DRAWN BY: J. HAMM

## STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

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**STATION** 

PLAN PROFILE XSECT 3298+92.00 - 3343+15.82

APPENDIX A - SPECIAL PROVISION FOR GEOGRID FOR EMBANKMENT SUBGRADE STABILIZATION

## **RAILWAY** SUBSURFACE INVESTIGATION

ROJ. REF	FERENCE NO.	F.A. PROJ
OUNTY	<b>DURHAM</b>	
ROJECT	DESCRIPTION	PROPOSED RAIL ALIGNMENT AT
		HOPSON ROAD GRADE SEPARATION
	R	<b>ECOMMENDATIONS</b>

SIAIB SIAIS FE	STATE PRODUCT NUMBERONCE INC.								
N.C.		1	10						
STATE PROJ. NO.	F. A. PROJ. NO.	DESCR	IPTION						
			<del></del>						

## **CAUTION NOTICE**

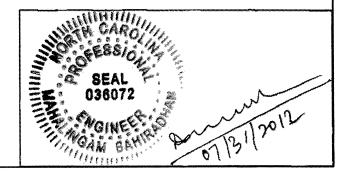
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

CENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A CEDTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSUPFACE DATA AND MAY NOT NECESSABILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BORENOLE. THE LABORATORY SAMPLE DATA AND THE IN STIU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABLITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOSITURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS AND VARY CONSIDERABLE WHIT THIS ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DEFERENT, FOR BIDDING AND CONSTRUCTION PLANS DESIGN. TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF 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 SATISTY HINKELE AS TO CONDITIONS TO BE ENCOUNTERED 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 ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

	PERSONNEL
	M. BAHIRADHAN
	J. HAMM
	T. EVANS
	C. NORVILLE
	and the second s
INVESTIGATED BY_	T. EVANS
CHECKED BY	M. BAHIRADHAN
SUBMITTED BY	FALCON ENG.

