STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5014	1	65

REFERENCE: R-5014

PROJECT: 41162

SEE SHEET 3 FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

CONTENTS

LINE	STATION	PLAN	PROFILE
-L-	11+00 to 240+00	4-20	21-37
-Y1-	12+18 to 13+85	20	-
-Y2-	10+15 TO 11+57	8	38
-Y3-	11+00 to 12+78	8	38
-Y4-	10+15 TO 11+73	11	38
-Y5-	10+70 TO 12+74	11	38
-Y1A-	11+70 TO 13+63	7	39
-Y3A-	11+60 TO 12+81	9	39
-Y3B-	11+92 TO 12+21	10	39
-Y3C-	10+00 TO 11+00	10	39
-MUP-	10+11 to 37+55	15-18	40-41

LINE	STATION	CROSS SECTIONS
-L-	53+50 to 56+98	42-45
-L-	66+00 to 68+50	45-48
-L-	71+50 to 74+00	49-51
-L-	76+50	52
-L-	85+00 to 87+00	52-54
-L-	101+00 to 104+00	54-57
-L-	115+50 to 117+00	58-59
-L-	130+50 to 133+00	60-61
-L-	163+00 to 177+00	62-71
-Y3A-	11+65 to 12+50	72

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

ROADWAY SUBSURFACE INVESTIGATION

COUNTY *DARE*

PROJECT DESCRIPTION *SR 1217 (COLINGTON RD.) FROM DEAD END TO US 158 CROATAN HIGHWAY IN KILL DEVIL HILLS*

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

Lindsay Pugh

Ted Triantis

Bill Miller

INVESTIGATED BY *Lee Stone, P.G.*

DRAWN BY *Lee Stone P.G.*

CHECKED BY *Steve Hudson, P.G.*

SUBMITTED BY *Lee Stone, P.G.*

DATE *October 2016*

SIGNATURE DATE

NORTH CAROLINA LICENSED SEAL 2007 GEOLOGIST JOSEPH L. STONE

DocuSigned by:
Joseph L. Stone 12/2/2016
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SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
R-5014	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
W/ - WITH
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
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [X] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [X] TRICONE 2 7/8 " 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
- [X] SOIL PUSH PROBE

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: r5014_ls_tin.tin

ELEVATION: FEET

NOTES:

U.C.P. - UNDIVIDED COASTAL PLAIN

NM - GROUNDWATER NOT MEASURED (SEE SHEET 76 FOR EXAMPLE)

T T - APPROXIMATE LIMIT OF ORGANIC SOILS

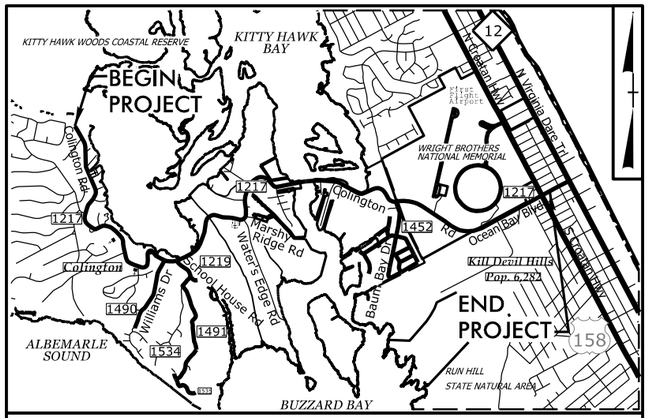
DATE: 8-15-14

09/08/99

TIP PROJECT: R-5014

CONTRACT:

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DARE COUNTY

APPROVED
25% PLANS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5014	3	65

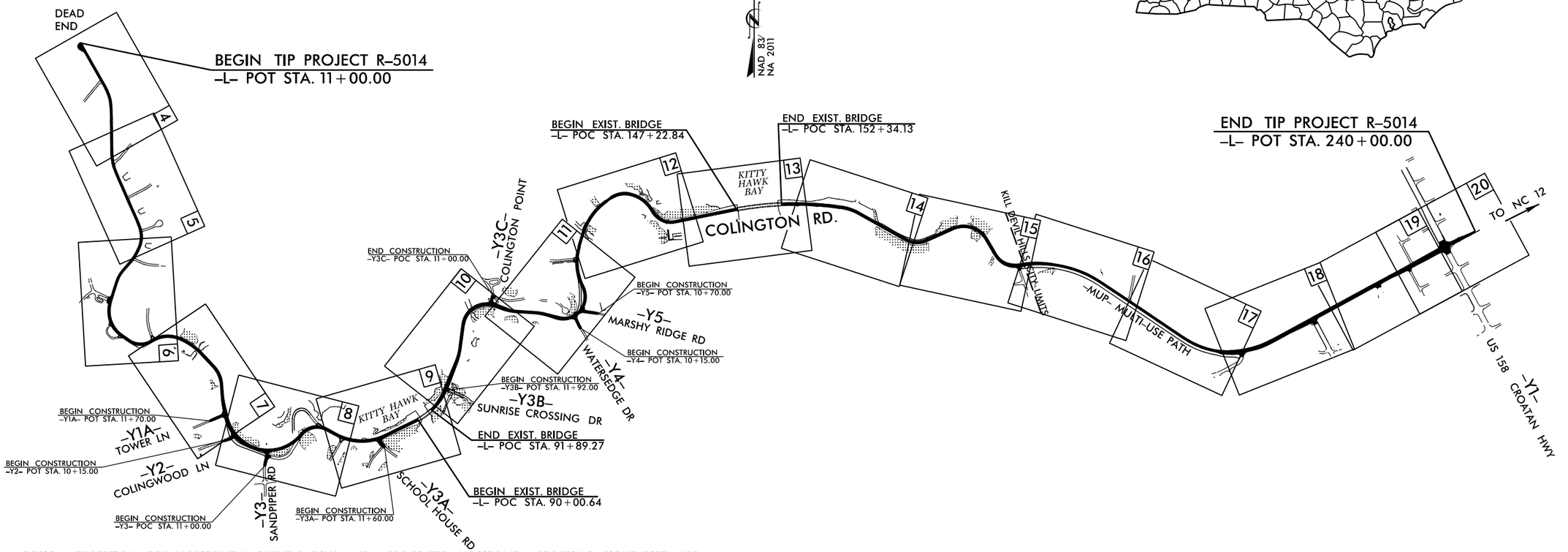
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
41162.1.1	STP-1217(6)	PE

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

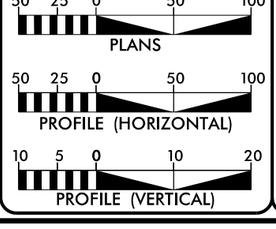
LOCATION: SR 1217 (COLINGTON RD.) FROM DEAD END TO US 158 CROATAN HIGHWAY IN KILL DEVIL HILLS

TYPE OF WORK: GRADING, DRAINAGE, & PAVING



THERE IS A DESIGN EXCEPTION FOR HORIZONTAL CURVE RADIUS AND ASSOCIATED HORIZONTAL STOPPING SIGHT DISTANCE.
THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.
A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF KILL DEVIL HILLS.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ___.

GRAPHIC SCALES



DESIGN DATA

ADT 2018 = 13,970
ADT 2038 = 19,300
DHV = 11 %
D = 65 %
T = 3 % *
V = 40 MPH

* TTST =1% DUAL 2%
FUNC CLASS = LOCAL
STATEWIDE TIER

PROJECT LENGTH

TOTAL LENGTH ROADWAY TIP PROJECT R-5014 = 4.337 MILES

Prepared in the Office of:
CALYX ENGINEERS + CONSULTANTS

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MAY 19, 2017

LETTING DATE:
NOVEMBER 20, 2018

JOHNNY BANKS
CALYX E & C PROJECT MANAGER

STEPHEN C. BROWDE, PE
CALYX E & C PROJECT DESIGN ENGINEER

NCDOT CONTACT: GARY LOVERING, PE
ROADWAY DESIGN - PROJECT ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION

October 28, 2016

WBS Number:	41162.1.1
TIP Number:	R-5014
F.A .Project	STP-1217(6)
County:	Dare
Description:	SR 1217 (Colington Rd.) from Dead End to US 158 Croatan Hwy. in Kill Devil Hills
CATLIN Number:	216070

SUBJECT: Geotechnical Inventory Report

Project Description

This project begins at the dead end of SR 1217 (Colington Rd.) and extends east along existing SR 1217 for approximately 4.3 miles to the intersection of SR 1217 and US 158. This geotechnical investigation was confined to the areas of proposed construction.

Fieldwork was conducted in August, September, and October of 2016. SPT, hand auger, and push probe borings were completed at various offsets along the project corridor. Representative soil samples were collected for visual classification in the field and for laboratory analysis.

The following alignments were investigated. Subsurface profiles and selected cross sections of these alignments are included in this report.

Line	Station(±)
-L-	11+00 to 240+00
-Y1-	12+18 to 13+85
-Y2-	10+15 to 11+57
-Y3-	11+00 to 12+78
-Y4-	10+15 to 11+73
-Y5-	10+70 to 12+74
-Y1A-	11+70 to 13+63
-Y3A-	11+60 to 12+81
-Y3B-	11+92 to 12+21
-Y3C-	10+00 to 11+00
-MUP-	10+11 to 37+55

Areas of Special Geotechnical Interest

1) The entire project exhibits seasonal high groundwater except the following sections:

Line	Station(±)
-L-	59+50 to 65+50
-L-	69+00 to 71+00
-L-	78+00 to 80+00
-L-	177+00 to 183+00
-L-	229+00 to 240+00
-Y2-	10+15 to 11+34
-Y3-	11+00 to 12+00

2) The following sections contain organic soils that have the potential to cause embankment/subgrade and or slope stability problems during construction.

Line	Station(±)
-L-	53+85 to 55+75
-L-	56+25 to 56+75
-L-	57+74 to 59+08
-L-	66+45 to 68+47
-L-	71+56 to 73+80
-L-	76+01 to 77+80
-L-	85+25 to 95+82
-L-	101+87 to 102+25
-L-	115+64 to 116+85
-L-	131+28 to 132+75
-L-	163+08 to 173+60
-L-	174+75 to 176+85
-Y3A-	11+60 to 12+81
-Y3B-	11+92 to 12+21

Physiography and Geology

This project corridor is located within the Coastal Plain Physiographic Province. Topography along the project is nearly flat to gently sloping. Natural ground elevations ranged from sea level to 13± feet above sea level.

Surficial soils in this area are generally classified as undivided coastal plain sediments.

Ground Water

Ground water data was collected in August, September, and October 2016, and was found at elevations ranged from 1± feet below sea level to 2± feet above sea level.

Soils

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

Soils identified as undivided coastal plain are composed of 6 or more feet of very loose to medium dense sand (A-2-4, A-3); with 1± to 6 ± feet of very soft muck, very loose moderately organic sand, very loose sand with little organic content and moderately organic silty clay (A-7-5.) Samples taken within these organic soils returned organic percentages ranging from 4% to 79%.

Roadway embankment soils were found along the existing SR 1217 corridor and associated intersecting side roads. Where encountered it was composed of 1± to 15± feet of very loose sand (A-2-4, A-3).

Soils identified as artificial fill were primarily comprised of less than 2 feet of loose to medium dense sand with gravel (A-3, A-1-b.)

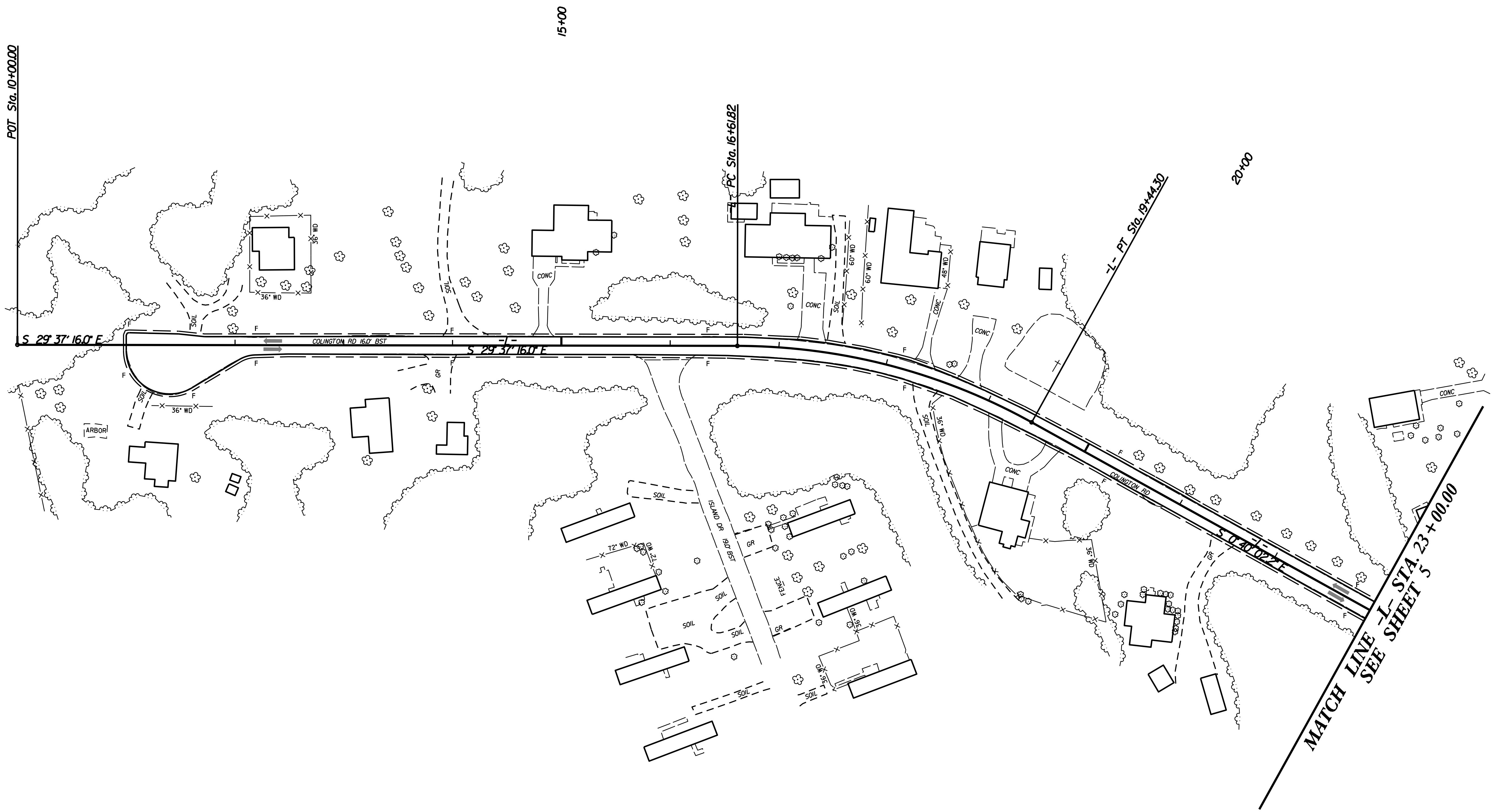
PROJECT REFERENCE NO.	SHEET NO.
R-5014	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-
PI Sta 18+06.15
Δ = 28° 57' 13.8" (RT)
D = 10° 15' 00.0"
L = 282.48'
T = 144.32'
R = 558.98'
SE = EXIST.
V = EXIST.

NAD 83/NA 2011



REVISIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
R-5014	5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-

PI Sta 25+43.98	PI Sta 34+44.90
Δ = 23° 04' 34.3" (LT)	Δ = 48° 32' 06.7" (RT)
D = 9° 00' 00.0"	D = 17° 30' 00.0"
L = 256.40'	L = 277.34'
T = 129.96'	T = 147.61'
R = 636.62'	R = 327.40'
SE = EXIST.	SE = EXIST.
V = EXIST.	V = EXIST.

REVISIONS

8/17/99

29-SEP-2016 12:41
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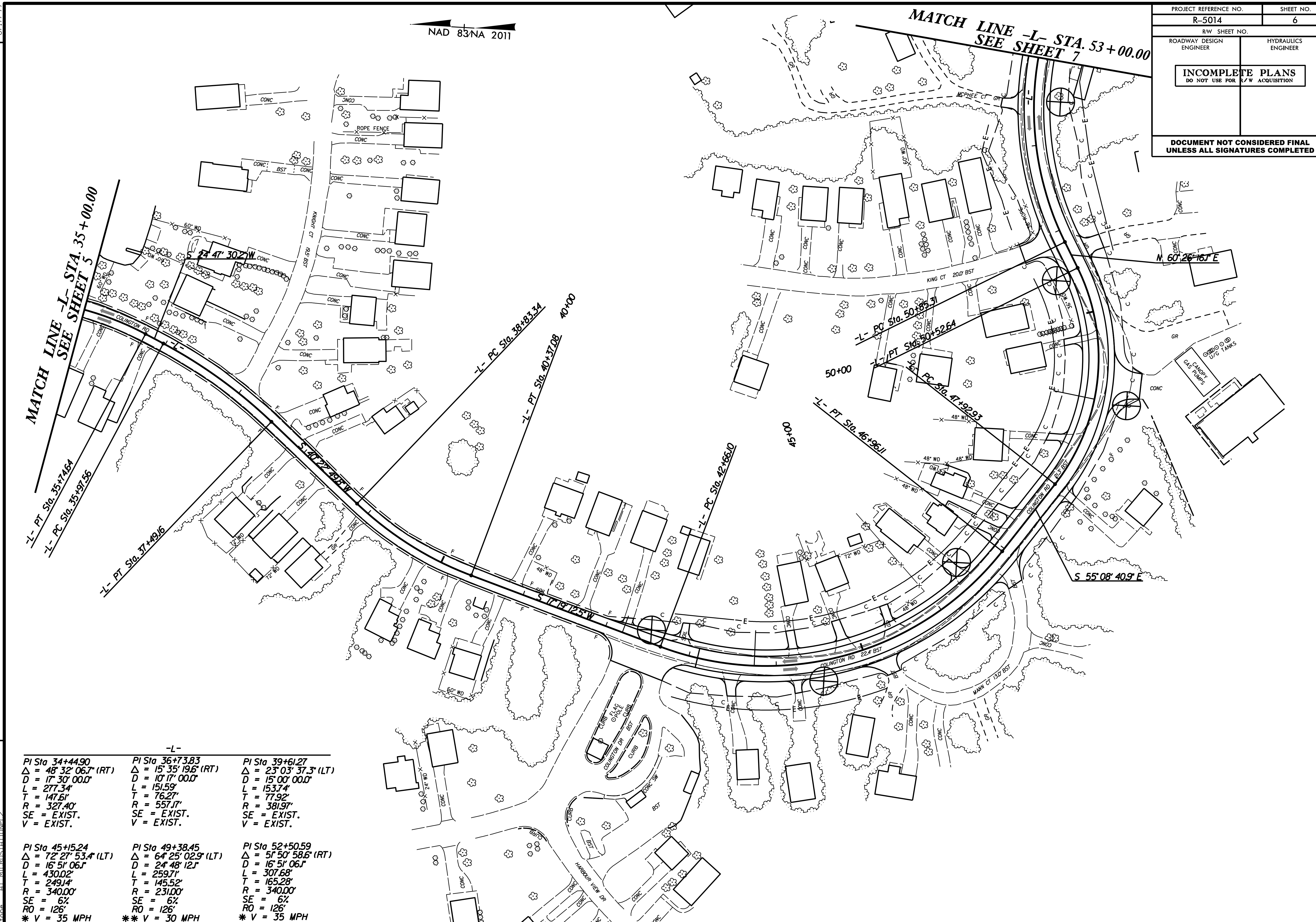
PROJECT REFERENCE NO.	SHEET NO.
R-5014	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-L-

PI Sta 34+44.90	
Δ =	48° 32' 06.7" (RT)
D =	17° 30' 00.0"
L =	277.34'
T =	147.61'
R =	327.40'
SE =	EXIST.
V =	EXIST.

PI Sta 36+73.83	
Δ =	15° 35' 19.6" (RT)
D =	10° 17' 00.0"
L =	151.59'
T =	76.27'
R =	557.17'
SE =	EXIST.
V =	EXIST.

PI Sta 39+61.27	
Δ =	23° 03' 37.3" (LT)
D =	15° 00' 00.0"
L =	153.74'
T =	77.92'
R =	381.97'
SE =	EXIST.
V =	EXIST.

PI Sta 45+15.24	
Δ =	72° 27' 53.4" (LT)
D =	16° 51' 06.1"
L =	430.02'
T =	249.14'
R =	340.00'
SE =	6%
RO =	126'
* V =	35 MPH

PI Sta 49+38.45	
Δ =	64° 25' 02.9" (LT)
D =	24° 48' 12.1"
L =	259.71'
T =	145.52'
R =	231.00'
SE =	6%
RO =	126'
** V =	30 MPH

PI Sta 52+50.59	
Δ =	51° 50' 58.6" (RT)
D =	16° 51' 06.1"
L =	307.68'
T =	165.28'
R =	340.00'
SE =	6%
RO =	126'
* V =	35 MPH

REVISIONS

8/17/99

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istone AT MICROSTATIONPC2

PROJECT REFERENCE NO.	SHEET NO.
R-5014	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-

PI Sta 52+50.59	PI Sta 55+48.13	PI Sta 60+12.41	PI Sta 63+20.66	PI Sta 74+83.10
Δ = 51° 50' 58.6" (RT)	Δ = 24° 28' 32.5" (RT)	Δ = 38° 39' 22.3" (RT)	Δ = 8° 14' 30.6" (LT)	Δ = 127° 49' 20.5" (LT)
D = 16° 51' 06.1"	D = 8° 00' 39.4"	D = 17° 00' 00.0"	D = 6° 30' 00.0"	D = 11° 48' 48.8"
L = 307.68'	L = 305.53'	L = 227.39'	L = 126.80'	L = 1,082.00'
T = 165.28'	T = 155.13'	T = 118.21'	T = 63.51'	T = 990.50'
R = 340.00'	R = 715.22'	R = 337.03'	R = 881.47'	R = 485.00'
SE = 6%	SE = 6%	SE = 6%	SE = 5%	SE = 6%
RO = 126'	RO = 126'	RO = 126'	RO = 105'	RO = 126'
* V = 35 MPH	V = 45 MPH	* V = 30 MPH	V = 50 MPH	V = 40 MPH

NAD 83/NA 2011

55+00

60+00

65+00

MATCH LINE -L- STA. 53+00.00 SEE SHEET 6

MATCH LINE -L- STA. 66+50.00 SEE SHEET 8

-L- POC Sta. 53+93.00

-L- PT Sta. 56+98.52

-L- PC Sta. 58+94.19

-L- PT Sta. 61+21.58

-L- PC Sta. 62+57.15

-L- PT Sta. 63+83.95

-L- PC Sta. 64+92.60

-L- POT Sta. 66+60.08 =
-Y1A- POT Sta. 13+63.71

BEGIN CONSTRUCTION
-Y1A- STA. 11+70.00

-Y1A- POT Sta. 10+00.00

S 43° 14' 12.8" E

S 44° 30' 05" E

S 12° 49' 21" E

COLINGTON RD 219' BST

TOWER LANE 66' BST

APPROXIMATE LIMITS OF ORGANIC SOILS

GRAU 350 TL-2

PDE

POND

FLAG POLE

CONC

GR

SOIL

60' MD

REVISIONS

8.17.99

28-OCT-2016 03:22
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ejones

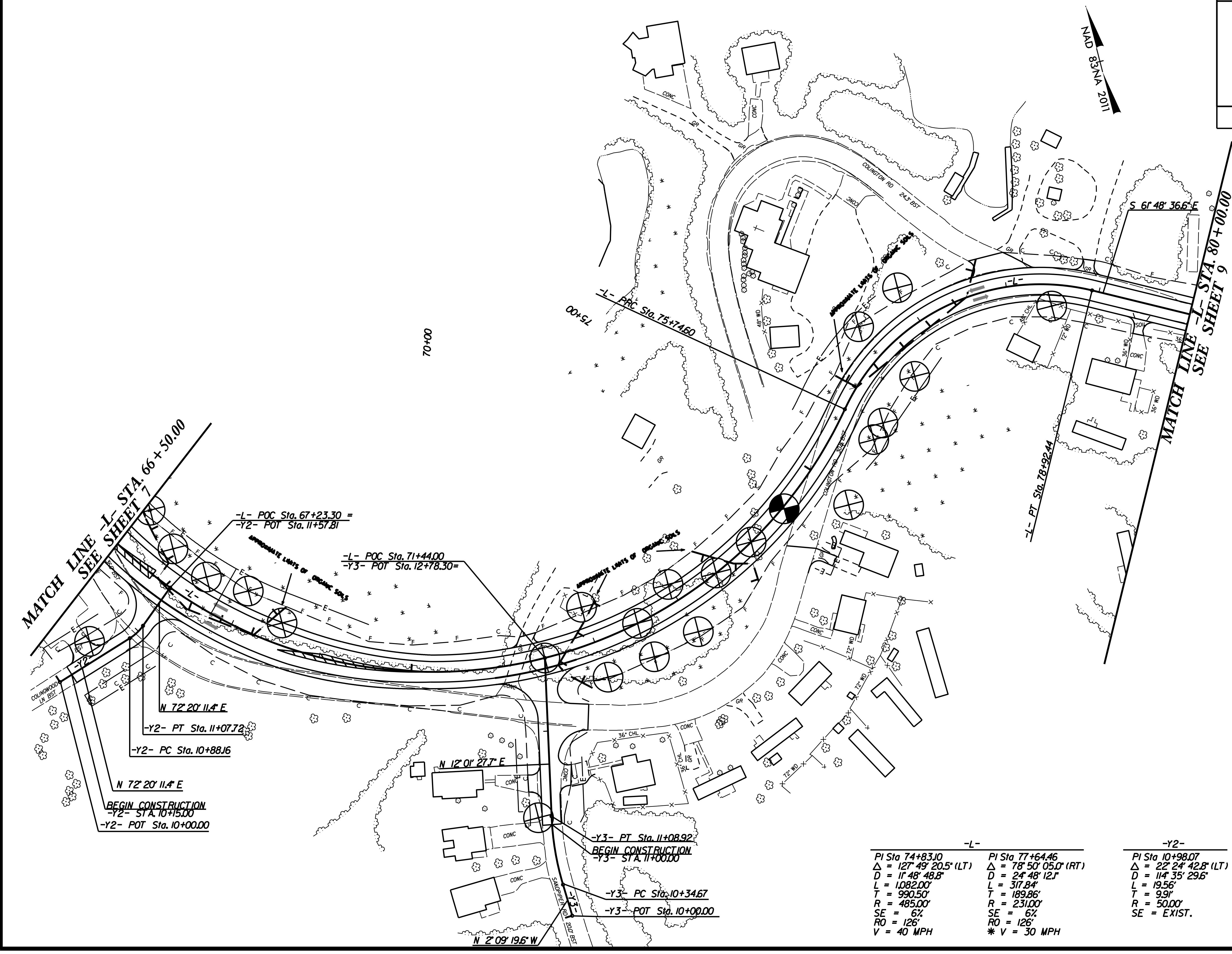
PROJECT REFERENCE NO.	SHEET NO.
R-5014	8
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

8/17/99



-L-		-Y2-	-Y3-
PI Sta 74+83.10	PI Sta 77+64.46	PI Sta 10+98.07	PI Sta 10+71.99
Δ = 127° 49' 20.5" (LT)	Δ = 78° 50' 05.0" (RT)	Δ = 22° 24' 42.8" (LT)	Δ = 14° 10' 47.4" (RT)
D = 11° 48' 48.8"	D = 24° 48' 12.1"	D = 114° 35' 29.6"	D = 19° 05' 54.9"
L = 1,082.00'	L = 317.84'	L = 19.56'	L = 74.25'
T = 990.50'	T = 189.86'	T = 9.91'	T = 37.31'
R = 485.00'	R = 231.00'	R = 50.00'	R = 300.00'
SE = 6%	SE = 6%	SE = EXIST.	SE = EXIST.
RO = 126'	RO = 126'		
V = 40 MPH	* V = 30 MPH		

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PROJECT REFERENCE NO.	SHEET NO.
R-5014	9

R/W SHEET NO.

