STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-6005	1	29

REFERENCE: U-6005

PROJECT: 47140

SEE SHEET 3 FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

CONTENTS

APPENDICES

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

ROADWAY SUBSURFACE INVESTIGATION

COUNTY *FORSYTH*

PROJECT DESCRIPTION *NC 65 (BETHANIA-RURAL HALL RD.) WIDENING FROM US 52 TO SR 3983 (NORTHRIDGE PARK DR.) IN RURAL HALL*

INVENTORY

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT 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 THE 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.

NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
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.

PERSONNEL

M. STANBURY

D. JOYNES

N. MOHS, LG

INVESTIGATED BY *N. MOHS, LG*

DRAWN BY *M. STANBURY*

CHECKED BY *S. JOHNSON, PE, PG*

SUBMITTED BY *N. MOHS, LG*

DATE *JULY 2022*

ICE of CAROLINAS, PLLC

NORTH CAROLINA LICENSED SEAL 2124 GEOLOGIST NATHAN DANIEL MOHS

DocuSigned by:
Nathan D. Mohs 07/20/2022
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SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
U-6005	2

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-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	— 6 MX		— NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	NO MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS 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 ($TONS/FT^2$)
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	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	0.42	0.25	0.075	0.053

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

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

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
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
- 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
- SPT, DPT, DMT, VST, PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — 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
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

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
- [X] D-50 TRACK
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [X] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [ ] TRICONE _____" TUNG.-CARB.
- [ ] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B _____ [ ] -H _____
- [ ] -N _____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [X] 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 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, 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 PEICES 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 FINGERNAIL.

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 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 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 (SRQD) - 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: ELEVATIONS DETERMINED FROM FILE U6005_LS_TIN.TIN
DATED 11-19-2018

ELEVATION: FEET

NOTES:

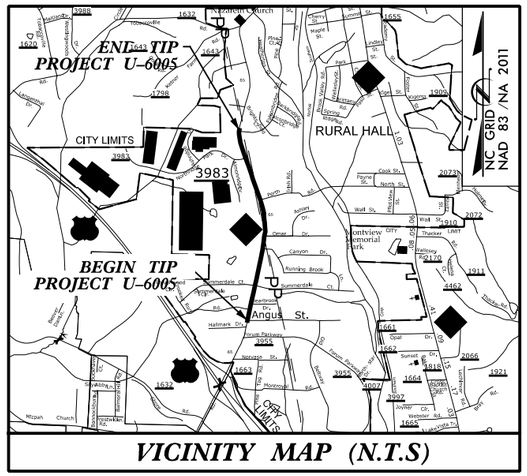
FIAD - FILLED IMMEDIATELY AFTER DRILLING

DATE: 8-15-14

09/08/09

TIP PROJECT: U-6005

See Sheet 1A For Index of Sheets



VICINITY MAP (N.T.S)

NC GRID
NAD 83 /NA 2011

25% PRELIMINARY PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

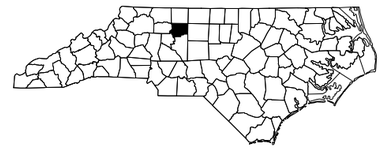
FORSYTH COUNTY

LOCATION: NC 65 (BETHANIA RURAL HALL RD.) FROM ANGUS STREET TO SR 3983 (NORTHRIDGE PARK DRIVE)

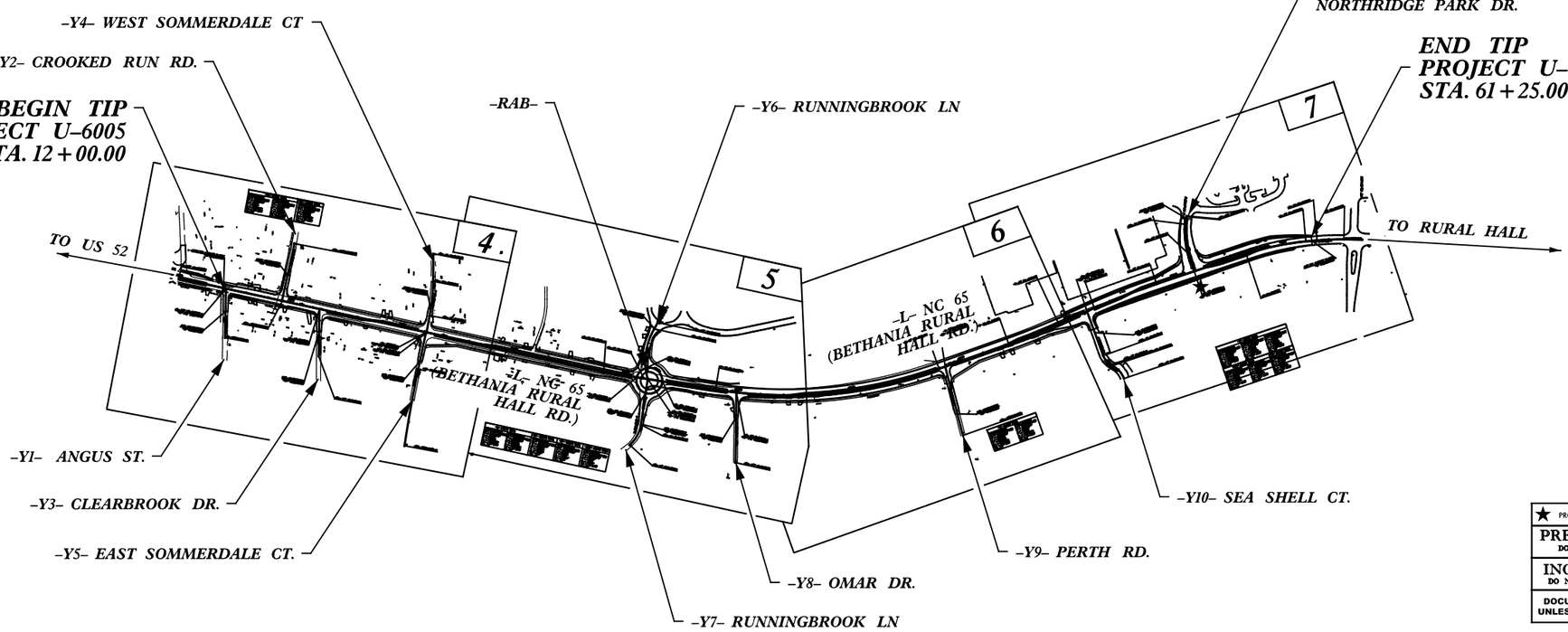
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND SIGNALS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-6005	3	29

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
47140.1.1	N/A	P.E.



V&M Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2795
Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5600
Middlesboro, KY 606-248-6600
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488
Atlanta, GA 770-827-3590



★ PROPOSED SIGNAL

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2021 = 12,800
ADT 2040 = 15,600
K = 10 %
D = 60 %
T = 6 % *
V = 50 MPH
* TTST = 3% DUAL 3%
FUNC CLASS = MINOR ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-6005 = 0.933 MILES

TOTAL LENGTH OF TIP PROJECT U-6005 = 0.933 MILES

Prepared In the Office of:
V&M Vaughn & Melton Consulting Engineers
1318-F Patton Ave. Asheville, NC 28806

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE 30, 2021

LETTING DATE: JUNE 20, 2023

JOEL SETZER, PE
PROJECT ENGINEER

DANIEL ALMUETI, EIT
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

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nathan.mons

July 12, 2022

STATE PROJECT: 47140.1.1 (U-6005)
PROJECT ID: 39378
COUNTY: Forsyth
DESCRIPTION: NC 65 (Bethania-Rural Hall Rd.) Widening from US 52 to SR 3983 (Northridge Park Dr.) in Rural Hall

SUBJECT: Geotechnical Report – Inventory

Project Description

This project consists of widening NC 65 (-L-). The project begins just north of Tobaccoville Road and runs 0.933 miles south to Angus Street. A traffic circle will be added to the intersection of Falconbridge Road (-Y7-) and Spruce Garden Drive (-Y6-).

The geotechnical field investigation was conducted from May to June 2022. Standard Penetration Tests were performed with a track mounted D-50 with an automatic hammer along the project mainline. Borings performed in the existing roadway were filled and patched immediately after drilling (FIAD). Several hand augers were also performed along -L-, -Y6-, and -Y7- in areas of shallow cut/fill. Representative soil samples were collected for visual classification in the field and submitted for laboratory analysis by ICE, PLLC in Columbia, SC.

The following alignments, totaling 0.933 miles, were investigated. Subsurface cross-sections of these alignments are included in this report:

Line	Stations		
-L-	10+00	to	63+46
-Y6-	10+00	to	11+00
-Y7-	10+00	to	13+06

Physiography and Geology

The project is in the gently rolling terrain of central North Carolina. The project runs through the town of Rural Hall, North of US 52.

Geologically, the project lies within the Milton terrane. The Milton terrane consists of gneiss, schist, and metamorphose intrusive rocks. The rocks were formed 460 to 470 Mya. Generally, the rocks of the terrane are interpreted as part of a chain of volcanic islands.

The geology of the project area consists of residual soils which are the weathered remains of parent material, crystalline meta-volcanic rock.

Soil Properties

Soils encountered at the project site include roadway embankment, artificial fill and residual soils.

Roadway embankment mostly underlies the existing lanes of NC-65 and the surrounding surface roads. Due to the area topography portions of the roadway were graded and paved. Where encountered roadway embankment soils range from 3 to 7 feet thick. These soils mainly consist of dry to moist, medium to very stiff, sandy silt and silty clay (AASHTO classifications of A-4 and A-7-5/A-7-6). Some of the A-7 soils exhibit a PI of 26 or more and are considered to be highly plastic.

Artificial fill is found in landscaping features along NC-65 from approximate stations -L- 51+00 to 55+00 and 57+00 to 59+50. The artificial fill soils range from 1.5 to 3.5 feet thick. The artificial fills soils consist of moist, loose, silty sand and medium stiff, silty clay (AASHTO classifications of A-2-4 and A-7-5). Both soil types were placed during the during the construction of NC 65 from nearby borrow sources.

