET (ROADWAY EMBANKMENT)

STIFF SM 02701 TAN SANDY SILT AND SANDY CLAY, MOIST TO WET

62+40.00

10

5

+10.0% +16.0% +12.0% +8.0% +4.0%

Ⓐ STIFF TAN SANDY SILT AND SANDY CLAY, MOIST TO WET

62+20.00

10

5

-5.0%

Ⓐ STIFF TAN SANDY SILT AND SANDY CLAY, MOIST TO WET

62+00.00

-L-

50 40 30 20 10 0 10 20 30 40 50

10/26/08

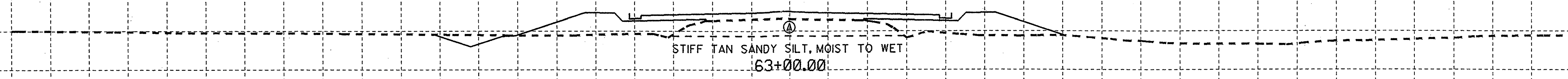
29-MAY-2008 15:09
J:\projects\TIP\R-2414B_050_RDWY_REV2\CADD_GEOTECH\xsov\r-2414b_Rdy_xs1.1.dgn
$gsmoser (MT SSCOMOSS)

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	71

METRIC

Ⓐ MEDIUM STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)

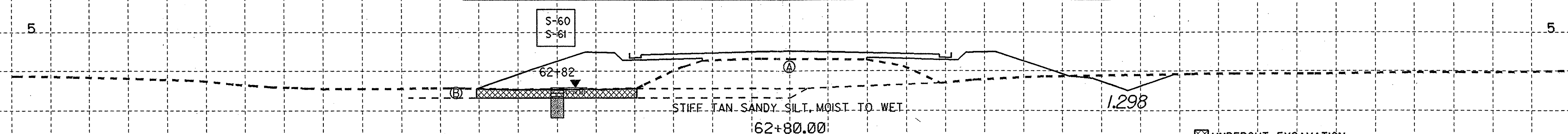
Ⓑ VERY SOFT SILT WITH LITTLE ORGANIC MATTER, WET



END UNDERCUT -L- STA. 62+96.00 +/-

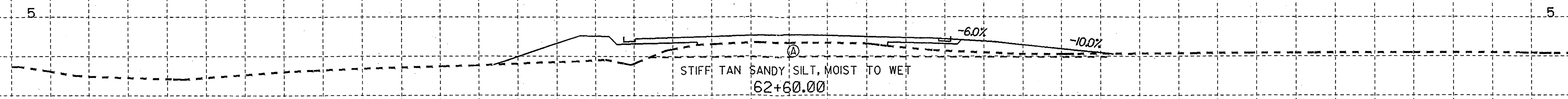
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	2.00	425	75		
S-60	10M LT	62+82	0.00-0.60	A-4(3)	30	6	7.5	42.3	30.1	20.1	100	98	70		
S-81	10M LT	62+82	0.60-1.90	A-4(0)	19	NP	10.3	60.1	20.5	9.1	100	98	58	25.2	



UNDERCUT EXCAVATION

BEGIN UNDERCUT -L- STA. 62+72.00 +/-



-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	72

2.5 0 2.5 5 METRIC

50 40 30 20 10 0 10 20 30 40 50

10

5

Ⓐ MEDIUM STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)

STIFF 02/01 TAN SANDY SILT, MOIST TO WET

63+60.00

10

5

1.894

Ⓐ STIFF TAN SANDY SILT, MOIST TO WET

63+40.00

10

5

1.682

Ⓐ STIFF TAN SANDY SILT, MOIST TO WET

63+20.00

-L-

50 40 30 20 10 0 10 20 30 40 50

2.5 0 2.5 5	METRIC	PROJECT REFERENCE NO.	SHEET NO.
		R-2414B	73

50 40 30 20 10 0 10 20 30 40 50

10

5

Ⓐ MEDIUM STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)

STIFF TAN SANDY SILT, MOIST TO WET

64+20.00

10

5

STIFF TAN SANDY SILT, MOIST TO WET

64+00.00

10

5

STIFF TAN SANDY SILT, MOIST TO WET

63+80.00

-L-

50 40 30 20 10 0 10 20 30 40 50

10/26/08

28-MAY-2008 15:19
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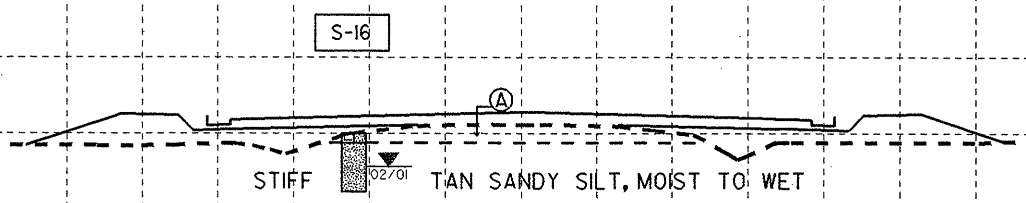
User name: RT DEZIEMONE

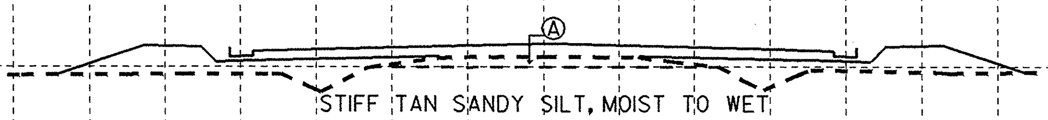
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 2.00	425	75	% MOISTURE	% ORGANIC
S-16	5.5M LT	64+80	0.80-1.93	A-4(0)	20	4	20.6	49.6	11.7	18.1	100	94	40		

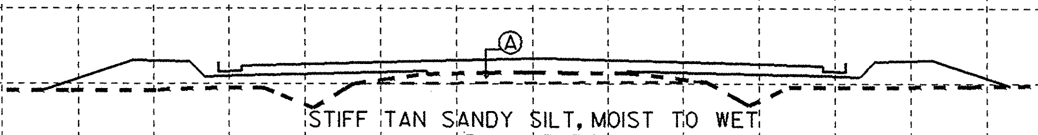
Ⓐ MEDIUM STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)



64+80.00



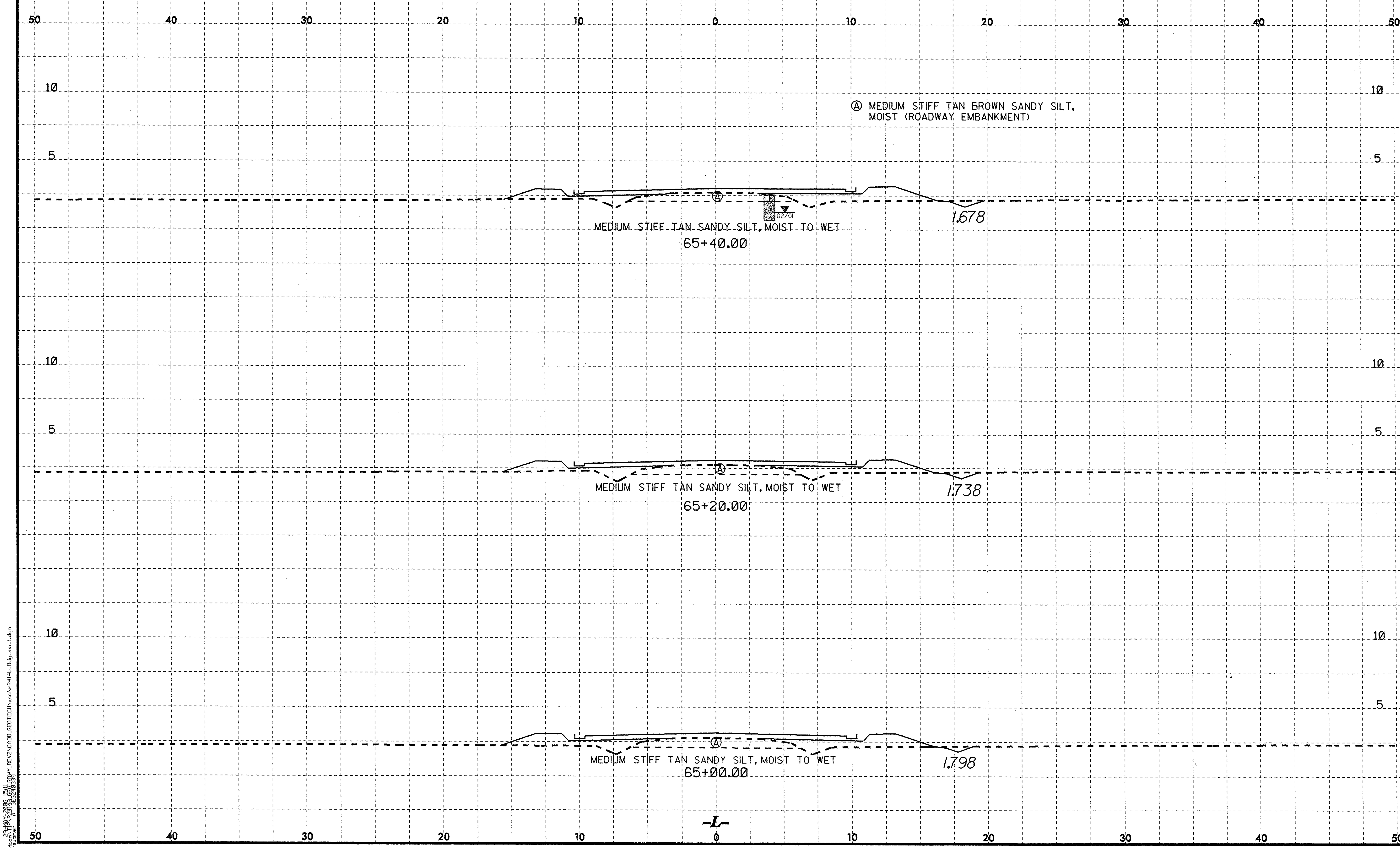
64+60.00



64+40.00

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	75

METRIC



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	76

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) 2.00	425	75	% MOISTURE	% ORGANIC
S-48	5.5M LT	66+00	0.00-1.93	A-4(0)	16	NP	14.9	54.8	16.2	14.1	100	97	46		

Ⓐ MEDIUM STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)

S-48

MEDIUM Ⓐ 02/01 STIFF TAN SANDY SILT, MOIST TO WET

66+00.00

MEDIUM STIFF TAN SANDY SILT, MOIST TO WET

65+80.00

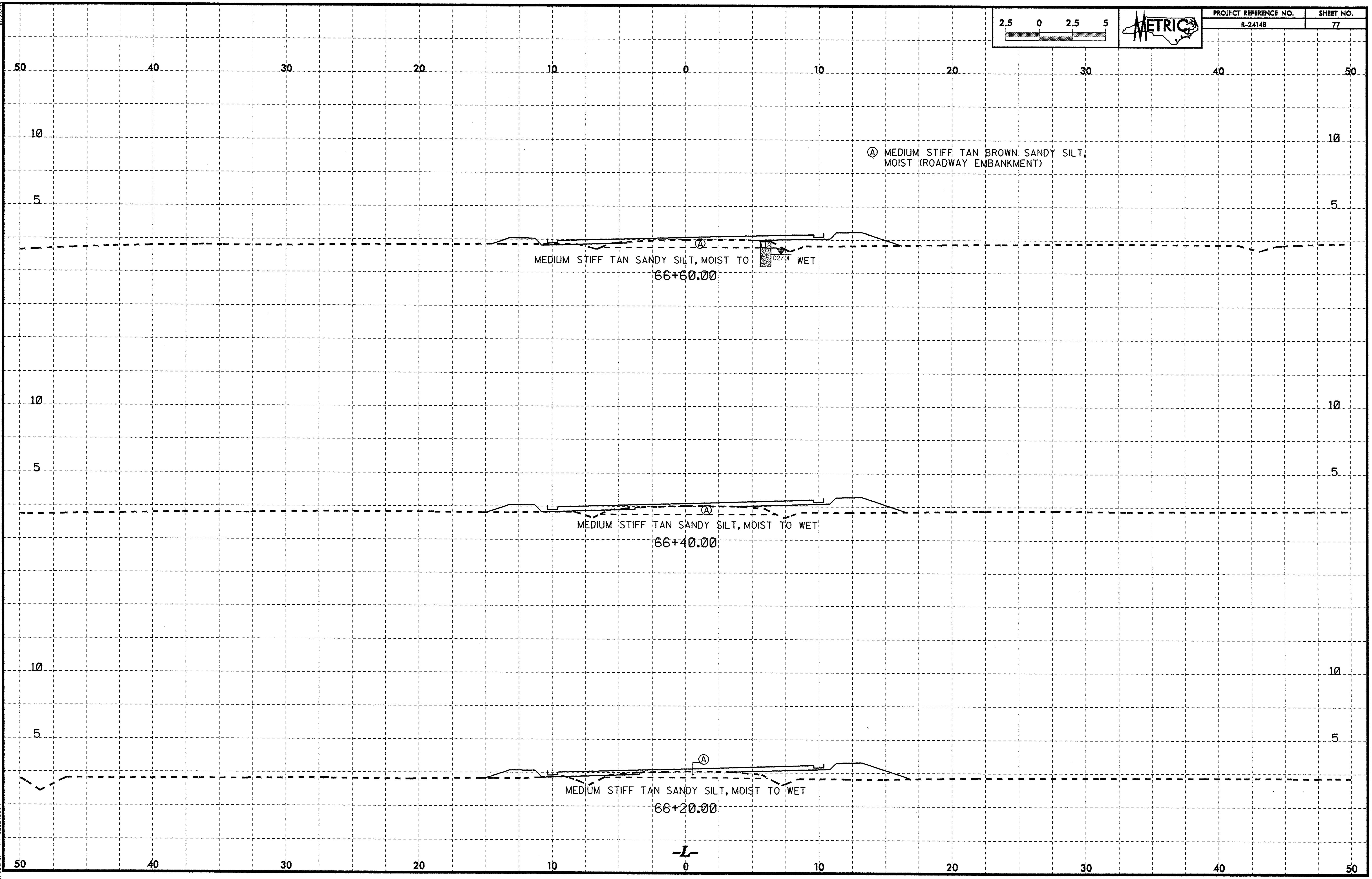
+10.0% +4.0%

MEDIUM STIFF TAN SANDY SILT, MOIST TO WET

65+60.00

1.618

-L-



10/26/98

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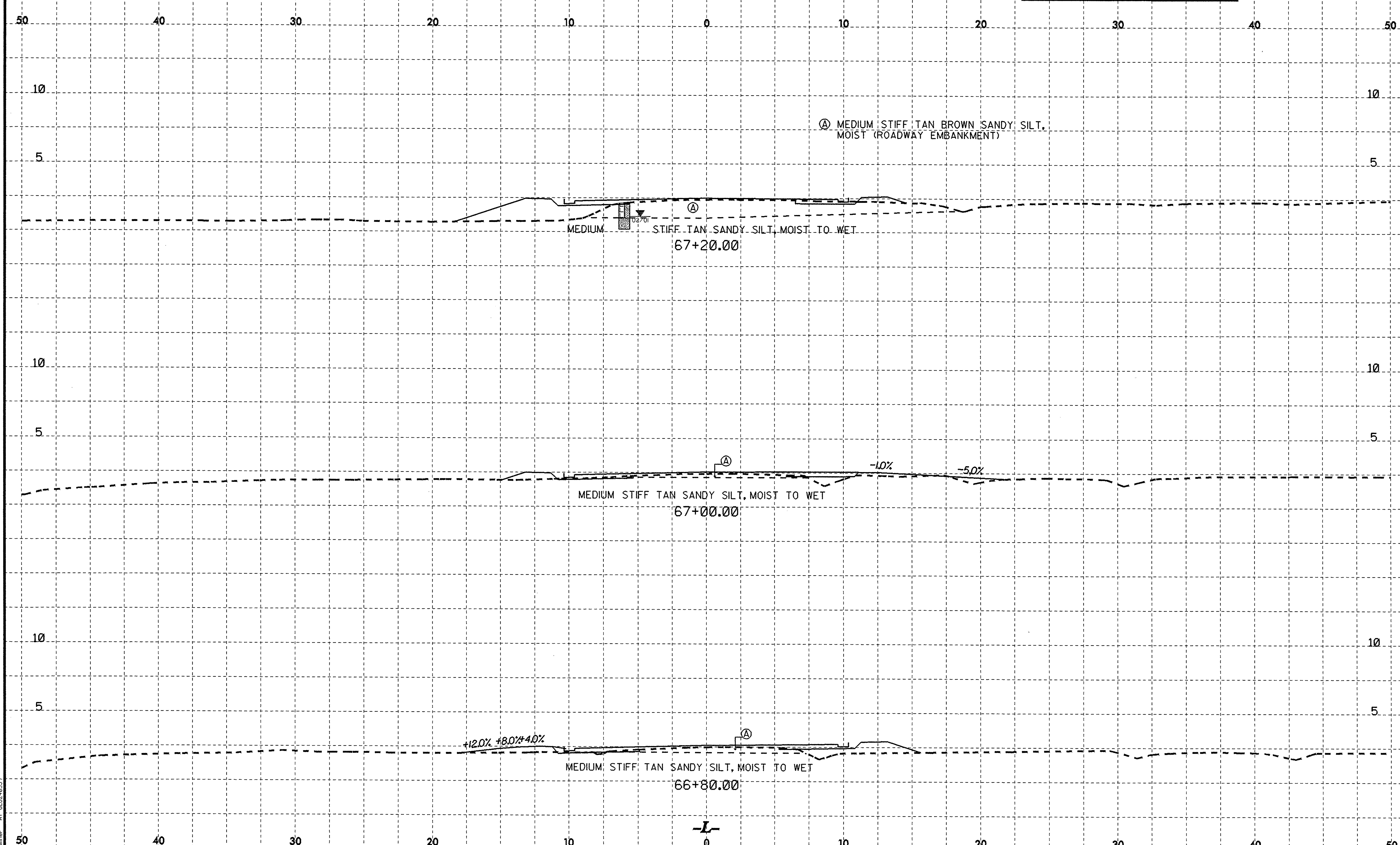
crsumner AT GEG240339

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	78

METRIC



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	79

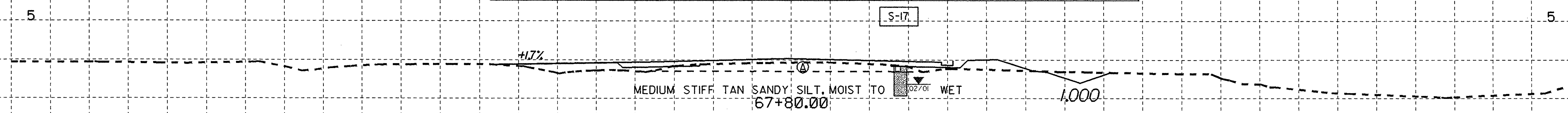
METRIC

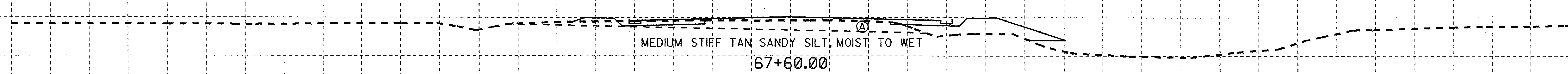
2.5 0 2.5 5

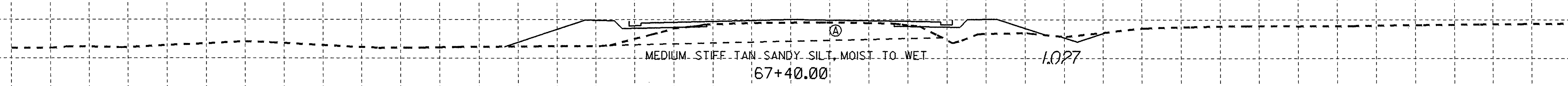
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 2.00	% PASSING (SIEVES) .425	% PASSING (SIEVES) .075	% MOISTURE	% ORGANIC
S-17	7M RT	67+80	0.00-1.93	A-4(0)	22	3	9.7	61.7	16.5	12.1	100	98	69		

(A) MEDIUM STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)





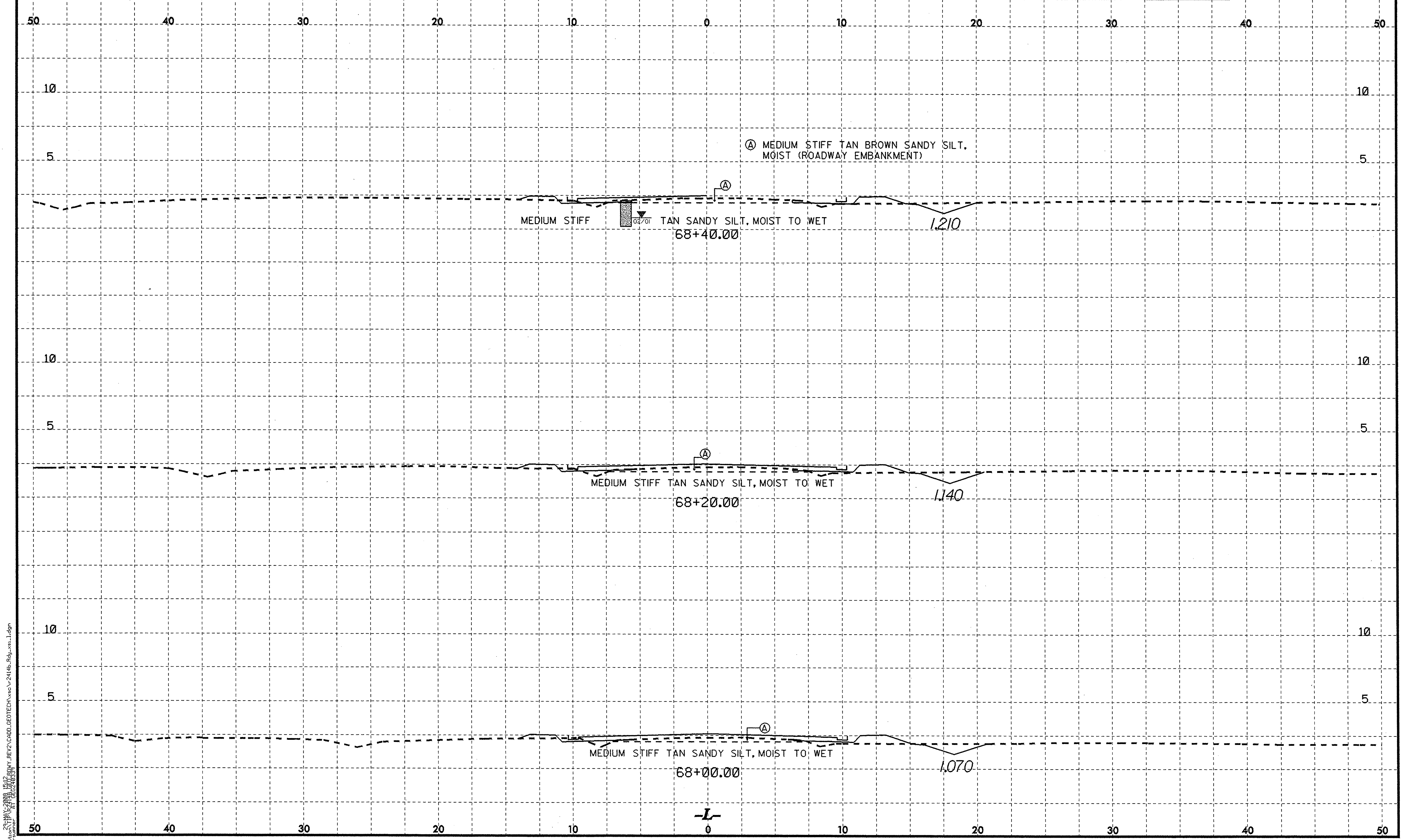


-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	80

2.5 0 2.5 5

METRIC



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crsumner AT GEG2403339

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	81

2.5 0 2.5 5

METRIC

50 40 30 20 10 0 10 20 30 40 50

10

5

Ⓐ MEDIUM STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)

+4.0%

Ⓐ

MEDIUM STIFF TAN SANDY SILT, MOIST TO WET

02701

69+00.00

Ⓐ

MEDIUM STIFF TAN SANDY SILT, MOIST TO WET

68+80.00

Ⓐ

MEDIUM STIFF TAN SANDY SILT, MOIST TO WET

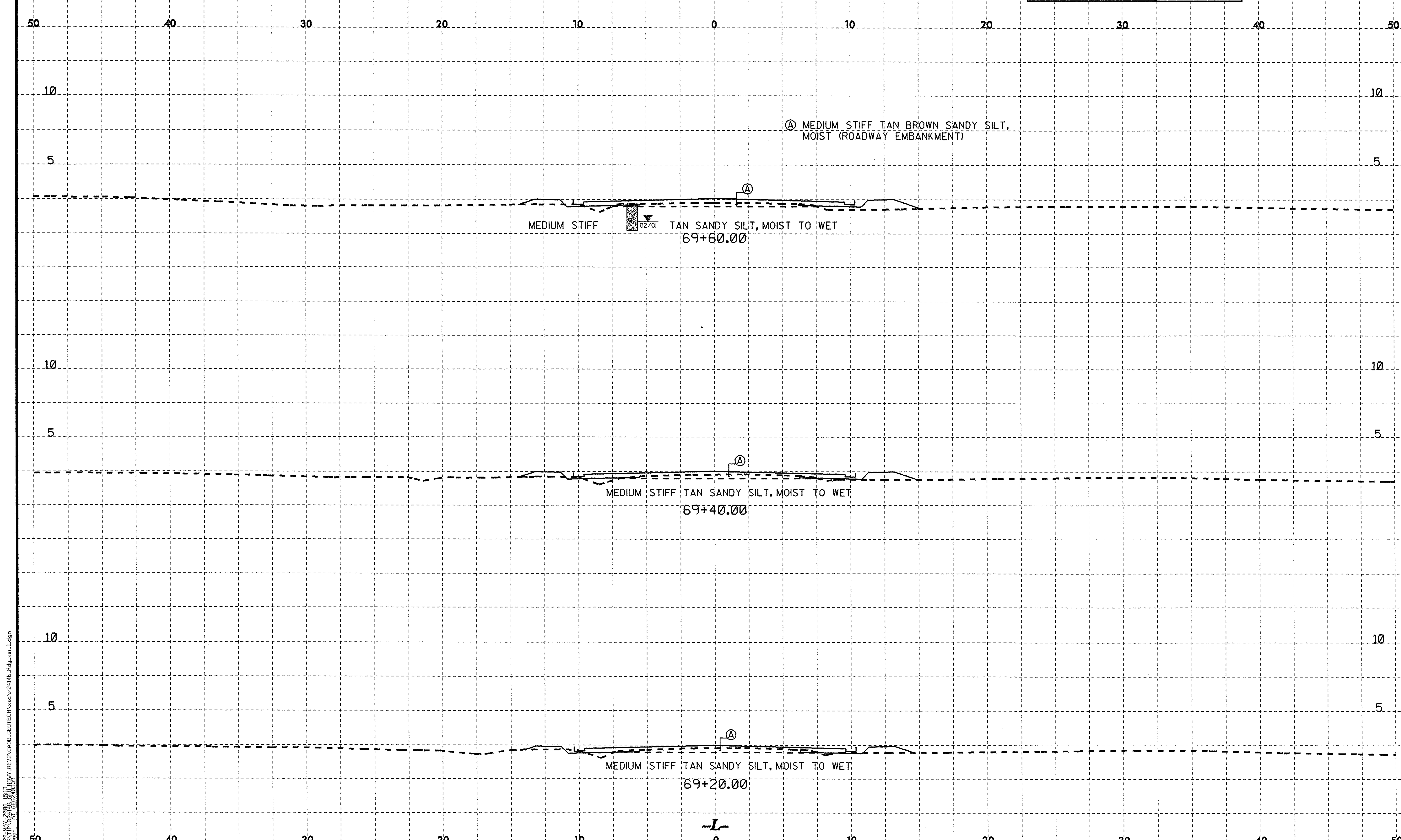
1.280

68+60.00

-L-

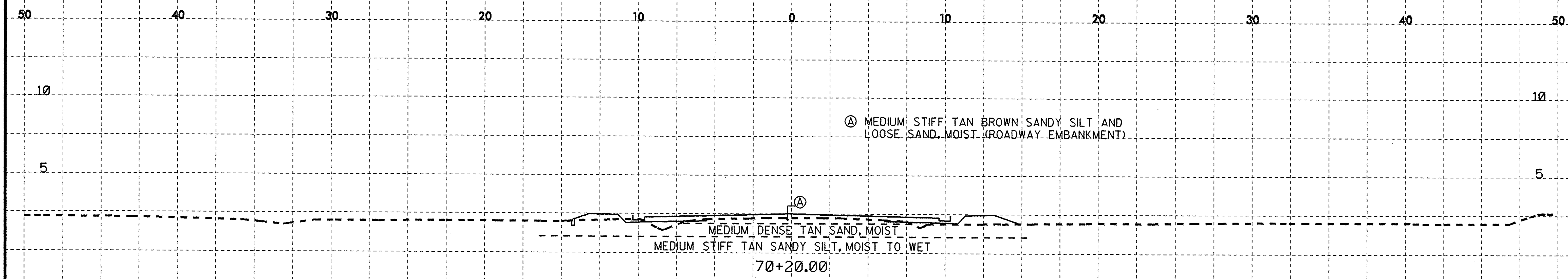
50 40 30 20 10 0 10 20 30 40 50

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	82



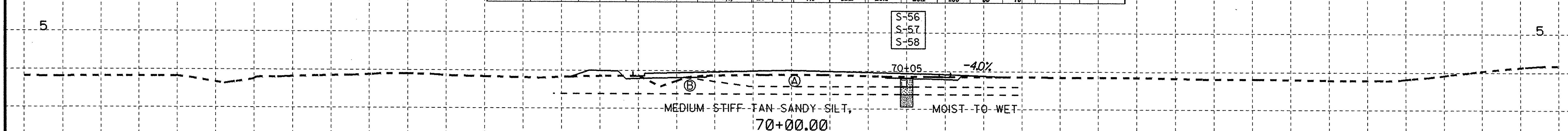
PROJECT REFERENCE NO.	SHEET NO.
R-2414B	83

