



WBS 32635.1.3						TIP B-2500				COUNTY Dare				GEOLOGIST Hatfield			
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet														GROUND WTR (ft)			
BORING NO. B-53				STATION N/A				OFFSET N/A				ALIGNMENT N/A				0 HR. 5.1	
COLLAR ELEV. 5.6 ft				TOTAL DEPTH 154.0 ft				NORTHING 762,175				EASTING 3,023,837				24 HR. 6.0	
DRILL RIG/HAMMER EFF./DATE SME R-2 DIEDRICH D-50 87% 6/2/2011										DRILL METHOD NW Casing and 2 7/8 Tricone				HAMMER TYPE Automatic			
DRILLER Walker, J.				START DATE 05/31/11				COMP. DATE 06/01/11				SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
10																	
5																	
	3.1	2.5	1	1	WOH										5.6	GROUND SURFACE	
0																	
	-1.9	7.5	6	6	5										0.6	COASTAL PLAIN Tan Coarse to Fine SAND	
-5																	
	-6.9	12.5	9	10	9												
-10																	
	-11.9	17.5	7	9	11												
-15																	
	-16.9	22.5	6	6	6												
-20																	
	-21.9	27.5	4	3	5												
-25																	
	-26.9	32.5	2	7	13												
-30																	
	-31.9	37.5	1	WOH	1												
-35																	
	-36.9	42.5	WOH	2	2												
-40																	
	-41.9	47.5	2	6	6												
-45																	
	-46.9	52.5	4	6	6												
-50																	
	-51.9	57.5	7	9	5												
-55																	
	-56.9	62.5	4	6	4												
-60																	
	-61.9	67.5	4	3	4												
-65																	
	-66.9	72.5	11	11	14												
-70																	



WBS 32635.1.3			TIP B-2500			COUNTY Dare			GEOLOGIST Hatfield					
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet									GROUND WTR (ft)					
BORING NO. B-53			STATION N/A			OFFSET N/A			ALIGNMENT N/A					
COLLAR ELEV. 5.6 ft			TOTAL DEPTH 154.0 ft			NORTHING 762,175			EASTING 3,023,837					
DRILL RIG/HAMMER EFF./DATE SME R-2 DIEDRICH D-50 87% 6/2/2011						DRILL METHOD NW Casing and 2 7/8 Tricone			HAMMER TYPE Automatic					
DRILLER Walker, J.			START DATE 05/31/11			COMP. DATE 06/01/11			SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)
-70						Match Line								
	-71.9	77.5	7	12	18							Sat.		Gray Coarse to Fine SAND with Trace of Silt and Clay (continued)
-75														
	-76.9	82.5	4	5	6						SS-509	W.	-75.9	Gray Silty Clayey Fine SAND 81.5
-80														
	-81.9	87.5	2	3	6							W	-81.9	Gray Clayey Fine Sandy SILT 87.5
-85														
	-86.9	92.5	1	1	1						SS-510	30% W		
-90														
	-91.9	97.5	15	28	39						SS-511	Sat.	-89.9	Gray Coarse to Fine SAND with Trace of Silt, Clay and Shell Fragments 95.5
-95														
	-96.9	102.5	20	39	44							Sat.		
-100														
	-101.9	107.5	16	25	32						SS-512	Sat.		
-105														
	-106.9	112.5	25	39	47							Sat.		
-110														
	-111.9	117.5	22	34	44						SS-513	Sat.		
-115														
	-116.9	122.5	50	50/0.5							SS-514	Sat.		
-120														
	-121.9	127.5	34	60/0.5								Sat.		
-125														
	-126.9	132.5	21	34	38						SS-515	Sat.		
-130														
	-131.9	137.5	40	53	47/0.4							Sat.		
-135														
	-136.9	142.5	17	30	32						SS-516	Sat.	-136.9	Gray Silty Coarse to Fine SAND 142.5
-140														
	-141.9	147.5	39	24	29							Sat.		
-145														
	-146.9	152.5	4	5	7						SS-517	80% W	-146.4	Gray Silty CLAY 152.0
													-148.4	Boring Terminated at Elevation -148.4 ft in 154.0



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

SHEET 3

WBS 32635.1.3		TIP B-2500		COUNTY Dare		GEOLOGIST Hatfield									
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet						GROUND WTR (ft)									
BORING NO. B-53		STATION N/A		OFFSET N/A		ALIGNMENT N/A									
COLLAR ELEV. 5.6 ft		TOTAL DEPTH 154.0 ft		NORTHING 762,175		EASTING 3,023,837									
DRILL RIG/HAMMER EFF./DATE SME R-2 DIEDRICH D-50 87% 6/2/2011						DRILL METHOD NW Casing and 2 7/8 Tricone									
DRILLER Walker, J.						HAMMER TYPE Automatic									
START DATE 05/31/11		COMP. DATE 06/01/11		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	L O G	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)
-150						Match Line								Gray Silty CLAY	
														1) Advanced NW casing to 18.5' (20' total use). 2) Advanced 2 7/8 Tricone to 154.0'. 3) Fresh water used as drilling fluid. 4) Approximate drilling fluid density 64.4 pcf. 5) Some loss of drilling fluid observed. 6) Shelby tube ST-2 Taken from 41 to 43 feet 7) Shelby tube ST-3 Taken from 58 to 60 feet	



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 1

WBS 32635.1.3			TIP B-2500			COUNTY Dare			GEOLOGIST Bradley/Plummer							
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet										GROUND WTR (ft)						
BORING NO. B-54B			STATION N/A			OFFSET N/A			ALIGNMENT N/A							
COLLAR ELEV. -19.6 ft			TOTAL DEPTH 183.3 ft			NORTHING 755,035			EASTING 3,025,705							
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011						DRILL METHOD H Casing/3-7/8" Tricone			HAMMER TYPE Automatic							
DRILLER Moseley/White			START DATE 06/04/11			COMP. DATE 06/06/11			SURFACE WATER DEPTH 19.6ft							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG ELEV. (ft)	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
0																
-5																
-10																
-15																
-20																
-25	-24.4	4.8	4	4	7											
-30																
-35																
-40	-39.8	20.2	12	13	16											
-45																
-50	-50.0	30.4	5	6	7											
-55																
-60	-60.4	40.8	4	4	4											
-65																
-70	-70.9	51.3	7	11	14											
-75																
-80																

NCDOT BORE SINGLE 11-015.GPJ NC_DOT.GDT 6/24/11



WBS 32635.1.3			TIP B-2500			COUNTY Dare			GEOLOGIST Bradley/Plummer				
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet									GROUND WTR (ft)				
BORING NO. B-54B			STATION N/A			OFFSET N/A			ALIGNMENT N/A				
COLLAR ELEV. -19.6 ft			TOTAL DEPTH 183.3 ft			NORTHING 755,035			EASTING 3,025,705				
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011									DRILL METHOD H Casing/3-7/8" Tricone				
									HAMMER TYPE Automatic				
DRILLER Moseley/White			START DATE 06/04/11			COMP. DATE 06/06/11			SURFACE WATER DEPTH 19.6ft				
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			
-80	-81.0	61.4	14	17	23								
-85													
-90	-89.8	70.2	4	4	2								
-95													
-100	-99.3	79.7	2	2	4								
-105													
-110	-109.0	89.4	8	12	15								
-115													
-120	-119.5	99.9	23	34	31								
-125													
-130	-130.3	110.7	11	13	17								
-135													
-140	-140.0	120.4	13	17	25								
-145													
-150	-149.3	129.7	3	4	6								
-155													
-160	-159.6	140.0											



WBS 32635.1.3			TIP B-2500			COUNTY Dare			GEOLOGIST Bradley/Plummer				
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet										GROUND WTR (ft)			
BORING NO. B-54B			STATION N/A			OFFSET N/A			ALIGNMENT N/A				
COLLAR ELEV. -19.6 ft			TOTAL DEPTH 183.3 ft			NORTHING 755,035			EASTING 3,025,705				
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011						DRILL METHOD H Casing/3-7/8" Tricone			HAMMER TYPE Automatic				
DRILLER Moseley/White			START DATE 06/04/11			COMP. DATE 06/06/11			SURFACE WATER DEPTH 19.6ft				
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			
-160						Match Line							
-165			5	6	9							W	Gray Fine Sandy Silty CLAY(continued)
-170	-170.4	150.8	4	5	7							W	
-175													
-180	-179.0	159.4	1	1	5							W	
-185													
-190	-188.7	169.1	WOH	5	8							M	-189.6 170.0 Gray Clayey Fine Sandy SILT
-195													-194.6 175.0 Gray Fine Sandy Silty CLAY
-200	-201.4	181.8	6	3	4							W	-202.9 183.3 Boring Terminated at Elevation -202.9 ft Gray Fine Sandy Silty CLAY 1) Advanced H casing to 24.2 feet (50.4 total). 2) Advanced 3/8" Tricone to 181.8 feet. 3) Ocean water used as drilling fluid. 4) Approximate drilling fluid density 66.0 pcf. 5) Some loss of drilling fluid observed. 6) In-Situ Soil Testing, L.C. performed Pressuremeter testing on 10' intervals between SPT Testing



