STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
STRUCTURES DIVISION
BRIDGE INSPECTION & REPAIR OFFICE
SUITE 1200, JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-1402
(615) 741-0776

CLAY BRIGHT
COMMISSIONER

BILL LEE
GOVERNOR

Date, 2020

NAME
Company
Address
City, Tennessee 37XXX

Subject: Agreement no.: EXXXX
Lump Sum Assignment
Load Rating of On-System Bridges
Bridge ID: See attached list

Dear Mr. XXXX:

We are assigning the enclosed list of XX bridges for load rating. We are also uploading electronic files containing plans and inspection report for each bridge to a shared site. We will provide a link to this site in a separate email.

Please prepare a man-day estimate to perform the scope of services detailed below and develop a compensation ceiling based upon the rates contained in the subject agreement. We consider thirteen (13) percent to be an adequate fee for the proposed work. The man-day estimate shall include a cost for each individual bridge location and a summary estimate for the total work order.

SCHEDULE

The initial load rating reports should be submitted for our review by Date, 2020.

SCOPE OF ENGINEERING SERVICES

1) Develop an AASHTOWare computer model for each bridge on the attached list that accurately reflects the current capacity, dead loads and live loads. The modeling effort shall be limited to the superstructure components. The substructure units need not be modeled or load rated.
2) Use the model to load rate the bridge(s) for the following vehicles:
    a. HL-93 (for LRFR Analysis only)
    b. AASHTO HS-20-44 Vehicle (both Truck and Lane Loading)
    c. AASHTO H-15-44 Vehicle (both Truck and Lane Loading)
    d. AASHTO Type 3 Vehicle
    e. AASHTO Type 3S2 Vehicle
    f. AASHTO Type 3-3 Vehicle
    g. AASHTO SU4 Vehicle
    h. AASHTO SU5 Vehicle
    i. AASHTO SU6 Vehicle
    j. AASHTO SU7 Vehicle

    In addition to the above AASHTO vehicles, we also require that the bridge be load rated for the passage of a Test Permit Vehicle, two Annual Permit trucks and a Class 10 Gravel Truck, the FHWA EV2 and EV3 vehicles. Attached are the axle configurations for the non-AASHTO vehicles and appropriate load cases for each truck.

3) The analysis method to be used is restricted to Load and Resistance Factor Rating (LRFR) or Load Factor (LF). Either approach may be used at the option of the Load Rating Engineer. However, the material properties and member dimensions used in the computer model shall conform to the materials and dimensions specified in the provided bridge design plans. For LRFR load rating, the bridge should be assumed to be in fair condition with ADTT>5000, conservatively. For continuous bridges or bridges with spans greater than 200', addition LRFR load cases shall be considered accordance with AASHTO MBE 6A.4.4.2.1.

4) Should any models yield results that conflict with the performance of the bridge, TDOT Structures Division may request the model be refined with current traffic, bridge condition, travel lanes, etc. The model should also reflect the current bridge conditions provided in the latest inspection report including: dead loads, deterioration or other condition(s) that affect the live load capacity.

DELIVERABLES

Deliverables for this assignment shall consist of an electronic report file, in PDF Format, for the Final Load Rating Report. In addition, electronic copies of the model data files shall be provided.

The report shall include an executive summary section with a table of load rating factors for each bridge and vehicle rated. The report shall also include, AASHTOWare Bridge Rating Overall Summary sheets outlining the rating results for the controlling interior and exterior members. An example is attached.

Your designated contact person for questions concerning analysis procedures and for the final report submittal at the conclusion of the project shall be:

Rebecca Hayworth, P.E.
CE Manager 1
Structures Division / Bridge Inspection HQ
James K Polk Building, 12th Floor
505 Deaderick St, Nashville, TN 37243-0338
P. 615-253-2448
rebecca.hayworth@tn.gov

Steven Paulson, P.E.
CE Manager 1
Structures Division / Bridge Inspection HQ
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505 Deaderick St, Nashville, TN 37243-0338
P. 615-741-4232
steven.paulson@tn.gov

The services provided under this assignment shall comply with the specifications contained in the AASHTO Manual for Bridge Evaluation, Current Edition.

