Manuals Committee
Meeting Agenda
Wednesday, March 1, 2023 (immediately after Standards Committee Meeting)
Meeting Location: 1334 Smith Street, Charleston, WV in Lower-Level Conference
Also meeting virtually via Google Meet. E-mail distribution includes instruction.

Call to Order

Old Business

TITLE	Champion
2nd time to Committee. Discussed in January. 2023 Bridge Load Rating Manual (BLRM) for In-Service Bridges. The manual describes the policies and procedure for load rating and posting of public road bridges. It is an update to the 2020 BLRM. The manual has been updated per comments at the last meeting; adding references to the Structural Directives and minor formatting updates. It is a clean copy showing the proposed manual.	R. Tennant & C. Iser
2nd time to Committee. Discussed in January. WVDOH Tunnel Inspection Manual. The manual gives guidance and requirements of tunnel inspection and report requirements to meet state and federal code. No update to the manual. It is a clean copy showing the proposed manual.	S. Johnson & J. Bennett

New Business

TITLE	Champion
1st time to Committee. Consultant Services Manual. This is an update of the 2011 manual; it includes four new chapters and revisions to the other chapters for consistency with current WVDOH policies and procedures. New Chapters: • Chapter 1 – Checklist to Perform Services • Chapter 8 – Project Reporting • Chapter 9 – Consultant Evaluations • Chapter 10 – Project Closeout • Chapter 11 – Audit Requirements Significantly Modified Chapters: • Chapter 2 – Requirements to Perform Services It is a clean copy showing the proposed manual.	D. Bodnar & Amy Staud

Next Meeting Date: Wednesday, May 3, 2023.
Deadline for submissions: April 7, 2023.

Adjournment

Bridge Load Rating Manual for In-Service Bridges

2023

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TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION

1.1 PURPOSE

This manual describes the West Virginia Division of Highways WVDOH policies and procedures for load rating and posting of in-service public road bridges. This manual serves as a standard and provides uniformity in the policy and procedures for determining the load capacity of bridges under the jurisdiction of the West Virginia Division of Highways. Design load ratings for bridges being designed in West Virginia should follow Structure Directive 2150 Load Rating of New Bridge Design.

1.2 SCOPE

The provisions of this manual are intended to serve as a guide to the West Virginia Division of Highways personnel involved in the load rating and posting of in-service highway bridges. Those involved in the load rating and posting of in-service highway bridges includes, but is not limited to: district bridge engineers, district evaluation engineers, district evaluation staff, central office evaluation staff, and any consultant or contractor performing load rating analysis on a bridge owned by the West Virginia Division of Highways for legal load evaluation.

1.3 DEFINITIONS, ABBREVIATIONS, AND ACRONYMS

1.3.1 Definitions and Terminology

- *Bridge* – A structure including supports erected over a depression or an obstruction such as water, highway, or railway; having a track or passageway for carrying traffic or other moving loads; and having an opening measured along the center of the roadway of more than 20 feet between undercopings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes. It may also include multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening.
- *Live Load Distribution Factor* – The fraction of a rating truck or lane load assumed to be carried by a structural component. The American Association of State Highway and Transportation Officials Standard Specifications for Highway Bridges use wheel line distribution factors whereas the American Association of State Highway and Transportation Officials Load and Resistance Factor Bridge Design Specifications use axle/lane distribution factors.
- *Load Rating* – The determination of the live-load carrying capacity of an existing bridge.
- *Load Factor* – A load multiplier accounting for the variability of loads, the lack of accuracy in analysis, and the probability of simultaneous occurrence of different loads.
- *Program Manager* – The individual in charge of the program who has been assigned or delegated the duties and responsibilities for bridge inspection, reporting, and inventory. The program manager provides overall leadership and is available to inspection team

leaders to provide guidance. The program manager for West Virginia is also the Assistant Director (Bridge) of Operations Division.

- *Rating Factor* – The ratio of the available capacity in excess of dead load to the live load demand.

1.3.2 Abbreviations and Acronyms

AASHTO – American Association of State Highway and Transportation Officials
ADT – Average Daily Traffic
ADTT – Average Daily Truck Traffic
ASD – Allowable Stress Design
ASR – Allowable Stress Rating
BMD – WV Bridge Maintenance Directive
BrR – AASHTOWare Bridge Rating Software
CO – Commissioner's Order
CRTS – Coal Resource Transportation System
DBE – District Bridge Engineer
FHWA – Federal Highway Administration
GVW – Gross Vehicle Weight
HO – WVDOH Deputy State Highway Engineer – Operations
LFD – Load Factor Design
LFR – Load Factor Rating
LRE – Load Rating Engineer
LRFD – Load and Resistance Factor Design
LRFR – Load and Resistance Factor Rating
MBE – AASHTO Manual for Bridge Evaluation
NBI – National Bridge Inventory
NBIS – National Bridge Inspection Standards
NCHRP – National Cooperative Highway Research Program
NSTM – Nonredundant Steel Tension Member
OM – Operations Division
QA – Quality Assurance
QC – Quality Control
SI&A – Structure Inventory and Appraisal
UBI – Under Bridge Inspection
WVDOH – West Virginia Division of Highways

1.4 REFERENCES

WVDOH bridge evaluations shall adhere to the requirements of AASHTO except when directed otherwise by this manual or the WV NBIS Program Manager. Users of this manual are encouraged to use the following reference manuals.

- AASHTO Publications
  - MBE, most current edition with applicable revisions/interims
  - LRFD Bridge Design Specifications, most current edition with applicable revisions/interims
  - Standard Specifications for Highway Bridges, 17th Edition
- WVDOH Publications
  - WVDOH Structural Directives
  - Bridge Inspection Manual
  - Modern Timber Bridge Manual
- Other
  - NCHRP Report 725 Guidelines for Analysis Methods and Construction Engineering of Curved and Skewed Steel Girder Bridges

1.5 COORDINATION

Users should direct questions concerning the applicability or requirements of the referenced documents to the Evaluation Section of Operations Division.

1.6 REVISIONS

Revisions may be the result of changes in WVDOH, FHWA, or AASHTO requirements.

Users are invited to send suggestions to the Evaluation Section of Operations Division.

Approved policy and editorial revisions will be included in interim revisions to this manual or a new edition containing all updates.

CHAPTER 2: LOAD RATING PROCESS

2.1 General

The WVDOH aims to provide a safe, effective, and efficient highway system. Load ratings shall be governed by the current version of the MBE specifications and as modified by this manual. Consultant load rating is subject to the terms of contract and scope of work.

2.2 Responsibility

The load rating must be performed under the supervision of a professional engineer licensed by the state of West Virginia. Both in-house and consultant structure load rating results should be checked for accuracy as part of the QA/QC process. It is the responsibility of the LRE and the approving engineer to verify acceptability of all load rating results and safe load capacities.

2.2.1 Computer Program Verification

Whenever possible, longhand verifications shall be performed for a portion of the computer analysis to satisfy the LRE or checker that the computer program is accurate and performing as intended.

2.2.2 Independent Verification

An independent verification of the rating should be performed when possible. When computer programs are used, the verifier should ensure: the accuracy of all input data; the accuracy and suitability of the computer program; and the final load capacities match the analysis results.

2.3 Inspection Data Used for Load Rating

A load rating is based on existing structural conditions of a bridge as stated in MBE 6.1.1 and 6.1.2. For information on inspection information used in load rating, refer to the MBE, CHAPTER 4 of this manual, and the WVDOH Inspection Manual.

2.4 Concepts and Load Rating Methodologies

1. Members of substructures need not be routinely rated for live load except for steel caps and columns, which shall be load rated in most cases. Substructure elements should be rated in situations where the engineer has reason to believe their capacity may govern the load capacity of the entire bridge. See CHAPTER 11 for further guidance.

2. All superstructure spans and their respective live load carrying components shall be load rated for all applicable load effects including, but not limited to: moment, shear, axial, combined moment and shear, combined bending plus axial, and torsion. If the LRE using engineering judgment, determines certain components will not control the rating, a full investigation of the non-controlling elements is not required.
3. For most structures, the governing rating shall be the lesser of the safe load determined by shear or moment of the critical component. For more complex structures, other force effects or limit states may control the rating.
4. The load rating and posting of bridges shall be based on satisfying the requirements for the strength and service limit states, guided by the considerations discussed this manual. For LRFR, limit states shall be considered in accordance with MBE Table 6A.4.2.2-1.
5. WVDOH typically uses BrR for routine, production use bridge load rating; however, the LRE should use other software, spreadsheets, and hand calculations, as necessary, to obtain accurate load ratings.
6. When consultants perform load ratings, they will follow the requirements outlined in their contract which will require adherence to this manual and the current MBE. Contract requirements take precedence over the requirements of this manual. Consultant load ratings shall be signed and sealed by a professional engineer registered in the State of West Virginia. The consultant shall have QC procedures in place. If a consultant has a question about load rating, they should contact the Evaluation Section of Operations Division.

2.5 New Bridges

Load ratings shall be obtained and documented no later than the time of the inventory inspection. Ratings may be obtained before bridge construction as part of the plan review process. Load ratings performed during the design phase shall conform to the requirements of this manual and the MBE.

Bridges load rated during the design process shall have the load ratings and other supporting data submitted on the plan sheets in accordance with the applicable structural directives.

Load ratings reported on the DS-25 at the inventory inspection should be from a district load rating file/model, not from assigned load ratings based on the design plans. If the structure type prevents accurate modeling with available software, assigned ratings will be allowed.

2.5.1 Phased Construction

If a bridge project utilizes phased construction, the safe load capacity of the structure carrying traffic shall be rated in its current condition. Phased construction may lead to structural configurations containing Priority 1 members, as defined later in Chapter 14 of this manual, and are to be evaluated as such in accordance with the posting policy outlined in Chapter 14. Bridge inventory updates and load ratings to determine safe load capacity of phased construction must take place within applicable timeframes outlined by WVDOH and FHWA.

2.6 EXISTING BRIDGES

Existing bridges shall be evaluated at every inspection. If the LRE determines the existing load ratings are still valid, such as when no changes to the bridge affecting load ratings, a new load rating is not required. If possible, any computer analysis should be verified to check any software updates. At each in-depth inspection, the bridge load rating analysis should be thoroughly checked for accuracy.

Items requiring an update to an existing load rating include, but are not limited to:

1. A change in member capacity
    a. Section loss, broken rebar or strands, spalled concrete, broken diaphragm/cross-frame, etc.
2. A change in dead load
    a. New or altered wearing surface, rehabilitated deck, new attachments, etc.
3. A change in live load
    a. New rating trucks
    b. Change in usage: more truck traffic, change in lane striping
    c. Overweight permits
4. A change in load rating methodology

Refer to CHAPTER 4 through CHAPTER 13 of this manual for WVDOH's policies on rating methods to use for various structural types.

2.7 REHABILITATED BRIDGES

Rehabilitated bridges shall be load rated as necessary to update SI&A information. At the time of the next inspection, the rehabilitated bridge shall be treated as an existing bridge (see Section 2.6).

2.8 USE OF COMPUTER SOFTWARE

The use of in-house and/or commercial computer software and spreadsheets is encouraged to aid in the load rating calculations. The LRE and checker are responsible for using the software and/or spreadsheets appropriately, interpreting the results appropriately, and performing the independent checks as required.

Internally, DOH utilizes the following programs and spreadsheets to load rate structures:

- Commercial Software

    BrR – Can be used for most bridge structures and is the preferred software for the WVDOH.

    LARS Bridge – Used to maintain the current Superload permit evaluation system until a new hauling permit system is in place that interfaces directly with BrR's Load Rating Tool for permit live load analysis.

MDX – May be used to load rate curved and straight steel bridges as a secondary check to BrR.

Midas – Used for complex structure load rating for structure configurations and types not easily handled by BrR.

Other commercial software purchased after this time

- Spreadsheets

  There are several in-house spreadsheets that aid in load rating available on the DBE Google Drive resource site.

2.9 QA/QC

2.9.1 QC Review

In accordance with BMD I300-1, some bridge inspection reports submitted to central office for review shall have the load rating summary reviewed to ensure compliance with this manual.

2.9.2 Specific Requirements

2.9.2.1 WVDOH Load Ratings QC Review

BMD-I300-1 outlines "District Statewide Quality Control – Evaluation" as the Evaluation Section's requirement to perform periodic quality control checks and reviews of load ratings performed by district load rating and evaluation staff. For information on these reviews, please reference BMD-I300-1. District LRE's are expected to review the findings and make any necessary changes to specific bridge load ratings and load rating procedures in future load ratings.

The Evaluation Section of OM, with approval from the Program Manager or the Evaluation Section Manager, may independently verify the load ratings performed by district staff to validate the accuracy and completeness of any bridge evaluation as part of the overall QA/QC program.

2.9.2.2 Consultant Load Ratings

Consultants are responsible for the QA/QC of their work, checking both accuracy and completeness. WVDOH reserves the right to review consultant assumptions, methodology, and accuracy before accepting load rating results from consultants.

CHAPTER 3: DATA COLLECTION

3.1 General

The collection of relevant and pertinent existing data regarding the structure is required to perform the load rating. The available information for a specific bridge may be assembled from many different sources or may rely exclusively on inspection and field measurements when other information does not exist. It is the LRE's responsibility to determine the reliability and applicability of available information used to obtain the load rating.

3.2 Existing Plans

Existing plans are often necessary to perform a load rating. The DBE and evaluation engineer will be able to provide plans for most bridges when they are available. As-built plans show the bridge dimensions and properties as it was constructed, thus, they are the preferred plan documentation. Construction plans may be used if the LRE judges them to accurately represent the as-built structure. Construction plans should be used in conjunction with the inventory report to establish basic bridge layout and geometry for load rating. Occasionally bridge plan sets (mainly newer bridges) will have design stress and/or load rating information that may assist with load rating.

3.3 Inspection Reports

The inventory report details many necessary properties of the bridge. The inventory report should indicate if plans are available or not. When plans are not available, the inventory report should provide all necessary information pertaining to bridge layout and geometry.

The most recent inspection report is required to perform a load rating. It should have documentation of condition defects affecting the load rating. It is the responsibility of the LRE to include all appropriate deficiencies documented in the latest inspection reports in the load rating analysis. The latest in-depth inspection report and all the subsequent reports should contain all deterioration documentation necessary for load rating. Some deficiencies to look for include but are not limited to: structural steel section loss, reinforcing steel section loss, broken prestressing strands, and heavily deteriorated concrete.

3.4 OTHER RECORDS

Shop drawings are occasionally available. and commonly required for prestressed concrete beams. Shop drawings may be useful for detailed connection information, particularly gusset plate dimensions. Typically, the shop drawings supersede the contract plans where differences arise.

Other structure history records may exist that will provide additional information pertinent to the load rating. These records may override specifications or measurements reported in the construction plans or repair plans. Examples include:

- Correspondence
- Field Testing Reports
- Maintenance History
- Mill Reports
- Posting History

CHAPTER 4: GENERAL REQUIREMENTS

4.1 CONDITION OF BRIDGE MEMBERS

The condition and extent of deterioration, cracking, bending, or other deficiencies of structural components shall be considered in the load rating. The load rating shall be representative of the structure as it exists in the field; future wearing surfaces accounted for in the design, but not present on the bridge, should not be included.

4.2 DEAD LOADS

The dead load unit weights given in the current AASHTO LRFD Bridge Design Specifications Section 3.5 shall be used in the absence of more precise information.

4.2.1 Distribution of Dead Loads Applied Along Lines (Line Girder Analysis)

Dead loads applied along lines would include parapets, railings, barriers, sidewalks, curbs, and any other superimposed dead load localized along one "line" of the bridge. If these superimposed loads are added to a concrete deck after the deck has hardened, specifications note the load may be distributed uniformly to all beam (or girder) lines. While this method may work well for narrower cross-sections with fewer beams, the proper load distribution diminishes as the bridge width and number of beam lines increases. For this reason, a conservative approach for application of dead loads along lines is outlined below.

For 3-line beam systems, line loads should be distributed equally to all beam lines. For systems with 4 or more lines of beams, the line loads should be distributed as follows: for line loads along the outside of the bridge deck (parapets, railings, curbs, etc.), 60% of that load should be applied to the exterior beam line. The maximum of 40% of the weight in question, or the total line load weight equally distributed to all beam lines (including all line loads traversing the bridge deck), should be applied to the first interior beam. The remainder of the interior beams, if the cross-section has more than 4 lines, should have the equally distributed weight applied to them.

Line loads applied away from the outside edge of decks (median barriers, sidewalks, etc.) should be distributed using engineering judgement. These loads may be uniformly distributed to all beam lines if deemed acceptable by the LRE.

4.3 SIDEWALK LOADING OR PEDESTRIAN LOADING

4.3.1 Pedestrian Live Loading Using the LRFR Method

Follow MBE Article 6A.2.3.4.

4.3.2 Sidewalk Loading Using the LFR or ASR Method

Follow MBE Article 6B.6.2.4.

For bridges closed to vehicular traffic but opened to pedestrian traffic, see Section 15.2.1 of this manual.

4.4 LIVE LOADS

4.4.1 LRFR Method

The following live loads shall be used when rating a structure using the LRFR method (CRTS loads are only required for bridges on the CRTS):

- Design Live Load
  - HL-93 (See MBE Figure C6A-1)
- Legal Live Load (See Figure 4-1 through 4-3)
  - T3
  - SU4
  - SU5
  - SU6
  - SU7
  - WV-2S2
  - 3S2
  - Lane-Type Legal Load
    - See MBE Article 6A.4.4.2.1a
    - The lane-type load models shown in MBE Figures D6A-4 and D6A-5 shall be used (no combination with other state legal loads is required)
  - Emergency Vehicles (See Section 4.6.2.1 and 4.11.1.3)
    - EV2
    - EV3
  - CRTS Trucks
    - SU-40
    - SU-45
    - 3S-55
    - 3S-60
  - WP-47 (See Section 4.9.1)

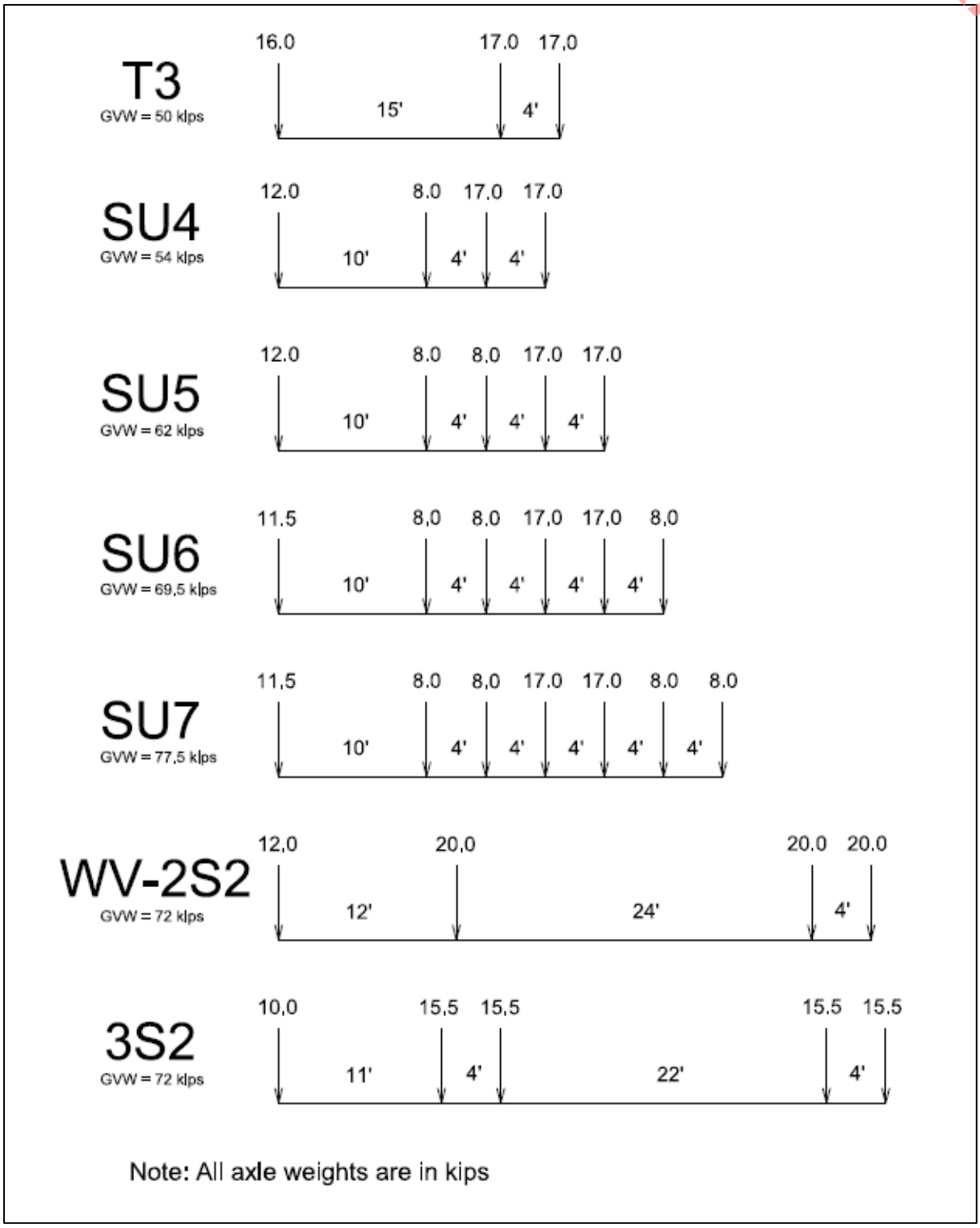


Figure 4-1 Legal Live Load Vehicles

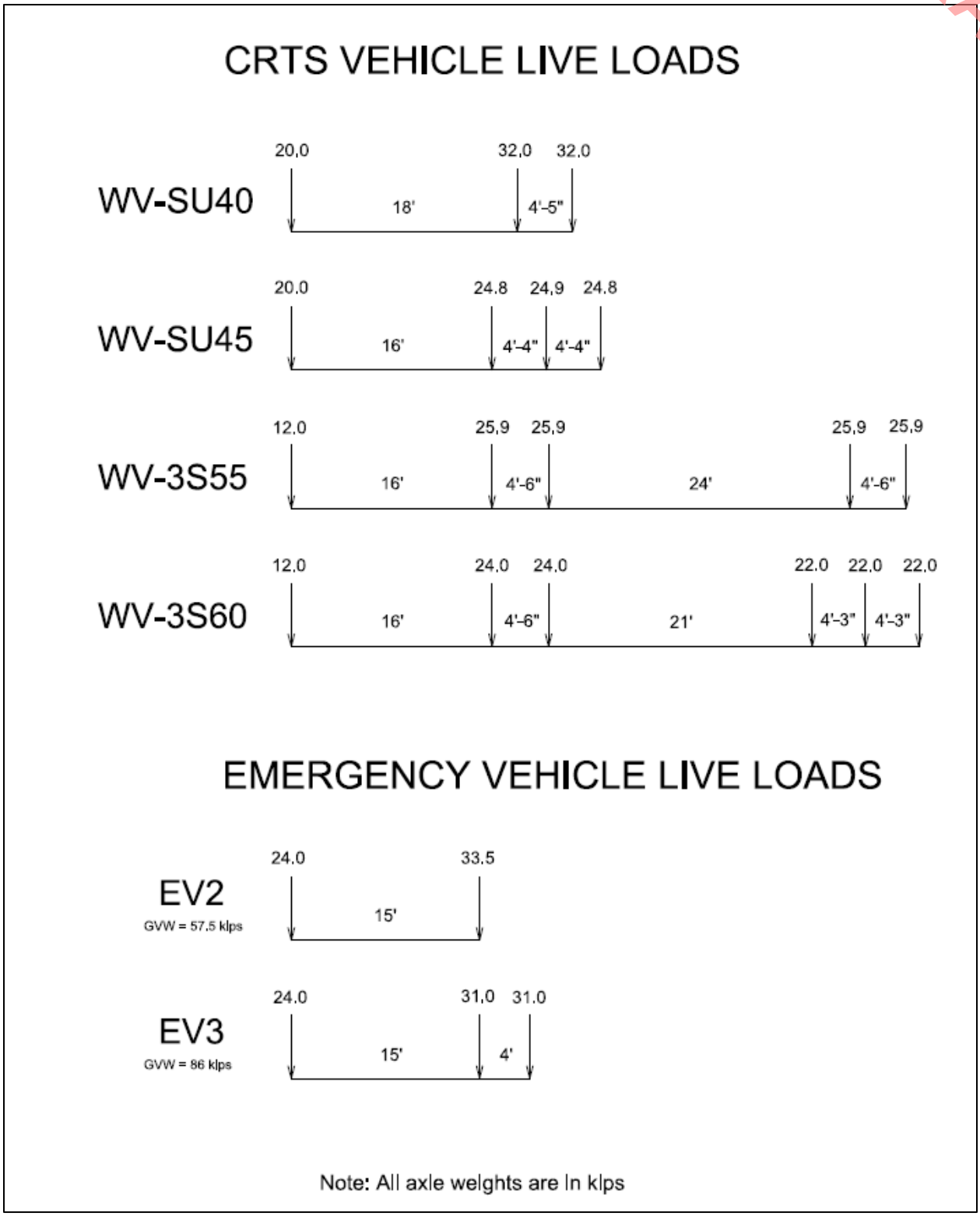


Figure 4-2 CRTS and Emergency Vehicle Live Loads

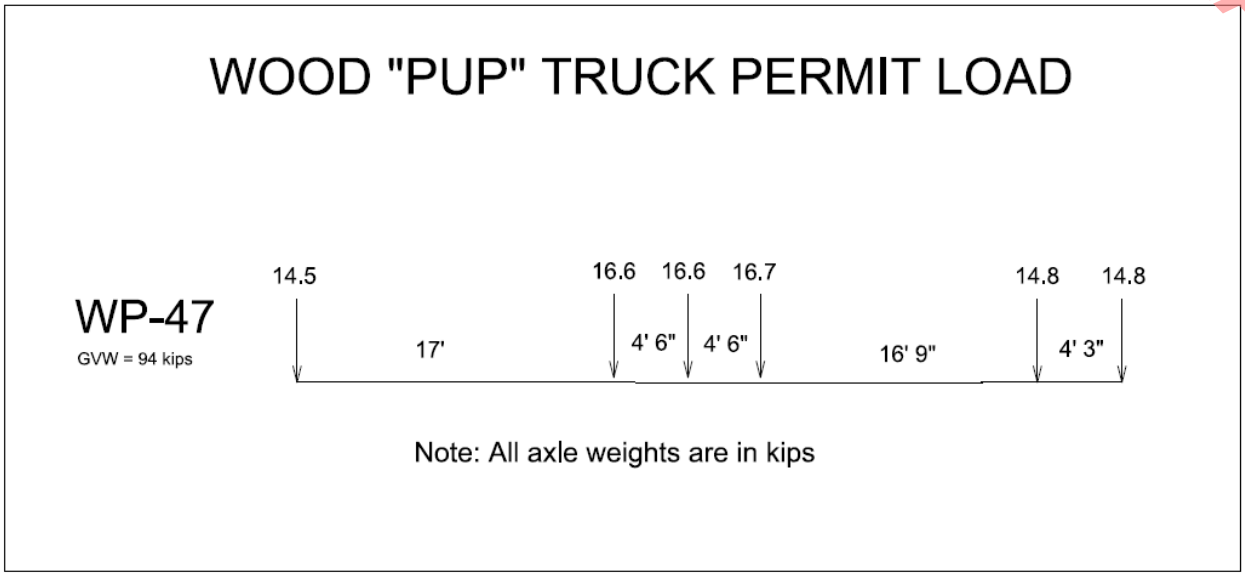


Figure 4-3 Wood "Pup" Truck Live Load

4.4.2 LFR or ASR Method

The following live loads shall be used when rating a structure using the LFR or ASR method (CRTS loads are only required for bridges on the CRTS):

- Design Live Load
  - HS20-44 (See MBE, Figures 6B.6.2-1 and 6B.6.2-2)
- Legal Live Load (See Figure 4-1 through 4-3)
  - T3
  - SU4
  - SU5
  - SU6
  - SU7
  - WV-2S2
  - 3S2
  - Emergency Vehicles (See Section 4.6.2.1 and 4.11.1.3)
    - EV2
    - EV3
  - CRTS Trucks
    - SU-40
    - SU-45
    - 3S-55
    - 3S-60
  - WP-47 (See Section 4.9.1)

4.5 WIND LOADS

Wind loads are not normally considered in load rating. However, the effects of wind on special structures such as movable bridges, long-span bridges, and other high-level bridges should be considered in accordance with applicable standards.

4.6 IMPACT AND TRANSVERSE LIVE LOAD DISTRIBUTION

4.6.1 Impact

The live load impact used for design and legal rating shall be as specified in the MBE. WVDOH does not permit reducing the impact of legal loads as in MBE Table C6A4.4.3-1.

Live load impact for single-trip overweight permit trucks may be reduced and is discussed in Section 4.9.2.

4.6.2 Transverse Live Load Distribution

The transverse live load distribution used for rating shall be as specified in the MBE, Section 6, "Part A" for the LRFR method and Section 6, "Part B" for the ASR and LRFR methods.

When a refined method of analysis is used for the transverse distribution of live load (for example, methods other than the approximate method), the truck and lane load shall be positioned to maximize the force effect being analyzed. Positioning of the truck and uniform lane load within a design lane or adjacent lane shall be determined following MBE 6A.2.3.2 for LRFR and 6B.6.2.2 for LFR/ASR. WVDOH recommends using a 10-foot-wide design lane for wheel placement, resulting in 4 feet between wheel lines of adjacent lanes. WVDOH recommends using the design lanes instead of the actual striped lanes; that is, wheel loads should be placed 2 feet from the curb regardless of the location of striped lanes. Instances may warrant using striped lanes when more feasible, such as a roadway cross-section that includes mountable barriers or sidewalks with no indication of vehicular encroachment. In cases where the roadway width is less than 10 feet wide, the load should be centered in the roadway so that the distance to the wheel load from the barrier would be less than 2 feet. The 6 feet gage distance between wheels should be maintained.

4.6.2.1 Emergency Vehicles

If necessary, when combined with other unrestricted legal loads for rating purposes, the emergency vehicle needs only to be considered in a single lane of one direction of a bridge.

4.7 MATERIAL PROPERTIES FOR LOAD RATING

The material properties used for the ratings of all structures shall be based on the material grade or design stresses specified in the plans. In the absence of plans, or if the plans do not specify the material grades or design stresses, the LRE must use others means to determine the appropriate material properties based on the information available. Typically, this information is based on the year the bridge was constructed and can be found in the MBE, Section 6. If the plans designate the AASHTO specification or WVDOH specification, it may be possible to find historical specifications on material properties. Material testing may be used to determine material properties which may be prudent when higher load ratings are desired.

4.7.1 Structural Steel

Material properties for structural steel of unknown grade shall be obtained from MBE Table 6A.6.2.1-1. Material properties for pins of unknown grade shall be obtained from MBE Table 6A.6.2.2-1.

4.7.2 Steel Rivets

Material properties for steel rivets of unknown grade shall be obtained from MBE Table 6A.6.12.5.1-1.

4.7.3 Reinforcing Steel

Material properties for reinforcing steel of unknown grade shall be obtained from MBE Table 6A.5.2.2-1.

4.7.4 Prestressing Steel

Material properties for prestressing steel of unknown grade shall be obtained from MBE Table 6A.5.2.3-1.

4.7.5 Timber

If documented material properties are not available, the type and grade of wood may be used to find material properties in the AASHTO Standard Specifications or AASHTO LRFD.

4.8 RATING METHODS

4.8.1 When to Use LRFR, LFR, or ASR

LRFR is the most current methodology for rating bridges. It is based on the latest bridge research and technology. LRFR methodology uses load and resistance factors calibrated based on structural reliability theory to achieve a minimum target reliability for the strength limit state.

Any bridge may be rated using LRFR. All bridges designed using LRFD shall be rated using LRFR.

Bridges not designed by LRFD may be rated using LFR. Certain structure types such as timber and masonry, which cannot be rated by LFR, shall be rated using ASR or LRFR.

4.8.2 When to Use Field Evaluation and Documented Engineering Judgment

Field evaluation and documented engineering judgment may be used when one of the following criteria is satisfied:

- Plans are not available for reinforced concrete or prestressed concrete structures.
- A structure type is not able to be analyzed by district personnel such as arches, frames, culverts, etc. Using judgment ratings for these structure types is not ideal; however, for bridges with little to no deterioration a judgment load rating is acceptable.

For assistance on rating concrete structures such as arches, beams, girders, slab bridges, etc., which are in good or fair condition and for which little or no design load information is available, or for concrete, steel, or aluminum culverts where an analysis cannot be performed, see Appendix A.

Field evaluation and documented engineering judgment may also be used for load rating when severe deterioration is found in reinforced/prestressed concrete, steel or timber superstructures or substructures. In this case, the superstructure/substructure condition rating shall not be higher than three.

4.8.3 Original Design Loading/Assigned Ratings

If a load rating analysis is not possible, it may be possible to assign load ratings based on the design load/design load ratings. In order to assign ratings, the current condition of the bridge should not have changed from the original design in a manner affecting the load rating.

4.9 PERMIT LOAD ANALYSIS

4.9.1 Annual (Blanket) Permit Trucks

The WV oversize and overweight annual (blanket) permit allows carriers using a truck tractor, semi-trailer combination with five or more axles to be in excess of legal weight limits up to the following limits:

Table 4-1 Annual Overweight Permit Limits

	Interstate and Other Divided Routes	US and Selected Routes*	All Other Routes
GVWT (lbs)	110,000	90,000	Legal
	All Routes		
Single Axle (lbs)	28,000		
Tandem Axle (lbs)	45,000		
Tridem Axle (lbs)	50,000		

*The list of selected routes is kept and maintained by the Permits Section of Operations Division located in the central office.

Users of the annual permit are required to obey posted weight limits. Most bridges not satisfying overweight permit limits will also not satisfy legal weight limits; annual permit holders are currently only prevented from crossing bridges by restricting the bridge with a weight posting by CO. It should be noted annual permits can be evaluated at 100% of the operating/legal rating level. OM will periodically screen bridges using inspection report queries to determine if any structures require special restrictions for annual overweight permit trucks.

In addition to the annual (blanket) permits mentioned above, WV offers two additional specialty annual permits (aside from CRTS)– the commodity permit and the wood-truck permit. The commodity permit allows industry to apply for permits to allow weights up to a GVW of 120,000 pounds designated for interstate commerce typically considered divisible and not allowed under other legal load provisions. The applicant must demonstrate through engineering analysis the vehicle permitted under this permit does not adversely affect the designated routes. For a list of current permits and routes that need to be load rated for each commodity permit, please see Appendix D.

