CONTRACT: ID: P-5208E

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

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LINE	STATION	PLAN	PROFILE	XSECT
-L-	9+62.43-75+30.00	4-9	10-12	X-6, X-7, X-8 X-10, X-11 X-16, X-17 X-21, X-22 X-26, X-29 X-30, X-33 X-35, X-36 X-39, X-40 X-41, X-42
-Y1-	10+00.00-17+00.00	8	12	NA

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

ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. P-5208E F.A. PROJ. _____

COUNTY MECKLENBURG & CABARRUS

PROJECT DESCRIPTION CALDWELL PARK DRIVE EXTENSION ON NEW LOCATION FROM CHOCHRANE FARM PROPERTY TO EXISTING CALDWELL PARK DRIVE

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-5208E	1	35

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
50000.1.STR20T1B		P.E.
		R/W & UTIL

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF PREPARING THE SCOPE OF WORK TO BE INCLUDED IN THE REQUEST FOR PROPOSAL. 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) TDT-6850. THE SUBSURFACE PLANS, FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

SOIL AND ROCK BOUNDARIES WITHIN A BOREHOLE ARE BASED ON GEOTECHNICAL INTERPRETATION UNLESS ENCOUNTERED IN A SAMPLE. INTERPRETED BOUNDARIES MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN SAMPLED STRATA , AND BOREHOLE INFORMATION MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS. 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 DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, OR THE 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.

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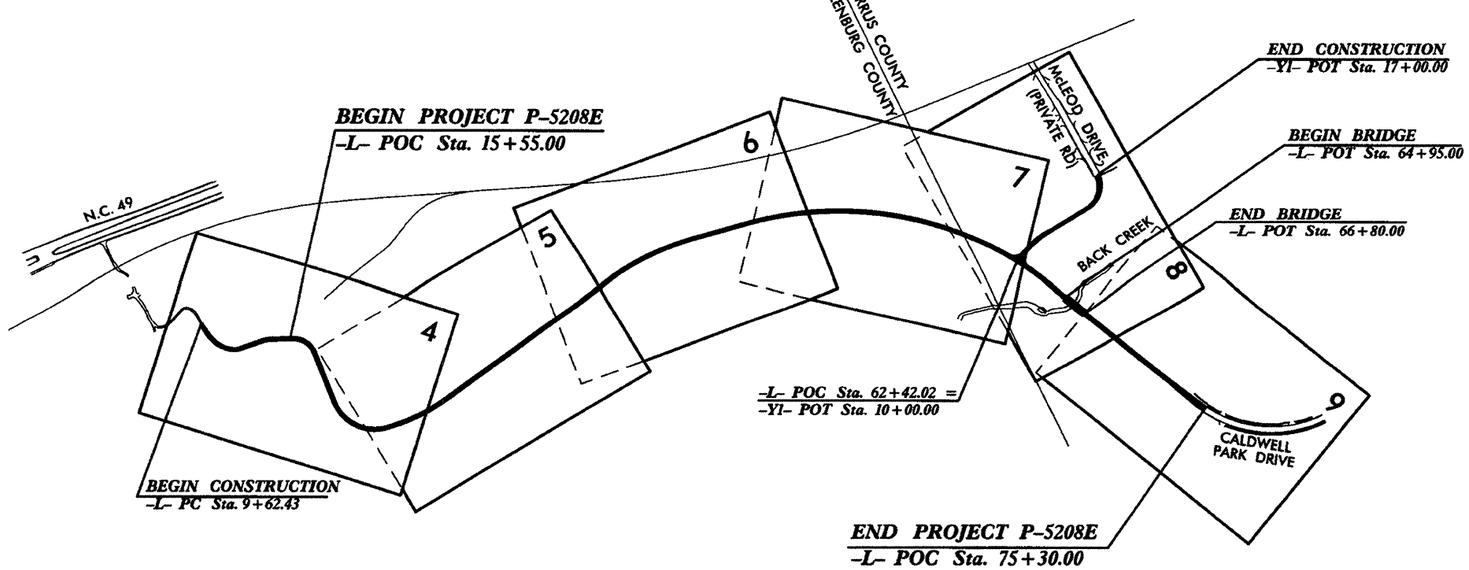
NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.



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SUBMITTED BY S&ME, INC.

DATE APRIL 19, 2012

NORTH CAROLINA PROFESSIONAL SEAL 14155 ENGINEER ALBERT F. RIGGS, JR. 4/19/12

PROJECT REFERENCE NO.	SHEET NO.
P-5208E	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 TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

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

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING • 10 • 40 • 200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
LIQUID LIMIT PLASTIC INDEX	6 MX		NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	<4	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<0.25
	SOFT	2 TO 4	0.25 TO 0.50
	MEDIUM STIFF	4 TO 8	0.5 TO 1.0
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	>30	>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	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL — SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.
UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	20 - 35%
HIGHLY ORGANIC	>10%	>20%	HIGHLY	35% AND ABOVE

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW — PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
- SPRING OR SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- 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 W/ CORE
- SPT N-VALUE
- REF — SPT REFUSAL

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:
- [ ] MOBILE B-___
- [ ] BK-51
- [ ] CME-45C
- [ ] CME-550
- [ ] PORTABLE HOIST
- [X] DIEDRICH D-50
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [ ] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [ ] TRICONE _____" TUNG.-CARB.
- [ ] CORE BIT
- [X] 3 7/8" H.S.A.

HAMMER TYPE:
- [X] AUTOMATIC
- [ ] MANUAL

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

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 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, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS SPT N VALUES < 100 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 FEET
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 THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 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: R/R SPIKE SET IN FIRST JOINT OF CONC. C&G AT EOP ON EAST SIDE OF PRIVATE DRIVE
STA 360+18.91 163.38' RT -BL- ELEVATION: 664.51 FT.

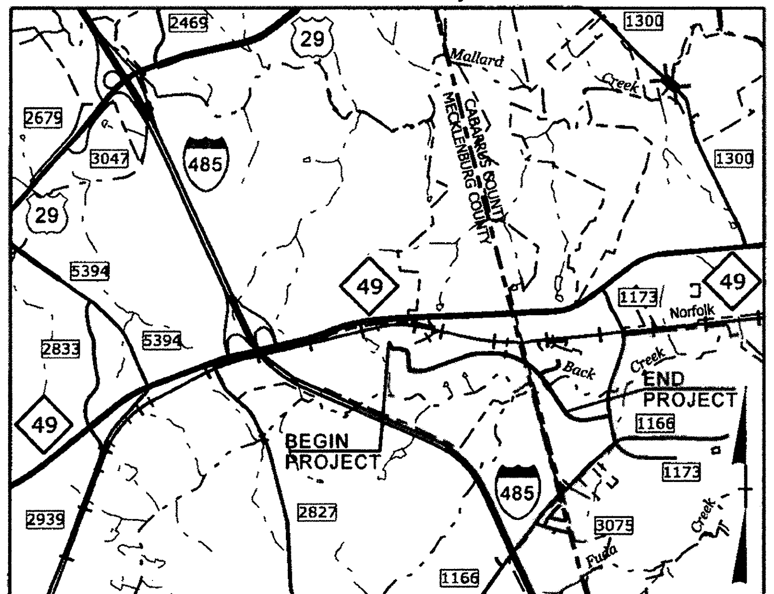
NOTES:
BRIDGE BORINGS EB1-A, EB1-B, B1-A, B1-B, EB2-A AND EB2-B TO BE SUBMITTED IN BRIDGE INVENTORY REPORT UNDER SEPARATE COVER.

REVISED 09/23/09

TIP PROJECT: P-5208E

CONTRACT:

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



SKETCH MAP SHOWING THE VICINITY OF STATE PROJECT P-5208E

STATE OF NORTH CAROLINA
NCDOT RAIL DIVISION

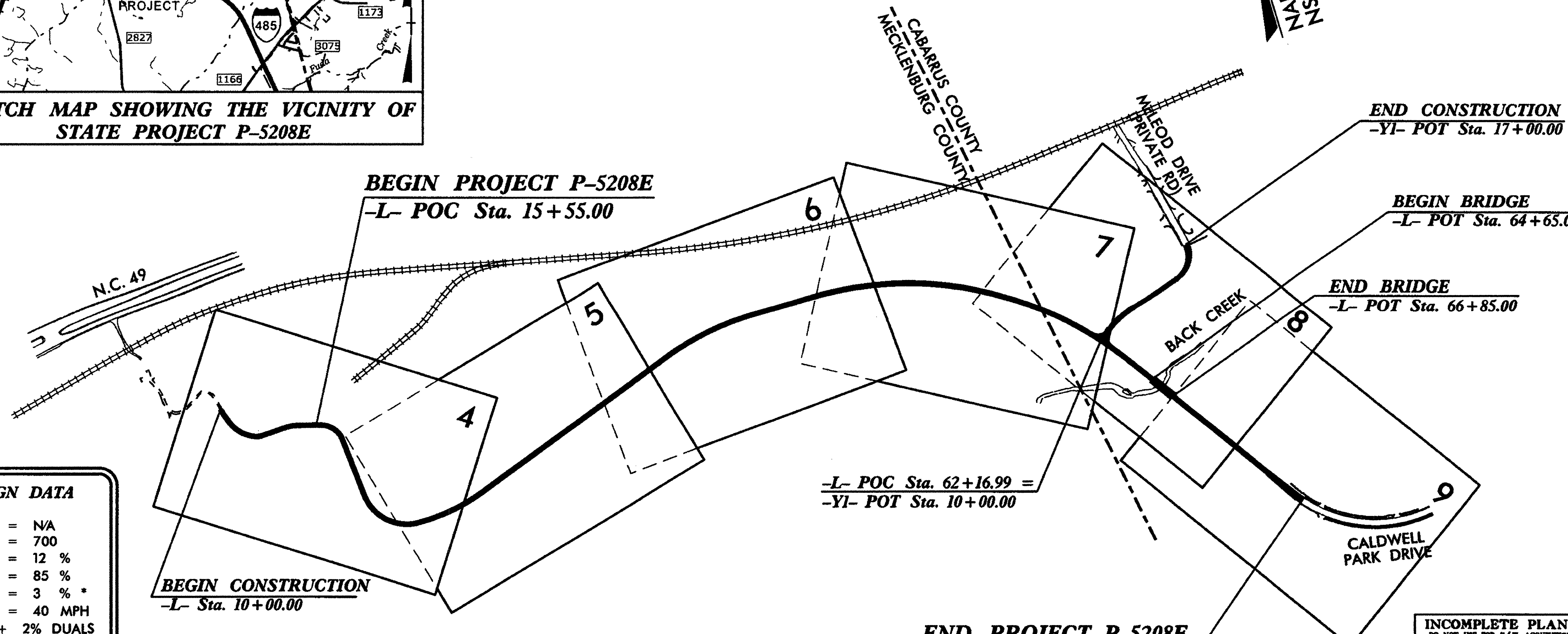
MECKLENBURG & CABARRUS COUNTIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-5208E	2A	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
50000.1.STR20T1B		P.E.	

LOCATION: CALDWELL PARK DRIVE EXTENSION ON NEW LOCATION FROM COCHRANE FARM PROPERTY TO EXISTING CALDWELL PARK DRIVE

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

NAD 83/ NSRS 2007



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

INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION

DESIGN DATA

ADT 2012 = N/A
ADT 2035 = 700
DHV = 12 %
D = 85 %
T = 3 % *
V = 40 MPH
* 1% TTST + 2% DUALS
FUNC CLASS = LOCAL

GRAPHIC SCALES

50 25 0 50 100 PLANS
50 25 0 50 100 PROFILE (HORIZONTAL)
10 5 0 10 20 PROFILE (VERTICAL)

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT P-5208E = 1.096 MILES
LENGTH STRUCTURES TIP PROJECT P-5208E = 0.035 MILES
TOTAL LENGTH TIP PROJECT P-5208E = 1.131 MILES

SUBMITTAL: 25% PLANS
DATE: NOVEMBER 17, 2011

Prepared In the Office of:
Florence & Hutcheson
CONSULTING ENGINEERS

2012 STANDARD SPECIFICATIONS

DAVID C. WALLER, PE
PROJECT ENGINEER

LETTING DATE: APRIL 16, 2013

RIGHT OF WAY DATE: APRIL 16, 2012

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

HYDRAULICS ENGINEER
SIGNATURE: P.E.

NC DEPARTMENT OF TRANSPORTATION
RAIL DIVISION
ENGINEERING AND SAFETY BRANCH
CAPITAL YARD
1556 MAIL SERVICE CENTER
RALEIGH, NC 27699-1556

18-APR-2012 09:33
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BRatt1 AT BRATT17-13500

Earthwork Balance Sheet

Volumes in Cubic Yards

PROJECT: P-5208E COUNTY: Cabarrus / Mecklenburg DATE: 2/12/2013 COMPILED BY: DCW

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. +20%		ROCK	SUITABLE	UNSUIT.	TOTAL
-L- 9+63.43	-L- 30+00.00	4,914	59	1,018	170	4,685	6,455	59	6,382	7,717	2,973			1,188	1,188
	SUBTOTAL	4,914	59	1,018	170	4,685	6,455	59	6,382	7,717	2,973			1,188	1,188
-L- 30+00.00	-L- 64+95.00	81,207	33	2,257	4,915	76,259	38,821	33	38,780	46,569			29,723	7,172	36,895
-Y1- 10+50.00	-Y1- 17+00.00	466				466	13,783		13,783	16,540	16,074				
	SUBTOTAL	81,673	33	2,257	4,915	76,725	52,604	33	52,563	63,109	16,074		29,723	7,172	36,895
-L- 66+80.00	-L- 75+30.00	640		2,478	396	244	15,792		15,792	18,950	18,706			2,874	2,874
	SUBTOTAL	640		2,478	396	244	15,792		15,792	18,950	18,706			2,874	2,874
TOTAL		87,227	91	5,753	5,481	81,655	74,851	91	74,737	89,776	37,753		29,723	11,234	40,957
MATERIAL FOR SHOULDER CONSTRUCTION							500		500	600	600				
LOSS DUE TO CLEARING & GRUBBING		-10,680				-10,680					10,680				
ADDITIONAL UNDERCUT				8,200			8,200		8,200	9,840	9,840			8,200	8,200
ROCK WASTE TO REPLACE BORROW															
ADJUST FOR ROCK WASTE															
WASTE IN LIEU OF BORROW											-29,723		-29,723		-29,723
PROJECT TOTAL		76,547	91	13,953	5,481	70,975	83,551	91	83,437	100,216	29,150			19,434	19,434
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT											1,457				
GRAND TOTAL		76,547	91	13,953	5,481	70,975	83,551	91	83,437	100,216	30,607			19,434	19,434
SAY		76,560		13,960							30,650				

Approx. quantities only. Borrow, fine grading, clearing & grubbing and removal of existing pavement will be paid for at the lump sum price for "Grading".

EST. DDE = 1000 CUBIC YARDS
SHOULDER BORROW = 500 CUBIC YARDS
EST. SHALLOW UNDERCUT = 750
EST.SHALLOW UNDERCUT BY STATIONS = 0
TOTAL SHALLOW UNDERCUT = 750
CLASS IV SUBGRADE STABILIZATION = 2,200 TONS
PER GEOTECH RECOMMENDATION, ESTIMATED 8,200 CUBIC YARDS OF UNDERCUT TO BE USED IN THE DISCRETION OF THE RESIDENT ENGINEER.

TO: Simpson Engineers & Associates
5520 Dillard Drive, Suite 120
Cary, North Carolina 27518

ATTENTION: Mr. Andy Batts, P.E.