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

SHEET 1

WBS 32635.1.3	TIP B-2500	COUNTY Dare	GEOLOGIST Bradley/Plummer
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet			
BORING NO. B-55	STATION N/A	OFFSET N/A	ALIGNMENT N/A
COLLAR ELEV. -17.1 ft	TOTAL DEPTH 186.3 ft	NORTHING 755,266	EASTING 3,025,516

GROUND WTR (ft)
0 HR. N/A
24 HR. N/A

DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011	DRILL METHOD H Casing/3-7/8" Tricone	HAMMER TYPE Automatic
DRILLER Moseley/White	START DATE 05/24/11	COMP. DATE 05/26/11
SURFACE WATER DEPTH 16.7ft		

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100		MOI	ELEV. (ft)	DEPTH (ft)
0														
-5														
-10														
-15														
-20	-19.2	2.1	3	5	8								-17.1	0.0
-25	-24.2	7.1	1	2	2								-19.1	2.0
-30	-29.2	12.1	7	7	7								-23.6	6.5
-35	-34.2	17.1	WOH	WOH	WOH								-27.6	10.5
-40	-39.2	22.1	4	5	8								-32.6	15.5
-45	-43.7	26.6	4	6	5								-37.4	20.3
-50	-48.7	31.6	9	11	11									
-55	-53.7	36.6	11	13	12									
-60	-58.7	41.6	9	17	23								-56.6	39.5
-65	-63.7	46.6	5	4	5									
-70	-68.7	51.6	9	9	10								-67.6	50.5
-75	-73.7	56.6	5	6	6									
-80	-78.7	61.6	7	7	20									

NCDOT BORE SINGLE 11-015.GPJ NC DOT GDT 6/24/11



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 2

WBS 32635.1.3			TIP B-2500			COUNTY Dare			GEOLOGIST Bradley/Plummer		
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet									GROUND WTR (ft)		
BORING NO. B-55			STATION N/A			OFFSET N/A			ALIGNMENT N/A		
COLLAR ELEV. -17.1 ft			TOTAL DEPTH 186.3 ft			NORTHING 755,266			EASTING 3,025,516		
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011			DRILL METHOD H Casing/3-7/8" Tricone			HAMMER TYPE Automatic					
DRILLER Moseley/White			START DATE 05/24/11			COMP. DATE 05/26/11			SURFACE WATER DEPTH 16.7ft		

ELEV. (ft)	DRIVE ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
-80						Match Line								
-83.4	66.3		12	17	14								Sat.	Gray Silty Coarse to Fine SAND with Trace of Shell Fragments(continued)
-85													Sat.	
-88.4	71.3		6	8	6								Sat.	
-90													Sat.	
-93.1	76.0		1	2	1								W	-91.6 Gray Fine Sandy Silty CLAY 74.5
-95													W	-96.1 Gray Clayey Fine Sandy SILT 79.0
-98.1	81.0	WOH	2	2									W	-101.1 Gray Silty Fine to Coarse SAND 84.0
-100													Sat.	
-102.3	85.2		6	2	7								Sat.	
-105													Sat.	
-107.3	90.2		11	15	22								Sat.	
-110													Sat.	
-112.3	95.2		20	25	30								Sat.	
-115													Sat.	
-118.8	101.7		16	24	27								Sat.	
-120													Sat.	
-123.8	106.7		25	35	46								Sat.	
-125													Sat.	
-128.8	111.7		6	16	24								Sat.	
-130													Sat.	
-133.8	116.7		13	17	23								Sat.	
-135													Sat.	
-138.9	121.8		8	8	9								Sat.	
-140													Sat.	
-143.8	126.7		13	27	17								Sat.	
-145													Sat.	
-148.8	131.7		1	2	4								M	-147.1 Gray Fine Sandy Silty CLAY 130.0
-150													M	
-152.8	135.7		1	2	4								M	
-155													M	
-157.8	140.7		2	3	4								M	
-160													M	

NCDOT BORE SINGLE 11-015.GPJ NC DOT GDT 6/24/11



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 3

WBS 32635.1.3		TIP B-2500		COUNTY Dare		GEOLOGIST Bradley/Plummer	
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet							GROUND WTR (ft)
BORING NO. B-55		STATION N/A		OFFSET N/A		ALIGNMENT N/A	
COLLAR ELEV. -17.1 ft		TOTAL DEPTH 186.3 ft		NORTHING 755,266		EASTING 3,025,516	
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011		DRILL METHOD H Casing/3-7/8" Tricone		HAMMER TYPE Automatic			
DRILLER Moseley/White		START DATE 05/24/11		COMP. DATE 05/26/11		SURFACE WATER DEPTH 16.7ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
-160						Match Line									
-162.6	-145.5		1	3	4	7								Gray Fine Sandy Silty CLAY(continued)	
-167.6	-150.5		1	3	4	7									
-172.6	-155.5		1	2	4	6									
-177.6	-160.5		1	1	4	5									
-182.6	-165.5		1	2	3	5									
-186.8	-169.7		15	23	23	46								Gray Silty Fine SAND with Trace of Shell Fragments	168.5
-191.8	-174.7		20	19	20	39									
-196.8	-179.7		25	27	22	49									
-201.9	-184.8		36	52	48/0.3	100/0.8									
														Boring Terminated at Elevation -203.4 ft in Gray Silty Fine Sand with Trace Shell Fragments	
														1) Advanced H casing to 26.6 feet (50.4 total).	
														2) Advanced 3 7/8" Tricone to 184.8 feet.	
														3) Ocean water used as drilling fluid.	
														4) Approximate drilling fluid density 66.0 pcf.	
														5) Some loss of drilling fluid observed.	
														6) In-Situ Soil Testing, L.C. performed	
														Pressuremeter testing next to boring	
														on 10' intervals.	



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 1

WBS 32635.1.3			TIP B-2500		COUNTY Dare		GEOLOGIST Bradley/Plummer											
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet							GROUND WTR (ft)											
BORING NO. B-56		STATION N/A		OFFSET N/A		ALIGNMENT N/A		0 HR.	N/A									
COLLAR ELEV. -6.6 ft		TOTAL DEPTH 195.0 ft		NORTHING 756,023		EASTING 3,024,585		24 HR.	N/A									
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011				DRILL METHOD H Casing/3-7/8" Tricone			HAMMER TYPE Automatic											
DRILLER Moseley/White		START DATE 05/22/11		COMP. DATE 05/24/11		SURFACE WATER DEPTH 6.2ft												
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION				
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)			
0																		
-5																		
-10	-8.4	1.8	11	6	3						SS-137	Sat.						
-15	-14.4	7.8	6	8	9							Sat.						
-20	-19.4	12.8	4	1	1						SS-138	Sat.						
-25	-24.4	17.8	WOH	WOH	WOH							Sat.						
-30	-28.7	22.1	WOH	WOH	WOH						SS-139	32% W						
-35	-34.2	27.6	WOR	WOR	WOR							W						
-40	-39.2	32.6	WOR	WOR	WOR						SS-140	44% W						
-45	-44.2	37.6	WOR	WOR	WOH							W						
-50	-49.2	42.6	WOR	WOR	WOR						SS-141	41% W						
-55	-54.1	47.5	WOH	WOH	WOH							W						
-60	-59.0	52.4	12	29	37						SS-142	Sat.						
-65	-64.1	57.5	30	60	40/0.3							Sat.						
-70	-69.1	62.5	6	6	10						SS-143	Sat.						
-75	-74.1	67.5	5	5	4							Sat.						
-80	-79.1	72.5	7	9	8													

NCDOT BORE SINGLE 11-015.GPJ NC_DOT.GDT 6/24/11



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 2

WBS 32635.1.3		TIP B-2500		COUNTY Dare		GEOLOGIST Bradley/Plummer	
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet							GROUND WTR (ft)
BORING NO. B-56		STATION N/A		OFFSET N/A		ALIGNMENT N/A	
COLLAR ELEV. -6.6 ft		TOTAL DEPTH 195.0 ft		NORTHING 756,023		EASTING 3,024,585	
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011				DRILL METHOD H Casing/3-7/8" Tricone		HAMMER TYPE Automatic	
DRILLER Moseley/White		START DATE 05/22/11		COMP. DATE 05/24/11		SURFACE WATER DEPTH 6.2ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
-80																
-85	-84.2	77.6	4	5	10										Green Gray Silty Clayey Fine SAND with Trace of Shell Fragments (continued)	
-90	-89.2	82.6	8	6	10											
-95	-94.2	87.6	3	3	4											
-100	-99.2	92.6	4	4	5										Gray Clayey Fine Sandy SILT with Trace of Shell Fragments	90.0
-105	-104.2	97.6	WOR	3	3											
-110	-109.2	102.6	1	2	2											
-115	-114.2	107.6	1	1	3										Gray Silty Fine Sandy CLAY	105.0
-120	-118.9	112.3	WOH	WOH	1											
-125	-123.9	117.3	6	6	13										Gray Silty Clayey Fine SAND	116.0
-130	-128.9	122.3	9	9	17											
-135	-133.3	126.7	16	18	30										Gray Silty Clayey Coarse to Fine SAND with Trace of Shell Fragments	126.0
-140	-138.3	131.7	20	22	26										Gray Fine to Coarse SAND	131.0
-145	-143.3	136.7	15	20	28											
-150	-149.0	142.4	4	4	5										Gray Fine Sandy Silty CLAY	141.0
-155	-154.0	147.4	1	3	3											
-160	-159.0	152.4	1	5	6											

