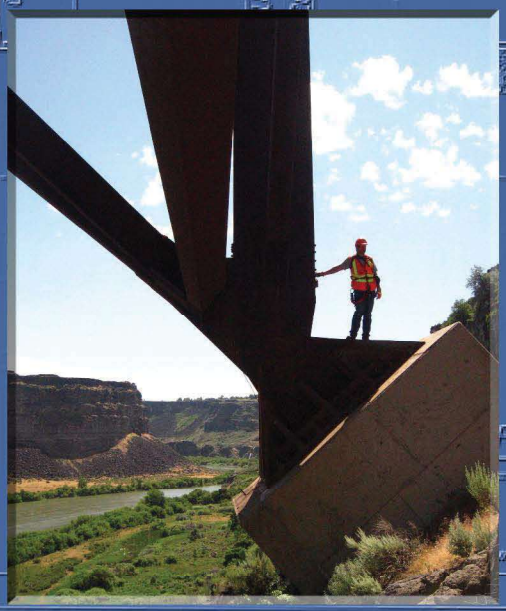
2024 Edition

Idaho Manual for Bridge Evaluation



PAGE INTENTIONALLY LEFT BLANK

ABBREVIATED TABLE OF CONTENTS

IMBE Revision History

IMBE First Edition Published	December 2013
IMBE 2015 Edition Published	December 2014
IMBE 2016 Edition Published	February 2016
IMBE 2018 Edition Published	December 2017
IMBE 2020 Edition Published	January 2020
IMBE 2021 Edition Published	January 2021
IMBE 2022 Edition Published	July 2022
IMBE 2024 Edition Published	January 2024

PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

PAGE INTENTIONALLY LEFT BLANK

IDAHO MANUAL FOR BRIDGE EVALUATION
SECTION 1:

INTRODUCTION

1.1—PURPOSE

The *Idaho Manual for Bridge Evaluation* (*IMBE*) is written as a supplement to the AASHTO *Manual for Bridge Evaluation* (*MBE*) Third Edition 2018. The *IMBE* is not intended to override information in the *MBE*; it is intended to provide supplemental information specific to the State of Idaho. The section/article headings in this manual match the section/article headings in the *MBE*. Gaps in the sequencing of sections and articles occur due to the *MBE* providing sufficient guidance resulting in no need to provide supplemental information specific to Idaho.

1.4—QUALITY MEASURES

1.4.1—Introduction

In order to insure that Idaho's bridges are being inspected and data is gathered in an accurate and consistent manner, it is necessary to implement quality control and quality assurance plans. Accuracy and consistency of the data is important since the bridge inspection process is the foundation of the entire bridge management operation. The accuracy and consistency of the inspection and documentation is vital because it not only impacts programming and funding appropriations, it also affects public safety.

These procedures are intended to maintain the quality of Idaho Transportation Department (ITD) bridge inspection and load rating at or above a specified level. These are daily functions of persons performing safety inspections or load ratings, including consultants. These procedures will provide for uniformity and consistency among the numerous personnel responsible for bridge inspection and load rating.

1.4.2—Definitions

Bridge Asset Management Engineer (BAME) - ITD person in charge of the National Bridge Inspection Standards (NBIS) program who has been assigned or delegated the duties and responsibilities for bridge inspection, reporting, inventory, and load rating. The BAME provides overall leadership and is available to bridge inspectors, load rating engineers, database managers, consultants, and equipment specialists to provide guidance. The BAME is responsible for the bridge inspection program statewide.

Bridge Inspector - ITD personnel in charge of a bridge inspection team (NBIS Team Leader), is responsible for planning, preparing, and performing field inspections. The Bridge Inspector is responsible for the overall management/supervision of an inspection team composed of one or more inspectors. The Bridge Inspector assures that inspections within the jurisdiction of the team are performed on-time and in accordance with the NBIS and ITD's current policies and procedures.

Bridge Inspector's Reference Manual (BIRM) - An FHWA publication that explains the basic concepts of bridge inspection and requirements of the National Bridge Inspection Standards.

Bridge Inspector Trainee - An individual who assists a Bridge Inspector with the inspection of a structure.

Consultant Bridge Inspector - Personnel hired by ITD to act as a Bridge Inspector on behalf of ITD.

Consultant Load Rating Engineer - Personnel hired by ITD to act as a Load Rating Engineer on behalf of ITD

Database Manager – ITD personnel in charge of maintaining and updating the central bridge files and the BrM™ Bridge Management System in accordance with ITD's current policies and procedures.

Load Rating Engineer - ITD personnel responsible for determining the safe load-carrying capacity of a structure in accordance with AASHTO *Manual for Bridge Evaluation* as modified by the *Idaho Manual for Bridge Evaluation*.

Manual for Bridge Evaluation (MBE) - AASHTO publication that serves as the standard and provides guidance in the policies and procedures for determining the physical condition, maintenance needs, and load capacity of the nation's highway bridges.

Quality Control (QC) - Procedures put in place to maintain the quality level of a bridge inspection and load rating program at or above a specified level.

Quality Assurance (QA) - An independent evaluation (through the use of sampling and other methods) to measure the quality level of a bridge inspection and load rating program.

Underwater Bridge Inspection Diver - ITD or consultant personnel responsible for inspecting underwater elements of a bridge. For safety reasons underwater bridge inspection divers shall work in teams of at least three. One member of the team is designated as the "lead" diver. The lead underwater bridge inspection diver is responsible for documentation of underwater bridge elements and reporting to the bridge inspector. The lead underwater bridge inspection diver assures that inspections within the jurisdiction of the team are performed in accordance with the NBIS and ITD's current procedures.

1.4.3—Quality Review Procedures for ITD Bridge Section Performed Inspections

Field Review

Review of field inspections by the Program Manager can be a most effective quality control measure. It can build a strong communication link between the inspectors and the reviewer(s).

The BAME or ITD designee (i.e., someone familiar with inspection procedures and coding) will conduct spot checks of Bridge Inspectors working in the field at least once every 24 months. At least three (3) bridges will be reviewed in the field **for each Bridge Inspector** whom conducts more than 25 inspections per year (1 bridge will be reviewed for each Bridge Inspector whom conducts more than 10 inspections per year). The field review may include the following as determined by the BAME:

- truss bridge
- timber girder bridge
- steel girder bridge
- concrete girder bridge (pre-stressed or conventionally reinforced)
- bridge length culvert

These bridges may also include structures that are posted for weight restrictions. Other bridges that may be considered include poor condirion bridges, bridges programmed for rehab/replacement, critical findings bridges, bridges with unusual changes in condition ratings (e.g., more than one appraisal rating change from previous inspections), and bridges that require special inspections (underwater, fracture critical, other special).

This field review will consist of the BAME assessing the correctness and completeness of the inspection, including coding, elements and quantities, maintenance recommendations, and photos as required by ITD's current procedures as well as those needed to depict critical conditions, etc. This review should be done with the inspector(s) present so that any improper coding or procedures can be discussed in the field and immediately corrected.

Office Review

The BAME or ITD designee (i.e., someone familiar with inspection procedures and coding) will review at least five (5) bridge files at least once every 24 months, in the office to ensure the information collected during bridge inspections is accurate, consistent, of the highest quality, and readily available. All documentation of inventory and inspection information should be kept in an orderly and retrievable manner. The BAME will review for completeness and accuracy and compare the files to previous inspection reports noting any significant changes.

As necessary, the BAME will review the need to rotate inspection teams including consultants between the Districts.

1.4.4—Quality Review Procedures for Bridge Inspections Performed by Consultants

The BAME may delegate the Quality Review procedure of Consultant Bridge Inspectors working in their districts to the Bridge Inspectors, to ensure the quality is acceptable. Consultants are responsible for internal QC/QA controls within their own organization and should be aligned with the QC/QA procedures described in this manual.

Field Review

The Bridge Inspector will conduct spot checks of Consultant Bridge Inspectors working in the field at least once every 24 months. The ITD Bridge Inspector will randomly choose at least five (5) bridges to review in the field for each Consultant Bridge Inspector. These bridges will typically have been previously inspected by said Consultant Bridge Inspector. The composition of these five bridges will be such that they represent a cross-section of bridge types inspected. It is strongly recommended that they include one of each of the following:

- truss bridge
- timber girder bridge
- steel girder bridge
- concrete girder bridge (pre-stressed or conventionally reinforced)
- bridge length culvert

Two (2) of these representative bridges will include bridges that are posted for weight restrictions (if available in the bridges area assigned to the Consultant Bridge Inspector). Other bridges to be considered may include poor condition bridges, , bridges programmed for rehab/replacement, critical findings bridges, bridges with unusual changes in condition ratings (e.g., more than one appraisal rating change from previous inspections), and bridges that require special inspections (underwater, fracture critical, other special).

This field review will consist of the ITD Bridge Inspector assessing the correctness and completeness of the inspection, including coding, elements and quantities, maintenance recommendations, and photos as required by ITD's latest policies and procedures as well as those needed to depict critical conditions, etc. This review shall be done with the Consultant Bridge Inspector(s) present so that any improper coding or procedures can be discussed in the field and immediately corrected.

Office Review

The Bridge Inspector and/or the Database Manager will review all consultant bridge inspection reports to ensure the information collected during bridge inspections is accurate, consistent, and of the highest quality. Among items to be reviewed are:

- the appropriateness of the identified BrM™ elements and their approximate quantities
- all necessary BrM™ element defects have been identified and properly coded
- the correlation between spread of BrM™ condition states and the NBIS coding
- work candidates, if needed, are present and appropriate
- load restrictions, if present, correlate with load rating and recommended posting
- all required photos are attached
- the "wearing surface/dead load" does not exceed "max wearing surface for load capacity" by more than ½ inch
- all items necessary for accurate reporting to the NBI are properly coded

- any significant changes from the previous inspection reports
- file documentation is sufficient
- bridge owner was notified of any critical findings and the follow up documentation was received to indicate the critical finding has been resolved.

The Database Manager will make completed consultant bridge inspection reports readily available.

Federal Review

Every year FHWA performs a field review for bridge inspections across the state. Each year reviews are performed for a specific district(s) on randomly chosen bridges. Notification of areas under federal review will made to consultants prior to negotiation of inspection agreements. If a consultant's area is included in the year's review the Consultant Bridge Inspector(s) shall be present during the review of their bridges to discuss improper coding or procedures.

Disqualification

When the inspection review indicates that a consulting firm and/or Consultant Bridge Inspector continue to make the same or similar mistakes, omissions, etc., ITD may implement disqualification procedures as follows:

Upon receiving notice of incorrect coding and significant findings, the Consultant Bridge Inspector shall address the findings and prepare a report which explains the steps that will be taken to correct the problems to insure they will not be repeated in the future.

The Consultant Bridge Inspector will be placed on probation and reviewed again in three months. This review will be conducted by a team consisting of the Consultant Bridge Inspector, the (ITD) Bridge Inspector, and the BAME. A member of the FHWA also may attend the review if they desire.

If the same or similar mistakes are found during this second review, the Consultant Bridge Inspector shall be given notification that they will be disqualified if these problems are not corrected and avoided in the future, and placed on a secondary probation period of three months.

The Consultant Bridge Inspector shall be reviewed again in three months by the reviewing team. If the same or similar problems are found, the Consultant Bridge Inspector and/or consulting firm will be notified that they are hereby disqualified for a minimum of two years.

A disqualified Consultant Bridge Inspector and/or firm may be re-qualified after the two-year period if they indicate in their term agreement proposal how they have corrected their deficiencies, i.e. refresher training, change in personnel, etc.

Reasons for Disqualification

Typical reasons for disqualification can be, but are not limited to, the following:

- lack of proper contact with the bridge owner after finishing inspections in the area
- lack of proper follow-up with the bridge owner for critical findings
- failure to report significant deterioration or damage such as fractured load-carrying members, critical scour at foundations, and vehicular impacts
- failure to perform bridge inspections and produce inspection reports on time
- failure to attend training provided by ITD

1.4.5—Quality Review Procedures for Load Rating

An initial rating will be done based on the as-built condition of the bridge for every state and local bridge in accordance with AASHTO *Manual for Bridge Evaluation* as modified by the *Idaho Manual for Bridge Evaluation* and AASHTO *LRFD Bridge Design Specifications* as modified by the *Bridge Design LRFD Manual*. Once the initial rating is done the rating will be modified to reflect any changes in condition of the bridge or dead load applied. These changes will be brought to the attention of the Load Rating Engineer by review of the bridge inspection reports.

The following procedures shall apply for all load ratings done by ITD personnel; procedures for consultants may vary per the consultant agreement:

Rater

All the data available for the structure to be load rated shall be collected and reviewed for completeness and accuracy. The inspection report and photos will be compared to any plans or sketches to ensure they are for the bridge in place. The load rating will be based on the current loads on the bridge. The rater will generate a computer file for the bridge and fill out an ITD Load Rating Summary Form (LRS).

Checker

The checker will review all the available data for the bridge and check the rater's conclusions for current loads. The input for the load rating computer file will be confirmed by the checker and the file will be run to confirm the output. All information on the LRS will be checked for completeness and accuracy. The computer file and LRS along with any comments are returned to the rater for correction, or a stamp and signature.

QC/QA

Once the rater and checker have a completed checked rating, the computer file and LRS will be submitted to the QC/QA person for review. The ITD Quality Assurance Checklist (internal ITD document only) will be filled out for the load rating. If there are any comments, the rating goes back to the rater for correction. Once the QC/QA person determines the computer file and LRS form are correct, the rating information is input into the BrM™ database, a hard copy of the LRS form is put in the bridge file, and the computer model is put into use for the analysis of overweight permit vehicles. Additional QC/QA information for the load rating analysis can be found in Section 6 of this manual.

1.4.6—Qualifications of Personnel

See Article 4.2.2. for detailed qualifications of personnel.

1.4.7—Personnel Files

ITD maintains files for all personnel (including consultants) serving in roles defined by the NBIS. All personnel are required to provide information demonstrating they meet the qualifications defined in the NBIS and this program manual to the Program Manager. Items that are to be provided to ITD include:

- Name, position title, contact information
- Summary of bridge inspection experience and responsible duties
- Bridge inspection training completed including copies of completion certificates
- Professional License registration/renewals (when applicable)

ITD will maintain this information in the Bridge Asset Management's files.

1.4.8—Continued Training Requirements

The Program Manager and Bridge Inspectors (ITD and Consultant) must take at least one training course every 60 months. Training courses may be scheduled by the Bridge Asset Management Engineer as budget considerations allow. Suggested topics include:

- any NHI training courses, these may be rotated over several inspection cycles to cover all topics
- Bridge Inspection Refresher Training
- Engineering Concepts for Bridge Inspectors

- Safety Inspection of In-Service Bridges
- Fracture Critical Inspection Techniques for Steel Bridges
- Inspection of Ancillary Highway Structures
- Underwater Bridge Inspection
- OSHA Confined Space Training
- Specialized Equipment Training
- other safety training

1.4.9—Reference Manuals and Publications

As can be true with any inspection, specific problems not covered in these general procedures may be encountered. If that is the case, the inspector will want to refer to manuals which describe special inspection procedures and equipment needs in greater detail.

Suggestions are:

- *Idaho Bridge Inspection Coding Guide*
- FHWA *Recording and Coding Guide for the Structure Inventory and Appraisal of the Nations Bridges*
- AASHTO *The Manual for Bridge Evaluation (MBE)*
- NHI *Bridge Inspector's Reference Manual (BIRM)*
- AASHTO *Manual for Bridge Element Inspection*
- FHWA *Inspection of Fracture Critical Bridge Members*
- HEC 18 *Evaluating Scour at Bridges*
- HEC 20 *Stream Stability at Highway Structures*
- HEC 23 *Bridge Scour and Stream Instability Countermeasures Experience, Selection, and Design Guidance*
- FHWA *Guidelines for the Installation, Inspection, Maintenance and Repair of Structural Supports for Highway Signs, Luminaries, and Traffic Signals*

If the inspector does not find the guidance needed, the concern should be brought to the attention of the BAME. Consultant Bridge Inspectors should contact the Bridge Inspector responsible for the area they are working in.

TABLE OF CONTENTS

Note: Some appendixes may be out of date as ITD transitions to the new NBI coding guide

INSPECTION

4.2—PROVISIONS TO SUPPORT THE NBIS REQUIREMENTS

4.2.2—Qualifications of Personnel

Responsibilities of Inspection Personnel may vary due to section needs and staffing availability. Duties not covered by the CFR may be switched as necessary and new duties may be assigned as allowed in the ITD Human Resources *Employee Policy & Procedure Handbook*.

4.2.2.1—Inspection Program Manager

The Bridge Asset Management Engineer (BAME) is the inspection program manager and meets all qualification requirements specified in *23 CFR 650.309*. The BAME is responsible for Idaho's compliance with the National Bridge Inspection Standards which include the inspections, load ratings, and scour evaluations of all bridges in Idaho. The BAME is also responsible for the analyses of state bridges for over legal truck loads.

The BAME manages a staff which includes state bridge inspectors, load rating engineers, a special projects engineer, and a bridge inspection equipment specialist. The BAME or designee also administers contracts with local bridge inspection consultants, and load rating consultant engineers.

4.2.2.2—Inspection Team Leader

Staff Inspectors meet the qualification requirements for team leader specified in *23 CFR 650.309* and are responsible for the inspection of state bridges. Staff Inspectors are centralized at the Boise headquarters and travel to their respective areas.

ITD contracts with 7-10 consultants to inspect locally-owned bridges throughout the state. These contracts are negotiated annually with qualified firms from ITD's term agreement list. All consultants are qualified as team leaders according to *23 CFR 650.309*. The consultant inspection areas typically follow county lines.

Inspectors are responsible for the inventory, routine, Nonredundant Steel Tension Members (NSTM), underwater, complex, damage and all special inspections of the bridges in their areas. ITD presently is a licensee of BrM™ and inspectors use this software for all data collection and reporting. The state bridge inspectors are responsible for quality assurance on consultant inspections in their districts.

ITD contracts with a firm to perform the underwater inspections for all state and local bridges whose foundations cannot be inspected and evaluated during a routine inspection.

4.2.2.3 – Bridge Inspector Trainee

The trainee position gives an individual the experience necessary to meet the requirements of team leader as specified in *23 CFR 650.309*. Experience is gained by successfully completing required training and assisting the team leaders with performing routine, NSTM, in-depth, and other inspection types. The inspector trainee, after gaining experience, is also responsible for the inventory, inspection and reporting of the short-span bridges. These are structures on the state system with lengths greater than or equal to 10 feet but less than or equal to 20 feet.

4.2.2.4—Bridge Inspection Equipment Specialist

The Bridge Inspection Equipment Specialist (BIES) is responsible for the operation and maintenance of ITD's under-bridge inspection truck (UBIT). This includes all maintenance, repairs and inspections of the boom and the UBIT itself. The BIES shall maintain all records showing maintenance and inspections of the UBIT. This position also makes sure all equipment required for inspections is maintained and is in working order. The BIES shall make recommendation(s) for the purchase of new equipment.

The BIES is responsible for scheduling the UBIT with the state inspectors and consultant inspectors, making every effort to coordinate the truck with the inspection due date. This position is responsible for scheduling the truck with outside agencies and all contractual documents required by ITD for use of the truck, other equipment and additional inspection personnel.

4.2.2.5—Database Manager

ITD uses an Oracle database with BrM™. The database manager is responsible for the accuracy and integrity of the items required by the NBI, additional Idaho specific items, and element data for all bridges in Idaho. The database manager is also responsible for the yearly update to the NBI of Idaho's bridge data.

Additional responsibilities of this position include:

- creating reports for ITD management, other sections and outside agencies requesting bridge data
- testing new versions of the BrM™ software
- troubleshooting and responding to users' questions regarding BrM™
- coordinate data from ITD and consultant inspectors
- assigning permissions to users for access to bridge data
- overseeing the Critical Findings process
- overseeing the posting & closing of bridges
- quality assurance of inspection reports

4.2.2.6—Load Rating Engineer

All new bridges must be load rated according the procedures described in this manual and *Articles 0.3 and 0.4* of the *Bridge Design Manual*. This as-built model provides a benchmark for future load ratings as the bridge deteriorates over time. Overlays, improvements, and deterioration may trigger a new load rating. Bridges are analyzed for live load carrying capacity.

ITD has a team of licensed engineers in BAM whose primary duties are load ratings. All meet the qualifications as specified in *23 CRF 650.309(c)*. Responsibilities include modeling the bridge in the AASHTOWare Bridge Rating program (BrR™), analyzing the results, troubleshooting errors, and providing rating factors for the required trucks. All load ratings are checked by another engineer and QA'd before the electronic bridge model is finalized. Additionally, the load rating engineer fills out a load rating summary sheet for the bridge file and prepares posting letters for the BAME's signature if load posting is required.

4.2.2.7—Special Projects Engineer

The special projects engineer has a variety of duties, including being the sentinel for the BridgeWatch™ system. This person is responsible for evaluating and responding to alerts from the system, working with the contractor to ensure that all scour critical and high risk unknown foundation bridges are in the system and advising the scour committee of changes or adjustments necessary so that personnel can respond to alerts in a timely manner.

This position is responsible for maintaining the IMBE and ensuring that it is compatible with all updates to the MBE. This position also is part of the load rating staff and may be assigned other duties of the section that have to do with inspection, scour evaluation, and overweight permitting.

4.2.3—Inspection Types

4.2.3.1—Inventory (Initial) Inspections

The inventory (initial) inspection is the first inspection conducted on a bridge by ITD. An inventory inspection must meet all the requirements of a routine inspection (see *Article 4.2.3.2*) including all Structure Inventory and Appraisal (SI&A) data and other relevant element level data necessary to determine the baseline structural condition.

An inventory inspection shall occur:

- following the construction of a new bridge
- when a structure previously under the jurisdiction of another agency is added to the state system or local/off system

New bridges or existing bridges added to the inventory (typically with jurisdictional change), not previously inspected by ITD shall have an inventory inspection within 3-months of opening to traffic, jurisdictional change, or whatever event is causing the bridge to be added to the inventory.

4.2.3.2—Routine Inspection

A Routine Inspection is a regularly scheduled inspection that generally consists of visual observations and/or measurements that are needed to determine the following:

- the physical and functional condition of the bridge
- changes from initial or previously recorded conditions
- repairs or other services that may be needed

4.2.3.3—In-Depth Inspection

In-Depth Inspections are performed to complete a close-up, detailed inspection of a portion of a bridge on a recurring basis. The In-depth Inspection is typically performed for:

1. Use special access equipment to assess portions of the bridge that are not accessible using regular access methods. Special access equipment includes, but is not limited to, the under-bridge inspection truck (UBIT), climbing gear, unmanned aerial systems (drones), or bucket truck.
    a. Ladders and waders are not considered special access equipment.
2. Use advanced NDE equipment to assess deficiencies not readily detectable using regular inspection equipment. Advanced NDE equipment includes, but is not limited to, ground penetrating radar, infrared thermography, acoustic emissions, or impact echo. If advanced NDE is performed on a recurring basis, code it as an In-depth Inspection. If it is a one-time event, code it as a Special Inspection.
    a. D-meters, dye-penetrant, magnetic particle, or eddy current are not considered advanced NDE equipment and do not require an In-Depth Inspection. They should be utilized on Routine, Underwater, and NSTM inspections as necessary.
3. Confined Space Inspections that follow OSHA requirements.
4. Assess fatigue-prone details (categories E & E') on a non-NSTM bridge. NSTM bridges with fatigue prone details have those details assessed as part of their NSTM Inspection.
5. Resistograph drilling of timber members.
6. Assess Complex Features on a bridge. Article 4.3.6 Complex Feature, explains what features on a bridge are complex.
7. Any other portion of the bridge that the Team Leader recommends receive recurring, close-up, detailed inspection. These recommendations shall be brought to the BAME for discussion and approval in order to schedule an In-Depth Inspection.

Each In-Depth Inspection requires a bridge-specific inspection procedure. Bridge-specific inspection procedures explain what must be planned/coordinated (e.g. traffic control), access & equipment requirements, what portions need to be inspected, what inspection methods are to be used, and required qualifications of personnel (if applicable) to ensure a successful inspection is completed.

The findings from an In-Depth Inspection are written in an inspection report. The report shall clearly indicate what elements were looked at, what methods of inspection were used (visual, dye penetrant, ground penetrating radar, etc.), what was found, who performed the work, and when it occurred.

The bridge-specific inspection procedure and inspection report shall be one document. See Appendix (to be determined) for an In-Depth Inspection procedure and report template.

A brief description of the portions of the bridge that received an In-Depth Inspection must be documented in the Inspection Note item (B.IE.11) in BrM. Findings from the In-Depth Inspection are updated in the appropriate BrM component condition ratings, element condition states/commentary and applicable notes for the bridge. Repair recommendations are documented in the Maintenance Recommendations section in BrM.

4.2.3.4—Nonredundant Steel Tension Members (NSTM) Inspection

A Nonredundant Steel Tension Members (NSTM)) is a steel member, in tension, that is not load path redundant. Failure of a NSTM has the potential to cause the bridge to collapse.

The purpose of a NSTM inspection is to identify and record the location of NSTMs and any problems or potential problems at these locations in order to determine the safety of the structure. NSTM inspections provide a history of cracking (time of initiation, rate of growth, etc.) that can greatly assist the engineer in determining the need and priority of repairs and in estimating the remaining life of the bridge.

NSTM inspections are always done in conjunction with a routine inspection, the NSTM inspection schedule and follow up procedures are part of the routine inspection report.

4.2.3.5—Underwater Inspection

If the underwater portion of a bridge substructure or the surrounding stream channel cannot be inspected visually at low water by wading or probing, it shall require an underwater inspection using divers or other appropriate techniques to accomplish these tasks. An inspection team leader must be present for all Underwater Inspections.

4.2.3.6—Special Inspection

Special Inspections are performed to monitor known or suspected deficiencies, or to monitor special details or unusual characteristics of bridge that does not necessarily have defects. Anytime a bridge element or a portion of the bridge requires further evaluation, analysis, or investigation to accurately assess its condition, a Special Inspection shall be performed. This inspection may involve testing, monitoring, or conducting specific analyses of select bridge elements.

The Special Inspection is typically performed for:

1) to obtain more sophisticated data
2) to perform NDE or other advanced testing
3) to bring in experts to assess a problem

Special Inspections are scheduled on a case-by-case basis based on issues that are usually specific to one bridge. However, occasionally multiple bridges with similar materials, details, performance history or defects may receive Special Inspections together if there is a possibility that the concern(s) could be present on other bridges (e.g. parallel bridges carrying both directions of a divided highway).

The Team Leader shall discuss the issue(s) of concern with the BAME. The BAME may request additional information from the Team Leader in order to make a decision about whether to schedule a Special Inspection and if personnel with subject matter expertise should be brought in to perform a Special Inspection.

Special Inspections do not require bridge specific inspection procedures. Special Inspection reports do not follow a standard template. They are prepared on a case-by-case basis. However, each Special Inspection must have a final report that clearly indicates what elements were looked at, what methods of inspection were used (visual, radiography, phased array ultrasonic, etc.), what was found, who performed the work, and when it occurred. The personnel performing the Special Inspection should discuss with the BAME how to document findings from the Special Inspection in a final report.

A brief description of the portions of the bridge that received a Special Inspection must be documented in the Inspection Note item (B.IE.11) in BrM. Findings from the Special Inspection are updated in the appropriate BrM

component condition ratings, element condition states/commentary and applicable notes for the bridge. Repair recommendations are documented in the Maintenance Recommendations section in BrM.

Special Inspections are performed as one-time events. If a Special Inspection's findings warrant continued follow-up inspection on some interval, then an In-Depth Inspection event and interval shall be scheduled in BrM.

4.2.3.7—Damage Inspection

Damage Inspections are unscheduled inspections required when a bridge has been damaged. A Damage Inspection must be conducted by an inspection team leader.

A Damage Inspection can occur following:

- a vehicle striking the bridge
- high water under the bridge
- a severe environmental event such as an earthquake or tornado

4.2.3.7.1—Damage Assessments

Following notification of potential damage to a bridge, the BAME may request an onsite Damage Assessment be conducted by ITD personnel who are near the affected bridge. Damage assessors usually do not meet the requirements of an inspection team leader but serve an important role because they are often the first-responder(s) for the Department.

Measurements and photographs of damage may be required so that the BAME can determine:

- whether or not to dispatch a bridge inspection team
- if a bridge should be closed or restricted until bridge inspectors can get to the site and inspect the damage

No official report is required. A phone call or email to BAM staff is sufficient documentation of a damage assessment.

4.2.4—Inspection Intervals

4.2.4.1—Inventory (Initial) Inspection Interval

The Inventory Inspection shall be conducted within 3 months of opening to traffic for all new, replaced, rehabilitated and temporary bridges.

4.2.4.2—Routine Inspection Interval

See IMBE *Article 4.2.3.2* for a description of routine inspections.

Bridges inspected using the 1995 Coding Guide:

For structures meeting **one** of the following criteria, Routine Inspections shall be conducted at reduced intervals **not to exceed 12 months.**

1. A condition rating of 4 or less for at least one of the following Coding Guide items:
   a) Deck (Item 58)
   b) Superstructure (Item 59)
   c) Substructure (Item 60)
   d) Culvert (Item 62)

2. Scour (Item 113) ≤ 2.

3. Any structure may have a reduced interval when recommended by the inspection team leader and approved by the BAME. The reason(s) for reducing the interval will be documented in the inspection report in the notes to the BAME.

Bridges inspected using the SNBI:

For structures meeting **one** of the following criteria, Routine Inspections shall be conducted at reduced intervals **not to exceed 12 months.**

1. A condition rating of 4 or less for at least one of the following SNBI items:
    a. Deck (B.C.01)
    b. Superstructure (B.C.02)
    c. Substructure (B.C.03)
    d. Culvert (B.C.04)
2. Scour Condition Rating (B.C.11) ≤ 4
3. Any structure may have a reduced interval when recommended by the inspection team leader and approved by the BAME. The reason(s) reducing the interval will be documented in the inspection report in the notes to the BAME.

Bridges inspected using the 1995 Coding Guide:

For structures meeting **all** of the following criteria, Routine Inspections shall be conducted at extended intervals **not to exceed 48 months.**

1. Structure must have condition ratings of 6 or greater (Items 58, 59, 60,61, and 62).
2. The Inventory rating factors (Legal Load Rating Factor for LRFR) for the State's Type 3 (27 tons), Type 3S2 (42tons), and Type 3-3 (45 tons) legal loads are all greater than or equal to 1.0.
3. Structure is open with no restrictions (Item 41 = "A" and Item 70 = 5).
4. Structure has load path redundancy (not NSTM) (Item 43B & 44B $\neq$ 3, 9, 10, 13, 14, 15, 16, 17 or 00 types). Structure design is not uncommon or unusual (Item 43B 14 and 21) and has a proven performance history.
5. Complex bridges do not qualify for a 48 month inspection interval.
6. Minimum vertical clearance over the bridge roadway (Item 53) must be greater than 14'
7. Minimum vertical under-clearance must be greater than 14' when the bridge is over a highway (Item 54A = H and Item 54B > 14).
8. Structure does not include material types such as timber, masonry, aluminum, wrought iron, cast iron, and other (Item 43A & 44A $\neq$ 7, 8, 9, 0 types).
9. Structure has received an Inventory Inspection and at least 1 Routine Inspection approximately 24 months after construction/rehabilitation was completed or the existing bridge was added to the inventory. The Inventory and Routine Inspection(s) must reveal no major deficiencies.
10. Structure is not scour critical, does not require action to address scour, does not have an unknown foundation, and has been evaluated for scour (Item 113 $\neq$ 0-4, 6, T, or U).
11. Structure has not been determined by the Bridge Inspection Program Manager to need an inspection interval of two years or less. If Bridge Inspection Program Manager sets an inspection interval of 2 years or less, this will be documented in the "NOTES" section of the inspection report.

Bridges inspected using the SNBI:

For structures meeting **all** of the following criteria, routine inspections shall be conducted at extended intervals **not to exceed 48 months.**

1. Structure must have condition ratings of 6 or greater (B.C.01-.04).
2. The channel and channel protection are rated 6 or greater. (B.C.09 & B.C.10)
3. The Inventory rating factor is greater than or equal to 1.0 (B.LR.05) and routine permit loads are not restricted or are not issued (B.LR.08) = A or N.
4. Structure has load path redundancy (not NSTM) SNBI B.IR.01 = N
5. Structure does not have Category E or E' fatigue details (B.IR.02) = N
6. All roadway vertical clearance(s) over the roadway carried on the structure (SNBI B.H.13) must be greater than 14'.
7. Minimum vertical under-clearance(s) must be greater than 14' when the structure is over a highway (when B.F.01 = H## is coded, then B.H.13 ≥ 14.0).
8. All superstructure materials are steel or concrete (B.SP.04 = C01-05 or S01-S05 types).
9. All superstructure types are limited to certain arches, box girders/beams, frames, girders/beams, slabs, and culverts (B.SP.06 = A01, B02 - B03, F01, F02, G01 – 08, P01, P02, S01, or S02).
10. Structure has received an Inventory Inspection and at least 1 Routine Inspection 24 months after Inventory inspection was completed. The Inventory and Routine Inspection(s) must reveal no major deficiencies.
11. Observed scour condition is 6 or greater (B.C.11)
12. Scour vulnerability is stable = A or B (B.AP.03)
13. Structure has not been determined by the Bridge Inspection Program Manager to need an inspection interval of 24 months or less. If Bridge Inspection Program Manager sets an inspection interval of 24 months or less, this will be documented in the "NOTES" section of the inspection report.

For structures not meeting the criteria for a reduced (12 month) or extended (48 month) interval, Routine Inspections shall be conducted at regular intervals **not to exceed 24 months.**

4.2.4.2.1—Reduced Routine Inspection Interval

If the Routine Inspection interval of a bridge is reduced as a result of a change found during an inspection the next Routine Inspection will be scheduled accordingly. If the Routine Inspection interval is reduced in between scheduled Routine Inspections as a result of a change in scour, or load rating the next Routine Inspection shall be scheduled to be conducted within 12 months of recording the change in BrM. If the next scheduled Routine Inspection was already planned to occur within the next 12 months the inspection shall be conducted as scheduled. Changes to inspection intervals shall be documented in the bridge notes. Notes shall include when the change occurred (date), what caused the change, and the new date (MM/YY) of the next scheduled inspection.

Example 1: A bridge is on a 48 month inspection interval scheduled to be inspected in 23 months, the scour vulnerability code is changed from B to C, causing the inspection interval to reduce to 24 months. The next Routine Inspection will be moved up and scheduled to occur in the next 12 months.

Example 2: A bridge is on a 48 month inspection interval scheduled to be inspected in 8 months, a new load rating is conducted and the bridge has an inventory rating < 1 causing the inspection interval to reduce to 24 months. The next Routine Inspection will be conducted as scheduled in 8 months.

4.2.4.3—In-Depth Inspection Interval

The In-depth Inspection interval is set according to the reason(s) it is being performed:

1) Special Access Equipment –
    a. Regular interval is 48 months.
    b. Use reduced interval that is equal to the Routine Inspection interval when the component rating for the portion(s) of the bridge needing special access equipment to assess it, is 4 or less. Example – UBIT is needed to access superstructure. Superstructure (B.C.02) lowered to a 4 due to worsening section-loss; set In-Depth interval equal to Routine Inspection Interval.
    c. Use extended interval equal to twice Routine Inspection interval when Deck (B.C.01), Superstructure (B.C.02), and Substructure (B.C.03) are all 6 or greater.
2) Advanced NDE Equipment –
    a. Regular interval is 48 months.
    b. Use reduced interval that is equal to the Routine Inspection interval when the component rating for the portion(s) of the bridge needing advanced NDE equipment to assess it, is 4 or less. Example – Impact Echo is needed to assess debonding on a deck overlay. Deck (B.C.01) lowered to a 4 due to additional areas of debonding and deterioration of structural deck underneath; set In-Depth interval equal to Routine Inspection Interval.
    c. Use extended interval equal to twice Routine Inspection interval when portion(s) of the bridge needing advanced NDE equipment to assess it, is 6 or greater.
3) Confined Space -
    a. Regular interval is at every Routine Inspection.
    b. No reduced interval.
    c. May use an extended interval equal to twice Routine Inspection interval when portion(s) of the bridge needing Confined Space inspection to access it, is 6 or greater. Extended interval shall be approved by BAME.
4) Fatigue Prone Details on non-NSTM bridge –
    a. Regular interval is 48 months.
    b. Use reduced interval that is equal to Routine Inspection interval when the component rating for the portion(s) of the bridge with fatigue prone details, is 4 or less. Example – there are fatigue prone details on the superstructure. Superstructure (B.C.02) lowered to a 4 due to fatigue crack growth; set In-Depth interval equal to Routine Inspection interval.
    c. There is no extended interval for fatigue prone details.
5) Timber Member – refer to Timber Member Inspection Guidelines
    a. Timber member in CS2 – check for further decay every 96 months
    b. Timber member in CS3 – check for further decay every 48 months
    c. Timber member in CS4 – check for further decay every 24 months
6) Complex Feature – interval is set by considering the condition state for the element(s) with complex feature(s). Team Leader makes recommendation, BAME approves. Guidelines: CS1 is up to 96 months. CS2 is up to 72 months. CS3 is up to 48 months. CS4 is up to 24 months.
7) Other – interval is set by recommendation of Team Leader and approval of BAME. Max interval is 96 months.