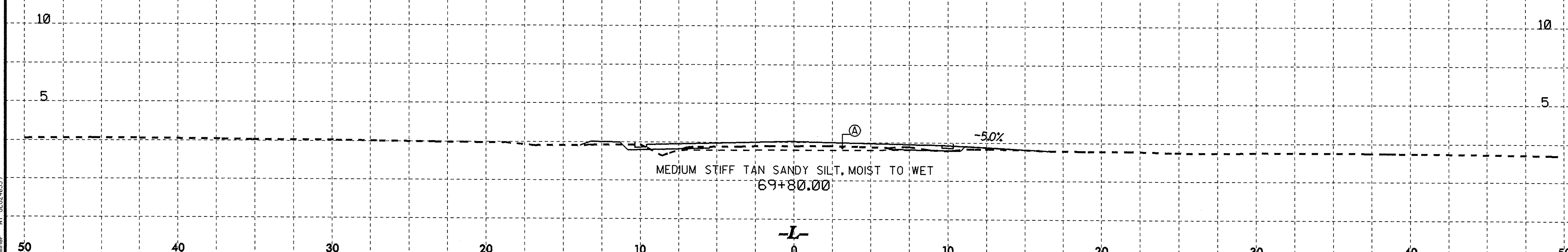
METRIC

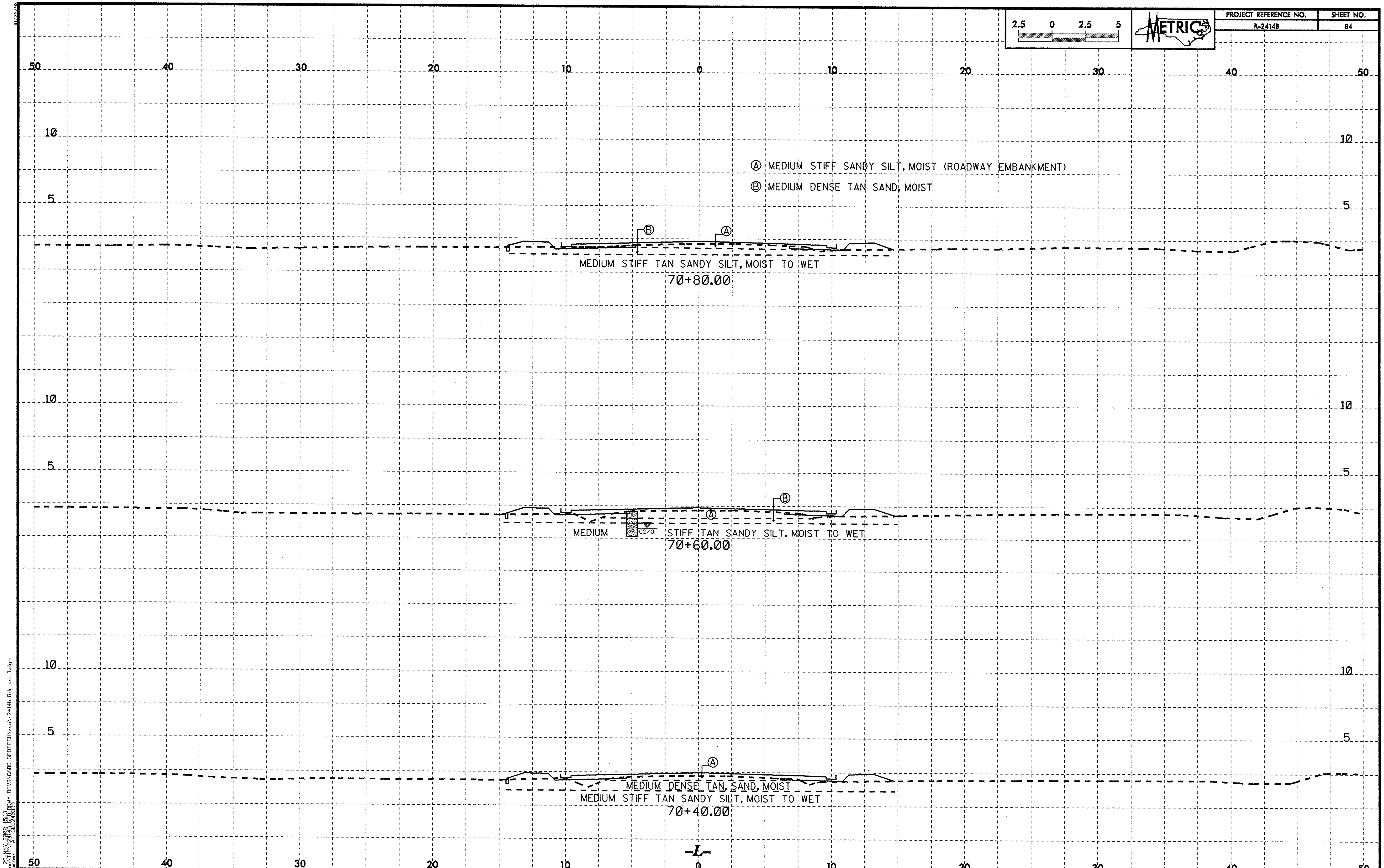


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 2.00	425	75	% MOISTURE	% ORGANIC
S-56	7.5M RT	70+05	0.00-0.60	A-2-4(0)	21	NP	30.3	46.1	12.5	11.1	83	74	25		
S-57	7.5M RT	70+05	0.60-1.10	A-2-4(0)	22	5	21.1	52.8	18.0	8.1	100	96	35		
S-58	7.5M RT	70+05	1.10-1.93	A-4(3)	26	6	7.0	52.2	20.6	20.1	100	99	79		





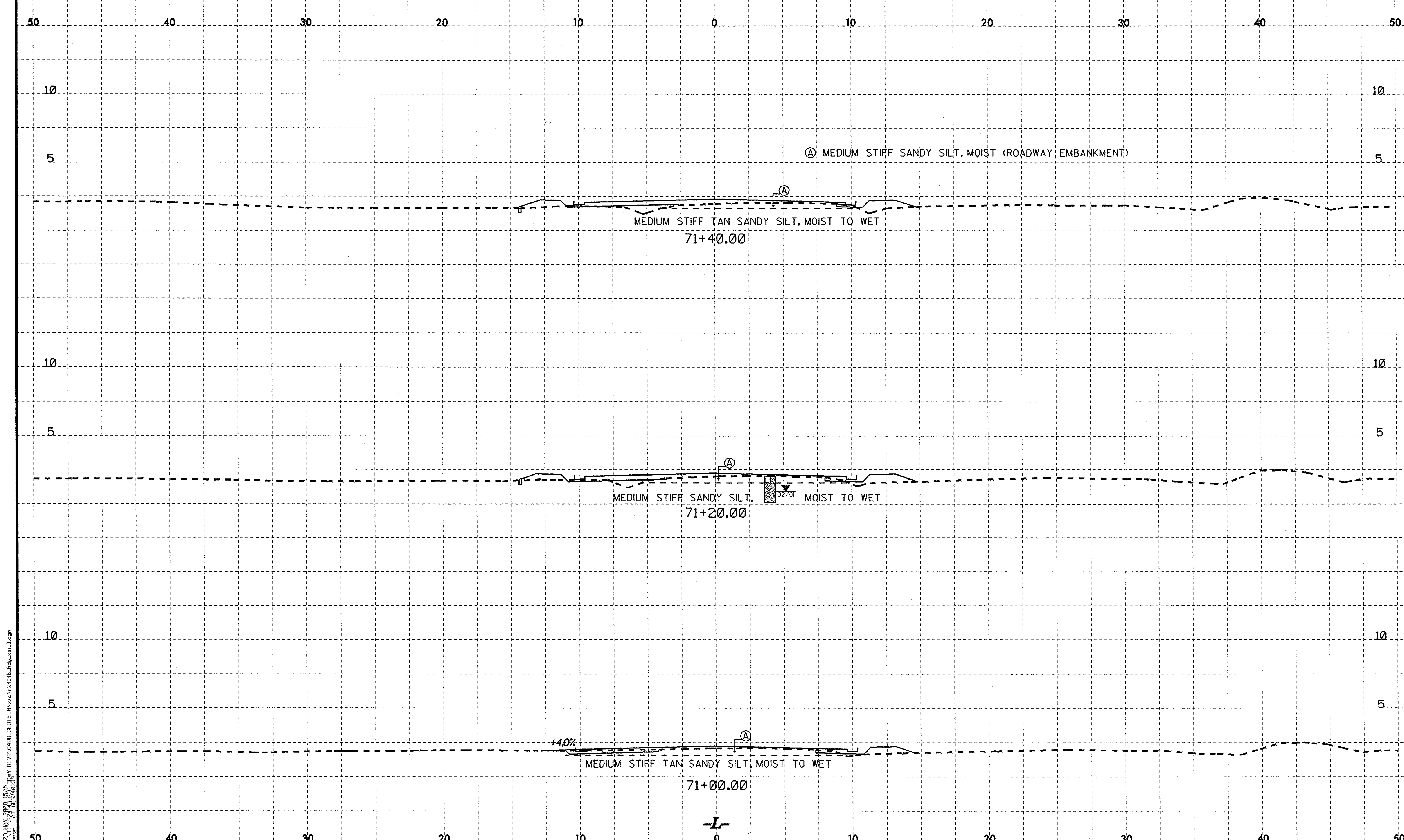


2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
R-2414B
SHEET NO.
84
Ⓐ MEDIUM STIFF SANDY SILT, MOIST (ROADWAY EMBANKMENT)
Ⓑ MEDIUM DENSE TAN SAND, MOIST
MEDIUM STIFF TAN SANDY SILT, MOIST TO WET
70+80.00
MEDIUM
02/01
STIFF TAN SANDY SILT, MOIST TO WET
70+60.00
MEDIUM DENSE TAN SAND, MOIST
MEDIUM STIFF TAN SANDY SILT, MOIST TO WET
70+40.00
-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	85

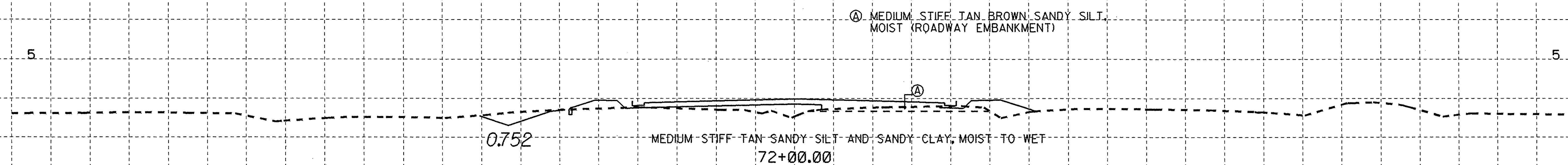
2.5 0 2.5 5

METRIC



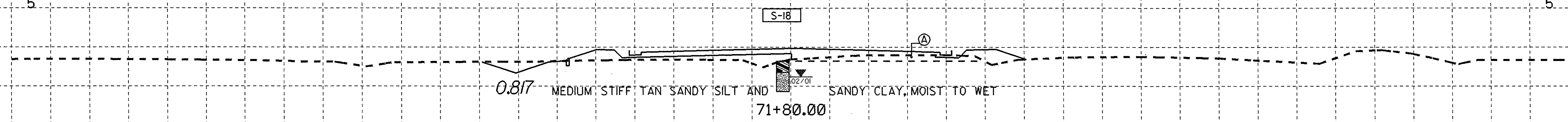
PROJECT REFERENCE NO.	SHEET NO.
R-2414B	86

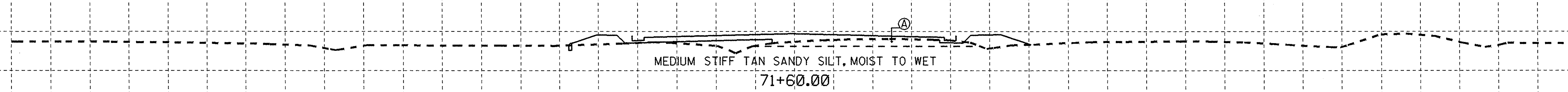
METRIC



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 2.00	% PASSING (SIEVES) 425	% PASSING (SIEVES) 75	% MOISTURE	% ORGANIC
S-18	0.5M LT	71+80	0.00-0.70	A-6(3)	27	11	16.9	39.3	15.5	28.2	100	96	54	20.5	





-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	87

2.5 0 2.5 5

50 40 30 20 10 0 10 20 30 40 50

10

5

Ⓐ MEDIUM STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)

Ⓑ VERY SOFT DARK BROWN MUCK AND MODERATELY ORGANIC SILT, WET

B-2/01

Ⓐ

Ⓑ

MEDIUM DENSE GRAY SAND, MOIST TO SATURATED

72+60.00

B-2/01

0.30Ø

36 A

10

5

A

B-2/01

MEDIUM STIFF TAN SANDY SILT, MOIST TO WET

72+40.00

0.40'

10

5

A

-4.0%

-8.4%

MEDIUM STIFF TAN SANDY SILT, MOIST TO WET

72+20.00

-L-

50 40 30 20 10 0 10 20 30 40 50

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	88

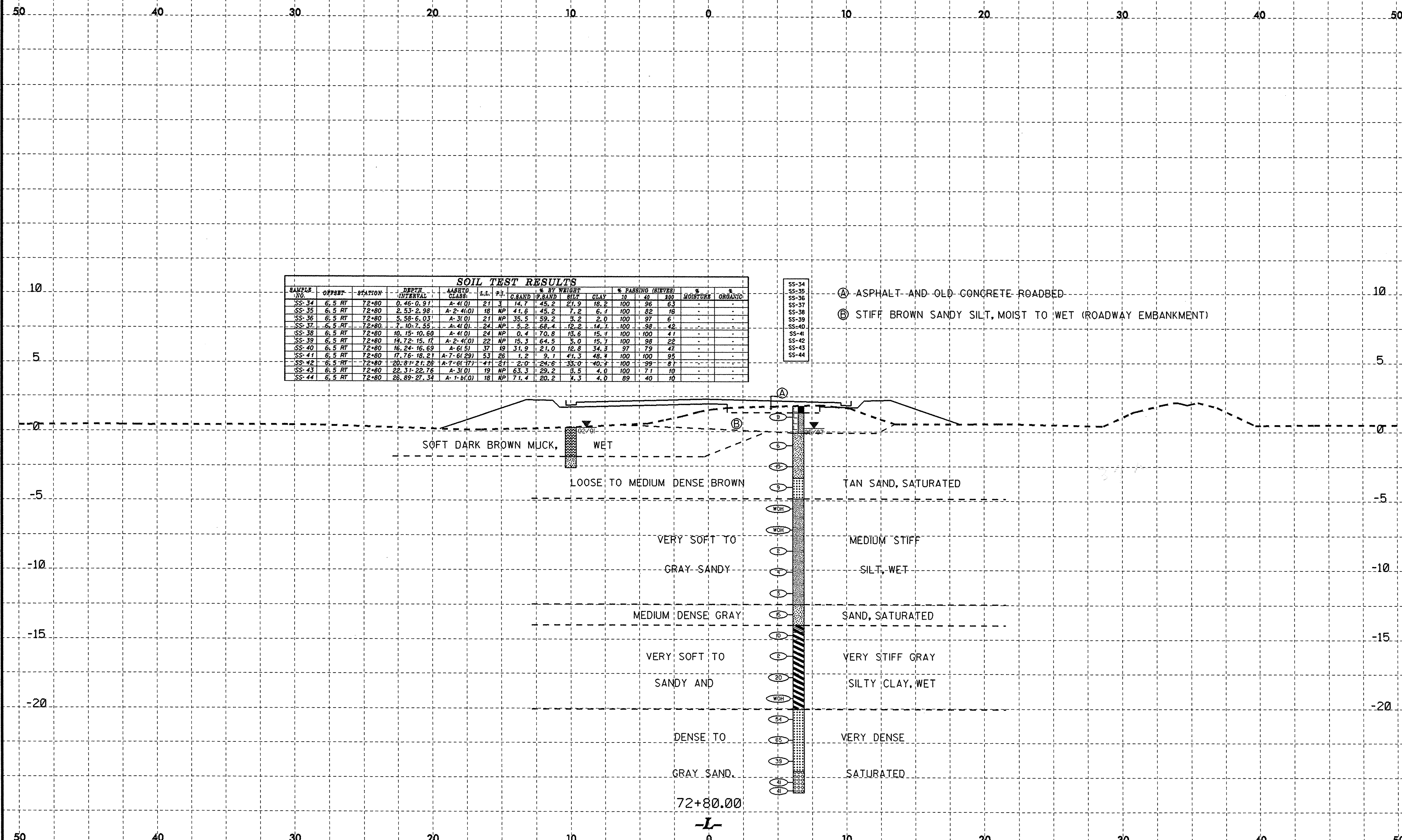
METRIC

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-34	6.5 RT	72+80	0.46-0.91	A-4(0)	21	3	14.7	45.2	21.9	18.2	100	96	63	-	-
SS-35	6.5 RT	72+80	2.53-2.98	A-2-4(0)	18	NP	41.6	45.2	7.2	6.1	100	82	16	-	-
SS-36	6.5 RT	72+80	5.58-6.03	A-3(0)	21	NP	35.5	59.2	3.2	2.0	100	97	6	-	-
SS-37	6.5 RT	72+80	7.10-7.55	A-4(0)	24	NP	5.2	68.4	12.2	14.1	100	98	42	-	-
SS-38	6.5 RT	72+80	10.15-10.60	A-4(0)	24	NP	0.4	70.8	13.6	15.1	100	100	41	-	-
SS-39	6.5 RT	72+80	14.72-15.17	A-2-4(0)	22	NP	15.3	64.5	5.0	15.1	100	98	22	-	-
SS-40	6.5 RT	72+80	16.24-16.69	A-6(5)	37	19	31.9	21.0	12.8	34.3	97	79	47	-	-
SS-41	6.5 RT	72+80	17.76-18.21	A-7-6(29)	53	26	1.2	9.1	41.3	48.4	100	100	95	-	-
SS-42	6.5 RT	72+80	20.81-21.26	A-7-6(17)	41	21	2.0	24.6	33.0	40.4	100	99	81	-	-
SS-43	6.5 RT	72+80	22.31-22.76	A-3(0)	19	NP	63.3	29.2	3.5	4.0	100	71	10	-	-
SS-44	6.5 RT	72+80	26.89-27.34	A-1-b(0)	18	NP	71.4	20.2	4.3	4.0	89	40	10	-	-

Ⓐ ASPHALT AND OLD CONCRETE ROADBED

Ⓑ STIFF BROWN SANDY SILT, MOIST TO WET (ROADWAY EMBANKMENT)



50 40 30 20 10 0 10 20 30 40 50

10
5
0

Ⓐ MEDIUM STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)

VERY SOFT DARK BROWN MUCK, WET

MEDIUM DENSE GRAY SAND, MOIST TO SATURATED

Qz/Ol Qz/Ol Qz/Ol

B-5 Ⓐ

73+00.00

-L-

50 40 30 20 10 0 10 20 30 40 50

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) 2.00	425	75	% MOISTURE	% ORGANIC
SS-100	CL	73+20	1.07-1.52	A-4(0)	20	NP	11.6	57.4	18.9	12.2	100	97	68	-	-
SS-101	CL	73+20	5.55-6.00	A-2-4(0)	24	NP	17.4	76.8	5.8	0.0	100	100	11	-	-
SS-102	CL	73+20	7.07-7.52	A-4(0)	25	2	0.6	68.5	16.7	14.2	100	100	43	-	-
SS-103	CL	73+20	11.64-12.09	A-4(0)	23	1	1.0	70.5	14.3	14.2	100	100	42	-	-
SS-104	CL	73+20	14.69-15.14	A-7-6(29)	53	35	0.8	25.1	37.6	36.5	100	100	82	-	-
SS-105	CL	73+20	16.21-16.66	A-4(0)	24	6	1.2	64.2	16.3	18.2	100	100	37	-	-
SS-106	CL	73+20	19.26-19.71	A-7-6(54)	76	49	2.0	7.3	29.9	60.8	100	99	95	-	-
SS-107	CL	73+20	20.79-21.24	A-4(0)	21	1	10.7	54.9	20.2	14.2	100	99	48	-	-
SS-108	CL	73+20	22.31-22.76	A-4(6)	28	10	1.6	34.7	37.4	26.3	100	100	77	-	-
SS-109	CL	73+20	23.84-24.29	A-1-b(0)	21	NP	74.6	19.8	3.6	2.0	90	44	6	-	-
SS-110	CL	73+20	29.93-30.38	A-1-b(0)	20	NP	76.7	18.0	3.2	2.0	88	47	6	-	-
ST-2	12M RT	73+20	0.30-0.85	A-4(1)	33	NP	6.1	46.5	33.3	14.2	99	97	74	145	6.3
S-51	12M RT	73+20	1.00-4.40	A-7-5(26)	80	22	11.3	10.1	42.4	36.3	98	90	80	77.4	21.8

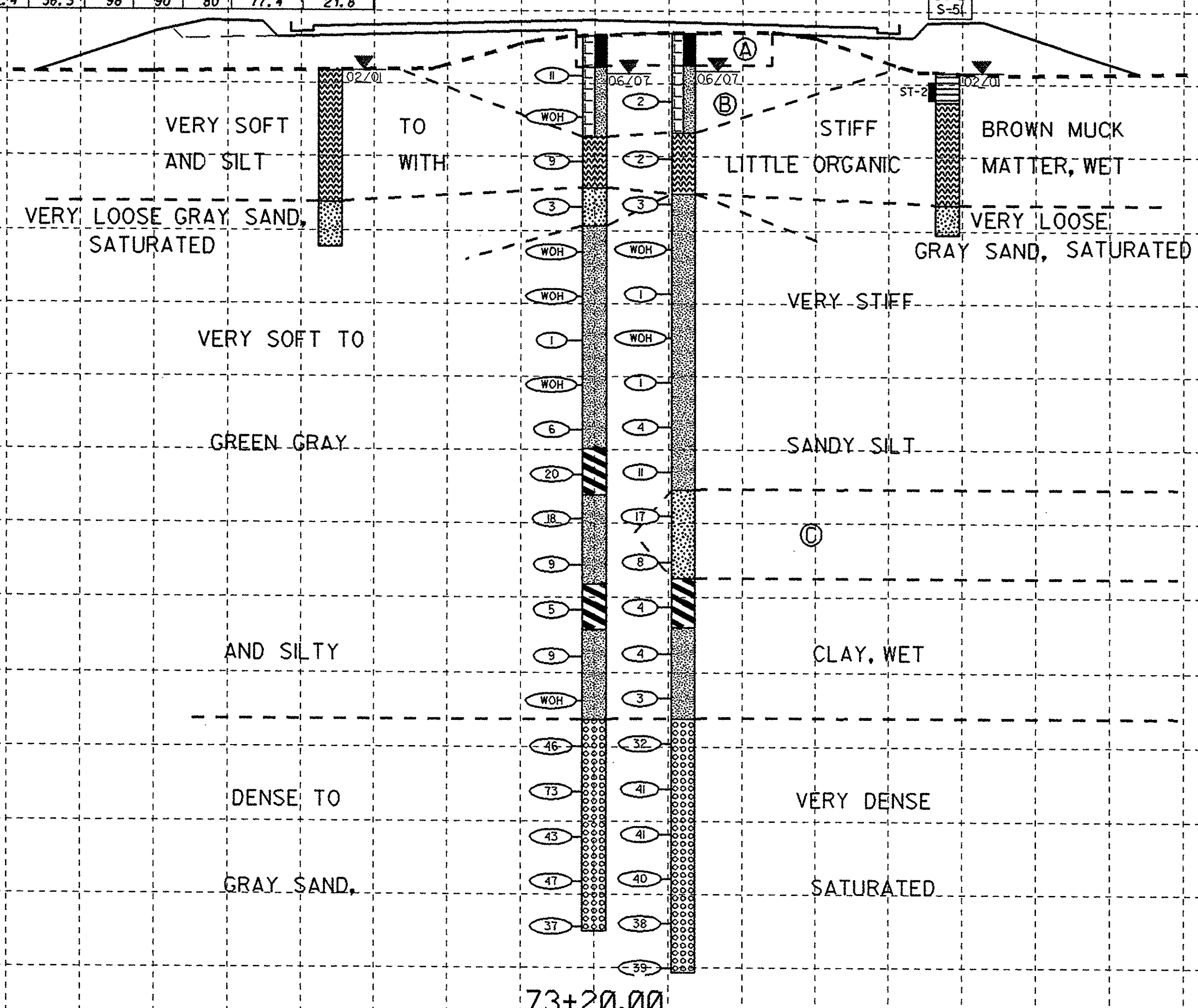
SS-100
SS-101
SS-102
SS-103
SS-104
SS-105
SS-106
SS-107
SS-108
SS-109
SS-110

SS-53
SS-54
SS-55
SS-56
SS-57
SS-58
SS-59
SS-60
SS-61
SS-62
SS-63

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) 2.00	425	75	% MOISTURE	% ORGANIC
SS-53	4M RT	73+20	2.04-2.49	A-4(0)	20	3	16.6	42.6	22.4	18.3	100	96	59	-	-
SS-54	4M RT	73+20	4.02-4.47				NOT	ENOUGH	SAMPLE					357.0	
SS-55	4M RT	73+20	5.55-6.00	A-4(0)	22	NP	14.8	63.8	17.4	4.1	100	98	38	-	3.9
SS-56	4M RT	73+20	7.07-7.52	A-4(0)	24	3	1.0	69.2	21.6	8.1	100	100	43	-	-
SS-57	4M RT	73+20	13.17-13.62	A-4(2)	28	6	0.6	50.6	34.6	14.2	100	100	62	-	-
SS-58	4M RT	73+20	16.21-16.66	A-2-4(0)	21	2	2.6	75.1	12.1	10.2	100	100	24	-	-
SS-59	4M RT	73+20	19.26-19.71	A-7-6(38)	68	39	8.5	6.1	24.5	60.9	100	96	86	91.8	-
SS-60	4M RT	73+20	20.79-21.24	A-4(0)	22	NP	4.1	57.1	30.8	8.1	100	99	59	-	-
SS-61	4M RT	73+20	22.31-22.76	A-4(7)	28	10	1.2	30.7	43.8	24.4	100	100	82	-	-
SS-62	4M RT	73+20	25.36-25.81	A-1-b(0)	19	NP	75.1	20.1	3.8	1.0	98	47	6	-	-
SS-63	4M RT	73+20	29.92-30.37	A-1-b(0)	19	NP	75.8	16.8	5.4	2.0	96	46	9	-	-

ST-2
S-51



VANE SHEAR TESTS

STATION	OFFSET	DEPTH	S (kPa)	SR (kPa)
73+20	9m LT	0.4	9.8	_
73+20	9m LT	0.6	5.3	_
73+20	9m LT	0.8	4.5	_
73+20	9m LT	1.0	<2.4	_
73+20	9m LT	1.2	<2.4	_
73+20	9m LT	1.4	5.3	_
73+20	9m LT	1.6	2.7	_
73+20	9m LT	1.8	5.3	_
73+20	9m LT	2.2	11.5	_
73+20	9m LT	2.4	9.8	_
73+20	9m LT	2.6	16.9	_
73+20	9m LT	3.0	15.9	_
73+20	9m LT	3.2	16.9	_

Ⓐ ASPHALT AND OLD CONCRETE ROAD BED

Ⓑ VERY SOFT TO STIFF TAN SANDY SILT, MOIST TO WET (ROADWAY EMBANKMENT)

Ⓒ LOOSE TO MEDIUM DENSE GRAY SAND, SATURATED

VANE SHEAR TESTS

STATION	OFFSET	DEPTH	S (kPa)	SR (kPa)
73+20	14m RT	0.0	<2.4	_
73+20	14m RT	0.5	6.2	_
73+20	14m RT	0.7	10.6	_
73+20	14m RT	0.9	14.2	_
73+20	14m RT	1.1	7.9	_
73+20	14m RT	1.3	14.2	_
73+20	14m RT	1.5	11.1	_
73+20	14m RT	1.9	18.6	_
73+20	14m RT	2.1	22.2	_
73+20	14m RT	2.3	21.3	_
73+20	14m RT	2.5	20.4	_