FROM: S&ME, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

STATE PROJECT: 50000.1.STR20T1B
FEDERAL PROJECT: N/A
TIP NUMBER: P-5208E
COUNTY: Mecklenburg and Cabarrus
S&ME PROJECT NO. 1051-11-285
DESCRIPTION: Caldwell Park Drive Extension Grade Separation

SUBJECT: Roadway Subsurface Investigation – Inventory Report

Project Description

S&ME, Inc. has completed he authorized roadway inventory report for the above referenced project. This report was performed in accordance with our Subconsultant Agreement for Professional Services between Simpson Engineers & Associates and S&ME, Inc. dated September 16, 2011 and the terms and conditions stated within. This project is located southwest of Harrisburg, North Carolina in Mecklenburg and Cabarrus County. The proposed project consists of extending Caldwell Park Drive, on new location, from Chochrane farm property to existing Caldwell Park Drive. The roadway will consist of a two lane roadway with curb and gutter. A new bridge will be constructed along the new Caldwell Park Drive alignment between (Stations 65+00 to 66+85 -L-) over Back Creek.

A geotechnical investigation was conducted between January 31, 2012 and February 9, 2012 by performing soil test borings. Drilling consisted of advancing 3-1/4 inch diameter hollow stem augers with standard penetration testing by a Diedrich D-50 drill rig mounted on an all-terrain carrier. The Diedrich D-50 drill rig is equipped with an automatic hammer. The roadway was investigated with thirty-three (33) soil test borings (B-1 through B-27, B-21A, B-23A and B-27A -L-) and (B-28 through B-30 -Y1-) including borings EB1-B, B1-B and EB2-B at the proposed bridge location. The borings were advanced to depths ranging from about 6.0 to 35.0 feet (elevations 675.4 to 598.4 feet) at collar elevations ranging from about 685.4 to 606.4 feet. Representative split-spoon soil samples were collected for visual classification and selected soil samples were submitted for laboratory analysis. Laboratory testing was performed in accordance with the AASHTO Soil Classification System.

The following survey lines were investigated.

Line	Station
-L-	9+62.43 to 75+30
-Y1-	10+00 to 17+00

Areas of Special Geotechnical Interest

1) Highly Plastic Soils: Areas were identified that contain soils that have plasticity indices of 35 or higher within the upper 2 feet of proposed grade within the following locations:

Line	Station
-L-	15+00 to 19+00
-L-	21+50 to 24+00
-L-	31+50 to 34+00
-L-	60+85 to 61+50
-L-	72+50 to 75+30

2) Crystalline Rock: Crystalline rock was encountered at or near proposed roadway grades within the following locations:

Line	Station
-L-	29+00 to 29+40
-L-	60+00 to 60+70

3) Alluvial Soils : The following areas contain relatively soft or wet soils which have the potential for subgrade problems during construction. In addition, these soils may contain cohesive soils or organic materials which may cause embankment instability or long term settlement problems.

Line	Station
-L-	40+90 to 44+90
-L-	48+50 to 49+25
-L-	63+50 to 66+85

4) Artificial Fill: Poorly compacted artificial fill exist above existing underground utilities including unpaved roadways, sewer easements and in areas where previous grading has occurred. Artificial fill material was encountered at the following locations:

Line	Station
-L-	60+85 to 61+50
-Y1-	69+75 to 75+30

Physiography and Geology

The site is located within the Western Piedmont Physiographic and Geologic Province of North Carolina. The Piedmont Province is characterized by gently to steeply sloping topography with well-rounded hills and along rolling ridges with a northeast-southwest trend dissected by a moderate to well developed (mature) dendritic-type drainage system consisting of drainage swales, hollows, tributaries, streams and rivers.

More specifically, the site is located within the Charlotte Belt. Based on previous mapping (N.C. Geologic Map 1985) and our knowledge of the local geology, the parent rock is interpreted to be felsic metavolcanic rock. These rocks typically weather irregular with shallow to deep residual soils overlying saprolite to bedrock.

Soil Properties

Soils present on this project are separated into three major categories based on origin. These categories include artificial fill, alluvial and residual soils.

Artificial fill materials were found in association with previous construction, utility easements and unpaved roadways in borings B-23, B-26, B-27 and B-27A.The depth of the fill materials ranged from about 2 to 9.5 feet. The fill materials encountered consist of soft to medium stiff red-brown and tan-orange highly plastic fine sandy silty clay (A-7-5, A-7-6). The standard penetration test (SPT) N-values in these soils ranged from 3 to 13 blows per foot (bpf). These soils appeared to be moist.

Alluvial deposits were encountered at the ground surface within drainage features (B-13, B-14 and B-17), and within the Back Creek flood plain (EB1-B, B1-B and EB2-B) to depths ranging from about 3 to 7 feet beneath the ground surface. Typically, alluvial deposits encountered consist of medium dense brown, clayey fine to coarse sand (A-2-4) and soft to medium stiff red-brown and brown fine to coarse sandy silty clay (A-7-5 and A-6) and slightly clayey fine to coarse sandy silt (A-4). N-values for the alluvial soils encountered ranged from 1 to 18 bpf.

Residual soils were encountered at the ground surface in borings B-1 through B-12, B-15, B-16, B-18 through B-23A, B-24, B-25 and B-28, B-29, B-30, and beneath the artificial fill and alluvium in the remaining borings. The residual soils consist of medium stiff to hard tan, brown and green-gray fine sandy silt (A-4), medium stiff to hard red-orange, orange-tan low to highly plastic coarse to fine sandy silty clay (A-6, A-7-5) and dense tan-white silty fine to coarse sand (A-2-4). The SPT N-values for the residual soils ranged from 6 to 78 bpf. The residual soils transition to weathered rock in borings B-7, B-8, B-9, B-15, B-18, B-19, B-21, B-22, B-23A, B-24, EB1-B, B1-B, B-28, B-29, B-30 at depths ranging from about 3 to 18.5 feet (elevations 675.6 to 599.4 feet) and extend to the depth of boring termination. Borings B-19 and B-32 encountered 3.5 to 4.5 feet thick ledges of weathered rock within the highly weathered residual soils. N-values in the weathered rock exceed 100 blows per foot.

Auger refusal material on crystalline rock (Metavolcanic) was encountered in borings B-7, B-23A, B-24, EB1-B, B1-B, EB2-B and B-29 at depths of approximately 5 to 22.6 feet (elevations of 672.5 to 605.8 feet) beneath the ground surface.

Groundwater

Groundwater was encountered only in the borings located adjacent to drainage features and the Back Creek flood plain (B-17 and B1-B). Water levels at these locations were measured at depths of about 1 and 6.5 feet (elevations 639.0 to 599.9 feet) beneath the ground surface. The elevation of the Back Creek at the time of our investigation was at about elevation 601.9 feet. In the higher elevation portions of the site, groundwater generally occurs greater than 10 feet below proposed grades. The potential for perched water levels is likely in most of the upland areas where stiff to hard relatively impermeable clays and silts exist as the surface.

Geotechnical Descriptive Analysis

For descriptive purposes, the project has been divided into three segments. The division of the alignments into three segments is based on the near surface and subsurface materials.

<u>Segment I</u>

-L-	9+62.43 to 40+90
-L-	44+90 to 48+50
-L-	49+25 to 52+50
-L-	60+75 to 63+50
-L-	66+80 to 75+30
-Y1-	10+00 to 17+00

Segment I consists of areas near grade or requiring fill above residual soils and cut sections along the alignment which will require excavations of about 8 to 10 feet of residual soils to reach design grades. The majority of this section consists of residual soils as described in the Soil Properties section of this report. These sections consist of extending the existing roadway along the alignments with typical construction methods. Segment I makes up approximately 80 percent of the investigated alignment.

<u>Segment II</u>

-L-	40+90 to 44+90
-L-	48+50 to 49+25
-L-	63+50 to 64+85

Segment II consists of areas requiring 10 to 20 feet of embankment fill above soft alluvial soils. Approximately 8 percent of the investigation falls within Section II.

Segment III

-L- 52+50 to 60+75

Segment III consists of areas requiring excavation depths of 10 to 25 feet in very stiff to hard residual soils and weathered rock materials. Approximately 12 percent of the investigation falls within Section III.

S&ME appreciates the opportunity to be your geotechnical consultant on this project.
If you have any questions or need additional information in regard to this report, please contact us.

Very truly yours,

S&ME, Inc.

Nicole Bradley P.G.
Professional Geologist

Abner F. Riggs, Jr., P.E.
Senior Geotechnical Engineer
N.C. Registration No. 14155

NORTH CAROLINA PROFESSIONAL SEAL 14155 ENGINEER ABNER F. RIGGS, JR. 4/18/12

Attachments

S:\PROJECTS\2011\11-285Caldwell Park Drve Extension\Geotech DOT\Report\11-285 rpt Inventory.doc

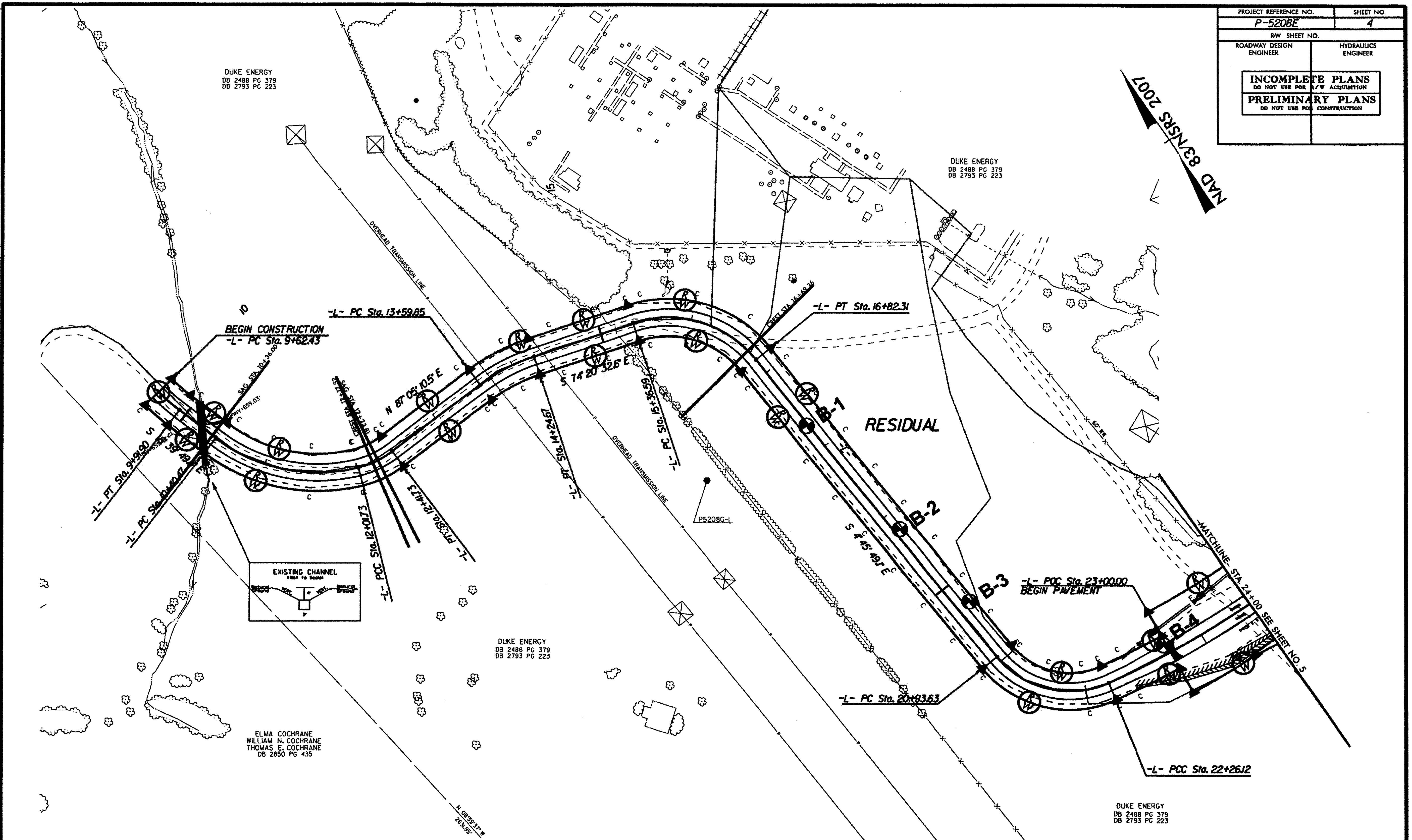
PROJECT REFERENCE NO.	SHEET NO.
P-5208E	4

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-L-	-L-	-L-	-L-	-L-	-L-	-L-
PI Sta 9+77.19	PI Sta 11+26.97	PI Sta 12+22.01	PI Sta 13+92.55	PI Sta 16+19.96	PI Sta 21+71.64	PI Sta 24+84.68
Δ = 8° 26' 30.0" (LT)	Δ = 51° 19' 53.8" (LT)	Δ = 22° 55' 05.9" (LT)	Δ = 18° 34' 16.9" (RT)	Δ = 69° 34' 43.5" (RT)	Δ = 75° 54' 57.5" (LT)	Δ = 28° 59' 35.2" (LT)
D = 28° 38' 52.4"	D = 31° 49' 51.6"	D = 57° 17' 44.8"	D = 28° 38' 52.4"	D = 47° 44' 47.3"	D = 57° 17' 44.8"	D = 5° 43' 46.5"
L = 29.47'	L = 161.26'	L = 40.00'	L = 64.83'	L = 145.73'	L = 132.50'	L = 506.03'
T = 14.76'	T = 86.50'	T = 20.27'	T = 32.70'	T = 83.37'	T = 78.01'	T = 258.55'
R = 200.00'	R = 180.00'	R = 100.00'	R = 200.00'	R = 120.00'	R = 100.00'	R = 1,000.00'
SE = NC	SE = NC	SE = NC	SE = NC	SE = NC	SE = NC	SE = 0.05
						RO = 95'
						DS = 20 MPH

FOR -L- PROFILE SEE SHEET 10

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No. F-0258

17-APR-2012 14:14
S:\PROJECTS\2011\11-285 Caldwell Rd. P-5208E\Standard DOT Structure\GEOTECH DOT\Cadd Files\TIP\P5208E_GEO_RDWY\CADD_GEOTECH\PlanProf\p5208e_rdy_psh_04.dgn

