1.0 BRIDGE PROJECT MANAGEMENT (Source Type 1010)

1.1 Bridge Design Administration
State will provide a Bridge Office Project Manager to help manage bridge design activities. It will be the responsibility of the Bridge Office Project Manager to receive the work produced by Contractor, review the work for compliance with contract requirements, and to recommend payment for such work. Contractor will utilize a ProjectWise directory for file sharing. Project directory standards and file naming standards are available upon request to the Bridge Office Project Manager.

1.2 Schedule Management
State anticipates that the CMGC will provide a Critical Path Method (CPM) schedule for the construction of the project. Contractor will coordinate its design schedule with the construction schedule in order to meet proposed project completion date(s). This may include dividing the overall project into separate work packages.

1.3 Bridge Design Meetings

1.3.1 Bridge Design Kick-Off Meeting
Contractor will schedule and facilitate a design kick-off meeting to establish communication protocol for the design, discuss known project issues, and review the project schedule. Contractor will receive available project information from State, including the most up-to-date preliminary design information. Note: Contractor must submit its list of meeting attendees to State’s Project Manager five days prior to the meeting. (Assume a 4 hour duration).

1.3.2 Project Design Team (PDT)
State has established the PDT that will include:

- Project Director (Darren Nelson - State District 3)
- Assistant Project Manager (Claudia Dumont - State District 3)
- Project Design Manager (Tom Highum - State District 3)
- Project Construction Manager (Tim Paul - State District 3)
- Bridge Office Project Manager (Matt Harold - State Bridge Office)
- Geotechnical Project Manager (Rich Lamb - State Geotechnical Office)
- Other State Specialty Offices as needed
- Road Design Project Manager (Road Design Consultant)
- Road Design Oversight Manager (Road Design Consultant)
- Bridge Design Oversight Manager (Road Design Consultant)
- CMGC (Ames Construction)
- CMGC Program Manager (Kevin Hagness – State Central Office)
- ICE (per separate Contract)
- EE (per separate Contract)
- Estimating Representative(s) (State)
- Bridge Design Consultant (Contractor)

State will schedule weekly progress meetings during the design phase for the PDT that will be held at the MnDOT Office in St. Cloud, Minnesota. State’s Project Director will lead these meetings. Contractors’
design team will attend these meetings as needed via video or teleconference (Assume 50 PDT meetings of 3 hours duration).

Contractor will maintain a log of bridge design related issues and meet with the State’s Bridge Office Project Manager on a weekly basis to discuss action items and resolved issues. (Assume 50 meetings of 1 hour duration for key personnel).

1.3.3  Bridge Design Meetings
Contractor will collaborate with State to schedule progress meetings during the final design phase for the bridge design team, separate from the PDT which will be held either via Skype/WebEx or in person at State’s Bridge Office. Contractor’s Lead Bridge Design Engineer will lead the meetings. Contractor will coordinate meeting attendance and agenda items with other project stakeholders as required.

Contractor will meet with the Bridge Office Project Manager to discuss action items and design specific issues and maintain a comment log and action item list (specific to each bridge) that require resolution, which must be included in meeting minutes. Contractor will record and submit meeting minutes to the Bridge Office Project Manager within three business days after each meeting. (Assume 25 meetings of 1 hour duration).

1.3.4  Plan Review Meetings
Following State’s review of each Final Design Submittal, Contractor’s Project Manager and Lead Bridge Designer will participate in meetings (assumed for resolution of plan comments if necessary). If needed, Contractor will coordinate meeting agenda items, provide response to plan review redlines and provide comment logs with comment resolution responses to State’s Project Manager for each submittal. Contractor will also record and furnish meeting minutes within three business days after each meeting (assume six, one-hour meetings).

1.4  Contractor’s Key Personnel
Contractor’s key personnel required to work on this contract include:

- Project Manager
- Lead Bridge Design Engineer
  - Final Bridge Design Engineer(s) for both superstructure and substructures
  - Quality Control (QC) Checkers for superstructure and substructures
- 3D Model Lead
- QA Manager

Contractor’s Project Manager will administer and manage delivery of the bridge plans as described in the staff approved layout. Administration includes communication with State, coordination with the PDT, invoicing, supplemental agreements, cost and schedule updates, billing preparation, and other non-technical work.

