

M E M O R A N D U M

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DATE: January 28, 2019

SUBJECT: Henderson County
FD52 051 0060 019-020 D; BRO 5053 026
MARS No. 8675901D
US 60, Replace Bridge over Green River @ KY 1078
Item No. 2-1080.00
Geotechnical Engineering Structure Foundation Report Addendum

At the request of the designer in an email dated Monday, January 21, 2019, this report addendum serves to provide additional drilled shaft axial resistance tables for rock socket diameters in a range from 6.0 to 7.5 feet. The remaining recommendations, figures, special notes, and other attachments from the original report (S-058-2016) and report addendum (SA-006-2018) shall still apply.

The designer should feel free to contact the Geotechnical Branch at 502-564-2374 for further recommendations or if any questions arise pertaining to this project.

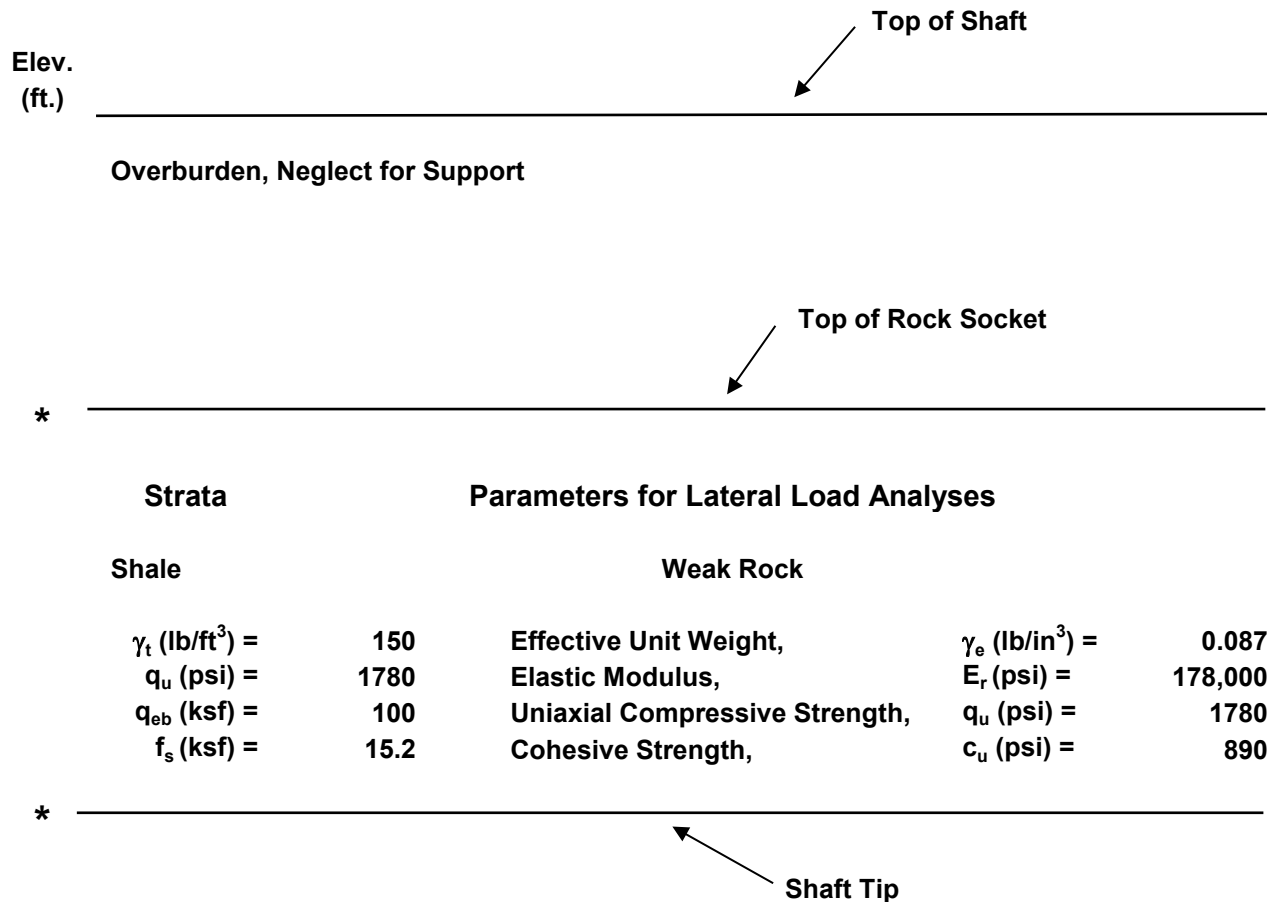
Attachment:

- **Idealized Soil and Bedrock Profiles and Drilled Shaft Axial Resistance Tables For Piers 1 through 4 – Shaft Socket Diameters from 6 to 7.5 feet**

IDEALIZED SOIL AND BEDROCK PROFILE

Henderson, US 60 over Green River
Piers 1 - 4

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* Elevations vary and are provided in the report body.