Residual soils are found at the ground surface and immediately below the embankment soils. These soils mainly consist of dry to moist, soft to very stiff, sandy silt, clayey silt, sandy clay, and silty clay (AASHTO classifications of A-4, A-5, A-6, and A-7-5/A-7-6). Some of the A-7 soils exhibit a PI of 26 or more and are considered to be highly plastic.

Groundwater

No groundwater was encountered in any borings across this project. The investigation was conducted during a period of relatively low rainfall. Seasonal fluctuations in groundwater elevations can be expected.

Areas of Special Geotechnical Interest

1. Highly Plastic Clays: Highly plastic clay (PI>25) was encountered on the project at the following locations:

Line	Stations	Offset
-L-	32+00	RT
-L-	48+00	LT
-L-	57+07	LT
-L-	59+38	RT

Prepared by,

DocuSigned by:
Nathan D. Mons
85A8C11A4E4409...

Nathan Mons, LG
Engineering Geologist Manager

PROJECT REFERENCE NO.	SHEET NO.
U-6005	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011

BEGIN TIP PROJECT U-6005 -L- STA.12+00.00

-L- POT Sta.10+00.00

-L- POT STA.12+10.52 = -Y1- POT Sta.10+00.00

END CONSTRUCTION -Y1- STA.11+00.00

-Y1- POT Sta.12+14.69

-Y2- POT Sta.12+56.66

BEGIN CONSTRUCTION -Y2- STA.11+40.00

-Y2- POT Sta.10+00.00

-L- STA.16+30.01 = -Y3- POT Sta.10+00.00

END CONSTRUCTION -Y3- STA.11+00.00

-Y3- POT Sta.12+06.29

-Y4- PC Sta.10+00.00

-Y4- PCC Sta.11+21.41

BEGIN CONSTRUCTION -Y4- STA.12+40.00

-Y4- PT Sta.12+71.41

-L- 21+07.30 = -Y5- POT Sta.10+00.00

-L- STA 21+10.13 = -Y4- POT Sta.13+46.98

END CONSTRUCTION -Y5- STA.11+30.00

-Y5- PC Sta.11+65.94

-Y5- PT Sta.15+06.48

MATCHLINE -L- STA. 24+00.00 (SEE SHEET 5)

NC 65 BETHANIA-RURAL HALL ROAD

NC HWY 65-BETHANIA-RURAL HALL RD.

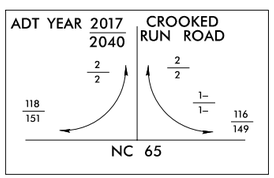
CROOKED RUN ROAD VARIES 18' TO 20' BST

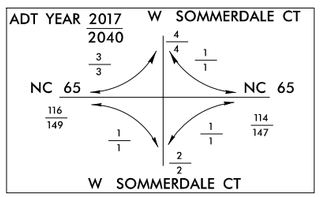
ANGUS STREET

REARBROOK DRIVE 19' BST

SOMMERDALE COURT VARIES 18' TO 19' BST

HALLMARK DR 20' BST





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patton.mills

PROJECT REFERENCE NO.	SHEET NO.
U-6005	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

25	BITTING HALL HOMEOWNERS ASSOC. INC. DB 2866 PG 4490	J
26	U.S. S.F.E. ASSET COMPANY 5, LLC. DB 3362 PG 829	K
A	HOME S.F.R. BORROWER IV, LLC. DB 3381PG 1942	L
B	DESHAUNDA HAMPTON DB 2873 PG 891	M
C	WESLEY A. BLEVINS DB 3035 PG 1709	N
D	TAMEKA MEBANE DB 3243 PG 3161	O
E	HEATHER OVERBY DB 3057 PG 2396	P
F	DAKOTA DONITHAN DB 3299 PG 3366	AA
G	FREDA DAVIS DB 2917 PG 1531	BB
H	ANGELA AUSTIN DB 2915 PG 626	CC
I	HOME S.F.R. BORROWER II, LLC DB 3344 PG 4256	DD

ADT YEAR 2017 / 2040

RUNNINGBROOK LN

NC 65 — NC 65

RUNNINGBROOK LN

NAD 83/NA 2011

MATCHLINE -L- STA 24+00.00 (SEE SHEET 4)

MATCHLINE -L- STA 38+00.00 (SEE SHEET 6)

BEGIN CONSTRUCTION -Y6- STA.10+30.00

-L- PC Sta. 29+04.44

-L- PT Sta. 39+82.23

-Y6- PC Sta.10+32.58

-Y6- POT Sta.10+00.00

-Y6- STA.12+11.48 = -RAB- STA.12+99.62

-L- PC Sta. 34+00.74

-L- STA.30+51.52 = -RAB- STA.10+06.00

-Y7- STA.10+62.35 = -RAB- STA.10+87.63

-L- STA 31+64.90 = -RAB- STA.11+90.86

-L- STA 31+00.00 = -Y6- PT Sta.12+59.98 = -Y7- BOT STA.10+00.00

-L- STA.34+92.85 = -Y8- POT Sta.10+00.00

END CONSTRUCTION -Y7- STA.12+00.00

-Y7- PC Sta.12+02.85

END CONSTRUCTION -Y8- STA.11+00.00

-Y8- POT Sta.13+07.83

-Y7- PT Sta.13+06.36

-L- CURVE DATA		-Y6- CURVE DATA	-Y7- CURVE DATA	-RAB- CURVE DATA
PI Sta 29+93.36	PI Sta 39+08.03	PI Sta 11+52.64	PI Sta 12+56.98	PI Sta 10+00.07
Δ = 3° 23' 44.0" (LT)	Δ = 28° 27' 55.3" (LT)	Δ = 45° 26' 33.8" (LT)	Δ = 41° 24' 08.7" (RT)	Δ = 359° 51' 27.7" (LT)
D = 1° 54' 35.5"	D = 2° 51' 53.2"	D = 19° 59' 01.8"	D = 40° 00' 00.0"	D = 100° 31' 08.1"
L = 177.79'	L = 993.63'	L = 227.40'	L = 103.51'	L = 358.00'
T = 88.92'	T = 507.29'	T = 120.06'	T = 54.13'	T = 0.07'
R = 3,000.00'	R = 2,000.00'	R = 286.71'	R = 143.24'	R = 57.00'
DS = 50 MPH	DS = 50 MPH	DS = SC	DS = SC	DS = 25 MPH
e = NC	e = 3%	e = NC	e = NC	e = 2%

PROJECT REFERENCE NO.	SHEET NO.
U-6005	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011

MATCHLINE -L- STA. 38+00.00 (SEE SHEET 5)

MATCHLINE -L- STA. 50+00.00 (SEE SHEET 7)

-L- PT Sta. 43+94.36

-L- STA. 44+32.14 = -Y9- POT Sta. 10+00.00

-L- PC Sta. 47+17.93

-L- PT Sta. 49+54.05

END CONSTRUCTION -Y9- Sta. 12+15.00

-Y9- POT Sta. 13+11.08

N 19°34'46" E

N 75°37'20" E

-L- CURVE DATA	
PI Sta 39+08.03	PI Sta 48+36.05
Δ = 28° 27' 55.3" (LT)	Δ = 4° 30' 34.5" (LT)
D = 2° 51' 53.2"	D = 1° 54' 35.5"
L = 993.63'	L = 236.12'
T = 507.29'	T = 118.12'
R = 2,000.00'	R = 3,000.00'
DS = 50 MPH	DS = 50 MPH
e = 3%	e = RC

PROJECT REFERENCE NO.	SHEET NO.
U-6005	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011

BEGIN CONSTRUCTION
-Y11- STA.10+10.00

-Y11- PC Sta.10+34.98

-Y11- PT Sta.11+69.50

-Y11- POT Sta.10+00.00

-L- STA.50+90.07 =
-Y10- POT Sta.10+00.00
-L- PC Sta. 51+24.42

-L- PT Sta. 54+17.51

ARTIFICIAL FILL

ARTIFICIAL FILL

-L- PC Sta. 61+47.99

-L- PT Sta. 60+98.99

PT Sta. 62+66.57

WATCHTINE L STA. 50+00.00 (SEE SHEET 6)

NC 65 BETHANIA RURAL HALL RD.

NORTH RIDGE PARK DR.

SEA SHELL CT.

FALCONBRIDGE RD.

TEST STATION

UNDERGROUND SPLICEBOX

SPARE CONDUIT FOR FUTURE USE

END CONSTRUCTION
-Y10- STA.11+00.00

-Y10- PC Sta.12+06.81

-Y10- PT Sta.12+61.40

-Y10- PC Sta.12+70.37

-Y10- PT Sta.13+45.39

-L- STA.55+91.39 =
-Y11- POT Sta.12+45.98

PC Sta. 58+31.05

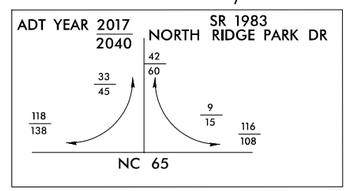
END TIP PROJECT U-6005
-L- STA.61+25.00

-L- CURVE DATA		
PI Sta 52+71.08	PI Sta 59+65.63	PI Sta 62+07.21
Δ = 5° 35' 51.2" (RT)	Δ = 13° 20' 57.8" (RT)	Δ = 5° 55' 00.0" (RT)
D = 1° 54' 35.5"	D = 4° 58' 56.1"	D = 5° 00' 00.0"
L = 293.09'	L = 267.94'	L = 118.33'
T = 146.66'	T = 134.58'	T = 59.22'
R = 3,000.00'	R = 1,150.00'	R = 1,145.92'
DS = 50 MPH	DS = 50 MPH	DS = 50 MPH
e = RC	e = 4%	e = 4%

