

REFERENCE: U-5789

PROJECT: 44361

SEE SHEET 3 FOR PLAN SHEET LAYOUT
AT TIME OF INVESTIGATION

CONTENTS

LINE	STATION	PLAN	PROFILE
-L-	13+00 - 42+50	4-6	8-9
-Y-	10+00 - 28+16	4,7	10
-YI-	21+50 - 27+02	4	11
-YA2-	10+00 - 13+44	5	N/A

CROSS SECTIONS

LINE	STATION	SHEETS
-L-	12+00 - 42+50	12-31
-Y-	11+50 - 28+00	32-36
-YI-	21+50 - 26+00	37-38
-YA2-	11+00 - 13+00	39-40

APPENDICES

APPENDIX	TITLE	SHEETS
A	LABORATORY TEST RESULTS	41-42

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

**ROADWAY
SUBSURFACE INVESTIGATION**

COUNTY ONSLOW
PROJECT DESCRIPTION NC 53 (WESTERN BOULEVARD)
AT JACKSONVILLE PARKWAY /GATEWAY DRIVE
NORTH/SOUTH - RESURFACING AND WIDENING
INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5789	1	42

CAUTION NOTICE

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2. 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.

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SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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 UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR 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-1-b		A-2-4		A-2		A-2-5		A-2-6		A-2-7		A-4		A-5		A-6		A-7		A-1, A-2		A-3		A-4, A-5		A-6, A-7								
SYMBOL																																					
% PASSING #10 #40 #200	50 MX 30 MX 15 MX		50 MX 25 MX		51 MN 10 MX		35 MX		35 MX		35 MX		35 MX		36 MN		36 MN		36 MN		36 MN		GRANULAR SOILS		SILT-CLAY SOILS		MUCK, PEAT										
MATERIAL PASSING #40 LL PI	— 6 MX		— NP		40 MX 41 MN 10 MX		41 MN 40 MX 11 MN		41 MN 40 MX 11 MN		41 MN 40 MX 11 MN		41 MN 40 MX 11 MN		41 MN 40 MX 11 MN		41 MN 40 MX 11 MN		41 MN 40 MX 11 MN		41 MN 40 MX 11 MN		SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS												
GROUP INDEX	0		0		0		4 MX		8 MX		12 MX		16 MX		NO MX																						
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND		SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS																										
GEN. RATING AS 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 RESISTANCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE OPENING (MM)	4	10	40	60	200	270
	4.75	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 IN.	305 12	75 3	2.0	0.25	0.05	0.005
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SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	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.
UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES 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 WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LL < 31
MODERATELY COMPRESSIBLE	LL = 31 - 50
HIGHLY COMPRESSIBLE	LL > 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

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

DIP & DIP DIRECTION OF ROCK STRUCTURES

TEST BORING

AUGER BORING

CORE BORING

MONITORING WELL

PIEZOMETER INSTALLATION

SLOPE INDICATOR INSTALLATION

CONE PENETROMETER TEST

SOUNDING ROD

TEST BORING WITH CORE

SPT N-VALUE

RECOMMENDATION SYMBOLS

UNDERCUT

SHALLOW UNDERCUT

UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE

UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK

UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

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
HL - 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
W - UNIT WEIGHT
W_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS
S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
☒ CME-45C

☐ CME-55

☐ CME-550

☐ VANE SHEAR TEST

☐ PORTABLE HOIST

☐ _____

☐ _____

ADVANCING TOOLS:
☐ CLAY BITS
☐ 6" CONTINUOUS FLIGHT AUGER
☐ 8" HOLLOW AUGERS
☐ HARD FACED FINGER BITS
☐ TUNG-CARBIDE INSERTS
☐ CASING ☐ W/ ADVANCER
☐ TRICONE _____ * STEEL TEETH
☐ TRICONE _____ * TUNG.-CARB.
☐ CORE BIT
☒ 2 7/8 DRAG BIT

HAMMER TYPE:
☒ AUTOMATIC ☐ MANUAL

CORE SIZE:
☐ -B _____ ☐ -H _____
☐ -N _____

HAND TOOLS:
☐ POST HOLE DIGGER
☒ HAND AUGER
☐ SOUNDING ROD
☐ VANE SHEAR TEST

☐ _____

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. 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 0.1 FOOT 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 FOOT 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 YIELD 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 SL.)
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 (SL.)
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, WOULD YIELD SPT N VALUES > 100 BPF*

VERY SEVERE (V SEV.)
ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF*

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 0.25 INCHES 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 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH 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 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FOOT
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF 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, SUCH 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 DISLOOED 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 4 INCHES 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 OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT 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 (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK:

ELEVATION: FEET

NOTES:

NORTHING AND EASTING OBTAINED USING A TRIMBLE GEO 7X WITH SUB FOOT ACCURACY.

SURVEY INFORMATION PROVIDED BY DAVENPORT

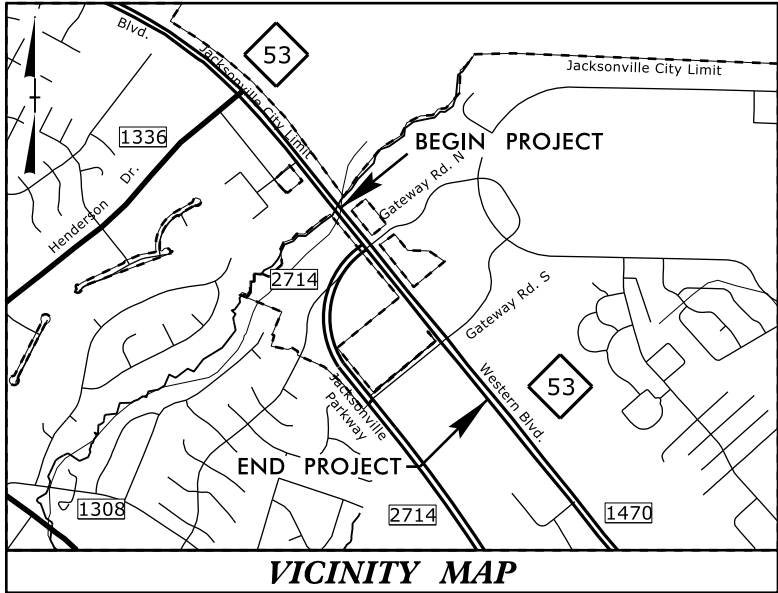
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08cad AT EGS-QP\CS\KEYV2H

TIP PROJECT: U-5789

CONTRACT:

See Sheet 1-B For Conventional Plan Sheet Symbols



VICINITY MAP

25% PLANS

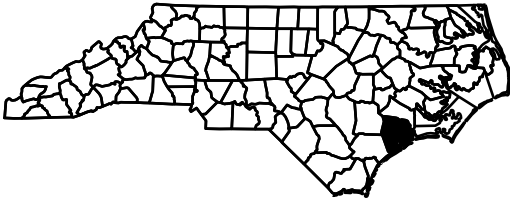
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ONSLOW COUNTY

LOCATION: JACKSONVILLE - NC 53 (WESTERN BOULEVARD)
AT JACKSONVILLE PARKWAY /GATEWAY DR. NORTH/SOUTH

TYPE OF WORK: WIDENING, GRADING, DRAINAGE, PAVING, RESURFACING,
AND SIGNALS

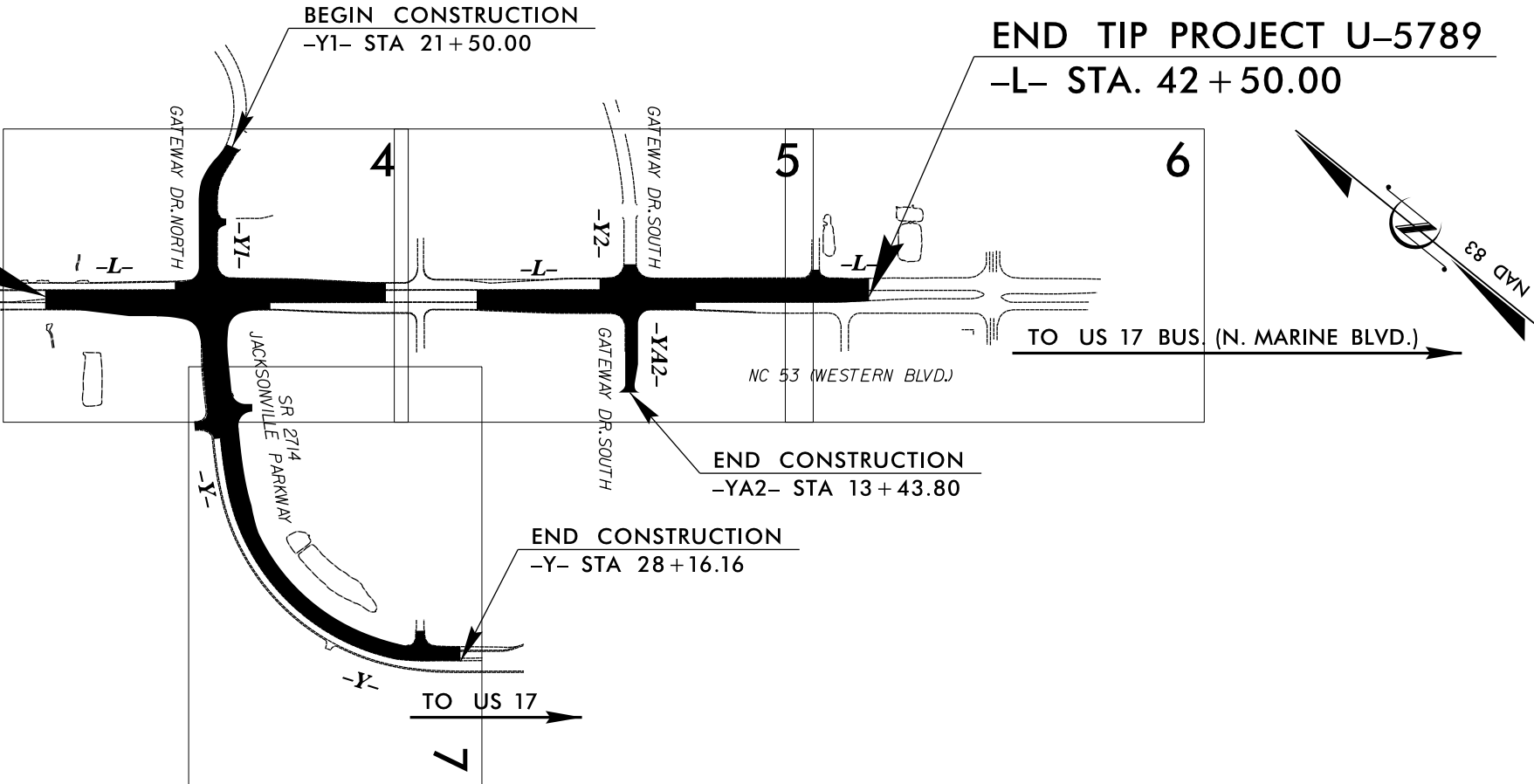
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5789	3	42
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
44361.1.1	N/A	PE	



BEGIN TIP PROJECT U-5789
-L- STA. 13 + 00.00

TO HENDERSON DR.

NC 53 (WESTERN BLVD.)



THIS IS NOT A CONTROL OF ACCESS PROJECT
THIS PROJECT IS WITHIN THE JACKSONVILLE MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

☆ EXISTING SIGNAL TO BE UPGRADED

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2019 = 41500
ADT 2040 = 52000
DHV = 10 %
D = 60 %
T = 2 % *
V = 50 MPH
* TTST 1% + DUAL 1%
FUNC CLASS =
MINOR URBAN ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-5728 = 0.568 MILES
LENGTH STRUCTURE TIP PROJECT U-5728 = 0.000 MILES
TOTAL LENGTH OF TIP PROJECT U-5728 = 0.568 MILES



Prepared for the North Carolina Department
of Transportation in the Office of:
HOME OFFICE
305 WEST FOURTH STREET, SUITE 2A
WINSTON-SALEM, NC 27101
336.744.1635
www.davenportnc.com
NCBELS FIRM LICENSE NO. C-2522

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FY 2018

LETTING DATE:
FY 2019

NCDOT CONTACT:

M. SCOTT CLARK, PE
PROJECT ENGINEER

TERRANCE A. HARRIS, JR., PE
PROJECT DESIGN ENGINEER

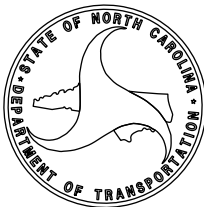
DAVID B. LEONARD, PE
DDC ENGINEER

HYDRAULICS ENGINEER

- P.E.
SIGNATURE:

ROADWAY DESIGN
ENGINEER

- P.E.
SIGNATURE:





ECS Southeast, LLP

6714 Netherlands Drive
Wilmington, NC 28405
T 910.686.9114 | F 910.686.9666
www.ecslimited.com

January 25, 2017

WBS NO: 44361.1.1
TIP NO: U-5789
F.A. NUMBER: N/A
COUNTY: Onslow
DESCRIPTION: NC-53 (Western Blvd) at Jacksonville Parkway/Gateway North and Gateway South
– Resurfacing and Widening

SUBJECT: Geotechnical Report – Inventory

Project Description

The proposed project consists of the intersection improvements of NC-53 (Western Boulevard) at Jacksonville Parkway/Gateway North and NC-53 (Western Boulevard) at Gateway Drive South. The improvements will consist of adding turn lanes at the intersection of NC-53 and Jacksonville Parkway/Gateway North and at the intersection of NC-53 and Gateway South. We understand that portions of NC-53, Gateway North and Jacksonville Parkway will be milled and resurfaced as part of the intersection improvement project. Based on the information provided to us by Davenport, the areas along the project corridor will have cut/fill depths on the order of approximately 6 feet or less.

Geotechnical cross sections and profiles presented in this report are based on the roadway plans and design files provided to us by Davenport dated 10/14/2016, and the subsurface exploration information obtained by ECS. In cases where other areas of concern are encountered in addition to the areas addressed in this report, ECS should be notified for further evaluation based on the actual field conditions.

A geotechnical field investigation was performed by ECS between November 10 and November 15, 2016. During this time period, a total of twenty-six (26) standard penetration test (SPT) borings were advanced with a CME-45C trailer drill rig and a CME-45C track rig, each equipped with an automatic hammer. In addition to the SPT borings, ten (10) hand auger borings were performed. Representative soil samples were collected for visual classification in the field and for analysis by ECS’s testing laboratory.

The following alignments were investigated:

Line	Station (±)	Offsets
-L-	13+00 to 42+50	CL to RT
-Y-	10+00 to 28+16	LT
-Y1-	21+50 to 27+02	RT
-YA2-	10+00 to 13+44	LT

Site Description

The project corridor includes the intersection of NC-53 (Western Boulevard) at Jacksonville Parkway/Gateway Drive North and continues to the intersection of NC-53 at Gateway Drive South. The -L- alignment (NC-53) starts approximately 600 feet northwest of the intersection of Gateway Drive North/Jacksonville Parkway and extends to approximately 850 feet southeast of Gateway Drive South. The road elevations along the L line are relatively level and range from approximately 49 to 51 feet. Drainage ditches located along NC 53 generally range from approximately 3 to 5 feet deep.

Jacksonville Parkway (-Y-) starts at the intersection of Western Blvd. and extends approximately 1,820 feet south. Existing road grades of the -Y- alignment range from approximately 49 to 51 feet.

Gateway Drive North (-Y1-) starts at Station 21+50 and continues south approximately 550 feet to Station 27+02 and terminates at the intersection of Western Blvd. The existing road grades along -Y1- generally slope upward from north to south with elevations ranging from approximately 39 to 48 feet.

Gateway South (-YA2-) starts at the intersection of Western Boulevard and extends approximately 350 feet south. Existing road grades along -YA2- is relatively flat with elevations ranging from approximately 47 to 50 feet.

Areas of Special Geotechnical Interest

- 1) Artificial Fill: The following area encountered artificial fill. Artificial fill poses risks associated with undetected deleterious inclusions or soft zones within the fill and/or deleterious materials at the virgin ground/fill interface.

Line	Station (±)	Offset
-YA2-	11+00 to 13+44	LT

2) High Groundwater: Relatively shallow groundwater was encountered within six feet of the proposed subgrade elevation at the following areas. This has the potential to cause subgrade problems and/or constructability issues:

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-L-	17+00 to 19+00, 20+00 to 42+50	LT to RT
-Y-	11+00 to 13+00, 15+00 to 17+00, 20+00 to 28+00	LT to RT
-YA2-	10+00 to 13+44	LT to RT

3) Soft/Very Loose Soils: The following areas contain relatively soft or very loose near-surface soils that have the potential for subgrade problems, embankment stability or long-term settlement problems during construction:

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-L-	13+00 to 42+50	LT to RT
-Y-	10+00 to 28+00	LT
-Y1-	21+50 to 27+02	LT to RT
-YA2-	10+00 to 13+44	LT

4) Wet or Saturated Soils: The following areas contain near surface soils with natural moisture contents in excess of the liquid limit, high moisture contents noted in the field during drilling, or soils encountered below the water table:

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-L-	13+00 to 42+50	LT to RT
-Y-	10+00 to 28+00	LT
-YA2-	10+00 to 13+44	LT

5) Moderate to High Plasticity Soils: The following areas contain moderate to high plasticity soils with plasticity indices (PI's) in excess of 15. These soils have the potential to cause subgrade problems during construction, embankment stability or long term settlement problems:

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-L-	15+00 to 23+50, 28+50 to 32+50	LT to RT
-L-	36+50 to 38+50	LT to RT
-Y-	10+50 to 13+50, 22+00 to 26+00	LT to RT

6) Organic Soils: The following areas contain soils with little organic content with organic soil thicknesses in excess of 0.3 feet. Organic soils have the potential to cause subgrade problems during construction, embankment stability or long term settlement problems:

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-L-	11+75 to 12+18, 32+25 to 33+49	LT to RT
-L-	36+75 to 37+75, 41+75 to 42+49	LT to RT

Physiography and Geology

The site is located in the Coastal Plain Physiographic Province of North Carolina. According the Geological Map of North Carolina, 1985, the River Bend Formation is in the Tertiary geologic age with the primary and secondary rock types being sedimentary rock consisting of Limestone and Calcarene, respectively. However, the River Bend Formation lies at greater depths and was not encountered during this investigation.

The Coastal Plain is composed of seven terraces, each representing a former level of the Atlantic Ocean. Soils in this area generally consist of sedimentary materials transported from other areas by the ocean or rivers. These deposits vary in thickness from a thin veneer along the western edge of the region to more than 10,000 feet near the coast. The sedimentary deposits of the Coastal Plain rest upon consolidated rocks similar to those underlying the Piedmont and Mountain Physiographic Provinces. In general, shallow unconfined groundwater movement within the overlying soils is largely controlled by topographic gradients. Recharge occurs primarily by infiltration along higher elevations and typically discharges into streams or other surface water bodies. The elevation of the shallow water table is transient and can vary greatly with seasonal fluctuations in precipitation.

Proposed cut and fill depths on this project are on the order of approximately 6 feet or less. In general, the proposed fill and widened areas of the project consisted of surficial materials underlain by roadway embankment and undivided coastal plain soils.

Soil Properties

The subsurface conditions discussed below represent the subsurface conditions based on interpretation of the boring data using normally accepted geotechnical engineering judgments. The transitions between different soil strata are usually less distinct than those shown on the Borelogs. Sometimes the relatively small sample obtained in the field is insufficient to definitively describe the origin of the subsurface material. Although individual soil test borings are representative of the subsurface conditions at the boring locations on the dates shown, they are not necessarily indicative of subsurface conditions at other locations or at other times.