NCDOT BORE SINGLE 11-015.GPJ NC_DOT.GDT 6/24/11



WBS 32635.1.3			TIP B-2500			COUNTY Dare			GEOLOGIST Bradley/Plummer							
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet									GROUND WTR (ft)							
BORING NO. B-56			STATION N/A			OFFSET N/A			ALIGNMENT N/A							
COLLAR ELEV. -6.6 ft			TOTAL DEPTH 195.0 ft			NORTHING 756,023			EASTING 3,024,585							
									0 HR. N/A							
									24 HR. N/A							
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011						DRILL METHOD H Casing/3-7/8" Tricone			HAMMER TYPE Automatic							
DRILLER Moseley/White			START DATE 05/22/11			COMP. DATE 05/24/11			SURFACE WATER DEPTH 6.2ft							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
-180						Match Line										
-165	-164.2	157.6	1	1	5						SS-153	66% W		Gray Fine Sandy Silty CLAY(continued)		
-170	-169.3	162.7	WOH	4	4							M				
-175	-174.3	167.7	WOH	3	4						SS-154	84% M				
-180	-179.4	172.8										M				
-185	-184.6	178.0									SS-155	49% M				
-190	-189.6	183.0	6	9	10							M				
-195	-189.6	183.0	6	6	7						S-156	Sat.		Gray Silty Clayey Fine SAND with Trace of Shell Fragments		
-200	-200.1	193.5	5	4	5							Sat.				
			12	20	37							Sat.				
Boring Terminated at Elevation -201.6 ft in Gray Silty Clayey Fine SAND with Trace of Shell Fragments 1) Advanced H casing to 62.5 feet (75.4 total used). 2) Advanced 3 7/8" Tricone to 193.5 feet. 3) Ocean water used as drilling fluid. 4) Approximate drilling fluid density 66.0 pcf. 5) Some loss of drilling fluid observed.																

[illegible]



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 2

WBS 32635.1.3		TIP B-2500		COUNTY Dare		GEOLOGIST Bradley/Plummer	
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet							GROUND WTR (ft)
BORING NO. B-57		STATION N/A		OFFSET N/A		ALIGNMENT N/A	
COLLAR ELEV. -15.6 ft		TOTAL DEPTH 200.1 ft		NORTHING 753,802		EASTING 3,026,436	
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011				DRILL METHOD H Casing/3-7/8" Tricone		HAMMER TYPE Automatic	
DRILLER Moseley/White		START DATE 05/20/11		COMP. DATE 05/21/11		SURFACE WATER DEPTH 16.3ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
-80																
-85	-84.0	68.4	11	24	28										Green to Gray Silty Fine to Coarse SAND with Trace of Shell Fragments (continued)	
-90	-89.2	73.6	4	8	7											
-95	-94.2	78.6	4	2	4											
-100	-99.4	83.8	7	8	12											
-105	-104.4	88.8	15	20	21											
-110	-109.4	93.8	12	21	19											
-115	-114.1	98.5	14	18	19											
-120	-118.5	102.9	19	24	25											
-125	-123.5	107.9	11	25	32											
-130	-128.5	112.9	15	16	21											
-135	-133.1	117.5	15	22	25											
-140	-137.6	122.0	22	26	40											
-145	-142.6	127.0	25	45	55/0.4											
-150	-147.6	132.0	6	7	5										Gray Fine Sandy Silty CLAY with Trace of Shell Fragments	
-155	-152.6	137.0	3	4	7											
-160	-158.1	142.5	4	5	10											

NCDOT BORE SINGLE 11-015.GPJ NC_DOT.GDT 6/24/11



SHEET 3

WBS 32635.1.3			TIP B-2500			COUNTY Dare			GEOLOGIST Bradley/Plummer						
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet									GROUND WTR (ft)						
BORING NO. B-57			STATION N/A			OFFSET N/A			ALIGNMENT N/A						
COLLAR ELEV. -15.6 ft			TOTAL DEPTH 200.1 ft			NORTHING 753,802			EASTING 3,026,436						
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011						DRILL METHOD H Casing/3-7/8" Tricone			HAMMER TYPE Automatic						
DRILLER Moseley/White			START DATE 05/20/11			COMP. DATE 05/21/11			SURFACE WATER DEPTH 16.3ft						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
-180						Match Line									
-165	-163.6	148.0	3	5	9							M		Gray Fine Sandy Silty CLAY with Trace of Shell Fragments(continued)	
-170	-168.9	153.3	4	6	7							M			
-175	-173.6	158.0	2	3	6							M			
-180	-178.3	162.7	3	4	8							M			
-185	-183.3	167.7	3	5	9							M			
-190	-188.3	172.7	10	34	51							M			
-195	-193.7	178.1	55	45/0.2								Sat.		Gray Silty Fine SAND	173.2
-200	-199.1	183.5	10	20	20							Sat.			
-205	-204.1	188.5	2	8	18							W		Gray Fine to Coarse Sandy CLAY	186.0
-210	-209.2	193.6	50	50/0.3								Sat.		Gray Silty Fine to Coarse SAND	191.0
-215	-214.2	198.6	35	42	33							Sat.		Boring Terminated at Elevation -215.7 ft in Gray Silty Fine to Coarse SAND	200.1

NC DOT BORE SINGLE 11-015 GPJ NC_DOT.GDT 6/24/11



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 1

WBS 32635.1.3		TIP B-2500		COUNTY Dare		GEOLOGIST Bradley/Plummer	
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet							GROUND WTR (ft)
BORING NO. B-58		STATION N/A		OFFSET N/A		ALIGNMENT N/A	
COLLAR ELEV. -19.1 ft		TOTAL DEPTH 184.5 ft		NORTHING 753,800		EASTING 3,026,983	
DRILL RIG/HAMMER EFF/DATE SME R-6 CME-550X 80% 6/7/2011				DRILL METHOD H Casing/3-7/8" Tricone		HAMMER TYPE Automatic	
DRILLER Moseley/White		START DATE 06/06/11		COMP. DATE 06/08/11		SURFACE WATER DEPTH 17.2ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
0																
-5																
-10																
-15																
-20																
-21.1	-21.1	2.0	2	2	3											
-25																
-26.1	-26.1	7.0	5	8	10											
-30																
-35																
-36.6	-36.6	17.5	12	9	8											
-40																
-45																
-46.0	-46.0	26.9	7	12	8											
-50																
-55																
-56.0	-56.0	36.9	6	8	12											
-60																
-65																
-66.2	-66.2	47.1	5	9	6											
-70																
-75																
-74.8	-74.8	55.7	10	12	20											
-80																

WATER SURFACE (06/06/11)

INLET BOTTOM

COASTAL PLAIN
Gray Fine to Coarse SAND with Trace of Shell Fragments and Silt

Gray Silty Coarse to Fine SAND

Gray Fine Sandy SILT With Trace of Shell Fragments

NCDOT BORE SINGLE 11-015.GPJ NC DOT GDT 6/24/11



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

SHEET 2

WBS 32635.1.3		TIP B-2500		COUNTY Dare		GEOLOGIST Bradley/Plummer						
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet						GROUND WTR (ft)						
BORING NO. B-58		STATION N/A		OFFSET N/A		ALIGNMENT N/A						
COLLAR ELEV. -19.1 ft		TOTAL DEPTH 184.5 ft		NORTHING 753,800		EASTING 3,026,983						
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011		DRILL METHOD H Casing/3-7/8" Tricone		HAMMER TYPE Automatic								
DRILLER Moseley/White		START DATE 06/06/11		COMP. DATE 06/08/11		SURFACE WATER DEPTH 17.2ft						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT			SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100		ELEV. (ft) DEPTH (ft)
-80						Match Line						
-85	-84.4	65.3	20	25	30							-80.4 Gray Silty Fine to Coarse SAND 61.3
-90												
-95	-95.0	75.9	25	31	31							
-100												
-105	-104.5	85.4	33	45	34							
-110												
-115	-114.5	95.4	20	19	24							
-120												
-125	-124.9	105.8	16	27	40							
-130												
-135	-135.5	116.4	22	40	60/0.4							
-140												
-145	-145.4	126.3	20	46	54/0.4							
-150												
-155	-156.7	137.6	2	3	6							
-160												