-Y10- CURVE DATA		-Y11- CURVE DATA
PI Sta 12+35.38	PI Sta 13+09.56	PI Sta 11+03.12
Δ = 41° 42' 00.0" (LT)	Δ = 40° 56' 08.6" (RT)	Δ = 22° 32' 00.0" (LT)
D = 76° 23' 39.7"	D = 54° 34' 02.7"	D = 16° 45' 00.0"
L = 54.59'	L = 75.02'	L = 134.53'
T = 28.56'	T = 39.19'	T = 68.14'
R = 75.00'	R = 105.00'	R = 342.06'
DS = 25 MPH	DS = 25 MPH	DS = 25 MPH
e = NC	e = NC	e = NC

ADT YEAR 2017 / 2040

SR 1983
NORTH RIDGE PARK DR



REVISIONS

8/17/99

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connerstephens

6/23/16

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	U-6005	8

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985 980 975 970 965 960 955 950

4:1

RESIDUAL, BROWN, RED AND ORANGE, DRY TO MOIST, MEDIUM STIFF TO VERY STIFF, SANDY SILT WITH TRACE GRAVEL

4:1

DRY
(05/22)

15+00.00

4:1

RESIDUAL, BROWN AND RED, MOIST, MEDIUM STIFF TO VERY STIFF, SANDY SILT WITH TRACE GRAVEL

4:1

DRY
(05/22)

13+00.00

—L—

985 980 975 970 965 960 955

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connor.stephens

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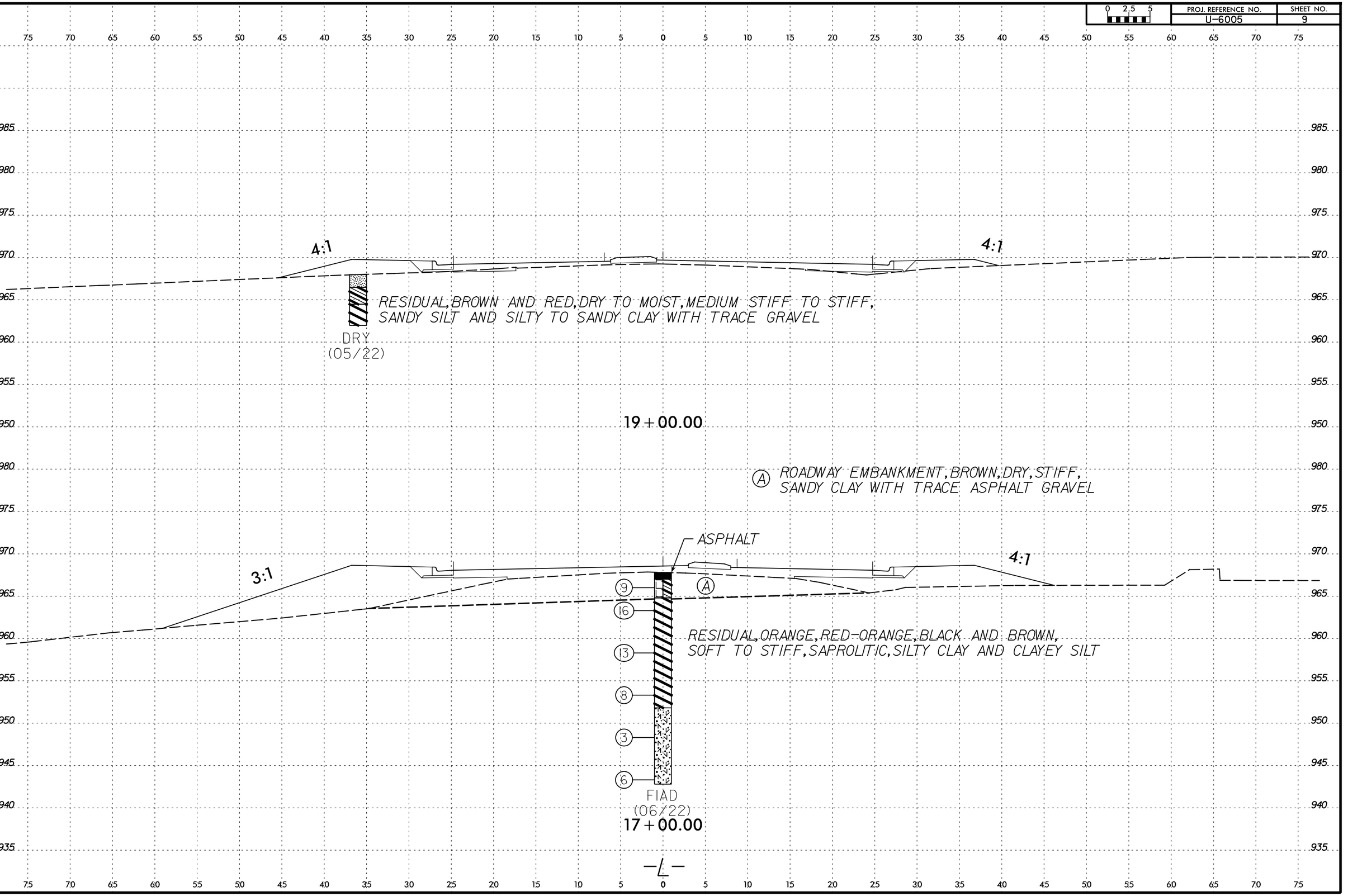

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	U-6005	10

SS-7 Ⓐ ROADWAY EMBANKMENT, BROWN AND ORANGE, MOIST, VERY STIFF, SANDY SILT WITH TRACE GRAVEL

ASPHALT

4:1

3:1

Ⓐ

21

17

17

10

16

RESIDUAL, ORANGE, RED, GRAY, BLACK AND BROWN, MOIST, STIFF TO VERY STIFF, SAPROLITIC, SILTY CLAY AND MICACEOUS, SANDY SILT WITH TRACE GRAVEL

FIAD
(06/22)

23+00.00

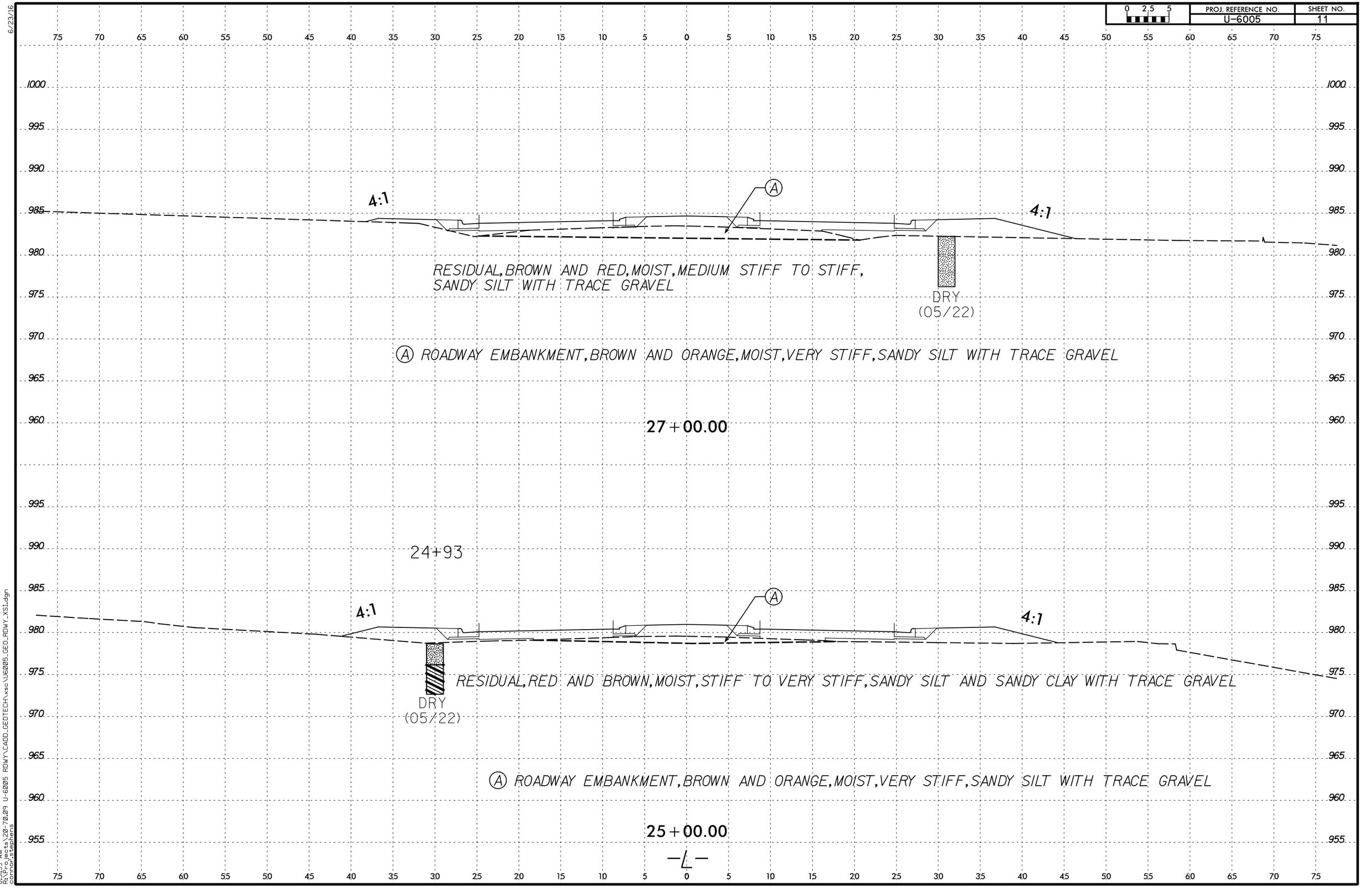
21+24

RESIDUAL, BROWN AND RED, MOIST, MEDIUM STIFF TO VERY STIFF, SANDY SILT WITH TRACE GRAVEL

DRY
(05/22)

21+00.00

—L—



6/23/16

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1010 1005 1000 995 990 985 980 975 970

SS-12

ASPHALT

4:1

4:1

16
10
9
9

RESIDUAL, ORANGE AND BROWN, MOIST, STIFF TO VERY STIFF, SILTY CLAY AND SANDY SILT WITH TRACE GRAVEL

FIAD
(06/22)

