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EARTHWORK BALANCE SHEET

MAIN TRACK 2 STA. -M2-9218+01.63 BK =

STA. -M2- 9218+02.82 AH

LEGEND

206 TR07 2000.

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS** GEOTECHNICAL ENGINEERING UNIT

KIMBALL ROAD SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. <u>52000.1.STR07T1B(P-5206C)</u>.A. PROJ. <u>FRA-FR-HSR-0006-10-01-00</u> COUNTY <u>ROWAN</u>

PROJECT DESCRIPTION NCRR/NS MAINLINE REID TO NORTH KANNAPOLIS RAILROAD ROADBED (MP 337.0 TO MP 348.3)

SITE DESCRIPTION KIMBALL ROAD EXTENSION, INVENTORY REPORT

CAUTION NOTICE

STATE STATE PROJECT REFERENCE NO. SHEET TOTAL

52000.1.STR07T1B

URFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES.

CENERAL SOR AND ROCK STRATA DESCRIPTIONS AND MDICATED BOUNDARES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARLY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORNICS OR BETWEEN SAMPLED STRATA WITHIN THE BORRHOLE. THE ABOUT AND THE IN STILL UN-PLACE TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INTERENT IN THE STANDARD TEST METHOD. THE OBSERVE WATER LEVELS OR SOM, MOSTURE CONDITIONS MODICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOM, MOSTURE CONDITIONS MODICATED IN CLIMATIC CONDITIONS THE MOSTURE CONDITIONS THE ACCORDING TO CLIMATIC CONDITIONS MOSTURE CONDITIONS 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 DEFERENT. 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 OPROND OF THE POPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BODIER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS RECESSARY TO SATISFY HUMSELF AS TO CONDITIONS TO BE REPOCULTIERED ON THIS PROJECT, THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTEED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE REFORMATION.

PERSONNEL

S. KITTS

S. BUCHANAN

TERRACON

M. BAHIRADHAN

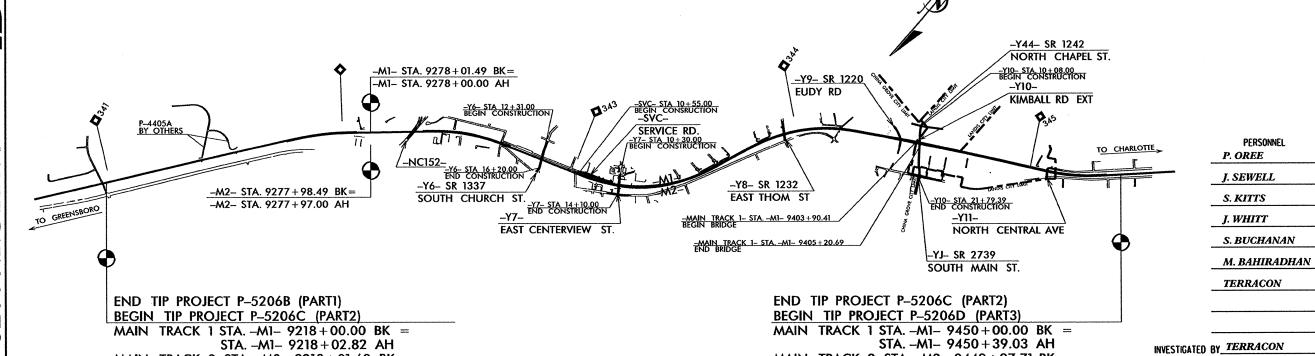
SUBMITTED BY SCHNABEL ENG. MAY 2013

CHECKED BY_

ORTH CARO

036072

CAM BAHIRA



MAIN TRACK 2 STA. -M2 - 9449 + 97.71 BK =

STA. -M2- 9450+39.03 AH

Jan 18 18 18 British B

DRAWN BY: _S. KITTS

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROJECT REFERENCE NO. 52000.I.STR07TIB (P-5206C) SHEET NO. 2 OF 36

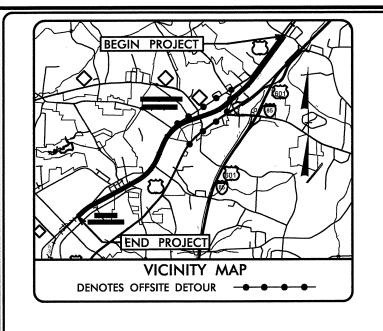
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

	SOIL AND ROCK LEGEN	ND, TERMS, SYMBOLS, AND ABBREVIATIONS	
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO CDARS UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO	E. 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.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO 1206, ASTM D-1586). SOIL	POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO DR MORE SIZES.	SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER COUAL 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	ADUIFER - A WATER BEARING FORMATION OR STRATA.
CLASSIFICATION IS BASED ON THE AASHTO SYSTEM, BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	ANGULARITY OF GRAINS	OF MEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR,	WEATHERED WON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100	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.
VERY STIFF, GRAY, SLITY CUM, MOST WITH INTEREEDOED FINE SAND UNFERS, HIGHLY PUSTIC, A-7-6	SUBANGULAR, SUBROUNDED, OR ROUNDED, MINERALOGICAL COMPOSITION	ROCK (WR) BLOWS PER FOOT IF TESTED.	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL
SOIL LEGEND AND AASHTO CLASSIFICATION GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS CONTROL OF CANADA CONTROL OF CANAD	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTION	S CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE,	AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE CROUND SURFACE.
CLASS. (≤ 35% PASSING "200) (> 35% PASSING "200) UNGANIC MATERIALS	WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	ONE ISS, GABBRO, SCHIST, ETC.	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-6 A-7 A-1, A-2 A-4, A-5 A-6, A-7	COMPRESSIBILITY	NUM-CATSTALLINE SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
CLASS. A-1-a-A-1-b A-2-4 A-2-5 A-2-5 A-2-7 A-3 A-5, A-7 SYMBOL 000000000000000000000000000000000000	SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50	INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD	CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL
Z. PASSING	HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50 PERCENTAGE OF MATERIAL	SEDIMENTARY ROCK SPT REFUSAL, ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.	LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
* 10 50 MX GRANULAR SILT MUCK,	ODCANIC MATERIAL GRANULAR SILT - CLAY	WEATHERING	<u>DIKE</u> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
# 40 38 MX 50 MX 51 MN 51 MN 52 MX 18 MX 35 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN SOILS CLAT PEAT	TRACE OF DRGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
LIQUID LIMIT 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN SOILS WITH	LITTLE DRGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% SOME 20 - 35% SOME 20 - 35%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN.	<u>DIP DIRECTION (DIP AZIMUTH) -</u> THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF
PLASTIC INDEX 6 MX NP 18 MX 18 MX 11 MN 11 MN 18 MX 18 MX 11 MN 11 MN LITTLE OR HIGHLY	HIGHLY ORGANIC >10% >20% HIGHLY 35% AND 6	OF CLASS CONCEAN COME A PROMEN CRECIMEN FACE CHIME PRICHELY POCK DINCE WHITE HANDED IN ONE IF	THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX 8 8 8 4 MX 8 MX 12 MX 16 MX No MX MODERATE ORGANIL		SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO	<u>FAULT</u> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
OF MAJOR GRAVEL, AND GRAVEL AND GRAVEL AND SAND SOLIS SOLIS MATTER	WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	(SLI,) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
MATERIALS SAND SHIP SHIP SHIP SHIP SHIP SHIP SHIP SHIP	STATIC WATER LEVEL AFTER 24 HOURS	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS, IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
AS A EXCELLENT TO GOOD FAIR TO POOR POOR POOR UNSUITABLE		(MOD.) GRANITOID ROCKS, MOST FELOSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	PARENT MATERIAL,
SUBGRADE PI OF A-7-5 SUBGROUP IS ≤ LL - 30 :PI OF A-7-6 SUBGROUP IS > LL - 30	SPRING OR SEEP	WITH FRESH ROCK. MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION, ROCK SHOWS SEVERE LOSS OF STRENGTH	FORMATION (FM.) - A MAPPABLE CEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD RANGE OF UNCONFINED COMPRESSIVE STRENGTH		TEST BORING W/ CORE MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
(N-YALUE) (TONS/FI-)	AUGED DODAG	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
GRANULAR LOOSE 4 TO 10	3012 31110012	EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	ITS LATERAL EXTENT.
MATERIAL DENSE 10 TO 30 N/M	ARTIFICIAL FILL (AF) OTHER ————————————————————————————————————	SPT REFUSAL IF TESTED, YIELDS SPT N VALUES > 100 BPF VERY SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT	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
VERY DENSE >50	INFERRED SOIL BOUNDARY MONITORING WELL	(V SEV.) THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK	SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
VERY SOFT	INFERRED ROCK LINE A PIEZOMETER	REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, YIELDS SPT N VALUES < 100 BPF</i>	<u>PERCHED WATER</u> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0 MATERIAL STIFF 8 TO 15 1 TO 2	INSTALLATION	COMPLETE ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
(COHESIVE) VERY STIFF 15 TO 30 2 TO 4	SLOPE INDICATOR INSTALLATION	SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.	ROCK QUALITY DESIGNATION (ROD) - 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
TEXTURE OR GRAIN SIZE	25/025 DIP & DIP DIRECTION OF ROCK STRUCTURES CONE PENETROMETER TEST	ROCK HARDNESS	EXPRESSED AS A PERCENTAGE.
	COUNDING DOD	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
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	SDUNDING ROD	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	ABBREVIATIONS AR - AUGER REFUSAL MED MEDIUM VST - VANE	TO DETACH HAND SPECIMEN.	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
(BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.)	BT - BORING TERMINATED MICA MICACEOUS WEA WEATH	MERED MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR
GRAIN MM 305 75 2.0 0.25 0.05 0.005	CL CLAY MOD MODERATELY γ - UNIT WE CPT - CONE PENETRATION TEST NP - NON PLASTIC γ_d - DRY UNI	IT WEIGHT BY MODERATE BLOWS.	SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF
SIZE IN. 12 3	CSE COARSE ORG ORGANIC	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. BBREVIATIONS HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE	A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH
SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION	DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK	POINT OF A GEOLOGIST'S PICK.	A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
(ATTERBERG LIMITS) DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	e - VOID RATIO SD SAND, SANDY SS - SPLIT S F - FINE SL SILT, SILTY ST - SHELBY	TUBE FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT, SMALL, THIN	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY	FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMP	PIECES CAN BE BROKEN BY FINGER PRESSURE. ACTED TRIAXIAL VERY CAN BE CARVED WITH KNIFF CAN BE FYCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH	STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY
LL LIOUID LIMIT (SAT.) FROM BELOW THE GROUND WATER TABLE	FRAGS FRAGMENTS w - MOISTURE CONTENT CBR - CALIFO	DRNIA BEARING SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY 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.
PLASTIC SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMINA MOTOTURE	HI HIGHLY V - VERY RATIO EQUIPMENT USED ON SUBJECT PROJECT	FINGERNAIL. FRACTURE SPACING BEDDING	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
PL PLASTIC LIMIT ATTAIN OPTIMUM MOISTURE	- LIAMED TUDE	TERM SPACING TERM THICKNESS	BENCH MARK:
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	BRILL UNITS: ADTRICTIO TODES:	MANUAL VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED > 4 FEET	
OM OPTIMUM MOISTURE - MUIST - (M) SULLIDER OF TEMOR MUISTURE SL SHRINKAGE LIMIT	MOBILE B-	MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET	ELEVATION: FT.
REQUIRES ADDITIONAL WATER TO - DRY - (D) ATTAIN OPTIMUM MOISTURE	6' CONTINUOUS FLIGHT AUGER CORE SIZE:	VEDY CLOSE LESS THAN DIS FEET THICKLY LAMINATED 0.008 - 0.03 FEET	NOTES:
HITHIN OFTIMUM MUISTORE	LA 8 HULLUW AUGERS L-8	THINLY LAMINATED C 0.008 FEET INDURATION	FIAD: FILLED IMMEDIATELY AFTER DRILLING
PLASTICITY PLASTICITY INDEX (PI) DRY STRENGTH	→ CME-45C	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
NONPLASTIC 0-5 VERY LOW	CME-550 TUNG,-CARBIDE INSERTS	ERIARI F RUBBING WITH FINGER FREES NUMEROUS GRAINS;	
LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM	CASING W/ ADVANCER HAND TOOLS:	GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
HIGH PLASTICITY 26 OR MORE HIGH	PORTABLE HOIST TRICONE STEEL TEETH POST HOLE	BREAKS FASILY WHEN HIT WITH HAMMER.	
COLOR	X DIEDRICH D-50 TRICONE TUNG,-CARB. HAND AUGE	ROD INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE;	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY),	CORE BIT SOUNDING I	DIFFICULT TO BREAK WITH HAMMER. R TEST	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	