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	91

2.5 0 2.5 5

METRIC

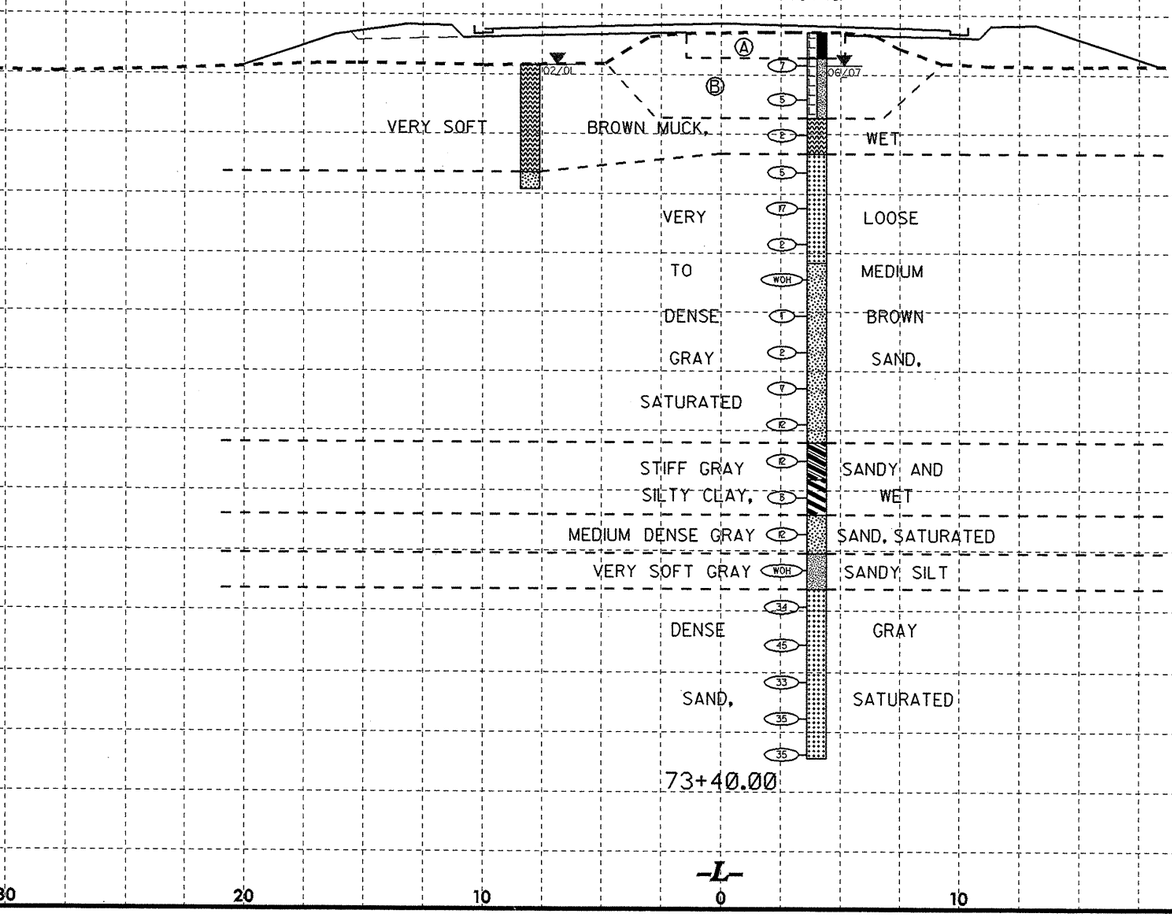
Ⓐ ASPHALT AND OLD CONCRETE ROAD BED
Ⓑ MEDIUM STIFF GRAY SANDY SILT, MOIST TO WET (ROADWAY EMBANKMENT)

SS-45
SS-46
SS-47
SS-48
SS-49
SS-50
SS-51
SS-52

73+43

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	2.00	425	75		
SS-45	4M RT	73+43	1.07-1.52	A-4(0)	20	NP	10.8	55.4	20.7	13.1	100	97	71	-	-
SS-46	4M RT	73+43	2.07-2.52	A-3(0)	21	NP	23.9	70.7	4.3	1.0	100	98	8	-	-
SS-47	4M RT	73+43	10.12-10.57	A-2-4(0)	24	NP	0.4	77.3	12.2	10.1	100	100	32	-	-
SS-48	4M RT	73+43	17.74-18.19	A-6(6)	34	18	29.3	21.8	20.7	28.3	100	89	51	-	-
SS-49	4M RT	73+43	19.26-19.71	A-7-6(33)	63	34	11.5	4.0	25.9	58.5	100	91	86	-	-
SS-50	4M RT	73+43	20.79-21.24	A-2-4(0)	21	NP	8.9	75.1	10.0	6.1	100	99	26	-	-
SS-51	4M RT	73+43	22.31-22.76	A-4(4)	29	8	3.0	35.7	37.0	24.2	100	100	73	-	-
SS-52	4M RT	73+43	23.83-24.28	A-3(0)	18	NP	69.8	23.5	3.6	3.0	99	67	8	-	-



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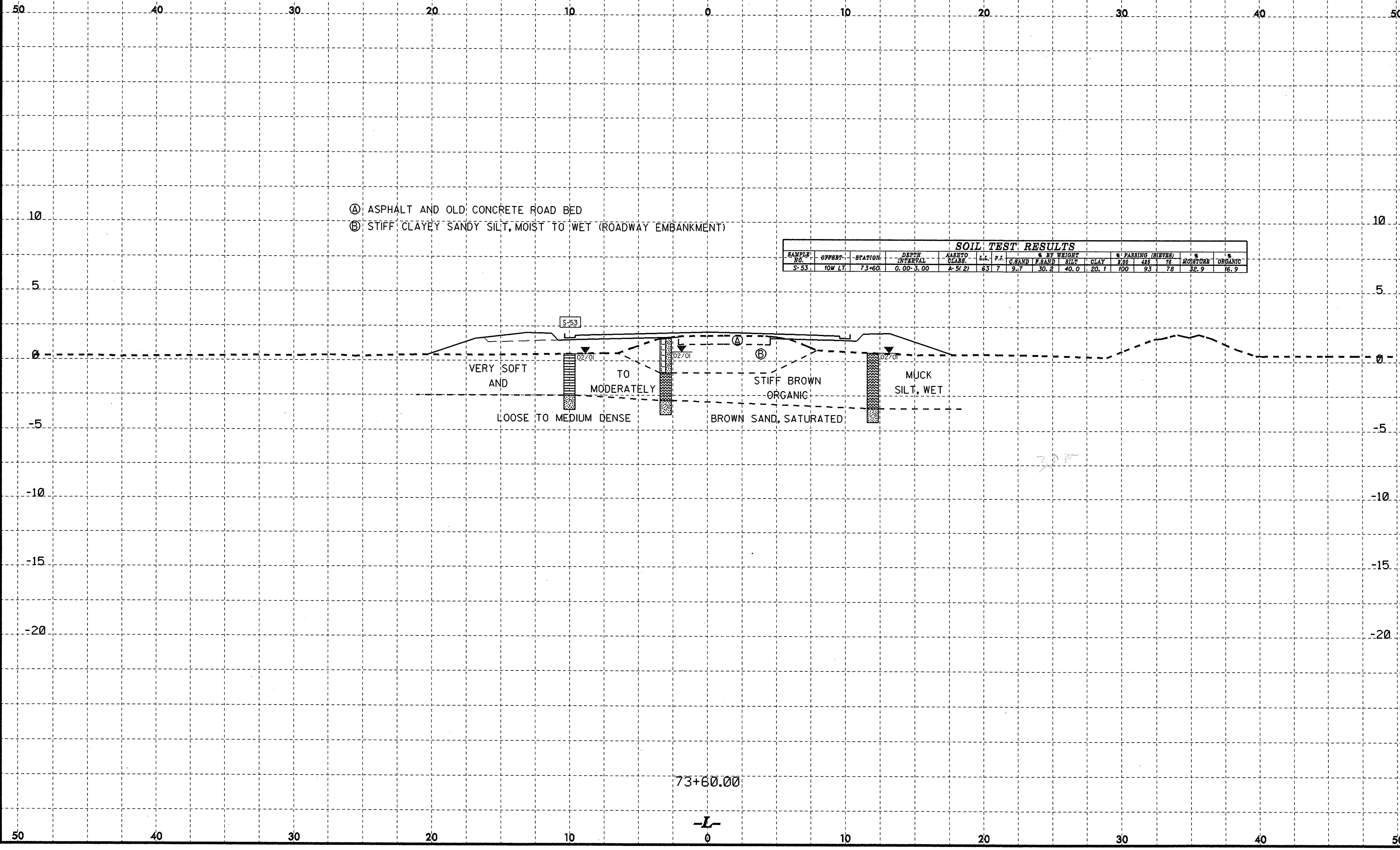
PROJECT REFERENCE NO.	SHEET NO.
R-2414B	92

METRIC

Ⓐ ASPHALT AND OLD CONCRETE ROAD BED
Ⓑ STIFF CLAYEY SANDY SILT, MOIST TO WET (ROADWAY EMBANKMENT)

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	2.00	.425	.075		
S-53	10M LT	73+60	0.00-3.00	A-5(2)	63	7	9.7	30.2	40.0	20.1	100	93	78	32.9	16.9



73+60.00

-L-

SOIL TEST RESULTS

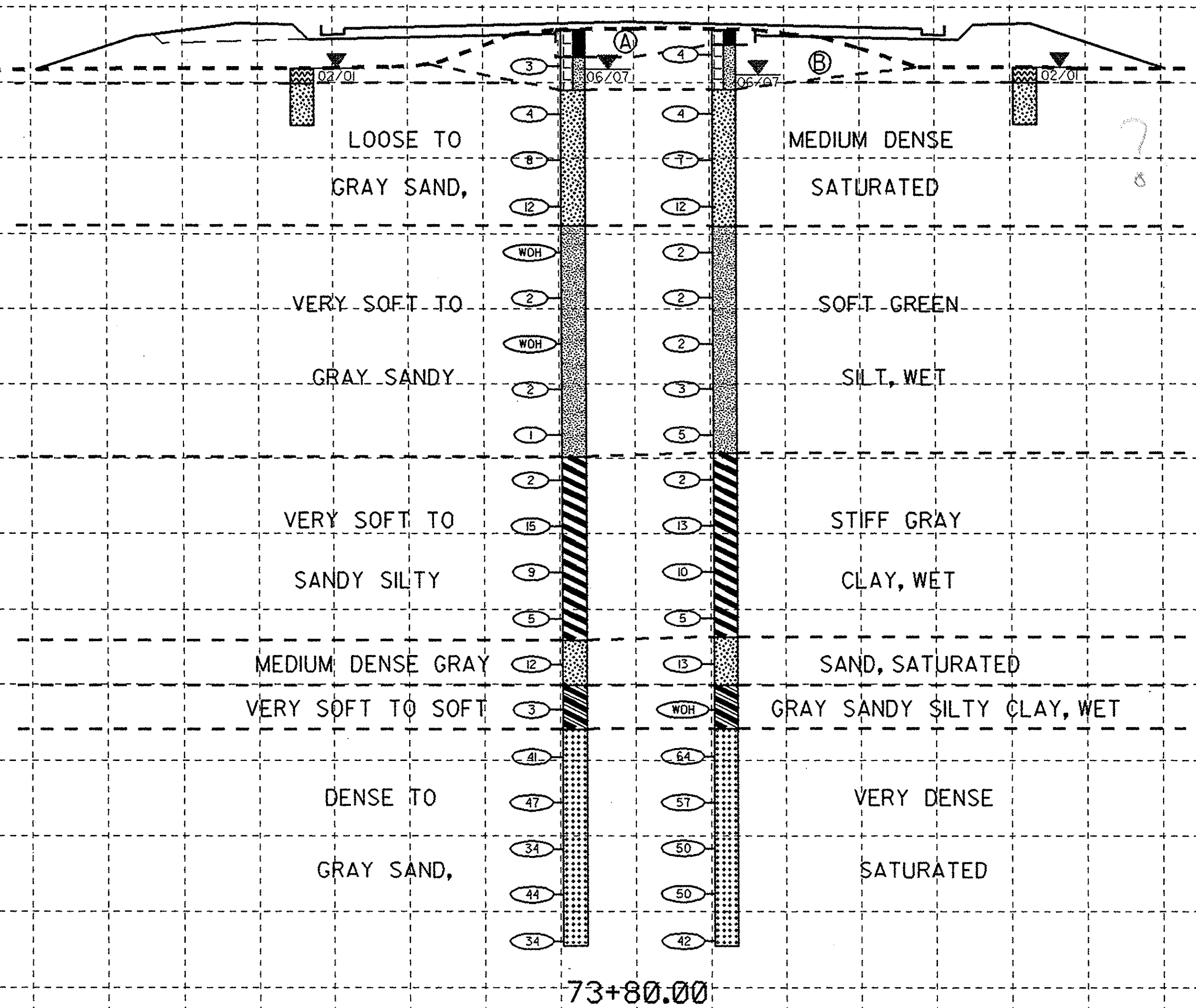
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-84	2M LT	73+80	0.91-1.36	A-4(0)	19	4	17.5	39.4	22.8	20.3	100	96	58	-	-
SS-85	2M LT	73+80	2.50-2.95	A-2-4(0)	19	NP	25.8	63.1	11.1	0.0	100	95	25	-	-
SS-86	2M LT	73+80	7.07-7.52	A-4(0)	23	1	3.0	66.6	18.2	12.2	100	99	42	-	-
SS-87	2M LT	73+80	14.69-15.14	A-7-6(32)	53	32	0.6	14.6	38.1	46.7	100	100	91	-	-
SS-88	2M LT	73+80	19.27-19.72	A-7-6(43)	69	46	2.4	18.5	28.3	50.8	100	99	86	-	-
SS-89	2M LT	73+80	20.79-21.24	A-2-4(0)	25	NP	4.5	74.6	12.9	8.1	100	98	34	-	-
SS-90	2M LT	73+80	22.31-22.76	A-6(14)	38	19	1.4	30.2	40.0	28.4	100	100	80	-	-

SS-84
SS-85
SS-86
SS-87
SS-88
SS-89
SS-90

SS-64
SS-65
SS-66
SS-67
SS-68
SS-69
SS-70
SS-71
SS-72
SS-73

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-64	3M RT	73+80	0.52-0.97	A-4(0)	17	1	19.7	42.2	21.8	16.2	100	95	53	-	-
SS-65	3M RT	73+80	5.55-6.00	A-2-4(0)	22	NP	11.8	78.4	7.8	2.0	100	100	11	-	-
SS-66	3M RT	73+80	7.07-7.52	A-4(0)	24	1	2.0	68.0	17.8	12.2	100	99	42	-	-
SS-67	3M RT	73+80	10.12-10.57	A-4(0)	24	NP	0.2	75.1	16.5	8.1	100	100	36	-	-
SS-68	3M RT	73+80	16.21-16.66	A-7-6(34)	53	34	1.2	11.8	48.4	38.6	100	100	93	-	-
SS-69	3M RT	73+80	17.74-18.19	A-7-6(15)	47	24	20.4	15.0	26.0	38.6	100	92	67	-	-
SS-70	3M RT	73+80	20.79-21.24	A-2-4(0)	26	NP	2.7	77.9	12.3	7.1	100	99	34	-	-
SS-71	3M RT	73+80	22.31-22.96	A-6(14)	39	17	1.0	18.1	54.5	26.4	100	100	83	-	-
SS-72	3M RT	73+80	23.83-24.28	A-3(0)	14	NP	71.2	21.9	3.9	3.0	100	66	9	-	-
SS-73	2M LT	73+50	29.92-30.38	A-1-b(0)	15	NP	75.0	18.2	4.8	2.0	96	42	9	-	-

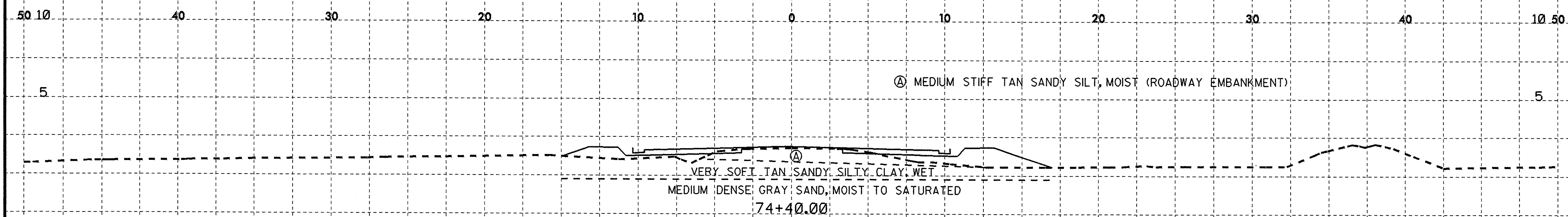


Ⓐ ASPHALT AND OLD CONCRETE ROAD BED

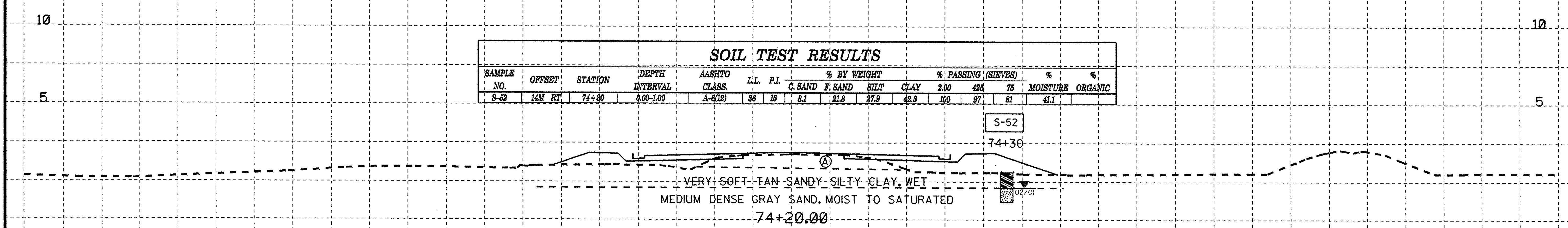
Ⓑ SOFT BROWN SANDY SILT, MOIST TO WET (ROADWAY EMBANKMENT)

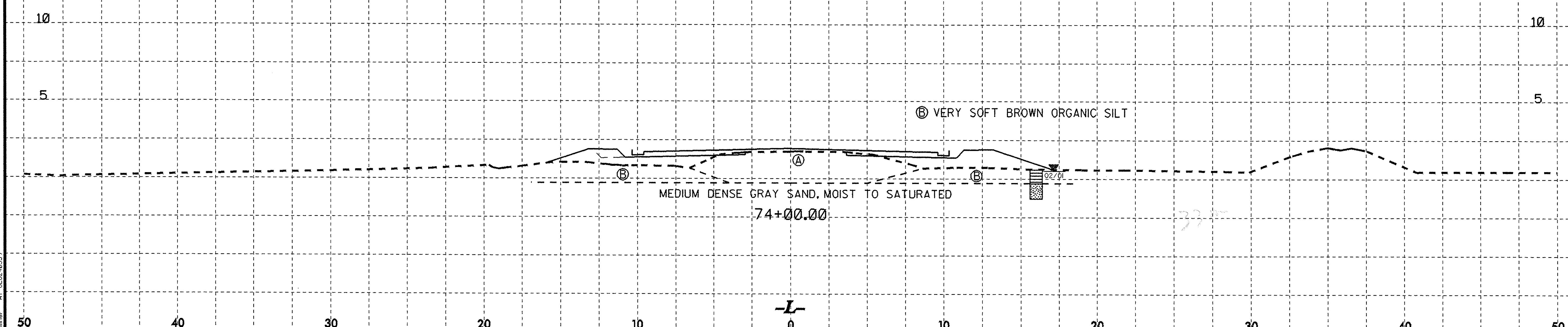
-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	94



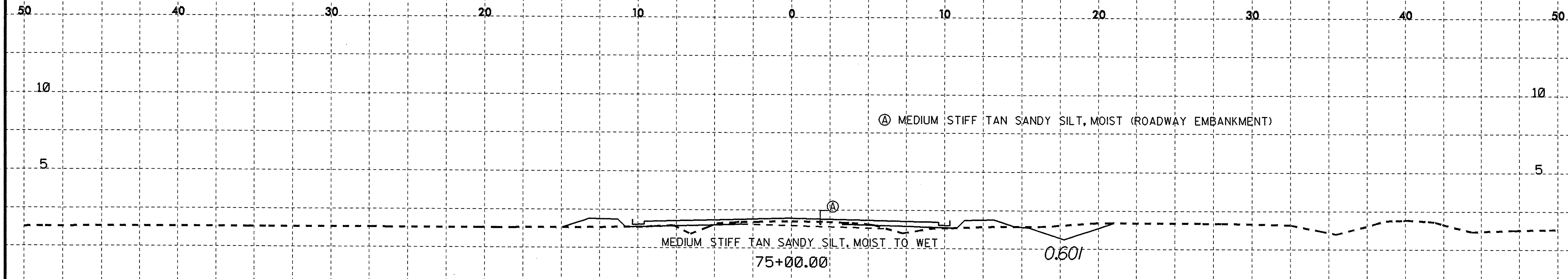
SOIL TEST RESULTS																
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	2.00	425	75		
S-52	14M RT	74+30	0.00-1.00	A-6(12)	38	15	8.1	21.8	27.9	42.3	100	97	81	41.1	





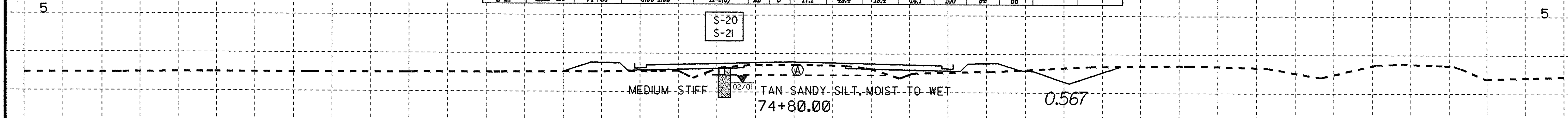
PROJECT REFERENCE NO.	SHEET NO.
R-2414B	95

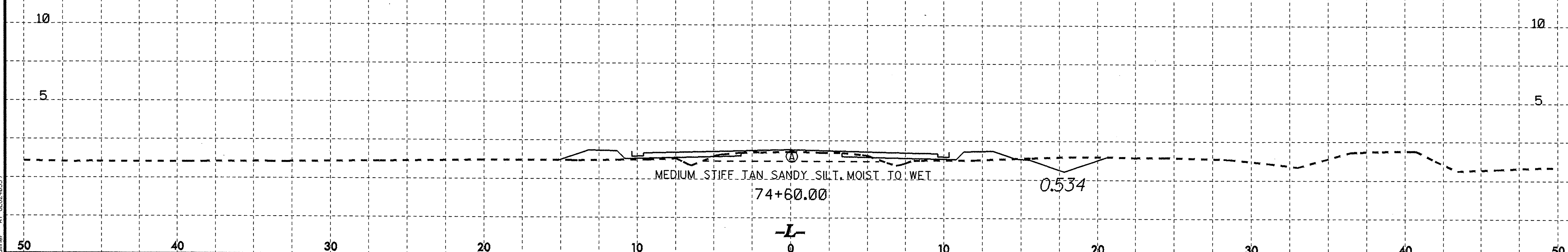
METRIC

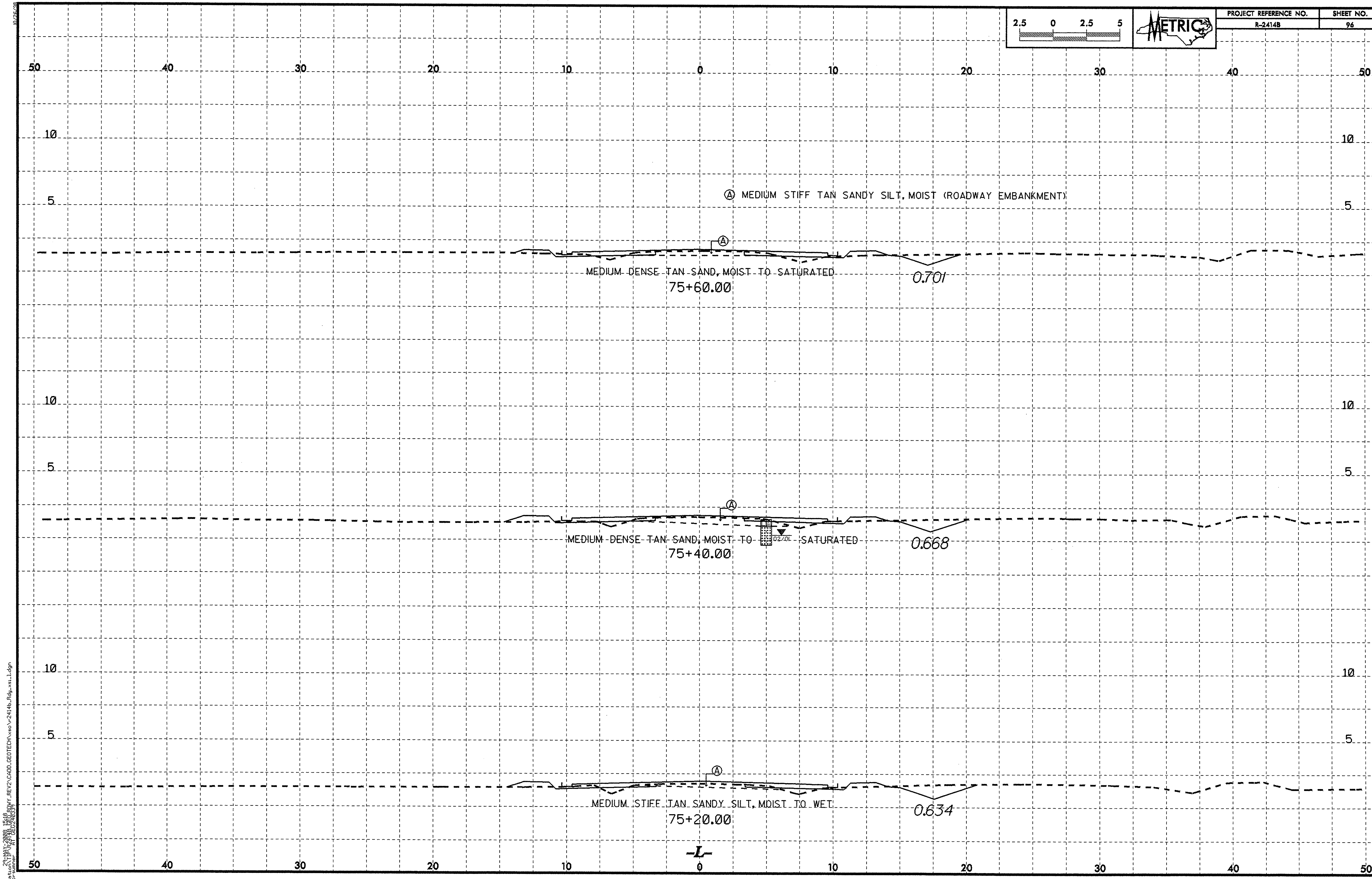


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	2.00	.425	.75		
S-20	4.5M LT	74+80	0.00-0.50	A-4(0)	19	3	23.4	45.0	19.6	12.1	100	95	49		
S-21	4.5M LT	74+80	0.50-1.93	A-4(0)	22	3	17.1	49.4	19.4	14.1	100	94	56		