30+00.00

S-34

4:1

4:1

DRY
(05/22)

RESIDUAL, BROWN, ORANGE AND RED, MOIST, MEDIUM STIFF TO STIFF, SILTY CLAY WITH TRACE TO SOME GRAVEL

29+00.00

—L—

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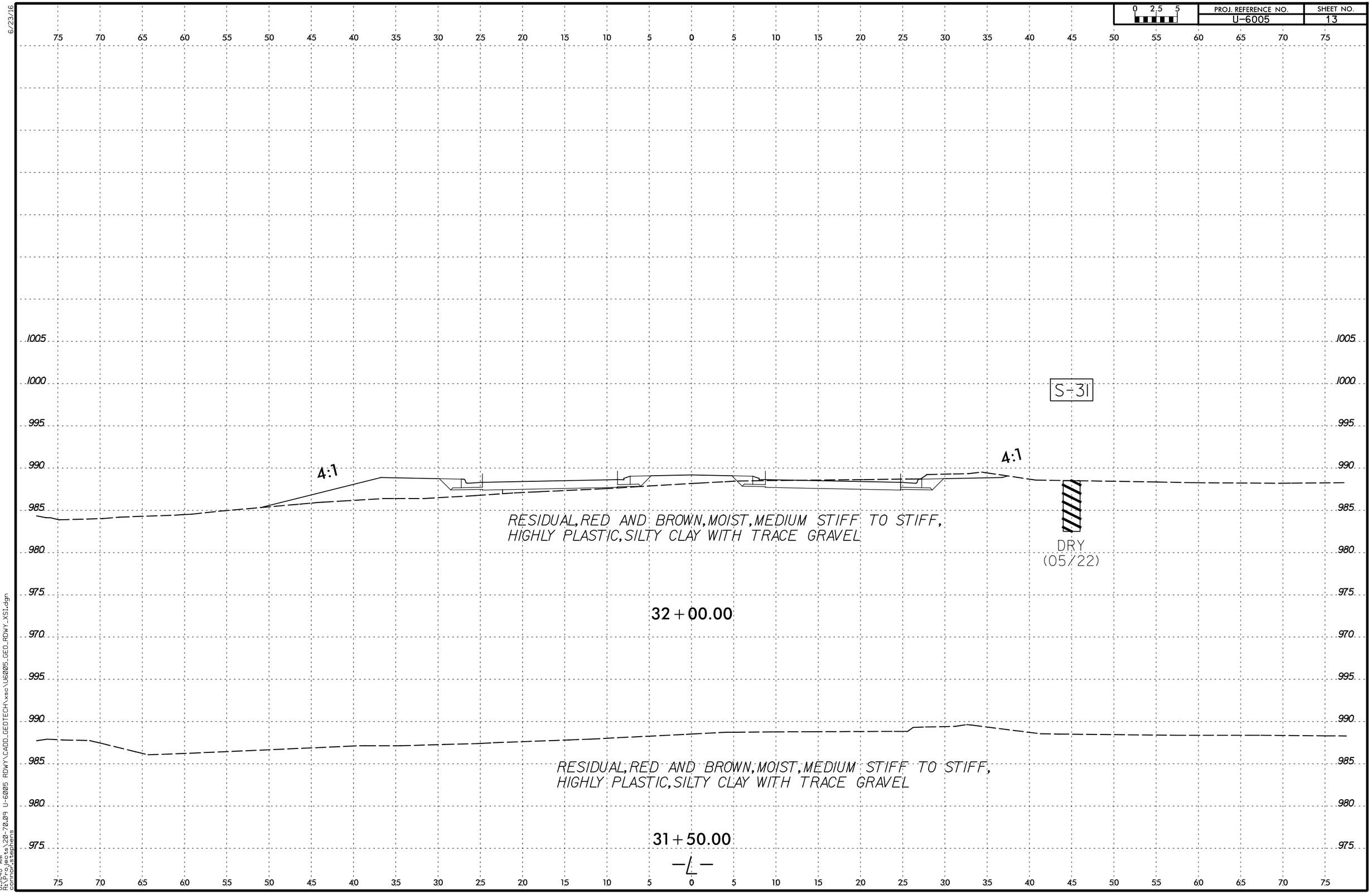

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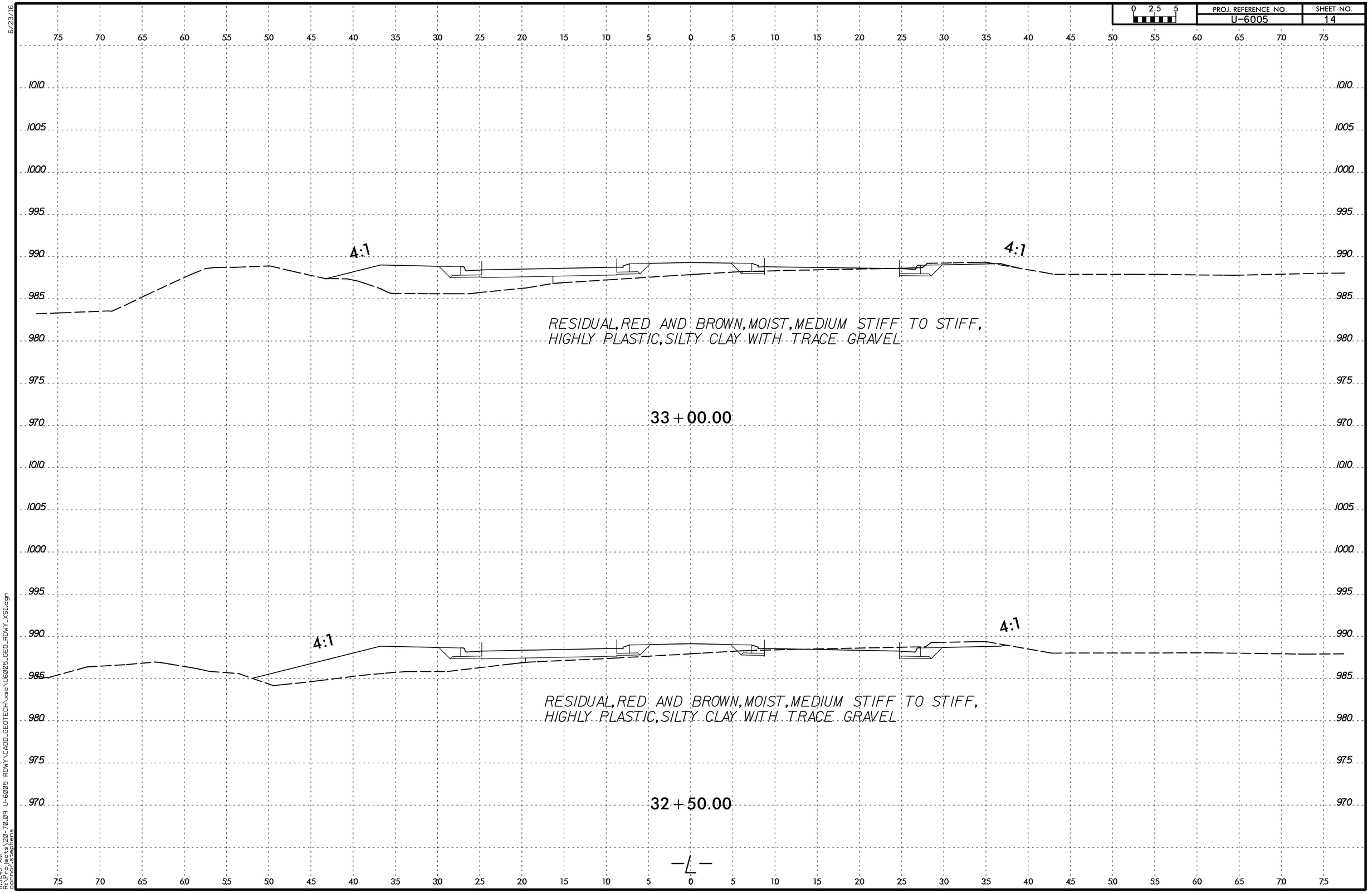

