



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

April 17, 2012

MEMORANDUM TO: C. E. (Neil) Lassiter, Jr., P.E.
Division 2 Engineer

ATTENTION: Lang Jones
Division Design Engineer

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

STATE PROJECT: 45348.1.12 (BD-5102L)
FEDERAL PROJECT: BRZ-1134(6)
COUNTY: Jones

DESCRIPTION: Bridge No. 64 on SR 1134 (Old Comfort Rd.) between Richlands Rd.
and NC 41 over Cypress 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 (9) pages
- Foundation Design Recommendations (3) pages
- Design Calculations () pages
- Special Provisions () pages

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

KJK/CAK/MK
Attachment

MAILING ADDRESS:
EASTERN REGIONAL OFFICE
GEOTECHNICAL ENGINEERING UNIT
1570 MAIL SERVICE CENTER
RALEIGH NC 27699-1570

TELEPHONE: 919-662-4710
FAX: 919-662-3095

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

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

FOUNDATION RECOMMENDATIONS

WBS: 45348.1.12

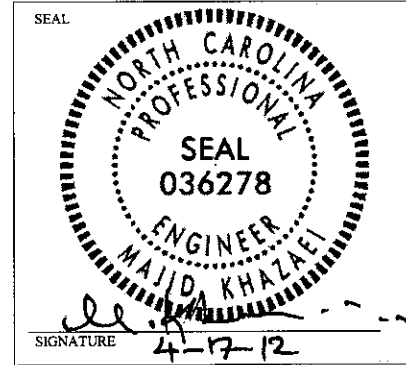
DESCRIPTION : Bridge No. 64 on SR 1134 (Old Comfort Rd.)

T.I.P. NO.: BD-5102L

over Cypress Creek

COUNTY: Jones

STATION: 13+79.00 -L-



	INITIALS	DATE
DESIGN	MK.	4/17/12
CHECK	CAK	4/17/12
APPROVAL	CAK	4/17/12

BENT	STATION	FOUNDATION TYPE	FACTORED RESISTANCE	MISCELLANEOUS DETAILS
END BENT 1	13+19.00 ± -L-	Cap on HP 12x53 Steel Piles	70 tons/pile	Bottom of Cap El. = 40.5 ft ± Estimated Length of Pile = 10.0 ft ± Number of Piles = 5 ✓
BENT 1	13+59.00 ± -L-	Cap on HP 14x73 Steel Piles	100 tons/pile	Bottom of Cap El. = 40.5 ft ± Point of Fixity = 30 ft ± Tip Elevation No Higher than = 27.5 ft Minimum Rock Socket = 5 ft Estimated Length of Pile = 15 ft ± Number of Piles = 7 ✓
BENT 2	14+09.00 ± -L-	Cap on HP 14x73 Steel Piles	100 tons/pile	Bottom of Cap El. = 40.5 ft ± Point of Fixity = 30 ft ± Tip Elevation No Higher than = 27.5 ft Minimum Rock Socket = 5 ft Estimated Length of Pile = 15 ft ± Number of Piles = 7 ✓
END BENT 2	14+39.00 ± -L-	Cap on HP 12x53 Steel Piles	70 tons/pile	Bottom of Cap El. = 40.5 ft ± Estimated Length of Pile = 10.0 ft ± Number of Piles = 5 ✓

NOTES ON PLANS & COMMENTS

See Following Pages

FOUNDATION RECOMMENDATION NOTES ON PLANS

- 1) FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- 2) PILES AT END BENT NO. 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 70 TONS PER PILE.
- 3) DRIVE PILES AT END BENT NO. 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 120 TONS PER PILE. ✓
- 4) PILES AT BENT NO. 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.
- 5) DRIVE PILES AT BENT NO. 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 170 TONS PER PILE.
THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAW OR SCOUR. ✓
- 6) INSTALL PILES AT BENT NO. 1 AND BENT NO. 2 TO A TIP ELEVATION NO HIGHER THAN 27.5 FT. ✓
- 7) STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT BOTH END BENT NO. 1 AND 2 AND
BENT NO. 1 AND 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS. ✓
- 8) THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS ELEVATION 31.5 FT. SCOUR CRITICAL ELEVATIONS
ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE. ✓
- 9) THE SCOUR CRITICAL ELEVATION FOR BENT NO. 2 IS ELEVATION 32.0 FT. SCOUR CRITICAL ELEVATIONS
ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE. ✓
- 10) IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF
30 to 45 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BOTH END BENT NO. 1 AND 2 AND
BENT NO. 1 AND 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM
PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD
SPECIFICATIONS. ✓
- 11) PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT BENT NO. 1 AND BENT NO. 2.
EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION NO HIGHER THAN 27.5 FT AND OBTAIN A MINIMUM
5.0 FT OF ROCK SOCKET. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS. ✓
- 12) CONCRETE OR GROUT IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT BENT NO. 1 AND BENT NO. 2. ✓

FOUNDATION RECOMMENDATION COMMENTS

- 1) 1½:1 (H:V) SLOPE AT THE END BENTS ARE OK WITH SLOPE PROTECTION.
- 2) REINFORCED BRIDGE APPROACH FILLS ARE REQUIRED AT EACH END BENT.
- 3) THE DESIGN SCOUR ELEVATION FOR BENT NO. 1 IS 32.6 FT.
- 4) THE DESIGN SCOUR ELEVATION FOR BENT NO. 2 IS 33.1 FT.
- 5) 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

(For 2012 Lettings and Later - Revised 4/18/11)

WBS ELEMENT	45348.1.12		DATE	4/17/2012
TIP NO.	BD-5102L		DESIGNED BY	MK
COUNTY	Jones		CHECKED BY	CAR
STATION	13+79.00 -L-			
DESCRIPTION	Bridge No. 64 on SR 1134 (Old Comfort Rd.) over Cypress Creek			

NUMBER OF BENTS WITH PILES	2	}	Only required for "Predrilling for Piles" & "Pile Excavation" pay items
NUMBER OF PILES PER BENT	7		
NUMBER OF END BENTS WITH PILES	2		
NUMBER OF PILES PER END BENT	5		

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				0	0	
Bent #1	yes				29	36	
Bent #2	yes				25	39	
End Bent #2	yes				0	0	
TOTALS			0	0	54	75	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.