PROJECT REFERENCE NO.	SHEET NO.
P-5208E	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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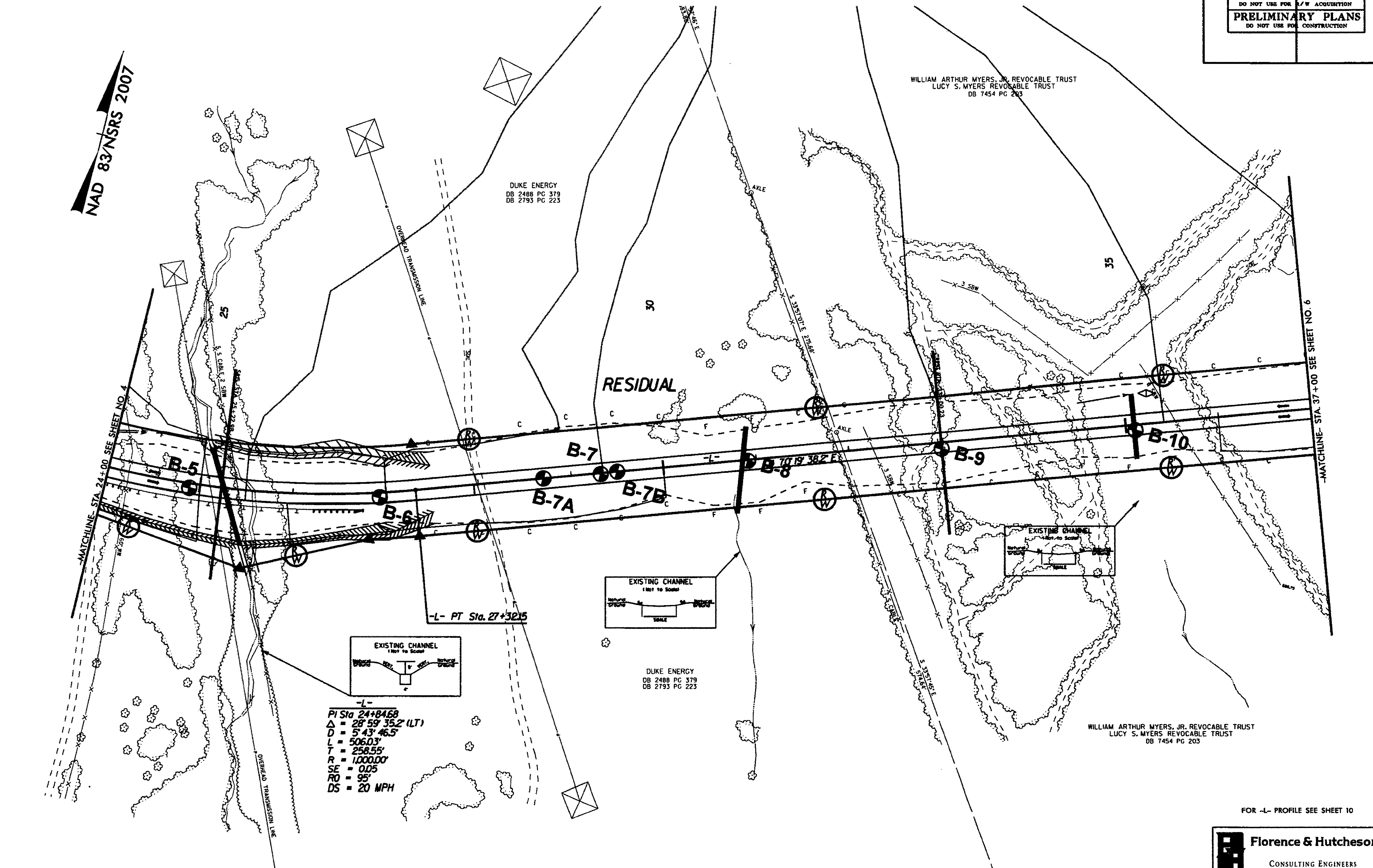
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



FOR -L- PROFILE SEE SHEET 10

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0268

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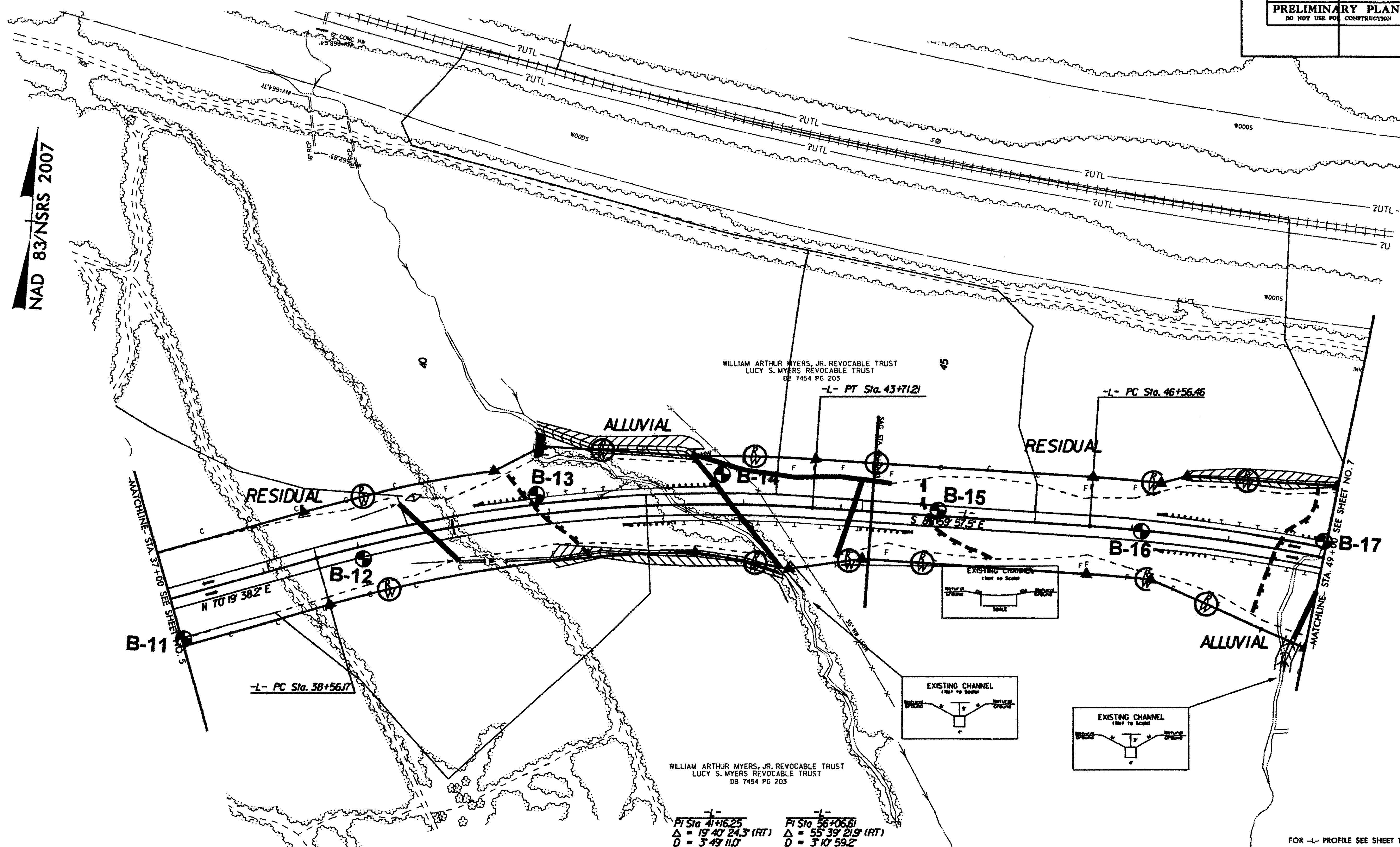
PROJECT REFERENCE NO.	SHEET NO.
P-5208E	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



WILLIAM ARTHUR MYERS, JR. REVOCABLE TRUST
LUCY S. MYERS REVOCABLE TRUST
DB 7454 PG 203

-L-	-L-
PI Sta 41+16.25	PI Sta 56+06.61
Δ = 19°40' 24.3" (RT)	Δ = 55° 39' 21.9" (RT)
D = 3°49' 11.0"	D = 3°10' 59.2"
L = 515.05'	L = 1,748.49'
T = 260.08'	T = 950.16'
R = 1,500.00'	R = 1,800.00'
SE = 0.04	SE = 0.04
RO = 76'	RO = 76'
DS = 40 MPH	DS = 40 MPH

FOR -L- PROFILE SEE SHEET 11

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

17-APR-2012 14:22
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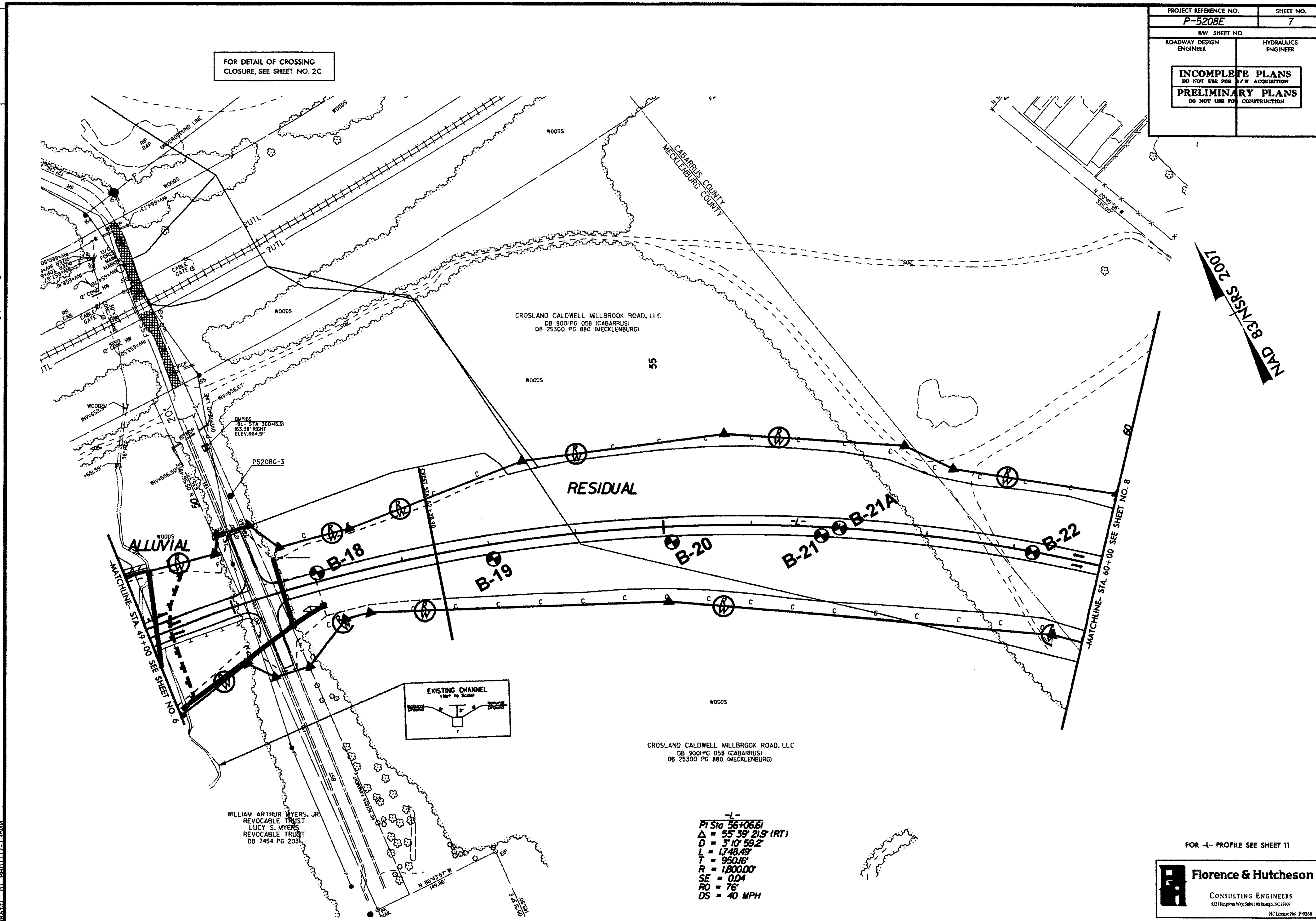
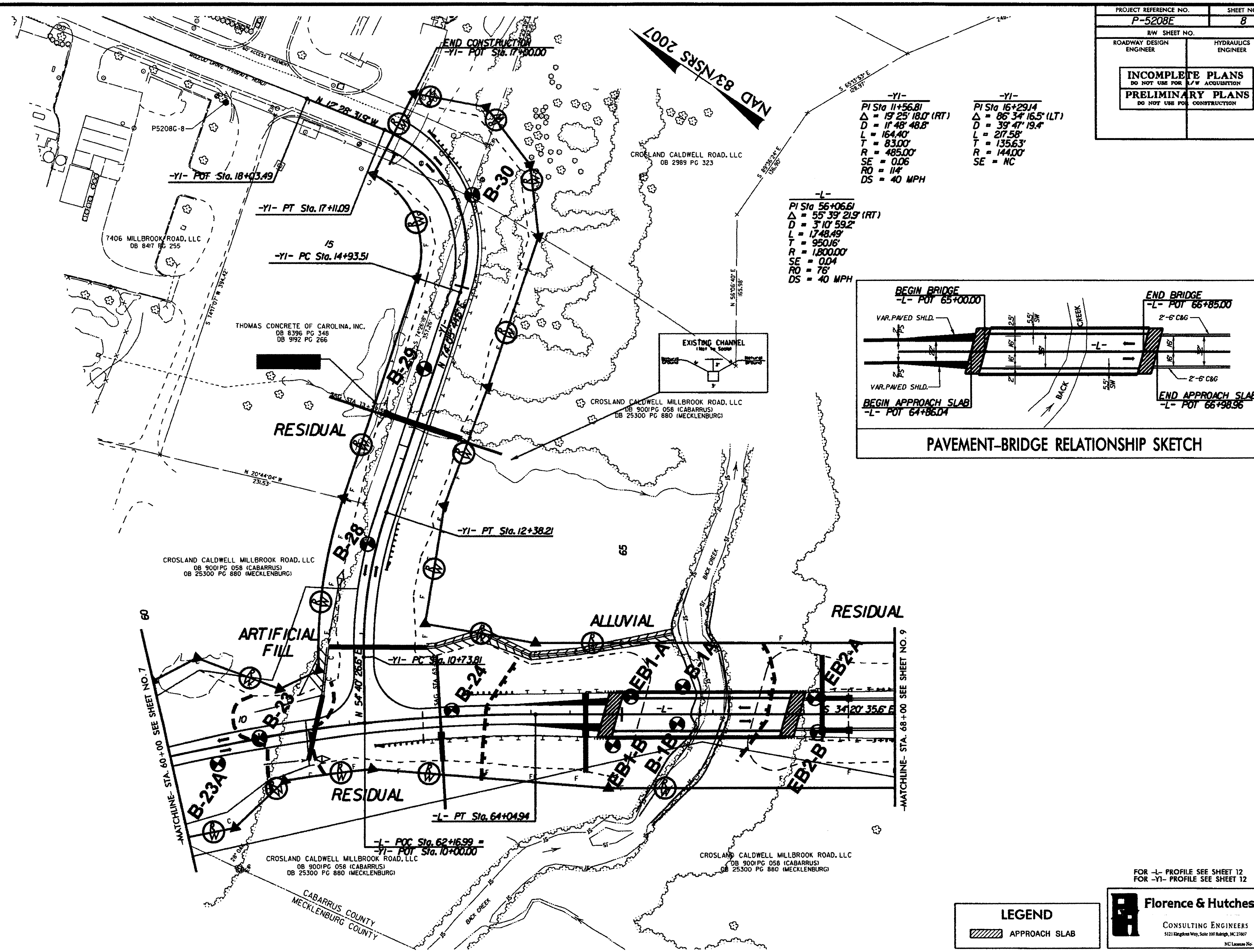

PROJECT REFERENCE NO.
P-5208E
SHEET NO.
7
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
FOR DETAIL OF CROSSING CLOSURE, SEE SHEET NO. 2C
NAD 83/NSRS 2007
CABARRUS COUNTY
MECKLENBURG COUNTY
CROSLAND CALDWELL MILLBROOK ROAD, LLC
DB 9001 PG 058 (CABARRUS)
DB 25300 PG 880 (MECKLENBURG)
55
WOODS
RESIDUAL
ALLUVIAL
P5208G-3
B-18
B-19
B-20
B-21
B-21A
B-22
-MATCHLINE- STA. 49+00 SEE SHEET NO. 6
-MATCHLINE- STA. 60+00 SEE SHEET NO. 8
60
EXISTING CHANNEL
WILLIAM ARTHUR MYERS, JR.
REVOCABLE TRUST
LUCY S. MYERS
REVOCABLE TRUST
DB 7454 PG 203
-L-
PI Sta 56+06.61
Δ = 55° 39' 21.9" (RT)
D = 3° 10' 59.2"
L = 1,748.49'
T = 950.16'
R = 1,800.00'
SE = 0.04
RO = 76'
DS = 40 MPH
FOR -L- PROFILE SEE SHEET 11
Florence & Hutcheson
CONSULTING ENGINEERS
NC License No. F-0256

