



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

October 12, 2012

MEMORANDUM TO: J. Wally Bowman, P.E.
Division 5 Engineer

ATTENTION: Mark Craig, P.E.
Division Bridge Program Manager

FROM: *CAK* Kyung (K. J.) Kim, Ph.D., P.E.
Eastern Regional Geotechnical Manager

STATE PROJECT: 17BP.5.R.43 (SF-340060)
FEDERAL PROJECT: N/A
COUNTY: Franklin

DESCRIPTION: Bridge No. 60 on SR 1451 over Tributary to Sandy Creek

SUBJECT: Bridge Foundation Recommendations

The Geotechnical Engineering Unit has completed the subsurface investigation and has prepared the foundation design recommendations for the above structure and presents the following project data:

- Bridge Inventory (8) pages
- Foundation Design Recommendations (3) pages
- Design Calculations () pages
- Special Provisions () pages

Please call Nadia Al-Dhalimy, P.E. or Chris Kreider, P.E. at (919) 662-4710 if there are any questions concerning this memorandum.

KJK/CAK/NAA

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RALEIGH NC 27699-1570

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WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
3301 JONES SAUSAGE RD., SUITE 100
GARNER, NC 27529-9489

FOUNDATION RECOMMENDATIONS

PROJECT 17BP.5.R.43

DESCRIPTION Bridge No. 60 on SR 1451

T.I.P. NO. SF-340060

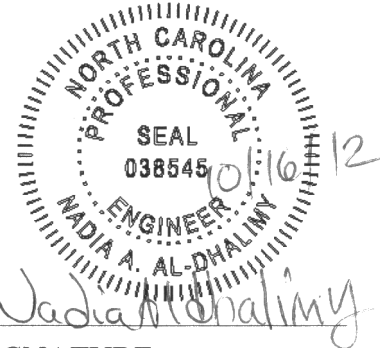
over Tributary to Sandy Creek

COUNTY Franklin

STATION 13+17.00 -L-

	INITIALS	DATE
DESIGN	NAA	10/12/2012
CHECK	CAH	10/16/12
APPROVAL	CAH	10/16/12

SEAL



SIGNATURE

BENT NO.	STATION	FOUNDATION TYPE	FACTORED RESISTANCE	MISCELLANEOUS DETAILS
END BENT 1	12+80.88 -L-	Cap on HP 12 x 53 Steel Piles with Steel H-Pile points	97 Tons/Pile	Bottom of Cap Elevation = 224 ft. ± Estimated Pile Length = 10 ft. ± Number of Piles = 5
END BENT 2	13+53.13 -L-	Cap on HP 12 x 53 Steel Piles with Steel H-Pile points	97 Tons/Pile	Bottom of Cap Elevation = 224 ft. ± Estimated Pile Length = 10 ft. ± Number of Piles = 5

COMMENTS & NOTES (See Following Page)

FOUNDATION RECOMMENDATION NOTES ON PLANS

1. FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
2. PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 97 TONS PER PILE.
3. DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 165 TONS PER PILE.
4. STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO. 1 AND END BENT NO. 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
5. PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT NO. 1 AND END BENT NO. 2. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 214 FT. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
6. CONCRETE OR GROUT IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT NO. 1 AND END BENT NO. 2.

FOUNDATION RECOMMENDATION COMMENTS

1. 1.5:1 (H:V) SLOPES FOR END BENTS WITH SLOPE PROTECTION TO BERM ARE OK.
2. USE APPROACH FILL DETAIL FOR SUB-REGIONAL TIER BRIDGES AT EACH END BENT.
3. NO WAITING PERIOD IS REQUIRED BEFORE BEGINNING ANY WORK FOR END BENT CONSTRUCTION AFTER COMPLETION OF THE EMBANKMENT AT EACH END BENT.