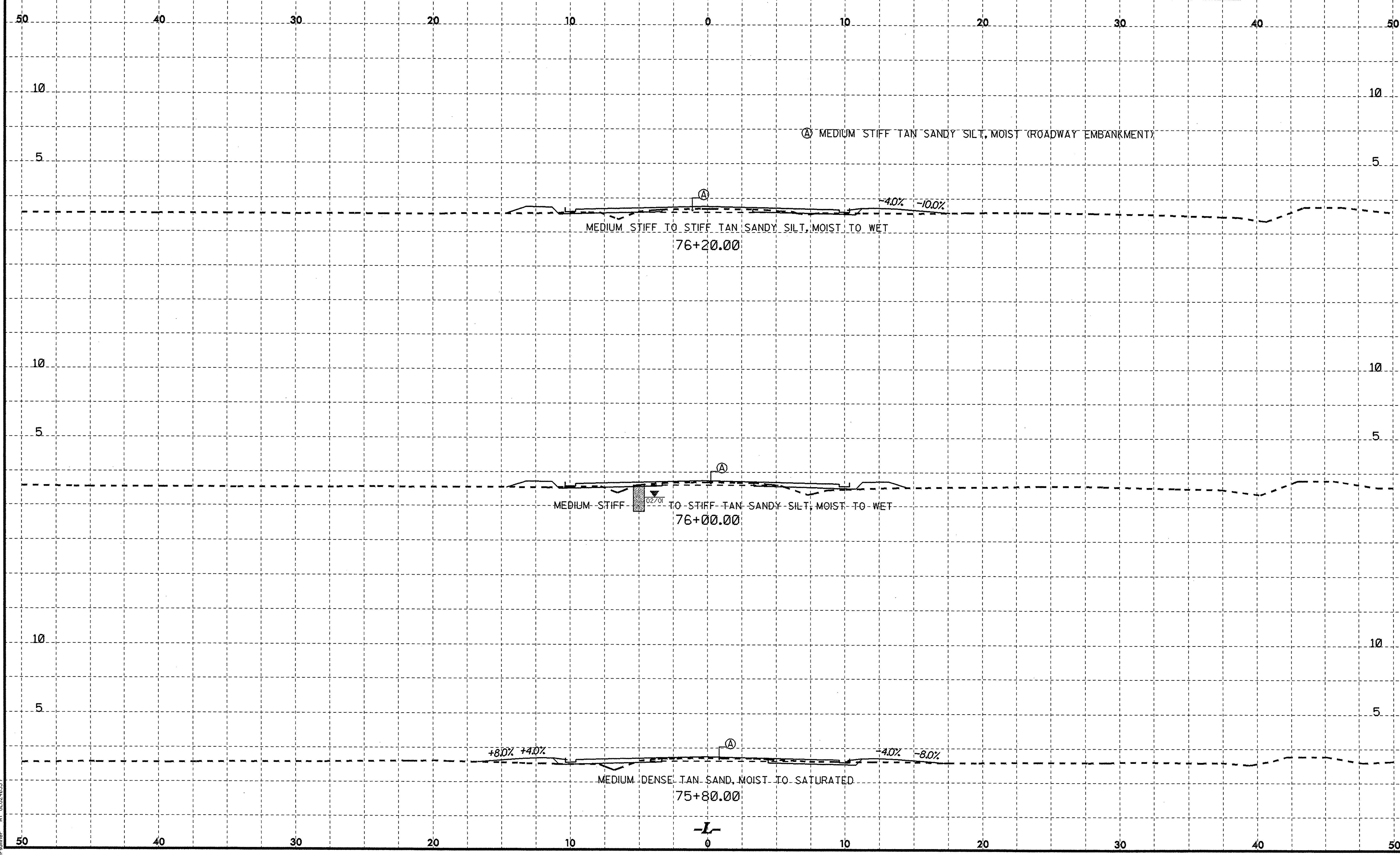




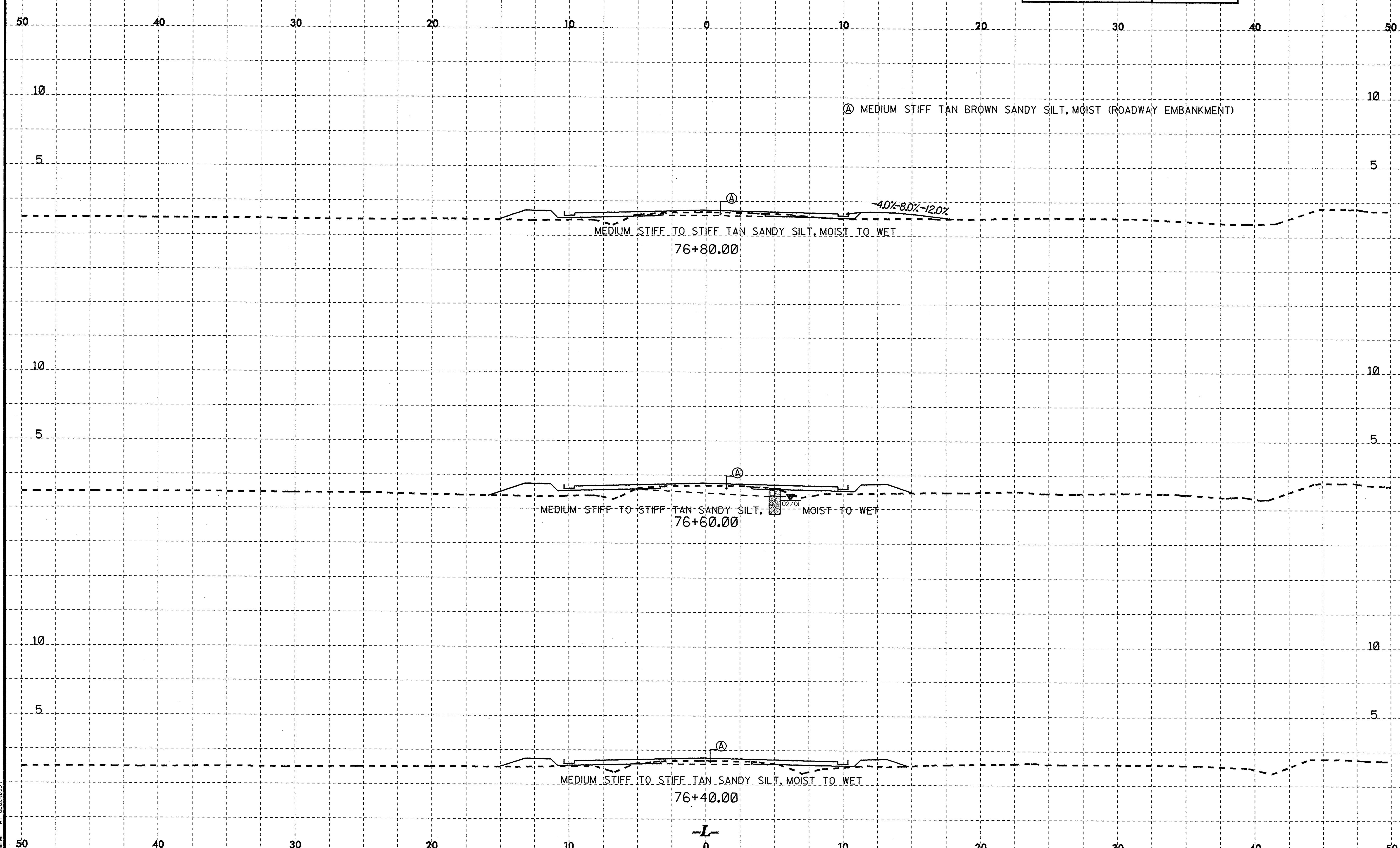
PROJECT REFERENCE NO.
R-2414B
SHEET NO.
96
METRIC
2.5 0 2.5 5
Ⓐ MEDIUM STIFF TAN SANDY SILT, MOIST (ROADWAY EMBANKMENT)
MEDIUM DENSE TAN SAND, MOIST TO SATURATED
75+60.00
0.701
MEDIUM DENSE TAN SAND, MOIST TO SATURATED
75+40.00
0.668
MEDIUM STIFF TAN SANDY SILT, MOIST TO WET
75+20.00
0.634
-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	97

METRIC



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	98



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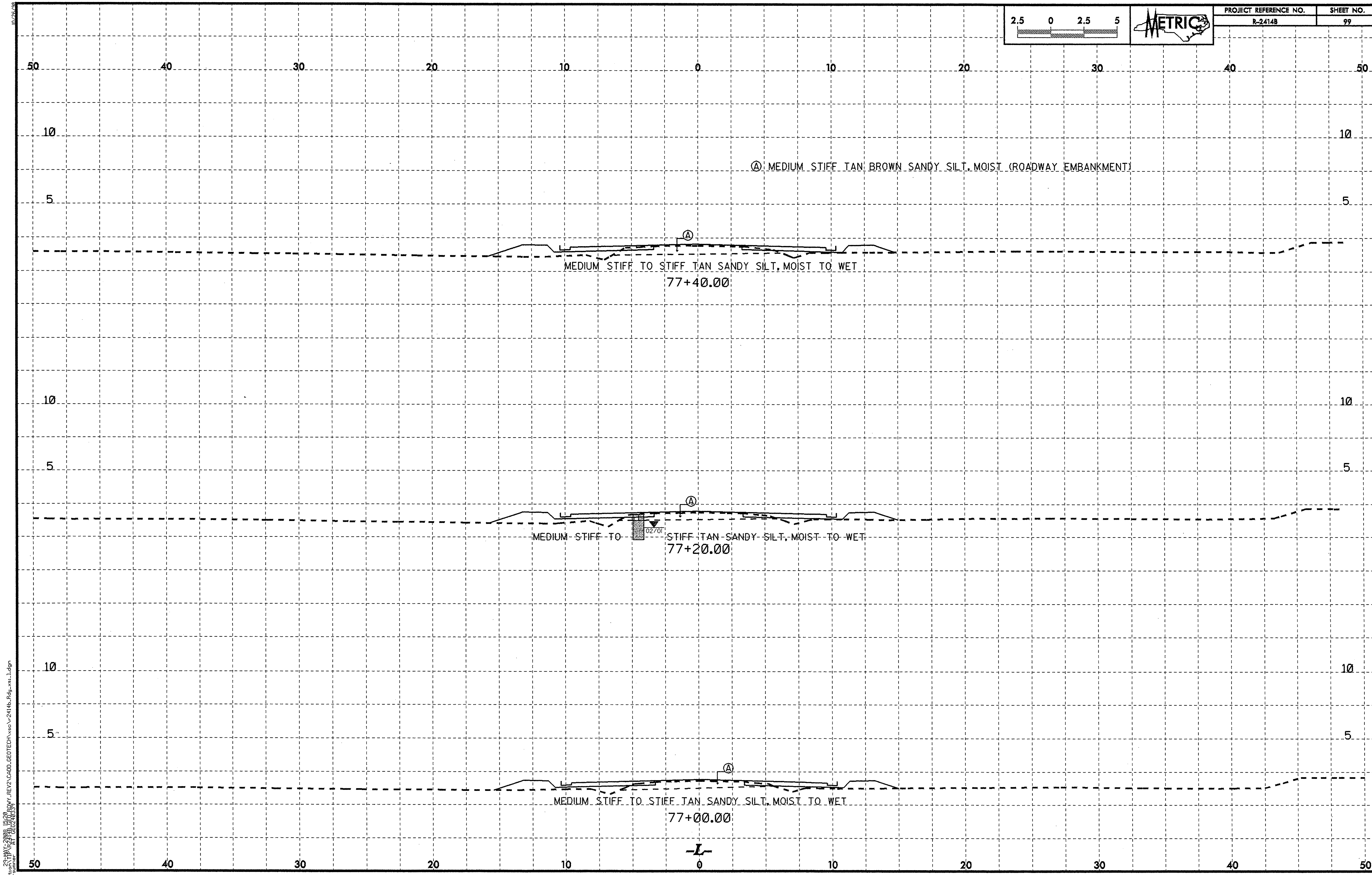
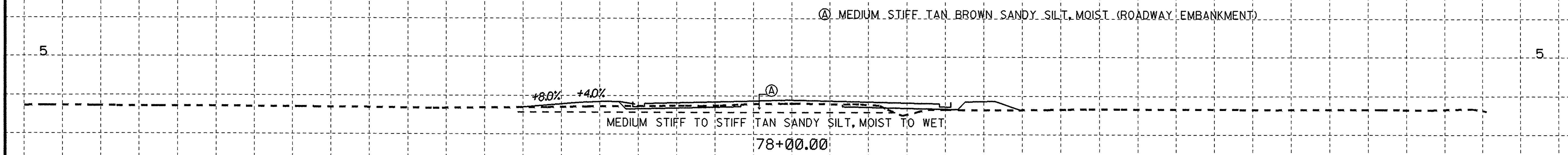
crsumner AT GEG240339


PROJECT REFERENCE NO.
R-2414B
SHEET NO.
99
2.5 0 2.5 5
METRIC
50 40 30 20 10 0 10 20 30 40 50
10
5
Ⓐ MEDIUM STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)
MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET
77+40.00
MEDIUM STIFF TO
02/01
STIFF TAN SANDY SILT, MOIST TO WET
77+20.00
MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET
77+00.00
-L-

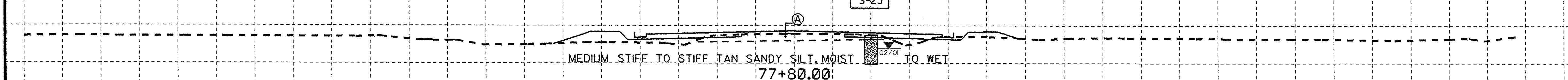
PROJECT REFERENCE NO.	SHEET NO.
R-2414B	100

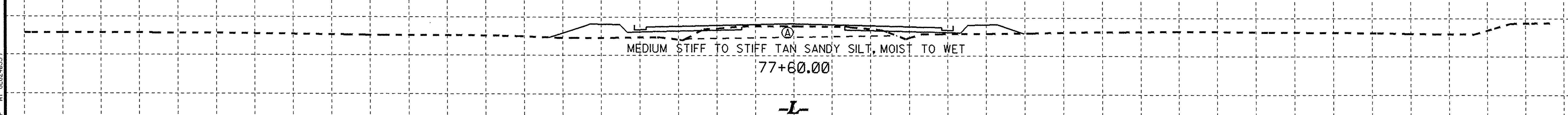
METRIC



SOIL TEST RESULTS

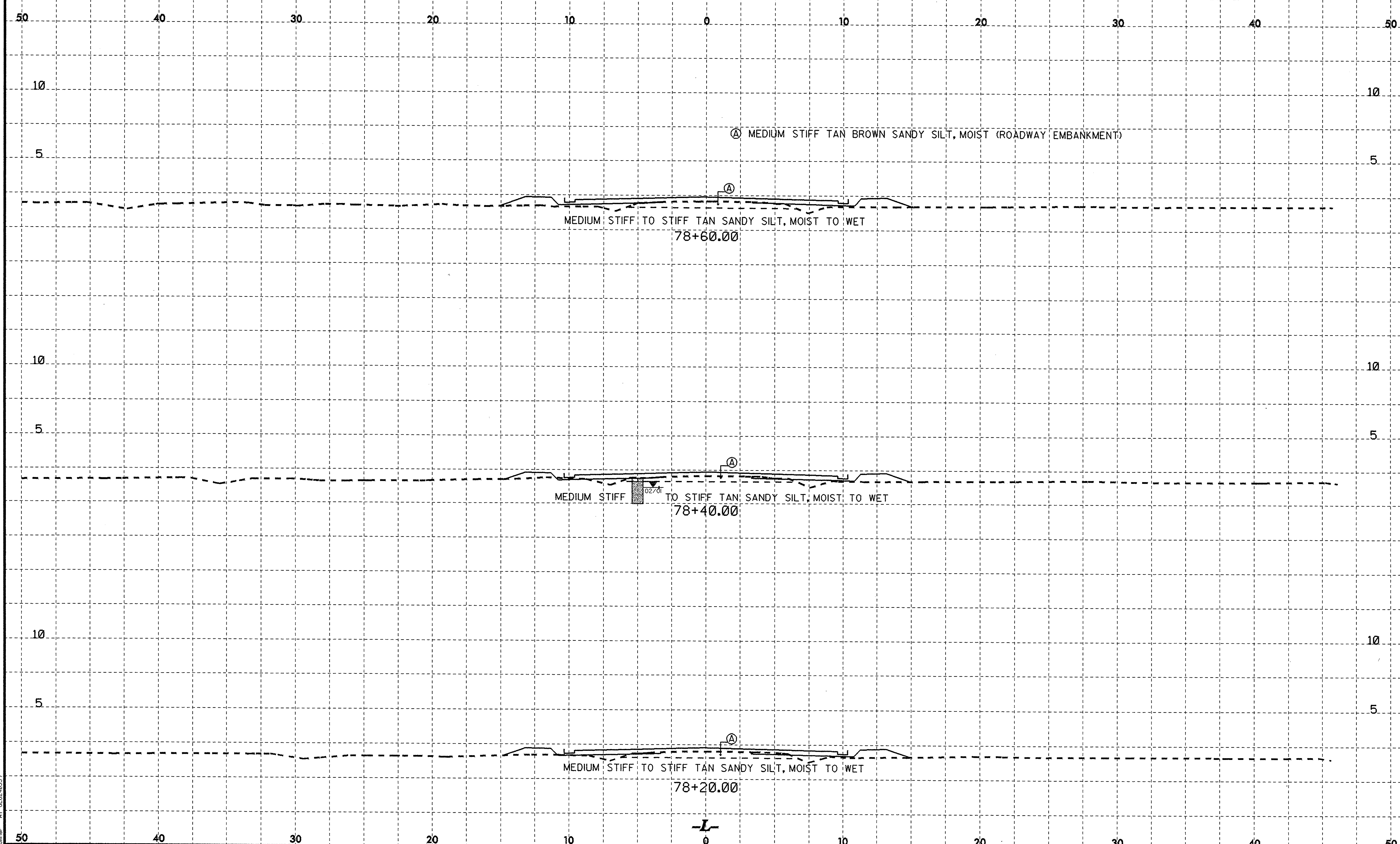
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 2.00	% PASSING (SIEVES) .425	% PASSING (SIEVES) .075	% MOISTURE	% ORGANIC
S-22	5M RT	77+80	0.00-1.50	A-4(2)	22	8	14.5	38.9	24.4	22.2	100	96	59		
S-23	5M RT	77+80	1.50-1.93	A-4(1)	23	5	9.9	47.8	22.2	20.2	100	98	60		





PROJECT REFERENCE NO.	SHEET NO.
R-2414B	101

METRIC



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crsumner AT GEO2403339

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	102

2.5 0 2.5 5 METRIC

50 40 30 20 10 0 10 20 30 40 50

10

5

Ⓐ MEDIUM DENSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

Ⓐ

MEDIUM DENSE TAN SAND, MOIST TO SATURATED

79+20.00

10

5

+8.0% +4.0%

Ⓐ

02/01

MEDIUM DENSE TAN SAND, MOIST TO SATURATED

79+00.00

10

5

Ⓐ

MEDIUM DENSE TAN SAND, MOIST TO SATURATED

78+80.00

-L-

50 40 30 20 10 0 10 20 30 40 50

10/26/08

29-MAY-2008 15:29
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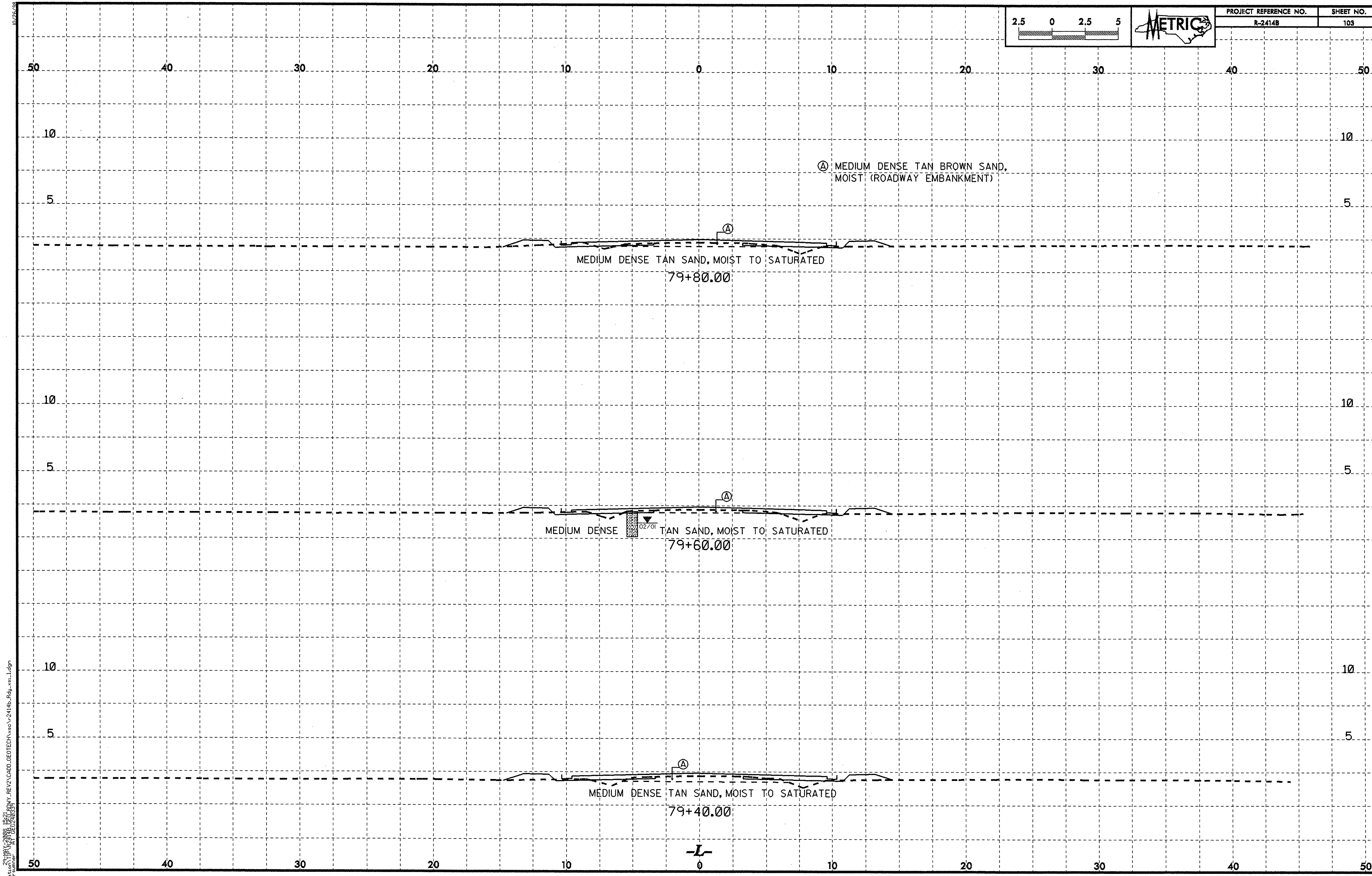


PROJECT REFERENCE NO.
R-2414B
SHEET NO.
103
METRIC
2.5 0 2.5 5
Ⓐ MEDIUM DENSE TAN BROWN SAND, MOIST (ROADWAY EMBANKMENT)
MEDIUM DENSE TAN SAND, MOIST TO SATURATED
79+80.00
MEDIUM DENSE TAN SAND, MOIST TO SATURATED
02/01
79+60.00
MEDIUM DENSE TAN SAND, MOIST TO SATURATED
79+40.00
-L-
50 40 30 20 10 0 10 20 30 40 50
10
5

50 40 30 20 10 0 10 20 30 40 50

10
5

Ⓐ MEDIUM DENSE TAN BROWN SAND, MOIST (ROADWAY EMBANKMENT)

MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET

80+40.00

MEDIUM DENSE SAND, MOIST TO SATURATED AND MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET

80+20.00

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) 2.00	425	75	% MOISTURE	% ORGANIC
SS-7	6M LT	80+00	0.7ft-1.2ft	A-2-4(0)	19	NP	36.0	53.8	6.7	4.0	100	88	23		

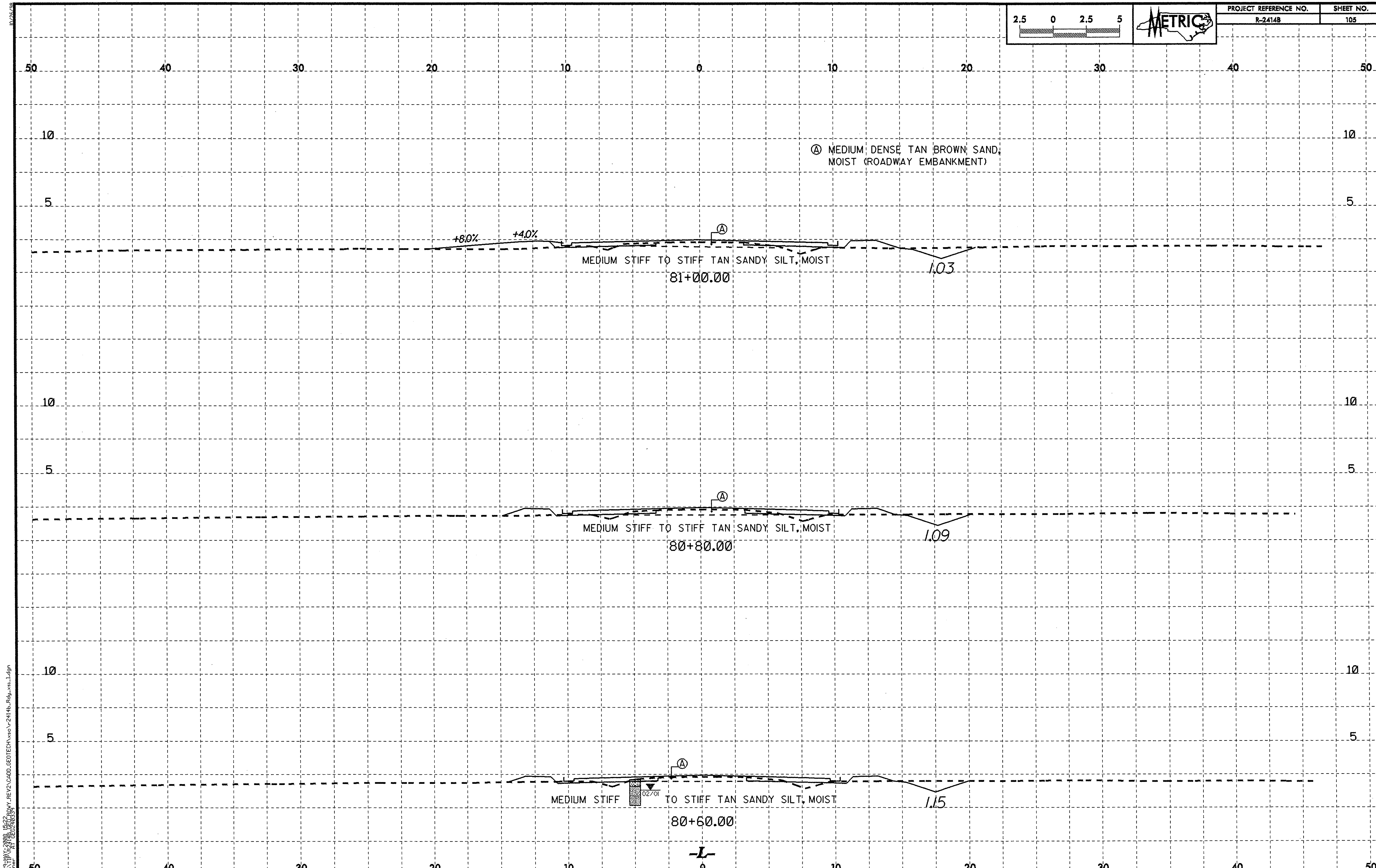
SS-7

+8.0% +4.0%

MEDIUM DENSE TAN SAND, MEDIUM STIFF TO STIFF — 03/01 — MOIST TO SATURATED TAN SANDY SILT, WET

80+00.00

-L-



PROJECT REFERENCE NO.
R-2414B
SHEET NO.
105
METRIC
2.5 0 2.5 5
Ⓐ MEDIUM DENSE TAN BROWN SAND, MOIST (ROADWAY EMBANKMENT)
+8.0%
+4.0%
MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST
1.03
81+00.00
MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST
1.09
80+80.00
MEDIUM STIFF
02/01
TO STIFF TAN SANDY SILT, MOIST
1.15
80+60.00
-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	106

2.5 0 2.5 5

50 40 30 20 10 0 10 20 30 40 50

10

5

Ⓐ MEDIUM DENSE TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)

Ⓐ MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET

81+60.00

Ⓐ MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET

81+40.00

1.00

Ⓐ MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET

81+20.00

02701

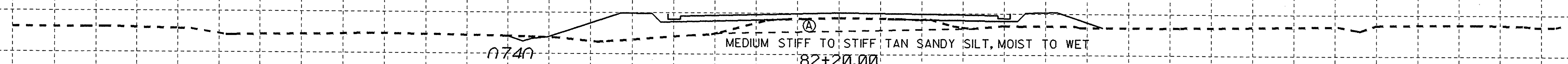
0.97

-L-

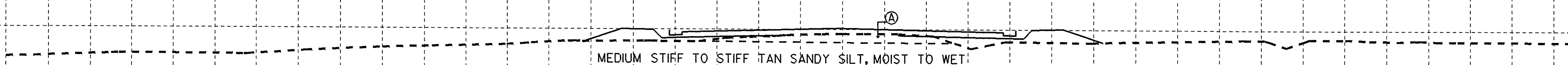
PROJECT REFERENCE NO.	SHEET NO.
R-2414B	107

METRIC

Ⓐ MEDIUM STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)



82+20.00

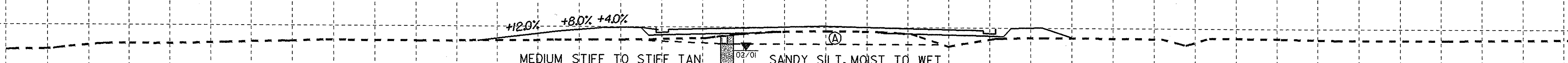


82+00.00

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) 2.00	425	75	% MOISTURE	% ORGANIC
S-24	6M LT	81+80	0.00-1.93	A-4(0)	15	NP	23.8	46.2	15.9	14.1	100	94	44		

S-24



81+80.00

-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	108

2.5 0 2.5 5

METRIC

50 40 30 20 10 0 10 20 30 40 50

10

5

Ⓐ MEDIUM STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)

Ⓐ

MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET

82+80.00

10

5

0.868

Ⓐ

MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET

82+60.00

10

5

0.804

Ⓐ

02/01

MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET

82+40.00

-L-

50 40 30 20 10 0 10 20 30 40 50

50 40 30 20 10 0 10 20 30 40 50

10
5

Ⓐ VERY STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)

-4.0% -8.0% -12.0%

MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET

83+40.00

10
5

-4.0% -8.0% -12.0%

MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET

83+20.00

10
5

MEDIUM STIFF D2/01 TO STIFF TAN SANDY SILT, MOIST TO WET

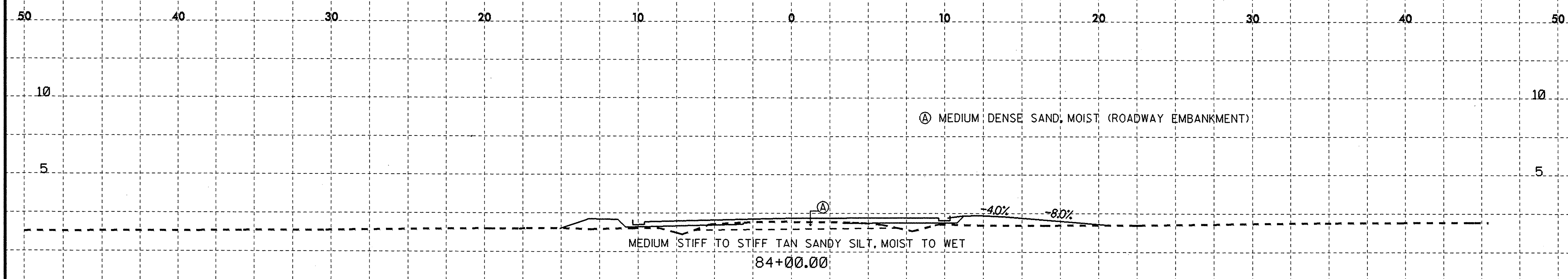
83+00.00

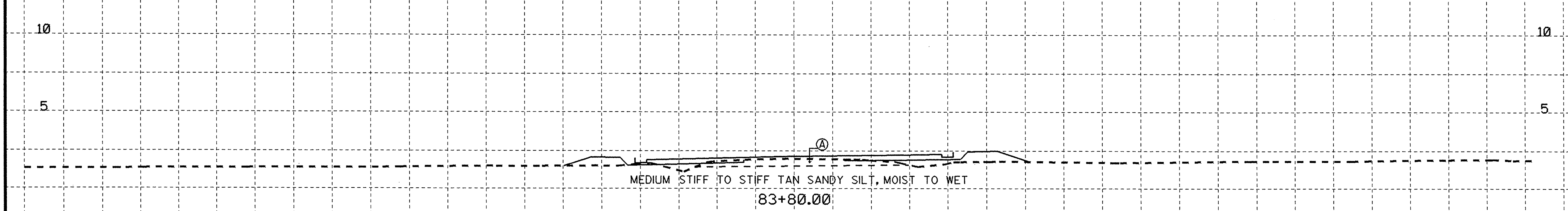
-L-

50 40 30 20 10 0 10 20 30 40 50

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	110

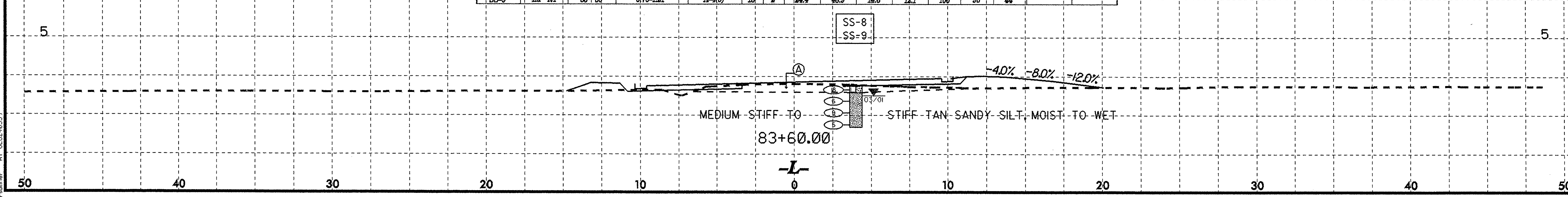
METRIC





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) 2.00	425	75	% MOISTURE	% ORGANIC
SS-8	4M RT	83+60	0.00-0.45	A-2-4(0)	15	NP	45.1	36.9	12.0	6.0	81	59	20		
SS-9	4M RT	83+60	0.76-1.21	A-4(0)	18	2	24.4	48.9	14.6	12.1	100	95	44		



