

To: Tom Barnitz, P.E. ODOT District 9 Project Manager 650 Eastern Ave Chillicothe, OH 45601	
From: Doug Voegele, P.E. HDR Engineering, Inc.	Project: SCI-823-6.81 PID No. 19415 Portsmouth Bypass, Phase 1
CC: Brad Hyre, P.E.	
Date: 6/23/11	Job No: 45878

**RE: Revised GB-1 Spreadsheet – CR 28 interchange**

HDR has revised the GB-1 spreadsheet "Subgrade Analyses, version 9.09" as originally prepared by DLZ for the CR 28 interchange. These revisions were necessitated as a result of the geometric modifications made by HDR during the Stage 2 design, as well as to include the supplemental subsurface information and laboratory test results along Ramps B and C as provided by the OGE on August 18, 2010.

The soils encountered within 6 feet below the proposed grade (or existing ground surface) were reevaluated using the guidelines as presented in GB1: Plan Subgrades, dated June 29, 2005. According to GB1, those soils that exceed the estimated optimum moisture by more than 3 percent will likely require some form of subgrade stabilization. In addition, stabilization is also expected for those soils where the  $N_L$  value is less than 9 blows per foot. As shown in the attached GB1 spreadsheet, several locations require subgrade stabilization based on these criteria. The stabilization options available based on the soils encountered include undercut and replacement and cement stabilization. Undercutting and Replacement is recommended as the total area to be stabilized is relatively small, and for consistency with the previous recommendations already approved by the District.

The table below presents the modified subgrade treatment recommendations for Ramps B and C. The subgrade treatments for Ramps A and D as presented in Table 4 and Table 5 of the *Addendums to Geotechnical Reports* (HDR, 7/31/09) remain unchanged.

**UNDERCUT AND REPLACE – SUBGRADE IN SOIL**

Alignment	Beginning Station	Ending Station	Depth of Undercut
CR 28 Ramp B	527+00	530+00	12 inches
CR 28 Ramp C	522+00	522+50	36 inches
CR 28 Ramp C	523+50	525+00	36 inches
CR 28 Ramp C	526+00	530+00	12 inches



SCI-823, SR 728 Ramps A - D, PID 19415					Standard Penetration						Physical Characteristics						Moisture		Classification		Comments		Problem		Treatments				Analysis							
#	B #	Boring Location	Depth	To	Cut Fill	n <sub>2</sub>	n <sub>3</sub>	N <sub>m</sub>	Rig	N <sub>60</sub>	N <sub>L</sub>	LL	PL	PI	% Silt	% Clay	P 200	M	M <sub>opt</sub>	Class	G			w/ Class	w/ MN	LS	CS	UC Class	UC MN							
14 Ramp C	B-1210	Sta. 517+43 2 Lt. Ramp C	0.0	1.5	2.0	2	3	5	A	5		24	14	10	42	23	65	14	10		4a	6			MN					5						
			1.5	3.0		5	6	11	11	32	17	15	39	27	66	13	14	6a	8																	
			3.0	4.5		4	3	7	7	38	16	22	46	41	87	21	16	6b	13																	
			4.5	6.0		3	5	8	8	46	19	27	38	59	97	23	18	7-6	16																	
15 Ramp C	B-1211	Sta. 519+38 31.1' Lt. Ramp C	0.0	1.5	10.0	3	4	7	A	7		23	16	7	52	21	73	15	11		4b	8		4b				16	3	3						
			1.5	3.0		3	4	7	7	52	19	33	21	73	94	22	18	7-6	18																	
			3.0	4.5		3	4	7	7	50	27	23	7	93	100	29	24	7-6	15																	
			4.5	6.0		2	3	5	5	60	24	36	8	92	100	15	21	7-6	20																	
16 Ramp C	B-1212	Sta. 521+46 17' Lt. Ramp C	0.0	1.5	7.0	5	8	13	A	13		27	17	10	57	32	89	11	12		4b	8		4b				3	3							
			1.5	3.0		10	11	21	21	23	17	6	60	26	86	9	12	4b	8																	
			3.0	4.5		7	8	15	15	25	18	7	43	20	63	9	13	4a	6																	
			4.5	6.0		5	7	12	12	64	21	43	8	92	100	22	18	7-6	20																	
17 Ramp D/C	B-1213	Sta. 534+33 14.9' Rt. Ramp D	0.0	1.5	6.0	2	2	4	A	4		25	12	13	57	28	85	17	14		6a	9		N												
			1.5	3.0		3	4	7	7	30	17	13	51	32	83	16	14	6a	9																	
			3.0	4.5		3	6	9	9	62	34	28	13	87	100	26		7-5	19																	
			4.5	6.0		3	6	9	9	4	57	25	32	13	87	100	36	22	7-6	19																
18 Ramp D	B-1214	Sta. 532+70 86.7' Lt. Ramp D	11.0	12.5	-10.0	4	5	9	A	9														N												
			13.5	15.0		3	4	7	7																											
			16.0	17.5		4	4	8	8																											
19 Ramp D	B-1215	Sta. 530+98 145' Lt. Ramp D	2.0	4.0	-2.0	4	4	8	A	8														N												
			4.0	6.0		4	5	9	9																											
																											N									

**Ramp D**  
36 inch undercut from Sta. 528+50 to Sta. 530+00, Sta. 531+00 to Sta. 532+50 and Sta. 535+00 to Sta. 537+50