If PDA testing may be required, show quantities of "PDA Testing" on the substructure plans as totals only. If PDA testing is required, show quantities of "PDA Testing" on the substructure plans for each bent or end bent.

STATE	DATE	PROJECT NUMBER	REVISION
N.C.		BD-5102L	1
			9

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 45348.1.12 (BD-5102L) F. A. PROJ. BRZ-1134(6)
 COUNTY JONES
 PROJECT DESCRIPTION BRIDGE NO. 64 ON SR 1134 OVER CYPRESS
CREEK AT L- STA. 13 + 79.00

CONTENTS

SHEET	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5-7	BORELOGS AND CORE REPORT
8	CORE PHOTOGRAPH

CAUTION NOTICE

THE INFORMATION CONTAINED HEREIN IS NOT TO BE USED FOR ANY PURPOSE OTHER THAN THAT SPECIFICALLY AUTHORIZED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED TO THE ENGINEER. THE ENGINEER'S RESPONSIBILITY IS LIMITED TO THE DESIGN OF THE STRUCTURE AND THE SUPERVISORY CONTROL OF THE CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF THE EXISTING UTILITIES AND THE PRESERVATION OF THE SURROUNDING ENVIRONMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF ALL PERSONNEL AND EQUIPMENT ON THE PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF THE EXISTING UTILITIES AND THE PRESERVATION OF THE SURROUNDING ENVIRONMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF ALL PERSONNEL AND EQUIPMENT ON THE PROJECT.

PERSONNEL

JRS

CATZIN

CMW

RES

JME

INVESTIGATED BY J.L. STONE
 CHECKED BY D.N. ARGENBRIGHT
 SUBMITTED BY D.N. ARGENBRIGHT
 DATE APRIL 2012



PROJECT: 45348.1.12

ID: BD-5102L

NOTE: THE INFORMATION CONTAINED HEREIN IS NOT TO BE USED OR DISSEMINATED BY THE S.C. DEPARTMENT OF TRANSPORTATION FOR ANY PURPOSE OTHER THAN THAT SPECIFICALLY AUTHORIZED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF THE EXISTING UTILITIES AND THE PRESERVATION OF THE SURROUNDING ENVIRONMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF ALL PERSONNEL AND EQUIPMENT ON THE PROJECT.