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	111

2.5 0 2.5 5

METRIC

50 40 30 20 10 0 10 20 30 40 50

10

5

Ⓐ MEDIUM DENSE SAND, MOIST (ROADWAY EMBANKMENT)

+12.0% +8.0% +4.0% -4.0% -8.0%

MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET

84+60.00

MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET

84+40.00

MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET

84+20.00

-L-

10/26/08

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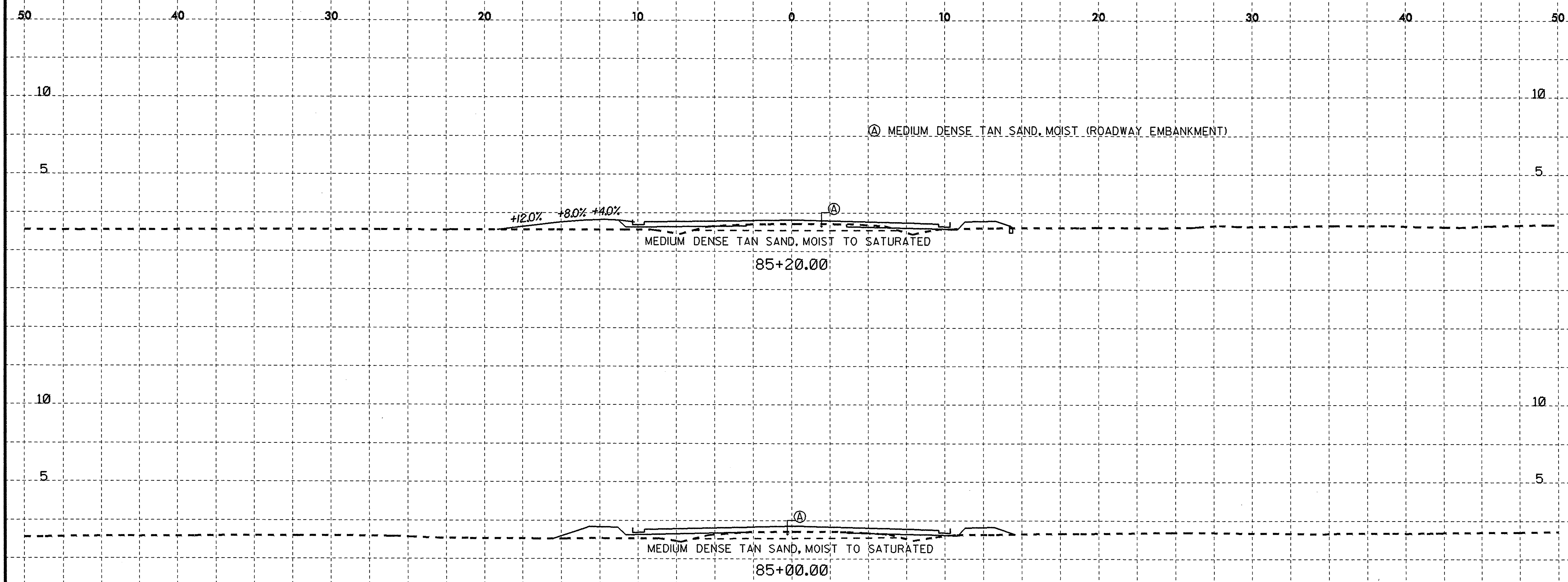
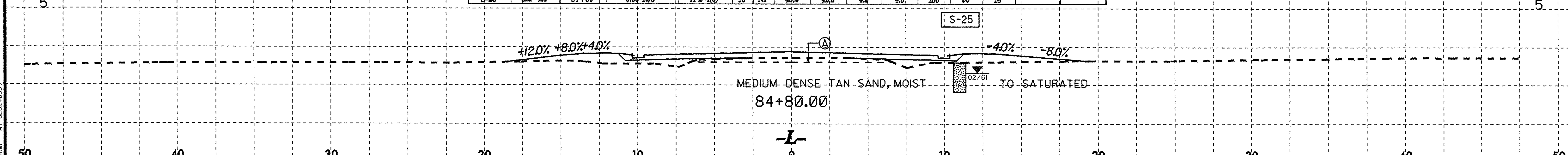
PROJECT REFERENCE NO.	SHEET NO.
R-2414B	112

METRIC



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 2.00	% PASSING (SIEVES) 425	% PASSING (SIEVES) 75	% MOISTURE	% ORGANIC
S-25	5M RT	84+80	0.00-1.93	A-2-4(0)	16	NP	49.4	42.3	4.2	4.0	100	90	18		



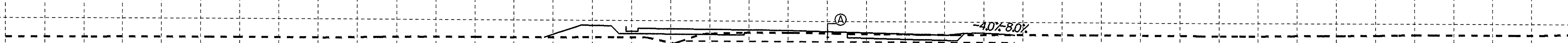
PROJECT REFERENCE NO.	SHEET NO.
R-2414B	113

METRIC

2.5 0 2.5 5

Ⓐ MEDIUM DENSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

85+80.00

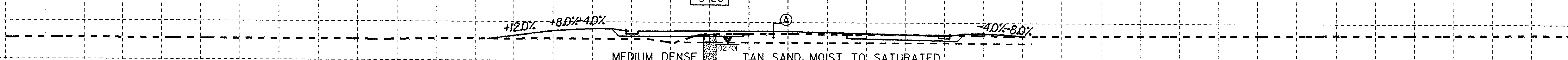


85+60.00

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	2.00	425	75		
S-26	5M LT	85+40	0.00-1.93	A-2-4(0)	20	NP	41.9	37.3	12.7	8.1	100	94	25		

S-26

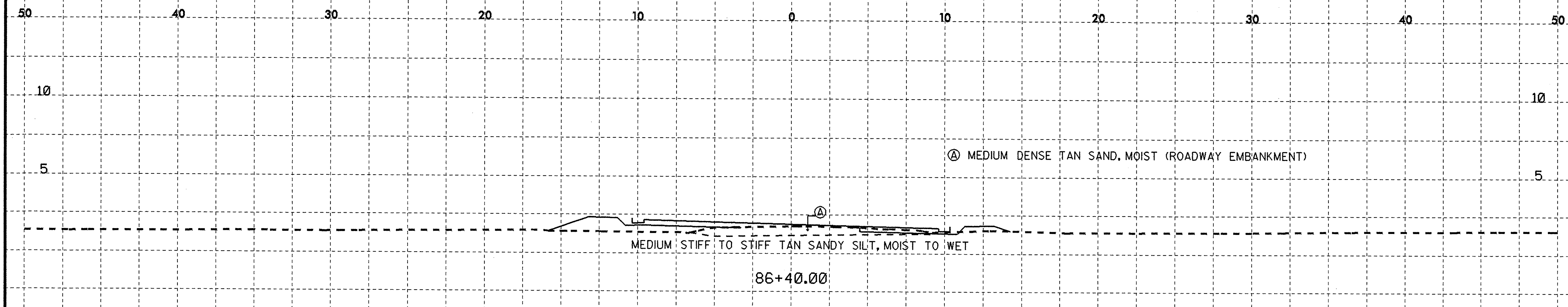


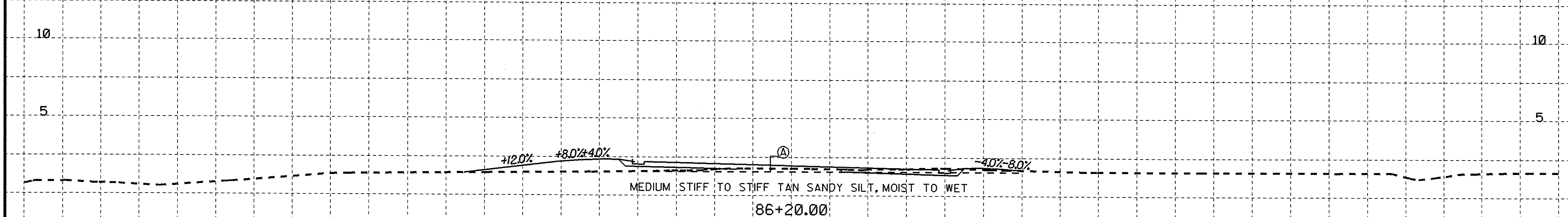
85+40.00

-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	114

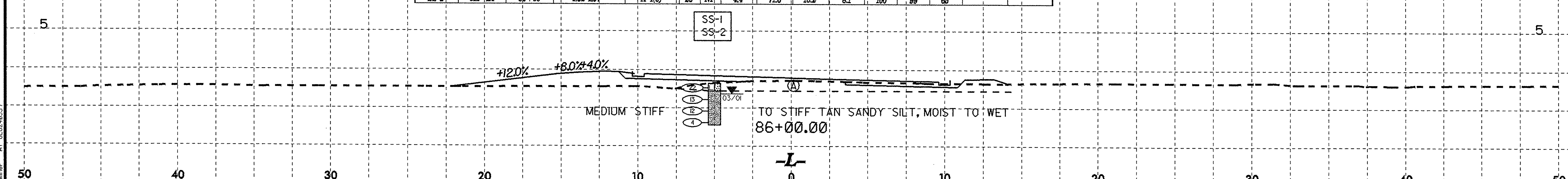
METRIC

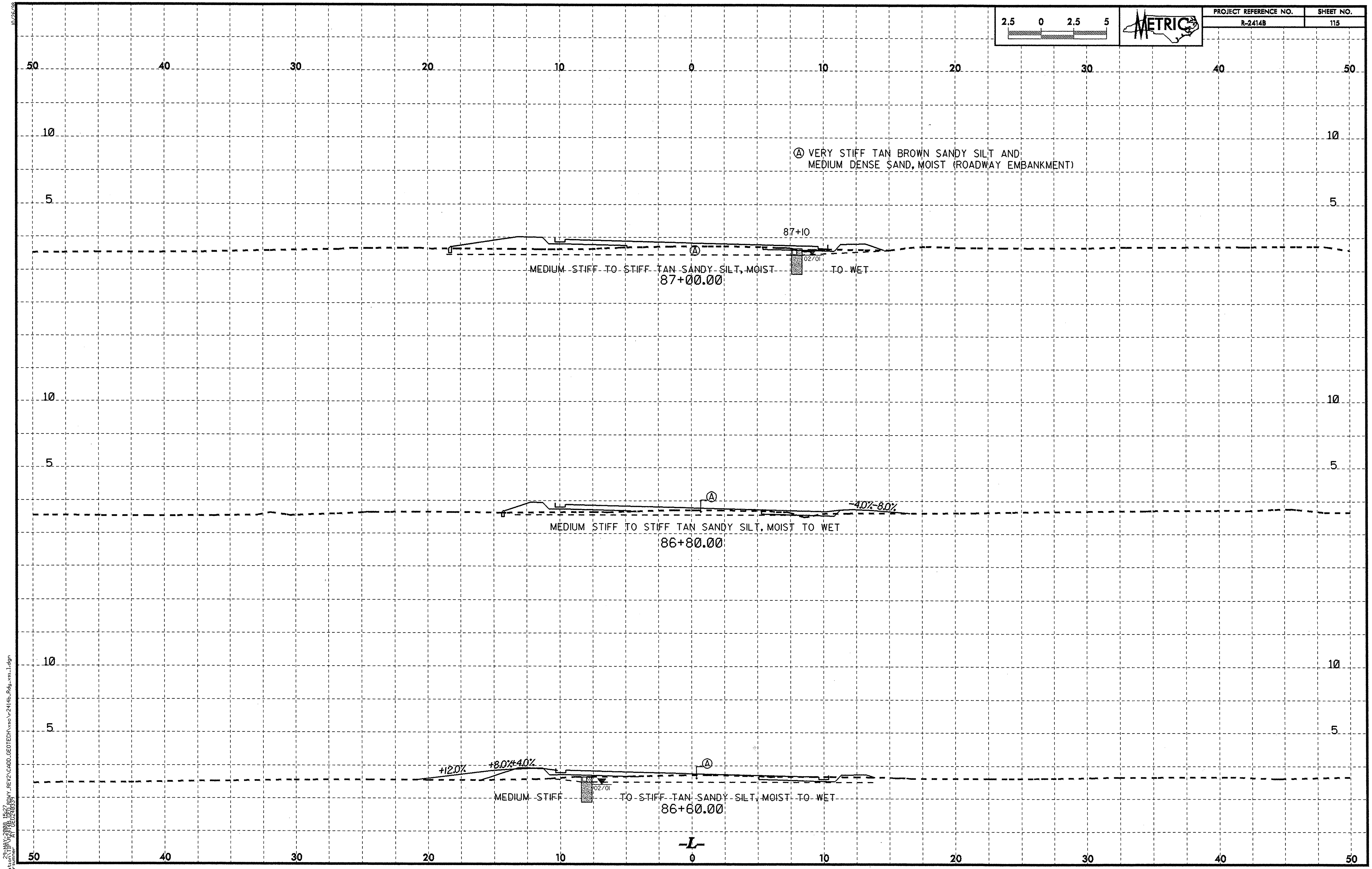




SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 2.00	425	75	% MOISTURE	% ORGANIC
SS-1	5M LT	86+00	0.76-1.21	A-4(0)	16	3	41.5	34.4	10.0	14.1	100	92	36		
SS-2	5M LT	86+00	1.52-1.97	A-4(0)	23	NP	4.4	71.3	16.2	8.1	100	99	65		





PROJECT REFERENCE NO.
R-2414B
SHEET NO.
115
METRIC
2.5 0 2.5 5
Ⓐ VERY STIFF TAN BROWN SANDY SILT AND
MEDIUM DENSE SAND, MOIST (ROADWAY EMBANKMENT)
87+10
02/01
MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET
87+00.00
-4.0% -8.0%
MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET
86+80.00
+12.0%
+8.0% +4.0%
02/01
MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET
86+60.00
-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	116

2.5 0 2.5 5

METRIC

50 40 30 20 10 0 10 20 30 40 50

10

5

Ⓐ VERY STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)

MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET

87+60.00

MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET

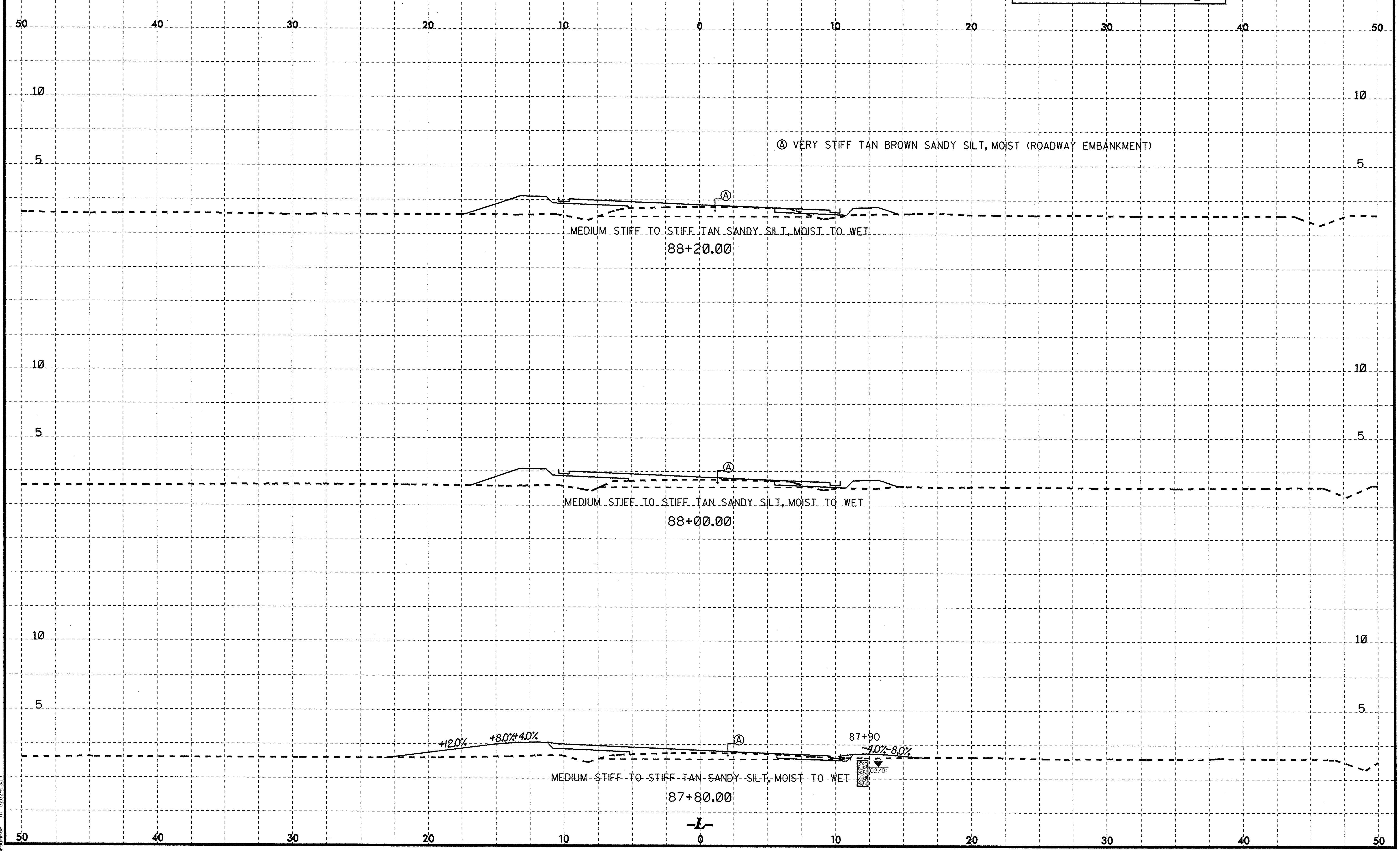
87+40.00

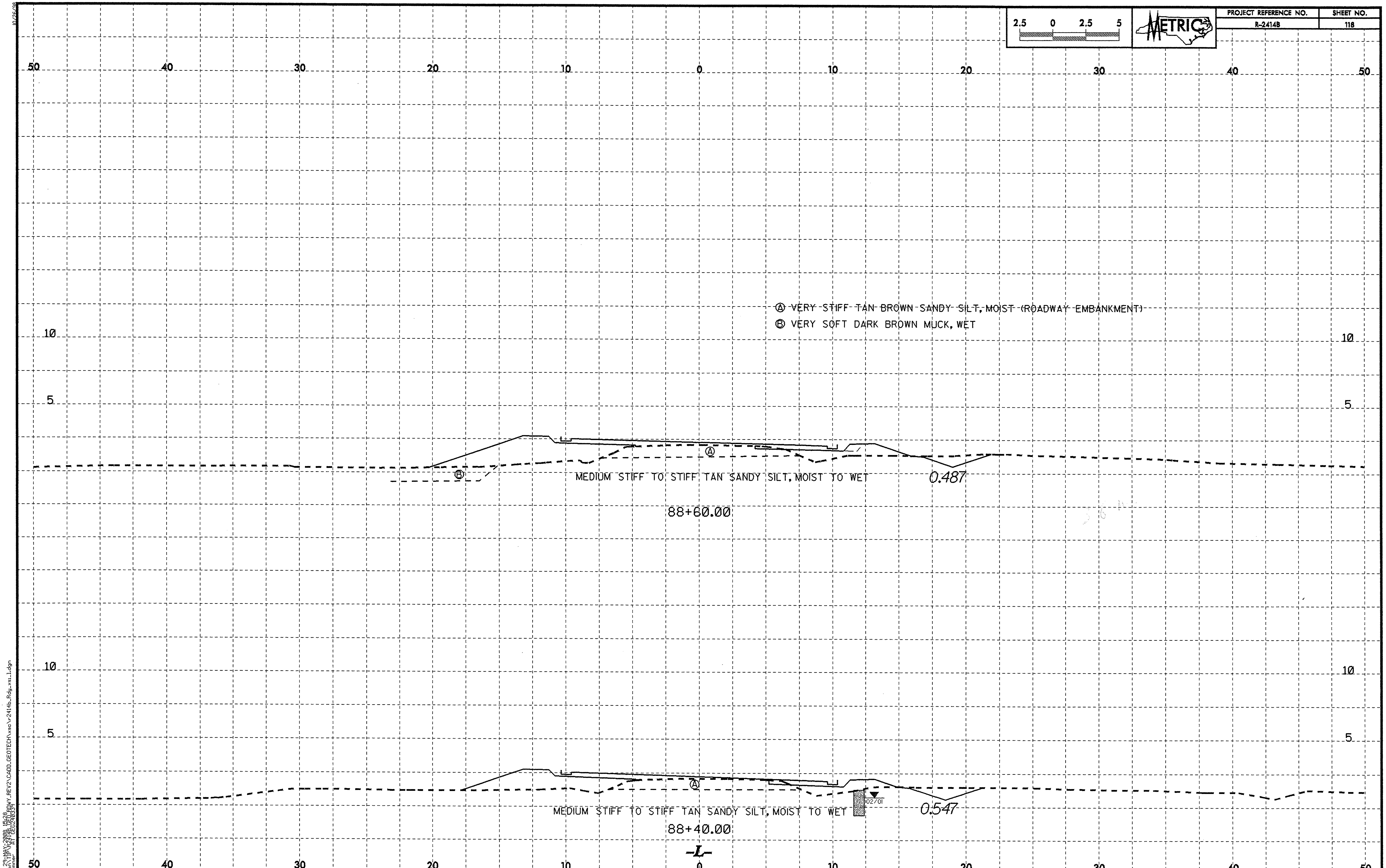
MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET

87+20.00

-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	117





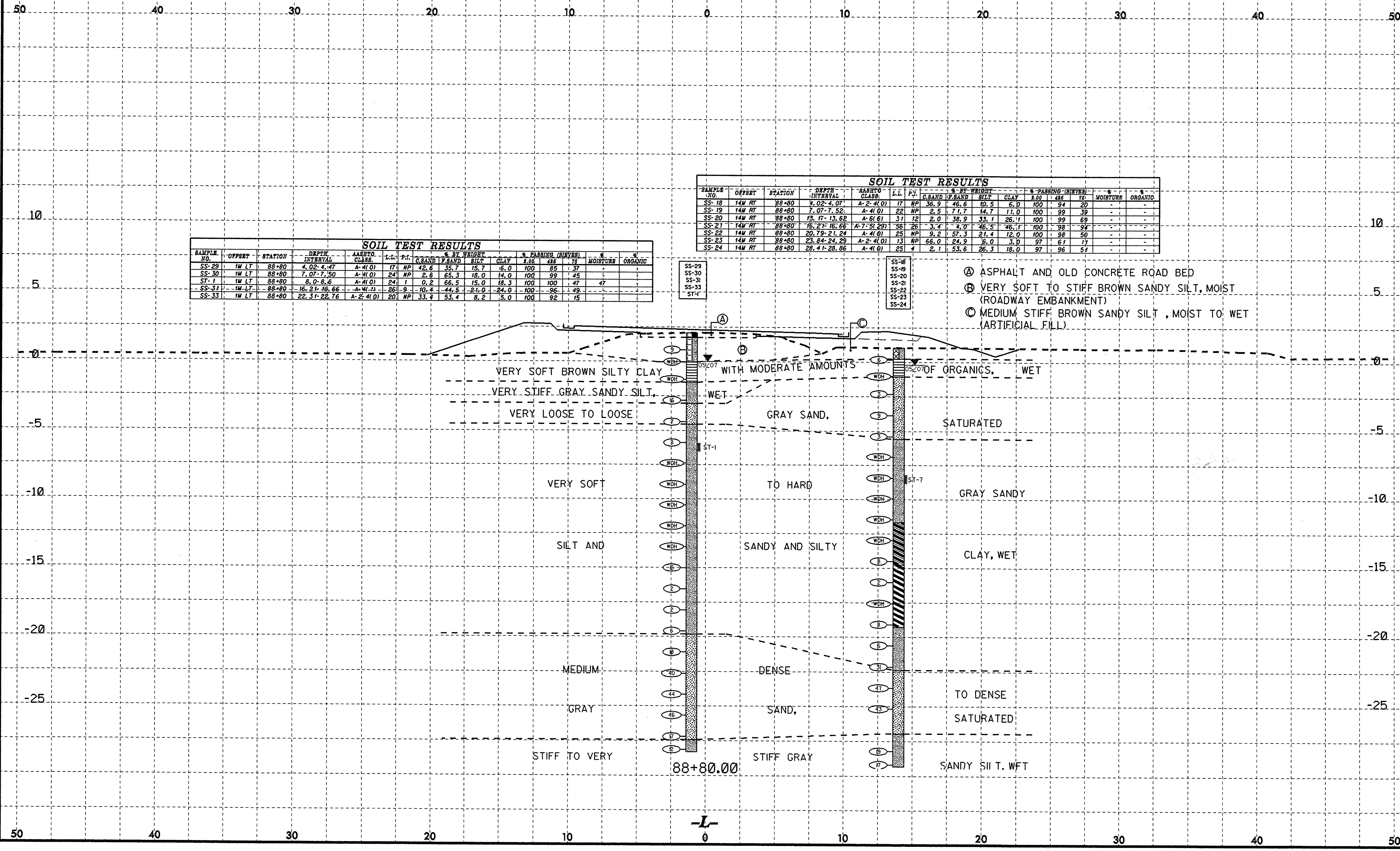
METRIC
PROJECT REFERENCE NO.
R-2414B
SHEET NO.
118
2.5 0 2.5 5
Ⓐ VERY STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)
Ⓑ VERY SOFT DARK BROWN MUCK, WET
MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET
0.487
88+60.00
MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET
0.547
88+40.00
-L-
50 40 30 20 10 0 10 20 30 40 50
10
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) 2.00	.425	.75	% MOISTURE	% ORGANIC
SS-18	14M RT	88+80	4.02-4.07	A-2-4(0)	17	NP	36.9	46.6	10.5	6.0	100	94	20	-	-
SS-19	14M RT	88+80	7.07-7.52	A-4(0)	22	NP	2.5	71.7	14.7	11.0	100	99	39	-	-
SS-20	14M RT	88+80	13.17-13.62	A-6(6)	31	12	2.0	38.9	33.1	26.1	100	99	69	-	-
SS-21	14M RT	88+80	16.21-16.66	A-7-5(29)	56	26	3.4	4.0	46.5	46.1	100	98	94	-	-
SS-22	14M RT	88+80	20.79-21.24	A-4(0)	25	NP	9.2	57.3	21.4	12.0	100	98	50	-	-
SS-23	14M RT	88+80	23.84-24.29	A-2-4(0)	13	NP	66.0	24.9	6.0	3.0	97	61	11	-	-
SS-24	14M RT	88+80	28.41-28.86	A-4(0)	25	4	2.1	53.6	26.3	18.0	97	96	51	-	-

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) 2.00	.425	.75	% MOISTURE	% ORGANIC
SS-29	1M LT	88+80	4.02-4.47	A-4(0)	17	NP	42.6	35.7	15.7	6.0	100	85	37	-	-
SS-30	1M LT	88+80	7.07-7.50	A-4(0)	24	NP	2.6	65.3	18.0	14.0	100	99	45	-	-
ST-1	1M LT	88+80	8.0-8.6	A-4(0)	24	1	0.2	66.5	15.0	18.3	100	100	47	47	-
SS-31	1M LT	88+80	16.21-16.66	A-4(-1)	26	9	10.4	44.5	21.0	24.0	100	96	49	-	-
SS-33	1M LT	88+80	22.31-22.76	A-2-4(0)	20	NP	33.4	53.4	8.2	5.0	100	92	15	-	-