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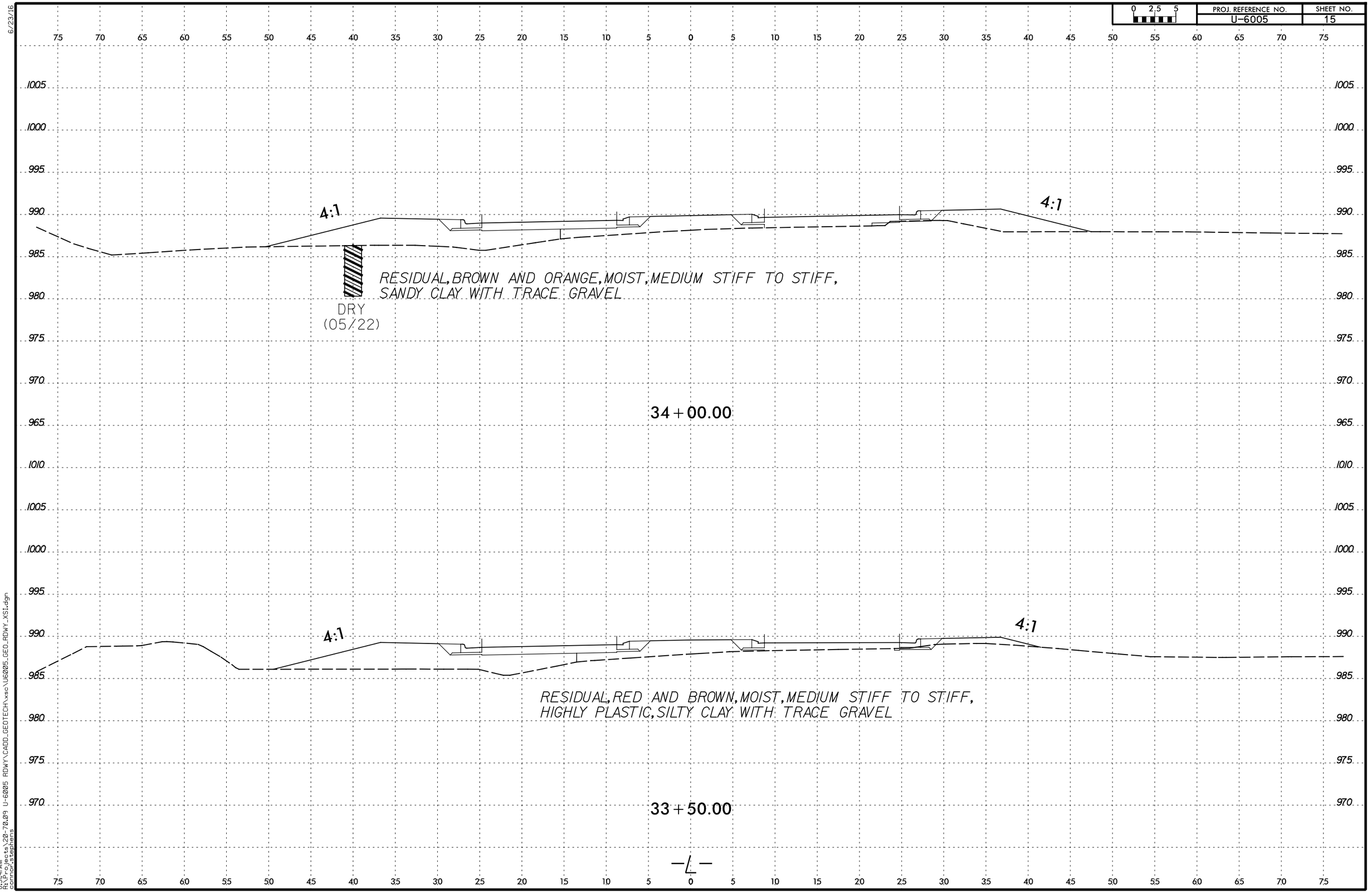

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6/23/16

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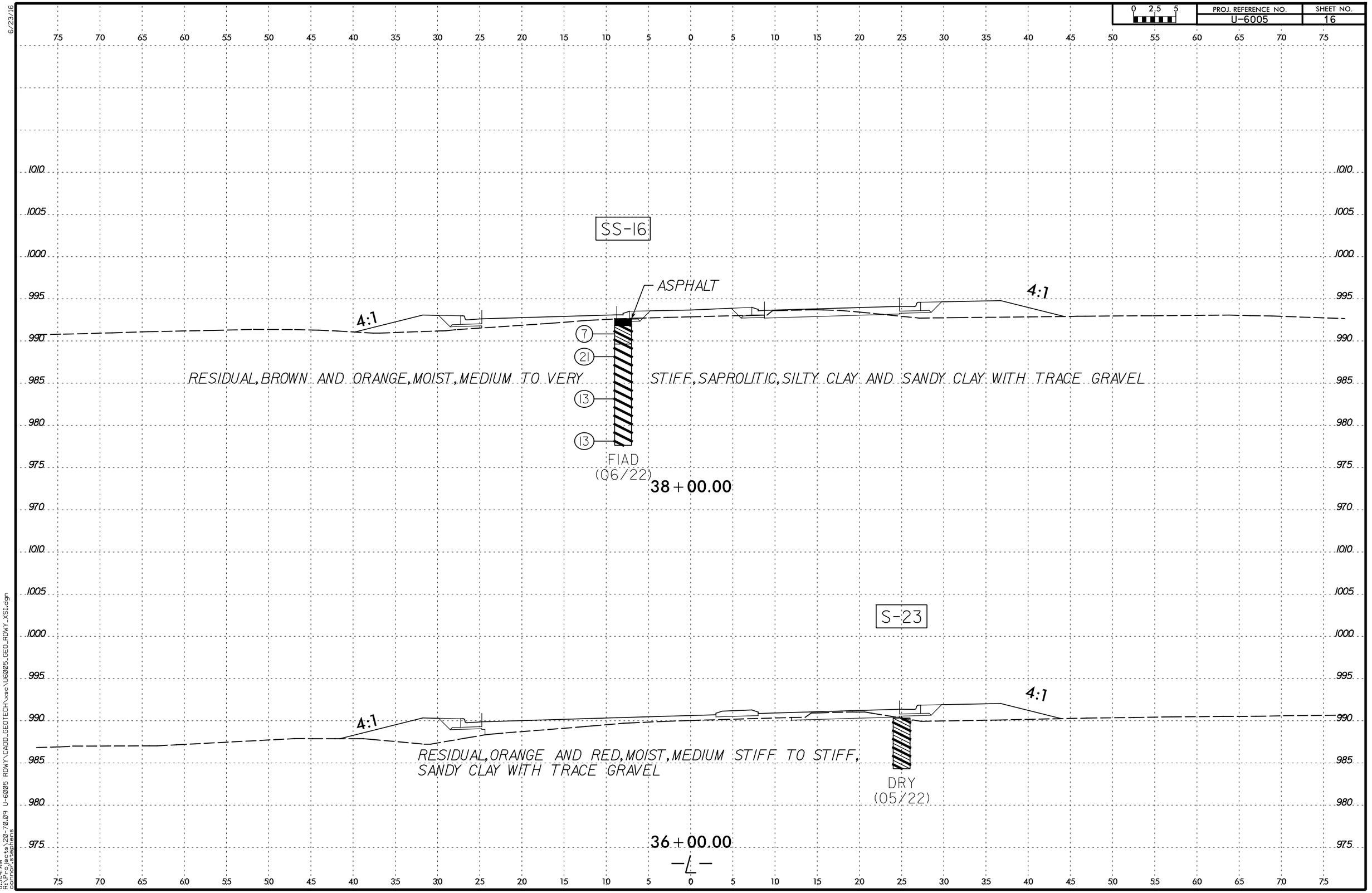

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6/23/16

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	U-6005	17

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1010 1005 1000 995 990 985 980 975 970

Ⓐ ROADWAY EMBANKMENT, BROWN AND ORANGE, DRY, STIFF, SANDY SILT WITH TRACE ASPHALT GRAVEL

S-16

4:1

Ⓐ

2:1

RESIDUAL, BROWN AND RED, MOIST, MEDIUM STIFF TO STIFF, SANDY SILT WITH TRACE GRAVEL

DRY
(05/22)

42+00.00

1010 1005 1000 995 990 985 980 975 970

4:1

4:1

RESIDUAL, RED, ORANGE AND BROWN, MOIST, MEDIUM STIFF TO STIFF, SANDY SILT AND SILTY CLAY WITH TRACE GRAVEL

DRY
(05/22)

40+00.00

—L—

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connor.stephens

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-6005	18

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

1010 1005 1000 995 990 985 980 975

SS-21

Ⓐ ROADWAY EMBANKMENT, BROWN AND ORANGE, DRY, STIFF, SANDY SILT WITH TRACE ASPHALT GRAVEL

ASPHALT

4:1

3:1

Ⓐ

15 16 13 10 12

RESIDUAL, ORANGE, GRAY, TAN AND BROWN, STIFF TO TO VERY STIFF, SAPROLITIC, MICACEOUS, SILTY CLAY AND SANDY SILT

FIAD
(06/22)

45+00.00

970 1015 1010 1005 1000 995 990 985 980

Ⓐ ROADWAY EMBANKMENT, BROWN AND ORANGE, DRY, STIFF, SANDY SILT WITH TRACE ASPHALT GRAVEL

Ⓐ

4:1

RESIDUAL, RED AND ORANGE, MOIST, MEDIUM STIFF TO STIFF, SANDY SILT WITH TRACE GRAVEL

DRY
(05/22)

44+00.00

—L—

8:31:42 AM
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connor.stephens

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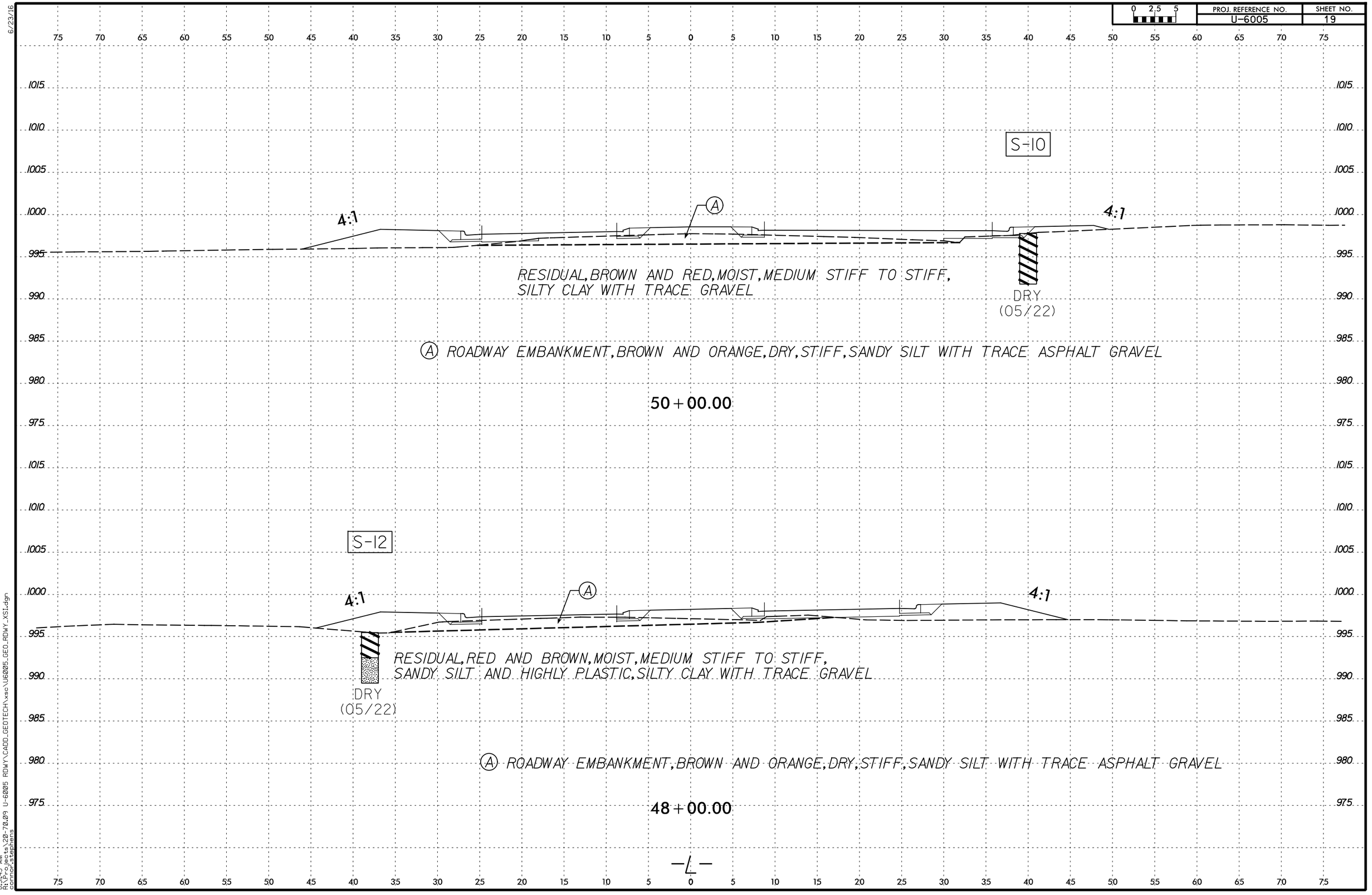