NCDOT BORE SINGLE 11-015.GPJ NC_DOT.GDT 8/24/11



WBS 32635.1.3			TIP B-2500			COUNTY Dare			GEOLOGIST Bradley/Plummer			
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet									GROUND WTR (ft)			
BORING NO. B-58			STATION N/A			OFFSET N/A			ALIGNMENT N/A			
COLLAR ELEV. -19.1 ft			TOTAL DEPTH 184.5 ft			NORTHING 753,800			EASTING 3,026,983			
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011									DRILL METHOD H Casing/3-7/8" Tricone			
DRILLER Moseley/White									START DATE 06/06/11			
COMP. DATE 06/08/11									SURFACE WATER DEPTH 17.2ft			
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100		ELEV. (ft) DEPTH (ft)
-160						Match Line						
-165	-166.1	147.0	4	4	6	10					W	Gray Fine Sandy Silty CLAY with Trace of Shell Fragments(continued)
-170												
-175	-173.8	154.7	3	3	6	9					M	
-180												
-185	-183.8	164.7	2	4	8	12					M	
-190												
-195	-195.9	176.8	46	54	0.4				100	0.9	Sat.	-194.1 175.0 Gray Silty Coarse to Fine SAND
-200												
												-203.6 184.5 Boring Terminated at Elevation -203.6 ft in Gray Silty Coarse to Fine SAND
												1) Advanced H casing to 60.7 feet (Total 80'). 2) Advanced 3 7/8" tricone to 184.5 feet. 3) Ocean water used as drilling fluid. 4) Approximate drilling fluid density 66.0 pcf. 5) Some loss of drilling fluid observed. 6) In-Situ Soil Testing , L.C. performed Pressuremeter testing on 10' intervals between SPT Testing



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 1

WBS 32635.1.3		TIP B-2500		COUNTY Dare		GEOLOGIST Bradley/Plummer	
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet							GROUND WTR (ft)
BORING NO. B-59		STATION N/A		OFFSET N/A		ALIGNMENT N/A	
COLLAR ELEV. -19.5 ft		TOTAL DEPTH 199.7 ft		NORTHING 753,364		EASTING 3,026,887	
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011				DRILL METHOD H Casing/3-7/8" Tricone		HAMMER TYPE Automatic	
DRILLER Moseley/White		START DATE 05/12/11		COMP. DATE 05/14/11		SURFACE WATER DEPTH 19.8ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
0																
-5																
-10																
-15																
-20																
-25	-23.7	4.2	3	6	7											
-30	-28.8	9.3	6	6	10											
-35	-33.8	14.3	6	8	8											
-40	-38.8	19.3	2	3	5											
-45	-43.8	24.3	4	3	3											
-50	-49.3	29.8	6	15	18											
-55	-54.7	35.2	4	6	5											
-60	-59.7	40.2	9	9	17											
-65	-64.7	45.2	3	2	8											
-70	-69.7	50.2	12	18	20											
-75	-74.7	55.2	6	7	7											
-80	-79.7	60.2														

INLET BOTTOM 0.0

COASTAL PLAIN
Brown Coarse to Fine SAND with Trace of Silt

Gray Silty Coarse to Fine SAND

Gray Fine Sandy SILT with Some Shell Fragments

Gray Silty Fine SAND with Some Shell Fragments

Gray Silty Coarse to Fine SAND with Trace of Shell Fragments

NCDOT BORE SINGLE 11-015.GPJ NC DOT.GDT 6/24/11



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 2

WBS 32635.1.3			TIP B-2500			COUNTY Dare			GEOLOGIST Bradley/Plummer							
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet									GROUND WTR (ft)							
BORING NO. B-59			STATION N/A			OFFSET N/A			ALIGNMENT N/A							
COLLAR ELEV. -19.5 ft			TOTAL DEPTH 199.7 ft			NORTHING 753,364			EASTING 3,026,887							
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011						DRILL METHOD H Casing/3-7/8" Tricone			HAMMER TYPE Automatic							
DRILLER Moseley/White			START DATE 05/12/11			COMP. DATE 05/14/11			SURFACE WATER DEPTH 19.8ft							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
-80			15	28	34	Match Line										
-85	-84.5	65.0	20	25	38									Sat.	Gray Silty Coarse to Fine SAND with Trace of Shell Fragments(continued)	
-90	-89.5	70.0	13	20	32									Sat.		
-95	-94.2	74.7	10	13	27									Sat.		
-100	-99.2	79.7	13	15	30									Sat.		
-105	-103.9	84.4	11	12	16									Sat.		
-110	-108.1	88.6	20	17	20									Sat.		
-115	-113.1	93.6	10	20	20									Sat.		
-120	-118.1	98.6	21	25	21									Sat.		
-125	-122.8	103.3	13	18	14									Sat.		
-130	-127.8	108.3	6	9	13									Sat.		
-135	-132.8	113.3	12	22	30									Sat.		
-140	-137.8	118.3	15	30	42									Sat.		
-145	-142.8	123.3	17	37	47									Sat.		
-150	-147.8	128.3	13	33	40									Sat.		
-155	-152.8	133.3	4	4	6									M		
-160	-158.4	138.9	3	5	9									M		

NCDOT BORE SINGLE 11-0145.GPJ NC_DOT.GDT 6/24/11



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

SHEET 3

WBS 32635.1.3		TIP B-2500		COUNTY Dare		GEOLOGIST Bradley/Plummer	
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet							GROUND WTR (ft)
BORING NO. B-59		STATION N/A		OFFSET N/A		ALIGNMENT N/A	
COLLAR ELEV. -19.5 ft		TOTAL DEPTH 199.7 ft		NORTHING 753,364		EASTING 3,026,887	
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011		DRILL METHOD H Casing/3-7/8" Tricone		HAMMER TYPE Automatic			
DRILLER Moseley/White		START DATE 05/12/11		COMP. DATE 05/14/11		SURFACE WATER DEPTH 19.8ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			
-160						Match Line							
-163.4	-143.9		3	5	9								Gray Fine Sandy Silty CLAY(continued)
-168.1	-148.6		5	7	6								
-173.1	-153.6		7	9	10								
-178.0	-158.5		5	6	7								
-182.9	-163.4	WOH	3	6									
-187.9	-168.4		6	18	47								
-192.7	-173.2		40	60/0.4									
-197.9	-178.4		57	43/0.4									
-202.9	-183.4		50	40	17								
-208.3	-188.8		60	40/0.3									
-213.3	-193.8		100/0.5										
-218.7	-199.2		100/0.5										

Gray Silty Fine SAND

Gray Silty Coarse to Fine SAND with Some Shell Fragments

Boring Terminated at Elevation -219.2 ft in Gray Silty Coarse to Fine SAND

- 1) Advanced H casing to feet.
- 2) Advanced 3 7/8" Tricone to 199.7 feet.
- 3) Ocean water used as drilling fluid.
- 4) Approximate drilling fluid density 66.0 pcf.
- 5) Some loss of drilling fluid observed.

NCDOT BORE SINGLE 11-015.GPJ NC_DOT_GDT 6/24/11



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 1

WBS 32635.1.3		TIP B-2500		COUNTY Dare		GEOLOGIST Bradley/Plummer	
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet							GROUND WTR (ft)
BORING NO. B-60		STATION N/A		OFFSET N/A		ALIGNMENT N/A	
COLLAR ELEV. -31.8 ft		TOTAL DEPTH 169.1 ft		NORTHING 753,302		EASTING 3,027,465	
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011		DRILL METHOD H Casing/3-7/8" Tricone		HAMMER TYPE Automatic			
DRILLER Moseley/White		START DATE 06/02/11		COMP. DATE 06/15/11		SURFACE WATER DEPTH 31.3ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
0																
-5																
-10																
-15																
-20																
-25																
-30																
-31.8																
-35																
-40	-39.5	7.7	14	17	16											
-45																
-50	-49.5	17.7	5	6	7											
-55																
-60	-59.5	27.7	WOH	3	1											
-65																
-70	-68.9	37.1	16	13	13											
-75																
-80	-78.0	46.2	6	14	30											

INLET BOTTOM 0.0

COASTAL PLAIN
Gray Fine to Coarse SAND with Trace of Silt

Sat.

Sat.

W

Sat.

Sat.