DRAWN BY: J.L. STONE

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

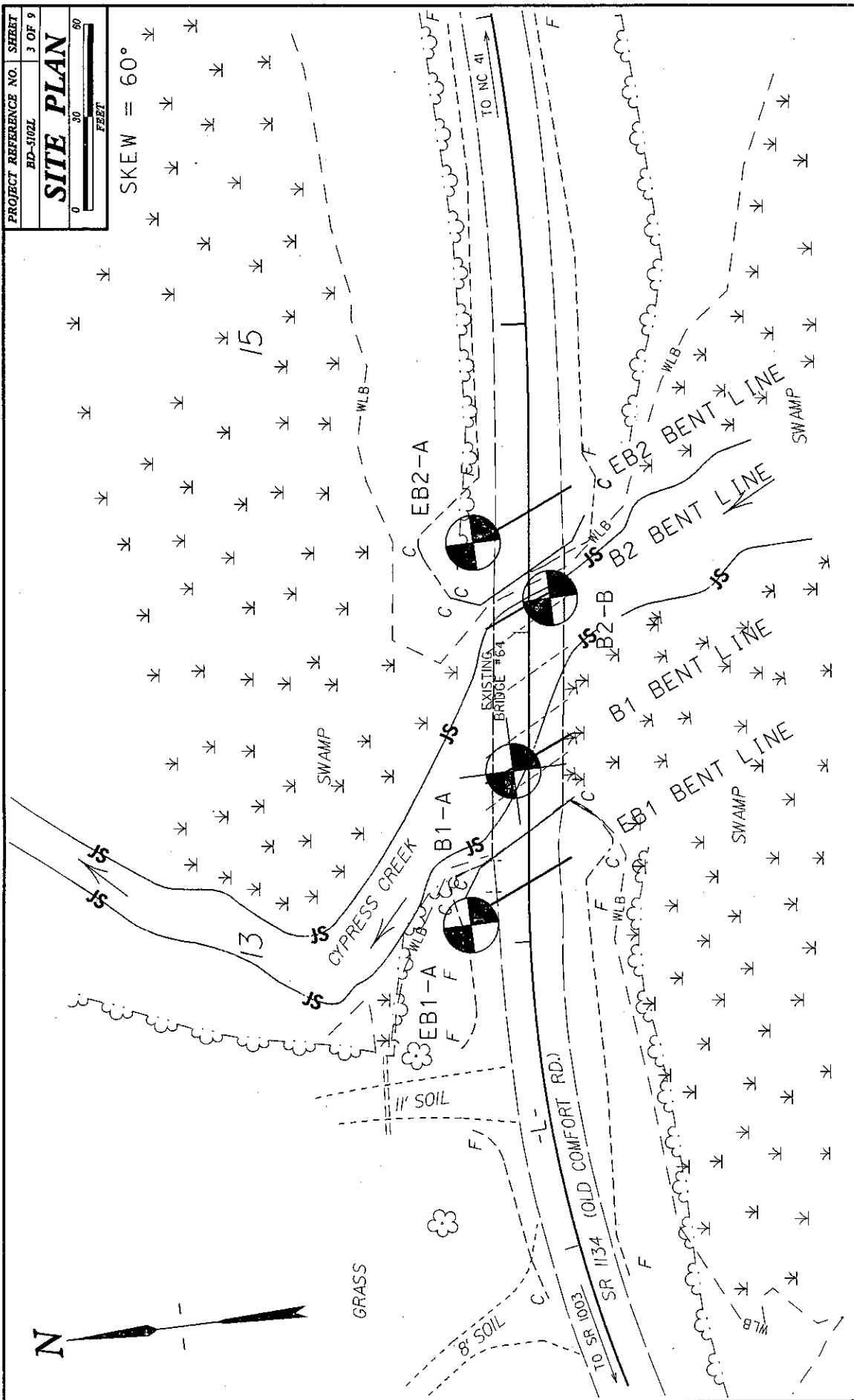
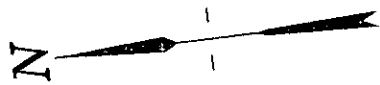
SOIL DESCRIPTION	SOIL LEGEND AND ABBREVIATION	GRADEATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS	ELEVATION	REMARKS																																																																																																																																																																																																									
<p>SOIL IS CONSIDERED TO BE THE DISCONTINUOUS, UNCONSOLIDATED OR WEATHERED (ARTIFICIAL) MATERIALS THAT CAN BE PENETRATED WITH A STANDARD POINT TEST AND YIELD LESS THAN 2000 PSI. SOILS ARE CLASSIFIED INTO FOUR GENERAL CATEGORIES: SANDS, SILTS, CLAYS, AND ORGANICS.</p> <p>SOIL LEGEND AND ABBREVIATION</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>GROUP CLASS.</td> <td>1-5, 30% PASSING 20</td> <td>1-2</td> <td>1-3</td> <td>1-4</td> <td>1-5</td> <td>1-6</td> <td>1-7</td> <td>1-8</td> <td>1-9</td> <td>1-10</td> <td>1-11</td> <td>1-12</td> <td>1-13</td> <td>1-14</td> <td>1-15</td> <td>1-16</td> <td>1-17</td> <td>1-18</td> <td>1-19</td> <td>1-20</td> <td>1-21</td> <td>1-22</td> <td>1-23</td> <td>1-24</td> <td>1-25</td> <td>1-26</td> <td>1-27</td> <td>1-28</td> <td>1-29</td> <td>1-30</td> <td>1-31</td> <td>1-32</td> <td>1-33</td> <td>1-34</td> <td>1-35</td> <td>1-36</td> <td>1-37</td> <td>1-38</td> <td>1-39</td> <td>1-40</td> <td>1-41</td> <td>1-42</td> <td>1-43</td> <td>1-44</td> <td>1-45</td> <td>1-46</td> <td>1-47</td> <td>1-48</td> <td>1-49</td> <td>1-50</td> <td>1-51</td> <td>1-52</td> <td>1-53</td> <td>1-54</td> <td>1-55</td> <td>1-56</td> <td>1-57</td> <td>1-58</td> <td>1-59</td> <td>1-60</td> <td>1-61</td> <td>1-62</td> <td>1-63</td> <td>1-64</td> <td>1-65</td> <td>1-66</td> <td>1-67</td> <td>1-68</td> <td>1-69</td> <td>1-70</td> <td>1-71</td> <td>1-72</td> <td>1-73</td> <td>1-74</td> <td>1-75</td> <td>1-76</td> <td>1-77</td> <td>1-78</td> <td>1-79</td> <td>1-80</td> <td>1-81</td> <td>1-82</td> <td>1-83</td> <td>1-84</td> <td>1-85</td> <td>1-86</td> <td>1-87</td> <td>1-88</td> <td>1-89</td> <td>1-90</td> <td>1-91</td> <td>1-92</td> <td>1-93</td> <td>1-94</td> <td>1-95</td> <td>1-96</td> <td>1-97</td> <td>1-98</td> <td>1-99</td> <td>1-100</td> </tr> </table>	GROUP CLASS.	1-5, 30% PASSING 20	1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10	1-11	1-12	1-13	1-14	1-15	1-16	1-17	1-18	1-19	1-20	1-21	1-22	1-23	1-24	1-25	1-26	1-27	1-28	1-29	1-30	1-31	1-32	1-33	1-34	1-35	1-36	1-37	1-38	1-39	1-40	1-41	1-42	1-43	1-44	1-45	1-46	1-47	1-48	1-49	1-50	1-51	1-52	1-53	1-54	1-55	1-56	1-57	1-58	1-59	1-60	1-61	1-62	1-63	1-64	1-65	1-66	1-67	1-68	1-69	1-70	1-71	1-72	1-73	1-74	1-75	1-76	1-77	1-78	1-79	1-80	1-81	1-82	1-83	1-84	1-85	1-86	1-87	1-88	1-89	1-90	1-91	1-92	1-93	1-94	1-95	1-96	1-97	1-98	1-99	1-100	<p>GRADEATION</p> <p>GRADEATION IS A CLASSIFICATION OF SOILS BASED ON THE PERCENTAGE OF SOILS PASSING THROUGH STANDARD SIEVES. 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ROCKS ARE CLASSIFIED INTO TWO GENERAL CATEGORIES: SANDSTONES AND SLATES.</p> <p>ROCK LEGEND AND ABBREVIATION</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>GROUP CLASS.