Soils within the area of this project have been divided into three categories: artificial fill, roadway embankment, and undivided coastal plain soils.

Roadway Embankment: Roadway Embankment (R.E.) soils were encountered along the following alignments and at the approximate stationing:

Line	Station (±)	Offsets
-L-	13+00 to 38+00	CL to RT
-Y-	10+00 to 28+00	LT
-Y1-	21+50 to 24+00	RT

The roadway embankment encountered generally consisted of soft to medium stiff, moist, orange-gray-brown, fine sandy clay (A-6), and soft to stiff, moist, brown-black-gray, fine sandy silt (A-4), and very loose to medium dense, moist, gray-brown-orange, silty/clayey fine sand (A-2-4, A-2-6). The roadway embankment extends to depths ranging from approximately 2 to 5.5 feet below existing grades. Laboratory testing of the roadway embankment soils indicated plasticity indices ranging from 4 to 10.

Laboratory testing of the organic soils indicated organic percentages ranging between 4 and 11 percent. The organic soil consisted of topsoil and rootmat and was noted at the ground surface at the following locations:

Line	Station (±)	Offsets
-L-	11+75 to 12+18, 32+25 to 33+49, 36+75 to 37+75	LT to RT
-L-	41+75 to 42+49	LT to RT

Artificial Fill: Artificial Fill (A.F.) soils were encountered along the following alignments and at the approximate stationing:

Line	Station (±)	Offsets
-YA2-	10+00 to 13+44	LT

The artificial fill encountered generally consisted of medium dense, moist, tan-brown, silty fine sand (A-2-4) and extended to depths of approximately 3 feet below existing grades.

Undivided Coastal Plain Soils: Undivided Coastal Plain soils (U.C.P.) were encountered along the following alignments and at the approximate stationing:

Line	Station (±)	Offsets
-L-	11+00 to 42+50	CL to RT
-Y-	10+00 to 28+00	LT

-Y1-	21+50 to 27+00	RT
-YA2-	10+00 to 13+00	LT

The undivided coastal plain soils generally consisted of very soft to very stiff, moist to wet, orange-gray-tan, silty and sandy clay (A-7-5, A-7-6, A-6), very soft to medium stiff, moist to wet, gray-tan-orange, sandy silt (A-4), loose to medium dense, moist to wet, orange-tan-gray, fine to coarse sand (A-3), and very loose to loose, moist to wet, gray-tan silty or clayey sand (A-2-4, A-2-6). Laboratory testing indicated plasticity indices ranging from 2 to 35 for the A-7-5, A-7-6, A-6, A-5, A-4, and A-2-4 soils.

Groundwater Properties

Groundwater levels were measured in the soil test borings after a stabilization period of at least 24 hours, due to mud rotary drilling techniques. For the hand auger borings, groundwater levels were measured immediately after augering and after the 24-hour stabilization period. After a stabilization period of at least 24 hours, groundwater was encountered in twenty five (25) borings at depths ranging from approximately 2.2 to 7.3 feet below existing grades. The recovered soil samples were generally described as moist above the groundwater level and moist to wet below the groundwater level.

Respectively submitted,



Mike Ellis, E.I.
Project Manager

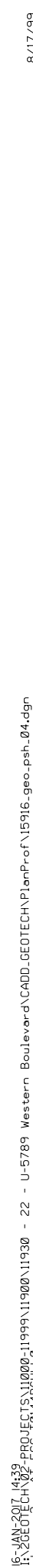


Michael J. Walko, P.E.
Principal Engineer



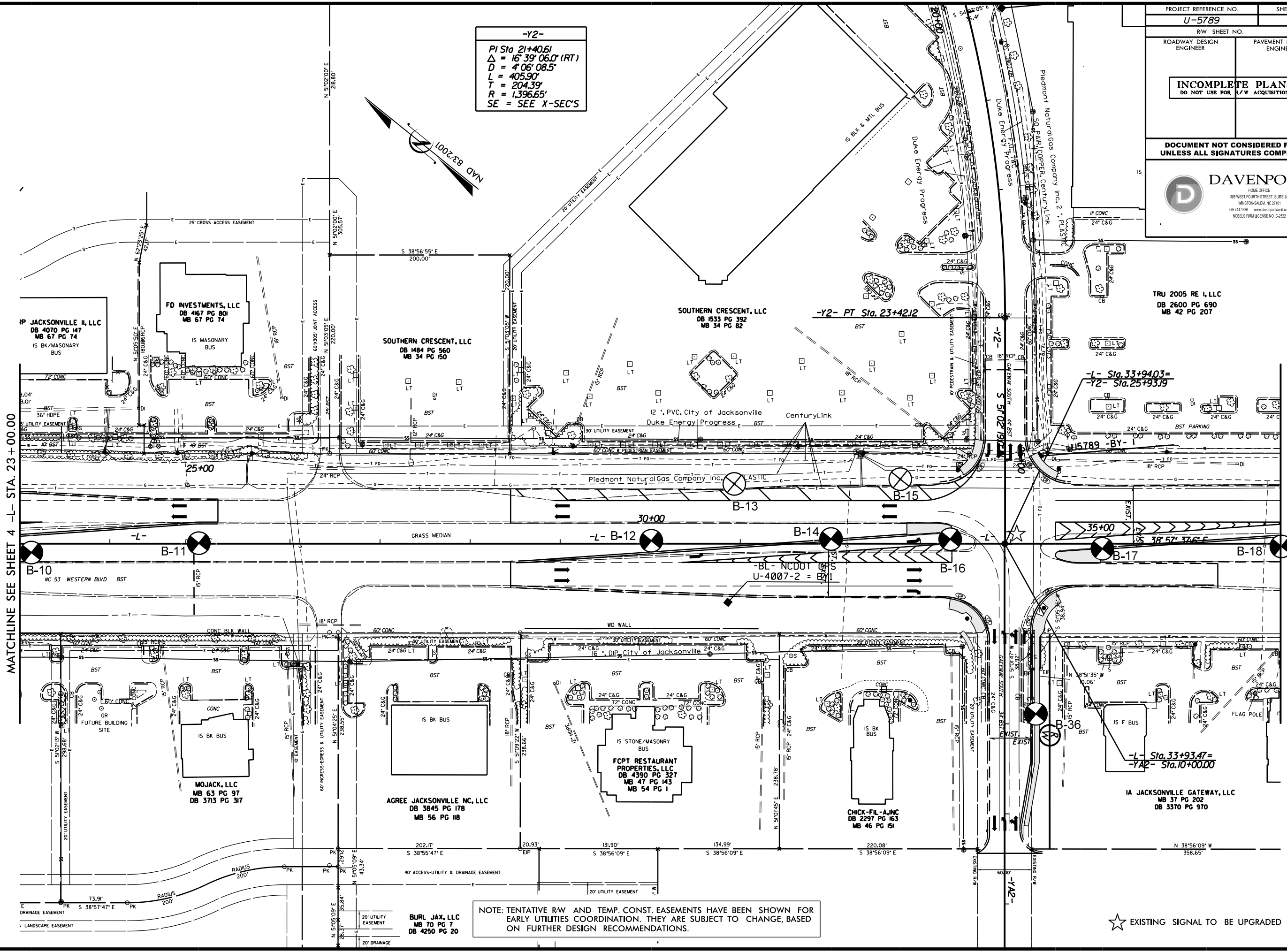
D. Matthew Brewer, P.E.
Senior Project Engineer
N.C. Registration No. 041986





MATCHLINE SEE SHEET 4 -L- STA. 23 + 00.00

MATCHLINE SEE SHEET 6 -L- STA. 37 + 00.00



-Y2-
PI Sta 21+40.61
Δ = 16° 39' 06.0" (RT)
D = 4° 06' 08.5"
L = 405.90'
T = 204.39'
R = 1,396.65'
SE = SEE X-SEC'S

PROJECT REFERENCE NO. U-5789		SHEET NO. 5	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		PAVEMENT DESIGN ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
 DAVENPORT HOME OFFICE 305 WEST FOURTH STREET, SUITE 2A WINSTON-SALEM, NC 27101 336.744.1556 www.davenportinc.com NCELS 5-FRM LICENSE NO. C-2022			

TRU 2005 RE I, LLC
DB 2600 PG 690
MB 42 PG 207

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-Y2- Sta. 25+93.79

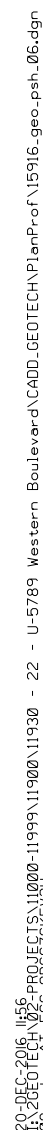
U5789 -BY-

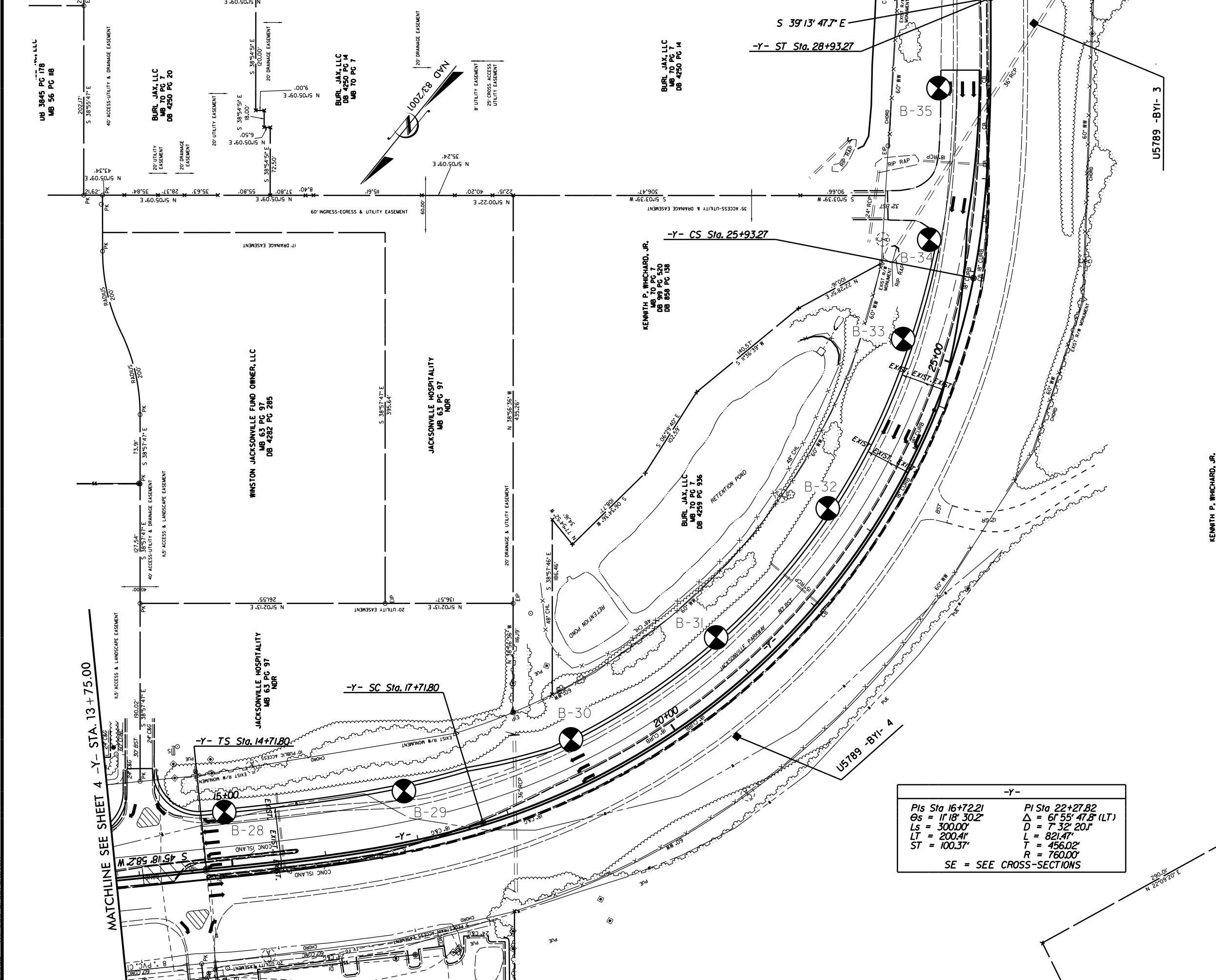
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★ EXISTING SIGNAL TO BE UPGRADED

NOTE: TENTATIVE RW AND TEMP. CONST. EASEMENTS HAVE BEEN SHOWN FOR EARLY UTILITIES COORDINATION. THEY ARE SUBJECT TO CHANGE, BASED ON FURTHER DESIGN RECOMMENDATIONS.

BURL JAX, LLC
MB 70 PG 7
DB 4250 PG 20





PROJECT REFERENCE NO.
U-5789

SHEET NO.
7

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

PAYMENT DESIGN ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

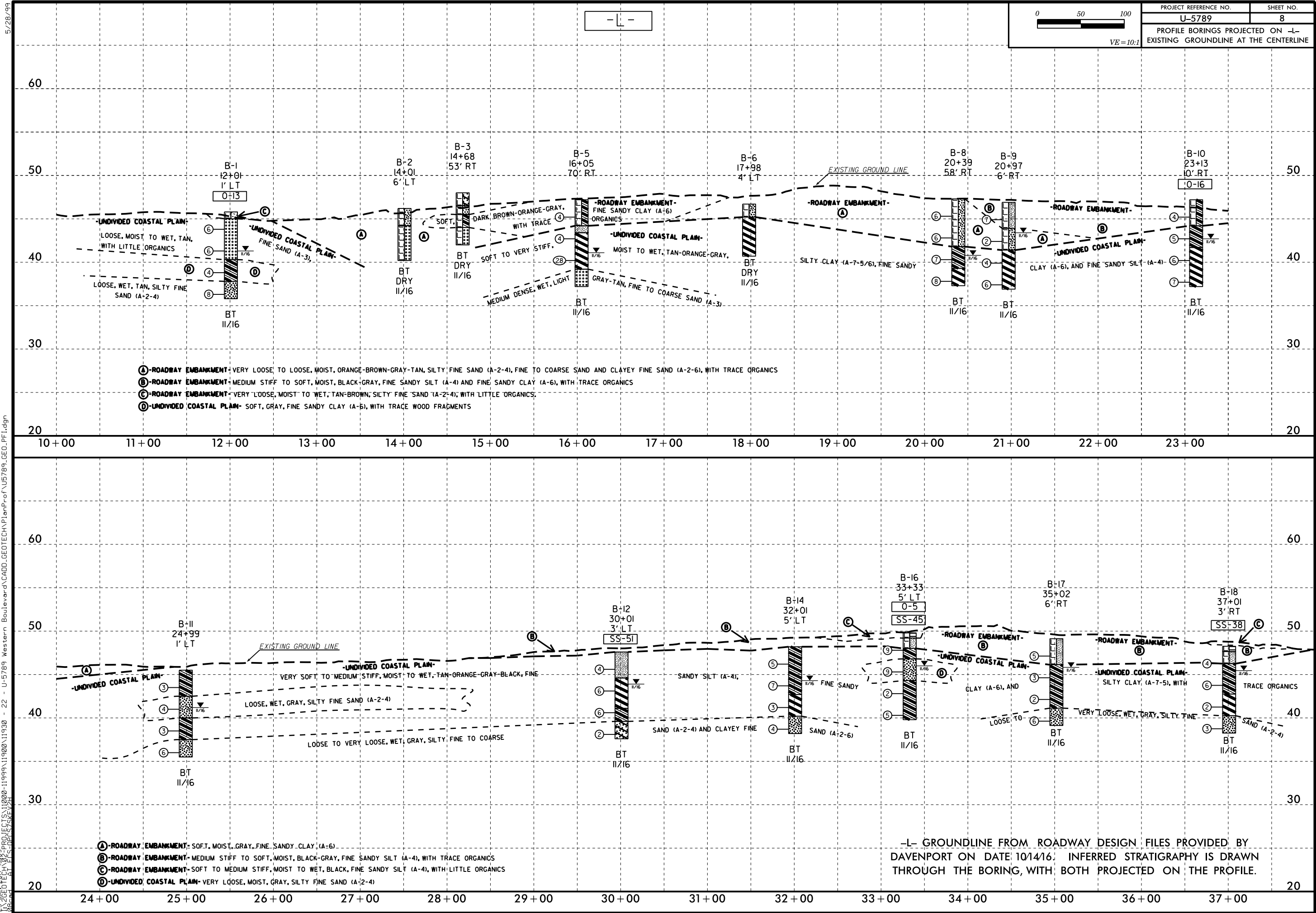
DAVENPORT
HOME OFFICE
305 WEST FOURTH STREET, SUITE 2A
WINSTON-SALEM, NC 27101
336.744.1636 www.davenportnc.com
NCELS FIRM LICENSE NO. C-2622

KENNETH P. WHICHARD, JR.
MS 56 PG 139
MS 47 PG 143
MS 858 PG 503
DB 858 PG 138

-Y-	
PIs Sta 16+72.21	PI Sta 22+27.82
Θs = 11° 18' 30.2"	Δ = 61° 55' 47.8" (LT)
Ls = 300.00'	D = 7° 32' 20.1"
LT = 200.41'	L = 821.47'
ST = 100.37'	T = 456.02'
	R = 760.00'
SE = SEE CROSS-SECTIONS	

