

Supplemental Report of Structure Soundings



Form 610014 (10-15)

English Project NHSX-030-6(231)--3H-06 Design No. 718 File No. 31044 Date Reported 12/16/2016

Type and Size of Bridge 8' X 8' X 141' Reinforced Box Culvert Road No. US 30 County Benton

Bridge over Local Drainage at Station 1400+94

Core Data															
Test Hole No.	Layer	*Core Type	Depth		Blows 6 in. Seat	Blows 1st 6 in.	Blows 2nd 6 in.	Blows per foot	Cohesion psf	Friction	**Test tsf	Density pcf	Moisture %	AASHTO Class.	Remarks
			From	To											
RB30-340	B1	SH	0.5	2.5					1250	0	UC	81	35		
	C1	ST	3.5	5.0	2	2	2	4							
	D1	SH	8.0	10.0					2390	0	UC	118	13		
	D2	ST	13.5	15.0	3	5	8	13							
	D3	SH	18.0	20.0					2360	0	UC	119	14		
	D4	ST	23.5	25.0	5	8	9	17							

Note: All Standard Penetration Test blow counts in this boring obtained with an automatic SPT hammer.

Station 1400+94 Estimated consolidation of 0.17 feet in 8 foot thick

Percent	10	30	50	70	90
Days	1	4	10	21	45

compressible layers under the 18 foot embankment at the following rate:

Recommendations:
 We recommend placing a granular blanket below the RCB that consists of 12 inches of Special Backfill (Iowa DOT Standard Specifications Section 4132), extending at least 2 feet beyond the RCB perimeter (east and west). We recommend using an at-rest equivalent fluid pressure of 65 pounds per cubic foot (pcf) and an active equivalent fluid pressure of 45 pcf for design of the RCB walls. Design RCB to accommodate a minimum of 2 inches of differential settlement over a distance of 50 feet and total settlement of 2 inches.

* SH - Shelby Tube Core
 ST - Split Tube Core
 DC - Density Core
 UU - Unconsolidated Undrained (Triaxial)
 CU - Consolidated Undrained (Triaxial)
 ** UC - Unconfined Compression (Cohesion = 1/2 U.C. Strength)
 NQ - Diamond Core

Bryan Kumm, PE
 Reporting Engineer

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Form 610014 (10-15)

English Project NHSX-030-6(231)--3H-06 Design No. 718 File No. 31044 Date Reported 12/16/2016

Type and Size of Bridge 8' X 8' X 84' Reinforced Box Culvert Road No. US 30 County Benton

Bridge over Local Drainage at Station 1400+94

Core Data															
Test Hole No.	Layer	*Core Type	Depth		Blows 6 in. Seat	Blows 1st 6 in.	Blows 2nd 6 in.	Blows per foot	Cohesion psf	Friction	**Test tsf	Density pcf	Moisture %	AASHTO Class.	Remarks
			From	To											
RB30-341	B1	ST	4.0	5.5	5	5	8	13					21		
	C1	ST	9.0	10.5	2	4	6	10							
	D1	ST	14.0	15.5	9	15	14	29					15		
	E1	ST	19.0	20.5	3	5	7	12							
	E2	ST	24.0	25.5	4	6	9	15					15		
	E3	ST	29.0	30.5	5	9	13	22							
	E4	ST	34.0	35.5	5	9	11	20					13		
	G1	ST	39.0	40.5	11	18	25	43							
Note: All reported blow counts are uncorrected. Multiply blow counts by 1.46 to determine N60-values.															

Note: All Standard Penetration Test blow counts in this boring obtained with an automatic SPT hammer.

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compressible layers under the 18 foot embankment at the following rate:

Percent	10	30	50	70	90
Days	1	4	10	21	45

Recommendations:

We recommend placing a granular blanket below the RCB that consists of 12 inches of Special Backfill (Iowa DOT Standard Specifications Section 4132), extending at least 2 feet beyond the RCB perimeter (east and west). We recommend using an at-rest equivalent fluid pressure of 65 pounds per cubic foot (pcf) and an active equivalent fluid pressure of 45 pcf for design of the RCB walls. Design RCB to accommodate a minimum of 2 inches of differential settlement over a distance of 50 feet and total settlement of 2 inches.

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