-56.8 25.0
Gray Fine Sandy Silty CLAY

-65.0 33.2
Gray Silty Coarse to Fine SAND

NCDOT BORE SINGLE 11-015.GPJ NC DOT.GDT 6/24/11



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 2

WBS 32635.1.3		TIP B-2500		COUNTY Dare		GEOLOGIST Bradley/Plummer										
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet							GROUND WTR (ft)									
BORING NO. B-60		STATION N/A		OFFSET N/A		ALIGNMENT N/A										
COLLAR ELEV. -31.8 ft		TOTAL DEPTH 169.1 ft		NORTHING 753,302		EASTING 3,027,465										
						0 HR. N/A										
						24 HR. N/A										
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011				DRILL METHOD H Casing/3-7/8" Tricone		HAMMER TYPE Automatic										
DRILLER Moseley/White		START DATE 06/02/11		COMP. DATE 06/15/11		SURFACE WATER DEPTH 31.3ft										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
-80						Match Line										
-85	-85.8	54.0	18	19	47										Gray Silty Coarse to Fine SAND (continued)	
-90																
-95																
-100	-97.5	65.7	9	13	20											
-105																
-110	-106.5	74.7	8	11	24											
-115																
-120	-115.5	83.7	6	11	13											
-125																
-130	-124.0	92.2	9	24	32											
-135																
-140	-134.8	103.0	19	33	50											
-145																
-150	-145.8	114.0	27	40	49											
-155																
-160	-155.6	123.8	3	4	5											

NCDOT BORE SINGLE 11-015.GPJ NC_DOT.GDT 6/24/11



WBS 32635.1.3			TIP B-2500			COUNTY Dare			GEOLOGIST Bradley/Plummer			
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet									GROUND WTR (ft)			
BORING NO. B-60			STATION N/A			OFFSET N/A			ALIGNMENT N/A			
COLLAR ELEV. -31.8 ft			TOTAL DEPTH 169.1 ft			NORTHING 753,302			EASTING 3,027,465			
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011									DRILL METHOD H Casing/3-7/8" Tricone			HAMMER TYPE Automatic
DRILLER Moseley/White			START DATE 06/02/11			COMP. DATE 06/15/11			SURFACE WATER DEPTH 31.3ft			
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100		ELEV. (ft) DEPTH (ft)
-160						Match Line						
-165	-164.2	132.4	WOR	5	6							Gray Fine Sandy Silty CLAY(continued)
-170												
-175	-174.6	142.8	1	4	4							
-180												
-185	-185.4	153.6	20	40	60/0.4					100/0.9		Gray Silty Fine SAND with Trace of Shell Fragments
-190												
-195	-194.8	163.0	23	41	45							
-200												
Boring Terminated at Elevation -200.9 ft Gray Silty Fine to Coarse SAND												
1) Advanced H casing to 59.1' 2) Advanced 3 7/8" Tricone to 169.1 feet. 3) Ocean water was used as drilling fluid. 4) Approximate drilling fluid density 66.0 pcf. 5) Some loss of drilling fluid observed. 6) In-Situ Soil Testing, L.C. performed Pressuremeter testing on 10' intervals between SPT Testing 7) Hole was started 6/2/11 and tide pushed barge off hole. Reset back up on hole 6/13/11 and daylighted down to 46.2 feet to resume testing.												



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 1

WBS 32635.1.3			TIP B-2500		COUNTY Dare		GEOLOGIST Bradley/Plummer									
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet										GROUND WTR (ft)						
BORING NO. B-61			STATION N/A			OFFSET N/A		ALIGNMENT N/A		0 HR.	N/A					
COLLAR ELEV. -26.3 ft			TOTAL DEPTH 198.2 ft			NORTHING 752,935		EASTING 3,027,523		24 HR.	N/A					
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011						DRILL METHOD H Casing/3-7/8" Tricone			HAMMER TYPE Automatic							
DRILLER Moseley/White			START DATE 05/14/11			COMP. DATE 05/15/11		SURFACE WATER DEPTH 26.8ft								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					ELEV. (ft)	
0																
-5																
-10																
-15																
-20																
-25																
-26.3																

NCDOT BORE SINGLE 11-015.GPJ NC_DOT.GDT 6/24/11



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

SHEET 2

WBS 32635.1.3		TIP B-2500		COUNTY Dare		GEOLOGIST Bradley/Plummer	
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet							GROUND WTR (ft)
BORING NO. B-61		STATION N/A		OFFSET N/A		ALIGNMENT N/A	
COLLAR ELEV. -26.3 ft		TOTAL DEPTH 198.2 ft		NORTHING 752,935		EASTING 3,027,523	
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011				DRILL METHOD H Casing/3-7/8" Tricone		HAMMER TYPE Automatic	
DRILLER Moseley/White		START DATE 05/14/11		COMP. DATE 05/15/11		SURFACE WATER DEPTH 26.8ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
-80																
-82.6	56.3		10	23	36											
-85																
-87.6	61.3		11	11	18											
-90																
-92.6	66.3		14	17	20											
-95																
-97.8	71.5		8	6	14											
-100																
-103.1	76.8		8	16	18											
-105																
-108.1	81.8		13	18	22											
-110																
-113.2	86.9		17	21	19											
-115																
-118.4	92.1		9	11	18											
-120																
-123.4	97.1		9	18	19											
-125																
-128.4	102.1		15	20	27											
-130																
-133.4	107.1		14	22	26											
-135																
-138.0	111.7		15	26	31											
-140																
-143.0	116.7		18	33	33											
-145																
-148.0	121.7		14	24	40											
-150																
-153.0	126.7		12	10	12											
-155																
-158.0	131.7		4	5	7											
-160																

Match Line

Gray Silty Fine SAND with Trace of Shell Fragments (continued)

-157.3

Gray Fine Sandy Silty CLAY

131.0

M

NCDOT BORE SINGLE 11-015.GPJ NC_DOT.GDT 6/24/11



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 3

WBS 32635.1.3		TIP B-2500		COUNTY Dare		GEOLOGIST Bradley/Plummer							
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet							GROUND WTR (ft)						
BORING NO. B-61		STATION N/A		OFFSET N/A		ALIGNMENT N/A							
COLLAR ELEV. -26.3 ft		TOTAL DEPTH 198.2 ft		NORTHING 752,935		EASTING 3,027,523							
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011				DRILL METHOD H Casing/3-7/8" Tricone		HAMMER TYPE Automatic							
DRILLER Moseley/White		START DATE 05/14/11		COMP. DATE 05/15/11		SURFACE WATER DEPTH 26.8ft							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT			SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			
-180						Match Line							
-165	-162.5	136.2	WOH	4	5						M		Gray Fine Sandy Silty CLAY(continued)
-170	-167.5	141.2	WOH	4	7						M		
-175	-173.0	146.7		2	4						M		
-180	-178.7	152.4		2	4						M		
-185	-184.4	158.1			3						M		
-190	-189.4	163.1		31	50	100/0.9					Sat.		Gray Silty Fine SAND
-195	-194.4	168.1		35	65/0.5	100/1.0					Sat.		
-200	-199.9	173.6		23	14						M		Gray Fine Sandy Silty CLAY
-205	-204.9	178.6		75	25/0.1	100/0.6					Sat.		Gray Silty Coarse to Fine SAND with Trace of Shell Fragments
-210	-209.9	183.6		25	45	100/0.9					Sat.		
-215	-214.7	188.4		47	53/0.4	100/0.9					Sat.		
-220	-219.1	192.8		70	30/0.1	100/0.6					Sat.		
	-223.7	197.4		25	75/0.3	100/0.8					Sat.		
													Boring Terminated at Elevation -224.5 ft in Gray Silty Coarse to Fine SAND

NCDOT BORE SINGLE 11-015.GPJ NC DOT GDT 6/24/11

1) Advanced H Casing to 58.6 feet.
 2) Advanced 3 7/8" tricone to 197.4 feet.
 3) Ocean water used as drilling fluid.
 4) Approximate drilling fluid density 66.0 pcf.
 5) Some loss of drilling fluid observed.
 6) *Note Rods Dropped No Data



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 1

WBS 32635.1.3				TIP B-2500		COUNTY Dare		GEOLOGIST Bradley/Plummer											
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet								GROUND WTR (ft)											
BORING NO. B-62		STATION N/A		OFFSET N/A		ALIGNMENT N/A		0 HR. N/A											
COLLAR ELEV. -20.0 ft		TOTAL DEPTH 182.5 ft		NORTHING 752,581		EASTING 3,027,938		24 HR. N/A											
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011				DRILL METHOD H Casing/3-7/8" Tricone		HAMMER TYPE Automatic													
DRILLER Moseley/White		START DATE 05/11/11		COMP. DATE 05/12/11		SURFACE WATER DEPTH 21.3ft													
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION					
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)				
0																			
-5																			
-10																			
-15																			
-20																			
-25	-23.1	3.1																	
-30	-28.1	8.1																	
-35	-33.1	13.1																	
-40	-38.1	18.1																	
-45	-43.1	23.1																	
-50	-48.1	28.1																	
-55	-51.9	31.9																	
-60	-56.9	36.9																	
-65	-61.9	41.9																	
-70	-67.3	47.3																	
-75	-72.3	52.3																	
-80	-77.3	57.3																	