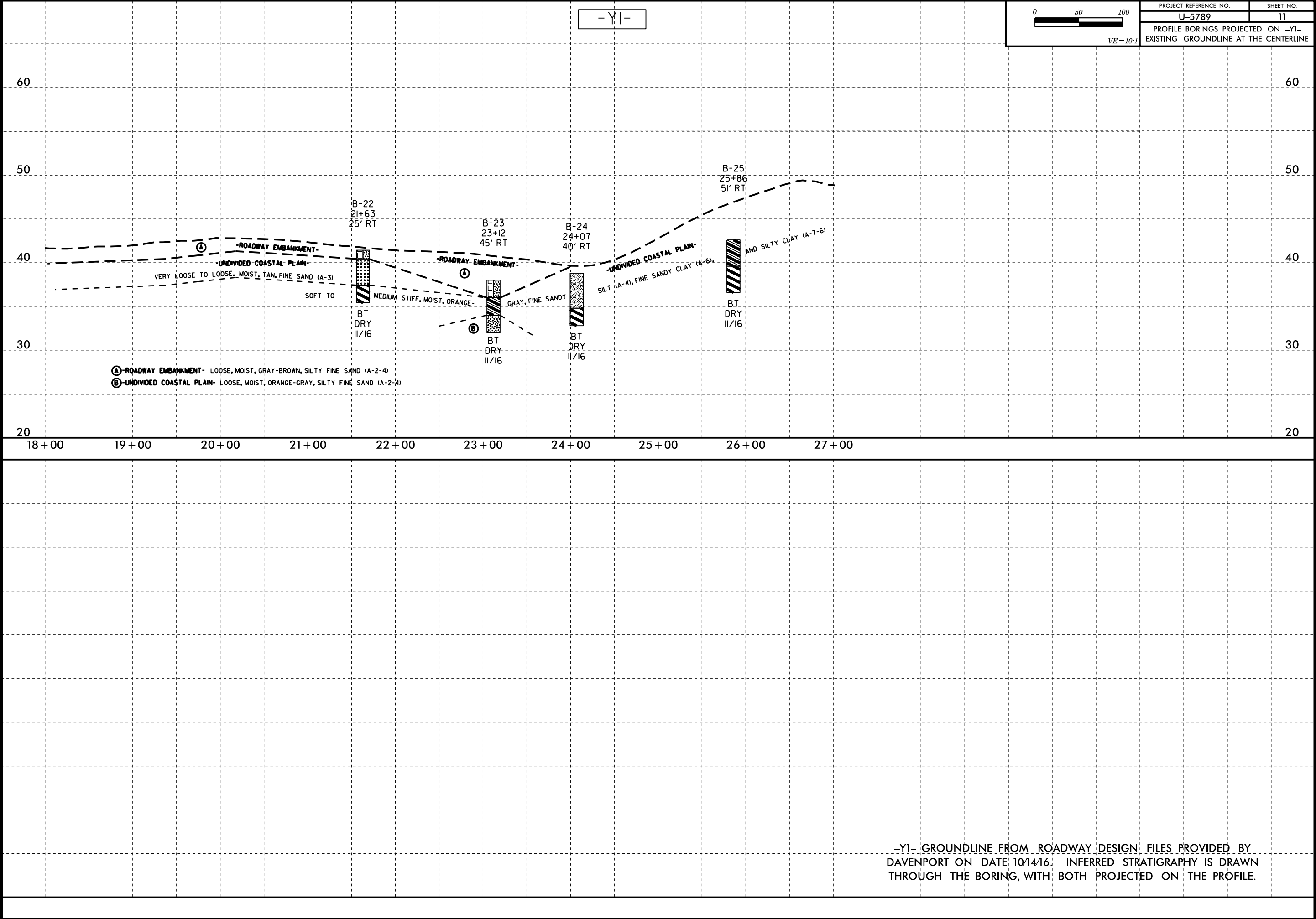
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5/28/99
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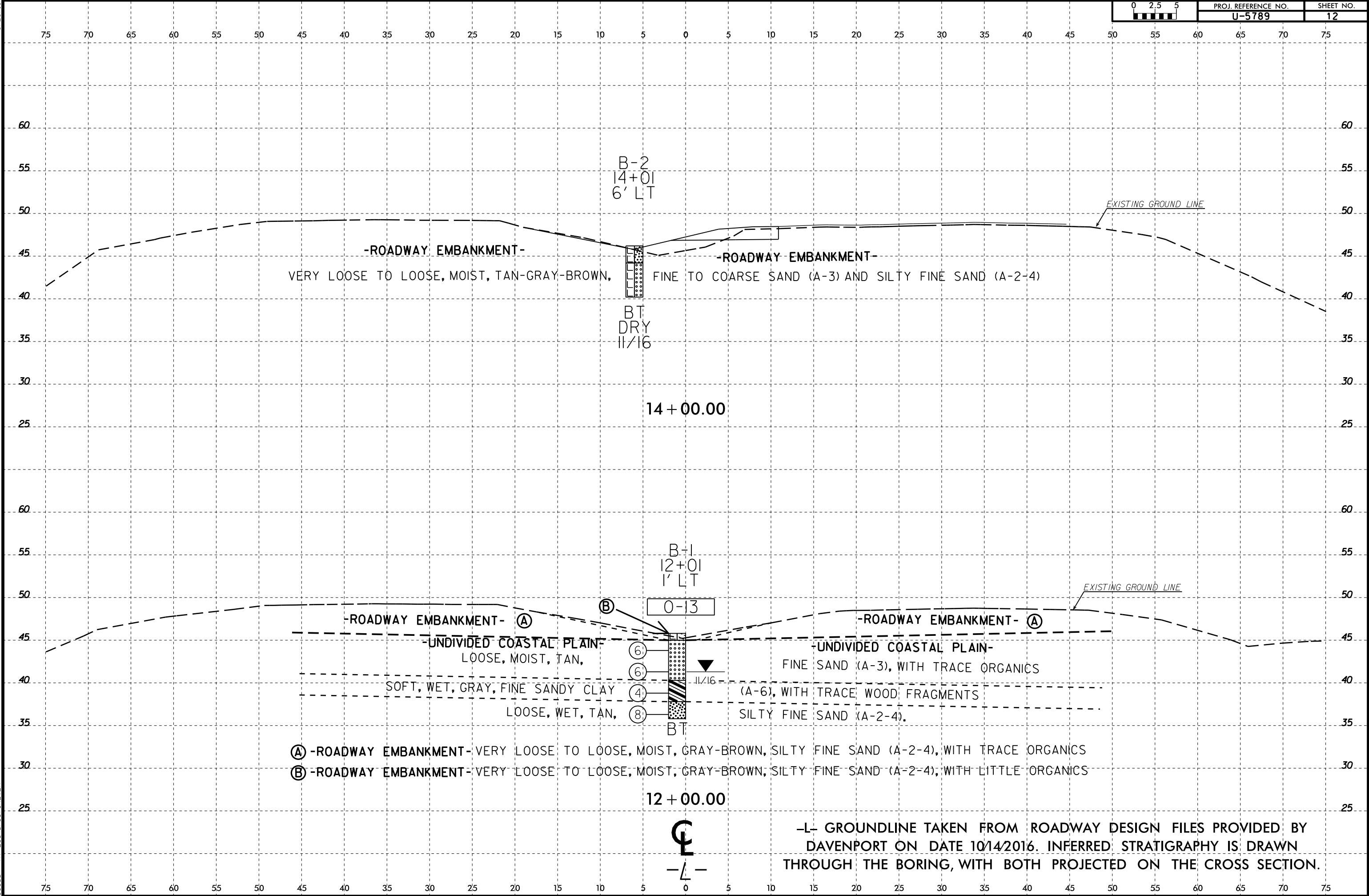
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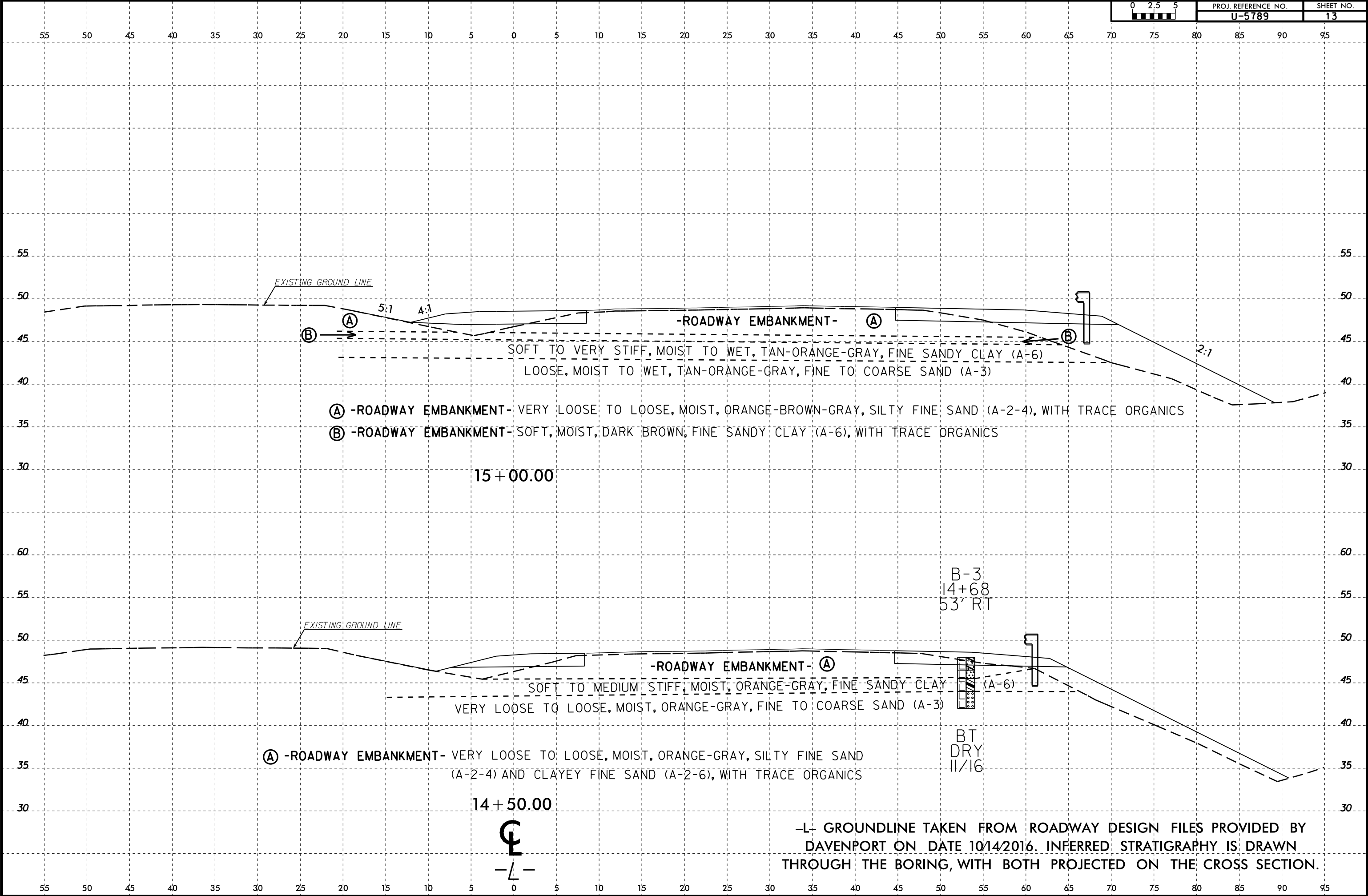
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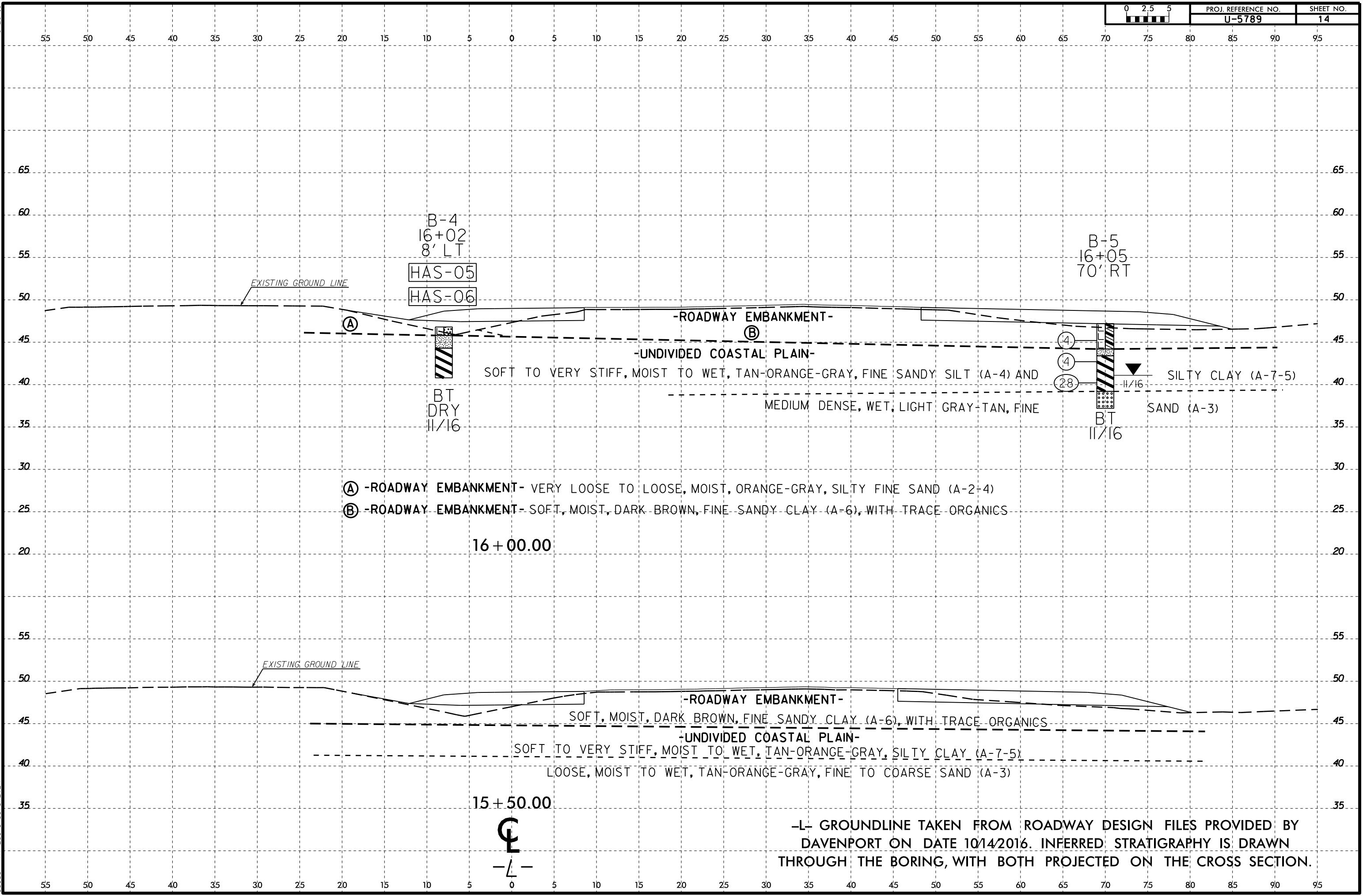


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U-5789	12





6/23/16
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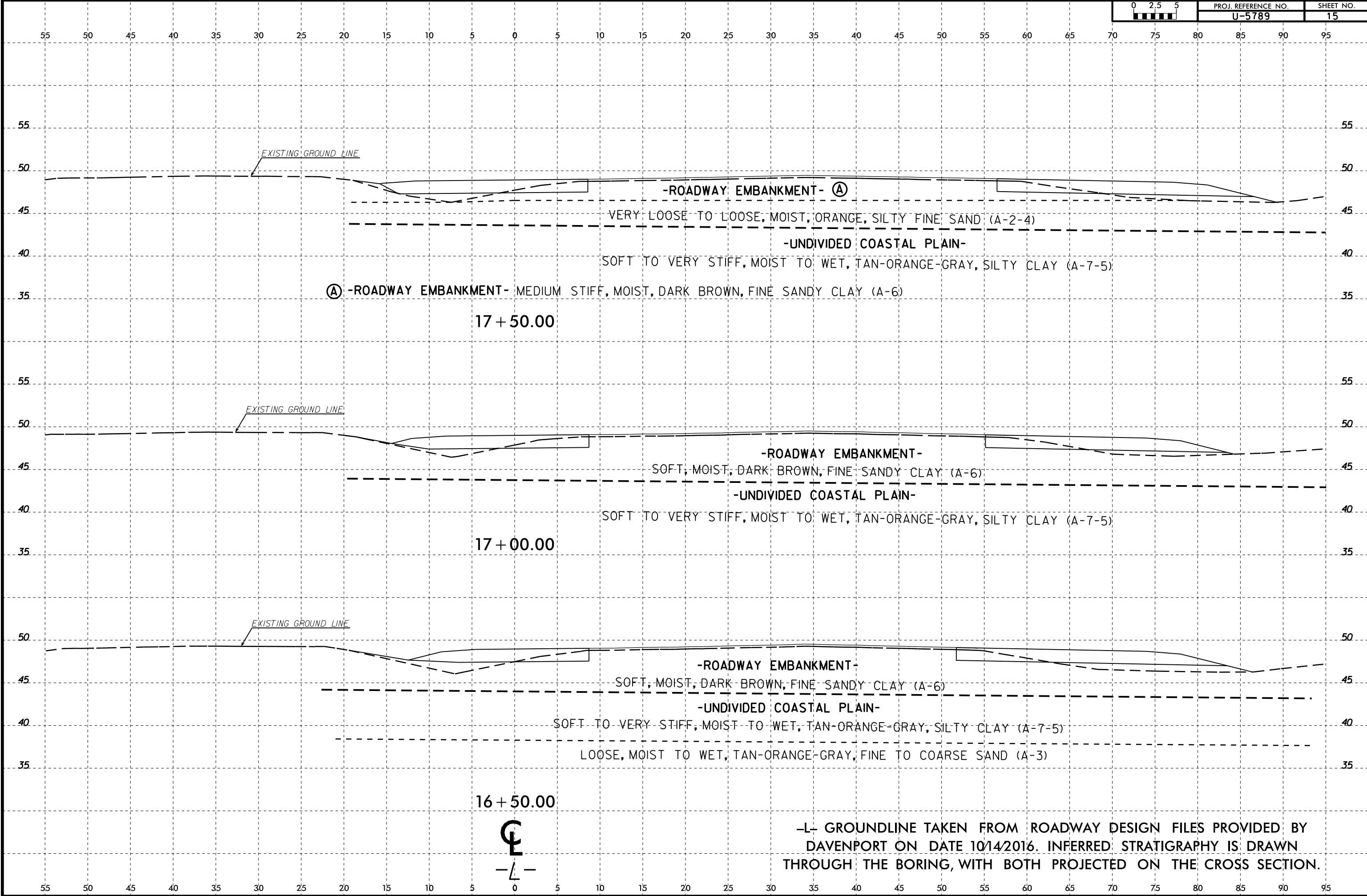
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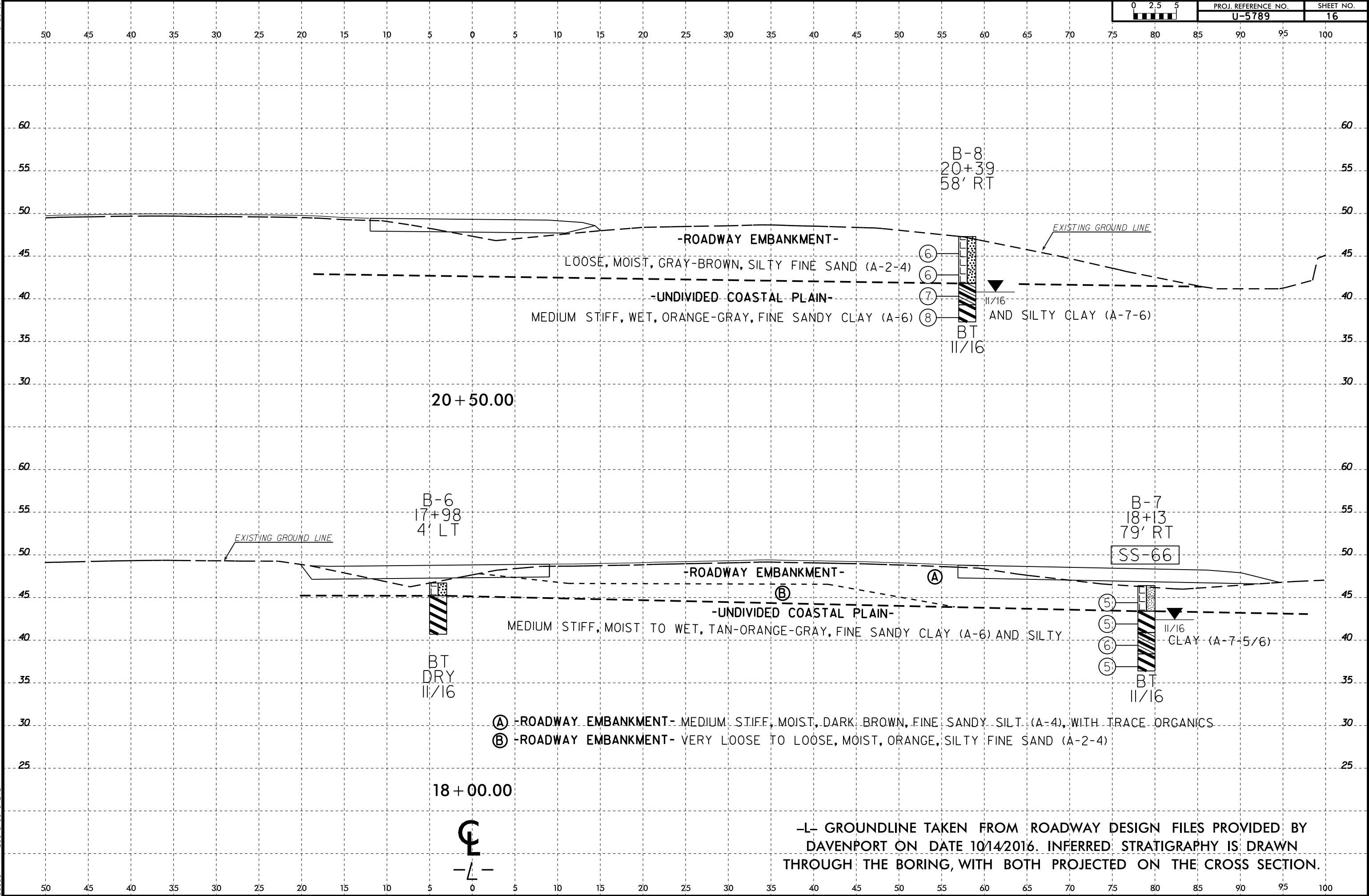
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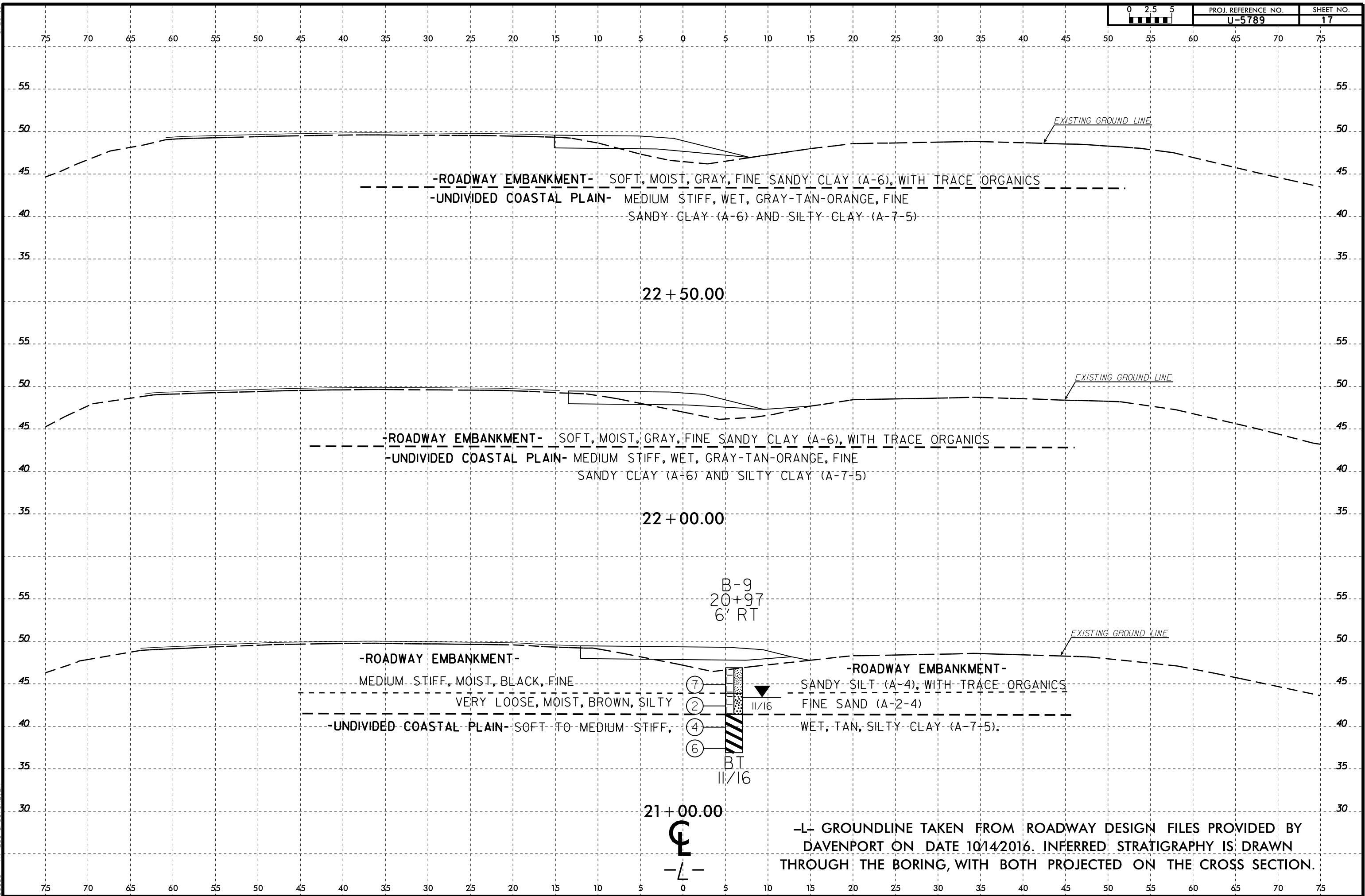