6/23/16

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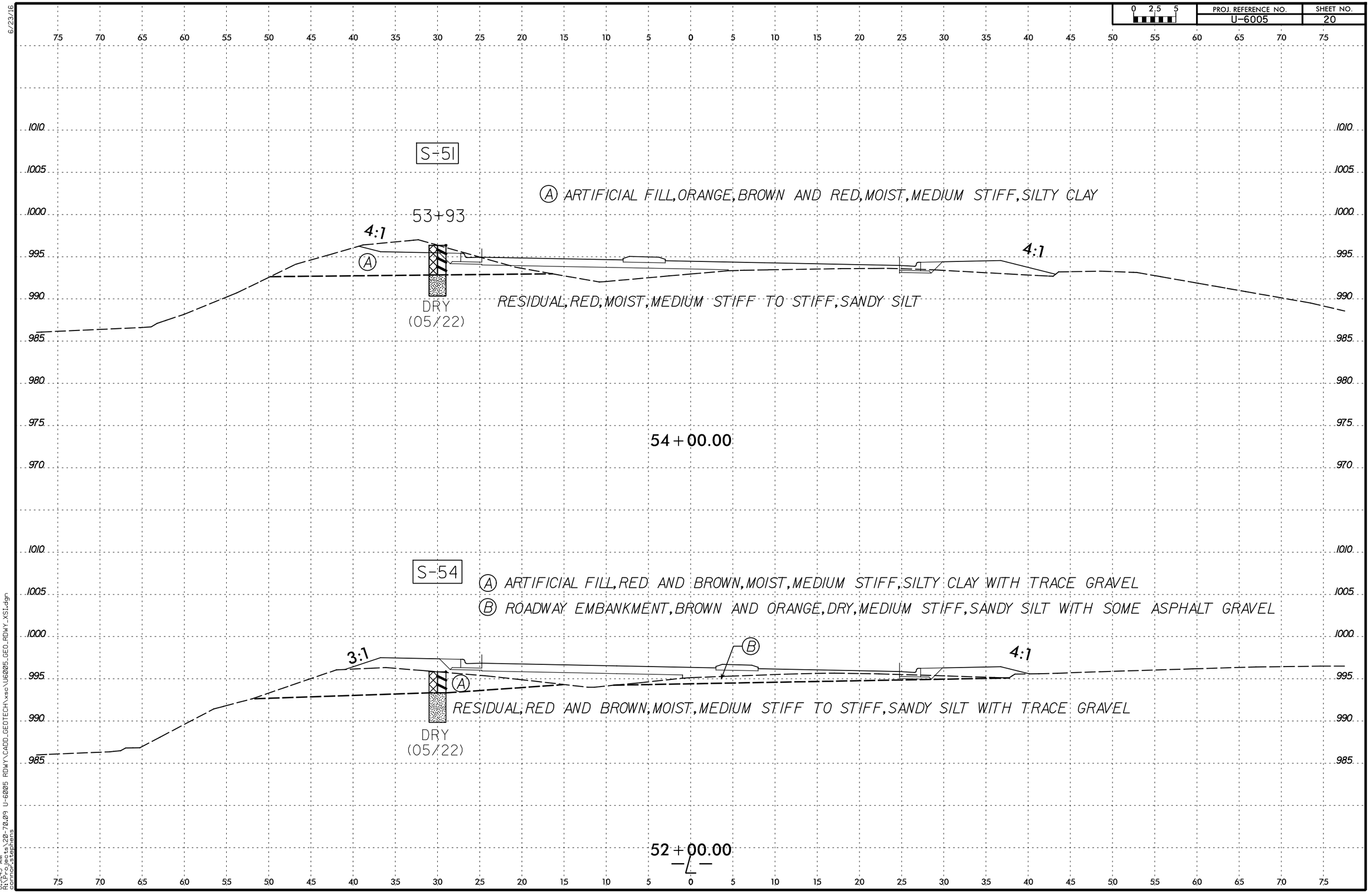

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connor.stephens

6/23/16

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1000
995
990
985
980
975

4:1

Ⓐ

4:1

RESIDUAL, BROWN AND RED, MOIST, MEDIUM STIFF TO STIFF, HIGHLY PLASTIC, SILTY CLAY AND SANDY SILT WITH TRACE GRAVEL

Ⓐ ROADWAY EMBANKMENT, BROWN, MOIST, MEDIUM STIFF, SANDY SILT WITH TRACE GRAVEL

56+50.00

1005
1000
995
990
985
980
975
970

S-1

4:1

Ⓐ

RESIDUAL, BROWN, RED AND ORANGE, MOIST, MEDIUM STIFF TO STIFF, SANDY CLAY AND CLAYEY SILT WITH TRACE GRAVEL

DRY
(05/22)

Ⓐ ROADWAY EMBANKMENT, BROWN, MOIST, MEDIUM STIFF, SANDY SILT WITH TRACE GRAVEL

56+00.00

—L—

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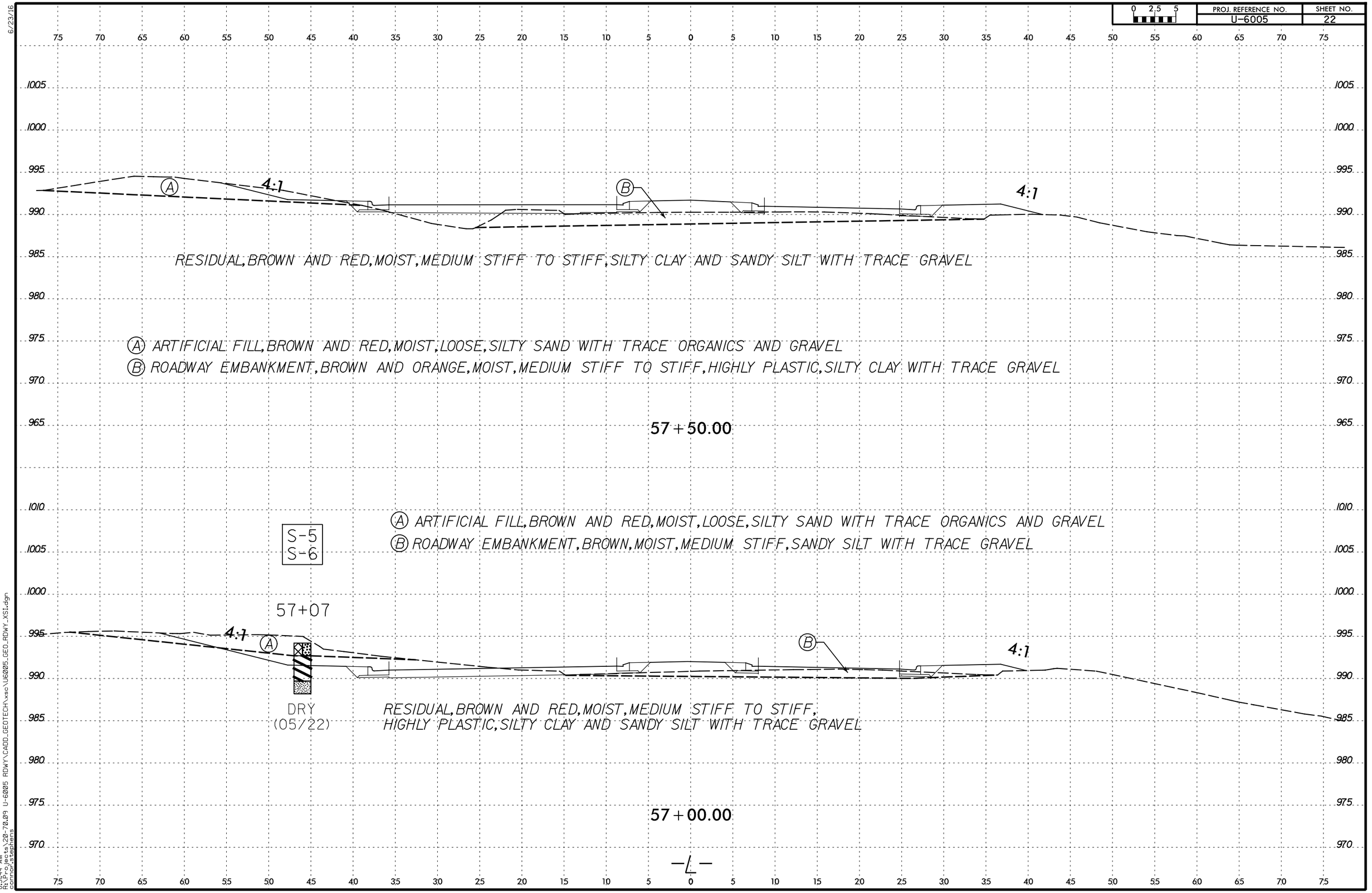