NCDOT BORE SINGLE 11-015.GPJ NC_DOT.GDT 6/24/11



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

SHEET 2

WBS 32635.1.3			TIP B-2500			COUNTY Dare			GEOLOGIST Bradley/Plummer							
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet										GROUND WTR (ft)						
BORING NO. B-62			STATION N/A			OFFSET N/A			ALIGNMENT N/A							
COLLAR ELEV. -20.0 ft			TOTAL DEPTH 182.5 ft			NORTHING 752,581			EASTING 3,027,938							
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011						DRILL METHOD H Casing/3-7/8" Tricone			HAMMER TYPE Automatic							
DRILLER Moseley/White			START DATE 05/11/11			COMP. DATE 05/12/11			SURFACE WATER DEPTH 21.3ft							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION		DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
-80						Match Line										
-82.8	62.8														Gray Coarse to Fine SAND with Trace of Silt, Clay and Shell Fragments(continued)	
-85			24	34	28									Sat.		
-87.8	67.8															
-90			30	40	50						SS-8		Sat.			
-92.8	72.8															
-95			14	20	18						SS-9		Sat.		Gray Slightly Silty Clayey Fine SAND with Trace of Shell Fragments	72.0
-97.6	77.6															
-100			17	15	21								Sat.			
-102.6	82.6															
-105			14	17	23						SS-10		Sat.			
-107.6	87.6															
-110			15	23	28								Sat.			
-112.1	92.1															
-115			19	29	32						SS-11		Sat.			
-117.1	97.1															
-120			10	11	20								Sat.			
-122.1	102.1															
-125											SS-12		Sat.			
-126.5	106.5															
-130			17	27	38								Sat.			
-131.5	111.5															
-135			27	35	40						SS-13		Sat.		Light Gray Fine to Coarse Fine SAND with Trace of Silt, Clay and Shell Fragments	110.5
-136.3	116.3															
-140			25	33	33								Sat.			
-141.3	121.3															
-145			27	33	63						SS-14		Sat.			
-146.3	126.3															
-150			27	37	47								Sat.		Dark Gray Silty Clayey Fine SAND with Some Shell Fragments	124.8
-151.3	131.3															
-155			2	1	5						SS-16	32% M			Gray Fine Sandy Silty CLAY with Trace of Shell Fragments	129.8
-155.9	135.9															
-160			2	4	7								M			

NCDOT BORE SINGLE 11-015 GP NC DOT GDT 6/24/11



WBS 32635.1.3			TIP B-2500			COUNTY Dare			GEOLOGIST Bradley/Plummer				
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet										GROUND WTR (ft)			
BORING NO. B-62			STATION N/A			OFFSET N/A			ALIGNMENT N/A				
COLLAR ELEV. -20.0 ft			TOTAL DEPTH 182.5 ft			NORTHING 752,581			EASTING 3,027,938				
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011						DRILL METHOD H Casing/3-7/8" Tricone			HAMMER TYPE Automatic				
DRILLER Moseley/White			START DATE 05/11/11			COMP. DATE 05/12/11			SURFACE WATER DEPTH 21.3ft				
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			
-160	-160.7	140.7				Match Line							
-165	-166.0	146.0	1	4	7	11					SS-17	62% W	Gray Fine Sandy Silty CLAY with Trace of Shell Fragments(continued)
-170	-171.0	151.0	*	*	*							W	
-175	-176.2	156.2	4	7	9	16					SS-18	67% M	
-180	-181.2	161.2	5	6	10	16						M	
-185	-186.2	166.2	7	24	59						SS-19	41% M	
-190	-191.2	171.2	57	43/0.3								Sat.	Gray Slightly Clayey Fine SAND With Trace of Shell Fragments
-195	-196.2	176.2	55	45/0.2								Sat.	
-200	-201.2	181.2	60	40/0.2							SS-21	Sat.	
	-202.5	182.5	3	41	59/0.3							Sat.	Boring Terminated at Elevation -202.5 ft in Gray Slightly Clayey Fine SAND with Trace of Shell Fragments
1) Advanced H casing to 50.1 feet (71.4 total used). 2) Advanced 3 7/8" drag bit to 181.2 feet. 3) Ocean water used as drilling fluid. 4) Approximate drilling fluid density 66.0 pcf. 5) Some loss of drilling fluid observed. 6) *Note: Rods Dropped No Data													



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

SHEET 1

WBS 32635.1.3		TIP B-2500		COUNTY Dare		GEOLOGIST Bradley/Plummer						
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet							GROUND WTR (ft)					
BORING NO. B-63		STATION N/A		OFFSET N/A		ALIGNMENT N/A						
COLLAR ELEV. -12.3 ft		TOTAL DEPTH 200.0 ft		NORTHING 752,567		EASTING 3,028,233						
DRILL RIG/HAMMER EFF/DATE SME R-6 CME-550X 80% 6/7/2011		DRILL METHOD H Casing/3-7/8" Tricone		HAMMER TYPE Automatic								
DRILLER Moseley/White		START DATE 05/21/11		COMP. DATE 05/22/11		SURFACE WATER DEPTH 11.8ft						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT			SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100		DEPTH (ft)
0												
-5												
-10												
-15	-14.8	2.5	1	2	4							
-20	-19.8	7.5	4	3	5							
-25	-24.8	12.5	WOR	WOR	WOR							
-30	-29.8	17.5	10	12	17							
-35	-34.8	22.5	WOR	WOH	2							
-40	-39.9	27.6	4	5	7							
-45	-44.9	32.6	5	5	8							
-50	-49.9	37.6	4	2	2							
-55	-54.8	42.5	3	4	2							
-60	-59.8	47.5	3	7	14							
-65	-64.5	52.2	5	5	8							
-70	-70.3	58.0	12	20	24							
-75	-75.3	63.0	6	9	8							
-80												

WATER SURFACE (05/21/11)

INLET BOTTOM 0.0

COASTAL PLAIN
Gray Coarse to Fine SAND with Trace Silt

Green Gray Fine Sandy CLAY

Gray Silty Coarse to Fine SAND

Gray Silty CLAY

Gray Fine Sandy SILT

Gray Silty Fine SAND with Trace of Shell Fragments

NCDOT BORE SINGLE 11-015.GPJ NC DOT GDT 6/24/11



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 2

WBS 32635.1.3	TIP B-2500	COUNTY Dare	GEOLOGIST Bradley/Plummer
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet			
BOHRING NO. B-63	STATION N/A	OFFSET N/A	ALIGNMENT N/A
COLLAR ELEV. -12.3 ft	TOTAL DEPTH 200.0 ft	NORTHING 752,567	EASTING 3,028,233
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011		DRILL METHOD H Casing/3-7/8" Tricone	HAMMER TYPE Automatic
DRILLER Moseley/White	START DATE 05/21/11	COMP. DATE 05/22/11	SURFACE WATER DEPTH 11.8ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
-80						Match Line								
-80.6	68.3		6	10	15								Gray Silty Fine SAND with Trace of Shell Fragments (continued)	
-85	-85.6	73.3	25	32	26									
-90	-90.6	78.3	12	15	25									
-95	-96.3	84.0	18	21	22									
-100	-101.3	89.0	12	15	20									
-105	-106.8	94.5	12	20	20									
-110	-112.3	100.0	29	18	24									
-115	-117.3	105.0	20	25	25									
-120	-122.3	110.0	15	15	20									
-125	-127.3	115.0	18	37	60									
-130	-132.3	120.0	100/0.5										Gray Silty Fine to Coarse SAND with Some Shell Fragments	118.0
-135	-137.3	125.0	4	3	3								Gray Silty CLAY	122.5
-140	-142.3	130.0	WOR	WOR	WOH									
-145	-147.3	135.0	32	40	60/0.5								Gray Silty Fine SAND with Trace of Shell Fragments	133.0
-150	-152.0	139.7	40	60/0.5										
-155	-156.8	144.5	WOH	2	2								Gray Silty CLAY	142.5
-160														

NCDOT BORE SINGLE 11-015.GPJ NC_DOT.GDT 6/24/11



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 3

WBS 32635.1.3		TIP B-2500		COUNTY Dare		GEOLOGIST Bradley/Plummer										
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet							GROUND WTR (ft)									
BORING NO. B-63		STATION N/A		OFFSET N/A		ALIGNMENT N/A										
COLLAR ELEV. -12.3 ft		TOTAL DEPTH 200.0 ft		NORTHING 752,567		EASTING 3,028,233										
						0 HR.	N/A									
						24 HR.	N/A									
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011				DRILL METHOD H Casing/3-7/8" Tricone		HAMMER TYPE Automatic										
DRILLER Moseley/White		START DATE 05/21/11		COMP. DATE 05/22/11		SURFACE WATER DEPTH 11.8ft										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
-160						Match Line										
-165	-161.8	149.5	1	1	4	5							W		Gray Silty CLAY (continued)	
-170	-166.5	154.2	1	1	3	4							W			
-175	-171.2	158.9	1	1	3	4							M			
-180	-175.9	163.6	1	4	4	8							W			
-185	-180.8	168.5	1	1	3	4							M			
-190	-185.5	173.2	4	15	39	54							Sat.		Green Gray to Gray Silty Coarse to Fine SAND with Trace of Shell Fragments	172.0
-195	-190.3	178.0	28	36	48	84							Sat.			
-200	-195.3	183.0	42	50	50/0.3	100/0.8							Sat.			
-205	-200.5	188.2	7	3	4	7							W		Gray Silty CLAY	186.0
-210	-205.7	193.4	1	9	10	19							Sat.		Gray Clayey Silty Fine SAND	189.3
-212.3	-210.8	198.5	18	34	56	90							Sat.		Boring Terminated at Elevation -212.3 ft in Gray Clayey Silty Fine SAND	200.0
1) Advanced H casing to 47.5 feet (65.4 total). 2) Advanced 3 7/8" tricone to 198.5 feet. 3) Ocean water used as drilling fluid. 4) Approximate drilling fluid density 66.0 pcf. 5) Loss of drilling fluid observed.																