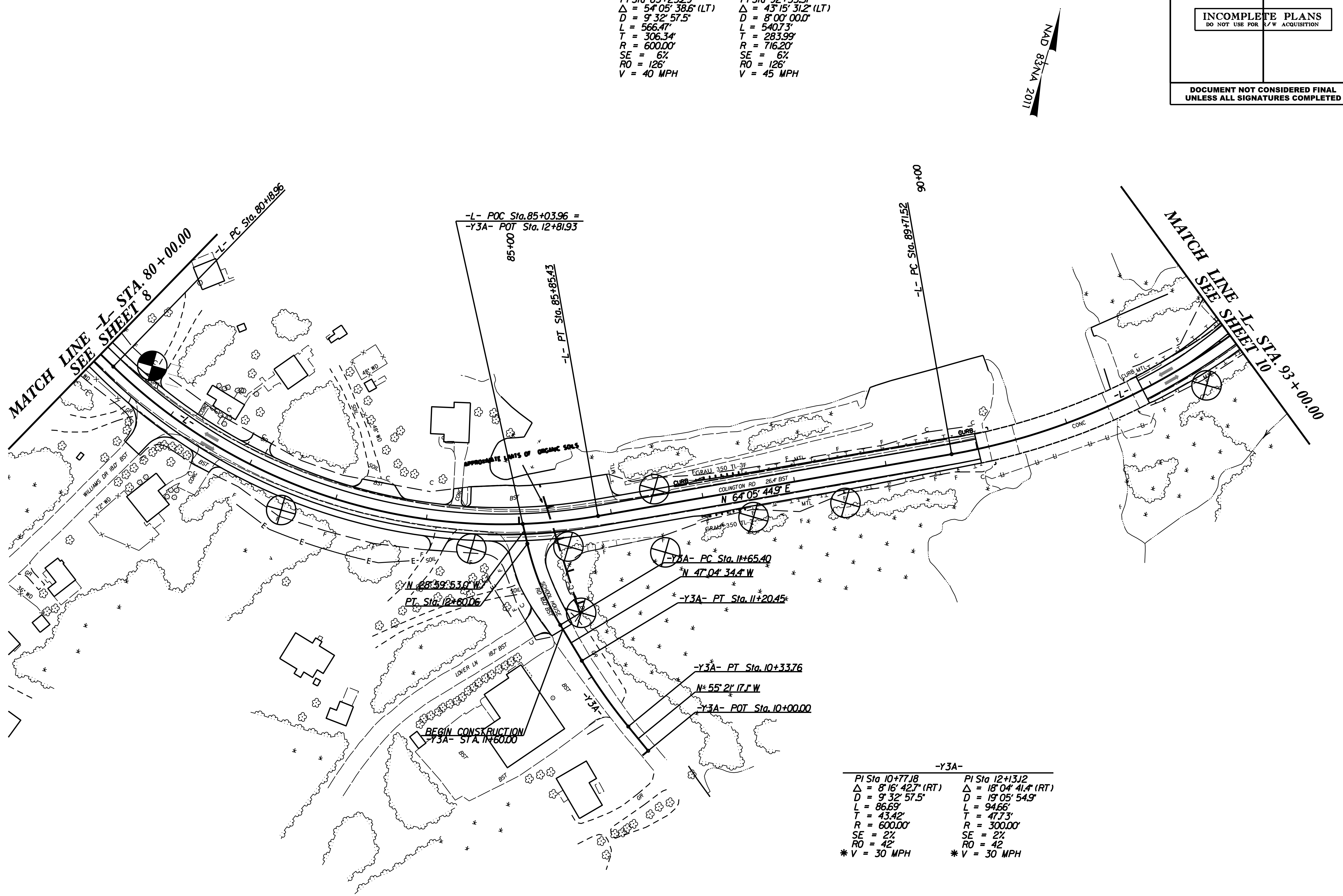
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-

PI Sta 83+25.29	PI Sta 92+55.51
Δ = 54° 05' 38.6" (LT)	Δ = 43° 15' 31.2" (LT)
D = 9° 32' 57.5"	D = 8° 00' 00.0"
L = 566.47'	L = 540.73'
T = 306.34'	T = 283.99'
R = 600.00'	R = 716.20'
SE = 6%	SE = 6%
RO = 126'	RO = 126'
V = 40 MPH	V = 45 MPH



-Y3A-

PI Sta 10+77.18	PI Sta 12+13.12
Δ = 8° 16' 42.7" (RT)	Δ = 18° 04' 41.4" (RT)
D = 9° 32' 57.5"	D = 19° 05' 54.9"
L = 86.69'	L = 94.66'
T = 43.42'	T = 47.73'
R = 600.00'	R = 300.00'
SE = 2%	SE = 2%
RO = 42'	RO = 42
* V = 30 MPH	* V = 30 MPH

REVISIONS

8/17/99

11-OCT-2016 09:37
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PROJECT REFERENCE NO.	SHEET NO.
R-5014	10

R/W SHEET NO.

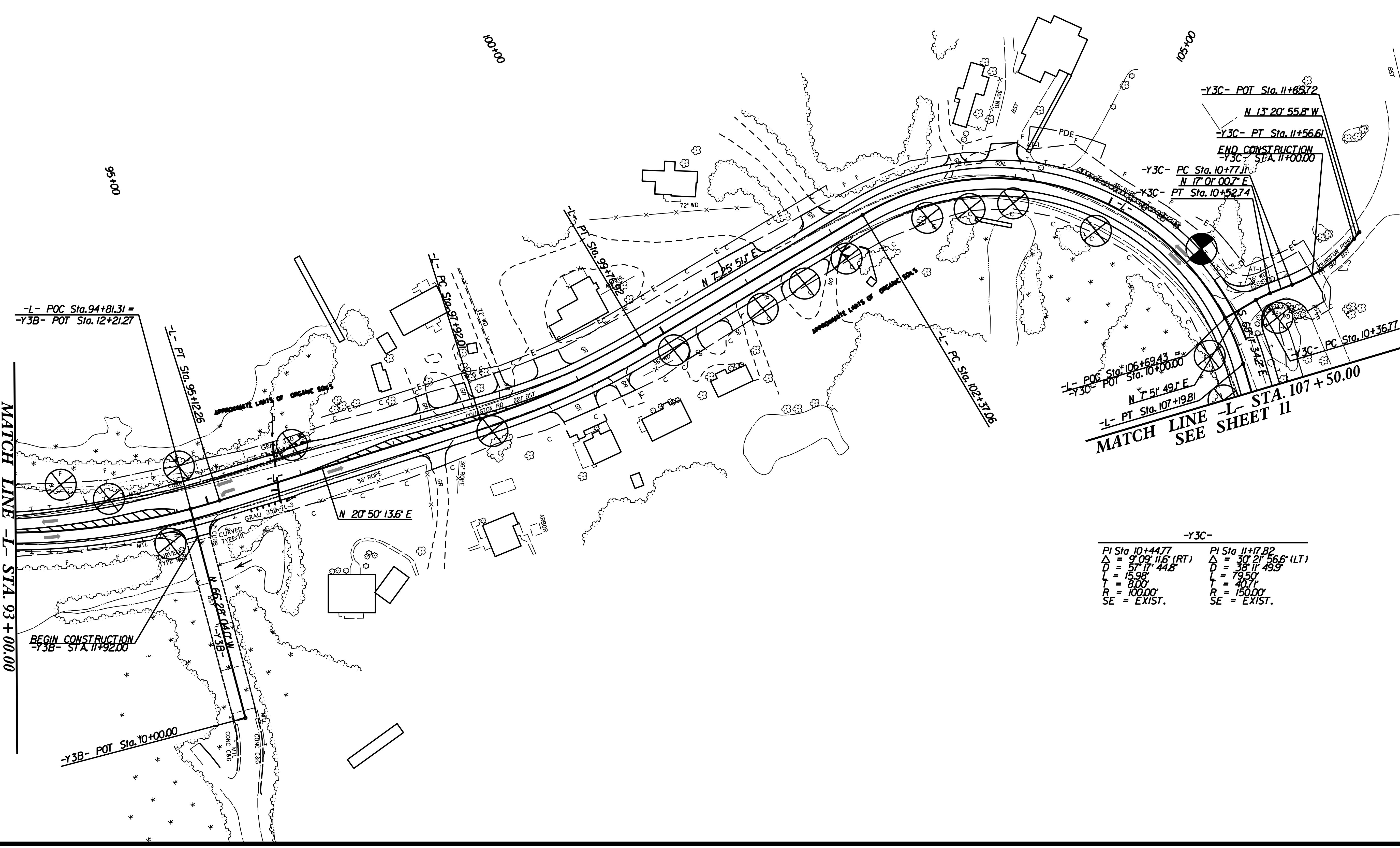
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-

PI Sta 92+55.51	PI Sta 98+84.89	PI Sta 105+78.55
Δ = 43° 15' 31.2" (LT)	Δ = 13° 24' 22.6" (LT)	Δ = 104° 22' 34.7" (RT)
D = 8° 00' 00.0"	D = 7° 15' 00.0"	D = 21° 37' 15.8"
L = 540.73'	L = 184.91'	L = 482.75'
T = 283.99'	T = 92.88'	T = 341.49'
R = 716.20'	R = 790.29'	R = 265.00'
SE = 6%	SE = 5%	SE = 6%
RO = 126'	RO = 105'	RO = 126'
V = 45 MPH	V = 45 MPH	* V = 30 MPH



-Y3C-

PI Sta 10+44.77	PI Sta 11+17.82
Δ = 9° 09' 11.6" (RT)	Δ = 30° 21' 56.6" (LT)
D = 57° 17' 44.8"	D = 38° 11' 49.9"
L = 15.98'	L = 79.50'
T = 8.00'	T = 40.71'
R = 100.00'	R = 150.00'
SE = EXIST.	SE = EXIST.

REVISIONS

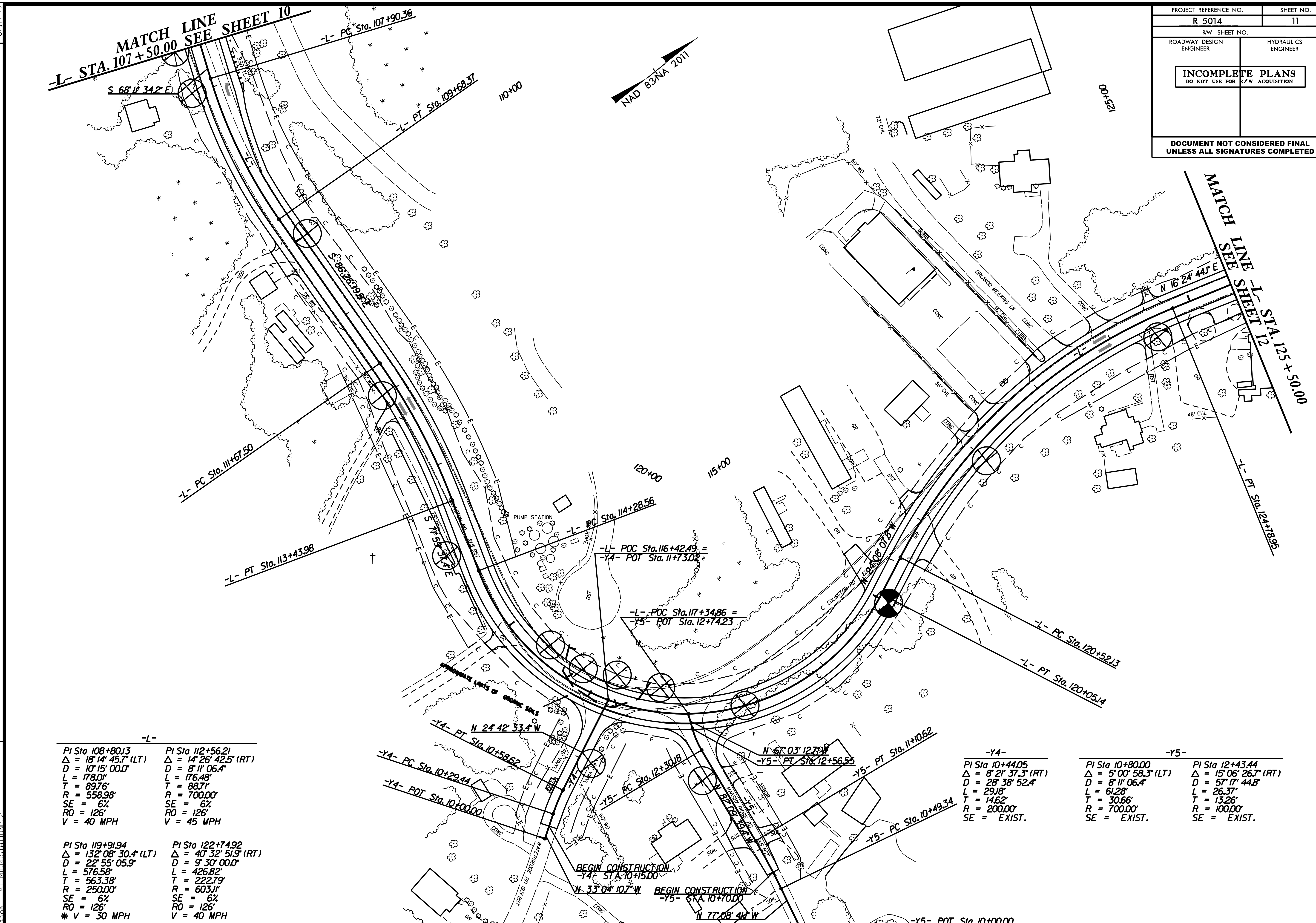
8/17/99

21-OCT-2016 09:52

PROJECT REFERENCE NO.	SHEET NO.
R-5014	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-L-

PI Sta 108+80.13
Δ = 18° 14' 45.7" (LT)
D = 10° 15' 00.0"
L = 178.01'
T = 89.76'
R = 558.98'
SE = 6%
RO = 126'
V = 40 MPH

PI Sta 112+56.21
Δ = 14° 26' 42.5" (RT)
D = 8° 11' 06.4"
L = 176.48'
T = 88.71'
R = 700.00'
SE = 6%
RO = 126'
V = 45 MPH

PI Sta 119+91.94
Δ = 132° 08' 30.4" (LT)
D = 22° 55' 05.9"
L = 576.58'
T = 563.38'
R = 250.00'
SE = 6%
RO = 126'
* V = 30 MPH

PI Sta 122+74.92
Δ = 40° 32' 51.9" (RT)
D = 9° 30' 00.0"
L = 426.82'
T = 222.79'
R = 603.11'
SE = 6%
RO = 126'
V = 40 MPH

-Y4-

PI Sta 10+44.05
Δ = 8° 21' 37.3" (RT)
D = 28° 38' 52.4"
L = 29.18'
T = 14.62'
R = 200.00'
SE = EXIST.

-Y5-

PI Sta 10+80.00
Δ = 5° 00' 58.3" (LT)
D = 8° 11' 06.4"
L = 61.28'
T = 30.66'
R = 700.00'
SE = EXIST.

PI Sta 12+43.44
Δ = 15° 06' 26.7" (RT)
D = 57° 17' 44.8"
L = 26.37'
T = 13.26'
R = 100.00'
SE = EXIST.

REVISIONS

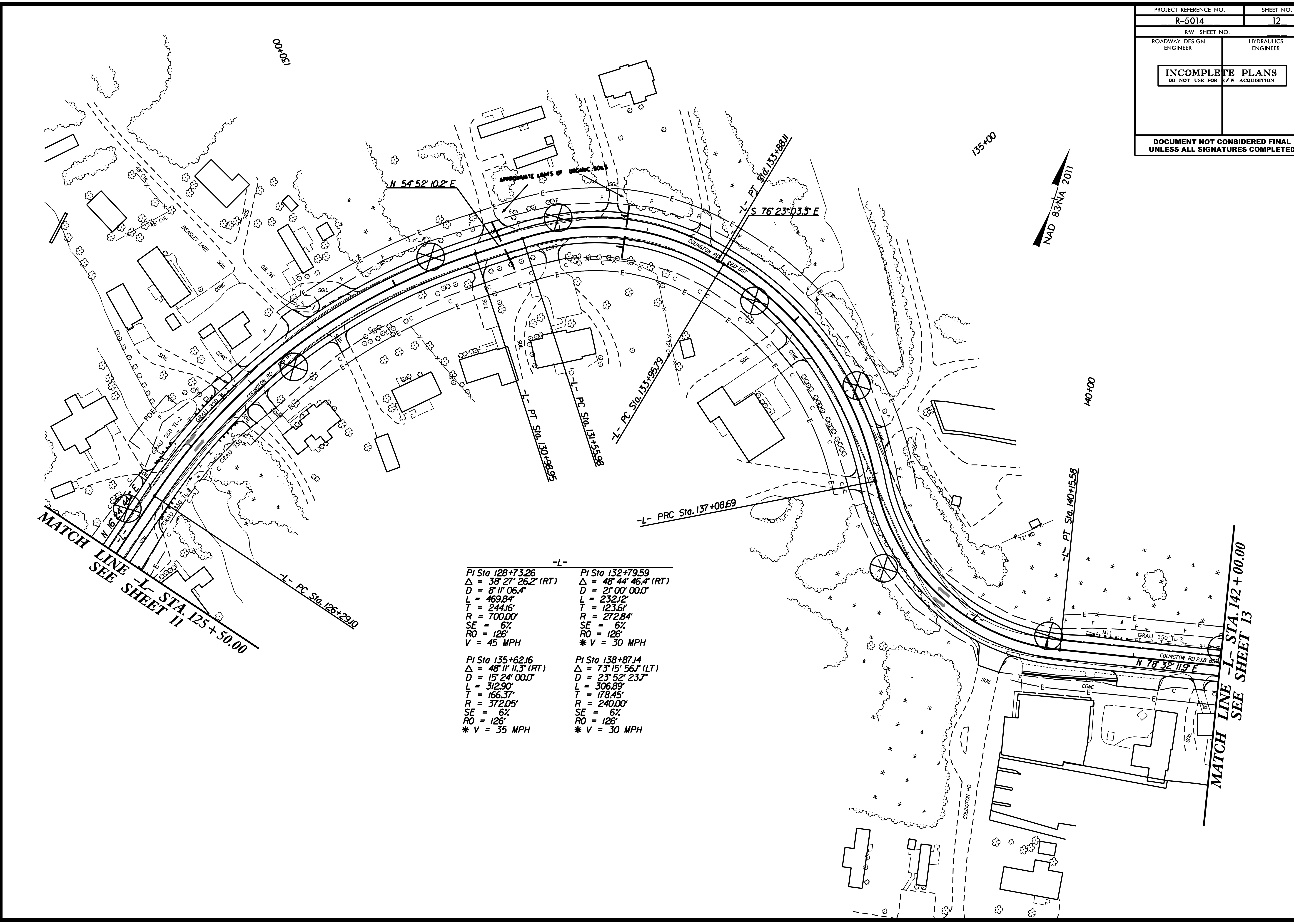
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-5014	12
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-L-

PI Sta 128+73.26
Δ = 38° 27' 26.2" (RT)
D = 8° 11' 06.4"
L = 469.84'
T = 244.16'
R = 700.00'
SE = 6%
RO = 126'
V = 45 MPH

PI Sta 132+79.59
Δ = 48° 44' 46.4" (RT)
D = 21° 00' 00.0"
L = 232.12'
T = 123.61'
R = 272.84'
SE = 6%
RO = 126'
* V = 30 MPH

PI Sta 135+62.16
Δ = 48° 11' 11.3" (RT)
D = 15° 24' 00.0"
L = 312.90'
T = 166.37'
R = 372.05'
SE = 6%
RO = 126'
* V = 35 MPH

PI Sta 138+87.14
Δ = 73° 15' 56.1" (LT)
D = 23° 52' 23.7"
L = 306.89'
T = 178.45'
R = 240.00'
SE = 6%
RO = 126'
* V = 30 MPH

REVISIONS

8/17/99

24-OCT-2016 11:59
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PROJECT REFERENCE NO.	SHEET NO.
R-5014	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-
PI Sta 151+21.17
Δ = 14° 36' 20.0" (RT)
D = 1° 37' 00.0"
L = 903.44'
T = 454.18'
R = 3,544.07'
SE = 2%
R0 = 42'
V = 80 MPH

NAD 83/NA 2011

145+00

150+00

MATCH LINE -L- STA. 142+00.00
SEE SHEET 12

-L- PC Sta. 146+66.99

MATCH LINE -L- STA. 154+50.00
SEE SHEET 14

COLINGTON RD 23.8' BST

N 78° 32' 11.9" E

COLINGTON RD 23.9' BST

CURB
MTL
CONC
GRAU 3.5'
SOIL
BST
GR
POOL
ROSEPOCK RD

REVISIONS

8/17/99

29-SEP-2016 12:41
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stroge
GEOTECHNICAL

-L-			
PI Sta 151+21.17	PI Sta 157+25.02	PI Sta 160+11.81	PI Sta 168+56.10
Δ = 14° 36' 20.0" (RT)	Δ = 4° 12' 41.2" (RT)	Δ = 21° 56' 11.8" (RT)	Δ = 53° 18' 40.2" (LT)
D = 1° 37' 00.0"	D = 1° 45' 00.0"	D = 10° 00' 00.0"	D = 22° 55' 05.9"
L = 903.44'	L = 240.65'	L = 219.37'	L = 232.61'
T = 454.18'	T = 120.38'	T = 111.04'	T = 125.49'
R = 3,544.07'	R = 3,274.04'	R = 572.96'	R = 250.00'
SE = 2%	SE = 2%	SE = 6%	SE = 6%
RO = 42°	RO = 42°	RO = 126'	RO = 126'
V = 80 MPH	V = 80 MPH	V = 40 MPH	* V = 30 MPH