JULY 31, 2012



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,

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

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

# SUBSURFACE INVESTIGATION

				SOIL AND ROC	CK LEGEND, TERM	S, SYMBO	LS, AND ABBRE	VIATIONS	•	
	SOIL DESCRIPTION			GRADATION				CK DESCRIPTION		TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSO	OLIDATED, SEMI-CONSOLIDATED, OR WEATHE	ERED EARTH MATERIALS	WELL GRADED - INDICATES A GO UNIFORM - INDICATES THAT SOIL	000 REPRESENTATION OF PARTICLE SIZES FI L PARTICLES ARE ALL APPROXIMATELY THE	ROM FINE TO COARSE. E SAME SIZE.(ALSO	ROCK LINE IN	DICATES THE LEVEL AT WHICH	THAT IF TESTED, WOULD YIELD SPT NON-COASTAL PLAIN MATERIAL WOULD	YIELD SPT REFUSAL.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
THAT CAN BE PENETRATED WITH A CONTIL 180 BLOWS PER FOOT ACCORDING TO STAI			POORLY GRADED) GAP-GRADED - INDICATES A MIXT	TURE OF UNIFORM PARTICLES OF TWO OR M	MORE SIZES.	SPT REFUSAL IN NON-COAST	IS PENETRATION BY A SPLIT S	POON SAMPLER EQUAL TO OR LESS TO SITION BETWEEN SOIL AND ROCK IS	HAN 0.1 FOOT PER 66 BLOWS.	AGUIFER - A WATER BEARING FORMATION OR STRATA.
CLASSIFICATION IS BASED ON THE AASHT		LY SHALL INCLUDE:		ANGULARITY OF GRAINS		OF WEATHERED	ROCK.		or retributiness of the cone	ARENACEDUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND,
AS MINERALOGICAL COMPOSITION, ANGULAR	RITY, STRUCTURE, PLASTICITY, ETC. EXAMPLI	E: "		OF SOIL GRAINS IS DESIGNATED BY THE	TERMS: ANGULAR,	WEATHERED	LS ARE TYPICALLY DIVIDED AS			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.
	W. MOIST WITH INTERBEDDED FINE SAID LIVERS, HIGHLY PLA		SUBANGULAR, SUBROUNDED, OR R			ROCK (WR)	BLOWS PER	AL PLAIN MATERIAL THAT WOULD YIE FOOT IF TESTED.		ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL
	AND AASHTO CLASSIFICA	ATION	·····	MINERALOGICAL COMPOSITIO z, Feldspar, MICA, TALC, KAOLIN, ETC. ARE U		CRYSTALLINE	FINE TO CO	PARSE GRAIN IGNEOUS AND METAMORP	HIC ROCK THAT	AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
GENERAL GRANULAR MATERIAL CLASS. (≤35% PASSING *20		ORGANIC MATERIALS	WHENEVER THEY ARE CONSIDERED		DSECTIN DESCRIPTIONS	ROCK (CR)	GNEISS, GA	BBRO, SCHIST, ETC.	THE INCLUDES SHANITE,	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
<u></u>	A-2 A-4 A-5 A-6 A-7	A-1, A-2 A-4, A-5		COMPRESSIBILITY		NON-CRYSTALLINE		IARSE GRAIN METAMORPHIC AND NON-C RY ROCK THAT WOULD YEILD SPT REF		COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM
CLASS. A-1-6 A-1-6 A-2-4 A-2-	-5 A-2-6 A-2-7 A-7-6 A-7-6	A-3 A-6, A-7	SLIGHTLY COMPRESSIB	LE LIQUID LIMIT	LESS THAN 31	COASTAL PLAIN	INCLUDES F	HYLLITE, SLATE, SANDSTONE, ETC. AIN SEDIMENTS CEMENTED INTO ROCI		OF SLOPE.
SYMBOL COCCOCCOCC			MODERATELY COMPRES HIGHLY COMPRESSIBLE		EQUAL TO 31-50 GREATER THAN 50	SEDIMENTARY RO	CK SPT REFUS	AL. ROCK TYPE INCLUDES LIMESTONE.		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.
% PASSING		SILT-		PERCENTAGE OF MATERIAL	L	(CP)	SHELL BED	S, ETC. WEATHERING		DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
* 10 50 MX * 40 30 MX 50 MX 51 MN		GRANULAR CLAY MUCK, SOILS CON C	ORGANIC MATERIAL	Granular Silt - Clay Soils Soils	OTHER MATERIAL	5050 PM		W JOINTS MAY SHOW SLIGHT STAIN!	NO DOCK DIACO HADED	ROCKS OR CUTS MASSIVE ROCK.
	MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN	SOILS SOILS		2 - 3% 3 - 5% TRA 3 - 5% 5 - 12% LITT			MMER IF CRYSTALLINE.	W JUINIS MAT SHUW SLIGHT STAINE	NO. HUCK KINGS UNDER	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
	4N 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN	SOILS WITH	MODERATELY ORGANIC	5 - 10% 12 - 20% SOM				STAINED, SOME JOINTS MAY SHOW THE		DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF
	MX 11 MN 11 MN 16 MX 10 MX 11 MN 11 MN	LITTLE OR HIGHLY	HIGHLY ORGANIC		HLY 35% AND ABOVE		RYSTALS ON A BROKEN SPECIME A CRYSTALLINE NATURE.	N FACE SHINE BRIGHTLY. ROCK RINGS	UNDER HAMMER BLOWS IF	THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX 8 8 8	4 MX 8 MX 12 MX 16 MX No MX	AMOUNTS OF SOILS		GROUND WATER				STAINED AND DISCOLORATION EXTENDS		FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
	OR CLAYEY SILTY CLAYEY AND SAND SOILS SOILS	ORGANIC MATTER		EL IN BORE HOLE IMMEDIATELY AFTER D	DRILLING			n Clay. In Granitoid Rocks some ( DRED. CRYSTALLINE ROCKS RING UNDE		FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
MATERIALS SAND	HND SHND SULS SULS			TER LEVEL AFTER 24 HOURS		MODERATE SI	GNIFICANT PORTIONS OF ROCK :	SHOW DISCOLORATION AND WEATHERIN	G EFFECTS. IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
GEN. RATING AS A EXCELLENT TO GOO	DD FAIR TO POOR	FAIR TO POOR UNSUITABLE	∑PW PERCHED W	ATER, SATURATED ZONE, OR WATER BEARIN	NG STRATA			IS ARE DULL AND DISCOLORED, SOME IS AND SHOWS SIGNIFICANT LOSS OF		PARENT MATERIAL.
SUBGRADE SUBGRADE A 7 E SUBGRADE IS	≤ LL - 30 ; PI OF A-7-6 SUBGRO		O-MING OR	SEEP		WI	TH FRESH ROCK.		400 4 - 5	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
	SISTENCY OR DENSENESS	JUP 15 > LL - 30		MISCELLANEOUS SYMBOLS	3			ORED OR STAINED. IN GRANITOID ROO SHOW KAOLINIZATION, ROCK SHOWS		FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN
COMPACTNE	RANGE OF STANDARD	RANGE OF UNCONFINED	T ROADWAY EMBANKME	cot CPT				GEOLOGIST'S PICK, ROCK GIVES "CLUN	K" SOUND WHEN STRUCK.	THE FIELD.
PRIMARY SOIL TYPE CONSISTI		COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> )	WITH SOIL DESCRIP	TION DPT DMT TEST BORIN		1	TESTED, WOULD YIELD SPT REF	<i>usal</i> Lored or Stained Rock Fabric Cle	AD AND EVIDENT BUT DEDICED	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
GENERALLY VERY LOO		0	SOIL SYMBOL	AUGER BORING	S - BULK SAMPLE	(SEV.) IN	STRENGTH TO STRONG SOIL. I	GRANITOID ROCKS ALL FELDSPARS		LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
GRANULAR LUUSE		N/A	ARTIFICIAL FILL (A	AET OTHER	SS - SPLIT SPOON SAMPLE		(TENT. SOME FRAGMENTS OF ST TESTED. YIELDS SPT N VALUE:			LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
MATERIAL DENSE (NON-COHESIVE) VERY DEN	30 TD 50		THAN ROADWAY EMB		ST - SHELBY TUBE	VERY SEVERE AL	L ROCK EXCEPT QUARTZ DISCO	ORED OR STAINED. ROCK FABRIC ELE	MENTS ARE DISCERNIBLE BUT	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN
VERY SOF			- INFERRED SOIL BOU	INDARY HY	SAMPLE			ED TO SOIL STATUS, WITH ONLY FRAI MPLE OF ROCK WEATHERED TO A DEG		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
GENERALLY SOFT	2 TO 4	<0.25 0.25 TO 0.50	THE INFERRED ROCK LIN	MONITORING WEL	RS - ROCK SAMPLE			FABRIC REMAIN. IF TESTED, YIELDS		INTERVENING IMPERVIOUS STRATUM.
SILT-CLAY MEDIUM S MATERIAL STIFF		0.5 TO 1.0 1 TO 2	TTTT ALLUVIAL SOIL BOU	A PIEZOMETER INSTALLATION	RT - RECOMPACTED TRIAXIAL			BRIC NOT DISCERNIBLE, OR DISCERNIB		RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
(COHESIVE) VERY STI	IFF 15 TO 30	2 TO 4	-	SLOPE INDICATO	SAMPLE DR		SO AN EXAMPLE.	RTZ MAY BE PRESENT AS DIKES OR S	SIKINGERS. SAPRULITE IS	ROCK QUALITY DESIGNATION (RQQ) - 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
		. >4	25/625 DIP & DIP DIRECTION ROCK STRUCTURES	ON OF INSTALLATION	CBR - CALIFORNIA BEARING RATIO SAMPLE		Ri	OCK HARDNESS		EXPRESSED AS A PERCENTAGE.
15/	XTURE OR GRAIN SIZE	·		SPT N-VALUE		VERY HARD	CANNOT BE SCRATCHED BY KNIF	OR SHARP PICK, BREAKING OF HAND	SPECIMENS REQUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE
	4 10 40 60 200 8.76 2.00 0.42 0.25 0.075		SOUNDING ROD	REF— SPT REFUSAL		1	SEVERAL HARD BLOWS OF THE G			PARENT ROCK.  SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
	COARSE EINE	T		ABBREVIATIONS			CAN BE SCRATCHED BY KNIFE OF TO DETACH HAND SPECIMEN.	R PICK ONLY WITH DIFFICULTY. HARD	HAMMER BLOWS REQUIRED	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL
	SAND SAND		AR - AUGER REFUSAL BT - BORING TERMINATED	HI HIGHLY MED MEDIUM	w - MOISTURE CONTENT V - VERY	MODERATELY C	CAN BE SCRATCHED BY KNIFE OF	R PICK. GOUGES OR GROOVES TO 0.25	INCHES DEEP CAN BE	TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.  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	MICA MICACEOUS	VST - VANE SHEAR TEST	HARD E		GEOLOGIST'S PICK, HAND SPECIMENS		SLIP PLANE.
SIZE IN. 12 3	2.0 9.25	COM.6 CM.6	CPT - CONE PENETRATION TE CSE COARSE	EST MOD MODERATELY  NP - NON PLASTIC	WEA WEATHERED	1		5 INCHES DEEP BY FIRM PRESSURE	OF KNIFE OR PICK PUINT.	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF
SOIL MOISTL	URE - CORRELATION OF T	ERMS	DMT - DILATOMETER TEST	ORG ORGANIC	$\gamma_{ m d}$ - DRY UNIT WEIGHT		CAN BE EXCAVATED IN SMALL C	HIPS TO PEICES 1 INCH MAXIMUM SIZ	E BY HARD BLOWS OF THE	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
SOIL MOISTURE SCALE	FIELD MOISTURE GUIDE FOR F	FIELD MOISTURE DESCRIPTION	DPT - DYNAMIC PENETRATION  - VOID RATIO	N TEST PMT - PRESSUREMETER TEST SAP SAPROLITIC		1		DILY BY KNIFE OR PICK. CAN BE EXC	CAVATED IN FRAGMENTS	THAN Ø.1 FOOT PER 60 BLOWS.
(ATTERBERG LIMITS)	DESCRIPTION		F - FINE FOSS FOSSILIFEROUS	SD SAND, SANDY SL SILT, SILTY		f	From Chips to Several inche Pieces can be broken by Fino	S 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.
		OUID; VERY WET, USUALLY W THE GROUND WATER TABLE	FRAC FRACTURED, FRACTUR	ES SLI SLIGHTLY		1		N BE EXCAVATED READILY WITH POIN	T OF PICK, PIECES 1 INCH	STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY
LL LIQUID LIMIT _			FRAGS FRAGMENTS	TCR - TRICONE REFUSAL				BROKEN BY FINGER PRESSURE. CAN E	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 RANGE		REQUIRES DRYING TO	FOUT	PMENT USED ON SUBJECT P	PROJECT		INGERNAIL. CTURE SPACING	BEDI	TNG	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
(PI) PLL PLASTIC LIMIT	ALIAIN UPI	IMUM MOISTURE			HAMMER TYPE:	TERM	SPACING	TERM	THICKNESS	BENCH MARK:
ODTINUM MOTOTUDE	- MOIST - (M) SOLID; AT	OR NEAR OPTIMUM MOISTURE	DRILL UNITS:	ADVANCING TOOLS:	X AUTOMATIC MANUAL	VERY WIDE	MORE THAN 10 FEET	VERY THICKLY BEDDED THICKLY BEDDED	> 4 FEET 1.5 - 4 FEET	DENOT THINK
OM _ OPTIMUM MOISTURE SL _ SHRINKAGE LIMIT _	10101 W. 00210; H.		MOBILE B	CLAY BITS		WIDE MODERATELY	3 TO 10 FEET CLOSE 1 TO 3 FEET	THINLY BEDDED	0.16 - 1.5 FEET	ELEVATION: FT.
	- DRY - (D) REQUIRES A	ADDITIONAL WATER TO		6° CONTINUOUS FLIGHT AUGER	CORE SIZE:	CLOSE VERY CLOSE	0.16 TO 1 FEET	VERY THINLY BEDDED THICKLY LAMINATED	0.03 - 0.16 FEET 0.008 - 0.03 FEET	NOTES:
	ATTAIN OPT	TIMUM MOISTURE	□ 8к-51	X 8 HOLLOW AUGERS	□-в	VENT CLUSE	ress tuen ett p FE	THINLY LAMINATED	< 0.008 FEE?	FIAD - BORING FILLED IN AFTER DRILLING
	PLASTICITY		CME-45C	HARD FACED FINGER BITS		FOD 65011511	V 00000 THIS IDATION TO THE	INDURATION .	NITHE HEAT DOCCOURS ST	-
	PLASTICITY INDEX (PI)	DRY STRENGTH		TUNGCARBIDE INSERTS		1	DI#	RDENING OF THE MATERIAL BY CEME		
NONPLASTIC LOW PLASTICITY	<b>0-</b> 5 6-15	VERY LOW SLIGHT	CME-550	CASING W/ ADVANCER	HAND TOOLS:	FRIAB		BBING WITH FINGER FREES NUMEROUS WILE BLOW BY HAMMER DISINTEGRATE		
MED. PLASTICITY HIGH PLASTICITY	16-25	MEDIUM HIGH	PORTABLE HOIST	X TRICONE 3 STEEL TEETH	POST HOLE DIGGER	MODER		AINS CAN BE SEPARATED FROM SAMPL		
TION FEMALICITY	26 OR MORE COLOR	112011	W DIEDDIG:: 2 52	TRICONE TUNGCARB.	HAND AUGER		BRI	EAKS EASILY WHEN HIT WITH HAMMER		
accounting the results of the		SULON ODOLAN DIVISIONAL	X DIEDRICH D-50	CORE BIT	SOUNDING ROD	INDUR		AINS ARE DIFFICULT TO SEPARATE WI	ITH STEEL PROBE:	
1	OR COLOR COMBINATIONS (TAN, RED. YE STREAKED, ETC. ARE USED TO DESCRI			4" DRAG BIT	VANE SHEAR TEST	FYTDE		ARP HAMMER BLOWS REQUIRED TO BRI	EAK SAMPLE;	
		· · · ·			<u> </u>	LAINE		MPLE BREAKS ACROSS GRAINS.		