PROJECT REFERENCE NO.	SHEET NO.
P-5208E	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION



NAD 83/NSRS 2007
END CONSTRUCTION
-Y1- POT Sta. 17+90.00
-Y1- POT Sta. 18+03.49
-Y1- PT Sta. 17+11.09
-Y1- PC Sta. 14+93.51
-Y1- PT Sta. 12+38.21
-Y1- PC Sta. 10+73.81
-L- PT Sta. 64+04.94
-L- POC Sta. 62+16.99 =
-Y1- POT Sta. 10+00.00
P5208G-8
7406 MILLBROOK ROAD, LLC
DB 8417 PG 255
THOMAS CONCRETE OF CAROLINA, INC.
DB 8396 PG 348
DB 9192 PG 266
[redacted]
CROSLAND CALDWELL ROAD, LLC
DB 2989 PG 323
CROSLAND CALDWELL MILLBROOK ROAD, LLC
DB 9001 PG 058 (CABARRUS)
DB 25300 PG 880 (MECKLENBURG)
EXISTING CHANNEL
RESIDUAL
ALLUVIAL
ARTIFICIAL FILL
B-30
B-29
B-28
B-24
B-23
B-23A
EB1-A
EB1-B
B-1A
B-1B
EB2-A
EB2-B
S 34°20' 35.6" E
N 54°40' 26.6" E
N 20°44'04" W 231.53'
BACK CREEK
CABARRUS COUNTY
MECKLENBURG COUNTY
MATCHLINE - STA. 60+00 SEE SHEET NO. 7
MATCHLINE - STA. 68+00 SEE SHEET NO. 9
-Y1-
PI Sta 11+56.81
Δ = 19° 25' 18.0" (RT)
D = 11° 48' 48.8"
L = 164.40'
T = 83.00'
R = 485.00'
SE = 0.06
RO = 114'
DS = 40 MPH
-Y1-
PI Sta 16+29.14
Δ = 86° 34' 16.5" (LT)
D = 39° 47' 19.4"
L = 217.58'
T = 135.63'
R = 144.00'
SE = NC
-L-
PI Sta 56+06.61
Δ = 55° 39' 21.9" (RT)
D = 3° 10' 59.2"
L = 1,748.49'
T = 950.16'
R = 1,800.00'
SE = 0.04
RO = 76'
DS = 40 MPH
BEGIN BRIDGE
-L- POT 65+00.00
END BRIDGE
-L- POT 66+85.00
VAR. PAVED SHLD.
2'-6" C&G
BEGIN APPROACH SLAB
-L- POT 64+86.04
END APPROACH SLAB
-L- POT 66+98.96
PAVEMENT-BRIDGE RELATIONSHIP SKETCH

FOR -L- PROFILE SEE SHEET 12
FOR -Y1- PROFILE SEE SHEET 12

LEGEND

APPROACH SLAB

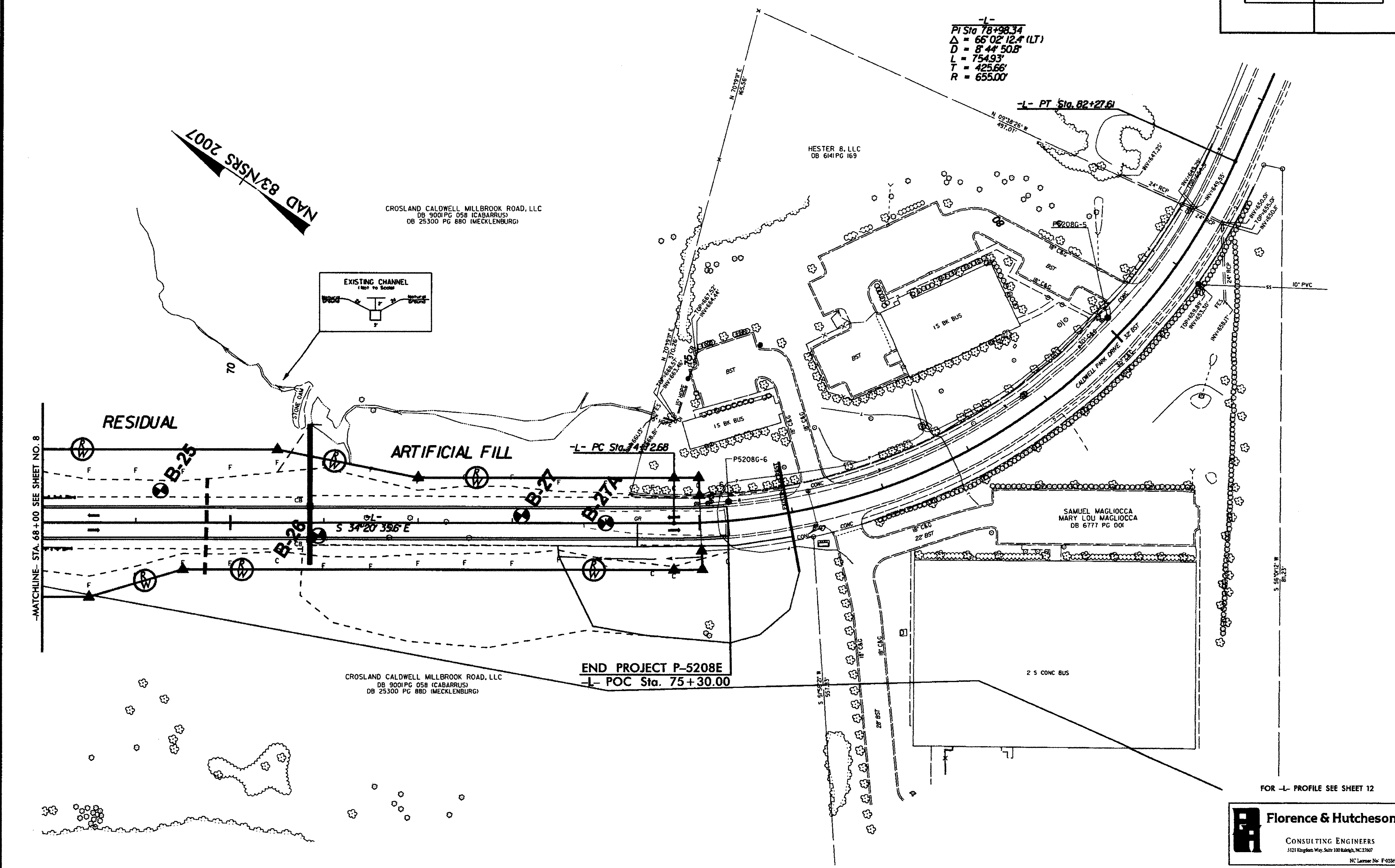
Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No F-0258

17-APR-2012 14:30

PROJECT REFERENCE NO.	SHEET NO.
P-5208E	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



FOR -L- PROFILE SEE SHEET 12

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0206

17-APR-2012 14:34
S:\PROJECTS\2011\U-285 Caldwell Rd. P-5208E\Standard DOT Structure\GEOTECH DOT\Cadd Files\TIP\P5208E_GEO_ROWY\CADD_GEOTECH\PlanProf\p5208e_rdy_psh_09.dgn

Florence & Hutcheson
CONSULTING ENGINEERS
NC License No. F-0558

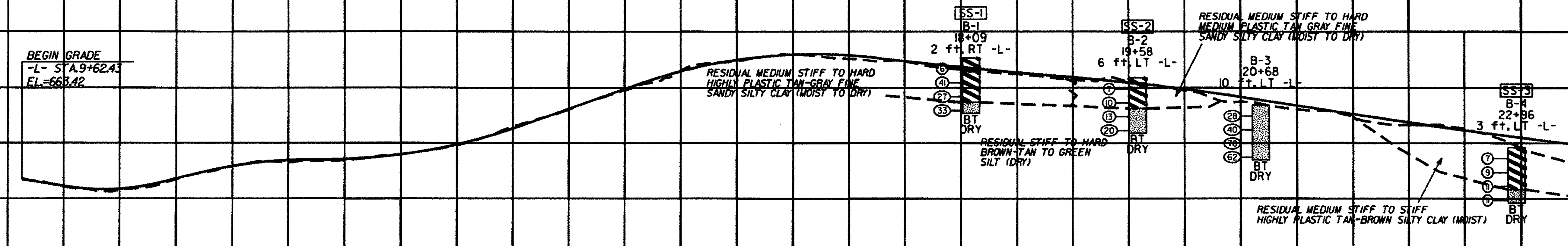
PROJECT REFERENCE NO.	SHEET NO.
P-5208E	10

R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-



BEGIN GRADE
-L- STA.9+62.43
EL.=663.42
RESIDUAL MEDIUM STIFF TO HARD HIGHLY PLASTIC TAN-GRAY FINE SANDY SILTY CLAY (MOIST TO DRY)
SS-1
B-1
18+09
2 ft. RT -L-
BT
DRY
SS-2
B-2
19+58
6 ft. LT -L-
BT
DRY
B-3
20+68
10 ft. LT -L-
BT
DRY
SS-3
B-4
22+96
3 ft. LT -L-
BT
DRY
RESIDUAL MEDIUM STIFF TO HARD MEDIUM PLASTIC TAN GRAY FINE SANDY SILTY CLAY (MOIST TO DRY)
RESIDUAL STIFF TO HARD BROWN-TAN TO GREEN SILT (DRY)
RESIDUAL MEDIUM STIFF TO STIFF HIGHLY PLASTIC TAN-BROWN SILTY CLAY (MOIST)
690
680
670
660
650

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)				% MOI
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200	
SS-1	18+09	2 ft RT	L	1' - 2.5'	A-7-6 (44)	67	45	4	15	25	56	100	98	96	89	23
SS-2	19+58	6 ft LT	L	1' - 2.5'	A-7-6 (24)	57	28	10	18	37	35	100	96	90	78	40
SS-3	22+96	3 ft LT	L	1' - 2.5'	A-7-6 (72)	93	64	1	5	25	69	100	99	99	96	33

640
630

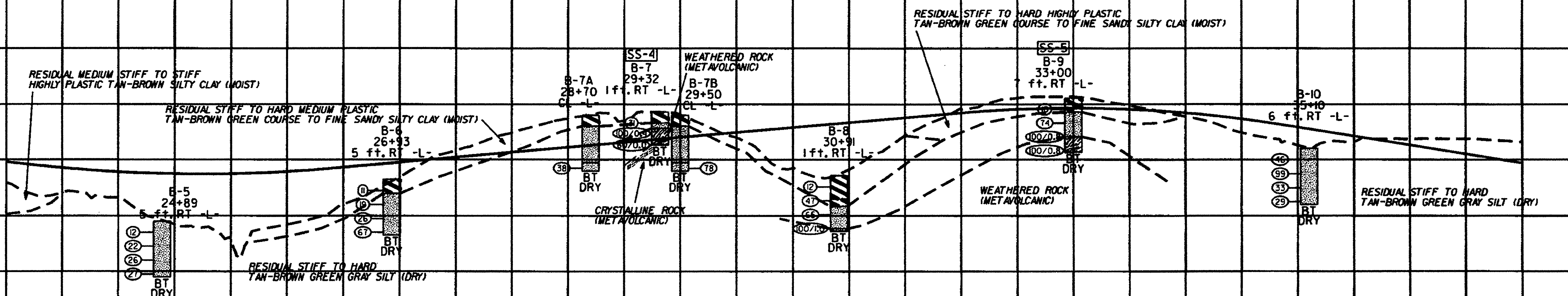
(FOR -L- PLAN SEE SHEET 6)

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

-L-

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)				% MOI
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200	
SS-4	29+32	1 ft RT	L	1' - 2.5'	A-7-6 (23)	54	32	10	14	40	36	89	84	80	73	14
SS-5	33+00	7 ft RT	L	1' - 2.5'	A-7-6 (45)	70	43	2	14	37	47	100	99	98	91	35



RESIDUAL MEDIUM STIFF TO STIFF HIGHLY PLASTIC TAN-BROWN SILTY CLAY (MOIST)
RESIDUAL STIFF TO HARD MEDIUM PLASTIC TAN-BROWN GREEN COURSE TO FINE SANDY SILTY CLAY (MOIST)
B-5
24+89
5 ft. RT -L-
BT
DRY
B-6
26+93
5 ft. RT -L-
BT
DRY
B-7A
28+70
CL -L-
BT
DRY
SS-4
B-7
29+32
1 ft. RT -L-
WEATHERED ROCK (METAVOLCANIC)
B-7B
29+50
CL -L-
BT
DRY
CRYSTALLINE ROCK (METAVOLCANIC)
B-8
30+91
1 ft. RT -L-
BT
DRY
RESIDUAL STIFF TO HARD HIGHLY PLASTIC TAN-BROWN GREEN COURSE TO FINE SANDY SILTY CLAY (MOIST)
SS-5
B-9
33+00
7 ft. RT -L-
BT
DRY
WEATHERED ROCK (METAVOLCANIC)
B-10
35+10
6 ft. RT -L-
BT
DRY
RESIDUAL STIFF TO HARD TAN-BROWN GREEN GRAY SILT (DRY)
RESIDUAL STIFF TO HARD TAN-BROWN GREEN GRAY SILT (DRY)
690
680
670
660
650

640

(FOR -L- PLAN SEE SHEET 7)

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

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Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
P-5208E	11

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

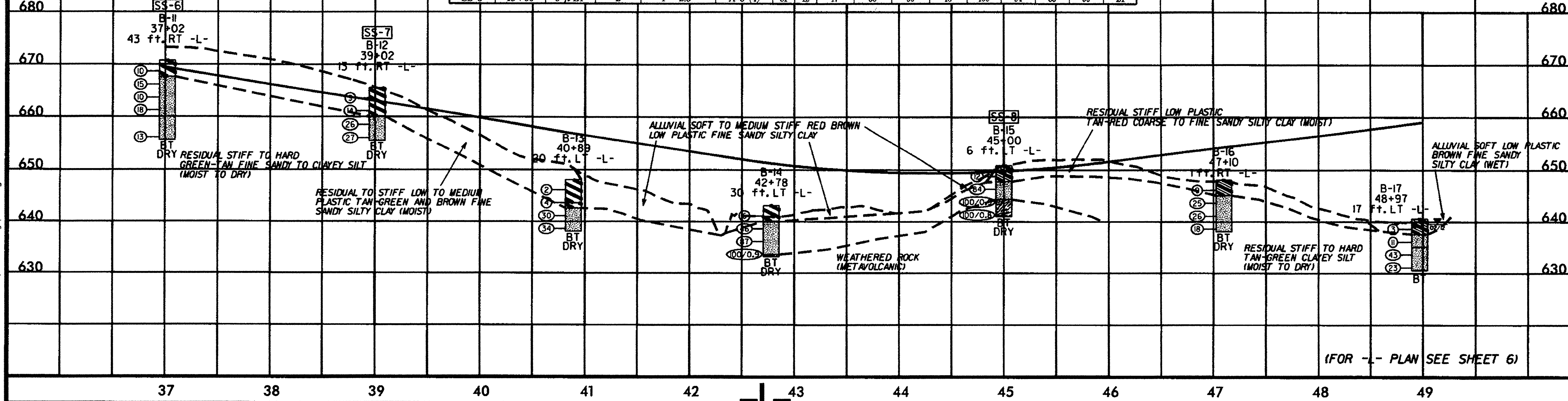
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