90



STATE OF NORTH CAROLINA NCDOT RAIL DIVISION

ROWAN COUNTY

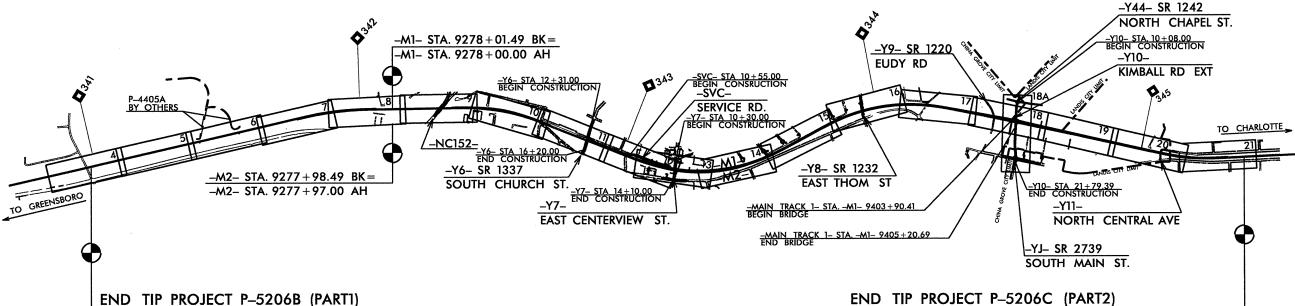
LOCATION: NCRR'NS MAINLINE RAILROAD ROADBED FROM SOUTH
OF MT. HOPE CHURCH RD (SR 1505, MP 340.9) TO NORTH
OF RYDER AVE (SR 1210, MP 345.4)

RAIL ENGINEER

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE
CURB AND GUTTER, AND SIGNALS

FTATE | STATE | PROJECT REPRENCE NO. | SHEET | NO. | NO. | SHEET | N

PART 2 OF 3



BEGIN TIP PROJECT P-5206C (PART2)

MAIN TRACK 1 STA. -M1- 9218+00.00 BK =

STA. -M1- 9218+02.82 AH

MAIN TRACK 2 STA. -M2- 9218+01.63 BK = STA. -M2- 9218+02.82 AH

STA. -M2- 9450+39.03 AH

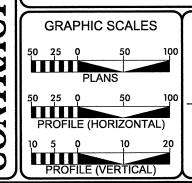
PRELIMINARY PLANS
DO NOT USE POR CONSTRUCTION

DO NOT USE FOR CONSTRUCTION

IRMITTAT • 0.004 PLANS

SUBMITTAL: 90% PLANS
DATE: JANUARY 25, 2013

NCDOT RAIL DIVISION CONTACT:



PROJECT LENGTH

LENGTH OF RAIL TIP PROJECT =4.368 MILES

LENGTH OF STRUCTURE TIP PROJECT =0.025 MILES

TOTAL LENGTH OF TIP PROJECT =4.393 MILES

TGS ENGINEERS
BOA-C. N.LAF AYETTE STREET
SHELDY.NC 20150
PH 1704) 476 0003
CORP.UCENSE NO..C-0275

2012 STANDARD SPECIFICATIONS
LEONARD FLETCHER, PE, PLS
RAIL PROJECT ENGINEER
JIMMY TERRY, PE
RAIL DESIGN ENGINEER
DAVID PETTY, PE
HYDRAULIC ENGINEER
LETTING DATE:
JULY 16, 2013

MATTHEW B. SIMMONS, PE

ROADWAY HYDRAULICS ENGINEER ENGINEER

BEGIN TIP PROJECT P-5206D (PART3)

MAIN TRACK 1 STA. -M1- 9450+00.00 BK =

MAIN TRACK 2 STA. -M2-9449+97.71 BK =

STA. -M1- 9450+39.03 AH

MATTHEW B. SIMMONS, PE

NC DEPARTMENT OF

NC DEPARTMENT OF TRANSPORTATION

RAIL DIVISION

PLANNING AND DEVELOPMENT

SDE-JOBSNI2821003_TGS Engineers NCDOT RailProject\CADD\P! AT 08-2110-007

013 11:39 0F-105



May 2, 2013

Mr. Jimmy Terry, PE TGS Engineers 804-C N. Lafayette Street Shelby, North Carolina 28150

WBS Number:

52000.1.STR07T1B

TIP Number:

P-5206C

FA Number:

FRA-FR-HSR-0006-10-01-00

County:

Rowan

Description:

Reid to Kannapolis - Task Order 1

Subject:

Roadway Inventory Report

For Kimball Road Extension

Schnabel Engineering Project No. 12821003.00

Dear Mr. Terry:

SCHNABEL ENGINEERING SOUTH, PC (Schnabel) is pleased to submit our geotechnical engineering report for this project. This report includes foundation recommendations and pay items with appendices where other relevant information is presented. This study was performed in accordance with our proposal dated October 17, 2011.

1.0 PROJECT DESCRIPTION

The project consists of extending Kimball Road from South Main Street to North Chapel Street, approximately 2,100 feet southeast. We understand construction for the extension will consist of new pavements with cuts up to 25 feet deep and fills up to 5 feet in height to achieve the proposed alignment grades. The alignment will pass under existing railroad tracks running parallel to South Main Street. The railroad tracks will be supported by a new bridge spanning Kimball Road. Recommendations for the new rail bridge will be provided in a separate report. Project information was provided by TGS Engineers. The following survey line was investigated:

Line -Y10-

Station 10+00 to Station 21+17

2.0 AREAS OF SPECIAL INTEREST

Following areas consisted of loose/soft fill soils.

<u>Station</u>

Offset

18+50 to 21+17

Lt. & Rt.

Following areas consisted of highly plastic soil.

<u>Station</u>

<u>Offset</u>

10+00 to 18+50

Lt. & Rt

schnabel-eng.com

Following areas consisted of saturated soils and perched water table within 6 feet from the proposed roadway subgrade.

<u>Station</u>

<u>Offset</u>

14+00 to 17+00

Lt. & Rt.

3.0 PHYSIOGRAPHY AND GEOLOGY

The project site is located within the Piedmont geological province. The site is underlain by artificial fills, residual soils, and rock. Based on local geology maps and rock cores recovered nearby, we believe the parent bedrock is composed of intrusive granite and metamorphosed granitic rock (Geologic Map of North Carolina, 1991).

The project site slopes to the southeast from EL 830 feet at South Main Street to EL 806 feet at North Chapel Street, draining to a stream south of North Chapel Street. The site cover is a mix of wooded areas, residential housing, and commercial buildings. The site cover near the railroad track was mostly wooded, while the sites near South Main Street and North Chapel Street vary from residential and commercial property to open fields or lots. Below grade utilities, including electric, water, and sewer are present in the vicinity of the site, servicing the nearby buildings.

The existing rail track is supported by an artificial fill embankment. Other artificial fills were observed throughout the project site. Natural residual soils were observed below the artificial fill soils. This information was obtained during our site visits and field investigation.

4.0 SOIL PROPERTIES

We characterized the subsurface strata based on the subsurface data and the laboratory test results. We have divided the soil into strata as described below.

Ground Cover

Topsoil thicknesses of 0 to 4 inches were encountered in several of the borings. Approximately 4 inches of asphalt pavement over 2 inches of stone base was observed at the surface of boring R-7, performed through the outside shoulder of existing South Main Street.

Artificial Fill Soils

Artificial fill soils were encountered in most test borings from below the ground surface or topsoil to depths ranging from 3.5 to 13.5 feet. These fills were likely placed during previous site grading and construction. The deepest fills were observed between Stations 13+00 and 15+00, in the vicinity of the proposed rail bridge along the existing rail track. The artificial fill soils observed at this project site typically consisted of orange and brown clayey sands (A-2), and sandy silty clays (A-6, A-7-5, A-7-6) with varying amounts of rock fragments, gravel, asphalt, organics, and mica. The existing fill had variable densities and consistencies, with Standard Penetration Test (N) values ranging from 4 to 28 blows per foot (bpf) indicating the fill may have been placed in an uncontrolled manner. The soil samples tested within this stratum have the following properties:

Liquid Limits = 51 to 67

Plasticity Indices = 25 to 31

Moisture Content = 4.2 to 28.2%

Maximum Dry Density (MDD) = 98.5 to 111.3 pcf per AASHTO T-99

SHEET NO. 3A OF 36

TGS Engineers

Kimball Road Extension

Opt. Moisture Content (OMC) 15.9 to 21.2% per AASHTO T-99 **CBR Value** 9.9 at 95% of MDD per AASHTO T-99

w/ Swell 0.5% to 0.9% per AASHTO T-193

Residual Soils

Residual soils were encountered in all of the test borings from below the artificial fills to boring termination depths of 10 to 30 feet below the ground surface. Residual materials are derived from the chemical and physical weathering of the underlying parent bedrock. The residual soils observed at this project site typically consisted of orange, brown, and gray Silty, Clayey Sands, (A-2), Sandy Silty Clays and Sandy Silts (A-7-5, A-7-6, A-4) with varying amounts of rock fragments, organics, and mica. N values ranged from 3 bpf to 36 bpf, indicating the granular soils were loose to medium dense and the fine-grained soils had medium stiff to very stiff consistencies, generally increasing with depth. The soil samples tested within this stratum have the following properties:

> Liquid Limits 61 to 73 **Plasticity Indices** 36 to 39

Moisture Content 9.9 to 57.2%

Maximum Dry Density (MDD) 91.2 to 103.9 pcf per AASHTO T-99

Opt. Moisture Content (OMC) 19.5 to 28.7% per AASHTO T-99

CBR Value 5.1 to 5.6 at 95% of MDD per AASHTO T-99

w/ Swell 1.2% to 2.5% per AASHTO T-193

GROUNDWATER PROPERTIES

Groundwater was observed in two test borings, R-4 and R-10, at depths of 14 and 17.3 feet below existing grade (EL 802.5 feet and EL 810 feet), respectively. The test boring logs also describe the moisture condition of our split spoon samples, indicating whether the soil appeared to be saturated, wet, moist, or dry. Based on the proposed alignment grades, the groundwater table was observed within 6.4 feet of the proposed pavement subgrade, while saturated soils were observed up to 0.5 feet above the proposed pavement subgrade.

Temporary stand-pipes were installed to depths of 30 feet below the existing ground surface in borings R-3 and R-10 to monitor the stabilized groundwater levels. The stand-pipe in boring R-3 was checked several times over a period of a few weeks in July and August 2012, and was dry each time. The stand-pipe in boring R-10 was checked several times in September 2012 where groundwater was observed at depths of 17.3 feet (EL 802.5 feet) each time. Table 1 summarizes our groundwater observations at each boring.

Perched water may be encountered above these grades during excavation, particularly in the vicinity of the existing track embankment. Perched water was observed in several test borings within artificial fills. Perched water occurs when a low permeability soil retards surface infiltration. Perched water may occur at other locations on site and at higher elevations than those recorded on the logs.

Table 1: Groundwater Observation Summary

Test Boring	Station Along Kimball Road (-Y10-)*	Existing Ground Surface Elevation (feet)	Test Boring Termination Elevation (feet)	Proposed Pavement Subgrade Elevation (feet)	Groundwater Elevation (feet)	Water Table Depth Above Proposed Roadway Subgrade (feet)	Comments
R-1	10+00	805.5	795.5	802	Dry		
R-2	12+00	812.0	792.0	808	Dry		
R-3	14+64	823.5	793.5	810	Dry		
R-10	14+90	819.8	789.8	811	802.5	-8.5	
R-4	16+00	824.0	804.0	816	809.6	-6.4	Saturated below EL 815.5
R-5	18+00	825.5	810.5	823	Dry		Saturated below EL 812
R-6	20+00	826.0	811.0	829	Dry		Wet below EL 814
R-9	20+99	829.5	819.5	831	Dry		
R-7	21+12	830.0	820.0	831	Dry		
R-8	21+16	N/A	821.5	831	Dry		

*Note: borings performed from 25 feet left to 72 feet right of the centerline of the proposed alignment

The water level readings are considered a reliable indication of the groundwater depth at the time the observations were made. Fluctuations of the groundwater taken should be anticipated based on variations in precipitation, runoff, flooding, evaporation, leaking utilities, season of the year, and other similar factors.

EARTHWORK BALANCE SHEET

The Earthwork Balance Sheet (Sheet 3C) included in this report was provided by TGS Engineers to be included in this report. We recommend that TGS Engineers verify the quantities presented in this earthwork balance sheet considering the recommended quantities presented in the recommendations report submitted under a separate cover.

LIMITATIONS 7.0

We based the analyses and recommendations submitted in this report on the information revealed by our exploration. We attempted to provide for normal contingencies, but the possibility remains that unexpected conditions may be encountered during construction.

We prepared this report to aid in the evaluation of this site and to assist in the design of the project. We intend it for use concerning this specific project. We based our recommendations on information on the site and proposed construction as described in this report. Substantial changes in locations or grades should be brought to our attention so we can modify

TGS Engineers

Kimball Road Extension

our recommendations as needed. We would appreciate an opportunity to review the plans and specifications as they pertain to the recommendations contained in this report, and to submit our comments to you based on this review.

We have endeavored to complete the services identified herein in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality and under similar conditions as this project. No other representation, express or implied, is included or intended, and no warranty or guarantee is included or intended in this report, or any other instrument of service.

We appreciate the opportunity to be of service for this project. Please call us if you have any questions regarding this report.