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U-5789

SHEET NO.
15





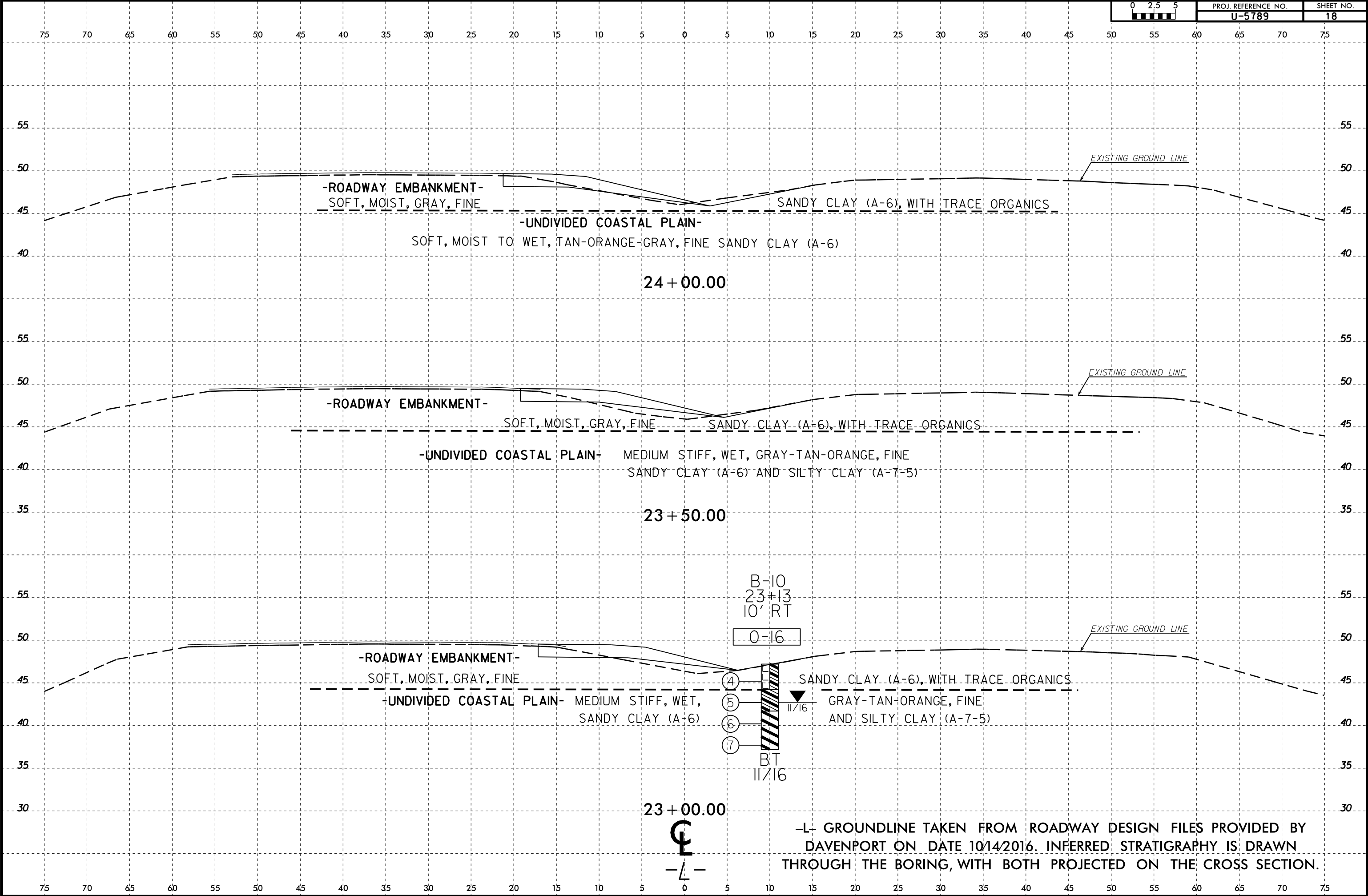


6/23/16

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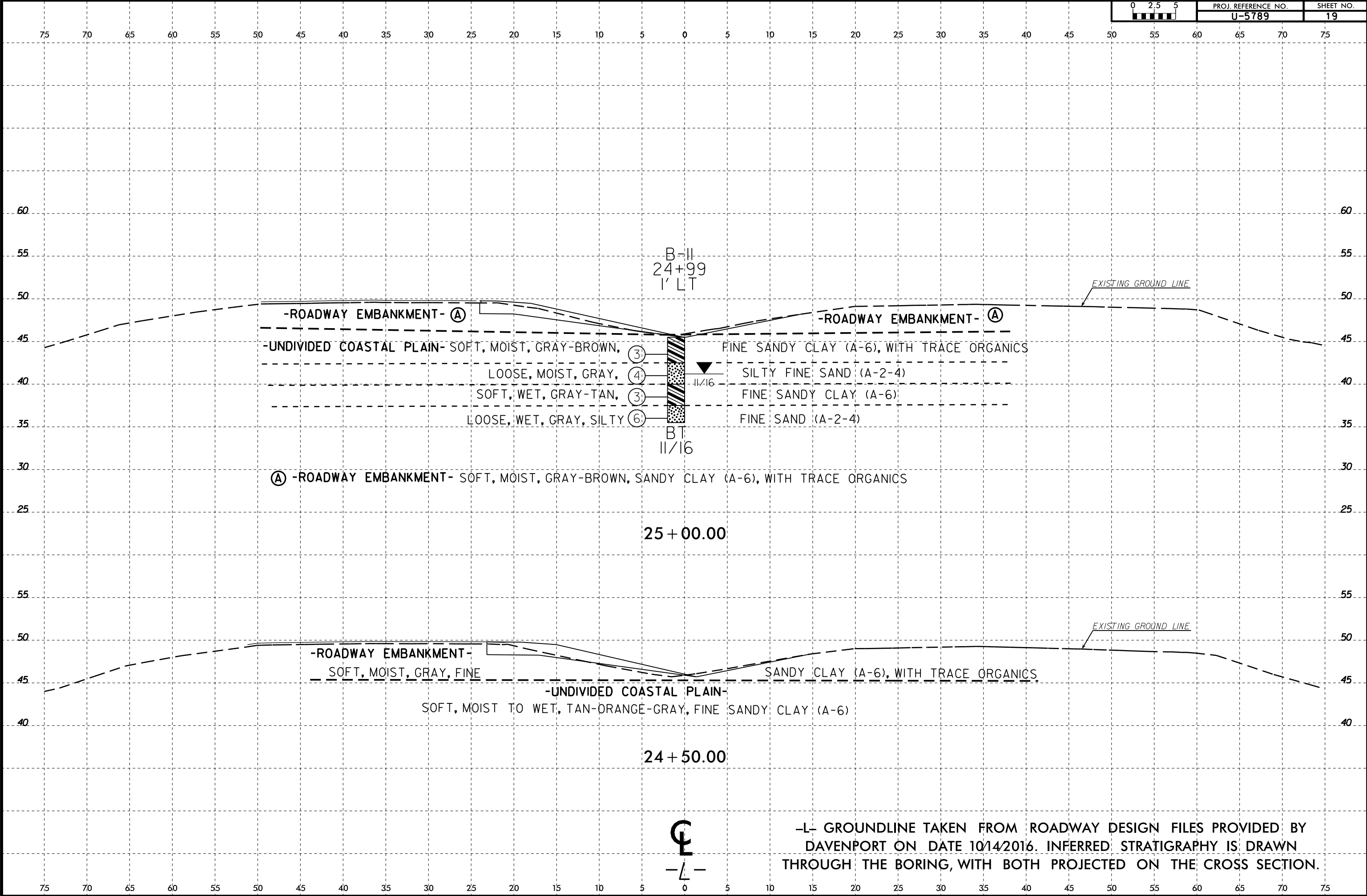


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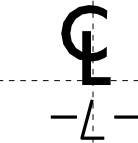
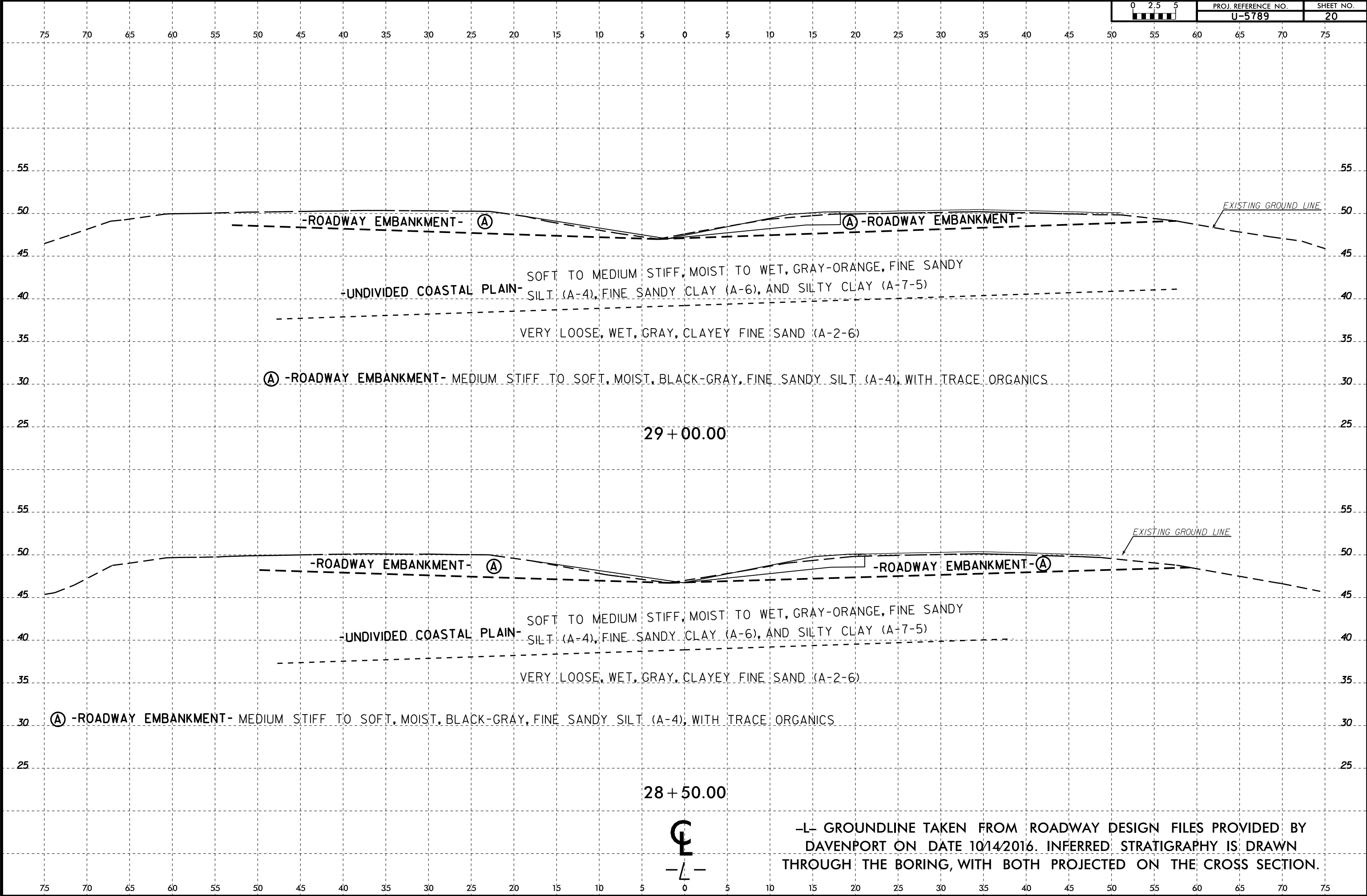


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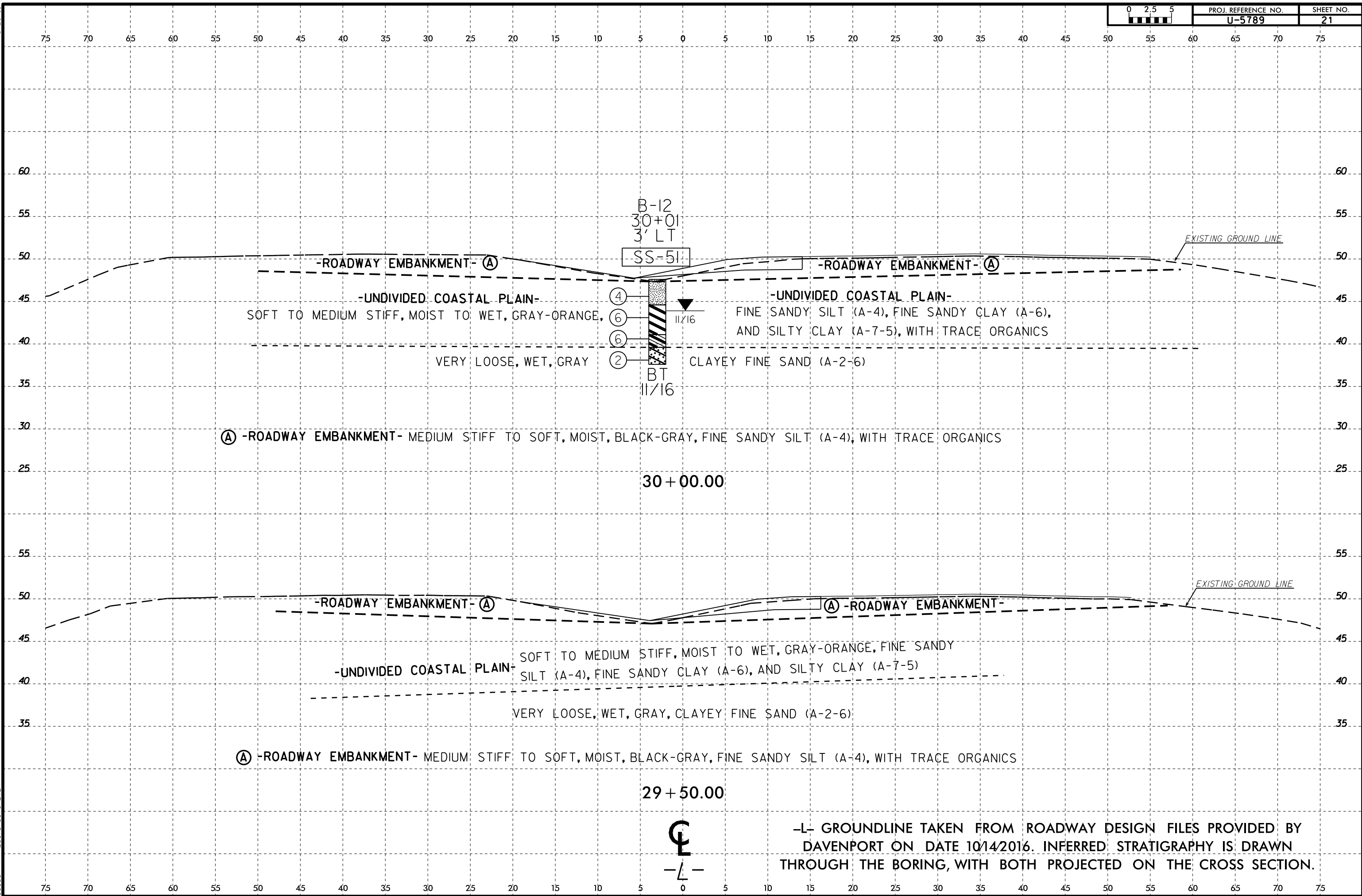
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PROJ. REFERENCE NO.	SHEET NO.
U-5789	20



-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY
DAVENPORT ON DATE 10/14/2016. INFERRED STRATIGRAPHY IS DRAWN
THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.