</td> <td>1-101</td> <td>1-102</td> <td>1-103</td> <td>1-104</td> <td>1-105</td> <td>1-106</td> <td>1-107</td> <td>1-108</td> <td>1-109</td> <td>1-110</td> <td>1-111</td> <td>1-112</td> <td>1-113</td> <td>1-114</td> <td>1-115</td> <td>1-116</td> <td>1-117</td> <td>1-118</td> <td>1-119</td> <td>1-120</td> <td>1-121</td> <td>1-122</td> <td>1-123</td> <td>1-124</td> <td>1-125</td> <td>1-126</td> <td>1-127</td> <td>1-128</td> <td>1-129</td> <td>1-130</td> <td>1-131</td> <td>1-132</td> <td>1-133</td> <td>1-134</td> <td>1-135</td> <td>1-136</td> <td>1-137</td> <td>1-138</td> <td>1-139</td> <td>1-140</td> <td>1-141</td> <td>1-142</td> <td>1-143</td> <td>1-144</td> <td>1-145</td> <td>1-146</td> <td>1-147</td> <td>1-148</td> <td>1-149</td> <td>1-150</td> <td>1-151</td> <td>1-152</td> <td>1-153</td> <td>1-154</td> <td>1-155</td> <td>1-156</td> <td>1-157</td> <td>1-158</td> <td>1-159</td> <td>1-160</td> <td>1-161</td> <td>1-162</td> <td>1-163</td> <td>1-164</td> <td>1-165</td> <td>1-166</td> <td>1-167</td> <td>1-168</td> <td>1-169</td> <td>1-170</td> <td>1-171</td> <td>1-172</td> <td>1-173</td> <td>1-174</td> <td>1-175</td> <td>1-176</td> <td>1-177</td> <td>1-178</td> <td>1-179</td> <td>1-180</td> <td>1-181</td> <td>1-182</td> <td>1-183</td> <td>1-184</td> <td>1-185</td> <td>1-186</td> <td>1-187</td> <td>1-188</td> <td>1-189</td> <td>1-190</td> <td>1-191</td> <td>1-192</td> <td>1-193</td> <td>1-194</td> <td>1-195</td> <td>1-196</td> <td>1-197</td> <td>1-198</td> <td>1-199</td> <td>1-200</td> </tr> </table>	GROUP CLASS.	1-101	1-102	1-103	1-104	1-105	1-106	1-107	1-108	1-109	1-110	1-111	1-112	1-113	1-114	1-115	1-116	1-117	1-118	1-119	1-120	1-121	1-122	1-123	1-124	1-125	1-126	1-127	1-128	1-129	1-130	1-131	1-132	1-133	1-134	1-135	1-136	1-137	1-138	1-139	1-140	1-141	1-142	1-143	1-144	1-145	1-146	1-147	1-148	1-149	1-150	1-151	1-152	1-153	1-154	1-155	1-156	1-157	1-158	1-159	1-160	1-161	1-162	1-163	1-164	1-165	1-166	1-167	1-168	1-169	1-170	1-171	1-172	1-173	1-174	1-175	1-176	1-177	1-178	1-179	1-180	1-181	1-182	1-183	1-184	1-185	1-186	1-187	1-188	1-189	1-190	1-191	1-192	1-193	1-194	1-195	1-196	1-197	1-198	1-199	1-200	<p>TERMS AND DEFINITIONS</p> <p>ALUMINA (AL₂O₃): SOILS THAT HAVE BEEN TREATED BY WATER.</p> <p>ARTIFICIAL: A WATER BEARING FORMATION OR STRATA.</p> <p>ARTIFICIAL: A WATER BEARING FORMATION OR STRATA.</p> <p>ARTIFICIAL: A WATER BEARING FORMATION OR STRATA.</p> <p>ARTIFICIAL: A WATER BEARING FORMATION OR STRATA.</p> <p>ARTIFICIAL: A WATER BEARING FORMATION OR STRATA.</p>	<p>ELEVATION</p> <p>ELEVATION IS A MEASUREMENT OF THE HEIGHT OF A POINT ABOVE A REFERENTIAL SURFACE. 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GROUP CLASS.	1-5, 30% PASSING 20	1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10	1-11	1-12	1-13	1-14	1-15	1-16	1-17	1-18	1-19	1-20	1-21	1-22	1-23	1-24	1-25	1-26	1-27	1-28	1-29	1-30	1-31	1-32	1-33	1-34	1-35	1-36	1-37	1-38	1-39	1-40	1-41	1-42	1-43	1-44	1-45	1-46	1-47	1-48	1-49	1-50	1-51	1-52	1-53	1-54	1-55	1-56	1-57	1-58	1-59	1-60	1-61	1-62	1-63	1-64	1-65	1-66	1-67	1-68	1-69	1-70	1-71	1-72	1-73	1-74	1-75	1-76	1-77	1-78	1-79	1-80	1-81	1-82	1-83	1-84	1-85	1-86	1-87	1-88	1-89	1-90	1-91	1-92	1-93	1-94	1-95	1-96	1-97	1-98	1-99	1-100																																																																																																											
GROUP CLASS.	1-101	1-102	1-103	1-104	1-105	1-106	1-107	1-108	1-109	1-110	1-111	1-112	1-113	1-114	1-115	1-116	1-117	1-118	1-119	1-120	1-121	1-122	1-123	1-124	1-125	1-126	1-127	1-128	1-129	1-130	1-131	1-132	1-133	1-134	1-135	1-136	1-137	1-138	1-139	1-140	1-141	1-142	1-143	1-144	1-145	1-146	1-147	1-148	1-149	1-150	1-151	1-152	1-153	1-154	1-155	1-156	1-157	1-158	1-159	1-160	1-161	1-162	1-163	1-164	1-165	1-166	1-167	1-168	1-169	1-170	1-171	1-172	1-173	1-174	1-175	1-176	1-177	1-178	1-179	1-180	1-181	1-182	1-183	1-184	1-185	1-186	1-187	1-188	1-189	1-190	1-191	1-192	1-193	1-194	1-195	1-196	1-197	1-198	1-199	1-200																																																																																																											