Sincerely,

SCHNABEL ENGINEERING SOUTH, PC

Mahalingam Bahiradhan (Bahi), PE

Senior Engineer

Jeff Sewell, PE Senior Associate SHEET NO. 3B OF 36

Earthwork Balance Sheet

Volumes in Cubic Yards DATE: 9/27/2013

SGM

COMPILED BY:

SHEET_OF_SHEETS

				EXCAVATIO	N			EMBAN	KMENT				WA	STE	
STATION	STATION	TOTAL	ROCK	UNDERCUT	UNSUIT.	SUITABLE	TOTAL	ROCK	EARTH	EMBANK.	BORROW	ROCK	SUITABLE	UNSUIT.	TOTAL
		UNCLASS.			UNCLASS.	UNCLASS.				+20%					
-M2- 9218+02.82	-M2- 9248+00.00	4,960				4,960	7,058		7,058	8,470	3,510				
	SUBTOTAL 1	4,960				4,960	7,058		7,058	8,470	3,510				
-M2- 9248+00.00	-M2- 9277+98.49	5,904	<u> </u>			5,904	1,054		1,054	1,265			3,479	1,160	4,639
	SUBTOTAL 2	5,904				5,904	1,054		1,054	1,265	***************************************		3,479	1,160	4,639
2000	100000000000000000000000000000000000000														
-M2- 9277+97.00	-M2- 9308+00.00	9,367				9,367	5,702		5,702	6,842			1,894	631	2,525
	SUBTOTAL 3	9,367				9,367	5,702		5,702	6,842			1,894	631	2,525
-M2- 9308+00.00	M2 021(+05.9)	2056				2056			_						
**************************************	-M2- 9316+95.86	2,056				2,056	8		7	8			1,536	512	2,048
-Y6- CROSSING -M2- 9316+95.86	-M2- 9335+05.57	4,631				4,631	2 601		2 601	1 117			161	52	214
-W12- 9310+93.80 -Y7- 10+30	-W12-9333+03.37 -Y7-14+10	115				115	3,681 270		3,681 270	4,417 324	209		161	53	214
-M2- 9335+05.57	-M2- 9338+00.00	3,128				3,128	2/0		2/0	324	209		2,346	782	3,128
112 3555 105,57	SUBTOTAL 4	9,930				9,930	3,959		3,958	4,749	209		4,043	1,347	5,390
	SOBIGINE					9,550	3,737		3,738	7,772	207		4,043	1,547	3,390
-M2- 9338+00.00	-M2- 9368+00.00	15,398				15,398	29,681		29,681	35,617	20,219				
	SUBTOTAL 5	15,398				15,398	29,681		29,681	35,617	20,219				
-M2- 9368+00.00	-M2- 9398+00.00	21,675				21,675	3,987		3,987	4,784			12,668	4,223	16,891
	SUBTOTAL 6	21,675				21,675	3,987		3,987	4,784			12,668	4,223	16,891
-M2- 9398+00.00	-M2- 9403+87	4,449				4,449	5,684		5,684	6,821	2,372				
BRIDGE															
-Y10- 10+08.00	-Y10-21+79.39	16,180				16,180	673		673	808			6,186	9,186	15,372
-YJ- 10+96.84 -M2- 9405+17	-YJ- 13+12.98 -M2- 9428+00.00	15 7,963				15	25		25	30	15				
-1012- 9403+17	SUBTOTAL 7	28,607		-		7,963	32,573		32,573	39,088	31,125		(10)	0.106	15.350
	SUBIUIAL /	28,007				28,607	38,955		38,955	46,747	33,512		6,186	9,186	15,372
-M2- 9428+00.00	-M2- 9449+97.71	5,900				5,900	1,296		1,296	1,555			3,259	1,086	4,345
7,20 - 00,00	SUBTOTAL 8	5,900				5,900	1,296		1,296	1,555			3,259	1,086	4,345
						2,700	1,270		1,20	1,555			3,237	1,000	7,545
TOTAL		101,741				101,741	91,692		91,691	110,029	57,450		31,529	17,633	49,162
	, , , , , , , , , , , , , , , , , , , ,														
LOSS DUE TO CLEARING &	& GRUBBING	-42,000				-42,000					42,000				
EST. SHOULDER MATERIA	XL						252		210	252	252				
WALGER DAY JEW OF DODD														***************************************	
WASTE IN LIEU OF BORRO	JW	50.741				50.541	01.044		01.001	110.001	-31,529		-31,529		-31,529
PROJECT TOTAL		59,741				59,741	91,944		91,901	110,281	68,173			17,633	17,633
ECT 50/ TO BERY ACE TO	COIL ON DODDOM DA	1									2 (22				
EST. 5% TO REPLACE TOP	SOIL ON BORKOW PIT	 									3,409				
GRAND TOTAL		59,741		 		59,741	91,944		91,901	110,281	71,582			17,633	17,633
344412 4 34144		35,712				37,171	71,777		71,701	110,201	71,302			17,055	17,033
SAY		60,400									72,300	·			
SA.		00,400				ļ I				ļ	12,300				

EST. DDE =410 CUBIC YARDS

EST. SHALLOW UNDERCUT = 1,600 CUBIC YARDS

PROJECT: P-5206C

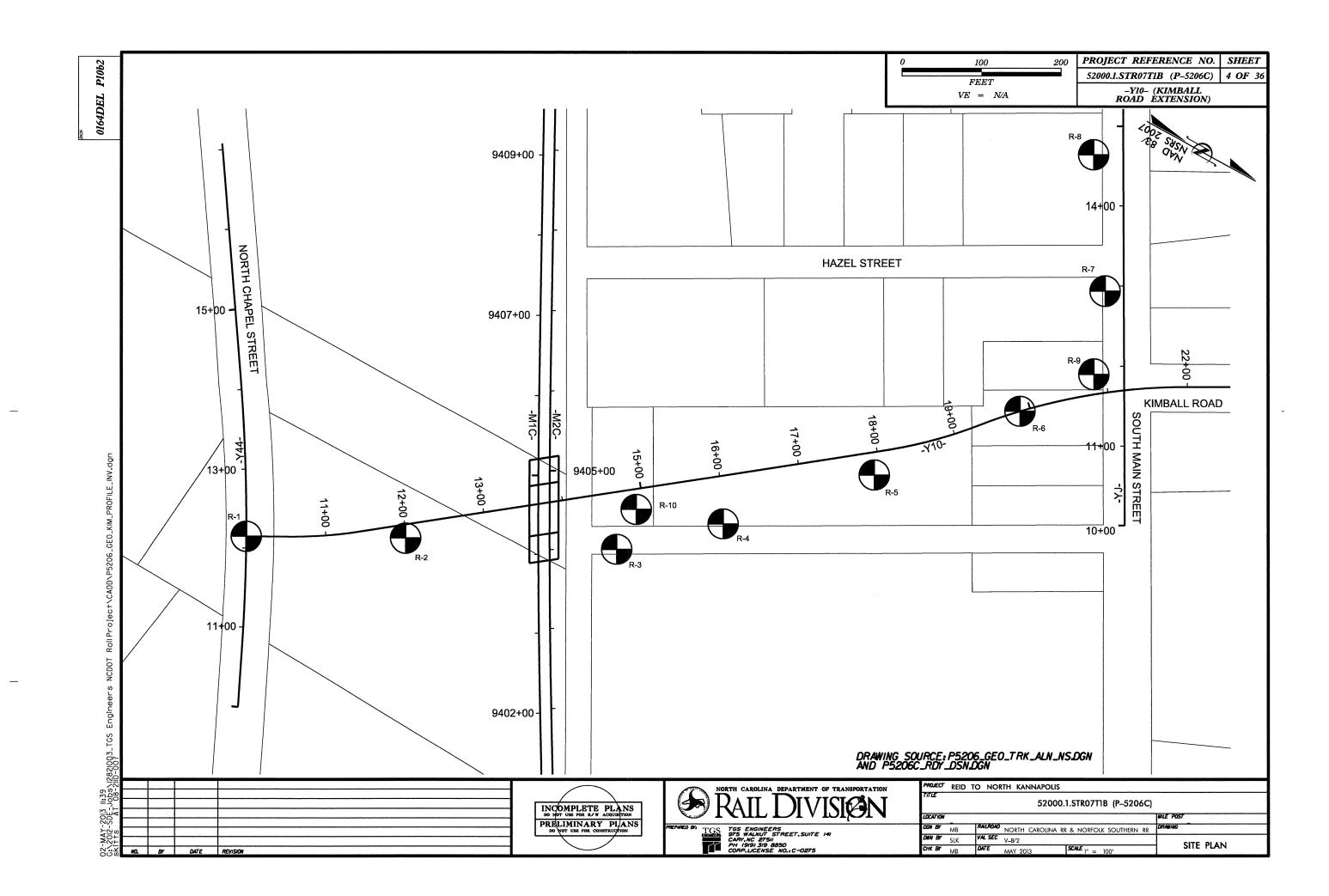
COUNTY: Rowan

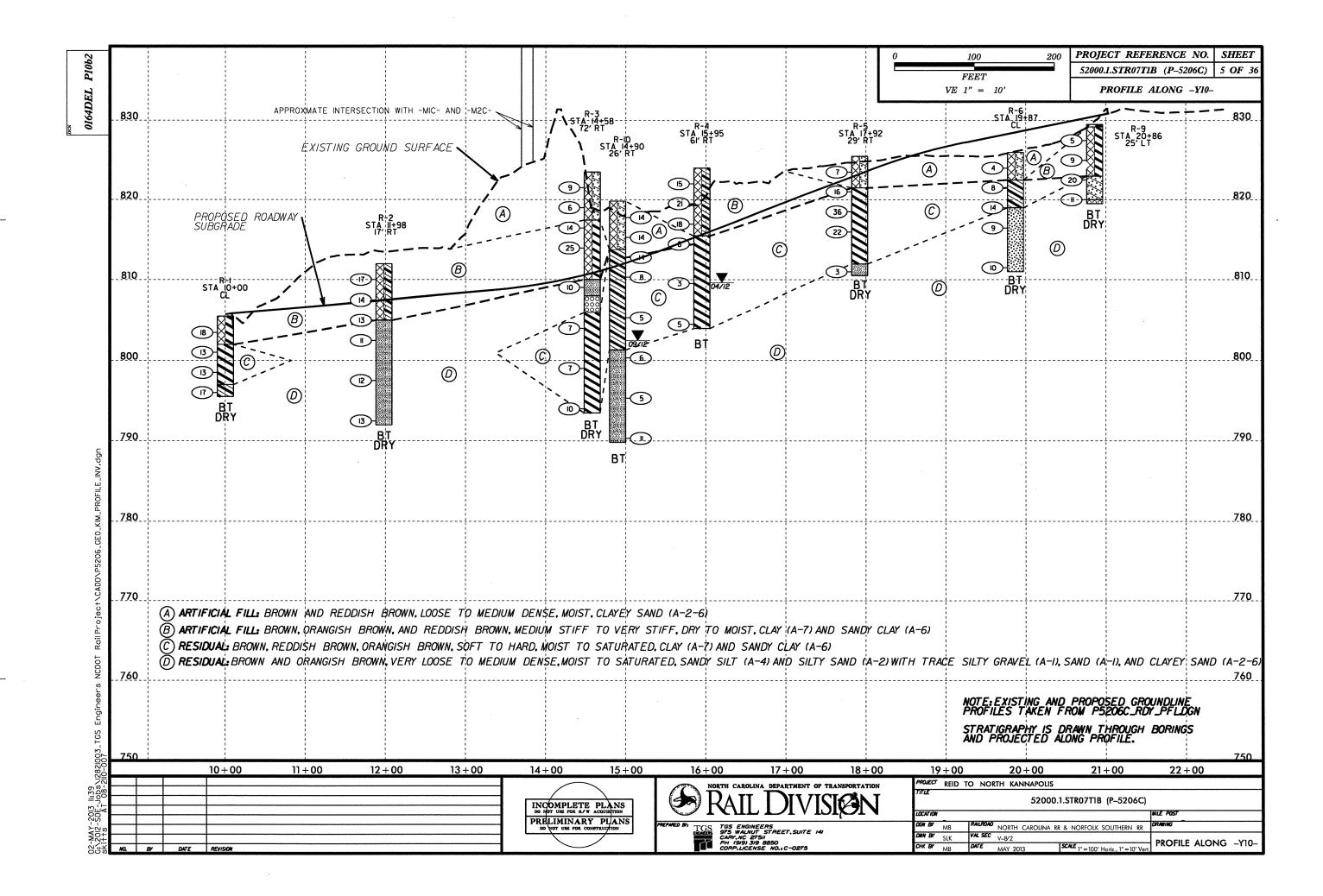
EST.SHALLOW UNDERCUT BY STATIONS = 1,350 CUBIC YARDS

TOTAL SHALLOW UNDERCUT = 2,950 CUBIC YARDS

CLASS IV SUBGRADE STABILIZATION = 6,250 TONS

PER GEOTECH & DIVISION RECOMMENDATIONS, ESTIMATED 4,700 CUBIC YARDS OF UNDERCUT TO BE USED IN THE DISCRETION OF THE RESIDENT ENGINEER.