The wood-truck permit allows special permits for applicants who transport any wood product (forest, craft, or manufacturing), allowing up to a GVW of 94,000 pounds without tolerance. See

Figure 4-3 under Section 4.4 for the truck configuration including axle weights and spacings. Please note this configuration, the Wood "Pup" Truck, WP47, was typically found to be the controlling truck configuration considering the two legal wood truck permit configurations allowed by state statute. For this reason, the other 6-axle combination wood truck, WT47, previously included will not be routinely evaluated. For routine load rating of this permit truck using LRFR methodology, consider this configuration at the legal load rating level with all other legal truck configurations. This will simplify the load rating process and add some potential conservatism to the ratings. If a bridge is found to require posting using LRFR for this truck only, the analysis should be performed with this wood truck as a routine/annual permit evaluation with the revised live load factor to determine if the posting is warranted.

4.9.2 Single Trip Oversize and Overweight Permit Trucks

Single trip oversize and overweight permit trucks are analyzed during the permit application process using the Superload analysis system hosted at the GotPermits website. Superload uses LARS Bridge Modeler file data to load rate structures for overweight loads.

Currently, Superload cannot perform an LRFR analysis; therefore, all permit analyses are either LFR or ASR. For structures rated using the LRFR method, it is recommended an LFR version of the LARS file be created for Superload.

For bridges load rated using engineering judgment, or in cases where an accurate LARS Bridge file cannot be produced, a capacity table should be used. For the information and spreadsheet needed to create capacity tables, WVDOH personnel may go to the DBE Google Drive resource site or contact the Evaluation Section of Operations Division.

Currently, BrR models should have a capacity table developed for inclusion in the permitting system. This capacity table should be conservatively based, as any permit that fails analysis and is sent for technical review can be further evaluated inside of BrR for more accurate permit load ratings.

If a permit truck fails a standard rating analysis, the load may be considered for crossing a structure at reduced impact. Superload yields results of rating factors for the truck at various levels of impact. Permit trucks may be analyzed using a minimum reduced impact factor of 10%. Permit trucks approved to traverse a structure at low impact do so by reducing speed. These loads will be monitored to ensure compliance with speed restrictions.

In addition to low impact provisions, permit evaluators may utilize LRFR permit evaluation for a bridge failing LFR permit review from Superload. LRFR permit evaluation uses lower live load factors, especially for single trip permits.

4.10 LIMIT STATES

4.10.1 LRFR

MBE Table 6A.4.2.2-1 shall be followed. For prestressed concrete members, the Service III limit state should be satisfied for design checks, but bridges should not be posted based on the Service III limit state.

4.10.2 LFR or ASR

For legal load rating and posting, the strength limit state shall be utilized. In addition, for steel beams and girders the service ratings based on the overload provision in Standard Specification Article 10.57 should be routinely considered when establishing safe load capacity, per MBE Section 6B.5.3.1. Under unique circumstances, and when the bridge's safe load capacity has not previously considered the overload provision, a DBE may waive the requirement of load rating for the Overload provision. This waiver should be used judiciously. Common causes for waiver may include, but are not limited to: near future replacement, or minimal commercial traffic/low ADT routes, on bridges not previously rated for this provision. For causes outside of those listed, the DBE should seek concurrence from the Evaluation Section of Operations Division. If the waiver is utilized, the reasoning must be described in detail on the DS-25.

4.11 LOAD FACTORS, CONDITION FACTORS, AND SYSTEM FACTORS

4.11.1 Load Factors

4.11.1.1 LRFR Method

For the LRFR method, the load factors shown in the MBE shall be used per MBE Section 6A.4.2.2 and Appendix B6A which has been updated in the 2013, 2014, and 2016 interim revisions).

In determining the ADTT used to select live load factors, use the data from SI&A. The ADTT used to determine live load factors should be for one direction. Therefore, to convert a bidirectional ADTT to one direction, it should be assumed 55 percent of the total traffic is unidirectional, unless known otherwise. The 55 percent assumption is taken from the AASHTO LRFD Bridge Design Specifications Article C3.6.1.4.2. For fatigue rating, the calculated ADTT must be converted to a single lane value by use of the appropriate factor from AASHTO LRFD Bridge Design Specifications Table 3.6.1.4.2-1.

For structures with an unknown ADTT, the most conservative live load factor should be used.

LARS Bridge internally determines the appropriate load factor based on the input ADTT. LARS Bridge linearly interpolates the live load factor in accordance with the MBE.

4.11.1.2 LFR and ASR Methods

For the LFR method, the load factors specified in the MBE should be used. For the ASR method, there are no load factors.

4.11.1.3 Emergency Vehicles

A live load factor of 1.3 may be utilized in the LRFR or LFR method per previous FHWA guidance. The revised emergency vehicle live load factors presented in NCHRP 20-07 Task 410, as acknowledged by FHWA Acting Director Shay Burrows by email dated August 16, 2019, may be used as an alternative to previous FHWA guidance stating a live load factor of 1.3 should be used. A copy of this report's information and revised live load factors for the EVs is located on the DBE Google Drive resource site.

4.11.2 Condition Factor

4.11.2.1 LRFR Method

The condition factor provides a reduction to account for the increased uncertainty in the resistance of deteriorated members and the likely increased future deterioration of these members during the period between inspection cycles. The condition factor is not intended to be a substitute for using accurately measured section properties of bridge members.

The condition factors presented in MBE Table 6A.4.2.3-1 shall be used. As noted in MBE Section C6A.4.2.3, if section properties are obtained accurately, by field measurement of losses, rather than by an estimated percentage of losses, the condition factor values in MBE Table 6A.4.2.3-1 may be increased by .05 to a maximum of 1.0.

4.11.3 System Factor

4.11.3.1 LRFR Method

System factors should be used in accordance with MBE Table 6A.4.2.4-1. The system factors listed in the MBE are more conservative than the LRFD design values and may be modified with approval from the Evaluation Section of Operations Division.

4.12 LOAD TESTING

Load testing should be considered when certain conditions exist resulting in less reliable conventional methods of analysis. Specific situations allowing for load testing are as follows:

1. Deterioration is difficult to quantify.
2. Conventional analysis methods are difficult to apply to a unique structural configuration.
3. There is a public need to allow heavy vehicles to traverse a bridge where conventional analysis will not allow (i.e. to avoid, remove, or raise a posting).

4.13 LOAD RATING FOR UBI TRUCKS

UBI inspection trucks are utilized statewide to perform bridge safety inspections. Once the safe load capacity of a bridge reaches the point where load posting/restriction is warranted, the weight and utilization of these inspection vehicles becomes a concern. For this reason, all load posted structures across the state shall be evaluated for all UBI vehicles operating within the state.

Once a bridge is to be posted, or if a bridge is currently posted, the current UBI truck configurations shall be load rated for the bridge, in addition to the standard legal loads currently rated. If a bridge is to be inspected by use of a UBI truck, that bridge and all bridges along the travel route to and from the bridge must rate satisfactorily for the UBI truck in question. UBI trucks can be considered at 100% of operating stress level for ASR/LFR. For LRFR, the UBI trucks may be considered a single trip permit, allowing a lower live load factor to be applied in the rating calculation. Low impact may be used for the bridge being inspected if the UBI truck will traverse the bridge at slow speed. For bridges along the travel route to and from the bridge, low impact evaluation will typically not be allowed.

For the current and typical UBI truck configurations in WV, please refer to Figure 4-4 (below). Most rental UBI truck configurations are similar to those shown in Figure 4-4. If an evaluation notes borderline unsatisfactory ratings for the rental vehicle, the rental company should be contacted for correct axle weight and configuration.

It should be noted the overall weight of the UBI truck, when in the extended position, can place up to 76% of the overall axle weight on the loaded side tires. Each applicable truck configuration's loading is included in Figure 4-4 below. This should be considered during calculation and application and distribution of the truck's live load.

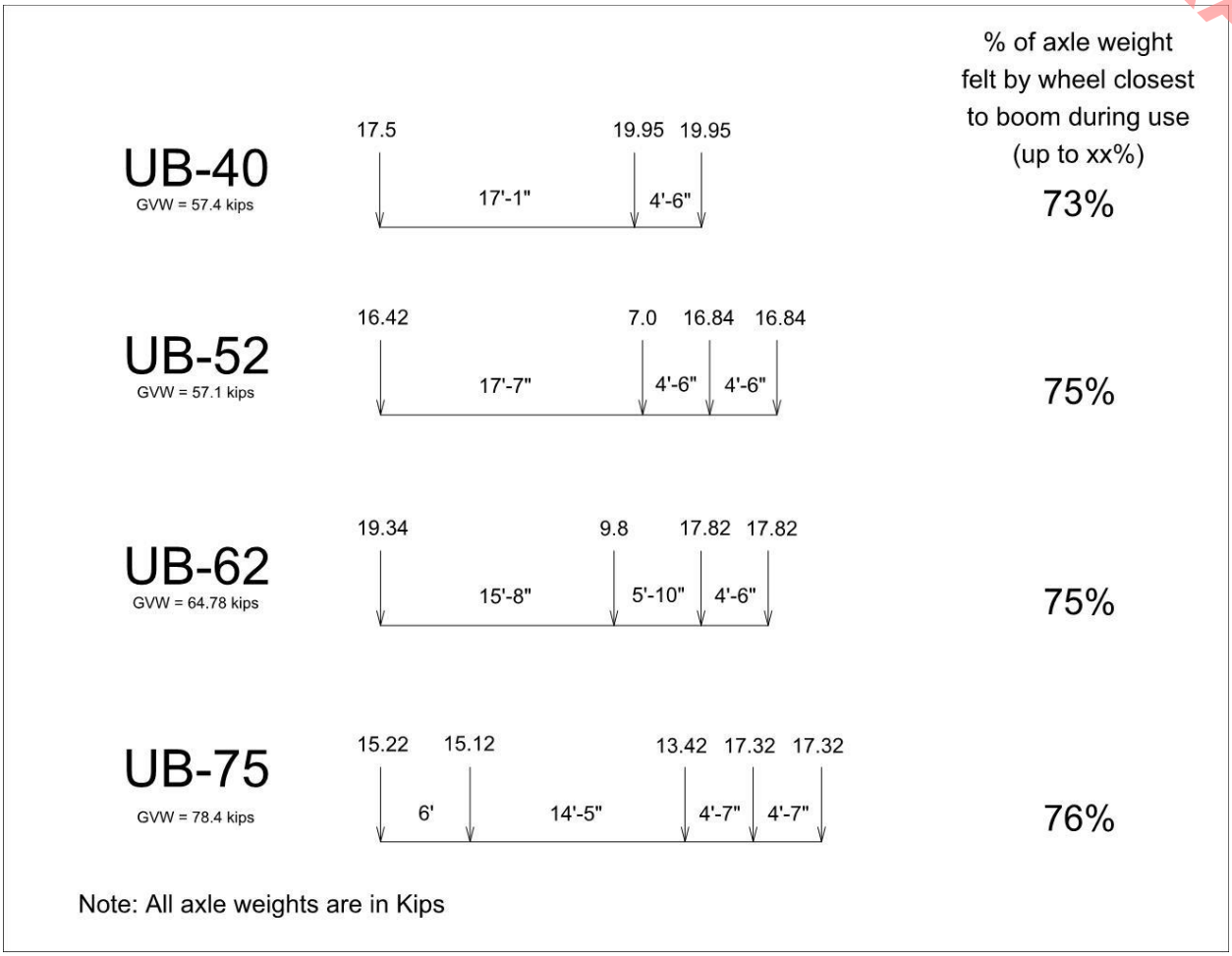


Figure 4-4 UBI Truck Live Loads

CHAPTER 5: DECKS

5.1 INTRODUCTION

This section covers decks of all materials supported by girders, stringers, or other floor systems.

5.2 POLICIES AND GUIDELINES

Beam-supported concrete deck slabs and metal decks satisfactorily carrying normal traffic need not be routinely evaluated for load capacity. If, due to deterioration, the LRE believes the deck will govern the safe load capacity of the structure, the deck may need to be load rated and/or load posted.

Timber decks exhibiting excessive deformations or deflections under normal traffic loads are considered suitable candidates for further evaluation and often control the rating.

When design plans are available, the applicable concrete strength and reinforcing steel yield strength should be used. If plans or material information is not available, use values found in MBE Sections 6A.5.2.1 6A.5.2.2.

CHAPTER 6: REINFORCED CONCRETE SUPERSTRUCTURES

6.1 INTRODUCTION

This section covers the rating of reinforced concrete girders and longitudinally reinforced concrete slabs. This section does not cover prestressed concrete members. All reinforced concrete girders and slabs shall be rated.

6.2 POLICIES AND GUIDELINES

When design plans are available, the applicable concrete strength and reinforcing steel strength should be used. If plans or material information is not available, use values in MBE Section 6A.5.2.1 and 6A.5.2.2. The general preference setting template(s) to be used in BrR are available in the AASHTOWareBr central database. They are available for download from the Google Drive resource site, as found in Appendix B, and are shown for reference in Appendix C.

For reinforced concrete bridges in which plans are not available and the details needed for a load rating stress analysis cannot be found, the use of engineering judgment is permitted, as discussed in Appendix A. In some instances, exposed rebar may reveal the size and spacing of reinforcement, allowing for a load rating analysis. This method of analysis is encouraged.

A concrete bridge with unknown reinforcement need not be posted for restricted loading when it has been carrying normal traffic for an appreciable length of time and shows no distress. In other cases, a concrete bridge with no visible signs of distress, but whose calculated load rating indicates the bridge needs to be posted, can be alternately evaluated through load testing per MBE Section 6A.8.1.

6.2.1 Analysis and Rating

6.2.1.1 Special Considerations

The following items shall be considered:

- For reinforced concrete slab bridges, it is advised to use the method described in Standard Specifications 3.24.3, and LRFD 4.6.2.3 is advised.
- Integral/Sacrificial wearing surfaces present on decks exposed to traffic shall not be considered in strength calculations. If the thickness of the integral wearing surface is not specified, at least ¼" shall be assumed to be an integral wearing surface and not included in strength calculations. This difference in full thickness and effective thickness shall be assumed for any concrete deck exposed to traffic.

6.2.2 LRFR Method

No exceptions to the MBE should be made.

6.2.3 LFR or ASR Method

No exceptions to the MBE should be made.

CHAPTER 7: PRESTRESSED CONCRETE SUPERSTRUCTURES

7.1 INTRODUCTION

This section describes the rating of prestressed concrete girders. All prestressed concrete bridges are to be rated.

7.2 POLICIES AND GUIDELINES

When design plans are available, the applicable concrete strength and prestressing steel strength should be used. Shop drawings often have more specific and accurate material properties than construction plans. If plans or material information is not available, use values found in MBE Sections 6A.5.2.1, 6A.5.2.2, and 6A.5.2.3.

Stress-relieved strands should be assumed when the strand type is unknown.

7.2.1 Analysis and Rating

7.2.1.1 Special Considerations

The following items shall be considered:

- Integral/Sacrificial wearing surfaces present on decks exposed to traffic shall not be considered in strength calculations. If the thickness of the integral wearing surface is not specified, at least ¼" shall be assumed to be an integral wearing surface and not included in strength calculations. This difference in full thickness and effective thickness shall be assumed for any concrete deck or top flange of prestressed beam exposed to traffic.

7.2.2 Software-Specific WVDOH Policy

7.2.2.1 BrR

WVDOH policy specific to BrR is as follows:

1. The general preference setting template(s) to be used in BrR are available in the AASHTOWareBr central database and are available for download from the Google Drive resource site per see Appendix B, and are shown for reference in Appendix C.
2. For continuous superstructures with continuity diaphragms providing continuous behavior for live loads and any other loads applied to the composite section over interior supports, most WVDOH structures of this type include extended strands from

the beam ends spliced and bent upwards into the continuity diaphragm to resist positive moment effects related to creep. BrR's input cannot currently accept prestress strands as reinforcement in the continuity diaphragm. For this reason, it is prudent to set an area of mild reinforcement equal to the area of strands provided in the diaphragm, while setting the modulus of elasticity, yield strength, and ultimate strength equal to that of the prestressing strands. Any additional mild reinforcement in the longitudinal direction of the beams included in the continuity diaphragm should be included to calculate the resistance at this location.

7.2.3 Deteriorated PSC Member Guidelines

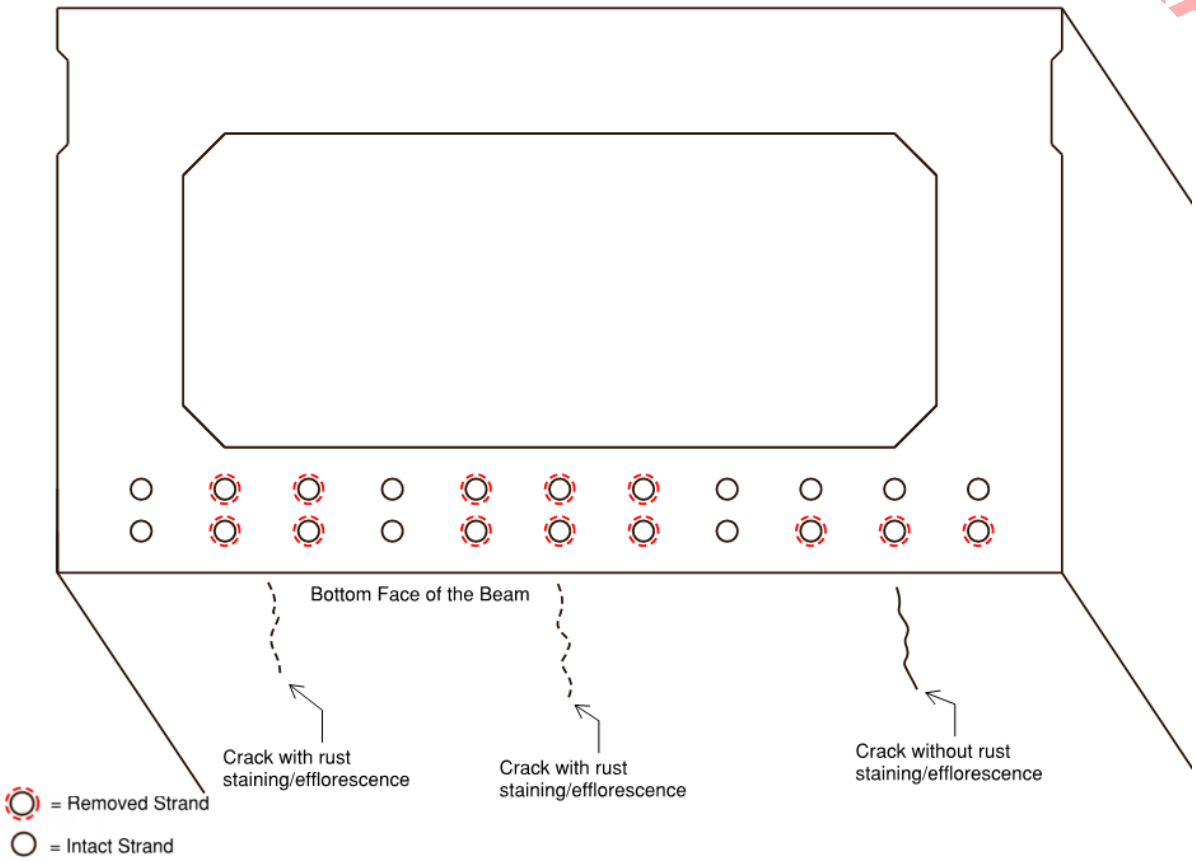
Previous condition ratings or bridge performance should not be used to determine the prestressed beam capacity. If a prestressed member shows signs of deterioration, including exposed/severed prestressing strands, cracking, rust staining, efflorescence, spalling, etc., the following guidelines should be followed by using engineering judgment. Concurrence with the Evaluation Section of Operations Division should be obtained when safe load capacity ratings are produced by means or methods outside of the guidance below.

Longitudinal cracking with/without rust or efflorescence:

- If a longitudinal crack is present in the concrete beam element, remove one (1) strand above or next to the crack, including adjacent strands. Hairline and narrow cracks, as defined by the 2014 WVDOH Bridge Inspection Manual (Appendix C) for prestressed members, may be ignored for this guideline.

- If a longitudinal crack with rust staining and/or efflorescence is present in the concrete beam element, remove at least two (2) rows/columns of strands, including adjacent strands.

- If full length longitudinal cracking is observed in the wearing surface of an adjacent beam superstructure (adjacent box beams, channel beams, slabs, etc.), the current load rating analysis should consider a live load distribution of one wheel line per beam to account for independent action of adjacent beams. This independent action should be confirmed with camber differential measurements taken by inspection teams. Additionally, load testing and/or monitoring may be used to verify or negate independent beam action and loss of load sharing within the superstructure.

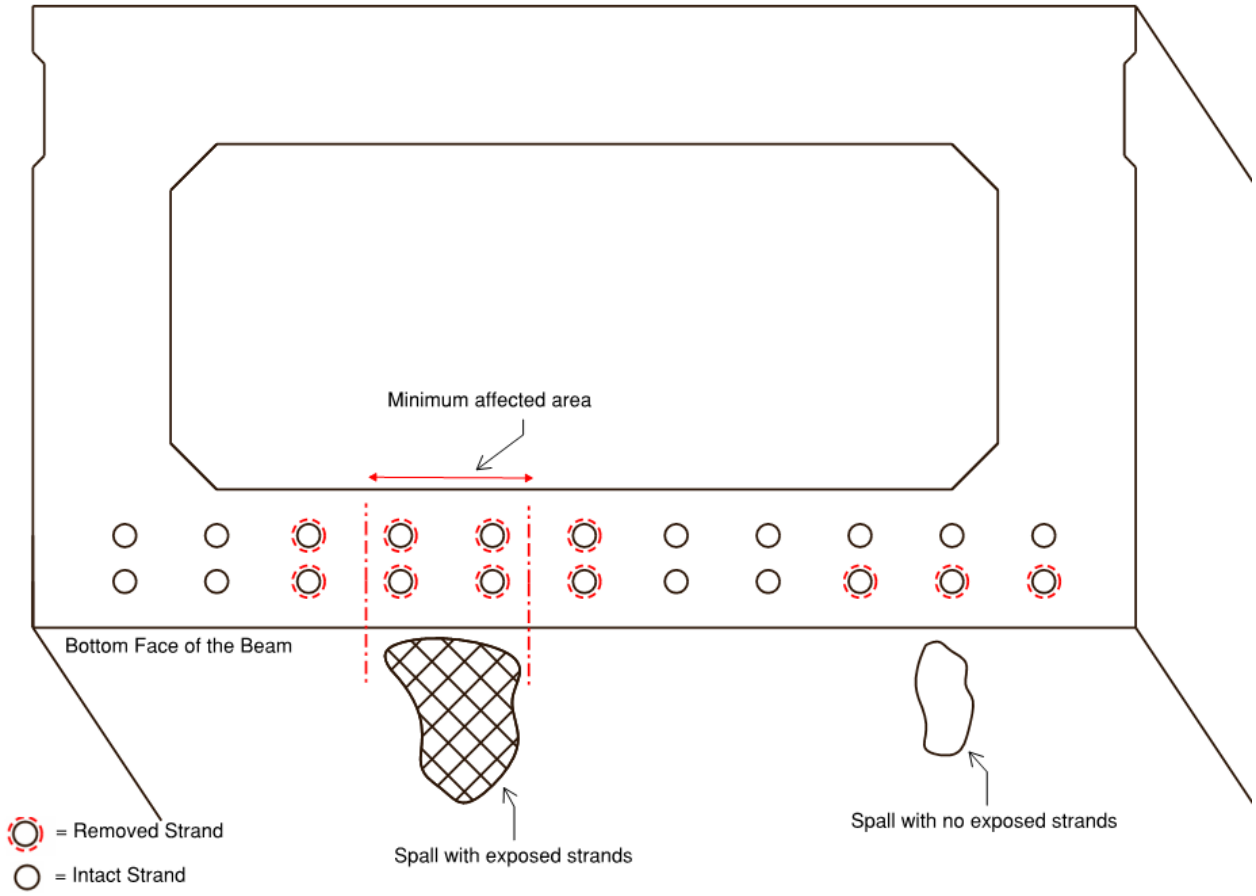


Spalling, exposed strands, and/or severed strands:

- If a spall is present and strands are not exposed, assume strands within the minimum affected area of the spall and strands adjacent to the affected area are not functioning, only for the closest row/column of strands to the spall.

- If a spall is present with exposed strands, assume strands within the minimum affected area of the spall and strands adjacent to the affected area are not functioning, for the closest two (2) rows/columns of strands to the spall.

- If a spall is present and exposed strands are severed, assume strands within the minimum affected area of the spall and strands adjacent to the affected area are not functioning, for the closest two (2) rows/columns of strands to the spall. Depending on the severity and area of the spall, consider taking twice the depth of the spall as the minimum affected area where strands are not functioning (e.g. If a spall has a depth of 5 inches, consider all the strands within 10 inches of the original beam cross-section as not functioning, including adjacent strands).



If the location of the deficiencies described above is localized, engineering judgment should be used to determine the extent and application of the guidelines. There may be instances when removal of strands from the entire beam is overly-conservative; however, decisions on the extent of strand removal or strand inclusion should be made judiciously.

If transverse cracks, particularly on the bottom flange or bottom portions of the web, are noted in the inspection report in areas of high positive bending moment, extreme caution should be exercised when load rating the prestressed member. These cracks could imply flexural cracking of the member, which may indicate a previous overloading or a loss of capacity of the member.

For post-tensioned, segmental concrete channel beams, a loss of post-tensioning cables can greatly reduce the capacity of the bridge and pose an immediate threat to public safety. In accordance with BMD-I185, post-tensioned, segmental beams should be considered for load posting once the beams have reached a condition similar to those shown in the group 1 photographs (of BMD-I185). If the condition of the segmental channel beams is worse than that shown by the group 1

photographs, including failed wires or cables of the post-tensioning, the Evaluation Section of Operations Division should be contacted immediately for further direction and assistance.

CHAPTER 8: STEEL SUPERSTRUCTURES

8.1 INTRODUCTION

This section covers the rating of steel girders. All steel superstructure bridges shall be rated.

8.2 POLICIES AND GUIDELINES

The plastic capacity of a girder can be used for determining the load capacity. All required checks must be satisfied in the AASHTO specifications before the plastic capacity is allowed.

Girders with shear studs or anchors are considered composite sections.

8.2.1 Analysis and Rating

8.2.1.1 Special Considerations

The following items shall be considered:

- Top flanges of through-girder bridges shall be considered unbraced unless shown otherwise by acceptable analysis methods and permitted by the Evaluation Section of Operations Division.
- Steel stringers and girders supporting a timber deck connected through metal deck clips shall not be considered laterally braced by the deck or deck clips.
- Webs shall be considered stiffened when a full depth transverse stiffener is present, but not when a partial depth cross-frame/diaphragm connection plate is present (web panels still need to meet provisions in specification, e.g., spacing requirements, to allow the web to be considered a stiffened panel).
- Cross-frames and diaphragms resisting primary loads shall be rated. Cross-frames and diaphragms in horizontally curved structures are typically primary members (see section 8.2.1.2 below for additional information). Cross-frames and diaphragms in straight, skewed bridges with skew angles exceeding 20 degrees from normal shall be considered primary load resisting members.
- Rating for Service II limit state is required when using the LRFR Design and Legal Load ratings, but optional for permit rating.
- Integral/Sacrificial wearing surfaces present on decks exposed to traffic shall not be considered in strength calculations. If the thickness of the integral wearing surface is not specified, at least ¼" shall be assumed to be an integral wearing surface and not included in strength calculations. This difference in full thickness and effective thickness shall be assumed for any concrete deck exposed to traffic.

8.2.1.2 Curved Girders

Analysis and rating of curved girders should be performed as follows; refer to NCHRP Report 725, Guidelines for Analysis Methods and Construction Engineering of Curved and Skewed Steel Girder Bridges:

- Use one of the following analysis methods:
    - 3D analysis
    - Grid
    - Line girder with V-Load method
- Rate curved girders as follows:
    - Incorporate lateral flange bending effects
    - Rate for bending and shear at controlling locations
    - Rate cross-frames
    - When curved girders meet the conditions listed in LRFD 4.6.1.2.4b and 4c, the effects of curvature may be ignored in the analysis for determining the major-axis bending moments and bending shears.
- BrR is the software of preference for any curved girder superstructure. Curved superstructures should be modeled as such in BrR, even if curvature effects can be ignored. This provides the best representation of the as-built structure and will give the most accurate ratings for safe load capacity.
    - If the superstructure meets the provisions listed in AASHTO LRFD 4.6.1.2.4b and 4c to ignore the effects of curvature, WVDOH will consider the cross-frames and/or diaphragms as secondary members not requiring load rating.
- Load ratings reported on the DS-25 and for NBI purposes should be obtained from BrR, and a capacity table for inclusion in Superload for OS/OW permits shall be generated.

8.2.2 Software-Specific WVDOH Policy

8.2.2.1 BrR

WVDOH policy specific to BrR is as follows:

1. The general preference setting template(s) to be used in BrR are available in the AASHTOWareBr central database. They are available for download from the Google Drive resource site (see Appendix B) and are shown for reference in Appendix C.
2. When a rolled shape is converted to a plate girder for input in BrR, the plate chosen should result in a section modulus as near as practical to the actual section modulus of the rolled shape. Additionally, the web height should be adjusted to maintain the section height; however, the web thickness used in the equivalent section shall be the actual web thickness.
3. The length of cover plates should be input reducing the total length of the plate by the development length at each end of the plate. WVDOH policy is to assume the development length is equal to 1.5 times the width of the cover plate.
4. For composite decks, ¼ inch thickness shall be removed for the effective deck thickness unless known otherwise. The dead load from the sacrificial wearing surface must be considered in the rating.
5. Slab reinforcing steel is not required to be modeled for simple span composite decks.

8.2.3 LRFR Method

No exceptions to the MBE should be made other than noted above.

8.2.4 ASR or LFR Method

No exceptions to the MBE should be made other than noted above.

CHAPTER 9: STEEL TRUSS SUPERSTRUCTURE

9.1 INTRODUCTION

This section pertains to the rating of steel truss superstructures. All steel trusses shall be rated.

9.2 POLICIES AND GUIDELINES

The WVDOH uses the following policies and guidelines:

1. Truss Members – A rating is required for all members in the main truss line. A rating is required only for members carrying live load (typically a rating is not required for portal or sway bracing members; however, cross-frames of deck trusses supporting stringers are required).
2. Interior Floor Beams – A rating is required for the critical interior floor beam. To determine the critical floor beam, more than one interior floor beam may require investigation due to variations in cross-sectional size, grade of material, loads, or any other determining factor.
3. End Floor Beams – A rating is required for an end floor beam when its capacity is different from the interior floor beams or when member deterioration or loading could result in a lower rating factor than an interior floor beam.
4. Interior Stringers – A rating is required for the critical interior stringer. To determine the critical stringer, more than one interior stringer may require analysis due to variations in cross-sectional size, grade of material, span length, loads, or any other determining factor.
5. Exterior Stringers – A rating is required for an exterior stringer when its cross-sectional size is different from that used for the interior stringers or when member deterioration or loading could result in a lower rating factor than an interior stringer.
6. Gusset Plates – A rating is required for all gusset plates carrying live load. Gusset plate ratings shall be performed in accordance with the MBE. All effort should be made to model and rate the gusset plates within BrR – this will allow each gusset plate to be rated automatically during any rerating or for automated permit analysis. For assistance in rating, in-house personnel should refer to the spreadsheet “WVDOH Gusset Plate LFR v2.9.xlsx” (or latest version) available on the Google Drive resource site. Gusset plates can vary greatly, so every type of gusset is not easily rated by one spreadsheet.
7. Main Chord Splices – A rating is required for all splices in the truss members. If chord splices provide a controlling capacity for any given member, the BrR model should reflect the controlling capacity for the chord member in the model for automated inclusion in permit analysis.
8. Main Chord Pins – A rating is required for all pin hanger connections and pin bearing connections present in the truss. If pin and/or hanger ratings control a given member in the truss, the BrR model should reflect the controlling capacity for the pin/hanger in the model for automated inclusion in permit analysis.

CHAPTER 10: TIMBER SUPERSTRUCTURES

10.1 INTRODUCTION

This section pertains to the rating of timber superstructures. All timber bridges shall be rated.

10.2 POLICIES AND GUIDELINES

The LRFR or ASR method shall be used for timber bridges as there is no LFR method for this type of bridge.

Many timber bridges in the WV inventory can be load rated using BrR or the WVDOH Modern Timber Bridge Manual created by WVU-CFC. The manual can be found on the Google Drive resource site. WVDOH uses the following:

1. Impact from live load shall not be applied to timber structures per AASHTO LRFD Section 3.6.2.3, or Standard Specifications Section 3.8.1)
2. Bending stress can be affected by imperfections in the members and should be accounted for in the rating calculations.

CHAPTER 11: SUBSTRUCTURES

11.1 INTRODUCTION

Members of substructures need not be routinely rated for live load. Substructure elements such as pier caps and columns should be rated in situations where the engineer has reason to believe the capacity may govern the load capacity of the entire bridge.

11.2 POLICIES AND GUIDELINES

WVDOH uses the following criteria to determine when the substructure should be load rated:

1. Substructure units potentially controlling the overall ratings for the bridge shall be load rated. This may include concrete, masonry, or timber substructures with deterioration, tipping, or damage present determined to be detrimental to the substructure's load carrying capabilities.
2. Steel bent/pier caps, abutment caps, and columns shall be load rated routinely.
3. Piles should be load rated when significant soil erosion has occurred in the vicinity of the pile. This typically occurs when scour of the pile leads to the susceptibility of buckling or when the pile cannot be supported in friction.

CHAPTER 12: BOX CULVERTS

12.1 INTRODUCTION

This section pertains to the rating of bridge-length concrete box culverts. Bridge-length box culverts have a length of 20 feet or greater between inside faces of outside walls measured along the centerline of the roadway.

12.2 POLICIES AND GUIDELINES

Culverts should be rated according to the guidelines provided in the MBE. If the plans or original design calculations do not exist, or severe deterioration exists, engineering judgment can be used. Engineering judgment must be based on a field evaluation. Field evaluation and engineering judgment ratings must be documented.

AASHTO MBE 6A.5.12.10.3a outlines when live load effects become negligible. If a bridge meets the provisions of MBE 6A.5.12.10.3a and live load is neglected, the DS-25 should be left blank (see section 15.2.1).

12.3 SOFTWARE

BrR should be utilized to load rate box culverts with known details, with a capacity table generated for use in Superload for OS/OW permits.

CHAPTER 13: NON-TYPICAL BRIDGE TYPES

13.1 INTRODUCTION

This section pertains to bridge types not covered in other sections of this manual, such as steel arch bridges, concrete arch bridges, cable stayed bridges, suspension bridges, and other uncommon bridge types.

13.2 POLICIES AND GUIDELINES

At this time, no policy guidelines exist for the rating of non-typical bridge types with the exception listed below. The LRE should discuss different options with the DBE and with the Evaluation Section of Operations Division, particularly if contract work is an option.