Contractor’s Lead Bridge Design Engineer will manage development of final bridge plans for the assigned bridges based on the staff approved layout.
Contractor’s 3D Model Lead will manage the development and Quality Control of the 3D BIM models.

Contractor’s QA Manager will be responsible for implementation and management of a QMP and QA and QC Procedures.

No changes in Contractor’s project management or lead design personnel may be made without prior written consent of the Bridge Office Project Manager. State will notify Contractor immediately if there are changes to State’s project management or lead design personnel.

2.0 3D BRIDGE MODELS

2.1 Overview
In support of the Department’s goal to utilize 3D design tools in preconstruction, the Contractor will develop a BIM model including all pertinent bridge elements in order to develop construction plans. The level of development (LOD) can vary on each model depending on the intended use.

LOD Levels
LOD 100 – The Model Element may be graphically represented in the Model with a symbol or other generic representation, but does not satisfy the requirements for LOD 200. Information related to the Model Element can be derived from other Model Elements.

LOD 200 – The Model Element is graphically represented within the Model as a generic system, object, or assembly with approximate quantities, size, shape, location, and orientation. Non-graphic information may also be attached to the Model Element.

LOD 300 – The Model Element is graphically represented within the Model as a specific system, object or assembly in terms of quantity, size, shape, location, and orientation. Non-graphic information may also be attached to the Model Element.

LOD 350 – The Model Element is graphically represented within the Model as a specific system, object, or assembly in terms of quantity, size, shape, location, orientation, and interfaces with other structural systems. Non-graphic information may also be attached to the Model.

LOD 400 – The Model Element is graphically represented within the Model as a specific system, object, or assembly in terms of size, shape, location, quantity, and orientation with detailing, fabrication, assembly, and installation information. Non-graphic information may also be attached to the Model Element.

Two levels of development in the 3D BIM models will be required as shown in Sections 2.2 and 2.3 below.

2.2 Full 3D BIM Model
One bridge (assumed to be BR 71017) will be modeled fully in 3D, including all pertinent bridge elements in order to develop the construction plans. 2D construction plans will be created using cross-sections and views generated from the 3D model, to the extent practical, and be used as the documents of record. The required level of development for each bridge element (if applicable) is as shown below in Table 1.
<table>
<thead>
<tr>
<th>Component</th>
<th>LOD 100</th>
<th>LOD 200</th>
<th>LOD 300</th>
<th>LOD 350</th>
<th>LOD 400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridge deck concrete</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Bridge deck rebar</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bridge barrier concrete</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Barrier rebar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Barrier conduit</td>
<td></td>
<td>_</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barrier cover plates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Bearing assemblies</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expansion joints</td>
<td></td>
<td>_</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abutment concrete</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Abutment rebar</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Abutment piles</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Abutment aesthetic treatments</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Abutment backfill</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Abutment slope protection</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Pier concrete</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Pier rebar</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Pier piles</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Pier aesthetic treatments</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Girders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Crossframes/diaphragms and stiffeners</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Girder shear connectors</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Deck drains and drainage system</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.3 Geometry-Only 3D BIM Model

One bridge (assume to be BR 71019) will have the geometry modeled in 3D in order to assist the roadway design coordination. Plans may be developed in a conventional 2D method. The required level of development for each bridge element (if applicable) is as shown below in Table 2.

<table>
<thead>
<tr>
<th>Component</th>
<th>LOD 100</th>
<th>LOD 200</th>
<th>LOD 300</th>
<th>LOD 350</th>
<th>LOD 400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridge deck concrete</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Bridge deck rebar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bridge barrier concrete</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Barrier rebar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barrier conduit</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Barrier cover plates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bearing assemblies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Expansion joints  X  
Abutment concrete  X  
Abutment rebar  
Abutment piles  X  
Abutment aesthetic treatments  X  
Abutment backfill  X  
Abutment slope protection  X  
Pier concrete  X  
Pier rebar  
Pier piles  X  
Pier aesthetic treatments  X  
Girders  X  
Crossframes/diaphragms and stiffeners  X  
Girder shear connectors  
Deck drains and drainage system  X  

3.0 Quality Management Plan and Quality Assurance/Quality Control Procedures (Source Type 1250)
Contractor will develop a QMP that specifies how Contractor will perform QA and QC activities throughout the duration of the project to ensure delivery of a quality product in a timely manner that conforms to established contract requirements. Contractor will prepare the QMP and distribute it to all project team members, including subcontractors. Components of the QMP must include the following:

- A List of Requirements
- Checking Procedures for calculations
- Checking Procedures for 3D model
- Checking Procedures for plan development
- Quality Assurance Definitions

Independent peer review contracts are not anticipated to be required for this project, but will be assessed by State upon further development of preliminary bridge plans.