PROJECT REFERENCE NO.	SHEET NO.
R-5014	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

155+00

160+00

165+00

NAD 83/NA 2011

-L- PT Sta.155+70.42

-L- PC Sta.156+04.64

-L- PT Sta.158+45.30

-L- PC Sta.159+00.77

-L- PT Sta.161+20.13

-L- PC Sta.167+30.60

APPROXIMATE LIMITS OF ORGANIC SOILS

MATCH LINE -L- STA. 154+50.00
SEE SHEET 13

MATCH LINE -L- STA. 168+00.00
SEE SHEET 15

S 86° 51' 28.7" E

S 82° 38' 46.9" E

S 60° 42' 35.0" E

COLINGTON RD 23.3' BST

GRAU 350

48" CHL

72" WD

72" WD POSTS

CONC

SOIL

WALKABOUT LANE

DRIVEWAY LANE

REVISIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
R-5014	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS 8/17/99

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stone

NAD 83/NA 2011

MATCH LINE -L- STA. 168 + 00.00
SEE SHEET 14

-L- PT Sta. 169+63.22

-L- PC Sta. 172+98.50

APPROXIMATE LIMITS OF ORGANIC SOILS

FLAG POLE

CONC

CURB

175+00

-L- PT Sta. 177+36.46

S 30° 22' 37.7" E

-L- PC Sta. 179+38.79

-MUP- PC Sta. 10+20.92

-MUP- PT Sta. 182+37.96

-MUP- PC Sta. 182+66.75 =
-L- PT Sta. 180+00

180+00

MATCH LINE -L- STA. 183 + 50.00
SEE SHEET 16

N 80° 48' 50.0" E

72" PLASTIC

-MUP- POT Sta. 10+00.00

N 80° 48' 50.0" E

BEGIN CONSTRUCTION
-MUP- STA 10+11.53

BAUM BAY DRIVE

PRATES MOOR DR

153' BST

24" WD

-L-

PI Sta 168+56.10	PI Sta 175+66.94	PI Sta 181+09.39	PI Sta 187+68.88
Δ = 53° 18' 40.2" (LT)	Δ = 83° 38' 37.6" (RT)	Δ = 68° 48' 32.2" (LT)	Δ = 43° 02' 44.8" (RT)
D = 22° 55' 05.9"	D = 19° 05' 54.9"	D = 23° 00' 00.0"	D = 4° 30' 00.0"
L = 232.61'	L = 437.96'	L = 299.17'	L = 956.57'
T = 125.49'	T = 268.44'	T = 170.60'	T = 502.13'
R = 250.00'	R = 300.00'	R = 249.11'	R = 1,273.24'
SE = 6%	SE = 6%	SE = 6%	SE = EXIST.
R0 = 126'	R0 = 126'	R0 = 126'	V = 55 MPH
* V = 30 MPH	* V = 30 MPH	* V = 30 MPH	

-MUP-

PI Sta 15+06.09
Δ = 43° 02' 44.8" (RT)
D = 4° 39' 26.2"
L = 924.27'
T = 485.17'
R = 1,230.24'

PROJECT REFERENCE NO.	SHEET NO.
R-5014	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011

-L-	-MUP-
PI Sta 187+68.88	PI Sta 15+06.09
Δ = 43° 02' 44.8" (RT)	Δ = 43° 02' 44.8" (RT)
D = 4° 30' 00.0"	D = 4° 39' 26.2"
L = 956.57'	L = 924.27'
T = 502.13'	T = 485.17'
R = 1,273.24'	R = 1,230.24'
SE = EXIST.	
V = 55 MPH	

185+00

190+00

195+00

MATCH LINE -L- STA. 183+50.00
SEE SHEET 15

MATCH LINE -L- STA. 196+50.00
SEE SHEET 17

-L- PT Sta 192+23.32 =
-MUP- PI Sta 193+74.59

BST WALK

-L-

-MUP-

COLINGTON RD

23.8' BST

UNION ST

21.3' BST

CONC

S 56° 08' 25.2" E

S 56° 08' 45.8" E

REVISIONS

8/17/99

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tstone
ST BRIDGESTATIONED

PROJECT REFERENCE NO.	SHEET NO.
R-5014	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011

-L-
PI Sta 209+11.27
Δ = 62° 13' 20.7" (LT)
D = 6° 05' 00.0"
L = 1,022.83'
T = 568.41'
R = 941.85'
SE = EXIST.
V = 50 MPH

-MUP-
PI Sta 32+67.01
Δ = 23° 12' 51.8" (LT)
D = 5° 49' 03.8"
L = 399.03'
T = 202.29'
R = 984.85'

PI Sta 34+86.04
Δ = 5° 06' 18.4" (RT)
D = 11° 27' 33.0"
L = 44.55'
T = 22.29'
R = 500.00'

PI Sta 35+76.00
Δ = 15° 25' 19.7" (LT)
D = 11° 27' 33.0"
L = 134.58'
T = 67.70'
R = 500.00'

PI Sta 37+12.08
Δ = 23° 05' 12.6" (RT)
D = 28° 38' 52.4"
L = 80.59'
T = 40.85'
R = 200.00'

200+00

205+00

MATCH LINE -L- STA. 196+50.00
SEE SHEET 16

MATCH LINE -L- STA. 209+50.00
SEE SHEET 18

-L- PC Sta. 203+42.86=
-MUP- PC Sta. 30+64.72

BST WALK

-L-
S 56° 08' 25" E

COLINGTON RD. 23.9' BST

-MUP- PRC Sta. 34+63.75

-MUP- PRC Sta. 35+08.30

-MUP- PT Sta. 36+42.89

-MUP- PC Sta. 36+71.23

N 85° 30' 49" E

CURB

CONC

8' CHL

29-SEP-2016 12:41
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stange
GEOTECHNICAL

REVISIONS

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-5014	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-
PI Sta 209+11.27
Δ = 62° 13' 20.7" (LT)
D = 6° 05' 00.0"
L = 1022.83'
T = 568.41'
R = 941.85'
SE = EXIST.
V = 50 MPH

-MUP-
PI Sta 37+12.08
Δ = 23° 05' 12.6" (RT)
D = 28° 38' 52.4"
L = 80.59'
T = 40.85'
R = 200.00'

NAD 83/NA 2011

210+00

215+00

220+00

-L- PT Sta 213+65.69

MATCH LINE -L- STA. 209+50.00
SEE SHEET 17

MATCH LINE -L- STA. 221+50.00
SEE SHEET 19

-L-
N 61° 38' 14.5" E

OCEAN BAY BLVD. 39' BST

BERMUDA BAY BLVD.
32.2' BST

S 68° E 50.2'
-MUP-

END CONSTRUCTION
-MUP- POT Sta. 37+55.60

-MUP- PT Sta. 37+51.82

TOWNHALL DR

VETERANS DRIVE

BST
BST WALK
CONC
SOIL
CURB
F
96' WD
36' WD
24' WD
8' CHL
CONC CSG
48' BST

REVISIONS
8/17/99

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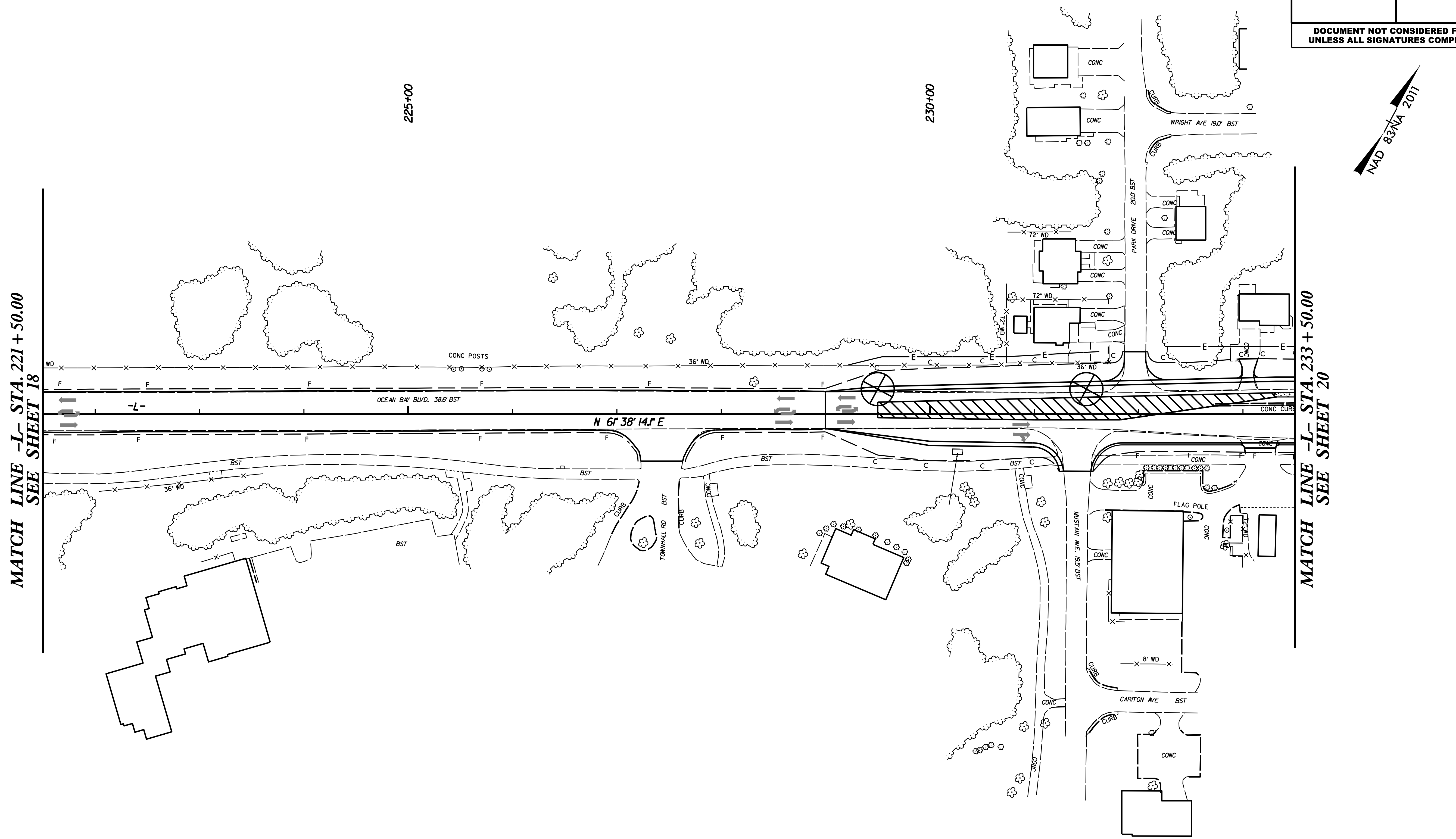
stroop
At MicroStation V8

PROJECT REFERENCE NO.	SHEET NO.
R-5014	19
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



REVISIONS

8/17/99

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REVISIONS

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stone AT MICROSTATIONPE2 8/17/99

MATCH LINE –L– STA. 233+50.00
SEE SHEET 19

-Y1- POT Sta. 10+00.00

-Y1- POT Sta. 16+00.03

15+00

235+00

240+00

-L-

N 67° 38' 14" E

-Y1-

N 21° 48' 46" W

-Y1- POT Sta. 13+00.01 =
-L- POT Sta. 236+19.02

-L- POT Sta. 240+55.05

OCEAN BAY BLVD

CARTON AVE 20DT BST

WRIGHT AVE 20DT BST

US 158 S.CROATAN HWY 70T BST

US 158 S.CROATAN HWY 60 BST

NAD 83/NA 2011

PROJECT REFERENCE NO. R-5014
SHEET NO. 20
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-5014	21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BEGIN 1.5" OVERLAY
-L- STA. 11+00.00
ELEV. = 6.96'

90 80 70 60 50 40 30 20 10 0 –10 –20 –30 –40 –50 –60 –70 –80 –90 –100

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00

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lsroop
ET MicroStation V8

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-5014	22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

90 80 70 60 50 40 30 20 10 0 –10 –20 –30 –40 –50 –60 –70 –80 –90 –100

24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00 36+00 37+00 38+00

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lsloop
ei_MicroStation_V8

5/14/99

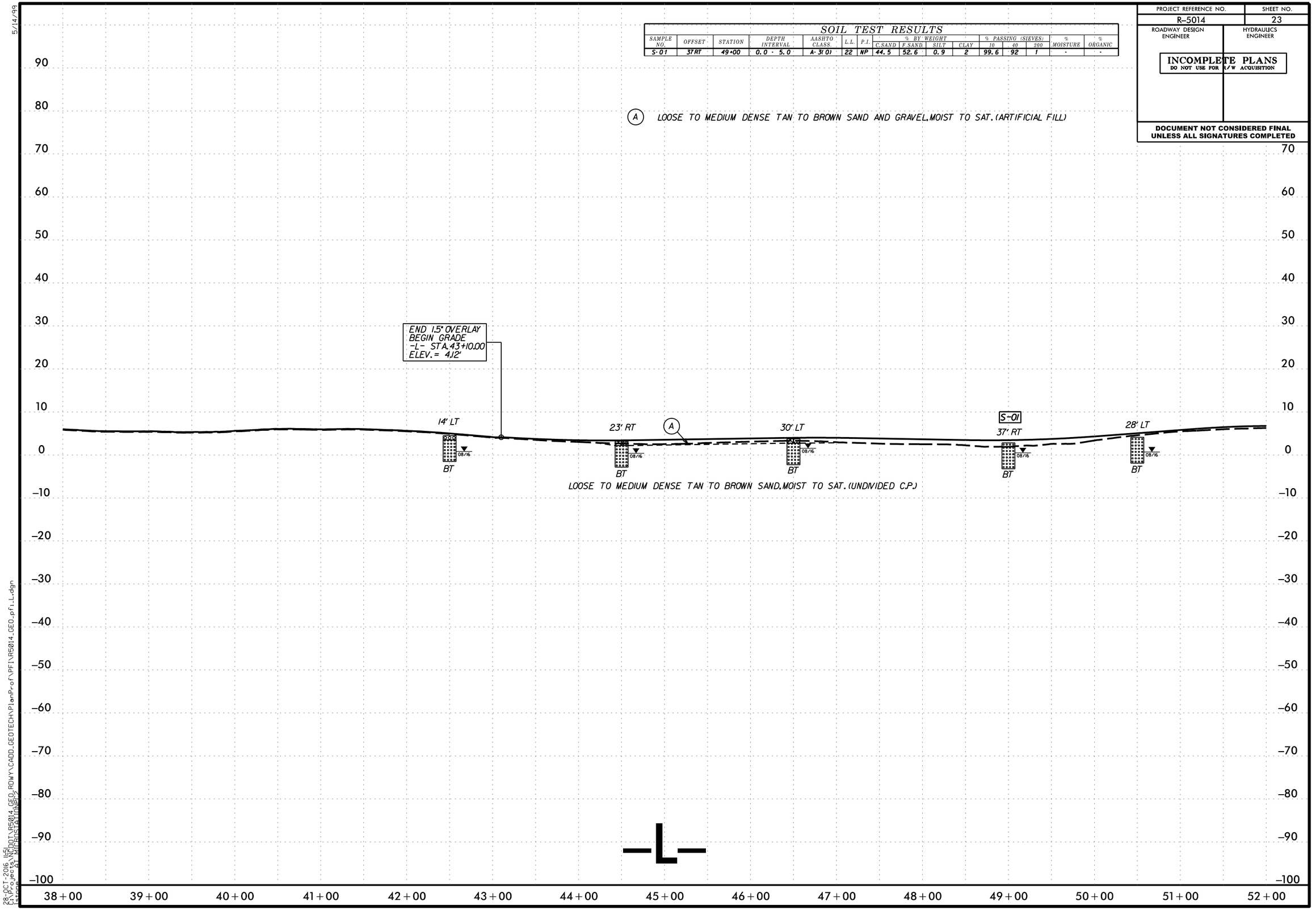
PROJECT REFERENCE NO.	SHEET NO.
R-5014	23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
S-01	37 RT	49+00	0.0 - 5.0	A-3(0)	22	NP	44.5	52.6	0.9	2	99.6	92	1	-	-



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PROJECT REFERENCE NO.	SHEET NO.
R–5014	24

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

5/14/99

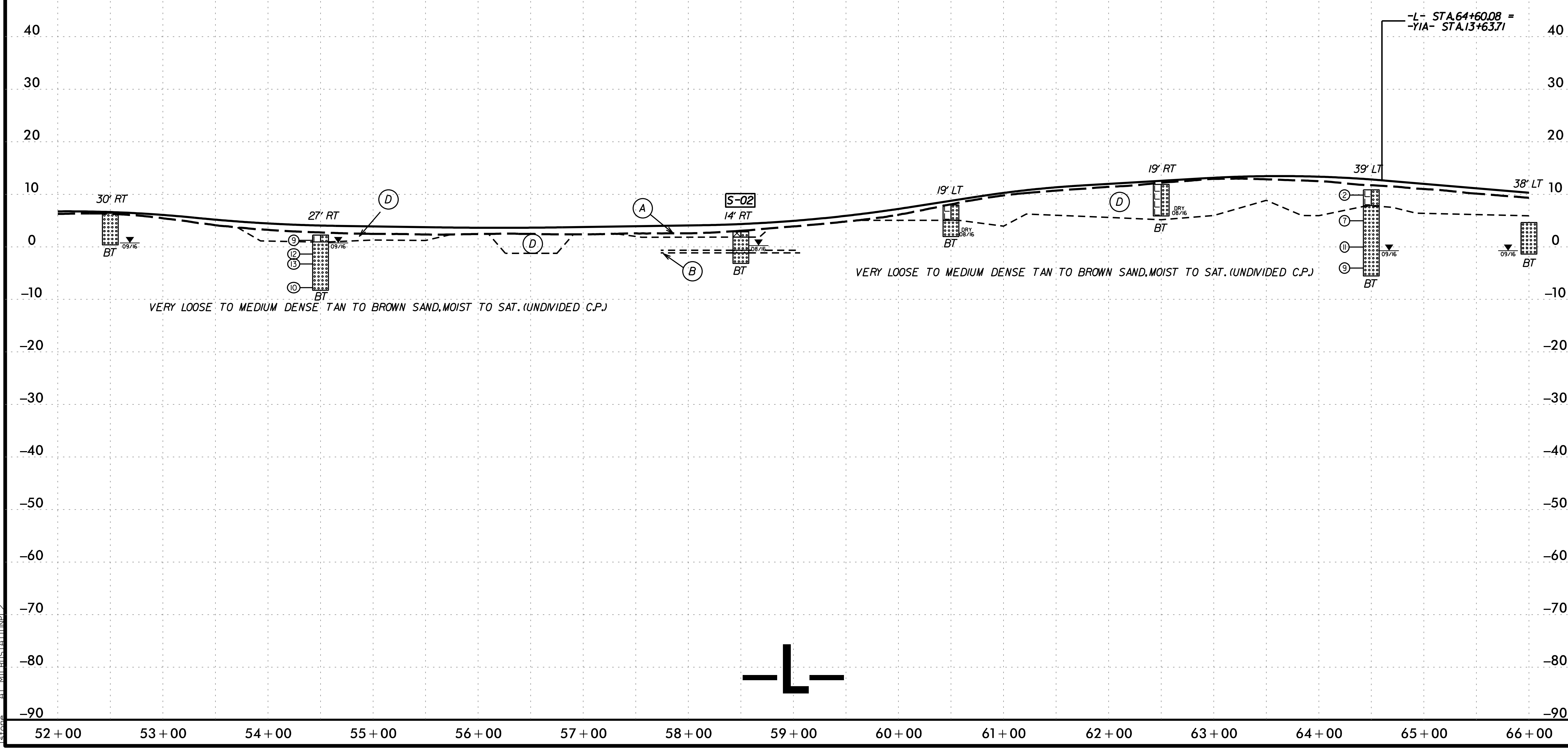
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-02	14RT	58+50	3.5 - 4.0	A-3(0)	35	NP	49.8	43.2	3.7	3.3	82.8	86	4	-	10

(A) LOOSE TO MEDIUM DENSE TAN TO BROWN SAND AND GRAVEL,MOIST TO SAT.(ARTIFICIAL FILL)

(B) VERY LOOSE BROWN BLACK MODERATLEY ORGANIC SAND,SAT.(UNDIVIDED C.P.)

(D) VERY LOOSE TAN SAND,MOIST (ROADWAY EMBANKMENT)



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PROJECT REFERENCE NO.	SHEET NO.
R-5014	25
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-03	CL	72+50	0.5 - 1.5	A-2-5(0)	67	NP	30.1	64.1	3.3	2.5	100	90	27	-	23.3
S-04	40RT	73+00	0.0 - 1.7	-	-	-	-	-	-	-	-	-	-	-	79.6
S-05	38LT	76+50	5.0 - 5.5	(1)	-	-	13.5	77.9	5.8	2.8	100	97	33	-	42.2
S-06	43LT	77+00	5.0 - 5.5	A-3(0)	30	NP	20.9	72.6	4.5	2	99.7	95	3	-	4.8

(B) VERY SOFT BROWN BLACK MUCK, MOIST TO SAT. (UNDIVIDED C.P.)

(C) VERY LOOSE BROWN SAND WITH LITTLE ORGANIC MATTER, MOIST TO SAT. (UNDIVIDED C.P.)

(D) VERY LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

-L- STA. 67+23.30 =
-Y2- STA. 11+57.81

-L- STA. 71+44.00 =
-Y3- STA. 12+78.30

S-03 S-04 S-05 S-06

38' LT 31' LT 40' LT 23' LT 40' RT 40' RT 2' RT 54' RT 42' RT 43' RT 38' LT 43' LT 23' RT

VERY LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

100 90 80 70 60 50 40 30 20 10 0 –10 –20 –30 –40 –50 –60 –70 –80 –90

66+00 67+00 68+00 69+00 70+00 71+00 72+00 73+00 74+00 75+00 76+00 77+00 78+00 79+00 80+00

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User: BTHOMPSON2

PROJECT REFERENCE NO.	SHEET NO.
R-5014	26

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

5/14/99

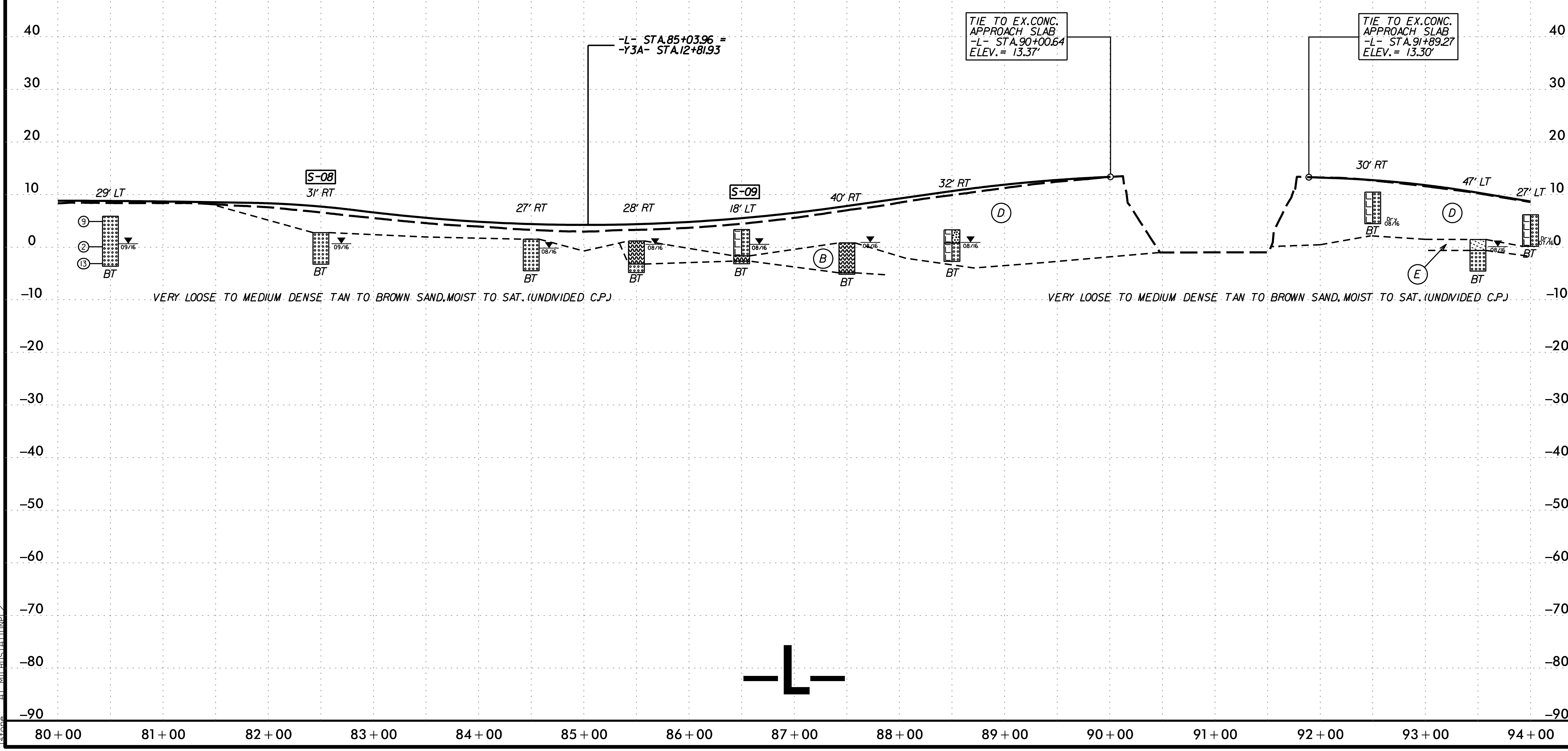
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-08	31RT	82+50	0.0 - 6.0	A-3(0)	21	NP	26.8	70.3	0.9	2.0	99.6	94	2	-	-
S-09	18LT	86+50	5.0 - 6.0	( )	-	-	38.1	56.3	3.3	2.3	57.5	85	8	-	13.7

(B) VERY SOFT BROWN BLACK MUCK,MOIST TO SAT.(UNDIVIDED C.P.)