13.3 STEEL BEAMS RESISTING GRAVITY LOADS ON WEAK AXIS

This section pertains to bridges constructed of steel beams whose weak axis resists gravity loads. These beams are placed directly flange to flange with concrete poured onto the beams. To rate these bridges using LFR, use the spreadsheet named "LFR Weak Axis Beam 2.4.xlsx" (or latest version) located on the DBE Google Drive resource site. Some of these structures have attachments providing composite action. Engineering judgement should be used to determine if composite action is present.

CHAPTER 14: BRIDGE POSTING

14.1 GENERAL

Bridge owners shall post all bridges as required. Before weight limit posting is recommended, a complete and accurate analysis should be performed and approved by the WVDOH supervisor or contracting authority.

Posting bridges for load limits is critical to the safety of the traveling public but may create hardship on the motoring public and industry using the bridge. Bridges rating low using ASR may benefit by being rated using LFR or LRFR to determine if the bridge can accommodate higher loads based on currently accepted codes. Similarly, bridges rating low using LFR method may benefit by being rated using LRFR prior to posting. If a bridge was designed using ASD, ASR ratings may be used to justify load postings and safe load capacity even if LFR was performed and reported to the NBI. It is acceptable to rate any bridge type using the LRFR method.

The Program Manager can authorize deviations from the following policy if in their opinion such deviation is in the best interest of the traveling public and does not compromise public safety.

14.2 POSTING FOR LEGAL TRUCK LOADS

Bridges shall be load rated according to the provisions of this manual using the legal trucks set forth in Section 4.4. The legal weight limits for each legal truck on each route type are shown in Table 14-1.

Table 14-1 Legal Weight Limits (for posting) in Tons

ROUTE	T3	SU4	SU5	SU6	SU7	2S2	3S2	LANE	EV2	EV3	SU-40	SU-45	3S-55	3S-60
Interstate	25	27	31	34.75	38.75	-	40	40	28.75	43	-	-	-	-
65,000	33	35.75	35.75	35.75	35.75	35.75	35.75	40	28.75	43	-	-	-	-
80,000	33	38.5	40.15	40.15	40.15	36	44	40	28.75	43	-	-	-	-
120,000	33	38.5	40.15	40.15	40.15	36	44	40	28.75	43	42	47.25	57.75	63

14.3 POSTING REQUIREMENTS

For the purpose of the posting requirements, please note the two following bridge element classifications:

Priority 1 – All NSTMs and their connections apart from floorbeams in good or fair conditions and their connections.

- When considering the safe load capacity of connections, including gusset plates, if any NSTMs frame into the connection, that connection in its entirety shall be considered Priority 1 for evaluation purposes. If, in the opinion of the engineer, any one failure mode being checked should be evaluated at the higher priority 2 rating level for safe load capacity, concurrence with the Evaluation Section of OM must be obtained.

Priority 2 – All other members and connections not qualifying as Priority 1.

The following conditions and maximum rating levels are the maximum posting limits.

- Bridges load rated based on a calculated LRFR analysis must be limited to a load limit not to exceed the legal rating level.
- Bridges load rated based on a calculated LFR or ASR analysis or by engineering judgment must be limited to a load limit not to exceed the following limits:
    - All bridges must be limited to a load limit not to exceed 70% of the operating rating of Priority 1 members and 85% of the operating rating of Priority 2 members with the following exceptions:
        - If the bridge has an ADTT (one-direction) less than or equal to 1,000 and the member has a condition of fair (5) or better, the bridge must be limited to a load limit not to exceed 85% of the operating rating of Priority 1 members and 100% of the operating rating of Priority 2 members.
        - For emergency vehicles and UBI trucks, bridges must be limited to a load limit not to exceed 100% of the operating rating of all members.
- Any bridge not load rated by the LRFR method containing Priority 1 members limited to a load limit exceeding 70% of the operating ratings and any bridge containing Priority 2 members limited to a load limit exceeding 85% of the operating rating must be subjected to more frequent competent inspections (i.e. must be inspected at an interval less than 24 months).
- For all simple spans greater than 200’ and all continuous spans of any length, the force effects generated by multiple trucks in a single lane becomes a concern. In certain instances, the bridge shall be restricted by posting a sign requiring trucks to maintain a set distance apart when crossing the structure. The MBE specified lane-type load models should be used to decide whether to restrict bridges for multiple trucks in a single lane; however, if those live load effects cannot be generated, use the following procedure to determine whether to restrict the distance of consecutive trucks:
    - For bridges load rated based on a calculated LRFR analysis, the HL-93 design operating rating factor will be used as a screening tool. For all simple spans greater than 200’ and all continuous spans of any length, if the HL-93 operating rating factor is less than 1.0, please contact the Evaluation Section of OM for guidance.

  - For bridges load rated based on a calculated LFR or ASR analysis, the HS20 lane load model should be used as a screening tool. For all simple spans greater than 200' and all continuous spans of any length, if the HS20 operating rating is less than 36 tons, please contact central office for guidance.
- Bridge type structures, box culverts, pipes, and other miscellaneous structures not meeting the definition of a bridge due to span length may be limited to legal (operating) rating levels if deemed prudent in the opinion of the DBE.

The above written posting requirements are also described in the following tables. Table 14-2 indicates the maximum weight limits displayed as percentages of the operating rating.

Table 14-2 Maximum Weight Limits as Percentages of the Operating Rating

Rating Method	Vehicle	Criteria	Priority 1	Priority 2
LFR, ASR, or Judgment	Standard and CRTS	ADTT ≤ 1,000 **AND** Member Condition Rating ≥5	85%	100%
		ADTT > 1,000 **OR** Member Condition Rating <5	70%	85%
	Emergency/UBI Trucks		100%	
LRFR			100% (of legal)	

When a bridge has a weight limit exceeding the values in Table 14-3 (expressed as percentages of the operating rating), more frequent inspections are required (interval <24 months).

Table 14-3 Percentages of the Operating Rating Representing Weight Limits Requiring More Frequent Inspections

Rating Method	Vehicle	Priority 1	Priority 2
LFR, ASR, or Judgment	Standard and CRTS	70%	85%

For convenience during legal load evaluations, safe load capacity weight limit tables have been provided in Appendix E.

14.3.1 Required Timeframes for Bridge Postings

Bridge postings should be expeditiously reviewed and processed to ensure timely erection of weight limit signs once the determination of bridge posting need has been made. FHWA mandated a maximum of 30 days to erect bridge posting signs, per see FHWA Memorandum dated April 17, 2019. For non-emergency bridge postings, WVDOH policy requires signs to be erected in the field within 30 days from the date of the CO. Additionally, under no circumstances shall the timeframe from the load rating date to the CO date exceed 15 days. Any deviation from this ruling should be considered a rare circumstance and must be documented in the Engineer's Comments section of the state's database collection software and in the Posting Submittal Log located in the DBE Google Drive.

For city-owned bridges falling outside of the jurisdiction of WVDOH for bridge posting, the recommendation made to the city for a bridge posting shall occur within 15 days of the load rating date, on the DS-25 Form, determining the need for the posting.

If the bridge evaluation deems a posting would be necessary by policy, but repairs can be made within 45 days, the open inspection report can be submitted through normal processing with proper notes and documentation on the DS-25 Form and in the Engineer's Comments of the report. Prior to or during the next scheduled inspection, the bridge's inventory report and DS-25 Form will be updated to reflect the repairs made. If the repairs cannot be completed within 45 days, a temporary safe load capacity and bridge posting must be issued until repairs can be made. At no time can temporary safe load capacity exceed the full operating (ASR/LFR/Judgment) or legal (LRFR) rating level.

All dates required to be tracked along the process of a bridge posting are on the "Posting Submittal Log, C.O. Tracking" spreadsheet housed on the DBE Google Drive. If these timeframes for bridge posting cannot be met, proper notes should be documented on the tracking spreadsheet to explain the specific reason for the delay.

14.3.2 Emergency Bridge Posting

Damage and loss of structural capacity can occur from vehicular or vessel impact strikes, flood damage, overloads, or other conditions. These situations can lead to the necessity to immediately post a bridge, prior to proper evaluation and review procedures outlined in the routine posting process in Section 14.5. This immediate response may be realized during a routine inspection, or it may be driven by factors outside of the inspection cycle.

If a bridge is determined to unsafe at the current legal or posted level and requires emergency bridge posting, the DBE, District Evaluation Engineer, or other qualified bridge engineer shall

immediately act as outlined in the steps below. If the bridge requires immediate closure, refer to BMD-P57 for guidance.

Emergency Bridge Posting Procedure:

- Immediate issuance of an emergency bridge posting work order to the District Sign Shop.
    - Erection of a gross load posting (R12-1) sign by district forces using available sign stock and numbering as soon as possible. (If deemed an emergency, a gross load posting should be used in lieu of a silhouette sign until such time that a complete evaluation can be performed.)
    - If advanced posting is warranted, the advanced signs with applicable mileage placards should be installed as soon as possible, but sign installation at the bridge should not be postponed.
    - If detour signage is needed, prompt erection of detour signs to allow truck traffic alternate routes.
- Prompt notification (within 24 hours of determination) to the District Engineer/Manager, NBIS Program Manager, OM Evaluation Section, and any other appropriate organizations. If the temporary posting level is below 18 tons gross load, local school officials and public transits need notified (if applicable).
- Submission of a DS-25 Form requesting an Emergency CO within 24 hours of determination of the emergency posting.
    - The ratings on this DS-25 should be assigned by judgment based on the level of posting requested for the emergency restriction.
    - The tracking spreadsheet on the DBE Google Drive resource site should include a note designating an Emergency Posting.
- An updated load rating and evaluation reflecting the condition of the bridge/element in question performed within 15 days of temporary posting.
    - If the emergency posting need was determined outside of a regular bridge inspection, this updated load rating should be coupled with a Special Bridge Inspection documenting what occurred to cause the emergency.
    - If this completed evaluation determines a permanent weight restriction differing from the emergency posting value is warranted without immediate repairs, a new DS-25 Form shall be submitted for processing to OM's Evaluation Section as outlined in the routine posting process (section 14.5 below), subject to the timeframes listed in section 14.3.1.
    - If the updated evaluation leads to repairs or retrofits that can be accomplished within 45 days, the emergency posting can remain in place until such time that the repairs are performed. After repairs are performed, a new DS-25 Form shall be submitted for processing to OM's Evaluation Section to modify the bridge's safe load capacity (either complete removal of the emergency posting or higher posting level).
        - If this results in a modified safe load capacity and posting level, an updated CO shall be requested through normal procedures.

14.4 WEIGHT LIMIT SIGNAGE

In the event a posting is required, the decision to use a gross load or silhouette posting is left to the discretion of the DBE; however, if the posted load limit cannot meet the following minimum posting requirements, a gross load posting is required.

- T3 – 9 Tons, SU4 – 11 Tons, 3S2 – 13 Tons
- SU40 – 12 Tons, SU45 – 14 Tons, 3S55 – 17 Tons, 3S60 – 18 Tons

The minimum load posting weight is 3 tons. Bridges not capable of carrying a minimum gross load weight of 3 tons shall be closed.

For any type of weight limit posting sign, whole numbers shall be used.

Advanced posting signage should be recommended when it is expected drivers will not be able to stop and turn around without much disruption to traffic. The advanced posting scheme should be coordinated with district traffic engineering staff. If a bridge is determined to warrant advanced posting, it should be indicated on the DS-25 (checkbox on the group IV sheet). Records of which bridge postings include advanced warning signs should be kept and maintained by the district.

When a bridge is silhouette posted on a non-CRTS route, the posted values shall not exceed the values shown in Figure 14-1. When a bridge is silhouette posted on a CRTS, the posted values shall not exceed the posted values shown in Figure 14-2. The values for each truck arranged from top to bottom of the silhouette shall be equal to or greater than the preceding truck.

On CRTS routes, the silhouette posting (either the 4-line CRTS silhouette or 5-line CRTS silhouette including the 2-axle configuration) must be compared to and evaluated with the standard legal truck configurations. If a standard legal truck configuration (T3, SU4, etc.) needs restricted by policy in addition to the CRTS configurations, the load rating must evaluate the lowest safe load capacity for each silhouette line on the sign (i.e., the T3 should be evaluated with the SU40, the SU4-SU7 trucks should be evaluated with the SU45, and the 3S2 should be evaluated with the 3S55).

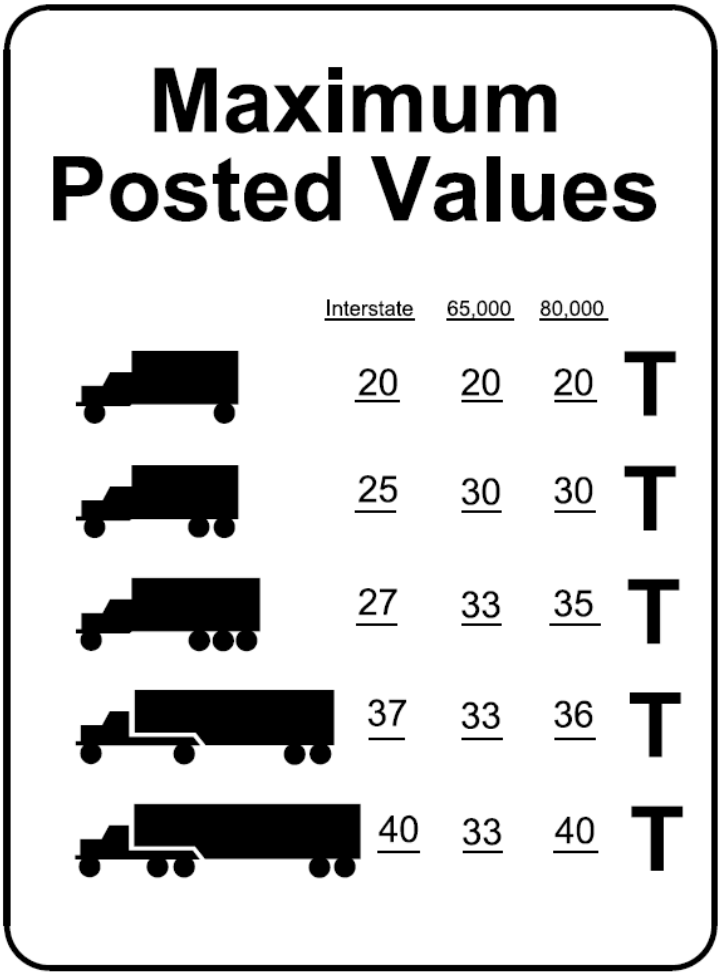


Figure 14-1 Maximum Posted Values for non-CRTS Silhouette Weight Limit Sign

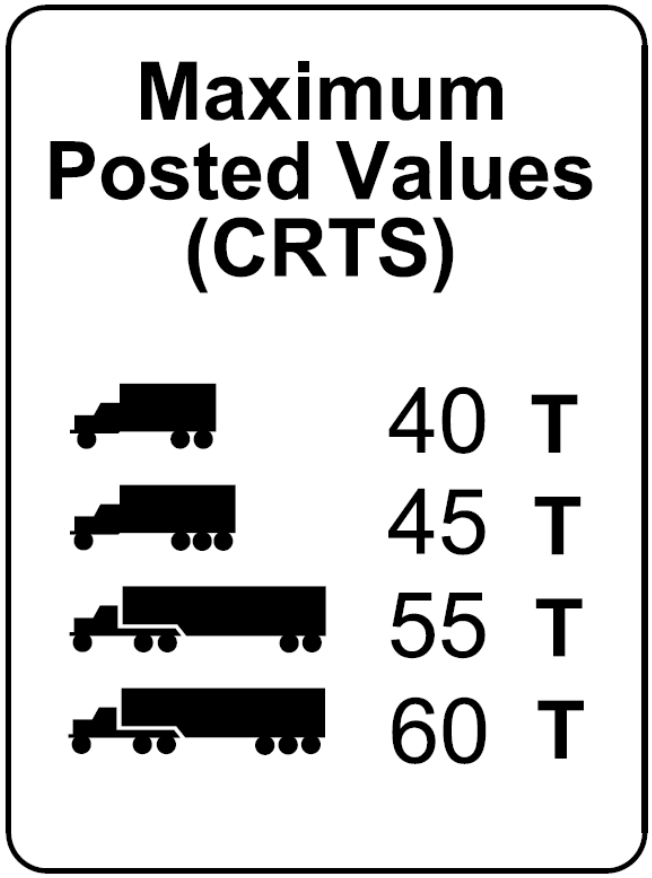


Figure 14-2 Maximum Posted Values for CRTS Weight Limit Sign

14.5 ROUTINE POSTING PROCESS

Once a structure is determined to be posted, per Section 14.3, the following steps shall occur to limit weight on the structure within timeframes outlined in Section 14.3.1.

1. The DBE decides to limit truck weights on a bridge.
2. The DS-25 of the current open inspection report is filled out. If posting recommendations occur outside of a normal inspection report, either a Special inspection report can be generated for purposes of documenting the posting recommendation/change or a DS-25 Form external to AssetWise can be developed and sent to the Evaluation Section of OM for handling.
3. If a silhouette posting sign is recommended, a mockup is created.
4. SI&A Sheet 8: Item 16 (NBI 41) may be coded as “B”.
5. The District Engineer/Manager reviews and signs the DS-25.
6. The district bridge staff initiate a new line on the “Posting Submittal Log, C.O. Tracking” spreadsheet housed on the DBE Google Drive resource site.
7. The completed DS-25, location map of structure, silhouette sign mockup, if used,), and previous CO, if applicable, is sent to Evaluation Section of OM.

8. The DS-25 is reviewed to ensure completeness and compliance with this manual, particularly Section 14.3.
9. OM approves and signs the DS-25.
10. OM provides a CO.
11. OM sends the DS-25, location map, silhouette sign mockup, if used, previous CO, if applicable, and new CO to the HO.
12. The HO and the Commissioner review, approve, and sign the CO, then distribute it to various entities including the appropriate District Engineer/Manager and/or DBE office.
13. The DBE ensures weight limit signs are installed at the bridge, typically performed in coordination with the district sign shop.
14. The DBE updates the SI&A and Google Drive DBE document tracking spreadsheet accordingly.
    a. The fields to be updated are on Sheet 8: Item 16 (NBI 41) and on Sheet 9: posting values and date of posting.
    b. Update the values of the open inspection report or if it has been finalized, the asset values shall be updated.
    c. Ensure all data fields on the Google Drive DBE "Posting Submittal Log, C.O. Tracking" spreadsheet have been populated.

14.5.1 Rescinding Bridge Postings based on New or Rehabilitated Structure

Typically, a request to rescind a restriction placed on a particular county-route-milepost (CO-RT-MP) associated with a bridge is completed with the inventory inspection of the new or rehabilitated structure as updated or new bridge load ratings are performed during the inventory inspection. This also holds true for bridge projects using phased construction. If inventory update efforts are performed correctly, when traffic is switched to the new bridge, or portion thereof, this method of rescinding works and is consistent.

Note the restriction is in reference to the CO-RT-MP, not the structure itself. For this reason, it is acceptable to attach a copy of the rescind CC Order to the current in-service bridge asset in AssetWise – this shows there is no current restriction along that CO-RT-MP.

If a rescind request is issued for a location with traffic being maintained by a temporary structure after the low-rating bridge is demolished/removed, the safe load capacity ratings for the temporary structure must ensure all legal loads are safe and meet the provisions of this manual.

CHAPTER 15: LOAD RATING DOCUMENTATION

15.1 INTRODUCTION

All load ratings analyses shall be documented in accordance with this manual. The purpose of good documentation is to clearly present: the safe load carrying capacity of the structure and supporting documentation used to obtain these results.

15.2 DS-25 AND WV SI&A

15.2.1 DS-25

The DS-25, Safe Load Capacity Analysis and Justification Report, details and justifies the safe load capacity of the bridge and any current or recommended weight restrictions related to the bridge's capacity. The DS-25 should always be updated when new load ratings are obtained; therefore, every structure shall have an up-to-date DS-25 reflecting the current known condition of the structure. Ratings shall be recorded for the legal trucks set forth in Section 4.4.

Each truck configuration should have a controlling rating reported on the DS-25, Group II page. Typically, only the controlling ratings should be reported on this page; however, if both Priority 1 and Priority 2 members are present for an LFR or ASR analysis, the controlling member ratings for each priority level should be reported. An example would be an LFR truss with several NSTMs. The controlling NSTM ratings would be reported under the Priority 1 line, while the controlling non-NSTM ratings would be reported under the Priority 2 line.

Once the controlling ratings are reported on the DS-25, each line shall be evaluated against the thresholds defined in Appendix E - Safe Load Capacity Weight Limit Tables to determine if posting is warranted (see Chapter 14 – Bridge Posting for more information).

On the DS-25 Group III sheet, under item 27, if the ratings are controlled by the deteriorated condition of a member, an explanation under the same item 27 shall be provided for the member and deteriorated component controlling the ratings. For item 28 on the same sheet, the safe load capacity is defined as one of three options: Legal Loads, Present Restrictions, or Recommended Restrictions. If a posting is in place or being recommended, the safe load capacity cannot be set to legal loads.

There are certain instances when the DS-25 form should be left blank and is not needed. This would include under record inspection reports (DS-33), instances when depth of fill negates live load effects on the bridge (NBI 64 and NBI 66 codes of 99), or structures with no loading applied, such as bridges closed to all traffic.

Bridges closed to vehicular traffic but accessible by pedestrians should be load rated and evaluated accordingly, with a maximum gross weight for pedestrian use reported on the DS-25 under the notes box on the Group II page. There may be instances when the bridge is lightly loaded with pedestrian traffic; likewise, some bridges may be loaded with large volumes of pedestrian traffic. For this reason, the DBE should decide on a case-by-case basis the level of load rating and evaluation required to determine the safe load capacity of the bridge. The DBE may use engineering judgment to determine the anticipated pedestrian loading of the bridge. If the anticipated pedestrian loading exceeds the safe load capacity of the bridge, the bridge shall be closed to all traffic.

If a temporary bridge is in place and carrying traffic, the DS-25 shall reflect the safe load capacity of the temporary bridge. If this temporary bridge is part of a construction contract, where a contractor installed the temporary bridge to maintain traffic during demolition/construction of a new bridge, ratings may be based on design loading information found in the contract plans.

15.2.2 WV SI&A

The WV SI&A load rating data fields, housed in Sheet 8 and Sheet 9 of the SI&A form, include NBI items 63, 64, 65, and 66, all relating to the inventory and operating design ratings of the bridge. NBI items 64 and 66, on Sheet 8 of the SI&A, should be coded in English tons. NBI items 63 and 65, on Sheet 9 of the SI&A, should be picked from available options representing ratings coded in tons. This means a code of 6, 7, 8, D, E, or F should NOT be used for NBI 63 or NBI 65.

Any bridge with negligible live load effects due to fill depth, in accordance with applicable specifications, shall be coded “99” for the inventory and operating ratings on Sheet 8 (NBI 64 and NBI 66).

If a bridge rates at or above 98 tons for the inventory or operating stress level of the design vehicle, the tonnage rating reported on Sheet 8 will be limited to 98 tons, with 99 tons reserved for negligible live load effects discussed above.

15.2.3 LRFR

The HL-93 rating factors shall be reported on the DS-25. HL-93 ratings in tons shall be reported for NBI purposes. These tonnage ratings reported for HL-93 shall be obtained by multiplying the controlling rating factors by 36 tons. The “Method Used to Determine … Rating” fields, NBI items 63 and 65, should be coded to “3” to correspond to LRFR ratings reported in tons. All other legal truck ratings shall be reported as discussed in Section 15.2.1.

15.3 ANALYSIS PACKET – LOAD RATING SUMMARY AND SUPPORTING DOCUMENTATION

While the DS-25 shows the controlling rating values governing the safe load capacity of the structure, a need exists to document a summary of all applicable load ratings for the bridge and all supporting documentation used to perform the bridge evaluation and load rating into an analysis packet. This load rating summary is best captured on a DS-35 Form. The DS-35 is a detailed summary of the load rating results for each limit state of each member of the structure. In addition to the load rating summary, all supporting documentation used during the bridge rating should be included in the analysis packet. This includes hand calculations, assumptions made, references used, etc.

The analysis packet in its entirety shall be attached to the bridge asset in AssetWise as an asset file under Manager Files (same location as inventory report attachments, DS-12's, etc.). There is no need to attach the analysis packet under each report separately.

15.4 HAND CALCULATIONS

Any hand calculations performed should be clearly documented and kept by the district, included in the analysis packet mentioned in Section 15.3.

15.5 COMPUTER MODELS

For in-house ratings, all BrR model files will be stored in the central server database, AASHTOWareBr. For access requests or information on this database, please contact Evaluation Section of OM. Other load rating software input files shall be kept by the district and submitted to OM. Consultants shall submit all computer model input files with final load rating reports.

15.5.1 Superload Model Files

The most recent LARS Bridge files and capacity table files submitted to OM for inclusion into Superload are kept by OM. See Section 4.9.2 for more information.

APPENDIX A: JUDGMENT LOAD RATING CONCRETE STRUCTURES

The purpose of this directive is to revise the statewide policy for assigning load ratings to those concrete structures rated by judgment due to the lack of sufficient information and/or plans to allow a structural analysis to be completed. This directive is intended to include concrete structures such as arches, beams, girders, slab bridges, etc., which are in good or fair condition and for which little or no design load information is available, or for concrete, steel, or aluminum culverts where an analysis cannot be performed by normal procedures.

These tables should not be used for material types other than the specific group of bridges described in this directive. However, the values in the tables may be useful as a guide in assigning rating values for other types of structures where an analysis cannot be completed by hand or available computer software. In this situation, the DBE should determine rating values based on judgment, but this policy should not be referenced as the basis for that judgment.

The current edition of the MBE allows concrete bridges with unknown details to be exempt from posting if it has been carrying normal traffic for an appreciable length of time and shows no distress; however, the bridge may need inspected at more frequent intervals than bridges with calculated load ratings or with load ratings determined from load testing. The MBE and NBIS limit the operating rating level as the maximum permissible live load to which the structure may be subjected. Any bridge assigned an operating rating lower than the legal load for a vehicle on that route system must be posted at levels that satisfy the WVDOH posting policy.

The rating tables contained herein represent reasonably accurate rating values for concrete bridges similar to those used for development of the tables. However, actual ratings for some specific bridges may be significantly different than what the tables predict, and the DBE may use judgment to assign values different from those shown in the tables. For example, our experience with concrete arches has shown those structures are capable of safely carrying loads much higher than their original design load. The DBE may use their judgment to assign rating values not requiring the bridge to be posted. Concrete beams, girders, and slabs have not performed as well as arches and may not be suitable structures for this exception.

The tables are to only be used for superstructures in good or fair condition and of WVDOH quality construction. Bridges coded poor or critical in the SI&A should be evaluated by the DBE, and the rating values should be reduced appropriately considering the degree of deterioration, excessive dead load, signs of distress, and other factors important in assigning the judgment ratings and justifying the safe load capacity. The condition rating of these bridges should be based on the condition of the main load carrying element and not secondary elements. For arch bridges this would normally be the arch ring and not the spandrel, parapet, or wing walls. It may be appropriate to review/revise condition codes for these structures rated poor or critical.

The rating tables were developed from design calculations of six arches, six through girders and eight tee beams with spans ranging from 25 to 80 feet. Operating ratings were approximated for

each bridge and an inventory to operating ratio was calculated. For convenience, the concrete bridges were grouped into three span length ranges. The live load design vehicle was converted to equivalent vehicles and new values were projected for the various AASHTO or State legal vehicles shown in the tables.

To use the rating tables, first determine the rating vehicle as described below. Once the rating vehicle has been determined, select the appropriate table based on span length and use the corresponding ratings for reporting on form DS-25.

If one of the following design vehicles or design criteria is known, use the corresponding rating vehicle:

Design Vehicle/Criteria	Rating Vehicle
15 Ton Roller	H15
100 psf	H15
150 psf	H20

If the design load is unknown, use the following rating vehicles based on the date of construction or estimated date of construction:

Date Built	Rating Vehicle
Prior to 1921	H10
1921 thru 1943	H15 or H20*
1944 and Newer	HS15

* Routes which were a part of the mainline road system during this period should be assigned the higher value.

Various precast concrete beam structures produced through the late 1980 were designed for an HS20 live load. Structures produced after the late 1980s were designed for an HS25 live load. If the design loading is known to be a conventional H or HS AASHTO vehicle, use that as the rating vehicle. If the design loading is known to be HL-93, use HS25 as the rating vehicle.

APPENDIX A.1 – JUDGMENT TABLES

TABLE 1
Spans less than 41'

Rating Vehicle	OPERATING (Tons)															HS20 (Tons)	
	Standard							CRTS				Emergency		Permit			
	T3	SU4	SU5	SU6	SU7	2S2	3S2	SU40	SU45	3S55	3S60	EV2	EV3	WP47		Inv	Oper
H10	30	26	28	29	31	37	43	28	32	45	45	29	28	42		16	35
H15	45	43	43	43	46	55	65	43	48	67	67	44	43	62		24	52
H20	60	53	56	57	62	73	86	56	63	89	89	58	57	83		32	70
HS15	51	46	48	49	52	62	73	47	54	76	76	50	48	71		27	59
HS20	69	61	64	66	71	84	99	64	73	103	103	67	65	96		36	79
HS25	84	74	79	80	86	103	121	78	89	125	125	82	79	117		45	99

TABLE 2
Spans 41' through 60'

Rating Vehicle	OPERATING (Tons)															HS20 (Tons)	
	Standard							CRTS				Emergency		Permit			
	T3	SU4	SU5	SU6	SU7	2S2	3S2	SU40	SU45	3S55	3S60	EV2	EV3	WP47		Inv	Oper
H10	28	27	28	28	29	39	41	28	29	46	46	28	27	38		13	31
H15	42	43	43	43	43	59	61	43	43	69	69	42	43	57		19	46
H20	57	54	57	57	59	79	83	56	58	93	93	57	56	78		26	61
HS15	60	57	60	60	62	84	87	59	61	97	97	60	59	82		27	65
HS20	68	65	68	68	70	95	99	67	71	123	123	68	66	103		36	72
HS25	99	94	99	99	102	138	144	98	101	162	162	99	97	135		45	107

TABLE 3
Spans longer than 60'

Rating Vehicle	OPERATING (Tons)															HS20 (Tons)	
	Standard							CRTS				Emergency		Permit			
	T3	SU4	SU5	SU6	SU7	2S2	3S2	SU40	SU45	3S55	3S60	EV2	EV3	WP47		Inv	Oper
H10	29	28	29	29	30	36	35	29	29	40	40	29	29	34		12	31
H15	44	43	44	44	45	55	54	43	44	60	60	44	43	52		18	46
H20	58	56	58	58	59	72	71	57	59	80	80	58	57	69		24	61
HS15	67	65	67	67	68	83	82	66	68	92	92	67	66	80		27	70
HS20	89	86	89	89	91	111	109	89	91	125	125	89	88	108		36	94
HS25	111	108	111	111	113	138	136	109	112	153	153	111	110	132		45	117

APPENDIX B: LOAD RATING RESOURCES

- **AASHTO Manuals**

MBE, LRFD, and more.

WVDOH maintains a list of available AASHTO manuals on ProjectWise.

- **Load Rating Examples**

The appendices to the MBE has several good load rating examples.

- **Highways Operations DBE Document Library – Google Drive**

Previous BIC presentations, AASHTOWare BrR Resources, Load Rating Spreadsheets and Resources, WV Timber Bridge Manual, BMDs, etc.

https://drive.google.com/drive/folders/1YEsUtvBmewBA6yPzU61p62mZ8iDM7z3S

- **BrR**

Help can be obtained from pressing F1 while inside of the BrR program, for any input field. In addition, the help button on the top menu bar has a few helpful features, including the "Support" option, which includes several links to tutorials, training, and online help files.

  - Google Drive (link above) BrR Resources folder
    - BrR Training and Self-Learn Resources
  - www.aashtobr.org
    - BrDR User Group Home Page
    - "Presentations" link shows most previous RADBUG meeting presentations
  - JIRA Access
    - BrDR support ticket center
    - Read-only access for viewing support issues
    - https://bridgeware.atlassian.net/servicedesk/customer/portals
      - Login email: brdr@promiles.com
      - Password: readaccess

- **LARS**

C:\BKey\Docs – On each user's local computer. Contains the following:

LARS_LarsBridgeUserManual – Explains the software screen by screen and is quite helpful.

LARS Specification Manual – Explains calculations LARS uses in detail with code references and might be helpful for understanding the LARS detailed outputs such as capacities of beams, etc.

Release Notes - Summarizes changes in LARS for each version release.

C:\BKey\Training – Contains walkthrough examples

The 6 PDFs, an overview pdf, and 6 examples are helpful when first using LARS.

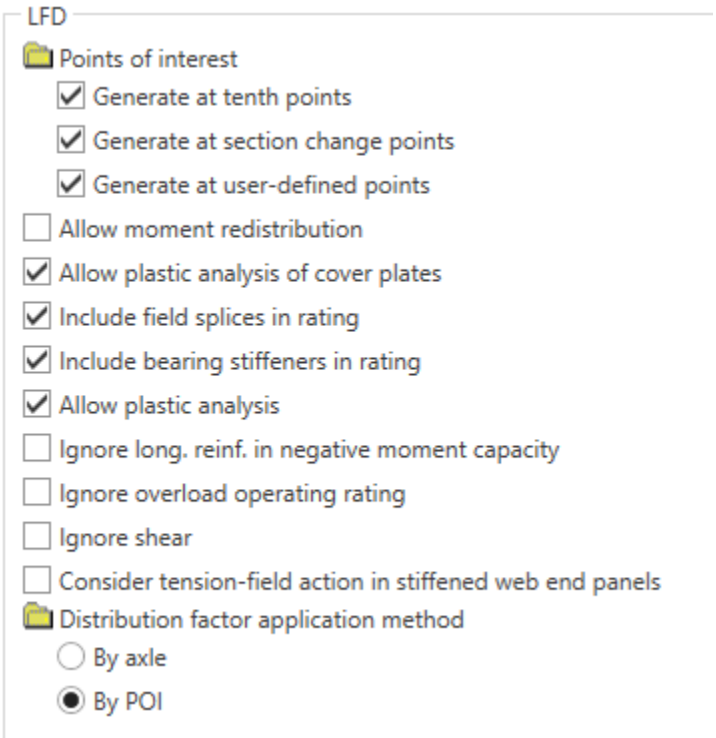
APPENDIX C: AASHTOWARE BRR PREFERENCES, TEMPLATES, AND BEST PRACTICES

General Preference Setting Templates currently available in AASHTOWareBr central DB and available for inclusion and use in any local DB in BrR:

- LFR steel A36 allow plastic
- LRFR steel A36 allow plastic
- LFR steel pre-A36 no plastic
- LRFR steel pre-A36 no plastic
- LFR steel no 10.57 allow plastic
- LFR concrete
- LRFR concrete – design
- LRFR concrete - legal

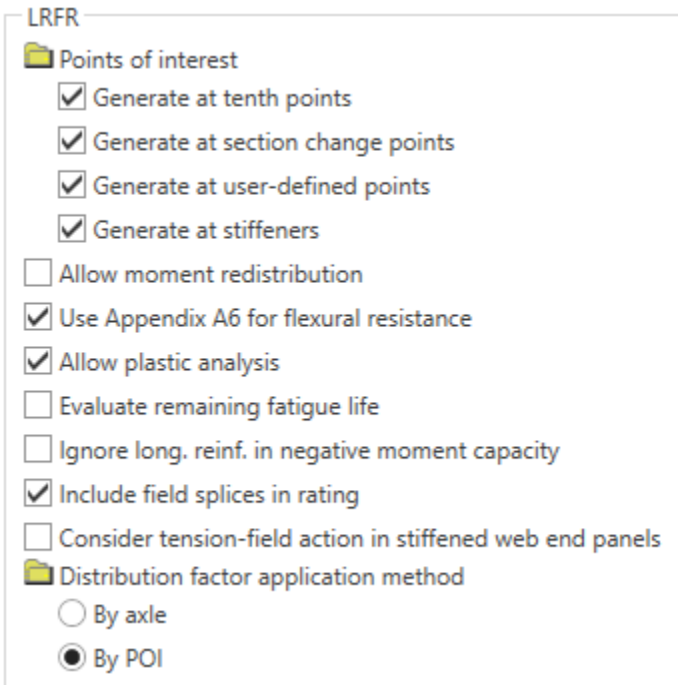
Template Name: LFR steel A36 allow plastic

Template Description: LFR - This template is to be used for steel bridges allowing plastic analysis per specification. A36 and newer steel is considered ductile; steel designations older than A36 are not ductile enough to consider plastic analysis.