Ⓐ ASPHALT AND OLD CONCRETE ROAD BED

Ⓑ MEDIUM STIFF TO STIFF BROWN SANDY SILT, MOIST TO WET

SOIL TEST RESULTS

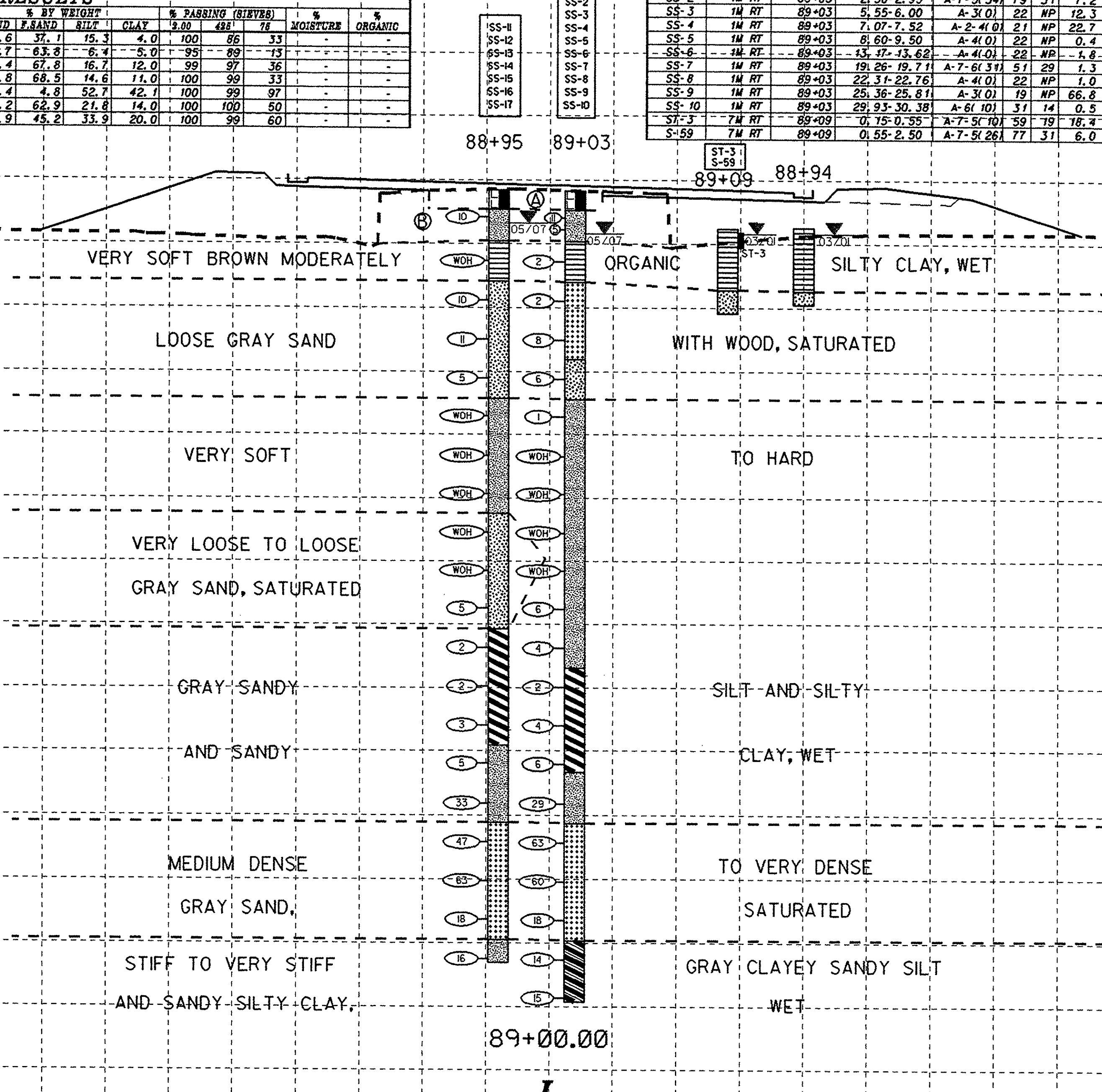
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.00	425	75	% MOISTURE	% ORGANIC
SS-11	2M LT	88+95	4.02-4.47	A-2-4(0)	18	NP	43.6	37.1	15.3	4.0	100	86	33	-	-
SS-12	2M LT	88+95	7.07-7.52	A-2-4(0)	21	NP	24.7	63.8	6.4	5.0	95	89	13	-	-
SS-13	2M LT	88+95	8.60-9.50	A-4(0)	26	NP	3.4	67.8	16.7	12.0	99	97	36	-	-
SS-14	2M LT	88+95	13.17-13.62	A-2-4(0)	21	NP	5.8	68.5	14.6	11.0	100	99	33	-	-
SS-15	2M LT	88+95	17.74-18.19	A-7-6(35)	55	32	0.4	4.8	52.7	42.1	100	99	97	-	-
SS-16	2M LT	88+95	22.31-22.46	A-4(0)	24	NP	1.2	62.9	21.8	14.0	100	100	50	-	-
SS-17	2M LT	88+95	29.93-30.38	A-4(3)	27	10	0.9	45.2	33.9	20.0	100	99	60	-	-

SOIL TEST RESULTS

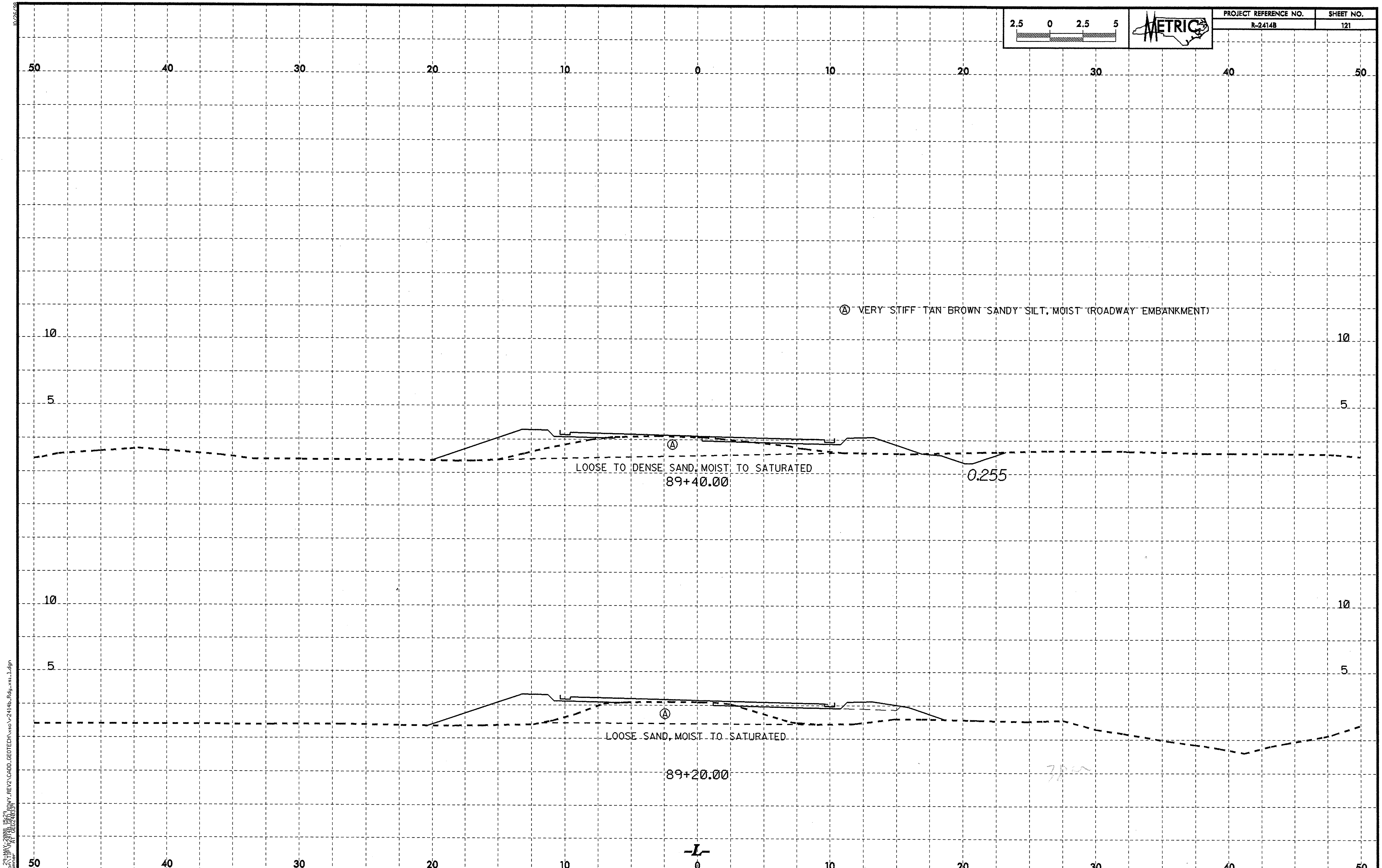
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.00	425	75	% MOISTURE	% ORGANIC
SS-1	1M RT	89+03	0.76-1.21	A-4(0)	16	NP	29.7	43.1	17.2	10.0	100	92	38	-	-
SS-2	1M RT	89+03	2.50-2.95	A-7-5(34)	79	31	7.2	15.0	33.7	44.1	100	97	84	90.0	19.6
SS-3	1M RT	89+03	5.55-6.00	A-3(0)	22	NP	12.3	80.8	3.9	3.0	100	99	9	-	-
SS-4	1M RT	89+03	7.07-7.52	A-2-4(0)	21	NP	22.7	66.2	5.0	6.0	99	93	13	-	-
SS-5	1M RT	89+03	8.60-9.50	A-4(0)	22	NP	0.4	67.3	18.3	14.0	100	100	45	-	-
SS-6	1M RT	89+03	13.17-13.62	A-4(0)	22	NP	1.8	68.5	17.6	12.0	100	100	42	-	-
SS-7	1M RT	89+03	19.26-19.71	A-7-6(31)	51	29	1.3	6.5	52.1	40.1	100	100	96	-	-
SS-8	1M RT	89+03	22.31-22.76	A-4(0)	22	NP	1.0	70.4	18.5	10.0	100	100	41	-	-
SS-9	1M RT	89+03	25.36-25.81	A-3(0)	19	NP	66.8	25.1	7.1	1.0	96	62	9	-	-
SS-10	1M RT	89+03	29.93-30.38	A-6(10)	31	14	0.5	28.3	45.1	26.1	100	100	80	-	-
ST-3	7M RT	89+09	0.15-0.55	A-7-5(10)	59	19	18.4	14.7	38.6	28.3	100	91	71	90	13.2
S-59	7M RT	89+09	0.55-2.50	A-7-5(26)	77	31	6.0	5.4	34.1	54.4	98	95	89	19.4	17.4

VANE SHEAR TESTS

STATION	OFFSET	DEPTH	S (kPa)	SR (kPa)
89+00	6m RT	0.2		5.3
89+00	6m RT	0.4		15.5
89+00	6m RT	0.6		10.6
89+00	6m RT	0.8		12.4
89+00	6m RT	1.0		10.6
89+00	6m RT	1.2		13.3
89+00	6m RT	1.4		15.5
89+00	6m RT	1.6		21.3
89+00	6m RT	1.8		23.0



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	121



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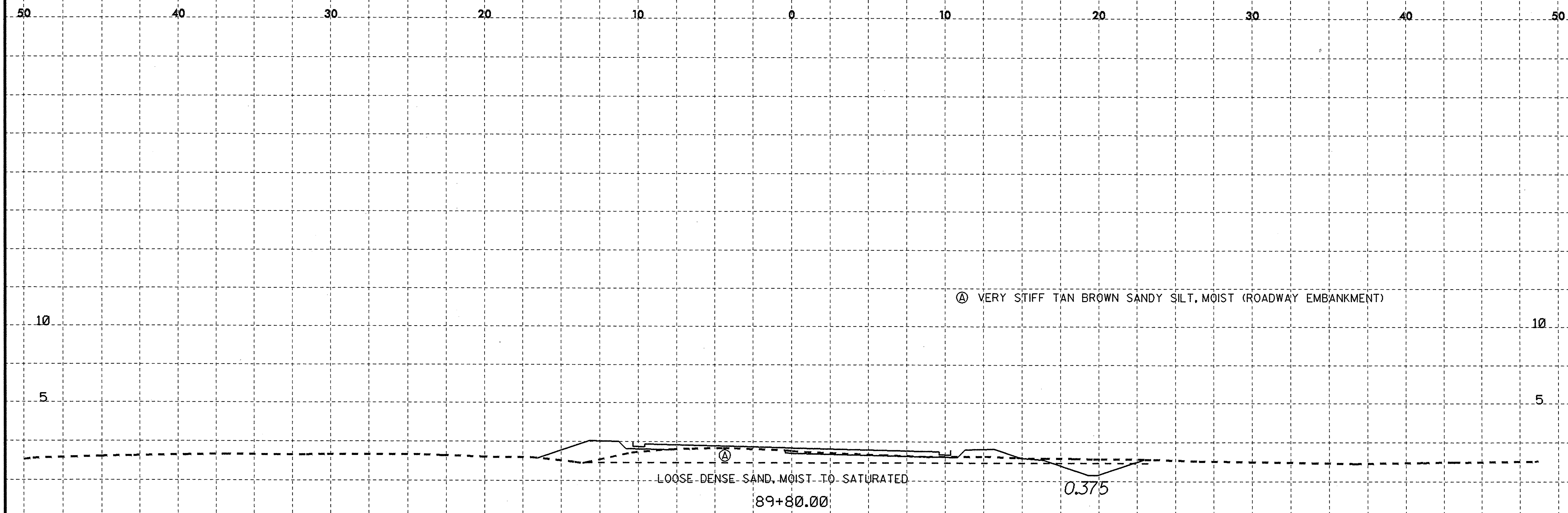
crsumner AT GEO2403339

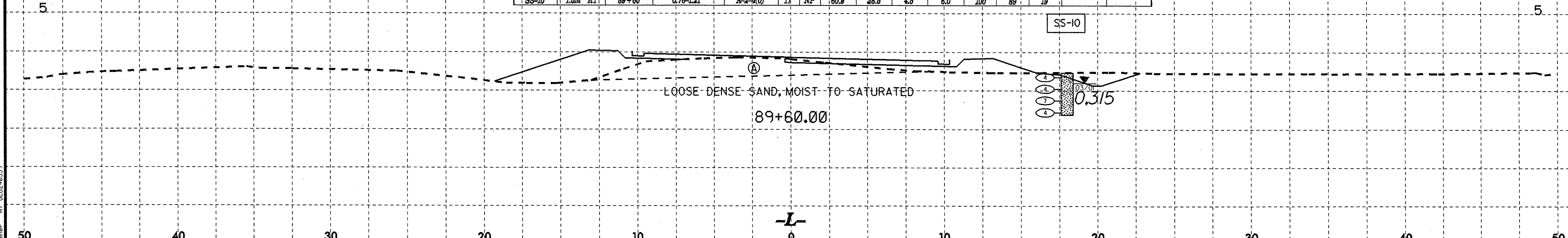
PROJECT REFERENCE NO.	SHEET NO.
R-2414B	122

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) 2.00	425	75	% MOISTURE	% ORGANIC
SS-10	1.5M RT	89+60	0.76-1.21	A-2-4(0)	17	NP	60.9	28.5	4.5	6.0	100	89	19		



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	123

2.5 0 2.5 5

50 40 30 20 10 0 10 20 30 40 50

10

5

Ⓐ MEDIUM DENSE TAN SAND, MOIST
(ROADWAY EMBANKMENT)

MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET

90+40.00

10

5

MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET

90+20.00

10

5

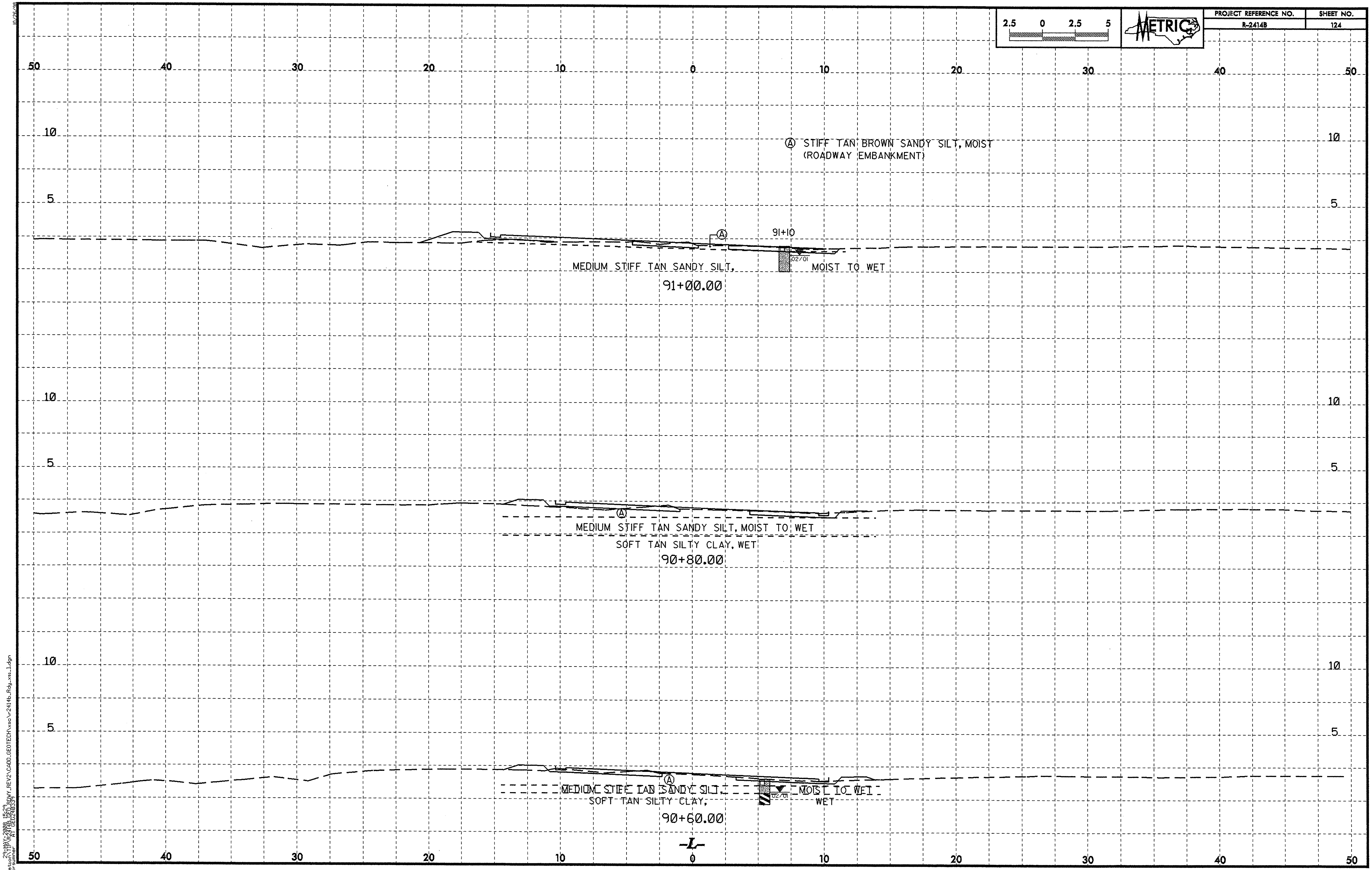
MEDIUM STIFF TO STIFF TAN SANDY SILT, MOIST TO WET

LOOSE TAN SAND, SATURATED

90+00.00

-L-

50 40 30 20 10 0 10 20 30 40 50



PROJECT REFERENCE NO.
R-2414B
SHEET NO.
124
METRIC
2.5 0 2.5 5
Ⓐ STIFF TAN BROWN SANDY SILT, MOIST
(ROADWAY EMBANKMENT)
91+10
MEDIUM STIFF TAN SANDY SILT,
MOIST TO WET
91+00.00
MEDIUM STIFF TAN SANDY SILT, MOIST TO WET
SOFT TAN SILTY CLAY, WET
90+80.00
MEDIUM STIFF TAN SANDY SILT,
MOIST TO WET
SOFT TAN SILTY CLAY,
WET
90+60.00
-L-
50 40 30 20 10 0 10 20 30 40 50
10
5

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	125

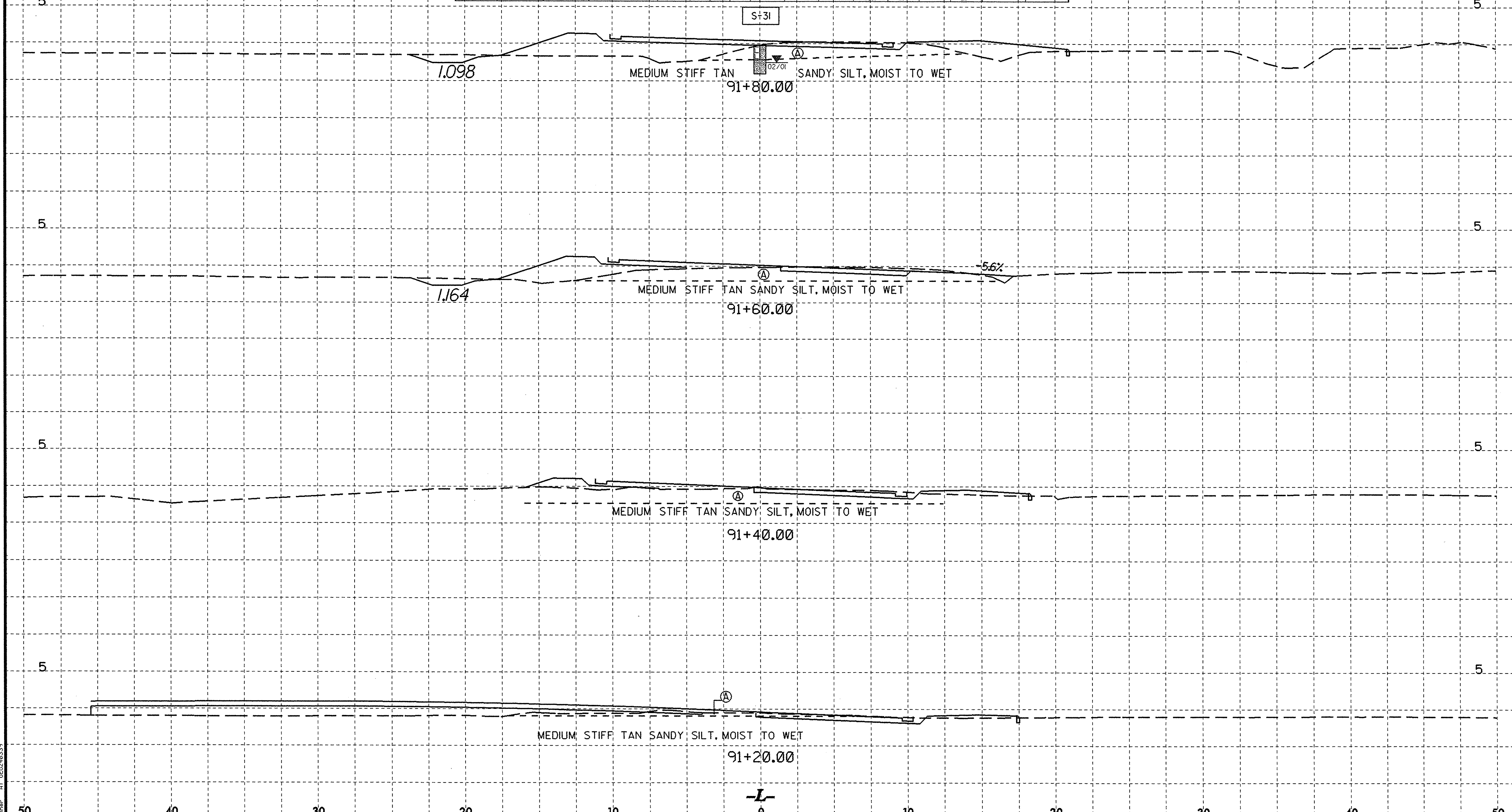
METRIC

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) 2.00	425	75	% MOISTURE	% ORGANIC
S-31	CL	91+80	0.00-1.93	A-4(0)	21	6	22.4	42.5	19.0	16.1	100	94	49		

Ⓐ STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	126

2.5 0 2.5 5

METRIC

50 40 30 20 10 0 10 20 30 40 50

5

Ⓐ STIFF TAN BROWN SANDY SILT, MOIST
(ROADWAY EMBANKMENT)

1.581

MEDIUM STIFF TAN SANDY SILT, MOIST TO WET

92+60.00

10

SHOULDER
WIDENED
0.3

5

92+50

Ⓐ

MEDIUM STIFF TAN SANDY 02/01 SILT, MOIST TO WET

92+40.00

5

0.965

MEDIUM STIFF TAN SANDY SILT, MOIST TO WET

92+20.00

5

1.032

MEDIUM STIFF TAN SANDY SILT, MOIST TO WET

92+00.00

-L-

50 40 30 20 10 0 10 20 30 40 50

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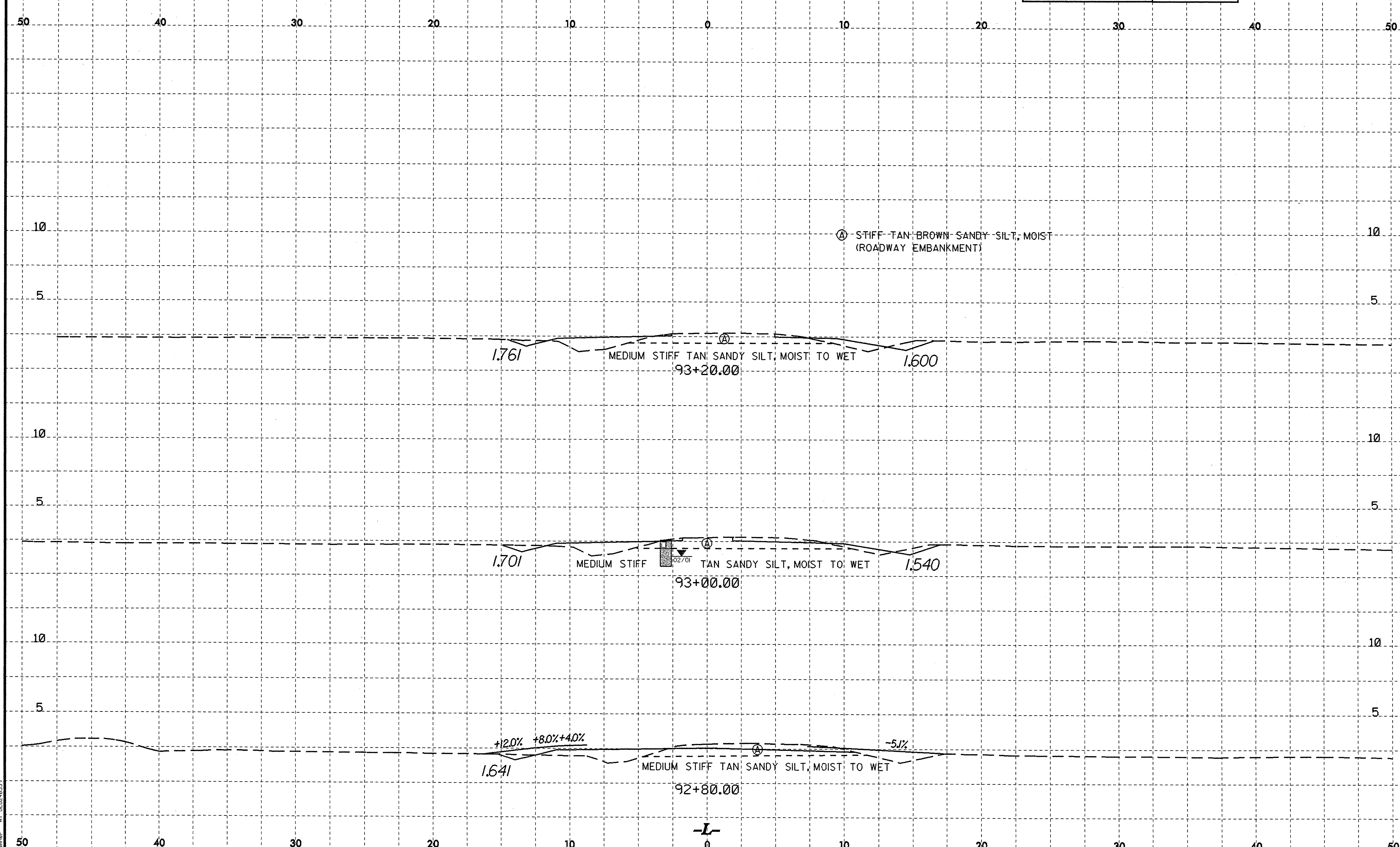
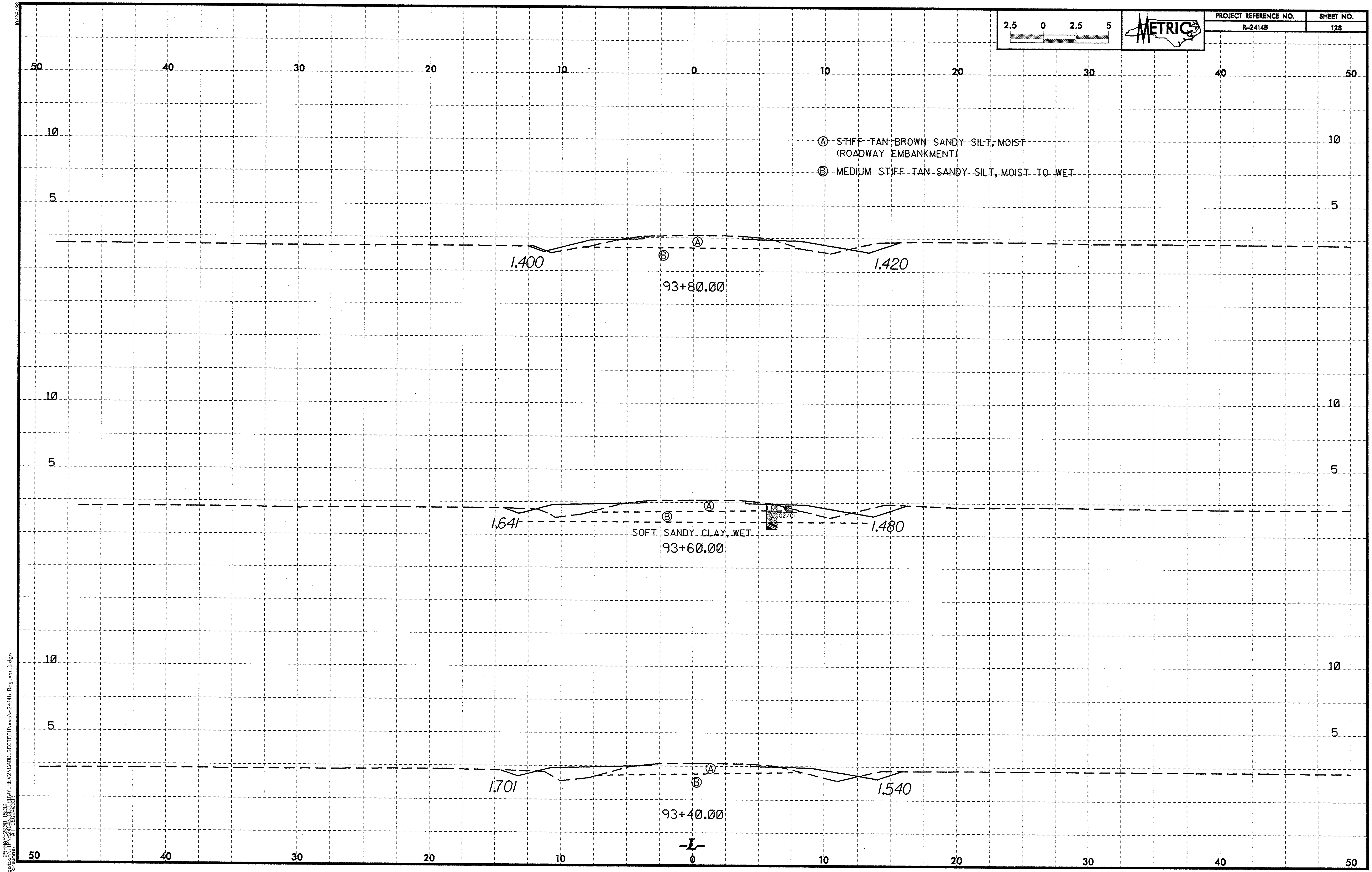
grammer