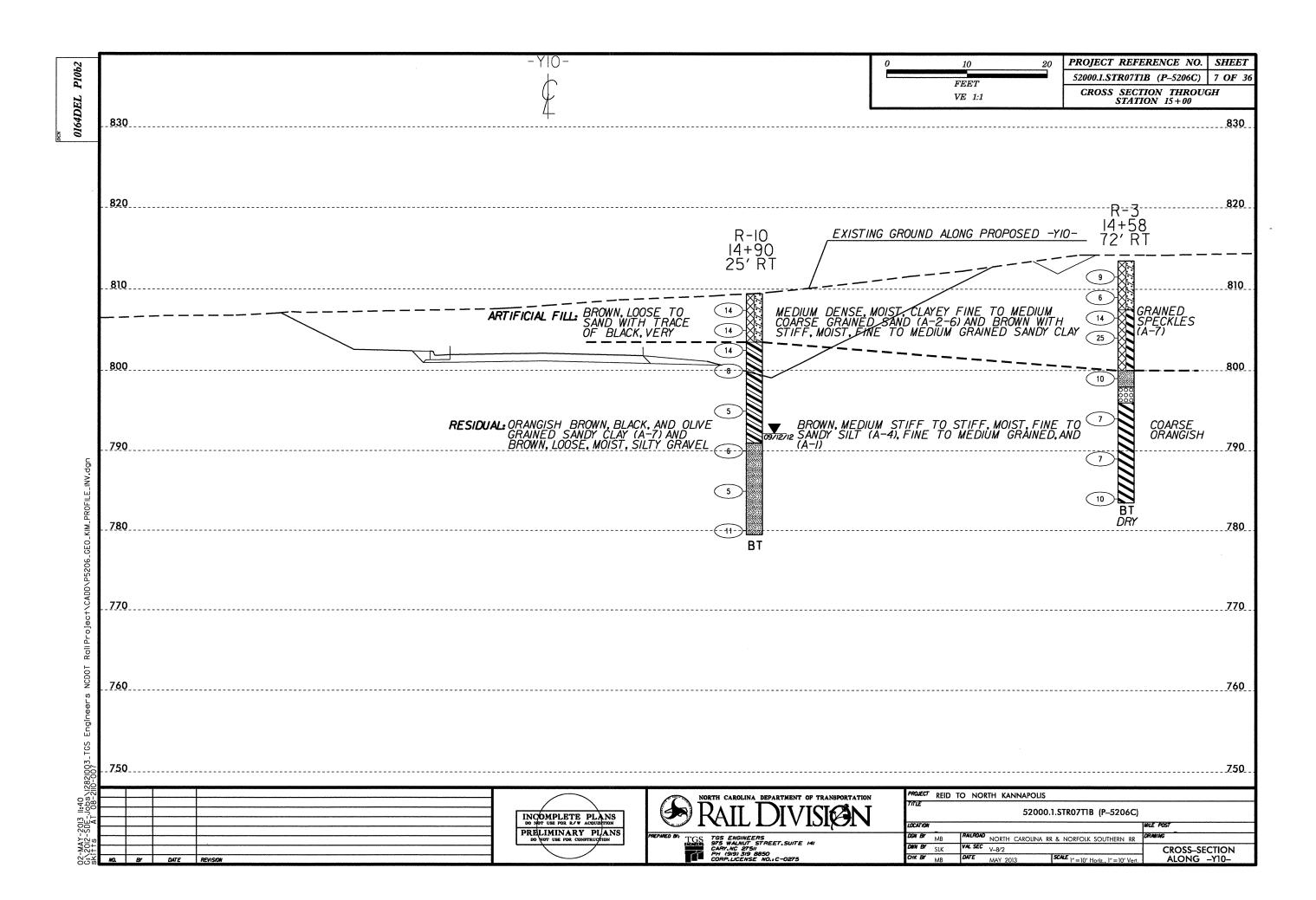




SHEET 810 800 790 780 760 820 790 780 770 P1062 6 OF 36 GRAINED 0164DEL SANDY SILT (A-4) COARSE **PROPOSED** 70 TO COARSE GRAINED SANDY CLAY

STIFF TO VERY STIFF, MOIST, FINE TO
BI
BI
DRY CLAY ALONG GRAINED EXISTING GROUND R-2 II+98 I7' RT BT ORY (12) OF BLACK, VERY CRAINED **RESIDUA:** ORANGISH BROWN AND BROWN, STIFF, MOIST, FINE -YIO <u>\</u> R-1 10+00 CL FINE (18) NWN WITH SPECKLES (ST. FINE TO COARSE (LAY (A-6) RESIDUAL: REDDISH BROWN, BROWN, ORANGISH BROWN, SANDY CLAY, WITH TRACE FINE TO MEDIUM PROPOSED ROAD ARTIFICIAL F BROWN AND 810 HORIZ. SCALE 0 10 20 HORIZ. SCALE 0 20 CROSS SECTION THROUGH STA 10+00 VE = 1:1CROSS SECTION THROUGH STA 12+00 VE = 1:1(FEET) REID TO NORTH KANNAPOLIS INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION 52000.1.STR07T1B (P-5206C) 02-MAY-2013 | G:\2012-SDE-J ski++s TGS ENGINEERS 975 WALNUT STREET,SUITE 141 CARY,NC 27511 PH 1993 319 8850 CORP.LICENSE NO.+C-0275 NORTH CAROLINA RR & NORFOLK SOUTHERN RR VAL SEC V-8/2 SLK CROSS-SECTION ALONG -Y10-DATE REVISION

SCALE 1"=10' Horiz., 1"=10' Vert. MAY 2013



PROJECT REFERENCE NO. SHEET 10 P10b2 -Y10-52000.1.STR07T1B (P-5206C) 8 OF 36 FEET CROSS SECTION THROUGH STATION 16+00 VE 1:1 0164DEL R-4 15+95 61' RT 820 EXISTING GROUND ALONG PROPOSED -YIO-ARTIFICIAL FILL: REDDISH BROWN, VERY STIFF, MOIST, FINE TO MEDIUM 21
GRAINED SANDY CLAY (A-6) (18) 800 800 RESIDUAL:ORANGISH BROWN, BROWN AND BLACK, SOFT TO MEDIUM STIFF, MOIST, CLAY WITH LITTLE FINE TO MEDIUM GRAINED SAND (A-7) BT _780_ 760 PROJECT REID TO NORTH KANNAPOLIS 52000.1.STR07T1B (P-5206C) INCOMPLETE PLANS PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION NORTH CAROLINA RR & NORFOLK SOUTHERN RR MB DAN BY SLK VAL SEC V-8/2 CROSS SECTION ALONG -Y10-DATE MAY 2013

SHEET 800 790 830 780 830 820 810 800 790 780 P10b2 9 OF 36 0164DEL 1/4 WITH R-5 -47+92-28 RT (A-2-SATURATED, CLAY GRAINED **RESIDUA:** REDDISH ORANGE, GRAY, BROWN AND BLACK, SOFT TO HARD, MOIST FINE TO MEDIUM GRAINED SAND (A-7) AND SILT (A-4) Θ **(** HORIZ. SCALE 0
(FEET) HORIZ. SCALE 0 (FEET) VE = 1:1CROSS SECTION THROUGH STA 18+00 CROSS SECTION THROUGH STA 19+00 VE = 1:1PROJECT REID TO NORTH KANNAPOLIS 02-MAY-2013 11:40 G:\2012-SDE-Jobs skitts AT 08-INCOMPLETE PLANS
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PRELIMINARY PUANS
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SHEET P10b2 810 780 810 790 10 OF 3 0164DEL SAWD MEDIUM GRANNED SANDY CLAY (A-6) AND MEDIUM DENSE, MOIST TO WET, SILTY FINE GRAINED TO MEDIUM FINE CLAYEY R-6 19+87 CL 0 | |-| BT $\stackrel{>}{\circ}$ (5) BROWN. 1 REDDISH R-9 0+86 5′LT \sim ARTIFICIAL HORIZ. SCALE 0 (FEET) HORIZ. SCALE 0 (FEET) 10 20 20 CROSS SECTION THROUGH STA 20+00 VE = 1:1CROSS SECTION THROUGH STA 21+00 PROJECT REID TO NORTH KANNAPOLIS INCOMPLETE PLANS
DO NOT USE FOR RAW ACQUISITION
PRELIMINARY PLANS
DO NOT USE POR CONSTRUCTION 52000.1.STR07T1B(P-5206C) 02-MAY-2013 1 G:\2012-SDE-J NORTH CAROLINA RE & NORFOLK SOUTHERN RR VAL SEC V-8/2 DWN BY SLK CROSS-SECTION ALONG -Y10-CHK BY MB **SCALE** 1"=10' Horiz., 1"=10' Vert. MAY 2013 DATE REVISION

SHEET P10b2 820 810 790 780 840 830 810 790 11 OF 36 0164DEL EXISTING GROUND ALONG PROPOSED ARTIFICIAL FILL: REDDISH ORANGE AND BROWN, VERY STIFF, MOIST, FINE TO COARSE GRANNED

SANDY CLAY WITH TRACE ROCK FRAGMENTS (A-7) WITH BROWN, MEDIUM STIFF, DRY, CLAY WITH LITTLE SAND (A-7) AND MEDIUM DENSE, DRY, CLAYEY FINE TO COARSE GRAINED SAND (A-2-6) SAND GRAINED EXISTING AND BROWN, LOOSE, DRY, FINE TO COARSE GRAINED LITTLE CLAY (A-1) TO COARSE **RESIDUAL:** BROWNISH ORANGE, MEDIUM DENSE, MOIST, SILTY FINE LITTLE ROCK FRAGMENTS (A-2) R-7 |2+94 24' LT ARTIFICIAL FILLS 810 HORIZ. SCALE 0 (FEET) HORIZ. SCALE 0 (FEET) 10 20 20 VE = 1:1CROSS SECTION THROUGH STA 13+00 VE = 1:1CROSS SECTION THROUGH STA 15+00 PROJECT REID TO NORTH KANNAPOLIS INCOMPLETE PLANS
DO NOT USE FOR RAW ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION 52000.1.STR07T1B(P-5206C) 02-MAY-2013 G:\2012-SDE-TGS ENGINEERS 975 WALNUT STREET.SUITE 141 CARY.NC 27511 PH 1919 319 8850 CORP.LICENSE NO.: C-0275 NORTH CAROLINA RE & NORFOLK SOUTHERN RE DWN BY SLK VAL SEC V-8/2 CROSS-SECTION ALONG -YJ-SCALE 1"=10' Horiz., 1"=10' Vert. DATE REVISION

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NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

TIP P-5206C COUNTY ROWAN WBS 52000.1.STR07T1B GEOLOGIST P. Oree DCN 0164DEL P10b2

SITE	DESCR	IPTION	l Kim	ball R	oad E	xte	nsion, Inv	entory	Report							GROUND	WTR (ft) S	SITE
BOR	ING NO.	R-1			S	TA	TION 10)+00		OFFSI	ET C	CL			ALIGNMENT -Y10-	0 HR.	Dry B	BOR
1	LAR ELE						AL DEPT			NORT	HING	660,6			EASTING 1,526,086	24 HR.	FIAD C	COLI
1				TE TE			DRICH D-5			T = = = =				D H		ER TYPE A		ORILL
J	LER W		·			TAI	RT DATE			L	. DAT	E 04/2		1 L I	SURFACE WATER DEPTH N/	<u> </u>		DRIL
ELEV (ft)	ELEV	DEPTH (ft)	0.5ft	W COL		$\ \ _{c}$) 2	5 5	50 PER FOOT	75	100	SAMP.	/	0	SOIL AND ROCK DESC	RIPTION	117	LEV (ft)
	(ft)		0.01	0.011	0.010	H		<u></u>				110.	/MOI	G	ELEV. (ft)		DEPTH (ft)	
810																		815
9.5	-	-													- -			210
	_														- - - 805.5 GROUND SURFA	ACE	0.0	
805	804.5	1.0	6	12	6	Ħ						SS-1	М		- ARTIFICIAL FILE BROWN AND TAN, FINE	L	<u> 8</u>	810
	802.0	3.5	4	6	7		¶.18					S-BULK			GRAINED SANDY CLAY, MICACEOUS	ODERATELY	Y 3.5	
800	799.5 -	- 6.0] -	· · • 13·			: :			М		RESIDUAL REDDISH BROWN, FINE			805
	797.0	8.5	4	5	8		13						М		GRAINED SANDY CLAY	Y, HIGHLY	8.5	
			5	8	9	\coprod		<u> </u>			- 1		М		- 795.5 AT 6 FT: BROWN, WITH TR		10.0	800
	-	-													MEDIUM GRAINED GRAVEI ORANGISH BROWN, FINE	L AND ROOT	rs	
	-	-													GRAINED SANDY Boring Terminated at Elevat	CLAY		795
	_	-													Sandy Clay		· '	30
															Bulk sample from 0 f	t to 5ft.		
	_	-							-					l	- - -			
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WBS	52000	.1.STF	R07T1	3	Т	IP	P-52	06C		C	OUNT	YR	OWA	N				GEOLO	GIST P. Oree)		
SITE	DESCR	IPTION	l Kim	ball R	oad E	xter	nsion,	, Inve	entory I	Rеро	rt										GROUN	ID WTR (ft)
BOR	ING NO.	R-2			s	TAT	TION	11-	+98			OF	FSET	1	7 ft RT			ALIGNN	MENT -Y10-		0 HR.	Dry
COL	LAR ELE	E V. 81	12.0 ft		Т	OT/	AL DE	EPTH	1 20.0	ft		NO	RTHIN	1G	660,8	71		EASTIN	G 1,525,991		24 HR.	FIAD
DRILL	. RIG/HAI	MER E	FF./DA	TE T	R255	DIE	DRICH	1 D-50	77% 0	7/15/2	2011				DRILL N	IETHO	DН	.S. Augers		HAMM	ER TYPE	Automatic
DRIL	LER W	. Dugg	jins		s	TAF	RT DA	ATE	04/24	/12		СО	MP. D	ΑT	E 04/2	24/12		SURFAC	CE WATER DE	PTH N	Ά	
ELEV (ft)	ELEV	DEPTH (ft)	BLC 0.5ft	0.5ft	UNT 0.5ft	0		25	BLOWS	S PER 50	F001	Г 75	10	n	SAMP. NO.		L O		SOIL AND RO	OCK DES	CRIPTION	
	(ft)	()	0.511	0.511	0.511	+	· 							+	NO.	/MOI	G					
815		_																				
																		812.0	GROU	ND SURF	ACE	0.
810	811.0	1.0	4	6	11	\prod		1.		- -		. -				М		- 0	ARTI RANGISH BROV	FICIAL FI		s of
	808.5	3.5				\prod]	7''							-	BLACK, FINE T SANDY CLAY, '	O COARS	E GRAINE	D
	806.0	6.0	4	6	8		•	14		: :		: :	: : :			М		-	OAND FOLAT,	vviii i i i v	AOL NOO!	0
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	798.5 -	- - 13.5					. j.					- -		1				-	AT 13.	5FT: BRO	WN	
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	793.5	- 18.5 -	3	6	7		i . •1		: : :	1		- 1	: : :			М		- - 792.0				20.0
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GROUND WTR (ft)