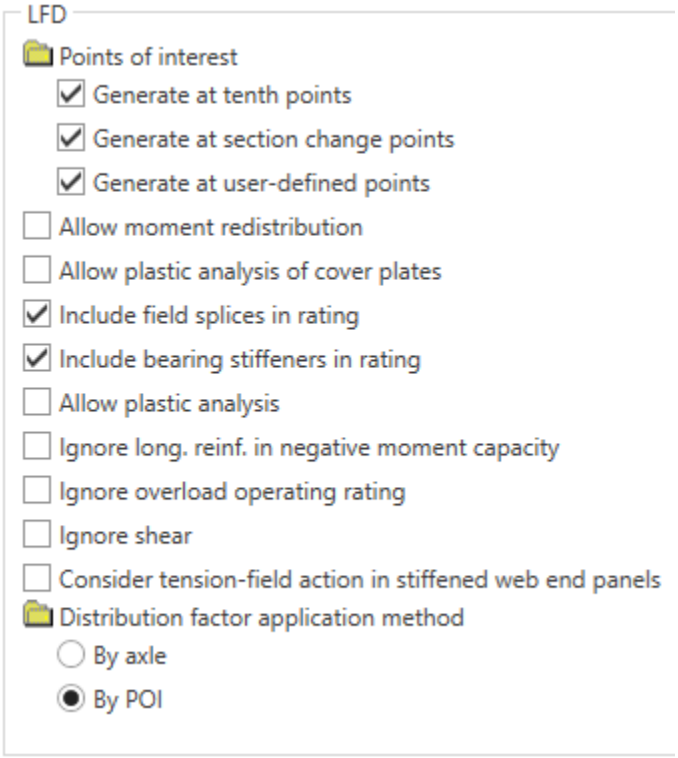
Template Name: LRFR steel A36 allow plastic

Template Description: LRFR - This template is to be used for steel bridges that should allow plastic analysis per spec. Also allows Appendix A6 when applicable. A36 and newer steel is considered ductile; steel designations older than A36 are not ductile enough to consider plastic analysis.



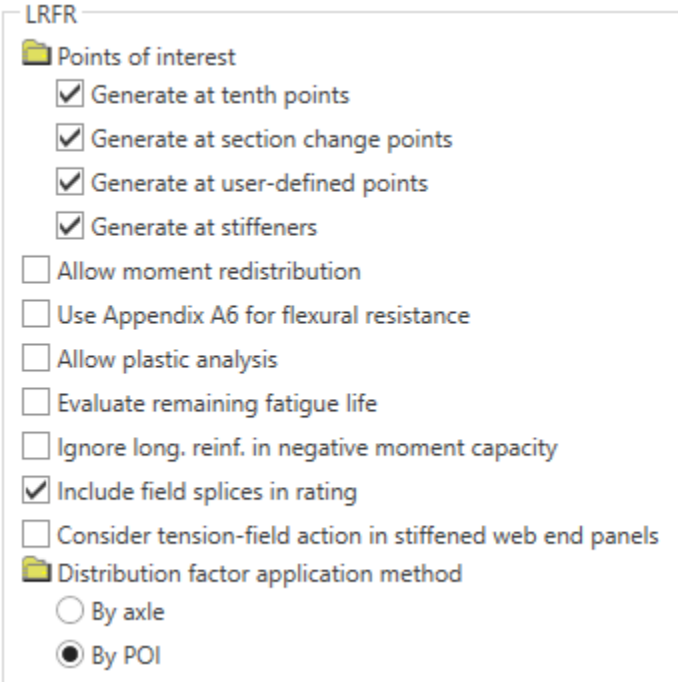
Template Name: LFR steel pre-A36 no plastic

Template Description: LFR - This template is to be used for steel bridges that should NOT allow plastic analysis per spec.



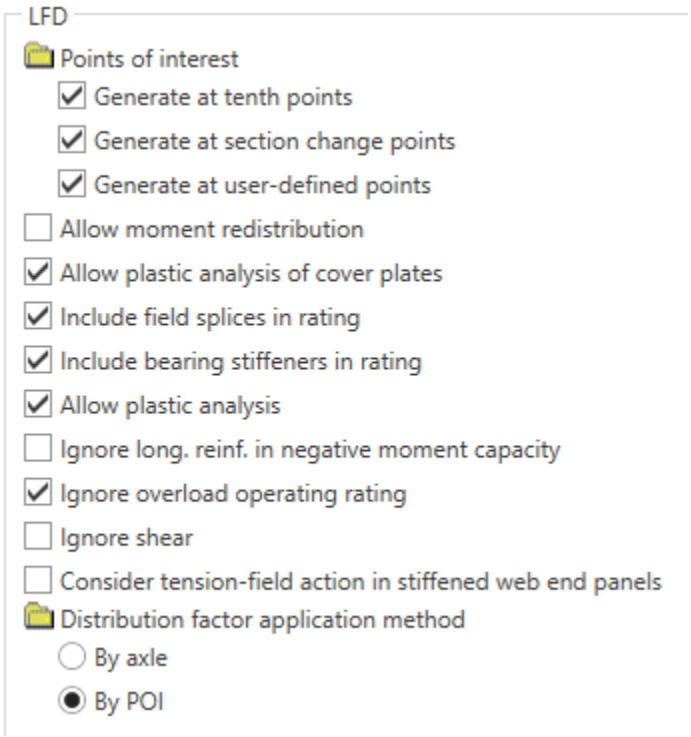
Template Name: LRFR steel pre-A36 no plastic

Template Description: LRFR - This template is to be used for steel bridges that should NOT allow plastic analysis per spec.



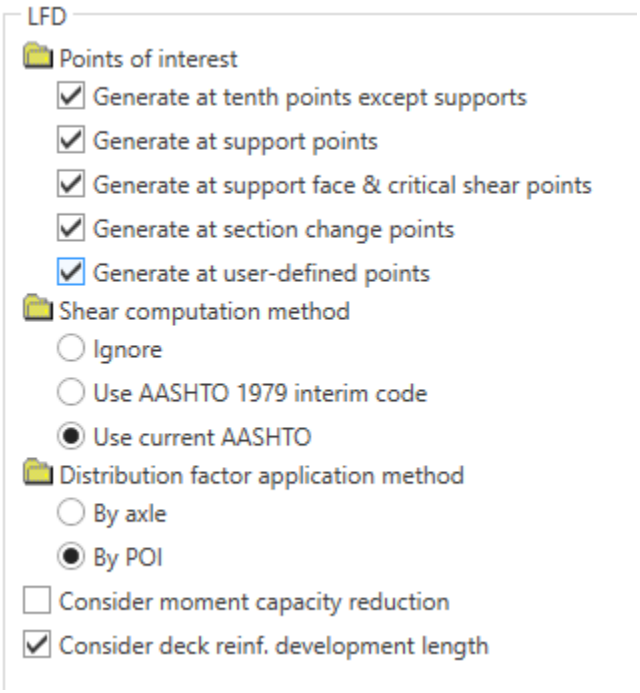
Template Name: LFR steel no 10.57 allow plastic

Template Description: LFR - This template is the same as "LFR steel A36 allow plastic", but it ignores the service ratings from stnd spec article 10.57



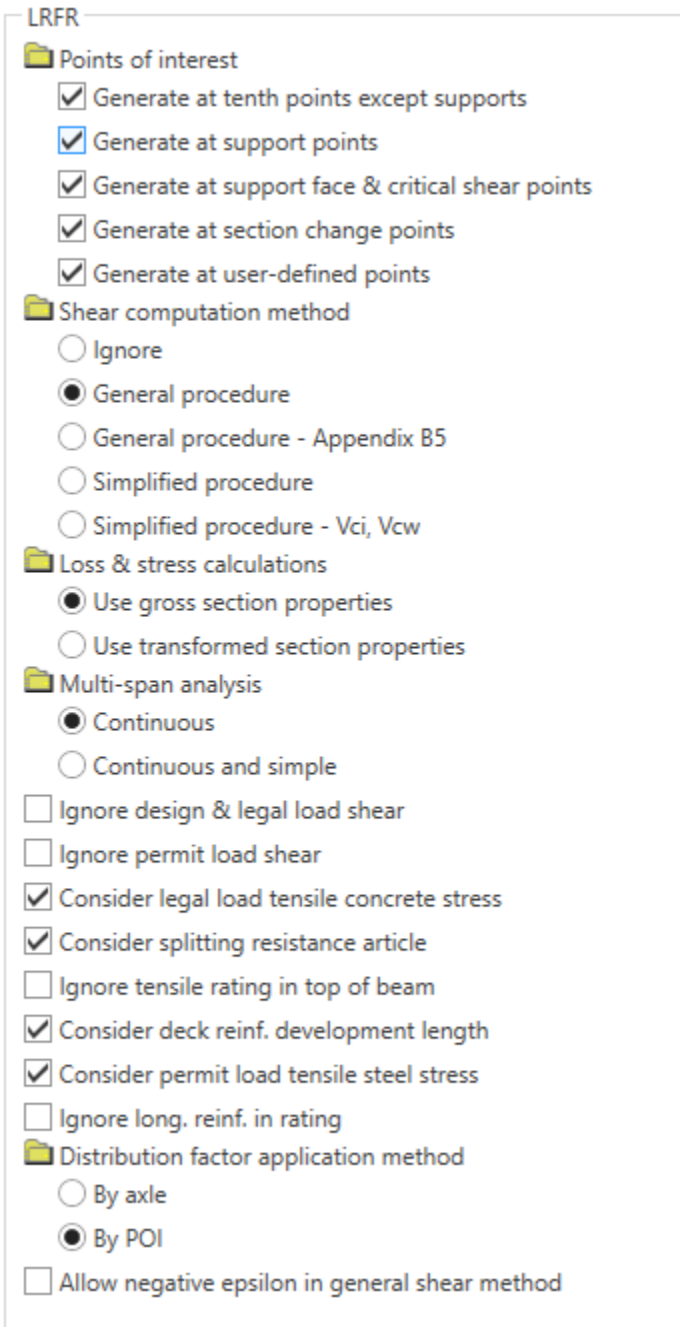
Template Name: LFR concrete

Template Description: This template includes default concrete settings (both R/C and P/S) for LFR analysis.



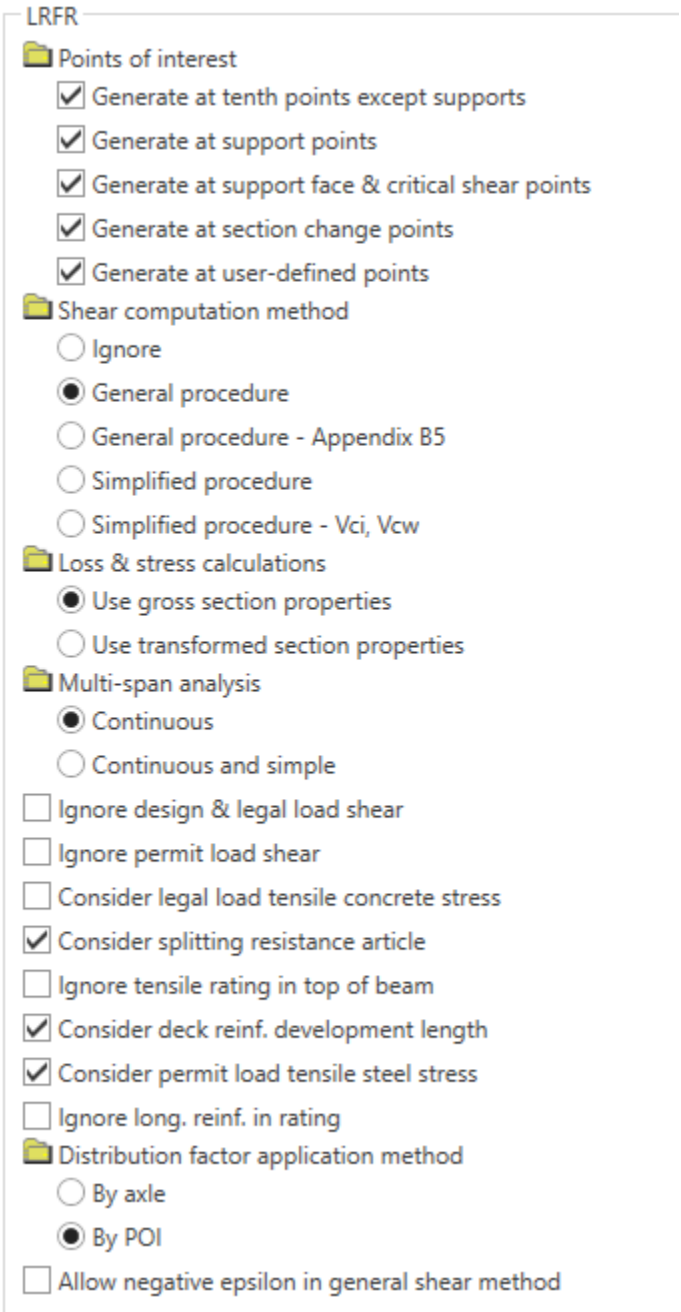
Template Name: LRFR concrete - design

Template Description: This template includes default concrete settings (both R/C and P/S) for LRFR analysis; includes service III for P/S design check.



Template Name: LRFR concrete - legal

Template Description: This template includes default concrete settings (both R/C and P/S) for LRFR analysis; IGNORES service III for P/S legal load rating.



Analysis Settings Templates currrently available in the AASHTOWareBr central DB and available for inclusion and use in any local DB in BrR:

Templates	Description	Analysis	Public / Private
HL 93 Design Review	HL 93 Design Review	LRFD	Public
HS 20 Rating	HS 20 Rating	Member Alternative	Public
LRFR Design Load Rating	LRFR Design Load Rating	LRFR	Public
LRFR Legal Load Rating	LRFR Legal Load Rating	LRFR	Public
WV LFR Standard w/ CRTS line	BrR new analysis event	LFD	Public
WV LFR Standard line	BrR new analysis event	LFD	Public
WV LFR Standard 3D FEM	BrR new analysis event	LFD	Public
WV LFR Standard w/ CRTS 3D FEM	BrR new analysis event	LFD	Public
WV LRFR Standard line	BrR new analysis event	LRFR	Public
WV LRFR Standard w/ CRTS line	BrR new analysis event	LRFR	Public
WV LRFR Standard 3D FEM	BrR new analysis event	LRFR	Public
WV LRFR Standard w/ CRTS 3D FEM	BrR new analysis event	LRFR	Public
WV LFR box culverts	BrR new analysis event	LFD	Public
WV LFR box culverts w/ CRTS	BrR new analysis event	LFD	Public

BrR Best Practices:

- Stage 2 superimposed DL application for line loads
  By default, for line girder analysis, BrR will apply stage 2 dead loads uniformly to all girder lines. For 3D FEM models, load distribution is based on the overall system stiffness. To better capture line weights (ref. WV BLRM 4.2.1) in BrR:
  1. Develop the model "normally" with line loads, label it "xxxxx – 3D FEM"
  2. Copy that original, complete superstructure system definition and label the new one "xxxxx – line girder"
  3. Under the line girder definition, delete the line loads (parapet rails, sidewalk, median barrier, etc.)
  4. Calculate actual line load distribution outside of BrR, then apply as member loads
  5. Make sure all alternative settings are correct
  6. See slides in EE Meeting_10.27.2021.pptx file for more information

- Miscellaneous DL
  It is good practice to consider some level of miscellaneous dead load, typically as a stage 1 structural component dead load, to account for anything that may be missed during normal load calculations and application within the model file. In prior application using LARS Bridge, the primary way of accomplishing this was to add a somewhat arbitrary dead load per unit length along the span(s). In BrR, miscellaneous DL can be added as a percentage of the member's self-weight or as additional load per unit length.

APPENDIX D: APPROVED COMMODITY PERMITS

Provided herein are approved commodity permits issued by WVDOH memorandum. Each memorandum shows the applicable truck configurations and associated routes they are permitted to travel on. Bridges along the listed routes and mileposts need to have all applicable permit truck configurations included on their routine load rating evaluations.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Jim Justice
Governor

Thomas J. Smith, P. E.
Secretary of Transportation/
Commissioner of Highways

October 10, 2017

MEMORANDUM

TO: All Law Enforcement Agencies

FROM: Gregory L. Bailey, P.E.
Deputy State Highway Engineer –
Operations/
Acting Maintenance Division Director

SUBJECT: TRAVEL ON WV-62, WV-869, AND US-35 IN PUTNAM AND MASON COUNTIES

Any truck operated by Challenger Freight while bearing this letter and a valid vehicle specific West Virginia overweight multi-trip hauling permit is authorized to haul engines above the established legal weight from the Toyota Plant located in Buffalo to the Ohio state line. These moves may be up to and including 120,000 lbs. (with no tolerance), GVW, over the routes listed with the designated vehicle configurations listed below.

Routes

WV-62 Putnam County	MP 17.70 - 19.90
WV-869 Putnam County	MP 0.00 – 0.58
WV-35 Putnam County	MP 20.19 – 23.82
WV-35 Mason County	MP 0.00 – 18.24

Vehicle Configuration

Option 1								
Axle Weight(pounds)	12,000	16,000	16,000	16,750	16,750	14,167	14,166	14,167
Axle Spacings	7'-5"	4'-6"	12'-10"	9'-1"	9'-1"	5'-0"		5'-0"
Option 2								
Axle Weight(pounds	12,000	16,000	16,000	18,000	18,000	13,333	13,334	13,333
Axle Spacings	17'-5"	4'-6"	12'-10"	9'-1"	9'-1"	5'-0"		5'-0"
Option 3								
Axle Weight(pounds	12,000	16,000	16,000	15,000	15,000	15,333	15,334	15,333
Axle Spacings	17'-5"	4'-6"	12'-10"	9'-1"	9'-1"	5'-0"		5'-0"

This authority is granted under House Bill 3064.

GLB:Gj

E.E.O./AFFIRMATIVE ACTION EMPLOYER

APPENDIX E: SAFE LOAD CAPACITY WEIGHT LIMIT TABLES

Weight Limits (Tons) 6/3/2020

Table 1 - Legal Weight Limits

100%	T3	SU4	SU5	SU6	SU7	2S2	3S2	Lane	EV2	EV3	SU-40	SU-45	3S-55	3S-60	WP47
Interstate	25	27	31	34.75	38.75	-	40	40	28.75	43	-	-	-	-	-
65,000	33	35.75	35.75	35.75	35.75	35.75	35.75	40	28.75	43	-	-	-	-	47
80,000	33	38.5	40.15	40.15	40.15	36	44	40	28.75	43	-	-	-	-	
120,000	33	38.5	40.15	40.15	40.15	36	44	40	28.75	43	42	47.25	57.75	63	

Table 2 - Legal Weight Limits divided by .7

70%	T3	SU4	SU5	SU6	SU7	2S2	3S2	Lane	EV2	EV3	SU-40	SU-45	3S-55	3S-60	WP47
Interstate	35.7	38.6	44.3	49.6	55.4	-	57.1	57.1	-	-	-	-	-	-	-
65,000	47.1	51.1	51.1	51.1	51.1	51.1	51.1	57.1	-	-	-	-	-	-	67.14
80,000	47.1	55.0	57.4	57.4	57.4	51.4	62.9	57.1	-	-	-	-	-	-	
120,000	47.1	55.0	57.4	57.4	57.4	51.4	62.9	57.1	-	-	60.0	67.5	82.5	90.0	

Table 3 - Legal Weight Limits divided by .85

85%	T3	SU4	SU5	SU6	SU7	2S2	3S2	Lane	EV2	EV3	SU-40	SU-45	3S-55	3S-60	WP47
Interstate	29.4	31.8	36.5	40.9	45.6	-	47.1	47.1	-	-	-	-	-	-	-
65,000	38.8	42.1	42.1	42.1	42.1	42.1	42.1	47.1	-	-	-	-	-	-	55.29
80,000	38.8	45.3	47.2	47.2	47.2	42.4	51.8	47.1	-	-	-	-	-	-	
120,000	38.8	45.3	47.2	47.2	47.2	42.4	51.8	47.1	-	-	49.4	55.6	67.9	74.1	

Priority 1 All fracture critical members and their connections with the exception of floorbeams that are in good or fair condition and their connections.

Priority 2 All other members and connections not qualifying as Priority 1

WVDOT TUNNEL INSPECTION MANUAL DRAFT

TABLE OF CONTENTS

LIST OF FIGURES

INTRODUCTION

The Tunnel Inspection Manual contains the following chapters:

1. Program Overview
2. Types of Inspections
3. Reporting Systems
4. Emergency Notifications / Critical Findings
5. Quality Control and Quality Assurance

These chapters define the qualifications required to become a team leader and the procedures that the team leader must follow. The performance expectations and responsibilities are provided in this manual. This manual provides the regulatory guidance and outlines the requirements that must be performed in order to provide the documents in the format and timely manner necessary for WVDOT to fulfill the requirements of the National Tunnel Inspection Standards. In addition, refer to TOMIE Manual for additional information.

1.0 PROGRAM OVERVIEW

1.01 Program Summary

It is important for the safety of the driving public that qualified personnel inspect West Virginia's Tunnels. The Tunnel Inspection Team Leader and other tunnel personnel are required to render judgment on a regular basis pertaining to the safety and integrity of the structures inspected.

The individuals involved in the State Tunnel Inspection Program (TIP) have critical input on many issues, including the allocation of scarce and limited rehabilitation funds and the decision to close tunnels. It is important that the Tunnel Inspector is highly trained and proficient; he/she must understand the mechanics, behavior trends, and economics of a wide range of Tunnel types.

West Virginia's State Tunnel Inspection Program (TIP) operates under the directives of the Federal Highway Administration (FHWA) and the West Virginia Department of Transportation (WVDOT). The mission of the program is as noted below:

1. Ensure public safety.

2. Provide for the efficient use of resources in maintaining the serviceability of West Virginia's tunnels.

3. Comply with all federal and state laws, rules, and policies.

4. The State is given the responsibility to accurately inventory and inspect all highway tunnels on public roads. The State shall inspect the tunnels on its highways and assigned non-state tunnels.

1.02 Inspection Program

The State Tunnel Inspection Program (TIP) is federally mandated and has been in effect since 2016. The program policies are based on the Specifications for the National Tunnel Inspection Standards (NTIS) and Tunnel Operations, Maintenance, and Evaluation (TOMIE) Manual. Tunnel inspection reports and records are stored in the Tunnel Inventory Database.

The required tunnel data is forwarded to the FHWA on an annual basis.

NTIS define a tunnel as *"an enclosed roadway for motor vehicular traffic with vehicle access limited to portals, regardless of type of structure or method of construction. Tunnels do not include bridges or culverts inspected under the National Bridge Inspection Standards (23 CFR 650- Subpart C- National Bridge Inspection Standards). Tunnels are structures that require, based on owner's determination, special design considerations that may include lighting, ventilation, fire protection systems, and emergency egress capacity."* This definition is consistent with the definition used by the American Association of State Highway and Transportation Officials (AASHTO).

This manual will address all tunnels that meet this definition.

1.03 Organization

The Tunnel State Program Manager (TSPM) is charged with administrating the State Tunnel Inspection Program (TIP). The Tunnel Inspection Team Leaders (TITL), report to the District Bridge Engineer (DBE). The TSPM, DBE and TITL are all required to be fully qualified Tunnel Inspectors.

The Tunnel State Program Manager (TSPM) ensures all Tunnel inspection reports and data have been uploaded to the Tunnel Inventory Database.

The review and quality assurance/quality/control procedure are discussed in Chapter 5.

1.04 Qualifications and Responsibilities

Below are listed the qualifications required for the various tunnel inspection positions and categories. In order to apply for these, one must: Submit an Inspection Qualifications Form. Qualifications have been determined for the following tunnel positions:

1) Tunnel State Program Manager (TSPM)

2) Tunnel Inspection Team Leader (TITL)

5) Load Rating Engineer (LRE)

6) Specialty Contractors or Discipline Specific Inspectors (SC or DSI)

For more information, refer to Section 4.4 of the TOMIE manual.

1.04(01) Tunnel State Program Manager (TSPM)

The TSPM is responsible for setting all tunnel inspection policies and procedures, and for all tunnel inspections and related reporting in the state.

TSPM Minimum Qualifications

The TSPM must meet the following minimum qualifications:

1. Capable of overseeing the Tunnel Inspection Team Leaders (TITL) in West Virginia, and other assigned Tunnel personnel.

2. Sound background in Tunnel Inspection and/or Bridge Inspection.

3. Specialized knowledge and skills in bridge or tunnel design, construction, soils, construction materials, and emergency repair techniques.

4. Successful completion of the Safety Inspection of In-Service Bridge (FHWA-NHI- 130055) course or Safety Inspection of In-Service Bridge for Professional Engineers (FHWA-NHI-130056) course.

5. Successful completion of Tunnel Safety Inspection (FHWA-NHI-130110) course.

6. Registered Professional Engineer (PE) in the state of West Virginia.

7. Has a minimum of 10 years of experience in either bridge and/or tunnel inspection.

8. Complete a cumulative of 18 hours of FHWA-approved tunnel inspection refresher training over each 60 months period.

9. Be able to determine when a team leader must meet additional requirements for complex and or other tunnels.

TSPM Responsibilities

As a part of the responsibilities of this position, the TSPM shall:

1. Oversee the WVDOT or consultant Tunnel Inspection Team Leaders (TITLs).

2. Manage the statewide tunnel inspection and inventory programs.

3. Ensure all tunnels in the state are inspected at a frequency and by a method consistent with the NTIS and state law.

4. Ensure that tunnel inspection data is uploaded to the Tunnel Inventory Database within mandated time frames.

5. Ensure load ratings are completed in accordance with all federal requirements.

6. Oversee quality assurance and quality control of all tunnel inspection programs.

7. Coordinate with federal, state, toll road, county, and local governmental agencies.

8. Formulate and monitor unique or special features requiring additional attention during inspection to assure the safety of such structures.

9. Conduct annual inspections of state border tunnels in company with respective states' personnel and district offices to determine required actions and lead the effort to accomplish Indiana's portion of any required actions.

10. Notify FHWA of all critical findings based on requirements within this manual.

11. Ensure proper signage is in place for tunnels that require load posting or other restrictions.

12. Ensure a system is in place that will notify WVDOT or consultant TITL(s) of required inspections and their due dates.

13. Ensure a system is in place to upload all approved inspection data.

14. Formulate and administer programs and policies.

15. Develop, implement, and evaluate inspection and preservation policies, standards, procedures, and programs.

16. Analyze federal and state legislation, administrative rules, and national and industry standards for incorporation in programs and policies.

17. Recommend the revision of legislation and participate in new legislation development.

18. Lead prompt, decisive, and effective responses to emergencies such as floods, earthquakes, and major tunnel damage.

19. Train tunnel inspection personnel when needed.

20. Develop, monitor, and update training programs for state and consultant inspectors.

21. Arrange or conduct inspection training programs and refresher programs throughout the state.

22. Provide training on proper access, equipment operation, and safety procedures.

23. Review and approve Tunnel Inspection Team Leader and consultant Tunnel Inspection Team Leader qualifications.

24. Maintain a list of all qualified Tunnel Inspection Team Leaders. The list will identify training required to keep the qualifications up to date.

25. Evaluate Tunnel Inspection Team Leaders and other tunnel personnel that require additional training as necessary.

26. Advice on technical issues concerning problems or deficiencies discovered during inspections.

27. Act as a Tunnel Inspection Team Leader, as needed.

28. Monitor inspections and develop a good, general knowledge of all tunnels in the state and their inspection records.

29. Manage state tunnel inspection personnel and consultants to meet the needs of the State Tunnel Inspection Program.

30. Manage state-owned tunnel access equipment to assist in the inspection of tunnels statewide.

1.04 (2) WVDOT and Consultant Tunnel Inspection Team Leader (TITL)

The TITL is responsible for the tunnel inspection and reporting for all assigned state-owned Tunnels, when assigned. In addition, TITL is responsible for ensuring the tunnel inspection work is filed properly.

WVDOT and Consultant Tunnel Inspection Team Leader (TITL) Minimum Qualifications

The WVDOT TITL and Consultant TITL must meet the following qualifications:

1. Successful completion of Tunnel Safety Inspection (FHWA-NHI-130110) course with a score of 70 percent or greater on the end-of-course assessment.

2. Complete a cumulative total of 18 hours of FHWA-approved tunnel inspection refresher training of NHI-130125 or NHI-130125V over each 60-month period.

3. Demonstrate a strong background in such areas as bridge or tunnel structural engineering, structural behavior trends and bridge or tunnel rehabilitation techniques.

4. Demonstrate management abilities.

5. Demonstrate thorough familiarity with NTIS, this manual and applicable WVDOT guidelines.

6. Must meet one of the following:

    a. Registered professional engineer and at least 6 months of tunnel or bridge inspection experience.

    b. 5 years of tunnel or bridge inspection experience.

    c. Appropriate combination of education and experience all of the following:

1. A bachelor's degree in engineering or engineering technology from a college or university accredited or determined as substantially equivalent by the Accredited Board for Engineering and Technology.
2. Successfully passed the National Council of Examiners for Engineering and Surveying Fundamentals of Engineering examination.
3. Two years of tunnel or bridge inspection experience.

d. Have all of the following:

1. An associate degree in engineering or engineering technology from a college or university accredited or determined as substantially equivalent by the Accreditation Board of Engineering and Technology.
2. Four years of tunnel or bridge inspection experience.

7. All complex tunnel inspections must be performed by a team leader registered as a professional engineer with 6 months tunnel and/or bridge inspection experience.

WVDOT and Consultant Tunnel Inspection Team Leader (TITL) Responsibilities

As a part of the responsibilities of this position, the WVDOT TITL shall:

1. Coordinate inspections to ensure that all inspections are completed in compliance with this manual.

2. Oversee assistant Tunnel Inspectors.

3. Ensure that all tunnel inspection results are approved and sent to the TSPM within 60 days of the date of the inspection and within seven days for all closures and emergency inspections.

4. Notify the TSPM of all tunnel's critical findings in accordance with this manual who will inform FHWA within 24 hours of being notified.

5. District Bridge Engineers must also contact central office within 60 days of load restriction or closure changes so that inventory coding may be updated.

1.04(3) Load Rating Engineer (LRE)

Routine load ratings of state-owned tunnels are generally performed and maintained by WVDOT's Bridge Load Rating Engineer who will also be a fully qualified Bridge Load Rating Engineer (LRE). The load rating of local tunnels is generally done by the consultant Tunnel Inspection Team Leader (TITL) of record for the owner.

LRE Minimum Qualifications

The LRE must meet the qualifications listed below:

1. Have experience calculating load ratings and knowledge of load capacity rating computer programs.

2. Registered PE licensed in the state of West Virginia, qualified to oversee, review, and certify all load capacity ratings performed under his/her supervision.

3. It is preferred that the LRE successfully complete FHWA-NHI-130055, Safety Inspection of In-Service Bridges and Tunnel Safety Inspection FHWA-NHI-130110 Tunnel Safety Inspection.

4. It is preferred, but not required, that the LRE be a certified Tunnel Inspection Team Leader in West Virginia.

LRE Responsibilities

The LRE must:

1. Provide engineering judgment to those performing the load ratings.

2. Be actively involved in reviewing the quality and accuracy of all load ratings.

1.04(4) Specialty Contractors or Discipline Specific Inspectors

Specialty contractors (SC) or Discipline Specific Inspectors (DSI) may be required to inspect Complex or specialized tunnel systems. This type of inspector may be necessary for In-Depth Inspections of tunnel systems where specialized tests for a system such as tunnel ventilation, emergency generators or other systems are required.

It should be noted that Specialty contractors may require very specific certifications to perform their Inspection work: For more information, refer to Sections 4.4.3 and 4.4.4 of the TOMIE manual.

SC or DSI Minimum Qualifications

When complex civil/structural, mechanical, or electrical systems need to be inspected, the team leader should assign discipline specific specialists (DSI) with suitable training and experience to help conduct these inspections. Ideally, these specialist individuals should be registered professional engineers or at least engineers-in-training.

Specialty contractors (SC) are beneficial when the regular inspection staff lacks the specialized skills and experience necessary to inspect sophisticated equipment or complex systems such as power distribution systems, fire protection and detection systems, security systems, and SCADA (Supervisory Control and Data Acquisition) systems. It is advisable to use qualified specialty contractors when inspecting complex units that pose elevated risks to safety such as boiler units, electrical systems, or energized equipment like transformers. This may help to minimize health and safety risks to the inspection crew and prevent damage to very expensive equipment.

SC or DSI Responsibilities

The SC and DSI are responsible for the following:

1. Following all Tunnel Inspection Team Leader (TITL) instructions in a safe and appropriate manner.

2. Assisting the TITL in the field.

3. Documenting his/her participation and experience.

4. Adhere to your assigned SC or DSI specific duties in Sections 4.4.3 and 4.4.4 of the TOMIE manual.

1.05 Tunnel Inventory Database

As the "Lead Agency" in interactions with USDOT/FHWA, it is WVDOT’s responsibility to maintain an inventory of all tunnels within West Virginia. All tunnel data shall be stored in the InspectTech (AssetWise) software.
All inspection data shall be approved by the Tunnel Inspection Team Leader.

Additional inventory information, inspection reference materials, field notes/sketches, and quantity take-offs can be found in above software.