The reason(s) for changing the inspection interval shall be documented in the inspection report in the Notes section, under the INSPECTION INTERVAL header. See *Article 4.2.3.3* for a description of In-Depth inspections.

4.2.4.4—NSTM Inspection Interval

NSTM inspections shall be conducted at regular intervals **not to exceed 24 months**. See *Article 4.2.3.4* for a description of NSTM inspections.

If the NSTMs are rated in poor condition as recorded by the NSTM inspection condition item coded 4 or less (SNBI B.C.14) the NSTM and routine inspection intervals shall be reduced to 12 months.

4.2.4.5—Underwater Inspection Interval

See IMBE *Article 4.2.3.5* for a description of Underwater Inspections.

Bridges inspected using the 1995 Coding Guide:

Underwater inspections shall be completed at regular intervals **not to exceed 60 months**. All bridges shall be on a 60 month inspection cycle unless they meet one of the following criteria for more frequent inspections:

1. If NBI Item 113=2 indicating that the bridge is scour critical, the underwater inspection frequency shall be set to **12 months.**

2. If the inspector observes conditions that warrant monitoring at an increased frequency, the underwater inspection frequency shall typically be set to **12 months** upon approval of the BAME**.** These conditions may include but are not limited to; evidence of substructure movement, significant deterioration or undermining in a primary underwater element, significant stream migration, significant bank sloughing, or debris buildup.

A Special Inspection may be conducted in lieu of an Underwater Inspection to monitor a known deficiency in between required 60 month inspections if the BAME deems it appropriate.

Bridges inspected using the SNBI:

For structures meeting **one** of the following criteria, Underwater Inspections shall be conducted at reduced intervals **not to exceed 24 months.**

1. A condition rating of 4 or less for at least one of the following SNBI items:
    a. Underwater Inspection Condition (B.C.15)
    b. Channel Condition (B.C.09)
    c. Channel Protection Condition (B.C.10)
    d. Scour Condition (B.C.11)

Any structure may have a reduced interval when recommended by the Underwater Inspection team leader and approved by the BAME. The reason(s) for reducing the interval will be documented in the inspection report in the INSPECTION INTERVAL section of the inspection report.

For structures meeting **all** of the following criteria, Underwater Inspections shall be conducted at extended intervals **not to exceed 72 months.**

1. A condition rating of 6 or greater for all of the following SNBI items:
    a. Underwater Inspection Condition (B.C.15)
    b. Channel Condition (B.C.09)
    c. Channel Protection Condition (B.C.10)
    d. Scour Condition (B.C.11)

2. Scour vulnerability is stable = A or B (B.AP.03)

Structure has not been determined by the BAME to need an underwater inspection interval of less than 72 months. If the BAME sets an underwater inspection interval of less than 72 months, this will be documented in the "INSPECTION INTERVAL" section of the inspection report.

For structures not meeting the criteria for a reduced (24 month) or extended (72 month) intervals, Underwater Inspections shall be conducted at regular intervals **not to exceed 60 months.**

Anytime the inspector determines the inspection interval needs to be changed, the reason shall be documented in the Underwater Inspection report (an example underwater inspection report is included as *Appendix 4.4*) and discussed with the BAME. If the inspection interval is unchanged, the date of the Underwater Inspection in which the inspection interval was set shall be noted on the current Underwater Inspection report.

4.2.4.6—Special Inspection Interval

Special Inspections are one-time events. They do not have an inspection interval. Use the In-Depth Inspection type if a Special Inspection's findings warrant follow-up inspections.

4.2.4.7—Damage Inspection Interval

Damage Inspections are scheduled as needed to assess damage to the bridge following an environmental or human caused event. A Damage Inspection or Damage Assessment shall be conducted within 24 hours of reported damage. See *Article 4.2.3.7* for a description of Damage Inspections.

4.2.5—Inspection Procedures

4.2.5.1—General

ITD has adopted the numeric coding system in *Recording and Coding Guide for the Structure Inventory and Appraisal of the Nations Bridges* (FHWA, December 1995) and *Specifications for the National Bridge Inventory* (FHWA, March 2022) for NBI inspections. Element level inspections are conducted in accordance with the most current version of the *AASHTO Manual for Bridge Element Inspection*, and *Idaho Coding Guide*.

4.2.5.2—Inventory (Initial) Inspection Procedure

The effort and intensity should be sufficient to accurately document the baseline condition of all AASHTOWare Bridge Management™ (BrM™) elements and NBI items. Traffic control and special access equipment, though not typically used for an inventory inspection, may be required.

The inspection team should have a set of as-built bridge drawings (if available) to refer to when performing the inventory inspection. When bridge plans are not available, the inspection team shall take field measurements to complete the inventory inspection.

An example of a completed Structural Inventory and Appraisal report is included as *Appendix 4.5*. A blank Inventory Inspection form is included as *Appendix 4.6*

4.2.5.3—Routine Inspection Procedure

The inspection team shall provide all Structure Inventory and Appraisal (SI&A) data and other relevant element level data needed to determine the structural condition in sufficient detail to clearly establish the bridge's condition and to ensure its continued safe operation.

The level of scrutiny and effort required to perform a routine inspection shall vary according to the structure's type, size, design complexity, and existing conditions. To provide a reasonable level of confidence in the safety of the bridge, knowledge of the structure and good engineering judgment are necessary to determine those portions that shall receive close-up scrutiny during a routine inspection.

Routine inspections are generally conducted from the deck, ground, and/or water levels. Typically ladders are utilized and permanent work platforms or walkways may also be used, if present. Inspection of underwater members of the substructure is generally limited to observations during periods of low flow and/or probing/sounding for evidence of local scour.

If scour is occurring at foundations, in addition to documenting it with the scour defect, a detailed drawing of the scour as it relates to the foundation shall be provided as part of the inspection report. Detailed pictures should also be provided for documented scour issues.

Photographs shall accompany the inspection reports showing:

- bridge looking down roadway

- elevation view of bridge
- upstream and downstream photos (if applicable)
- posting signs (if applicable), this includes weight limits, lane posting, vertical clearance, any other bridge restrictions
- any significant damage/deterioration noted in the report
- anything that warrants further review by the BAME
- abutments on new bridges to inventory so the scour condition (Item 113) can be evaluated

In general, the more severe the issue, the more detail and photographs should be provided in the inspection report. An example of a completed ITD Structure Inventory and Appraisal report is included in *Appendix 4.5*.

4.2.5.3.1 Channel Cross Sections

With the release of the 2024 IMBE all bridges over water shall have a Channel Cross Section performed at the upstream face during every initial inspection and at a regular interval of 48 months unless it meets one of the below criteria. This may require a cross section on bridges that have not required one previously.

Certain circumstances, such as a flooding event or shift in stream flow, may require that channel cross sections be performed more frequently. If inspector is requesting a scour committee review a cross section shall be performed. An example of a channel cross section is included in *Appendix 4.1*.

A channel cross section is not required when:

1. Underwater Inspection required (Item 92B = Y)
2. Bridge foundation on dry land well above flood water elevations (Item 113 = 9 or Item 113 = N)
3. Bridge spans a significant hydraulic control structure, such as a dam that is managed by others and in which the bridge is secondary to the hydraulic infrastructure. Example – bridge over the spillway crest of American Falls Dam. BAME must approve bridge exception.

The cross section interval may be extended to 96 months if any of the following conditions apply:

1. Structure foundations are founded on rock
2. Structure is over a canal, with no observed scour.
3. Structure has a constructed floor or full channel lining through it. This also includes pipes.

The cross section interval shall be reduced to every routine inspection and shall include upstream and downstream faces:

1. If Item 113 = 2

4.2.5.4—In-Depth Inspection Procedure

In-depth inspection reports shall generally contain sufficient detail to understand what elements were inspected at an in-depth level, description of findings (including sketches and photos as appropriate), and any other pertinent information to facilitate future inspections such as equipment and/or methods used to analyze and assess elements.

If an in-depth inspection is not done in association with a routine inspection and report it should be recorded on the non-SI&A inspection form. A blank non-SI&A inspection form is included as *Appendix 4.7*.

4.2.5.5— Nonredundant Steel Tension Members (NSTM) Inspection Procedure

The inspection intensity of all NST's during a NSTM Inspection should be sufficient to discover the onset of fatigue cracking. The inspector must have a hands-on level of access to all NSTMs. Prior to the inspection the inspector should review the available information for the bridge such as the construction plans, sketches, specifications, shop drawings, prior inspection reports, photos, etc. and consider the details present on the bridge along with the condition of the NSTMs.

Inspection for each NSTM shall adhere to the following general procedures.

1. Visually inspect for cracks, rust, nicks, gouges, or impact damage.

2. Check for loose, bent, misaligned, un-even or un-evenly loaded members.

3. Check all bolted, riveted, or welded connections in tension areas.

4. Use mirrors or other equipment to check inside surfaces.

5. Check all connections at gusset plates, with emphasis on the first row (closest row to edge of plate).

6. Check for poor welding techniques, including plug, tack, or repair welds.

7. Check the flanges of the steel girders in tension areas where they change thickness or widths.

In addition to the general procedures, each NSTM bridge shall have unique procedures specific to the bridge which contain information necessary to convey to an inspector preparing to perform an NSTM Inspection. The unique procedures describe additional steps in the inspection plan and are intended to mitigate significant risk factors associated with a particular bridge.

The unique procedures summarize in the written narrative and where feasible by annotation on the drawings identifying NSTMs, the pertinent details and/or focus (emphasis) areas for the bridge. It is not necessary to list each NSTM in the narrative of the unique procedure, as other sections of the report contain this information. However, if one NSTM is especially severe then specific mention of that NSTM and its particular concern might warrant specific mention in the unique procedures.

Generally speaking unique procedures are brief and concise. On some bridges in very good condition with no known defects or risk factors, unique procedures may not be applicable beyond a reference to the general procedures. Note this accordingly on the form. In other instances, bridges in poor condition or bridges with several risk factors present will contain several steps in the unique procedures to convey this information to future inspectors.

Potential risk factors for NSTMs and their reference can be found in table 4.2.5.5-1; the table is not all inclusive but is to be used as a guide to assess risk and to develop specific/unique inspection procedures.

Table 4.2.5.5-1 NSTM Risk Factors

NSTM Risk Factor	Reference
Problematic Materials	
Welded Structural Carbon Steel AASHTO M94 (ASTM A7)	BIRM page 6.3.iv & BIRM page 6.3.6
Welded Structural Silicon Steel AASHTO M95 (ASTM A94)	BIRM page 6.3.iv & BIRM page 6.3.7
Welded Structural Nickel Steel AASHTO M96 (ASTM A8)	BIRM page 6.3.iv & BIRM page 6.3.7
Welded "T-1" Steel AASHTO M270 Grade 100 (ASTM A514/A517)	FHWA Technical Advisory 5140.32
Fatigue and Fracture Prone Details	
AASHTO Categories D, E, E'	BIRM page 6.4.33, AASHTO's LRFD & MBE
Problematic Details	
Tri-axial Constraint	BIRM page 6.4.49
Cover Plates	BIRM page 6.4.51
Cantilevered suspended span	BIRM page 6.4.52
Insert plates	BIRM page 6.4.53
Out-of-plane bending	BIRM page 6.4.56
Pin and hanger assemblies	BIRM page 6.4.62, 10.7.1
Mechanical fasteners (bolt holes and rivets)	BIRM page 6.4.63
Flange Termination	BIRM page 6.4.64
Coped flanges	BIRM page 6.4.65
Blocked flanges	BIRM page 6.4.66
Nicks, gouges, notches, indentations	BIRM page 6.4.24 & 6.4.67
Poor Welding Techniques	
Intersecting Welds	BIRM page 6.4.50
Field welds (patch & splice plates)	BIRM page 6.4.54
Plug Welds	BIRM page 6.4.12
Intermittent or stitch welds	BIRM page 6.4.55
Tack Welds	BIRM page 6.4.12
Back-up bars	BIRM page 6.4.62
In Service Flaws	
Impact damage to FCMs	BIRM page 6.4.24
Improper heat straightening	BIRM page 6.4.25
Indiscriminate welds	BIRM page 6.4.24

Secondary NSTM Risk Factors

The bridge's condition and traffic may constitute secondary NSTM risk factors. These factors have the potential to cause or exacerbate NSTM risk factors listed in the table above. These factors should be considered by the inspector when developing unique procedures for the bridge. Secondary factors are largely based on SI&A data recorded elsewhere in the report. Generally they do not need to be specifically called out in the unique procedures unless the inspector determines that there is valuable information to convey to future inspectors. Secondary factors include but are not limited to:

- Load Restriction (NBI Item 41 ≠ "A") – Due to design or deterioration the bridge capacity is less than current legal loads, may be subject to overloads, may exhibit fatigue damage

- Cold Service Temperatures – May cause steel to become brittle reducing tensile strength or cause shrinkage affecting the geometry of bridge causing cracking or other damage, critical temperature depends on steel grade.

- Poor Superstructure (NBI Item 59 ≤ 4) – Significant section loss in critical stress area. Minor fatigue or out of plane bending cracks may be present in major structural elements.

- Older Bridge (NBI Item 27 ≤ 1980) – Fatigue, fracture, and toughness were not primary concerns when designing bridges prior to the 1980's. Material standards have become more stringent over time; there may be problematic materials or problematic details that should be noted on these older bridges.

- Long Service Life (Years of service > 75) – In addition to material standards, these bridges have been subjected to more loading cycles increasing the likelihood of fatigue issues.

- High ADTT (NBI Item 29 ≥ 5000) – Bridge is subject to more loading cycles and potentially more overweight traffic increasing the likelihood of fatigue issues.

- Retrofits and repairs – Has the potential to introduce problematic details and poor welding techniques, may be an indication that the bridge has a history of structural problems.

Equipment

At a minimum the inspector should have a dye penetrant kit and magnifying glass on-hand. Lighting to ensure details are visible may also be necessary on some bridges. Equipment necessary to access NSTM's such as ladder, UBIT or climbing equipment should be listed on the NSTM Inspection report.

In some cases it may be appropriate for the inspector to recommend using additional NDT equipment such as magnetic particle, ultrasonic, eddy current, acoustic emission, and radiography to evaluate a detail, particularly if there are known defects or past history of problems with the detail on the bridge. Additional NDT equipment usually requires additional supporting resources such as a generator or personnel with expertise using this equipment. Additional NDT testing shall be at the discretion of the BAME.

The recommendation for additional NDT testing should be in the NOTES section of the routine inspection report. If additional NDT testing is necessary for future NSTM Inspections in order to monitor an issue, the bridge's unique procedures should describe where (what portion of the NSTM) and at what inspection interval (how often) these defects are to be inspected with these additional tools. This is to inform future inspectors of the tools they will need to properly evaluate the NSTMs on the bridge during future NSTM Inspections.

Nonredundant Steel Tension Members (NSTM) Inspection Report

An annotated NSTM Inspection Summary form can be found in *Appendix 4.2*, an example NSTM Inspection Report can be found in *Appendix 4.3*. At a minimum the NSTM report should include:

- a schematic of the superstructure with all NSTM's and unique features (if feasible) identified

- equipment required to properly access and assess NSTMs (access equipment required is a dropdown menu on FC summary)

- Sketches or annotated design plans showing NSTM members to be visually monitored over time

- A description and condition of each NSTM inspected

- Procedures necessary to inspect NSTMs including:

    - a reference to the general procedures of article 4.2.5.5

    - any procedures to monitor risk factors listed in table 4.2.5.5-1

    - any hazards or other challenges to properly access FCMs

4.2.5.6—Underwater Inspection Procedure

Each underwater inspection has procedures that are unique to the bridge as part of the inspection report. Procedures should include:

- a description of underwater elements to be inspected
- scour countermeasures, if any, to be inspected
- inspection methods, frequencies, other scheduling considerations
- equipment needed for the inspection
- access points
- hydraulic features affecting the structure and/or inspection
- risk factors

At the conclusion of every dive, the diver must go over the inspection findings with the team leader in order to verify that the notes taken by staff on the surface are a correct representation of what the diver found. The diver should also go over all underwater photos, making sure that the photo numbers and descriptions are correct.

One channel cross section upstream of the bridge shall be performed on each underwater inspection. An example of an underwater inspection report is included as *Appendix 4.4*. An example of a channel cross section is included in *Appendix 4.1*.

4.2.5.8—Damage Inspection Procedure

The scope of damage inspections varies widely depending on upon the extent of the damage, the volume of traffic encountered, the location of the damage on the structure, and documentation needs. At a minimum, photographs and measurements shall be taken to show the extent of damage.

The inspector shall obtain sufficient information for the BAME to accurately assess the condition of bridge and determine a course of action. Potential courses of action include but are not limited to:

- placement of emergency load restrictions
- partial or full closure of the bridge to traffic
- repairs

For scour critical bridges, ITD utilizes a proprietary alert system BridgeWatch™. BridgeWatch™ takes rain, snow, and stream gauge data into account to determine when there is a potential for high flows. If it is determined that a high flow has occurred or is occurring at a scour critical bridge, a damage assessment (see *Article 4.2.3.7.1*) or inspection may be required to assess possible damage.

A damage inspection should be recorded on the non-SI&A inspection form. A blank non-SI&A inspection form is included as *Appendix 4.7*.

4.2.5.9—Critical Deficiency (Finding) Procedures

4.2.5.9.1 –Critical Finding Definition

A critical finding is any one or more of the following conditions:

1. A maintenance recommendation with an emergency priority assigned by the bridge inspector

2. Any of the following NBI items are a 2 or less:
   a) Item 58 (Deck)
   b) Item 59 (Superstructure)
   c) Item 60 (Substructure)

3. Any of the following NBI items are a 3 or less:
   a) Item 61 (Channel and Channel Protection)
   b) Item 62 (Culverts)

4. Item 41 (Structure Status) = B

5. Any event causing immediate concern to the traveling public, e.g., a bridge hit, flood, earthquake, etc.

6. When a bridge has a significant structural problem that requires an emergency load restriction, lane closure, bridge closure, or if a bridge has failed.

4.2.5.9.2—Critical Finding Reporting

The Inspection Team Leader shall notify the bridge owner/district personnel of all critical findings immediately. Due to the urgent nature, notification may be initially done through a phone call, meeting, or an email. However, formal notification shall occur shortly thereafter by completing and sending a Local Agency Communication Verification (see *Appendix 4.8* for blank form) to local bridge owners or a Critical Finding Communication (see *Appendix 4.9* for blank form) to appropriate ITD personnel. The purpose of these forms is to provide added visibility and attention for bridge owners/district personnel so that they can quickly and diligently take actions to resolve. Typically the Local Agency Communication Verification will be shared and signed at the initial meeting with the bridge owner.

A complete list of highway officials is contained in the *Directory of Idaho Government Officials* published yearly by the Association of Idaho Cities, www.idahocities.org

In addition to completing these forms, the following information shall be documented in the Notes section of the inspection report:

1. a brief summary of the critical finding

2. contact information for the bridge owner representative (name, title, phone number, etc.)

3. date of conversation with bridge owner representative

4. brief summary of interim actions that were/are to be taken, e.g., bridge closure, lane restriction, load posting

5. assign a priority for follow up (2 days, 10 days, 30 days)

The inspector shall inform the bridge owner at every Routine Inspection or district personnel that the Bridge Asset Management office must be notified when repairs are completed.

4.2.5.9.3– Emergency Notification to Police and Public

If the inspector determines that there is an immediate danger to the traveling public, state or local law enforcement and the BAME shall be contacted immediately. The bridge shall be closed. If the bridge is owned by the state, it shall be closed in accordance with the *ITD Operations Manual, Chapter 2 Road Closures.*.

4.2.5.9.4 – Critical Finding Procedures for ITD Maintained Structures

When a critical finding(s) is discovered during the inspection of a state-owned structure, the following procedure shall be followed:

1. Notification: In addition to the immediate notification described in *Article 4.2.5.9.2*, a completed Critical Findings Communications form shall be sent to the District Engineer and Maintenance Engineer within 24 hours of discovery of the critical finding. Copy the BAME and the Database Manager when sending Critical Findings Notification Forms to the Districts.

2. Action: The District Engineer or designee shall be required to perform the necessary actions within the prescribed timeframes on the form. A representative from the District is required to notify the Database Manager when proper action has been taken. Once BAM is notified, the BrM™ database shall be updated to reflect the current bridge condition.

3. Follow Up: If BAM is not notified that necessary actions were taken within the required timeframes, the District shall be contacted again by either e-mail or phone. The bridge shall be added to the Critical Deficiency Tracking System and continue to be monitored. If after two attempts BAM is unable to obtain confirmation from the District Engineer or designee that the necessary actions were taken, then the BAME will escalate the matter to the Chief of Operations.

All correspondence between the District and the Bridge Asset Management office should be documented in the bridge file. The date and brief summary of repairs that were made, or are scheduled to be made, shall be documented if it is not detailed in the correspondence.

The BrM™ Database Manager shall forward copies of the critical findings inspection reports and local agency communication verifications to the Bridge Asset Management Engineer, the Bridge Design Engineer, and the FHWA Division Bridge Engineer monthly.

4.2.5.9.5 – Critical Finding Procedures for Locally Owned Structures

When a critical finding(s) is discovered during the inspection of a locally-owned structure, the following procedures shall be followed:

1. Notification: In addition to the immediate notification described in *Article 4.2.5.9.2*, a completed Local Agency Communication Verification form shall be sent to the local agency within 24 hours of discovery of the critical finding. Copy the BAME and the Database Manager when sending Critical Findings Notification Forms to local agencies.

2. Action: The local agency shall be required to perform the necessary actions within the prescribed timeframes on the form and contact the Database Manager when proper action has been taken. Once BAM is notified, the BrM™ database shall be updated to reflect the current bridge condition.

3. Follow Up: If the local agency fails to notify BAM within the timeframes identified above, a follow-up letter shall be sent by the BAM Engineer. At this point the bridge shall be added to the Critical Deficiency Tracking System. If the local agency fails to notify BAM within 5 business days that corrective action has been taken, a second follow-up letter shall be sent by the Chief Engineer or designee. This letter shall inform the local agency that Federal and State funds may be suspended until appropriate corrective actions are taken. The FHWA Division Administrator and LHTAC shall be copied on the letter in addition to appropriate ITD personnel. Additionally, the appropriate ITD District Engineer shall be contacted and either he/she or designee shall follow-up with local highway agency personnel and offer assistance to get proper action taken.

4.2.5.9.6 – Critical Findings Tracking System

ITD shall maintain a system that tracks all critical findings. When a critical finding has been resolved, the tracking system shall be updated to indicate the critical finding has been closed. A historical record of resolved critical findings shall be maintained in order to track the types of critical findings found and to identify other bridges which may have similar structural details. At the discretion of the Program Manager, inspection of other bridges with similar structural details may be scheduled to verify that the critical finding is isolated to the identified bridge(s).

4.2.5.10—Procedure for Scour Evaluation of Bridges Recently Added to the Inventory

As part of federal requirements, all new bridges designed and constructed with federal funds must be assessed for their scour vulnerability during the design phase according to HEC 18 and therefore are assumed to be low risk for failure due to scour, i.e. Item 113 = 8 unless inspection findings show otherwise. For new non-federal aid bridges and existing bridges recently added to Idaho's inventory the following process will occur:

- At least once every two months, the Special Projects Engineer will obtain a report from the bridge inspection database of all bridges that haven't been evaluated for scour, i.e. Item 113 = 6.
- This set of bridges will be screened according to the flow chart located in *Appendix 4.10* and a new code for Item 113 may be assigned.
- If the Scour Committee is unable to properly assess the bridge, it will be assigned to a consultant engineer for a complete scour evaluation.

Assessments that can be done by the Scour Committee will be completed within 90 days of the database inquiry. In an effort to control costs and understanding that site visits to a bridge are best performed at certain times of the year, ITD anticipates that a consultant evaluation can take up to one year after the initial screening by the Scour Committee. Bridges that are being evaluated for scour by a consultant will be considered scour critical and added to the BridgeWatch™ system until the evaluation is completed.

4.2.5.11—Unknown Foundations Procedure

ITD utilizes all its resources, e.g., plan archives, inspection files, design files, and local highway district contacts to locate plans for each bridge in the inventory. However in some cases, primarily with local bridges, plans cannot be located. Without foundation drawings, appropriate calculations for scour evaluations cannot be made. Item 113 (Scour Critical Bridges) is coded a U for bridges with unknown foundations. This coding is primarily used when it cannot be determined if a bridge's foundations are spread footings or piles. If the foundation type can be determined by routine or underwater inspection, Item 113 shall be changed to the appropriate code.

ITD has developed a flow chart (see *Appendix 4.11*), based on a select number of NBI items, to determine whether an unknown foundation bridge is at high or low risk for failure during a flooding event. A bridge is categorized as low risk if it has performed well, has a low ADT, short detour length and has no history of significant scour related problems. High risk infers that the bridge has performed satisfactorily, but because of ITD defined criteria and experiences, a higher level of scrutiny is needed.

The risk category for an unknown foundation bridge is based on the following NBI items:

- Item 71 - Waterway Adequacy
- Item 61 - Channel and Channel Protection
- Item 45 - Number of Main Spans
- Item 46 - Number of Approach Spans
- Item 19 - Detour Length

- Item 29 – ADT

Failure risk for unknown foundation bridges with four or more spans shall be determined by the scour committee on a case-by-case basis since potential risk factors for multi-spans may not be adequately represented in the above NBI items.

A plan-of-action (POA) shall be developed for all unknown foundation bridges. BrM™ is the Department's filing location (electronic only) for scour POA's. Each POA shall be electronically linked to the bridge record in BrM™. All other scour related documents (if applicable) shall be retained in the bridge file.

High Risk

A bridge shall be categorized as high risk if it meets one of the following criteria:

1. The bank and/or protection is undermined or if overtopping of the bridge deck is possible (Waterway Adequacy or Channel Protection < 5).

2. The bridge has 2 or 3 spans, bank and/or protection is beginning to slump or erode, and overtopping is a slight possibility (Waterway Adequacy and Channel Protection < 7).

3. The bridge has one span, bank and/or protection is beginning to slump or erode, overtopping is a slight possibility, ADT is greater than 100, and the detour length is greater than 10 miles (Waterway Adequacy and Channel Protection < 7 and Detour Length > 10 and ADT > 100).

4. The Scour Committee has determined that exhibited scour warrants High Risk monitoring. Undermining is minimal and foundation type is unable to be determined.

High risk unknown foundation bridges shall be monitored on the BridgeWatch™ system in addition to their routine and/or underwater inspections at frequencies specified in *Article 4.2.4.2 – Routine Inspection Interval* and *Article 4.2.4.5 – Underwater Inspection Interval*

A high risk POA is similar to those for bridges determined to be scour critical. At a minimum, each high risk bridge is monitored in BridgeWatch™. BridgeWatch™ utilizes real-time data to continuously monitor bridge sites for local conditions that may extend the likelihood of a scour event occurring (high stream flow, heavy rainfall, etc.).

In addition to BridgeWatch™, additional monitoring occurs during routine and underwater (if applicable) inspections and after major flood events. The bridge inspector shall review high risk bridge POAs with the bridge owner(s) at least once every five years or more frequently if significant scour is observed by the inspector. Inspectors shall review and consider the POA as they perform bridge inspections.

Based on information in bridge inspection reports and feedback from bridge inspectors and bridge owners/maintenance personnel, the Scour Committee may make recommendations to the bridge owner for:

- foundation investigation

- countermeasure installation

- programming for bridge replacement (usually if significant scour occurs or recurs frequently)

Low Risk

Low risk unknown foundation bridges shall be monitored by routine and/or underwater inspections at frequencies specified in *Article 4.2.4.2 – Routine Inspection Interval* and *Article 4.2.4.5 – Underwater Inspection Interval*.

The POA for a low risk bridge shall describe an ongoing monitoring plan. Monitoring typically occurs during routine biennial inspections and after major flood events. The POA shall be sent to the bridge owner once every five years. Inspectors shall review and consider the POA as they perform bridge inspections. Inspectors may make a recommendation to the Scour Committee to re-assign a low risk bridge to high risk if field conditions warrant. The inspection report shall document findings and other pertinent information that the Scour Committee should consider for reassignment.

Additional Information:

- FHWA memo 1/9/2008: Technical Guidance for bridges over waterways with unknown foundations

- FHWA memo 6/3/2009: FAQs - Bridges over waterways with unknown foundations
- FHWA memo 10/29/2009: Additional Guidance for assessment of bridges over waterways with unknown foundations

4.2.5.12 – Procedure for Scour Critical or High Risk Unknown Foundation Bridges Over Canals

Bridges over irrigation canals that have been determined to be scour critical or a high risk unknown foundation shall not be placed on BridgeWatch. Inspection interval and Plan of Actions will be the same as other scour critical or high risk unknown foundation bridges. BridgeWatch utilizes the bridges drainage basin to determine if an over-threshold rainfall or snowmelt event is occurring. Canals have no natural drainage basin so an alert will never occur.

4.3—NONREGULATORY INSPECTION PRACTICES

4.3.6—Complex Bridge Inspections

Complex bridge inspections are required on bridges that include details such as moving parts, cable suspension, or eyebar-chain suspension systems. These complex details require individual inspection procedures that are not typically inspected with sufficient scrutiny in the routine inspection. The complex bridges in Idaho and their inspection procedures are included in below. Complex bridge inspections shall be on the same inspection intervalinterval as routine inspections.

The *Code of Federal Regulations [CFR 650.313(f)]* requires state agencies to "Identify specialized inspection procedures and additional inspector training and experience required to inspect complex bridges according to those procedures." Inspectors should review the inspection procedures specific to a complex bridge prior to completing an inspection on these bridges. ITD does not maintain a special staff for inspection of complex bridges. The procedures for all complex bridges inspected by ITD are linked in BrM™.

4.3.6.1—Movable Bridges

Idaho has the following lift bridge:

Snake River (Br. Key 10360), US 12, in Lewiston at State Line

This is a border bridge shared with Washington. Washington Department of Transportation is responsible for the development of inspection procedures and inspection of this bridge.

4.3.6.2—Suspension Bridges

Cable suspended structures may contain NSTM members and fatigue-prone details, and the inspection of those components are specifically covered in those types of inspections. The intent of the inspection of these complex details is to identify the structural geometry and the different load paths in order to assure that the structure is functioning as originally designed. The two distinct load paths consist of the cable suspension system back to the cable anchorages, along the stiffener truss, and down the interior piers. Over time, the cable suspension system shall relax or the interior bents can settle, transferring more of the load into these components. This inspection shall assess whether that load transfer is still within tolerable limits.

Idaho has the following suspension bridges:

Dent Bridge (Br. Key 20295), N. Fork Clearwater River, STC 4783, 8.8 N. 3.7 E. Orofino

Manning Crevice (Br. Key 29398), Salmon River, Salmon River Rd. Riggins

4.3.6.3—Cable-Stayed Bridges

Idaho does not have any publicly owned cable-stayed vehicular bridges.

4.3.6.4—Tied Arch Bridges

ITD does not consider these bridge types to be complex. Follow routine and NSTM inspection procedures.

4.3.6.5—Prestressed Concrete Segmental Bridges

ITD does not consider these bridge types to be complex. Follow routine inspection procedures.

4.4—REFERENCES

The most current edition of:

Code of Federal Regulations

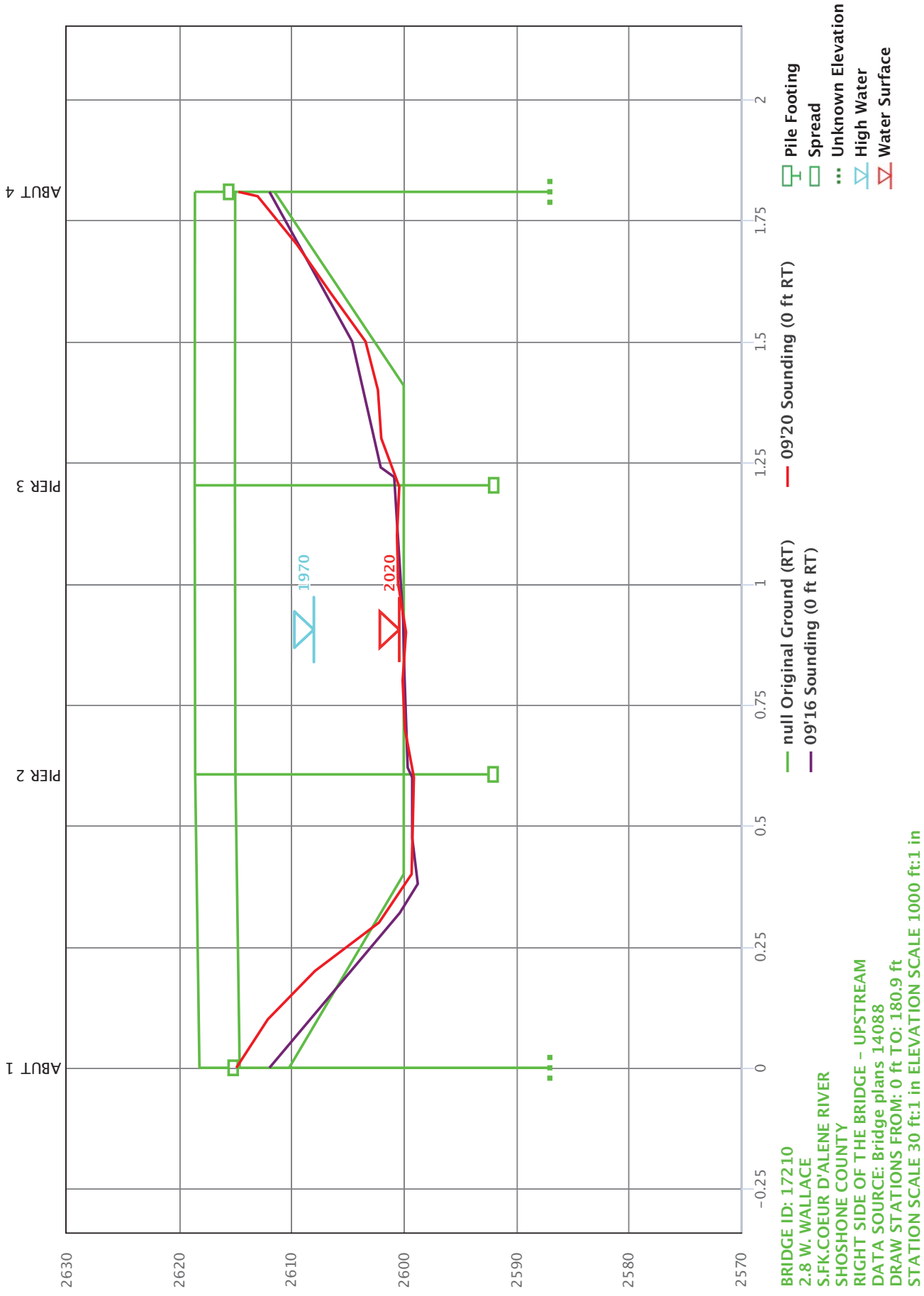
AASHTO Manual for Bridge Evaluation

FHWA manual “Inspection of Fracture Critical Bridge Members” (FHWA-IP-86-26)

The ‘‘Recording and Coding Guide for Structure Inventory and Appraisal of the Nation’s Bridges,’’

December 1995, Report No. FHWA–PD–96–001, *http//www.fhwa.dot.gov//bridge/mtguide.doc*

PAGE INTENTIONALLY LEFT BLANK


ABUT 1
PIER 2
PIER 3
ABUT 4
1970
2020
2630
2620
2610
2600
2590
2580
2570
-0.25
0
0.25
0.5
0.75
1
1.25
1.5
1.75
2
null Original Ground (RT)
09'16 Sounding (0 ft RT)
09'20 Sounding (0 ft RT)
Pile Footing
Spread
Unknown Elevation
High Water
Water Surface
BRIDGE ID: 17210
2.8 W. WALLACE
S.FK.COEUR D'ALENE RIVER
SHOSHONE COUNTY
RIGHT SIDE OF THE BRIDGE - UPSTREAM
DATA SOURCE: Bridge plans 14088
DRAW STATIONS FROM: 0 ft TO: 180.9 ft
STATION SCALE 30 ft:1 in ELEVATION SCALE 1000 ft:1 in

IDAHO TRANSPORTATION DEPARTMENT
FRACTURE CRITICAL INSPECTION REPORT

NSTM BRIDGE INSPECTION
SUMMARY SHEET

Features	NBI 6A
Bridge Key:	5 digit bridge key
Structure Name	Structure number with milepost
Owner:	Adminstrative Jurisdiction
Route:	NBI 7
Milepost:	NBI11
Equipment Required:	dropdown menu
Preparation Notes:	May include traffic control, access requirements, whom to notify for upcoming inspections

Equipment Required Dropdown Menu:
Stepladder
Ladder
Extension ladder
Climbing equipment
Under Bridge Inspection Truck (UBIT)
Scissor Lift
Other (please specify)

Inspection Procedures: (Should be specific to the bridge and discuss relevent risk factors)

Includes relevent risk factors from *IMBE table 4.2.5.5-1* , hazards or other challenges to properly access FCM's, or anything else unique to inspecting this structure. General procedures listed in *IMBE article 4.2.5.5* do not need to be listed here.