Contractor must ensure that, at a minimum, the following QC procedures are performed and included in the draft Project Design Schedule for delivery of preliminary and final plans:

- **Design, 3D Model and Plan Sheet Check**
  Contractor is responsible for the completeness and accuracy of its work. Calculations, the 3D model and plan sheets must be independently checked and reconciled prior to submittal. Review comments from State on Contractor’s various plan review submittals does not relieve Contractor of liability for an inaccurate or incomplete bridge plan.

- **Software**
  All computer programs and/or spreadsheets utilized by Contractor must be verified by Contractor’s in-house QA Program and conform to all requirements of BDM Section 4.1.
• Quality Assurance

Contractor’s QA Manager will review the entire plan design and production process to ensure the completeness and adequacy of their work and conformance with Contractor’s QA procedures.

4.0 FINAL BRIDGE DESIGN (Source Types: ABUT, DECK, GEOM, PIER)

Contractor will conduct detailed bridge design, develop 3D models, and prepare Final Certified Bridge Plans in accordance with the provisions detailed below. If State determines at any time during design that major plan revisions are necessary due to Contractor plan errors, Contractor will furnish revised plan sheets at no cost to State.

Contractor will perform all required engineering to determine the geometric, material, and procedural requirements for the construction of the bridges.

4.1 Design Standards and Plan Preparation

Final Certified Bridge Plan sheets will be prepared in accordance with the following manuals, standards and documents:

a) MnDOT Load and Resistance Factor Design (LRFD) Bridge Design Manual
b) American Association of State Highway and Transportation Officials (AASHTO) LRFD Bridge Design Specifications
c) MnDOT Bridge Details Manual (Parts I and II)
d) MnDOT Standard Specifications for Highway Construction
e) MnDOT Computer Assisted Design & Drafting (CADD) Standards
f) MnDOT Summary of Recommended Drafting Standards
g) AASHTO Manual for Bridge Evaluation, current edition
h) MnDOT Staff Approved Layout
i) MnDOT Checking List for Final Plans
j) MnDOT Preliminary Bridge Plans
k) Project Visual Quality Manual (VQM)
l) MnDOT Roadway Design Plan

All plan submittals will be on 11x17 paper, 20 lb. white bond or approved equivalent. Plan sheets will be produced using the current version of MicroStation. All 3D model submittals will be on a flash drive or approved file transfer system and must be the current version of Microstation and in a format that can be reviewed by State.

4.2 Bridge Surveys

State will provide survey sheets. Contractor must review the survey sheets and report any additional survey needs to State’s Project Manager as soon as possible. If needed, additional survey work will be added to this contract by amendment.

4.3 Foundations

State’s Foundations Unit will provide the Foundation Analysis and Design Recommendations (FADR).

4.4 Deck Drainage System

If the Preliminary Plan indicates the need for deck drainage, then Contractor will design a deck drainage system(s) on the bridges based on the allowable spread criteria for the given roadway geometrics based
on MnDOT Technical Memorandum No. 11-14-B-05. Use design frequency storm data from the Atlas 14 Regionalization Intensity-Duration-Frequency for the region in which the bridge is located. Contractor must coordinate the drainage system design with the roadway and grading design consultant.

4.5 Aesthetics
Contractor will incorporate aesthetic details consistent with the Preliminary Bridge Plan and VQM developed for the project. State anticipates having the VQM available at the kick-off meeting, with aesthetics finalized in the signed preliminary plans.

4.6 Cost Estimating
Contractor will provide estimated item quantities and pay item lists with all plan submittals. Contractor will consult with State to obtain Pay Items for inclusion with 30% Plans, and will update estimated quantities with each submittal for use by CMGC and estimating teams.

4.7 Final Design Submittals
Contractor will coordinate plan reviews with an assigned Final Bridge Design Unit of State’s Bridge Office. The District 3 Project Manager and Bridge Design Oversight Manager will be copied on all significant correspondence. For each submittal, Contractor must submit a flash drive containing all electronic files and documents required in the subarticles herein.