2.5 0 2.5 5	METRIC	PROJECT REFERENCE NO.	SHEET NO.
		R-2414B	127

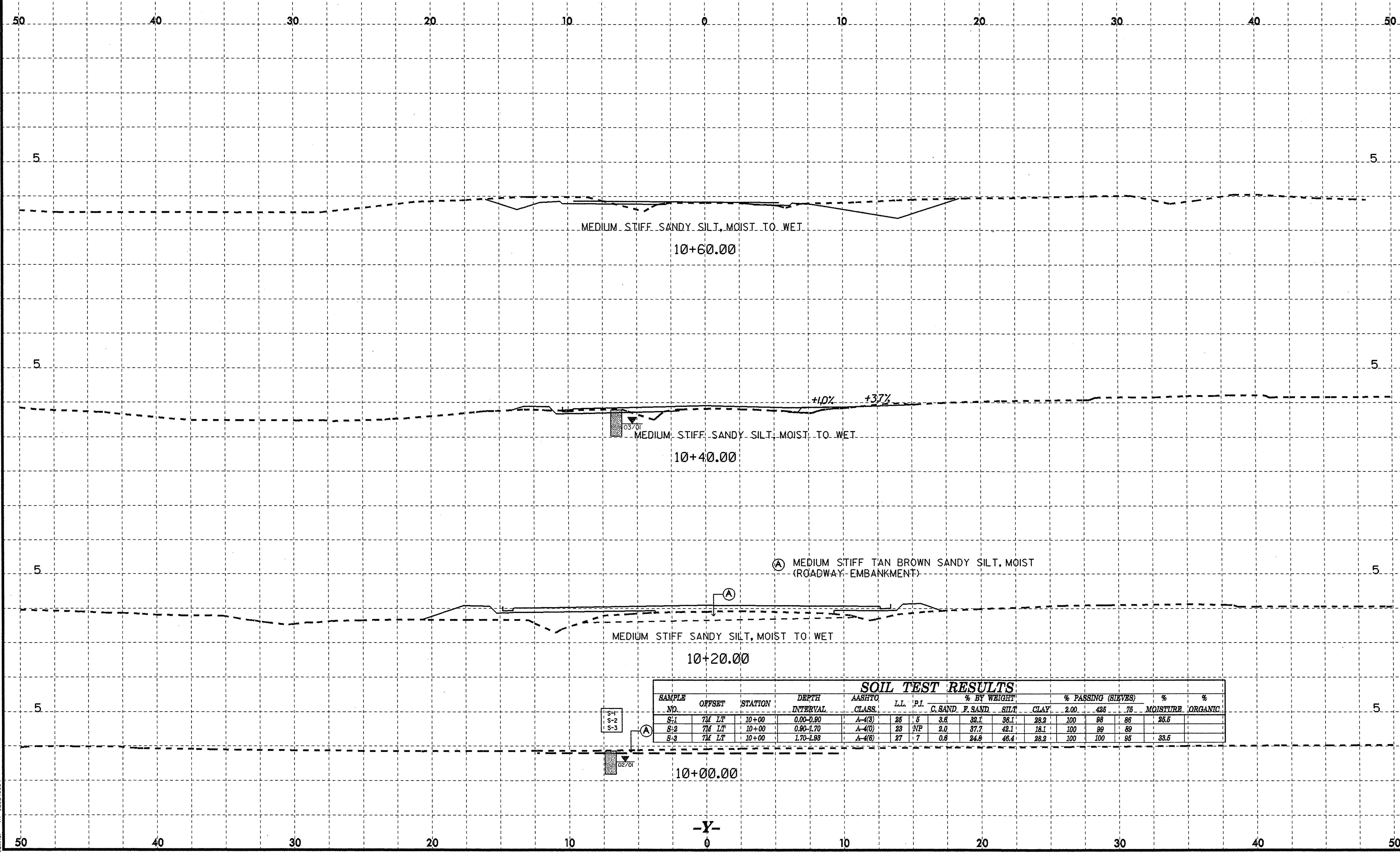




PROJECT REFERENCE NO.
R-2414B
SHEET NO.
128
METRIC
2.5 0 2.5 5
Ⓐ STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)
Ⓑ MEDIUM STIFF TAN SANDY SILT, MOIST TO WET
1.400
1.420
93+80.00
SOFT SANDY CLAY, WET
1.641
1.480
02/01
93+60.00
1.701
1.540
93+40.00
-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	129

METRIC



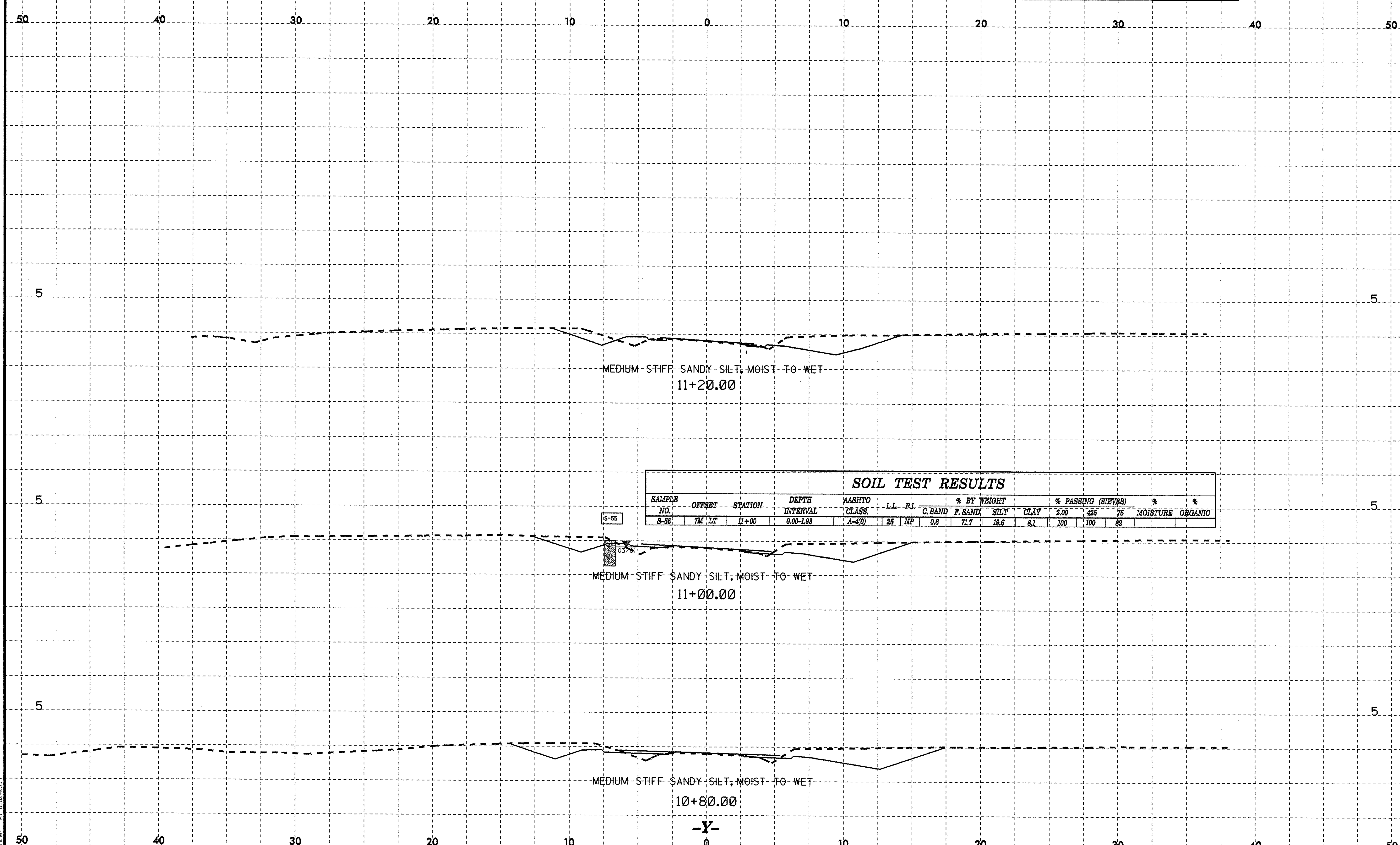
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 2.00	.425	.075	% MOISTURE	% ORGANIC
S-1	7M LT	10+00	0.00-0.90	A-4(3)	25	5	3.6	32.1	36.1	28.2	100	98	86	25.5	
S-2	7M LT	10+00	0.90-1.70	A-4(0)	23	NP	2.0	37.7	42.1	18.1	100	99	89		
S-3	7M LT	10+00	1.70-1.93	A-4(6)	27	7	0.6	24.8	46.4	28.2	100	100	95	33.5	

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	130

METRIC

2.5 0 2.5 5

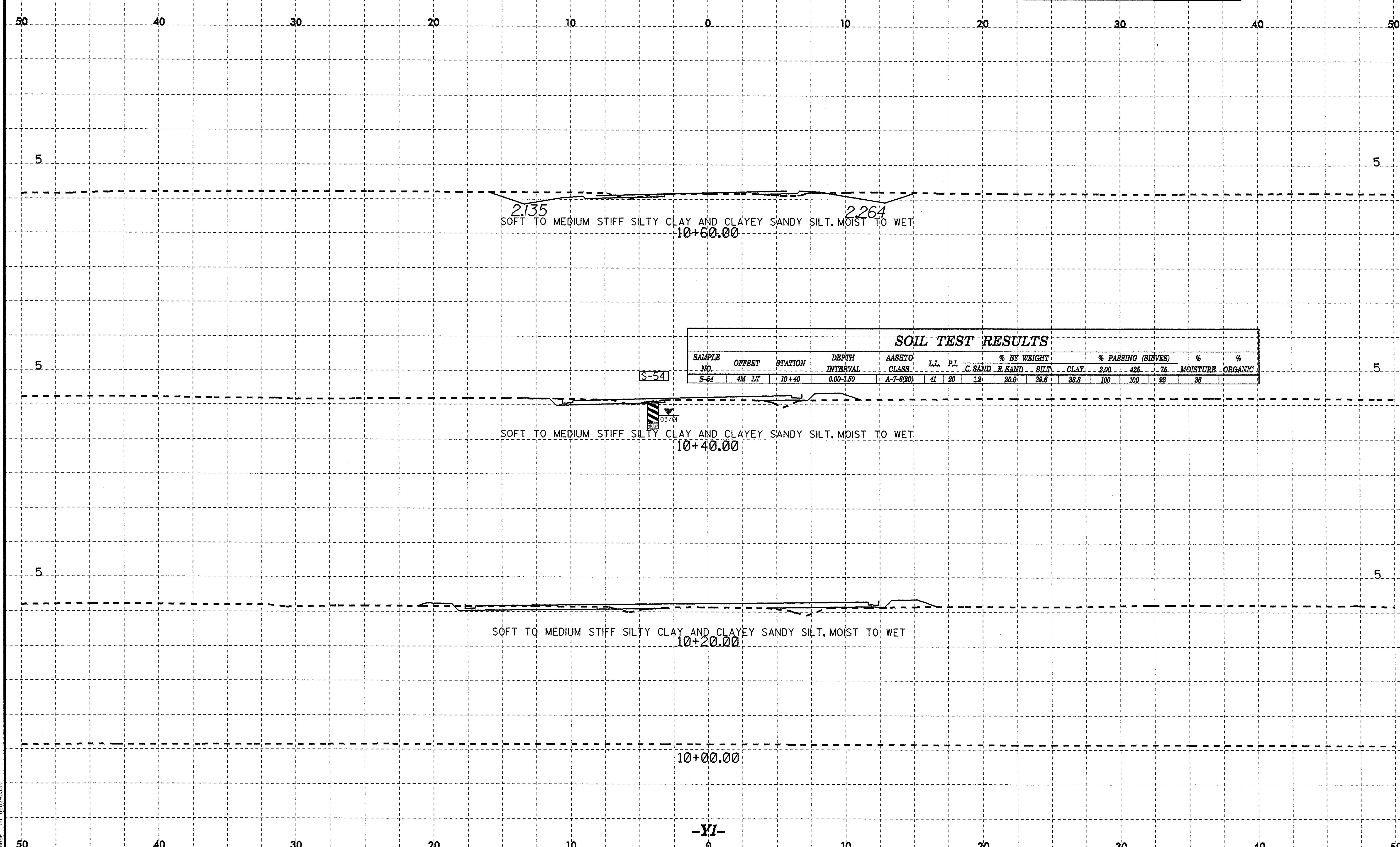


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 2.00	.425	.75	% MOISTURE	% ORGANIC
S-55	7M LT	11+00	0.00-1.93	A-4(0)	25	NP	0.6	71.7	19.6	8.1	100	100	82		

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	131

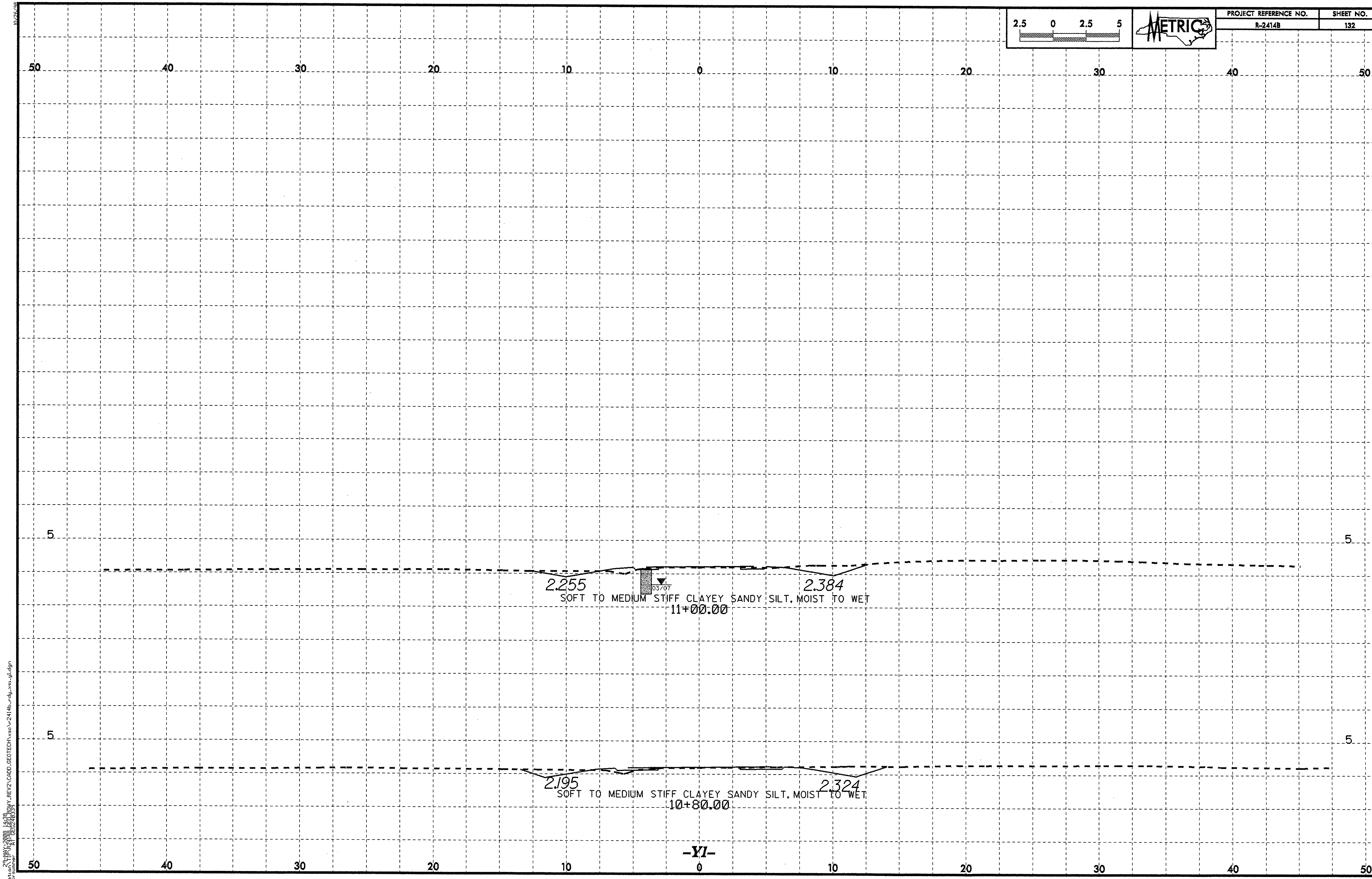
METRIC



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	2.00	.425	.75		
S-54	4M LT	10+40	0.00-1.50	A-7-6(20)	41	20	1.2	20.9	39.6	38.3	100	100	93	36	

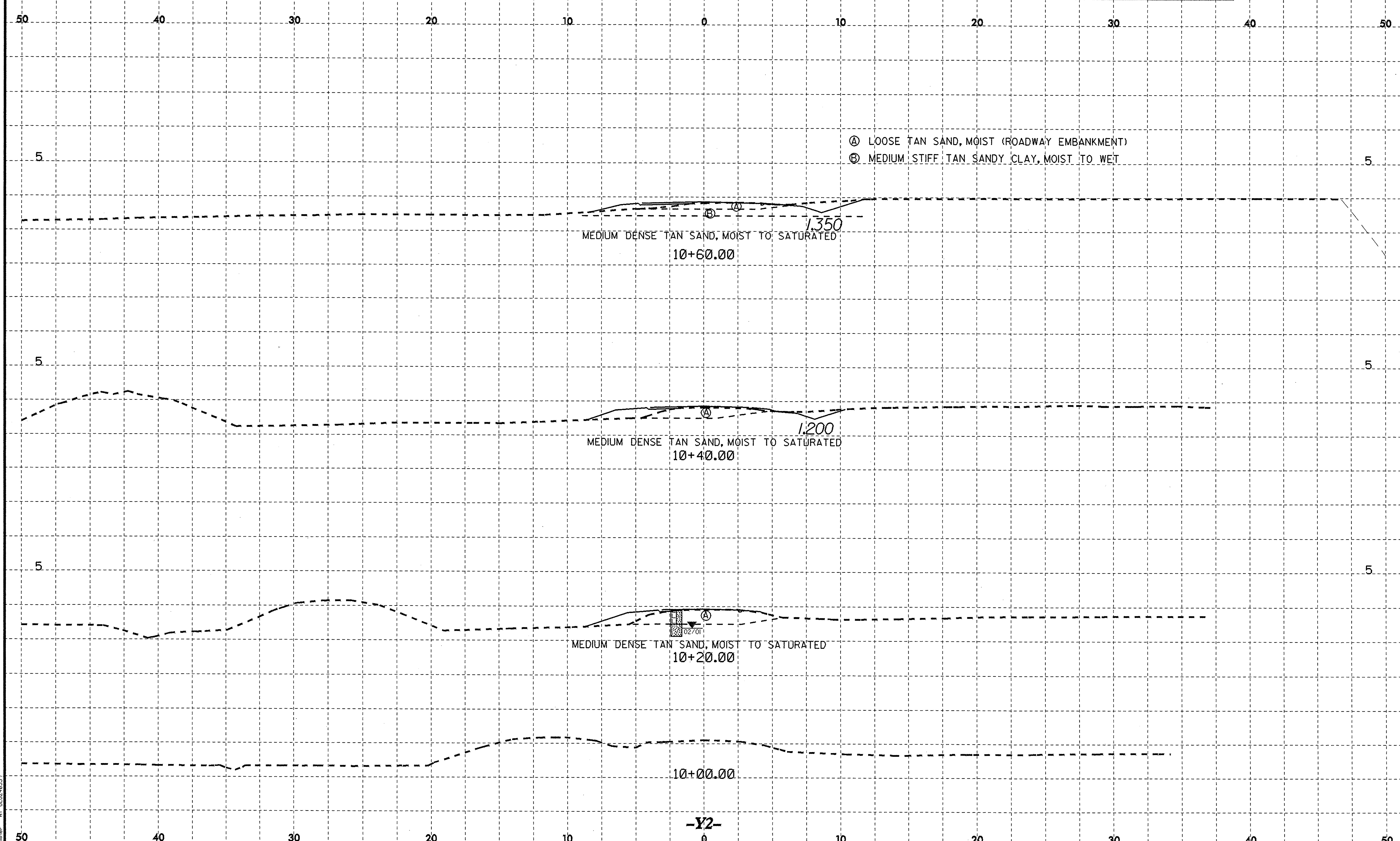
PROJECT REFERENCE NO.	SHEET NO.
R-2414B	132



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	133

METRIC

2.5 0 2.5 5



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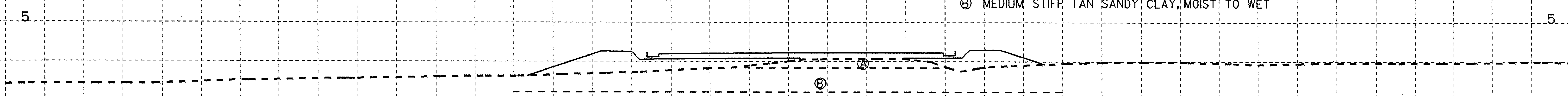
crsumner AT GEG240339

2.5 0 2.5 5	METRIC	PROJECT REFERENCE NO.	SHEET NO.
		R-2414B	134

Ⓐ LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

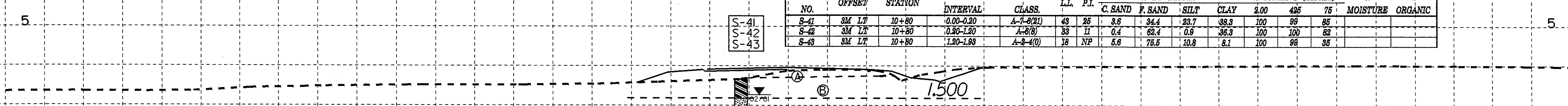
Ⓑ MEDIUM STIFF TAN SANDY CLAY, MOIST TO WET



11+00.00

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	2.00	425	75		
S-41	3M LT	10+80	0.00-0.20	A-7-6(21)	43	25	3.6	34.4	23.7	38.3	100	99	85		
S-42	3M LT	10+80	0.20-1.20	A-6(8)	33	11	0.4	62.4	0.9	36.3	100	100	82		
S-43	3M LT	10+80	1.20-1.93	A-2-4(0)	18	NP	5.6	75.5	10.8	8.1	100	99	35		



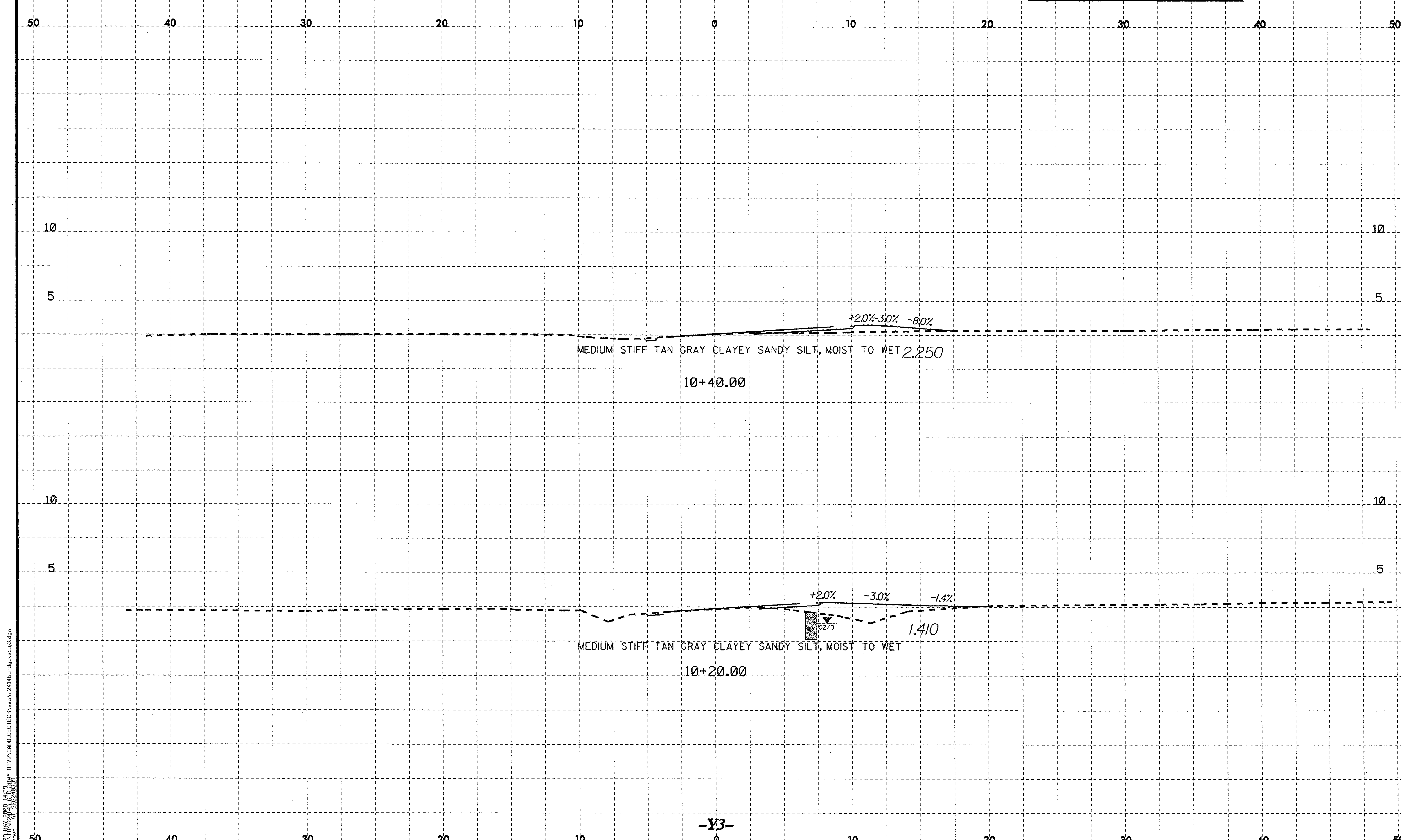
10+80.00

-Y2-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	135

2.5 0 2.5 5

METRIC



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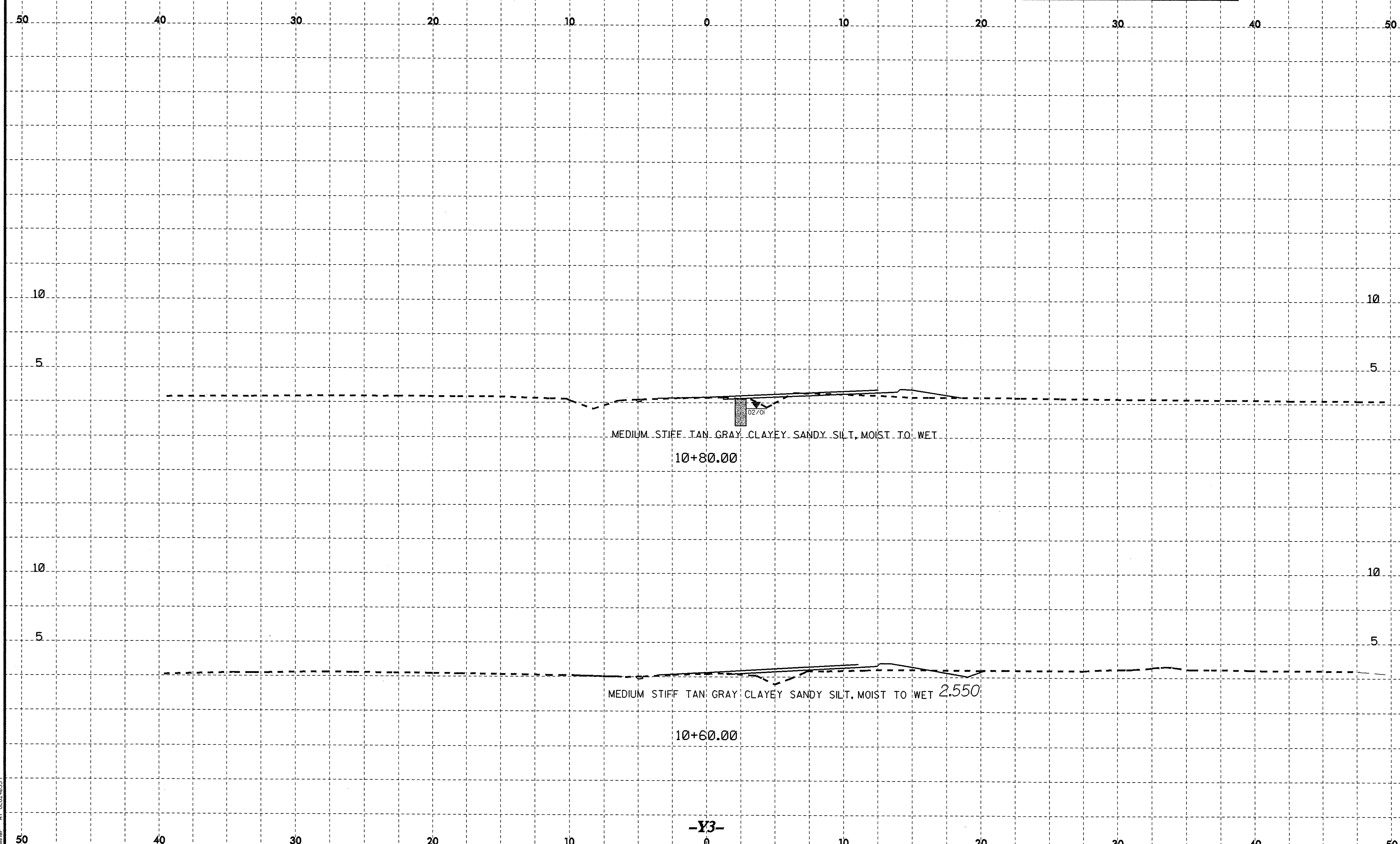
PROJECT REFERENCE NO.	SHEET NO.
R-2414B	136