14.4

14.4

0 HR.

24 HR.

RESIDUAL

HAMMER TYPE Automatic

NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 52000.1.STR07T1B TIP P-5206C COUNTY ROWAN **GEOLOGIST** P. Oree WBS 52000.1.STR07T1B TIP P-5206C COUNTY ROWAN GEOLOGIST P. Oree SITE DESCRIPTION Kimball Road Extension, Inventory Report SITE DESCRIPTION Kimball Road Extension, Inventory Report **GROUND WTR (ft)** ALIGNMENT -Y10-**STATION** 14+58 OFFSET 61 ft RT ALIGNMENT -Y10-BORING NO. R-3 OFFSET 72 ft RT 0 HR. BORING NO. R-4 STATION 15+95 COLLAR ELEV. 823.5 ft TOTAL DEPTH 30.0 ft **NORTHING** 661,109 **EASTING** 1,525,874 24 HR. FIAD COLLAR ELEV. 824.0 ft TOTAL DEPTH 20.0 ft **NORTHING** 661,211 **EASTING** 1,525,781 DRILL RIG/HAMMER EFF./DATE TER255 DIEDRICH D-50 77% 07/15/2011 DRILL METHOD H.S. Augers HAMMER TYPE Automatic DRILL RIG/HAMMER EFF./DATE TER255 DIEDRICH D-50 77% 07/15/2011 DRILL METHOD H.S. Augers COMP. DATE 04/24/12 DRILLER W. Duggins **START DATE** 04/23/12 COMP. DATE 04/23/12 SURFACE WATER DEPTH N/A DRILLER W. Duggins **START DATE** 04/24/12 SURFACE WATER DEPTH N/A ELEV DRIVE DEPTH BLOW COUNT DRIVE DEPTH BLOW COUNT SAMP. SAMP. BLOWS PER FOOT BLOWS PER FOOT SOIL AND ROCK DESCRIPTION SOIL AND ROCK DESCRIPTION ELEV (ft) (ft) (ft) 0.5ft 0.5ft 0.5ft 50 MOI G (ft) 0.5ft 0.5ft 0.5ft 50 75 100 NO. 25 75 100 NO. 25 (ft) (ft) 825 825 GROUND SURFACE 823.5 GROUND SURFACE ARTIFICIAL FILL 823.0 1.0 ARTIFICIAL FILL 822.5 + 1.0 REDDISH BROWN, FINE TO MEDIUM М BROWN, CLAYEY FINE TO MEDIUM М GRAINED SANDY CLAY 820 820.5 GRAINED SAND, WITH TRACE ROOTS 820 820.0 T 3.5 М AND COARSE GRAINED SAND M AT 3.5FT: FINE TO COARSE SAND WITH . . . 818.0 TRACE QUARTZ GRAVEL 817.5 + 6.0 10 М BROWN WITH SPECKLES OF BLACK 9 -5 . . . SS-3 М FINE TO MEDIUM GRAINED SANDY CLAY 815 | 815.5 + 8.5 815 815.0 Sat. ORANGISH BROWN TO LIGHT BROWN, CLAY, WITH LITTLE FINE TO MEDIUM . . . М **GRAINED SAND** S-BULF 810.5 + 13.5 810 810.0 T 13.5 SS-5 AT 13.5FT: SPECKLES OF DARK BROWN 6 RESIDUAL AT 18.5FT: BROWN WITH BLACK, HIGHLY ORANGISH BROWN, FINE TO MEDIUM GRAINED SANDY SILT, MODERATELY 806.0 MICACEOUS S-BULI 805.5 + 18.5 805 805.0 18.5 ORANGISH BROWN, SILTY GRAVEL 2 W 2 4 3 SS-6 BROWN, FINE TO MEDIUM GRAINED Boring Terminated at Elevation 804.0 ft In SANDY CLAY AT 23.5FT: TAN TO BROWN AND LIGHT GRAY, FINE TO COARSE GRAINED SAND, 800 800.0 7 23.5 Bulk sample from 10ft to 15ft. HIGHLY MICACEOUS 795 795.0 28.5 4 6 793.5 Boring Terminated at Elevation 793.5 ft In Sandy Clay Installed temporary piezometer upon completion. Shelby Tube sample from 10ft to 12ft. Bulk sample from 5ft to 10ft. Bulk sample from 15ft to 20ft. Other Samples: ST-1 (10.0 - 12.0)

NCDOT GEOTECHNICAL ENGINEERING UNIT

GEOLOGIST P. Oree TIP P-5206C COUNTY ROWAN GEOLOGIST P. Oree **WBS** 52000.1.STR07T1B TIP P-5206C COUNTY ROWAN WBS 52000.1.STR07T1B SITE DESCRIPTION Kimball Road Extension, Inventory Report **GROUND WTR (ft)** SITE DESCRIPTION Kimball Road Extension, Inventory Report GROUND WTR (ft) OFFSET CL ALIGNMENT -Y10-BORING NO. R-5 STATION 17+92 OFFSET 29 ft RT ALIGNMENT -Y10-0 HR. BORING NO. R-6 STATION 19+87 0 HR. Dry TOTAL DEPTH 15.0 ft **NORTHING** 661,346 **EASTING** 1,525,635 24 HR. FIAD COLLAR ELEV. 826.0 ft TOTAL DEPTH 15.0 ft **NORTHING** 661.468 **EASTING** 1,525,477 24 HR. FIAD COLLAR ELEV. 825.5 ft DRILL METHOD H.S. Augers HAMMER TYPE Automatic DRILL RIG/HAMMER EFF./DATE TER255 DIEDRICH D-50 77% 07/15/2011 DRILL METHOD H.S. Augers HAMMER TYPE Automatic DRILL RIG/HAMMER EFF./DATE TER255 DIEDRICH D-50 77% 07/15/2011 COMP. DATE 04/24/12 **COMP. DATE** 04/23/12 SURFACE WATER DEPTH N/A DRILLER W. Duggins **START DATE** 04/24/12 SURFACE WATER DEPTH N/A **DRILLER** W. Duggins **START DATE** 04/23/12 | Column | C DEPTH BLOW COUNT DRIVE SAMP. BLOWS PER FOOT **BLOWS PER FOOT** ELEV SOIL AND ROCK DESCRIPTION SOIL AND ROCK DESCRIPTION (ft) 0.5ft 0.5ft 0.5ft 100 75 100 NO. NO. (ft) MOI G MOI G 830 830 GROUND SURFACE GROUND SURFACE ARTIFICIAL FILL REDDISH BROWN, CLAYEY FINE TO MEDIUM GRAINED SAND 825 825 825.0 1.0 ARTIFICIAL FILL 824.5 1.0 M REDDISH BROWN, CLAYEY FINE TO MEDIUM GRAINED SAND, WITH TRACE 822.0 I RESIDUAL М ROOTS ORANGISH BROWN, FINE TO MEDIUM GRAINED SANDY CLAY 820 820 820.0 819.5 AT 3.5FT TO 4FT: BLACK, POSSIBLY 14 SS-3 LIGHT BROWN AND ORANGE, SILTY FINE 817.5 RESIDUAL TO COARSE GRAINED SAND 817.0 М REDDISH ORANGE, CLAY, WITH LITTLE М 815 815 AT 13.5FT: INCREASE IN SILT CONTENT FINE TO MEDIUM GRAINED SAND WITH TRACE SILT Sat. 812.0 812.5 + 13.5 812.0 AT 6.0FT: REDDISH ORANGE TO GRAY, w E TRACE COARSE SAND 15.0 Boring Terminated at Elevation 811.0 ft In BROWN WITH BLACK, SILT. Sitty Sand MODERATELY MICACEOUS Boring Terminated at Elevation 810.5 ft In

NCDOT GEOTECHNICAL ENGINEERING UNIT

GEOLOGIST J. Whitt GEOLOGIST P. Oree WBS 52000.1.STR07T1B TIP P-5206C COUNTY ROWAN WBS 52000.1.STR07T1B TIP P-5206C COUNTY ROWAN GROUND WTR (ft) SITE DESCRIPTION Kimball Road Extension, Inventory Report **GROUND WTR (ft)** SITE DESCRIPTION Kimball Road Extension, Inventory Report **STATION** 12+94 ALIGNMENT -YJ-0 HR. OFFSET 37 ft LT ALIGNMENT -YJ-0 HR. BORING NO. R-7 OFFSET 24 ft LT Dry BORING NO. R-8 **STATION** 14+64 Dry 面 **NORTHING** 661,488 **EASTING** 1,525,294 COLLAR ELEV. 830.0 ft TOTAL DEPTH 10.0 ft 24 HR. FIAD COLLAR ELEV. 831.5 ft TOTAL DEPTH 10.0 ft **NORTHING** 661,393 **EASTING** 1,525,151 24 HR. FIAD DRILL RIG/HAMMER EFF./DATE TER255 DIEDRICH D-50 77% 07/15/2011 DRILL METHOD H.S. Augers DRILL RIG/HAMMER EFF./DATE TER6847 CME-75 91% 02/02/2012 DRILL METHOD H.S. Augers HAMMER TYPE Automatic HAMMER TYPE Automatic DRILLER W. Duggins **START DATE** 05/04/12 COMP. DATE 05/04/12 SURFACE WATER DEPTH N/A **DRILLER** J. Turnage **START DATE** 06/04/12 COMP. DATE 06/04/12 SURFACE WATER DEPTH N/A DRIVE DEPTH BLOW COUNT DRIVE DEPTH BLOW COUNT **BLOWS PER FOOT** SAMP. **BLOWS PER FOOT** ELEV SOIL AND ROCK DESCRIPTION ELEV SOIL AND ROCK DESCRIPTION (ft) 0.5ft 0.5ft 0.5ft 75 100 (ft) (ft) 0.5ft 0.5ft 0.5ft 100 NO. NO. MOI G (ft) ELEV. (ft) (ft) MOI G GROUND SURFACE 830.0 835 829.5 - 827.5 829.0 1.0 ARTIFICIAL FILL ASPHALT AND ABC STONE RED AND BROWN, CLAY WITH LITTLE **GROUND SURFACE** 826.5 830.5 + 1.0 SAND ARTIFICIAL FILL D 825 RED AND BROWN, CLAYEY FINE TO REDDISH ORANGE AND BROWN, FINE TO COARSE GRAINED SANDY CLAY, WITH М SS-1 824.0 6.0 COARSE GRAINED SAND S-BULK D 828.0 TRACE ROCK FRAGMENTS, SS-2 M 821.5 MODERATELY MICACEOUS D 🖔 820.0 825.5 820 10.0 825 6.0 RESIDUAL WHITE, GRAY AND BROWN, FINE TO BROWNISH ORANGE, SILTY FINE TO COARSE GRAINED SAND, WITH LITTLE COARSE GRAINED SAND, WITH LITTLE ROCK FRAGMENTS, HIGHLY MICACEOUS 823.0 CLAY 5 Boring Terminated at Elevation 820.0 ft In Boring Terminated at Elevation 821.5 ft In Sand Bulk sample from 0ft to 5ft.

NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 52000.1.STR07T1B TIP P-5206C COUNTY ROWAN GEOLOGIST J. Whitt SITE DESCRIPTION Kimball Road Extension, Inventory Report **GROUND WTR (ft)** BORING NO. R-9 ALIGNMENT -Y10-STATION 20+86 OFFSET 25 ft LT 0 HR. Dry COLLAR ELEV. 829.5 ft TOTAL DEPTH 10.0 ft **NORTHING** 661,526 **EASTING** 1,525,391 24 HR. FIAD DRILL RIG/HAMMER EFF./DATE TER255 DIEDRICH D-50 77% 07/15/2011 DRILL METHOD H.S. Augers HAMMER TYPE Automatic DCN 0164 DRILLER W. Duggins SURFACE WATER DEPTH N/A **START DATE** 05/04/12 **COMP. DATE** 05/04/12 BLOWS PER FOOT SAMP. SOIL AND ROCK DESCRIPTION MOI G (ft) 0.5ft 0.5ft 0.5ft 25 50 75 100 NO. 830 GROUND SURFACE ARTIFICIAL FILL CONCRETE 828.5 + 1.0 D BROWN AND RED BROWN, CLAY WITH LITTLE MEDIUM TO COARSE GRAINED 826.0 825 D SAND 823.5 + 6.0 RESIDUAL
RED AND LIGHT BROWN, CLAYEY FINE
TO COARSE GRAINED SAND D 821.0 820 GRAY AND WHITE, FINE TO COARSE GRAINED SAND

Boring Terminated at Elevation 819.5 ft In Sand

WBS	52000	.1.STR	R07T1I	3	T	IP P-5	206C		COUNT	Y ROWAN	١			GEOLOGIST P. Oree	
SITE	DESCR	IPTION	l Kim	ball R	oad E	xtensio	n, Inv	entory R	eport		<u> </u>				GROUND WTR (
BOR	NG NO.	R-10			S	TATION	1 14	+90	······································	OFFSET	26 ft RT			ALIGNMENT -Y10-	0 HR. 17.
COLI	AR ELE	EV. 81	9.8 ft		T	OTAL [DEPT	1 30.0 f	t	NORTHIN	G 661,1	06		EASTING 1,525,818	24 HR. 17.
DRILL	RIG/HAN	MER E	FF./DA	TE TI	ER255	DIEDRIC	CH D-50	77% 07	/15/2011		DRILL I	METHO	D H.	S. Augers HAM	MER TYPE Automatic
DRIL	LER W	/. Dugo	ins		S	TART D	DATE	09/12/1	2	COMP. DA				SURFACE WATER DEPTH	
LEV	DRIVE	DEPTH		W CO		П			PER FOO	<u> </u>	SAMP.	1	1 4		
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	5	50	75 100	NO.	МОІ	O	SOIL AND ROCK DES	SCRIPTION
820														_819.8 GROUND SURI	ACE
	818.8 -	- 1.0	4	6	8	1			T	.		\		ARTIFICIAL F BROWN WITH SPECKLI	ILL
	816.3	3.5] : :'	14					М		CLAYEY FINE TO MEDI	UM GRAINED
15	242.0		5	7	7		14		<u> </u>		-	М			
	813.8 - -	- 6.0 -	4	6	8	1 : : ;	14					м		AT 3.5FT: SLIGHTLY N	MOACEOUS
310	811.3	8.5	3	3	5	1.1						м		ORANGISH BROWN, FIN GRAINED SANDY CLAY,	
10	-	-				78.			1:::		11	"		MICACEOU	
	806.3	13.5						: : : :	: : :					AT 8.5FT: INCREASE II	N MOISTURE
05	_000.3		2	2	3			· · · ·	1 : : :		11	М		AT 13.5FT: ORANGISH BLACK	BROWN AND
	1					[:	::		: : :	: : : : :				•	
	801.3	18.5	2	2	4		::		: : :	.				801.3 OLIVE BROWN, FINE	TO MEDIUM
00	_	_	-	-	4	6			+		-	М		GRAINED SANDY SIL	T, HIGHLY
	-													MICACEOU	S
95	796.3	23.5	1	2	3				: : :			м		AT 28.5FT: OLIVE WITH B	ROWN AND TAN
	-	-				1					11	"		- ·	
	791.3	28.5				./.								•	
90		20.5	2	4	7		11		<u> </u>	<u> </u>		М		_ 789.8	3
	-	-												Boring Terminated at Elev Sandy Silt	
	-													Installed temporary piez	ometer upon
	_	-												- completion	
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TEST SUMMARY NCRR/NS MAINLINE REID TO NORTH KANNAPOLIS RAILROAD ROADBED (MP 337.0 TO MP 348.3) KIMBALL ROAD EXTENSION

	SOIL TEST RESULTS														
				DEPTH	AASHTO	% PA	SSING (S	SIEVES)	LIQUID	PLASTICITY	MOISTURE	ORGANIC	STANDARD	OPTIMUM MOISTURE	
BORING NO.	SAMPLE NO.	STATION	OFFSET	INTERVAL (ft)	CLASS.	10	40	200	LIMIT	INDEX	CONTENT (%)	CONTENT (%)	PROCTOR (pcf)	CONTENT (%)	
R-1	BULK 1	10+00	CL	0.0-5.0	A-7-6	88	70	49	51	25	4.2	`	111.3	15.9	
R-1	SS-1	10+00	CL	1.0-2.5							68	- NT			
R-3	SS-3	14+58	72 ft RT	6.0-7.5			***				17.7	NT			
R-3	BULK 2	14+58	72 ft RT	15.0-20.0	A-7-6	95	79	59	61	36	9.9		103.9	19.5	
R-3	SS-6	14+58	72 ft RT	18.5-20.0							30.1	NT			
R-4	BULK 1	15+95	61 ft RT	10.0-15.0	A-7-5	99	92	79	73	39	15.8		91.2	28.7	
R-4	SS-5	15+95	61 ft RT	13.5-15.0							57.2	NT			
R-5	SS-3	17+92	29 ft RT	6.0-7.5	A-7-5	97	84	66	75	44	22.1				
R-8	BULK 1	14+64	37 ft LT	0.0-5.0	A-7-5	92	74	62	67	31			98.5	21.2	
R-8	SS-1	14+64	37 ft LT	1.0-2.5							28.2	NT			
R-8	SS-2	14+64	37 ft LT	3.5-5.0							22.2	NT			

NOTE: NT = NOT TESTED

						DI	IREC ⁻	Γ SHE	AR T	EST RES	ULTS				
	DEPTH AASHTO % PASSING (SIEVES) LIQUID PLASTICITY INITIAL INITIAL SPECIFIC AT MAXIMUM SHEAR STRESS														
BORING NO.	SAMPLE NO.	STATION	OFFSET	INTERVAL (ft)	CLASS.	10	40	200	LIMIT	INDEX	AREA (in²)	LENGTH (in)	GRAVITY	FRICTION (deg)	COHESION (psf)
R-3	UNDISTURBED SAMPLE	14+58	72 ft RT	10.0-12.0	A-6			57	36	13	4.2		111.3	23.0	1,208

SHEET NO. 18 OF 36

REPORT ON SOIL TEST RESULTS

PROJECT:	P-5206C Reid to	North Kannap	olis			COUNTY:	Rowan			
DATE SAMPLED:	April 2012	DATE RECE	EIVED:	May 31,	2012	DATE REP	ORTED:	June 18, 2012		
SAMPLED FROM:	N/A SAMPLED BY: N/A									
SUBMITTED BY:	Schnabel Engine	ering				STANI	ARD SPE	CIFICATION		
LABORATORY:	Terracon Consul	tants, Inc Ra	leigh							

TEST RESULTS

Boring No.	R-1	R-3	R-4	R-5			-	
Sample No.	Bulk 1	Bulk 2	Bulk 1	SS-3				
Retained #4 Sieve %	1	1	0	0				
Passing #10 Sieve %	88	95	99	97				
Passing #40 Sieve %	70	79	92	84	· ·	·		
Passing #200 Sieve %	49	59	79	66				

MINUS #10 FRACTION

Soil Mortar - 100%	-	-		-		
Coarse Sand -Ret. #60	27.5	23.8	10.6	19.5		
Fine Sand - Ret. #270	21.0	17.7	14.2	15.3		
Silt 0.05-0.005 mm %	12.4	12.5	20.7	9.7		
Clay < 0.005 mm %	39.1	46.0	54.5	55.5		
Passing # 40 Sieve %	-	-	-	-		
Passing # 200 Sieve %	-	-		-		

Liquid Limit	51	61	73	75		
Plastic Index	25	36	39	44		
AASHTO Classification	A-7-6 (9)	A-7-6 (19)	A-7-5 (35)	A-7-5 (29)		
Select Granular Class						
Туре						
Natural Moisture %	4.2	9.9	15.8	22.1		
Depth (ft) From:	0	15	10	6		
To:	5	20	15	7.5		

Remarks:

Stephanie E. Hardisan Certification No. 114-01-1203



SHEET NO. 19 OF 36

PROJECT NUMBER: 70125038

PROJECT NAME: P-5206C Reid to North Kannapolis

DATE RECEIVED: May 31, 2012

MOISTURE CONTENT AND ORGANIC CONTENT

BORING NUMBER	R-1	R-3	R-3	R-4
SAMPLE NUMBER	SS-1	SS-3 SS-6		SS-5
DEPTH	1.0'-2.5'	6.0'-7.5'	18.5'-20.0'	13.5'-15.0'
MOISTURE CONTENT (%)	6.8	17.7 30.1		57.2
ORGANIC CONTENT (%)	NT	NT	NT	NT

ADDITIONAL COMMENTS: NT = Not Tested

Stephanie E. Hardisan Certification No. 114-01-1203

REPORT FOR CALIFORNIA BEARING RATIO

70125038.0001 Report Number: Service Date: 06/01/12 Report Date: 06/11/12

SHEET NO. 20 OF 36

5240 Green's Dairy Road Raleigh, NC 27616 919-873-2211

Client

Schnabel Engineering South, P.C.

Attn: Tillman Marshall 11-A Oak Branch Drive Greensboro, NC 27407

Project

P-5206C Reid to North Kannapolis Kimball Road and Main Street

Kannapolis, NC

Project No. 70125038

SAMPLE INFORMATION

Sample Number:	Bulk Sample 1	Proctor Method: AAS	SHTO T99 - Method B
Boring Number:	R-1	Maximum Dry Density (pcf)	:111.3
Sample Location:	N/A	Optimum Moisture:	15.9
Depth:	0-5'	Liquid Limit:	51
Material Description:	A-7-6 (9)	Plasticity Index:	25

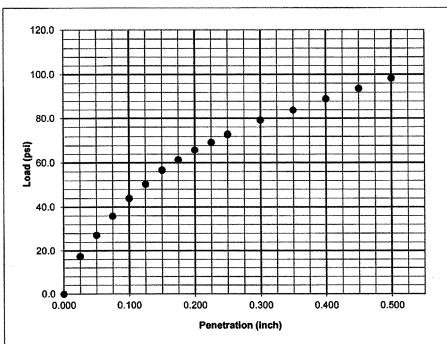
CBR TEST DATA

CBR Value at 0.100 inch 4.4 CBR Value at 0.200 inch Surcharge Weight (lbs) 10 Soaking Condition Soaked Length of Soaking (hours) 96 0.9 Swell (%) DENSITY DATA Dry Density Before Soaking (pcf) 100.1

MOISTURE DATA

Compaction of Proctor (%)

Before Compaction (%) 14.5 After Compaction (%) 14.9 21.3 Top 1" After Soaking (%) 20.8 Average After Soaking (%)



Comments:

Services: Obtain soil sample and test for California Bearing Ratio

89.9

Terracon Rep: Stephanie Hardison Reported To: Raymond "Levi" Denton

Contractor:

Report Distribution

Laboratory Testing by:

Stephanie Hardison

Certification No. 114-01-1203

Reviewed by:

Raymond "Levi" Denton Geotechnical Department Manager

Test Methods: ASTM D1883

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written approval of Terracon. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

REPORT FOR CALIFORNIA BEARING RATIO

 Report Number:
 70125038.0001

 Service Date:
 06/01/12

 Report Date:
 06/11/12

SHEET NO. 21 OF 36

5240 Green's Dairy Road Raleigh, NC 27616 919-873-2211

Client

Schnabel Engineering South, P.C. Attn: Tillman Marshall 11-A Oak Branch Drive Greensboro, NC 27407 **Project**

P-5206C Reid to North Kannapolis Kimball Road and Main Street Kannapolis, NC

Project No. 70125038

SAMPLE INFORMATION

Bulk Sample 1 Sample Number: Proctor Method: AASHTO T99 - Method B 111.3 Boring Number: R-1 Maximum Dry Density (pcf): 15.9 N/A Sample Location: Optimum Moisture: 0-5' Liquid Limit: Depth: 51 Plasticity Index: 25 Material Description: A-7-6 (9)

CBR TEST DATA

CBR Value at 0.100 inch

CBR Value at 0.200 inch

10.9

10.2

Surcharge Weight (lbs) 10
Soaking Condition Soaked
Length of Soaking (hours) 96
Swell (%) 0.5

DENSITY DATA

Dry Density Before Soaking (pcf) 106.9 Compaction of Proctor (%) 96.0

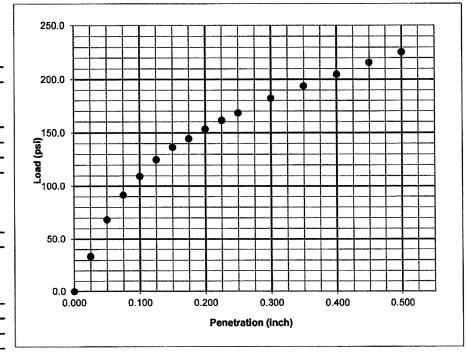
MOISTURE DATA

 Before Compaction (%)
 16.1

 After Compaction (%)
 16.4

 Top 1" After Soaking (%)
 18.1

 Average After Soaking (%)
 19.0



Comments:

Services: Obtain soil sample and test for California Bearing Ratio

Terracon Rep: Stephanie Hardison
Reported To: Raymond "Levi" Denton

Contractor:

Report Distribution

Laboratory Testing by:

Stephanie E. Hardison

Stephanie Hardison Certification No. 114-01-1203

Reviewed by:

Raymond "Levi" Denton Geotechnical Department Manager

Test Methods: ASTM D1883

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written approval of Terracon. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

REPORT FOR CALIFORNIA BEARING RATIO

 Report Number:
 70125038.0001

 Service Date:
 06/01/12

 Report Date:
 06/11/12

TEFFACON

SHEET NO. 22 OF 36

5240 Green's Dairy Road Raleigh, NC 27616 919-873-2211

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Schnabel Engineering South, P.C.