4.7.1 30% Plan Review
The 30% Plan provides State an early review of the final plan preparation for conformance with the approved Preliminary Plan, aesthetic guidelines, and key design specifications. The intent of this review is to identify design discrepancies at an early stage and avoid major plan modifications resulting from future reviews. At a minimum, the 30% Plan will include:

a) General Plan and Elevation Sheet(s)
For this submittal, the General Plan and Elevation sheet(s) need to be completed only to the extent necessary to show general dimensions, elevations, cross section with proposed bridge type, architectural features, stage construction information, and basic design data. The sheet(s) will be based on the approved Preliminary Plan.

b) Pay Items and estimated quantities
In addition to the pay item sheet, Contractor will provide a Microsoft Excel spreadsheet that includes all pay items and estimated quantities for use the estimating teams. It is understood that estimated quantities will be subject to change with each submittal, but additional effort will be required to provide accurate estimated quantities for all pay items with each submittal, including the initial 30% Plan stage.

c) Framing Plan
Include a preliminary beam run with computations.

d) Bridge Layout Sheet(s)
For this submittal, the Bridge Layout Sheet(s) must show a line diagram that indicates the control point, work line, reference lines, and proposed working point locations. The tabulations required do not need to be completely filled in; however, the sheet(s) will indicate the diagonal and other dimensions that will be included in the Final Plan. It will also contain any corner views sections, and notations (i.e. expansion joint details at gutters, sidewalks, barriers, etc.) needed to clarify the working point locations. Corner details may be detailed on a separate sheet for clarity.

e) Abutment Layout Sheet(s)
For this submittal, the abutment layout sheet(s) need to be completed only to the extent necessary to show footing size and the top/bottom elevations for coordination with Final
Road Design. It will also contain any tie-in points to adjacent bridges, retaining walls, or both. Contractor will promptly coordinate any changes in footing size, elevation, or both that occur between the 30% Plan and the 60% Plan that would impact the grading plans. Design input assumptions by the contractor may include controlling parameters that reduce the number of individual abutment or wing designs.

f) Architectural or Special Detail Sheet(s)
Architectural or special detail sheet(s) showing any standardized shapes proposed to maximize repeatability of pier forms and other special details that require early coordination between Contractor and State prior to Final Plan preparation.

g) Bridge Survey Sheet(s)
Survey sheets from the approved Preliminary Plan are to be included in this submittal; however, they are not required to be completed.

h) Stage Construction Detail Sheet(s)
Stage construction and deconstruction of the project is under development by others. Preliminary Plans will indicate general staging schemes and note(s) for any specific bridges requiring refined stage construction details that will be required for inclusion in Final Bridge Plans.

i) Bridge Mounted Overhead Sign Structures
Design and plans for overhead sign structures is assumed to be provided by others and included in the project roadway plans. If applicable, assumed work for bridge mounted overhead sign structures is limited to identification of the structure on the General Plan and Elevation sheets with reference to see the roadway plans. Loads from sign structures will be provided by State to be incorporated into the structural design by Contractor.

j) 3D Models
For this submittal, the 3D models will include the location and approximate size of the abutment and pier footings, the bridge deck modeled to the level required to accurately show begin and end of bridge locations, and any other bridge elements that are anticipated to be in conflict or nearly in conflict with utilities. It will also contain any tie-in points to adjacent bridges, retaining walls, or both. Contractor will promptly coordinate any changes in footing size, elevation, or both that occur between the 30% Plan and the 60% Plan that would impact the grading plans.

k) Any supporting design computations used to develop the aforementioned items.

Contractor will submit a digital copy of the 30% Plans to State for review, along with plan and calculation check prints, the 3D models and electronic Microsoft Excel format pay items and estimated quantities. State will return 30% Plan comments to Contractor within 20 working days. Contractor may proceed with further design during this review period.