PILE PAY ITEMS

(Revised 8/15/12)

WBS ELEMENT 17BP.5.R.43

TIP NO. SF-340060

COUNTY Franklin

STATION 13+17.00

DATE 10/12/2012

DESIGNED BY NAA

CHECKED BY CKK

DESCRIPTION Bridge No. 60 on SR 1451 over Tributary to Sandy Creek

NUMBER OF BENTS WITH PILES _____

NUMBER OF PILES PER BENT _____

NUMBER OF END BENTS WITH PILES 2

NUMBER OF PILES PER END BENT 5

Only required for "Predrilling for Piles" & "Pile Excavation" pay items

Bent # or End Bent #	PILE PAY ITEM QUANTITIES						PDA Testing (per each)
	Steel Pile Points (yes/no)	Pipe Pile Plates (yes/no/maybe)	Predrilling For Piles (per linear ft)	Pile Redrives (per each)	Pile Excavation (per linear ft)		
					In Soil	Not In Soil	
End Bent # 1	yes				45	5	X
End Bent # 2	yes				37	13	
TOTALS			0	0	82	18	0

Notes:

Blanks or "no" represent quantity of zero.

If steel pile points are required, calculate quantity of "Steel Pile Points" as equal to the number of steel piles.

If pipe pile plates are or may be required, calculate the quantity of "Pipe Pile Plates" as equal to the number of pipe piles.

Show quantity of "PDA Testing" on the plans as total only.

If quantity of "PDA Testing" is 3 or less, reference "Pile Driving Criteria" provision in PDA notes on plans and include "Pile Driving Criteria" provision in the contract.

PROJECT REFERENCE NO. SHEET
17BP.S.R.43 3

SITE PLAN



SKREW ANGLE = 90°

11+00 12+00 13+00 14+00 15+00



TBM-50
-EL- 12+91.37 38.91' LT
-ELEV. = 227.10'
"R/R SPIKE SET IN 30"
GUM TREE"

12' CONC
CONC WALL

20'
(MP)

TO MC 561

LEONARD ROAD (SR 1451) 18.3' BST
TO SR 1456

5' RCP
10' CONC

15' RCP
15' SOIL

TRIBUTARY TO
SANDY CREEK

4' WM

EB2-A

EB2-B

EB1-A

EB1-B

BRIDGE
34-0060

TBM-50

20'

20'

20'

20'

20'

20'

20'