PROJECT REFERENCE NO.

SHEET NO.

## **EARTHWORK BALANCE SHEET**

Volumes in Cubic Yards

PROJECT TIP# U-4716A/C

COUNTY Wake

DATE 8/10/2012

SHEET 1 OF 2 SHEETS

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT EXCAV.	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	EARTH EMB.	EMBANK. 20%	BORROW	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
MAIN	3242+89.00	3260+32.00	238				238	1,140		1,140	1,368	1,130	0		0
		SUBTOTAL	238				238	1,140		1,140	1,368	1,130	U.		<u> </u>
MATNI	3263+04.00	3291+18.00	7,169				7,169	2,576		2,576	3,091	0	4,078		4,078
MAIN	3203+04.00	SUBTOTAL	7,169				7,169	2,576		2,576	3,091	0	4,078		4,078
			l									27.002			0
MAIN	3292+92.00	3314+93.68	975				975	32,398		32,398	38,878	37,903 37,903	0		0
		SUBTOTAL	975				975	32,398		32,398	38,878	37,903			
	2216.50.60	2246+00-00	5 241		1,333		5,341	126,123		126,123	151,348	146,007	0	1,333	1,333
MAIN	3316+58.68	3346+00.00 SUBTOTAL	5,341 5,341	0	1,333	0	5,341	126,123		126,123	151,348	146,007	0	1,333	1,333
		SOBIOTAL	1 3,511		1 3333										
MAIN	3346+00.00	3376+00.00	8,506				8,506	1,874		1,874	2,249	0	6,257		6,257 6,257
		SUBTOTAL	8,506				8,506	1,874		1,874	2,249	0	6,257		0,237
			6.017	<u> </u>			6,817	10,067		10,067	12,080	5,263			0
MAIN	3376+00.00	3406+00.00 SUBTOTAL	6,817			-	6,817	10,067		10,067	12,080	5,263	0		0
		SUBTUTAL	0,817				1 0,017	10,001							
MAIN	3406+00.00	3436+00.00	9,688				9,688	14,459		14,459	17,351	7,663	0		0
./		SUBTOTAL	9,688				9,688	14,459		14,459	17,351	7,663	0		0
							1 415	1,809		1,809	2,171	756	0		0
MAIN	3436+00.00	3442+21.00 SUBTOTAL	1,415 1,415				1,415	1,809	<del>                                     </del>	1,809	2,171	756	0		0
		SUBTOTAL	1,413				1,113	1,000		1,1,1,1					
													<b></b>		1
	PROJECT SUBTOTAL		40,149	0	1,333	0	40,149	190,446	0	190,446		198,721	10,335	1,333	11,668
AD	DITIONAL UNDER	CUT			1,800			1,800		1,800	2,160	2,160	10.555	1,800	1,800
V	VASTE TO REPLAC	E BORROW								-	<u> </u>	-10,335	-10,335	<u> </u>	-10,335
	PROJECT T	OTAL	40,149	0	3,133	0	40,149	192,246	0	192,246	230,695	190,546	0	3,133	3,133
<b>ESTIMAT</b>	E 5% TO REPLA	ACE TOPSOIL								<u> </u>		9,527			
ON BORE	OW PIT					İ		1			<u></u>	<u> </u>	_Ц	1	

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT EXCAV.	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	EARTH EMB.	EMBANK. 20%		SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
	GRAND TOTAL				3,133							200,074			
SAY		40,200		3,140							200,100				

EST. DDE = 13,870 CY
EST. SHALLOW UNDERCUT = 2,450 CY PER GEOTECHNICAL RECOMMENDATION
EST. 2,000 CY OF SELECT GRANULAR MATERIAL PER GEOTECHNICAL RECOMMENDATION

<sup>\*</sup> THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEER.