REVISION 03/23/20

SITE PLAN

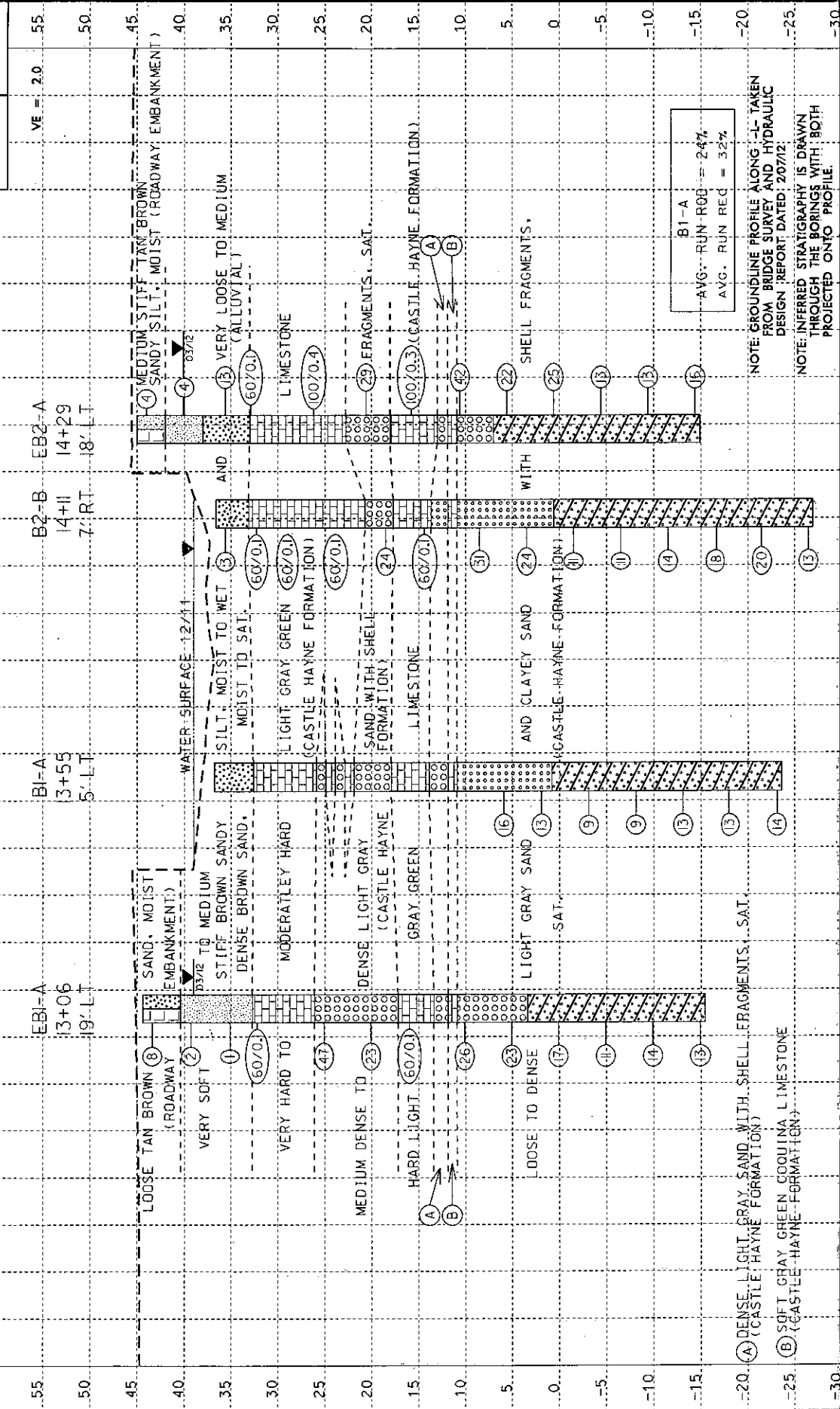


SKEW = 60°



INCOMPLETE PLANS
 DO NOT USE FOR CONSTRUCTION
 PRELIMINARY PLANS
 DO NOT USE FOR CONSTRUCTION

PROFILE THROUGH BORINGS PROJECTED ALONG -L-



B1-A
 AVG. RUN-ROB = 2.4%
 AVG. RUN REC = 3.2%

- (A) DENSE LIGHT GRAY SAND WITH SHELL FRAGMENTS, SAT. (CASTLE HAYNE FORMATION)
- (B) SOFT GRAY GREEN COQUINA LIMESTONE (CASTLE HAYNE FORMATION)

NC DOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 45348.1.12		TIP BD-5102L		COUNTY JONES		GEOLOGIST Wirke, C. M.		
SITE DESCRIPTION BRIDGE NO. 84 ON-L (SR 1134) OVER CYPRESS CREEK		STATION 13+06		ALIGNMENT -L-		GROUND WTR (ft)		
BORING NO. EB1-A		TOTAL DEPTH 59.8 ft		NORTHING 459,389		0 HR. N/A		
COLLAR ELEV. 44.4 ft		NORTHING 459,389		EASTING 2,454,245		24 HR. 5.4		
DRILL RIGHAMMER EFF. DATE GFO1042 CME-550 87% 09/03/2009		DRILL METHOD Mix Rotary		SURFACE WATER DEPTH N/A		HAMMER TYPE Automatic		
DRILLER Edmondson, J. M.		START DATE 03/19/12		COMP. DATE 03/20/12		SURFACE WATER DEPTH N/A		
DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT	BLOWS PER FOOT	SAMP. NO.	L O	ELEV. (ft)	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
45	0.0	2 3 5				44.4	GROUND SURFACE	0.0
40	4.1	WOH 1				40.3	ROADWAY EMBANKMENT TAN BROWN SAND, MOIST	4.1
35	8.3	WOH WOCH 1				36.1	ALLUVIAL BROWN SANDY SILT, MOIST TO WET	8.3
30	12.1	6000.1				32.7	COASTAL PLAIN SEDIMENTARY ROCK LIGHT GRAY GREEN LIMESTONE (CASTLE-HAYNE FORMATION)	12.1
25	16.3	15 30 17				26.1	COASTAL PLAIN LIGHT GRAY SAND WITH SHELL FRAGMENTS, SAT. (CASTLE-HAYNE FORMATION)	16.3
20	21.1	9 12 11				21.1	COASTAL PLAIN SEDIMENTARY ROCK LIGHT GRAY GREEN LIMESTONE (CASTLE-HAYNE FORMATION)	21.1
15	26.3	6000.1				17.2	COASTAL PLAIN SEDIMENTARY ROCK LIGHT GRAY GREEN LIMESTONE (CASTLE-HAYNE FORMATION)	26.3
10	33.3	12 13 13				13.4	COASTAL PLAIN LIGHT GRAY SAND WITH SHELL FRAGMENTS, SAT.	33.3
5	38.3	9 11 12				11.0	COASTAL PLAIN LIGHT GRAY SAND WITH SHELL FRAGMENTS, SAT. (CASTLE HAYNE FORMATION)	38.3
0	43.3	6 8 9				3.4		41.0
-5	48.3	5 6						
-10	53.3	7 7 7						
-15	58.3	6 7 8						
						-15.4	Boring Terminated at Elevation -15.4 ft IN MEDIUM DENSE CLAYEY SAND	59.8