WOODS

WOODS

WOODS

WOODS

WOODS

WOODS

TO SR 1456

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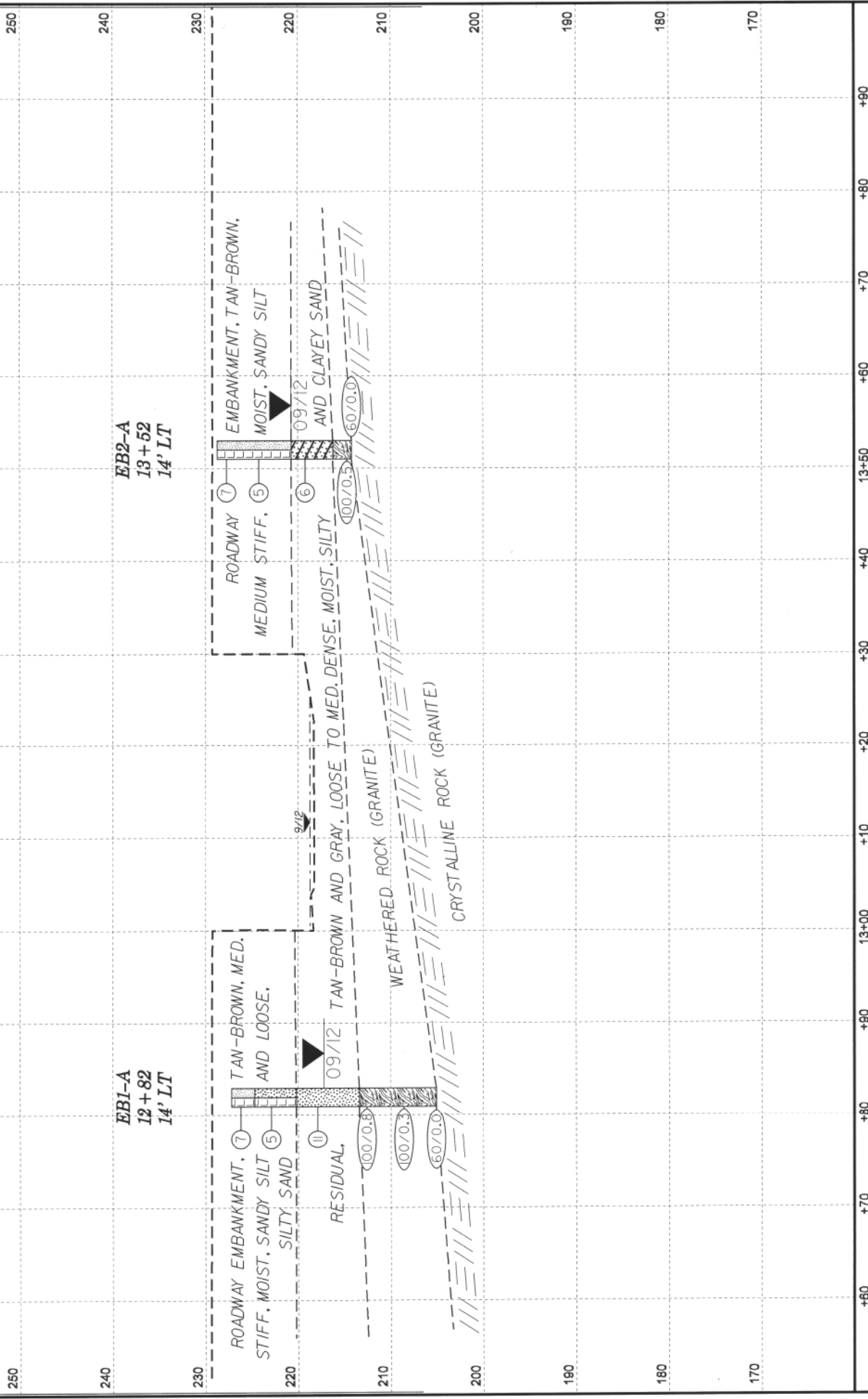
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