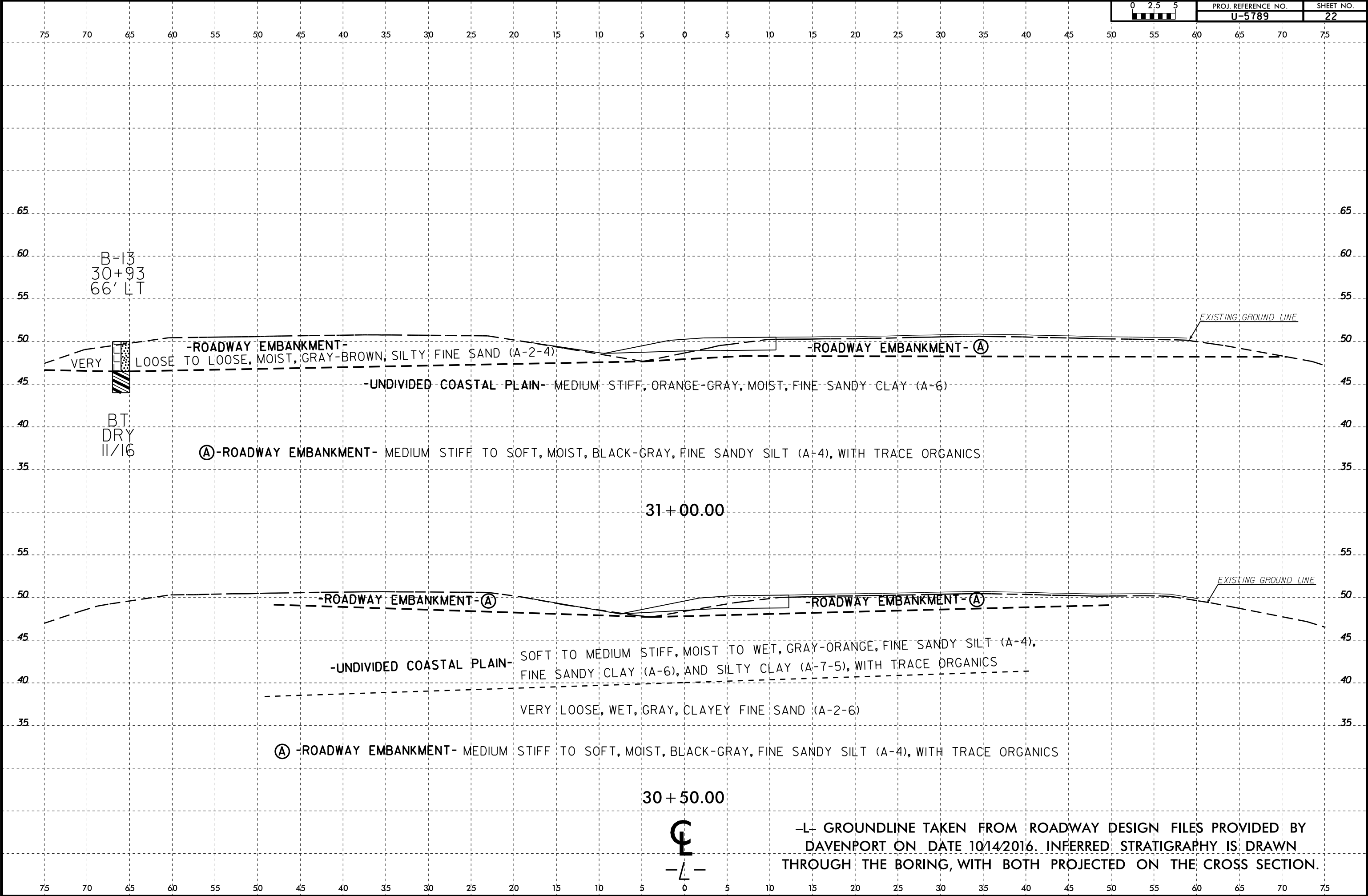
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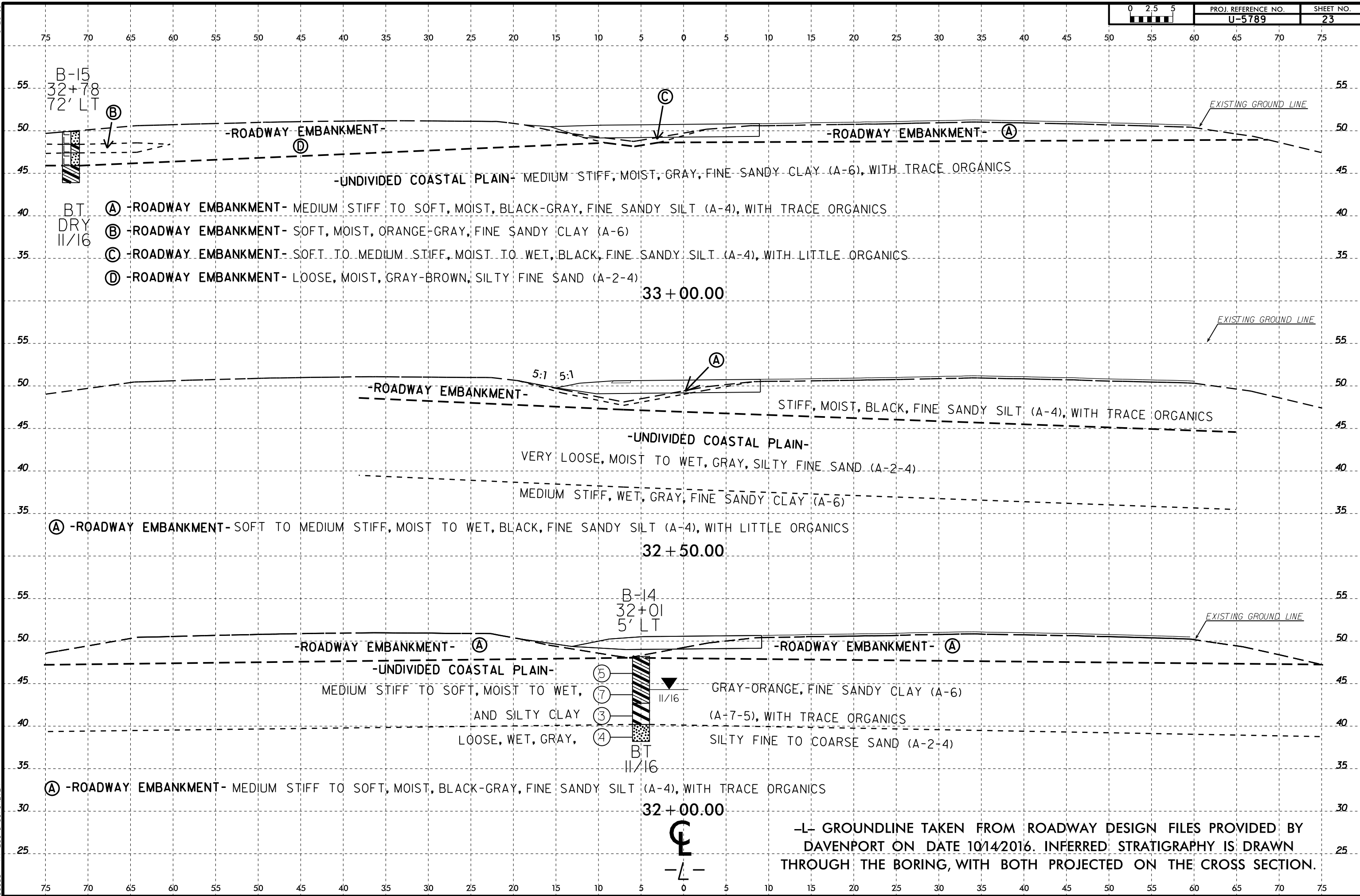
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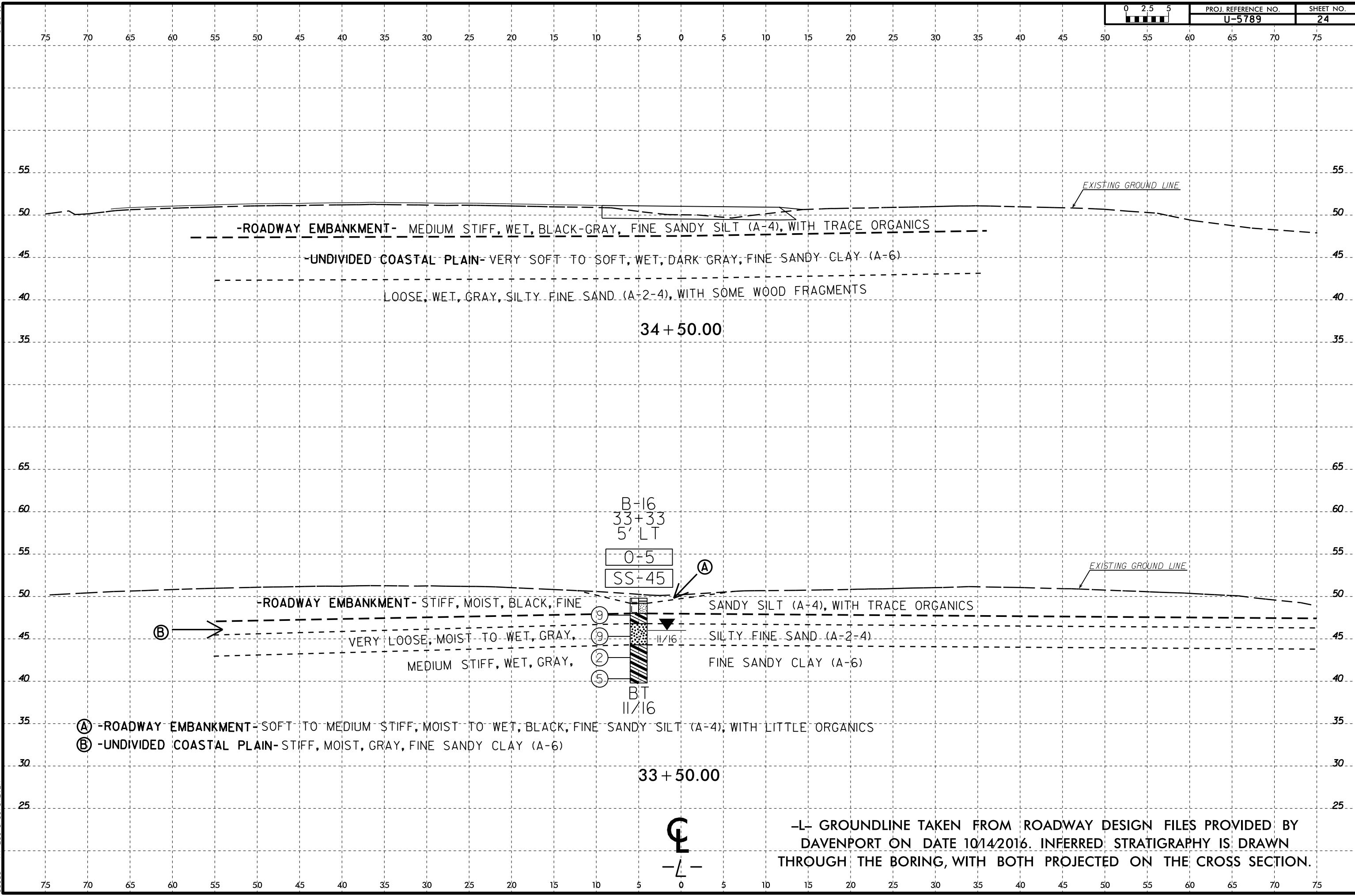
PROJ. REFERENCE NO.
U-5789

SHEET NO.
22





6/23/16
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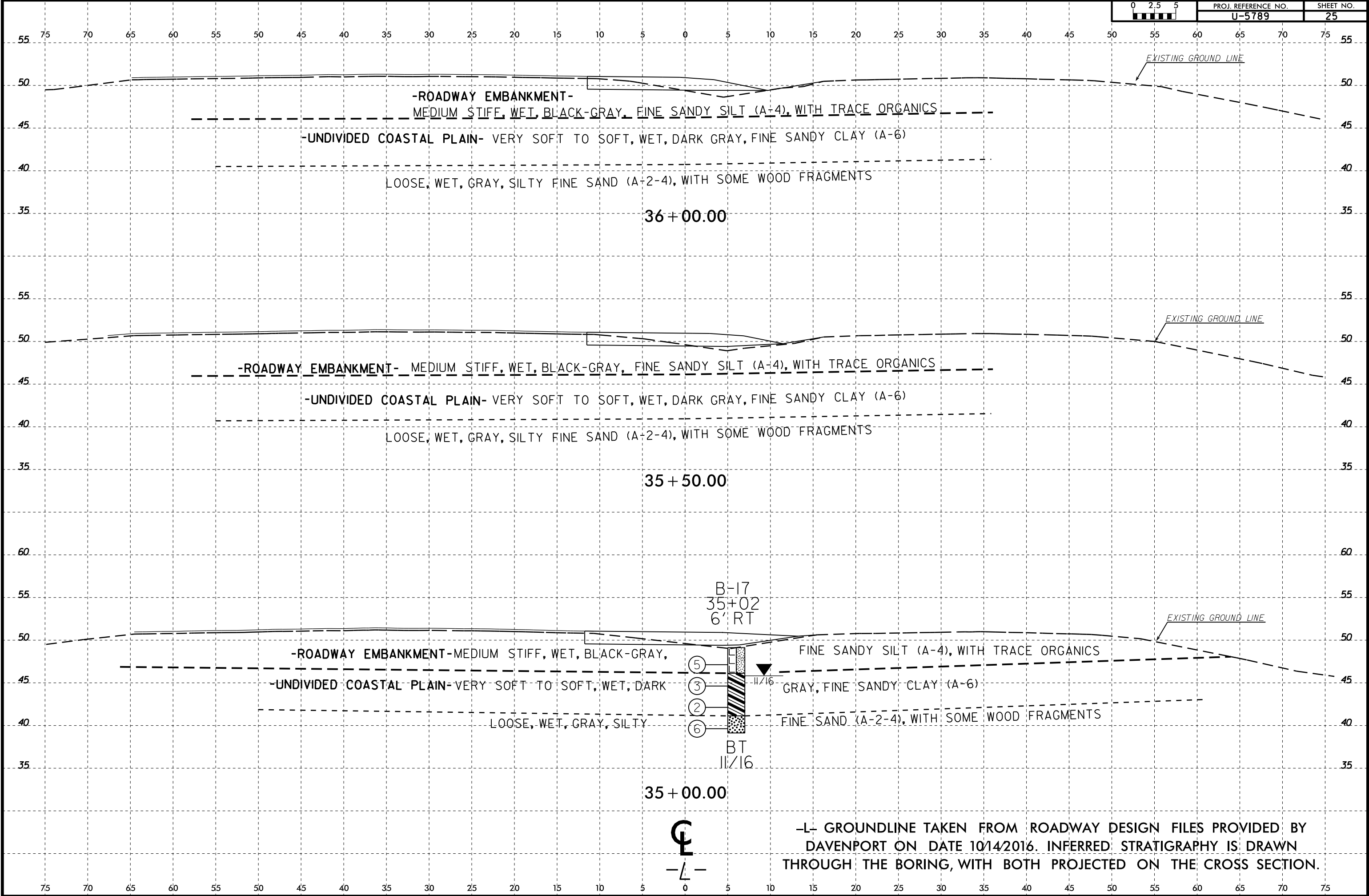


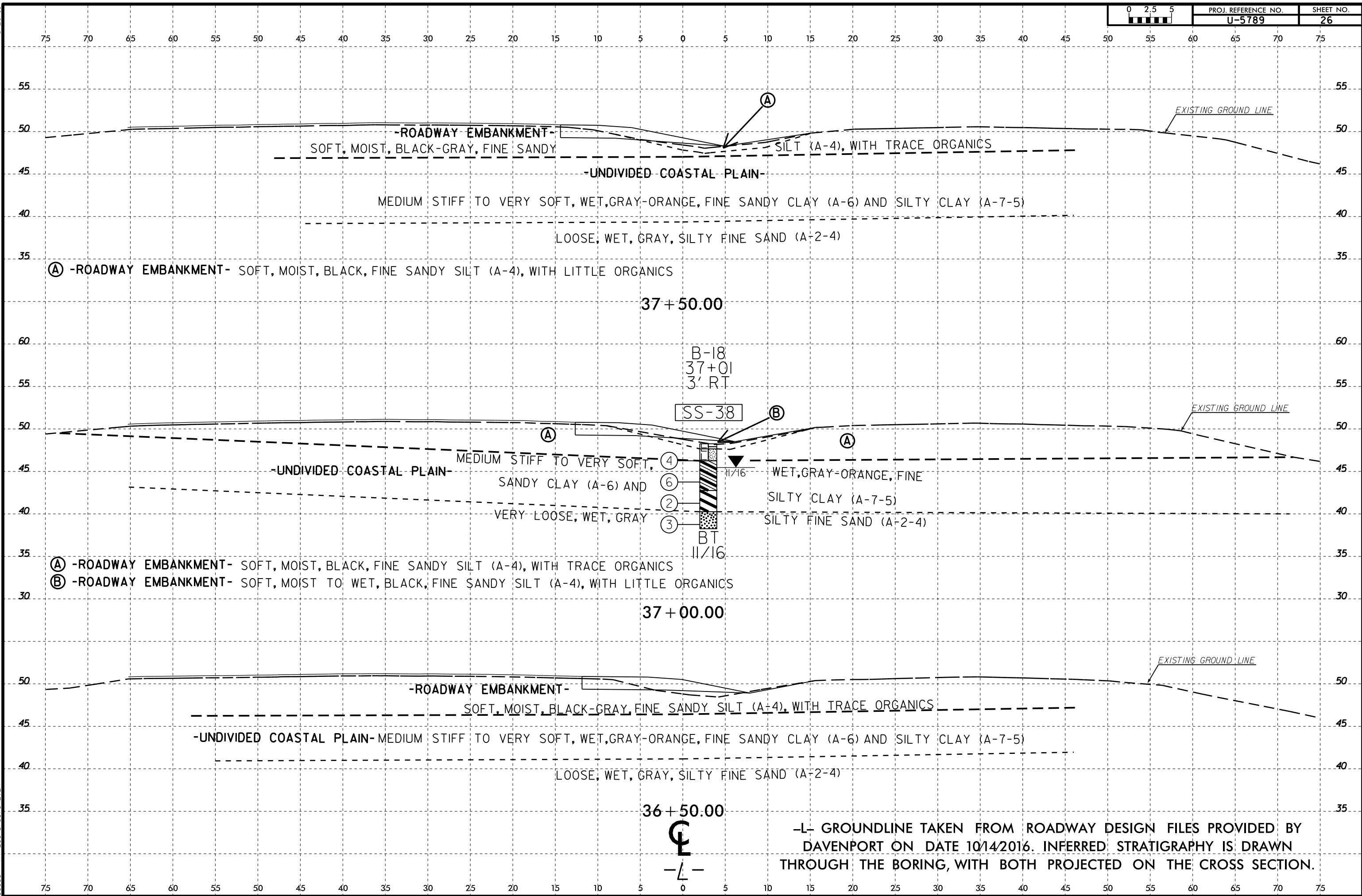
6/23/16

25-JAN-2017 15:26 PROJEGTS\1000_1999\1900\1930 - 22 - U-5789 Western Boulevard\CADD_GEO\TECH\XSC\U5789_Geo.XSL.dgn
1:2500 TECH V2 PEG-10446110
DRAWN BY: AT