(D) VERY LOOSE TAN SAND,MOIST (ROADWAY EMBANKMENT)

(E) VERY LOOSE TAN BROWN MODERATELY ORGANIC SAND,SAT.(UNDIVIDED C.P.)



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PROJECT REFERENCE NO.	SHEET NO.
R-5014	27

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

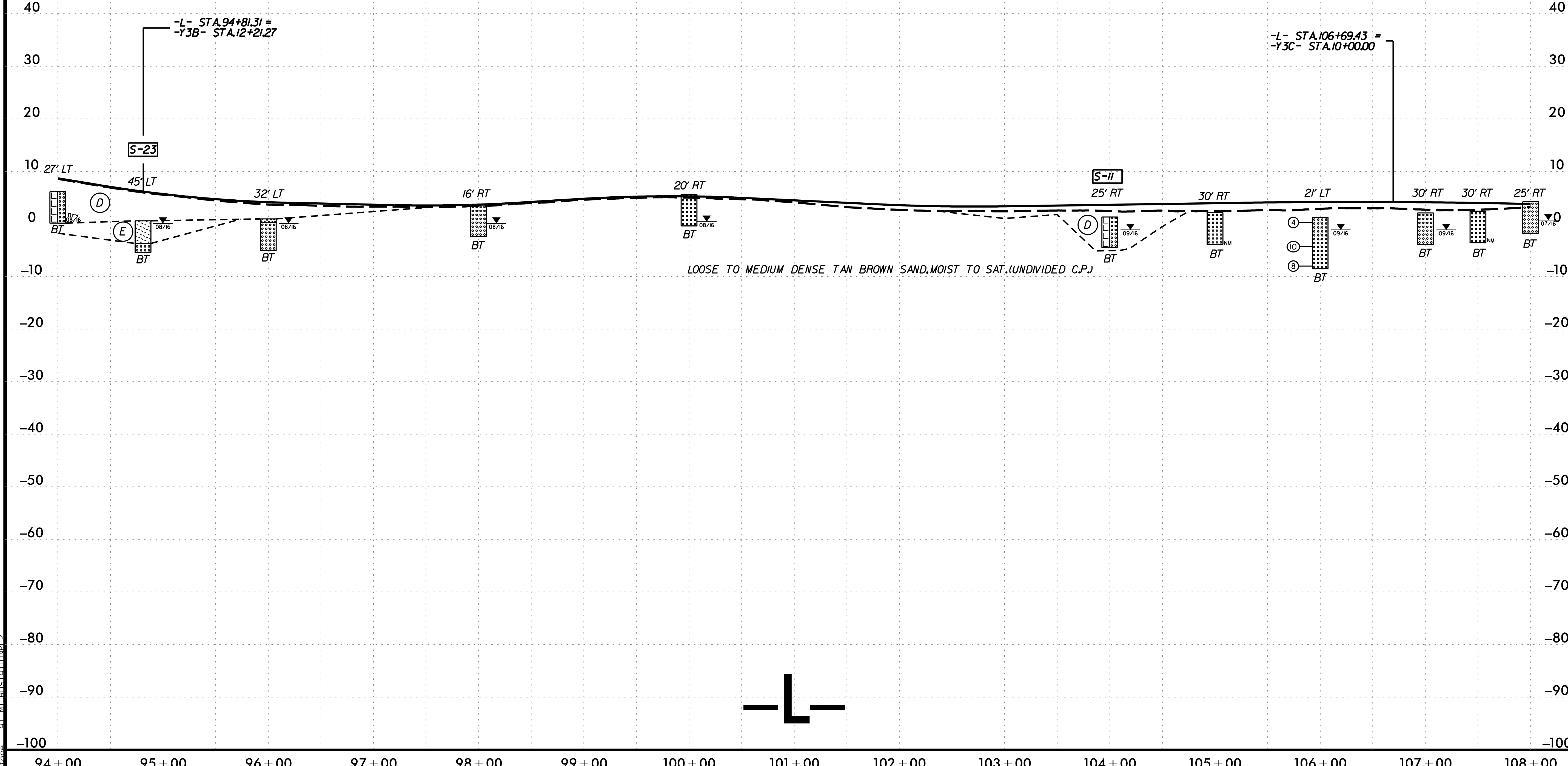
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-23	45LT	94+81	0.0 - 1.0	A-2-4(0)	29	NP	24.2	67.5	6.3	2	92	92	15	-	6.5
S-11	25RT	104+00	0.0 - 1.0	A-3(0)	32	NP	32.2	62	2.9	2.9	96.3	88	7	-	2.5

(D) VERY LOOSE TAN SAND WITH TRACE ORGANICS, MOIST TO SAT. (ROADWAY EMBANKMENT)

(E) VERY LOOSE TAN BROWN MODERATELY ORGANIC SAND, SAT. (UNDIVIDED C.P.)



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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-5014	28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

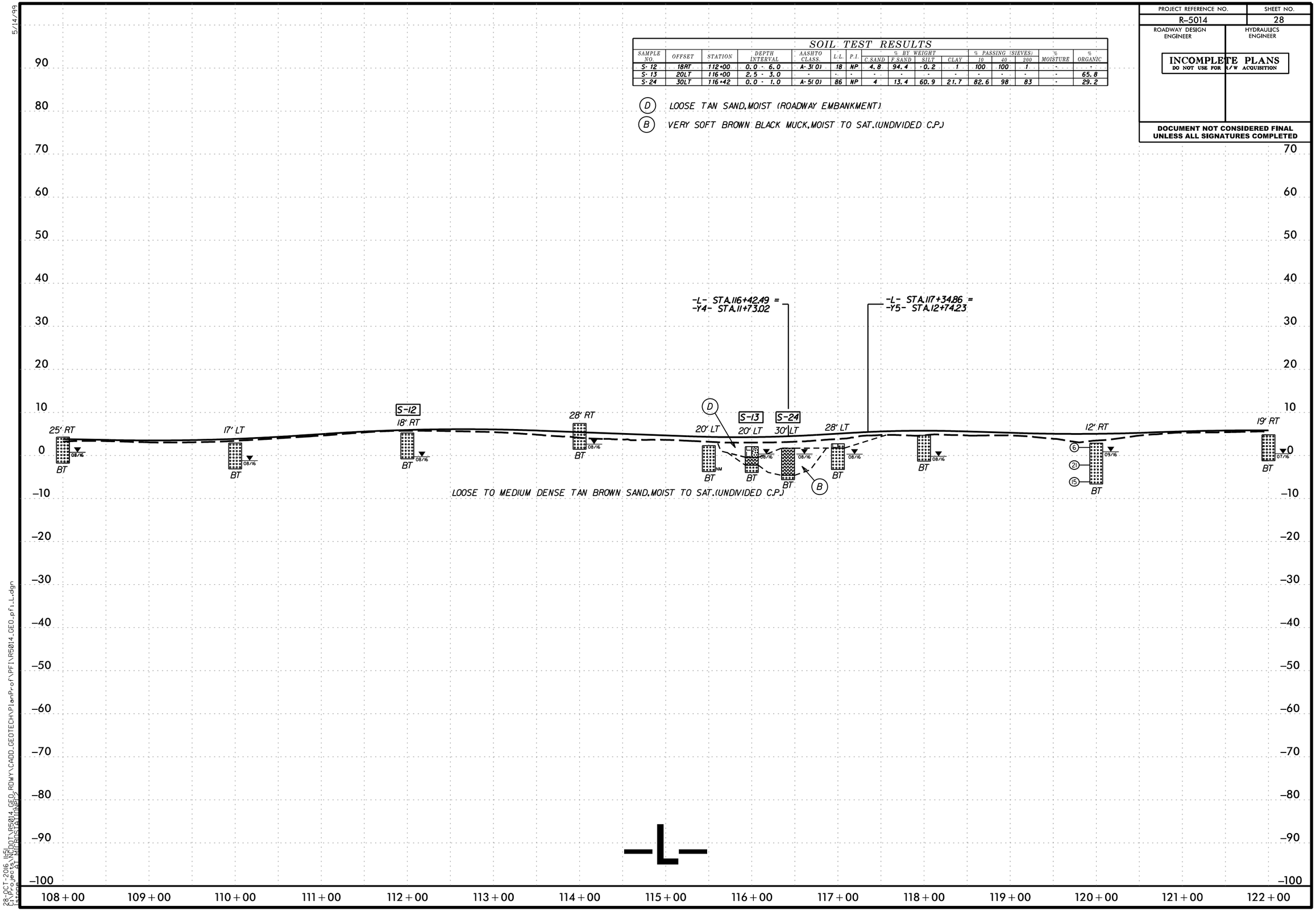
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C SAND	F SAND	SILT	CLAY	% PASSING SIEVES: 10	40	200	% MOISTURE	% ORGANIC
S-12	18RT	112+00	0.0 - 6.0	A-3(0)	18	NP	4.8	94.4	0.2	1	100	100	1	-	-
S-13	20LT	116+00	2.5 - 3.0	-	-	-	-	-	-	-	-	-	-	-	65.8
S-24	30LT	116+42	0.0 - 1.0	A-5(0)	86	NP	4	13.4	60.9	21.7	82.6	98	83	-	29.2

(D) LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

(B) VERY SOFT BROWN BLACK MUCK, MOIST TO SAT. (UNDIVIDED C.P.)



PROJECT REFERENCE NO.	SHEET NO.
R-5014	29

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

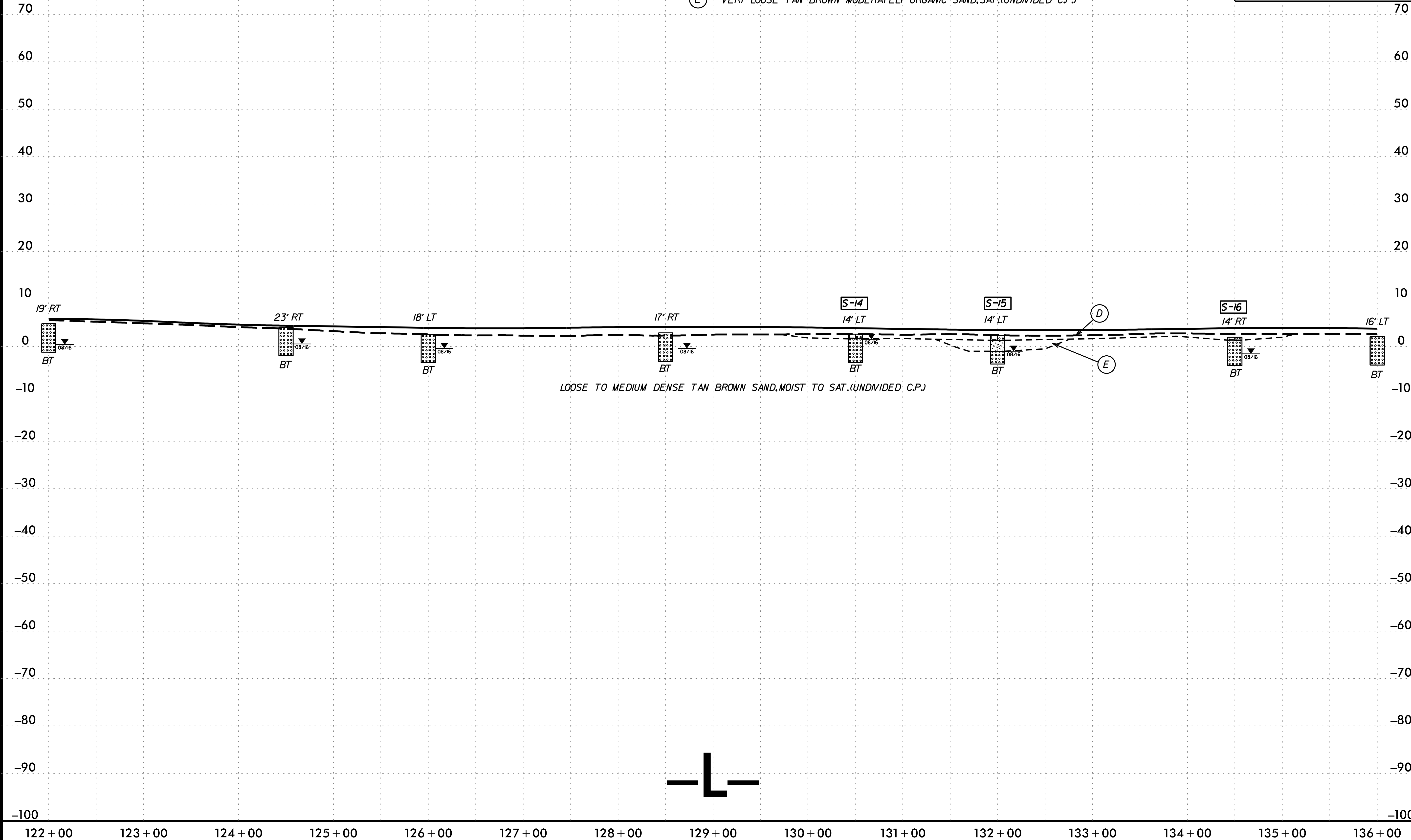
5/14/99

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-14	14LT	130+50	0.0 - 1.0	A-3(0)	32	NP	41.7	53.6	2.7	2	97.3	83	6	-	-
S-15	14LT	132+00	1.0 - 3.0	A-2-5(0)	59	NP	18.8	72.9	6.3	2	97.7	86	10	-	-
S-16	14RT	134+50	0.0 - 4.0	A-3(0)	31	NP	4.7	88.4	3.9	3	99	98	8	-	-

(D) LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

(E) VERY LOOSE TAN BROWN MODERATELY ORGANIC SAND, SAT. (UNDIVIDED C.P.)



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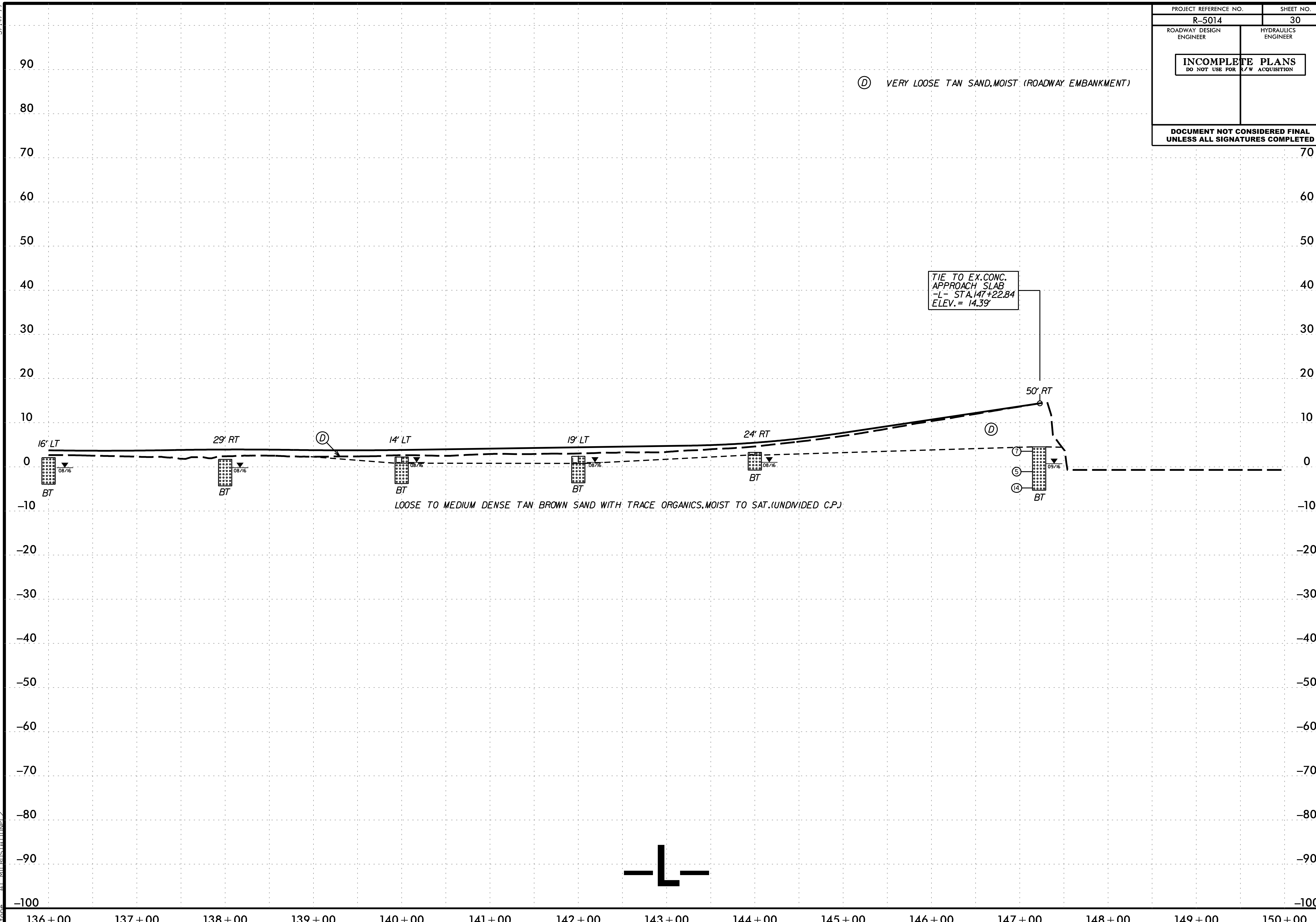
PROJECT REFERENCE NO.	SHEET NO.
R-5014	30

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



5/14/99

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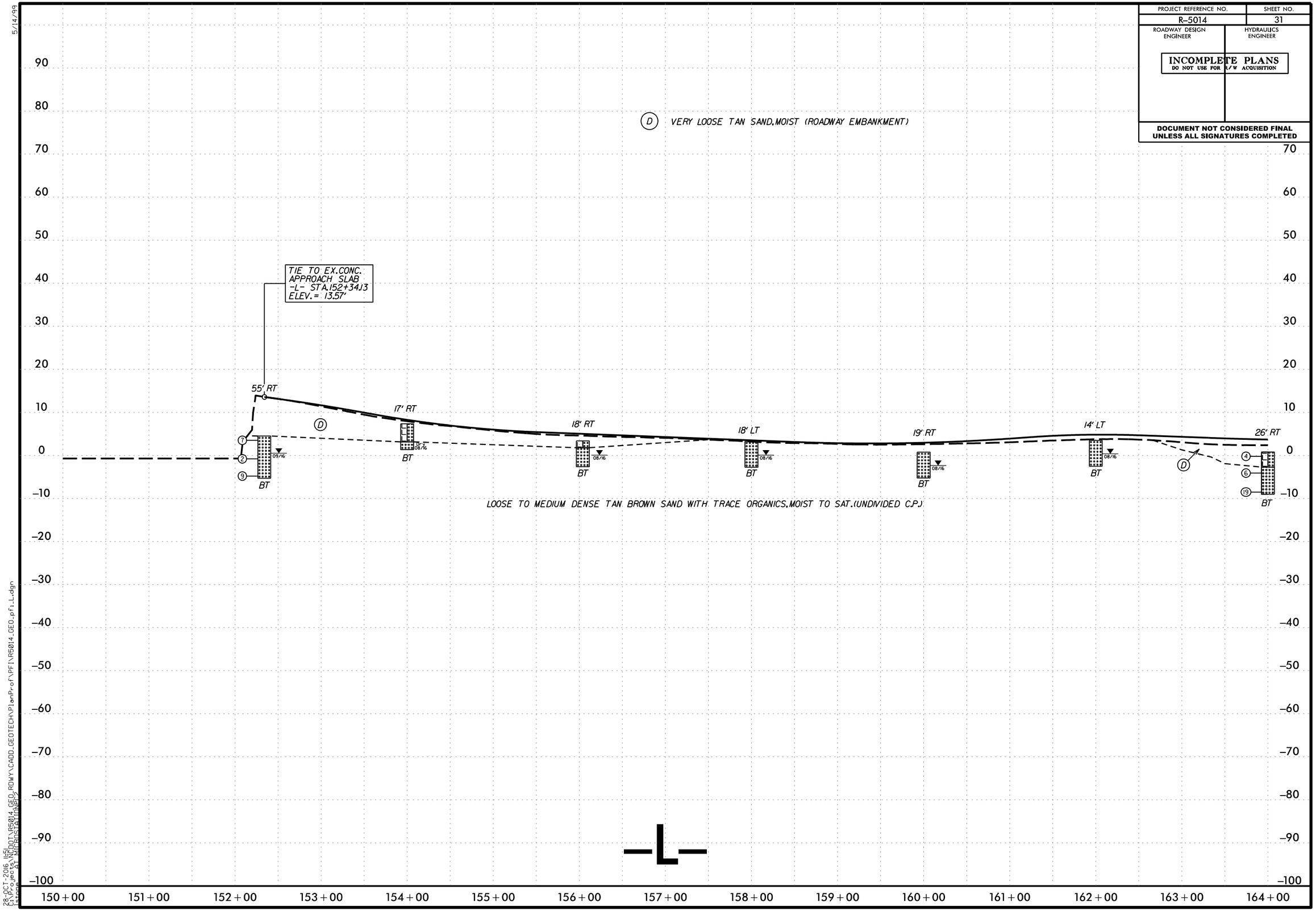
R5014_GEO_pfl_L.dgn

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-5014	31
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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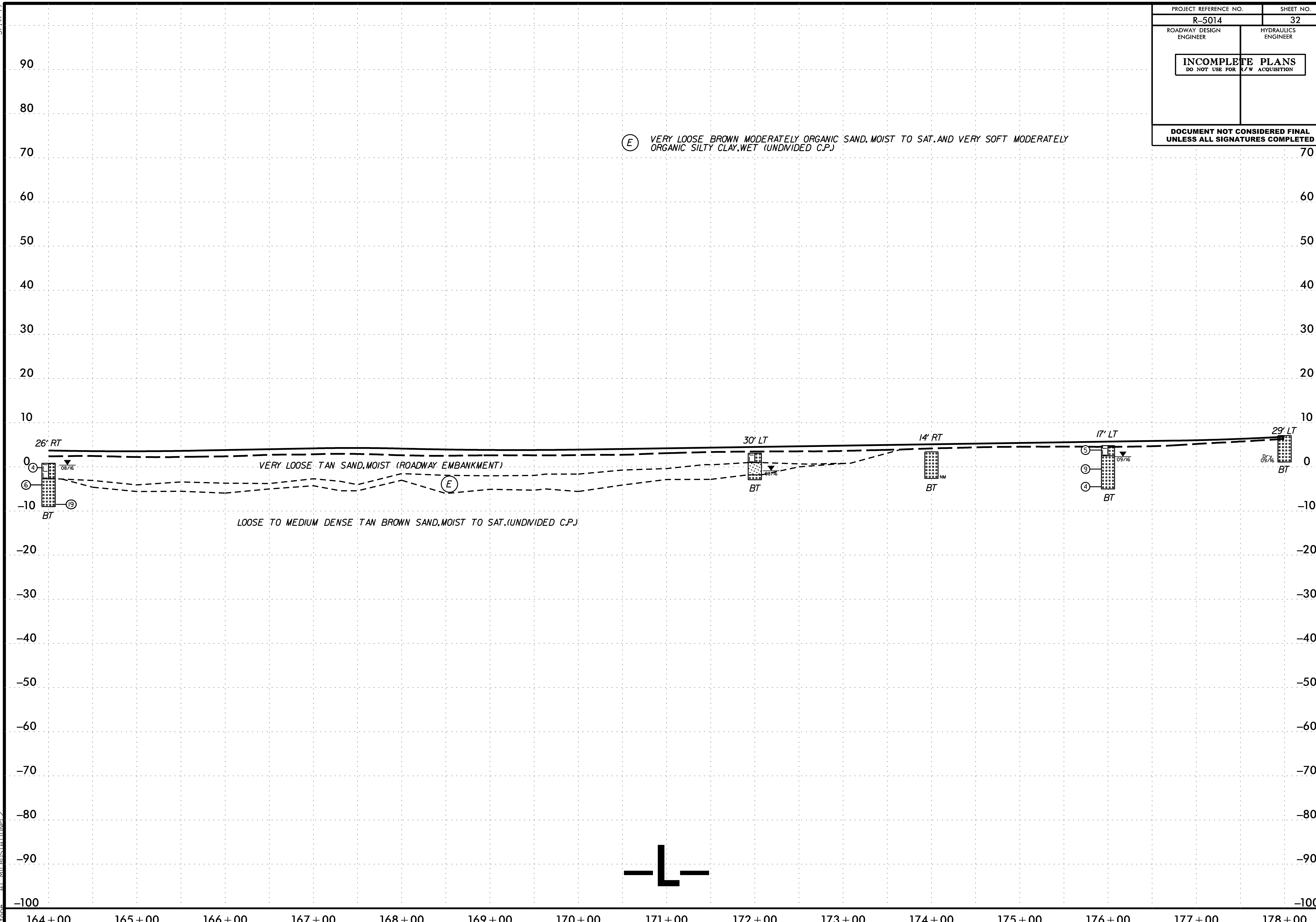
dlang
$$-L-$$