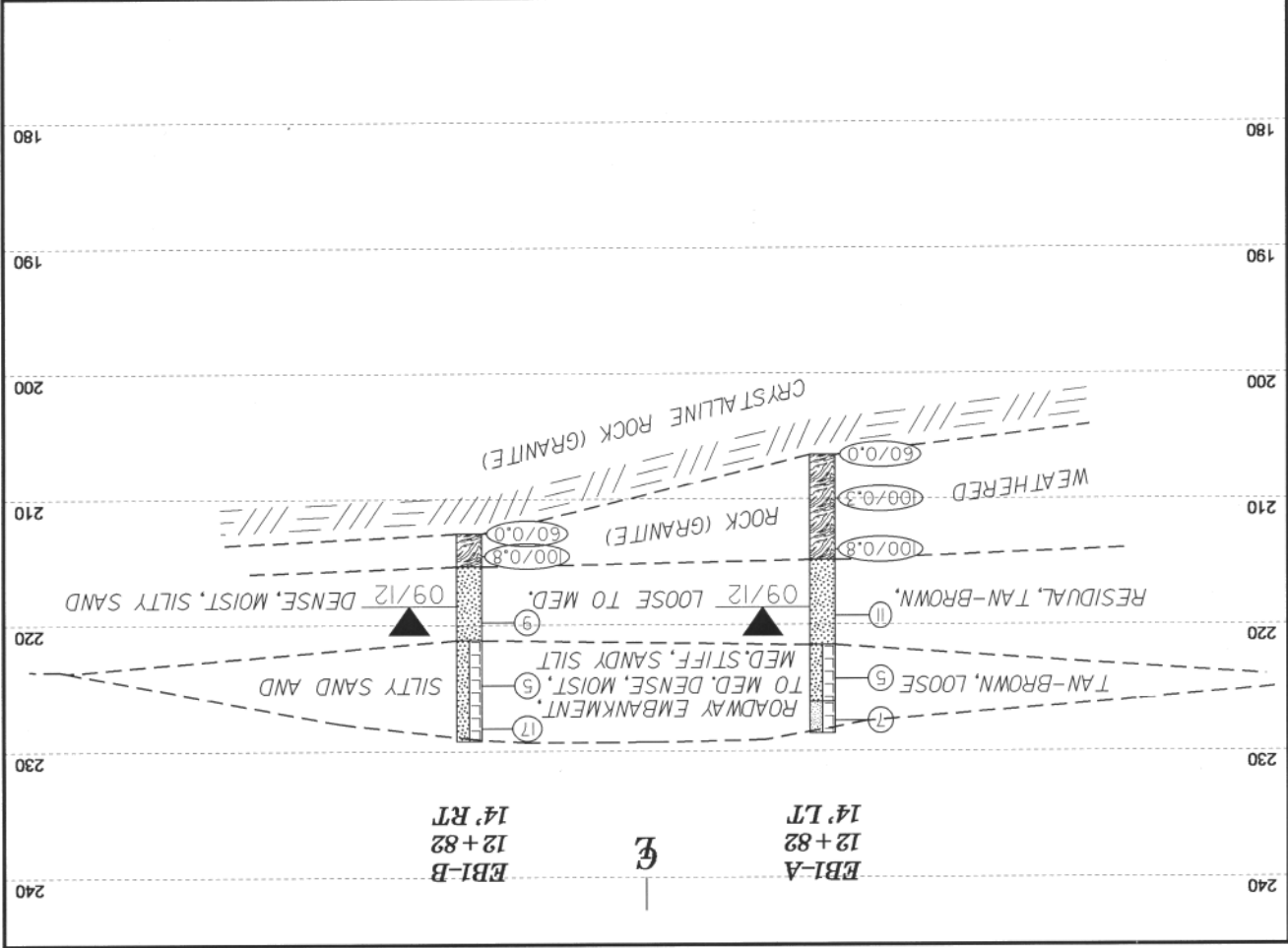
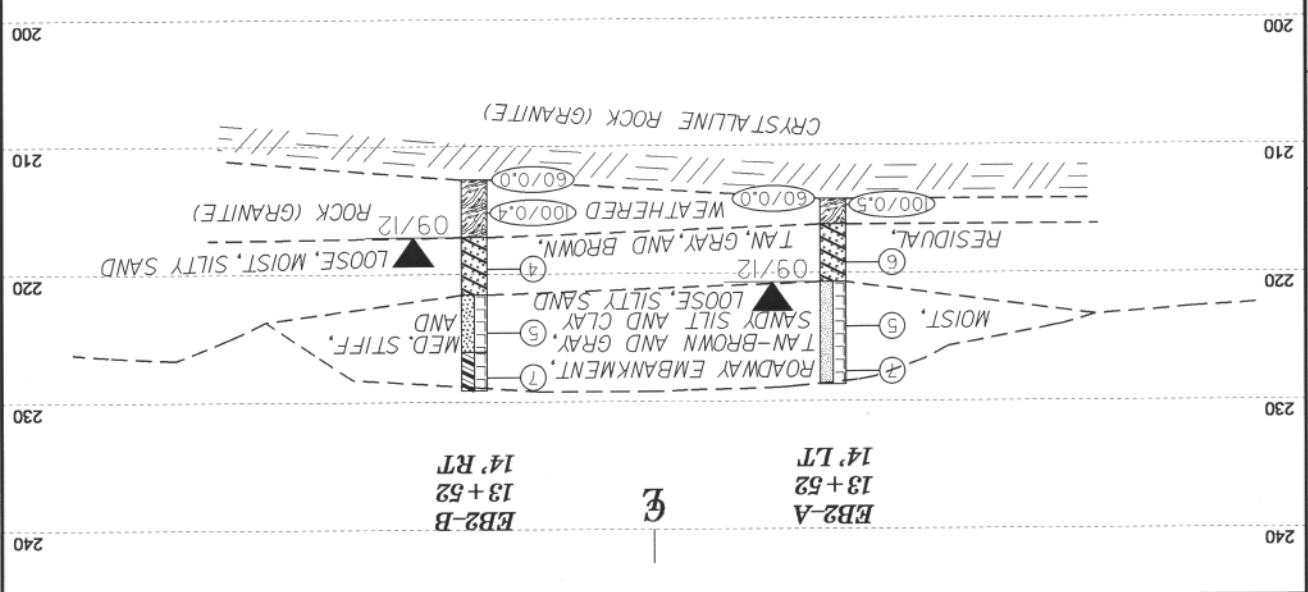
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TO SR 1456







**NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT**

WBS 17BP.5.R.43		TIP SF-340060		COUNTY FRANKLIN		GEOLOGIST Ohi, O. B.			
SITE DESCRIPTION BRIDGE NO. 60 ON L- (SR 1451) OVER TRIBUTARY TO SANDY CREEK		STATION 12+82		OFFSET 14 FT		ALIGNMENT -L-			
BORING NO. EB1-B		TOTAL DEPTH 16.5 ft		NORTHING 876,750		EASTING 2,247,303			
COLLAR ELEV. 229.2 ft		DRILL METHOD H.S. Augers		DRILL DATE 09/26/12		SURFACE WATER DEPTH N/A			
DRILL RIGHAMMER EFF. DATE RFO0074 CME-55 92% 07/12/2011		START DATE 09/26/12		COMP. DATE 09/26/12		SURFACE WATER DEPTH N/A			
DRILLER Conley, H. R.		BLOW COUNT		BLOWS PER FOOT		SOIL AND ROCK DESCRIPTION			
ELEV (ft)	DEPTH (ft)	0.5ft	0.5ft	0	25	50	75	100	SOIL AND ROCK DESCRIPTION
230	0.0								GROUND SURFACE
	0.0								ROADWAY EMBANKMENT
	0.0								TAN-BROWN, SANDY SILT
	0.0								TAN-BROWN, SILTY SAND
	0.0								RESIDUAL
	0.0								TAN-BROWN, SILTY SAND
	0.0								WEATHERED ROCK (GRANITE)
Boring Terminated with Standard Penetration Test Refusal at Elevation 212.7 ft ON CRYSTALLINE ROCK (GRANITE)									

WBS 17BP.5.R.43		TIP SF-340060		COUNTY FRANKLIN		GEOLOGIST Ohi, O. B.			
SITE DESCRIPTION BRIDGE NO. 60 ON L- (SR 1451) OVER TRIBUTARY TO SANDY CREEK		STATION 12+82		OFFSET 14 FT		ALIGNMENT -L-			
BORING NO. EB1-A		TOTAL DEPTH 22.1 ft		NORTHING 876,777		EASTING 2,247,283			
COLLAR ELEV. 228.6 ft		DRILL METHOD H.S. Augers		DRILL DATE 09/26/12		SURFACE WATER DEPTH N/A			
DRILL RIGHAMMER EFF. DATE RFO0074 CME-55 92% 07/12/2011		START DATE 09/26/12		COMP. DATE 09/26/12		SURFACE WATER DEPTH N/A			
DRILLER Conley, H. R.		BLOW COUNT		BLOWS PER FOOT		SOIL AND ROCK DESCRIPTION			
ELEV (ft)	DEPTH (ft)	0.5ft	0.5ft	0	25	50	75	100	SOIL AND ROCK DESCRIPTION
230	0.0								GROUND SURFACE
	0.0								ROADWAY EMBANKMENT
	0.0								TAN-BROWN, SANDY SILT
	0.0								TAN-BROWN, SILTY SAND
	0.0								RESIDUAL
	0.0								TAN-BROWN, SILTY SAND
	0.0								WEATHERED ROCK (GRANITE)
Boring Terminated with Standard Penetration Test Refusal at Elevation 206.5 ft ON CRYSTALLINE ROCK (GRANITE)									