[illegible]



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 2

WBS 32635.1.3			TIP B-2500			COUNTY Dare			GEOLOGIST Bradley/Plummer		
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet									GROUND WTR (ft)		
BORING NO. B-64			STATION N/A			OFFSET N/A			ALIGNMENT N/A		
COLLAR ELEV. -10.3 ft			TOTAL DEPTH 191.9 ft			NORTHING 752,509			EASTING 3,028,395		
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011						DRILL METHOD H Casing/3-7/8" Tricone			HAMMER TYPE Automatic		
DRILLER Moseley/White			START DATE 05/31/11			COMP. DATE 06/02/11			SURFACE WATER DEPTH 9.8ft		

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
-80	-80.4	70.1	9	14	19										
-85															
-90	-90.4	80.1	6	3	6										
-95															
-100	-100.1	89.8	3	10	24										
-105															
-110	-108.9	98.6	20	40	50										
-115															
-120	-118.9	108.6	17	23	40										
-125															
-130	-129.7	119.4	7	9	17										
-135															
-140	-140.2	129.9	36	28	54										
-145															
-150	-149.6	139.3	4	6	11										
-155															
-160	-158.0	147.7	WOH	1	4										

NCDOT BORE SINGLE 11-015.GPJ NC_DOT.GDT 6/24/11



WBS 32635.1.3			TIP B-2500			COUNTY Dare			GEOLOGIST Bradley/Plummer			
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet									GROUND WTR (ft)			
BORING NO. B-64			STATION N/A			OFFSET N/A			ALIGNMENT N/A			
COLLAR ELEV. -10.3 ft			TOTAL DEPTH 191.9 ft			NORTHING 752,509			EASTING 3,028,395			
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011						DRILL METHOD H Casing/3-7/8" Tricone			HAMMER TYPE Automatic			
DRILLER Moseley/White			START DATE 05/31/11			COMP. DATE 06/02/11			SURFACE WATER DEPTH 9.8ft			
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100		ELEV. (ft) DEPTH (ft)
-160						Match Line						
-165												Gray Fine Sandy Silty CLAY(continued)
-170	-169.0	158.7	WOH	1	3						M	
-175												
-180	-179.6	169.3	WOH	1	1						M	
-185												
-190	-189.6	179.3		25	60	40/0.1				100/0.6	Sat.	Gray Silty Fine to Coarse SAND
-195												
-200	-200.7	190.4		25	39	39				78.	Sat.	-202.2
												191.9
Boring Terminated at Elevation -202.2 ft in Gray Silty Fine to Coarse SAND												
1) Advanced H casing to 38.4 feet (55.4 total). 2) Advanced 3 7/8" Tricone to 190.4 feet. 3) Ocean water used as drilling fluid. 4) Approximate drilling fluid density 66.0 pcf. 5) Some loss of drilling fluid observed. 6) In-Situ Soil Testing , L.C. performed Pressuremeter testing on 10' intervals between SPT Testing												

[illegible]



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 2

WBS 32635.1.3			TIP B-2500			COUNTY Dare			GEOLOGIST Bradley/Plummer							
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet									GROUND WTR (ft)							
BORING NO. B-65			STATION N/A			OFFSET N/A			ALIGNMENT N/A							
COLLAR ELEV. -16.0 ft			TOTAL DEPTH 185.7 ft			NORTHING 752,120			EASTING 3,029,182							
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011						DRILL METHOD H Casing/3-7/8" Tricone			HAMMER TYPE Automatic							
DRILLER Moseley/White			START DATE 05/15/11			COMP. DATE 05/17/11			SURFACE WATER DEPTH 13.2ft							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	L O G	SOIL AND ROCK DESCRIPTION		DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
-80						Match Line										
-85	-83.5	67.5	4	7	7											
											SS-78	Sat.			Gray Coarse to Fine SAND with Some Shell Fragments and Trace of Silt and Clay (continued)	
-90	-88.5	72.5	15	30	45						SS-79	Sat.		-88.0	Gray Coarse to Fine SAND with Trace of Silt and Clay	72.0
-95	-93.5	77.5	16	26	50							Sat.				
-100	-98.5	82.5	23	42	48						SS-80	Sat.				
-105	-103.5	87.5	18	26	40							Sat.				
-110	-108.5	92.5	4	3	2						SS-81	Sat.		-109.3	Green to Gray Coarse to Fine SAND with Trace of Silt and Clay	93.3
-115	-113.5	97.5	8	14	20							Sat.				
-120	-118.5	102.5	15	35	55						SS-82	Sat.		-116.0	Gray Coarse to Fine SAND	100.0
-125	-123.5	107.5	27	40	60/0.4							Sat.				
-130	-128.5	112.5	60	40/0.2							SS-83	Sat.				
-135	-133.4	117.4	29	59	41/0.2							Sat.				
-140	-138.0	122.0	5	25	25						SS-84	Sat.		-136.5	Gray Coarse to Fine SAND with Trace of Silt and Clay	120.5
-145	-143.0	127.0	7	28	50							Sat.				
-150	-148.0	132.0	23	37	60						SS-85	Sat.				
-155	-152.7	136.7	26	29	49							Sat.				
-160	-157.7	141.7	3	2	3						SS-86	29% M		-155.0	Gray Coarse to Fine Sandy Silty CLAY with Trace of Shell Fragments	139.0

NCDOT BORE SINGLE 11-015.GPJ NC_DOT.GDT 6/24/11



WBS 32635.1.3			TIP B-2500			COUNTY Dare			GEOLOGIST Bradley/Plummer						
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet									GROUND WTR (ft)						
BORING NO. B-65			STATION N/A			OFFSET N/A			ALIGNMENT N/A						
COLLAR ELEV. -16.0 ft			TOTAL DEPTH 185.7 ft			NORTHING 752,120			EASTING 3,029,182						
DRILL RIG/HAMMER EFF./DATE SME R-6 CME-550X 80% 6/7/2011						DRILL METHOD H Casing/3-7/8" Tricone			HAMMER TYPE Automatic						
DRILLER Moseley/White			START DATE 05/15/11			COMP. DATE 05/17/11			SURFACE WATER DEPTH 13.2ft						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION		DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	
-160						Match Line									
-165	-162.7	146.7	1	2	4							M		-162.0	146.0
-170	-167.7	151.7	WOR			1	2				SS-87	77% M			
-175	-173.7	157.7	1	2	5							M			
-180	-179.8	163.8	1	1	4					SS-88	69% M				
-185	-185.0	169.0	1	2	4							M			
-190	-190.3	174.3	10	20	60					SS-89	Sat.			-189.3	173.3
-195	-195.3	179.3	32	55	45/0.4							Sat.			
-200	-200.3	184.3	25	45	55/0.4							Sat.			
												Sat.		-201.7	185.7
Boring Terminated at Elevation -201.7 ft in Gray Silty Clayey Fine SAND															
1) Advanced H casing to 67.0 feet (87.4 total used).															
2) Advanced 3 7/8" tricone to 184.3 feet.															
3) Ocean water used as drilling fluid.															
4) Approximate drilling fluid density 66.0 pcf.															
5) Loss of drilling fluid observed.															