FCM Types:
Two Girder System
Splice Plates
Floorbeams
Box Beams
Rigid Frames
Truss Tension Members (horizontal, vertical, diagonal)
Connection Pins
Arch Tension Members (horizontal, vertical, diagonal)
Pin and Hanger Assemblies

Fabrication Methods:
Rolled
Riveted
Bolted
Welded
Forged Eyebars

FCM Location	FCM type (Fabrication Method), optional decription	FCM Per Span and Type
Span 1	Horizontal truss tension members (bolted), bottom chord L0-L0'	8
	Vertical truss tension members (riveted)	6
	Diagonal truss tension members (welded)	4
	Gusset plates (rolled), interior & exterior	16
	Floor beams (bolted), FB0 - FB4	5
Span 2	Diagonal truss tension members (forged eyebar), bottom chord L0-L0'	4
	Vertical truss tension members (riveted)	2
	Gusset plates (welded, riveted)	4
	Connection pins (rolled)	6
	Floor beams (bolted), FB5 - FB7	3
Span 3	Two-girder system (welded) with milepost girder 1 (left) & 2 (right)	2
	Splice plates (bolted)	2
	Pin and hanger assemblies (welded)	2
Span 4	Horizontal arch tension member (bolted), bottom chord tie girder, 1 (left) & 2 (right)	2
	Cable support systems (Other - wire strand), vertical suspenders #1-9	18
	Floorbeams (welded), L0-L10	11

Note: FCM = Fracture Critical Member

***Fracture Critical Inspections are always done in conjunction with a routine inspection. Please see corresponding routine inspection report for FC inspection frequency, next scheduled inspection, and any follow up procedures.**

IDAHO TRANSPORTATION DEPARTMENT
FRACTURE CRITICAL INSPECTION REPORT

FRACTURE CRITICAL BRIDGE
INSPECTION SUMMARY SHEET

Features	Payette River	Inspection Date:	xx/xx/xxxx
Bridge Key:	26680	Drawing #:	17195
Structure Name	X993080 100.32		
Owner:	Boise County		
Route:	Boise Street		
Milepost:	100.320		

Equipment Required: Climbing gear, ladder, scaffold
Preperation notes: Climbing equipment needed to access floor beams

Inspection Procedures: (Should be specific to the bridge and discuss relevent risk factors)

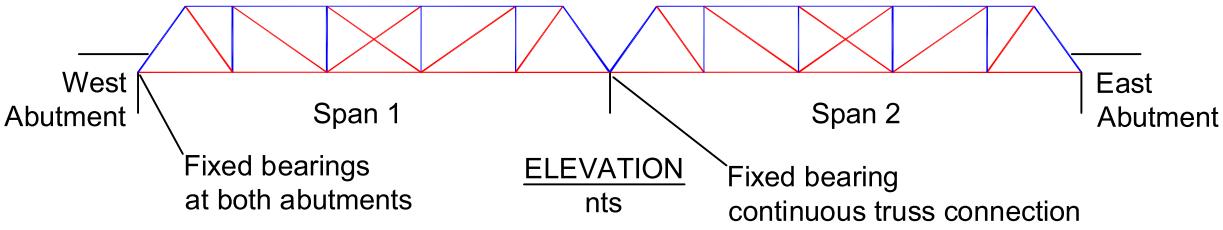
1 Inspect according to General procedures in IMBE 4.2.5.5.
2 Bridge is >100 yrs old with unknown design load, unknown history of vehicle loading, unknown steel alloys in tension members.
3 Emphasis on the eyebars - particularly the forged area around the eyebar head and shank looking for cracks.
4 Check the misaligned eyebars for evidence of substructure movement, impact damage, and/or unitended force reversal.
5 Emphasis on the misaligned eyebars as they may cause uneven and excessive loading on adjacent members.
6 Check pins for signs of wear and corrosion. Recommend UT on a sample of pins periodically to check for internal flaws.
7 Check spacers on pin assemblies to ensure members are being held in their proper positions.
8 Emphasis on the misaligned pin. This is creating a single shear (double the intended load) concentration on the pin.

FCM Location	FCM Type	FCM Per Girder or Truss Line
Span 1	Horizontal Truss Tension Members (forged eyebar), L0 - L7	10
Span 1	Diagonal Truss Tension Members (forged eyebar)	12
Span 1	Floorbeams (rolled)	4
Span 1	Connection Pins (rolled)	13
Span 2	Horizontal Truss Tension Members (forged eyebar), L0 - L7	10
Span 2	Diagonal Truss Tension Members (forged eyebar)	12
Span 2	Floorbeams (rolled)	4
Span 2	Connection Pins (rolled)	13

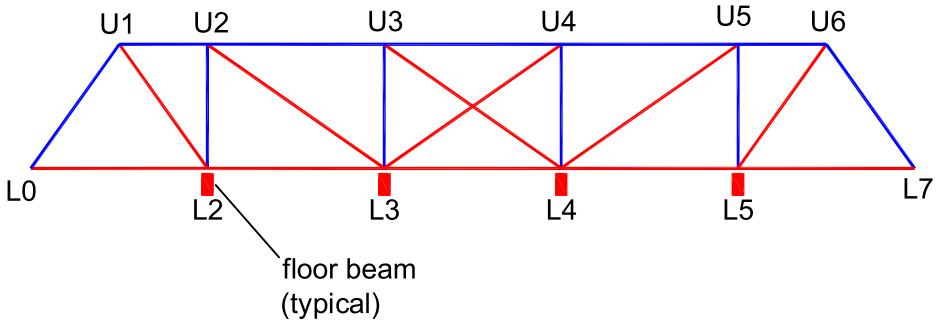
Note: FCM = Fracture Critical Member

***Fracture Critical Inspections are always done in conjunction with a routine inspection. Please see corresponding routine inspection report for FC inspection frequency, next scheduled inspection, and any follow up procedures.**

BK# 26680
X993080 100.32
PAYETTE RIVER
PRATT PONY TRUSS
2 SPAN, 182 FT TOTAL
MAX SPAN 91 FEET



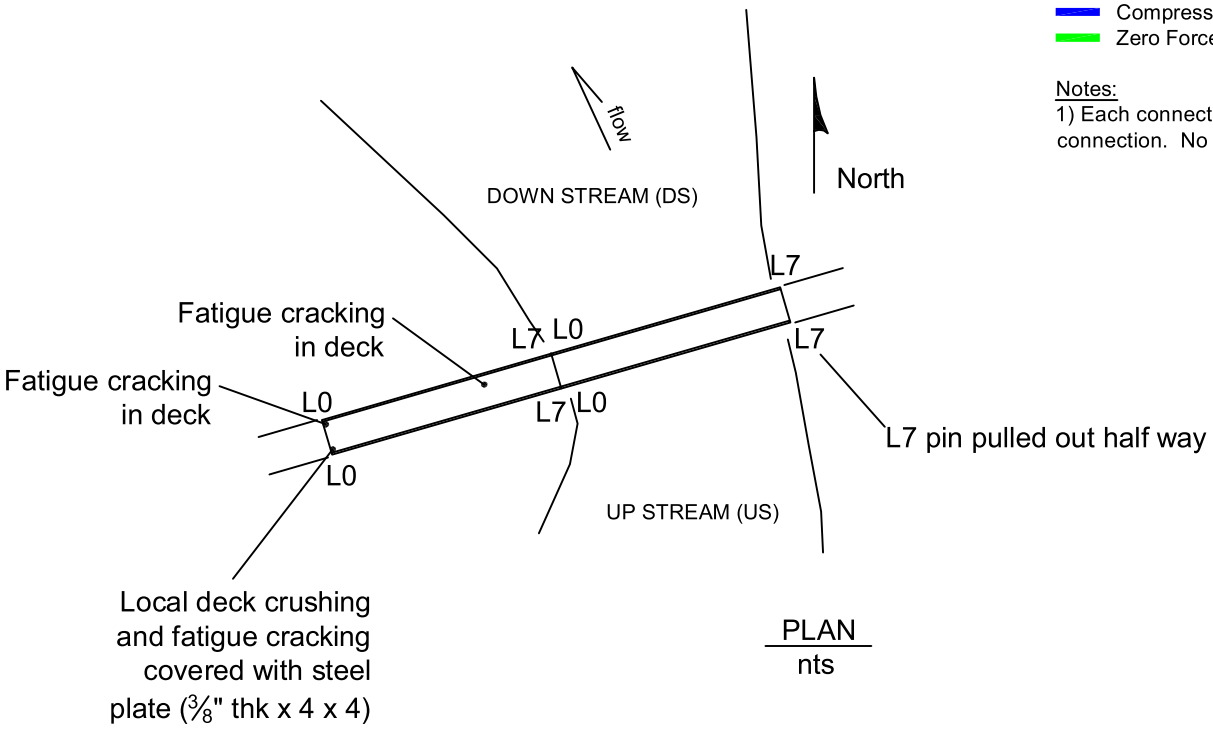
ELEVATION
nts



TRUSS NAMING CONVENTION
nts

Legend
Tension Member (FCM's)
Compression Member
Zero Force Member

Notes:
1) Each connection is a pinned connection. No Gusset Plates.



PLAN
nts

IDAHO TRANSPORTATION DEPARTMENT
FRACTURE CRITICAL INSPECTION REPORT

Features:	Payette River		FC Inspection Date 8/20/2015
Bridge Key:	26680	Hours 1.5	
Structure Name:	X993080 100.32		
Owner:	Boise County	Inspector:	
Route:	Boise Street	Co-Inspector:	
Milepost:	100.320		

Truss/ Girder	Span	Location	FCM Inspected	Detail Description	Inspection Method	Surface Preparation	Remarks
South - US	1	L0 - L2	Bottom Chord	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
South - US	1	L2 - L3	Bottom Chord	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
South - US	1	L3 - L4	Bottom Chord	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
South - US	1	L4 - L5	Bottom Chord	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
South - US	1	L5 - L7	Bottom Chord	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
South - US	1	L2 - U1	Diagonal	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
South - US	1	L3 - U2	Diagonal	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting. Exterior bar bent approximately 1"
South - US	1	L3 - U4	Diagonal	Single bar, forged ends w/ turn buckle	V	NO	Heavy rusting, moderate pitting
South - US	1	L4 - U3	Diagonal	Single bar, forged ends w/ turn buckle	V	NO	Heavy rusting, moderate pitting
South - US	1	L4 - U5	Diagonal	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting. Slightly bent
South - US	1	L5 - U6	Diagonal	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
South - US	1	L6 - U7	Diagonal	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
South - US	1	L0	Pin		V	NO	Heavy rusting and pitting
South - US	1	L2	Pin		V	NO	Heavy rusting and pitting
South - US	1	L3	Pin		V	NO	Heavy rusting and pitting
South - US	1	L4	Pin		V	NO	Heavy rusting and pitting
South - US	1	L5	Pin		V	NO	Heavy rusting and pitting
South - US	1	L7	Pin		V	NO	Heavy rusting and pitting

IDAHO TRANSPORTATION DEPARTMENT
FRACTURE CRITICAL INSPECTION REPORT

South - US	1	U1	Pin		V	NO	Moderate rusting and pitting
South - US	1	U2	Pin		V	NO	Moderate rusting and pitting
South - US	1	U3	Pin		V	NO	Moderate rusting and pitting
South - US	1	U4	Pin		V	NO	Moderate rusting and pitting
South - US	1	U5	Pin		V	NO	Moderate rusting and pitting
South - US	1	U6	Pin		V	NO	Moderate rusting and pitting
South - US	1	U7	Pin		V	NO	Moderate rusting and pitting
North - DS	1	L0 - L2	Bottom Chord	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
North - DS	1	L2 - L3	Bottom Chord	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
North - DS	1	L3 - L4	Bottom Chord	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting. Both bars slightly twisted
North - DS	1	L4 - L5	Bottom Chord	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
North - DS	1	L5 - L7	Bottom Chord	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
North - DS	1	L2 - U1	Diagonal	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
North - DS	1	L3 - U2	Diagonal	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting. Inner bar twisted & slightly bent
North - DS	1	L3 - U4	Diagonal	Single bar, forged ends w/ turn buckle	V	NO	Heavy rusting, moderate pitting
North - DS	1	L4 - U3	Diagonal	Single bar, forged ends w/ turn buckle	V	NO	Heavy rusting, moderate pitting
North - DS	1	L4 - U5	Diagonal	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting. Exterior bar slightly bent.
North - DS	1	L5 - U6	Diagonal	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
North - DS	1	L6 - U7	Diagonal	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
North - DS	1	L0	Pin		V	NO	Heavy rusting and pitting
North - DS	1	L2	Pin		V	NO	Heavy rusting and pitting
North - DS	1	L3	Pin		V	NO	Heavy rusting and pitting

IDAHO TRANSPORTATION DEPARTMENT
FRACTURE CRITICAL INSPECTION REPORT

North - DS	1	L4	Pin		V	NO	Heavy rusting and pitting
North - DS	1	L5	Pin		V	NO	Heavy rusting and pitting
North - DS	1	L7	Pin		V	NO	Heavy rusting and pitting
North - DS	1	U1	Pin		V	NO	Moderate rusting and pitting
North - DS	1	U2	Pin		V	NO	Moderate rusting and pitting
North - DS	1	U3	Pin		V	NO	Moderate rusting and pitting
North - DS	1	U4	Pin		V	NO	Moderate rusting and pitting
North - DS	1	U5	Pin		V	NO	Moderate rusting and pitting
North - DS	1	U6	Pin		V	NO	Moderate rusting and pitting
North - DS	1	U7	Pin		V	NO	Moderate rusting and pitting
North - South	1	L0	Floor Beam	I- beam	V	NO	Heavy rusting, moderate pitting at connections. Heavy staining from moisture seepage
North - South	1	L2	Floor Beam	I- beam	V	NO	Heavy rusting, moderate pitting at connections. Heavy staining from moisture seepage
North - South	1	L3	Floor Beam	I- beam	V	NO	Heavy rusting, moderate pitting at connections. Heavy staining from moisture seepage
North - South	1	L4	Floor Beam	I- beam	V	NO	Heavy rusting, moderate pitting at connections. Heavy staining from moisture seepage
North - South	1	L5	Floor Beam	I- beam	V	NO	Heavy rusting, moderate pitting at connections. Heavy staining from moisture seepage
North - South	1	L7	Floor Beam	I- beam	V	NO	Heavy rusting, moderate pitting at connections. Heavy staining from moisture seepage
South - US	2	L0 - L2	Bottom Chord	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting. Slightly bent
South - US	2	L2 - L3	Bottom Chord	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
South - US	2	L3 - L4	Bottom Chord	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
South - US	2	L4 - L5	Bottom Chord	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
South - US	2	L5 - L7	Bottom Chord	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting. Interior bar bent 4". Interior bar is very loose.
South - US	2	L2 - U1	Diagonal	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting. Slightly bent

IDAHO TRANSPORTATION DEPARTMENT

FRACTURE CRITICAL INSPECTION REPORT

South - US	2	L3 - U2	Diagonal	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting. Interior bar slightly bent.
South - US	2	L3 - U4	Diagonal	Single bar, forged ends w/ turn buckle	V	NO	Heavy rusting, moderate pitting
South - US	2	L4 - U3	Diagonal	Single bar, forged ends w/ turn buckle	V	NO	Heavy rusting, moderate pitting
South - US	2	L4 - U5	Diagonal	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
South - US	2	L5 - U6	Diagonal	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting. Slightly bent
South - US	2	L6 - U7	Diagonal	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
South - US	2	L0	Pin		V	NO	Heavy rusting and pitting
South - US	2	L2	Pin		V	NO	Heavy rusting and pitting
South - US	2	L3	Pin		V	NO	Heavy rusting and pitting
South - US	2	L4	Pin		V	NO	Heavy rusting and pitting
South - US	2	L5	Pin		V	NO	Heavy rusting and pitting
South - US	2	L7	Pin		V	NO	Heavy rusting and pitting. Pulled out on interior side, creating single shear condition.
South - US	2	U1	Pin		V	NO	Moderate rusting and pitting
South - US	2	U2	Pin		V	NO	Moderate rusting and pitting
South - US	2	U3	Pin		V	NO	Moderate rusting and pitting
South - US	2	U4	Pin		V	NO	Moderate rusting and pitting
South - US	2	U5	Pin		V	NO	Moderate rusting and pitting
South - US	2	U6	Pin		V	NO	Moderate rusting and pitting
South - US	2	U7	Pin		V	NO	Moderate rusting and pitting
North - DS	2	L0 - L2	Bottom Chord	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
North - DS	2	L2 - L3	Bottom Chord	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting. Exterior bar bent down 5" near L2
North - DS	2	L3 - L4	Bottom Chord	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting

IDAHO TRANSPORTATION DEPARTMENT
FRACTURE CRITICAL INSPECTION REPORT

North - DS	2	L4 - L5	Bottom Chord	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
North - DS	2	L5 - L7	Bottom Chord	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
North - DS	2	L2 - U1	Diagonal	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
North - DS	2	L3 - U2	Diagonal	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
North - DS	2	L3 - U4	Diagonal	Single bar, forged ends w/ turn buckle	V	NO	Heavy rusting, moderate pitting
North - DS	2	L4 - U3	Diagonal	Single bar, forged ends w/ turn buckle	V	NO	Heavy rusting, moderate pitting
North - DS	2	L4 - U5	Diagonal	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting. Exterior bar bent slightly.
North - DS	2	L5 - U6	Diagonal	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
North - DS	2	L6 - U7	Diagonal	Double bar, forged ends	V	NO	Heavy rusting, moderate pitting
North - DS	2	L0	Pin		V	NO	Heavy rusting and pitting
North - DS	2	L2	Pin		V	NO	Heavy rusting and pitting
North - DS	2	L3	Pin		V	NO	Heavy rusting and pitting
North - DS	2	L4	Pin		V	NO	Heavy rusting and pitting
North - DS	2	L5	Pin		V	NO	Heavy rusting and pitting
North - DS	2	L7	Pin		V	NO	Heavy rusting and pitting
North - DS	2	U1	Pin		V	NO	Moderate rusting and pitting
North - DS	2	U2	Pin		V	NO	Moderate rusting and pitting
North - DS	2	U3	Pin		V	NO	Moderate rusting and pitting
North - DS	2	U4	Pin		V	NO	Moderate rusting and pitting
North - DS	2	U5	Pin		V	NO	Moderate rusting and pitting
North - DS	2	U6	Pin		V	NO	Moderate rusting and pitting
North - DS	2	U7	Pin		V	NO	Moderate rusting and pitting

IDAHO TRANSPORTATION DEPARTMENT

FRACTURE CRITICAL INSPECTION REPORT

North - South	2	L0	Floor Beam	I- beam	V	NO	Heavy rusting, moderate pitting at connections. Heavy staining from moisture seepage
North - South	2	L2	Floor Beam	I- beam	V	NO	Heavy rusting, moderate pitting at connections. Heavy staining from moisture seepage
North - South	2	L3	Floor Beam	I- beam	V	NO	Heavy rusting, moderate pitting at connections. Heavy staining from moisture seepage
North - South	2	L4	Floor Beam	I- beam	V	NO	Heavy rusting, moderate pitting at connections. Heavy staining from moisture seepage
North - South	2	L5	Floor Beam	I- beam	V	NO	Heavy rusting, moderate pitting at connections. Heavy staining from moisture seepage
North - South	2	L7	Floor Beam	I- beam	V	NO	Heavy rusting, moderate pitting at connections. Heavy staining from moisture seepage

INSPECTION METHODS
(V) VISUAL
(DP) DYE PENTRANT
(UT) ULTRASONIC
(MP) MAGNETIC PARTICLE
(OT) OTHER

SURFACE PREPARATIONS
(NO) NONE
(WB) WIRE BRUSH
(GR) GRINDING
(CE) CHEMICAL
(SB) SAND BLASTING
(CH) CHIPPING HAMMER
(OT) OTHER

IDAHO TRANSPORTATION DEPARTMENT
UNDERWATER INSPECTION REPORT

Bridge Key:	**19796**			**Structure Name:**	**99773A 1.71**
Feature Intersected:	**Boise River; N. Channel**			**Location:**	**0.7 S. 3.0 W. Eagle**
Facility Carried:	**Linder Road**			**Admin Jurisdiction:**	**0101 ADA COUNTY HWY DISTRICT**
Macs Seg:	**002570**	**Milepost:**	**001.692**	**District:**	**3**
Latitude:	**N 43° 41' 15"**	**Longitude:**	**W 116° 24' 49"**	**Owner:**	**ADA COUNTY HWY DISTRICT**
County:	**001 ADA**			**Year Built:**	**1992**

INSPECTION INFORMATION AND PROCEDURES

Proposed UW Insp. Freq: 60 months Previous UW Insp. Freq: 60 months Previous UW Insp. Date: 8/26/2013

Reason for Proposed Change to UW Insp. Freq: N/A

Items to Inspect: Bent 3

Foundation Type: Steel piles

Scour Countermeasures: ☐ Yes ☒ No If Yes, Describe:

Structural Details: Reinforced concrete footings supported by steel piles

Plans Available: ☐ General Plan and Elevation ☐ Substructure Unit Details ☐ Repair/Rehabilitation Drawings ☐ No Plans Available

Hydraulic Features & Characteristics: No significant hydraulic features at this bridge.

Inspection Method: ☒ Wet/Dry Suit ☐ Scuba ☐ Surface Supplied Air ☐ Other

Comments: No Comments

Inspection Level: ☒ Level I ☒ Level II ☐ Level III

Comments: Level I inspection over 100 percent of each underwater element. Level II inspection over 10 percent of each underwater element.

Specialized Equip: None required

Flow control located upstream or immediately downstream of structure? ☒ Yes ☐ No

Contact to flow control agency required to adequately inspect structure? ☐ Yes ☒ No

Flow Controlling Agency: Lucky Peak Dam

Contact: Park manager

Phone: (208) 343-0671

Bridge Contact:

Phone:

Team Leader (Print & Sign): **Inspection Date: 8/26/2017**

RPT_10/2014

IDAHO TRANSPORTATION DEPARTMENT
UNDERWATER INSPECTION REPORT

Bridge Key: 19796 **Feature Intersected:** Boise River; N. Channel

Diver 1 (TL): _____ Diver 3: _____

Diver 2: _____ Diver 4: _____

Diving Hazards:

Debris	☐ Yes	☒ No
Swift Current	☐ Yes	☒ No
Black Water	☐ Yes	☒ No
Deep Dive	☐ Yes	☒ No
Constricted Waterway	☐ Yes	☒ No
Soft/Unstable Channel Bottom/Banks	☐ Yes	☒ No
Watercraft/Vessel Movements	☐ Yes	☒ No
Other: _____	☐ Yes	☒ No

Describe Diving Hazards:

Boat Required: ☐ Yes ☒ No

Access/Launch Site: North shoreline

Waterline Ref. & Elev: Bottom of cap at Bent 3 (Assumed 100.0 feet)

Distance to Waterline: 4.2 ft Waterline Elevation: 95.8 ft

Time Spent on Insp: 1 hr

Air Temp: 65 °F Weather: Sunny

Water Temp: 65 °F Water Visibility: 3 ft

Min. Depth at Substructure Unit(s): 2.4 ft Max. Depth at Substructure Unit(s): 4.2 ft

Flow Velocity: 1 ft/sec

Flow Direction: East to West

Inspection Preparation Notes:

None

RPT_10/2014

IDAHO TRANSPORTATION DEPARTMENT
UNDERWATER INSPECTION REPORT

Bridge Key: 19796 **Feature Intersected:** Boise River; N. Channel

INSPECTION FINDINGS

GENERAL NOTES (Shoreline Conditions, Channel Conditions, Special Details, Construction Operations, Etc.)

Shorelines near bridge consist of moderately vegetated cut banks with no significant areas of erosion.

Channel bottom material consisted of river stones up to 1 foot in diameter with silty sand infill.

UNDERWATER ELEMENT CONDITION STATES

				Current Condition State (Gray) /Proposed Condition State (white)							
Elem.	*Description*	*Qty**	*Units*	*1*		*2*		*3*		*4*	
227	Reinforced Concrete Pile	2	EA	0	0	0	2	0	0	0	0
	1190: Abrasion/Wear	2	EA	0	0	0	2	0	0	0	0
220	Reinforced Concrete Pile Cap/Footing	10	LF	0	0	0	10	0	0	0	0
	6000: Scour	10	LF	0	0	0	10	0	0	0	0

Remarks on Underwater Element Condition States:

227/1190: The concrete of Bent 3 typically exhibited abrasion, extending from 1 foot below the waterline to 1 foot above the waterline, with penetrations of up to 1/4 inch.

220/6000: The entire footing was exposed at the upstream column of Bent 3 except the southwest corner, with a maximum vertical exposure of 0.6 feet.

NBI CODING

Item	*Current Condition Code*	*Proposed Condition Code*	*Item*	*Current Condition Code*	*Proposed Condition Code*
60 (Substructure)	7	7	62 (Culvert)	N	N
61 (Channel)	8	8	113 (Scour)	3	3

Remarks on NBI Coding:

113: Rated a 3 on Scour Evaluation dated 9/10/1997.

MAINTENANCE RECOMMENDATIONS

Elem.	*Description*	*Priority*
220	Install properly designed scour countermeasures.	High

***Quantities listed above only represent the portions of the element that were inspected as part of the underwater inspection.**

RPT_10/2014

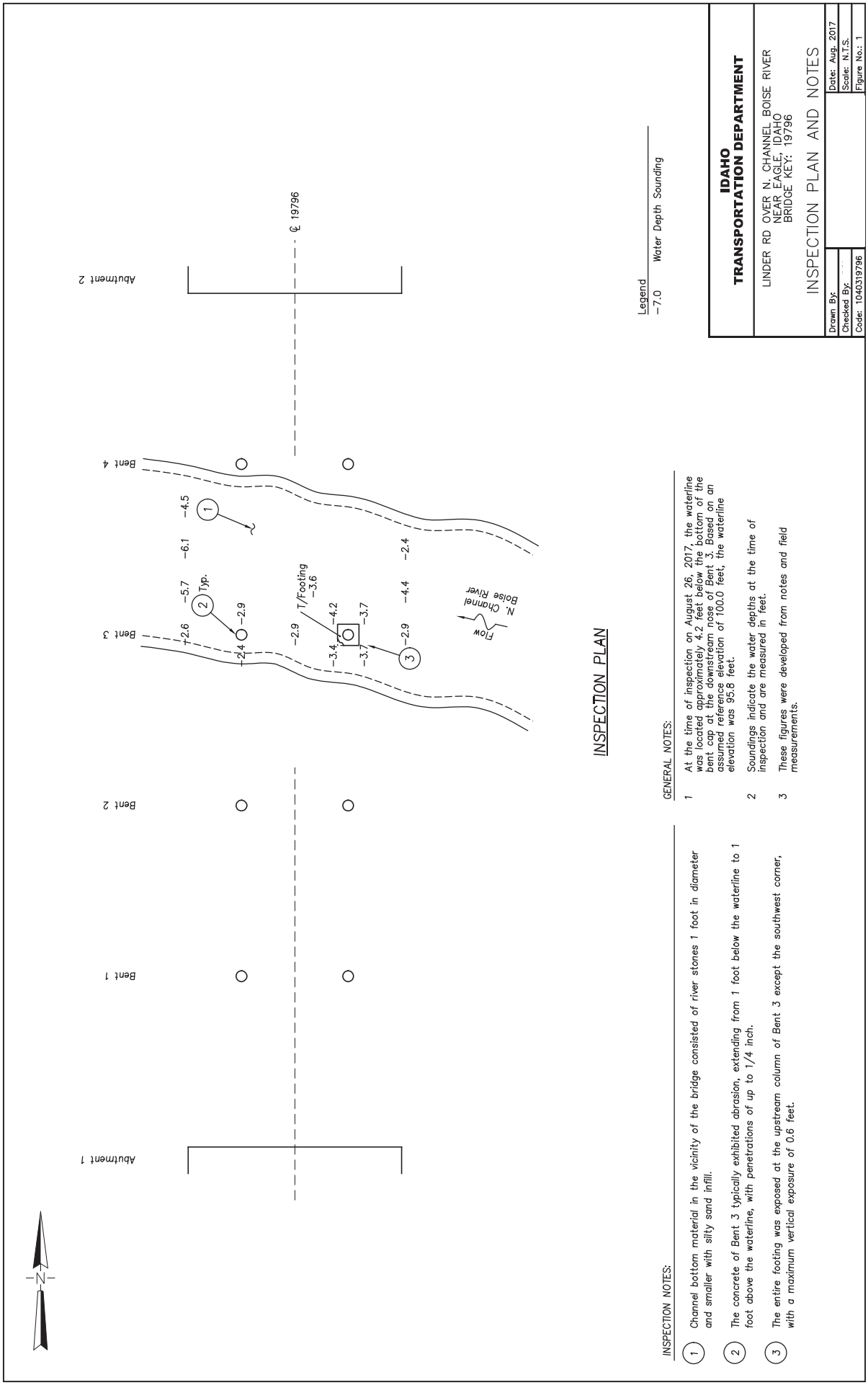
UNDERWATER INSPECTION
Bridge Key 19796 • Linder Road over N. Channel Boise River
Near Eagle, Idaho • August 2017

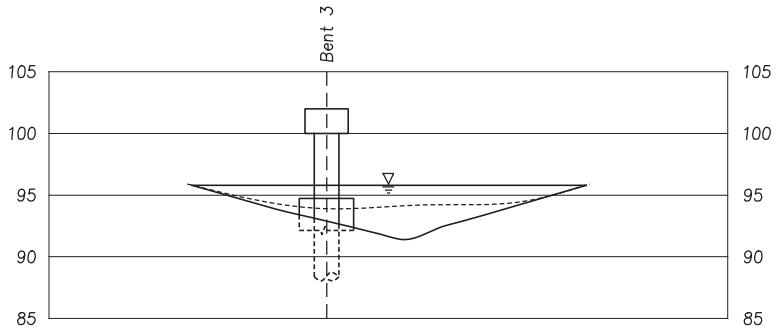
Photograph 1: Overall View of Bridge, Looking West.

Photograph 2: View of Bent 3, Looking South.

UNDERWATER INSPECTION
Bridge Key 19796 • Linder Road over N. Channel Boise River
Near Eagle, Idaho • August 2017

Photograph 3: Typical Condition of Concrete at the Waterline.


IDAHO
TRANSPORTATION DEPARTMENT
LINDER RD OVER N. CHANNEL BOISE RIVER
NEAR EAGLE, IDAHO
BRIDGE KEY: 19796
INSPECTION PLAN AND NOTES
Drawn By:
Checked By:
Code: 1040319796
Date: Aug. 2017
Scale: N.T.S.
Figure No.: 1
Legend
-7.0 Water Depth Sounding
℄ 19796
Abutment 1
Bent 1
Bent 2
Bent 3
Bent 4
Abutment 2
-4.5
-6.1
-5.7
-2.9
-2.4
-2.6
-2.9
T/Footing
-3.6
-4.2
-3.4
-3.7
-3.7
-2.9
-4.4
-2.4
N. Channel
Boise River
Flow
INSPECTION PLAN
GENERAL NOTES:
1 At the time of inspection on August 26, 2017, the waterline was located approximately 4.2 feet below the bottom of the bent cap at the downstream nose of Bent 3. Based on an assumed reference elevation of 100.0 feet, the waterline elevation was 95.8 feet.
2 Soundings indicate the water depths at the time of inspection and are measured in feet.
3 These figures were developed from notes and field measurements.
INSPECTION NOTES:
1 Channel bottom material in the vicinity of the bridge consisted of river stones 1 foot in diameter and smaller with silty sand infill.
2 The concrete of Bent 3 typically exhibited abrasion, extending from 1 foot below the waterline to 1 foot above the waterline, with penetrations of up to 1/4 inch.
3 The entire footing was exposed at the upstream column of Bent 3 except the southwest corner, with a maximum vertical exposure of 0.6 feet.



UPSTREAM FASCIA CROSS SECTION

GENERAL NOTES:

1 At the time of inspection on August 26, 2017, the waterline was located approximately 4.2 feet below the bottom of the bent cap at the downstream nose of Bent 3. Based on an assumed reference elevation of 100.0 feet, the waterline elevation was 95.8 feet.

2 Soundings indicate the water depths at the time of inspection and are measured in feet.

3 These figures were developed from notes and field measurements.

LEGEND:

——— Channel Bottom Profile August, 2017

----- Channel Bottom Profile August, 2013

IDAHO
TRANSPORTATION DEPARTMENT

LINDER RD OVER N. CHANNEL BOISE RIVER
NEAR EAGLE, IDAHO
BRIDGE KEY: 19796

UPSTREAM FASCIA CROSS SECTION

Drawn By: ...		Date: Aug. 2017
Checked By:		Scale: N.T.S.
Code: 1040319796		Figure No.: 2

Idaho Transportation Department
Bridge Inspection Report

Bridge Key:	12774	Structure Name:	02020C 48.31
(6)Features Intersected:	AMERICANA BLVD;15TH ST.	(9)Location:	IN BOISE; FRONT STREET
Facility Carried(Route):	US 20 WBL	Admin Jurisdiction:	0003 District 3
Xref Structure Name:	97363A 2.12	District:	03

Elm/Env	Element Description	Total Qty	Units	State 1	State 2	State 3	State 4
15/4	**Prestressed Concrete Top Flange**	30744	sq.ft	30744	0	0	0
	The top of the prestressed concrete box girder top flange has a silica fume overlay in satisfactory condition. The underside of the top flange, inside the structure, is in good condition with several hairline cracks.						
510/4	***Wearing Surfaces***	29097	*sq.ft*	25597	3500	0	0
	1.5-inch silica fume concrete overlay wearing surface placed during construction. Moderate abrasion in the wheel paths and hairline to slightly larger cracks in the surface (mostly longitudinal cracks and mostly in the wheel paths where concrete has abraded). Heavier map cracking occurring in span 1, in the inside lanes. Delamination was mapped along construction joint left side near center, 18-square feet along right curb in span 1 and 65-square feet along left curb. The repaired area in span 1 is in good condition.						
520/4	***Concrete Reinforcing Steel Protective System***	30744	*sq.ft*	30744	0	0	0
	Epoxy coated rebar in both the top and bottom mat of the top flange appears fully effective.						
104/4	**Prestressed Concrete Closed Web/Box Girder**	541	ft	451	90	0	0
	Continuous concrete post-tensioned box girder structure is in satisfactory condition. There are hairline to 1/32-inch cracks throughout, mostly in the webs and diaphragms. Longitudinal cracks at the portals inside the structure, typical. Span 1, right portal is not accessible and has heavy rust stains leaking past it. Assume the drain is separated inside. Bolts in the portal are heavily corroded.						
1110/4	***Cracking (PSC)***	90	*ft*	0	90	0	0
	Exterior notes: *- Hairline longitudinal cracks in the right exterior face at abutment 1* *- Hairline longitudinal cracks in the left exterior face at abutment 2* *- Longitudinal and diagonal cracks in the right exterior face at abutment 2 (cracks appear slightly wider than hairline)* *Interior notes:* *- Floor, walls, and diaphragms have hairline to 1/32-inch cracks, typical* *- Webs have hairline to 1/32-inch max diagonal and longitudinal cracks at their ends at the abutments and piers* *- A few longitudinal hairline cracks in the webs at a height of 2.5 to 4 feet above the floor* *- Diaphragms have vertical and diagonal cracking, typical* *- Span 3 webs seem to have a greater concentration of longitudinal cracks* *- Longitudinal cracks at the portals, typical*						
210/2	**Reinforced Concrete Pier Wall**	69	ft	69	0	0	0
	(2) Full height reinforced concrete pier walls per pier are in good condition with a few hairline transverse cracks. Pier caps are integral with box girder. Face of pier walls have a texture concrete finish.						
215/2	**Reinforced Concrete Abutment**	112	ft	109	3	0	0
	Full height reinforced concrete abutments are in good condition with hairline transverse cracks in the exterior faces. Area of delamination in the top of abutment 2, directly under bearing unit 2 from the right. Abutment 1 is separated from the eastbound structure by a full height vertical joint. Abutment walls are resting on concrete spread footings. Decorative painting on abutment walls.						