PROJECT REFERENCE NO.	SHEET NO.
R-5014	32
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



5/14/99

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lstone AT MICROSTATIONPC2

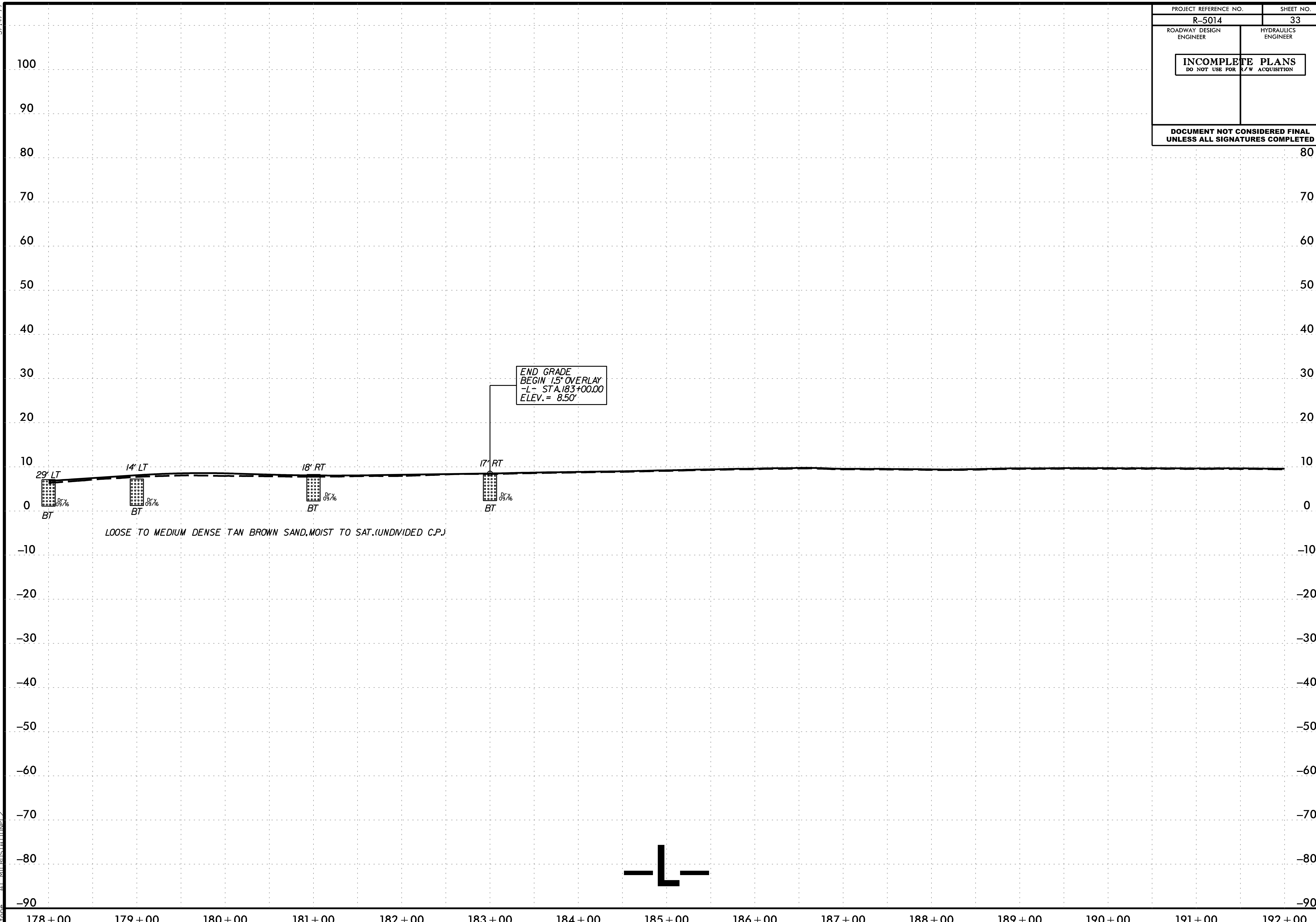
PROJECT REFERENCE NO.	SHEET NO.
R-5014	33

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



5/14/99

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lstone AT MICROSTATIONPC2

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-5014	34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

100
90
80
70
60
50
40
30
20
10
0
–10
–20
–30
–40
–50
–60
–70
–80
–90

192+00 193+00 194+00 195+00 196+00 197+00 198+00 199+00 200+00 201+00 202+00 203+00 204+00 205+00 206+00

28-OCT-2016 11:51
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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-5014	35
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

100
90
80
70
60
50
40
30
20
10
0
–10
–20
–30
–40
–50
–60
–70
–80
–90

206+00 207+00 208+00 209+00 210+00 211+00 212+00 213+00 214+00 215+00 216+00 217+00 218+00 219+00 220+00

28-OCT-2016 11:51
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lsroop
ezt MicroStation V8

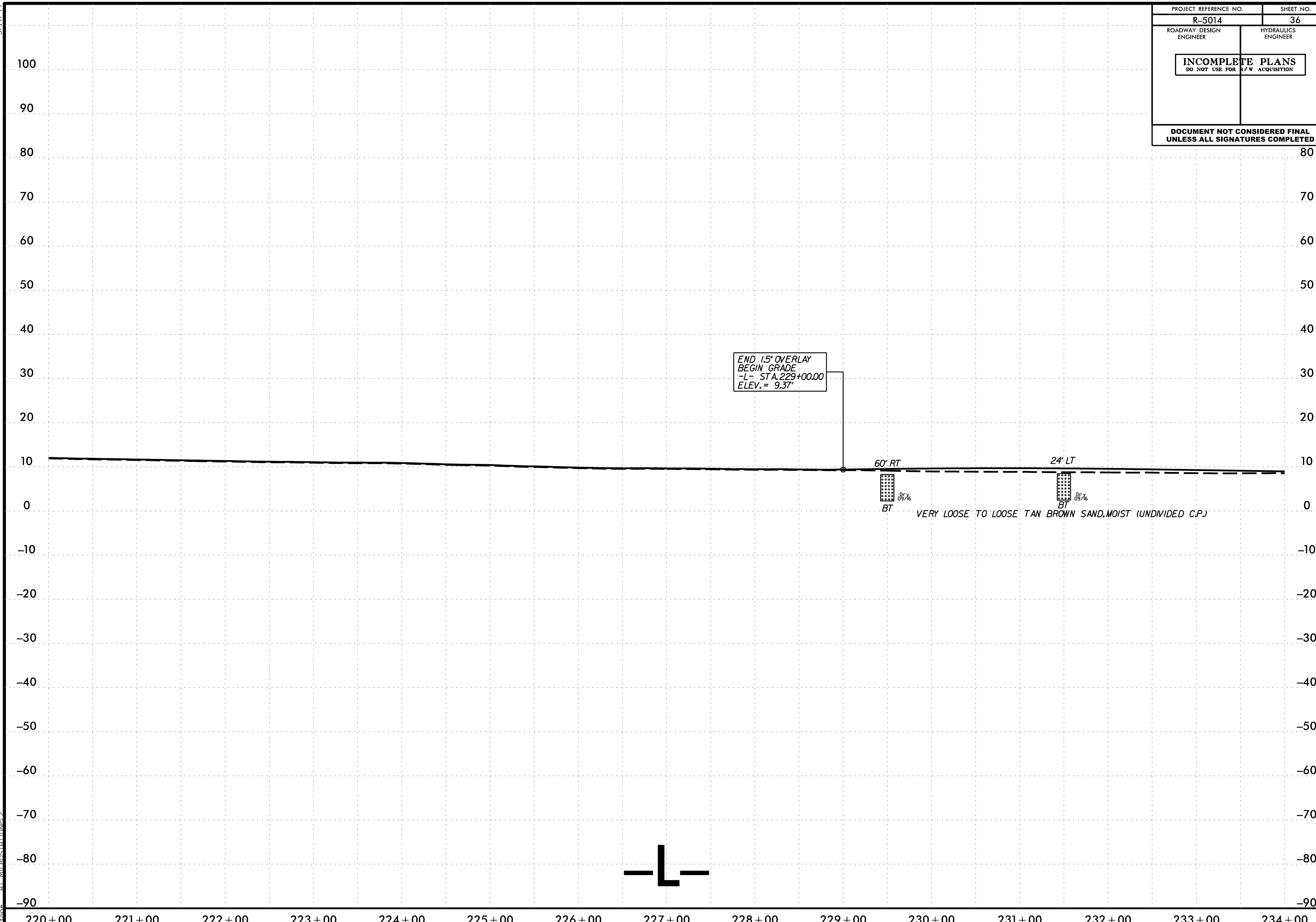
PROJECT REFERENCE NO.	SHEET NO.
R-5014	36

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

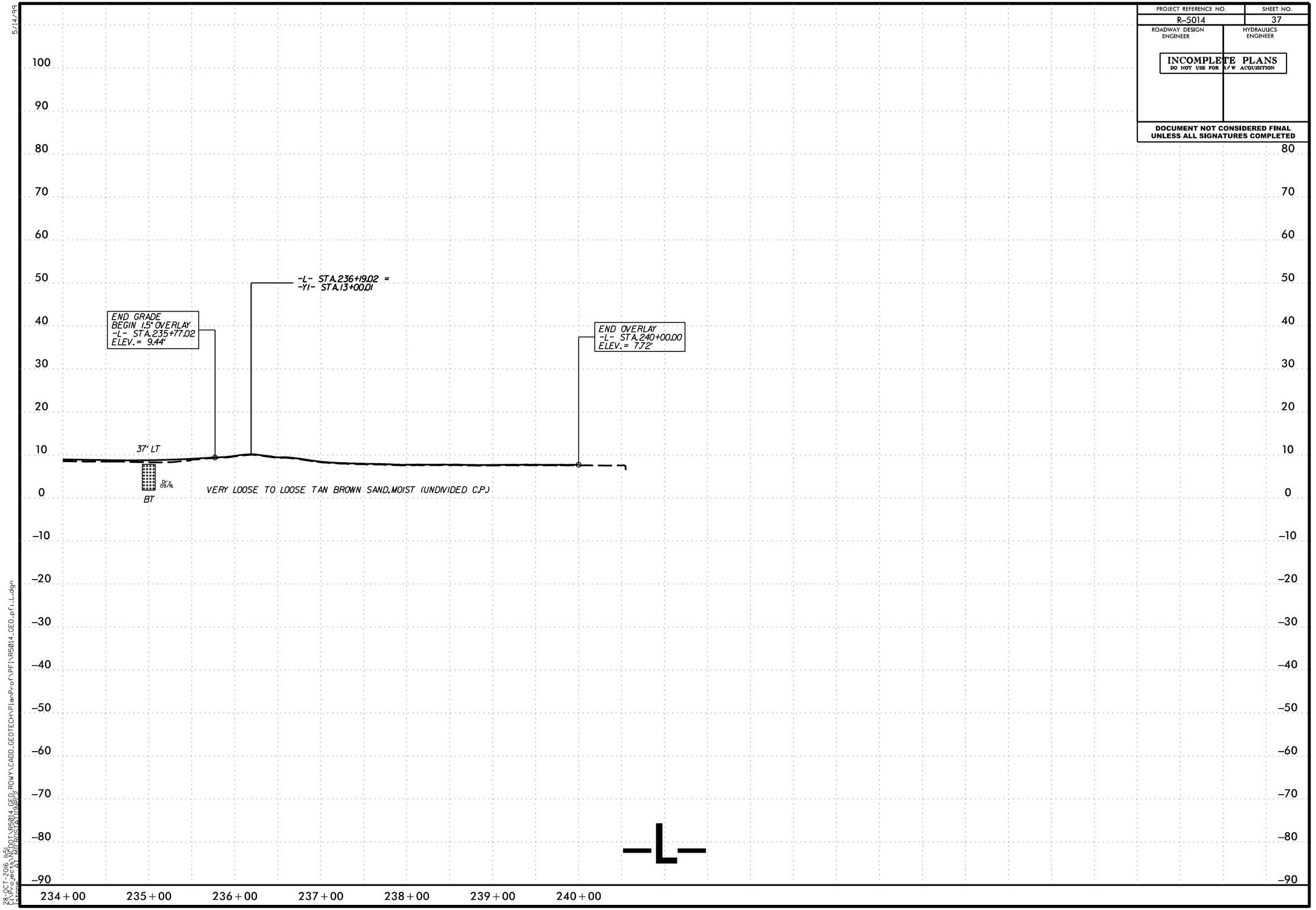


5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-5014	37
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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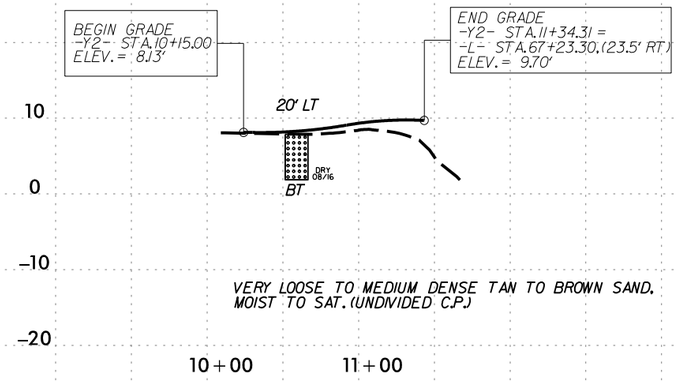
lsroop
ST MicroStation V8

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-5014	38
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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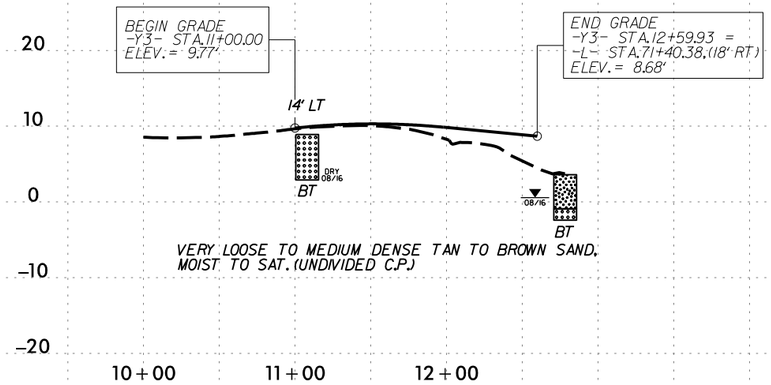

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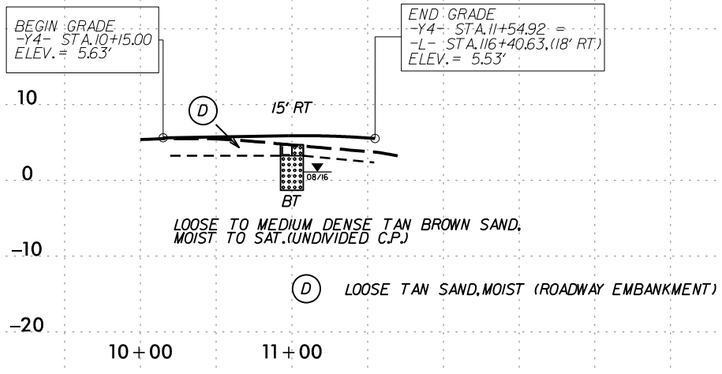

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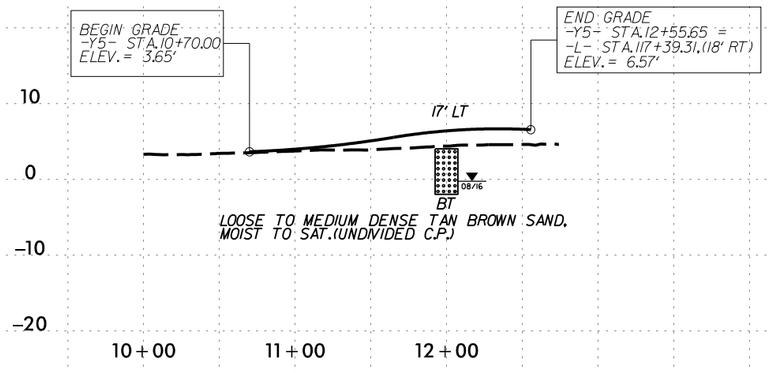

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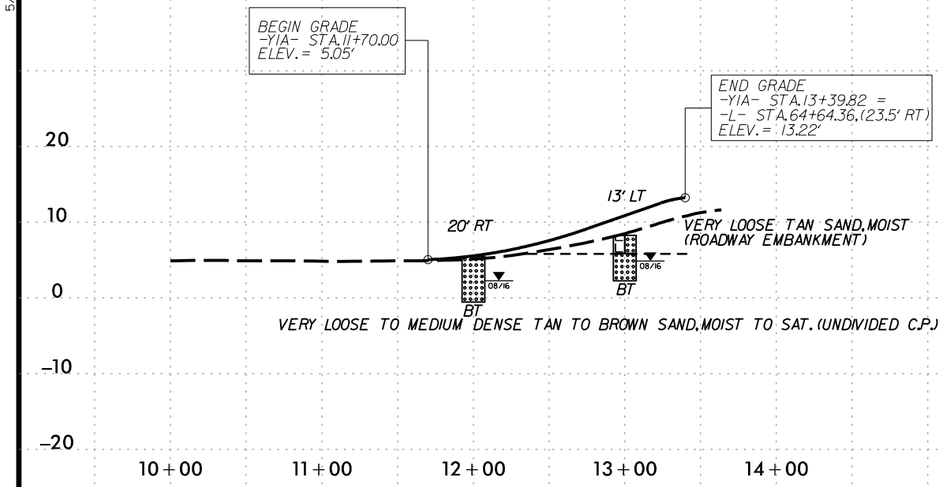
Layout: A1 MicroStation V8

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-5014	39
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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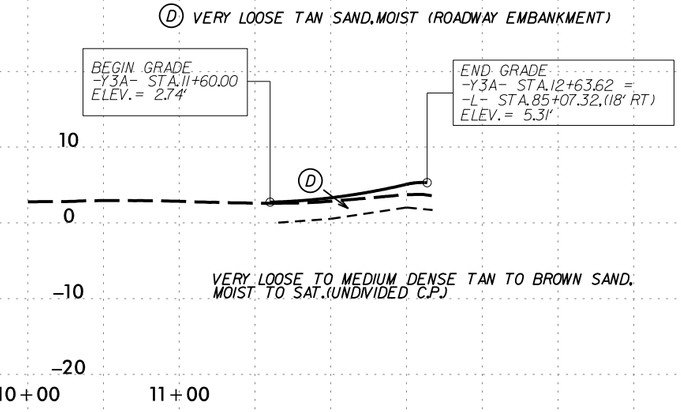

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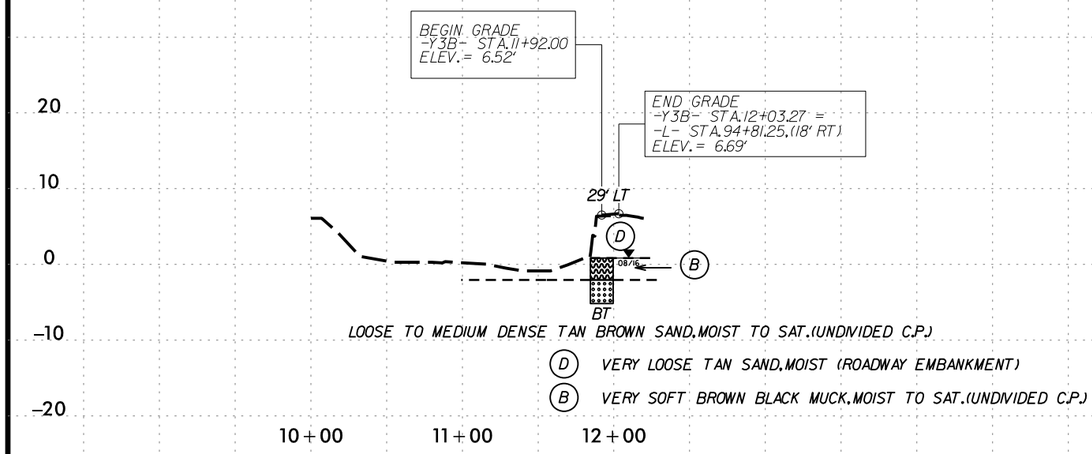

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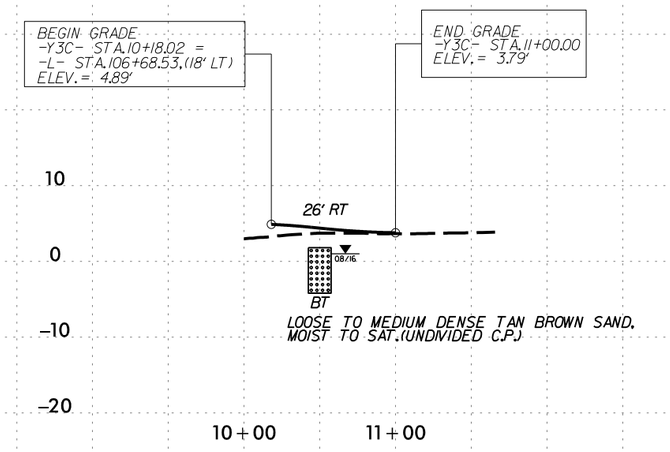

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User: MTHOMPSON1NDZ

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-5014	40
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
S-21	CL	18+00	0.0 - 4.0	A-3(0)	19	NP	30.4	68.6	0.0	1.0	96.9	95	1	-	-

90 80 70 60 50 40 30 20 10 0 –10 –20 –30 –40 –50 –60 –70 –80 –90

08/16 BT

LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

–MUP–

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00

28-OCT-2016 12:39
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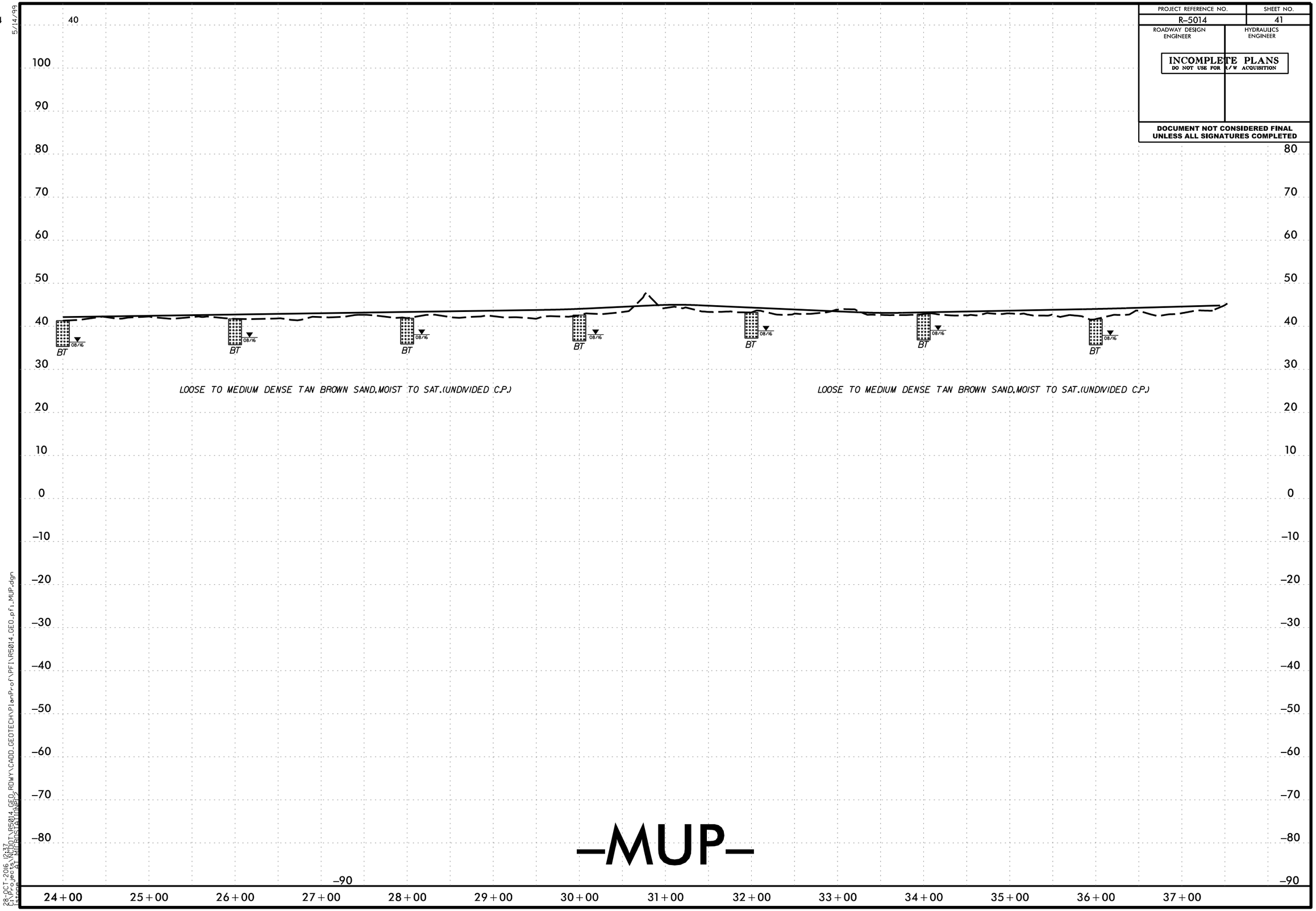
lsroop
ei: MicroStation V8

PROJECT REFERENCE NO.	SHEET NO.
R–5014	41
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



6/23/16

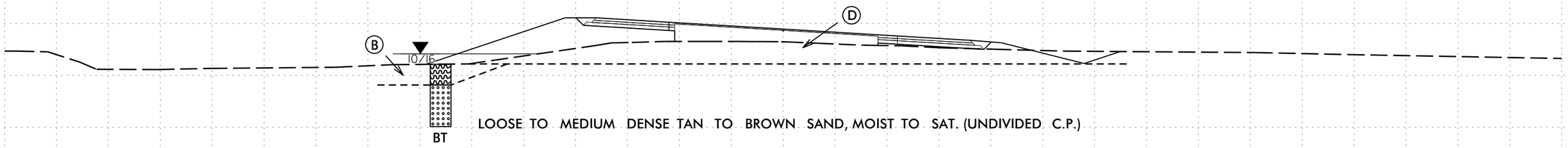
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	42

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

15 10 5 0 −5 −10

Ⓓ VERY LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

Ⓑ VERY SOFT BROWN BLACK MUCK, MOIST TO SAT. (UNDIVIDED C.P.)