4.7.2 60% Plan Review
The intent of the 60% Plan Review is to verify Contractor’s progress toward plan completion and evaluate against project and contract timelines. The 60% Plans must include digital copies of in-progress plan sheets, the 3D models, working copies of electronic design files (MicroStation, Geopak), Draft Unique Special Provisions, and updated pay items and estimated quantities (including updated Microsoft Excel format pay items and estimated quantities) for use by CMGC and estimating teams. Include PC beam design, abutment details, and pier design and details. The 3D models must be complete to the Level of Development as shown in Table 2 for both the Full 3D and Geometry-Only 3D models. State’s Bridge Office will return 60% Plan review comments within 20 working days. Include plan and calculation check prints, along with the comment log or other process documenting resolution of all State plan review comments from the 30% review. Contractor will be allowed to continue with design during this submittal.
4.7.3 **90% Plan Review**

The intent of the 90% Plan Review is for State to verify that the plan is acceptable for the State Bridge Engineer’s signature. The 90% Plans should be complete in all areas to the extent that it can be certified by Contractor, although a certification signature is not required until after this review has been completed. The 3D models must be complete to the Level of Development shown in Tables 1 and 2. Contractor will submit the 90% Plan and 3D models to State with updated pay items and estimated quantities (including updated Microsoft Excel format pay items and estimated quantities) for use by CMGC and estimating teams, together with the plan and calculation check prints and comment log or other process documenting resolution of all State plan review comments from the 60% review. State’s Bridge Office will return 90% Plan review comments within 20 working days. Contractor will also submit an electronic copy of finalized Unique Special Provisions with the 90% Plan submittal.

4.7.4 **Construction Elevations**

Upon reconciliation of State’s 90% Plans comments, Contractor will produce construction elevations for the bridge(s). Regardless of the software used, the output format for construction elevations must be consistent with State’s construction elevation program. State will provide instructions and an example of construction elevations output upon request. The construction elevations output must be submitted to State with the Final Certified Bridge Plans.

4.7.5 **Final Certified Bridge Plans**

Upon incorporation of State’s 90% Plan comments, Contractor will submit the Certified Final Bridge Plan and final 3D models to State.

5.0 **BRIDGE DESIGN DELIVERABLES**

Contractor will submit all bridge design deliverables directly to State’s Bridge Office Project Manager.

5.1 **Contractor Deliverables**

a) QMP

b) 30% Plan: **Anticipated due date: September 2020**

1) .pdf file of in-progress 30% Plan
2) Copy of in-progress 3D Models
3) Plan and calculation check prints and comment log (electronic copy)
4) Estimated item quantities and pay item lists, including updated Microsoft Excel format
5) Draft construction elevations output (to verify formatting)

c) 60% Plan: **Anticipated due date: January 2021**

1) Working copies of electronic design files (MicroStation)
2) .pdf file of in-progress of 60% Plan
3) Copy of in-progress 3D Models
4) Plan and calculation check prints and comment log (electronic copy)
5) Estimated item quantities and pay item lists including updated Microsoft Excel format
6) Draft Unique Special Provisions (electronic copy)

d) 90% Plan: **Anticipated due date: May 2021**

1) Working copies of electronic design files (MicroStation)
2) .pdf file of in-progress 90% Plan
3) Copy of in-progress 3D Models
4) Plan and calculation check prints and comment log (electronic copy)
5) Estimated item quantities and pay item lists including updated Microsoft Excel format
6) Unique Special Provisions (electronic copy)

e) Final Certified Bridge Plans: **Anticipated due date: October 2021**
1) Final Design Calculations (electronic copy)
2) Final Quantity Calculations and Pay Items (electronic copy) in Microsoft Excel format
3) Plan and calculation check prints and comment log (electronic copy)
4) MicroStation files of Final Bridge Plans. MicroStation files will allow direct reproduction of all plan sheets with reference files detached.
5) Final 3D Models
6) Construction elevation output
7) Flash drive with electronic copies of all final deliverables

5.2 State Deliverables

a) Signed Preliminary Bridge Plan
b) Checking List for Final Plans
c) Soil borings analysis
d) Foundations recommendations
e) Geopak (.gpk) files
f) Project VQM
g) Plan review comments
h) Signature and distribution of the Final Bridge Plan
i) Bridge Special Provisions (covering common items)
j) FADR
k) Roadway lighting plans
l) Ornamental rail details

6.0 LOAD RATING ANALYSIS (Source Type: 2850)

Contractor will provide a load rating analysis for its assigned bridge(s) and provide a Bridge Rating and Load Posting report. All load rating work will be done in accordance with the AASHTO Manual for Bridge Evaluation, current edition with interims.