These materials include the following:

Structure Inventory

1. Field inspection information including sketches and photographs showing typical and deteriorated conditions. This requirement includes a brief narrative to justify a change in condition rating. A plan of action is to be included, if required.

2. Critical Findings in accordance with this manual

3. Other Inspection Procedures. These items will include other required reports such as fracture critical. These reports will be in accordance with this manual.

4. Load Rating. A dated load rating along with identification of the analysis to determine capacity. Results must be included which clearly identify the loads and methodology used in the analysis. Identify controlling members. Include any updates that reflect changes in the condition of structural members. If calculations cannot be provided due to lack of information, provide documentation for justification of determined load rating.

5. Posting Documentation which is in accordance with this manual.

2.0 TYPES OF INSPECTIONS

2.01 Introduction

There are numerous types of inspections, each designed to obtain specific information. For example, an Initial Inspection is performed after a tunnel is constructed to document the as-built conditions, whereas Routine Inspections are used to monitor the condition of a tunnel at regular intervals. Damage Inspections are used to assess damage resulting from events such as deterioration, impacts, fires, or floods. These inspections help create a complete picture of a tunnel's condition and are described in detail in this chapter.

Visual inspection is the primary examination method for all inspections. Nondestructive testing (NDT) techniques may be required to identify internal flaws or hard-to-see external defects in critical members. NDT is detailed in this manual.

2.02 Inspection Types

The Federal Highway Administration (FHWA) and the state of West Virginia dictate the type of inspection each tunnel requires, and the maximum interval between inspections. Figure 1.1 Tunnel Inspection Types and Maximum Intervals gives an overview of the types of inspections, the maximum interval between inspections, and the governmental unit responsible for the inspection policy. These are the following five (5) types of tunnel Inspections that will be discussed in this manual:

1) Initial Inspection

2) Routine Inspection

3) Damage Inspection

4) In-depth Inspection

5) Special Inspection

For more information, refer to Section 4.6 of the TOMIE manual.

2.03 Inspection Schedules

Once a Routine Inspection has been conducted (which means there was an Initial Inspection performed) on a Tunnel, the following Routine Inspections and other scheduled inspections should be completed in the same month unless the TSPM approves changing the frequency. A scheduled inspection can be conducted early but must never be conducted late.

Upon final approval of any inspection type, the *Scheduling* fields will be reviewed on the primary Inspection Report Information page. All report type schedules will be maintained.

The Due Date and Schedule Date is calculated based on the last approved inspection of that type and can only be edited after the inspection report has been uploaded to the Tunnel Inventory Database.

In the event that a Schedule need modified following the upload and report approval, the TSPM will need to be notified to ensure changes are reflected in the Tunnel Inventory Database.

2.04 Inspection Plan of Action

Occasionally deterioration, or other issues are found on a tunnel that may require a reduced inspection frequency and/or more thorough inspection. In these cases, an Inspection Plan of Action is to be written and attached to the report and be stored in the Tunnel Inventory Database. The Plan of Action should be detailed in describing the actions needed, the time frames they are needed, and who should be informed if additional issues are found, and how to document the findings.

2.05 Initial Inspections

2.05(01) Purpose

The initial inspection is defined as the first inspection of a tunnel to provide all inventory, appraisal, and other data necessary to determine the baseline condition of the structural and functional systems. The importance of scheduling timely initial inspections cannot be understated. The NTIS requires an initial inspection to be performed after all construction has been completed, but prior to opening the structure to traffic. The timeframe imposed means that tunnel-specific inspection procedures must be developed during the design and/or construction phases. Federal law requires initial inspections to be performed for tunnels constructed after the August 13, 2015, NTIS effective date. Existing tunnels constructed prior to the effective date are to receive a routine inspection.

As a part of the Initial Inspection, Inspectors must review the “Tunnel File” and research and look for all missing documents and have any that are found scanned and uploaded into the Tunnel Inventory Database.

2.05(02) Precision

The Initial Inspection should be a fully documented investigation. Inspectors must be able to identify any deficiencies and verify the geometric data. All observed deficiencies, cracks, construction errors, and alignment problems should be documented.

An Initial Inspection should include:

1. Verify and record all Structure Inventory and Appraisal (SI&A) data required by federal and state regulations.
2. Gather relevant information required to maintain an accurate Tunnel file, scan and uploaded in the Tunnel Inventory Database.
3. Ensure that all tunnel systems are noted and evaluated in accordance with the SNTI which may include the following:

- Emergency Generator System
- Miscellaneous Mechanical systems
- Electrical Distribution systems
- Electrical and Lighting systems
- Fire and life safety, emergency systems
- Emergency communication systems
- Tunnel security and operation systems
- Tunnel ventilation systems
- Other tunnel systems that need special consideration

4. Determine and evaluate the baseline structural condition, as well as systems.
5. Identify the location and condition of any fracture critical members or details.
6. Identify the location and condition of any details that may require a Special Inspection.
7. Verify that all clearances and geometric dimensions are probably noted in the Tunnel Inventory Database.
8. Identify any critical findings and notify the appropriate individuals and agencies identified in this manual.

All inspection results should be fully documented and filed in the Tunnel Inventory Database.

2.05(03) Repairs

Rehabilitation repairs are permanent repairs that are intended to improve the structural condition of a member and/or component. Access to the repair plans is needed to determine if and to what extent rehabilitation improves any specific rating number.

Tunnels used to maintain traffic during construction must be inspected in the month the Routine inspection is due. The Contractor is required to provide access for inspectors to conduct a Tunnel Inspections of any type.

2.05(04) Frequency

For state-owned an Initial Inspection should be completed before the new construction or rehabilitation construction contract is finalized and the tunnel is open to traffic. These inspections are often performed in conjunction with the construction department's Pre-Final Inspection. Approved Initial Inspection data, including the SI&A data, must be entered in the Tunnel Inventory Database within 90 days of the completion of the construction.

A tunnel not previously documented in the Tunnel Inventory Database shall receive an Initial Inspection within 90 days of the discovery of the tunnel. The data must be entered the Tunnel Inventory Database. In addition, the report will be approved within 90 days of the discovery of the tunnel.

2.06 Routine Inspection

2.06(01) Purpose

A routine inspection is defined as a regularly scheduled comprehensive inspection encompassing all tunnel structural elements and functional systems and consisting of observations and measurements needed to determine the physical and functional condition of the tunnel, to identify any changes from initial or previously recorded conditions, and to ensure that tunnel components continue to satisfy present service requirements. All elements of the tunnel must be visually inspected at a distance that is close enough to determine the overall condition and detect deficiencies. In addition to performing a structural evaluation, each routine inspection will require access and examination of any electrical, mechanical, fire safety, life safety, and security systems. The degree of inspection and testing frequency for these systems must be performed in accordance with the tunnel-specific inspection procedures.

A routine inspection target date is established during the first inspection a tunnel receives and cannot be modified without program manager approval. Unlike current NBIS processes, an early or late inspection does not adjust the inspection cycle or month that the next routine inspection is due. In order to adjust the date of future routine inspections please send a request to the Tunnel State Program Manager - and provide justification that supports the change. The TSPM will review the justification, request additional information if necessary, and seek concurrence with the WV FHWA office. Routine Inspections must occur within a 24-month interval except if required to be inspected more frequently.

2.06(02) Precision

Routine Inspections will follow a Plan of Action, documented in the Tunnel Inventory Database, if the tunnel may unique issues such as difficult access which requires access equipment or traffic control.

Routine Inspections are generally conducted from the portal to portal or from permanent work platforms and walkways if present. A complete walk-around visual inspection of all components of the structure and adjacent roadway is required. A complete walk-around visual inspection of all tunnel systems is required, such as:

A Routine Inspection should include the following system inspections in accordance with SNTI, if present:

- Emergency Generator System
- Miscellaneous Mechanical systems
- Electrical Distribution systems
- Electrical and Lighting systems
- Fire and life safety, emergency systems
- Emergency communication systems
- Tunnel security and operation systems
- Tunnel ventilation systems
- Other tunnel systems that need special consideration

1. Complete an inspection and evaluation of all required data identified in accordance with this manual.

2. Verify SI&A data.

3. Gather other relevant information required to maintain an accurate Tunnel file, scan, and upload to the Tunnel Inventory Database InspectTech (AssetWise).

4. Note any existing problems or components.

5. Note the condition of fracture critical members or details.

6. Identify the location and condition of details that may require a Special Inspection.

7. Take alignment photos from both ends of the tunnel. Closing, posting, and/or restriction signs should be visible and legible in the photos.

8. Take elevation photos, preferably of both ends of the tunnel, (as a minimum on one side of the tunnel).

9. Take photos of all tunnel elements with a condition state of 2, 3, or 4.

10. If needed to complete the tunnel file, take one clear photo under each superstructure type, clearly showing details.

12. If needed to complete the tunnel file, take one clear photo of each substructure unit in the water.

13. If needed to complete the tunnel file, take one photo looking at the portal entrance (north or east portal entrance).

14. If needed to complete the tunnel file, take one photo looking at end portal entrance (south or west entrance).

15. If needed to complete the tunnel file, take one photo of any fracture critical member or details.

16. If needed to complete the tunnel file, take one photo of any detail that requires a Special Inspection.

17. Take photos of significant deterioration and collision damage.

18. Note if a new load rating is warranted.

19. Identify any Critical Findings and notify the appropriate individuals and agencies identified in this manual.

2.07 Special Inspection

2.07(01) Purpose

Special Inspections are scheduled to examine a portion of a tunnel in more detail or at a greater or lesser frequency than is standard for Routine Inspections. Special Inspections may provide follow-up after a Routine, Damage, or Initial Inspection. The Special Inspection mandates the component being inspected is at arm's length, and Non-Destructive Evaluation (NDE) methods utilized when necessary to complement visual evaluations. Details and tunnels that may require a Special Inspection include the following:

1. Known defects, significant section loss/deterioration, or damage severe enough to warrant extra scrutiny

2. Unique or problematic details as determined by the TSPM

3. A tunnel may require special inspection for the following systems:

- Emergency Generator System
- Miscellaneous Mechanical systems
- Electrical Distribution systems
- Electrical and Lighting systems
- Fire and life safety, emergency systems
- Emergency communication systems

- Tunnel security and operation systems
- Tunnel ventilation systems
- Other tunnel systems that need special consideration

2.07(02) Precision

Special Inspections may include a Plan of Action, if required. The Plan of Action may include:

1. A timetable for conducting each inspection.
2. The personnel requirements for each portion of each inspection.
3. A list detailing what is required to be inspected under each inspection.
4. The required access equipment needed for each inspection.
5. The required traffic control for each inspection.
6. Assistance from a specialist for potential problems for the following tunnel systems:

    a. Emergency Generator System:
    b. Miscellaneous Mechanical systems
    c. Electrical Distribution systems
    d. Electrical and Lighting systems
    e. Fire and life safety, emergency systems
    f. Emergency communication systems
    g. Tunnel security and operation systems
    h. Tunnel ventilation systems
    i. Other tunnel systems that need special consideration

2.07(03) Special Inspection because of unique or problematic details

For tunnels that require a Special Inspection because of unique or problematic details, the inspector must make sufficient measurements and observations to quantify the deficiencies to allow for future monitoring. Inspectors should document:

1. The physical and functional conditions of the known or suspected deficiency.
2. Any developing problems such as deterioration, foundation settlement, scour or erosion of the slopes, scour at the supports, ice damage, or other problems that, if left unchecked, would degrade the load-carrying capacity of the tunnel.
3. Signage is in place and visible for load-posted or restricted tunnels.
4. The ability of the tunnel to satisfy its present service requirements.
5. The condition state of the specific element or potential tunnel systems like:

    a. Emergency Generator System
    b. Miscellaneous Mechanical systems

c. Electrical Distribution systems

d. Electrical and Lighting systems

e. Fire and life safety, emergency systems

f. Emergency communication systems

g. Tunnel security and operation systems

h. Tunnel ventilation systems

i. Other tunnel systems that need special consideration

2.07(04) Recording Inspection Results

Inspection results must be recorded in the Tunnel Inventory Database. The date of the inspection and a list of the deficiencies investigated must be included. If any deficiency has become more severe, it may be necessary to notify the owner and re-evaluate the tunnel load rating. Critical findings shall be reported to the appropriate individuals and agencies identified in this manual.

Some Special Inspection tasks need not be performed with a Tunnel Inspection Team Leader on site. Inspection Team Members can be sent out to perform specific inspection or measurement tasks under the direction of an Inspection Team Leader. Such tasks might include measuring a crack, photographing a weld, or measuring section loss on specific members. These tasks must be clearly documented in the Special Inspection Plan of Action. The Inspection Team Leader is still required to review and sign off on all inspection data entered into Tunnel Inventory Database.

For state-owned or state-assigned tunnels that require a Special Inspection, a lead Inspection Team Leader is assigned by the District Bridge Engineer. The Plan of Action will be developed and modified by the lead Inspection Team Leader in consultation with the State Program Manager.
The lead Inspection Team Leader for state-owned or state-assigned tunnels may or may not be the Inspection Team Leader for any individual inspection performed as a part of the Special Inspection. The Inspection Team Leader for each individual inspection will approve the inspection results entered in the Tunnel Inventory Database for that inspection. The lead Inspection Team Leader must review all individual inspections performed as a part of the Special Inspection, as well as generate/approve a summary of the Special Inspection. This summary must be entered in the Tunnel Inventory Database.

Inspection teams for state-owned or state-assigned tunnels may consist of state personnel, consultants, or a combination. The lead Inspection Team Leader will ensure that each team is working within the scope of its professional ability.

The Plan of Action will be developed and modified by the lead Inspection Team Leader in consultation with the Tunnel State Program Manager.

The lead Inspection Team Leader must review all individual inspections performed as a part of the Special Inspection, as well as generate/approve a summary of the Special Inspection. This summary must be entered into the Tunnel Inventory Database.

Depending on the extent of the damage or deterioration, a Special Inspection may include a recommendation for a load rating to assess the capacity of damaged or deteriorated members. Nondestructive tests and/or other material tests may be needed to assist in determining the safe load-carrying capacity.

Critical findings shall be reported to the appropriate individuals and agencies identified in this manual.

All inspection results should be fully documented in the Tunnel Inventory Database.

2.07(05) Frequency

Special Inspections for unique and problematic details are completed in addition to Routine Inspections. The maximum inspection interval for a Special Inspection is 12 months. A problematic detail that is performing well on a structure can have an inspection interval of 12 months. A structure with a problematic detail that has a rating of 4 or less shall be inspected on a 12 month or less interval.

A written request should be sent to the TSPM requesting the Special Inspection be removed if the detail has been retrofitted or rehabilitated.

The inspection frequency of each component inspection of a Special Inspection for a complex tunnel may be identified in the Plan of Action. It may be most efficient to conduct all of the inspections at one time, using the same inspectors. However, it may not be practical to schedule inspections requiring different types of traffic control, access equipment, or NDT at the same time.

2.08 In-Depth Inspection

2.08(01) Purpose

In-Depth Inspections are a close-up, hands-on inspections conducted on one, several, or all tunnel elements or functional systems. These inspections are used to identify deficiencies that are not readily identifiable during initial, routine, or damage inspections. In-depth inspections may involve testing of tunnel systems, components, and/or materials. More extensive disassembly and cleaning of equipment parts may occur. This type of inspection may be used to support a structural analysis or a functional system evaluation where more information is needed. In-depth inspections are scheduled based on the needs of the tunnel facility, inspection findings, and established written procedures.

2.08(02) Precision

The scope of an In-Depth Inspection shall be defined in advance and shall be to inspect one, several, or all tunnel elements or functional systems. In-Depth inspections shall always be close-up and hands-on. An In-Depth Inspection is a scheduled inspection that will allow the inspector the opportunity to make sure that all of the components of the structure are performing as intended.

2.08(03) Frequency

The maximum frequency of an in-depth inspection is 72 months.

2.09 Damage Inspections

2.09(01) Purpose

A damage inspection is defined as an unscheduled inspection to assess structural damage resulting from environmental factors or human actions. They should be completed as warranted by district inspection staff. When detrimental damage occurs that causes a critical finding action must be taken immediately to protect public safety.

2.09(02) Precision

The scope of a Damage Inspection should be sufficient to determine whether there is a need for emergency load restriction, or closure of part or all of the tunnel to traffic. Inspectors of state-owned or state-assigned tunnels should also assess the level of effort necessary to repair the damage. The amount of effort expended on this type of inspection may vary significantly and depends on the extent of the damage. If major damage has occurred, the inspector shall document the damage, including measuring section loss or misalignment, and any loss of foundation support.

Inspection data and pictures shall be entered into the Tunnel Inventory Database as soon as possible, and no more than seven days after the inspection. This inspection may be supplemented by a timely Special Inspection to more fully document the extent of damage and the urgency and scope of repairs. A more refined analysis, to establish or adjust interim load restrictions, may also be required as follow-up for a Damage Inspection. A structural engineer may need to be consulted for the inspection or analysis. If the inspection identifies a Critical finding, the inspector must follow the notification procedures outlined in this manual.

A damage inspection is required for all tunnels in which the event has left permanent physical evidence. The damage inspection data and pictures shall be entered into the tunnel Inventory Database as soon as possible and no more than seven days after the inspection.

The Inspector of state-owned or state-assigned tunnels should gather data on the vehicles and drivers involved and any police report after a crash. This information will be used to bill the appropriate insurance company for damages.

2.09(03) Frequency

A Damage Inspection is an unscheduled inspection that is performed to determine if significant damage has been done to the tunnel. Based on the findings of the damage inspection, the inspector will determine if the damage warrants placing the structure on a special detail inspection. Pictures of any damage will be uploaded into Tunnel Inventory Database with a complete description of the event. Generally, a law enforcement officer on the site of an accident involving a tunnel will notify the owner who will request a Damage Inspection be performed to determine if the tunnel should be closed. Damage Inspections may be needed after flooding or earthquakes.

2.10 Tunnels Closed To Traffic

If a tunnel is closed to all traffic, for construction when an inspection is due, the inspection team shall:

1. Document the tunnel is properly closed with photos.

2. Note that the inspection date was changed in the Tunnel Inventory Database.

3. Verify the estimated date of completion of the construction.

4. Schedule on the Tunnel Inventory Database, a new Initial Inspection, and all other required inspections for the estimated completion date. All rescheduled inspections must be completed within 90 days of being opened to traffic. The Routine Inspections shall remain in the month that it had been prior to construction, once the Initial Post-construction Inspection is complete.

5. Leave other NTI data items unchanged, until the initial inspection is conducted.

If a tunnel is only partially closed to traffic during construction, then a tunnel inspection is required. On WVDOT tunnels, the contractor is required to provide a time and access for inspectors to conduct all needed inspections.

If a tunnel has been closed permanently when inspection is due, the inspection team shall:

1. Document the tunnel is properly closed with photos. No other inspection work is required. If the tunnel is not properly closed, a critical finding must be immediately submitted.

2. A memorandum will be published stating that the tunnel is permanently closed. The memorandum will be electronically stored on the Tunnel Inventory Database.

3. Code the appropriate NTI Date Item(s) with the date the inspectors were at the tunnel.

4. Note that the inspection dates were changed in the Tunnel Inventory Database.

5. Leave other NTI data items unchanged.

6. Recommend the removal of the tunnel be scheduled as soon as possible.

Permanently closed tunnels are generally not eligible to use federal tunnel inspection funds to conduct inspection activities.

3.0 REPORTING SYSTEMS

3.01 Tunnel File

Tunnel inspections shall be documented utilizing the InspectTech (AssetWise) software. The InspectTech (AssetWise) software will be utilized to maintain the record of inspections. An inspection report shall include at minimum, tunnel inventory data, tunnel element data, and supporting documentation. Supporting documentation can include photos, sketches, narrative, special reports, testing results, etc.

The required report sections in a Tunnel inspection report include the following:

1. Report Cover and Location Map

2. Executive Summary. The executive summary is to include a general statement of condition of the Tunnel and a statement of areas of concern.

3. National Tunnel Inventory and Miscellaneous Asset Data.

4. Field Inspection Information. Field inspection information is to include sketches and photographs showing typical and deteriorated conditions. A brief narrative is required to justify a change in condition rating. All pictures inspection report are to be labeled.

5. Critical Findings. Critical finding documentation is to be in accordance with this Tunnel Inspection Manual.

6. Posting Documentation. Posting documentation is to be in accordance with this Tunnel Inspection Manual.

7. Pictures and Sketches. All pictures and sketches in the inspection report are to be labeled.

8. Load Rating.

3.02 Tunnel Number

The state uses an alpha-numeric numbering system to identify the West Virginia Department of Transportation (WVDOT) Tunnel identification number based on:

1) County Number

2) Letter T

3) An assigned three-digit number

3.03 Tunnel Reporting

All initial, routine, damage, in-depth and special inspection reports must be submitted to central office (Via InspectTech) within 60 days after the completion of field work. District Bridge Engineers must also contact central office within 60 days of load restriction or closure changes so that inventory coding may be updated.

The District will report critical findings to Tunnel State Program Manager who will inform FHWA within 24 hours of being notified. Subsequent follow-up details describing the immediate action(s) taken, cause, and tentative repair plans will be provided as they are known.

In addition to as-needed notifications, an annual report summarizing the current status and resolution process of critical findings will be generated for review by FHWA.

4.0 EMERGENCY NOTIFICATION/CRITICAL FINDINGS

4.01 Introduction

The procedures in this chapter set forth a uniform method for timely notification of serious tunnel deficiencies that require an immediate response. They also document the baseline requirements for assuring that appropriate corrective or protective measures have been taken within a reasonable time frame and that established documentation protocol have been followed.

The procedures outlined in this chapter should be used to report conditions posing danger to persons or property or conditions that, if left unattended, would likely become such a danger.

This chapter outlines the responsibilities of the Inspection Team Leader, Inspection Consultants, District Bridge Engineers (DBE), and the Tunnel State Program Manager in an emergency.

Any WVDOT Approved Inspection Team Leader may close any tunnel if it appears to be unsafe.

4.02 Critical Findings

A critical finding is a structural or safety related deficiency that requires immediate follow-up inspection or action.
A structure-related deficiency can interrupt the load path, not allowing the loads to be transferred as designed. This can cause surrounding elements to become overstressed or unstable, potentially leading to partial or total collapse of the structure. Critical findings may also be non-structural deficiencies which jeopardize the safety of motorists or pedestrians.

The follow-up action may be a structural review to determine the strength or serviceability of an element or tunnel.

4.02(01) Procedures for Inspectors

Upon identifying a potential critical finding, immediately report the deficiency to the appropriate agency officials. For non-state-owned or non-state-assigned tunnels, the finding is to be first reported to the employee of responsible charge (ERC). The finding for state-owned or state assigned tunnels and the second reporting for non-state-owned tunnels is to be the Tunnel State Program Manager.

The immediate actions taken by the inspector will vary with the circumstance. The inspector may close all or part of the structure until further analysis can be performed to determine the structural integrity of the structure. Alternatively, the District Bridge Engineer may recommend that remedial work be performed within a short time frame. Even if no immediate action is taken, it is still required to report the potential critical finding immediately, even in situations where the structural review will ultimately resolve the structure as having adequate strength.

The Inspector shall notify the District Bridge Engineer at the time he/her reports a Critical Finding as to whether the Critical Finding is "Urgent" or "Severe". An "Urgent" Critical Finding must have an action completed and the Critical Finding closed-out with 3-days of it being found. A "Severe" Critical Finding must have an action completed and the Critical Finding closed-out within 30-days of the Critical Finding being found. This longer time may be used to conduct a load rating, have signage made, or other items that cannot be done immediately.

In addition to the initial reporting of the potential critical finding, which may be by verbal notification, email or by phone, a critical finding must be submitted to the Tunnel State Program Manager within 24 hours. If notification is via phone or verbal, then inspector shall follow up with an email notification. Send to the Tunnel State Program Manager, all of the pertinent data and picture, sketches, and other related files.

The Tunnel State Program Manager will record the critical finding for tracking and will notify the FHWA in a timely manner. If further action is required, the Tunnel State Program Manager will request additional information or actions be done by the inspector. Once the immediate safety concerns are addressed, the District Bridge Engineer will notify the Tunnel State Program Manager that the critical finding is closed, and the Tunnel State Program Manager may close out said critical finding.

4.02(02) Documentation

Critical Findings must be documented in the Tunnel Inventory Database within 24 hours for all tunnels. The Critical Finding will become a permanent record in the Tunnel file.

An ACTION must be recorded in the Tunnel Inventory Database Critical Finding Report, along with photos attached, in order for the Tunnel State Program Manager to close-out a Critical Finding. This does not necessarily mean that the deficiency has been corrected. It just means that an action has been taken to address the immediate safety concerns.

5.0 QUALITY CONTROL AND QUALITY ASSURANCE

5.01 Introduction

Quality Control and Quality Assurance are integrated into all aspects of tunnel inspection. They contain the essential requirements to demonstrate that care, skill, and diligence is used in the preparation of tunnel inspection reports.

The Tunnel Inspection personnel will put in place those management tools needed to define, implement, and evaluate the effectiveness of each tunnel inspection, to provide feedback for performance enhancement and institute actions to prevent recurrence. Together these activities ensure that:

1. Quality Control is the checks necessary to maintain a uniform level of quality. For the purposes of this Chapter, the Central Office QC Technician (COQCT) who performs these checks.

2. Quality Assurance is an independent evaluation of a service (i.e., an inspection) to establish that a pre-described level of quality has been met.

The review for the Quality Control and Quality Assurance program shall include Central Office QC Technician and the Tunnel State Program Manager.

5.02 Central Office QC Technician

The Central Office QC Technician responsibilities include but are not limited to the review of the inspection reports and review of the inspection methods by the teams in the field.

The Central Office QC Technician and his/her assistant shall collectively review 100% of all inspection reports. The Tunnel State Program Manager will sign all inspection reports reviewed by him/her. This review will be performed on inspection reports prepared by WVDOT staff and/or Consultants.

The Tunnel State Program Manager may delegate inspection reports for review except he/she will be personally responsible for the review of the following inspection reports:

All inspections containing element(s) with condition state 4 defects.

The Central Office QC Technician review of inspection reports will consist of the following:

1. Overall review of the inspection report to ensure that the correct form has been used, that the correct tunnel is identified and that all required information has been entered.

2. Review that all information has been correctly entered in accordance with the SNTI and this manual. This review will include but not be limited to a check that proper coding conventions, format, significant digits, and correct units have been used.

3. Check that the overall quantity of condition states is consistent with the condition states of the individual element deficiencies.

4. Check that there is adequate documentation for elements that have deficiencies in condition states 2, 3 & 4.

5. Check that all sketches, charts and/or photographs have been properly cross referenced in the inspection report.

6. Check that there is consistency of information between the current inspection report and previous inspection reports and/or rating report, if applicable.

7. Check that proper documentation was incorporated into the inspection report for any changes that may have occurred from the previous inspection report.

8. Review of all items after data entry to check that they have been properly and correctly entered.

9. For every Initial Inspection, a check of the inventory data against the construction plans to ensure that the data is consistent.

10. For every Initial Inspection, a set of inventory photos has been taken and included in the report and saved in the Tunnel Inventory Database.

5.03 Quality Assurance

The review by the Central Office QC Technician will include checking that the inspection data complies with the Federal and WVDOT requirements. As a minimum, the Central Office QC Technician shall review 100% of the following inspection reports:

1. All inspections containing element(s) with condition state of defects.

2. Also the Central Office QC Technician shall review a 100% of all reports for completeness.

The Central Office QC Technician is responsible for ensuring that the defined quality control procedures are enforced throughout the state. A review includes all aspects of functions to ensure adherence to Federal and State inspection criteria, laws, codes, standards, and regulatory requirements.

Also, the review may include the evaluation of inspection personnel's choice of inspection equipment, information retrieval methods, investigational processes, time, and frequency of required inspectional services, etc.

Tunnel inspection consultants shall maintain a current list of all qualified tunnel inspection personnel with their most current personal data regarding titles, duties, education, certification, and training. Copies of certificates should be maintained in the Tunnel Inventory Database.

5.04 Inspection Report Evaluation Procedures

This procedure shall be used to form the basis of a tunnel inspection report evaluation. The report shall list the structure type, team, and comparisons of the previous and current for the Structural Elements, Civil Elements, Mechanical Systems, Electrical Systems, Fire/Life Safety/Security Systems, Signs, Protective Systems. This procedure shall be undertaken in the field. Also, the report shall address the documentation provided by the inspection team with a particular emphasis on sketches, photographs, and detailed explanations. Conclusions shall be checked to verify that they are logically stated and correct and that they were independently checked by the District Evaluation Engineer and District Bridge Engineer. Finally, an overall evaluation shall be given of the inspection report.

Inspection reports shall be randomly evaluated on a regular basis.

After each inspection report evaluation, the Inspection Team shall fill out an Inspection Report Evaluation Form and shall discuss the result of its findings with the District Evaluation Engineer and District Bridge Engineer, so any improvement, as needed, can be initiated more quickly.

If an evaluation by the Central Office QC Technician and the Tunnel State Program Manager results in an unsatisfactory review of the report prepared by the Tunnel Inspection Team Leaders, then the Tunnel State Program Manager shall notify (via email) the District Bridge Engineer, of the result of the report evaluation. The Tunnel Inspection Team Leaders shall then address and correct the changes that the Central Office QC Technician and the Tunnel State Program Manager observed in the prepared report and shall resubmit the report for review.

LIST OF FIGURES

Inspection Type	Maximum Inspection Interval	Agency
Initial	Prior to Opening to Traffic	FHWA Mandate
Routine	24 months	FHWA Mandate
Special	12 months	FHWA Mandate
In-Depth	72 months	INDOT Policy
Damage	As needed	FHWA Mandate

Consultant Services Manual

Issue Date: <INSERT>
Revision Version: 0

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Introduction

This Manual is intended to assist Consultants in conducting business with the West Virginia Department of Transportation, Division of Highways. It has been prepared to inform Consultants and the various WVDOH personnel of the guidelines and methods for qualifying consultants, requesting a Letter of Qualifications, preparing fee proposals, negotiation procedures, agreement considerations, invoicing procedures and instructions, and other related subjects.

The information contained within this manual is applicable to all types of Engineering and Architectural Consultant agreements including Statewide and Supplemental Agreements for Shop Drawing/ Construction Engineering Review, Bridge Inspection, Construction Inspection, Materials Inspection and Testing, Cultural and Natural Resource Investigation, etc. This Manual is not applicable for services obtained by or through the Right of Way Division.

Any firm unwilling or unable to comply with any of the requirements herein may request in writing a waiver from the State Highway Engineer. The request shall detail the reason for such waiver and shall be filed in a timely manner prior to any work performed by the firm and must have written approval received from the State Highway Engineer before proceeding.

This Manual should not be considered a contract document, and its contents are not legally binding upon any West Virginia Department of Transportation, Division of Highways contract. The content within is subject to change. Approved revisions will be issued on an as-needed basis and tracked in the table below.

Revision	Issue Date	Brief description of modifications
0	<INSERT DATE>	Initial issuance of Consultant Services Manual

Any questions or comments on this Manual should be directed to the Consultant Services Division.

Table of Contents

List of Appendices

List of Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
ACEC-WV	American Council of Engineering Companies of West Virginia
A/E	Architecture/Engineering
CAWV	Contractor's Associate of West Virginia
CCQQ	Consultant Confidential Qualification Questionnaire
COA	Certificate of Authorization
CPA	Certified Public Accountant
CPM	Critical Path Method
DBE	Disadvantaged Business Enterprise
DD	Design Directive
FAR	Federal Acquisition Regulations
FCCM	Facilities Capital Cost of Money
FEIN	Federal Employer Identification Number
GSA	General Services Administration
ICQ	Internal Control Questionnaire
IRS	Internal Revenue Service
LOQ	Letter of Qualification
NEPA	National Environmental Policy Act
PM	Project Manager
PMD	Project Modification Document
QA/QC	Quality Assurance/Quality Control
SF-330	Standard Form 330
UCP	Unified Certification Program
WBE	Women Owned Business Enterprise
WV	West Virginia
WVDOH	West Virginia Division of Highways
WVDOT	West Virginia Department of Transportation

1 Checklist to Perform Services

A Consultant shall meet the following minimum requirements to provide services to the West Virginia Department of Transportation (WVDOT), Division of Highways (WVDOH).

- ☐ Register business with the Internal Revenue Service (IRS) to obtain a Federal Employer Identification Number (FEIN).

- ☐ Register business with the appropriate federal, state, county, and local agencies.
    a. At a minimum, Consultant shall register business with the WV Secretary of State's Office to obtain a WV Business License.
    b. A PDF of the WV Business License may be required with submittals.
    c. Consultant may need to register with local counties or municipalities depending on the actual location of their offices and where they are performing services.

- ☐ To provide (or offer to provide) engineering services for projects in West Virginia, the Consultant will need to obtain a Certificate of Authorization (COA) from the WV State Board of Registration for Professional Engineers. Note, this authorization is separate from the business license obtained from the WV Secretary of State's Office.

- ☐ To provide (or offer to provide) surveying services for projects in West Virginia, the Consultant will need to obtain a Certificate of Authorization (COA) from the WV State Board of Professional Surveyors. Note, this authorization is separate from the business license obtained from the WV Secretary of State's Office.

- ☐ To provide (or offer to provide) architectural services for projects in West Virginia, the Consultant will need to register with the WV Board of Architects. Note, this authorization is separate from the business license obtained from the WV Secretary of State's Office.

- ☐ Submit Consultant's AASHTO Internal Control Questionnaire (ICQ), Overhead information, Balance Sheet, CPA Audit Report, Overhead Calculation, and Consultant Overhead Certification to dotauditoverheads@wv.gov.
    a. The Consultant will need a PDF of their Indirect Cost Desk Review Memo from the WVDOT Auditing Division approving the Consultant's overhead rate for office and/or field services for potential cost proposals.

- ☐ Submit Consultant's Standard Form 330 (SF-330).
    a. The SF-330 should be submitted as soon as possible after January 1 of each year.

- ☐ Consultants interested in being considered for pre-qualification must submit a "Letter of Qualification" and one unpriced prospectus for the most recently advertised LOQ.
    a. Projects with an anticipated fee of less than $750,000 may be selected from the WVDOH list of prequalified Consultants. Projects with an anticipated fee of more than $750,000 may be selected using a project-specific advertisement.

2 Requirements to Perform Services

2.1 Standard Form 330 (SF 330)

To be qualified to perform services, the General Services Administration (GSA) Standard Form 330 (SF 330) must be completed and submitted annually to the Consultant Services section at "DOH.consultantservices@wv.gov". It is suggested that a read-receipt be added to the submission email as no written notification will be provided by WVDOH to confirm receipt.

These items are required by all entities conducting business with WVDOH, regardless if they are a Prime Consultant or Subconsultant. To be considered to perform services, these items MUST be submitted as soon as possible after January 1st of each calendar year. These items will NOT be accepted if predated or submitted prior to January 1st for the upcoming calendar year.