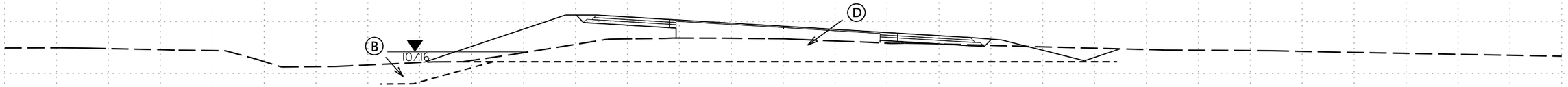


LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

54 + 00.00

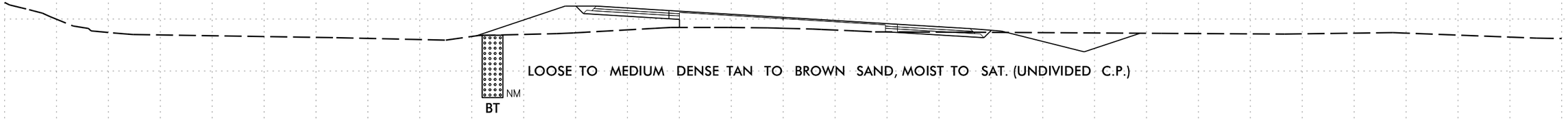
Ⓓ VERY LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

Ⓑ VERY SOFT BROWN BLACK MUCK, MOIST TO SAT. (UNDIVIDED C.P.)



LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

53 + 93.00



LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

53 + 50.00

−L−

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

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jstone AT MICROSTATIONPC2

6/23/16

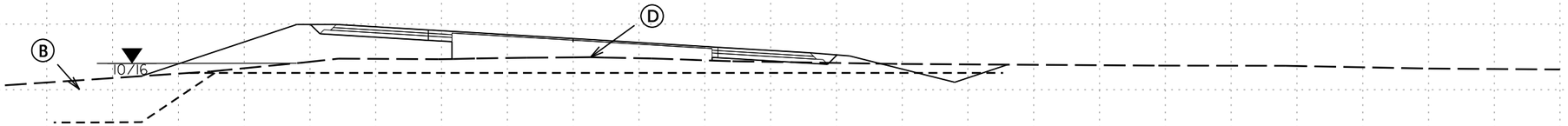
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	43

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

15
10
5
0
-5

Ⓓ VERY LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

Ⓑ VERY SOFT BROWN BLACK MUCK, MOIST TO SAT. (UNDIVIDED C.P.)



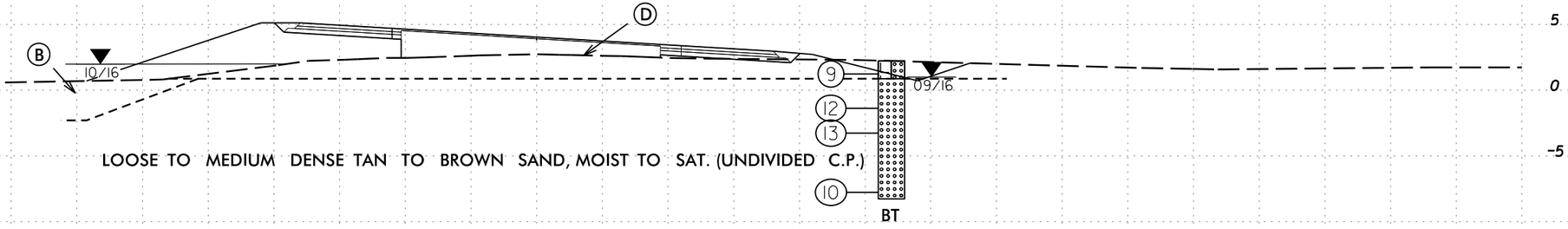
LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

55+00.00

20
15
10
5
0
-5

Ⓓ VERY LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

Ⓑ VERY SOFT BROWN BLACK MUCK, MOIST TO SAT. (UNDIVIDED C.P.)



LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

54+50.00

-L-

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

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jstone AT MICROSTATIONPC2

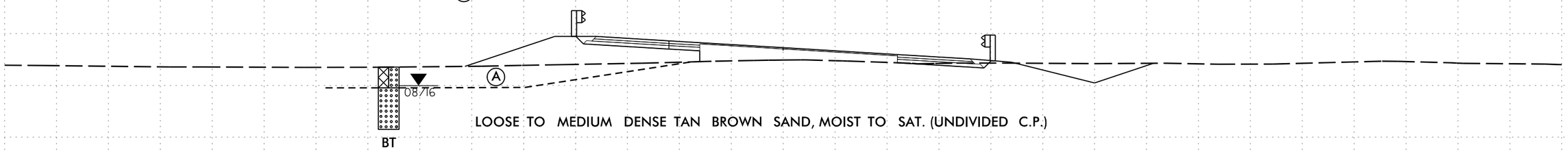
6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	44

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

15 10 5 0 -5 -10

Ⓐ LOOSE TO MEDIUM DENSE TAN BROWN SAND AND GRAVEL, MOIST (ARTIFICIAL FILL)

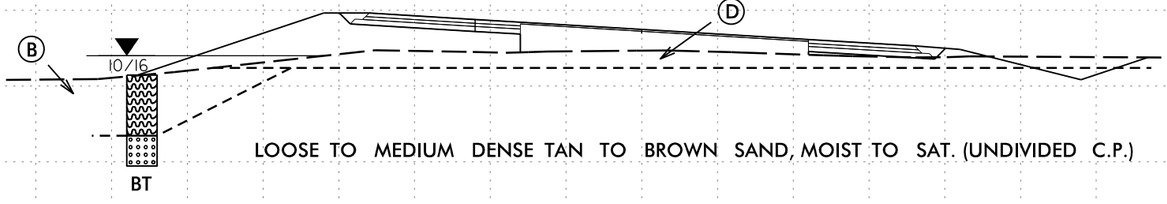


LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

56+00.00

Ⓓ VERY LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

Ⓑ VERY SOFT BROWN BLACK MUCK, MOIST TO SAT. (UNDIVIDED C.P.)



LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

55+50.00

-L-

15 10 5 0 -5 -10

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

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jstone AT MICROSTATIONPC2

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	45

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

20 15 10 5 0 -5 -10

(D) VERY LOOSE TO MEDIUM DENSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

(D)

VERY LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, MOIST TO SAT. (UNDIVICED C.P.)

09/16

BT

66+00.00

10 5 0 -5 -10

LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

56+98.52

10 5 0 -5 -10

(B) VERY SOFT BROWN BLACK MUCK, MOIST TO SAT. (UNDIVIDED C.P.)

(B)

08/16

VERY LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

BT

56+50.00

-L-

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

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	46

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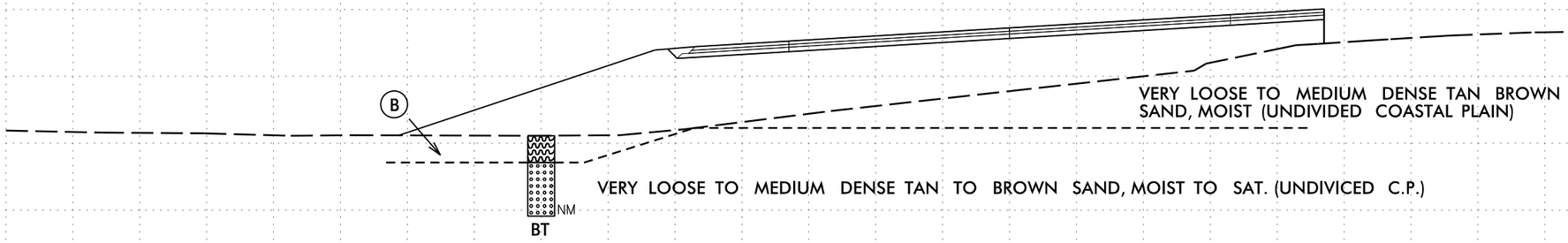
20 15 10 5 0 -5

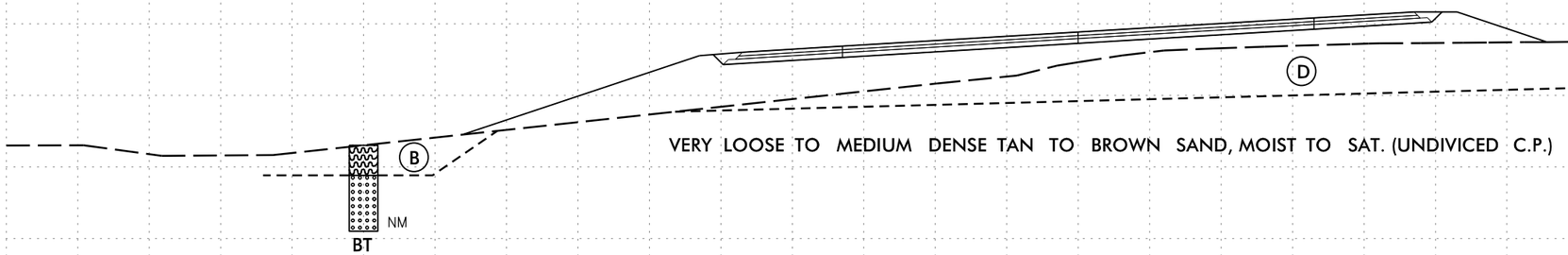


67 + 00.00

25 20 15 10 5 0

D VERY LOOSE TO MEDIUM DENSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

B VERY SOFT BROWN MUCK, MOIST TO SAT. (UNDIVIDED C.P.)



66 + 50.00

-L-

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

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tstone
A1 MICROSTATIONPE2

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	47

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

25 20 15 10 5 0

(B) VERY SOFT BROWN MUCK, MOIST TO SAT. (UNDIVIDED C.P.)

VERY LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST (UNDIVIDED COASTAL PLAIN)

09/16

(B)

VERY LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, MOIST TO SAT. (UNDIVICED C.P.)

BT

67+50.00

20 15 10 5 0 -5

VERY SOFT BROWN MUCK, MOIST TO SAT. (UNDIVIDED C.P.)

VERY LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST (UNDIVIDED COASTAL PLAIN)

VERY LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, MOIST TO SAT. (UNDIVICED C.P.)

67+23.00

—L—

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

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tstone AT MICROSTATIONPC2

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	48

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

15
10
5
0
-5
-10

VERY LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST (UNDIVIDED COASTAL PLAIN)

VERY LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, MOIST TO SAT. (UNDIVICED C.P.)

09/16

BT

68+50.00

20
15
10
5
0
-5

(B) VERY SOFT BROWN MUCK, MOIST TO SAT. (UNDIVIDED C.P.)

VERY LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST (UNDIVIDED COASTAL PLAIN)

09/16

(B)

BT

VERY LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, MOIST TO SAT. (UNDIVICED C.P.)

68+00.00

-L-

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

31-OCT-2016 10:14
c:\Projects\NCDOT\R5014_GEO_RDWY\CADD_GEOTECH\xsc\XS1\R5014_GEO_XS1_L.dgn
jstone AT MICROSTATIONPC2

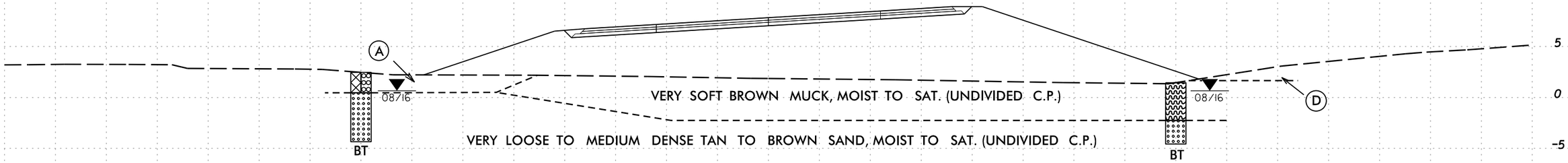
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	49

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

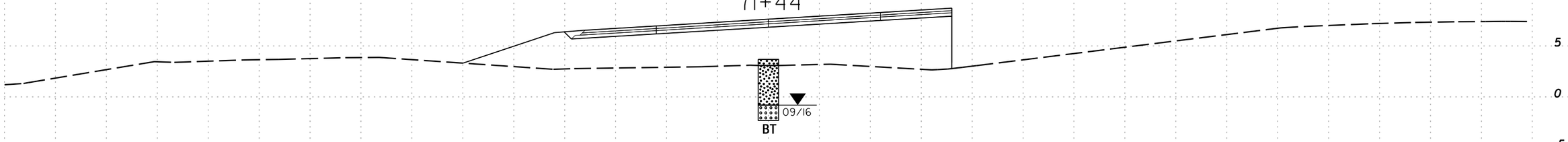
15 10 5 0 −5 −10

Ⓐ DENSE SAND AND GRAVEL, MOIST (ARTIFICAL FILL)

Ⓓ VERY LOOSE TO MEDIUM DENSE TAN SAND, MOIST (ROADWAY EMBANKMENT)



72+00.00



VERY LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

71+50.00

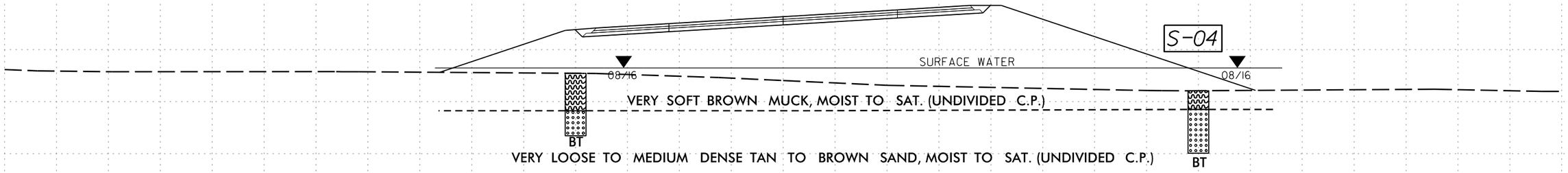
−L−

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

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	50

SOIL TEST RESULTS

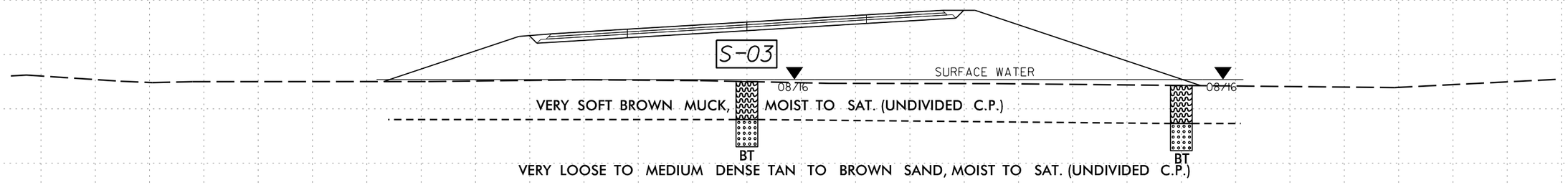
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-04	40RT	73+00	0.0 - 1.7	-	-	-	-	-	-	-	-	-	-	-	79.6



73+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	10	40	200		
S-03	CL	72+50	0.5 - 1.5	A-2-5(0)	67	NP	30.1		3.3	2.5	100	90	27	-	23.3



72+50.00

-L-

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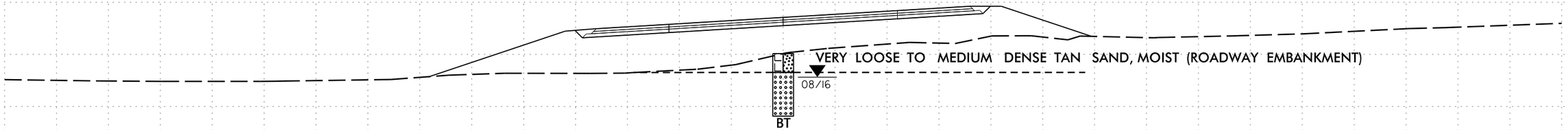
Estone A1 MICROSTATIONPE

6/23/16

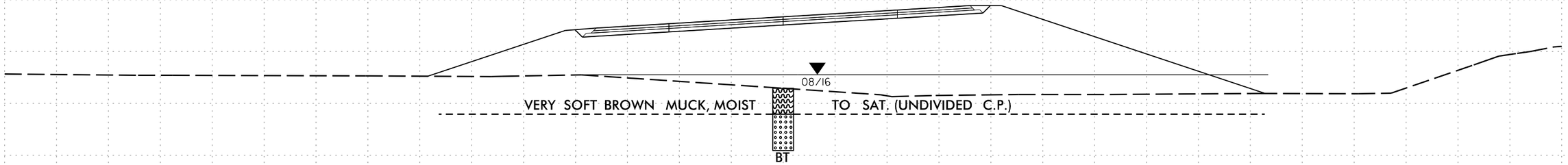
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	51

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

15 10 5 0 -5 -10



74+00.00



73+50.00

-L-

28-OCT-2016 13:31
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jstone AT MICROSTATIONPC2

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	52

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

15 10 5 0 -5

VERY LOOSE TO MEDIUM DENSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

VERY LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

85+00.00

25 20 15 10 5 0 -5

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-05	38LT	76+50	5.0 - 5.5	( )	-	-	13.5	77.9	5.8	2.8	100	97	33	-	42.2

S-05

07/16

VERY LOOSE TO MEDIUM DENSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

VERY SOFT BROWN MUCK, MOIST TO SAT. (UNDIVIDED C.P.)

BT

VERY LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

NM

BT

76+50.00

-L-

25 20 15 10 5 0 -5

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

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jstone AT MICROSTATIONPC2

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-5014	53

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

10 5 0 -5

VERY LOOSE TO MEDIUM DENSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

VERY SOFT BROWN MUCK, MOIST TO SAT. (UNDIVIDED C.P.)

VERY LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

86+00.00

10 5 0 -5

(D) VERY LOOSE TO MEDIUM DENSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

(D)

VERY SOFT BROWN MUCK, MOIST TO SAT. (UNDIVIDED C.P.)

VERY LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

85+85.43

15 10 5 0 -5 -10

(D) VERY LOOSE TO MEDIUM DENSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

(D)

VERY SOFT BROWN MUCK, MOIST TO SAT. (UNDIVIDED C.P.)