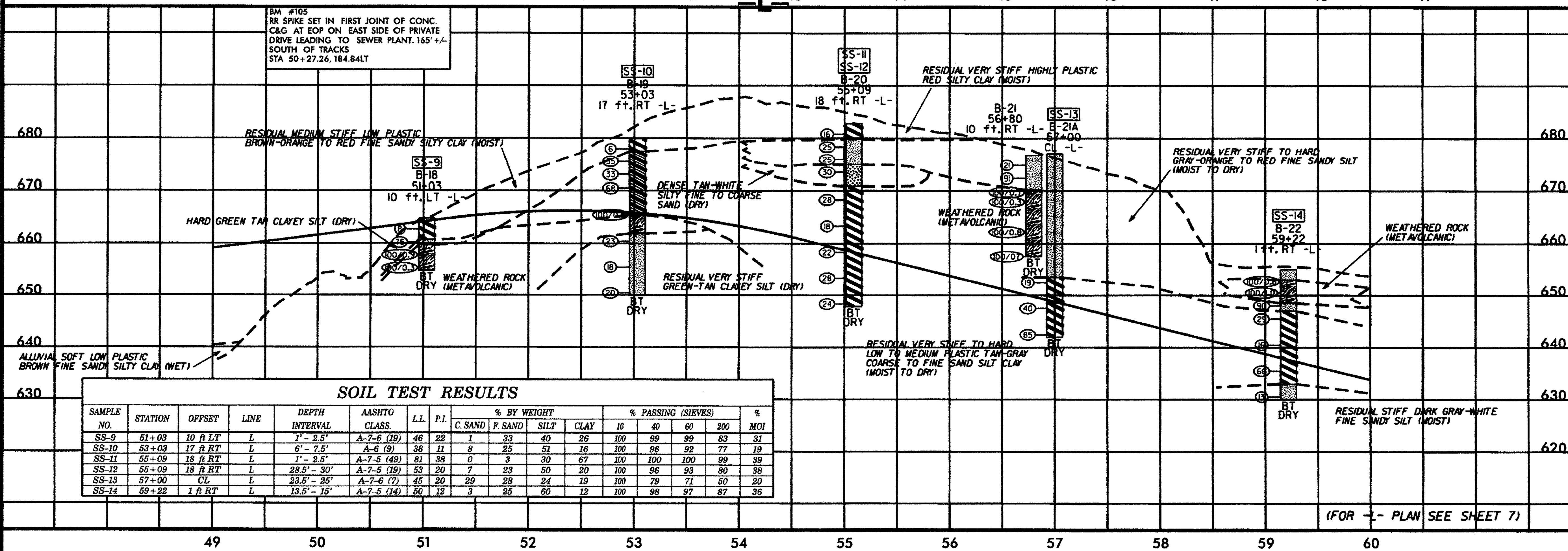
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)				% MOI
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200	
SS-6	37+02	43 ft RT	L	1' - 2.5'	A-7-6 (13)	44	18	9	29	44	18	100	95	91	74	24
SS-7	39+02	13 ft RT	L	1' - 2.5'	A-7-6 (29)	53	31	4	18	39	39	100	98	96	86	29
SS-8	45+00	6 ft LT	L	1' - 2.5'	A-6 (4)	31	12	17	35	30	18	100	94	83	56	21





SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)				% MOI
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200	
SS-9	51+03	10 ft LT	L	1' - 2.5'	A-7-6 (19)	46	22	1	33	40	26	100	99	99	83	31
SS-10	53+03	17 ft RT	L	6' - 7.5'	A-6 (9)	38	11	8	25	51	16	100	96	92	77	19
SS-11	55+09	18 ft RT	L	1' - 2.5'	A-7-5 (49)	81	38	0	3	30	67	100	100	100	99	39
SS-12	55+09	18 ft RT	L	28.5' - 30'	A-7-5 (19)	53	20	7	23	50	20	100	96	93	80	38
SS-13	57+00	CL	L	23.5' - 25'	A-7-6 (7)	45	20	29	28	24	19	100	79	71	50	20
SS-14	59+22	1 ft RT	L	13.5' - 15'	A-7-5 (14)	50	12	3	25	60	12	100	98	97	87	36

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
P-5208E	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)				%
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200	MOI
SS-15	70+94	14 ft RT	L	1' – 2.5'	A-7-6 (46)	71	43	1	12	32	55	100	100	99	92	36

-L-

-L-

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)				%
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200	MOI
SS-16	73+10	8 ft LT	L	3.5' – 5'	A-7-6 (52)	81	52	7	9	23	61	100	96	93	87	32

-Y1-

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)				%
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200	MOI
SS-17	11+99	10 ft LT	Y1	1' – 2.5'	A-7-6 (43)	67	39	2	8	28	62	100	99	98	94	33

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	P-5208E	X-6

RESIDUAL MEDIUM STIFF TO HARD HIGHLY PLASTIC TAN GRAY FINE SANDY SILTY CLAY (MOIST TO DRY)

STIFF TO HARD BROWN GREEN SILT (DRY)

684.84

16+00.00

RESIDUAL MEDIUM STIFF TO HARD HIGHLY PLASTIC TAN GRAY FINE SANDY SILTY CLAY (MOIST TO DRY)

STIFF TO HARD BROWN GREEN SILT (DRY)

683.06

15+50.00

RESIDUAL MEDIUM STIFF TO HARD HIGHLY PLASTIC TAN GRAY FINE SANDY SILTY CLAY (MOIST TO DRY)

STIFF TO HARD BROWN GREEN SILT (DRY)

680.82

15+36.59

RESIDUAL MEDIUM STIFF TO HARD HIGHLY PLASTIC TAN GRAY FINE SANDY SILTY CLAY (MOIST TO DRY)

STIFF TO HARD BROWN GREEN SILT (DRY)

679.55

15+00.00

-4-

8/23/99

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Brett AT BRETT-13500

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
P-5208E	X-7

0 5 10

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

700
690
680
670

STIFF TO HARD BROWN GREEN SILT (DRY) 684.71

17+50.00

RESIDUAL MEDIUM STIFF TO HARD HIGHLY PLASTIC TAN GRAY FINE SANDY SILTY CLAY (MOIST TO DRY)

STIFF TO HARD BROWN GREEN SILT (DRY) 685.21

17+00.00

RESIDUAL MEDIUM STIFF TO HARD HIGHLY PLASTIC TAN GRAY FINE SANDY SILTY CLAY (MOIST TO DRY)

STIFF TO HARD BROWN GREEN SILT (DRY) 685.48

16+82.31

RESIDUAL MEDIUM STIFF TO HARD HIGHLY PLASTIC TAN GRAY FINE SANDY SILTY CLAY (MOIST TO DRY)

STIFF TO HARD BROWN GREEN SILT (DRY) 685.97

16+50.00

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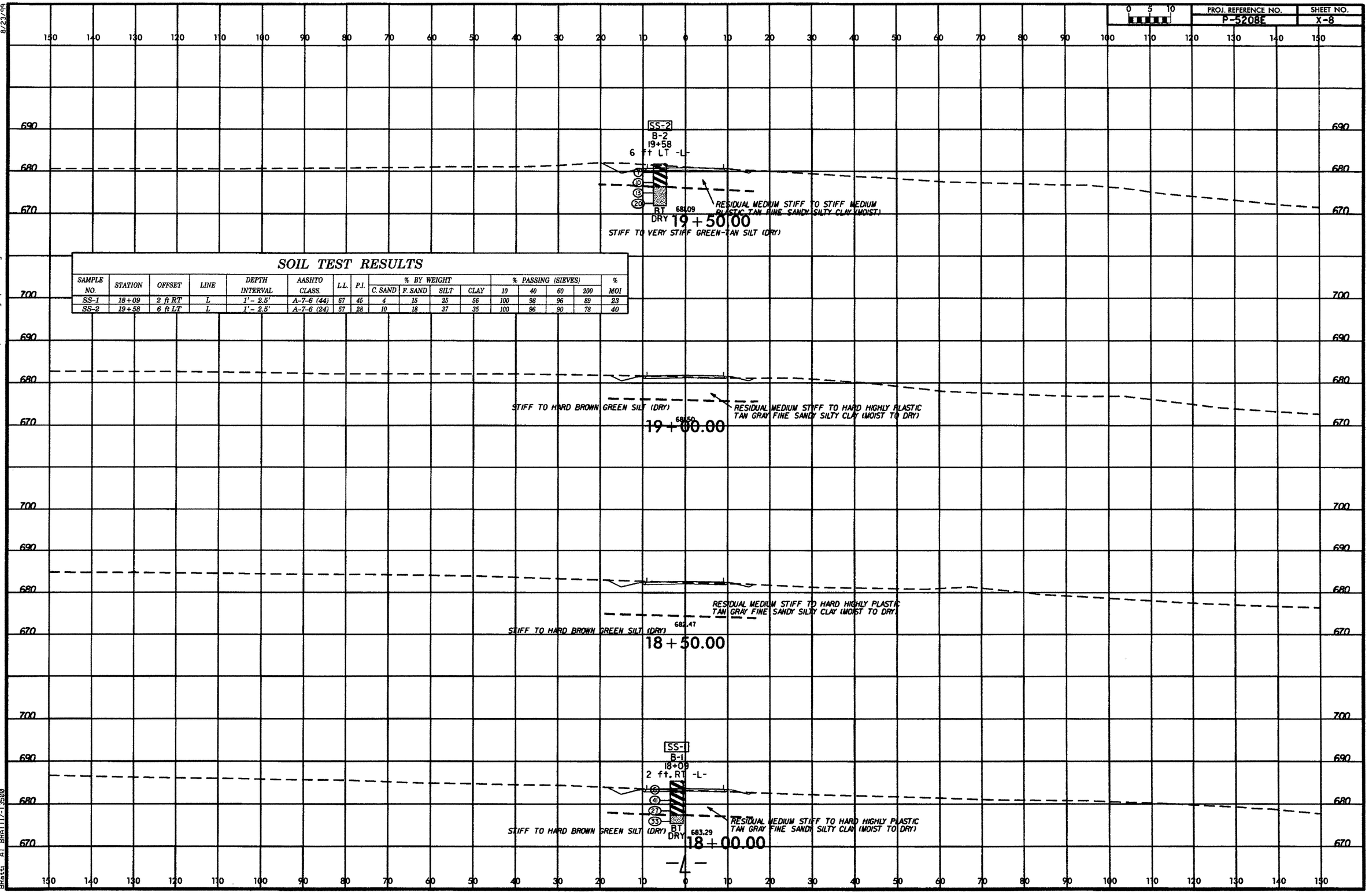
Brett AT BRETTV-13500



SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)				%
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200	MOI
SS-1	18+09	2 ft RT	L	1'- 2.5'	A-7-6 (44)	67	45	4	15	25	56	100	98	96	89	23
SS-2	19+58	6 ft LT	L	1'- 2.5'	A-7-6 (24)	57	28	10	18	37	35	100	96	90	78	40

PROJ. REFERENCE NO.	SHEET NO.
P-5208E	X-10

0 5 10

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

680
670
660

RESIDUAL MEDIUM STIFF TO STIFF
HIGHLY PLASTIC TAN-BROWN SILTY CLAY (MOIST)

STIFF GRAY-GREEN SILT (DRY) 672.61

22+50.00

680
670
660

RESIDUAL MEDIUM STIFF TO STIFF
HIGHLY PLASTIC TAN-BROWN SILTY CLAY (MOIST)

STIFF GRAY-GREEN SILT (DRY) 673.33

22+26.12

690
680
670
660

RESIDUAL MEDIUM STIFF TO STIFF
HIGHLY PLASTIC TAN-BROWN SILTY CLAY (MOIST)

STIFF GRAY-GREEN SILT (DRY) 673.33

22+00.00

690
680
670
660

RESIDUAL VERY STIFF TO HARD BROWN TAN SILT (DRY)

21+50.00 673.73

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

8/23/99

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BRatti AT BRATTI7-1500

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
P-5208E	X-11

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

680 670 660 650

RESIDUAL STIFF TO VERY STIFF
TAN-BROWN SILT (DRY)

663.32

24 + 50.00

RESIDUAL STIFF TO VERY STIFF
TAN-BROWN SILT (DRY)

661.16

24 + 00.00

RESIDUAL MEDIUM STIFF TO STIFF
HIGHLY PLASTIC TAN-BROWN SILTY CLAY (MOIST)

STIFF GRAY-GREEN SILT (DRY) 666.00

23 + 50.00

SS-3
B-4
22+96
3 ft. LT -L-

RESIDUAL MEDIUM STIFF TO STIFF
HIGHLY PLASTIC TAN-BROWN SILTY CLAY (MOIST)

STIFF GRAY-GREEN SILT (DRY) 659.21

BT
DRY

23 + 00.00

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)				%
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200	MOI
SS-3	22+96	3 ft LT	L	1' - 2.5'	A-7-6 (72)	93	64	1	5	25	69	100	99	99	96	33

PROJ. REFERENCE NO.	SHEET NO.
P-5208E	X-16

8/23/99

17-APR-2012 14:49
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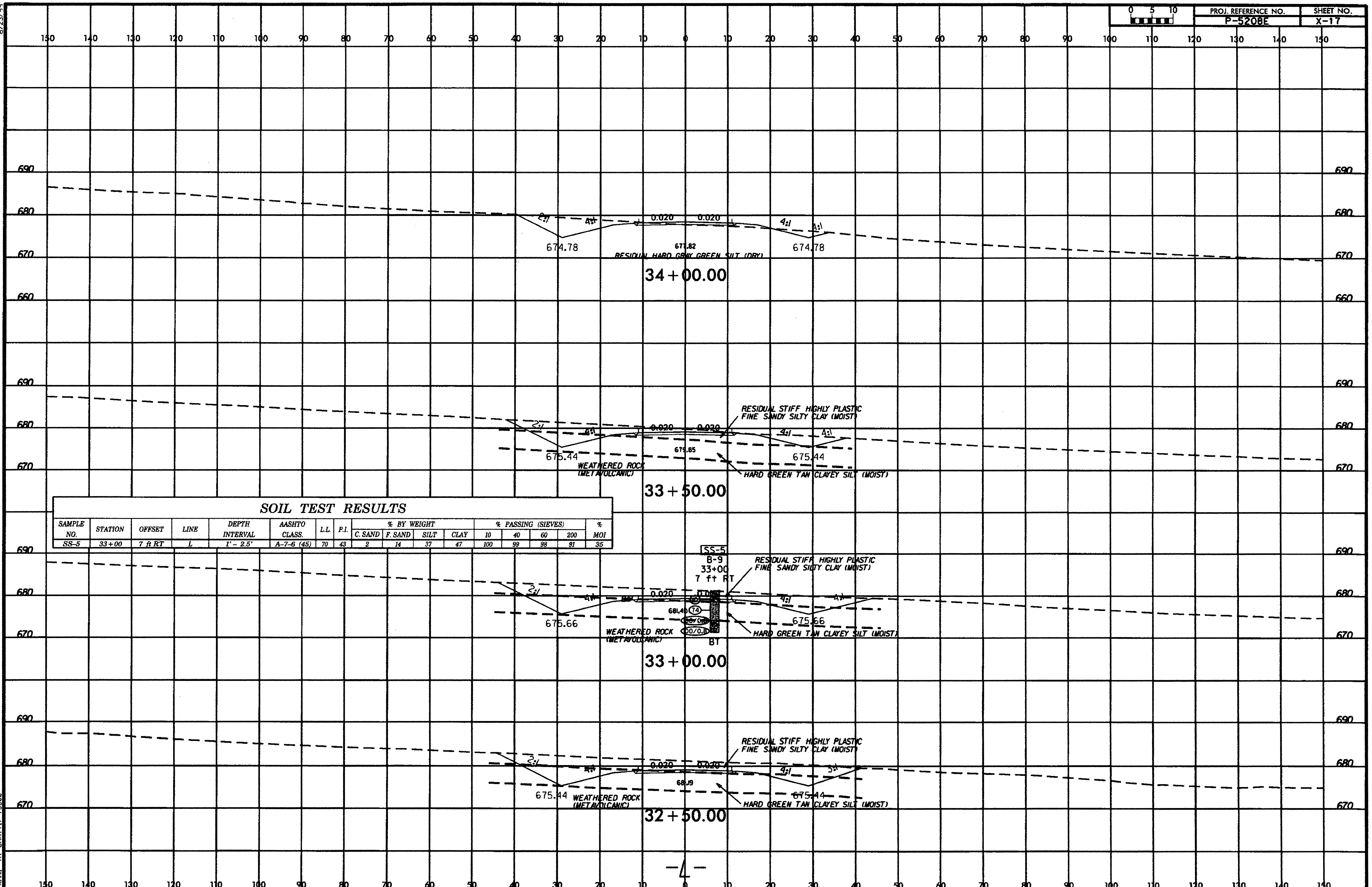
BRatti AT BRATTI7-T3500