Idaho Transportation Department
Bridge Inspection Report

Bridge Key:	12774	Structure Name:	02020C 48.31
(6)Features Intersected:	AMERICANA BLVD;15TH ST.	(9)Location:	IN BOISE; FRONT STREET
Facility Carried(Route):	US 20 WBL	Admin Jurisdiction:	0003 District 3
Xref Structure Name:	97363A 2.12	District:	03

1080/2	***Delamination/Spall/Patched Area***	3	*ft*	0	3	0	0
	Area of delamination in the top of abutment 2, directly under bearing unit 2 from the right.						
300/4	**Strip Seal Expansion Joint**	112	ft	101	11	0	0
	Steel edged strip seal expansion joints at the abutments are in good condition. Not much debris in the joints at time of inspection except for along the shoulders. One area of slight damage to the abutment 1 seal in the right shoulder. The abutment 1 joint also has some areas of minor gouges in the steel armor. Joint seals extend up concrete parapets a short distance.						
2330/4	***Seal Damage***	1	*ft*	0	1	0	0
	Area of slight damage to the abutment 1 seal in the right shoulder.						
2370/4	***Metal Deterioration or Damage***	10	*ft*	0	10	0	0
	The abutment 1 joint has some areas of minor gouges in the steel armor.						
311/2	**Movable Bearing**	10	each	10	0	0	0
	Bolted 1/2-inch steel sole plate bolted to steel plate on 14 gauge stainless steel plate on 1/8-inch TFE sheet on guided 1/2-inch steel plate bond to a 2 1/4-inch fabric pad on grout pad integral with abutment seats. 5 bearing units at the abutments. ½-inch by 24-inch by 2-foot steel jacking plates grouted to box girders and abutment seats between bearing units. Bearing units in good condition.						
331/4	**Reinforced Concrete Bridge Railing**	1079	ft	1079	0	0	0
	Reinforced concrete jersey parapets with epoxy coated rebar are in good condition with several hairline cracks and superficial collision scrapes. Numerous tire and scrape marks from vehicles hitting the rail. No significant impact damage.						
520/4	***Concrete Reinforcing Steel Protective System***	6383	*sq.ft*	6383	0	0	0
	Epoxy coated rebar appears fully effective.						

Idaho Transportation Department
Bridge Inspection Report

Bridge Key:	12774	Structure Name:	02020C 48.31
(6)Features Intersected:	AMERICANA BLVD;15TH ST.	(9)Location:	IN BOISE; FRONT STREET
Facility Carried(Route):	US 20 WBL	Admin Jurisdiction:	0003 District 3
Xref Structure Name:	97363A 2.12	District:	03

Additional Information

ROADWAY APPROACHES: Concrete approaches are in good condition. Bridge and approaches on a crest vertical curve.

CURBS/SIDEWALKS: None

DRAINS: Several drains are filled with debris.

EMBANKMENT: Mechanically stabilized earth (MSE) walls at both approaches in good condition. Spall with exposed bar in the bottom corner of the MSE wall "cap" on the abutment 2 right approach wall near abutment 2 along with a few other smaller spalls along the other MSE wall "caps."

CHANNEL: Americana Blvd, 15th St, and Rhodes skate park under structure.

SIGNS: Roadway caution signs on top of the parapets.

GUARDRAIL: Concrete jersey type rail with impact attenuator left side on east approach. Rail has numerous tire and scrape marks from vehicles hitting rail on left side.

UTILITIES: Electrical conduit and lighting attached to the underside of the structure in good condition. Street light poles attached to the tops of the parapets on both sides of the roadway in good condition.

NOTES: Confined space inspected by Jim Holland, Amy Bower, and Rene Leon on 7/6/2017.

INSPECTION FREQUENCY: None.

WORK ACCOMPLISHED: Routine roadway maintenance. Expansion joints cleaned (yearly maintenance).

LOAD RATING: None.

Maintenance Recommendations

Recommendation	Priority	Suggested Work Assignment
Clean the expansion joints yearly	Medium	State Forces
Remove rusted/corroded bolts in the portal access cover at abutment 1 right side. Coordinate with bridge inspector.	High	State Forces
Place an epoxy overlay	Medium	Contractor
Clean and clear the deck drains yearly	Medium	State Forces

Inspector's Signature: _____ 07/03/2019

Inspector Number and Name:

Idaho Transportation Department
Bridge Inspection Report

Bridge Key:	12774	Structure Name:	02020C 48.31
(6)Features Intersected:	AMERICANA BLVD;15TH ST.	(9)Location:	IN BOISE; FRONT STREET
Facility Carried(Route):	US 20 WBL	Admin Jurisdiction:	0003 District 3
Xref Structure Name:	97363A 2.12	District:	03

IDENTIFICATION

(1)State:	16 Idaho
(2)District:	District 3
(3)County:	001 Ada
(4)Place Code:	Boise
(5)Inventory Route:	121000200
(7)Facility Carried:	US 20 WBL
(11)Milepoint: 48.275	Agency Milepost: 048.275
(12)Base Hwy Network:	On Base Network
(13a)LRS Inventory Route:	00000US020
(13b)LRS Sub Route:	04
(16)Latitude:	43° 37' 08.1"
(17)Longitude:	116° 12' 53.1"
(98)Border Bridge Code:	
(99)Border Bridge ID:	
Segment Code:	007352
Segment Under Rte:	002820
Segment Other Rte:	002132
Drawing Number:	15375
Project Key Number:	
Inspection Area:	3
MPO:	COMPASS

STRUCTURE TYPE AND MATERIALS

(43a/b)Main Span Material/Design:
6 P/S Conc Continuous 5 Multiple Box Beam

(44a/b)Approach Span Material/Design:

(45)No. of Spans Main Unit:	4
(46)No. of Approach Spans:	0
(107)Deck Type:	1 Concrete-Cast-in-Place
(108a)Wearing Surface:	3 Latex Concrete/Similar
(108b)Membrane:	0 None
(108c)Deck Protection:	1 Epoxy Coated Reinforci

Deck Applications

CLASSIFICATION

(112)NBIS Length:	Long Enough
(104)Highway System:	1 On the NHS
(26)Functional Class:	14 Urban Other Princ
(100)Defense Highway:	0 Not a STRAHNET hwy
(101)Parallel Structure:	Left of || bridge
(102)Direction of Traffic:	1 1-way traffic
(103)Temporary Structure:	
(105)Federal Lands Highway:	0 N/A (NBI)
(110)Design Natl Network:	0 Not part of natl netwo
(20)Toll Facility:	3 On free road
(21)Custodian:	State Highway Agency
(22)Owner:	State Highway Agency
(37)Historical Significance:	4 Hist sign not determin

GEOMETRIC DATA

(48)Maximum Span Length:	140.0 ft
(49)Structure Length:	549 ft
Total Length:	549 ft
(50a)Curb/Sidewalk Width Lt:	0.0 ft
(50b)Curb/Sidewalk Width Rt:	0.0 ft
(51)Width Curb to Curb:	53.0 ft
(52)Width Out to Out:	56.0 ft
(32)App Roadway Width:	53 ft
(33)Median:	0 No median
(34)Skew:	0°
(35)Structure Flared:	0 No flare
(10)Vertical Clearance:	99.99 ft
(47)Total Horiz Clearance:	53.0 ft
(53)Min Vert Clr Over Deck:	99.99 ft
(54a)Min Vert Underclr Ref:	H Hwy beneath struct
(54b)Min Vert Underclr:	17.42 ft
(55a)Min Lat Underclr Ref Rt:	H Hwy beneath struct
(55b)Min Lat Underclr Rt:	13.0 ft
(56)Min Lat Underclr Lt:	4.5 ft

LRS

Route ID:	02070DUS020
Measure:	48.21554704
Route ID Under Rte:	02820AOH000
Measure Under Rte:	2.12904607
Route ID 2nd Rte Under:	02132AOH000
Measure 2nd Rte Under:	0.373688823

Idaho Transportation Department
Bridge Inspection Report

Bridge Key:	12774	Structure Name:	02020C 48.31
(6)Features Intersected:	AMERICANA BLVD;15TH ST.	(9)Location:	IN BOISE; FRONT STREET
Facility Carried(Route):	US 20 WBL	Admin Jurisdiction:	0003 District 3
Xref Structure Name:	97363A 2.12	District:	03

LOAD RATING

(31)Design Load:	9 MS 22.5 (HS 25)
(64)Operating Rating:	50 tons / HS27.8
(66)Inventory Rating:	27 tons / HS15.0
(70)Posting:	5 At/Above Legal Loads
(41)Posting Status:	A Open, no restriction

CONDITION

(58)Deck:	6 Satisfactory
(59)Superstructure:	6 Satisfactory
(60)Substructure:	7 Good
(61)Channel/Protection:	N N/A (NBI)
(62)Culvert:	N N/A (NBI)

AGE AND SERVICE

(27)Year Built:	1992		
(106)Year Reconstructed:			
(42a)Type of Service On:	1 Highway		
(42b)Type of Service Under:	1 Highway		
(28a)Lanes On:	3	(28b)Lanes Under:	6
(29)ADT:	16750		
(30)Year of ADT:	2018		
(109)Truck ADT:	4%		
(19)Detour Length:	0 miles		
Speed Limit:	45 MPH		

APPRAISAL

(67)Structure Condition:	6 Equal Min Criteria
(68)Deck Geometry:	7 Above Min Criteria
(69)Undrclear,Vert and Horiz:	6 Equal Minimum
(71)Waterway Adequacy:	N Not applicable
(72)Approach Alignment:	8 Equal Desirable Crit
(36)Traffic Safety Features:	
(a)Bridge Rail:	1 Meets Standards
(b)Transition:	1 Meets Standards
(c)Approach Rail:	1 Meets Standards
(d)Approach Rail Ends:	1 Meets Standards
(113)Scour Critical:	N Not Over Waterway

PROPOSED IMPROVEMENTS

(75a)Type of Work:	
(75b)Work Done By:	
(76)Length of Improvement:	
(94)Bridge Improvement Cost:	
(95)Rdwy Improvement Cost:	
(96)Total Project Cost:	
(97)Year of Cost Estimate:	
(114)Future ADT:	24375
(115)Year of Future ADT:	2038
YEAR PROGRAMMED:	

NAVIGATION DATA

(38)Navigation Control:	NA-no waterway
(39)Vertical Clearance:	
(40)Horizontal Clearance:	
(111)Pier Protection:	
(116)Lift Bridge Vert Clr:	

ENVIRONMENTAL

Environmental Concerns: No

INSPECTION

(90)Inspection Date: 7/3/2019 (91)Inspection Frequency: 24 months

(92)Supplemental Inspections Frequency: (93)Date of Inspections:

(a)Fracture Critical Detail:	NA	(a)FC Inspection Date:	
(b)Underwater Inspection:	NA	(b)UW Inspection Date:	
(c)Fatigue Detail (OS) Inspection:	NA	(c)Fatigue Detail (OS) Date:	
(d)UBIT Inspection:	NA	(d)UBIT Date:	2/5/2001
(e)Confined Space Inspection:	72 months	(e)Confined Space Date:	7/6/2017

Channel Cross Section Year:

Equipment Needed for Regular Inspection? None

Idaho Transportation Department
Bridge Inspection Report

Bridge Key:	12774	Structure Name:	02020C 48.31
(6)Features Intersected:	AMERICANA BLVD;15TH ST.	(9)Location:	IN BOISE; FRONT STREET
Facility Carried(Route):	US 20 WBL	Admin Jurisdiction:	0003 District 3
Xref Structure Name:	97363A 2.12	District:	03

WEARING SURFACE and DEAD LOAD INFORMATION

Asphalt:	0.0 *inches*	**Concrete:**	0.0 *inches*
Granular:	0.0 *inches*	**Timber:**	0.0 *inches*

POSTING INFORMATION

WEIGHT

Load Analysis Date: 07/16/2018

Load Analysis Required: N Analysis Complete

	Load Rating Analysis IR (tons)	OR (tons)		Recommended Posting(tons)	Actual Posting(tons)
H Truck					
HS Truck					
Type3		78	**Type3**		
Type 3S2		84	**Type 3S2**		
Type 3-3		84	**Type 3-3**		
			Axle Limit		

HEIGHT

	Recommended	Actual
Height Posting:		

ACTUAL WIDTH POSTING

Single Lane All Vehicles:	N
Single Lane Trucks/Buses:	N

Under Record Information:

(5)Inventory Route:	A50073630	B50073630
(7)Facility Under Structure:	AMERICANA BLVD	S. 15TH STREET
(10)Min Vert Clr:	17.67	18.00
(47)Inv Route Total Hrz Clr:	53.00	56.00
(11)Milepoint:	002.116	000.387
(20)Toll:	3 On free road	3 On free road
(26)Functional Classification:	16 Urban Minor Arterial	16 Urban Minor Arterial
(29)ADT:	11500	6500
(30)ADT Year:	2018	2018
(109)Truck ADT:	5%	
(100)Def Hwy Designation:	0 Not a STRAHNET hwy	0 Not a STRAHNET hwy
(102)Traffic Direction:	1 1-way traffic	1 1-way traffic
(104)Highway System:	0 Not on NHS	0 Not on NHS
(110)Design National Network:	0 Not part of natl netwo	0 Not part of natl netwo

Idaho Transportation Department
Structure Inventory and Appraisal Update

Bridge Key: _____ Structure Name: _____
(6)Feature Intersected: _____ (9)Location: _____
Xref Structure Name: _____ Admin Juris: _____

IDENTIFICATION

(1) State: 160
(2) District: ____
(3) County: _____
(4) Place Code: _____
(5) Inventory Route: _____
(7) Facility Carried: _____
(11) Milepoint: _____
(12) Base Highway Network: ____
(13a) LRS Inventory Route: _____
(13b) LRS Sub Route: ___
(16) Latitude: _____
(17) Longitude: _____
(98) Border Bridge Code/Pct: _____
(99) Border Bridge Number: _____
Macs Segment On Route: _____
Macs Segment Under Route: _____
Macs Segment Other: _____
Drawing Number: _____
Project Key Number: _____
Inspection Area: _____
MPO: _____

STRUCTURE TYPE & MATERIALS

(43) Main Span Material/Design: ____ / ____
(44) Approach Span Material/Design: ____ / ____
(45) Number of Spans - Main Unit: _____
(46) Number of Approach Spans: _____
(107) Deck Type: ____
(108a) Wearing Surface: ____
(108b) Membrane: ____
(108c) Deck Protection: ____

DECK APPLICATIONS

_____
_____
_____

ROUTE ID: _____
MEASURE: _____

CLASSIFICATION

(112) NBIS Bridge Length: ____
(104) Highway System: _____
(26) Functional Classification: ____

(100) Defense Highway: ____
(101) Parallel Structure: ____
(102) Direction of Traffic: ____
(103) Temporary Structure: ____
(105) Federal Lands Highway: ____
(110) Designated Natl Network: ____
(20) Toll Facility: ____
(21) Custodian: ____
(22) Owner: ____
(37) Historical Significance: ____

GEOMETRIC DATA

(48) Maximum Span Length: _____ ft
(49) Structure Length: _____ ft
Total Length: _____ ft
(50a) Curb/Sidewalk Width Lt: _____ ft
(50b) Curb/Sidewalk Width Rt: _____ ft
(51) Width Curb to Curb: _____ ft
(52) Width Out to Out: _____ ft
(32) Approach Roadway Width: _____ ft
(33) Median: ____
(34) Skew: ____
(35) Structure Flared: ____
(10) Vertical Clearance: _____ ft
(47) Total Horizontal Clearance: _____ ft
(53) Min Vertical Clr Over Deck: _____ ft
(54a) Min Vertical Underclearance Ref: ___
(54b) Min Vertical Underclearance: _____ ft
(55a) Min Lat Underclearance Ref Rt: ____
(55b) Min Lat Underclearance Rt: _____ ft
(56) Min Lat Underclearance Lt: _____ ft

ENVIRONMENTAL

Environmental Concerns: _____
Notes: _____

Idaho Transportation Department
Structure Inventory and Appraisal Update

Bridge Key: _____ Structure Name: _____
(6)Feature Intersected: _____ (9)Location: _____
Xref Structure Name: _____ Admin Juris: _____

LOAD RATING

(31) Design Load: ____
(64) Operating Rating: ____ ton
(66) Inventory Rating: ____ ton
(70) Bridge Posting: ____
(41) Structure Status: ____

AGE & SERVICE

(27) Year Built: _____
(106) Year Reconstructed: _____
(42a) Type of Service On: ____
(42b) Type of Service Under: ____
(28a) Lanes On: ____ (28b) Lanes Under: ____
(29) Average Daily Traffic: _____
(30) Year of ADT: _____
(109) Truck ADT: ____
(19) Detour Length: _____
Speed Limit:

PROPOSED IMPROVEMENTS

(75a) Type of Work: _____
(75b) Work Done by: _____
(76) Length of Improvement: _____
(94) Bridge Improvement Cost: _____
(95) Roadway Improvement Cost: _____
(96) Total Project Cost: _____
(97) Year of Cost Estimate: _____
(114) Future ADT: _____
(115) Year of Future ADT: _____
Year Programmed: _____

CONDITION

(58) Deck: ____
(59) Superstructure: ____
(60) Substructure: ____
(61) Channel/Channel Protection: ____
(62) Culvert: ____

APPRAISAL

(67) Structure Condition: ____
(68) Deck Geometry: ____
(69) Underclearance, Vert & Horiz: ____
(71) Waterway Adequacy: ____
(72) Approach Alignment: ____
(36) Traffic Safety Features:
a)Bridge Rail: ____
b)Transition: ____
c)Approach Rail: ____
d)Approach Rail Ends: ____
(113) Scour Critical: _____

NAVIGATION DATA

(38) Navigation Control: ____
(39) Vertical Clearance: _____ ft
(40) Horizontal Clearance: _____ ft
(111) Pier Protection: ____
(116) Lift Bridge Vert Clr: _____ ft

Route ID
Measure
Route ID Under(1st Route)
Meausre Under(1st Route)

INSPECTIONS

(90) Inspection Date: _____
(91) Inspection Frequency: ____ months
(92) Supplemental Inspections Frequency:
a)Fracture Critical Detail: ____ months
b)Underwater Inspection: ____ months
c)Fatigue Detail (OS) Inspection: ____ months
d)ReachAll Inspection: ____ months
e)Confined Space Inspection: ____ months
(93) Date of Supplemental Inspections:
a)FC Inspection Date: _____
b)UW Inspection Date: _____
c)Fatigue Detail (OS) Date: _____
d)ReachAll Date: _____
e)Confined Space Date: _____
Channel Cross Section Year: _____
Special Equipment Needed: _____

Idaho Transportation Department
Structure Inventory and Appraisal Update

Bridge Key: _____ Structure Name: _____

(6)Feature Intersected: _____ (9)Location: _____

Xref Structure Name: _____ Admin Juris: _____

Wearing Surface & Dead Load Information

Asphalt: _____inches Concrete: _____inches
Granular: _____inches Timber: _____inches

POSTING INFORMATION
WEIGHT

Load Analysis Date: _____

Analysis Required: ____

	Load Rating Analysis			**Recommended**	**Actual**
	IR (tons)	**OR(tons)**		**Posting(tons)**	**Posting(tons)**
H Truck	____	____			
HS Truck	____	____			
Type3 (3 axle)	____	____	Type3 (3 axle)	____	____
Type3S2 (5 axle)	____	____	Type3S2 (5 axle)	____	____
Type3-3(6 axle)	____	____	Type3-3 (6 axle)	____	____
			Max Axle	____	____

HEIGHT

	Recommended	Actual
Height Posting:	_____ ft	_____ ft

WIDTH

	Actual
Single Lane All Vehicles:	____
Single Lane Trucks/Buses:	____

****

UNDER RECORD INFORMATION (if applicable)

(5) Inventory Route: _____

(7) Facility Under Structure: _____

(10) Minimum Vertical Clearance: _____ ft

(47) Inventory Route Total Horiz Clr: _____ ft

(11) Milepoint: _____

(20) Toll: ____

(26) Functional Classification: ____

(29) ADT: _____

(30) Year ADT: _____

(109) Truck ADT: ____

(100) Defense Highway Designation: ____

(102) Traffic Direction: ____

(104) Highway System: ____

(110) Designated National Network: ____

Idaho Transportation Department
Field Inspection Report

Bridge Key: _____ Structure Name: _____

Feature Intersected: _____ Location: _____

Admin Jurisdiction: _____

Xref Structure Name: _____ District: _____

Element	Element Description	Env.	Total Qty	Units	State 1	State 2	State 3	State 4

Notes:

Idaho Transportation Department
Field Inspection Report

Bridge Key: _____ Structure Name: _____

Feature Intersected: _____ Location: _____

Admin Jurisdiction: _____

Xref Structure Name: _____ District: _____

Additional Condition Information

ROADWAY APPROACHES: _____

CURBS/SIDEWALKS:_____

EMBANKMENT: _____

CHANNEL: _____

SIGNS: _____

GUARDRAIL: _____

UTILITIES: _____

NOTES:_____

SCOUR REVIEW: _____

INSPECTION FREQ: _____

WORK ACCOMPLISHED: _____

LOAD RATING: _____

MTCE RECOMMENDATIONS
(Maintenance Item, Element, Priority, Work Assignment, Notes)

Inspector:_____ Date:_____

IDAHO TRANSPORTATION DEPARTMENT
INSPECTION FORM
DISTRICT NO.

BRIDGE KEY:
STRUCTURE NO:
FEATURES INTERSECTED:
LOCATION:

TYPE OF INSPECTION
☐ **DAMAGE**
☐ **UNDER BRIDGE INSPECTION TRUCK (UBIT)**
☐ **IN DEPTH**
☐ **SUPPLEMENTAL INSPECTION**

DECK:

SUPERSTRUCTURE:

BEARINGS:

SUBSTRUCTURE:

EXPANSION JOINTS:

NOTES TO BAME:

MISCELLANEOUS ITEMS:

WORK ACCOMPLISHED:

MTCE RECOMMENDATIONS:

INSPECTOR'S SIGNATURE:_____DATE:

IDAHO TRANSPORTATION DEPARTMENT
BRIDGE ASSET MANAGEMENT

LOCAL AGENCY COMMUNICATION VERIFICATION

BRIDGE INFORMATION

Bridge Key:
District:
Features:
Inspector:

BRIDGE OWNER/REPRESENTATIVE INFORMATION

Name:
Title:
Agency:
Contact Information:

CRITICAL FINDINGS NOTIFICATION

☐ Critical Finding (describe):

Priority:
Notification of corrective action must be sent to the Database Manager (Patty.Fish@itd.idaho.gov) within:

☐ 2 days ☐ 10 days ☐ 30 days
☐ Other (describe)

BRIDGE CONDITION DISCUSSION

Comments:

☐ Discussed future projects in area with owner representative

All questions regarding the aforementioned program by the local agency were answered and all noteworthy bridge inventory changes were identified. Local Agency shall retain a copy for their records.

Signed_____ Inspector Date

Signed_____ Local Agency Date

IDAHO TRANSPORTATION DEPARTMENT
BRIDGE ASSET MANAGEMENT

CRITICAL FINDING COMMUNICATION

BRIDGE INFORMATION

Bridge Key:
District:
Features:
Inspector:

DISTRICT REPRESENTATIVE INFORMATION

Name:
Title:

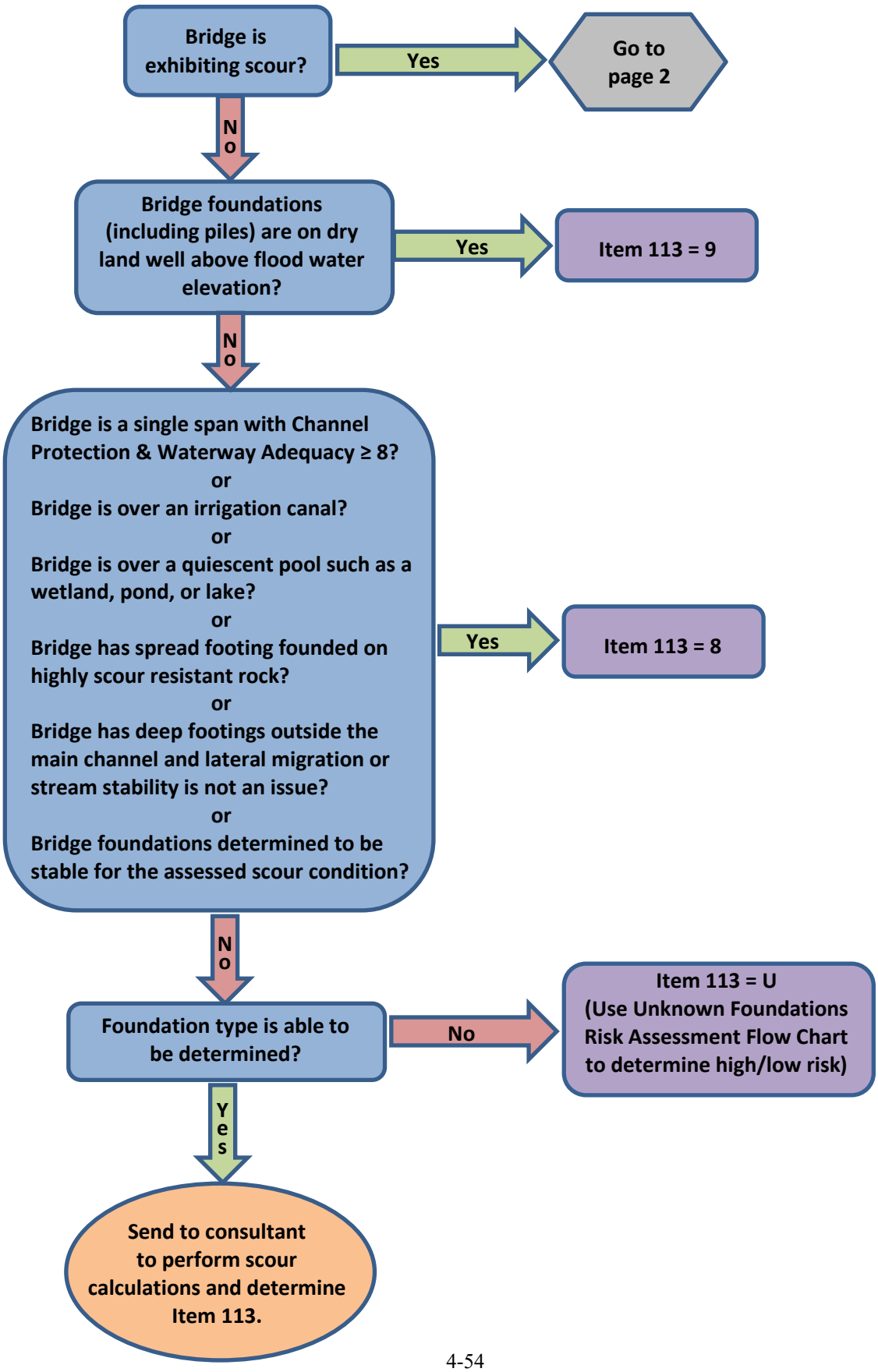
CRITICAL FINDINGS NOTIFICATION

☐ Critical Finding (describe):

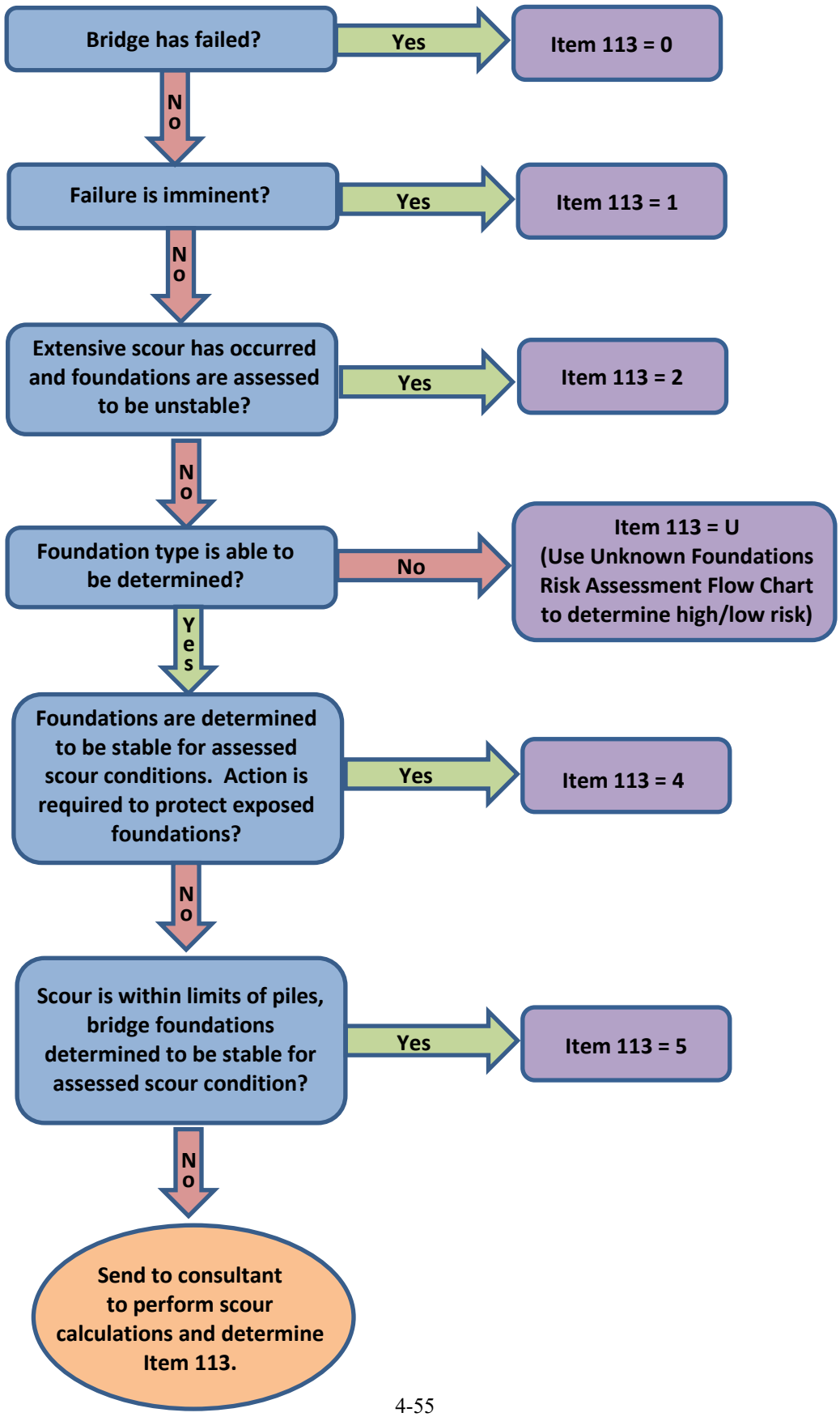
Priority:
Notification of corrective action must be sent to the Database Manager (Patty.Fish@itd.idaho.gov) within:

☐ 2 days ☐ 10 days ☐ 30 days
☐ Other (describe)

SCOUR COMMITTEE ASSESSMENT FLOW CHART
BRIDGES REQUIRING A SCOUR EVALUATION (ITEM 113 = 6)



SCOUR COMMITTEE ASSESSMENT FLOW CHART (CONTINUED)
BRIDGES EXHIBITING SCOUR



UNKNOWN FOUNDATIONS BRIDGES
RISK ASSESSMENT FLOW CHART

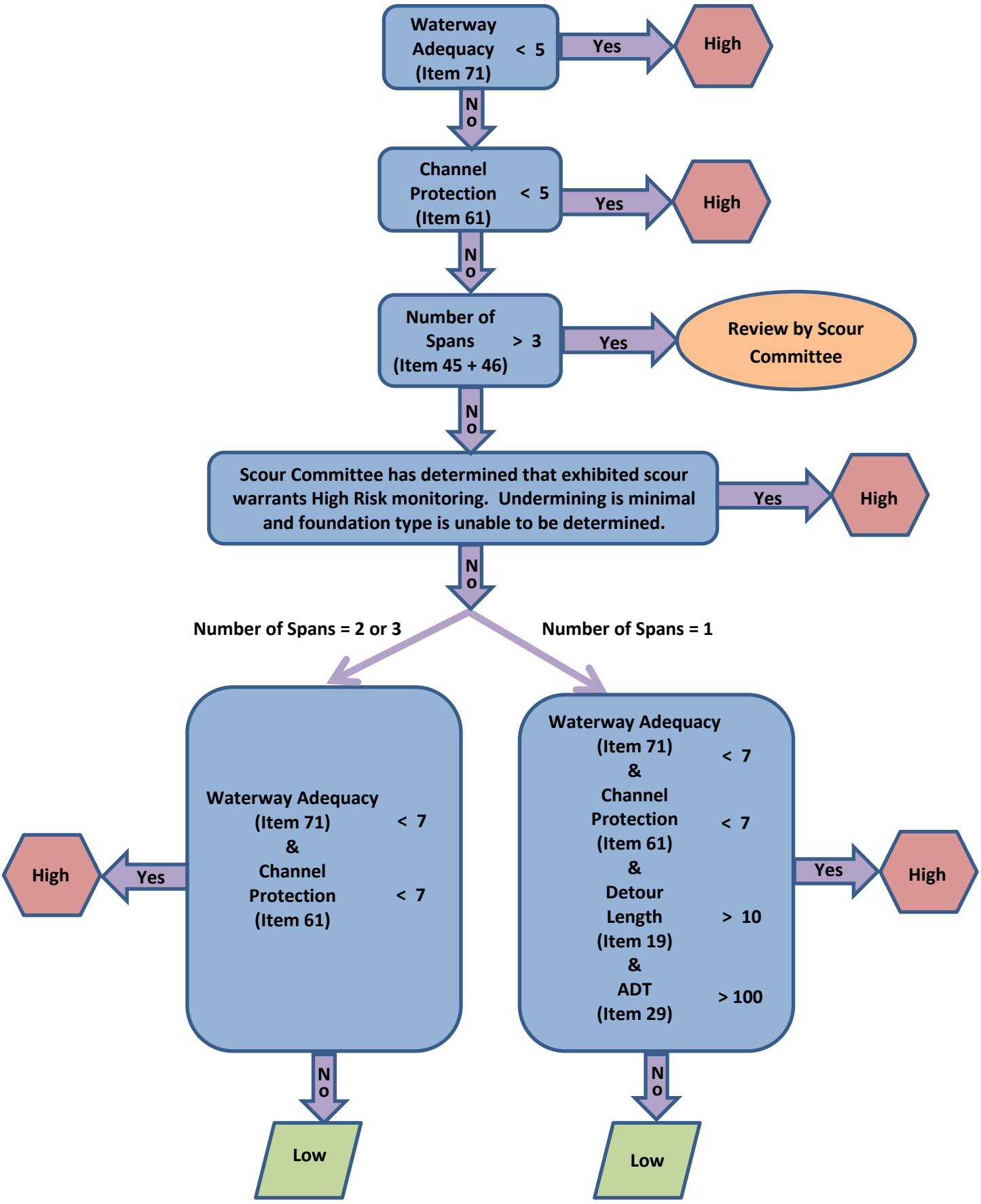


TABLE OF CONTENTS

PAGE INTENTIONALLY LEFT BLANK

6.0—LOAD RATING PROCEDURES

The procedures and requirements in *Section 6: Load Rating* shall be adhered to by anyone conducting load ratings for the Idaho Transportation Department.

Refer to the *Idaho Transportation Department Bridge Design LRFD Manual (BDM) Article 0.03 and Article 0.04* for submittal procedures on load rating of new/replacement bridges and bridge rehabilitation projects. In addition to the load rating procedures in the BDM, the BrR model shall include a staged construction superstructure definition for each portion of the bridge that will be used for traffic staging. The staged construction superstructure definitions shall be included with the final design submittal of the load rating and revised as needed for the PS&E submittal. A load rating summary (LRFR and LFR) shall be submitted for the staged construction in addition to the full structure. The HL-93 LRFR inventory rating for each staged construction superstructure definition shall be 1.00 or higher. As stated in the BDM, the HL-93 LRFR inventory rating, including future loads, shall be 1.10 or higher for new bridges on the state system, unless approved by the Group Leader.