METRIC



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	137

2.5 0 2.5 5

METRIC

50 5 40 30 20 10 0 10 20 30 40 5 50

MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT AND SILTY CLAY, MOIST
MEDIUM DENSE GRAY SAND, MOIST TO SATURATED
11+60.00

5 5

MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT AND SILTY CLAY, MOIST
MEDIUM DENSE GRAY SAND, MOIST TO SATURATED
11+40.00

10 10

Ⓐ MEDIUM STIFF SANDY SILT, MOIST (ROADWAY EMBANKMENT)

5 5

-5.0% -1.0%

MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT, MOIST TO WET
11+20.00

10 10

5 5

MEDIUM STIFF TAN GRAY CLAYEY SANDY SILT, MOIST TO WET
11+00.00

-Y3-

50 40 30 20 10 0 10 20 30 40 50

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	138

2.5 0 2.5 5

METRIC

50 40 30 20 10 0 10 20 30 40 50

10
5
0

-4.0% -8.0%

MEDIUM STIFF TAN SANDY SILT, MOIST TO WET
10+60.00

MEDIUM STIFF TAN SANDY SILT, MOIST TO WET
10+40.00

MEDIUM STIFF TAN SANDY 02/01 SILT, MOIST TO WET
10+20.00

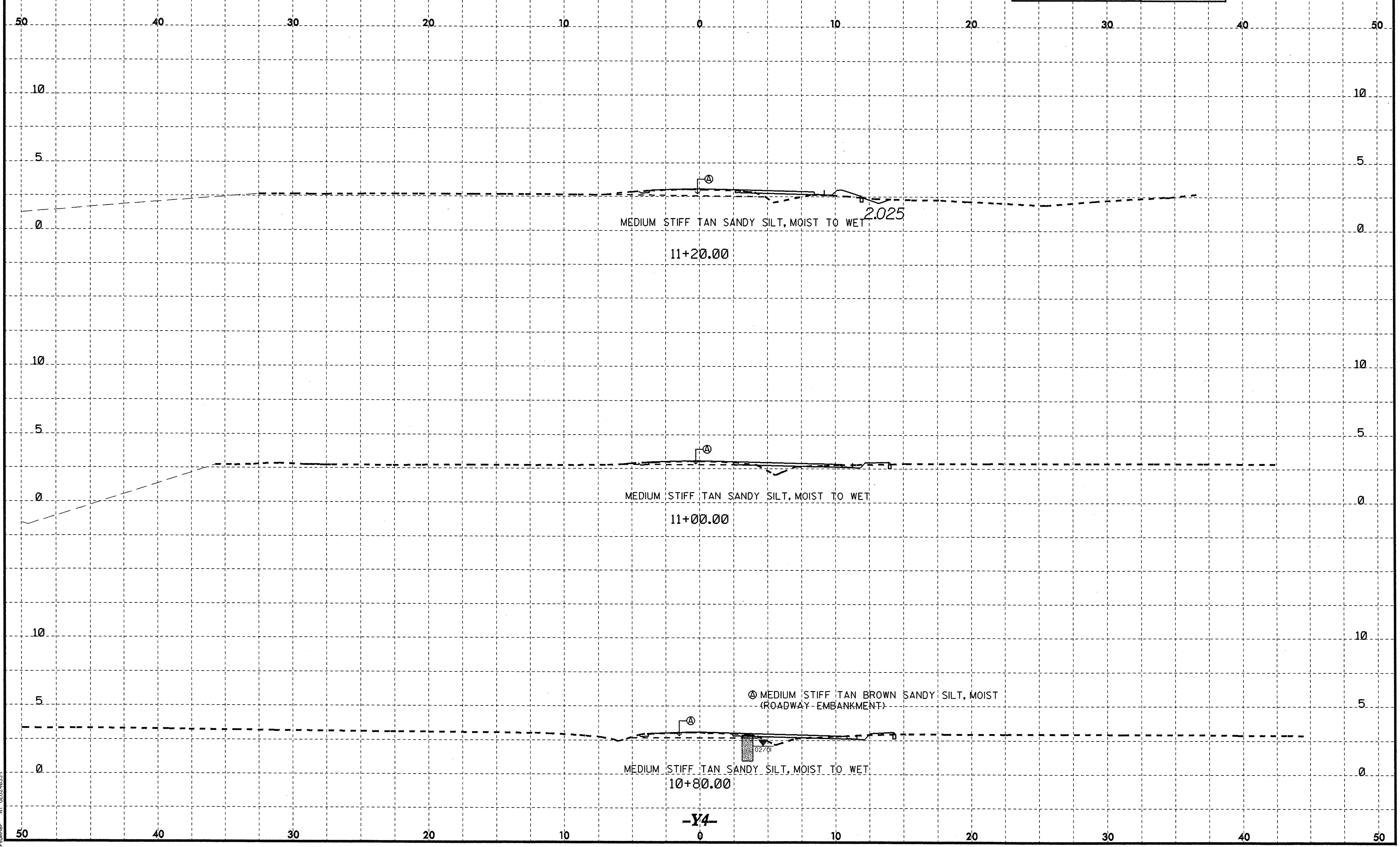
MEDIUM STIFF TAN BROWN SANDY SILT, MOIST
(ROADWAY EMBANKMENT)

MEDIUM STIFF TAN SANDY SILT, MOIST TO WET
10+00.00

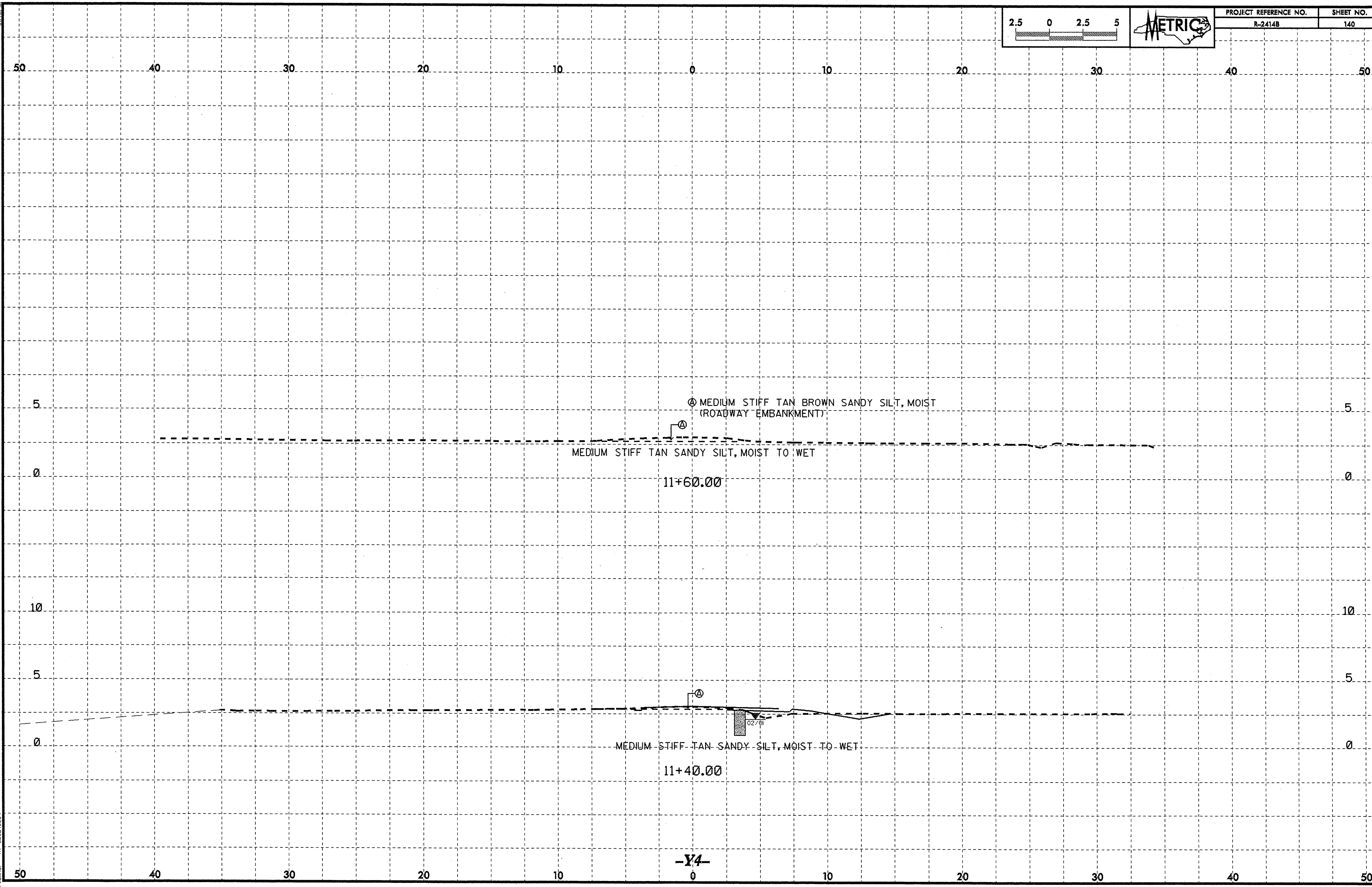
-Y4-

PROJECT REFERENCE NO. R-2414B

SHEET NO. 139



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	140



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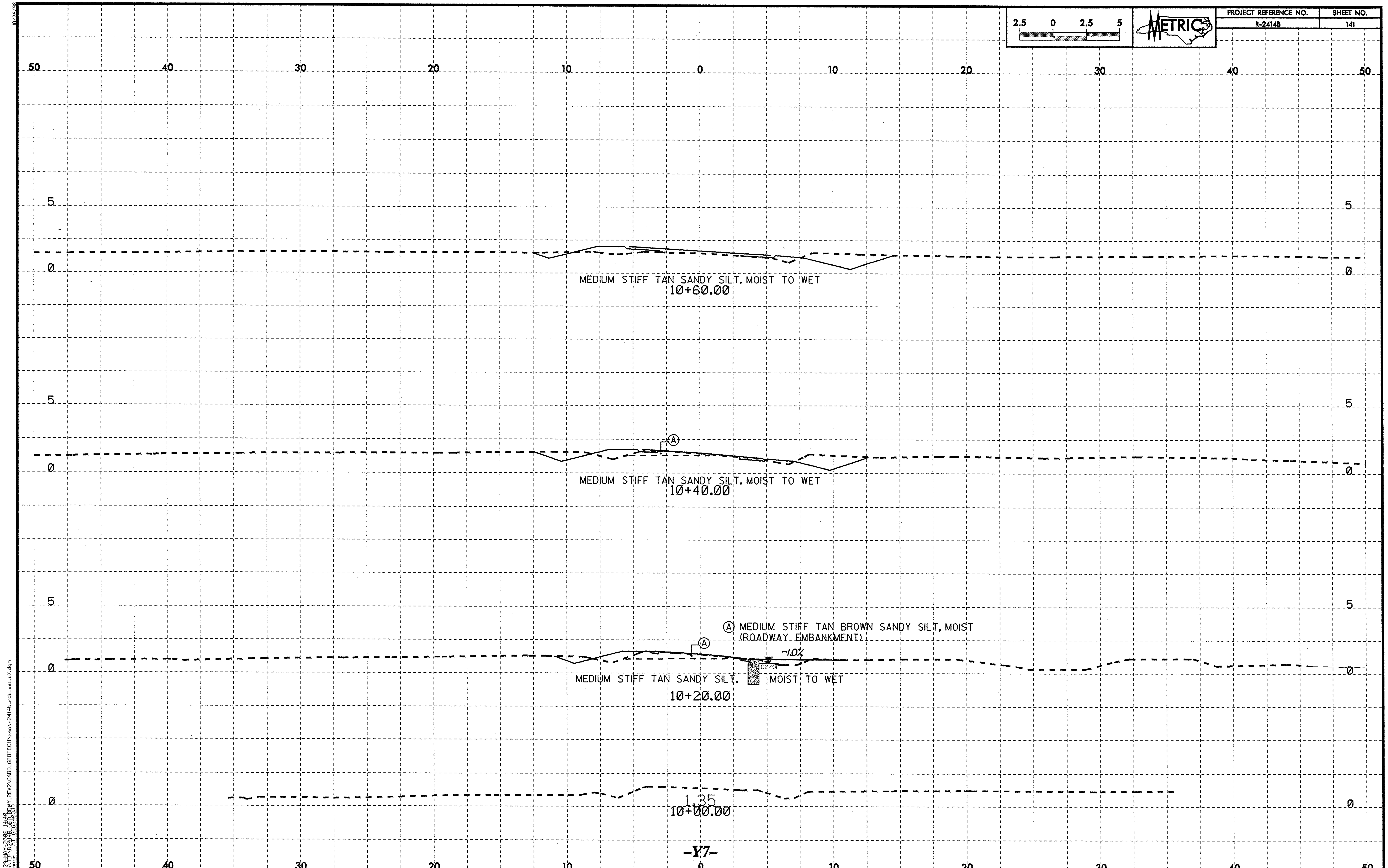
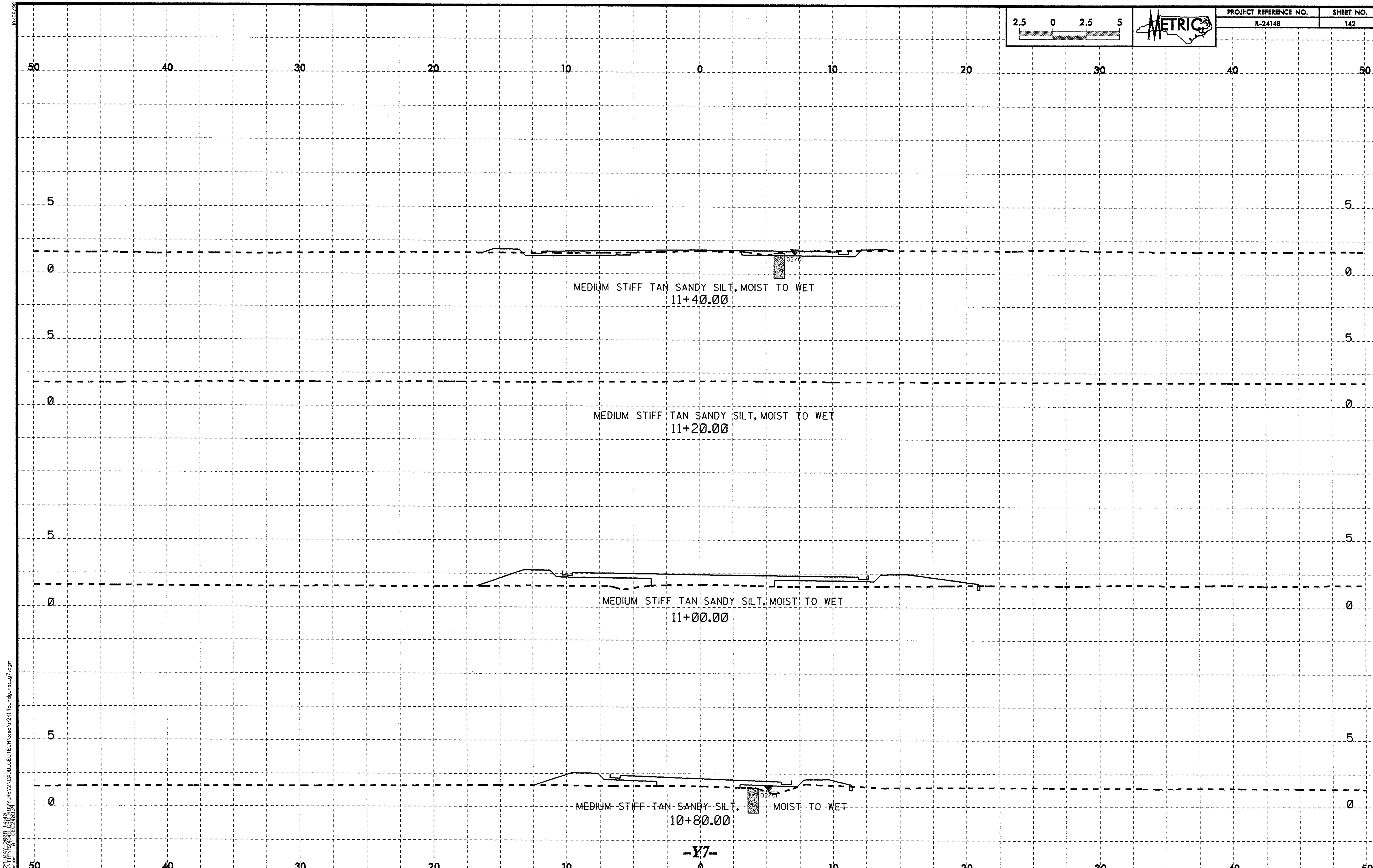


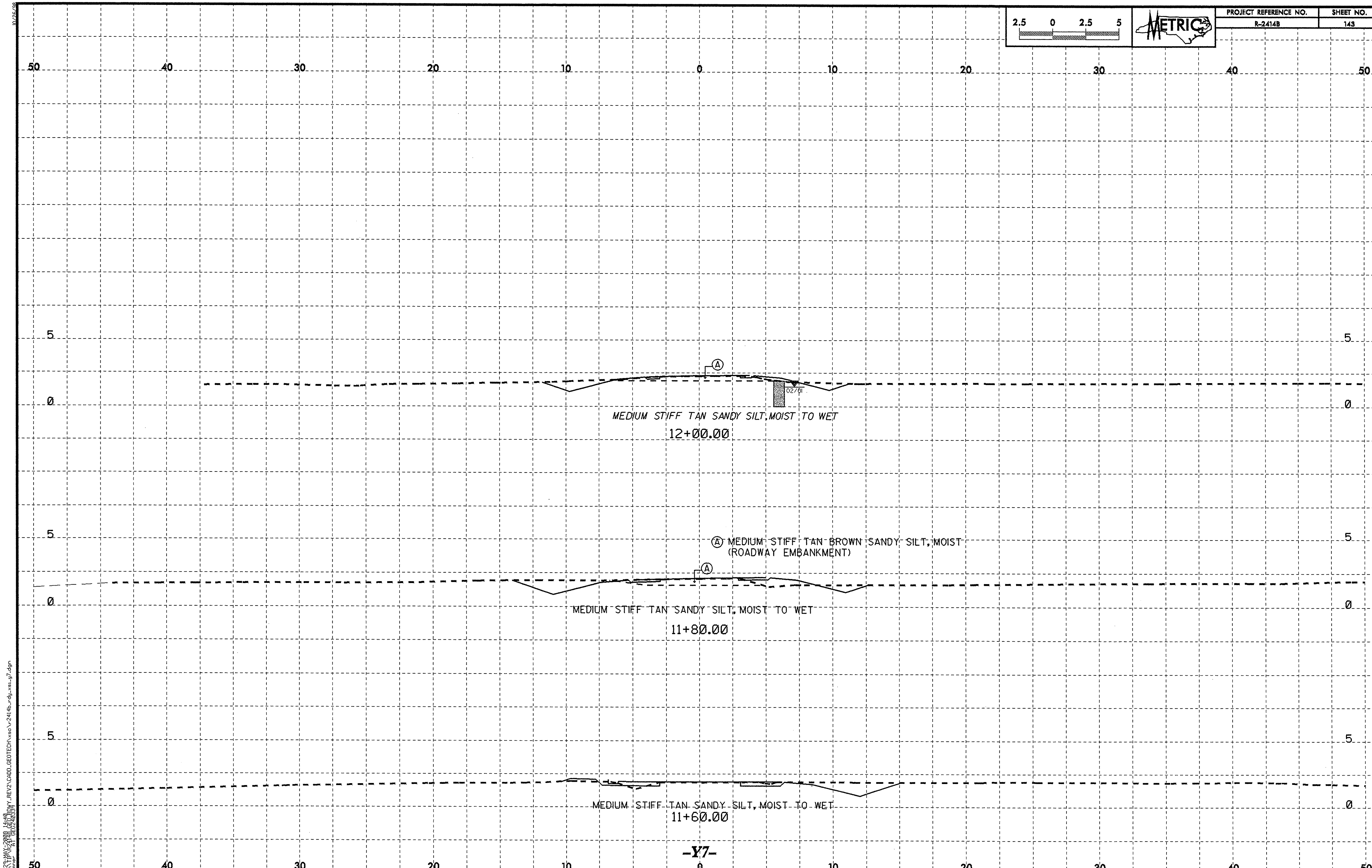
PROJECT REFERENCE NO.
R-2414B
SHEET NO.
141
METRIC
2.5 0 2.5 5
MEDIUM STIFF TAN SANDY SILT, MOIST TO WET
10+60.00
MEDIUM STIFF TAN SANDY SILT, MOIST TO WET
10+40.00
Ⓐ MEDIUM STIFF TAN BROWN SANDY SILT, MOIST (ROADWAY EMBANKMENT)
-1.0%
MEDIUM STIFF TAN SANDY SILT, MOIST TO WET
10+20.00
1.35
10+00.00
-Y7-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	142



-Y7-

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	143



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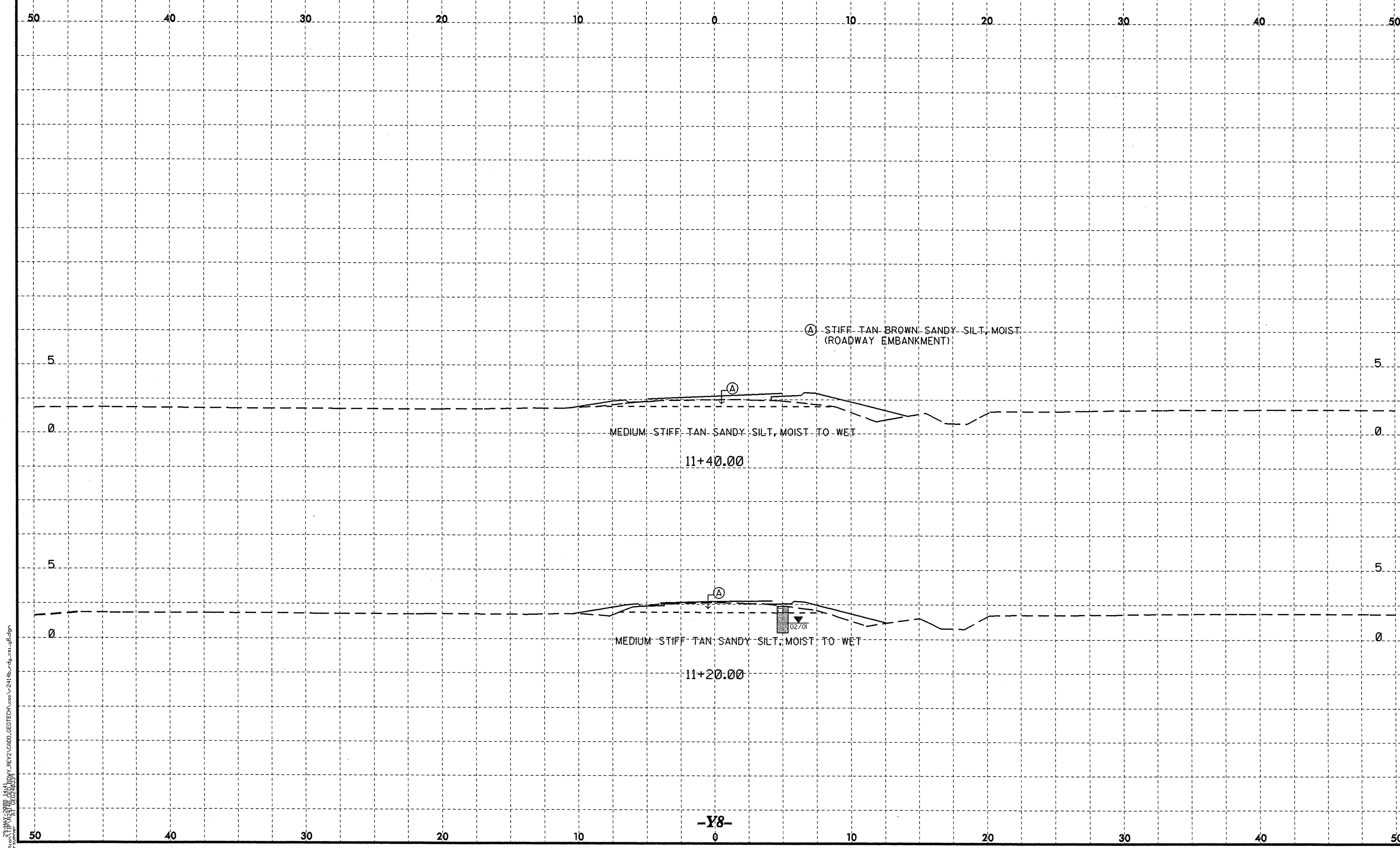
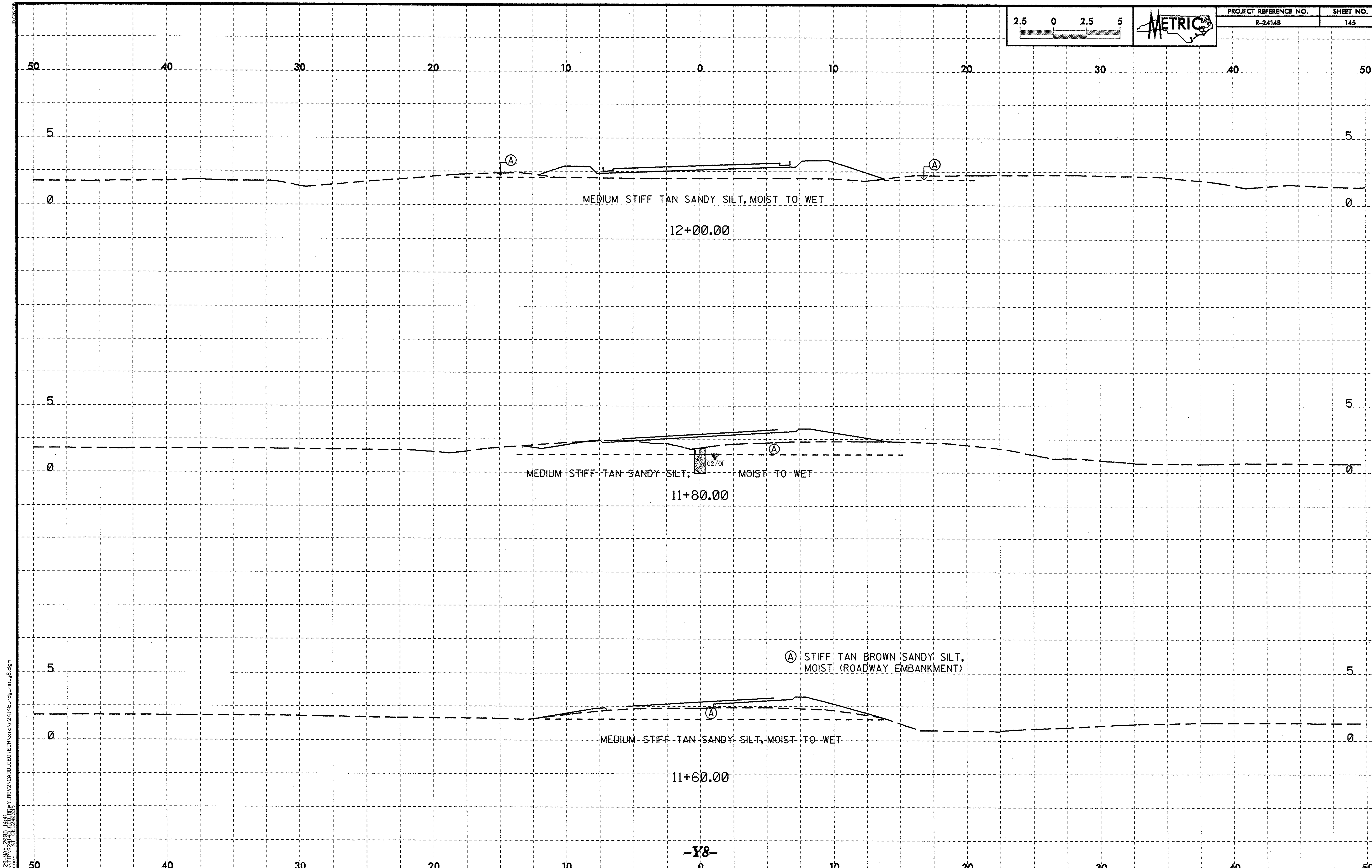
crsumner AT GEO2400339

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	144

METRIC



PROJECT REFERENCE NO.	SHEET NO.
R-2414B	145



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PROJECT REFERENCE NO.	SHEET NO.
R-2414B	146