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 45348.1.12		TIP BD-5102L		COUNTY JONES		GEOLOGIST Swartley, J. R.	
SITE DESCRIPTION BRIDGE NO. 64 ON L-L (SR 1134) OVER CYPRESS CREEK							
BORING NO. B1-A		STATION 13+65		OFFSET 5 ft LT		ALIGNMENT L	
COLLAR ELEV. 36.8 ft		TOTAL DEPTH 60.4 ft		NORTHING 459,369		EASTING 2,454,293	
DRILL RIG/METHOD DATE CA11619 DIEDRICH-D50 86% 04/07/2010		DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic		SURFACE WATER DEPTH 2.3 ft	
DRILLER Contract Driller		START DATE 03/21/12		COMP. DATE 03/28/12		SURFACE WATER DEPTH 2.3 ft	
DEPTH (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT	DEPTH (ft)	DRIVE ELEV (ft)	DEPTH (ft)	SOIL AND ROCK DESCRIPTION
0	36.8	0	0	0	36.8	0.0	GROUND SURFACE
5	34.5	5	7	5	34.5	0.0	WATER SURFACE (03/21/12)
10	32.2	10	6	7	32.2	0.0	GROUND SURFACE
15	29.9	15	6	7	29.9	0.0	WATER SURFACE (03/21/12)
20	27.6	20	6	7	27.6	0.0	GROUND SURFACE
25	25.3	25	6	7	25.3	0.0	WATER SURFACE (03/21/12)
30	23.0	30	6	7	23.0	0.0	GROUND SURFACE
35	20.7	35	6	7	20.7	0.0	WATER SURFACE (03/21/12)
40	18.4	40	6	7	18.4	0.0	GROUND SURFACE
42	16.1	42	6	7	16.1	0.0	WATER SURFACE (03/21/12)
44	13.8	44	6	7	13.8	0.0	GROUND SURFACE
46	11.5	46	6	7	11.5	0.0	WATER SURFACE (03/21/12)
48	9.2	48	6	7	9.2	0.0	GROUND SURFACE
50	6.9	50	6	7	6.9	0.0	WATER SURFACE (03/21/12)
52	4.6	52	6	7	4.6	0.0	GROUND SURFACE
54	2.3	54	6	7	2.3	0.0	WATER SURFACE (03/21/12)
56	0.0	56	6	7	0.0	0.0	GROUND SURFACE
58	-2.3	58	6	7	-2.3	0.0	WATER SURFACE (03/21/12)
60	-4.6	60	6	7	-4.6	0.0	GROUND SURFACE
62	-6.9	62	6	7	-6.9	0.0	WATER SURFACE (03/21/12)
64	-9.2	64	6	7	-9.2	0.0	GROUND SURFACE
66	-11.5	66	6	7	-11.5	0.0	WATER SURFACE (03/21/12)
68	-13.8	68	6	7	-13.8	0.0	GROUND SURFACE
70	-16.1	70	6	7	-16.1	0.0	WATER SURFACE (03/21/12)
72	-18.4	72	6	7	-18.4	0.0	GROUND SURFACE
74	-20.7	74	6	7	-20.7	0.0	WATER SURFACE (03/21/12)
76	-23.0	76	6	7	-23.0	0.0	GROUND SURFACE
78	-25.3	78	6	7	-25.3	0.0	WATER SURFACE (03/21/12)
80	-27.6	80	6	7	-27.6	0.0	GROUND SURFACE
82	-30.0	82	6	7	-30.0	0.0	WATER SURFACE (03/21/12)
84	-32.4	84	6	7	-32.4	0.0	GROUND SURFACE
86	-34.8	86	6	7	-34.8	0.0	WATER SURFACE (03/21/12)
88	-37.2	88	6	7	-37.2	0.0	GROUND SURFACE
90	-39.6	90	6	7	-39.6	0.0	WATER SURFACE (03/21/12)
92	-42.0	92	6	7	-42.0	0.0	GROUND SURFACE
94	-44.4	94	6	7	-44.4	0.0	WATER SURFACE (03/21/12)
96	-46.8	96	6	7	-46.8	0.0	GROUND SURFACE
98	-49.2	98	6	7	-49.2	0.0	WATER SURFACE (03/21/12)
100	-51.6	100	6	7	-51.6	0.0	GROUND SURFACE
102	-54.0	102	6	7	-54.0	0.0	WATER SURFACE (03/21/12)
104	-56.4	104	6	7	-56.4	0.0	GROUND SURFACE
106	-58.8	106	6	7	-58.8	0.0	WATER SURFACE (03/21/12)
108	-61.2	108	6	7	-61.2	0.0	GROUND SURFACE
110	-63.6	110	6	7	-63.6	0.0	WATER SURFACE (03/21/12)
112	-66.0	112	6	7	-66.0	0.0	GROUND SURFACE
114	-68.4	114	6	7	-68.4	0.0	WATER SURFACE (03/21/12)
116	-70.8	116	6	7	-70.8	0.0	GROUND SURFACE
118	-73.2	118	6	7	-73.2	0.0	WATER SURFACE (03/21/12)
120	-75.6	120	6	7	-75.6	0.0	GROUND SURFACE
122	-78.0	122	6	7	-78.0	0.0	WATER SURFACE (03/21/12)
124	-80.4	124	6	7	-80.4	0.0	GROUND SURFACE
126	-82.8	126	6	7	-82.8	0.0	WATER SURFACE (03/21/12)
128	-85.2	128	6	7	-85.2	0.0	GROUND SURFACE
130	-87.6	130	6	7	-87.6	0.0	WATER SURFACE (03/21/12)
132	-90.0	132	6	7	-90.0	0.0	GROUND SURFACE
134	-92.4	134	6	7	-92.4	0.0	WATER SURFACE (03/21/12)
136	-94.8	136	6	7	-94.8	0.0	GROUND SURFACE
138	-97.2	138	6	7	-97.2	0.0	WATER SURFACE (03/21/12)
140	-99.6	140	6	7	-99.6	0.0	GROUND SURFACE
142	-102.0	142	6	7	-102.0	0.0	WATER SURFACE (03/21/12)
144	-104.4	144	6	7	-104.4	0.0	GROUND SURFACE
146	-106.8	146	6	7	-106.8	0.0	WATER SURFACE (03/21/12)
148	-109.2	148	6	7	-109.2	0.0	GROUND SURFACE
150	-111.6	150	6	7	-111.6	0.0	WATER SURFACE (03/21/12)
152	-114.0	152	6	7	-114.0	0.0	GROUND SURFACE
154	-116.4	154	6	7	-116.4	0.0	WATER SURFACE (03/21/12)