If significant changes occur which impact the Consultant's information, it is the responsibility of the Consultant to provide a timely update to WVDOH. Examples of significant changes include point of contact, address, or unique entity identifier.

The Consultant shall complete the following sections of the SF 330 listed below. The current SF 330 form (Rev 7/2021) is provided as an attachment in Appendix A for reference; however, the Consultant should utilize the most current version available at https://www.gsa.gov/forms-library/architect-engineer-qualifications.

Note, as of the adoption of this Manual, the Consultant Confidential Qualification Questionnaire (CCQQ) will no longer be allowable for annual qualifications, nor is it considered a substitute or alternative for the SF-330 format.

Part I Section B (Architect-Engineer Point of Contact)

The Point of Contact shall be the designated Principal of the firm. The firm name (Box 5) shall exactly match how the Consultant's name appears in on their Certificate of Authorization from the West Virginia Secretary of State's office. This includes the use of uppercase/lowercase lettering, italics, abbreviations, etc.

Part I Section E (Resumes)

This section is ONLY required for the Consultant's initial SF 330 submission, unless there is a need to remove or add new staff associated with the firm. Section E should be prepared as follows:

- The Consultant shall be required to complete all fields in Section E. If a field is not applicable, insert "N/A".
- A maximum of ten (10) resumes are to be included.
    - One (1) resume shall be the Point of Contact from Part I Section B.
    - No more than five (5) resumes shall be submitted per discipline, e.g. roadway, traffic, structural, etc.
- Each resume shall be a maximum of two-pages and highlight relevant experience with WVDOH including specific roles on projects. If the Consultant does not have WVDOH or transportation experience, include similar type projects from other state or local agencies.

- Example projects used on resumes are required to either be current or have completion of professional services within the previous ten (10) years.

Part I Section F (Example Projects)

This section is ONLY required for the Consultant's initial SF 330 submission, unless there is a need to remove or add new projects associated with the firm. Section F should be prepared as follows:

- The Consultant shall be required to complete all fields in Section F. If a field is not applicable, insert "N/A".
- A maximum of ten (10) example projects are to be included.
    - Only include projects which are highlighted on the staff resumes.
- If the project experience is in a subconsultant or alternative delivery role, indicate this in Box 21.
- For Box 25, include all associated firms involved in this project.
- Example projects are required to either be current or have completion of professional services within the previous ten (10) years.

Part I Section G (Key Personnel Participation in Example Projects)

This section is ONLY required for the Consultant's initial SF 330 submission, unless there is a need to remove or add new staff or projects associated with the firm.

Part I Section H (Additional Information)

This Section, which shall not exceed two (2) pages, should be prepared as follows:

- Although not required, additional information regarding the firm's history and experience in West Virginia can be provided in Box 30.
- Boxes 31, 32, and 33 shall be signed by the firm's authorized representative, e.g. authorized signatory for contracts.

Part II

The firm name and address (Box 2) shall exactly match their Certificate of Authorization from the West Virginia Secretary of State's office. This includes the use of uppercase/lowercase lettering, italics, abbreviations, etc. Part II should be prepared as follows:

- The Consultant shall be required to complete all fields in Part II. If a field is not applicable, insert "N/A".
- Include the primary office where work will be managed and performed plus up to five (5) branch offices.

2.2 Transportation Auditing Overhead Submittal

The following shall be submitted to "dotauditoverheads@wv.gov" on an annual basis to determine an approved overhead rate for use on WVDOT projects.

- AASHTO Internal Control Questionnaire (ICQ)
- Company Financial Statements
- PPP Loan Certification, if applicable

In response to this submission, WVDOT will issue an "Indirect Cost Desk Review Memo" which shall be used on contracts funded by the State of West Virginia and/or Federal sources, including projects for WVDOT and WV Local Public Agencies. See Chapter 11 for additional information.

2.3 Quality Assurance/Quality Control Policy Submittal

Consultants shall submit an overview of their corporate Quality Assurance/Quality Control (QA/QC) procedures on an annual basis, as soon as possible after January 1st of each calendar year, to WVDOH at "DOH.consultantservices@wv.gov".

The intent of this request is to verify the Consultant has developed and implemented a QA/QC procedure. This overview shall provide sufficient detail to outline the content of the procedure and document how the Consultant will monitor the work to meet the standard of care.

If the Consultants QA/QC procedures have been certified to ISO (or equivalent standards) in any location in which you operate, please indicate location and scope of that certification.

2.4 Registrations

To be qualified to perform services, the following registrations are required to be obtained and maintained, as required, by each governing entity. These items are required for all entities conducting business with WVDOT, regardless if they are a prime consultant or subconsultant.

If significant changes occur which impact the Consultant's information, it is the responsibility of the Consultant to provide a timely update to the governing entity. Examples of significant changes include point of contact, address, or firm acquisition.

Where submission to the WVDOT is indicated, the Consultant shall submit the documentation to "dotauditoverheads@wv.gov". It is suggested that a read-receipt be added to the submission email as no written notification will be provided by WVDOT to confirm the receipt.

Certificates of Authorization (COA)

The Consultant shall maintain COAs, appropriate for the professional services being performed. Contact information for each governing board is provided below.

West Virginia State Board of Registration for Professional Engineers
300 Capitol Street, Suite 910
Charleston, WV 25301
(304) 558-3554
http://www.wvpebd.org

West Virginia Board of Professional Surveyors
1124 Smith Street, Suite B127C
Charleston, WV 25301
(304) 558-0350
www.wvbps.wv.gov

West Virginia Board of Architects
405 Capitol Street, Mezzanine Suite 3
Charleston, WV 25301
(304) 558-1406
https://brdarch.wv.gov

wvOasis Registration

Consultants shall be registered as a vendor with wvOasis to perform business with the WVDOT. It is critical the firm name and address be kept up to date as this information will be utilized on WVDOT invoicing and payments. Refer to the wvOasis website for additional information: www.wvoasis.gov.

State of West Virginia Business Registration

The Consultant shall be registered with the West Virginia Secretary of State and maintain the requirements of annual filing, as required. Refer to the Secretary of State's website for additional information: https://sos.wv.gov.

Workers Compensation and Unemployment Registration

The Consultant shall be registered with Workforce West Virginia and maintain good standing for Workers Compensation and Unemployment Accounts. Prior to entering into a contract, the WVDOT will check the default databases. If a firm is not in good standing, the contract will not be executed until corrective action is taken.

Registration requirements and additional information on Workers Compensation can be obtained by contacting:

Workforce West Virginia
Status Determination Unit
112 California Avenue
Charleston, West Virginia 25305
(304) 558-2677
www.workforcewv.org

Disadvantaged and Women-owned Business Enterprise (DBE/WBE) Registration, if applicable

It is the policy of the WVDOT that Disadvantaged and Women-owned Business Enterprises (DBE/WBE) shall have the maximum opportunity to participate in the performance of contracts financed in whole or in part with Federal funds in accordance with the WVDOH's Disadvantaged Business Enterprise Program and WVDOT's Unified Certification Program (UCP).

For certification as a DBE, Consultants shall follow the requirements outlined in the UCP and submit an application to the address listed below. It is recommended to contact the Civil Rights Compliance Division for additional details and requirements prior to initiating an application.

West Virginia Department of Transportation
Civil Rights Compliance Division
1900 Kanawha Boulevard, East
Building 5, Room 430
Charleston, WV 25305
(304) 558-3931
Dot.eeo@wv.gov

Important Links

- Standard Form 330 (SF-330) → https://www.gsa.gov/forms-library/architect-engineer-qualifications

3 Letters of Qualifications

Legal notifications requesting a Letter of Qualification (LOQ) and Unpriced Prospectus from consulting firms wishing to provide services to the WVDOH will be advertised in the West Virginia Gazette Mail and posted on the WVDOT and WV State Auditor's websites. In addition, copies of the classified advertisements will be provided to the American Council of Engineering Companies of West Virginia (ACEC-WV), and the West Virginia Contractor's Association (CAWV). The advertisement will indicate the type of service being requested.

The type of services being requested may include, but not necessarily limited to, the following:

- Project management
- Construction management/ construction inspection
- Bridge inspection
- Feasibility studies
- Preliminary engineering
- Design
- Engineering
- Surveying
- Aerial photography and mapping
- Architectural
- Materials inspection
- Sampling and testing materials
- NEPA related documentation
- Cultural resources
- Natural resources
- Related services to any above

Ability to Perform Work

Consultants submitting LOQs shall provide proof of ability to perform work in West Virginia and documentation that all business registrations are current. These documents may include the following, as per the legal notification:

- Registration with the WV Secretary of State Business & Licensing:
  - Copy of the Certificate of Authorization
  - Copy of the Business Organization Detail sheet from the Business and Licensing Section of the WV Secretary of State's office Online Data Services
- A copy of a valid "Certificate of Authorization" to offer Engineering, Surveying, and/or Architectural professional services within the state, issued by the appropriate West Virginia Board.
- Current Indirect Cost Desk Review Memo, which is in effect at the time of the LOQ, provided by the WVDOT Transportation Auditing Division.
- The Consultant will also provide a list of firms to be used as Subconsultants. The above requirements shall also pertain to any and all Subconsultants

ALL DOCUMENTATION FOR THE PRIME AND ANY SUBCONSULTANTS MUST BE INCLUDED IN THE PROSPECTUS.

Consultants failing to provide proper documentation or failure to meet the LOQ submission deadline shall be disqualified. In the case of a response to advertisement for services, if all previously listed requirements are not met, the Consultant's LOQ will not be forwarded to the Short List committee.

Evaluation Factors

The LOQ and Unpriced Prospectus may include the following evaluation information factors that will be rated by the Preliminary Selection Committee at the Short List Meeting, refer to the legal notification for evaluation factors specific to the project bring advertised:

Professional qualifications necessary for consideration and satisfactory performance of the required work and as a minimum shall have a professional engineer licensed by the State of West Virginia. That person shall be located within the office where the work is to be performed and shall demonstrate sufficient experience performed for transportation related design and plan development to be provided. This individual shall be the person-in-charge overseeing the work and must be readily accessible to the Department, preferably located in-state.

1. Consideration shall be given to specialized experience and technical competence. Specialized experience shall focus on the qualifications of the staff working on the project with emphasis placed on individual specialized expertise required for the project. Strong consideration will be based on the professional and non-professional staff stationed within the office where the work is to be performed.

   (a) As a minimum, the firm shall provide a Resume for the Project Manager and any discipline leader who will be committed to the needs of the project. Resumes may also be provided for additional key staff members only, utilizing the SF 330 format. Resumes shall be limited to ten individuals for all LOQ's unless WVDOH specifically increases or reduces this number within the individual advertisement and shall be limited to one page.

   (b) Experience may also be illustrated using project single-page descriptions provided in the SF 330 format. Projects shall be limited to no more than ten projects and may only include work performed within the previous ten years.

   (c) The total prospectus should be no more than thirty pages plus required appendices.

2. Capacity consideration shall be made on the firm's ability to accomplish the work within the Department's required schedule time frame and personnel dedicated to performing such work.

3. Documented past performance with the WVDOH, including past Consultant evaluations (see Chapter 9). If the Consultant has no past performance with the WVDOH, then the score will be determined by the Preliminary Selection Committee.

4. Location and knowledge of locality shall be based on the geographic location of the Consultant's office relative to the project site, along with experience and knowledge of the area.

In addition to the above evaluation factors, the LOQ and Unpriced Prospectus may include the following items, refer to the legal notification for additional items specific to the project bring advertised:

1. A completed copy of SF 330 (Architect-Engineer General Qualifications) must be submitted within the LOQ, if not already on file with WVDOH and must be dated for the calendar year specified in the advertisement. If submitted, this document shall be provided as an appendix. It must specifically indicate the staff levels by classification located in-state vs. out-of-state.

2. Firms submitting LOQ's shall submit a detailed current list of all work assigned by any WVDOH division or district. The list shall include division or district of assignment, project name, state project number, percentage of work completed based on maximum amount payable, and the total maximum amount payable. This document shall be provided as an appendix. Respondents must include this information using the WVDOH spreadsheet located on the department website.
3. Completed copies of the Department's "Consultant Short List Selection Criteria Technical Evaluation" form limited to a single page. Cross referencing on this form to other parts of the prospectus is not acceptable. This document shall be provided as an appendix of the prospectus.
4. Location of office or office(s) in which the work, or part of the work, will be performed.
5. Identification of subconsultants by name as to the type of work anticipated to be subcontracted or performed, if proposed as part of the design team.
6. Identification of software (including design software) that may potentially be utilized for this project.

Important Links

- Advertisements for consulting services may be found on the WVDOT website at https://transportation.wv.gov/highways/Pages/UpcomingContracts.aspx
- Advertisements for consulting services may be found on the WC State Auditor's website at: Legal Notices - wvsao.gov
- WV Secretary of State's office Online Data Services at: https://apps.sos.wv.gov/business/corporations/
- An example of the Spreadsheet to be utilized to summarize current contract workload with WVDOH can be found on the consultant services website at <insert link>
- The Technical Evaluation form can be downloaded from WVDOT's website at http://www.wvdot.com/9_consultants/9c_documents.htm <note, website link does not work>

4 Selection of Consultants

This chapter covers the selection process for non-Prequalification selections. These are typically projects with fees over $750,000. The WVDOH Division Director requesting consulting services shall designate the appropriate staff to review the LOQ and Unpriced Prospectus to assure that pertinent information and data have been submitted in accordance with the advertisement.

Information and comments from this review will be provided to the Preliminary Selection Committee also known as the Short List Selection Committee. A similar review by that committee will take place resulting in a short listing of Consultants. Typically, three (3) Consultants will be short listed unless the Committee, after considering the project particulars, decides that more should be short listed. At no time, will less than three (3) Consultants be short listed.

These reviews of the LOQs and Unpriced Prospectus will include, but may not be limited to, the following:

- Comparison of Factors of Interest
- Qualifications
- Consultant's Short List Selection Criteria Technical Evaluation
- The WVDOH's previous Performance Evaluations (if available)
- Current Workload for prime Consultant and Subconsultant.
- Office location where work is to be performed, not just managed.
- Completeness of the Prospectus which includes Approved Overhead Rates, COA, e.g., any information requested in the advertisement for both the prime Consultants and Subconsultants.

The Short List Selection Committee shall consist of the following members as defined by WVDOT Memorandum dated September 9, 2021:

- Chief Engineer-Development
- Engineering Division Director
- Deputy State Highway Engineer
- Chief Engineer Special Programs
- Performance Management Director
- Deputy State Highway Engineer responsible for the work being performed
- The Division Director requesting the service

In the event of scheduling conflicts, a Committee member may propose three alternates to serve in his or her absence to the State Highway Engineer. The State Highway Engineer shall select one of the proposed alternates to serve during the member's absence. At least three (3) members are necessary to transact the short list. The Committee shall serve as the interview panel also.

The short-listed Consultants will be notified via email. When the email is received, the short-listed Consultant shall acknowledge receipt of the email. This email will be followed up with an invitation scheduling the interview with the WVDOH containing the designated time and location. The Consultant shall accept the invitation to complete the scheduling process for the interview. Also included in the invite will be time limits for the interview and the number of Consultant representatives allowed to be present on the day of the interview.

The Selection Committee usually consists of five (5) members of the Short List Selection Committee and will vote at the conclusion of the final Consultant presentation. The Consultants will be ranked according to the total of their score with low score being the selected Consultant. In the case of a tie, the Consultant that receives the most No. 1 votes will be awarded the project. If neither Consultant received a majority of the No. 1 votes, the selection committee will recast their votes including only the Consultants that tied, and the Consultant receiving the lowest score will be awarded the project. The short-listed Consultants will be notified via email with the results of the scoring once the selection is approved by the Commissioner of Highways. The Consultant selected to perform the requested services will be notified via email with a designated time frame for holding a detailed Scope of Work Meeting.

All Consultants submitting an LOQ and Unpriced Prospectus will be notified via email of the selection. The results of the selections will also be posted on the WVDOH website. Per WV State Legislative Rule Title 157, Series 1, Section 7, the short-listed Consultants that were not selected to perform the services may request a debrief meeting from the WVDOH Division Director that is requesting the services. No debrief meetings will be performed for Consultants that were not short listed.

Important Links

- West Virginia State Code §5G provides the legislative requirements for Procurement of Architect-Engineer Services by State and Its Subdivisions → https://code.wvlegislature.gov/5G-1/
- Code of State Rules → https://apps.sos.wv.gov/adlaw/csr/
- Results of Consultant selections may be found on the WVDOT website at https://transportation.wv.gov/highways/Pages/UpcomingContracts.aspx

5 Procurement Timeline

After notification of selection, the procurement process is initiated with the Consultant. In general, the following are expected from the Consultant:

- Due diligence prior to the Scope of Work meeting to understand the project and required services.
- Providing appropriate level of written narrative to accurately describe the work required, assumptions, and exclusions to the Scope of Work.
- Thorough understanding of WVDOH's Specifications, Standards, and Manuals.
- Timely and accurate submissions (see Chapter 10 for WVDOH's process for evaluating Consultant procurement).
- Responsibility for reviewing the Subconsultant's proposals prior to submittal for completeness, quality, and accuracy.
- Submitting proposals electronically to the appropriate WVDOH Division's procurement email box, as an example, for Engineering Division procurement use "DOHEngineeringproposals@wv.gov".

The chart below outlines the procurement process from the Consultant's perspective:

1. Prior to Scope of Work Meeting

   Site Visit
   The Consultant, if possible, should conduct a site visit of the project area to understand the constraints, existing conditions, and services which may be required.

   Draft Narrative Submission
   The Consultant shall prepare a Draft Narrative Scope of Work which outlines the required services, assumptions, etc. It is recommended the narrative follow the WVDOH's Fee Proposal Spreadsheet to allow for correlation of services between the text and hours. No rates, hours, or fee information is to be submitted with the narrative. This narrative shall be provided to the WVDOH at least one (1) day prior to the Scope of Work Meeting for review.

2. Scope of Work Meeting

   WVDOH will contact the Consultant to schedule the Scope of Work Meeting. This meeting may be held virtually or in-person at the WVDOH offices or project site. During this meeting, WVDOH will review the Scope of Work notes, schedule, interim completion dates, and Consultant's Draft Narrative Scope of Work.

3. Revised Narrative Proposal Submission

   Subsequent to the Scope of Work Meeting, the Consultant will be required to submit the Revised Narrative Scope of Work by the date provided by WVDOH's PM (typically 3-5 days after the Scope of Work Meeting). This shall include the following:

- Revised Narrative
- "Zeroed out" Fee Proposal Spreadsheet
    - Consultant is responsible for utilizing the most current version of the spreadsheet and confirming their subconsultants utilize the same.
    - Consultant to determine planned labor categories and provide staff rates in the appropriate categories. Rates shall be certified by the Consultant's Principal or Office Manager prior to submission.
    - Consultant to input current overhead and facility capital cost of money (FCCM) rates.
    - Based on the narrative, the Consultant shall illustrate the tasks and labor categories which will be required for the project with a "0". Only tasks and labor categories in which the Consultant anticipates hours should be shown with a zero. Note, the WVDOH will utilize this spreadsheet to develop their independent estimate.
    - Based on the narrative, the Consultant shall identify anticipated mileage, travel, and other direct costs associated with the project. These can be identified, not by quantity, but by number of miles, lodging/meal rates, etc. associated with particular tasks.
- Approved CPM.

4. Fee Proposal Submission

   After the Consultant's Revised Narrative Proposal Submission, the WVDOH will prepare their Independent Fee Estimate. Once this is internally approved at WVDOH, the Consultant will be contacted to request their completed fee proposal. The Consultant shall submit the completed fee proposal within two (2) weeks after receiving the request from the WVDOH.

Important Links

- WVDOH Fee Proposal Template → https://transportation.wv.gov/highways/engineering/Pages/Manuals.aspx

6 Agreements

The WVDOH utilizes various agreement types depending on the overall contract amount and anticipated complexity.

6.1 Engineering Agreement

An Engineering Agreement is the primary contractual document between the WVDOT and the Consultant selected to perform a specific engineering function or functions. This Agreement provides a project description, general requirements, specifies the type of services to be performed and deliverables required by the consultant, the method of payment, the time schedule to complete the work, and standard specifications for consulting services.

6.2 Statewide Master Agreement

A Statewide Master Agreement is used to procure particular services such as architectural, etc. using a specified method of payment for a period of one year with the WVDOT's option to extend it for an additional year. Under a Master Agreement the overhead is fixed for the duration of the contract but may be adjusted during the extended period. Depending on the type of services performed, the WVDOT may specify the method of payment for services rendered and labor rates may be fixed or allowed to fluctuate during the contract period. Once a Master Agreement has been executed, specific assignments may be made for the type of services specified under the Master Agreement by issuing a Letter Agreement or Letter of Authorization also referred to as a Maximum Amount Payable Letter, as described below:

- A Letter Agreement outlines the project scope, confirms Notice to Proceed date, method of payment, scheduled completion, and sets the maximum amount payable.
- A Letter of Authorization, also called or referred to as a Maximum Amount Payable Letter, is used when specific rates of payment are utilized in the Master Agreement. This letter gives the Consultant notice to proceed to perform the work, as well as approval of the estimated cost as outlined in their proposal.

Each specific work assignment shall be executed under a Letter Agreement or Letter of Authorization and is subject to a maximum amount payable of $250,000 for State funded projects and $100,000 for Federal funded projects. Each Master Agreement is subject to a total maximum amount as specified therein. Letter Agreements and Letters of Authorization are processed in the same manner as other Agreements with regards to the submittal of a fee proposal and negotiations prior to its execution.

6.3 Prequalification Agreement

A Prequalification Agreement may be used for procuring professional services for projects estimated to cost less than maximum limits established by 23 CFR 172 for federally funded work or WV State Code §5G-1-4 for State funded work, currently $750,000 per assignment and $2,500,000 per year. The Commissioner of Highways must approve the use of this procurement method for all categories of work.

Each specific work assignment shall be executed under an Engineering Agreement or Letter of Authorization and is subject to a maximum amount payable. The Agreement shall serve as notice to proceed unless advance notice to proceed was given prior to the executed Agreement.

6.4 Supplemental Agreement

Any time during the execution of a contract, a Consultant who believes that there has been a change in the scope, complexity, or character of the work for which it has been contracted may submit a Project Modification Document (PMD) form requesting consideration for additional compensation to the Division's project manager overseeing the project. This request shall be made as soon as practical following the change or request in the change of work. The proposal submission shall be in the same format as required for the original fee proposal with a narrative describing the work performed or to be performed, a breakdown of man-hours, along with any direct costs associated with the project. Each supplemental request shall be subject to a review and subsequent negotiations. If found warranted, a Supplemental Agreement shall be executed, increasing the Consultant's fee to a new maximum amount payable for the project. In like manner, when work is decreased or eliminated, the Consultant shall submit a PMD and a supplemental request reducing the maximum amount payable.

Important Links

- Project Modification Document → https://transportation.wv.gov/highways/engineering/Pages/Manuals.aspx

7 Invoicing

All invoices are to follow the guidelines as set forth below. Example invoicing formats are provided in Appendix B.

1. The Consultant shall not submit any invoice for payment for services until an agreement has been fully executed.
2. Invoices are to be addressed and emailed to the appropriate District Engineer or Division Director. (The Consultant will be informed at the Scope of Work meeting as to the appropriate individual and email address.)
3. Identify project by State and Federal project number, name, and county;
4. Identify invoice by number and date (not by amount);
5. Identify invoice by Federal Employer's Identification Number (FEIN);
6. Content of invoice submissions:
    a) A PDF of the completed invoice shall be submitted to the DOH via email to the appropriate District Engineer, Division Director, or Division email address for invoicing, such as dohengineeringinvoices@wv.gov for the Engineering Division.
7. An invoice submission may be made up of several of the standard invoice forms, depending on the basis of payment. A completed BF-2 form shall accompany the original and all invoice copies.
8. Unless otherwise permitted by an agreement or Scope of Work note, separate invoices are required for each project; supplemental agreements are to be shown as separate phases or billing breakdowns on the invoice.
9. The DOH will not honor any invoice for work performed prior to Notice to Proceed. A copy of the Notice to Proceed letter must be submitted with the first invoice unless documented in the Scope of Work notes or agreement. Note, Notice to Proceed may be provided verbally, followed by written confirmation.

The most common invoicing errors that are encountered by DOH include:

1. Previous Amounts shown on current invoice do not match the previous invoice.
2. Subconsultant Certification not completed or filled out incorrectly.
3. Consultant Name and Address does not match wvOasis.
4. Copy of Subconsultant Invoices not provided with Prime Consultant's invoice.

<u>Important Links</u>

- WVDOT BF-2 form → <Insert Link, note, current link on WVDOT requires a password>

8 Project Reporting

Purpose

The Consultant will hold regular monthly progress meetings with each WVDOH Division in which the Consultant has a project assigned. The WVDOH Division will assign a day and time each month for the Consultant to meet to discuss project progress. The general purpose of the progress meeting is to:

- Review progress and schedule;
- Identify potential issues, solutions, and schedule delays;
- Needs from WVDOH; and
- Action items.

Progress Meetings

For each project, the Consultant shall provide the following:

1. Meeting Notes

   The Consultant will provide meeting notes for each assigned project at each progress meeting. It is important to develop notes for the discussions to being held. The Consultant is responsible for the preparation of the meeting notes. The Consultant will upload the current progress meeting notes to ProjectWise the day before the progress meeting. Although each WVDOH Division may require differing information in the progress meeting notes, the following shall be included in each at a minimum:

   - Previous progress notes;
   - Current progress notes;
   - Project percent complete of project budget (for auditing); and
   - Upcoming tasks/submissions (next steps).

2. CPM/Schedule

   The Consultant will provide a Critical Path Method Diagram (CPM) for each progress meeting. The CPM will follow Design Directive 202 (DD-202), if applicable, or a different CPM may be used upon approval of the WVDOH. The CPM will be updated to reflect any changes in schedule since the last progress meeting. A CPM is to be provided at each progress meeting even if there are no changes to the CPM. The Consultant will upload the current CPM to ProjectWise the day before the progress meeting.

9 Consultant Evaluations

9.1 Background

Purpose

The purpose of these procedures is to provide an updated evaluation process based specifically on quality of the deliverables and timely delivery. This policy provides workflow and definitions to provide prompt evaluations of Consultant deliverables. This is intended to supplement WV State Legislative Rule Title 157, Series 1, Section 7.11 regulations with specific guidance.

Goals

Evaluations are based on two criteria: quality and timeliness. This criterion provides the basis for information required when requesting services. These two measures identify objective indicators of the project health at the time of the review. Quality, accuracy, and completeness criteria shows that the Consultant is providing a consistent, correct set of deliverables that need very little quality assurance review by WVDOH. As important to the WVDOH as accurate plans are timely submittals. Timely submittals allow for funding milestones to be met and keep critical path tasks on schedule. Plans delivered on the PSE schedule but missing prior milestones may mean that the project funding, utility relocation or resource agency approvals may delay either federal authorization or construction schedules. To ensure all parties' understanding, the WVDOH's Project Manager will discuss the evaluation criteria, expectations, deliverables, and timing of evaluations before the Consultant begins work. Ideally, this should be done at the Scope of Work meeting and in correspondence transmitting the engineering agreement.

Definitions

Timeliness – Meeting or advancing the WVDOH-defined schedule date or CPM schedule date.

Quality – Having all necessary information presented properly.

9.2 Evaluation Criteria

Evaluations are important to communicate expectations beyond the legal agreement between the WVDOH and Consultant. Timely evaluations throughout task or project development are essential for the final product to meet the needs and goals of the WVDOH. Evaluations not only lead to understanding of needs between owner and Consultant but also provide a fundamental decision point in choosing Consultants for future work. Providing numeric values on the most critical objectives allows all to focus on these items. Evaluations will be based on timeliness and quality submittals. Guidelines for scoring can be found in Appendix C.

Timeliness Criteria

As timeliness implies, on time delivery is an important value for the project schedule. On time delivery is important at the beginning of a project when trying to procure and then when delivering the actual project. Timeliness affects many tasks beyond the milestone affected at the submission date. Rescheduling submittal dates may cause programmatic issues with National Environmental Policy Act (NEPA) clearance or funding deadlines. On time deliveries also provide the division with a sense the firm is fulfilling the needs of the agency.

Quality Submission Criteria

Quality submittals are of great importance. As more workload of review is delegated to Consultants, it is important that quality control measures are in place. The WVDOH generally acknowledges that quality is essential for proposal and plan submittals by providing time to Consultants for quality assurance and quality control tasks. As such, Consultants are required to have their QA/QC policy on file and to submit "marked up" plans at major milestones for review. "Marked up" proposals are not required during the procurement process. However, the Consultant shall make sure that the proposal is correct and complete both from the prime and subconsultant.

Procurement Submission Criteria

To meet schedules, the procurement of services must be in a timely manner and complete. To facilitate this, timeliness, correctness, and quality will be the criteria for the scoring. WVDOH will indicate at the beginning of the project if the Consultant will receive an evaluation on the procurement submission.

9.3 Milestone Weighting for Design Submissions

The WVDOH may elect to use weighting of a criteria if they feel it requires more emphasis at the design submittal milestones. Weights will be identified early in procurement and will be made known to the consultant. The weight between one (1) and four (4) will be used. If no weights are identified, then a value of one (1) will be used.

9.4 Reporting of Evaluations

Evaluations will be reported for short listing or other agency needs based on project score. If the Consultant has multiple projects, the WVDOH Division or WVDOH District overseeing the work will report on the average score of the Consultant's assigned projects. Partially complete projects will be reported as the score on that project at time of request for evaluations.

A Consultant's evaluation will be stored for three (3) years past project or task completion. This 3-year aggregate will be used when reports are requested. The Consultant's evaluation scores will be available to future selection committees and should be reviewed during the short list meeting for new procurements.

9.5 Evaluation of Design Submissions

To provide more consistent and relevant evaluations, scoring will occur at specified intervals as indicated in the agreement. Consultant evaluations are conducted at different timeframes for each WVDOH Division. The frequency of the evaluations should align with project deliverables and be often enough to affect changes in performance if they are needed. Evaluations will be given at standard reviews determined by DD- 202 submissions or at an identified interval in the agreement based on the type of services requested.

The milestones or task submissions to be evaluated will be identified in the agreement. Agreements that do not identify intermediate evaluations will be evaluated at final submission.

The Consultants may be evaluated based on any milestone deemed appropriate by the division or district requesting the work.

Consultant work product will be evaluated by the assigned project manager with concurrence by the next level supervisor. If the Consultant elects to subcontract out tasks assigned for the project, the prime will be evaluated on the work of the subcontractor regarding adherence to quality and timeliness. The WVDOH PM should consider the following throughout the project duration for the quality submission scoring:

- Did the Consultant adhere to the scope?
- Did Consultant produce quality products or were products returned for substantial corrections?
- Was Consultant self-sufficient or did the Consultant require additional assistance?
- Was the Consultant responsive and proactive in communications with the WVDOH?
- Did the Consultant place appropriate staff in roles to benefit the project?

The Consultant will receive the evaluation of the task within five (5) working days after the submission review meeting. The Consultant will have the opportunity to review the evaluation and sign the evaluation sheet. The assigned WVDOH PM is responsible for submitting the evaluation to the contracting agent for the division or district, or other assigned personnel for tracking all Consultant evaluations.

Comments are required for each assigned rating. For firms receiving an evaluation rating of “1”, “2” or “3” on any criteria, a detailed explanation is required outlining the performance issue and necessary corrective action(s). The evaluation should not be used as the first communication of issue or praise to consultants. Work with consultants to correct issues in the interim.

9.6 Appeals Process

The intent of the appeals process is to foster documented dialogue which explains both the WVDOH’s and the Consultant’s perspective and allows the PM to use their professional judgment when reviewing the evaluation and all supporting documents. Evaluations are signed by the PM and the Consultant’s project manager. The Consultant’s signature on the Evaluation Form is certification that the Consultant has been provided the opportunity to review and provide comments regarding the Department’s evaluation and comments. Signing the evaluation does not necessarily indicate that the Consultant agrees with the evaluation or comments provided. If the Consultant disagrees with the evaluation rating and/or comments the Consultant must still sign the evaluation and should provide a written response on the Evaluation Form. The signed performance evaluation should be returned to the WVDOH within ten (10) business days after receiving the evaluation. All ratings provided on the performance evaluation are final unless justification is provided to and approved by WVDOH. WVDOH reserves the right to revise a performance evaluation based upon supporting documentation presented by the Consultant. If a Consultant intends to appeal their evaluation, supporting documentation defining why a change should be considered will need to be sent to the WVDOH PM within ten (10) business days of receipt of the evaluation. Within those 10 business days, the Consultant may also request a meeting with the PM to resolve any differences. At the completion of the meeting the PM will add supporting documentation to the electronic evaluation indicating the outcome of the meeting, or

if needed, revise the evaluation. Supporting documentation may include but not be limited to, corrective action plans, additional comments from the Consultant, or comments from the PM acknowledging an alternative position regarding the evaluation. If the Consultant and the PM cannot resolve the dispute, the issue can be escalated to a higher level of management (Division Director). The assessment in the Consultant Evaluation System will be revised accordingly, depending on the outcome of the Consultant's appeal.

9.7 Performance Evaluation Scoring Process

Consultants will be evaluated using the ratings and corresponding scores in the Appendices. The descriptions should be used by PMs as general guidelines for scoring. The evaluation guidelines are not designed to be inclusive of all situations; they are intended to provide PMs with a general framework to assist in the completion of an evaluation. The effective management of consultant performance through documented feedback is essential to managing successful projects. Written comments are required for each assigned rating. For firms receiving an evaluation rating of "1, 2 or 3" on a design submission, a detailed explanation is required outlining the performance issue and necessary corrective action(s). Consultants rely on this information to improve their processes, products, and management, and assign resources properly for future opportunities. When writing comments, provide specifics (e.g., what the firm did well, what should be different; was project management adequate, and if not, why; was sub-consultant use helpful to project execution, and if not, why). The requirement for written evaluations does not rule out the option to meet with the Consultant when issues occur and improvement is needed related to performance on a given assignment, particularly if issues arise that affect deliverables. Proactive communication serves both the Consultant and WVDOH. See Appendix C for Scoring Criteria.

Important Links

- Code of State Rules → https://apps.sos.wv.gov/adlaw/csr/

10 Project Closeout

At the conclusion of each project, the Consultant shall undertake the following steps and ensure compliance to initiate project closeout.

The Consultant project manager shall submit an email to the WVDOH project manager indicating that the consultant has completed all project tasks and intends to submit Final Invoice. Prior to submission of the final invoice, the consultant must perform and/or ensure the following:

- Have submitted RW-4 Plans or note in the email to the WVDOH PM that RW-4 plans are NOT a scoped task or not applicable for the subject project.
- Request WVDOH PM to perform final Consultant evaluation.
- After receiving concurrence from the WVDOH PM, the Consultant should then submit the final invoice within thirty (30) days

11 Audit Requirements

This section is designed to address the requirements for overhead, proposal, and final cost reviews for the WVDOT. This follows the 23 U.S.C. 112(b)(2)(B), any contract or subcontract awarded for architectural and engineering (A/E) services whether funded in whole or in part with Federal-aid highway funds shall be performed and audited in compliance with cost principles contained in the Federal Acquisition Regulations (FAR).