PROJ. REFERENCE NO.	SHEET NO.
P-5208E	X-17



SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)				% MOI
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200	
SS-5	33+00	7 ft RT	L	1' – 2.5'	A-7-6 (45)	70	43	2	14	37	47	100	99	98	91	35

8/23/99

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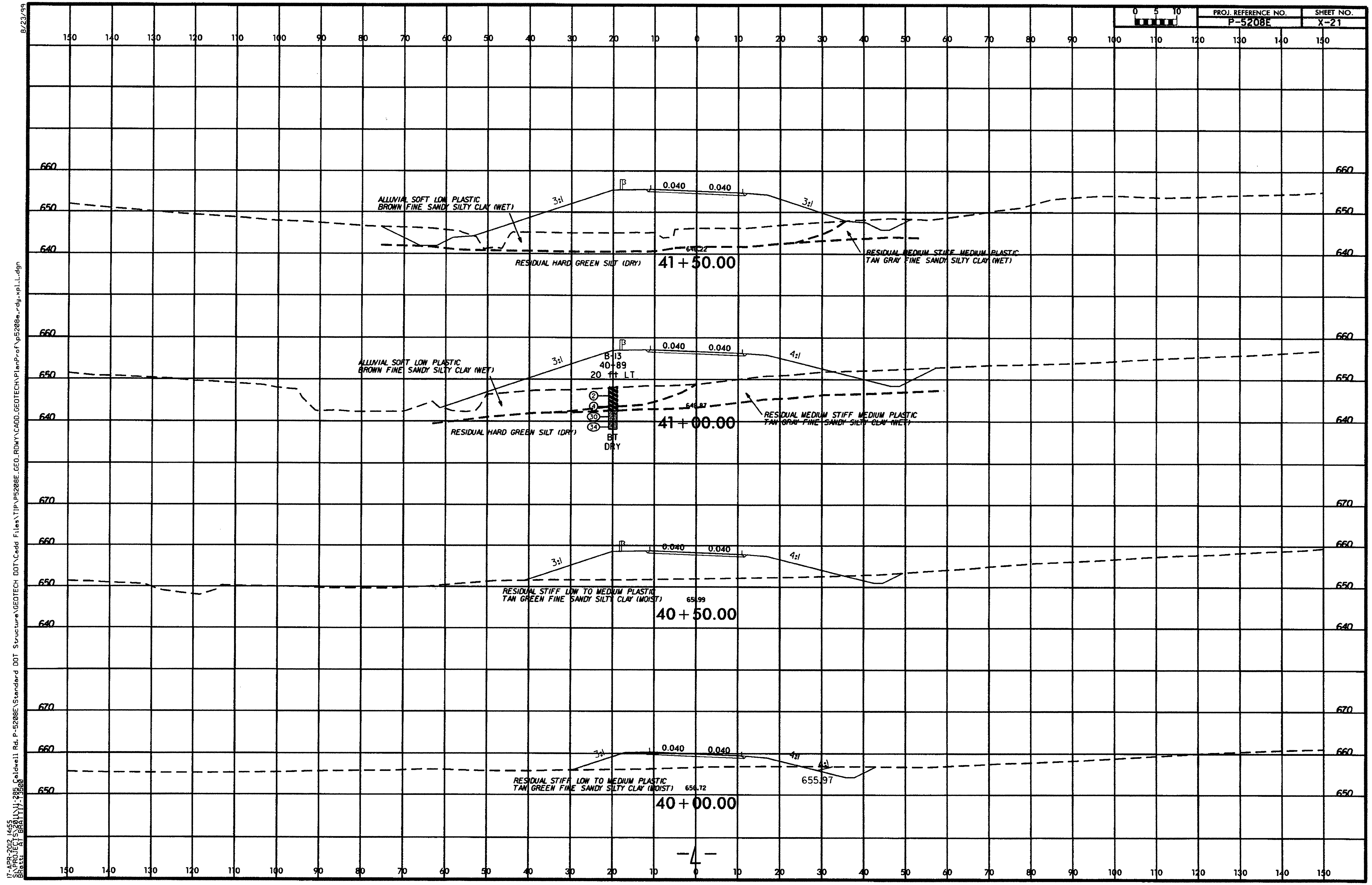
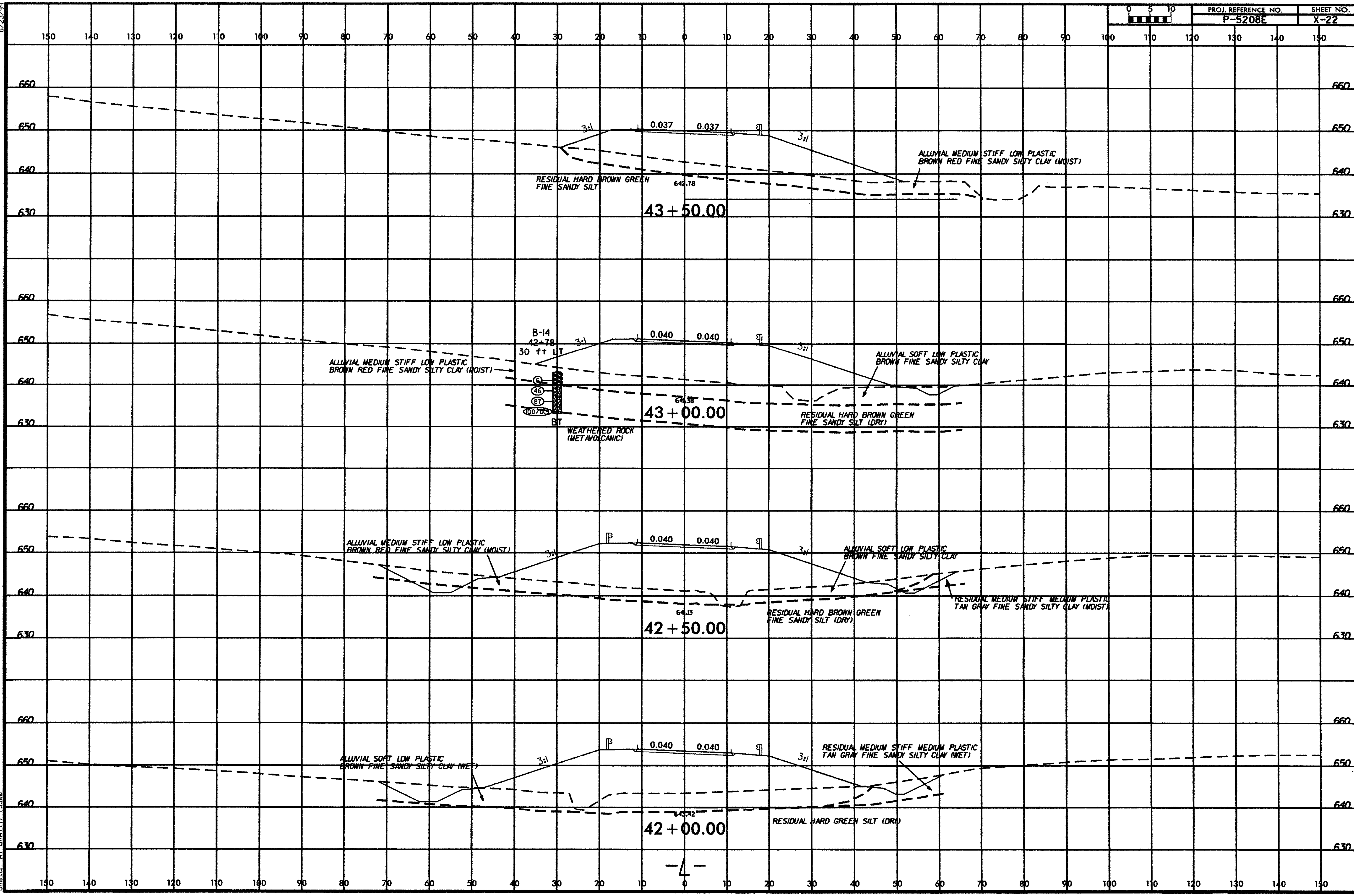
Bratti AT BRATTI7-T3500


PROJ. REFERENCE NO.
P-5208E
SHEET NO.
X-21
0 5 10
8/23/99
ALLUVIAL SOFT LOW PLASTIC BROWN FINE SANDY SILTY CLAY (WET)
RESIDUAL HARD GREEN SILT (DRY)
RESIDUAL MEDIUM STIFF MEDIUM PLASTIC TAN GRAY FINE SANDY SILTY CLAY (WET)
41 + 50.00
B-13
40+89
20 ft LT
BT
DRY
41 + 00.00
RESIDUAL STIFF LOW TO MEDIUM PLASTIC TAN GREEN FINE SANDY SILTY CLAY (MOIST)
40 + 50.00
655.97
40 + 00.00
0.040
3:1
4:1
-4-
17-APR-2012 14:55
BRatti AT BRATTI7-T3500

PROJ. REFERENCE NO.	SHEET NO.
P-5208E	X-22



0 5 10
43+50.00
0.037
0.037
3:1
642.78
RESIDUAL HARD BROWN GREEN FINE SANDY SILT
ALLUVIAL MEDIUM STIFF LOW PLASTIC BROWN RED FINE SANDY SILTY CLAY (MOIST)
43+00.00
B-14
42+78
30 ft LT
0.040
0.040
641.38
ALLUVIAL MEDIUM STIFF LOW PLASTIC BROWN RED FINE SANDY SILTY CLAY (MOIST)
ALLUVIAL SOFT LOW PLASTIC BROWN FINE SANDY SILTY CLAY
RESIDUAL HARD BROWN GREEN FINE SANDY SILT (DRY)
WEATHERED ROCK (METAVOLCANIC)
BT
42+50.00
641.13
ALLUVIAL MEDIUM STIFF LOW PLASTIC BROWN RED FINE SANDY SILTY CLAY (MOIST)
ALLUVIAL SOFT LOW PLASTIC BROWN FINE SANDY SILTY CLAY
RESIDUAL HARD BROWN GREEN FINE SANDY SILT (DRY)
RESIDUAL MEDIUM STIFF MEDIUM PLASTIC TAN GRAY FINE SANDY SILTY CLAY (MOIST)
42+00.00
640.42
ALLUVIAL SOFT LOW PLASTIC BROWN FINE SANDY SILTY CLAY (WET)
RESIDUAL MEDIUM STIFF MEDIUM PLASTIC TAN GRAY FINE SANDY SILTY CLAY (WET)
RESIDUAL HARD GREEN SILT (DRY)
660
650
640
630
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

8/23/99

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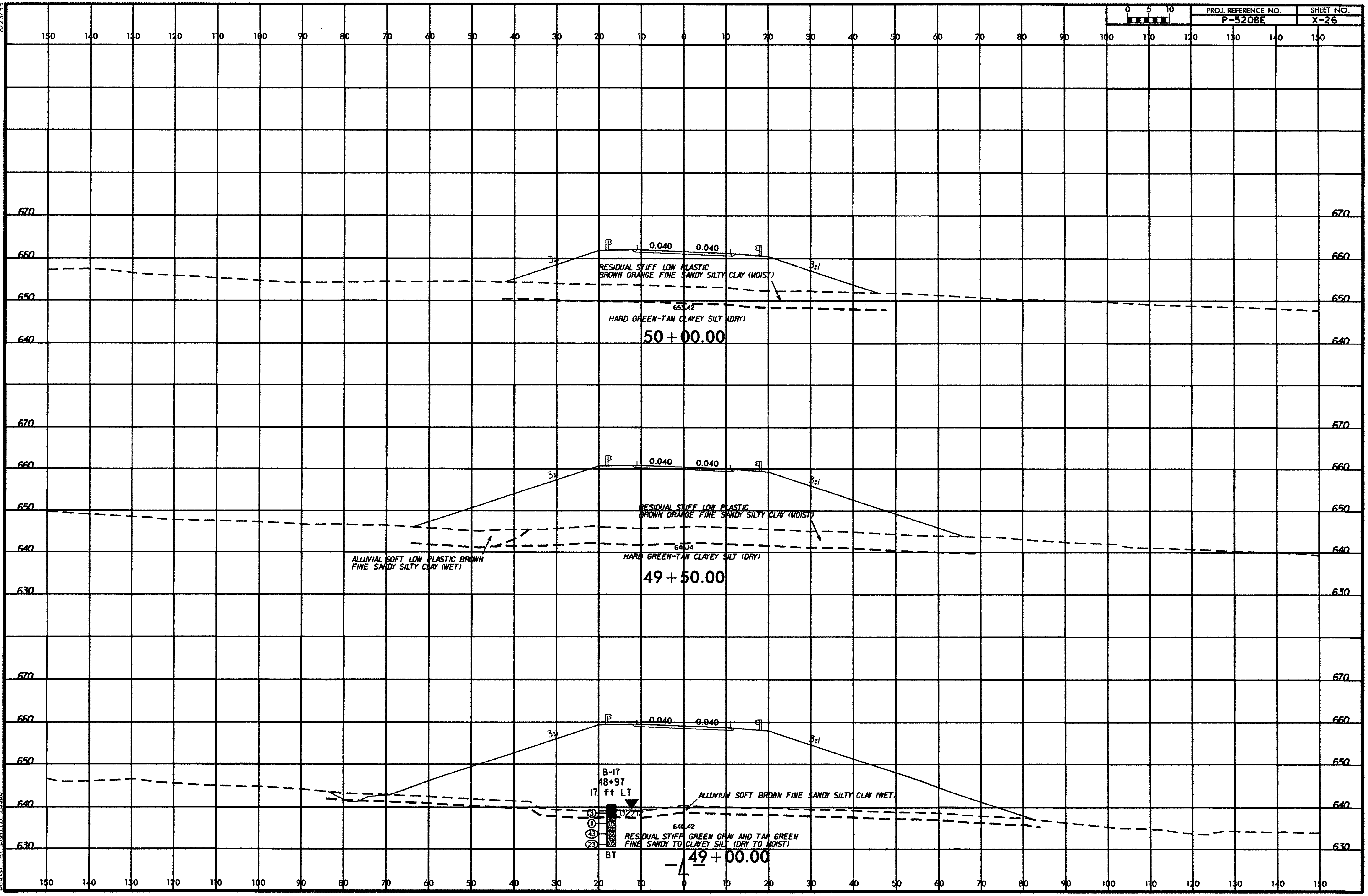
BRatti AT BRATTI7-T3500


PROJ. REFERENCE NO.
P-5208E
SHEET NO.
X-26
0 5 10
RESIDUAL STIFF LOW PLASTIC BROWN ORANGE FINE SANDY SILTY CLAY (MOIST)
653.42
HARD GREEN-TAN CLAYEY SILT (DRY)
50 + 00.00
RESIDUAL STIFF LOW PLASTIC BROWN ORANGE FINE SANDY SILTY CLAY (MOIST)
646.14
HARD GREEN-TAN CLAYEY SILT (DRY)
ALLUVIAL SOFT LOW PLASTIC BROWN FINE SANDY SILTY CLAY (WET)
49 + 50.00
B-17
48+97
17 ft LT
ALLUVIUM SOFT BROWN FINE SANDY SILTY CLAY (WET)
640.42
RESIDUAL STIFF GREEN GRAY AND TAN GREEN FINE SANDY TO CLAYEY SILT (DRY TO MOIST)
BT
49 + 00.00