Attn: Tillman Marshall 11-A Oak Branch Drive Greensboro, NC 27407 Project

P-5206C Reid to North Kannapolis Kimball Road and Main Street

Kannapolis, NC

Project No. 70125038

SAMPLE INFORMATION

Sample Number:	Bulk Sample 1	Proctor Method: AASI	HTO T99 - Method B
Boring Number:	R-1	Maximum Dry Density (pcf):	111.3
Sample Location:	N/A	Optimum Moisture:	15.9
Depth:	0-5'	Liquid Limit:	51
Material Description:	A-7-6 (9)	Plasticity Index:	25

CBR TEST DATA

12.5

11.8

Surcharge Weight (lbs) 10
Soaking Condition Soaked
Length of Soaking (hours) 96
Swell (%) 0.5

DENSITY DATA

CBR Value at 0.100 inch

CBR Value at 0.200 inch

Dry Density Before Soaking (pcf) 108.7 Compaction of Proctor (%) 97.6

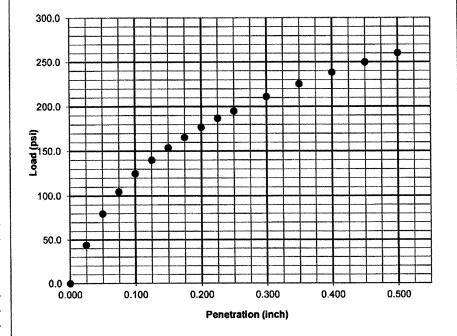
MOISTURE DATA

 Before Compaction (%)
 15.6

 After Compaction (%)
 15.7

 Top 1" After Soaking (%)
 18.2

 Average After Soaking (%)
 17.9



Comments:

Services: Obtain soil sample and test for California Bearing Ratio

Terracon Rep: Stephanie Hardison
Reported To: Raymond "Levi" Denton

Contractor:

Report Distribution

Laboratory Testing by:

Stephanie Hardison

Certification No. 114-01-1203

Reviewed by:

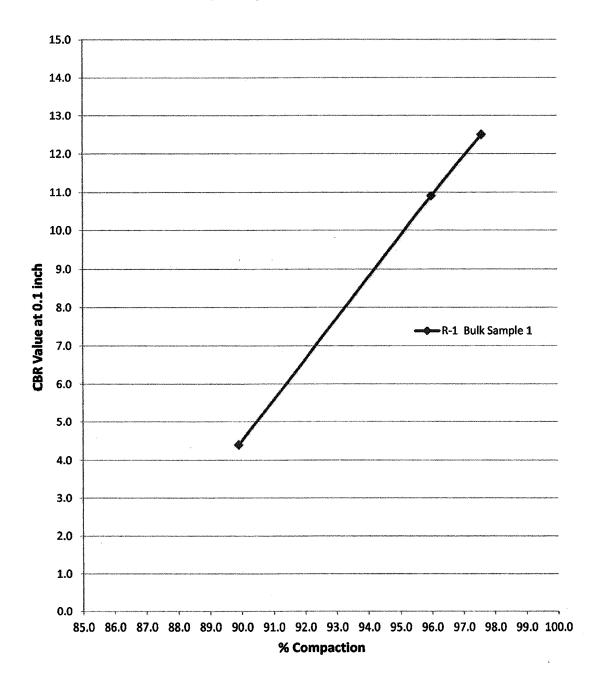
Raymond "Levi" Denton Geotechnical Department Manager

Test Methods: ASTM D1883

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R-1 Bulk Sample 1 Depth 0-5'

CALIFORNIA BEARING RATIO



Stephanie E. Handisan Certification No. 114-01-1203

REPORT FOR CALIFORNIA BEARING RATIO

Report Number: 70125038.0002 **Service Date:** 06/11/12

Report Date:

06/11/12 06/18/12 SHEET NO. 24 OF 36

5240 Green's Dairy Road Raleigh, NC 27616 919-873-2211

Client

Schnabel Engineering South, P.C.

Attn: Tillman Marshall 11-A Oak Branch Drive Greensboro, NC 27407 **Project**

P-5206C Reid to North Kannapolis Kimball Road and Main Street

Kannapolis, NC

Project No. 70125038

SAMPLE INFORMATION

Sample Number:	Bulk Sample 2	Proctor Method: AA	SHTO T99 - Method B
Boring Number:	R-3	Maximum Dry Density (pcf): 103.9	
Sample Location:	N/A	Optimum Moisture:	19.5
Depth:	15-20'	Liquid Limit:	61
Material Description:	A-7-6 (19)	Plasticity Index:	36

CBR TEST DATA

CBR Value at 0.200 inch

Surcharge Weight (lbs)

2.4

Surcharge Weight (lbs) 10
Soaking Condition Soaked
Length of Soaking (hours) 96
Swell (%) 2.5

DENSITY DATA

CBR Value at 0.100 inch

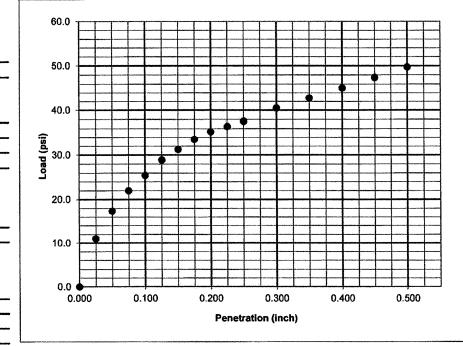
Dry Density Before Soaking (pcf) 94.3
Compaction of Proctor (%) 90.7

MOISTURE DATA

Before Compaction (%)
After Compaction (%)
Top 1" After Soaking (%)
Average After Soaking (%)

18.2 18.1 28.1 26.1

2.5



Comments:

Services: Obtain soil sample and test for California Bearing Ratio

Terracon Rep: Stephanie Hardison Reported To: Raymond "Levi" Denton

Contractor:

Report Distribution

Laboratory Testing by:

Stephanie E. Hardisan
Stephanie Hardison

Certification No. 114-01-1203

Reviewed by:

Raymond "Levi" Denton Geotechnical Department Manager

Test Methods: ASTM D1883

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written approval of Terracon. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

REPORT FOR CALIFORNIA BEARING RATIO

70125038.0002 Report Number: Service Date: 06/11/12 06/18/12 Report Date:

SHEET NO. 25 OF 36

5240 Green's Dairy Road Raleigh, NC 27616 919-873-2211

Client

Schnabel Engineering South, P.C.

Attn: Tillman Marshall 11-A Oak Branch Drive Greensboro, NC 27407

Project

P-5206C Reid to North Kannapolis Kimball Road and Main Street

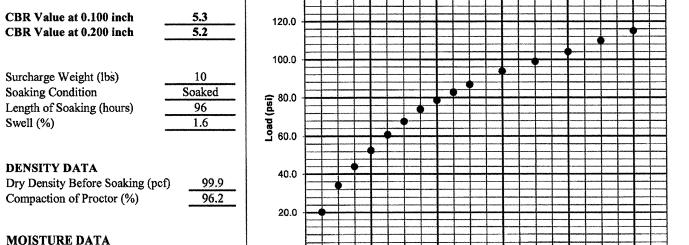
Kannapolis, NC

Project No. 70125038

SAMPLE INFORMATION

Sample Number:	Bulk Sample 2	Proctor Method: AAS	HTO T99 - Method B
Boring Number:	R-3	Maximum Dry Density (pcf): 103.9	
Sample Location:	N/A	Optimum Moisture:	19.5
Depth:	15-20'	Liquid Limit:	61
Material Description:	A-7-6 (19)	Plasticity Index:	36

CBR TEST DATA



0.100

Comments:

Services:

Contractor:

Report Distribution

Before Compaction (%) 20.2 After Compaction (%) 20.2 Top 1" After Soaking (%) 23.9 Average After Soaking (%) 24.5

Obtain soil sample and test for California Bearing Ratio

0.000

Laboratory Testing by:

0.300

Penetration (inch)

Stephanie Hardison Certification No. 114-01-1203

0.400

0.500

Reviewed by:

0.200

Raymond "Levi" Denton Geotechnical Department Manager

Test Methods: ASTM D1883

Terracon Rep: Stephanie Hardison

Reported To: Raymond "Levi" Denton

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written approval of Terracon. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

REPORT FOR CALIFORNIA BEARING RATIO

Report Number: 70125038.0002 **Service Date:** 06/11/12

Report Date: 06/18/12

SHEET NO. 26 OF 36

5240 Green's Dairy Road Raleigh, NC 27616 919-873-2211

Client

Schnabel Engineering South, P.C.

Attn: Tillman Marshall 11-A Oak Branch Drive Greensboro, NC 27407 Project

P-5206C Reid to North Kannapolis Kimball Road and Main Street

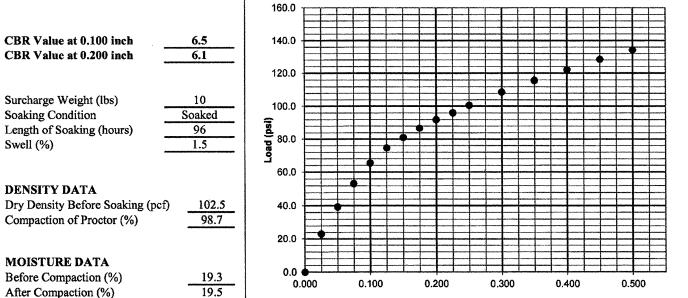
Kannapolis, NC

Project No. 70125038

SAMPLE INFORMATION

Sample Number:	Bulk Sample 2	Proctor Method: A	ASHTO T99 - Method B
Boring Number:	R-3	Maximum Dry Density (po	ef): 103.9
Sample Location:	N/A	Optimum Moisture:	19.5
Depth:	15-20'	Liquid Limit:	61
Material Description:	A-7-6 (19)	Plasticity Index:	36

CBR TEST DATA



Comments:

Top 1" After Soaking (%)

Average After Soaking (%)

Services: Obtain soil sample and test for California Bearing Ratio

22.7

24.4

Terracon Rep: Stephanie Hardison
Reported To: Raymond "Levi" Denton

Contractor:

Report Distribution

Laboratory Testing by:

me E. Handisan

Stephanie Hardison Certification No. 114-01-1203

Reviewed by:

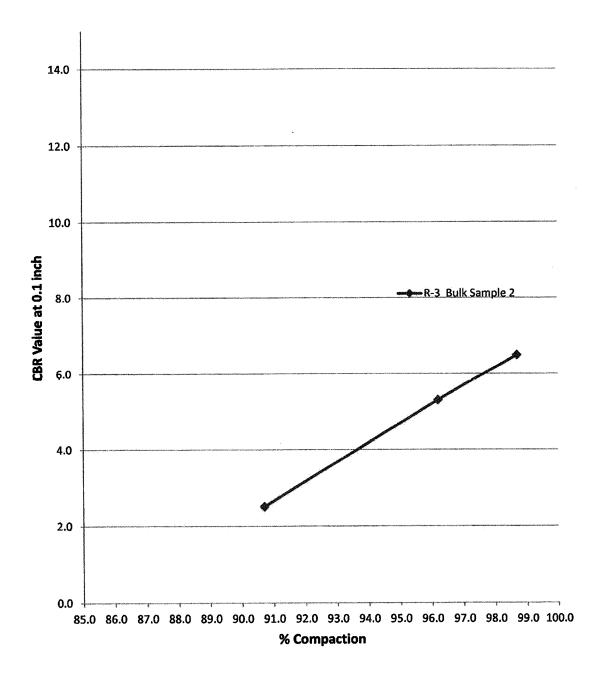
Penetration (inch)

Raymond "Levi" Denton Geotechnical Department Manager

Test Methods: ASTM D1883

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written approval of Terracon. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

R-3 Bulk Sample 2 Depth 15-20'
CALIFORNIA BEARING RATIO



Stephanie & Hardisan Certification No. 114-01-1203

REPORT FOR CALIFORNIA BEARING RATIO

Report Number: 70125038.0003 Service Date: 06/11/12 Report Date: 06/18/12

SHEET NO. 28 OF 36

5240 Green's Dairy Road Raleigh, NC 27616 919-873-2211

Client

Schnabel Engineering South, P.C.

Attn: Tillman Marshall 11-A Oak Branch Drive Greensboro, NC 27407

Project

P-5206C Reid to North Kannapolis Kimball Road and Main Street

Kannapolis, NC

Project No. 70125038

SAMPLE INFORMATION

Sample Number:	Bulk Sample 1	Proctor Method: AA	SHTO T99 - Method A
Boring Number:	R-4	Maximum Dry Density (pc	f): 91.2
Sample Location:	N/A	Optimum Moisture:	28.7
Depth:	10-15'	Liquid Limit:	73
Material Description:	A-7-5 (35)	Plasticity Index:	39

CBR TEST DATA 100.0 CBR Value at 0.100 inch 4.7 CBR Value at 0.200 inch 4.4 10 Surcharge Weight (lbs) 60.0 Soaked **Soaking Condition** Length of Soaking (hours) 96 2.0 Swell (%) **DENSITY DATA** Dry Density Before Soaking (pcf) 84.9 Compaction of Proctor (%) 93.0 **MOISTURE DATA** 0.0 Before Compaction (%) 28.3

0.100

0.000

Comments:

Obtain soil sample and test for California Bearing Ratio Services:

28.2

36.2

35.2

Terracon Rep: Stephanie Hardison Reported To: Raymond "Levi" Denton

Contractor:

Report Distribution

After Compaction (%)

Top 1" After Soaking (%)

Average After Soaking (%)

Laboratory Testing by:

0.200

Stephanie Hardison

0.500

Certification No. 114-01-1203

0.400

Reviewed by:

0.300

Penetration (inch)

Raymond "Levi" Denton Geotechnical Department Manager

Test Methods: ASTM D1883

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written approval of Terracon. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

REPORT FOR CALIFORNIA BEARING RATIO

Report Number: 70125038.0003 Service Date: 06/11/12 Report Date: 06/18/12

SHEET NO. 29 OF 36

5240 Green's Dairy Road Raleigh, NC 27616 919-873-2211

C	lie	nt

Schnabel Engineering South, P.C.