Questions about this section or Idaho Transportation Department (ITD) load rating issues shall be directed to:.

Melissa Hennessy
(208) 334-8545
melissa.hennessy@itd.idaho.gov

6.0.1—Abbreviations

ASD – Allowable Stress Design

ASR – Allowable Stress Rating

BAM – ITD Bridge Asset Management Section

BDM – ITD Bridge Design LRFD Manual: The ITD LRFD Bridge design policies which can be found at the following link: http://itd.idaho.gov/bridge/?target=LRFD-bridge-manual

BrM™ – AASHTOWare Bridge Management™ software (formerly known as Pontis™): Database used by ITD to store bridge inspection and load rating data

BrR™ – AASHTOWare Bridge Rating™ software (formerly known as Virtis™): ITD preferred load rating software

DC – Dead load of structural components and nonstructural attachments

DW – Dead load of wearing surfaces and utilities

EV – Emergency Vehicle as defined by the FAST Act (EV2, EV3)

FHWA – Federal Highway Administration

IR – Inventory Rating

ITD – Idaho Transportation Department

LFD – Load Factor Design

LFR – Load Factor Rating

LHTAC – Local Highway Technical Assistance Council

LRFD – Load and Resistance Factor Design

LRFR – Load and Resistance Factor Rating

LRS – Load Rating Summary: Form used by ITD to report load rating results

MBE – AASHTO Manual for Bridge Evaluation

MUTCD – Manual on Uniform Traffic Control Devices

NBI – National Bridge Inventory

NDS – National Design Specification for Wood Construction

NRL – Notional Rating Load

OR – Operating Rating

PS&E – Plans, Specifications, and Estimate

QA – Quality Assurance

QC – Quality Control

RCB – Reinforced Concrete Box

RCF – Reinforced Concrete Frame

SHV – Single Unit Specialized Hauling Vehicles (SU4, SU5, SU6, and SU7)

SI&A – Structural Inventory and Appraisal

6.0.2—General Load Rating Criteria

The load rating of new bridges shall be completed within 3 months of the initial inspection. The load rating of existing bridges with modifications shall be completed within 3 months of identifying a change that warrants a re-rating.

Bridges requiring a load rating that are added to the ITD inventory due to a jurisdictional change shall be completed within 3 months of the inventory inspection. Time extensions may be accepted in extenuating circumstances as approved by the FHWA.

All load ratings shall be in accordance with the *MBE* version currently used by ITD as supplemented by this manual.

6.0.3—Load Rating Software and Analysis Engine

Load ratings shall be done with the most current version of *BrR*™ as licensed by ITD. Reinforced concrete, prestressed concrete, timber, and steel bridges shall be analyzed in *BrR*™ utilizing the AASHTO engine, unless otherwise approved by ITD. If the structure cannot be load rated with *BrR*™, the ITD Load Rating Engineer shall be contacted for guidance on what load rating program should be used.

The *BrR*™ software is an *AASHTOWare* product and can be obtained by contacting AASHTO. The order form can be found at:

AASHTOWare - AASHTOWare Bridge Rating

The *BrR*™ Special Consultant License can be purchased to do work for ITD. Please contact the ITD Load Rating Engineer to obtain a *BrR*™ Special Consultant License.

There are several Appendices regarding the use of the *BrR*™ software they can be found as follows:

APPENDIX 6.3.1—BrR SETUP TUTORIAL
APPENDIX 6.3.2—CREATING A NEW BRIDGE IN BrR
APPENDIX 6.3.3—ENTERING DESCRIPTION DATA IN BrR
APPENDIX 6.3.4—BrR IMPORT EXPORT DELETE TUTORIAL
APPENDIX 6.3.5—MODIFICATIONS TO STANDARD BrR SETTINGS
APPENDIX 6.3.6—ANALYZE AND VIEW BrR RESULTS TUTORIAL
APPENDIX 6.3.7—USING NON-STANDARD GAGES WITH BrR

Appendices 6.3.1-6.3.7 were created in BrR™ version 7.1. Some screenshots and instructions may vary in later versions. Any inconsistencies that may affect the load rating shall be brought to the attention of the Load Rating Engineer prior to completing the load rating.

New corrugated metal structures shall be analyzed using the appropriate CMP spreadsheet originally developed by the Ohio Department of Transportation, as modified by ITD for the Idaho rating trucks; a copy of which can be obtained by contacting the ITD Load Rating Engineer. Corrugated metal structures outside the limits of the Ohio DOT spreadsheet or requiring a more refined analysis shall be analyzed using *CANDE*™ or a load rating program approved by the ITD Load Rating Engineer.

6.0.4—Required Deliverables

6.0.4.1—New/Replacement Bridge Projects, or Existing Bridges without a *BrR*™ File

Refer to the *BDM Article 0.03* and *Article 0.04* for submittal procedures on load rating of new/replacement bridges. Load rating submittals for new/replacement bridges, or existing bridges which do not have an existing *BrR*™ file, shall require the following deliverables:

1. *BrR*™ file (no hard copy; XML electronic file only), or CMP spreadsheet (.xlxs and pdf)

2. Stamped and signed Load Rating Summary (LRS) form (PDF format). An electronic copy of the LRS can be obtained by contacting the ITD Load Rating Engineer or downloaded using the following links (ASR/LFR, LRFR or CMP LFR, CMP LRFR, EJ). Example forms and directions on filling them out can be found in the following appendices:

   APPENDIX 6.1.1—EXAMPLE LRFR LOAD RATING SUMMARY FORM
   APPENDIX 6.1.2—LRFR LOAD RATING SUMMARY
   APPENDIX 6.1.3—EXAMPLE ASR/LFR LOAD RATING SUMMARY FORM
   APPENDIX 6.1.4—ASR/LFR LOAD RATING SUMMARY DIRECTIONS
   APPENDIX 6.1.5—EXAMPLE ENGINEERING JUDGMENT LOAD RATING SUMMARY FORM
   APPENDIX 6.1.6—ENGINEERING JUDGMENT LOAD RATING SUMMARY DIRECTIONS
   APPENDIX 6.1.7—EXAMPLE LFR LOAD RATING SUMMARY FORM FOR CULVERT > 8' OF FILL
   APPENDIX 6.1.8—EXAMPLE CMP LFR LOAD RATING SUMMARY FORM
   APPENDIX 6.1.9—EXAMPLE CMP LRFR LOAD RATING SUMMARY FORM
   APPENDIX 6.1.10—EXAMPLE CMP LRFR LOAD RATING SUMMARY FORM FOR > 8' OF FILL

3. Supporting calculations. If the rating is done in *BrR*™, supporting calculations shall be included in the Member Description as shown in *Appendix 6.3.3*. If the supporting calculations are too cumbersome to put in the Member Description, they may be submitted as a separate document in PDF and native format. Examples of this are LRFD live load distribution factors. Calculations for live load distribution factors do not need to be shown if they are automatically calculated by *BrR*™ from the bridge typical section.

4. Independent calculations for design truck inventory rating factors less than 0.90 or greater than 1.50 shall be submitted per *Article 6.0.6*.

5. For new/replacement bridges, the PS&E plans (11x17 hard copy or PDF format), and the approved shop drawings (PDF format).

6.0.4.2—Rehabilitated Bridges

All bridge rehabilitation projects shall have their load rating reviewed and updated as necessary. The load rating file should be updated to reflect the rehabilitation project changes, such as changes in wearing surface depth and/or unit weight, and rail retrofits.

Refer to the *BDM Article 0.03 and Article 0.04* for submittal procedures on load rating of bridge rehabilitation projects. For bridge rehabilitation projects designed by ITD staff, refer to the checklist in *Appendix 6.4.1* for the required steps for updating the *BrR*™ file. Load rating submittals for rehabilitated bridges shall require the following deliverables:

1. Updated *BrR*™ file (no hard copy; XML electronic file only).

2. Stamped (not necessary for minor rehabilitations) and signed Load Rating Summary (LRS) form (PDF format). An electronic copy of the LRS can be obtained by contacting the ITD Load Rating Engineer or downloaded using the following links (ASR/LFR, LRFR). Examples of ITD LRS forms and directions on how to fill them out can be found in *Appendices 6.1.1-6.1.4*. The LRS is not required to be stamped by the bridge rehabilitation project designer.

3. Any supporting calculations that could not be included in the member description in the *BrR*™ model(PDF format).

4. The bridge rehabilitation project plans (11x17 hard copy or PDF format).

Independent calculations for design truck inventory rating factors less than 0.90 or greater than 1.50 **do not** need to be submitted.

6.0.5—Rating Results and Rating Units

All rating results shall be reported in English units on the LRS form. *BrR*™ allows the rater to toggle between Metric and English units in the load rating summary output.

The live load models for load rating shall be evaluated under the rating criteria listed in *Tables 6A.2.3.1-1, 6A.2.3.1-2, and 6B.6.2-1* and summarized in the appropriate Load Rating Summary form, found in *Appendices 6.1.1-6.1.4*.

Bridge plans in English units shall be input into the rating software using English units and the rating results shall be reported in English Tons. Bridge plans in Metric units may be input into the rating software using Metric or English units, but the rating results shall be reported in English Tons.

6.0.6—Quality Control and Quality Assurance Requirements

For the clarification of Load Ratings the definitions of these has been defined consistent to the Code of Federal Regulations:

1. Quality Control (QC): Procedures that are intended to produce a quality level load rating.
2. Quality Assurance (QA): The use of sampling and other measures to assure the adequacy of QC procedures in order to verify or measure the quality level of the load rating program.

Procedures for New Ratings:

Consultant Ratings: All load ratings by consultants must have a load rater, a checker, and a QC engineer. Either the load rater or the checker must be a registered Professional Engineer licensed in the state of Idaho. All three parties are required to sign the Load Rating Summary form. The consultant shall develop and provide to ITD its own QC checklist as part of the bridge submittal in a standalone signed document.

ITD will perform the QA using the QA Checklist as shown in the Appendix 6.4.1. The QA shall be performed by an Engineering Manager or designee. The QA review at a minimum will include a review of the load rating package for completeness and successful migration to the ITD database.

ITD Ratings: All new load ratings by ITD staff (Bridge Design or Bridge Asset Management) require a load rater and a checker, a least one of which must be a registered Professional Engineer licensed in the state of Idaho. The QC of the load rating shall be performed by a Professional Engineer licensed in the state of Idaho. All three parties shall sign

the Load Rating Summary Sheet. The QA shall be performed by an Engineering Manager or designee. The QA review at a minimum will include a review of the load rating package for completeness and successful migration to the ITD database.

Load Rating Additional Check

For bridge load ratings that are based on design plans and/or shop drawings; if the inventory rating factor for the design vehicle is less than 0.90 or greater than 1.50, independent calculations for the design truck must be submitted with the load rating package for the controlling location on the controlling member for the controlling limit state.

- The independent calculations shall be performed for the dead loads, design truck live load, and capacities by hand calculations or by load rating software other than *BrR*™.

- No portion of the independent calculations shall be taken from the *BrR*™ output. A short description of the reason the structure rates low or high must also be included with the rating package (ex: code has changed significantly since the time this structure was built, this structure was designed for future loads that are not currently on the bridge, etc.)

For bridge load ratings that are based on bridge measurements from field sketches, independent calculations do not need to be performed for any rating factor.

Procedures for Reanalysis

All load ratings that require reanalysis shall require a load rater and a QC Engineer, the QC Engineer shall be a registered Professional Engineer licensed in the state of Idaho. The load rater shall complete ITD Reanalysis checklist as shown in Appendix 6.4.2. ITD will perform the QA using the QA Checklist as shown in the Appendix 6.4.1. The QA shall be performed by an Engineering Manager or designee. The QA review at a minimum will include a review of the load rating package for completeness and successful migration to the ITD database.

The exception to this policy is if the reanalysis is limited to a change in the deck. In this case, only a load rater and a Engineer are required. The QC Engineer shall be a Professional Engineer licensed in the state of Idaho.

6.0.7—Rating Model

Bridges modeled in *BrR*™ shall use a girder system definition when possible. Single line girder definition shall not be conducted unless approved in advance by the ITD Load Rating Engineer. The Wizard should not be used for creating the girder superstructure system. Under analysis settings, analysis type shall generally be line girder. The 3D FEM engine for girder analysis shall not be used except for curved steel girder bridges which don't meet the criteria to be modeled as straight in *Article 4.6.1.2.4b* of the *AASHTO LRFD Bridge Design Specifications,* unless approved in advance by the ITD Load Rating Engineer.

BrR considers multiple lanes and the location of the trucks over the girder when calculating the distribution factors for interior girders. In the model, select an interior girder for analysis that is 12' or greater from the outside limit of the travelway so that BrR properly calculates the live load distribution factors. If there are no interior girders greater than 12' from the outside limits of the travelway, analyze in the BrR model the interior girder that gives the highest live load distribution factors using the lever rule.

All primary superstructure members shall be load rated. For girder type bridges, load rating shall be performed for the girders and stringer/floor beam systems, if applicable. Load rating of cross-beams, diaphragms, and cross-frames shall not be performed unless the bridge has curved girders or other special circumstances. This does not apply to girders with minor curvature as defined by LRFD.

Concrete bridge decks need not routinely be evaluated, but timber and corrugated metal decks shall be evaluated per *Article 6.1.5.1.* Substructures need not routinely be evaluated per *Article 6.1.5.2.*

Model each simple span as a separate, single span superstructure. Model a continuous span as a multi-span superstructure. Restraint moments for continuous girders shall not be considered, except for cantilevered spans. Only one superstructure model is necessary for spans that are identical.

Example 1: Simple 2 span bridge. Both spans are identical (span length, typical section, applied loads, etc.). Only one superstructure model is necessary.

Example 2: Simple 3 span bridge. Spans 1 & 3 are identical, but Span 2 is longer. One superstructure model representing Spans 1 & 3 and one superstructure model representing Span 2 are necessary.

Simple span bridges modeled in *BrR*™ shall not have the deck reinforcement input into the model.

Varied Girder Spacing for LFR – In the case where girder spacing varies, the live load distribution factor shall be calculated using the spacing at the maximum third point along the span.

For bridges with a composite concrete deck, the structural deck thickness shall be reduced by 0.50 inch to account for a sacrificial wearing surface if both of the following are true:

1. If the design plans show less than 1.0-inch asphalt wearing surface or show less than 0.75" concrete overlay applied at the time of bridge construction.

2. There is less than 1.0 inch of asphalt wearing surface or less than 0.75" concrete overlay on the bridge per the most recent bridge inspection report.

The 0.50-inch sacrificial concrete wearing surface shall NOT be reported on the LRS form under the "Existing Wearing Surface Type & Depth" box. For bridges which have had a concrete overlay applied to the deck, the deck structural thickness shall be considered as the combined thickness of the original deck and the concrete overlay minus the 0.50-inch sacrificial wearing surface.

The typical epoxy overlay is 3/8", but can be input as 0.5-inches. For PPC overlay 3/4-inches or less, input as 1.0-inch. For PPC overlays greater than 3/4-inches, round the depth to the nearest 0.5-inches.

Girders meeting all of the following criteria may be assumed to act compositely with a concrete deck:

1. The concrete deck has a structural thickness of 4½-inches or greater, except no minimum thickness is required to be considered composite for side-by-side girders.

2. The girder has a mechanical shear connectors (reinforcement, shear studs, etc.) capable of providing shear transfer between the girder and the concrete deck, or if it meets the requirement of MBE Article 6A.6.9.4.

3. The connection between the deck and girders do not show signs of movement between the bottom of the deck and top of the girder.

If one or more of the criteria above is not met, composite action can be assumed if demonstrated using a refined analysis or non-destructive load tests.

Application of Vehicular Live Loads

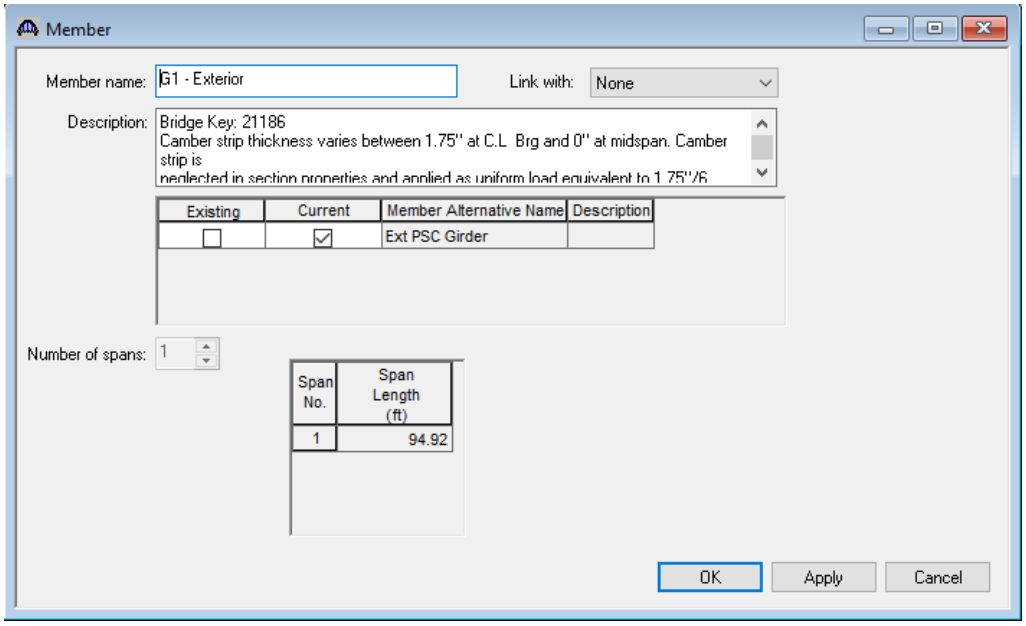
Roadway widths less than 20 feet shall be rated for one lane of traffic.

Vehicles shall be applied to the structure within the existing roadway section of the bridge. Only girders or structural members that are influenced by live load when applied within the travelway need to be analyzed.

For bridges with sidewalks, the travelway should be set based on the actual roadway width (from inside curb to inside curb of sidewalks). Girder live load distribution factors shall be based on the assumption that traffic stays within the travelway except for exterior girders under the sidewalk as described below. This may result in using different distribution factors for rating than what was used for design.

The exterior girder under the sidewalk should be input into the model and live load distribution factors calculated assuming the truck mounts the sidewalk. Analyze the exterior girder for the strength limit states ignoring service checks for the legal loads [Type 3 trucks, NRL, and EV trucks (if required)] for the Legal Load limit state (LRFR) or Operating (LFR). Notify the ITD Load Rating Engineer if the exterior girder rates below 1.0 for any of these trucks. Once the initial analysis is complete, uncheck the "Existing" boxes in the <Member> window for any girders input into the model

that are under the sidewalk (See below). The results of the girder under sidewalk should not be reported on the summary form. Put a note on the LRS stating the girders under sidewalks were input the model but the results not reported.



If a girder under the sidewalk rates below 1.0 for a legal load truck under the strength limit state, Bridge Asset Management will re-analyze the girder on a case by case basis. The re-analysis may include (but not limited to) sharing of loads to adjacent girders, a more refined analysis of live load distribution factors, reduction in impact, or/and reduction in load factor.

For structures with longitudinal deck joints, the Live Load Distribution Factor for the beams adjacent to the longitudinal joint shall be determined using the lever rule with the wheel load placed 1 foot from the joint.

In *BrR*™ files, the general description data and notes in the file shall be in accordance with *Appendix 6.3.3*.

6.0.7.1—Prestressed Girders

The actual strand pattern shown on the shop drawings shall be used in the rating model. If the shop drawings are not available, strand locations from the design drawings shall be used. If the strand locations are not available, the center of gravity of the prestressing steel shall be used.

Prestress losses shall be as shown on the plans and input into the rating model as lump sum losses. If losses are not shown on the plans, the final working force and number of strands shall be used to calculate the prestress losses. However, if losses less than 35 ksi are shown on the plans or calculated based on final working force, 35 ksi losses shall be used. Losses less than 35 ksi may be used if the structure was designed using LRFD and loss calculations accompany the rating. If losses and final working force and/or number of strands are not shown on the plans, 45 ksi losses shall be used.

When rating precast deck bulb-tee girder using Ultra-high performance concrete (UHPC) connections, the UHPC connection should be added as dead load only. The non-composite precast girder section properties shall be used to compute stresses for dead load and live load, unless approved by the ITD Load Rating Engineer. The distribution factors for structures with UHPC connections can be calculated assuming the connections are sufficient for the girders to act as a unit.

LFR

For prestressed girder inventory ratings, concrete tension at the Service III limit state shall be limited to $3\sqrt{f'c}$ (psi). For prestressed girder operating ratings, the Service III limit state shall not be checked. Shear ratings shall be performed

at a distance h/2 from the face of the support and at tenth points in accordance with *Article 9.20.1.4* of the *Standard Specifications for Highway Bridges*. Distances can be specified by utilizing points of interest in *BrR™*.

LRFR

For legal ratings, concrete tension at the Service III limit state shall be limited in accordance with *Table 5.9.2.3.2b-1* of the *AASHTO LRFD Bridge Design Specifications*. For permit ratings, the Service III limit state shall not be checked. Shear ratings shall be performed at a distance d_v from the face of the support and at tenth points in accordance with *Article 5.7.3.2* of the *AASHTO LRFD Bridge Design Specifications*. Distances can be specified by utilizing points of interest in *BrR™*.

LRFR Control Option "Consider Permit Load Tensile Steel Stress"

1. Run the bridge with this control option checked.
2. Look at the results in Specification Check Detail under 6A.5.4.2.2.2 Permit Load Rating. Check to see if M is less than M_{cr} such that the reported permit load ratings are based on $f_s = f_{pe}$. When this is happening, all of the permit vehicles will most likely have the same rating factor.
3. If the permit ratings are based on $f_s = f_{pe}$, re-run the bridge with "Consider Permit Load Tensile Steel Stress" unchecked and report these results on the LRFR LRS that is submitted.
4. Re-check "Consider Permit Load Tensile Steel Stress" when you submit the .xml file.

6.0.7.2—Steel Girders

Curved steel I-girders that satisfy the criteria in *Article 4.6.1.2.4b* of the *AASHTO LRFD Bridge Design Specifications* may be analyzed as straight girders.

For steel girder ratings on structures with field measurements only (no plans):

- If the inspection report specifically notes that the girders are rolled shapes, use the field dimensions to pick the closest rolled shape in the historic list of AISC shapes.
- If the inspection report does not indicate that the girders are rolled shapes, input the girders as a plate girder using the actual dimensions on the field sketch.
- Plastic analysis is allowed if permitted by the *Article 6.12.2* of the *AASHTO Bridge Design Specifications* (for LRFD) and *Articles 10.48.1, 10.53.1.1and 10.54.2.1 of the AASHTO Standard Specifications* (for LFR).
- Strength Limit State – Flexure Steel girder bridges with corrugated metal decks shall be designed and load rated using the provisions of section 6.10.6.2.3 of the AASHTO LRFD BDS based on the non-composite girder behavior. Using Appendix A6 and plastic analysis for bridges that don't meet the requirements in section 6.10.6.2.3 is not allowed.
- Bearing stiffeners shall be considered in the rating.
- For LFR, steel serviceability (overload) shall be checked for both inventory and operating ratings.
- Stiffener and splice plate dead loads shall be input into the *BrR™* model as concentrated Member Loads.
- The haunch may be entered in the haunch profile for steel girders and, thereby, considered part of the structural section unless the haunch thickness along the length of the girder is not well controlled during construction.
- In areas where the flange thickness and/or width changes, extend the thinner and/or narrower flange to the end of the transition in the BrR model.

6.0.7.3—Reinforced Concrete Girders

Shear ratings shall be performed at a distance d from the face of the support and at tenth points in accordance with *Article 8.16.6.1.2* of the *AASHTO Standard Specifications for Highway Bridges (Article 5.8.3.2* of the *AASHTO LRFD Bridge Design Specifications)*. Distances can be specified by utilizing points of interest in *BrR*™. Schedule based input shall be used for reinforced concrete girders.

Support conditions shall be set to "free" at bridge ends and "frame" at piers for both LFR and LRFR ratings of reinforced concrete bridges with cantilevered end spans. The effective width of the concrete deck slab in tension shall be taken as the tributary width perpendicular to the axis of the member for determining flexural resistance in accordance with *Article 4.6.2.6.1* of the *AASHTO LRFD Bridge Design Specifications*.

6.0.7.4—Reinforced Concrete Frames and Box Structures

Analysis

Reinforced concrete frame (RCF) and box (RCB) structures shall be input into *BrR*™ as Culvert Definitions when possible. For situations where the Culvert Definition is not possible, a line girder definition shall be used.

For Culvert Definitions:

- For both LFR and LRFR, structures shall be fixed against lateral movement at the base and free to side-sway at the top.
- RCF structures shall have moments released at the bottom of the walls. RCB structures shall NOT have moments released at the bottom of the walls.
- If the bottom slab of an RCB structure controls and has a low rating, a *k*-value (subgrade modulus also called the Modulus of Subgrade Reaction) may be entered for the subgrade soil. A k-value of 150 pci is recommended unless additional information is provided on the design plans or by the Load Rating Engineer.
- The length of segment shall be input as one foot.
- Shear in the top slab shall be ignored in the analysis.
- At-grade top slabs shall NOT have a 0.50-inch sacrificial wearing surface deducted from their thickness.
- If all the following conditions exist, the inside face of wall rating shall be ignored in the analysis:

    1. The inventory rating for the design vehicle is less than 1.0 and is controlled by the rating of the inside face of the wall.
    2. The structure has an NBI condition rating of 5 or greater for the substructure **Item 60** or culvert **Item 62**.
    3. The structure has been in place for 20 years or more.

Ignoring the inside face of wall can be accomplished by inputting points of interest along the structure and setting the control options to only evaluate at points of interest. Tenth points in the slab shall be input from the front faces of the walls or haunch so they match the tenth point locations generated by the AASHTO engine.

For Line Girder Definitions:

- Cross section based *BrR*™ input shall be used.
- Soil pressure shall be incorporated, but live load surcharge neglected.
- Where monolithic haunches inclined at 45 degrees are used, the negative moment shall be evaluated at the intersection of the haunch and the uniform depth member, for both LFR and LRFR.

- The structure width shall be input as one foot.
- Shear shall be ignored in the analysis.
- At-grade top slabs shall NOT have a 0.50-inch sacrificial wearing surface deducted from their thickness.
- For LRFR models, impact values shall be based on the depth of fill being used in the *BrR*™ member, not the minimum depth of fill on the structure.

Loads

For RCF and RCB structures, the inspection reports only show the fill and wearing surface depths for one location. The inspection report does not necessarily match the plans, and often does not cover the controlling case. When the minimum and maximum fill depths vary by more than approximately one foot, both cases shall be analyzed in *BrR*™. The fill depth shall be based on the more conservative case of the approximate depth calculated from the plans or the value listed in the inspection report. The certainty of the actual condition versus what is shown on the plans is low; therefore, the accuracy of the fill depth calculations over the culverts does not need to be more accurate than ± 6".

At-rest soil pressures shall be used in the analysis per *MBE Article 6A.5.12.10.2b*, and applied to both sides of the structure. If the at-rest soil properties are listed in the LRFD design notes on the plans, they should be used in the analysis. However, care shall be taken when inputting them to ensure they are applied properly in the model. For all other ratings, the default soil properties shown in *Table 6.0.7.4-1* shall be used.

Table 6.0.7.4-1 Default Soil Properties for Load Rating

soil unit load δ[a]	weighted average of the soil unit load used for the vertical earth load in pcf
saturated soil unit load δ_{sat}	same value as δ (assume free draining material)
at-rest lateral earth pressure coefficient (LRFD) k_o	55pcf / δ
active lateral earth pressure coefficient (LRFD) k_a	leave input blank
passive lateral earth pressure coefficient (LRFD) k_p	leave input blank
maximum lateral soil pressure (LFD) - RCF (stifflegs)	71.5 pcf
minimum lateral soil pressure (LFD) - RCF (stifflegs)	27.5 pcf
max. and min. lateral soil pressure (LFD) - RCB (box culverts)	55.0 pcf

[a] May use δ as shown on the plans if it is available. If not, use default δ values as shown in *Table 6A.2.2.1-1*.

LRFR Ratings:

ITD's geotechnical engineer recommends using a default δ value of 125 pcf and a k_o value of 0.44 to calculate the lateral earth loads for flat top backfill with no hydrostatic pressure. However, *BrR*™ does not have a way to input different δ values for vertical and horizontal earth loads. Therefore, the k_o value input under the soil properties tab shall be adjusted so when it is multiplied by the δ value input for the vertical earth loads it gives the proper lateral earth pressure (55 pcf).

LFR Ratings:

Lateral Earth Pressure (EH)

The maximum and minimum lateral soil pressure for LFR listed in *Table 6.0.7.4-1* is based on

$p = \beta_E k_o \delta$.

β_E values per *Article 3.22* of the *AASHTO Standard Specification of Highway Bridges*.

$\beta_E = 1.3$ for lateral earth pressure for RCF structures

$\beta_E = 0.5$ for lateral earth pressure when checking the positive moment in the top slab of RCF structures (This is also consistent with *MBE Article C6A.5.12.10.2b*).

$\beta_E = 1.0$ for lateral earth pressure for rigid culverts (RCB)

p = lateral soil pressure

$k_o = 0.44$ for flat top backfill with no hydrostatic pressure per recommendation from the ITD geotechnical engineer

$\delta = 125$ pcf per recommendation from the ITD geotechnical engineer

Maximum lateral soil pressure for RCF = 1.3 (0.44) (125 pcf) = 71.5 pcf
Minimum lateral soil pressure for RCF = 0.5 (0.44) (125 pcf) = 27.5 pcf
Max. and min. lateral soil pressure for RCB = 1.0 (0.44) (125 pcf) = 55 pcf

The β_E value used in *BrR*™ is 1.0. Since ITD uses different β_E values, they must be applied to the soil pressure input under the soil properties tab.

For live load surcharge equivalent soil depths, see *Article 3.20.3* of the *AASHTO Standard Specification of Highway Bridges* for LFR and *Table 3.11.6.4-1* of the *AASHTO LRFD Bridge Design Specifications* for LRFR. However, an adjusted live load surcharge depth shall be used for LFR when using *BrR*™ to ensure the correct load is being applied in the model. The β for live load should be used for live load surcharge. *BrR*™ does apply the correct β factor to the live load surcharge load (1.67). However, the lateral earth pressure value being used has already been multiplied by β_E per the procedure described above. Therefore, the equivalent height of soil input into *BrR*™ for live load surcharge for LFR ratings of RCF structures shall be reduced by β_E to get the correct load. The water load on interior walls shall be neglected per *MBE Article 6A.5.12.2*.

Table 6.0.7.4-2 Live Load Surcharge Height for *BrR*™ Input (h_{eq})

	H[a]	LFR	LRFR
Live Load Surcharge	<5'	2 '/ β_E (2'/1.3 = 1.538' for RCF; no modification required for RCB)	4.0'
	5'-10'		4.0' - 0.2 (H - 5')
	10'-20'		3.0' - 0.1 (H-10')
	>20'		2.0'

[a] H is the distance between the surface of the road and the bottom of footing..

6.0.7.5—Corrugated Metal Decks, Welded Steel Angle Decks, and Concrete Filled Grid Decks

The corrugated metal deck shall be assumed to provide full lateral support for steel beams (due to the typical practice of welding the corrugations to the top flange of the steel beam during installation) unless the condition of the deck or other notes in the inspection report indicates that the welds have failed.

The distribution of wheel loads in the evaluation of corrugated metal decks shall be in accordance with *Article 9.8.5.2* of the *AASHTO LRFD Bridge Design Specifications* for both LFR and LRFR.

For corrugated metal decks, include only the weight of fill material within the flutes in the "Corrugated Deck Metal Pan" input. Enter the unit weight of the fill material and enter zero under the thickness of fill above the plank. The additional fill depth above the top of the metal deck shall be entered under the typical section wearing surface.

The welded steel angle decks shall be assumed to provide full lateral support for steel beams if the inspection report or photographs indicate the deck has been attached to the top girders using a positive connection like clips or welding. Live load distribution factors shall be computed using the lever rule.

Live load distribution factors for LFR ratings of steel girders with concrete filled steel grid decks shall be in accordance with the live load distribution factors for steel girders with concrete decks in *Table 3.23.1* of the *AASHTO Standard Specifications for Highway Bridges.*

6.0.7.6—Corrugated Metal Culverts (Pipes, Arches, Boxes, etc.)

For corrugated metal culverts with sufficient information available to calculate a load rating, a load rating shall be performed with the Ohio Department of Transportation corrugated metal culvert Excel spreadsheets. The load rating results shall be documented on the LRS found in *Appendix 6.1.7 – 6.1.10*.

If the inventory rating tons for the HS-20 or HL-93 exceeds 99.9 tons, it is reasonable to assume that live load has little effect on the structure. In this case, the LFR LRS, found in in *Appendix 6.1.7*, shall be used to document the rating. The inventory and operating ratings for the HS-20 will be input as 99.9 tons in accordance with the guidance for Items 64 and 66 found in the *Idaho Bridge Inspection Coding Guide, January 2014*, for structures under sufficient fill that live load is negligible. For structures designed by LRFD after October 1, 2010, the HL-93 inventory and operating rating factors will be input as 2.77.

6.0.7.7—Railroad Flatcar & Boxcar Bridges

Consult Load Rating Engineer for rating of Railroad Flatcar & Boxcar Bridges.

6.1—SCOPE

The *Idaho Manual for Bridge Evaluation (IMBE)* is intended to supplement and provide interpretation for the *AASHTO Manual for Bridge Evaluation (MBE)*. Part A incorporates provisions specific to the Load and Resistance Factor Rating method and Part B is specific to the Allowable Stress and Load Factor methods of evaluation.

6.1.1—Assumptions

All load rating assumptions used in the load rating model shall be documented. It is preferable to have the assumptions listed in the remarks on the LRS form, however due to space constraints it is acceptable to document the load rating assumptions in the supporting calculations.

6.1.2—Condition of Bridge Members

If the most recent inspection report indicates deterioration significant enough to affect the live load carrying capacity of the bridge, it should be noted in the remarks section of the LRS form. For consultant load ratings, deterioration of the load rating, if necessary, shall be modeled by the ITD Load Rating Engineer unless otherwise approved by ITD. For some guidelines on coding thresholds see *Article 6A.4.2.3*.

For timber bridges rated under the ASR method, it is appropriate for consultant and ITD load raters to use a Shear Stress Factor, C_H, that corresponds to the condition of the splits or cracks noted on the inspection report. The C_H value used in the load rating shall be stated in the remarks on the LRS form.

6.1.3—Evaluation Methods

The rating method to be used is dictated by the design method used. See *Table 6.1.3-1* for the rating method required.

Table 6.1.3-1 Required Rating Method

Design Method	Rating Method
Allowable Stress (ASD)	timber structures - ASR all other structure types - LFR
Load Factor (LFD)	timber structures - ASR all other structure types - LFR
Load and Resistance Factor (LRFD)	all structure types - LRFR[a]
combination of design methods	timber components - ASR all other components - LFR

[a] *BrR*™ version 7.2 cannot rate LRFD timber bridges under the LRFR method. Contact the ITD Load Rating Engineer for guidance.

6.1.4—Concrete Bridges with Unknown Structural Components

For concrete bridges with unknown details, an exhaustive search for plans and shop drawings shall be conducted and documented. If the details required for load rating cannot be located, a load rating by engineering judgment shall be performed for a HS truck using the following procedures. This shall be documented using the Engineering Judgment LRS form shown in *Appendix 6.1.5*. Load ratings by engineering judgment must be performed or checked by a licensed Professional Engineer.

Recommended values for inventory/operating rating factors and inventory/operating ratings in tons are given in *Table 6.1.4-1*. The inventory rating (IR) shall be reported as NBI Item #66, the operating rating (OR) shall be reported as NBI Item #64.