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 17BP.5.R.43		TIP SF-340060		COUNTY FRANKLIN		GEOLOGIST Oti, O. B.				
SITE DESCRIPTION BRIDGE NO. 60 ON L-L (SR 1451) OVER TRIBUTARY TO SANDY CREEK				GROUND WTR (ft)						
BORING NO. EB2-A		STATION 13+52		OFFSET 14 ft LT		ALIGNMENT -L-				
COLLAR ELEV. 228.7 ft		TOTAL DEPTH 14.5 ft		NORTHING 876,800		EASTING 2,247,360				
DRILL RIGHAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic						
DRILLER Conley, H. R.		START DATE 09/28/12		SURFACE WATER DEPTH N/A						
ELEV (ft)	DRIVE DEPTH (ft)	BLOW COUNT		SAMP. NO.	L	O	MOL	G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
		0.5ft	1.0ft							
230	228.7	4	3	4					GROUND SURFACE	0.0
									ROADWAY EMBANKMENT	
									TAN-BROWN, SANDY SILT	
225	225.2	2	2	3						
220	220.2	1	2	4					RESIDUAL	8.0
									TAN-GRAY, CLAYEY SAND	
215	215.2	1000/0.5	1000/0.5	600/0.0					WEATHERED ROCK	12.5
									(GRANITE)	
									Boring Terminated with Standard Penetration Test Refusal at Elevation 214.2 ft ON CRYSTALLINE ROCK (GRANITE)	14.5

WBS 17BP.5.R.43		TIP SF-340060		COUNTY FRANKLIN		GEOLOGIST Oti, O. B.				
SITE DESCRIPTION BRIDGE NO. 60 ON L-L (SR 1451) OVER TRIBUTARY TO SANDY CREEK				GROUND WTR (ft)						
BORING NO. EB2-B		STATION 13+52		OFFSET 14 ft RT		ALIGNMENT -L-				
COLLAR ELEV. 229.1 ft		TOTAL DEPTH 16.5 ft		NORTHING 876,774		EASTING 2,247,369				
DRILL RIGHAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic						
DRILLER Conley, H. R.		START DATE 09/27/12		SURFACE WATER DEPTH N/A						
ELEV (ft)	DRIVE DEPTH (ft)	BLOW COUNT		SAMP. NO.	L	O	MOL	G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
		0.5ft	1.0ft							
230	229.1	0	0	100					GROUND SURFACE	0.0
									ROADWAY EMBANKMENT	
									TAN-BROWN, SANDY CLAY	
225	225.6	3	2	3					TAN-GRAY, SILTY SAND	3.0
220	220.6	1	2	2					RESIDUAL	7.5
									GRAY-BROWN, CLAYEY SAND	
215	215.6	1000/0.4	1000/0.4	600/0.0					WEATHERED ROCK	12.0
									(GRANITE)	
									Boring Terminated with Standard Penetration Test Refusal at Elevation 212.6 ft ON CRYSTALLINE ROCK (GRANITE)	16.5

SITE PHOTOGRAPH

Bridge No. 60 on -L- (SR 1451) over Tributary to Sandy Creek



Looking South towards End Bent 1