6/23/16

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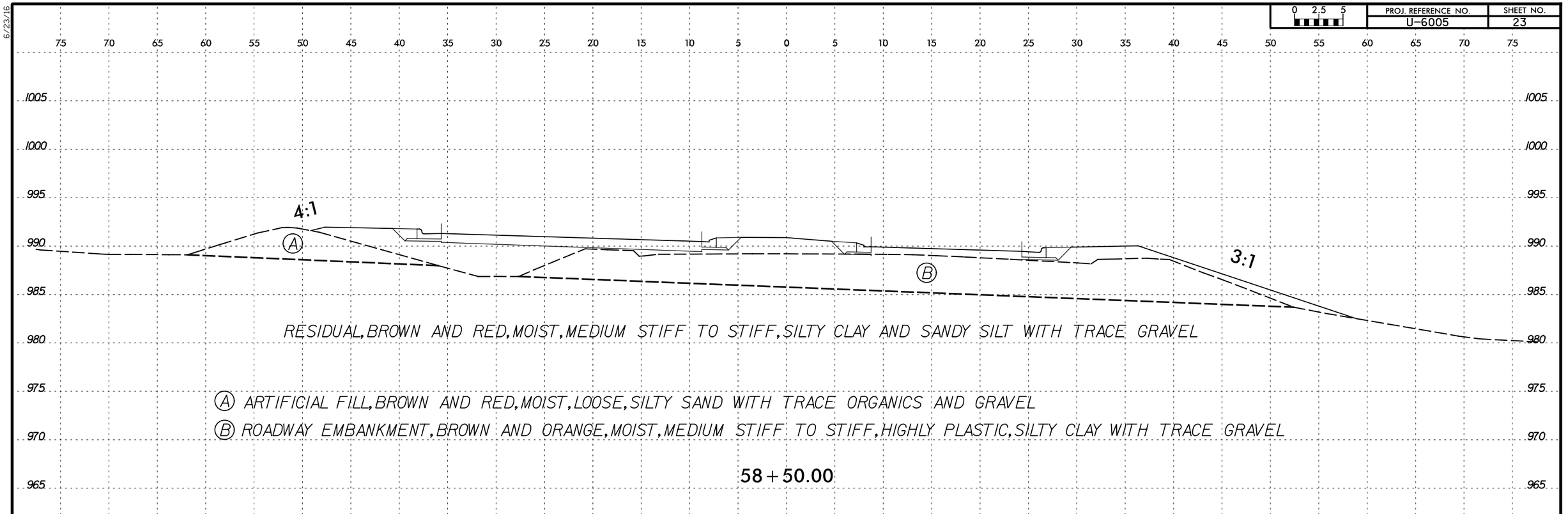

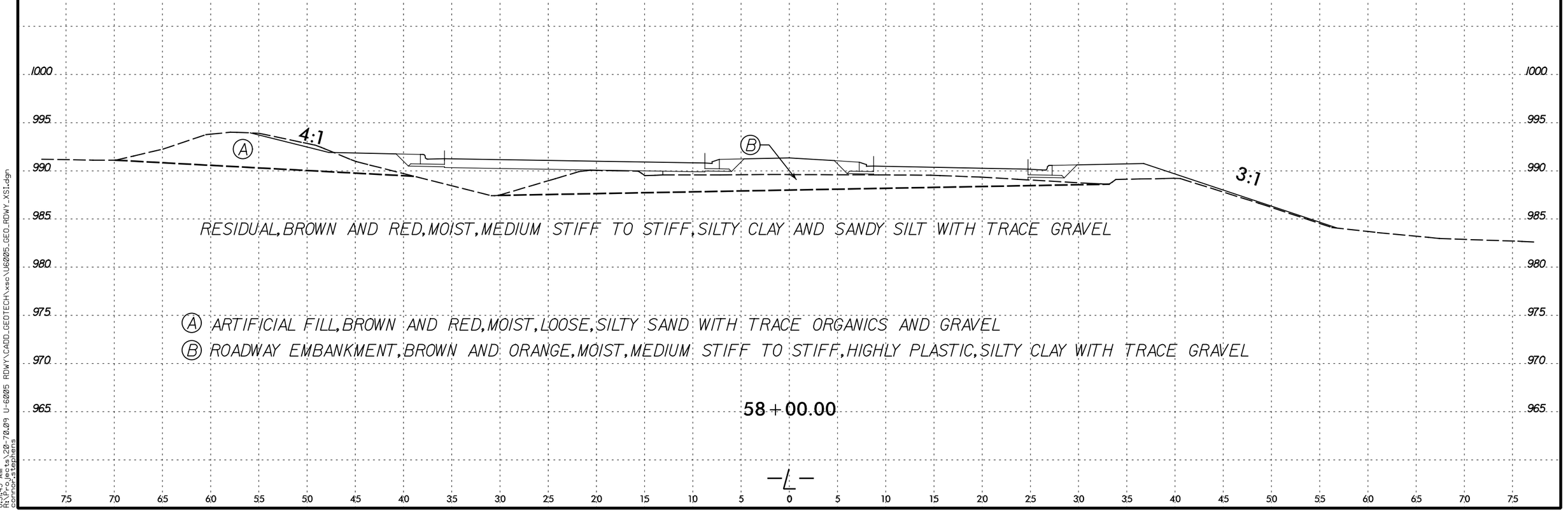

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6/23/16

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1005 1000 995 990 985 980 975 970 965

Ⓐ ROADWAY EMBANKMENT, BROWN AND ORANGE, MOIST, MEDIUM STIFF TO STIFF, HIGHLY PLASTIC, SILTY CLAY WITH TRACE GRAVEL

SS-25

4:1

59+38

ASPHALT

3:1

9
7
25
13
10

Ⓐ

RESIDUAL, RED, BROWN AND ORANGE, MOIST, STIFF TO VERY STIFF, SAPROLITIC, SANDY CLAY AND SANDY SILT WITH TRACE GRAVEL

FIAD
(06/22)

59+50.00

1005 1000 995 990 985 980 975 970 965

4:1

3:1

Ⓐ

RESIDUAL, RED, BROWN AND ORANGE, MOIST, STIFF TO VERY STIFF, SAPROLITIC, SANDY CLAY AND SANDY SILT WITH TRACE GRAVEL

Ⓐ ROADWAY EMBANKMENT, BROWN AND ORANGE, MOIST, MEDIUM STIFF TO STIFF, HIGHLY PLASTIC, SILTY CLAY WITH TRACE GRAVEL

59+00.00

—L—

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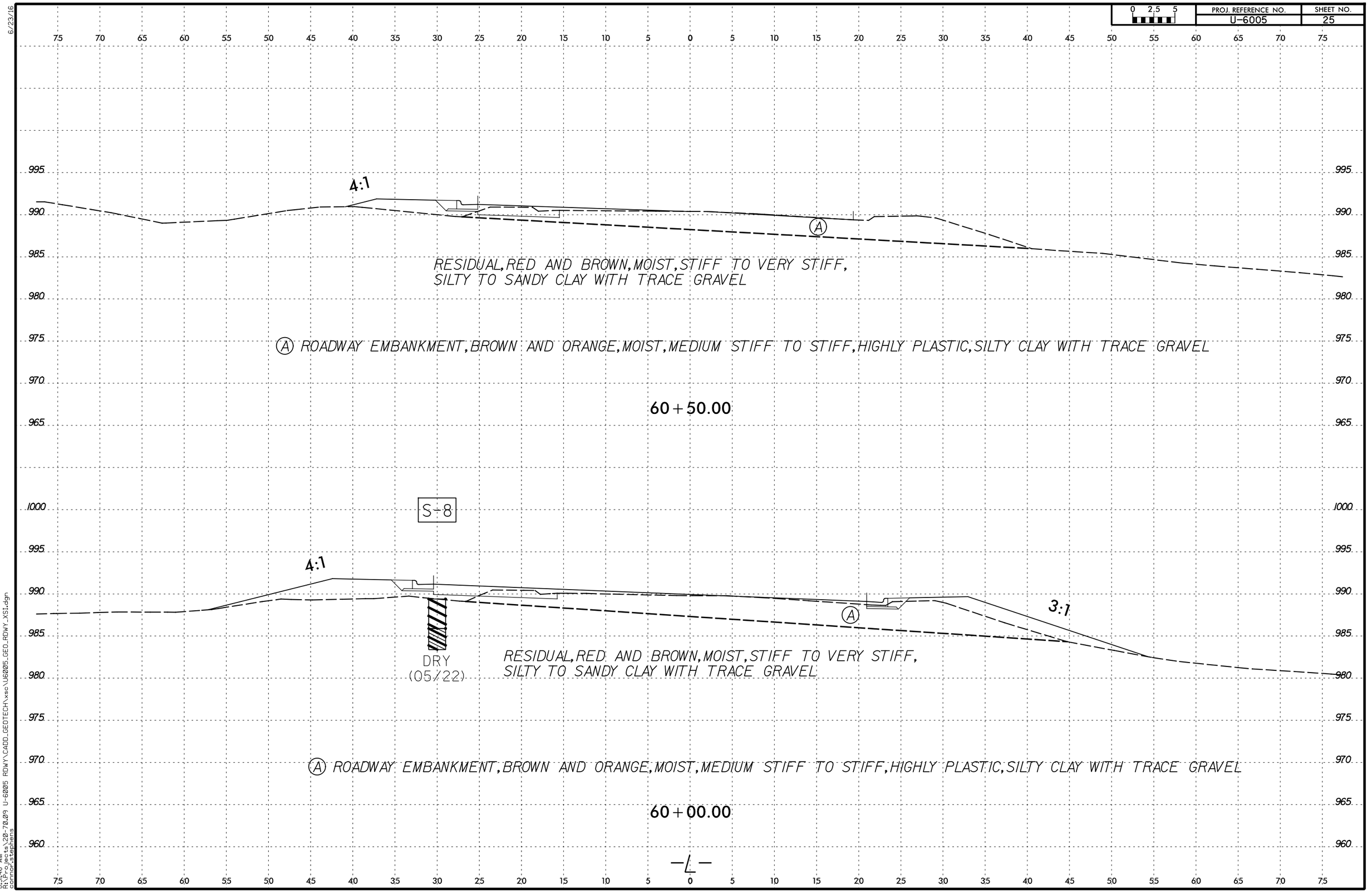