8/23/99

17-APR-2012 15:03
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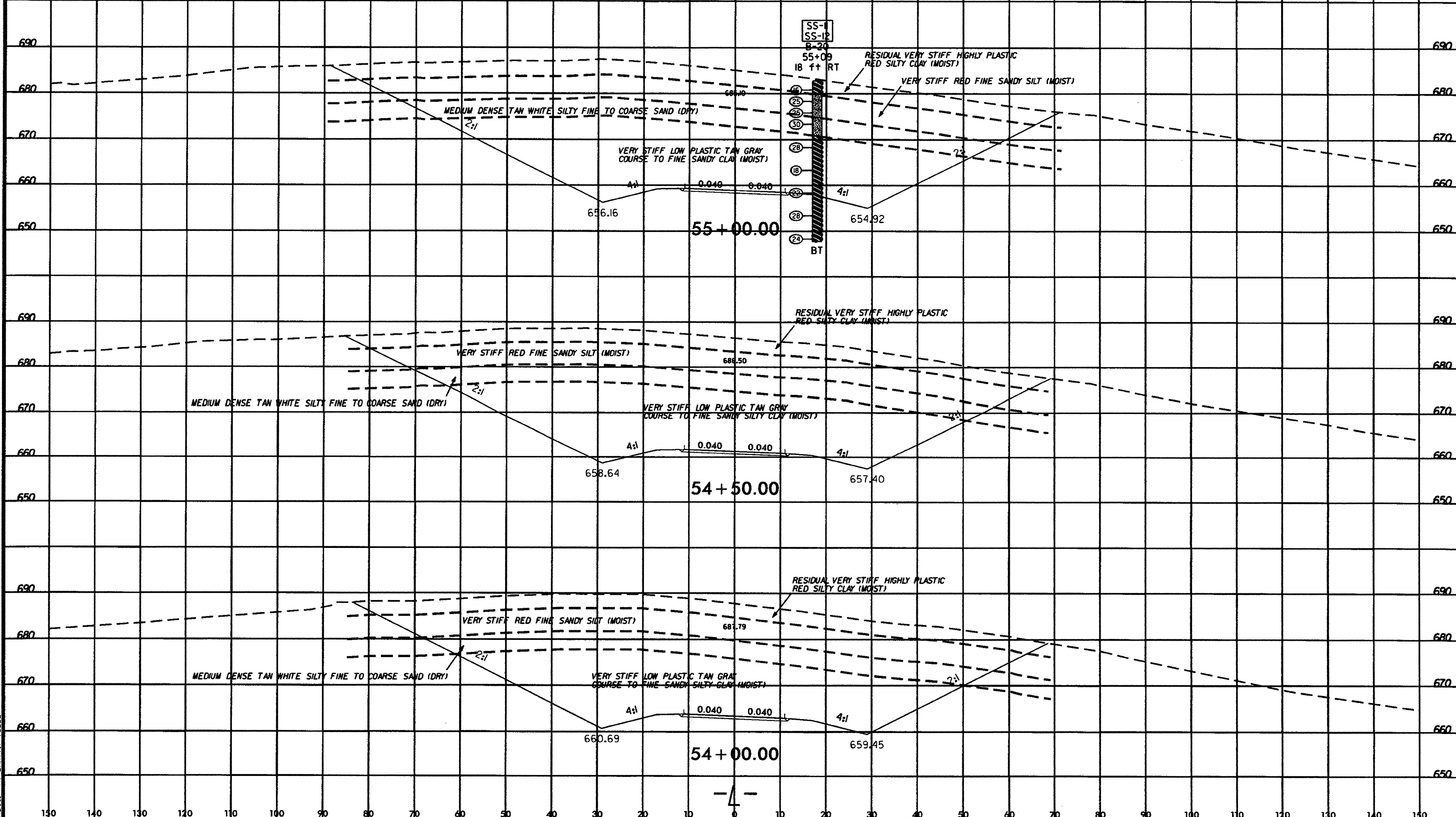
BRatti AT BRATTI7-T3500

PROJ. REFERENCE NO.	SHEET NO.
P-5208E	X-29

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)				% MOI
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200	
SS-11	55+09	18 ft RT	L	1' - 2.5'	A-7-5 (49)	81	38	0	3	30	67	100	100	100	99	39
SS-12	55+09	18 ft RT	L	28.5' - 30'	A-7-5 (19)	53	20	7	23	50	20	100	96	93	80	38



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Bhatti AT BRATTY-T3500

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
P-5208E	X-30

0 5 10

RESIDUAL VERY STIFF GRAY ORANGE FINE SANDY SILT (MOIST)

676.95

WEATHERED ROCK (METAVOLCANIC)

2:1

4:1 0.040 0.040 4:1

2:1

648.66

647.42

56+50.00

VERY STIFF RED FINE SANDY SILT (MOIST)

680.08

MEDIUM DENSE TAN WHITE SILTY FINE TO COARSE SAND (DRY)

VERY STIFF LOW PLASTIC TAN GRAY COURSE TO FINE SANDY SILTY CLAY (MOIST)

2:1

4:1 0.040 0.040 4:1

2:1

651.16

649.92

56+00.00

RED SILTY CLAY (MOIST)

VERY STIFF RED FINE SANDY SILT (MOIST)

682.61

MEDIUM DENSE TAN WHITE SILTY FINE TO COARSE SAND (DRY)

2:1

VERY STIFF LOW PLASTIC TAN GRAY COURSE TO FINE SANDY SILTY CLAY (MOIST)

2:1

4:1 0.040 0.040 4:1

653.66

652.42

55+50.00

-L-

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Brian Hall
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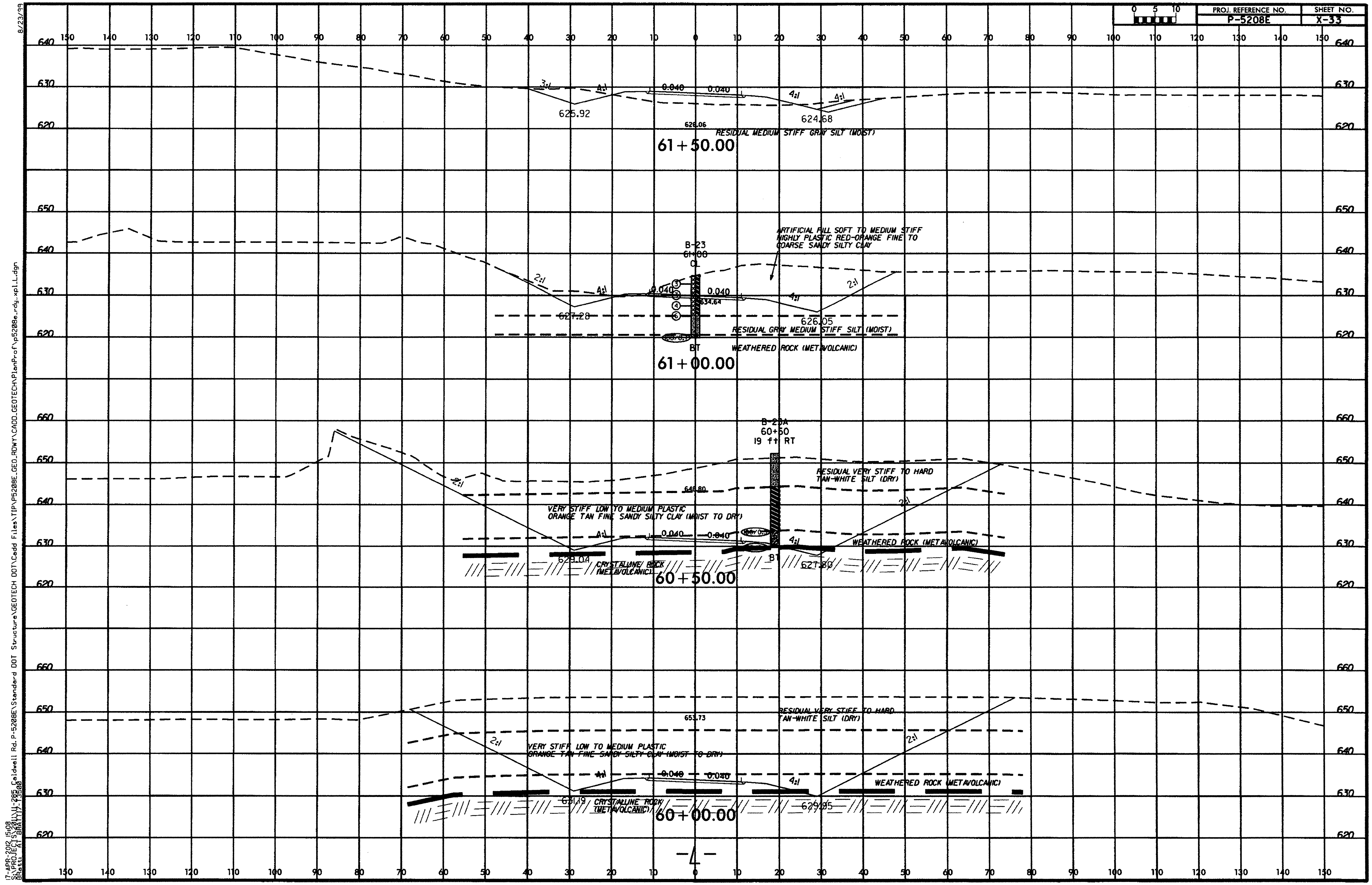
8/23/99


PROJ. REFERENCE NO.
P-5208E
SHEET NO.
X-33
0 5 10
625.92
626.06
624.68
0.040
0.040
3:1
4:1
4:1
4:1
RESIDUAL MEDIUM STIFF GRAY SILT (MOIST)
61+50.00
B-23
61+00
CL
ARTIFICIAL FILL SOFT TO MEDIUM STIFF HIGHLY PLASTIC RED-ORANGE FINE TO COARSE SANDY SILTY CLAY
2:1
2:1
4:1
4:1
627.28
626.05
RESIDUAL GRAY MEDIUM STIFF SILT (MOIST)
WEATHERED ROCK (METAVOLCANIC)
BT
61+00.00
B-23A
60+60
19 ft RT
RESIDUAL VERY STIFF TO HARD TAN-WHITE SILT (DRY)
648.80
VERY STIFF LOW TO MEDIUM PLASTIC ORANGE TAN FINE SANDY SILTY CLAY (MOIST TO DRY)
WEATHERED ROCK (METAVOLCANIC)
CRYSTALLINE ROCK (METAVOLCANIC)
629.04
627.80
60+50.00
653.73
RESIDUAL VERY STIFF TO HARD TAN-WHITE SILT (DRY)
VERY STIFF LOW TO MEDIUM PLASTIC ORANGE TAN FINE SANDY SILTY CLAY (MOIST TO DRY)
WEATHERED ROCK (METAVOLCANIC)
CRYSTALLINE ROCK (METAVOLCANIC)
631.49
629.95
60+00.00
-L-
8/23/99
17-APR-2012 15:08
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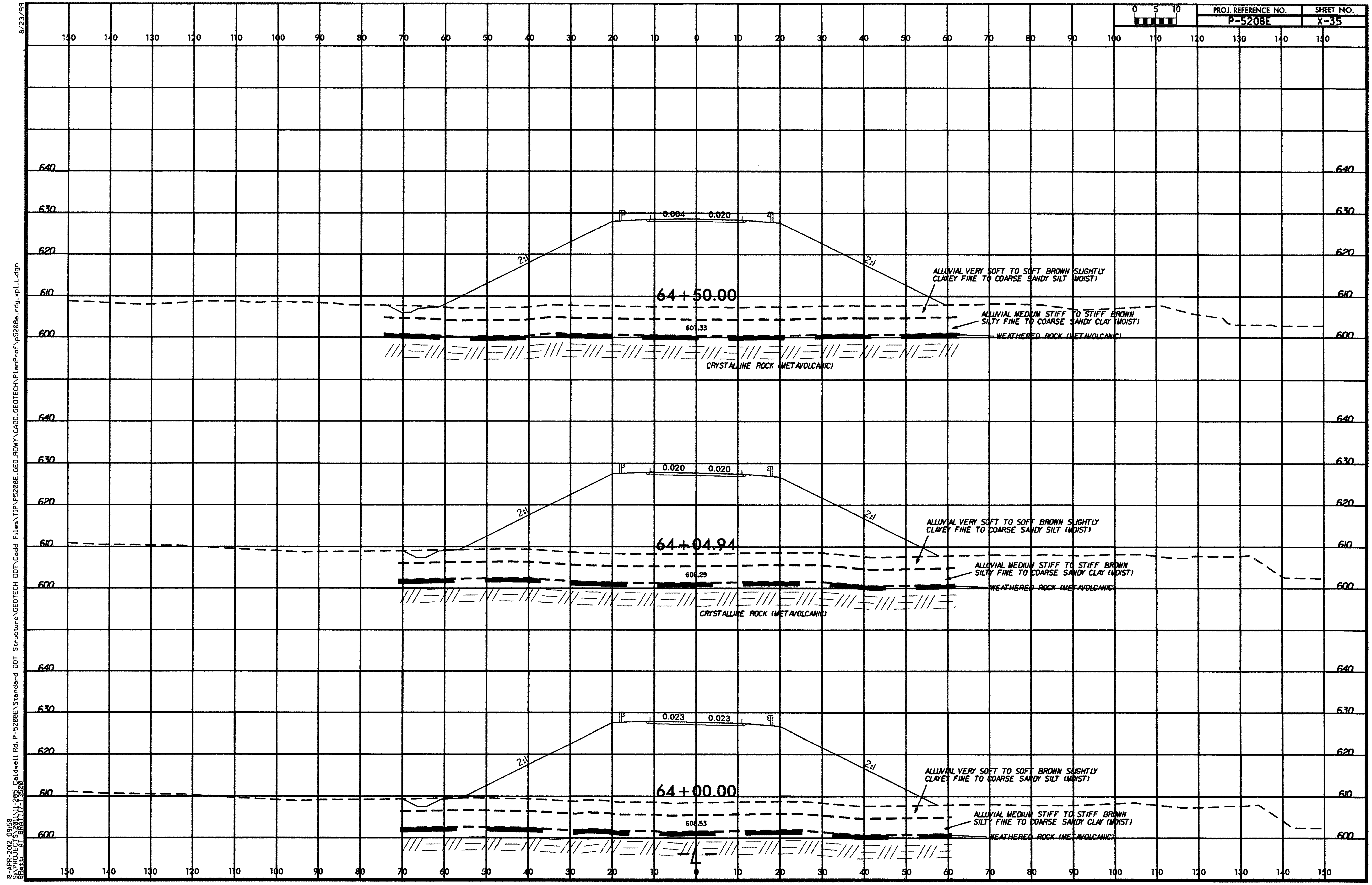

PROJ. REFERENCE NO.
P-5208E
SHEET NO.
X-35
0 5 10
64+50.00
0.004
0.020
2:1
ALLUVIAL VERY SOFT TO SOFT BROWN SLIGHTLY CLAYEY FINE TO COARSE SANDY SILT (MOIST)
ALLUVIAL MEDIUM STIFF TO STIFF BROWN SILTY FINE TO COARSE SANDY CLAY (MOIST)
WEATHERED ROCK (METAVOLCANIC)
CRYSTALLINE ROCK (METAVOLCANIC)
601.33
64+04.94
0.020
0.020
602.29
64+00.00
0.023
0.023
602.53
640
630
620
610
600
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
8/23/99
18-APR-2012 09:58