Table 6.1.4-1 Inventory and Operating Ratings by NBI Condition Rating

Lowest NBI Condition Rating[a]	Rating Factor		Rating in Tons[b]	
	IR	OR	IR[b]	OR[b]
9 through 5[c]	0.50	0.84	18	30
4[d]	0.33	0.56	12	20
3[d]	0.17	0.28	6	10
2[d]	0.08	0.09	3	3
1 or 0[d]	0	0	0	0

[a] Choose the lowest NBI Condition Rating for either the #59 (Superstructure), or #62 (Culvert).
[b] IR and OR are based on the HS-20 truck with a weight (W) of 36 Tons.
[c] Report the rating as 18 tons inventory and 30 tons operating for condition ratings of 5 through 9. These values are based on the rating factors for a condition rating of 5.
[d] Shaded areas where the Condition Rating for the Deck, Superstructure, Substructure or Culvert is 4 or less indicate that weight limit posting for State legal loads may be necessary.

Careful consideration should also be given to the specific *BrM*™ Element Condition States and their corresponding notes in the inspection report. Concrete slabs in Condition Rating 4 and reinforced concrete and prestressed beams with quantities in Condition Rating 4 may be considered for lower load rating values.

Coding of the NBI Items in *BrM*™ shall be as shown in *Table 6.1.4-2*.

Table 6.1.4-2 *BrM*™ Inputs for Engineering Judgment Ratings

NBI Item #	NBI Item Name	*BrM*™ Input
63	Operating Method	0 - Field Eval./Engr. Judgment
64	Operating Rating	Operating Rating (Tons)
65	Inventory Method	0 - Field Eval/Engr. Judgment
66	Inventory Rating	Inventory Rating (Tons)

RT = RF x W
RT = Rating in tons for HS truck rounded down the nearest whole ton
RF = Rating factor for HS truck
W = Weight in tons of HS truck

Load ratings for State legal loads shall not be performed, unless at least one of the NBI Items #58 (Deck), #59 (Superstructure), #60 (Substructure), or # 62 (Culvert) is coded as 4 or less and/or engineering judgment concludes that weight limit posting is required.

A common method used by ITD in establishing weight restrictions for a bridge which is in poor condition (i.e. NBI condition ratings are 4 or less) is to compare the bridge being rated to two similar bridges that have calculated load ratings based on design plans and/or shop drawings. The operating tons for the posting trucks (Idaho Type 3, 3S2 and 3-3) for the EJ bridge rating are derived by multiplying the operating rating tons for the HS-20 as taken from Table 6.1.4-1 by the ratio of the operating rating for the posting vehicle for the two similar bridges. The ratings are interpolated based on this ratio and the span length of the two similar bridges. If possible, use two bridges for comparison that were constructed around the same time frame as the bridge being rated.

6.1.4.1—Corrugated Metal Pipe and Arches

For corrugated metal pipe and arches with unknown details, an exhaustive search for plans and shop drawings shall be conducted. If plans cannot be located, it usually is possible to field measure the metal pipe and perform a load rating using the Ohio Department of Transportation corrugated metal pipe Excel spreadsheet. If field measurements cannot be obtained or measurements are insufficient to calculate load capacity, a load rating by engineering judgment shall be performed as outlined in *Article 6.1.4*.

In addition to the live loads listed in Article 6A.2.3.1, all new corrugated structures shall be load rated for a standard gage 120 kip tridem axles (40 kips per axle) with 4.5 foot spacing between axles. This live load can be found on the ITD-modified CMP spreadsheets and the 120 kip tridem load rating results shall be reported on the CMP LRFR LRS.

6.1.4.2—Steel and Timber Bridges

For steel and timber bridges where design plans cannot be located, the rating shall be based on field measurements. Self-weight loads of field-measured structural members shall be increased by ten percent to account for uncertainties in the measured dimensions. If the bridge exhibits severe deterioration or other structural problems, the procedures listed in *Article 6.1.4* for a load rating by engineering judgment may be performed.

6.1.5—Component-Specific Evaluation

6.1.5.1—Decks

Concrete bridge decks with an NBI rating of 5 or greater need not be evaluated for load capacity, unless bridge has wide spacing between girders or other unusual features. If the deck NBI rating is a 4 or less, consideration should be given to evaluating the bridge deck, if plans are available. For consultant load ratings, the concrete bridge deck rating model shall be done by the ITD Load Rating Engineer, unless otherwise approved.

Timber bridge decks shall be evaluated for load capacity using the *BrR*™ software regardless of their condition.

6.1.5.2—Substructures

Substructures are not routinely evaluated; special cases are detailed in the MBE. If the substructure NBI rating is a 4 or less, consideration should be given to evaluating the substructure. Substructure ratings for timber piles and timber caps should account for deterioration using Resistograph data completed as part of the inspection.

6.1.8—Qualifications and Responsibilities

A registered Professional Engineer licensed in the state of Idaho shall be charged with the overall responsibility for the load rating per *Article 6.0.6*.

6.1.9—Documentation of Load Rating

The electronic LRS and supporting calculations shall be placed in the bridge rating files. The *BrR*™ model shall be maintained in the *BrR*™ database by the ITD Load Rating Engineer. Load rating models utilizing approved software other than *BrR*™ shall be maintained by the ITD Load Rating Engineer.

PART A—LOAD AND RESISTANCE FACTOR RATING

6A.1—INTRODUCTION

All new bridges designed under the LRFD code shall be load rated by the LRFR method. Refer to the *BDM Article 0.03* and *Article 0.04* for submittal procedures on load rating of new bridges and bridge rehabilitation projects and *IMBE Article 6.04 – Required Deliverables* for details on the load rating submittal documentation requirements.

Present practice for BAM is to perform evaluations for LRFD bridges using both the LRFR and LFR methods. This is because ITD is currently using LFR to make posting and permitting decisions. For consultant load ratings using the LRFR method, the consultant shall submit the stamped LRFR load rating summary and an unstamped LFR load rating summary. The first line of the LFR summary for both inventory and operating sections should show the rating results for HS-25.

6A.1.2—Scope

Part A details procedures for load rating bridges for the LRFD design loading, State legal loads, and permit loads. The LRFR shall be consistent with the philosophy and approach of the *AASHTO LRFD Bridge Design Specifications* and the most current version of the *BDM.*

6A.1.5—Load and Resistance Factor Rating

For LRFD bridges load rated prior to the inventory bridge inspection, the load rating results shall be placed on the LRFR Bridge LRS form, an example is shown in *Appendix 6.1.1*. The legal and permit live load factors, γ_{LL}, are based on Average Daily Truck Traffic (ADTT). Prior to the initial inventory bridge inspection, the ADTT from the design plans for the construction year should be used.

For LRFD bridges already on the State Bridge Inventory, the load rating results shall be placed on the LRFR Bridge LRS found in *Appendix 6.1.1* and shall include the design vehicle, legal and permit load rating results. The legal and permit rating results shall be based on the most recent ADTT to determine the appropriate legal and permit live load factors, γ_{LL}. The ADTT can be calculated based on NBI Items 29 - ADT and 109 – % ADTT.

After construction is complete, the bridge load rating shall be updated by the bridge designer reflecting any changes during construction. The legal and permit rating results shall be based on the most recent ADTT as reported in the initial inspection to determine the appropriate legal and permit live load factors, γ_{LL}.

6A.2—LOADS FOR EVALUATION

6A.2.2—Permanent Loads and Load Factors

6A.2.2.1—Dead Loads: *DC* and *DW*

All dead load computations shall be documented in the *BrR*™ model under the member descriptions or supporting calculations. The girder self-weight and composite deck dead loads need not be documented unless providing independent calculations to verify the design load rating (Refer to *Article 6.0.6*).

The dead loads should be entered into the *BrR*™ model under separate Load Case Descriptions (i.e. DC1 – Haunch, DC1- SIP Forms, DC1 – Splices, DW - Utility, etc.). The use of Load Case Descriptions titled “Composite” or “Non-Composite” is highly discouraged as it is causes problems when updating the model for rehabilitation, repair or other condition changes.

Dead loads to be used in load rating of existing structures shall include the existing loads as noted in the plans and inspection report. Wearing surface dead load shall be based on the thickness of wearing surface noted on the most recent inspection report.

When material unit weights are not listed on the plans, dead load calculations shall be in accordance with *Table 3.5.1-1* of the most current edition of the *AASHTO LRFD Bridge Design Specifications* except as listed in *Table 6A.2.2.1-1*. Unit weight for concrete with a strength greater than 5.0 ksi shall be increased from 0.150 kcf and calculated per the equation in *Table 3.5.1-1* of the most current edition of the *AASHTO LRFD Bridge Design Specifications.* The modulus of elasticity for LRFD should be recomputed in BrR for the adjusted unit weight.

Table 6A.2.2.1-1 Generic Material Unit Weights

Material	Unit Weight (kcf)
Asphalt Wearing Surface	0.140
Epoxy and PPC Overlay Material	0.135
Granular Fill	0.125
Concrete	0.150

Dead loads to be used in the load rating submitted with the Final and PS&E package for a new bridge shall include the future loads that were included in the bridge design and plans. Once construction has been completed, the load rating shall be updated by the bridge designer to reflect the as-built conditions and future loads will be removed from the load rating.

Only vertical load effects shall be considered in the load rating analysis, typically no consideration should be given to transverse loading. Composite dead loads shall be equally distributed to all girders for bridges meeting the provisions of the *AASHTO LRFD Bridge Design Specifications* Article 4.6.2.2 that have cast-in-place composite decks. Non-composite dead loads shall be distributed by tributary area.

For bridges constructed with precast elements connected by shear keys, weld tabs, and/or tie rods, and also for voided slabs with UHPC joints, it shall be assumed that the connectivity is only enough to prevent relative vertical displacement at the interface and no distribution of dead loads shall be allowed. The exception is parapet load which can be distributed assuming 60% to the exterior girder and 40% to the adjacent interior girder in accordance with Idaho Bridge Design Manual Article 4.6.2.2. Special circumstances may warrant dead load distribution in a manner different than described above. Permission for an alternate dead load distribution shall be obtained from the ITD Load Rating Engineer.

For Deck Bulb-Tee girders connected by UHPC or generic equivalent filled shear keys, parapet and dead loads placed after the closure pour can be distributed to all girders.

For steel bridges composed of rolled shapes or welded plate girders, girder self-weight loads shall be increased by five percent if plans are available. The self-weight of cross frames, stiffeners, splices, and all other miscellaneous steel components shall be increased by ten percent. For built-up steel members, the self-weight loads shall be increased by ten percent. The intent of the self-weight increase is to account for incidental items such as bolts and rivets. Weights of items such as stiffeners and splice plates must be put into the BrR model as member loads.

For steel bridge ratings based on bridge measurements from field sketches, the steel self-weight loads shall be increased by ten percent.

For steel trusses with member forces listed on the plans, self-weight loads shall be increased by a percentage that causes the load rating model to see dead load forces as close to those shown on the plans as possible. When trusses are entered into BrR, the program only calculates the self-weight of the truss members. Additional weight from batten plates, lacing bars, rivets, etc. should be calculated and added as a percentage to the truss self-weight *plus* an additional ten percent increase.

6A.2.2.3—Load Factors

Load factors for permanent loads are as given in *Table 6A.4.2.2-1*. The load factor, γ_{DW}, for field-measured wearing surfaces shall be taken as 1.50.

6A.2.3—Transient Loads

Wind load, temperature effects, earthquake effects, creep, and shrinkage effects are not typically considered during load ratings. Pedestrian live loads shall not be considered simultaneously with vehicular loads.

6A.2.3.1—Vehicular Live Loads (Gravity Loads): *LL*

The live load models for LRFR load ratings shall be evaluated under the rating criteria listed in *Table 6A.2.3.1-1* or *Table 6A.2.3.1-2.* Schematics of the Idaho trucks can be found in *Appendix 6.2.1—Idaho Legal Truck Schematics*, and *Appendix 6.2.2—121Kip Truck Schematic*.

Table 6A.2.3.1-1 Required Rating Results for LRFR

Live Load	Inventory Rating	Operating Rating	Legal Rating	Permit Rating
HL - 93 (English Units)	X	X		
Idaho Type 3			X	X
Idaho Type 3S2			X	X
Idaho Type 3-3			X	X
Idaho 121 kip			X	X
NRL			X[a]	X[a]
EV2			X[b]	X[b]
EV3			X[b]	X[b]

[a] If the legal and/or permit rating for the NRL is less than 1.0, the legal and/or permit tonnages for the SU4, SU5, SU6, and SU7 vehicles must be reported on the LRS.

[b] Ratings needed for EV2, EV3 on bridges on interstate and all public bridges within one road mile of an interstate interchange.

6A.4—LOAD RATING PROCEDURES

6A.4.1—Introduction

LRFR ratings shall be reported in rating factors and rating tonnages as shown on the LRS in *Appendix 6.1.1*.

6A.4.2—General Load Rating Equation

6A.4.2.2—Limit States

Table 6A.4.2.2-1 Limit States and Load Factors for Load Rating

Bridge Type	Limit State[a]	Dead Load	Dead Load[b]	Design Load		Legal Load	Permit Load
				Inventory	Operating		
		γ_{DC}	γ_{DW}	γ_{LL}	γ_{LL}	γ_{LL}	γ_{LL}
Steel	Strength I	1.25	1.50	1.75	1.35	MBE Tables 6A.4.4.2.3a-1 and 6A.4.4.2.3b-1	--
	Strength II	1.25	1.50	--	--	--	MBE Table 6A.4.5.4.2a-1
	Service II	1.00	1.00	1.30	1.00	1.30	1.00[c]
	Fatigue[d]	0.00	0.00	--	--	--	--
Reinforced Concrete	Strength I	1.25	1.50	1.75	1.35	MBE Tables 6A.4.4.2.3a-1 and 6A.4.4.2.3b-1 γ_{LL} = 2.0 for Box and Stiffleg Culverts	--
	Strength II	1.25	1.50	--	--	--	MBE Table 6A.4.5.4.2a-1
	Service I[e]	1.00	1.00	--	--	--	1.00[c]
Prestressed Concrete	Strength I	1.25	1.50	1.75	1.35	MBE Tables 6A.4.4.2.3a-1 and 6A.4.4.2.3b-1	--
	Strength II	1.25	1.50	--	--	--	MBE Table 6A.4.5.4.2a-1
	Service III	1.00	1.00	*[f]	--	1.00 [c, g]	--
	Service I	1.00	1.00	--	--	--	1.00[c]
Wood	Strength I	1.25	1.50	1.75	1.35	MBE Tables 6A.4.4.2.3a-1 and 6A.4.4.2.3b-1	--
	Strength II	1.25	1.50	--	--	--	MBE Table 6A.4.5.4.2a-1

[a] Defined in the AASHTO LRFD Bridge Design Specifications.

[b] The load factor for DW at the strength limit state shall be taken at 1.50, even though the wearing surface is field measured on all ITD structures.

[c] Shaded cells of the table indicate optional checks. All optional Legal and Permit Load checks shall use the live load factor shown in *Table 6A.4.2.2-1*.

[d] The fatigue limit state for Steel need not be checked.

[e] Service I is used to check the $0.9F_y$ stress limit in reinforcing steel.

[f] 1.0 for prestressed concrete designed using refined time dependent losses, 0.8 for all other prestressed concrete
[g] Concrete tensile stress for prestressed concrete girders need not be checked for Legal Loads.

6A.4.2.3—Condition Factor: φ_c

Use $\varphi_c = 1.0$ for bridge components that have NBI ratings in accordance with *Table 6A.4.2.3-1*.

Table 6A.4.2.3-1 NBI Coding Thresholds for Use of $\varphi_c = 1.0$

NBI Item	NBI Coding
(58) Deck	5 or greater
(59) Superstructure	5 or greater
(60) Substructure	5 or greater
(62) Culvert	6 or greater

The BAM load rating staff may assign a value of φ_c less than 1.0 for a bridge component if the NBI coding is not in accordance with *Table 6A.4.2.3-1*. Consultant load rating engineers shall use $\varphi_c = 1.0$ in the load rating model. If the NBI coding for a bridge is not in accordance with *Table 6A.4.2.3-1*, a note should be made in the remarks on the LRS form.

6A.5—CONCRETE STRUCTURES

For specifics on the rating models for concrete members, see the following articles:
6.0.7.1 – Prestressed Girders
6.0.7.3 – Reinforced Concrete Girders
6.0.7.4 – Reinforced Concrete Frames and Box Structures

6A.5.8—Evaluation for Shear

Reinforced concrete and prestressed bridge members shall be evaluated for shear for the design live loads, state legal live loads, and permit live loads.

The preferred setting for the Shear Computation Method under the LRFR Control Options in the *BrR*™ model is General Procedure Appendix B5. ,

6A.5.12—Rating of Reinforced Concrete Box Culverts

Refer to *Article 6.0.7.4.*

6A.6—STEEL STRUCTURES

For specifics on the rating models for steel members, see the following articles:

Article 6.0.7.2 – Steel Girders
Article 6.0.7.5 – Corrugated Metal Decks and Concrete Filled Grid Decks

6A.8—POSTING OF BRIDGES

Posting decisions are not made based on LRFR. See *Article 6B.7* for posting procedures.

PART B—ALLOWABLE STRESS RATING AND LOAD FACTOR RATING

6B.5—NOMINAL CAPACITY: *C*

6B.5.2—Allowable Stress Method

6B.5.2.7—Timber

When timber properties are not provided, beam stresses shall be based on values listed for the wood type in the *National Design Specification for Wood Construction* (NDS) referenced in the *AASHTO Standard Specifications for Highway Bridges, 17th Edition*. If the species is not indicated in the plans or field sketches, Western Larch or Douglas Fir shall be assumed. For treated lumber, coastal region Douglas Fir – Larch shall be assumed. Timber stresses shall be based on the West Coast Lumber Inspection Bureau (WCLIB) rules for grading. If not provided, timber Number 1 commercial grade shall be assumed for the girders, and Number 2 commercial grade for decks. Default glue-lam will be assumed 20F-V3 western species. If there are site specific bridge plans showing bridge was designed and constructed by U.S. Forest Service, utilize the applicable timber design values from the AASHTO Standard Specs. Determine applicable timber design values from the year that the bridge was designed and per the grade of wood called out on the drawings.

Prior to 1970, the published allowable tension stress parallel to grain in the bottom laminations was overestimated in glued laminated beams. American Institute of Timber Construction issued Technical Note 26 that modified the allowable tension parallel to grain and the modulus of elasticity. Design values for Glued Laminated constructed prior to 1970 shall be modified based on the AITC Technical Note 26. AITC Technical Note 26 can be downloaded from the American Institute of Timber Construction website at: https://aitc-glulam.org/index.php/technical-notes.

Deads loads should be distributed to girders by tributary area for bridges with timber decks.

Without further information or more refined analysis, the Live Load Distribution Factor (LLDF) for engineered lumber stress-laminated deck Tee-beams with post-tension rods connections should be determined as described below:

Use LLDF = 0.5 flexure and shear, if the following conditions are met based on the latest Inspection Report:

- No post-tensioning rods are missing.
- No more than 25% of the rods show signs of loss of tension or being loose.
- There are no signs of differential movement of adjacent beams (i.e. reflecting cracking in the wearing surface, observed differential deflection when traffic crosses the bridge, etc.)
- The girders are in good condition and do not show signs of distress.
- There are no other conditions that may result in loss of post-tension force (ie sign of fire damage, rusting of the rods, rot that would affect the post-tensioning, etc)

Use a LLDF = 1.0 for bridges not meeting the criteria above

6B.5.3—Load Factor Method

6B.5.3.1—Structural Steel

When steel properties are not provided, the following yield strength, F_y, shall be used:

Table 6B.5.3.1-1Yield Strength Based on Year of Construction

Year of Construction	F_y (psi)
Prior to 1905	26,000
1905 to 1935	30,000
1936 to 1963	33,000
After 1963	36,000

6B.5.3.2—Reinforced Concrete

For specifics on the rating models for reinforced concrete members, see the following articles:
6.0.7.3 – Reinforced Concrete Girders
6.0.7.4 – Reinforced Concrete Frames and Box Structures

When reinforcing steel properties are not provided, the following yield strength, f_y, shall be used:

Table 6B.5.3.2-1 Yield Strength by Type of Reinforcing Steel

Type of Reinforcing Steel	f_y (psi)
Unknown prior to 1954	33,000
Structural Grade	36,000
Billet or Intermediate Grade or Unknown after 1954 (Grade 40)	40,000
Rail or Hard Grade (Grade 50)	50,000
Grade 60	60,000

When concrete properties are not provided, the following ultimate strength, f'_c, shall be used:

Table 6B.5.3.2-2 Ultimate Strength by Year of Construction

Year of Construction	f'_c (psi)
Prior to 1959	2,500
1959 and later	3,000

6B.5.3.3—Prestressed Concrete

For specifics on the rating models for prestressed concrete members, see *Article 6.0.7.1*. When prestressed concrete properties are not provided, the following ultimate strength, f'_c, shall be used:

Table 6B.5.3.3-1 Ultimate Strength by Year of Construction for Prestressed Concrete

Year of Construction	f'_c (psi)
Prior to 1959	3,000
1959 and later	3,500

When the type of prestressing strand is unknown, stress relieved strands should be assumed and the following tensile strength, f_{pu}, shall be used:

Table 6B.5.3.3-2 Tensile Strength by Year of Construction for Prestressed Concrete

Year of Construction	f_{pu} (psi)
Prior to 1963	232
1963 and later	250

For prestressed concrete girders with wide top flanges, determine the effective flange width according to Article 9.8.3 of the *AASHTO Standard Specifications for Highway Bridges, 17th Edition,* except that the effective web width shall be equal to the web thickness plus the fillet on each side.

6B.6—LOADINGS

Wind load, temperature effects, earthquake effects, creep, and shrinkage effects are typically not considered during load ratings. Pedestrian live loads shall not be considered simultaneously with vehicular loads.

6B.6.1—Dead Load: *D*

The provisions of *Article 6A.2.2.1* shall apply for Load Factor and Allowable Stress Ratings.

6B.6.2—Rating Live Load

The live load models for LFR and ASR load ratings shall be evaluated under the rating criteria listed in *Table 6B.6.2-1*. Schematics of the Idaho trucks can be found in *Appendix 6.2.1 (*Idaho Type 3, 3S2, and 3-3*)* and *Appendix 6.2.2 (*121Kip truck*)*.

Table 6B.6.2-1 Required Rating Results for ASR and LFR

Live Load	Inventory Rating	Operating Rating
Design Truck Shown on Plans[a]	X	X
HS-20	X	X
Idaho Type 3	X	X
Idaho Type 3S2	X	X
Idaho Type 3-3	X	X
Idaho 121 kip	X	X
NRL	X	X[b]
EV2	X[c]	X[c]
EV3	X[c]	X[c]

[a] If the design truck shown on the plans is the HS-20, this line shall be left blank on the LRS form. For structures designed for HL-93, the LFR load rating summary should show HS-25 on this line.

[b] If the operating rating for the NRL is less than 1.0, operating tonnages for the SU4, SU5, SU6, and SU7 vehicles must be reported on the LRS.

[c] Ratings needed for EV2, EV3 on bridges on interstate and all public bridges within one road mile of an interstate interchange.

6B.6.2.2—Truck Loads

Roadway widths less than 20 feet shall be rated for one lane of traffic.

6B.6.3—Distribution of Loads

The live load bending moment for each interior stringer shall be determined by applying to the stringer the fraction of a wheel load (both front and rear) determined in Table 6B.6.3-1.

The AASHTO Standard Specification for Highway Bridges, 17th edition Article 16.8.5.4 requires three-sided precast structures (stiffleg culverts) to be analyzed independently assuming no shear or stress transfer between sections. For structures with less than 2 feet of fill, the live load distribution width (E) shall be calculated in accordance with AASHTO Article 3.24.3; however, the distribution width is limited to one unit when the precast segment width is greater than 7’-8”. For structures with cover 2 feet or greater, the live load is distributed in accordance with Article 6.4, and is assumed to be transferred across the joints thru the fill.

Table 6B.6.3-1 Distribution of Wheel Loads in Longitudinal Beams

Kind of Floor	Timber Deck Type	Deck Thickness	One Traffic Lane	Two or More Traffic Lanes
Timber[a]	Plank[b]	Any	S/4.0	S/3.75
	Nail Laminated[c]	4" thick or multiple layer[d] floors over 5" thick	S/4.5	S/4.0
		6" or more thick	S/5.0 If S exceeds 5' use footnote f.	S/4.25 If S exceeds 6.5' use footnote f.
	Glued Laminated[e] Panels on Glued Laminated Stringers	4" thick	S/4.5	S/4.0
		6" or more thick	S/6.0 If S exceeds 6' use footnote f.	S/5.0 If S exceeds 7.5' use footnote f.
	Glued Laminated Panels on Steel Stringers	4" thick	S/4.5	S/4.0
		6" or more thick	S/5.25 If S exceeds 5.5' use footnote f.	S/4.5 If S exceeds 7' use footnote f.
Kind of Floor	**Beam Type**		**One Traffic Lane**	**Two or More Traffic Lanes**
Concrete	Steel I-Beam stringers[g] and prestressed concrete girder		S/7.0 If S exceeds 10' use footnote f.	S/5.5 If S exceeds 14' use footnote f.
	Concrete T-Beams		S/6.5 If S exceeds 6' use footnote f.	S/6.0 If S exceeds 10' use footnote f.
	Timber stringers		S/6.0 If S exceeds 6' use footnote f.	S/5.0 If S exceeds 10' use footnote f.
	Concrete box girders[h]		S/8.0 If S exceeds 12' use footnote f.	S/7.0 If S exceeds 16' use footnote f.
	Steel box girders		See 2002 AASHTO Standard Specifications for Highway Bridges, Article 10.39.2.	
	Prestressed concrete spread box beams		See 2002 AASHTO Standard Specifications for Highway Bridges, Article 3.28.	

S = average stringer spacing in feet.

[a, b, c, d, e, f, g, h, I] For corresponding footnotes, refer to the 2002 AASHTO Standard Specifications for Highway Bridges, Table 3.23.1

Table 6B.6.3-1 (Continued) Distribution of Wheel Loads in Longitudinal Beams

Kind of Floor	Deck Thickness	One Traffic Lane	Two or More Traffic Lanes
Steel Grid	Less than 4" thick	S/4.5	S/4.0
	4" or more thick	S/6.0 If S exceeds 6' use footnote f.	S/5.0 If S exceeds 10.5' use footnote f.
Kind of Floor	**Corrugation Depth**	**One Traffic Lane**	**Two or More Traffic Lanes**
Steel bridge corrugated plank[i]	2" min. depth	S/5.5	S/4.5

S = average stringer spacing in feet.

[a, b, c, d, e, f, g, h, I] For corresponding footnotes, refer to the 2002 AASHTO Standard Specifications for Highway Bridges, Table 3.23.1

6B.7—POSTING OF BRIDGES

6B.7.1—General

If load rating calculations indicate that any of the State legal loads, EV (if applicable), or SHV loads has an operating rating factor less than 1.0, then the bridge must be load posted for weight restrictions. For a schematic of the Idaho Load Posting trucks see *Appendix 6.2.1*.

ITD and consultant load raters shall routinely load rate state and local government structures and develop recommendations for weight restrictions. Recommendations are to be submitted to the BAME and entered into a database containing all bridge inspection information for each structure (*BrM*™). Recommended postings shall be compared with actual postings to verify whether the structure is properly posted for weight restrictions. If a structure is not properly posted, the procedures outlined in *Articles 6B.7.1.1* and *6B.7.1.2* shall be used.

Bridges not capable of carrying a minimum gross live load weight of three tons at the operating level must be closed.

The authority and responsibility of Bridge Owners to post or restrict bridges is outlined in the following regulations:

- Idaho Statute 40-619
- Idaho Statute 40-1206
- Idaho Statute 40-1207
- 23 CFR 650.307
- 23 CFR 650.313

In situations where a local Bridge Owner does not post or close a bridge in accordance with the policies outlined in the IMBE, ITD may have to take actions to ensure the public's safety on locally owned highway bridges.

6B.7.1.1—Posting and Closure Procedures of ITD Maintained Structures

When an ITD structure requires closure or load restrictions, and signage and/or barricades are not yet installed or properly installed, the following procedure shall be followed:

1. Notification—The District Engineer and Maintenance Engineer are notified of the posting or closure requirements via phone call or e-mail from the BAME or designee. As a follow-up, a letter prepared by the BAM Engineer is sent

to the District detailing required actions. If load posting is required, the letter shall also contain schematics of the required signs.

2. Action—The District Engineer shall be required to perform the necessary actions to properly load post or close the structure. Bridge closure shall occur within 2 days of notification and load posting shall occur within 10 days. A representative from the District is required to contact the BAME when the posting signs or barricades have been installed. Once BAM is notified that the proper signs and/or barricades have been installed, the *BrM*™ database shall be updated to reflect the actual posting tonnages or closure.

3. Follow Up—If BAM is not notified of compliance within the required timeframes, the District shall be contacted again by either e-mail or phone. The bridge shall be added to the Critical Deficiency Tracking System and continue to be monitored in accordance with *Article 4.8.1.4.4*. The bridge inspector confirms signs are in place and correct at all routine bridge inspections.

6B.7.1.2—Posting and Closure Procedures of Locally Owned Structures

When a locally owned structure requires closure or load restrictions, and signage and/or barricades are not yet installed or properly installed, the following procedures shall be followed:

1. Notification— The local agency shall be notified via phone call or email from the BAM Engineer or designee if closure is required. A letter prepared by the BAME shall be sent to the local agency detailing required actions. If load posting is required, the letter shall also contain schematics of the required signs.

2. Action—The local agency shall be required to perform the necessary actions to properly post or close the structure. Bridge closure shall occur within 5 days of notification and posting within 30 days. Certain unforeseen circumstances such as weather-related events may legitimately preclude the local agency from meeting these timelines. In that case the BAM and local agency shall agree to a reasonable date for the posting or closure. The local agency is required to contact the BAME when the posting signs or barricades have been installed.

3. Follow Up—If the local agency fails to notify BAM within the timeframes identified above, a follow-up letter shall be sent by the BAME. At this point the bridge shall be added to the Critical Deficiency Tracking System and shall continue to be monitored in accordance with *Article 4.8.1.4.5*. If the local agency fails to notify BAM within 5 business days that corrective action has been taken, a second follow-up letter shall be sent by the Chief Engineer or designee. This letter shall inform the local agency that Federal and State funds may be suspended until appropriate corrective actions are taken. The FHWA Division Administrator and LHTAC shall be copied on the letter in addition to appropriate ITD personnel. Additionally, the LHTAC Administrator shall be contacted and either he/she or designee shall follow-up with local highway agency personnel and offer assistance to get the bridge properly posted or closed.

Once BAM is notified that the proper signs and/or barricades have been installed, the *BrM*™ database shall be updated to reflect the actual posting tonnages or closure. The bridge inspector confirms proper signs are in place and correct at all routine bridge inspections.

6B.7.1.3—Emergency Posting of Weight Restrictions on Structures

In case of an emergency, the District Engineer or designee shall take the necessary steps to protect the public safety. Examples of emergencies are collision, flood, or fire damage.

Corrective action may be required prior to a complete evaluation by BAM or Bridge Design. Such action may consist of restricting the traffic to certain lanes or posting the structure for no trucks, or only trucks below a specified gross weight.

The offices of Ports of Entry, Motor Carrier, and over legal permits should immediately be verbally notified with a follow-up notification in writing of any temporary restrictions on the State Highway system as well as the time the restrictions are lifted or modified.

6B.7.2—Posting Loads

ITD State legal loads are as shown in *Appendix 6.2.1*.

6B.7.3—Posting Analysis

If load rating calculations indicate that any of the State legal loads, EV (if applicable), or SHV loads has an operating rating factor less than 1.0, the bridge must be load posted for weight restrictions. The bridge shall be posted based on the procedures detailed in *Articles 6B.7.1.1, 6B.7.1.2*, and *6B.7.1.3*. The safe load posting shall be based on *Equation 6B.7.3-1*.

Safe Posting Load = (RF) W *(6B.7.3-1)*
RF = Legal load rating factor
W = Weight of rating vehicle

6B.7.4—Regulatory Signs

Load posting signs shall be in accordance with *R12-5* and *R12-6B* as shown in the most current version of the *Idaho Transportation Department Sign Chart*. Closure barricades should conform to *Article 2B.67 of the MUTCD.*
The tonnage listed on the weight limit sign (*R12-5*) will be in accordance with the *Table 6B.7.4-1*.

Table 6B.7.4-1

Vehicle	Tonnage
 Single Unit Vehicle	Lower of the safe posting load of the Idaho Type 3, SU4, SU5, SU6, SU7, EV2, EV3, or 27 tons
 Semi Tractor-Trailer Combination	Lower of the safe posting load for the Idaho Type 3S2 or 42 tons
 Truck-Trailer Combination	Lower of the safe posting load for the Idaho Type 3-3 or 45 tons

The tonnage listed on the axle limit sign (*R12-6*) will be the greater of the following, rounded down to the nearest tenth of a ton:

- OR Idaho Type 3 x (9.45 / 27)
- OR Idaho Type 3S2 x (8.75 / 42)
- OR Idaho Type 3-3 x (7.0 / 45)

The weight of the maximum axle on the Idaho Type 3, Idaho Type 3S2, and Idaho Type 3-3 is 9.45 tons, 8.75 tons, and 7.0 tons respectively.

6C.1—REFERENCES

AASHTO Standard Specifications for Highway Bridges, 17th Edition, 2002

Current editions of:

AASHTO Manual for Bridge Evaluation

Idaho Transportation Department Bridge Design LRFD Manual (BDM)

AASHTO LRFD Bridge Design Specification

Manual on Uniform Traffic Control Devices

LRFR BRIDGE LOAD RATING SUMMARY

rev. 1/26/2024
Page 1

Bridge Key No.	Structure Name	(27) Year Built	(106) Year Reconstruct	Inspection Date	Inventory Data Date
21081	X996220 1.11	2020	N/A	11/9/2020	3/29/2022

(9) Bridge Location	(7) Facility Carried	(6a) Feature Intersected	Drawing Number
2.7 W ASHTON	E 1300 N	HENRYS FK SNAKE RIVER	17452

(49) Length	(11)Milepost	(2) District	(3) County	(22) Owner	Administrative Jurisdiction
483 ft.	1.109	6	Fremont	County Highway Agency	Fremont County

(45, 43a, 43b) Bridge Description	(31) Design Load (per SI&A)	Granular WS	Asphalt WS	Concrete WS	Timber WS
4 Span Prestressed Concrete Stringer/Girder	HL-93	N/A in.	N/A in.	N/A in.	N/A in.

Rating Program & Version	Rating Method	AASHTO Reference
BrR 7.1.1 - AASHTO Engine	LRFR	The Manual for Bridge Evaluation, Third Edition, 2011

(58) Deck	(59) Superstructure	(60) Substructure	(62) Culvert	(113) Scour Critical
9 Excellent	9 Excellent	9 Excellent	N N/A (NBI)	8 Stable Above Footing

(30) ADT Year	(29) ADT	(109) Truck % ADT	ADTT (ADT x Truck % ADT)	(19) Detour Length	Year Programmed
2020	504	3	15	2	N/A

INVENTORY AND OPERATING LOAD RATINGS

Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
HL-93 (Truck + Lane Ctrls.)	Inventory	36	G1 - Ext. Gir.	2.5	SERVICE-III PS Tensile Stress	1.36	48
HL-93 (Truck + Lane Ctrls.)	Operating	36	G1 - Ext. Gir.	1.5	STRENGTH-I Concrete Flexure	1.78	64

This LRFR Load Rating is based on: ☐ Design Plans ☑ Design Plans & Approved Shop Drawings ☐ Other (Please explain in Remarks)

Load Rating Engineer		Checker		Quality Control Engineer	
Name:		Name:		Name:	
Company:		Company:		Company:	
Date:		Date:		Date:	

Remarks:

*Load rating performed for the girders only.
*Composite dead load was distributed equally to all girders.
*No wearing surface per the design plans.
*The load rating was limited to vertical load effects only.
*Prestressing strand reinforcement was input into BrR using the strand locations given in the girder shop drawings.
*Lump sum girder losses were in accordance with the design drawings.

Insert Stamp

The information below is filled out once the ADTT data is entered onto the inspection report. If this bridge has not yet had the initial inspection (i.e. bridge is under development) leave the information below blank. The ADTT value listed below is to be used to establish Legal and Permit γ_{LL} factors.