Sincerely,

Rebecca Hayworth, P.E.
Civil Engineer, Manager 1
Structures Division

RPH,rph

Enclosures

Cc: Steven Paulson, P.E. Tom Quinn, P.E. Diana Long

Enclosure 1
Bridge List

	NBI_008	I43 Description	Item 43B Description

Enclosure 2
Additional TDOT Load Rating Trucks

Additional TDOT Load Rating Trucks

Truck	Truck Weight	Length	Load Cases		Axle No.	Load (kips)	Spacing (ft)	
			LRFR	LF			Minimum	Maximum
Gravel Truck	37 tons	19 ft	Legal	Operating	1	20		
					2	14	10.5	10.5
					3	20	4.25	4.25
					4	20	4.417	4.417
Annual Permit 1	82.50 tons	74 ft	Permit - Unlimited Crossings	Operating	1	13		
					2	20	12	12
					3	20	4.5	4.5
					4	20	4.5	4.5
					5	23	30	30
					6	23	4.5	4.5
					7	23	14	14
					8	23	4.5	4.5
Annual Permit 2	82.50 tons	59 ft	Permit - Unlimited Crossings	Operating	1	13		
					2	20	12	12
					3	20	4.5	4.5
					4	20	4.5	4.5
					5	23	15	15
					6	23	4.5	4.5
					7	23	14	14
					8	23	4.5	4.5
FHWA EV2	28.75 tons	15 ft	Per FHWA guidance		1	24		
					2	33.5	15	15
FHWA EV3	43 tons	17 ft	Per FHWA guidance		1	24		
					2	31	13	13
					3	31	4	4
Overweight Permit	255	108	Permit	Single-Trip	1	15		
					2	20	12	12
					3	20	4	4
					4	20	4	4
					5	20	12	12
					6	20	4	4
					7	20	4	4
					8	20	40	40
					9	20	4	4
					10	20	4	4
					11	20	12	12
					12	20	4	4
					13	20	4	4

Enclosure 3

Example AASHTOWare Bridge Rating Overall Summary

Bridge Name: SR 840 OVER WEST HARPETH RIVER
NBI Structure ID: 94SR8400051
Bridge ID: 94SR8400051

Analyzed By: bridgeware
Analyze Date: Wednesday, November 27, 2019 13:51:20
Analysis Engine: AASHTO LFR Engine Version 6.8.1.3001
Analysis Preference Setting: None

Report By: bridgeware
Report Date: Wednesday, November 27, 2019 13:54:17

Structure Definition Name: 3 SPAN 5 GIRDER SYSTEM
Member Name: BEAM A
Member Alternative Name: EXTERIOR GIRDER

Load Factor Rating Summary

Girder Summary

Live Load		Rating Factor	Controls	Capacity (Ton)	Span	Location (ft)	Percent	Impact	Lane
Annual Permit 1	Inventory	0.885	Design Flexure - Concrete	73.04	2	121.75	100.0	As Requested	As Requested
Annual Permit 1	Operating	1.479	Design Flexure - Concrete	121.98	2	121.75	100.0	As Requested	As Requested
Annual Permit 2	Inventory	0.798	Design Flexure - Concrete	65.83	2	121.75	100.0	As Requested	As Requested
Annual Permit 2	Operating	1.333	Design Flexure - Concrete	109.94	2	121.75	100.0	As Requested	As Requested
EV2	Operating	3.419	Design Shear - Concrete	98.30	3	12.06	10.0	As Requested	As Requested
EV3	Operating	2.132	Design Shear - Concrete	91.69	3	48.25	40.0	As Requested	As Requested
Gravel Truck	Inventory	1.559	PS Tensile Stress - Concrete	57.68	1	48.25	40.0	As Requested	As Requested
Gravel Truck	Operating	2.607	Design Shear - Concrete	96.46	3	48.25	40.0	As Requested	As Requested
H 15-44	Inventory	2.283	Design Shear - Concrete	34.25	3	12.06	10.0	As Requested	As Requested
H 15-44	Operating	3.813	Design Shear - Concrete	57.20	3	12.06	10.0	As Requested	As Requested
HS 20-44	Inventory	1.660	Design Shear - Concrete	59.75	3	12.06	10.0	As Requested	As Requested
HS 20-44	Operating	2.772	Design Shear - Concrete	99.78	3	12.06	10.0	As Requested	As Requested
Overweight Permit	Inventory	0.756	Design Shear - Concrete	96.45	3	12.06	10.0	As Requested	As Requested
Overweight Permit	Operating	1.263	Design Shear - Concrete	161.07	3	12.06	10.0	As Requested	As Requested
SU6 LFR	Operating	2.755	Design Shear - Concrete	95.73	3	48.25	40.0	As Requested	As Requested
SU7 LFR	Operating	2.598	Design Flexure - Concrete	100.68	2	121.75	100.0	As Requested	As Requested
Type 3S2	Inventory	1.757	Design Flexure - Concrete	63.24	2	121.75	100.0	As Requested	As Requested
Type 3S2	Operating	2.934	Design Flexure - Concrete	105.61	2	121.75	100.0	As Requested	As Requested