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	P-5208E	X-36

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

640 630 620 610 600 590

0.020 0.020

66+00.00 (607.78)

65+50.00 (607.34)

65+00.00

EB-A
65+10
20 ft LT

EBI-B
64+90
33 ft RT

607.91

2:1 2:1

ALLUVIAL VERY SOFT TO SOFT BROWN SLIGHTLY CLAYEY FINE TO COARSE SANDY SILT (MOIST)

ALLUVIAL MEDIUM STIFF TO STIFF BROWN SILTY FINE TO COARSE SANDY CLAY (MOIST)

WEATHERED ROCK (METAVOLCANIC)

CRYSTALLINE ROCK (METAVOLCANIC)

AR

18-APR-2012 09:58
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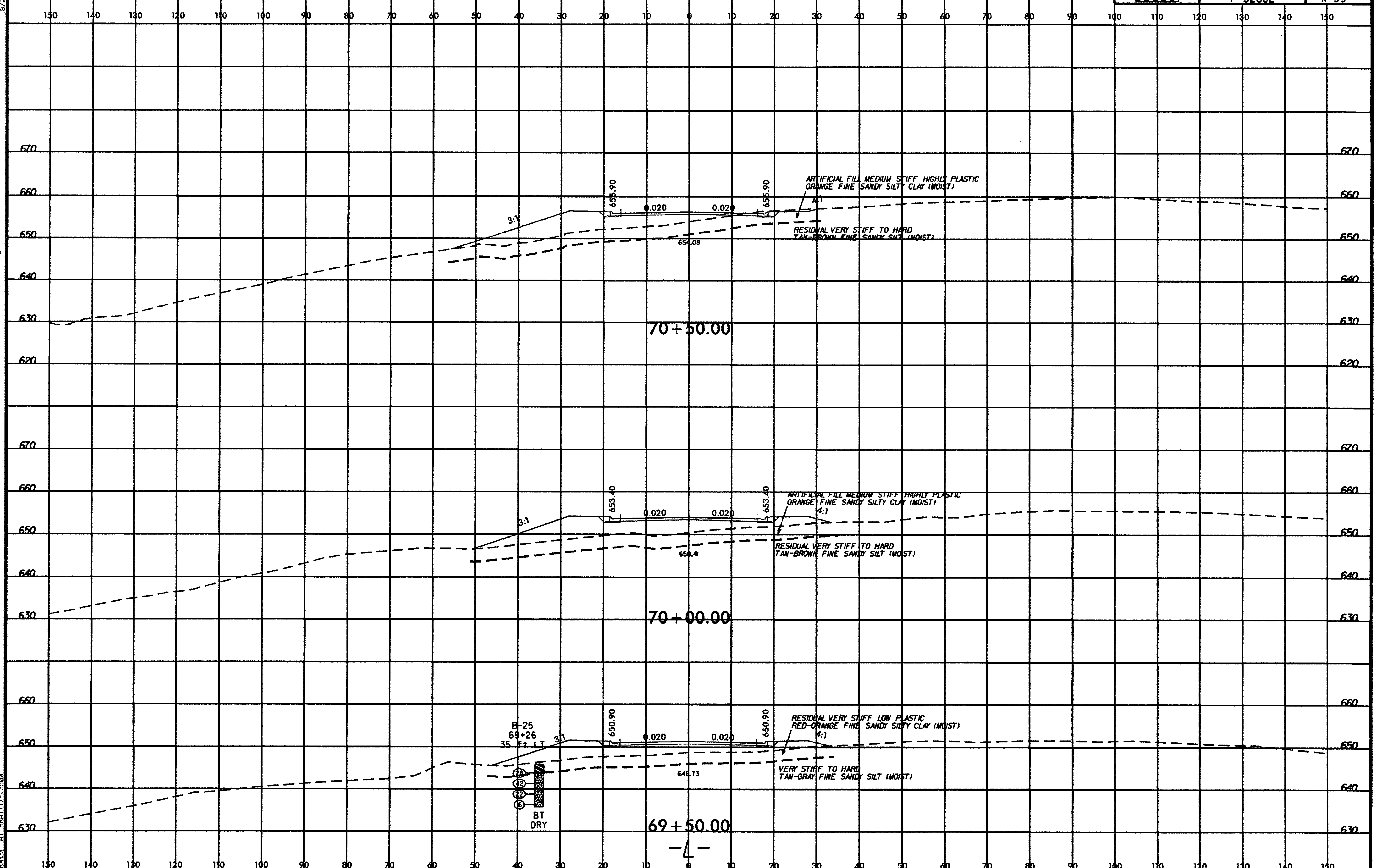
Bhatti Al BHATTI, 19500

PROJ. REFERENCE NO.	SHEET NO.
P-5208E	X-39


0 5 10
ARTIFICIAL FILL MEDIUM STIFF HIGHLY PLASTIC ORANGE FINE SANDY SILTY CLAY (MOIST)
RESIDUAL VERY STIFF TO HARD TAN-BROWN FINE SANDY SILT (MOIST)
655.90
655.90
0.020
0.020
3:1
4:1
654.08
70 + 50.00
ARTIFICIAL FILL MEDIUM STIFF HIGHLY PLASTIC ORANGE FINE SANDY SILTY CLAY (MOIST)
RESIDUAL VERY STIFF TO HARD TAN-BROWN FINE SANDY SILT (MOIST)
653.40
653.40
0.020
0.020
3:1
4:1
650.41
70 + 00.00
B-25
69+26
35 Ft LT
RESIDUAL VERY STIFF LOW PLASTIC RED-ORANGE FINE SANDY SILTY CLAY (MOIST)
VERY STIFF TO HARD TAN-GRAY FINE SANDY SILT (MOIST)
650.90
650.90
0.020
0.020
3:1
4:1
648.73
28
42
22
16
BT
DRY
69 + 50.00
670
660
650
640
630
620
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

8/23/99

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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	P-5208E	X-40

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680 670 660 650 640

4:1 663.40 0.020 0.020 663.40 4:1

ARTIFICIAL FILL MATERIAL STIFF HIGHLY PLASTIC ORANGE FINE SANDY SILTY CLAY (MOIST)

RESIDUAL VERY STIFF TO HARD TAN-BROWN FINE SANDY SILT (MOIST)

651.08

72+00.00

670 660 650 640

3:1 660.90 0.020 0.020 660.90 4:1

ARTIFICIAL FILL MATERIAL STIFF HIGHLY PLASTIC ORANGE FINE SANDY SILTY CLAY (MOIST)

RESIDUAL VERY STIFF TO HARD TAN-BROWN FINE SANDY SILT (MOIST)

652.60

71+50.00

670 660 650 640 630

2:1 658.40 0.020 0.020 658.40 4:1

B-26 70+94 F1 F2

ARTIFICIAL FILL MATERIAL STIFF HIGHLY PLASTIC ORANGE FINE SANDY SILTY CLAY (MOIST)

RESIDUAL VERY STIFF TO HARD TAN-BROWN FINE SANDY SILT (MOIST)

7 25 50 24

BT DRY

651.89

71+00.00

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

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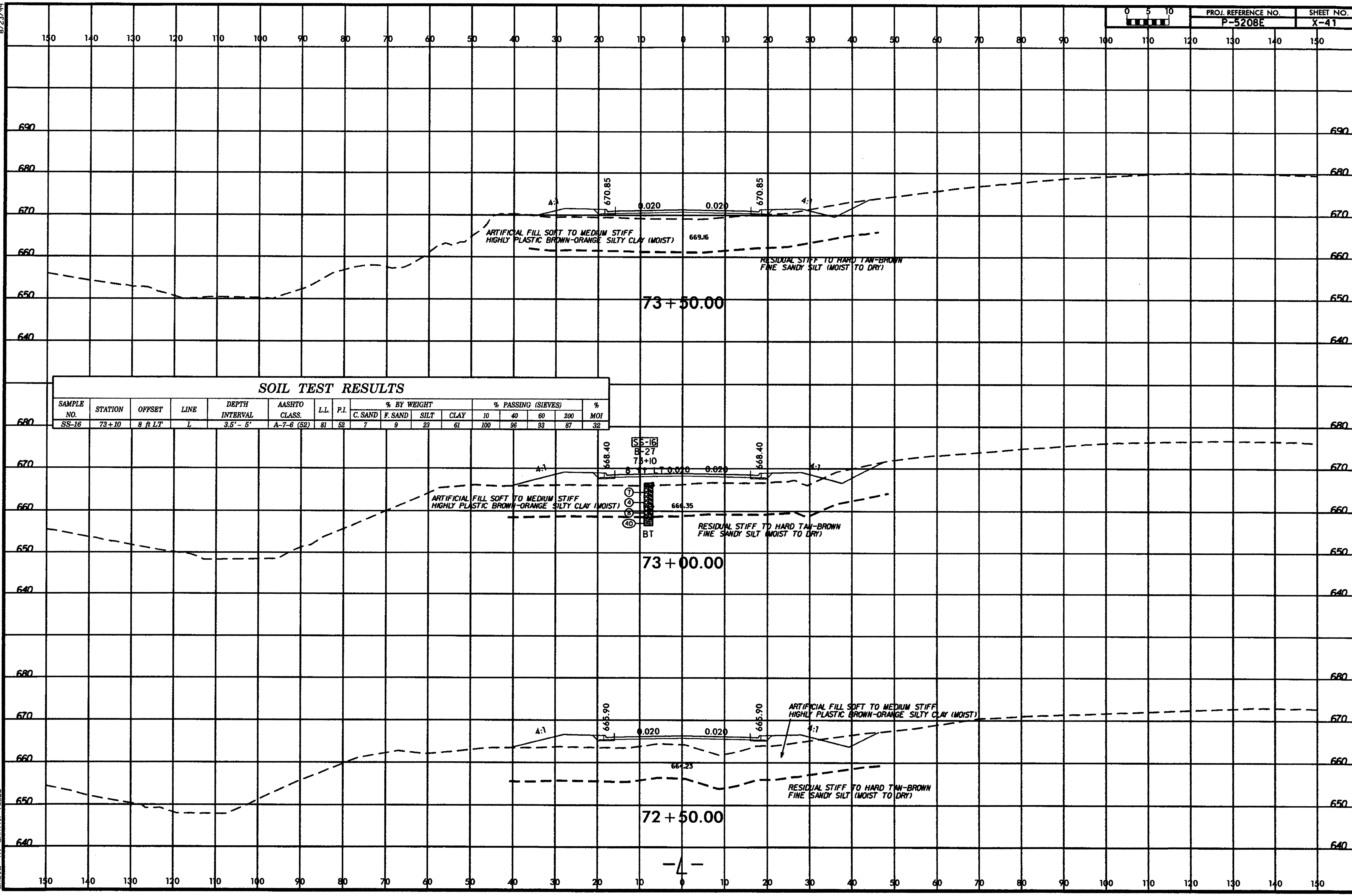
BRatti AT BRATTI7-T3500

PROJ. REFERENCE NO.	SHEET NO.
P-5208E	X-41



SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)				% MOI
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200	
SS-16	73+10	8 ft LT	L	3.5' – 5'	A-7-6 (52)	81	52	7	9	23	61	100	96	93	87	32

-L-

8/23/99

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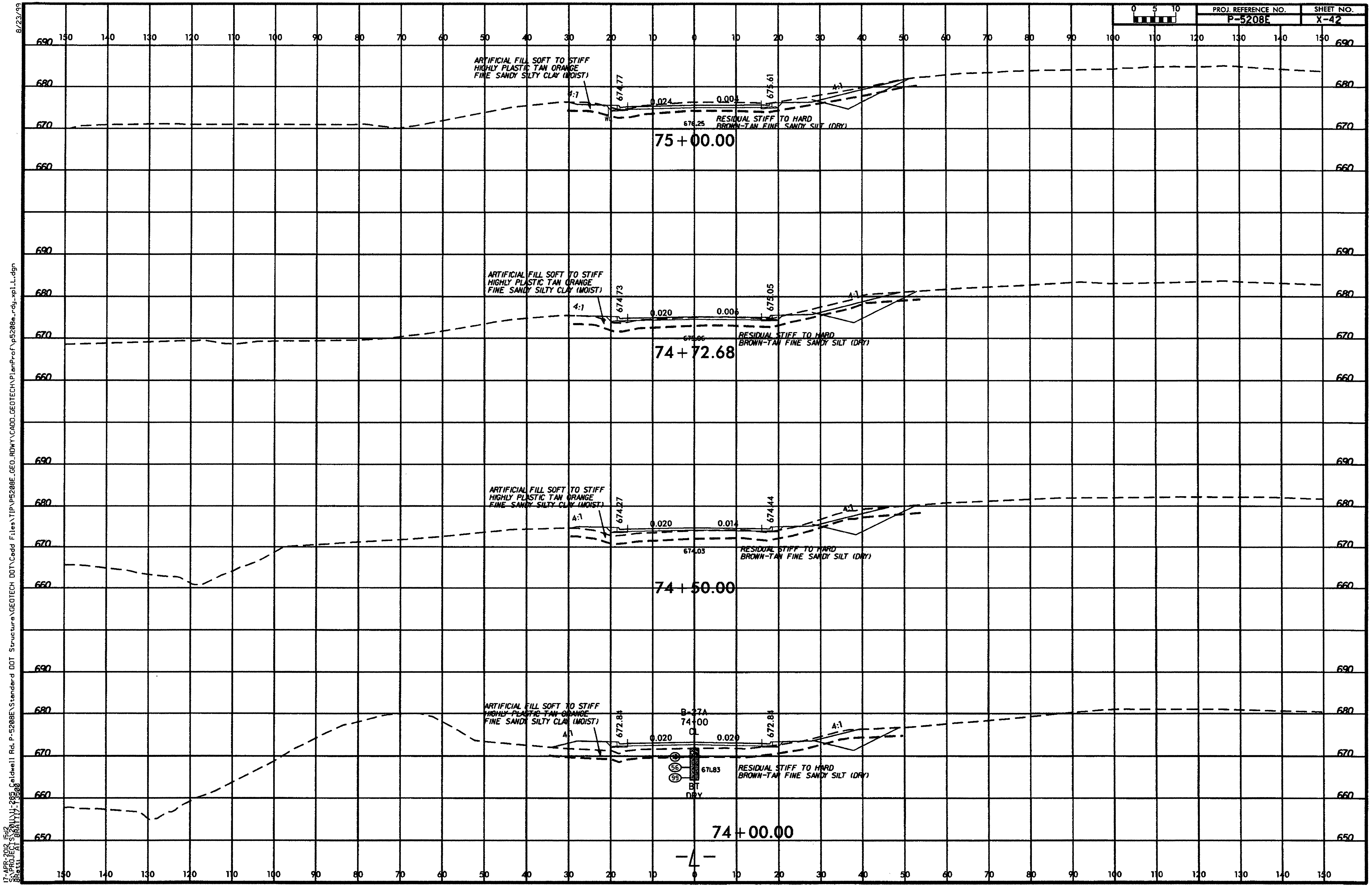
Bhatti AT BRATT17-13500



PROJ. REFERENCE NO.
P-5208E
SHEET NO.
X-42
0 5 10
ARTIFICIAL FILL SOFT TO STIFF HIGHLY PLASTIC TAN ORANGE FINE SANDY SILTY CLAY (MOIST)
RESIDUAL STIFF TO HARD BROWN-TAN FINE SANDY SILT (DRY)
674.77
675.61
0.024
0.004
676.25
75+00.00
674.73
675.05
0.020
0.006
675.66
74+72.68
674.27
674.44
0.020
0.014
674.03
74+50.00
672.84
672.84
B-27A
74+00
CL
0.020
0.020
671.83
BT
DRY
74+00.00
4:1