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 1

WBS 32635.1.3		TIP B-2500		COUNTY Dare		GEOLOGIST Hatfield							
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet							GROUND WTR (ft)						
BORING NO. B-66		STATION N/A		OFFSET N/A		ALIGNMENT N/A		0 HR. 3.9					
COLLAR ELEV. 4.0 ft		TOTAL DEPTH 190.0 ft		NORTHING 751,808		EASTING 303,830		24 HR. FIAD					
DRILL RIG/HAMMER EFF/DATE SME R-2 DIEDRICH D-50 87% 6/2/2011				DRILL METHOD NW Casing and 2 7/8 Tricone		HAMMER TYPE Automatic							
DRILLER Walker, J.		START DATE 06/01/11		COMP. DATE 06/02/11		SURFACE WATER DEPTH N/A							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT			SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100		ELEV. (ft)	DEPTH (ft)
5												4.0	0.0
												GROUND SURFACE	
												COASTAL PLAIN	
												Gray Silty Coarse to Fine SAND	
0	0.5	3.5	4	7	4								
-5	-4.5	8.5	3	7	5								
-10	-9.5	13.5	7	11	12								
-15	-14.5	18.5	5	6	7								
-20	-19.5	23.5	5	6	6								
-25	-24.5	28.5	1	WOH	WOH								
-30	-29.5	33.5	5	7	11								
-35	-34.5	38.5	3	2	1								
-40	-39.5	43.5	4	3	3								
-45	-44.5	48.5	4	7	12								
-50	-49.5	53.5	4	5	6								
-55	-54.5	58.5	2	3	3								
-60	-59.5	63.5	1	2	3								
-65	-64.5	68.5	6	9	6								
-70	-69.5	73.5	9	12	16								
-75	-74.5	78.5											

NCDOT BORE SINGLE 11-015.GPJ NC_DOT_GDT 6/24/11



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

SHEET 2

WBS 32635.1.3			TIP B-2500			COUNTY Dare			GEOLOGIST Hatfield		
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet										GROUND WTR (ft)	
BORING NO. B-66			STATION N/A			OFFSET N/A			ALIGNMENT N/A		
COLLAR ELEV. 4.0 ft			TOTAL DEPTH 190.0 ft			NORTHING 751,808			EASTING 303,830		
									0 HR. 3.9		
									24 HR. FIAD		
DRILL RIG/HAMMER EFF./DATE SME R-2 DIEDRICH D-50 87% 6/2/2011						DRILL METHOD NW Casing and 2 7/8 Tricone			HAMMER TYPE Automatic		
DRILLER Walker, J.			START DATE 06/01/11			COMP. DATE 06/02/11			SURFACE WATER DEPTH N/A		

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
-75						Match Line									
-80	-79.5	83.5	5	3	4								Sat.	Gray Silty Clayey Coarse to Fine SAND (continued)	
-85	-84.5	88.5	4	5	6								Sat.		
-90	-89.5	93.5	8	17	23								Sat.		
-95	-94.5	98.5	4	10	11								Sat.		
-100	-99.5	103.5	6	18	30								Sat.	Gray Coarse to Fine SAND with Trace of Silt	102.5
-105	-104.5	108.5	3	18	33								Sat.	Gray Silty Coarse to Fine SAND	108.0
-110	-109.5	113.5	7	8	11								W	Gray Coarse to Fine Sandy Silty CLAY with Trace of Shell Fragments	112.5
-115	-114.5	118.5	10	17	28								Sat.	Gray Silty Coarse to Fine SAND	117.0
-120	-119.5	123.5	14	14	34								Sat.		
-125	-124.5	128.5	16	20	29								Sat.		
-130	-129.5	133.5	34	40	29								Sat.		
-135	-134.5	138.5	6	9	12								Sat.	Red Clayey SILT	137.5
-140	-139.5	143.5	16	16	19								W	Gray Coarse to Fine Sandy Silty CLAY	142.5
-145	-144.5	148.5	11	30	40								Sat.	Gray Silty Clayey Coarse to Fine SAND	147.5
-150	-149.5	153.5	24	35	52								Sat.		
-155	-154.5	158.5												Gray Fine Sandy Silty CLAY with Trace of Shell Fragments	157.0

NCDOT BORE SINGLE 11-015.GPJ NC_DOT.GDT 6/24/11



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 3

WBS 32635.1.3		TIP B-2500		COUNTY Dare		GEOLOGIST Hatfield	
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet							GROUND WTR (ft)
BORING NO. B-66		STATION N/A		OFFSET N/A		ALIGNMENT N/A	
COLLAR ELEV. 4.0 ft		TOTAL DEPTH 190.0 ft		NORTHING 751,808		EASTING 303,830	
						0 HR.	3.9
						24 HR.	FIAD
DRILL RIG/HAMMER EFF./DATE SME R-2 DIEDRICH D-50 87% 6/2/2011				DRILL METHOD NW Casing and 2 7/8 Tricone		HAMMER TYPE Automatic	
DRILLER Walker, J.		START DATE 06/01/11		COMP. DATE 06/02/11		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
-155						Match Line									
-160	-159.5	163.5	5	3	6								W		Gray Fine Sandy Silty CLAY with Trace of Shell Fragments(continued)
-165	-164.5	168.5	3	4	5								W		
-170	-169.5	173.5	4	3	5								W		
-175	-174.5	178.5	13	31	36								Sat.	-168.5	Gray Silty Clayey Coarse to Fine SAND
-180	-179.5	183.5	11	13	13								W	-171.5	Gray Coarse to Fine Sandy Silty CLAY
-185	-184.5	188.5	15	37	38								W		
			92	8/0.1									Sat.	-183.5	Gray Silty Coarse to Fine SAND
														-186.0	Boring Terminated at Elevation -186.0 ft in Gray Silty Coarse to Fine SAND
															1) Advanced NW casing to 92.5 feet (95 feet total use). 2) Advanced 2 7/8 Tricone to 188.5 feet. 3) Fresh water used as drilling fluid. 4) Approximate drilling fluid density 64.4 pcf 5) Some loss of drilling fluid observed.



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

SHEET 1

WBS 32635.1.3	TIP B-2500	COUNTY Dare	GEOLOGIST Hatfield
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet			
BORING NO. B-67	STATION N/A	OFFSET N/A	ALIGNMENT N/A
COLLAR ELEV. 4.7 ft	TOTAL DEPTH 110.0 ft	NORTHING 751,598	EASTING 3,031,624
DRILL RIG/HAMMER EFF./DATE SME R-2 DIEDRICH D-50 87% 6/2/2011		DRILL METHOD NW Casing and 2 7/8 Tricone	HAMMER TYPE Automatic
DRILLER Walker, J.	START DATE 06/01/11	COMP. DATE 06/01/11	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
5														GROUND SURFACE 0.0
0	1.2	3.5	3	5	6						SS-518	▽		COASTAL PLAIN Gray Coarse to Fine SAND with Trace of Silt and Shell Fragments
-5	-3.8	8.5	2	1	1									
-10	-8.8	13.5	8	10	10						SS-519			
-15	-13.8	18.5	6	8	11									
-20	-18.8	23.5	2	7	5						SS-520			
-25	-23.8	28.5	7	11	13									
-30	-29.1	33.8	4	5	6						SS-521			
-35	-33.8	38.5	8	9	7									
-40	-38.8	43.5	5	7	8						SS-522			
-45	-43.8	48.5	8	8	5									
-50	-48.8	53.5	WOH	WOH	1						SS-523	49% W		Gray Fine Sandy Silty CLAY 51.5
-55	-53.8	58.5	WOH	1	WOH							W		
-60	-58.8	63.5	2	1	2						SS-524	W		Gray Silty Clayey Fine to Coarse SAND with Trace of Shell Fragments 61.0
-65	-63.8	68.5	3	2	3						SS-525	Sat.		Gray Coarse to Fine SAND with Trace of Silt and Clay 67.5
-70	-68.8	73.5	13	15	19									
-75	-73.8	78.5	7	8	10						SS-526	Sat.		

NCDOT BORE SINGLE 11-015.GPJ NC_DOT.GDT 6/24/11



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 2

WBS 32635.1.3		TIP B-2500		COUNTY Dare		GEOLOGIST Hatfield	
SITE DESCRIPTION Bridge No.11 (Bonner Bridge) on NC 12 over Oregon Inlet							GROUND WTR (ft)
BORING NO. B-67		STATION N/A		OFFSET N/A		ALIGNMENT N/A	
COLLAR ELEV. 4.7 ft		TOTAL DEPTH 110.0 ft		NORTHING 751,598		EASTING 3,031,624	
DRILL RIG/HAMMER EFF./DATE SME R-2 DIEDRICH D-50 87% 6/2/2011				DRILL METHOD NW Casing and 2 7/8 Tricone		HAMMER TYPE Automatic	
DRILLER Walker, J.		START DATE 06/01/11		COMP. DATE 06/01/11		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
-75						Match Line								
-80	-78.8	83.5	6	6	7							Sat.	Gray Coarse to Fine SAND with Trace of Silt and Clay (continued)	86.8
-85	-83.8	88.5	14	23	27						SS-527	Sat.	Gray Coarse to Fine SAND	
-90	-88.8	93.5	19	24	28							Sat.		
-95	-93.8	98.5	10	20	24						SS-528	Sat.	Gray Fine SAND with Trace of Clay	97.5
-100	-98.8	103.5	39	61/0.4							SS-529	Sat.	Gray Fine to Coarse SAND	102.0
-105	-103.8	108.5	26	37	61							Sat.		110.0
Boring Terminated at Elevation -105.3 ft in Gray Coarse to Fine SAND 1) Advanced NW casing to 38.5 feet (40 feet total used). 2) Advanced 2 7/8 Tricone to 110.0 feet. 3) Fresh water used as drilling fluid. 4) Approximate drilling fluid density 64.4 pcf. 5) Some loss of drilling fluid observed. 6) Shelby tube ST-1 Taken from 57 to 59 feet														