11.1 Overhead Rate

Overhead rate (including field office overhead and Facilities Capital Cost of Money (FCCM) rates, if applicable) must be on file for both prime Consultants and Subconsultants prior to entering contract negotiations and submission of a proposal. The submitted overhead information shall contain a detailed exhibit of the computations with all applicable FAR eliminations and the minimum audit report disclosure notes. Firms will be required to provide an indirect cost (overhead) rate schedule for the most recent fiscal year ended. The requirement applies to all engineering related Consultant agreements regardless of method of payment.

There are 4 types of overhead rates that can be submitted as listed below. Consultant shall submit all information to "dotauditoverheads@wv.gov".

1. Certified Public Accountant (CPA) audited overhead rates must be submitted for approval for agreements expected to exceed $500,000.00, per Consultant or Subconsultant. The audit shall be done in accordance with Government Auditing Standards issued by the Comptroller General of the United States and all eliminations required by Part 31 of the FAR are to be followed. The independent auditors' report must have issued an unqualified opinion stating that the financial statements are presented fairly.

   Information to be provided to WVDOT Auditing Division includes:

   - Indirect cost schedule with calculations
   - CPA overhead audit with report notes
   - Company audited financial reports, if available
   - AASHTO ICQ
   - AASHTO Consultant Rate Certification

   ******It will be the responsibility of the Consultant to contact the Transportation Auditing Division to verify approval/certification of the potential CPA to perform the requesting Consultant's FAR audit***

2. Company computed, or unaudited compiled overhead rates can be submitted under the following conditions:

   - The contract for the Consultant is not expected to exceed $500,000.00.
   - The Consultant has a verifiable accounting system that is an accrual system in accordance the US Generally Accepted Accounting Principles. WVDOT Auditing Division

may request supporting documentation, i.e., trial balance, general ledger for amounts used prior to accepting the submitted overhead.

Information to be provided to WVDOT Auditing Division includes:

- Indirect cost schedule with calculations
- Company audited financial reports/quarterly payroll tax returns (94ls)
- AASHTO ICQ
- AASHTO Consultant Rate Certification

3. Safe Harbor rate may be available for small engineering firms that have been recently established, with the following conditions:
   - Must not have ever had a CPA audited overhead rate.
   - Has not exceeded the three (3) year limitation on use of a Safe Harbor Rate.
   - Has sufficient data to complete and submit the AASHTO ICQ prior to consideration of Safe Harbor use.

   Information to be provided to WVDOT Auditing Divisoin include:
   - Company financial reports
   - AASHTO ICQ

4. A cognizant rate review from other DOT's may be submitted for review and approval. Please see Chapter 11.4.

The External Audit Section will review the CPA's audit report upon receipt of the overhead information before the audited rate will be accepted by the WVDOT. For the Safe Harbor rate, the department will obtain the necessary data from the ICQ to determine the eligibility and calculate the rate specific to the WVDOH. Transportation Auditing Division will issue a "Indirect Cost Desk Review Memo" to the Consultant and the WVDOH's contracting officer stating the rate that is accepted upon completion of the review. WVDOT Auditing Division has final say on the rate to be used for all WVDOH contracts.

For assistance with any overhead questions, email "dotauditoverheads@wv.gov" with your questions or provide contact information for a callback.

11.2 AASHTO Internal Control Questionnaire (ICQ)

The American Association of State Highway and Transportation Officials (AASHTO) ICQ is an important part of the annual submission of Overhead and other accounting information to WVDOT Auditing Division by all A/E firms that have an interest in performing engineering services with the WVDOH. The annual submission is required of all Consultants and Subconsultants. Prime Consultants must ensure that all Subconsultants have submitted the same accounting information prior to submitting proposals to the WVDOH. As an annual submission, a revised AASHTO ICQ shall be submitted as soon as possible, but generally no later than six (6) months after the end of the firm's fiscal year or whenever changes to the company's accounting system are made.

The AASHTO ICQ will determine if the company pays overtime at a premium portion to any employees. It will state whether the premium overtime cost is reimbursed directly to a project or is recovered through the indirect cost rate. This means the costs are compensated when the overhead rate is applied.

11.3 Consultant Cost Certification

The costs must be certified by an official of the Consultant as being allowable in accordance with the cost principles of 48 CFR, part 31 and does not include any costs which are expressly unallowable. The requirement applies to all indirect cost rate proposals submitted by the Consultants and sub-consultants. Each firm is responsible for its own indirect cost rate.

Certification of Labor Rates must have employees listed either under one pay classification or the percentage of work must equal 100% for the multiple classifications. The Consultant needs to have the individual's name and/or employee's number for every position listed with rates. The labor should be a raw hourly rate with profit and overhead added separately. Loaded rates for this type of contract are not allowable.

A copy of the Consultant Certification can be obtained at *transportation.wv.gov/auditing*.

11.4 Cognizant Agency

Cognizant audit on the Consultant's indirect cost rate(s) may be accepted as established for a 1-year applicable fiscal year by a cognizant agency of the state where the Consultant's accounting and financial records are located. The cognizant agency must conduct a review of the audit report and related work papers prepared by a CPA and issue a letter of concurrence with the related audited indirect cost rate.

A copy of the approved WVDOT Indirect Cost Desk Review Memo should be included in the fee proposal. The Consultant's actual approved overhead rate, as reflected in the memo, will be used. If the Consultant voluntarily proposes to use a lower overhead rate than the current audit in order to keep overall project costs competitive, the WVDOH may accept the lower overhead. The use of a lower overhead rate will not be a requirement for contracting.

11.5 RETAINAGE and FINAL PAYMENT

Complete Job Cost reports are required for every Cost Plus agreement and should be attached to the final invoice. Interim Job Cost reports may be required for projects exceeding five (5) years to complete, the Consultant merges with another consulting company, or the Consultant changes accounting systems. Job cost reports are to be submitted for Lump Sum supplemental requests when the request is for additional compensation due to underestimating the complexity or time necessary to complete a project.

Consultants are responsible for maintaining all supporting cost detail for any other Consultant they acquire for any ongoing project with the WVDOH. They have to keep these record for three (3) years. All adjustments to costs (i.e. overhead, non-supported costs) upon final audit are the responsibility of the Prime Consultant at time of final invoice.

Important Links:

- AASHTO ICQ can be obtained at Transportation.org – The home of transportation professionals.

11.6 FAR 31 QUESTIONS AND ANSWERS

1. **Question:**

   What is the purpose of FAR?

   Answer:

   The purpose of the FAR is to publish uniform policies and procedures for federal agencies to follow when going through the procurement process. These rules provide a consistent yet flexible purchasing procedure so that government contracts may be conducted in a transparent, fair, and impartial manner.

2. **Question:**

   Does FAR Part 31 apply to fixed price contracts?

   Answer:

   31.102 Fixed-price contracts. The applicable subparts of part 31 shall be used in the pricing of fixed-price contracts, subcontracts, and modifications to contracts and subcontracts whenever (a) cost analysis is performed, or (b) a fixed-price contract clause requires the determination or negotiation of costs.

3. **Question:**

   Which of the cost categories are not allowable under FAR Part 31?

   Answer:

   Examples of these include: Interest Expense, Donations or Contributions, Entertainment, Contingencies, Bad Debts, Fines & Penalties, Goodwill, Losses on Contracts, Organization/Re-Organization Costs, Alcohol, Promotion, Personal Use, Profit Distribution, First Class Airfare, and Legal Costs.

4. **Question:**

   Do you have to wait on a cognizant audit from your home state to submit your overhead information?

   Answer

   No, the concept was developed to assign responsibility for an audit to a single entity to avoid the duplication of audit work performed. If you have the required CPA audited information package ready, you can submit WVDOT Auditing Division earlier if your company is trying to meet a deadline.

Appendix A

Example SF-330

ARCHITECT-ENGINEER QUALIFICATIONS

OMB Control Number: 9000-0157
Expiration Date: 2/29/2024

PURPOSE

Federal agencies use this form to obtain information from architect-engineer (A-E) firms about their professional qualifications. Federal agencies select firms for A-E contracts on the basis of professional qualifications as required by 40 U.S.C. chapter 11, Selection of Architects Engineers, and Part 36 of the Federal Acquisition Regulation (FAR).

The Selection of Architects and Engineers statute requires the public announcement of requirements for A-E services (with some exceptions provided by other statutes), and the selection of at least three of the most highly qualified firms based on demonstrated competence and professional qualifications according to specific criteria published in the announcement. The Act then requires the negotiation of a contract at a fair and reasonable price starting first with the most highly qualified firm.

The information used to evaluate firms is from this form and other sources, including performance evaluations, any additional data requested by the agency, and interviews with the most highly qualified firms and their references.

GENERAL INSTRUCTIONS

Part I presents the qualifications for a specific contract.

Part II presents the general qualifications of a firm or a specific branch office of a firm. Part II has two uses:

1. An A-E firm may submit Part II to the appropriate central, regional or local office of each Federal agency to be kept on file. A public announcement is not required for certain contracts, and agencies may use Part II as a basis for selecting at least three of the most highly qualified firms for discussions prior to requesting submission of Part I. Firms are encouraged to update Part II on file with agency offices, as appropriate, according to FAR Part 36. If a firm has branch offices, submit a separate Part II for each branch office seeking work.

2. Prepare a separate Part II for each firm that will be part of the team proposed for a specific contract and submitted with Part I. If a firm has branch offices, submit a separate Part II for each branch office that has a key role on the team.

INDIVIDUAL AGENCY INSTRUCTIONS

Individual agencies may supplement these instructions. For example, they may limit the number of projects or number of pages submitted in Part I in response to a public announcement for a particular project. Carefully comply with any agency instructions when preparing and submitting this form. Be as concise as possible and provide only the information requested by the agency.

DEFINITIONS

Architect-Engineer Services: Defined in FAR 2.101.

Branch Office: A geographically distinct place of business or subsidiary office of a firm that has a key role on the team.

Discipline: Primary technical capabilities of key personnel, as evidenced by academic degree, professional registration, certification, and/or extensive experience.

Firm: Defined in FAR 36.102.

Key Personnel: Individuals who will have major contract responsibilities and/or provide unusual or unique expertise.

SPECIFIC INSTRUCTIONS

Part I - Contract-Specific Qualifications

Section A. Contract Information.

1. Title and Location. Enter the title and location of the contract for which this form is being submitted, exactly as shown in the public announcement or agency request.

2. Public Notice Date. Enter the posted date of the agency's notice on the Federal Business Opportunity website (FedBizOpps), other form of public announcement or agency request for this contract.

3. Solicitation or Project Number. Enter the agency's solicitation number and/or project number, if applicable, exactly as shown in the public announcement or agency request for this contract.

Section B. Architect-Engineer Point of Contact.

4-8. Name, Title, Name of Firm, Telephone Number, Fax (Facsimile) Number and E-mail (Electronic Mail) Address. Provide information for a representative of the prime contractor or joint venture that the agency can contact for additional information.

Section C. Proposed Team.

9-11. Firm Name, Address, and Role in This Contract. Provide the contractual relationship, name, full mailing address, and a brief description of the role of each firm that will be involved in performance of this contract. List the prime contractor or joint venture partners first. If a firm has branch offices, indicate each individual branch office that will have a key role on the team. The named subcontractors and outside associates or consultants must be used, and any change must be approved by the contracting officer. (See FAR Part 52 Clause "Subcontractors and Outside Associates and Consultants (Architect-Engineer Services)"). Attach an additional sheet in the same format as Section C if needed.

Section D. Organizational Chart of Proposed Team.

As an attachment after Section C, present an organizational chart of the proposed team showing the names and roles of all key personnel listed in Section E and the firm they are associated with as listed in Section C.

Section E. Resumes of Key Personnel Proposed for this Contract.

Complete this section for each key person who will participate in this contract. Group by firm, with personnel of the prime contractor or joint venture partner firms first. The following blocks must be completed for each resume:

12. Name. Self-explanatory.

13. Role in this contract. Self-explanatory.

14. Years Experience. Total years of relevant experience (block 14a), and years of relevant experience with current firm, but not necessarily the same branch office (block 14b).

15. Firm Name and Location. Name, city and state of the firm where the person currently works, which must correspond with one of the firms (or branch office of a firm, if appropriate) listed in Section C.

16. Education. Provide information on the highest relevant academic degree(s) received. Indicate the area(s) of specialization for each degree.

17. Current Professional Registration. Provide information on current relevant professional registration(s) in a State or possession of the United States, Puerto Rico, or the District of Columbia according to FAR Part 36.

18. Other Professional Qualifications. Provide information on any other professional qualifications relating to this contract, such as education, professional registration, publications, organizational memberships, certifications, training, awards, and foreign language capabilities.

19. Relevant Projects. Provide information on up to five projects in which the person had a significant role that demonstrates the person's capability relevant to her/his proposed role in this contract. These projects do not necessarily have to be any of the projects presented in Section F for the project team if the person was not involved in any of those projects or the person worked on other projects that were more relevant than the team projects in Section F. Use the check box provided to indicate if the project was performed with any office of the current firm. If any of the professional services or construction projects are not complete, leave Year Completed blank and indicate the status in Brief Description and Specific Role (block (3)).

Section F. Example Projects Which Best Illustrate Proposed Team's Qualifications for this Contract.

Select projects where multiple team members worked together, if possible, that demonstrate the team's capability to perform work similar to that required for this contract. Complete one Section F for each project. Present ten projects, unless otherwise specified by the agency. Complete the following blocks for each project:

20. Example Project Key Number. Start with "1" for the first project and number consecutively.

21. Title and Location. Title and location of project or contract. For an indefinite delivery contract, the location is the geographic scope of the contract.

22. Year Completed. Enter the year completed of the professional services (such as planning, engineering study, design, or surveying), and/or the year completed of construction, if applicable. If any of the professional services or the construction projects are not complete, leave Year Completed blank and indicate the status in Brief Description of Project and Relevance to this Contract (block 24).

23a. Project Owner. Project owner or user, such as a government agency or installation, an institution, a corporation or private individual.

23b. Point of Contact Name. Provide name of a person associated with the project owner or the organization which contracted for the professional services, who is very familiar with the project and the firm's (or firms') performance.

23c. Point of Contact Telephone Number. Self-explanatory.

24. Brief Description of Project and Relevance to this Contract. Indicate scope, size, cost, principal elements and special features of the project. Discuss the relevance of the example project to this contract. Enter any other information requested by the agency for each example project.

25. Firms from Section C Involved with this Project. Indicate which firms (or branch offices, if appropriate) on the project team were involved in the example project, and their roles. List in the same order as Section C.

Section G. Key Personnel Participation in Example Projects.

This matrix is intended to graphically depict which key personnel identified in Section E worked on the example projects listed in Section F. Complete the following blocks (see example below).

26. and 27. Names of Key Personnel and Role in this Contract. List the names of the key personnel and their proposed roles in this contract in the same order as they appear in Section E.

28. Example Projects Listed in Section F. In the column under each project key number (see block 29) and for each key person, place an "X" under the project key number for participation in the same or similar role.

29. Example Projects Key. List the key numbers and titles of the example projects in the same order as they appear in Section F.

Section H. Additional Information.

30. Use this section to provide additional information specifically requested by the agency or to address selection criteria that are not covered by the information provided in Sections A-G.

Section I. Authorized Representative.

31. and 32. Signature of Authorized Representative and Date. An authorized representative of a joint venture or the prime contractor must sign and date the completed form. Signing attests that the information provided is current and factual, and that all firms on the proposed team agree to work on the project. Joint ventures selected for negotiations must make available a statement of participation by a principal of each member of the joint venture.

33. Name and Title. Self-explanatory.

SAMPLE ENTRIES FOR SECTION G *(MATRIX)*

26. NAMES OF KEY PERSONNEL *(From Section E, Block 12)*	27. ROLE IN THIS CONTRACT *(From Section E, Block 13)*	28. EXAMPLE PROJECTS LISTED IN SECTION F *(Fill in "Example Projects Key" section below first, before completing table. Place "X" under project key number for participation in same or similar role.)*									
		1	2	3	4	5	6	7	8	9	10
Jane A. Smith	Chief Architect	X		X							
Joseph B. Williams	Chief Mechanical Engineer	X	X	X	X						
Tara C. Donovan	Chief Electricial Engineer	X	X		X						

29. EXAMPLE PROJECTS KEY

NUMBER	TITLE OF EXAMPLE PROJECT *(From Section F)*	NUMBER	TITLE OF EXAMPLE PROJECT *(From Section F)*
1	Federal Courthouse, Denver, CO	6	XYZ Corporation Headquarters, Boston, MA
2	Justin J. Wilson Federal Building, Baton Rouge, LA	7	Founder's Museum, Newport, RI

Part II - General Qualifications

See the "**General Instructions**" on page 1 for firms with branch offices. Prepare Part II for the specific branch office seeking work if the firm has branch offices.

1. Solicitation Number. If Part II is submitted for a specific contract, insert the agency's solicitation number and/or project number, if applicable, exactly as shown in the public announcement or agency request.

2a-2e. Firm (or Branch Office) Name and Address. Self-explanatory.

3. Year Established. Enter the year the firm (or branch office, if appropriate) was established under the current name.

4. Unique Entity Identifier. Insert the unique entity identifier issued by the entity designated at SAM. See FAR part 4.6.

5. Ownership.

a. Type. Enter the type of ownership or legal structure of the firm (sole proprietor, partnership, corporation, joint venture, etc.).

b. Small Business Status. Refer to the North American Industry Classification System (NAICS) code in the public announcement, and indicate if the firm is a small business according to the current size standard for that NAICS code (for example, Engineering Services (part of NAICS 541330), Architectural Services (NAICS 541310), Surveying and Mapping Services (NAICS 541370)). The small business categories and the internet website for the NAICS codes appear in FAR part 19. Contact the requesting agency for any questions. Contact your local U.S. Small Business Administration office for any questions regarding Business Status.

6a-6c. Point of Contact. Provide this information for a representative of the firm that the agency can contact for additional information. The representative must be empowered to speak on contractual and policy matters.

7. Name of Firm. Enter the name of the firm if Part II is prepared for a branch office.

8a-8c. Former Firm Names. Indicate any other previous names for the firm (or branch office) during the last six years. Insert the year that this corporate name change was effective and the associated unique entity identifier. This information is used to review past performance on Federal contracts.

9. Employees by Discipline. Use the relevant disciplines and associated function codes shown at the end of these instructions and list in the same numerical order. After the listed disciplines, write in any additional disciplines and leave the function code blank. List no more than 20 disciplines. Group remaining employees under "Other Employees" in column b. Each person can be counted only once according to his/her primary function. If Part II is prepared for a firm (including all branch offices), enter the number of employees by disciplines in column c(1). If Part II is prepared for a branch office, enter the number of employees by discipline in column c(2) and for the firm in column c(1).

10. Profile of Firm's Experience and Annual Average Revenue for Last 5 Years. Complete this block for the firm or branch office for which this Part II is prepared. Enter the experience categories which most accurately reflect the firm's technical capabilities and project experience. Use the relevant experience categories and associated profile codes shown at the end of these instructions, and list in the same numerical order. After the listed experience categories, write in any unlisted relevant project experience categories and leave the profile codes blank. For each type of experience, enter the appropriate revenue index number to reflect the professional services revenues received annually (averaged over the last 5 years) by the firm or branch office for performing that type of work. A particular project may be identified with one experience category or it may be broken into components, as best reflects the capabilities and types of work performed by the firm. However, do not double count the revenues received on a particular project.

11. Annual Average Professional Services Revenues of Firm for Last 3 Years. Complete this block for the firm or branch office for which this Part II is prepared. Enter the appropriate revenue index numbers to reflect the professional services revenues received annually (averaged over the last 3 years) by the firm or branch office. Indicate Federal work (performed directly for the Federal Government, either as the prime contractor or subcontractor), non-Federal work (all other domestic and foreign work, including Federally-assisted projects), and the total.

12. Authorized Representative. An authorized representative of the firm or branch office must sign and date the completed form. Signing attests that the information provided is current and factual. Provide the name and title of the authorized representative who signed the form.

List of Disciplines *(Function Codes)*

Code	Description	Code	Description
01	Acoustical Engineer	32	Hydraulic Engineer
02	Administrative	33	Hydrographic Surveyor
03	Aerial Photographer	34	Hydrologist
04	Aeronautical Engineer	35	Industrial Engineer
05	Archeologist	36	Industrial Hygienist
06	Architect	37	Interior Designer
07	Biologist	38	Land Surveyor
08	CADD Technician	39	Landscape Architect
09	Cartographer	40	Materials Engineer
10	Chemical Engineer	41	Materials Handling Engineer
11	Chemist	42	Mechanical Engineer
12	Civil Engineer	43	Mining Engineer
13	Communications Engineer	44	Oceanographer
14	Computer Programmer	45	Photo Interpreter
15	Construction Inspector	46	Photogrammetrist
16	Construction Manager	47	Planner: Urban/Regional
17	Corrosion Engineer	48	Project Manager
18	Cost Engineer/Estimator	49	Remote Sensing Specialist
19	Ecologist	50	Risk Assessor
20	Economist	51	Safety/Occupational Health Engineer
21	Electrical Engineer	52	Sanitary Engineer
22	Electronics Engineer	53	Scheduler
23	Environmental Engineer	54	Security Specialist
24	Environmental Scientist	55	Soils Engineer
25	Fire Protection Engineer	56	Specifications Writer
26	Forensic Engineer	57	Structural Engineer
27	Foundation/Geotechnical Engineer	58	Technician/Analyst
28	Geodetic Surveyor	59	Toxicologist
29	Geographic Information System Specialist	60	Transportation Engineer
30	Geologist	61	Value Engineer
31	Health Facility Planner	62	Water Resources Engineer

List of Experience Categories *(Profile Codes)*

Code	Description
A01	Acoustics, Noise Abatement
A02	Aerial Photography; Airborne Data and Imagery Collection and Analysis
A03	Agricultural Development; Grain Storage; Farm Mechanization
A04	Air Pollution Control
A05	Airports; Navaids; Airport Lighting; Aircraft Fueling
A06	Airports; Terminals and Hangars; Freight Handling
A07	Arctic Facilities
A08	Animal Facilities
A09	Anti-Terrorism/Force Protection
A10	Asbestos Abatement
A11	Auditoriums & Theaters
A12	Automation; Controls; Instrumentation
B01	Barracks; Dormitories
B02	Bridges
C01	Cartography
C02	Cemeteries *(Planning & Relocation)*
C03	Charting: Nautical and Aeronautical
C04	Chemical Processing & Storage
C05	Child Care/Development Facilities
C06	Churches; Chapels
C07	Coastal Engineering
C08	Codes; Standards; Ordinances
C09	Cold Storage; Refrigeration and Fast Freeze
C10	Commercial Building *(low rise)* ; Shopping Centers
C11	Community Facilities
C12	Communications Systems; TV; Microwave
C13	Computer Facilities; Computer Service
C14	Conservation and Resource Management
C15	Construction Management
C16	Construction Surveying
C17	Corrosion Control; Cathodic Protection; Electrolysis
C18	Cost Estimating; Cost Engineering and Analysis; Parametric Costing; Forecasting
C19	Cryogenic Facilities
D01	Dams *(Concrete; Arch)*
D02	Dams *(Earth; Rock);* Dikes; Levees
D03	Desalinization *(Process & Facilities)*
D04	Design-Build - Preparation of Requests for Proposals
D05	Digital Elevation and Terrain Model Development
D06	Digital Orthophotography
D07	Dining Halls; Clubs; Restaurants
D08	Dredging Studies and Design
E01	Ecological & Archeological Investigations
E02	Educational Facilities; Classrooms
E03	Electrical Studies and Design
E04	Electronics
E05	Elevators; Escalators; People-Movers
E06	Embassies and Chanceries
E07	Energy Conservation; New Energy Sources
E08	Engineering Economics
E09	Environmental Impact Studies, Assessments or Statements
E10	Environmental and Natural Resource Mapping
E11	Environmental Planning
E12	Environmental Remediation
E13	Environmental Testing and Analysis
F01	Fallout Shelters; Blast-Resistant Design
F02	Field Houses; Gyms; Stadiums
F03	Fire Protection
F04	Fisheries; Fish ladders
F05	Forensic Engineering
F06	Forestry & Forest products
G01	Garages; Vehicle Maintenance Facilities; Parking Decks
G02	Gas Systems (Propane; Natural, Etc.)
G03	Geodetic Surveying: Ground and Air-borne
G04	Geographic Information System Services: Development, Analysis, and Data Collection
G05	Geospatial Data Conversion: Scanning, Digitizing, Compilation, Attributing, Scribing, Drafting
G06	Graphic Design
H01	Harbors; Jetties; Piers, Ship Terminal Facilities
H02	Hazardous Materials Handling and Storage
H03	Hazardous, Toxic, Radioactive Waste Remediation
H04	Heating; Ventilating; Air Conditioning
H05	Health Systems Planning
H06	Highrise; Air-Rights-Type Buildings
H07	Highways; Streets; Airfield Paving; Parking Lots
H08	Historical Preservation
H09	Hospital & Medical Facilities
H10	Hotels; Motels
H11	Housing *(Residential, Multi-Family; Apartments; Condominiums)*
H12	Hydraulics & Pneumatics
H13	Hydrographic Surveying

Code	Description
I01	Industrial Buildings; Manufacturing Plants
I02	Industrial Processes; Quality Control
I03	Industrial Waste Treatment
I04	Intelligent Transportation Systems
I05	Interior Design; Space Planning
I06	Irrigation; Drainage
J01	Judicial and Courtroom Facilities
L01	Laboratories; Medical Research Facilities
L02	Land Surveying
L03	Landscape Architecture
L04	Libraries; Museums; Galleries
L05	Lighting (Interior; Display; Theater, Etc.)
L06	Lighting (Exteriors; Streets; Memorials; Athletic Fields, Etc.)
M01	Mapping Location/Addressing Systems
M02	Materials Handling Systems; Conveyors; Sorters
M03	Metallurgy
M04	Microclimatology; Tropical Engineering
M05	Military Design Standards
M06	Mining & Mineralogy
M07	Missile Facilities (Silos; Fuels; Transport)
M08	Modular Systems Design; Pre-Fabricated Structures or Components
N01	Naval Architecture; Off-Shore Platforms
N02	Navigation Structures; Locks
N03	Nuclear Facilities; Nuclear Shielding
O01	Office Buildings; Industrial Parks
O02	Oceanographic Engineering
O03	Ordnance; Munitions; Special Weapons
P01	Petroleum Exploration; Refining
P02	Petroleum and Fuel (Storage and Distribution)
P03	Photogrammetry
P04	Pipelines (Cross-Country - Liquid & Gas)
P05	Planning (Community, Regional, Areawide and State)
P06	Planning (Site, Installation, and Project)
P07	Plumbing & Piping Design
P08	Prisons & Correctional Facilities
P09	Product, Machine Equipment Design
P10	Pneumatic Structures, Air-Support Buildings
P11	Postal Facilities
P12	Power Generation, Transmission, Distribution
P13	Public Safety Facilities
R01	Radar; Sonar; Radio & Radar Telescopes
R02	Radio Frequency Systems & Shieldings
R03	Railroad; Rapid Transit
R04	Recreation Facilities (Parks, Marinas, Etc.)
R05	Refrigeration Plants/Systems
R06	Rehabilitation (Buildings; Structures; Facilities)
R07	Remote Sensing
R08	Research Facilities
R09	Resources Recovery; Recycling
R10	Risk Analysis
R11	Rivers; Canals; Waterways; Flood Control
R12	Roofing
S01	Safety Engineering; Accident Studies; OSHA Studies
S02	Security Systems; Intruder & Smoke Detection
S03	Seismic Designs & Studies
S04	Sewage Collection, Treatment and Disposal
S05	Soils & Geologic Studies; Foundations
S06	Solar Energy Utilization
S07	Solid Wastes; Incineration; Landfill
S08	Special Environments; Clean Rooms, Etc.
S09	Structural Design; Special Structures
S10	Surveying; Platting; Mapping; Flood Plain Studies
S11	Sustainable Design
S12	Swimming Pools
S13	Storm Water Handling & Facilities
T01	Telephone Systems *(Rural; Mobile; Intercom, Etc.)*
T02	Testing & Inspection Services
T03	Traffic & Transportation Engineering
T04	Topographic Surveying and Mapping
T05	Towers *(Self-Supporting & Guyed Systems)*
T06	Tunnels & Subways

Code	Description
U01	Unexploded Ordnance Remediation
U02	Urban Renewals; Community Development
U03	Utilities (Gas and Steam)
V01	Value Analysis; Life-Cycle Costing
W01	Warehouses & Depots
W02	Water Resources; Hydrology; Ground Water
W03	Water Supply; Treatment and Distribution
W04	Wind Tunnels; Research/Testing Facilities Design
Z01	Zoning; Land Use Studies

ARCHITECT-ENGINEER QUALIFICATIONS

PART I - CONTRACT-SPECIFIC QUALIFICATIONS

A. CONTRACT INFORMATION

1. TITLE AND LOCATION *(City and State)*

2. PUBLIC NOTICE DATE	3. SOLICITATION OR PROJECT NUMBER

B. ARCHITECT-ENGINEER POINT OF CONTACT

4. NAME AND TITLE

5. NAME OF FIRM

6. TELEPHONE NUMBER	7. FAX NUMBER	8. E-MAIL ADDRESS

C. PROPOSED TEAM

(Complete this section for the prime contractor and all key subcontractors.)

	(Check) PRIME	(Check) J-V PARTNER	(Check) SUBCON-TRACTOR	9. FIRM NAME	10. ADDRESS	11. ROLE IN THIS CONTRACT
a.				☐ CHECK IF BRANCH OFFICE		
b.				☐ CHECK IF BRANCH OFFICE		
c.				☐ CHECK IF BRANCH OFFICE		
d.				☐ CHECK IF BRANCH OFFICE		
e.				☐ CHECK IF BRANCH OFFICE		
f.				☐ CHECK IF BRANCH OFFICE		

D. ORGANIZATIONAL CHART OF PROPOSED TEAM ☐ *(Attached)*

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM

15. FIRM NAME AND LOCATION *(City and State)*

16. EDUCATION *(Degree and Specialization)*	17. CURRENT PROFESSIONAL REGISTRATION *(State and Discipline)*

18. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*

19. RELEVANT PROJECTS

	(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
a.	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☐ Check if project performed with current firm	
b.	(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☐ Check if project performed with current firm	
c.	(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☐ Check if project performed with current firm	
d.	(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☐ Check if project performed with current firm	
e.	(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☐ Check if project performed with current firm	

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT *(Present as many projects as requested by the agency, or 10 projects, if not specified. Complete one Section F for each project.)*	20. EXAMPLE PROJECT KEY NUMBER

21. TITLE AND LOCATION *(City and State)*	22. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.			
b.			
c.			
d.			
e.			
f.			

G. KEY PERSONNEL PARTICIPATION IN EXAMPLE PROJECTS

26. NAMES OF KEY PERSONNEL *(From Section E, Block 12)*	27. ROLE IN THIS CONTRACT *(From Section E, Block 13)*	28. EXAMPLE PROJECTS LISTED IN SECTION F *(Fill in "Example Projects Key" section below before completing table. Place "X" under project key number for participation in same or similar role.)*									
		1	2	3	4	5	6	7	8	9	10

29. EXAMPLE PROJECTS KEY

NUMBER	TITLE OF EXAMPLE PROJECT *(From Section F)*	NUMBER	TITLE OF EXAMPLE PROJECT *(From Section F)*
1		6	
2		7	
3		8	
4		9	
5		10	

H. ADDITIONAL INFORMATION

30. PROVIDE ANY ADDITIONAL INFORMATION REQUESTED BY THE AGENCY. ATTACH ADDITIONAL SHEETS AS NEEDED.

I. AUTHORIZED REPRESENTATIVE

The foregoing is a statement of facts.

31. SIGNATURE	32. DATE

33. NAME AND TITLE

ARCHITECT-ENGINEER QUALIFICATIONS

1. SOLICITATION NUMBER *(If any)*

PART II - GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work.)

2a. FIRM (*or Branch Office*) NAME		3. YEAR ESTABLISHED	4. UNIQUE ENTITY IDENTIFIER
2b. STREET		5. OWNERSHIP	
		a. TYPE	
2c. CITY	2d. STATE / 2e. ZIP CODE	b. SMALL BUSINESS STATUS	
6a. POINT OF CONTACT NAME AND TITLE		7. NAME OF FIRM *(If Block 2a is a Branch Office)*	
6b. TELEPHONE NUMBER	6c. EMAIL ADDRESS		

8a. FORMER FIRM NAME(S) *(If any)*	8b. YEAR ESTABLISHED	8c. UNIQUE ENTITY IDENTIFIER

9. EMPLOYEES BY DISCIPLINE

a. Function Code	b. Discipline	c. Number of Employees (1) FIRM	c. Number of Employees (2) BRANCH
	Other Employees		
	Total		

10. PROFILE OF FIRM'S EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS

a. Profile Code	b. Experience	c. Revenue Index Number *(see below)*

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS

(Insert revenue index number shown at right)

a. Federal Work	
b. Non-Federal Work	
c. Total Work	

PROFESSIONAL SERVICES REVENUE INDEX NUMBER

1. Less than $100,000
2. $100,000 to less than $250,000
3. $250,000 to less than $500,000
4. $500,000 to less than $1 million
5. $1 million to less than $2 million
6. $2 million to less than $5 million
7. $5 million to less than $10 million
8. $10 million to less than $25 million
9. $25 million to less than $50 million
10. $50 million or greater

12. AUTHORIZED REPRESENTATIVE

The foregoing is a statement of facts.

a. SIGNATURE	b. DATE

c. NAME AND TITLE

Appendix B

Example Invoicing Formats

Invoicing

The DOH realizes the importance of timely processing and payment for services rendered. In order for this to take place, the DOH must process the invoices as expeditiously as possible, but in order to do so, the consultant must make every effort to present their invoices accurately and in the proper format.

This section provides and outlines the format that is to be followed when submitting invoices for payment. Several examples have been provided that shows how the DOH needs the invoices presented relative to the different type of agreements (e.g. Lump Sum, Cost Plus Fixed Fee, Specific Rate of Pay, etc.). The work flow to process an invoice is not complex but passes through several reviews.