ADDITIONAL DATA FOR GEOTECHNICAL CALCULATIONS ONLY:

min. f'_c (psi) = 3500
 p_a (psi) = 14.7

Load and Resistance Factor Design (LRFD)

DRILLED SHAFT AXIAL RESISTANCE TABLE

Henderson, US 60 over Green River
Piers 1 - 4

Rock Socket Diameter = 6.0 feet

Rock Socket Diameter = 72 inches

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Rock Socket Length (ft.)	Nominal Unit Side Shear q_{ss} (ksf)	Nominal Unit End Bearing q_{eb} (ksf)	Nominal Side Resistance R_{sr} (kips)	Nominal End Bearing Resistance R_{eb} (kips)	Factored Side Resistance ϕR_{sr} (kips)	Factored End Bearing Resistance ϕR_{eb} (kips)	Total Factored Axial Resistance ϕR_t (kips)	Total Factored Uplift Resistance ϕR_{tu} (kips)
0.0								
6.0	15.2	100	1719	2827	860	1414	2273	688
7.0	15.2	100	2006	2827	1003	1414	2417	802
8.0	15.2	100	2292	2827	1146	1414	2560	917
9.0	15.2	100	2579	2827	1289	1414	2703	1031
10.0	15.2	100	2865	2827	1433	1414	2846	1146
11.0	15.2	100	3152	2827	1576	1414	2990	1261
>>> 12.0	15.2	100	3438	2827	1719	1414	3133	1375
13.0	15.2	100	3725	2827	1862	1414	3276	1490
14.0	15.2	100	4011	2827	2006	1414	3419	1604
15.0	15.2	100	4298	2827	2149	1414	3563	1719
16.0	15.2	100	4584	2827	2292	1414	3706	1834
17.0	15.2	100	4871	2827	2435	1414	3849	1948
18.0	15.2	100	5157	2827	2579	1414	3992	2063
19.0	15.2	100	5444	2827	2722	1414	4136	2178
20.0	15.2	100	5730	2827	2865	1414	4279	2292
21.0	15.2	100	6017	2827	3008	1414	4422	2407
22.0	15.2	100	6303	2827	3152	1414	4565	2521
23.0	15.2	100	6590	2827	3295	1414	4709	2636
24.0	15.2	100	6876	2827	3438	1414	4852	2751
25.0	15.2	100	7163	2827	3581	1414	4995	2865
26.0	15.2	100	7449	2827	3725	1414	5138	2980
27.0	15.2	100	7736	2827	3868	1414	5282	3094
28.0	15.2	100	8022	2827	4011	1414	5425	3209
29.0	15.2	100	8309	2827	4154	1414	5568	3324
AASHTO Table 10.5.5.2.4-1 Resistance Factor, ϕ					0.50	0.50		0.40
>>> = Min. Socket Length							D (ft.) = 6.0	

Load and Resistance Factor Design (LRFD)

DRILLED SHAFT AXIAL RESISTANCE TABLE

Henderson, US 60 over Green River Piers 1 - 4

Rock Socket Diameter = 6.5 feet

Rock Socket Diameter = 78 inches

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[illegible]

Load and Resistance Factor Design (LRFD)

DRILLED SHAFT AXIAL RESISTANCE TABLE

Henderson, US 60 over Green River
Piers 1 - 4

Rock Socket Diameter = 7.0 feet

Rock Socket Diameter = 84 inches

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Rock Socket Length (ft.)	Nominal Unit Side Shear q_{ss} (ksf)	Nominal Unit End Bearing q_{eb} (ksf)	Nominal Side Resistance R_{sr} (kips)	Nominal End Bearing Resistance R_{eb} (kips)	Factored Side Resistance ϕR_{sr} (kips)	Factored End Bearing Resistance ϕR_{eb} (kips)	Total Factored Axial Resistance ϕR_t (kips)	Total Factored Uplift Resistance ϕR_{tu} (kips)
0.0								
6.0	15.2	100	2006	3848	1003	1924	2927	802
7.0	15.2	100	2340	3848	1170	1924	3094	936
8.0	15.2	100	2674	3848	1337	1924	3261	1070
9.0	15.2	100	3008	3848	1504	1924	3428	1203
10.0	15.2	100	3343	3848	1671	1924	3596	1337
11.0	15.2	100	3677	3848	1838	1924	3763	1471
12.0	15.2	100	4011	3848	2006	1924	3930	1604
13.0	15.2	100	4345	3848	2173	1924	4097	1738
>>> 14.0	15.2	100	4680	3848	2340	1924	4264	1872
15.0	15.2	100	5014	3848	2507	1924	4431	2006
16.0	15.2	100	5348	3848	2674	1924	4598	2139
17.0	15.2	100	5683	3848	2841	1924	4765	2273
18.0	15.2	100	6017	3848	3008	1924	4933	2407
19.0	15.2	100	6351	3848	3176	1924	5100	2540
20.0	15.2	100	6685	3848	3343	1924	5267	2674
21.0	15.2	100	7020	3848	3510	1924	5434	2808
22.0	15.2	100	7354	3848	3677	1924	5601	2942
23.0	15.2	100	7688	3848	3844	1924	5768	3075
24.0	15.2	100	8022	3848	4011	1924	5935	3209
25.0	15.2	100	8357	3848	4178	1924	6103	3343
26.0	15.2	100	8691	3848	4345	1924	6270	3476
27.0	15.2	100	9025	3848	4513	1924	6437	3610
28.0	15.2	100	9359	3848	4680	1924	6604	3744
29.0	15.2	100	9694	3848	4847	1924	6771	3877
AASHTO Table 10.5.5.2.4-1 Resistance Factor, ϕ					0.50	0.50		0.40
>>> = Min. Socket Length							D (ft.) = 7.0	

Load and Resistance Factor Design (LRFD)

DRILLED SHAFT AXIAL RESISTANCE TABLE

**Henderson, US 60 over Green River
Piers 1 - 4**

Rock Socket Diameter = 7.5 feet

Rock Socket Diameter = 90 inches

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[illegible]