Attn: Tillman Marshall 11-A Oak Branch Drive Greensboro, NC 27407

Project

P-5206C Reid to North Kannapolis Kimball Road and Main Street

Kannapolis, NC

Project No. 70125038

SAMPLE INFORMATION

Sample Number:	Bulk Sample 1	Proctor Method: AA	ASHTO T99 - Method A
Boring Number:	R-4	Maximum Dry Density (pc	f): 91.2
Sample Location:	N/A	Optimum Moisture:	28.7
Depth:	10-15'	Liquid Limit:	73
-	A-7-5 (35)	Plasticity Index:	39

CBR TEST DATA CBR Value at 0.100 inch 5.5 100.0 5.2 CBR Value at 0.200 inch

10 Surcharge Weight (lbs) Soaked **Soaking Condition** Length of Soaking (hours) 96 Swell (%) 2.5

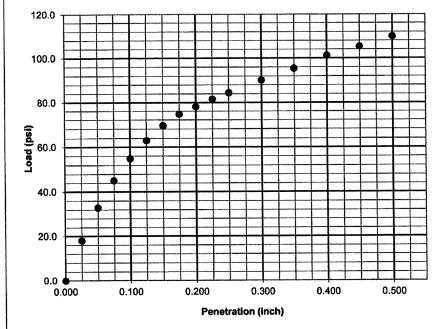
DENSITY DATA

MOISTURE DATA

Dry Density Before Soaking (pcf) 87.4 Compaction of Proctor (%) 95.9

27.8

Before Compaction (%) 28.9 After Compaction (%) 33.2 Top 1" After Soaking (%) 33.3 Average After Soaking (%)



Comments:

Services: Obtain soil sample and test for California Bearing Ratio

Terracon Rep: Stephanie Hardison Reported To: Raymond "Levi" Denton

Contractor:

Report Distribution

Laboratory Testing by:

Stephanie Hardison

Certification No. 114-01-1203

Reviewed by:

Raymond "Levi" Denton Geotechnical Department Manager

Test Methods: ASTM D1883

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REPORT FOR CALIFORNIA BEARING RATIO

Report Number: 70125038.0003 06/11/12 Service Date: Report Date: 06/18/12

SHEET NO. 30 OF 36

5240 Green's Dairy Road Raleigh, NC 27616 919-873-2211

Client

Schnabel Engineering South, P.C. Attn: Tillman Marshall

11-A Oak Branch Drive Greensboro, NC 27407

Project

P-5206C Reid to North Kannapolis Kimball Road and Main Street

Kannapolis, NC

Project No. 70125038

SAMPLE INFORMATION

Sample Number:	Bulk Sample 1	Proctor Method: AASI	HTO T99 - Method A
Boring Number:	R-4	Maximum Dry Density (pcf): 91.2	
Sample Location:	N/A	Optimum Moisture:	28.7
Depth:	10-15'	Liquid Limit:	73
Material Description:	A-7-5 (35)	Plasticity Index:	39

CBR TEST DATA

CBR Value at 0.100 inch 7.9 CBR Value at 0.200 inch 7.0

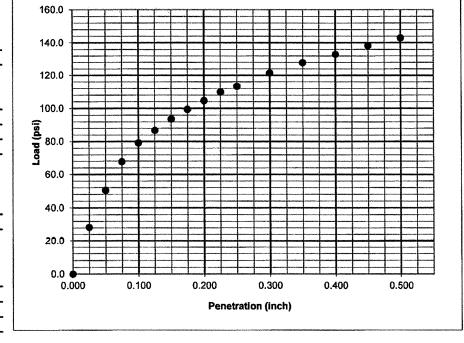
Surcharge Weight (lbs) 10 Soaking Condition Soaked Length of Soaking (hours) 96 1.2 Swell (%)

DENSITY DATA

Dry Density Before Soaking (pcf) 89.7 Compaction of Proctor (%) 98.3

MOISTURE DATA

Before Compaction (%) After Compaction (%) 33.7 Top 1" After Soaking (%) 32.3 Average After Soaking (%)



Comments:

Obtain soil sample and test for California Bearing Ratio Services:

29.1

29.4

Terracon Rep: Stephanie Hardison Reported To: Raymond "Levi" Denton

Contractor:

Report Distribution

Laboratory Testing by:

Stephanie Hardison Certification No. 114-01-1203

Reviewed by:

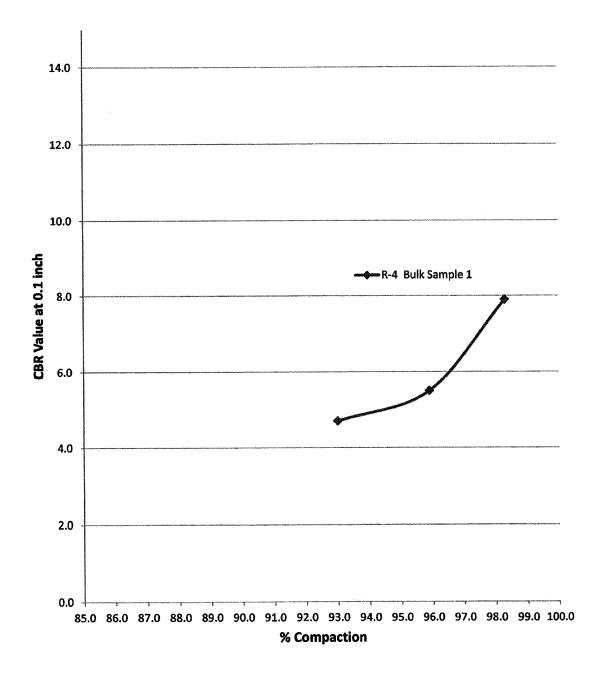
Raymond "Levi" Denton Geotechnical Department Manager

Test Methods: ASTM D1883

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SHEET NO. 31 OF 36

R-4 Bulk Sample 1 Depth 10-15'
CALIFORNIA BEARING RATIO



Stephanie E. Hardisan Certification No. 114-01-1203

SHEET NO. 32 OF 36

REPORT ON SOIL TEST RESULTS

PROJECT:	P-5206C Reid to North Kannapolis			COUNTY: Rowan			
DATE SAMPLED:	N/A	DATE RECI	EIVED:	N/A		DATE REPORTED:	July 16, 2012
SAMPLED FROM:	N/A SAMPLED BY:			N/A			
SUBMITTED BY:	Schnabel Engineering			STANDARD SPE	CIFICATION		
LABORATORY:	Terracon Consul	tants, Inc Ra	leigh				

TEST RESULTS

Boring No.	R-8				
Sample No.	Bulk				
Retained #4 Sieve %	0				
Passing #10 Sieve %	92				
Passing #40 Sieve %	74				
Passing #200 Sieve %	62				

MINUS #10 FRACTION

Soil Mortar - 100%	*				
Coarse Sand -Ret. #60	22.9				
Fine Sand - Ret. #270	13.1		·		
Silt 0.05-0.005 mm %	14.7				
Clay < 0.005 mm %	49.3				
Passing # 40 Sieve %	-				
Passing # 200 Sieve %	-			·	

Liquid Limit	67				
Plastic Index	31				
AASHTO Classification	A-7-5 (19)				
Select Granular Class					
Type					
Natural Moisture %	4				
Organic Content %	-				
Depth (ft) From:	0				
То:	5.0				

Remarks:

Stephanie E. Hardisan Certification No. 114-01-1203



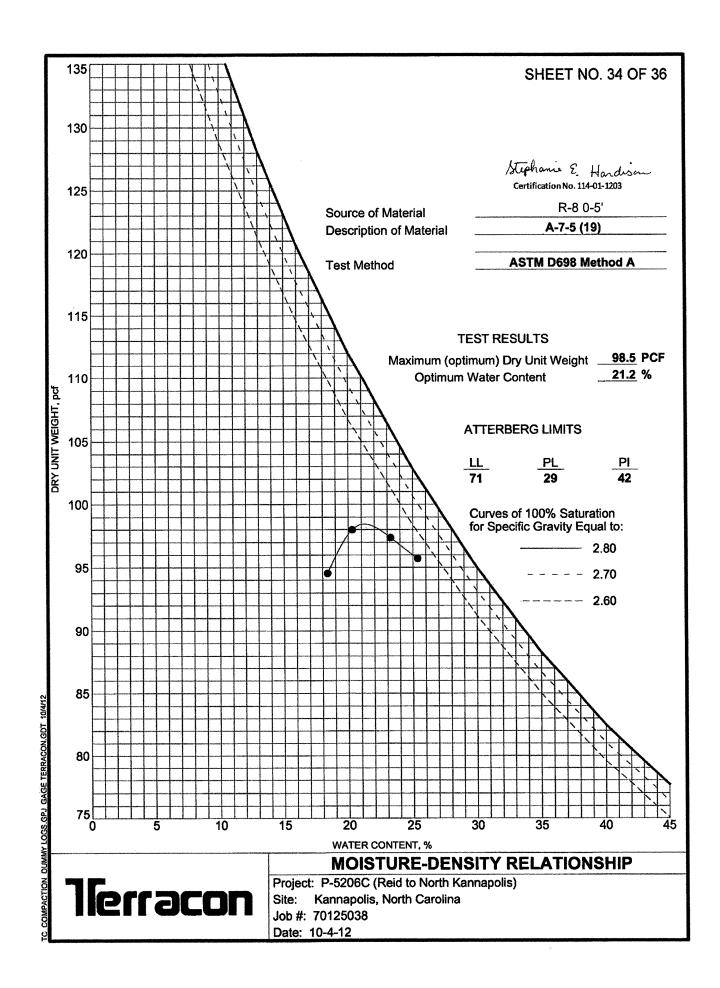
JEL P10b

SHEET NO. 33 OF 36

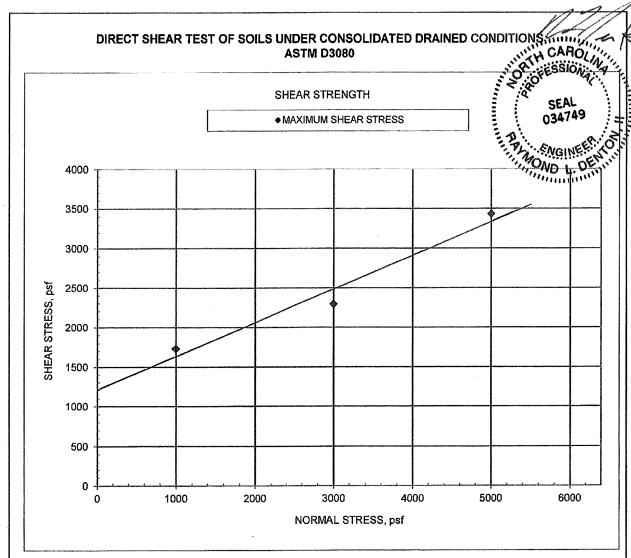
STANDARD TEST METHOD FOR MOISTURE CONTENT IN SOILS

Project Number: Date Sampled:		70125038				Project Name:	P-5206C (Reid to N. Kannapolis N/A			
		N/A				Sampled By:				
Date Tested: <u>7/9/2012</u>						Terracon - Raleigh, NC				
							Dry			
Boring	Sample				Wet Wt. of	Dry Weight of	Weight of	Wt. of		
Number	Number	Depth	Can ID	Tare Wt.	Soil + Tare	Soil + Tare	Soil	Water	% Moisture	
R-8	SS-1	1.0-2.5	WW	254.0	510.5	454.1	200.1	56.4	28.2%	
R-8	SS-2	3.5-5.0'	13	255.0	540.0	488.3	233.3	51.7	22.2%	

Stephanie E. Hardison Certification No. 114-01-1203



SHEET NO. 35 OF 36



and the second s	**************************************	FRICTIO	N ANGLE	СОН	ESION	NORMAL	NORMAL	NORMAL
AT MAXIMUM SHEAR STRESS		23.0 deg	dan.	1208		STRESS, psf	STRESS, psf	STRESS, psf
			1200	psf	1000	3000	5000	
INITIAL AREA, in2	4.909	INITIAL MO	DISTURE, %			26.8	26.8	26.8
INITIAL LENGTH, in	1.000	INITIAL DE	RY DENSITY.	pcf	89.2	89.4	89.7	
SPECIFIC GRAVITY	2.65	INITIAL SA	TURATION,	%	83	84	84	
SG ASSUMED	Х	INITIAL VOID RATIO				0.86	0.85	0.85
#200 WASH, %	57	FINAL MO	ISTURE, %		34.4	33.1	30.2	
LIQUID LIMIT	36	FINAL SAT	TURATION, %)		100.0	100.0	100.0
PLASTIC LIMIT	23	FINAL VO	D RATIO			0.8	0.7	0.6
PLASTICITY INDEX	13	MAXIMUM	SHEAR STR	ESS, psf		1731	2288	3432
SAMPLE TYPE	UNDISTURBED	RATE OF	LOADING, in/	min .		0.0007	0.0004	0.0005
DESCRIPTION	A-6 (31)							

 PROJECT NAME:
 P5206 Reid to North Kannapolis
 BORING NO.
 R-3

 LOCATION:
 Kannapolis, NC
 SAMPLE NO.
 S-1

 JOB NO.:
 70125038
 DEPTH, feet
 10 TO 12

11. Projects to 101125030 Winton Free Lawrency-Field Data-Boring Logal/Revised 70125038 Direct Shear 10-4-12.xismi/Report

DATE: 10/7/2011

SHEET NO. 36 OF 36