Generally, the invoice is logged for processing and then sent to the Project Manager for review. The Project Manager will review the percentage of funds that the consultant is requesting relative to the progress of the work completed to date. The Engineering Division's Administration Section, which is responsible for most invoices, tracks the invoices so that they are not out of their office more than seven days. Once approved by the Project Manager, it is then returned to the Administration Section for further processing which generally takes two days. The Administration Section will review the invoice for accuracy and other required elements necessary for processing the invoice payment generally taking two days. Once the invoice clears this review, it is then sent to the Finance Division for processing and submission to the State Auditors office for payment. Payment generally is received within seven to ten working days. Payment is made in the form of a check or through direct-deposit. It is recommended that if payment has not been received within thirty days from the date submitted the consultant should contact the Administration Section for an update on its status. This is strongly recommended when final invoices have been submitted and final payment is being requested. However, it should be understood that a final invoice will take much longer to process; generally a few months lump sum contracts and several months for other contract types.

The following section shows examples with information needed in the submission of each invoice that is being presented for payment. The invoice information required for processing is dependant on the type of payment stated in the consultant's agreement

Example Invoice Format

Notes:

1) *Add or delete specific invoice line items as appropriate to your agreement.*

2) *Elements in [Brackets or Italics] represent general information to be provide or modified by the Consultant,(e.g.* ***Consultant,*** *should be replaced with the name of its firm or* ***Subconsultant firm where applicable)***

3) *Subconsultant invoices are submitted to the prime consultant for payment and submitted to the WVDOH. The costs are subtotaled and included as shown in the prime consultant's invoice to the WVDOH.*

4) *Backup Documentation where applicable and when require should include:*
   a. *Summary of Billable time*
   b. *Summary of Expenses*
      i. *Vehicle charges*
      ii. *Lodging receipts*
      iii. *Meal expenses*
      iv. *Telephone bills*
      v. *Etc.*

   For Cost Plus and Fixed Rate (Specific Rate of Pay) type invoices, the actual receipts are not to be sent but must be keep on file for final audits.

5) *Subconsultant Invoice and Documentation (repeat above information for each sub) Subconsultant invoices should follow prescribed format.*

Consultant's Logo, if applicable

[Consultant's name and address as it appears on the contract documents and OASIS]

[Invoice Date]

[Name and Title of Current Division Director]
[Division Name]
[Division Address]

Subject: **PROGRESS REPORT AND INVOICE # [Invoice sequence number 1, 2, 3, etc.]**
State Project [Project number from Scope of Work Meeting notes]
Federal Project [Project number from Scope of Work Meeting notes]
Project Description [Project name from Scope of Work Meeting notes]
[Location of Project] County

Dear **[Name and Title of Current Division Director]:**

Below is our Progress Report which summarizes our work performed on this project through **End of Period.**

PROGRESS REPORT:

- **[Work Item #1]**
- **[Work Item #2]**
- **[Work Item #etc.]**

We have enclosed our Invoice. If this meets your approval, we would appreciate having it placed in line for payment.

If you have any questions or require additional information, please let me know.

Sincerely,
[Consultant's name]

[Authorized Company Representative]

Consultant's Logo, if applicable

Remit payment to:

[Consultant's address as it appears on the contract documents and OASIS]

Invoice

State Project No.	**[Project number from Agreement]**	**Date**	**[Invoice Date]**
Federal Project No.	**[Project number from Agreement]**	**Invoice No.**	**[Invoice sequence number]**
Project Name	**[Project name from Agreement]**	**FEIN No.**	**Company's FEIN**
County	**[Location of Project] County**		

Lump Sum Type Billing

For the study, design, and preparation of construction contract plans and related documents in accordance with the terms of the agreement dated **Date of Agreement** and

Invoice Period **Start of Period** to **End of Period**

Contract Plans		Current	To Date
Lump Sum Fee	$950,000.00		
Completed to Date	50.0000%		
Previously Invoiced	30.0000%		$ 285,000.00
Earned this Period	20.0000%	$ 190,000.00	
Earned to Date			$ 475,000.00

Subconsultant (Name of Subconsultant)			
Lump Sum Fee	$50,000.00		
Completed to Date	100.0000%		
Previously Invoiced	65.0000%		$ 32,500.00
Earned this Period	35.0000%	$ 17,500.00	
Earned to Date			$ 50,000.00

Drillng Subcontractor [Name of Subcontractor]			
Not to Exceed Cost	$25,250.00		
Completed to Date	100.0000%		
Previously Invoiced	0.0000%		$ -
Earned this Period	100.0000%	$ 25,250.00	
Earned to Date			$ 25,250.00

Amount Payable to Date	$	550,250.00
Amount Previous Invoiced	$	317,500.00
Amount Due	$	232,750.00

Certification

I, the undersigned, do hereby certify that; (1) the above invoice reflects a true and accurate accounting of the records of **[Consultant's name]** and the amount has not been paid or previously invoiced; and (2) insurance coverage as specified in the agreement furnished by Acord is still in effect and current.

[Authorized Company Representative] **[Title]**

Sample Lump Sum Invoice

CONSULTANT VOUCHER
FORM BF-2
REVISED: 3/2000
WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Progress Report of Work Performed For **Engineering** Services By

Name, FEIN / Address: **[Consultant's Name, FEIN, and Address as it appears on the contract documents and OASIS]**

Invoice Period: **Start of Period** to **End of Period**

Project No.

WVDOT FINANCE USE ONLY

Org. No.
Account No.
Auth. No.
Act. Code
Obj. Code
Sequence No.

SERVICES PERFORMED AS PER ATTACHED INVOICE

Vendor's Invoice No.	**[Invoice sequence number]**
Date of Invoice	**[Invoice Date]**
Dates of Agreement	**Date of Agreement**
Supplemental Agreement 1	
Supplemental Agreement 2	

MAXIMUM AMOUNT PAYABLE

Original Agreement	**$1,025,250.00**
Supplemental	**$ -**
TOTAL	**$1,025,250.00**

DESCRIPTION OF WORK AND CHARGES

State Project No. **[Project number from Agreement]**
Federal Project No. **[Project number from Agreement]**
Project Description **[Project name from Agreement]**
County **[Location of Project] County**
% of Funds Expended 53.669837%

	Previous Total	Amount Current	Amount To Date
Invoice Amount	**$ 317,500.00**	**$ 232,750.00**	**$ 550,250.00**
Less Retainage Withheld	$ -	$ -	$ -
Plus Retainage Paid	$ -	$ -	$ -
Balance Due	**$ 317,500.00**	**$ 232,750.00**	**$ 550,250.00**

Approved for Payment

_____

Less Previous Invoices	**$ 317,500.00**
Amount Due Consultant This Payment	**$ 232,750.00**

Consultant's Logo, if applicable

Subconsultant/Subcontractor Certification

State Project No. [Project number from Agreement] **Date** [Invoice Date]

Federal Project No. [Project number from Agreement] **Invoice No.** [Invoice sequence number]

Project Description [Project name from Agreement] **FEIN No.** [Company's FEIN]

County [Location of Project] County

Certification

SUBCONSULTANT/SUBCONTRACTOR CERTIFICATION

Please select one of the two subconsultant/subcontractor certifications below:

[X] I hereby certify that on [Payment Received Date] [Consultant Name] received payment for Invoice No. dated in the amount of and the following subconsultant(s) and subcontractor(s) included in the subject invoice have been paid:

Subconsultant	Amount
Subconsultant Name	Subconsultant Amount
Subconsultant Name	Subconsultant Amount

[ ] There were no subconsultant(s) or subcontractor(s) included on the previous invoice.

[ ] [Consultant Name] has not received payment for Invoice No. [Previous Invoice(s)]

[Authorized Company Representative] [Title]

Consultant's Logo, if applicable

[Consultant's name and address as it appears on the contract documents and OASIS]

[Invoice Date]

[Name and Title of Current Division Director]
[Division Name]
[Division Address]

Subject: **PROGRESS REPORT AND INVOICE # [Invoice sequence number 1, 2, 3, etc.]**
State Project No. **[Project number from Agreement]**
Federal Project No. **[Project number from Agreement]**
Project Description **[Project name from Agreement]**
County **[Location of Project] County**

Dear **[Name and Title of Current Division Director]:**

Below is our Progress Report which summarizes our work performed on this project through **End of Period**.

Progress Report:

- **[Work Item #1]**
- **[Work Item #2]**
- **[Work Item #etc.]**

We have enclosed our Invoice. If this meets your approval, we would appreciate having it placed in line for payment.

If you have any questions or require additional information, please let me know.

Sincerely,
[Consultant's name]

[Authorized Company Representative]
[Title]

CONSULTANT VOUCHER
FORM BF-2
REVISED: 3/2000
WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Progress Report of Work Performed For **Engineering** Services By

Name, FEIN
Address — **[Consultant's Name, FEIN, and Address as it appears on the contract documents and OASIS]**

Invoice Period **[Start of Period]** to **[End of Period]**

Project No.

WVDOT FINANCE USE ONLY
Org. No.
Account No.
Auth. No.
Act. Code
Obj. Code

Sequence No.

SERVICES PERFORMED AS PER ATTACHED INVOICE

Vendor's Invoice No.	**[Invoice sequence number]**
Date of Invoice	**[Invoice Date]**
Dates of Agreement	**[Date of Agreement]**
Supplemental Agreement 1	
Supplemental Agreement 2	

MAXIMUM AMOUNT PAYABLE

Original Agreement	$	1,025,250.00
Supplemental	$	-
TOTAL		**$1,025,250.00**

DESCRIPTION OF WORK AND CHARGES

State Project No. **[Project number from Agreement]**
Federal Project No. **[Project number from Agreement]**
Project Description **[Project name from Agreement]**
County **[Location of Project] County**
% of Funds Expended 53.669837%

	Previous Total	Amount Current	Amount To Date
Invoice Amount	$ 317,500.00	$ 232,750.00	$ 550,250.00
Less Retainage Withheld	$ -	$ -	$ -
Plus Retainage Paid	$ -	$ -	$ -
Balance Due	$ 317,500.00	$ 232,750.00	$ 550,250.00

Approved for Payment

_____

Less Previous Invoices	$ 317,500.00
Amount Due Consultant This Payment	$ 232,750.00

Sample Cost Plus Fixed Fee Invoice

DRAFT

Consultant's Logo, if applicable

Remit payment to:

[Consultant's address as it appears on the contract documents and OASIS]

Invoice

State Project No.	[Project number from Agreement]	**Date**	[Invoice Date]
Federal Project No.	[Project number from Agreement]	**Invoice No.**	[Invoice
Project Name	[Project name from Agreement]	**FEIN No.**	Company's FEIN
County	[Location of Project] County		

Cost Plus Fixed Fee Basis of Payment

For the study, design, and preparation of construction contract plans and related documents in accordance with the terms of the agreement dated [Date of Agreement] and

Total	[Prime Consultant's Name] (Prime Consultant)	$	950,000.00
	[Subconsultant's Name] (Subconsultant)	$	50,000.00
	[Subconsultant's Name] (Subconsultant)	$	25,250.00
	Maximum Amount Payable	$	1,025,250.00

OVERALL PROJECT SUMMARY

PREVIOUS AMOUNT INVOICED	Current	To Date
Previously Earned		
[Prime Consultant's Name] (Prime Consultant)		$ 285,000.00
[Subconsultant's Name] (Subconsultant)		$ 32,500.00
[Subconsultant's Name] (Subconsultant)		$ -
Previously Invoiced		$ 317,500.00

CURRENT AMOUT EARNED	Current	To Date
Earned this Period		
[Prime Consultant's Name] (Prime Consultant)	$ 190,000.00	$ 475,000.00
[Subconsultant's Name] (Subconsultant)	$ 17,500.00	$ 50,000.00
[Subconsultant's Name] (Subconsultant)	$ 25,250.00	$ 25,250.00
Earned this Period	$ 232,750.00	$ 550,250.00

CURRENT AMOUT DUE	
Amount Payable to Date	$ 550,250.00
Total Previously Invoiced	$ 317,500.00
AMOUNT NOW DUE	$ 232,750.00

Sample Cost Plus Fixed Fee Invoice

Consultant's Logo, if applicable

Remit payment to:

[Consultant's address as it appears on the contract documents and OASIS]

Invoice

State Project No. [Project number from Agreement]
Federal Project No. [Project number from Agreement]
Project Name [Project name from Agreement]
County [Location of Project] County

Date [Invoice Date]
Invoice No. [Invoice sequence number]
FEIN No. Company's FEIN

Cost Plus Fixed Fee Type Billing

For the study, design, and preparation of construction contract plans and related documents in accordance with the terms of the agreement dated **Date of Agreement** and

Invoice Period **Start of Period** to **End of Period**

Total	Orginal Agreement	$	950,000.00
	Supplemental Agreement #1	$	-
	Supplemental Agreement #2	$	-
	Maximum Amount Payable	$	950,000.00

Prime Consultant Summary

CURRENT AMOUNT INVOICED		Current	To Date
Direct Labor (Tabulation Attached)		$ 68,000.00	$ 160,000.00
Overhead	170.00%	$ 115,600.00	$ 272,000.00
Direct Costs (Tabulation Attached)		$ 1,060.00	$ 2,200.00
		$ 184,660.00	$ 434,200.00
Fixed Fee	$ 100,000.00		
% Completed to Date	40.00%		
% Previously Invoiced	35.00%		
% Completed this Period	5.00%	$ 5,000.00	$ 40,000.00
FCCM	0.50%	$ 340.00	$ 800.00
Earned this Period		$ 38,633.76	$ 475,000.00

CURRENT AMOUT DUE	
Amount Payable to Date	$ 323,633.76
Total Previously Invoiced	$ 285,000.00
INVOICE TOTAL	$ 190,000.00
AMOUNT NOW DUE	$ 190,000.00

Direct Labor Tabulation

Employee Number	Classification	Hours	Rate	Amount
Employee Number	Administrative Assistant	Actual Hours	Actual Wage Rate	
Employee Number	Engineer I	Actual Hours	Actual Wage Rate	
Employee Number	Engineer II	Actual Hours	Actual Wage Rate	
Employee Number	Engineer III	Actual Hours	Actual Wage Rate	
Employee Number	Engineering Technician I	Actual Hours	Actual Wage Rate	
Employee Number	Engineering Technician I	Actual Hours	Actual Wage Rate	
Employee Number	Engineering Technician I	Actual Hours	Actual Wage Rate	
Employee Number	Engineering Technician II	Actual Hours	Actual Wage Rate	
Employee Number	Engineering Technician II	Actual Hours	Actual Wage Rate	
Employee Number	Engineering Technician III	Actual Hours	Actual Wage Rate	
Employee Number	Planner I	Actual Hours	Actual Wage Rate	
Employee Number	Planner II	Actual Hours	Actual Wage Rate	
Employee Number	Registered Land Surveyor	Actual Hours	Actual Wage Rate	
Employee Number	Senior Project Engineer	Actual Hours	Actual Wage Rate	
Employee Number	Senior Project Engineer	Actual Hours	Actual Wage Rate	
Employee Number	Senior Project Engineer	Actual Hours	Actual Wage Rate	
Employee Number	Senior Project Engineer	Actual Hours	Actual Wage Rate	
Employee Number	Senior Project Scientist	Actual Hours	Actual Wage Rate	
Employee Number	Survey Technician	Actual Hours	Actual Wage Rate	
Employee Number	Survey Technician	Actual Hours	Actual Wage Rate	
	Totals:	0.00		$ 60,000.00

Direct Cost Tabulation

Direct Costs Tabulation

Description	Quantity	Unit	Unit Price	Price
Hotel		days		$ -
Meals		days		$ -
Mileage	500	miles	$ 0.625	$ 312.50
Other approved Direct Cost items				

Totals: $ 1,060.00

Consultant's Logo, if applicable

Subconsultant/Subcontractor Certification

State Project No. [Project number from Agreement] [Invoice Date]
Federal Project No. [Project number from Agreement] [Invoice sequence number]
Project Description [Project name from Agreement] [Company's FEIN]
County [Location of Project] County

Certification

SUBCONSULTANT/SUBCONTRACTOR CERTIFICATION

Please select one of the two subconsultant/subcontractor certifications below:

[X] I hereby certify that on [Payment Received Date] [Consultant Name] received payment for Invoice No. [Previous Invoice sequence number] dated [Previous Invoice Date] in the amount of [Previous Invoice Amount] and the following subconsultant(s) and subcontractor(s) included in the subject invoice have been paid:

Subconsultant	Amount
Subconsultant Name	Subconsultant Amount
Subconsultant Name	Subconsultant Amount

[ ] There were no subconsultant(s) or subcontractor(s) included on the previous invoice.

[ ] [Consultant Name] has not received payment for Invoice No. [Previous Invoice(s)]

_____ _____
[Authorized Company Representative] [Title]

Subconsultant Invoice

State Project No. [Project number from Agreement]
Federal Project No. [Project number from Agreement]
Project Name [Project name from Agreement]
County [Location of Project] County

Date [Invoice Date]
Invoice No. [Invoice sequence number]
FEIN No. Company's FEIN

Cost Plus Fixed Fee Basis of Payment

For the study, design, and preparation of construction contract plans and related documents in accordance with the terms of the agreement dated [Date of Sub Agreement] and

Orginal Agreement	$	50,000.00
Supplemental Agreement #1	$	-
Supplemental Agreement #2	$	-
Maximum Amount Payable	$	50,000.00

Subconsultant Summary

CURRENT AMOUNT INVOICED		Current		To Date
Amount Due (Invoice Attached)	$	17,500.00	$	50,000.00

CURRENT AMOUT DUE		
Amount Payable to Date	$	50,000.00
Total Previously Invoiced	$	32,500.00
AMOUNT NOW DUE	$	17,500.00

Sample Cost Plus Fixed Fee Invoice

Subconsultant Invoice

State Project No. [Project number from Agreement]
Federal Project No. [Project number from Agreement]
Project Name [Project name from Agreement]
County [Location of Project] County

Date [Invoice Date]
Invoice No. [Invoice sequence number]
FEIN No. Company's FEIN

Cost Plus Fixed Fee Basis of Payment

For the study, design, and preparation of construction contract plans and related documents in accordance with the terms of the agreement dated [Date of Sub Agreement] and

Orginal Agreement	$	25,250.00
Supplemental Agreement #1	$	-
Supplemental Agreement #2	$	-
Maximum Amount Payable	$	25,250.00

Subconsultant Summary

	Current	To Date
CURRENT AMOUNT INVOICED		
Amount Due (Invoice Attached)	$ 25,250.00	$ 25,250.00
CURRENT AMOUT DUE		
Amount Payable to Date		$ 25,250.00
Total Previously Invoiced		$ -
AMOUNT NOW DUE		$ 25,250.00

Consultant's Logo, if applicable

[Consultant's name and address as it appears in the Agreement and OASIS]

[Invoice Date]

[Name and Title of Current Division Director]
[Division Name]
[Division Address]

Subject: **PROGRESS REPORT AND INVOICE # [Invoice sequence number 1, 2, 3, etc.]**
State Project No. **[Project number from Agreement]**
Federal Project No. **[Project number from Agreement]**
Project Description **[Project name from Agreement]**
County **[Location of Project] County**

Dear **[Name and Title of Current Division Director]:**

Below is our Progress Report which summarizes our work performed on this project through **End of Period**.

Progress Report:

- **[Work Item #1]**
- **[Work Item #2]**
- **[Work Item #etc.]**

Enclosed you will find our Invoice. If this meets your approval, we would appreciate having it placed in line for payment.

If you have any questions or require additional information, please let me know.

Sincerely,
[Consultant's name]

[Authorized Company Representative]
[Title]

Sample Specific Rate of Pay Invoice

CONSULTANT VOUCHER
FORM BF-2
REVISED: 3/2000
WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Progress Report of Work Performed For **Engineering** Services By

Name, FEIN
Address — **[Consultant's Name, FEIN, and Address as it appears in the Agreement and OASIS]**

Invoice Period **Start of Period** to **End of Period**

Project No.

WVDOT FINANCE USE ONLY

Org. No.
Account No.
Auth. No.
Act. Code
Obj. Code

Sequence No.

SERVICES PERFORMED AS PER ATTACHED INVOICE

Vendor's Invoice No.	**[Invoice sequence number]**
Date of Invoice	**[Invoice Date]**
Dates of Agreement	**Date of Agreement**
Supplemental Agreement 1	
Supplemental Agreement 2	

MAXIMUM AMOUNT PAYABLE

Original Agreement	$	1,025,000.00
Supplemental	$	-
TOTAL		**$1,025,000.00**

DESCRIPTION OF WORK AND CHARGES

State Project No. **[Project number from Agreement]**
Federal Project No. **[Project number from Agreement]**
Project Description **[Project name from Agreement]**
County **[Location of Project] County**
% of Funds Expended 53.682927%

	Previous Total	Amount Current	Amount To Date
Invoice Amount	$ 317,500.00	$ 232,750.00	$ 550,250.00
Less Retainage Withheld	$ -	$ -	$ -
Plus Retainage Paid	$ -	$ -	$ -
Balance Due	$ 317,500.00	$ 232,750.00	$ 550,250.00

Approved for Payment

_____

Less Previous Invoices	$ 317,500.00
Amount Due Consultant This Payment	$ 232,750.00

Consultant's Logo, if applicable

Remit payment to:

[Consultant's address as it appears on the contract documents and OASIS]

Invoice

State Project No.	**[Project number from Agreement]**	**Date**	**[Invoice Date]**
Federal Project No.	**[Project number from Agreement]**	**Invoice No.**	**[Invoice**
Project Name	**[Project name from Agreement]**	**FEIN No.**	**Company's FEIN**
County	**[Location of Project] County**		

Specific Rate of Pay Basis of Payment

For the study, design, and preparation of construction contract plans and related documents in accordance with the terms of the agreement dated **[Date of Agreement]** and

Total	**[Prime Consultant's Name]** (Prime Consultant)		**$ 950,000.00**
	[Subconsultant's Name] (Subconsultant)		**$ 50,000.00**
	[Subconsultant's Name] (Subconsultant)		**$ 25,250.00**
		Maximum Amount Payable	**$ 1,025,250.00**

OVERALL PROJECT SUMMARY

PREVIOUS AMOUNT INVOICED	Current	To Date
Previously Earned		
[Prime Consultant's Name] (Prime Consultant)		**$ 285,000.00**
[Subconsultant's Name] (Subconsultant)		**$ 32,500.00**
[Subconsultant's Name] (Subconsultant)		**$ -**
Previously Invoiced		**$ 317,500.00**

CURRENT AMOUT EARNED	Current	To Date
Earned this Period		
[Prime Consultant's Name] (Prime Consultant)	**$ 190,000.00**	**$ 475,000.00**
[Subconsultant's Name] (Subconsultant)	**$ 17,500.00**	**$ 50,000.00**
[Subconsultant's Name] (Subconsultant)	**$ 25,250.00**	**$ 25,250.00**
Earned this Period	**$ 232,750.00**	**$ 550,250.00**

CURRENT AMOUT DUE	
Amount Payable to Date	**$ 550,250.00**
Total Previously Invoiced	**$ 317,500.00**
AMOUNT NOW DUE	**$ 232,750.00**

Labor Tabulation

ATTACHMENT A1 - Mead & Hunt Labor Costs

LABOR COSTS

Title	ST[1] Rate	ST Hours	ST Subtotal	OT[2] Rate	OT Hours	OT Subtotal
Project Manager	$ 190.00	4.00	$ 760.00	N/A		
Administrative Assistant	$ 60.00			$ 65.00		
Level IV Inspection/Technician	$ 110.00	160.00	$ 363.18	$ 115.00		
Level III Inspection/Technician	$ 95.00	120.00	$ 11,400.00	$ 100.00		
Level II Inspection/Technician	$ 65.00			$ 70.00		
Level I Inspection/Technician	$ 55.00			$ 60.00		
Subtotal		5.00	$ 896.46		0.00	$ -

Straight Time	**$**	**190,000.00**
Overtime	**$**	**-**
Total Labor	**$**	**190,000.00**
Total Direct Cost	**$**	**-**
Total Amount	**$**	**190,000.00**

Notes:

1) Straight time rate per contract **[Billing Rates per Agreeement]**

2) Overtime rate per contract **[Billing Rates per Agreeement]**

Direct Cost Tabulation

ATTACHMENT A2
Direct Costs

Items	Description	Quantity	Unit Rate	Unit	Amount
1a	**Vehicles - Reg**	0.0	$ 0.625	mile	$ -
1b	**Vehicles - OT**	0	$ 0.625	mile	$ -
2	**Magnetic ID Signs**	0	$ 15.00	pair	$ -
3	**Flashing Lights (1 Vehicle)**	0	$ 110.00	month	$ -
4	**On-Site Mileage**	0	$ 0.59	mile	$ -
5	**Cellular Phone**	0	$ 75.00	month	$ -
6	**Lodging (2-Inspectors)**	0	$ 93.00	day	$ -
7	**Meals (2-Inspectors)**		$ 51.00	day	$ -
8	**Inspector Tools**				$ -
	100' Chain	0	$ 15.00	each	$ -
	Hard Hat	0	$ 30.00	each	$ -
	6' Engineer's Rule	0	$ 15.00	each	$ -
	Hand Levels	0	$ 50.00	each	$ -
	Safety Vests	0	$ 25.00	each	$ -
9	**Asphalt Testing**				$ -
	Equipment & Supplies	0	$ 325.00	month	$ -
10	**Concrete Testing**				$ -
	Equipment & Supplies	0	$ 325.00	month	$ -
11	**Soils Testing**				$ -
	Equipment & Supplies	0	$ 325.00	month	$ -
12	**Nuclear Density Gauge**	0	$ 390.00	month	$ -
	Nuclear Density Gauge Storage	0	$ 65.00	month	$ -
13	**Other**				$ -
	Asphalt Core Machine	0	$ 300.00	month	$ -
14	Komax Copier Base Rate	0	$ 302.10	month	$ -
	Komax Copier Overage	0	$ -		$ -
				Total	**$ 1,060.00**

Consultant's Logo, if applicable

Subconsultant/Subcontractor Certification

State Project No.	**[Project number from Scope of Work Meeting notes]**	**Date**	**[Invoice Date]**
Federal Project No.	**[Project number from Scope of Work Meeting notes]**	**Invoice No.**	**[Invoice sequence number]**
Project Description	**[Project name from Scope of Work Meeting notes]**	**FEIN No.**	**[Company's FEIN]**
County	**[Location of Project] County**		

Certification

SUBCONSULTANT/SUBCONTRACTOR CERTIFICATION

Please select one of the two subconsultant/subcontractor certifications below:

☒ I hereby certify that on **[Payment Received Date]** **[Consultant Name]** received payment for Invoice No. **[Previous Invoice sequence number]** dated **[Previous Invoice Date]** in the amount of **[Previous Invoice Amount]** and the following subconsultant(s) and subcontractor(s) included in the subject invoice have been paid:

Subconsultant	Amount
Subconsultant Name	**Subconsultant Amount**
Subconsultant Name	**Subconsultant Amount**

☐ There were no subconsultant(s) or subcontractor(s) included on the previous invoice.

☐ **[Consultant Name]** has not received payment for Invoice No. **[Previous Invoice(s)]**

[Authorized Company Representative] **[Title]**

Subconsultant Invoice

State Project No. [Project number from Agreement]
Federal Project No. [Project number from Agreement]
Project Name [Project name from Agreement]
County [Location of Project] County

Date [Invoice Date]
Invoice No. [Invoice sequence number]
FEIN No. Company's FEIN

Cost Plus Fixed Fee Basis of Payment

0

For the study, design, and preparation of construction contract plans and related documents in accordance with the terms of the agreement dated [Date of Sub Agreement] and

Contract [Prime Consultant's Name] (Prime Consultant)		$ 950,000.00
[Subconsultant's Name] (Subconsultant)		$ 50,000.00
[Subconsultant's Name] (Subconsultant)		$ 25,250.00
	Maximum Amount Payable	$ 1,025,250.00

CURRENT AMOUNT INVOICED	Current	To Date
Amount Due (Invoice Attached)	$ 17,500.00	$ 50,000.00

CURRENT AMOUT DUE	
Amount Payable to Date	$ 50,000.00
Total Previously Invoiced	$ 32,500.00
AMOUNT NOW DUE	$ 17,500.00

Appendix C

Performance Evaluation Criteria

Procurement Submission
Timeliness Criteria for Design and CEI Projects

Numeric Rating	Description	Generic Description
5	Consultant was responsive and delivered each submission in advance of the due date	Outstanding
4	Consultant was responsive and delivered each submission on time.	Very Good
3	Consultant delivered submission on time.	Good
2	Consultant delivered each submission within a three-day window following the due date.	Unacceptable
1	Consultant delivered each submission consistently late, and the submission was incomplete with revisions needed.	Notify Management

Procurement Submission
Quality, Accuracy and Completeness Criteria (QAC) for Design and CEI Projects

Numeric Rating	Description	Generic Description
5	Consultant was responsive and the submission was complete with no revisions needed unless it was at the request of the WVDOH.	Outstanding
4	The submission was complete with no revisions needed unless it was a preference of the WVDOH.	Very Good
3	The submission was complete with minor revisions needed.	Good
2	The submissions were incomplete with minor revisions needed.	Unacceptable
1	The submission was incomplete with major revisions needed.	Notify Management

Design Submission
Timeliness Criteria for Design and CEI Projects

Numeric Rating	Description	Generic Description
10	An acceptable work product was delivered more than 2 weeks ahead of schedule.	Outstanding
9	An acceptable work product was delivered more than 1 week ahead of schedule.	Excellent
8	An acceptable work product was delivered on schedule.	Very Good
7	An acceptable work product was delivered no more than 3 working days late.	Good
6	An acceptable work product was delivered no more than 1 week late.	Acceptable
5	An acceptable work product was delivered no more than 2 weeks late.	Fair
4	An acceptable work product was delivered no more than 3 weeks late.	Poor
3	An acceptable work product was delivered no more than 4 weeks late.	Very Poor
2	An acceptable work product was delivered no more than 5 weeks late.	Unacceptable
1	An acceptable work product was delivered more than 5 weeks late.	Notify Management

Note: The scoring system is based on the documented received date of the submission compared to the required date by the approved CPM.

Design Submission
Quality, Accuracy and Completeness (QAC) Criteria for Design Projects

Numeric Rating	Description	Generic Description
10	Submission completed with minimal comments and technical guidance from the Division, including compliance with DOH manuals and procedures. Consultant was an asset to the Division.	Outstanding
9	Submission completed with a small number of comments and minimal technical guidance from the Division, relative to the size and the complexity of the project. The PM's time commitments to complete reviews are relatively small.	Excellent
8	Submission completed with some comments and technical guidance. Comments are minor in nature and do not include serious design or product quality issues, relative to the size and complexity of the project. PM's time commitments to complete the reviews are still relatively small.	Very Good
7	Submission completed with some comments and technical guidance. Comments are mostly minor in nature but more numerous, relative to the size and complexity of the project, but do not include serious design or cost issues.	Good
6	Submission completed with a significant but acceptable level of DOH involvement required including comments and technical guidance. Comments do not include serious design or product quality issues.	Acceptable
5	Significant level of comments included serious design, plan preparation or product quality issues.	Fair
4	Consultant was deficient in knowledge of DOH practices and manuals. Extensive DOH staff involvement required to achieve an acceptable work product.	Poor
3	Consultant was deficient in knowledge of DOH practices and manuals. Extensive DOH staff involvement required to achieve an acceptable work product. Project Manager spends excessive amounts of time in coordinating response to consultants.	Very Poor
2	Submission is unacceptable to the point that deliverable is returned for revision without detailed comments.	Unacceptable
1	Submission is unacceptable to the point that removal of prequalification is warranted.	Remove prequalification

Submission
Quality, Accuracy and Completeness (QAC) Criteria for CEI Projects

West Virginia Department of Transportation
Division of Highways
Contract Administration Division
Consultant Evaluation Form

Agreement type:	District:	Key to Ratings
Name of Consultant Firm:		1-2. Unsatisfactory (comment required) 3-4. Marginal 5-6. Satisfactory 7-8. Commendable 9-10. Outstanding
Project name and number		
Evaluation Date		

1. Knowledge, Skill, Ability : Is the consultant competent to fulfill the requirements of the job and have the knowledge, skill, and ability necessary to perform the work, including the appropriate certifications required.	Comments:	**Score:**
2. Quality of Work : Does the consultant provide quality work which is neat, accurate, thorough, and free of errors	Comments:	**Score:**
3. Work Habits : Is the consultant punctual, diligent, dependable, resourceful, not disruptive	Comments:	**Score:**
4. Attitude, Cooperation: Does the consultant sustain a positive attitude, willing to work when needed, cooperative, high morale	Comments:	**Score:**
5. Adaptability/Flexibility: Does the conultant have the ability to grasp, understand, apply new or changing duties/assignments	Comments:	**Score:**
6. Judgement: Does the consultant have the ability to think clearly and impartially, utilizing all available information	Comments:	**Score:**
7. Professional Relationships: Does the consultant work well as a member of a group or team.	Comments:	**Score:**
8. Quantity of Work : Is the amount of work satisfactory considering workload and given time	Comments:	**Score:**
9. Communication : Is the consultant communicating with the Division and the Contractor Effectively	Comments:	**Score:**
10. Responsiveness : Is the consultant responsvie to the needs of the Division, requests, invoicing, etc.	Comments:	**Score:**
	TOTAL	0.0

Project Supervisor/Engineer Comments:
Prepared by: Date:

Construction Engineer/ Project Manager Comments:
Prepared by: Date:

Consultant Firm's Response:
Prepared by: Date:

Reviewed and approved by:

Construction Engineer/Project Manager	Date

Example Evaluation Scoring

Equations

$$\text{Procurement Score} = \text{QAC Score} + \text{Timliness Score}$$

$$\text{Submission Score} = \frac{(\text{QAC Score} * \text{Weight}) + (\text{Timeliness Score} * \text{Weight})}{\sum \text{Weights}}$$

$$Evaluation\ Score = \frac{\sum Procurement + Submission\ Scores}{Number\ of\ Scores}$$

Note: For CEI, the QAC Score for Submissions shall be the total from the form divided by 10.

Example

Consultant ABC completed a design project with three submissions. Prior to starting the project, the WVDOH provided criteria weighting to identify critical performance areas and reinforce their primary objectives. The following weighting was provided to the Consultant:

Example Weighting

	QAC	Timeliness
Submission 1	4	1
Submission 2	1	1
Submission 3	3	1

The summary table below illustrates the ratings the Consultant received and the calculation of individual scores and the average for the project.

Evaluation Area and Rating	Score Calculation
Procurement Consultant received a 5 for QAC and 4 for Timeliness	$\text{Procurement Score} = 5 + 4 = 9.0$
Submission 1 Consultant received an 8 for QAC and 10 for Timeliness	$\text{Submission Score} = \frac{(8 * 4) + (10 * 1)}{4 + 1} = 8.4$
Submission 2 Consultant received a 7 for QAC and 7 for Timeliness	$\text{Submission Score} = \frac{(7 * 1) + (7 * 1)}{1 + 1} = 7.0$
Submission 3 Consultant received a 10 for QAC and 6 for Timeliness	$\text{Submission Score} = \frac{(10 * 3) + (6 * 1)}{3 + 1} = 9.0$
Evaluation Score for Agreement	**8.35**