156	-118.8	156	6	7	-118.8	0.0	GROUND SURFACE
158	-121.2	158	6	7	-121.2	0.0	WATER SURFACE (03/21/12)
160	-123.6	160	6	7	-123.6	0.0	GROUND SURFACE
162	-126.0	162	6	7	-126.0	0.0	WATER SURFACE (03/21/12)
164	-128.4	164	6	7	-128.4	0.0	GROUND SURFACE
166	-130.8	166	6	7	-130.8	0.0	WATER SURFACE (03/21/12)
168	-133.2	168	6	7	-133.2	0.0	GROUND SURFACE
170	-135.6	170	6	7	-135.6	0.0	WATER SURFACE (03/21/12)
172	-138.0	172	6	7	-138.0	0.0	GROUND SURFACE
174	-140.4	174	6	7	-140.4	0.0	WATER SURFACE (03/21/12)
176	-142.8	176	6	7	-142.8	0.0	GROUND SURFACE
178	-145.2	178	6	7	-145.2	0.0	WATER SURFACE (03/21/12)
180	-147.6	180	6	7	-147.6	0.0	GROUND SURFACE
182	-150.0	182	6	7	-150.0	0.0	WATER SURFACE (03/21/12)
184	-152.4	184	6	7	-152.4	0.0	GROUND SURFACE
186	-154.8	186	6	7	-154.8	0.0	WATER SURFACE (03/21/12)
188	-157.2	188	6	7	-157.2	0.0	GROUND SURFACE
190	-159.6	190	6	7	-159.6	0.0	WATER SURFACE (03/21/12)
192	-162.0	192	6	7	-162.0	0.0	GROUND SURFACE
194	-164.4	194	6	7	-164.4	0.0	WATER SURFACE (03/21/12)
196	-166.8	196	6	7	-166.8	0.0	GROUND SURFACE
198	-169.2	198	6	7	-169.2	0.0	WATER SURFACE (03/21/12)
200	-171.6	200	6	7	-171.6	0.0	GROUND SURFACE
202	-174.0	202	6	7	-174.0	0.0	WATER SURFACE (03/21/12)
204	-176.4	204	6	7	-176.4	0.0	GROUND SURFACE
206	-178.8	206	6	7	-178.8	0.0	WATER SURFACE (03/21/12)
208	-181.2	208	6	7	-181.2	0.0	GROUND SURFACE
210	-183.6	210	6	7	-183.6	0.0	WATER SURFACE (03/21/12)
212	-186.0	212	6	7	-186.0	0.0	GROUND SURFACE
214	-188.4	214	6	7	-188.4	0.0	WATER SURFACE (03/21/12)
216	-190.8	216	6	7	-190.8	0.0	GROUND SURFACE
218	-193.2	218	6	7	-193.2	0.0	WATER SURFACE (03/21/12)
220	-195.6	220	6	7	-195.6	0.0	GROUND SURFACE
222	-198.0	222	6	7	-198.0	0.0	WATER SURFACE (03/21/12)
224	-200.4	224	6	7	-200.4	0.0	GROUND SURFACE
226	-202.8	226	6	7	-202.8	0.0	WATER SURFACE (03/21/12)
228	-205.2	228	6	7	-205.2	0.0	GROUND SURFACE
230	-207.6	230	6	7	-207.6	0.0	WATER SURFACE (03/21/12)
232	-210.0	232	6	7	-210.0	0.0	GROUND SURFACE
234	-212.4	234	6	7	-212.4	0.0	WATER SURFACE (03/21/12)
236	-214.8	236	6	7	-214.8	0.0	GROUND SURFACE
238	-217.2	238	6	7	-217.2	0.0	WATER SURFACE (03/21/12)
240	-219.6	240	6	7	-219.6	0.0	GROUND SURFACE
242	-222.0	242	6	7	-222.0	0.0	WATER SURFACE (03/21/12)
244	-224.4	244	6	7	-224.4	0.0	GROUND SURFACE
246	-226.8	246	6	7	-226.8	0.0	WATER SURFACE (03/21/12)
248	-229.2	248	6	7	-229.2	0.0	GROUND SURFACE
250	-231.6	250	6	7	-231.6	0.0	WATER SURFACE (03/21/12)
252	-234.0	252	6	7	-234.0	0.0	GROUND SURFACE
254	-236.4	254	6	7	-236.4	0.0	WATER SURFACE (03/21/12)
256	-238.8	256	6	7	-238.8	0.0	GROUND SURFACE
258	-241.2	258	6	7	-241.2	0.0	WATER SURFACE (03/21/12)
260	-243.6	260	6	7	-243.6	0.0	GROUND SURFACE
262	-246.0	262	6	7	-246.0	0.0	WATER SURFACE (03/21/12)
264	-248.4	264	6	7	-248.4	0.0	GROUND SURFACE
266	-250.8	266	6	7	-250.8	0.0	WATER SURFACE (03/21/12)
268	-253.2	268	6	7	-253.2	0.0	GROUND SURFACE
270	-255.6	270	6	7	-255.6	0.0	WATER SURFACE (03/21/12)
272	-258.0	272	6	7	-258.0	0.0	GROUND SURFACE
274	-260.4	274	6	7	-260.4	0.0	WATER SURFACE (03/21/12)
276	-262.8	276	6	7	-262.8	0.0	GROUND SURFACE
278	-265.2	278	6	7	-265.2	0.0	WATER SURFACE (03/21/12)
280	-267.6	280	6	7	-267.6	0.0	GROUND SURFACE
282	-270.0	282	6	7	-270.0	0.0	WATER SURFACE (03/21/12)
284	-272.4	284	6	7	-272.4	0.0	GROUND SURFACE
286	-274.8	286	6	7	-274.8	0.0	WATER SURFACE (03/21/12)
288	-277.2	288	6	7	-277.2	0.0	GROUND SURFACE
290	-279.6	290	6	7	-279.6	0.0	WATER SURFACE (03/21/12)
292	-282.0	292	6	7	-282.0	0.0	GROUND SURFACE
294	-284.4	294	6	7	-284.4	0.0	WATER SURFACE (03/21/12)
296	-286.8	296	6	7	-286.8	0.0	GROUND SURFACE
298	-289.2	298	6	7	-289.2	0.0	WATER SURFACE (03/21/12)
300	-291.6	300	6	7	-291.6	0.0	GROUND SURFACE
302	-294.0	302	6	7	-294.0	0.0	WATER SURFACE (03/21/12)
304	-296.4	304	6	7	-296.4	0.0	GROUND SURFACE
306	-298.8	306	6	7	-298.8	0.0	



**NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT**

WBS 45348.1.12		TIP BD-5102L		COUNTY JONES		GEOLOGIST Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 64 ON -L- (SR 1134) OVER CYPRESS CREEK							
BORING NO. B2-B		STATION 14+11		OFFSET 7 ft RT		ALIGNMENT L-	
COLLAR ELEV. 36.6 ft		TOTAL DEPTH 63.6 ft		NORTHING 459,350		EASTING 2,454,347	
DRILL RIG/HAMMER EFF./DATE GFO1042 CME-50 87%, 08/03/2009		DRILL METHOD Mud Rotary		DRILL DATE 03/12/12		COMP. DATE 03/14/12	
DRILLER Edmondson, J. M.		START DATE 03/12/12		SURFACE WATER DEPTH 3.0 ft		HAMMER TYPE Automatic	
ELEV (ft)	DEPTH (ft)	BLOW COUNT	BLOWS PER FOOT	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT	SOIL AND ROCK DESCRIPTION
40	0.0	WOR 1		38.6	0.0	2	GROUND SURFACE
35	4.2	6000.1		32.4	4.2	2	GROUND SURFACE
30	7.1	59		28.6	7.1	2	GROUND SURFACE
25	12.1	49		24.5	12.1	2	GROUND SURFACE
20	17.1	10		19.5	17.1	2	GROUND SURFACE
15	22.1	6000.1		14.5	22.1	2	GROUND SURFACE
10	27.1	6		9.5	27.1	2	GROUND SURFACE
5	32.1	8		4.5	32.1	2	GROUND SURFACE
0	37.1	5		-0.5	37.1	2	GROUND SURFACE
-5	42.1	5		-5.5	42.1	2	GROUND SURFACE
-10	47.1	4		-10.5	47.1	2	GROUND SURFACE
-15	52.1	6		-15.5	52.1	2	GROUND SURFACE
-20	57.1	6		-20.5	57.1	2	GROUND SURFACE
-25	62.1	8		-25.5	62.1	2	GROUND SURFACE

WBS 45348.1.12		TIP BD-5102L		COUNTY JONES		GEOLOGIST Wrike, C. M.	
SITE DESCRIPTION BRIDGE NO. 64 ON -L- (SR 1134) OVER CYPRESS CREEK							
BORING NO. B2-A		STATION 14+29		OFFSET 18 ft LT		ALIGNMENT L-	
COLLAR ELEV. 45.0 ft		TOTAL DEPTH 95.9 ft		NORTHING 459,372		EASTING 2,454,368	
DRILL RIG/HAMMER EFF./DATE GFO1042 CME-50 87%, 08/03/2009		DRILL METHOD Mud Rotary		DRILL DATE 03/09/12		COMP. DATE 03/12/12	
DRILLER Edmondson, J. M.		START DATE 03/09/12		SURFACE WATER DEPTH N/A		HAMMER TYPE Automatic	
ELEV (ft)	DEPTH (ft)	BLOW COUNT	BLOWS PER FOOT	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT	SOIL AND ROCK DESCRIPTION
45	0.0	2		45.0	0.0	2	GROUND SURFACE
40	4.0	2		41.0	4.0	2	GROUND SURFACE
35	8.4	5		38.6	8.4	2	GROUND SURFACE
30	12.0	6000.1		33.0	12.0	2	GROUND SURFACE
25	18.4	10000.7		26.6	18.4	2	GROUND SURFACE
20	21.4	14		21.6	21.4	2	GROUND SURFACE
15	28.4	34		16.6	28.4	2	GROUND SURFACE
10	33.4	17		11.6	33.4	2	GROUND SURFACE
5	38.4	14		6.6	38.4	2	GROUND SURFACE
0	43.4	8		1.6	43.4	2	GROUND SURFACE
-5	48.4	7		-3.4	48.4	2	GROUND SURFACE
-10	53.4	7		-8.4	53.4	2	GROUND SURFACE
-15	58.4	6		-13.4	58.4	2	GROUND SURFACE

Bores terminated at Elevation -14.9 ft in MEDIUM DENSE CLAYEY SAND

Bores terminated at Elevation -27.0 ft in MEDIUM DENSE CLAYEY SAND

Bores terminated at Elevation -27.0 ft in MEDIUM DENSE CLAYEY SAND

CORE PHOTOGRAPH

B1-A

Box 1 of 1 (4.9' to 29.9')