0	2.5	5

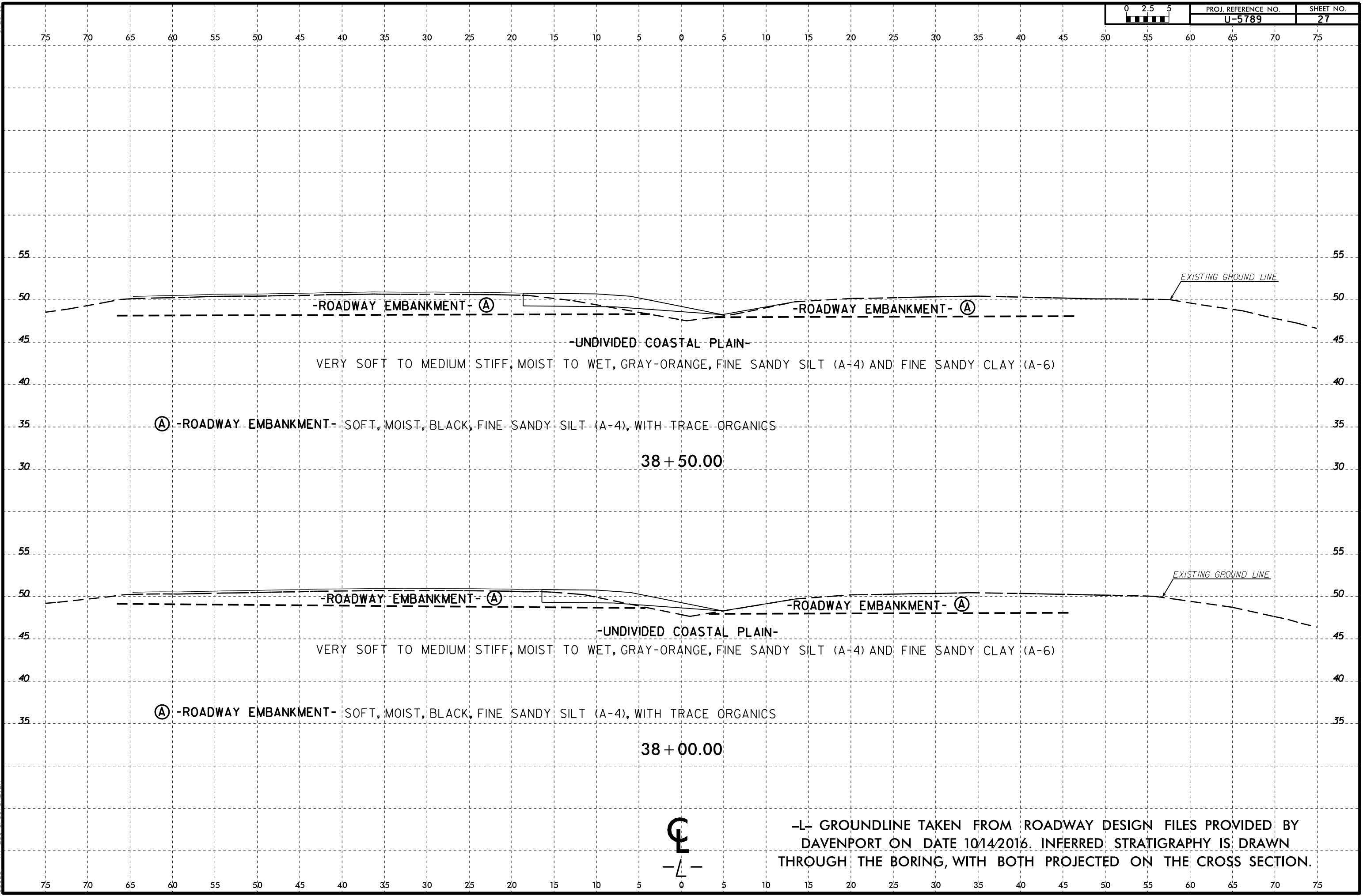
PROJ. REFERENCE NO.	SHEET NO.
U-5789	25



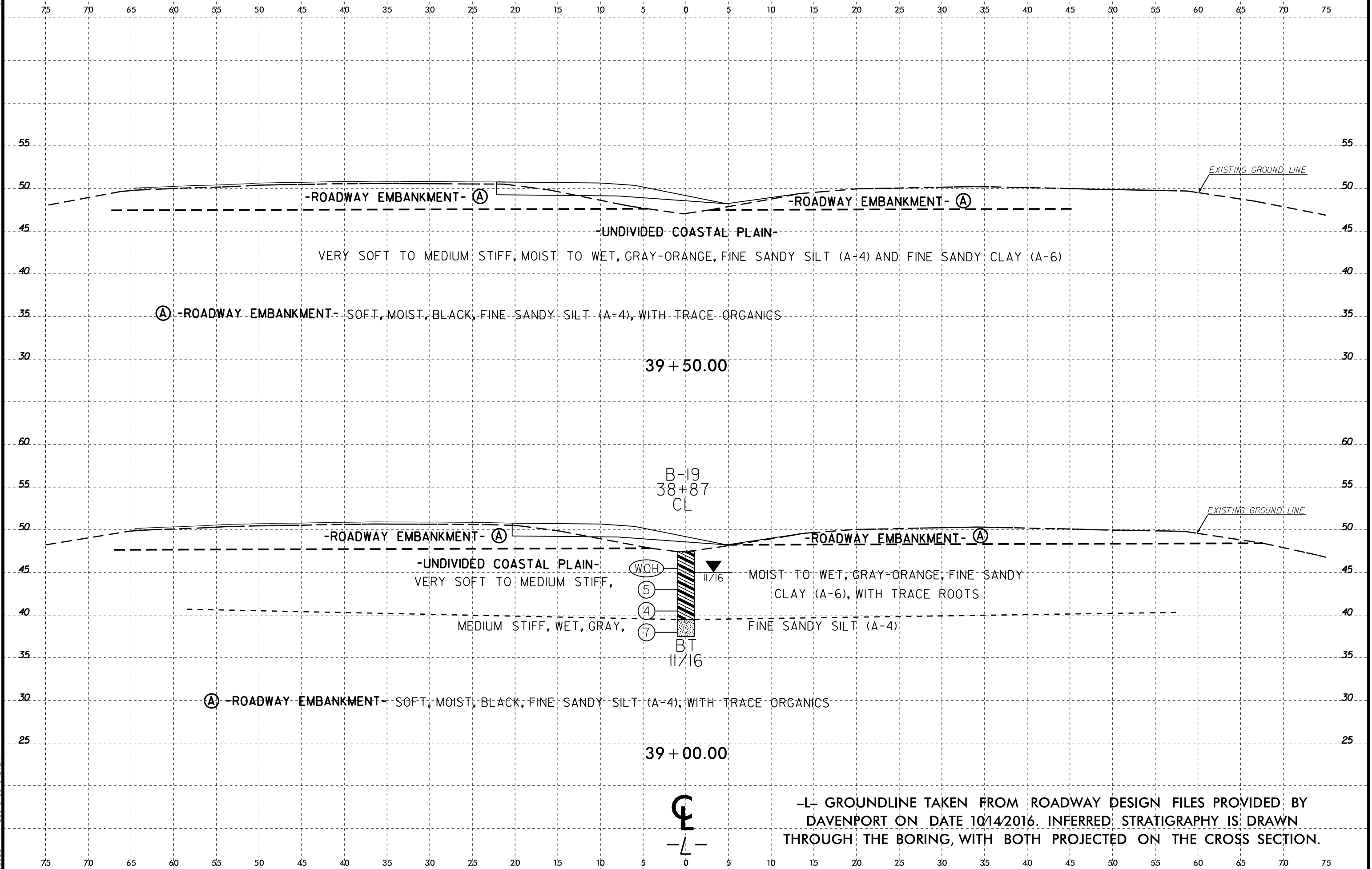


6/23/16
23-JAN-2017 14:57
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08cad AT EGS-OPCSYSKEV2H

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-5789	27



6/23/16
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08cad AT EDS-OPCSYSKEV2H



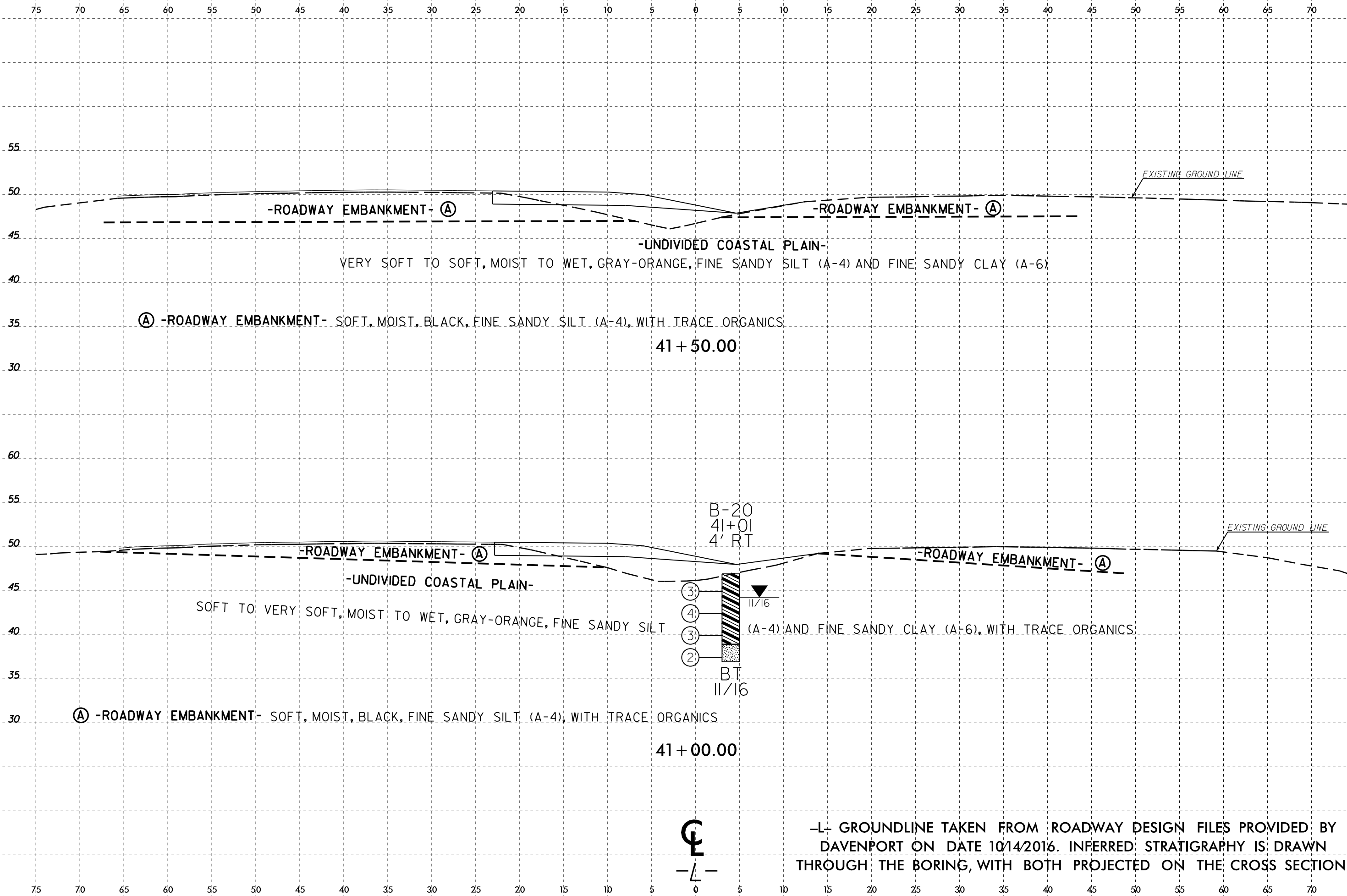


6/23/16



PROJ. REFERENCE NO.
U-5789

SHEET NO.
30



-ROADWAY EMBANKMENT- (A)

-ROADWAY EMBANKMENT- (A)

-UNDIVIDED COASTAL PLAIN-

VERY SOFT TO SOFT, MOIST TO WET, GRAY-ORANGE, FINE SANDY SILT (A-4) AND FINE SANDY CLAY (A-6)

(A) -ROADWAY EMBANKMENT- SOFT, MOIST, BLACK, FINE SANDY SILT (A-4), WITH TRACE ORGANICS

41 + 50.00

-ROADWAY EMBANKMENT- (A)

-ROADWAY EMBANKMENT- (A)

-UNDIVIDED COASTAL PLAIN-

SOFT TO VERY SOFT, MOIST TO WET, GRAY-ORANGE, FINE SANDY SILT (A-4) AND FINE SANDY CLAY (A-6), WITH TRACE ORGANICS

(A) -ROADWAY EMBANKMENT- SOFT, MOIST, BLACK, FINE SANDY SILT (A-4), WITH TRACE ORGANICS

41 + 00.00

B-20
41+01
4' RT
12/16
BT
12/16



-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY
DAVENPORT ON DATE 10/14/2016. INFERRED STRATIGRAPHY IS DRAWN
THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

25-JAN-2017 15:30
1:26GEO TECH V2
PROJECTS\1000_1999\1900\1930 - 22 - U-5789 Western Boulevard\CADD_GEO TECH\XSC\U5789_Geo.XSL.dgn
DRAWN BY: AT EES-1014761160

6/23/16

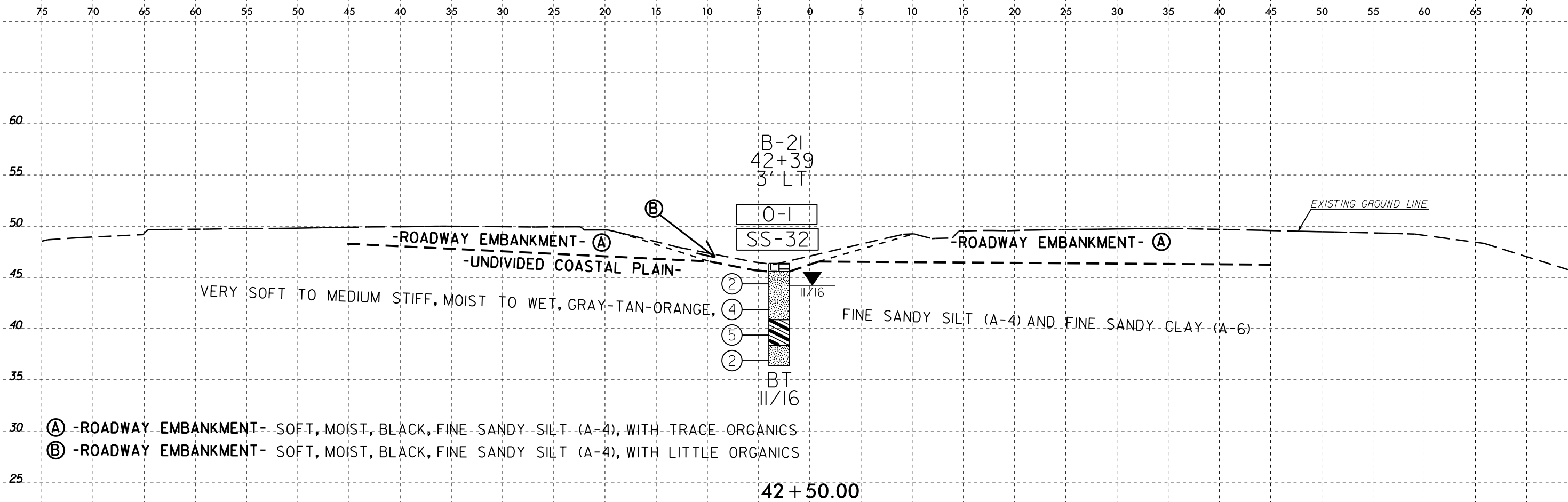


PROJ. REFERENCE NO.

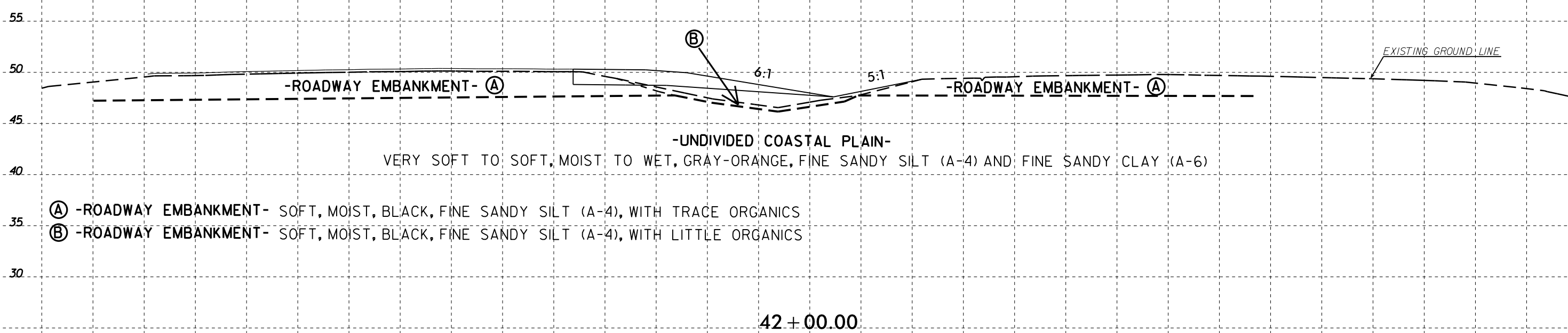
U-5789

SHEET NO.