VERY LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

NM

BT

85+50.00

-L-

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

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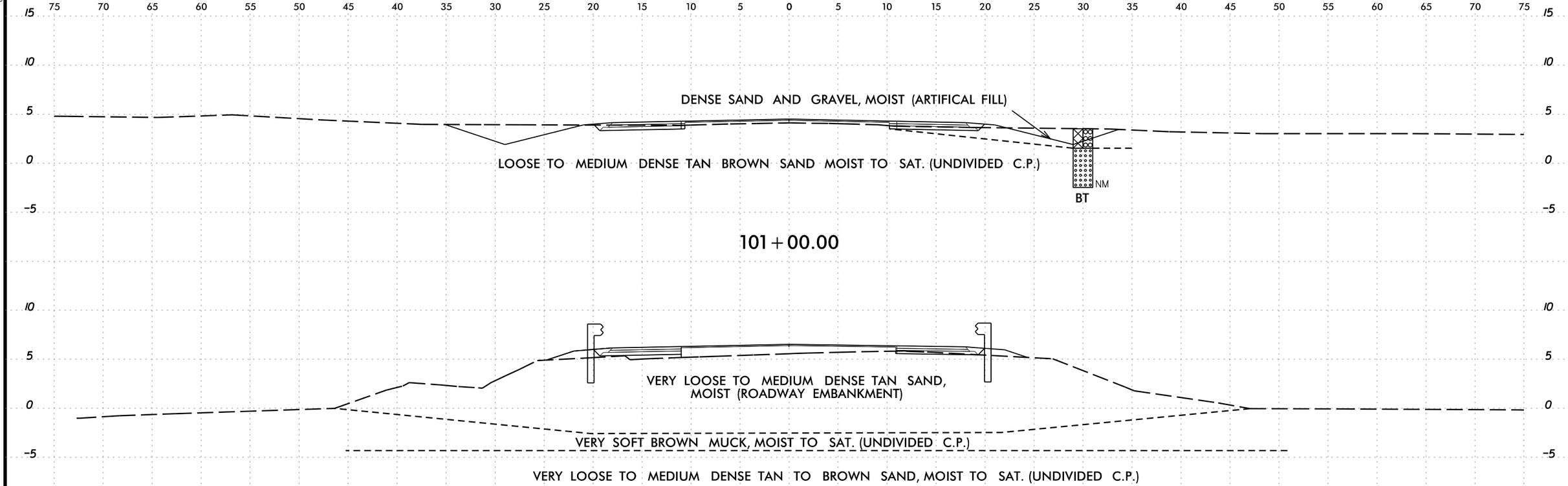
istone AT MICROSTATIONPC2

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	54

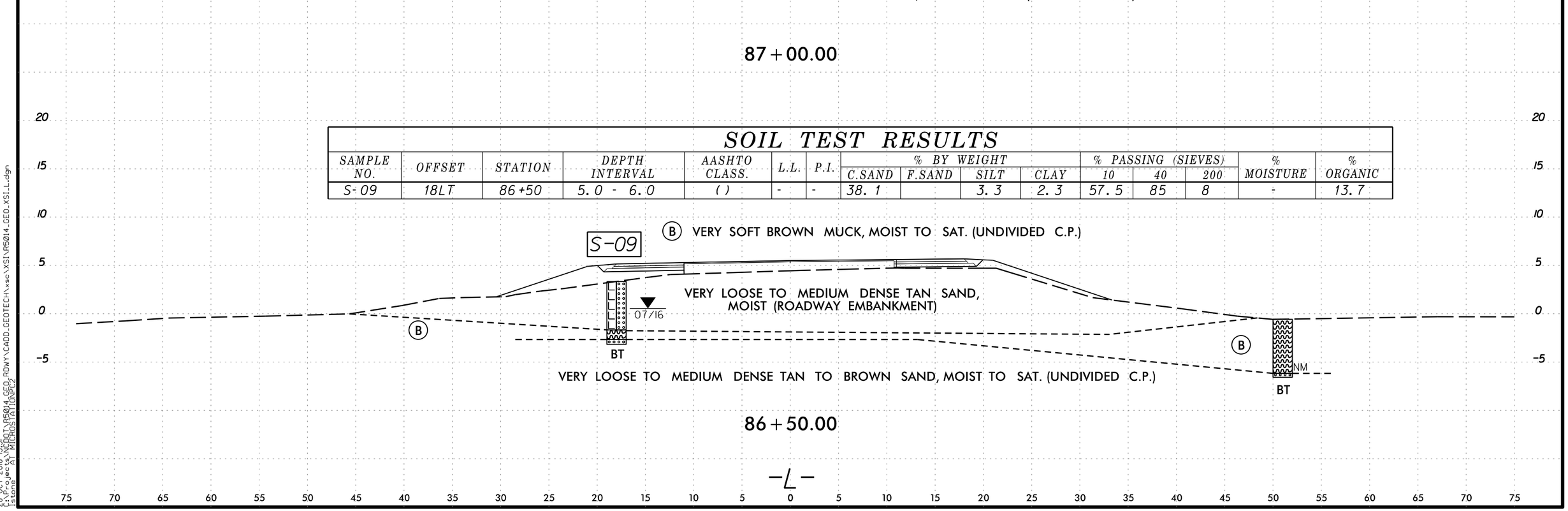


101+00.00

87+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	10	40	200		
S-09	18LT	86+50	5.0 - 6.0	( )	-	-	38.1		3.3	2.3	57.5	85	8	-	13.7



86+50.00

—L—

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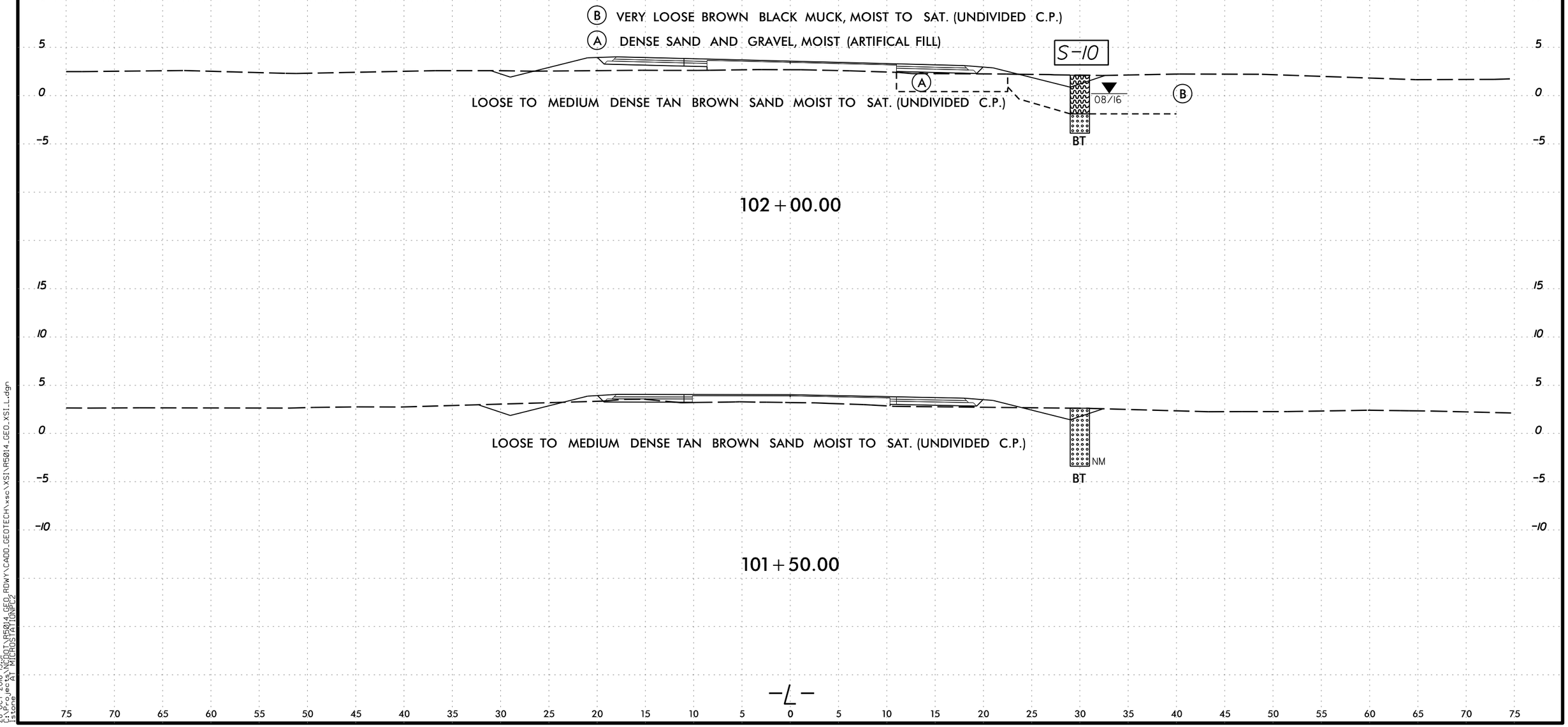
stone AT MICROSTATIONPC2

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-5014	55

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-10	30RT	102+00	0.0 - 4.0	A-2-4(0)	33	NP	26.2	50.3	20.8	2.7	72.6	89	25	-	21.6



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istone AT MICROSTATIONPC2

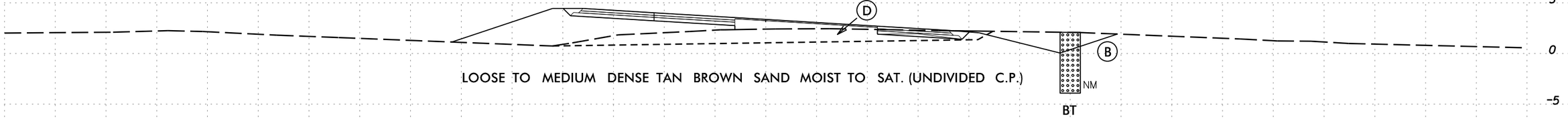
6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	56

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

15
10
5
0
-5

(D) LOOSE TO MEDIUM DENSE TAN BROWN SAND WITH TRACE ORGANICS, MOIST TO SAT. (ROADWAY EMBANKMENT)

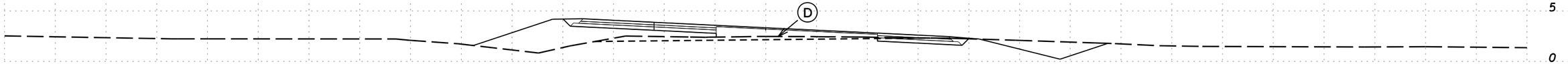


LOOSE TO MEDIUM DENSE TAN BROWN SAND MOIST TO SAT. (UNDIVIDED C.P.)

103 + 00.00

20
15
10
5
0

(D) LOOSE TO MEDIUM DENSE TAN BROWN SAND WITH TRACE ORGANICS, MOIST TO SAT. (ROADWAY EMBANKMENT)

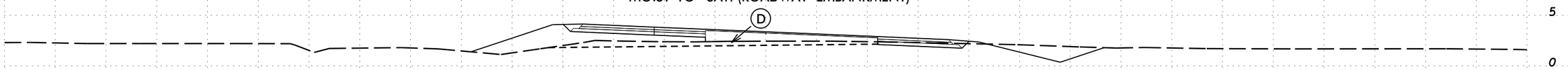


LOOSE TO MEDIUM DENSE TAN BROWN SAND MOIST TO SAT. (UNDIVIDED C.P.)

102 + 50.00

10
5
0
-5

(D) LOOSE TO MEDIUM DENSE TAN BROWN SAND WITH TRACE ORGANICS, MOIST TO SAT. (ROADWAY EMBANKMENT)



LOOSE TO MEDIUM DENSE TAN BROWN SAND MOIST TO SAT. (UNDIVIDED C.P.)

102 + 37.06

$-\mathit{L}-$

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

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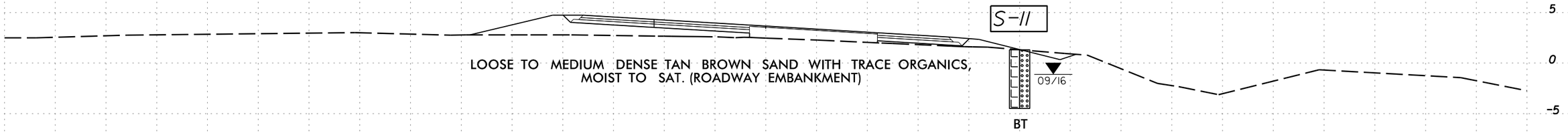
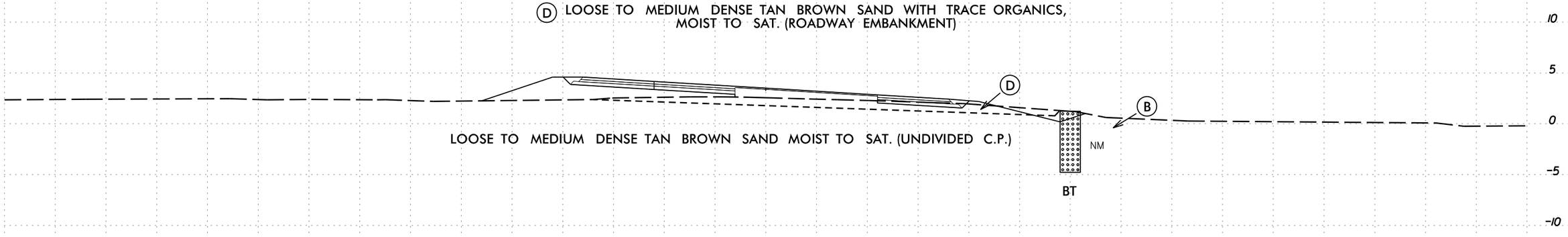
tstone
AT MICROSTATIONPE2

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-11	25RT	104+00	0.0 - 1.0	A-3(0)	32	NP	32.2	62	2.9	2.9	96.3	88	7	-	2.5



104+00.00

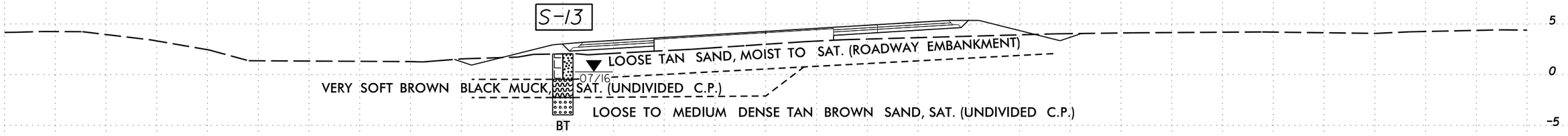


103+50.00

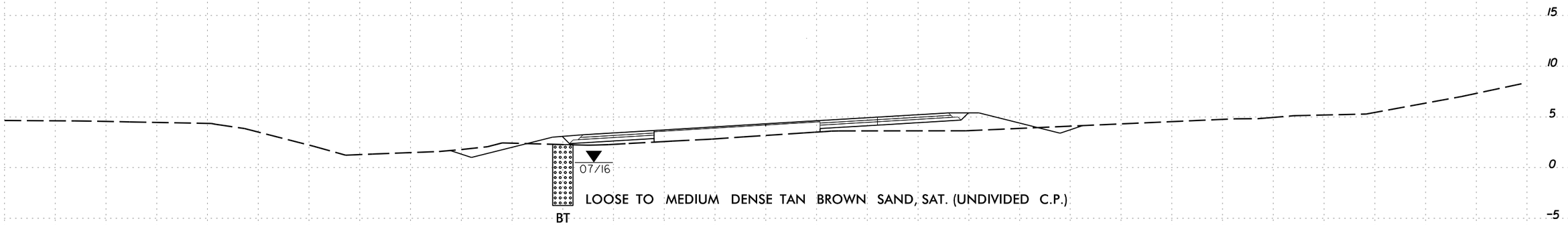
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	58

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-13	20LT	116+00	2.5 - 3.0	-	-	-	-	-	-	-	-	-	-	-	65.8



116 + 00.00



115 + 50.00

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	59

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

10 / 5 / 0 / -5

LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

07/16

LOOSE TO MEDIUM DENSE TAN BROWN SAND, SAT. (UNDIVIDED C.P.)

BT

117 + 00.00

10 / 5 / 0

(D) LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

(D)

VERY SOFT BROWN BLACK MUCK, SAT. (UNDIVIDED C.P.)

LOOSE TO MEDIUM DENSE TAN BROWN SAND, SAT. (UNDIVIDED C.P.)

116 + 50.00

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-24	30LT	116+42	0.0 - 1.0	A-5(0)	86	NP	4	13.4	60.9	21.7	82.6	98	83	-	29.2

20 / 15 / 10 / 5 / 0

116+42 (D) LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

S-24

07/16

VERY SOFT BROWN BLACK MUCK, SAT. (UNDIVIDED C.P.)

BT

LOOSE TO MEDIUM DENSE TAN BROWN SAND, SAT. (UNDIVIDED C.P.)

(D)

116 + 38.00

-L-

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

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jstone AT MICROSTATIONPC2

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	60

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

10 / 5 / 0 / -5

Ⓓ LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST TO SAT. (ROADWAY EMBANKMENT)

VERY LOOSE TAN BROWN MODERATELY ORGANIC SAND, MOIST (UNDIVIDED C.P.)

LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

131+55.98

10 / 5 / 0

Ⓓ LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST TO SAT. (ROADWAY EMBANKMENT)

LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

130+98.95

25 / 20 / 15 / 10 / 5 / 0

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-14	14LT	130+50	0.0 - 1.0	A-3(0)	32	NP	41.7	53.6	2.7	2	97.3	83	6	-	-

Ⓓ LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST TO SAT. (ROADWAY EMBANKMENT)

S-14

07/16

BT

LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

130+50.00

-L-

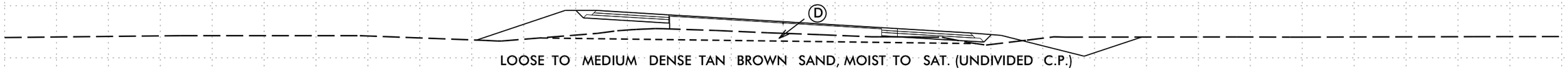
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	61

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

10 / 5 / 0

Ⓓ LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST TO SAT. (ROADWAY EMBANKMENT)

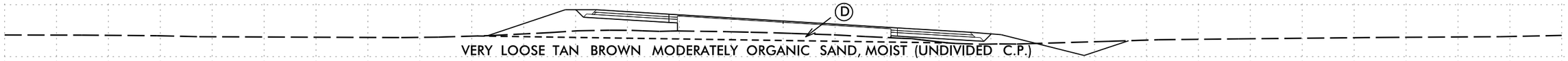


LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

133 + 00.00

15 / 10 / 5 / 0

Ⓓ LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST TO SAT. (ROADWAY EMBANKMENT)



VERY LOOSE TAN BROWN MODERATELY ORGANIC SAND, MOIST (UNDIVIDED C.P.)

LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

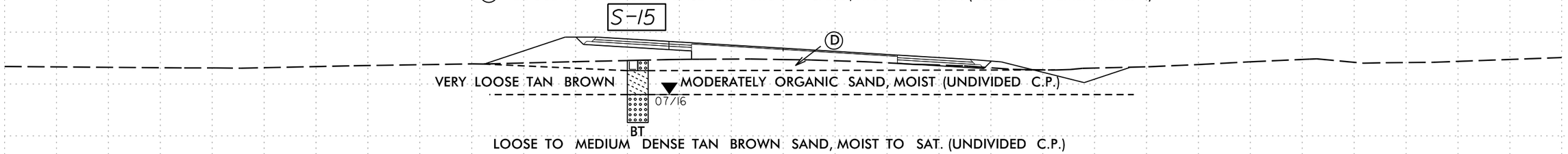
132 + 50.00

20 / 15 / 10 / 5 / 0 / -5

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-15	14LT	132+00	1.0 - 3.0	A-2-5(0)	59	NP	18.8	72.9	6.3	2	97.7	86	10	-	-

Ⓓ LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST TO SAT. (ROADWAY EMBANKMENT)



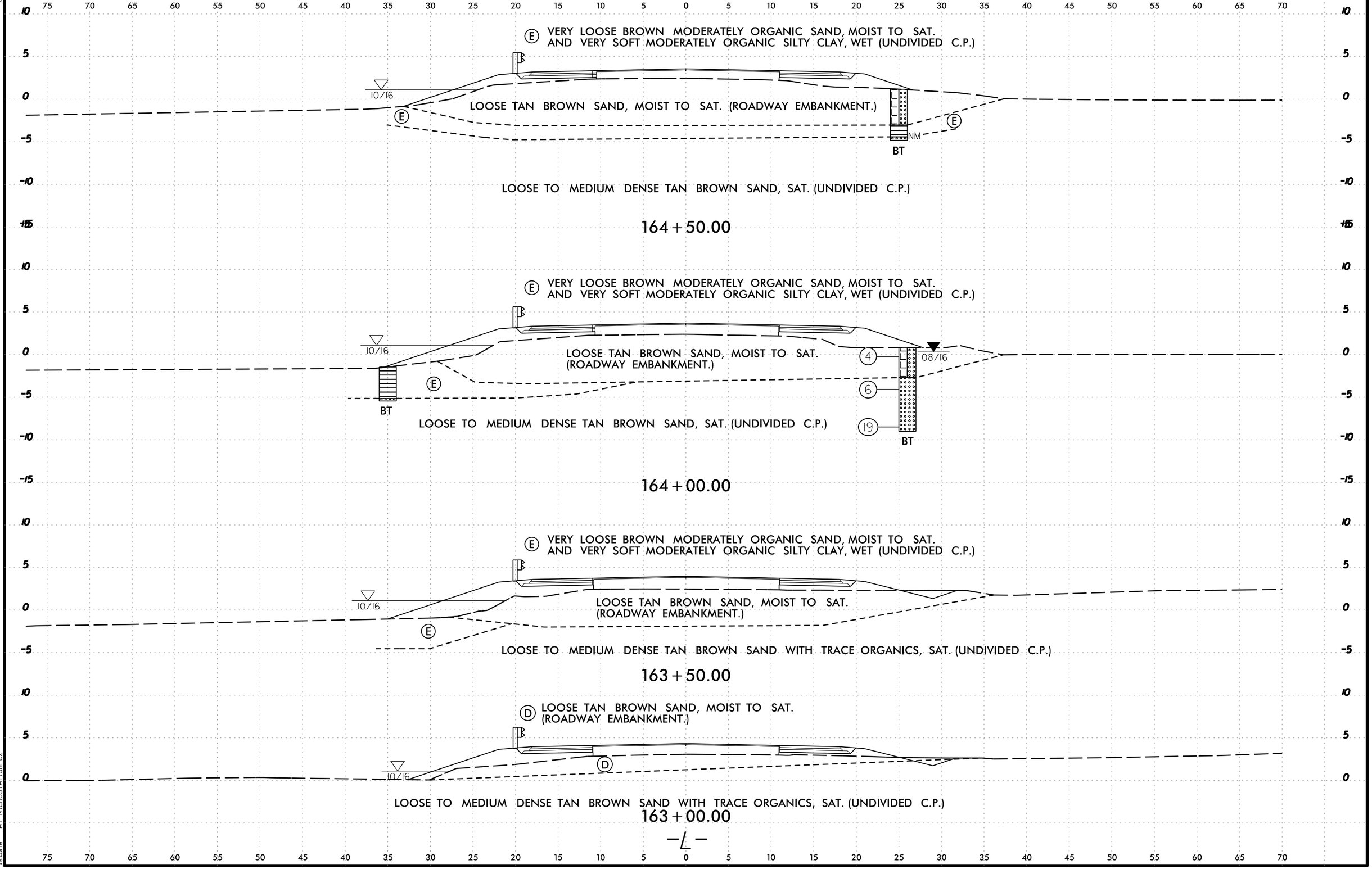
LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

132 + 00.00

-L-

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

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	62

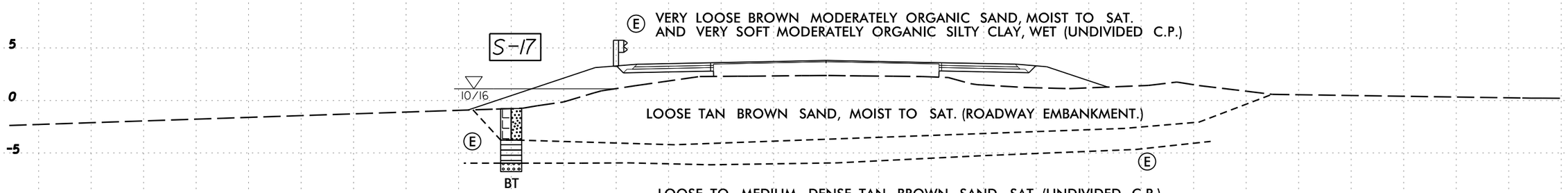


0 2.5 5

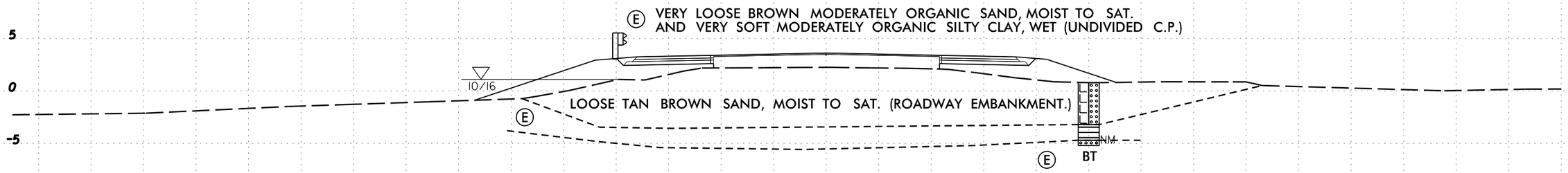
PROJ. REFERENCE NO.	SHEET NO.
R-5014	63

SOIL TEST RESULTS

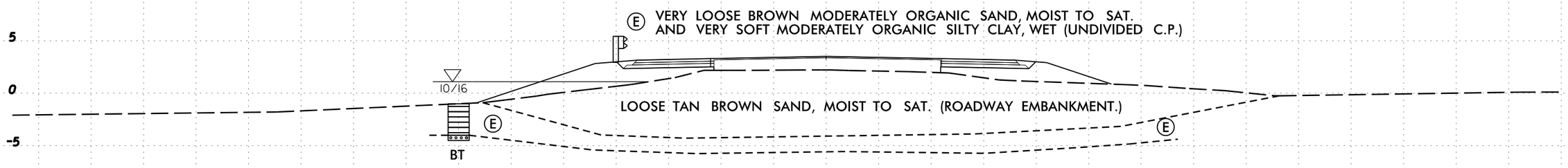
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-17	30LT	166+00	3.0 - 4.0	A-7-5(31)	71	35	5.3	18	37	39.7	99.9	97	78	-	-



166+00.00



165+50.00



165+00.00

—L—

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	64

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

15 10 5 0 -5 -10 -15

Ⓔ VERY LOOSE BROWN MODERATELY ORGANIC SAND, MOIST TO SAT.
AND VERY SOFT MODERATELY ORGANIC SILTY CLAY, WET (UNDIVIDED C.P.)

10/16

LOOSE TAN BROWN SAND, MOIST TO SAT. (ROADWAY EMBANKMENT.)

Ⓔ

LOOSE TO MEDIUM DENSE TAN BROWN SAND, SAT. (UNDIVIDED C.P.)

167 + 30.60

Ⓔ VERY LOOSE BROWN MODERATELY ORGANIC SAND, MOIST TO SAT.
AND VERY SOFT MODERATELY ORGANIC SILTY CLAY, WET (UNDIVIDED C.P.)

10/16

LOOSE TAN BROWN SAND, MOIST TO SAT.
(ROADWAY EMBANKMENT.)

Ⓔ Ⓔ

BT

LOOSE TO MEDIUM DENSE TAN BROWN SAND, SAT. (UNDIVIDED C.P.)

167 + 00.00

Ⓔ VERY LOOSE BROWN MODERATELY ORGANIC SAND, MOIST TO SAT.
AND VERY SOFT MODERATELY ORGANIC SILTY CLAY, WET (UNDIVIDED C.P.)

10/16

Ⓔ

LOOSE TAN BROWN SAND, MOIST TO SAT.
(ROADWAY EMBANKMENT.)