6/23/16

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1000 995 990 985 980 975 970

RESIDUAL, RED AND BROWN, MOIST, STIFF TO VERY STIFF, SILTY TO SANDY CLAY WITH TRACE GRAVEL

(A) ROADWAY EMBANKMENT, BROWN AND ORANGE, MOIST, MEDIUM STIFF TO STIFF, HIGHLY PLASTIC, SILTY CLAY WITH TRACE GRAVEL

61+25.00

4:1

RESIDUAL, RED AND BROWN, MOIST, STIFF TO VERY STIFF, SILTY TO SANDY CLAY WITH TRACE GRAVEL

(A) ROADWAY EMBANKMENT, BROWN AND ORANGE, MOIST, MEDIUM STIFF TO STIFF, HIGHLY PLASTIC, SILTY CLAY WITH TRACE GRAVEL

61+00.00

—L—

965

8:31:46 AM
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connor.stephens

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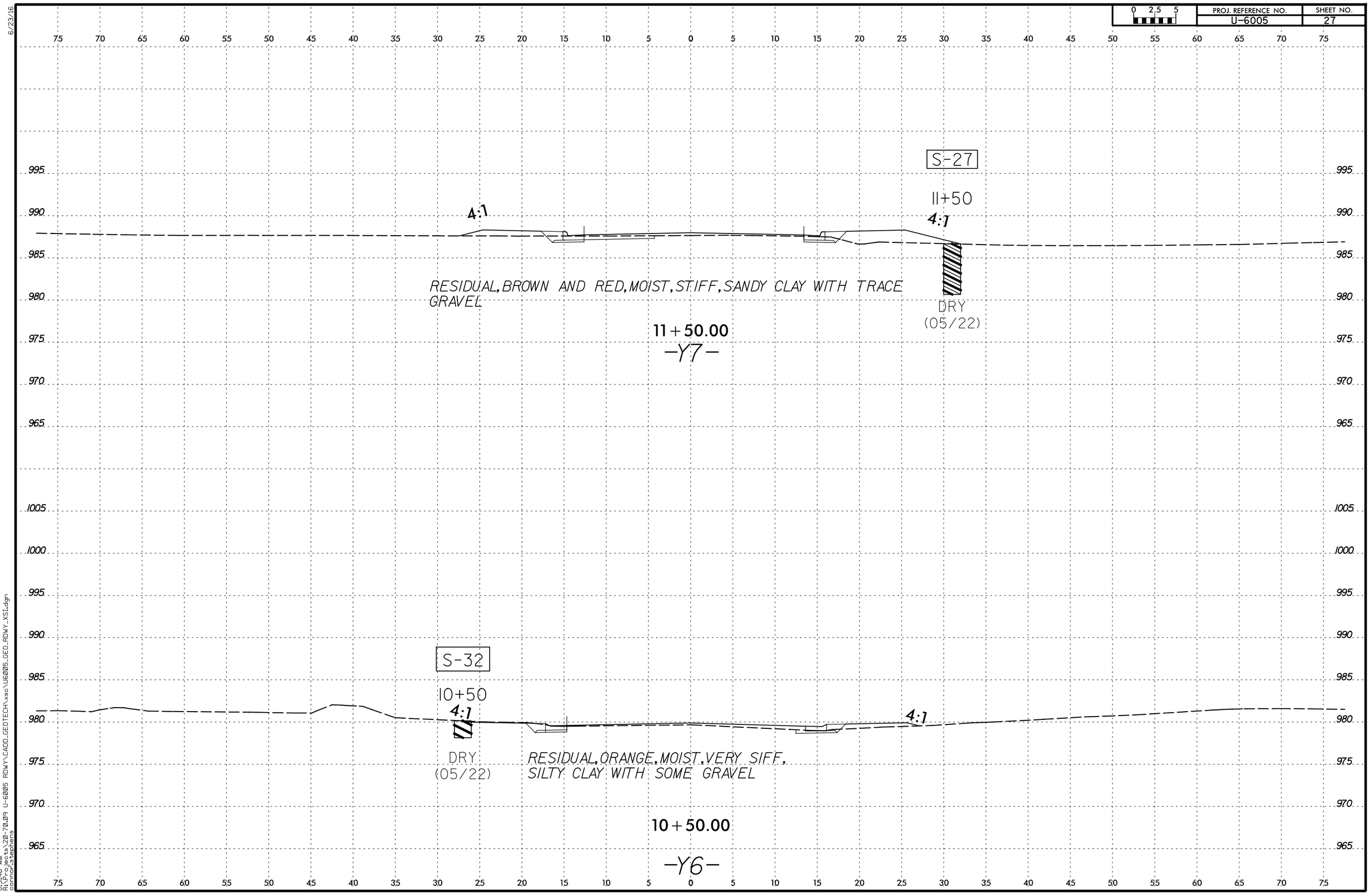

PROJECT REFERENCE NO.	SHEET NO.
U–6005	28

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

APPENDIX A
LABORATORY TESTING SUMMARY

REFERENCE: U–6005

PROJECT: 47140

ICE of CAROLINAS, PLLC

Laboratory Testing Summary

Project Number: 47140.1.1
TIP Number: U-6005
City/County/State: Rural Hall, Forsyth, NC
Description: NC 65 (Bethania-Rural Hall Rd.) Widening from US 52 to SR 3983 (Northridge Park Dr.) in Rural Hall

Sample No.	Alignment	Station	Offset (feet)	Depth Interval (feet)	ICE Lab No.	AASHTO Class.	L.L.	P.I.	% by Weight				% Retained #4 Sieve	% Passing (sieves)			% Moisture	% Organic
									Coarse Sand	Fine Sand	Silt	Clay		#10	#40	#200		
SS-7	-L-	23+00	1 RT	0.8-2.3	22-0835	A-4 (0)	23	6	22.4	38.5	15.1	24	0	94.6	85.7	40.7	10.6%	-
S-34	-L-	29+00	38 LT	2.5-3.0	22-0775	A-7-5 (25)	70	20	5.7	12.3	20.5	61.5	0.3	98.9	95.9	84	33.3%	-
SS-12	-L-	30+00	CL	0.8-2.3	22-0836	A-7-6 (9)	44	18	21	22.2	20.6	36.2	0	89.7	79.3	53.3	12.9%	-
S-31	-L-	32+00	45 RT	1.5-2.0	22-0776	A-7-5 (30)	71	30	7.7	13	14.1	65.2	1.5	97.4	94.2	79	26.3%	-
S-23	-L-	36+00	25 RT	0.5-1.0	22-0777	A-6 (4)	31	12	19.7	31.3	14.6	34.4	4.5	93.2	84.8	48.8	9.4%	-
SS-16	-L-	38+00	8 LT	0.8-2.3	22-0837	A-6 (7)	37	16	17.8	27.5	16.4	38.3	0	97.8	90.2	56.1	16.3%	-
S-16	-L-	42+00	28 RT	0.5-1.0	22-0778	A-4 (0)	32	2	18.4	42.8	28.2	10.6	2	96.5	88.2	46.5	11.9%	-
SS-21	-L-	45+00	16 LT	3.5-5.0	22-0839	A-7-5 (10)	58	11	8.8	29.4	19.1	42.7	0	99.8	97.1	67.7	26.4%	-
S-12	-L-	48+00	38 LT	0.5-1.0	22-0779	A-7-5 (24)	66	28	9.9	17.5	13.2	59.4	0.3	99.1	94.9	74.3	27.1%	-
S-10	-L-	50+00	40 RT	0.5-1.0	22-0780	A-7-6 (13)	46	20	14.5	19.9	14.6	51	0	99.1	92.8	67.1	18.2%	-
S-54	-L-	52+00	30 LT	0.5-1.0	22-0810	A-7-5 (21)	58	23	8.5	16.7	22	52.8	0	98.1	94.3	76.2	17.6%	-
S-51	-L-	53+93	30 LT	2.5-3.0	22-0809	A-7-5 (17)	58	16	7.1	18.4	20.1	54.4	0	98.3	95.3	77.3	40.3%	-
S-1	-L-	56+00	47 RT	0.5-1.0	22-0781	A-4 (0)	NP	NP	14.8	43.6	28.7	12.9	0	98.6	93.6	48.8	18.2%	-
S-5	-L-	57+07	46 LT	1.5-2.0	22-0782	A-7-5 (22)	61	27	13	15.9	16.2	54.9	0	98.9	91.6	72.7	23.8%	-
S-6	-L-	57+07	46 LT	3.5-4.0	22-0783	A-7-5 (13)	64	20	25.1	17.5	16.9	40.5	17.2	73.1	59.6	44.6	18.9%	-
SS-25	-L-	59+38	13 RT	0.8-2.3	22-0838	A-7-5 (25)	61	27	8.9	13.5	18.4	59.2	0	96.3	91.6	76.7	26.9%	-
S-8	-L-	60+00	30 LT	0.5-1.0	22-0784	A-7-6 (18)	51	22	8.1	18.7	21.2	52	0	95	92.1	72.1	18.1%	-
S-32	-Y6-	10+50	27 LT	0.5-1.0	22-0785	A-7-5 (18)	60	18	8.3	17.4	29.2	45.1	0	99	94.9	77.7	26.8%	-
S-27	-Y7-	11+50	31 RT	0.5-1.0	22-0786	A-6 (4)	32	11	22.1	26.8	22.4	28.7	0	98.2	87.4	53	10.5%	-