31



- (A) -ROADWAY EMBANKMENT- SOFT, MOIST, BLACK, FINE SANDY SILT (A-4), WITH TRACE ORGANICS
(B) -ROADWAY EMBANKMENT- SOFT, MOIST, BLACK, FINE SANDY SILT (A-4), WITH LITTLE ORGANICS



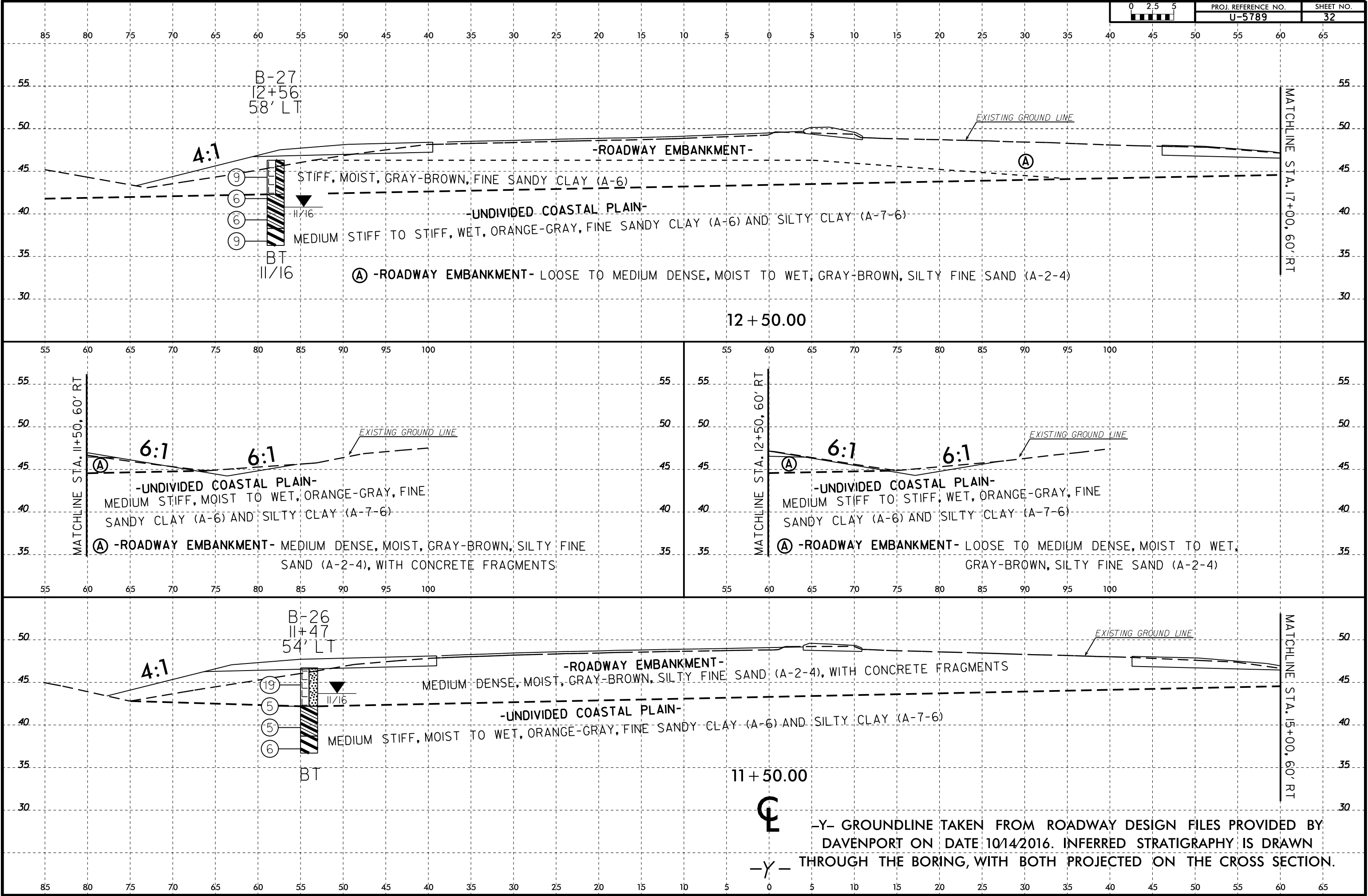
- (A) -ROADWAY EMBANKMENT- SOFT, MOIST, BLACK, FINE SANDY SILT (A-4), WITH TRACE ORGANICS
(B) -ROADWAY EMBANKMENT- SOFT, MOIST, BLACK, FINE SANDY SILT (A-4), WITH LITTLE ORGANICS



-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY DAVENPORT ON DATE 10/14/2016. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

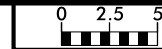
6/23/16

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DRAWN BY: JAT
CHECKED BY: JAT

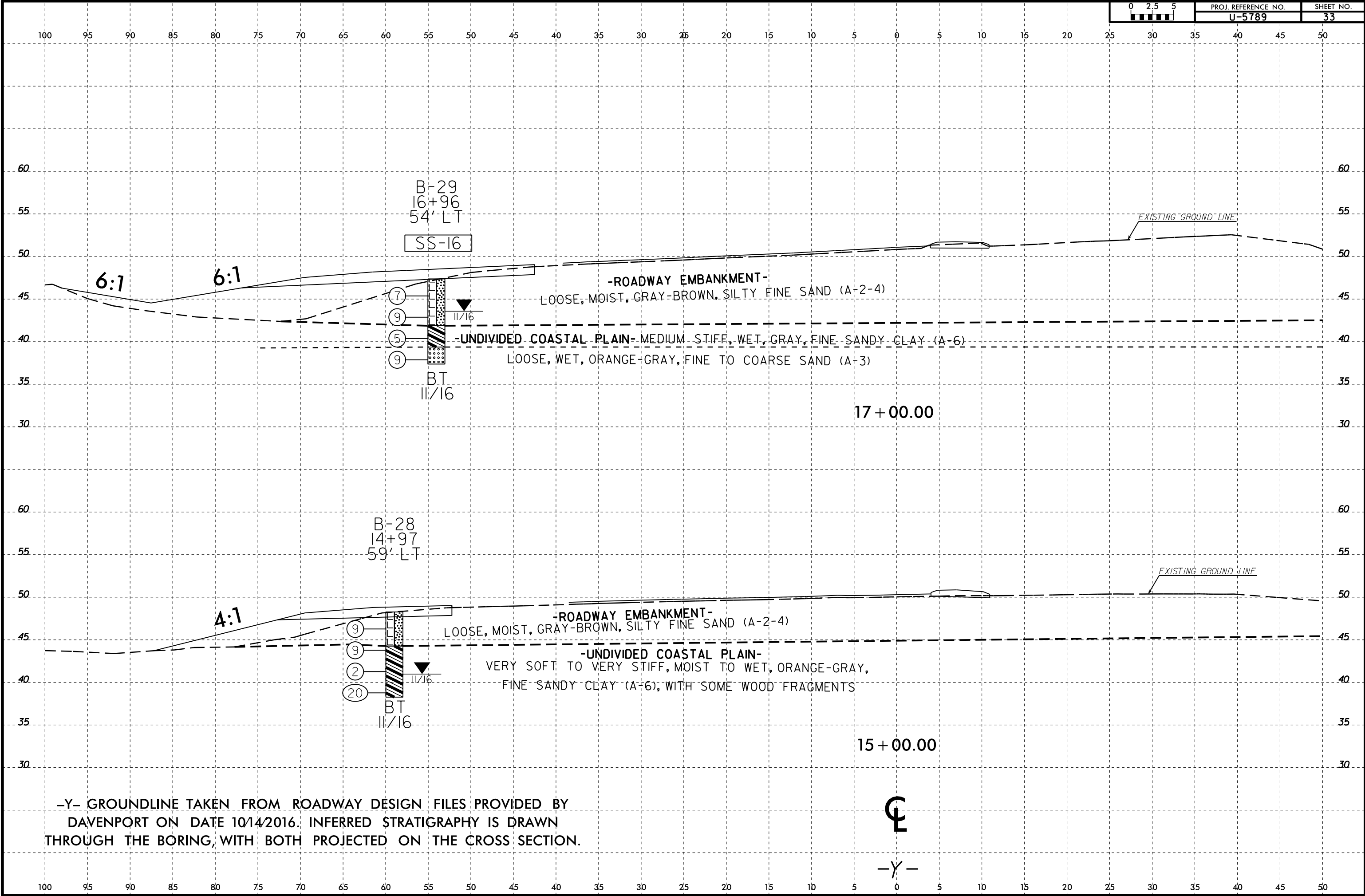


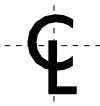
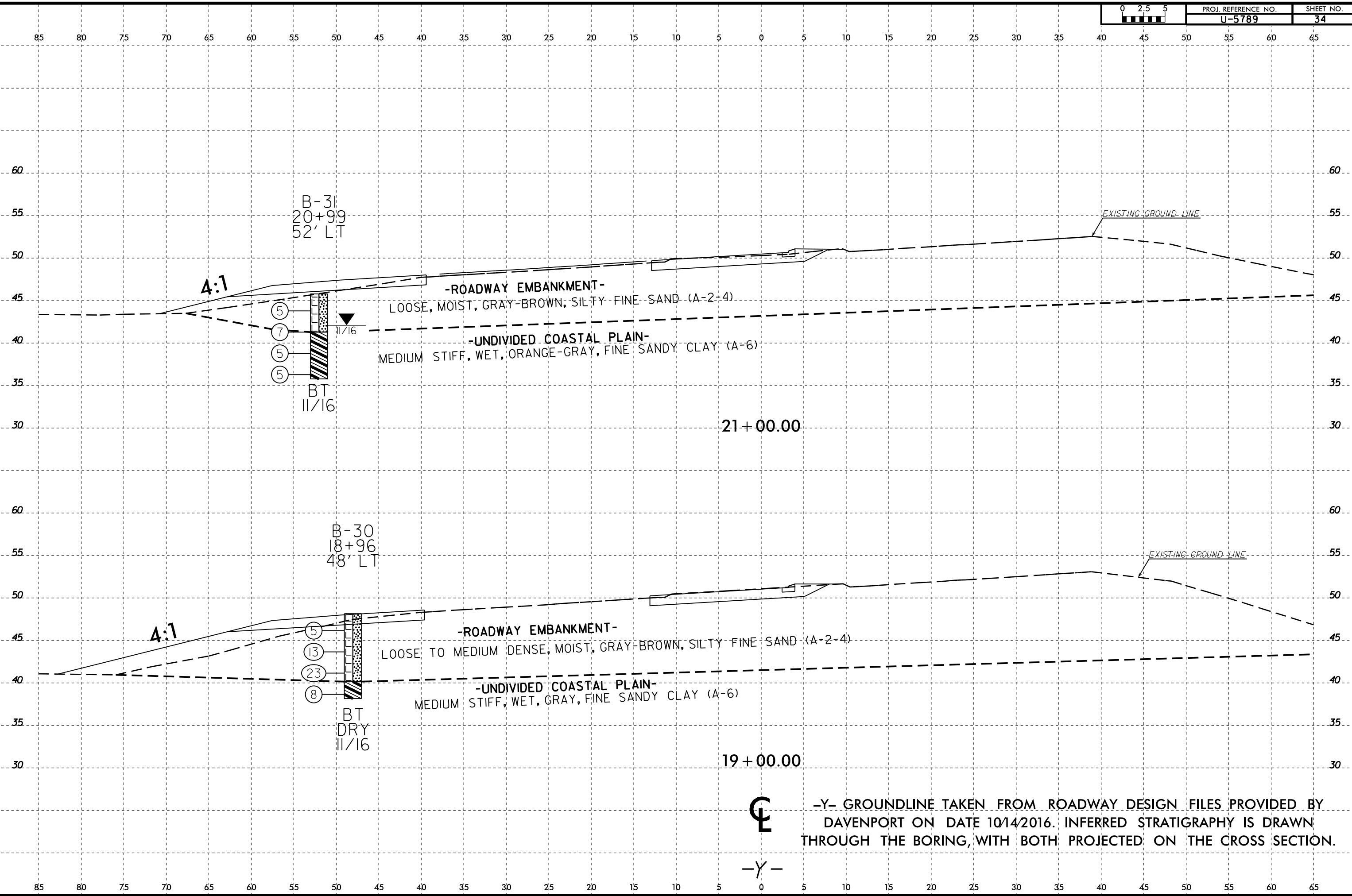
6/23/16

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DRAWN BY: J. L. BELL



PROJ. REFERENCE NO.	SHEET NO.
U-5789	33



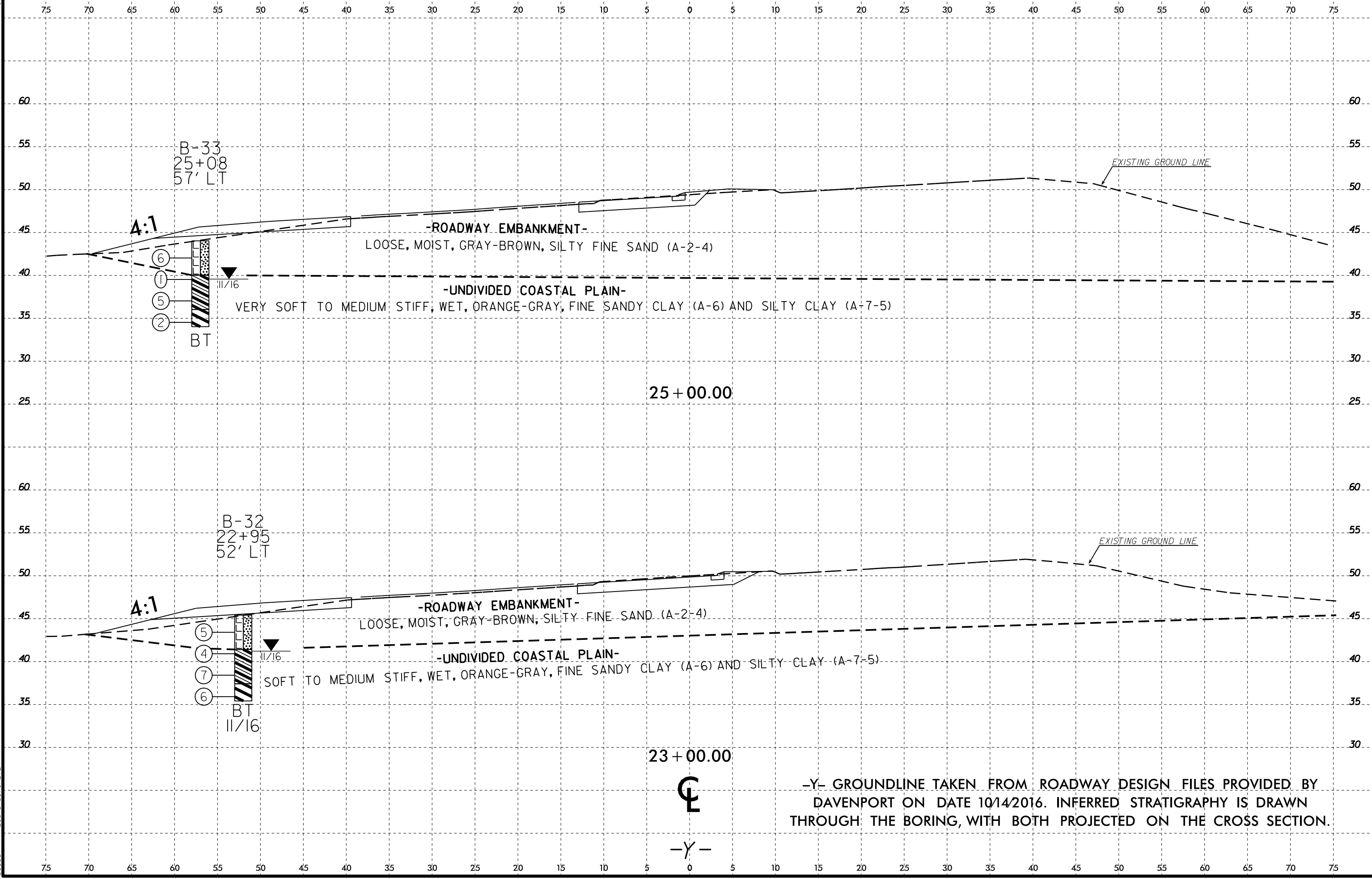


-Y-

-Y- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY DAVENPORT ON DATE 10/14/2016. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

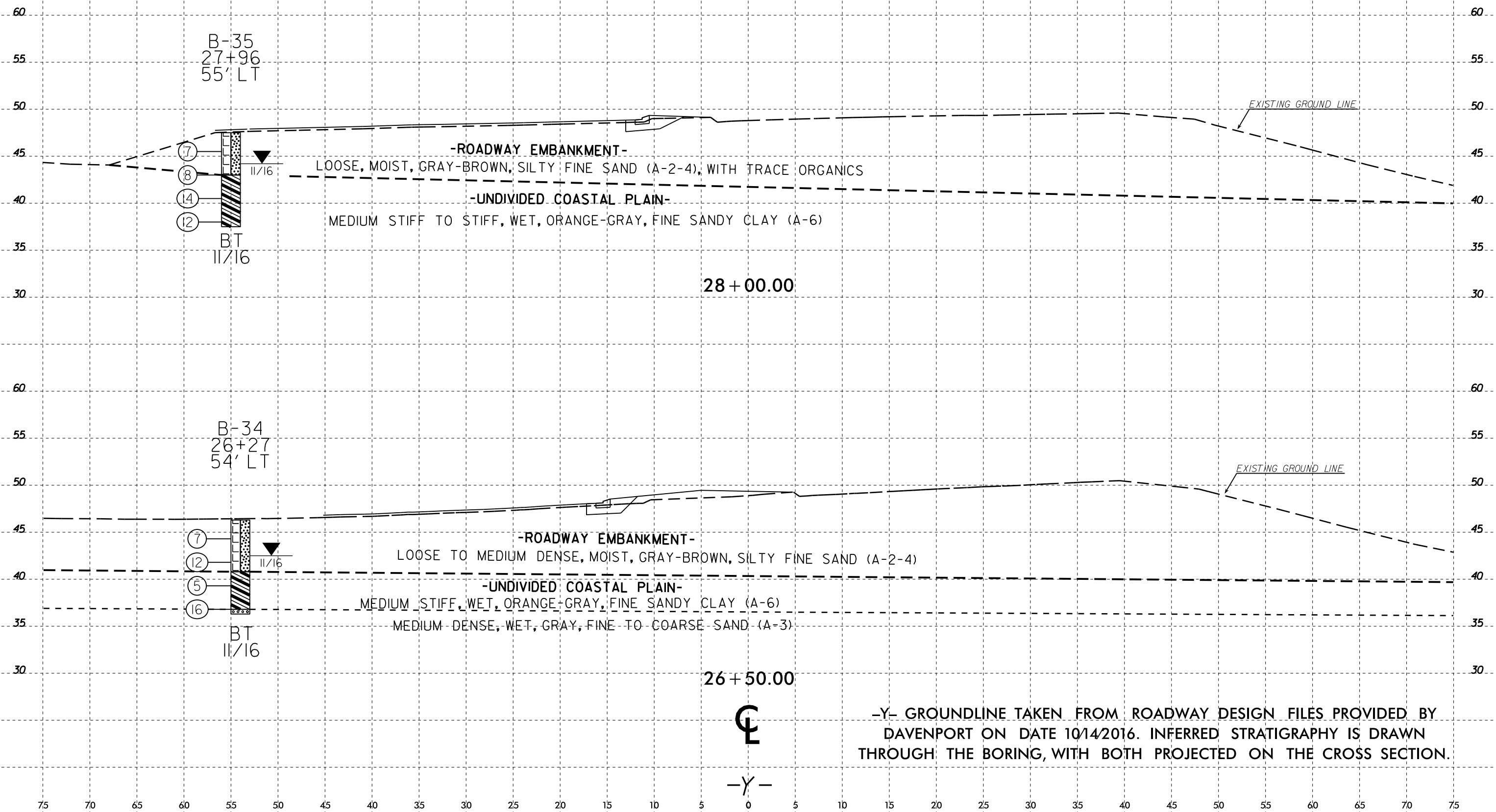
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08cad AT EGS-OPCSYSKEV2H