Ⓔ

NM

BT

LOOSE TO MEDIUM DENSE TAN BROWN SAND, SAT. (UNDIVIDED C.P.)

166 + 50.00

—L—

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

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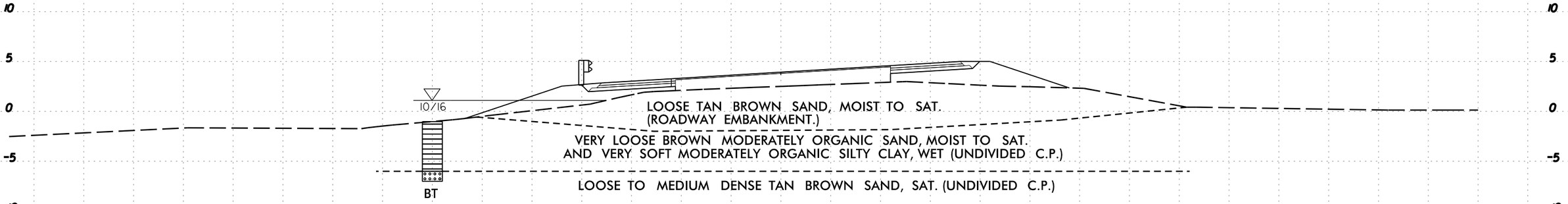
C:\Projects\NCDOT\R5014_GEO_RDWY\CADD_GEOTECH\xsc\XS1\R5014_Geo_xs_L_163-174.dgn
tstone AT MICROSTATIONPC2

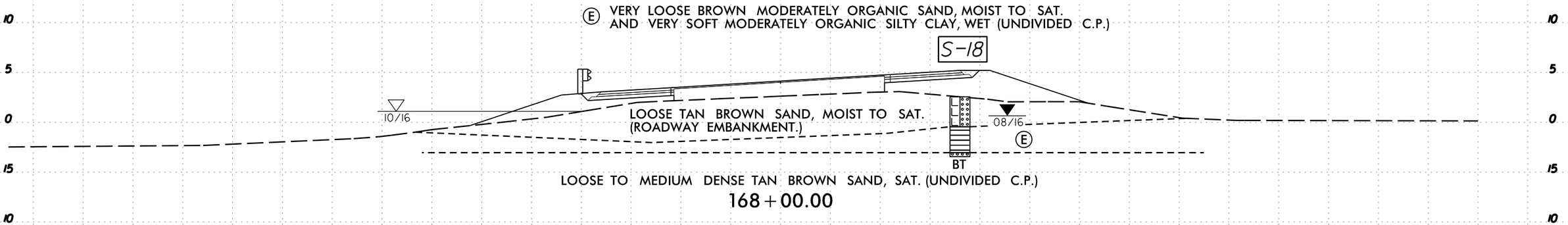
0 2,5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	65



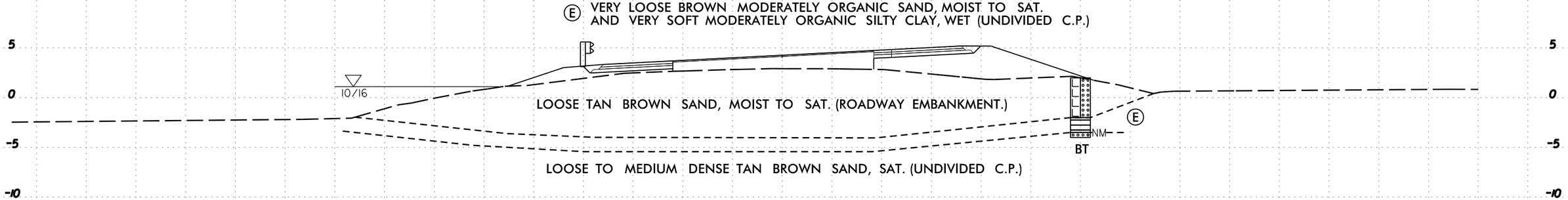
168 + 50.00

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-18	18RT	168+00	3.0 - 4.0	A-7-5(28)	78	33	9.7	18.8	32.7	38.8	91.4	93	73	-	13.3



168 + 00.00



167 + 50.00

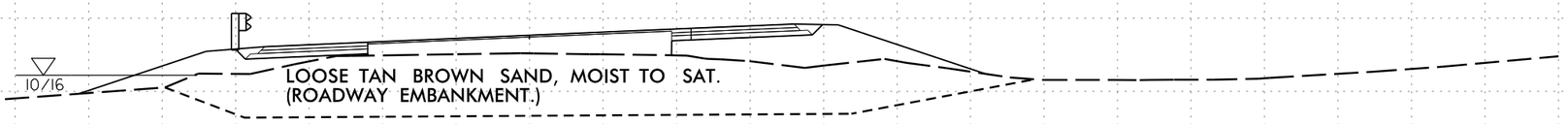
−L−

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	66

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

10 5 0 -5



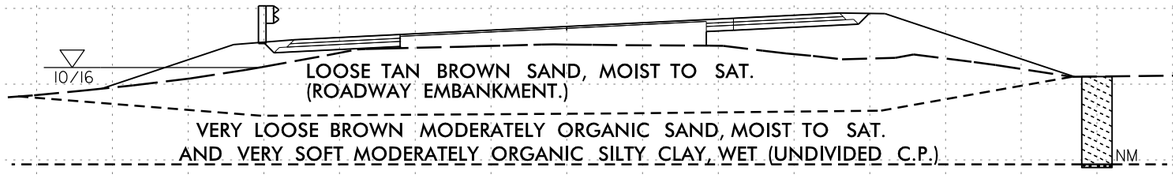
LOOSE TAN BROWN SAND, MOIST TO SAT.
(ROADWAY EMBANKMENT.)

VERY LOOSE BROWN MODERATELY ORGANIC SAND, MOIST TO SAT.
AND VERY SOFT MODERATELY ORGANIC SILTY CLAY, WET (UNDIVIDED C.P.)

LOOSE TO MEDIUM DENSE TAN BROWN SAND, SAT. (UNDIVIDED C.P.)

169+63.22

10 5 0 -5 -10 -15



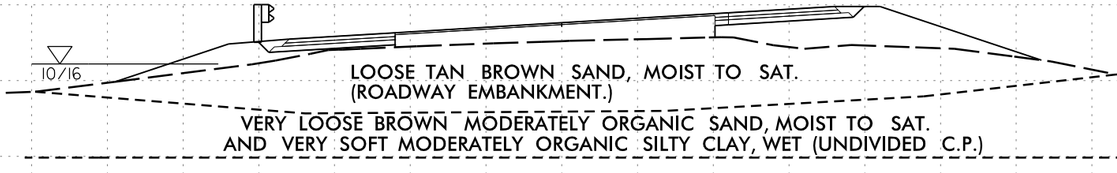
LOOSE TAN BROWN SAND, MOIST TO SAT.
(ROADWAY EMBANKMENT.)

VERY LOOSE BROWN MODERATELY ORGANIC SAND, MOIST TO SAT.
AND VERY SOFT MODERATELY ORGANIC SILTY CLAY, WET (UNDIVIDED C.P.)

LOOSE TO MEDIUM DENSE TAN BROWN SAND, SAT. (UNDIVIDED C.P.)

169+50.00

10 5 0 -5



LOOSE TAN BROWN SAND, MOIST TO SAT.
(ROADWAY EMBANKMENT.)

VERY LOOSE BROWN MODERATELY ORGANIC SAND, MOIST TO SAT.
AND VERY SOFT MODERATELY ORGANIC SILTY CLAY, WET (UNDIVIDED C.P.)

LOOSE TO MEDIUM DENSE TAN BROWN SAND, SAT. (UNDIVIDED C.P.)

169+00.00

-L-

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

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tstone AT MICROSTATIONPC2

6/23/16

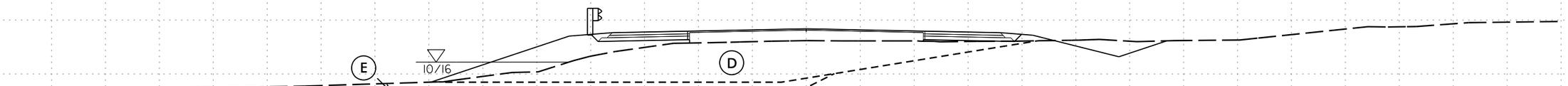
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	67

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

15 10 5 0 -5 10 5 0 -5 20 15 10 5 0 -5

(D) LOOSE TAN BROWN SAND, MOIST TO SAT. (ROADWAY EMBANKMENT.)

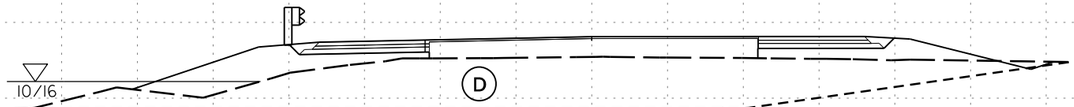
(E) VERY LOOSE BROWN MODERATELY ORGANIC SAND, MOIST TO SAT.
AND VERY SOFT MODERATELY ORGANIC SILTY CLAY, WET (UNDIVIDED C.P.)



LOOSE TO MEDIUM DENSE TAN BROWN SAND, SAT. (UNDIVIDED C.P.)

171+00.00

(D) LOOSE TAN BROWN SAND, MOIST TO SAT. (ROADWAY EMBANKMENT.)



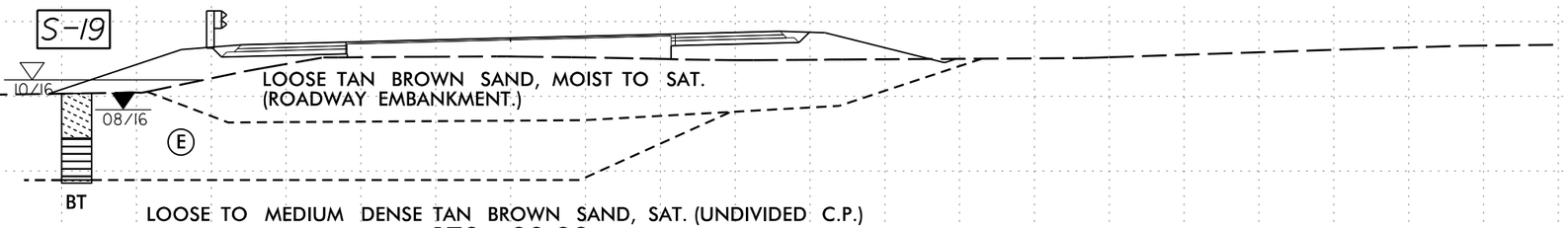
VERY LOOSE BROWN MODERATELY ORGANIC SAND, MOIST TO SAT.
AND VERY SOFT MODERATELY ORGANIC SILTY CLAY, WET (UNDIVIDED C.P.)

LOOSE TO MEDIUM DENSE TAN BROWN SAND, SAT. (UNDIVIDED C.P.)

170+50.00

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-19	29LT	170+00	0.0 - 3.0	A-2-4(0)	26	NP	26.9	55.7	10.8	6.6	95.6	90	19	-	5.3



LOOSE TO MEDIUM DENSE TAN BROWN SAND, SAT. (UNDIVIDED C.P.)

170+00.00

-L-

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

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jstone AT MICROSTATIONPC2

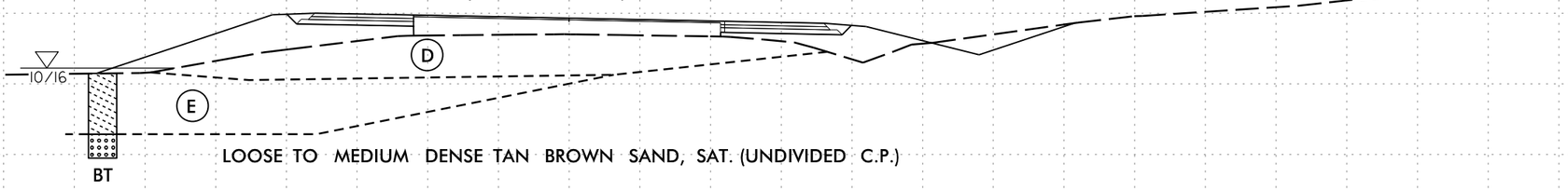
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	68

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

15 10 5 0 -5 -10 15

D LOOSE TAN BROWN SAND, MOIST TO SAT. (ROADWAY EMBANKMENT.)

E VERY LOOSE BROWN MODERATELY ORGANIC SAND, MOIST TO SAT. (UNDIVIDED C.P.)

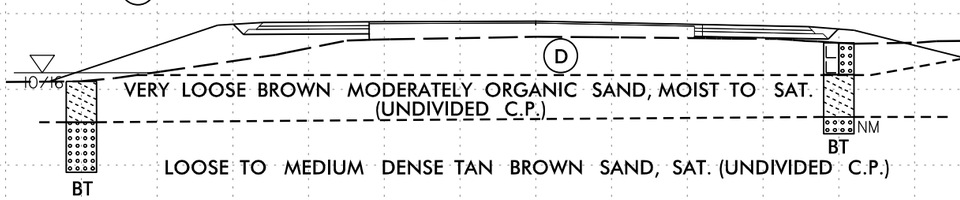


LOOSE TO MEDIUM DENSE TAN BROWN SAND, SAT. (UNDIVIDED C.P.)

172 + 50.00

D LOOSE TAN BROWN SAND, MOIST TO SAT. (ROADWAY EMBANKMENT.)

VERY LOOSE BROWN MODERATELY ORGANIC SAND, MOIST TO SAT. (UNDIVIDED C.P.)

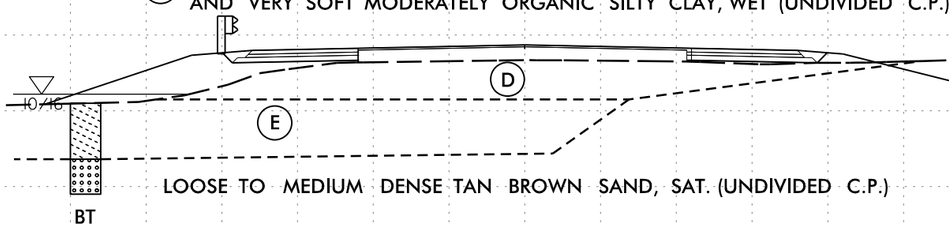


LOOSE TO MEDIUM DENSE TAN BROWN SAND, SAT. (UNDIVIDED C.P.)

172 + 00.00

D LOOSE TAN BROWN SAND, MOIST TO SAT. (ROADWAY EMBANKMENT.)

E VERY LOOSE BROWN MODERATELY ORGANIC SAND, MOIST TO SAT. AND VERY SOFT MODERATELY ORGANIC SILTY CLAY, WET (UNDIVIDED C.P.)



LOOSE TO MEDIUM DENSE TAN BROWN SAND, SAT. (UNDIVIDED C.P.)

171 + 50.00

—L—

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	69

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

10 5 0 15 10 5 0 -5 -10

(D) LOOSE TAN BROWN SAND, MOIST TO SAT. (ROADWAY EMBANKMENT.)

LOOSE TO MEDIUM DENSE TAN BROWN SAND, MOIST TO SAT. (UNDIVIDED C.P.)

174+50.00

LOOSE TO MEDIUM DENSE TAN BROWN SAND, SAT. (UNDIVIDED C.P.)

NM

BT

174+00.00

(D) LOOSE TAN BROWN SAND, MOIST TO SAT. (ROADWAY EMBANKMENT.)

(E) VERY LOOSE BROWN MODERATELY ORGANIC SAND, MOIST TO SAT. (UNDIVIDED C.P.)

LOOSE TO MEDIUM DENSE TAN BROWN SAND, SAT. (UNDIVIDED C.P.)

173+50.00

(D) LOOSE TAN BROWN SAND, MOIST TO SAT. (ROADWAY EMBANKMENT.)

(E) VERY LOOSE BROWN MODERATELY ORGANIC SAND, MOIST TO SAT. (UNDIVIDED C.P.)

10/16

LOOSE TO MEDIUM DENSE TAN BROWN SAND, SAT. (UNDIVIDED C.P.)

BT

172+98.50

-L-

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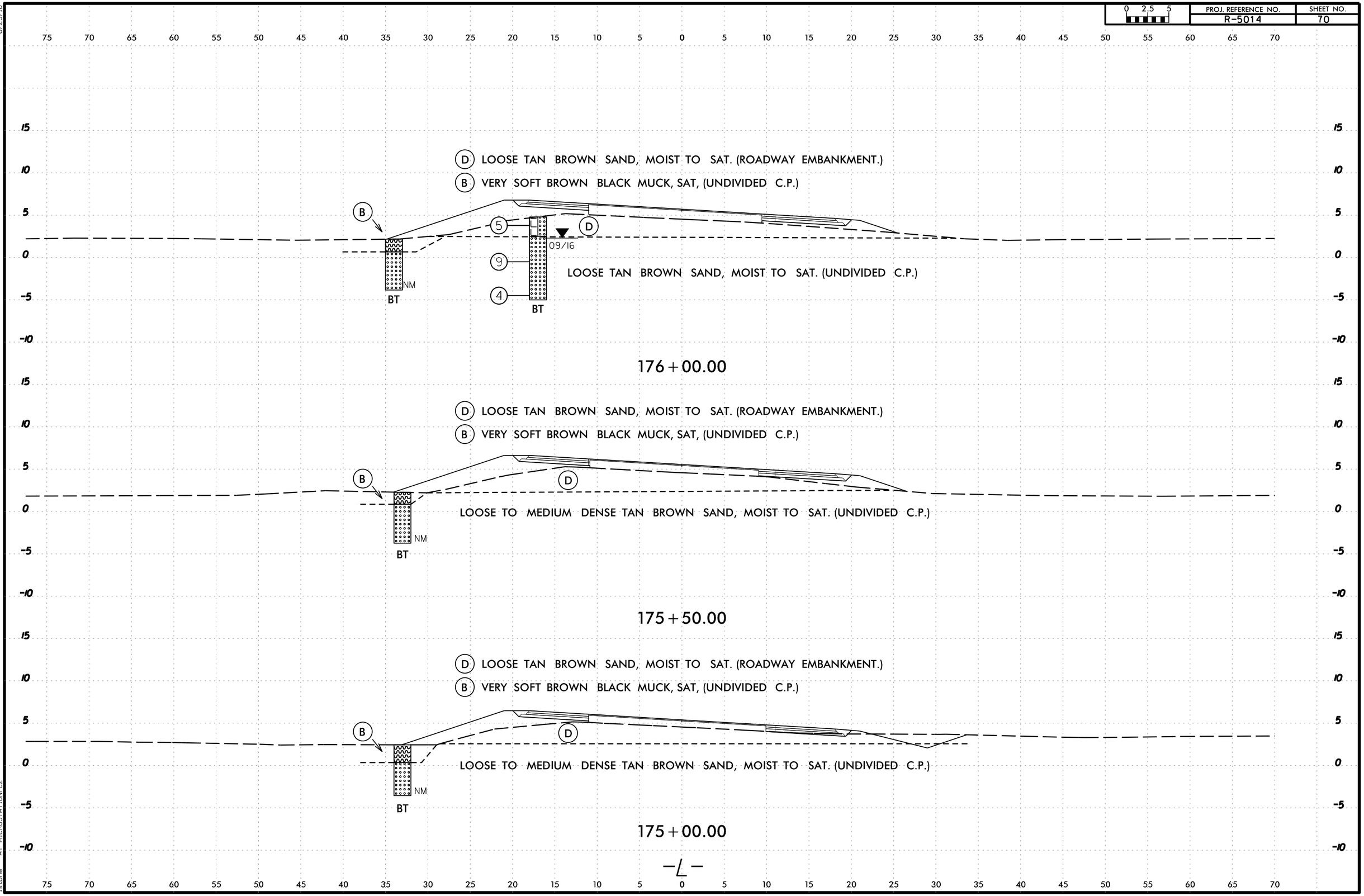
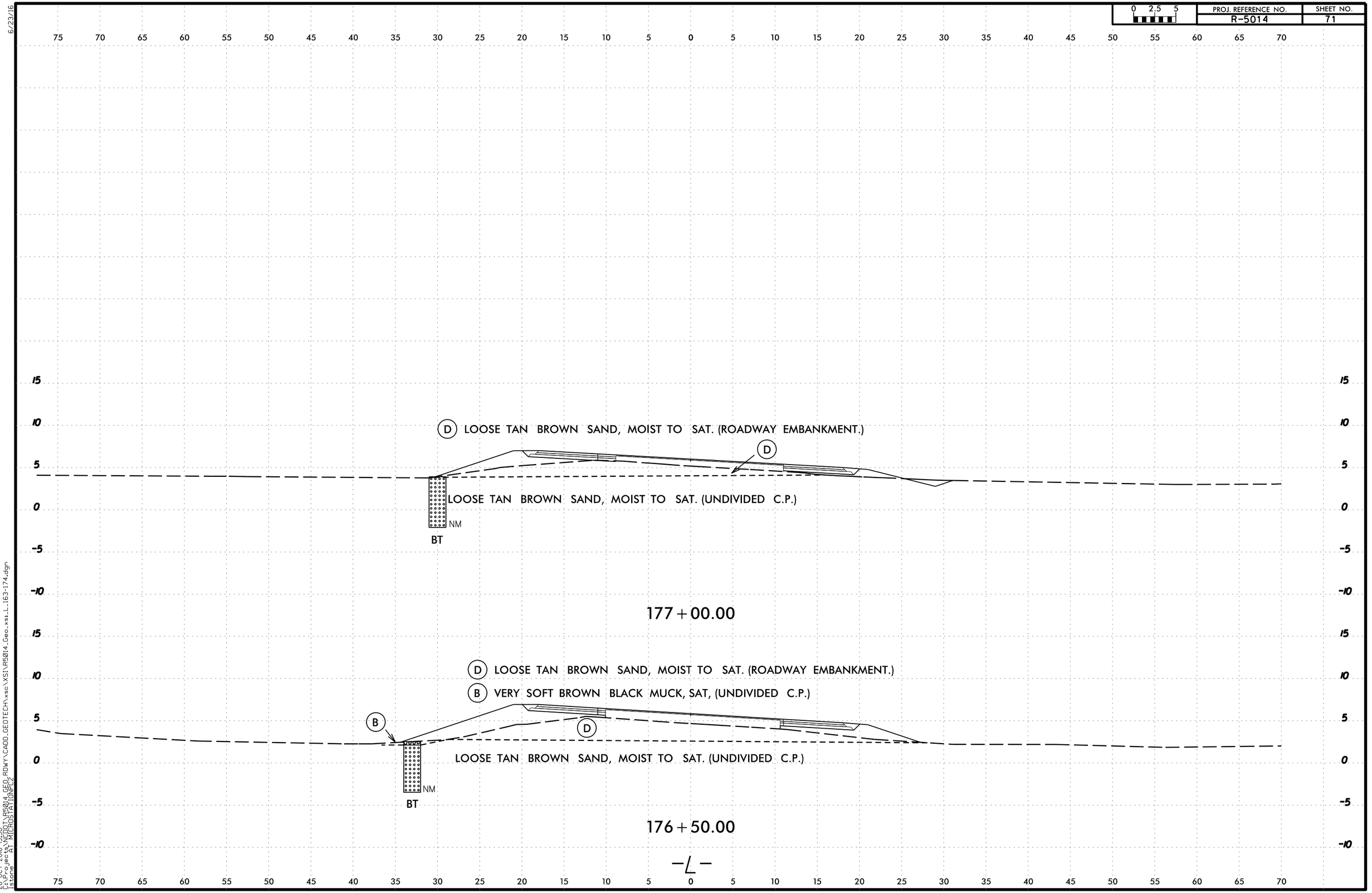
tstone
AT MICROSTATION PE2



6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	71



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jstone AT MICROSTATIONPC2

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5014	72

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

B VERY SOFT BROWN BLACK MUCK, MOIST TO SAT. (UNDIVIDED C.P.)

D VERY LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

VERY LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, SAT. (UNDIVIDED C.P.)

10 5 0 -5

12+50.00

B VERY SOFT BROWN BLACK MUCK, MOIST TO SAT. (UNDIVIDED C.P.)

D VERY LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

VERY LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, SAT. (UNDIVIDED C.P.)

10 5 0 -5

12+00.00

A LOOSE TO MEDIUM DENSE TAN TO BROWN SAND AND GRAVEL, MOIST TO SAT. (ARTIFICIAL FILL)

B VERY SOFT BROWN BLACK MUCK, MOIST TO SAT. (UNDIVIDED C.P.)

D VERY LOOSE TAN SAND, MOIST (ROADWAY EMBANKMENT)

07/16

VERY LOOSE TO MEDIUM DENSE TAN TO BROWN SAND, SAT. (UNDIVIDED C.P.)

BT

15 10 5 0 -5 -10

11+65.40

-Y3A-

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

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tstone AT MICROSTATIONPC2