(30) ADT Year	(29) ADT	(109) Truck % ADT	ADTT (ADT x Truck % ADT)	Legal and Permit Ratings Completed by Name:
2020	504	3	15	

Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
Idaho - Type 3	Legal	27	G1 - Ext. Gir.	1.5	STRENGTH-I Concrete Flexure	3.22	86
Idaho - Type 3S2	Legal	39.5	G1 - Ext. Gir.	1.5	STRENGTH-I Concrete Flexure	2.77	109
Idaho - Type 3-3	Legal	39.5	G1 - Ext. Gir.	1.5	STRENGTH-I Concrete Flexure	2.69	106
Idaho - 121k	Legal	60.5	G1 - Ext. Gir.	1.5	STRENGTH-I Concrete Flexure	2.17	131
NRL	Legal	40	G1 - Ext. Gir.	1.5	STRENGTH-I Concrete Flexure	2.28	91
Idaho - Type 3	Permit	27	G1 - Ext. Gir.	1.5	STRENGTH-II Concrete Flexure	4.18	112
Idaho - Type 3S2	Permit	39.5	G1 - Ext. Gir.	1.5	STRENGTH-II Concrete Flexure	3.60	142
Idaho - Type 3-3	Permit	39.5	G1 - Ext. Gir.	1.5	STRENGTH-II Concrete Flexure	3.49	137
Idaho - 121k	Permit	60.5	G1 - Ext. Gir.	1.5	STRENGTH-II Concrete Flexure	2.82	170
NRL	Permit	40	G1 - Ext. Gir.	1.5	STRENGTH-II Concrete Flexure	2.96	118

BRIDGE LOAD RATING SUMMARY

Controlling Truck	Bridge Factor	Bridge Color	Load Posting Required?	Max Axle Weight if Posting Req.
Idaho - Type 3-3	1328	Interstate	No	N/A

LRFR BRIDGE LOAD RATING SUMMARY

Bridge Key No.	Structure Name	(27) Year Built	(106) Year Reconstruct	Inspection Date	Inventory Data Date
21081	X996220 1.11	2020	N/A	11/9/2020	3/29/2022

(9) Bridge Location	(7) Facility Carried	(6a) Feature Intersected	Drawing Number
2.7 W ASHTON	E 1300 N	HENRYS FK SNAKE RIVER	17452

(49) Length	(11)Milepost	(2) District	(3) County	(22) Owner	Administrative Jurisdiction
483 ft.	1.109	6	Fremont	County Highway Agency	Fremont County

(45, 43a, 43b) Bridge Description	(31) Design Load (per SI&A)	Granular WS	Asphalt WS	Concrete WS	Timber WS
4 Span Prestressed Concrete Stringer/Girder	HL-93	N/A in.	N/A in.	N/A in.	N/A in.

Rating Program & Version	Rating Method	AASHTO Reference
BrR 7.1.1 - AASHTO Engine	LRFR	The Manual for Bridge Evaluation, Third Edition, 2018

(58) Deck	(59) Superstructure	(60) Substructure	(62) Culvert	(113) Scour Critical
9 Excellent	9 Excellent	9 Excellent	N N/A (NBI)	8 Stable Above Footing

(30) ADT Year	(29) ADT	(109) Truck % ADT	ADTT (ADT x Truck % ADT)	(19) Detour Length	Year Programmed
2020	504	3	15	2	N/A

LEGAL RATINGS - Specialized Hauling Vehicles (SHV)

(Fill in the below SHV Legal Ratings only when Legal Rating Factor for NRL is less than 1.0)

Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
SU4	Legal	27					0
SU5	Legal	31					0
SU6	Legal	34.75					0
SU7	Legal	38.75					0

LEGAL RATINGS - Emergency Vehicles (EV)

(Fill in the below EV Legal Ratings only when bridge is within one mile of Interstate System)

Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
EV2	Legal	28.75					0
EV3	Legal	43					0

PERMIT RATINGS - Specialized Hauling Vehicles (SHV)

(Fill in the below SHV Permit Ratings only when Permit Rating Factor for NRL is less than 1.0)

Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
SU4	Permit	27					0
SU5	Permit	31					0
SU6	Permit	34.75					0
SU7	Permit	38.75					0

Additional Remarks:

LRFR Load Rating Summary Form Directions

There are many pull down menus available in the form. Please use these when possible. However, if the desired value cannot be found on the pull down menu it can be typed into the cell.

Section 1: General Bridge Data

- Type in the bridge key number under the Dynamic Inventory tab. The data for the rest of the fields will automatically populate based on a link to the Pontis file. Do not change any of these cells manually in the Dynamic Inventory tab, except for the Rating Program & Version. For NBI items, the NBI item numbers are included in the cell title for easy reference.
- Copy the data from the Dynamic Inventory tab (Cells B1:K14) and use "Paste, Values" starting in cell B5 of the Summary tab.
- If the rating is for a structure that has not yet been built, fill in just the bridge key number and leave the rest blank. The unknown data will be completed once the structure is built and has been inventoried by the Bridge Inspector.
- For load rating updates, you will be prompted to update the bridge data when you open it. Select to update.
- Any values on the Dynamic Inventory tab that have changed since the Summary sheet was made will be highlighted in red.
- Recopy the information from the Dynamic Inventory tab (Cells B1:K14) and paste values into the Summary tab starting in cell B5.

Section 2: Inventory and Operating Load Ratings

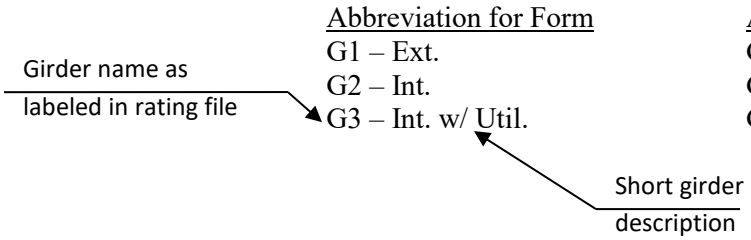
- Once you have run all of the superstructure definitions and members defined in BrR, you will copy the results directly from BrR into the Results tab in the LRS spreadsheet. The Results tab is set up to determine the controlling rating for each rating vehicle. For each member, perform the following steps:
    - Select "Tabular Results" in BrR
    - Change "Display Format" to "Single rating level per row"
    - Select Ctrl A and then Ctrl C
    - In the Results tab of the LRS spreadsheet, select the first box under live load, right click, and select paste
    - Change the Span number and Member name to correspond to the correct member
    - Repeat this process continuing to the right in the Results tab until all member results are included
    - The spreadsheet will determine the controlling ratings and populate the Summary tab accordingly
- The results for bridges that cannot be load rated in BrR should be directly input into the Summary tab.

Rating Vehicles

The rating vehicle shown on line one and two of this section of the LRS form shall be the HL-93 truck configuration that controls the rating (truck + lane, tandem + lane, or truck pair).

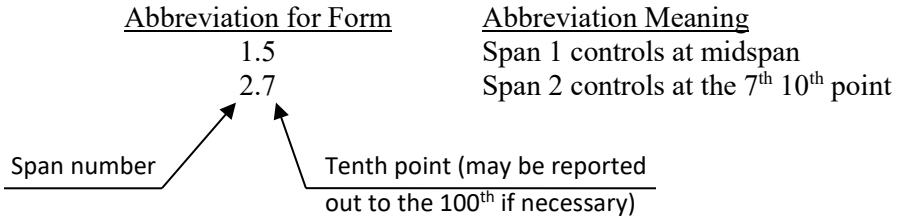
- Controlling Member

See the following examples for guidance on how to report the controlling member.



- Controlling Location

See the following example for guidance on how to report the controlling location.



- Rating (Tons)

This is automatically calculated based on the rating factor and tonnage of the rating vehicle.

- Load Rating Basis

Please indicate if the load rating is based on Design Plans, Design Plans and Approved Shop Drawings, or Other. When "Other" is used, provide an explanation in the remarks (e.g., Approved Shop Drawings only, or Field Measurements).

Section 3: Remarks and Signature

- There is a text box under remarks. Please fill this in with any assumptions that were made for the load rating. If needed, the bottom of page 2 of the LRS has extra room for additional remarks.
- Please fill in the information for the people that worked on the load rating.
- Please have a Professional Engineer licensed in the State of Idaho stamp the final copy. For load ratings completed prior to the inventory inspection, the stamp will only apply to the HL-93 ratings.

Section 4: Legal, Permit, and Emergency Vehicle (EV) Ratings

- Fill in the traffic data per the inspection report. The ADTT shown on the inspection report shall also be used to compute the Legal and Permit Live Load Factors (γ_{LL}) used in the load rating model.
- If the bridge has not had the inventory inspection, fill in the Legal and Permit Ratings based on the traffic data in the design plans. Once the inventory inspection is completed, the Legal and Permit Ratings shall be updated for any construction changes and updated traffic data shown on the inventory inspection report.
- The Legal and Permit rating vehicles shall be as shown on the LRS form.
- Legal and Permit rating results should be entered into the Results tab in the spreadsheet to populate the Summary following the same procedure as outlined in Section 2 above.
- If the Legal and/or Permit Rating Factor for the NRL truck is less than 1.0, refer to Section 7: Legal and Permit Ratings for Specialized Hauling Vehicle (SHV).
- Emergency vehicle rating (when applicable) Type EV2 & EV3 shall be reported as legal rating factor in the remarks. If the bridge requires Emergency Vehicle rating, the value shown after the text "Fast Act?" will be "1" and "Error" will be shown for the EV2 and EV3 rating factors if the Type EV2 and Type EV3 vehicles were not included in the results. If the bridge does not require Emergency Vehicle rating, the value shown after the test "Fast Act?" will be "0".

Section 5: Bridge Load Rating Summary

- All of the fields in this section are automatically calculated based on the ratings input in Section 4. These fields are related to ITD's over legal weight permit vehicle screening process and ITD's Route Capacity Map.

Section 6: General Bridge Data

- The General Bridge Data on page 2 of the LRS will automatically be populated once the General Bridge Data on page 1 is completed.

Section 7: Legal and Permit Ratings for Specialized Hauling Vehicle (SHV)

- If the Legal Rating Factor for the NRL truck is less than 1.0, the Legal Ratings for the four SHV trucks (SU4, SU5, SU6, and SU7) on page 2 of the LRS must be completed. If the Legal Rating Factor for the NRL truck is 1.0 or above, leave the Legal Ratings for the SHV blank.
- If the Permit Rating Factor for the NRL truck is less than 1.0, the Permit Ratings for the four SHV trucks on page 2 of the LRS must be completed. If the Permit Rating Factor for the NRL is 1.0 or above, leave Permit Ratings for the SHV blank.

ASR/LFR Bridge Load Rating Summary

rev. 1/26/2024

Bridge Key No.	Structure Name	(27) Year Built	(106) Year Reconstruct	Inspection Date	Inventory Data Date
21081	X996220 1.11	2020	N/A	11/9/2020	3/29/2022

(9) Bridge Location	(7) Facility Carried	(6a) Feature Intersected	Drawing Number
2.7 W ASHTON	E 1300 N	HENRYS FK SNAKE RIVER	17452

(49) Length	(11)Milepost	(2) District	(3) County	(22) Owner	Administrative Jurisdiction
483 ft	1.109	6	Fremont	County Highway Agency	Fremont County

(45, 43a, 43b) Bridge Description	(31) Design Load (per SI&A)	Granular WS	Asphalt WS	Concrete WS	Timber WS
4 Span Prestressed Concrete Stringer/Girder	HL-93	N/A in.	N/A in.	N/A in.	N/A in.

Rating Program & Version	Rating Method	AASHTO Reference
BrR 7.0 - AASHTO Engine	LFR	The Manual for Bridge Evaluation, Third Edition, 2018

(58) Deck	(59) Superstructure	(60) Substructure	(62) Culvert	(113) Scour Critical
9 Excellent	9 Excellent	9 Excellent	N N/A (NBI)	8 Stable Above Footing

(30) ADT Year	(29) ADT	(109) Truck % ADT	ADTT (ADT x Truck % ADT)	(19) Detour Length	Year Programmed
2020	504	3	15	2	N/A

INVENTORY RATINGS

Rating Vehicle	Controlling Configuration	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
HS-25	Truck	45	G3 - Int. Gir.	1.5	PS Tensile Stress - Concrete	1.14	51
HS-20	Truck	36	G3 - Int. Gir.	1.5	PS Tensile Stress - Concrete	1.43	51
Idaho - Type 3	Truck	27	G3 - Int. Gir.	1.5	PS Tensile Stress - Concrete	1.77	47
Idaho - Type 3S2	Truck	39.5	G3 - Int. Gir.	1.5	PS Tensile Stress - Concrete	1.52	60
Idaho - Type 3-3	Truck	39.5	G3 - Int. Gir.	1.5	PS Tensile Stress - Concrete	1.48	58
Idaho - 121k	Truck	60.5	G3 - Int. Gir.	1.5	PS Tensile Stress - Concrete	1.20	72
NRL	Truck	40	G3 - Int. Gir.	1.5	PS Tensile Stress - Concrete	1.25	50

OPERATING RATINGS

Rating Vehicle	Controlling Configuration	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
HS-25	Truck	45	G3 - Int. Gir.	1.5	Design Flexure - Concrete	2.31	103
HS-20	Truck	36	G3 - Int. Gir.	1.5	Design Flexure - Concrete	2.89	104
Idaho - Type 3	Truck	27	G3 - Int. Gir.	1.5	Design Flexure - Concrete	3.58	96
Idaho - Type 3S2	Truck	39.5	G3 - Int. Gir.	1.5	Design Flexure - Concrete	3.08	121
Idaho - Type 3-3	Truck	39.5	G3 - Int. Gir.	1.5	Design Flexure - Concrete	2.99	118
Idaho - 121k	Truck	60.5	G3 - Int. Gir.	1.5	Design Flexure - Concrete	2.41	145
NRL	Truck	40	G3 - Int. Gir.	1.5	Design Flexure - Concrete	2.53	101

BRIDGE LOAD RATING SUMMARY

Controlling Truck	Bridge Factor	Bridge Color	Load Posting Required?	Max Axle Weight if Posting Req.
Idaho - Type 3-3	1466	Interstate	No	N/A

Load Rating Engineer		Checker		Quality Control Engineer	
Name:		Name:		Name:	
Company:		Company:		Company:	
Date:		Date:		Date:	

Remarks:

*Load rating performed for the girders only.
*Composite dead load was distributed equally to all girders.
*No wearing surface per the design plans.
*The load rating was limited to vertical load effects only.
*Prestressing strand reinforcement was input into BrR using the strand locations given in the girder shop drawings.
*Lump sum girder losses were in accordance with the design drawings.
*The allowable concrete tension stress was limited to 3 x sqrt f'c for LFR Inventory Ratings.

ASR/LFR BRIDGE LOAD RATING SUMMARY

rev. 1/26/2024

Bridge Key No.	Structure Name	(27) Year Built	(106) Year Reconstruct	Inspection Date	Inventory Data Date
21081	X996220 1.11	2020	N/A	44144	44649

(9) Bridge Location	(7) Facility Carried	(6a) Feature Intersected	Drawing Number
2.7 W ASHTON	E 1300 N	HENRYS FK SNAKE RIVER	17452

(49) Length	(11)Milepost	(2) District	(3) County	(22) Owner	Administrative Jurisdiction
483 ft.	1.109	6	Fremont	County Highway Agency	Fremont County

(45, 43a, 43b) Bridge Description	(31) Design Load (per plans)	Granular WS	Asphalt WS	Concrete WS	Timber WS
4 Span Prestressed Concrete Stringer/Girder	HL-93	N/A in.	N/A in.	N/A in.	N/A in.

Rating Program & Version	Rating Method	AASHTO Reference
BrR 7.0 - AASHTO Engine	LFR	The Manual for Bridge Evaluation, Third Edition, 2018

(58) Deck	(59) Superstructure	(60) Substructure	(62) Culvert	(113) Scour Critical
9 Excellent	9 Excellent	9 Excellent	N N/A (NBI)	8 Stable Above Footing

(30) ADT Year	(29) ADT	(109) Truck % ADT	ADTT (ADT x Truck % ADT)	(19) Detour Length	Year Programmed
2020	504	3	15	2	N/A

OPERATING RATINGS - Specialized Hauling Vehicles (SHV)

(Fill in the below SHV OperatingRatings only when Operating Rating Factor for NRL is less than 1.0)

Rating Vehicle	Controlling Configuration	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
SU4	Truck	27					0
SU5	Truck	31					0
SU6	Truck	34.75					0
SU7	Truck	38.75					0

OPERATING RATINGS - Emergency Vehicles (EV)

(Fill in the below EV Operating Ratings only when bridge is within one mile of Interstate System)

Rating Vehicle	Controlling Configuration	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
EV2	Truck	28.75					0
EV3	Truck	43					0

POSTING

Vehicle	Schematic	Posting (Tons)
Single Unit		N/A
Semi Tractor-Trailer Combination		N/A
Truck-Trailer Combination		N/A
	Max Axle	N/A

Additional Remarks:

LFR Load Rating Summary Form Directions

There are many pull down menus available in the form. Please use these when possible. However, if the desired value cannot be found on the pull down menu it can be typed into the cell.

Section 1: General Bridge Data

- Type in the bridge key number under the Dynamic Inventory tab. The data for the rest of the fields will automatically populate based on a link to the Pontis file. Do not change any of these cells manually in the Dynamic Inventory tab, except for the Rating Program & Version. For NBI items, the NBI item numbers are included in the cell title for easy reference.
- Copy the data from the Dynamic Inventory tab (Cells B1:K14) and use "Paste, Values" starting in cell B5 of the Summary tab.
- If the rating is for a structure that has not yet been built, fill in just the bridge key number and leave the rest blank. The unknown data will be completed once the structure is built and has been inventoried by the Bridge Inspector.
- For load rating updates, you will be prompted to update the bridge data when you open it. Select to update.
- Any values on the Dynamic Inventory tab that have changed since the Summary sheet was made will be highlighted in red.
- Recopy the information from the Dynamic Inventory tab (Cells B1:K14) and paste values into the Summary tab starting in cell B5.

Section 2: Inventory Ratings

- Once you have run all of the superstructure definitions and members defined in BrR, you will copy the results directly from BrR into the Results tab in the LRS spreadsheet. The Results tab is set up to determine the controlling rating for each rating vehicle. For each member, perform the following steps:
    - Select "Tabular Results" in BrR
    - Change "Display Format" to "Single rating level per row"
    - Select Ctrl A and then Ctrl C
    - In the Results tab of the LRS spreadsheet, select the first box under live load, right click, and select paste
    - Change the Span number and Member name to correspond to the correct member
    - Repeat this process continuing to the right in the Results tab until all member results are included
    - The spreadsheet will determine the controlling ratings and populate the Summary tab accordingly
- The results for bridges that cannot be load rated in BrR should be directly input into the Summary tab.

Rating Vehicles

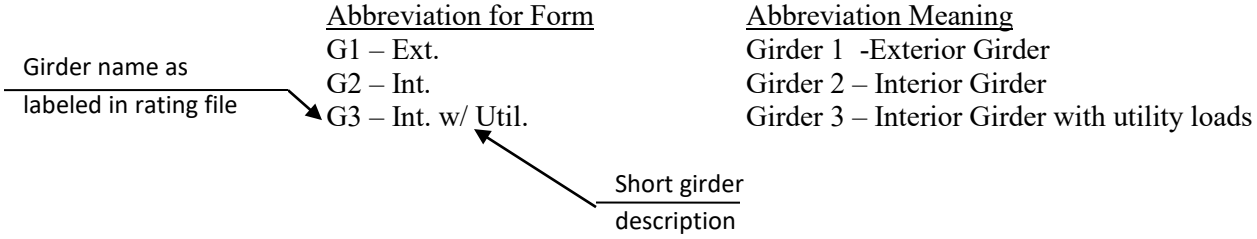
The rating vehicle shown on line one of the Inventory Ratings section of the LRS form shall be the design vehicle as shown on the plans. If the design vehicle is an HS-20 truck, this cell can be left blank. If the design is based on LRFD, the first line of the LFR summary should be HS-25. The rating vehicles on lines 2 thru 7 shall be as shown on the LRS form.

- Controlling Configuration

  The controlling configuration for the H or HS trucks shall be "Lane" if the lane load controls or "Truck" if the axle configuration controls.

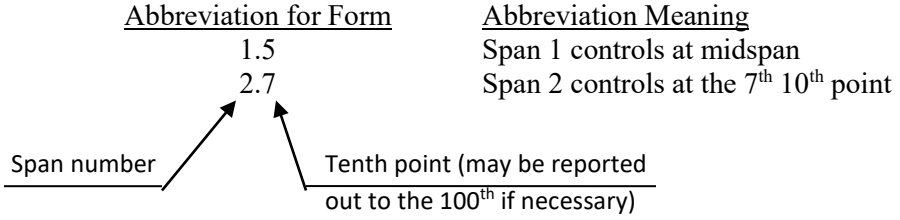
- Controlling Member

  See the following examples for guidance on how to report the controlling member.



- Controlling Location

  See the following example for guidance on how to report the controlling location.



- Rating (Tons)

  This is automatically calculated based on the rating factor and tonnage of the rating vehicle. The first line will highlight itself if an H truck is selected for the design truck in column 1 of the table. It will not be highlighted if anything other than an H truck is selected for the design truck in column one.

Section 3: Operating Ratings

- See Section 2: Inventory Ratings for directions on how to fill in required cells.

- If the Operating Rating Factor for the NRL truck is less 1.0, the SHV Operating Ratings on page 2 of the LRS must be completed. If the Operating Rating Factor for the NRL is 1.0 and above, it is not necessary to complete the SHV Operating Ratings.
- Emergency vehicle rating (when applicable) Type EV2 & EV3 shall be reported as legal rating factor in the remarks. If the bridge requires Emergency Vehicle rating, the value shown after the text "Fast Act?" will be "1" and "Error" will be shown for the EV2 and EV3 rating factors if the Type EV2 and Type EV3 vehicles were not included in the results. If the bridge does not require Emergency Vehicle rating, the value shown after the test "Fast Act?" will be "0".

Section 4: Bridge Load Rating Summary

- All of the fields in this section are automatically calculated based on the input in Section 3. These fields are related to ITD's overweight permit vehicle screening process and ITD's Route Capacity Map.

Section 5: Remarks and Signature

- There is a text box under remarks. Please fill this in with any assumptions that were made for the load rating. See below for example remarks.

*Girders were evaluated assuming simple span load distribution.
*Actual wearing surface thickness from the 2021 Inspection Report was input into the rating.
*The load rating was limited to the vertical load effects only.
* Timber was assumed to be Douglas-Fir Larch Grade L2D for the decking per Project Certification of Conformance and Douglas-Fir Larch Dense No. 1 for the girders.
*Assumed no intermediate diaphragms.

- Please fill in the information for the people that worked on the load rating.
- Please have a professional licensed engineer stamp the final copy.

Section 6: General Bridge Data

- The General Bridge Data on page 2 of the LRS will automatically be populated once the General Bridge Data on page 1 is completed.

Section 7: Operating Ratings for Specialized Hauling Vehicle (SHV)

- If the Operating Rating Factor for the NRL truck is less than 1.0, the Operating Ratings for the four SHV trucks (SU4, SU5, SU6, and SU7) on page 2 of the LRS must be completed. If the Operating Rating Factor for the NRL truck is 1.0 or above, leave the Operating Ratings for the SHV blank.

BRIDGE LOAD RATING SUMMARY
LOAD RATINGS BY ENGINEERING JUDGMENT

rev. 1/26/2024

Bridge Key No.	Structure Name	(27) Year Built	(106) Year Reconstruct	Insp. Date	Data Date
36200	X996330 0.99	1992	N/A	12/2/2020	5/25/2021

(9) Bridge Location	(7) Facility Carried	(6a) Feature Intersected
0.58 SW PLANO	W 4000 N	ST ANTHONY CANAL

(49) Length	(11)Milepost	(2) District	(3) County	(22) Owner	Administrative Jurisdiction
25 ft.	0.989	6	Madison	County Highway Agency	Madison County

(45, 43a, 43b) Bridge Description	(31) Design Load (per SI&A)	Granular WS	Asphalt WS	Concrete WS	Timber WS
1 Span Concrete Frame	HS-20	N/A in.	N/A in.	N/A in.	N/A in.

(58) Deck	(59) Superstructure	(60) Substructure	(62) Culvert	(113) Scour Critical
7 Good	7 Good	7 Good	N N/A (NBI)	8 Stable Above Footing

(30) ADT Year	(29) ADT	(109) Truck % ADT	ADTT (ADT x Truck % ADT)	(19) Detour Length	Year Prog.	Fast Act?
2020	10	1	0	99 mi.	N/A	No

DOCUMENT SEARCH FOR PLANS

All ITD resources were exhausted in the search for original structure plans (plan archives, inspection files, design files), but no design plans could be located.

ASSIGNED RATINGS

Rating Vehicle	Inventory Rating		Operating Rating	
	Factor	(Tons)	Factor	(Tons)
HS-20	0.5	18	0.86	30

Remarks:

Rating Factors assumed based on lowest of the Superstructure (NBI Item # 59) or Culvert (NBI Item # 62) per Table 6.1.4.1-1 of the Idaho Manual for Bridge Evaluation.

POSTING

Vehicle	Schematic	Posting (Tons)
Single Unit		N/A
Semi Tractor-Trailer Combination		N/A
Truck-Trailer Combination		N/A
	Max Axle	N/A

NBI CODING IN PONTIS

NBI Item #	NBI Item Name	Pontis Input
63	Operating Type	0 Field Eval/Engr Judge
64	Operating Rating	30
65	Inventory Type	0 Field Eval/Engr Judge
66	Inventory Rating	18

Load Rating Engineer		Checker		Quality Control Engineer	
Name:		Name:		Name:	
Company:		Company:		Company:	
Date:		Date:		Date:	

LFR Load Rating Summary Form Directions

There are many Macros used in the form. Macros must be enabled for form to function properly.

Section 1: General Bridge Data

- Type in the bridge key number in cell B6 under the Summary tab. The data for the rest of the fields will automatically populate in the Dynamic Inventory tab based on a link to the Pontis file. Do not change any of these cells manually in the Dynamic Inventory tab. Click "Update Bridge Info" to show the information in the Summary tab. For NBI items, the NBI item numbers are included in the cell title for easy reference.
- For updates to previously created EJ LRS forms, if "Highlights" are on, cells will highlight red when they do not match the information found in the current linked Dynamic Inventory. When highlights are present, user needs to verify, resolve, update, turn OFF, and/or enable/disable when before printing to a pdf.

Settings

- Adjust the number of note pages as needed.
- Use "View Control" to set which vehicle ratings are displayed. For a bridge in Fair or better condition, the default is to just display the HS-20 ratings. However, there may be a specific reason to also display the NRL/SHV ratings.
- Use "If Fast Act" to toggle between "Show when Posted" and "Always Show".
- The "Bridge Type" and associated note are used when Bridge Type Factors are needed.
- Based on engineering judgement, enter a **"**Manual Rating Reduction" to adjust the corresponding tonnage for NBI Condition Ratings. This adjusts the values shown on the *[CAL]* tab.
- If needed, adjust whether or not to include (58) Deck and (60) Substructure when determining the minimum NBI used to trigger posting.
- Enter overrides (located outside print area) based on engineering judgement to adjust the Type Factors, Vehicle Tonnage, or Posting (Tons). Type Factor ignored if Vehicle Tonnage override is used.
- "Form Updated" shows when the Prior Data has been populated (uses value in cell W6 as trigger).
- Use the Admin tab to add or adjust Bridge Type Factors and Memos.

CMP ASR/LFR Bridge Load Rating Summary

rev. 1/26/2024

Bridge Key No.	Structure Name	(27) Year Built	(106) Year Reconstruct	Inspection Date	Inventory Data Date
10180	S00510A	1970	N/A	7/16/2016	9/20/2017

(9) Bridge Location	(7) Facility Carried	(6a) Feature Intersected	Drawing Number
2.7 E. Plummer	SH 5	LITTLE PLUMMER CREEK	14238

(49) Length	(11)Milepost	(2) District	(3) County	(22) Owner	Administrative Jurisdiction
14	2.757	1	Benewah	State Highway Agency	District 1

(45, 43a, 43b) Bridge Description	(31) Design Load (per SI&A)	Granular WS	Asphalt WS	Concrete WS	Timber WS
1 Span Steel Culvert	HS-20	1078 in.	4 in.	in.	in.

Rating Program & Version	Rating Method	AASHTO Reference
Microsoft Excel 2010	LFR	The Manual for Bridge Evaluation, Second Edition, 2011

(58) Deck	(59) Superstructure	(60) Substructure	(62) Culvert	(113) Scour Critical
N N/A (NBI)	N N/A (NBI)	N N/A (NBI)	7 Minor Deterioration	8 Stable Above Footing

(30) ADT Year	(29) ADT	(109) Truck % ADT	ADTT (ADT x Truck % ADT)	(19) Detour Length	Year Programmed
2015	2100	8	168	99	N/A

INVENTORY RATINGS

Rating Vehicle	Controlling Configuration	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
HS-25	Truck	45	N/A	N/A	AASHTO Article 6.4.2	2.20	99
HS-20	Truck	36	N/A	N/A	AASHTO Article 6.4.2	2.75	99
Idaho - Type 3	Truck	27	N/A	N/A	AASHTO Article 6.4.2	3.67	99
Idaho - Type 3S2	Truck	39.5	N/A	N/A	AASHTO Article 6.4.2	2.51	99
Idaho - Type 3-3	Truck	39.5	N/A	N/A	AASHTO Article 6.4.2	2.51	99
Idaho - 121k	Truck	60.5	N/A	N/A	AASHTO Article 6.4.2	1.64	99
NRL	Truck	40	N/A	N/A	AASHTO Article 6.4.2	2.48	99
120 Tridum	Truck	60	N/A	N/A	AASHTO Article 6.4.2	1.65	99

OPERATING RATINGS

Rating Vehicle	Controlling Configuration	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
HS-25	Truck	45	N/A	N/A	AASHTO Article 6.4.2	2.20	99
HS-20	Truck	36	N/A	N/A	AASHTO Article 6.4.2	2.75	99
Idaho - Type 3	Truck	27	N/A	N/A	AASHTO Article 6.4.2	3.67	99
Idaho - Type 3S2	Truck	39.5	N/A	N/A	AASHTO Article 6.4.2	2.51	99
Idaho - Type 3-3	Truck	39.5	N/A	N/A	AASHTO Article 6.4.2	2.51	99
Idaho - 121k	Truck	60.5	N/A	N/A	AASHTO Article 6.4.2	1.64	99
NRL	Truck	40	N/A	N/A	AASHTO Article 6.4.2	2.48	99
120 Tridum	Truck	60	N/A	N/A	AASHTO Article 6.4.2	1.65	99

BRIDGE LOAD RATING SUMMARY

Controlling Truck	Bridge Factor	Bridge Color	Load Posting Required?	Max Axle Weight if Posting Req.
Idaho - Type 3-3	1241	Interstate	No	N/A

Load Rating Engineer		Checker		Quality Control Engineer	
Name:		Name:		Name:	
Company:		Company:		Company:	
Date:		Date:		Date:	

Remarks:

Per AASHTO Standard Specifications for Highway Bridges, 17th ed. Article 6.4.2, effects of live load may be neglected if:
- Single spans - the fill depth is greater than 8 feet and exceeds the span length.
- Multiple spans - the depth of fill exceeds the distance between faces of end supports or abutments.

Fill Height (per inspection report) = X" (Asphalt) + X" (Granular) = X'
Span length = X'-X"

Since both criteria of Art. 6.4.2, this structure does not need to be load rated for live load.

CMP ASR/LFR BRIDGE LOAD RATING SUMMARY

rev. 1/26/2024

Bridge Key No.	Structure Name	(27) Year Built	(106) Year Reconstruct	Inspection Date	Inventory Data Date
10180	S00510A 2.76	1970	N/A	7/6/2016	9/20/2017

(9) Bridge Location	(7) Facility Carried	(6a) Feature Intersected	Drawing Number
2.7 E. PLUMMER	SH 5	LITTLE PLUMMER CREEK	14238

(49) Length	(11)Milepost	(2) District	(3) County	(22) Owner	Administrative Jurisdiction
14	2.757	1	Benewah	State Highway Agency	District 1

(45, 43a, 43b) Bridge Description	(31) Design Load (per SI&A)	Granular WS	Asphalt WS	Concrete WS	Timber WS
1 Span Steel Culvert	HS-20	1078 in.	4 in.	in.	in.

Rating Program & Version	Rating Method	AASHTO Reference
Microsoft Excel 2010	LFR	The Manual for Bridge Evaluation, Second Edition, 2011

(58) Deck	(59) Superstructure	(60) Substructure	(62) Culvert	(113) Scour Critical
N N/A (NBI)	N N/A (NBI)	N N/A (NBI)	7 Minor Deterioration	8 Stable Above Footing

(30) ADT Year	(29) ADT	(109) Truck % ADT	ADTT (ADT x Truck % ADT)	(19) Detour Length	Year Programmed
2015	2100	8	168	99	N/A

OPERATING RATINGS - Specialized Hauling Vehicles (SHV)

(Fill in the below SHV OperatingRatings only when Operating Rating Factor for NRL is less than 1.0)

Rating Vehicle	Controlling Configuration	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
SU4	Truck	27					0
SU5	Truck	31					0
SU6	Truck	34.75					0
SU7	Truck	38.75					0

POSTING

Vehicle	Schematic	Posting (Tons)
Single Unit		N/A
Semi Tractor-Trailer Combination		N/A
Truck-Trailer Combination		N/A
	Max Axle	N/A

Additional Remarks:

CMP ASR/LFR Bridge Load Rating Summary

rev. 1/26/2024
Page 1 of 2

Bridge Key No.	Structure Name	(27) Year Built	(106) Year Reconstruct	Inspection Date	Inventory Data Date
33191	S06200A 10.50	2017	N/A	2/7/2018	2/23/2018

(9) Bridge Location	(7) Facility Carried	(6a) Feature Intersected	Drawing Number
10.2 E. Craigmont	SH 62	HOLES CREEK	17476

(49) Length	(11)Milepost	(2) District	(3) County	(22) Owner	Administrative Jurisdiction
18	10.500	2	Lewis	State Highway Agency	District 2

(45, 43a, 43b) Bridge Description	(31) Design Load (per SI&A)	Granular WS	Asphalt WS	Concrete WS	Timber WS
1 Span Steel Culvert	HL-93	80 in.	6 in.		

Rating Program & Version	Rating Method	AASHTO Reference
Microsoft Excel 2010	LFR	The Manual for Bridge Evaluation, Second Edition, 2011

(58) Deck	(59) Superstructure	(60) Substructure	(62) Culvert	(113) Scour Critical
N/A	N N/A (NBI)	N N/A (NBI)	7 Minor Deterioration	8 Stable Above Footing

(30) ADT Year	(29) ADT	(109) Truck % ADT	ADTT (ADT x Truck % ADT)	(19) Detour Length	Year Programmed
2015	2100	8	168	99	N/A

INVENTORY RATINGS

Rating Vehicle	Controlling Configuration	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
HS-25	Truck	45	Culvert	Culvert	minimum cover	10.15	456
HS-20	Truck	36	Culvert	Culvert	minimum cover	10.15	365
Idaho - Type 3	Truck	27	Culvert	Culvert	minimum cover	10.15	274
Idaho - Type 3S2	Truck	39.5	Culvert	Culvert	minimum cover	10.15	400
Idaho - Type 3-3	Truck	39.5	Culvert	Culvert	minimum cover	10.15	400
Idaho - 121k	Truck	60.5	Culvert	Culvert	minimum cover	10.15	614
NRL	Truck	40	Culvert	Culvert	minimum cover	10.15	406
120 Tridum	Truck	60	Culvert	Culvert	wall strength	9.98	598

OPERATING RATINGS

Rating Vehicle	Controlling Configuration	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
HS-25	Truck	45	Culvert	Culvert	minimum cover	10.15	456
HS-20	Truck	36	Culvert	Culvert	minimum cover	10.15	365
Idaho - Type 3	Truck	27	Culvert	Culvert	minimum cover	10.15	274
Idaho - Type 3S2	Truck	39.5	Culvert	Culvert	minimum cover	10.15	400
Idaho - Type 3-3	Truck	39.5	Culvert	Culvert	minimum cover	10.15	400
Idaho - 121k	Truck	60.5	Culvert	Culvert	minimum cover	10.15	614
NRL	Truck	40	Culvert	Culvert	minimum cover	10.15	406
120 Tridum	Truck	60	Culvert	Culvert	minimum cover	10.15	609

BRIDGE LOAD RATING SUMMARY

Controlling Truck	Bridge Factor	Bridge Color	Load Posting Required?	Max Axle Weight if Posting Req.
Idaho - Type 3-3	5013	Interstate	No	N/A

Load Rating Engineer		Checker		Quality Control Engineer	
Name:		Name:		Name:	
Company:		Company:		Company:	
Date:		Date:		Date:	

Remarks:

*LFR load rating summary generated by ITD on 3/7/2018 for input into BrM.