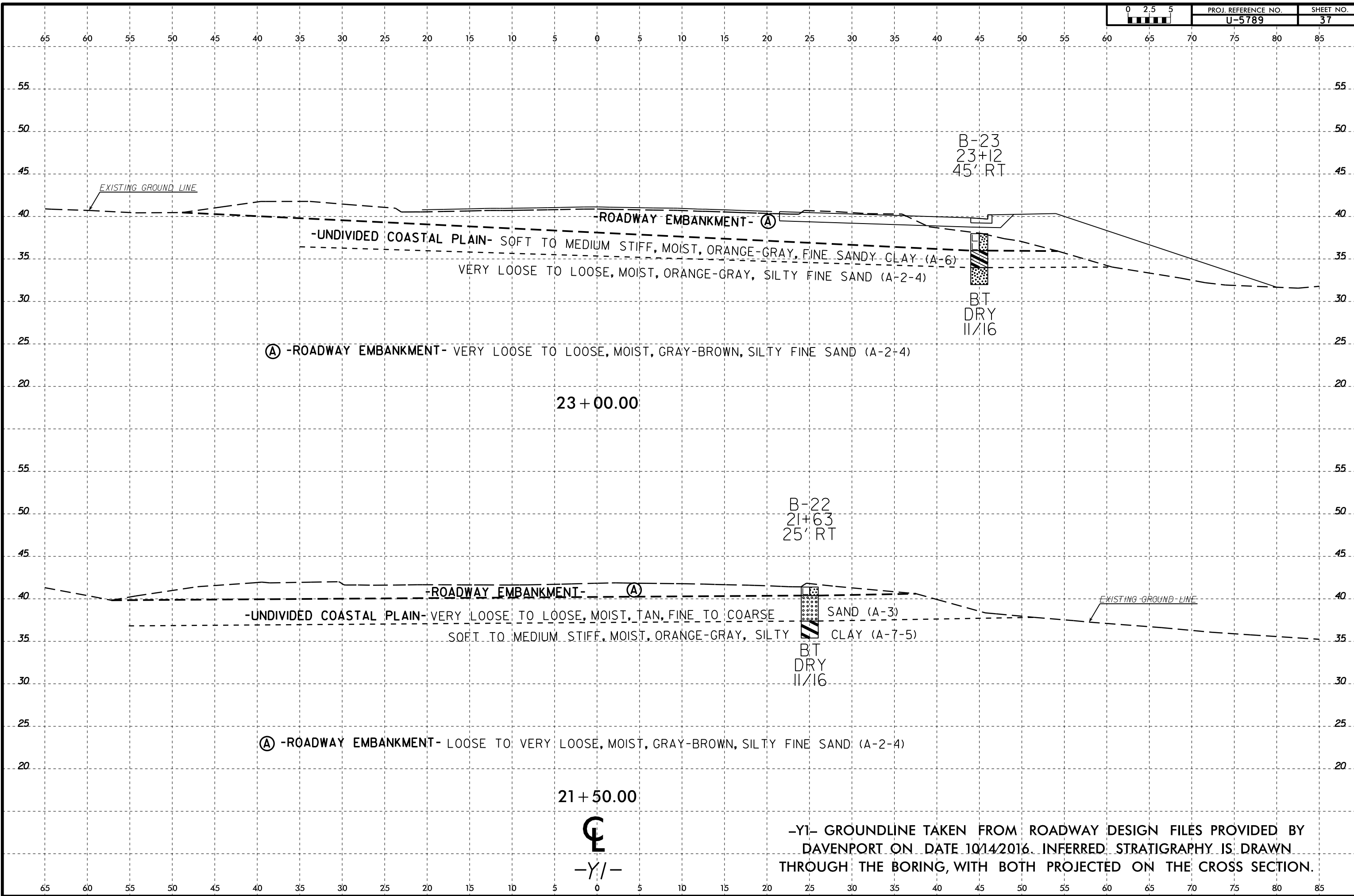
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-5789	35



6/23/16

I:\26GEOTECH\02-PROJECTS\1000-11999\11900\11930 - 22 - U-5789 Western Boulevard\CADD_GEOTECH\XAC\U5789_Geo_xsi_Y.dgn
08cad AT EGS-OPCSYSKEV2H



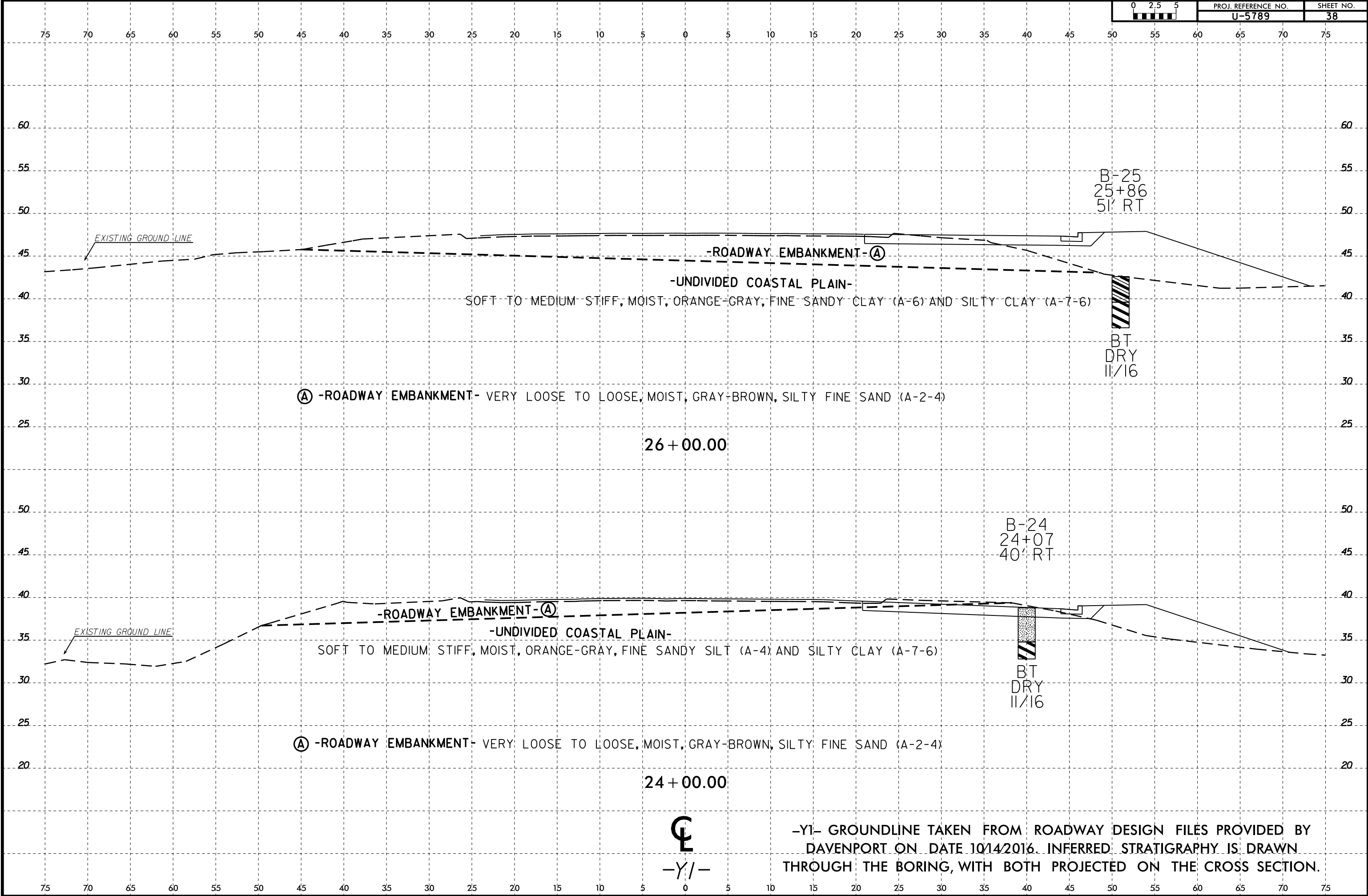


6/23/16

25-JAN-2017 09:02
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DRAWN BY: AT EGS-1014761160



PROJ. REFERENCE NO.	SHEET NO.
U-5789	38



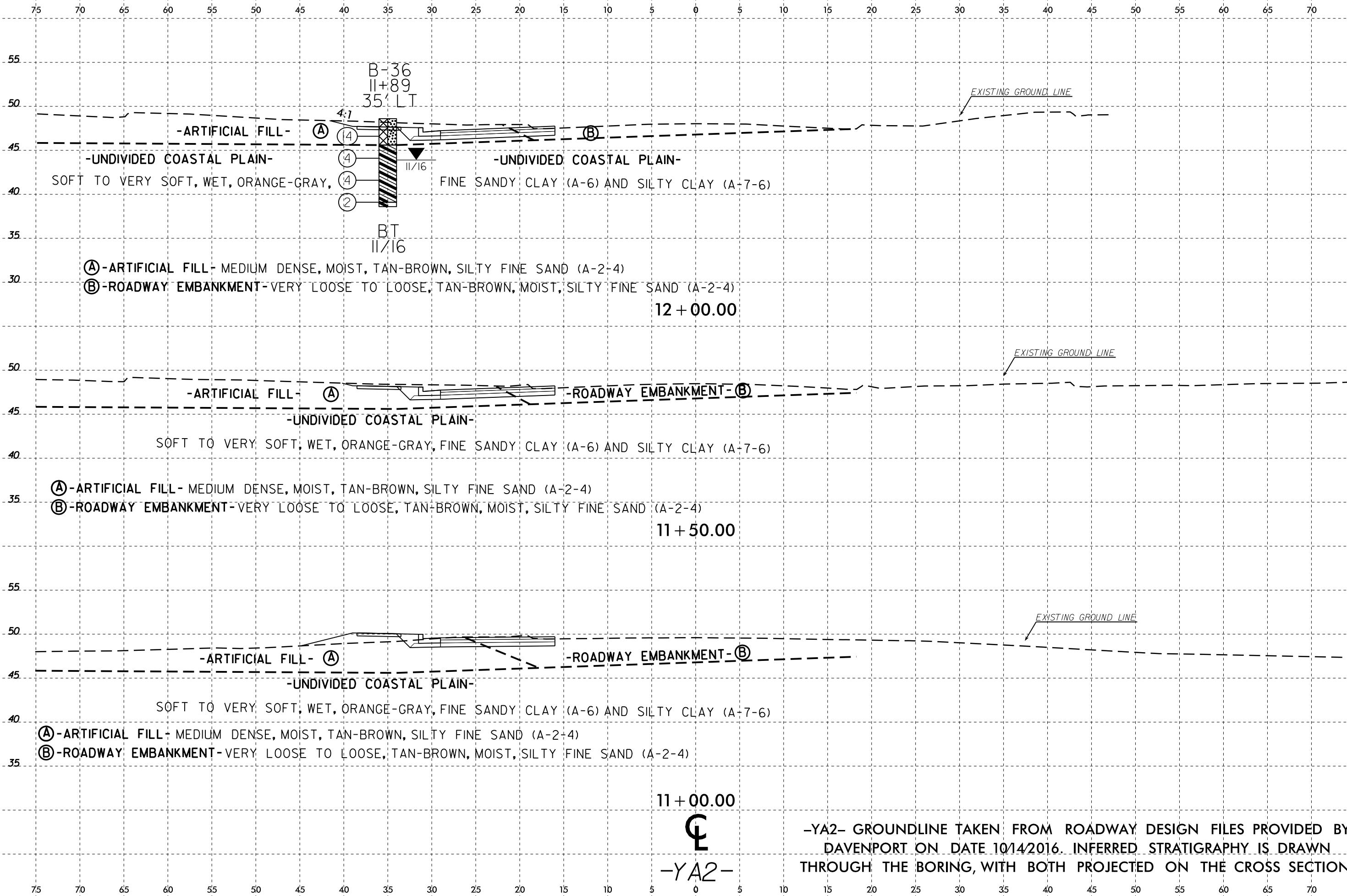
-Y1- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY
DAVENPORT ON DATE 10/14/2016. INFERRED STRATIGRAPHY IS DRAWN
THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

6/23/16

25-JAN-2017 09:14
I:\2016\10\10\1000\1999\11900\11930 - 22 - U-5789 Western Boulevard\CADD\GEOTECH\XSC\U5789_Geo.xsl-YA2.dgn
DRAWN BY: AT EGS-10/14/16/LLG

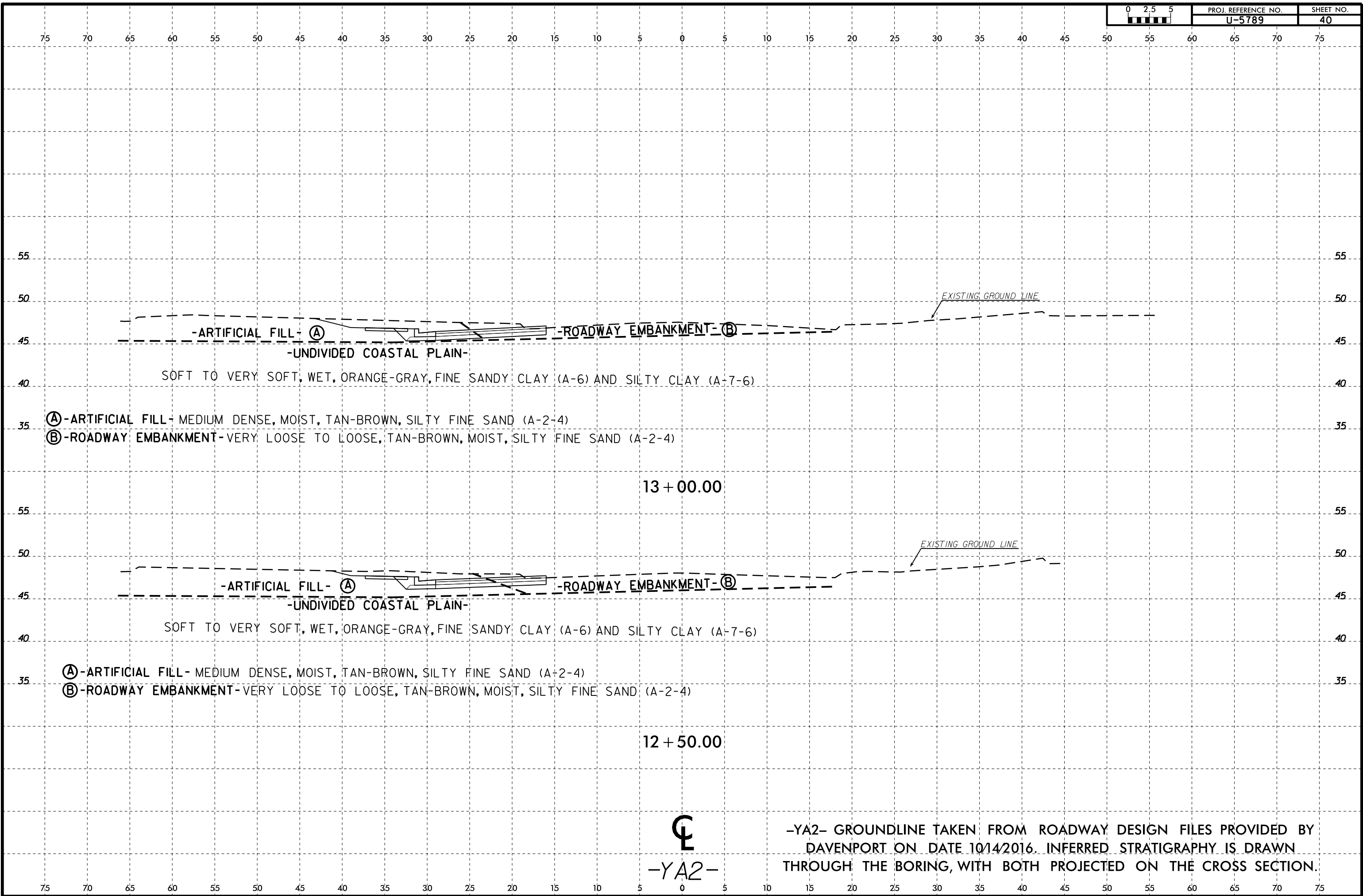


PROJ. REFERENCE NO.	SHEET NO.
U-5789	39



-YA2-

-YA2- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY
DAVENPORT ON DATE 10/14/2016. INFERRED STRATIGRAPHY IS DRAWN
THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.



PROJECT: 44361

REFERENCE: U-5789

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
APPENDIX A
LABORATORY TEST RESULTS

PROJECT REFERENCE NO.	SHEET NO.
U-5789	41

Prepared in the Office of:



ECS SOUTHEAST, LLP
6714 NETHERLANDS DRIVE
WILMINGTON NC 28405
(910) 686-9114 [PHONE]
(910) 686-9666 [FAX]
NC REGISTERED
ENGINEERING
FIRM # F-1078

SOIL TEST RESULTS																
BORING NO.	SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
								C. SAND	F. SAND	SILT	CLAY	10	40	200		
B-4	HAS-05	8' LT	16+02 -L-	1.0 - 2.5'	A-4(0)	19	2	4.6	16.4	54.3	24.7	100.0	99.0	81.0	21.8	*
B-4	HAS-06	8' LT	16+02 -L-	2.5 - 3.5'	A-7-5(18)	57	35	0.6	27.7	18.5	53.2	100.0	100.0	74.0	27.7	*
B-7	SS-66	79' RT	18+13 -L-	1.0 - 2.5'	A-4(2)	23	10	12.1	37.2	17.4	33.3	99.0	95.0	52.0	15.2	*
B-12	SS-51	3' LT	30+01 -L-	1.0 - 2.5'	A-4(0)	19	7	28.8	30.0	12.7	28.5	100.0	89.0	43.0	15.4	*
B-16	SS-45	5' LT	33+33 -L-	1.8 - 2.5'	A-6(2)	23	11	20.4	31.7	16.7	31.2	100.0	94.0	49.0	11.8	*
B-21	SS-32	3' LT	42+39 -L-	1.0 - 2.5'	A-4(2)	25	10	13.4	35.5	22.3	28.8	100.0	94.0	53.0	19.2	*
B-29	SS-16	54' LT	16+96 -Y-	1.0 - 2.5'	A-2-4(0)	18	4	24.3	44.1	12.9	18.7	98.0	89.0	33.0	13.2	*
B-1	O-13	1' LT	12+01 -L-	0.0 - 0.8'	*	*	*	*	*	*	*	*	*	*	17.3	4.3
B-10	O-16	10' RT	23+13 -L-	0.0 - 0.4'	*	*	*	*	*	*	*	*	*	*	17.2	4.6
B-16	O-5	5' LT	33+33 -L-	0.0 - 0.6'	*	*	*	*	*	*	*	*	*	*	29.7	8.9
B-18	SS-38	3' RT	37+01 -L-	0.0 - 0.6'	*	*	*	*	*	*	*	*	*	*	20.9	5.8
B-21	O-1	3' LT	42+39 -L-	0.0 - 0.8'	*	*	*	*	*	*	*	*	*	*	42.7	10.4

LAB TECHNICIAN: KENNETH E. LEIMER

NCDOT CERTIFICATION NO. 108-02-1003

SIGNATURE: 