Note:
"N/A" indicates not applicable
"**" indicates not available

Bridge Name: SR 840 OVER WEST HARPETH RIVER
NBI Structure ID: 94SR8400051
Bridge ID: 94SR8400051

Analyzed By: bridgeware
Analyze Date: Wednesday, November 27, 2019 13:51:20
Analysis Engine: AASHTO LFR Engine Version 6.8.1.3001
Analysis Preference Setting: None

Report By: bridgeware
Report Date: Wednesday, November 27, 2019 13:54:17

Structure Definition Name: 3 SPAN 5 GIRDER SYSTEM
Member Name: BEAM B
Member Alternative Name: INTERIOR GIRDER

Load Factor Rating Summary

Girder Summary

Live Load		Rating Factor	Controls	Capacity (Ton)	Span	Location (ft)	Percent	Impact	Lane
Annual Permit 1	Inventory	0.895	Design Flexure - Concrete	73.84	2	0.00	0.0	As Requested	As Requested
Annual Permit 1	Operating	1.495	Design Flexure - Concrete	123.31	2	0.00	0.0	As Requested	As Requested
Annual Permit 2	Inventory	0.807	Design Flexure - Concrete	66.55	2	0.00	0.0	As Requested	As Requested
Annual Permit 2	Operating	1.347	Design Flexure - Concrete	111.14	2	0.00	0.0	As Requested	As Requested
EV2	Operating	3.451	Design Shear - Concrete	99.22	1	108.56	90.0	As Requested	As Requested
EV3	Operating	2.167	Design Shear - Concrete	93.18	1	72.37	60.0	As Requested	As Requested
Gravel Truck	Inventory	1.607	PS Tensile Stress - Concrete	59.47	3	72.37	60.0	As Requested	As Requested
Gravel Truck	Operating	2.651	Design Shear - Concrete	98.07	1	72.37	60.0	As Requested	As Requested
H 15-44	Inventory	2.305	Design Shear - Concrete	34.57	1	108.56	90.0	As Requested	As Requested
H 15-44	Operating	3.849	Design Shear - Concrete	57.74	1	108.56	90.0	As Requested	As Requested
HS 20-44	Inventory	1.675	Design Shear - Concrete	60.31	1	108.56	90.0	As Requested	As Requested
HS 20-44	Operating	2.798	Design Shear - Concrete	100.71	1	108.56	90.0	As Requested	As Requested
Overweight Permit	Inventory	0.764	Design Shear - Concrete	97.35	1	108.56	90.0	As Requested	As Requested
Overweight Permit	Operating	1.275	Design Shear - Concrete	162.58	1	108.56	90.0	As Requested	As Requested
SU6 LFR	Operating	2.799	Design Shear - Concrete	97.27	1	72.37	60.0	As Requested	As Requested
SU7 LFR	Operating	2.627	Design Flexure - Concrete	101.78	2	0.00	0.0	As Requested	As Requested
Type 3S2	Inventory	1.776	Design Flexure - Concrete	63.93	2	0.00	0.0	As Requested	As Requested
Type 3S2	Operating	2.966	Design Flexure - Concrete	106.77	2	0.00	0.0	As Requested	As Requested

Note:
"N/A" indicates not applicable
"**" indicates not available