Contractor will provide the load rating using AASHTOWare BrR software. Guidelines for AASHTOWare BrR input requirements will be provided by State upon request. If the bridge cannot be rated with AASHTOWare BrR, Contractor must use another commercially available structural analysis software with the approval of State. The software must be capable of running overweight vehicles as described below.

Contractor will load rate the bridge carrying vehicular traffic for Load and Resistance Factor Rating (LRFR) using the following:

a) HL-93 loading
b) Minnesota Standard Permit Trucks G-80
c) Minnesota Standard Permit Trucks G-07, when a non-BrR software is used

The LRFR rating factor for new bridges must be a minimum of 1.0 at the Inventory level for HL-93 loading and 1.15 at the Operating level for permit loading. Contractor must demonstrate that the minimum rating factors are being provided during the design of the bridge. For bridges with a minimum of one span over 200 feet long, the permit vehicle loading must consist of a combination of the permit vehicle and lane load. The lane load must be in accordance with Article 3.6.1.2.4 of the AASHTO LRFD Bridge Design Specifications, except that the load will be 0.20 klf.

Contractor will rate the deck for any design that deviates from MnDOT standard design tables. Rate and report each separate superstructure component, segment, or type within the overall bridge; at a minimum, rate for moment and shear at the tenth points of each span. The overall rating must be the lowest rating of any individual component, segment, or type. The final rating and each component rating must be
accompanied by the location of the rating, the limit state, and the impact factor. Where ramps extend onto a bridge, rate the ramp as a separate member. For culverts, complete MnDOT Form 90.

6.1 Contractor Deliverables
a) At the 60% Plan Submittal, Contractor will submit the following:
   1) AASHTOWare BrR software file or the file from another commercially available software.
   2) Any supplemental documentation in memo format that cannot be found in the plan sheets provided with the 60% Plan.

b) Contractor must investigate the applicability of AASHTOWare BrR. If this software will not work for the bridge, then Contractor must submit a brief memo documenting the investigation and findings.

c) At the Final Certified Plan Submittal, Contractor will submit the following:
   1) Bridge Rating and Load Posting Report. The AASHTOWare BrR software file or the file from another commercially available software must be submitted with the Bridge Rating and Load Posting Report. The ratings must be based on the final configuration of the bridge.

7.0 APPROACH PANEL DESIGN & DETAILING (Source Type: 1250)
For bridge approach panels, Contractor will:

a) Choose and modify the appropriate standard plan sheets necessary for the bridge approach panels (http://standardplans.dot.state.mn.us/StdPlan.aspx). It has been assumed that modifications are geometry and joint location related and do not include additional structural calculations including barriers or moment slab design/detailing.

b) Prepare any other necessary details needed for the construction of the bridge approach panels.

c) Coordinate the approach panel design with the roadway and grading design consultant.

d) Submit final plan sheets to State for bridge approach panels.

e) Submit any necessary special provisions for the bridge approach panels (for any construction requirements in addition to the State’s current standard provisions).

f) Submit Microstation files to State for bridge approach panels designed.

Contractor will provide plans signed by a professional engineer registered in the State of Minnesota and any special provisions needed for the approach panels. The approach panel plan sheets will be included in the grading plans being prepared by State. Contractor will provide a list of approach panel sheets expected for detailing at the same time as the 30% bridge plans. The approach panel sheets are not expected to be complete with the 30% submittal. Contractor must provide finalized approach panel plans sheets at the same time as the 60% bridge plans.

7.1 Contractor Deliverables
a) At the 30% Plan Submittal, Contractor will submit the following:
   1) Standard approach panel sheets with no modifications done, but a list of proposed sheets and the indication whether or not those sheets will be modified. The primary purpose is to identify an approximate sheet count for the grading plans.

b) At the 60% Plan Submittal, Contractor will submit the following:
   1) Certified approach panel sheets and any special provisions needed for approach panels.

8.0 CONSTRUCTION SUPPORT (Source Type 1800)
During the construction phase of the project, Contractor will respond to Requests for Information (RFIs) and provide supporting design analysis as needed. If these services are needed, State’s Project Manager will send
the RFIs to Contractor, and Contractor will direct its responses back to State’s Project Manager. Assume 120 hours for construction support.

THE BALANCE OF THIS PAGE HAS BEEN INTENTIONALLY LEFT BLANK