CMP ASR/LFR BRIDGE LOAD RATING SUMMARY

rev. 1/26/2024

Bridge Key No.	Structure Name	(27) Year Built	(106) Year Reconstruct	Inspection Date	Inventory Data Date
33191	S06200A 10.50	2017	N/A	2/7/2018	2/23/2018

(9) Bridge Location	(7) Facility Carried	(6a) Feature Intersected	Drawing Number
10.2 E Craigmont	SH 62	Holes Creek	17476

(49) Length	(11)Milepost	(2) District	(3) County	(22) Owner	Administrative Jurisdiction
18	10.5	2	Lewis	State Highway Agency	District 2

(45, 43a, 43b) Bridge Description	(31) Design Load (per SI&A)	Granular WS	Asphalt WS	Concrete WS	Timber WS
1 Span Steel Culvert	HL-93	80 in	6 in	0	0

Rating Program & Version	Rating Method	AASHTO Reference
Microsoft Excel 2010	LFR	The Manual for Bridge Evaluation, Second Edition, 2011

(58) Deck	(59) Superstructure	(60) Substructure	(62) Culvert	(113) Scour Critical
N/A	N/A	N/A	9 No Deficiency	8 Stable Above Footing

(30) ADT Year	(29) ADT	(109) Truck % ADT	ADTT (ADT x Truck % ADT)	(19) Detour Length	Year Programmed
2018	400	22	88	18 Miles	N/A

OPERATING RATINGS - Specialized Hauling Vehicles (SHV)

(Fill in the below SHV OperatingRatings only when Operating Rating Factor for NRL is less than 1.0)

Rating Vehicle	Controlling Configuration	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
SU4	Truck	27					0
SU5	Truck	31					0
SU6	Truck	34.75					0
SU7	Truck	38.75					0

POSTING

Vehicle	Schematic	Posting (Tons)
Single Unit		N/A
Semi Tractor-Trailer Combination		N/A
Truck-Trailer Combination		N/A
	Max Axle	N/A

Additional Remarks:

CMP LRFR BRIDGE LOAD RATING SUMMARY

rev. 1/26/2024

Bridge Key No.	Structure Name	(27) Year Built	(106) Year Reconstruct	Inspection Date	Inventory Data Date
33191	S06200A 10.50	2017	N/A	2/7/2018	2/23/2018

(9) Bridge Location	(7) Facility Carried	(6a) Feature Intersected	Drawing Number
10.2 E Craigmont	SH 62	Holes Creek	17476

(49) Length	(11)Milepost	(2) District	(3) County	(22) Owner	Administrative Jurisdiction
18	10.500	2	Lewis	State Highway Agency	District 2

(45, 43a, 43b) Bridge Description	(31) Design Load (per SI&A)	Granular WS	Asphalt WS	Concrete WS	Timber WS
1 Span Steel Culvert	HL-93	80 in.	6 in.		

Rating Program & Version	Rating Method	AASHTO Reference
Microsoft Excel 2010	LRFR	The Manual for Bridge Evaluation, Second Edition, 2011

(58) Deck	(59) Superstructure	(60) Substructure	(62) Culvert	(113) Scour Critical
N/A	N/A	N/A	9 No Deficiency	8 Stable Above Footing

(30) ADT Year	(29) ADT	(109) Truck % ADT	ADTT (ADT x Truck % ADT)	(19) Detour Length	Year Programmed
2018	400	22	88	18 Miles	N/A

INVENTORY AND OPERATING LOAD RATINGS

Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
HL-93 (Truck + Lane Ctrls.)	Inventory	36	Culvert	Culvert	Minimum Cover	7.79	280
HL-93 (Truck + Lane Ctrls.)	Operating	36	Culvert	Culvert	Minimum Cover	7.79	280

This LRFR Load Rating is based on: ☐ Design Plans ☑ Design Plans & Approved Shop Drawings ☐ Other (Please explain in Remarks)

Load Rating Engineer		Checker		Quality Control Engineer	
Name:		Name:		Name:	
Company:		Company:		Company:	
Date:		Date:		Date:	

Remarks:

*LRFR load rating summary generated by ITD on 3/7/2018 using structural design checks and Ohio DOT LRFR spreadsheet submitted by contech and contractor in May 2017.

The information below is filled out once the ADTT data is entered onto the inspection report. If this bridge has not yet had the initial inspection (i.e. bridge is under development) leave the information below blank. The ADTT value listed below is to be used to establish Legal and Permit γ_{LL} factors.

(30) ADT Year	(29) ADT	(109) Truck % ADT	ADTT (ADT x Truck % ADT)	Legal and Permit Ratings Completed by
2018	400	22	88	Name: Anthony Beauchamp

Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
Idaho - Type 3	Legal	27	Culvert	Culvert	minimum cover	7.79	210
Idaho - Type 3S2	Legal	39.5	Culvert	Culvert	minimum cover	7.79	307
Idaho - Type 3-3	Legal	39.5	Culvert	Culvert	minimum cover	7.79	307
Idaho - 121k	Legal	60.5	Culvert	Culvert	minimum cover	7.79	471
NRL	Legal	40	Culvert	Culvert	minimum cover	7.79	311
120 Tridum	Legal	60	Culvert	Culvert	minimum cover	7.79	467
Idaho - Type 3	Permit	27	Culvert	Culvert	minimum cover	7.79	210
Idaho - Type 3S2	Permit	39.5	Culvert	Culvert	minimum cover	7.79	307
Idaho - Type 3-3	Permit	39.5	Culvert	Culvert	minimum cover	7.79	307
Idaho - 121k	Permit	60.5	Culvert	Culvert	minimum cover	7.79	471
NRL	Permit	40	Culvert	Culvert	minimum cover	7.79	311

BRIDGE LOAD RATING SUMMARY

Controlling Truck	Bridge Factor	Bridge Color	Load Posting Required?	Max Axle Weight if Posting Req.
Idaho - Type 3-3	3847	Interstate	No	N/A

CMP LRFR BRIDGE LOAD RATING SUMMARY

rev. 1/26/2024

Bridge Key No.	Structure Name	(27) Year Built	(106) Year Reconstruct	Inspection Date	Inventory Data Date
33191	S06200A 10.50	2017	N/A	2/7/2018	2/23/2018

(9) Bridge Location	(7) Facility Carried	(6a) Feature Intersected	Drawing Number
10.2 E Craigmont	SH 62	Holes Creek	17476

(49) Length	(11)Milepost	(2) District	(3) County	(22) Owner	Administrative Jurisdiction
18	10.5	2	Lewis	State Highway Agency	District 2

(45, 43a, 43b) Bridge Description	(31) Design Load (per SI&A)	Granular WS	Asphalt WS	Concrete WS	Timber WS
1 Span Steel Culvert	HL-93	80 in	6 in	0	0

Rating Program & Version	Rating Method	AASHTO Reference
Microsoft Excel 2010	LRFR	The Manual for Bridge Evaluation, Second Edition, 2011

(58) Deck	(59) Superstructure	(60) Substructure	(62) Culvert	(113) Scour Critical
N/A	N/A	N/A	9 No Deficiency	8 Stable Above Footing

(30) ADT Year	(29) ADT	(109) Truck % ADT	ADTT (ADT x Truck % ADT)	(19) Detour Length	Year Programmed
2018	400	22	88	18 Miles	N/A

LEGAL RATINGS - Specialized Hauling Vehicles (SHV)

(Fill in the below SHV Legal Ratings only when Legal Rating Factor for NRL is less than 1.0)

Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
SU4	Legal	27					0
SU5	Legal	31					0
SU6	Legal	34.75					0
SU7	Legal	38.75					0

PERMIT RATINGS - Specialized Hauling Vehicles (SHV)

(Fill in the below SHV Permit Ratings only when Permit Rating Factor for NRL is less than 1.0)

Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
SU4	Permit	27					0
SU5	Permit	31					0
SU6	Permit	34.75					0
SU7	Permit	38.75					0

Additional Remarks:

CMP LRFR BRIDGE LOAD RATING SUMMARY

rev. 1/26/2024

Bridge Key No.	Structure Name	(27) Year Built	(106) Year Reconstruct	Inspection Date	Inventory Data Date
10180	S00510A 2.76	1970	N/A	7/6/2016	9/20/2017

(9) Bridge Location	(7) Facility Carried	(6a) Feature Intersected	Drawing Number
2.7 E. PLUMMER	SH 5	LITTLE PLUMMER CREEK	14238

(49) Length	(11)Milepost	(2) District	(3) County	(22) Owner	Administrative Jurisdiction
14	2.757	1	Benewah	State Highway Agency	District 1

(45, 43a, 43b) Bridge Description	(31) Design Load (per SI&A)	Granular WS	Asphalt WS	Concrete WS	Timber WS
1 Span Steel Culvert	HS-20	1078 in.	4 in.	in.	in.

Rating Program & Version	Rating Method	AASHTO Reference
BrR 6.7.0 - AASHTO Engine	LRFR	The Manual for Bridge Evaluation, Second Edition, 2011

(58) Deck	(59) Superstructure	(60) Substructure	(62) Culvert	(113) Scour Critical
N N/A (NBI)	N N/A (NBI)	N N/A (NBI)	7 Minor Deterioration	8 Stable Above Footing

(30) ADT Year	(29) ADT	(109) Truck % ADT	ADTT (ADT x Truck % ADT)	(19) Detour Length	Year Programmed
2015	2100	8	168	99	N/A

INVENTORY AND OPERATING LOAD RATINGS

Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
HL-93 (Truck + Lane Ctrls.)	Inventory	36	N/A	N/A	AASHTO Article 3.6.1.2.6	2.75	99
HL-93 (Truck + Lane Ctrls.)	Operating	36	N/A	N/A	AASHTO Article 3.6.1.2.6	2.75	99

This LRFR Load Rating is based on: ☐ Design Plans ☐ Design Plans & Approved Shop Drawings ☐ Other (Please explain in Remarks)

Load Rating Engineer		Checker		Quality Control Engineer	
Name:		Name:		Name:	
Company:		Company:		Company:	
Date:		Date:		Date:	

Remarks:

Per AASHTO LRFD Bridge Design Specifications 8th ed. Article 3.6.1.2.6, effects of live load may be neglected if:
- Single spans - the fill depth is greater than 8 feet and exceeds the span length.
- Multiple spans - the depth of fill exceeds the distance between faces of end supports or abutments.

Fill Height (per Inspection Report) = 4" (Asphalt) + 1078" (Granular) = 90.167'
Span length = 12'-0"

Since both criteria of Art. 3.6.1.2.6, this structure does not need to be load rated for live load.

The information below is filled out once the ADTT data is entered onto the inspection report. If this bridge has not yet had the initial inspection (i.e. bridge is under development) leave the information below blank. The ADTT value listed below is to be used to establish Legal and Permit γ_{LL} factors.

(30) ADT Year	(29) ADT	(109) Truck % ADT	ADTT (ADT x Truck % ADT)	Legal and Permit Ratings Completed by Name:
2015	2100	8	168	

Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
Idaho - Type 3	Legal	27	N/A	N/A	AASHTO Article 3.6.1.2.6	3.67	99
Idaho - Type 3S2	Legal	39.5	N/A	N/A	AASHTO Article 3.6.1.2.6	2.51	99
Idaho - Type 3-3	Legal	39.5	N/A	N/A	AASHTO Article 3.6.1.2.6	2.51	99
Idaho - 121k	Legal	60.5	N/A	N/A	AASHTO Article 3.6.1.2.6	1.64	99
NRL	Legal	40	N/A	N/A	AASHTO Article 3.6.1.2.6	2.48	99
120 Tridum	Legal	60	N/A	N/A	AASHTO Article 3.6.1.2.6	1.65	99
Idaho - Type 3	Permit	27	N/A	N/A	AASHTO Article 3.6.1.2.6	3.67	99
Idaho - Type 3S2	Permit	39.5	N/A	N/A	AASHTO Article 3.6.1.2.6	2.51	99
Idaho - Type 3-3	Permit	39.5	N/A	N/A	AASHTO Article 3.6.1.2.6	2.51	99
Idaho - 121k	Permit	60.5	N/A	N/A	AASHTO Article 3.6.1.2.6	1.64	99
NRL	Permit	40	N/A	N/A	AASHTO Article 3.6.1.2.6	2.48	99

BRIDGE LOAD RATING SUMMARY

Controlling Truck	Bridge Factor	Bridge Color	Load Posting Required?	Max Axle Weight if Posting Req.
Idaho - Type 3-3	1241	Interstate	No	N/A

CMP LRFR BRIDGE LOAD RATING SUMMARY

rev. 1/26/2024

Bridge Key No.	Structure Name	(27) Year Built	(106) Year Reconstruct	Inspection Date	Inventory Data Date
10180	S00510A 2.76	1970	N/A	7/6/2016	9/20/2017

(9) Bridge Location	(7) Facility Carried	(6a) Feature Intersected	Drawing Number
2.7 E. PLUMMER	SH 5	LITTLE PLUMMER CREEK	14238

(49) Length	(11)Milepost	(2) District	(3) County	(22) Owner	Administrative Jurisdiction
14	2.757	1	Benewah	State Highway Agency	District 1

(45, 43a, 43b) Bridge Description	(31) Design Load (per SI&A)	Granular WS	Asphalt WS	Concrete WS	Timber WS
1 Span Steel Culvert	HS-20	1078 in.	4 in.	in.	in.

Rating Program & Version	Rating Method	AASHTO Reference
BrR 6.7.0 - AASHTO Engine	LRFR	The Manual for Bridge Evaluation, Second Edition, 2011

(58) Deck	(59) Superstructure	(60) Substructure	(62) Culvert	(113) Scour Critical
N N/A (NBI)	N N/A (NBI)	N N/A (NBI)	7 Minor Deterioration	8 Stable Above Footing

(30) ADT Year	(29) ADT	(109) Truck % ADT	ADTT (ADT x Truck % ADT)	(19) Detour Length	Year Programmed
2015	2100	8	168	99	N/A

LEGAL RATINGS - Specialized Hauling Vehicles (SHV)

(Fill in the below SHV Legal Ratings only when Legal Rating Factor for NRL is less than 1.0)

Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
SU4	Legal	27					0
SU5	Legal	31					0
SU6	Legal	34.75					0
SU7	Legal	38.75					0

PERMIT RATINGS - Specialized Hauling Vehicles (SHV)

(Fill in the below SHV Permit Ratings only when Permit Rating Factor for NRL is less than 1.0)

Rating Vehicle	Rating Level	Weight (Tons)	Controlling Member	Controlling Location	Controlling Limit State	Rating Factor	Rating (Tons)
SU4	Permit	27					0
SU5	Permit	31					0
SU6	Permit	34.75					0
SU7	Permit	38.75					0

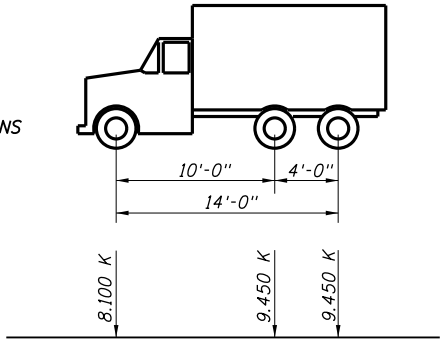
Additional Remarks:

3-30-2004

IDAHO TRANSPORTATION DEPARTMENT

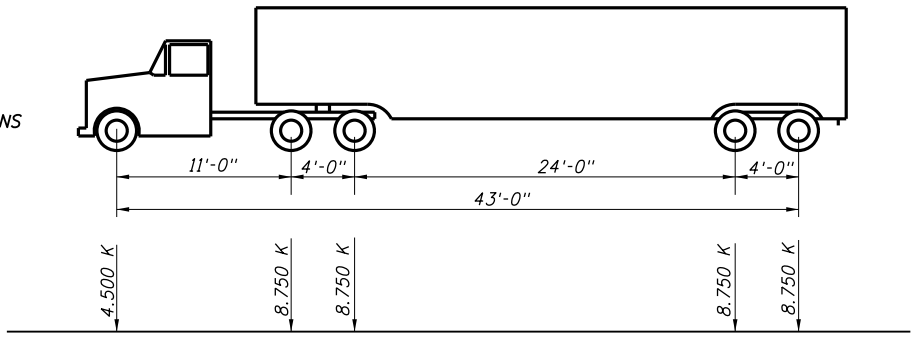
TYPICAL LEGAL LOAD TYPES FOR CAPACITY RATING & POSTING

TYPE 3 UNIT
WEIGHT = 27.00 TONS

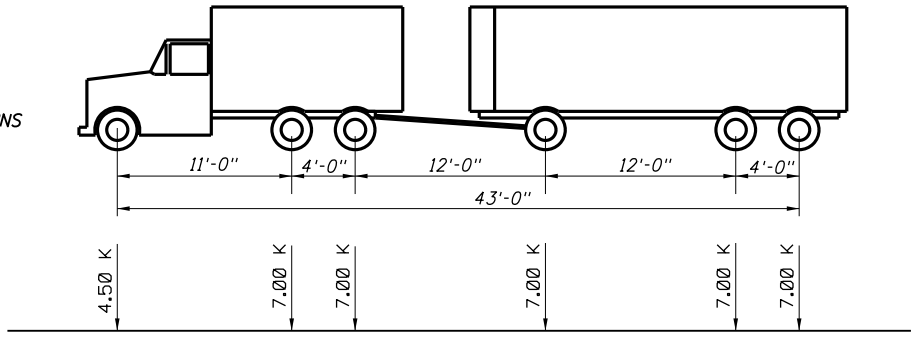


NOTE: INDICATED CONCENTRATIONS ARE WHEEL LOADS IN KIPS OR AXLE LOADS IN TONS.

TYPE 3S2 UNIT
WEIGHT = 39.50 TONS



TYPE 3-3 UNIT
WEIGHT = 39.50 TONS



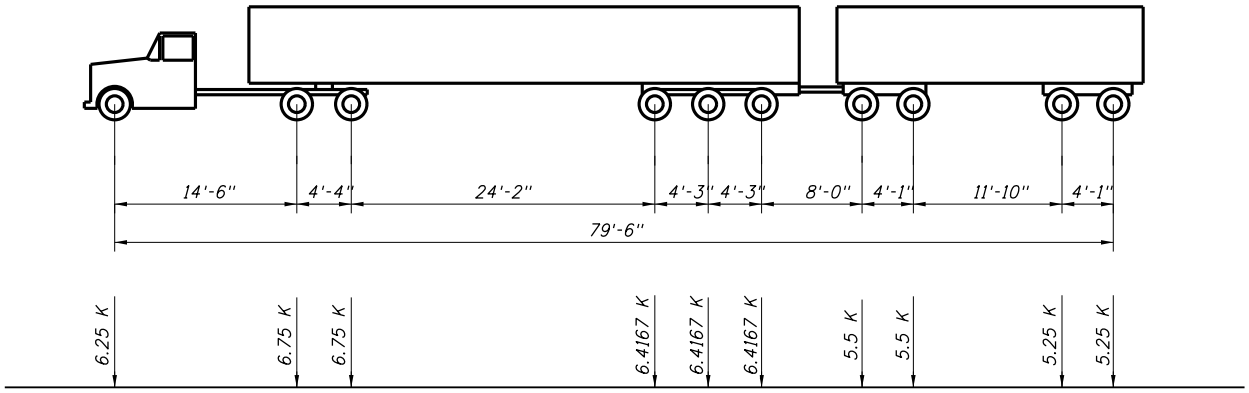
3-30-2004

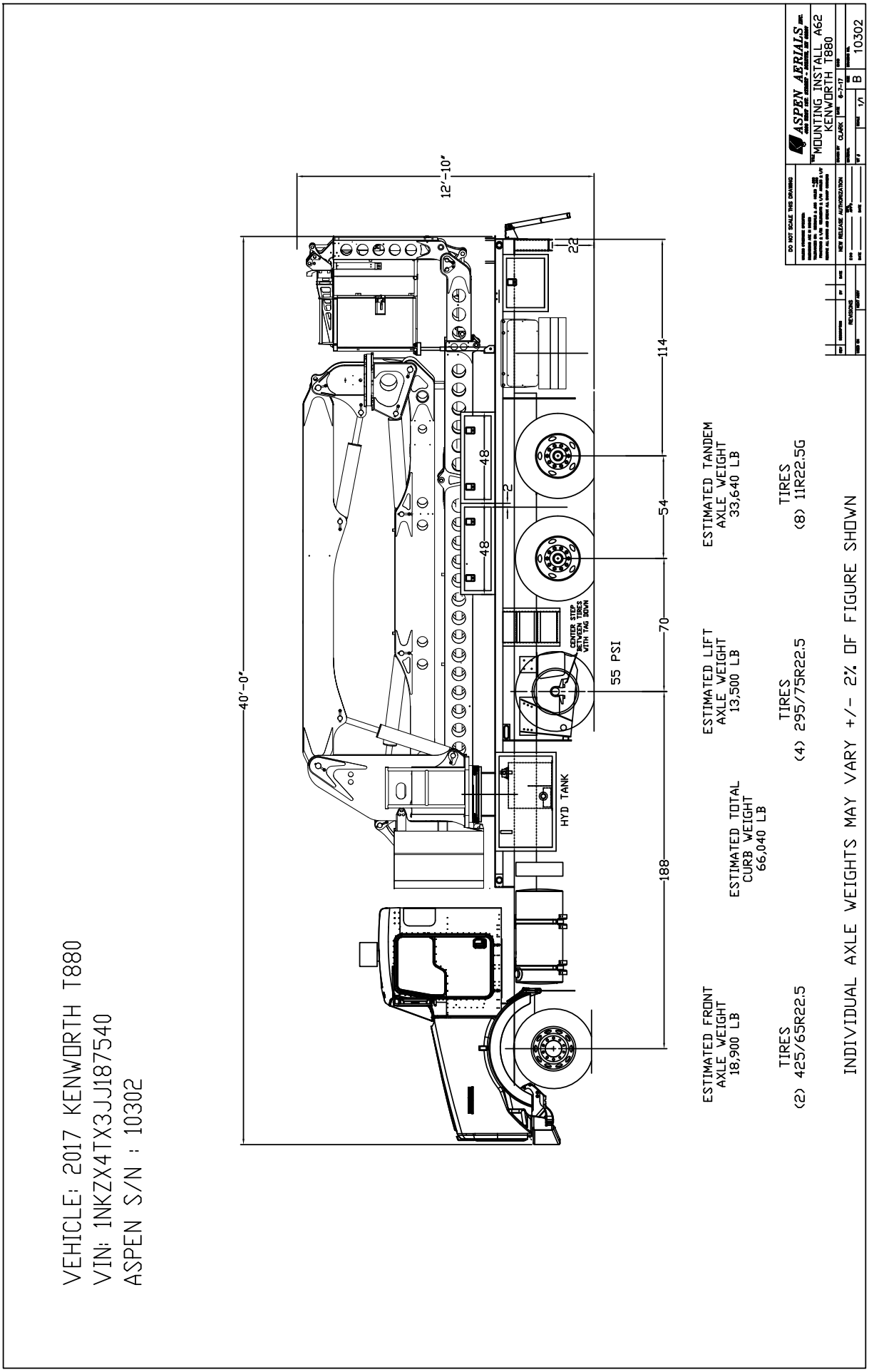
IDAHO TRANSPORTATION DEPARTMENT

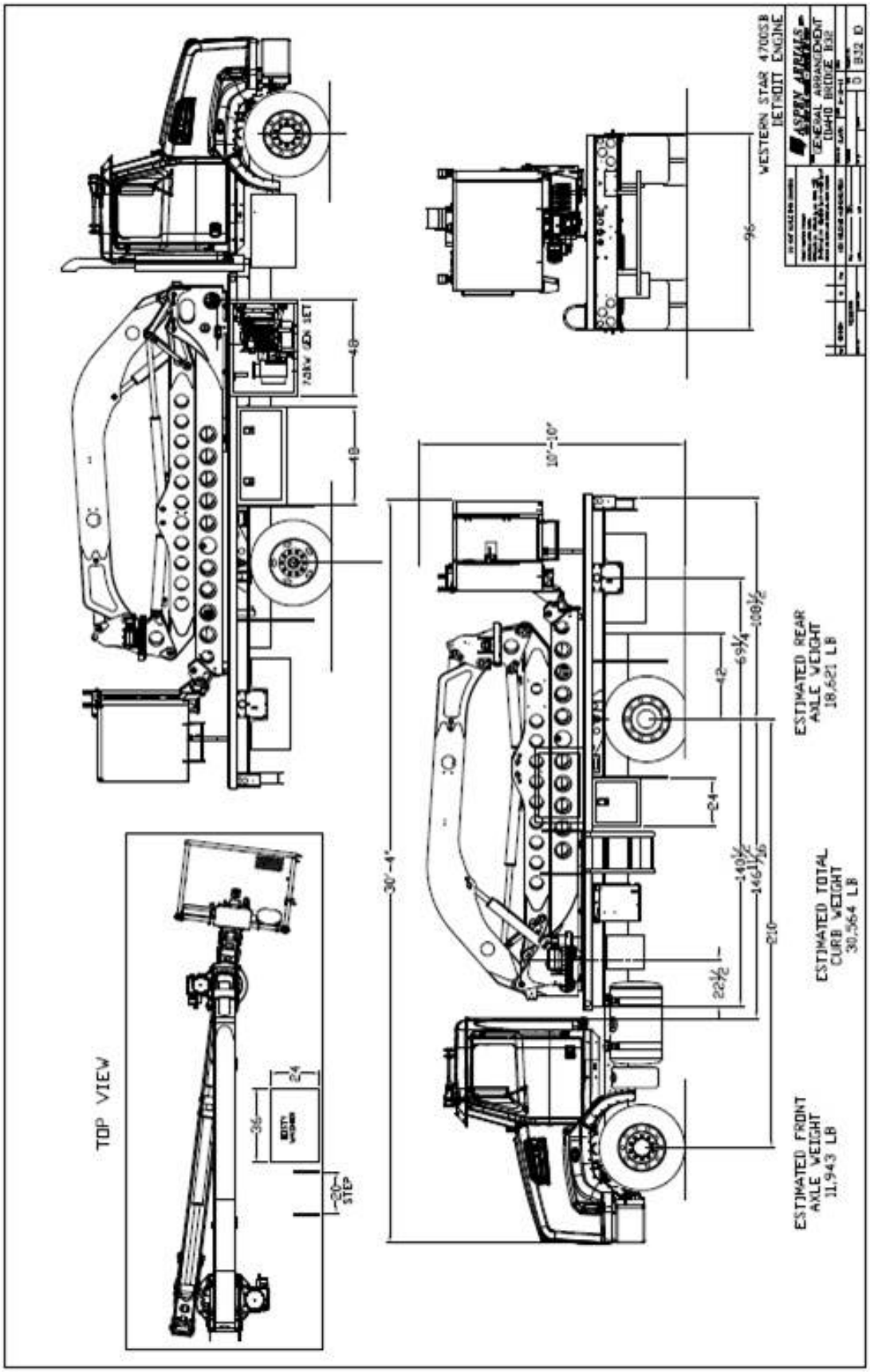
121 KIP TRUCK
FOR CAPACITY RATING

IDAHO 121K UNIT
WEIGHT = 60.5 TONS

NOTE: INDICATED CONCENTRATIONS ARE WHEEL LOADS IN KIPS OR AXLE LOADS IN TONS.




VEHICLE: 2017 KENWORTH T880
VIN: 1NKZX4TX3JJ187540
ASPEN S/N : 10302
40'-0"
12'-10"
22
114
54
70
188
48
48
2
55 PSI
HYD TANK
CENTER STEP
ESTIMATED FRONT AXLE WEIGHT 18,900 LB
TIRES (2) 425/65R22.5
ESTIMATED TOTAL CURB WEIGHT 66,040 LB
ESTIMATED LIFT AXLE WEIGHT 13,500 LB
TIRES (4) 295/75R22.5
ESTIMATED TANDEM AXLE WEIGHT 33,640 LB
TIRES (8) 11R22.5G
INDIVIDUAL AXLE WEIGHTS MAY VARY +/- 2% OF FIGURE SHOWN
DO NOT SCALE THIS DRAWING
NEW RELEASE AUTHORIZATION
REVISIONS
ASPEN AERIALS
MOUNTING INSTALL A62
KENWORTH T880
CLARK
6-7-17
1/1
B
10302


WESTERN STAR 4700SB
DETROIT ENGINE
ASPEN AERIALS
GENERAL ARRANGEMENT
10HD BRIDGE B32
B32 D
TOP VIEW
ESTIMATED REAR
AXLE WEIGHT
18,621 LB
ESTIMATED TOTAL
CURB WEIGHT
30,564 LB
ESTIMATED FRONT
AXLE WEIGHT
11,943 LB

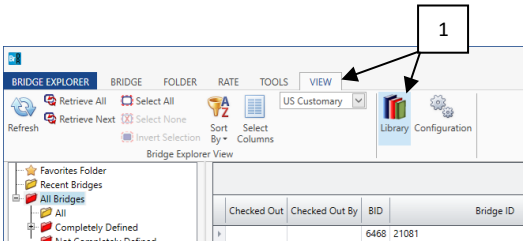
BrR SETUP

IMPORTING TRUCKS INTO BrR LIBRARY

*Note: All instructions and screenshots were made using BrR 7.1.1

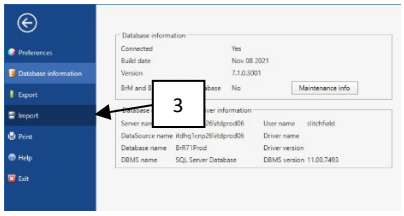
---

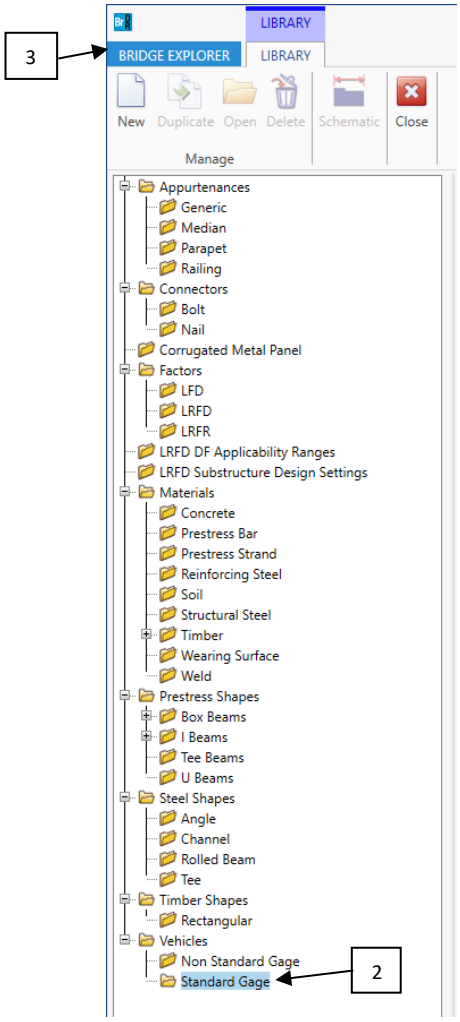
1. Click on the *Library* icon on the *VIEW* toolbar at the top of the screen.



---

2. Select *Vehicles* ➔ *Standard Gage* from the *Manage* tree on the left side of the screen.
3. Select *BRIDGE EXPLORER* at the top of the screen ➔ *Import*

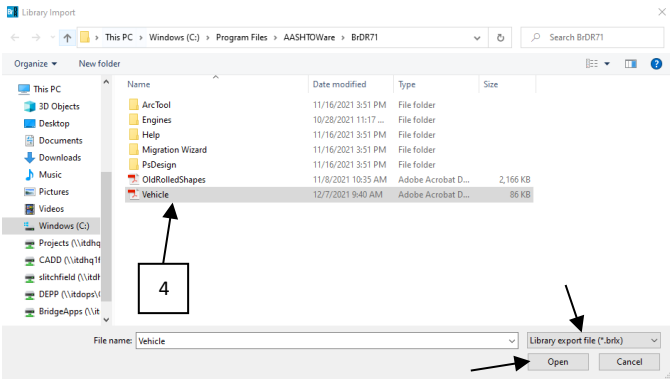




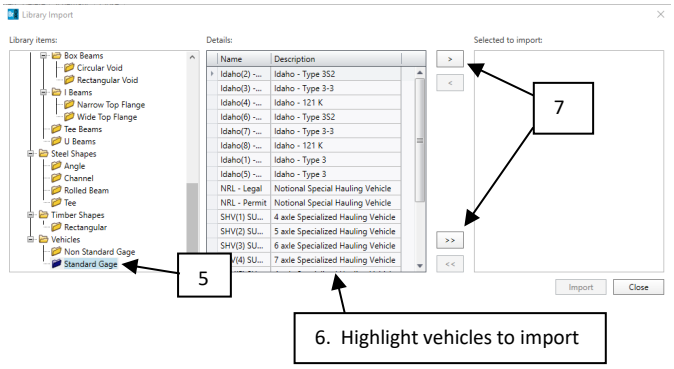
---

4. Locate the file “Vehicle” with the Library export file (*.brlx) and select *Open*

This file may be obtained by contacting the ITD Load Rating Engineer.

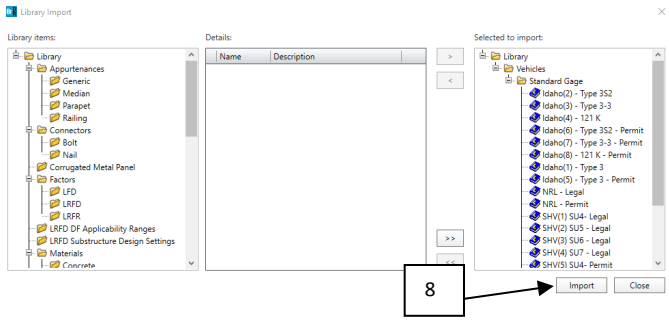


5. Select *Standard Gage* under *Vehicles* in the Library items: window.
6. Highlight the vehicles to import in the *Details*: window.
7. Select the “>” button and the highlighted vehicle(s) will move to the *Selected to import:* window or select the “>>” button to move all the vehicles over.

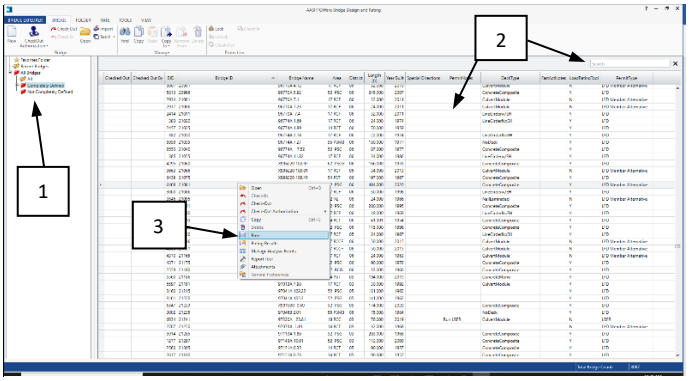


8. When all vehicles have been moved to the *Selected to import:* window, select the *Import* button.

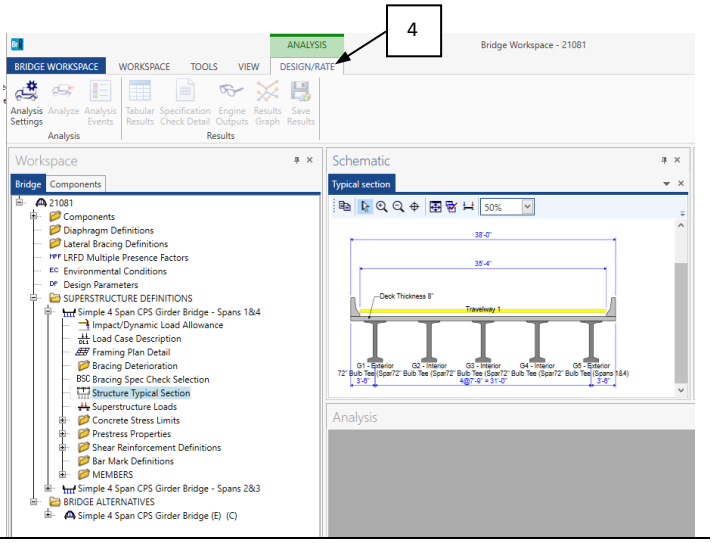
The imported vehicles will now be located in the Agency folder.



SETTING UP AN ANALYSIS TEMPLATE IN BrR

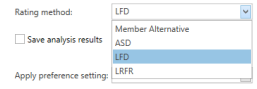


1. Select desired folder on the left side of the screen.
2. Search for desired bridge by either scrolling or entering the bridge key into the search bar (Use CTRL-F to get the search bar).
3. Right click on desired bridge and select *Rate* to run from Bridge Explorer.
4. To run in the BrR file, open the file and select *Design/Rate*.

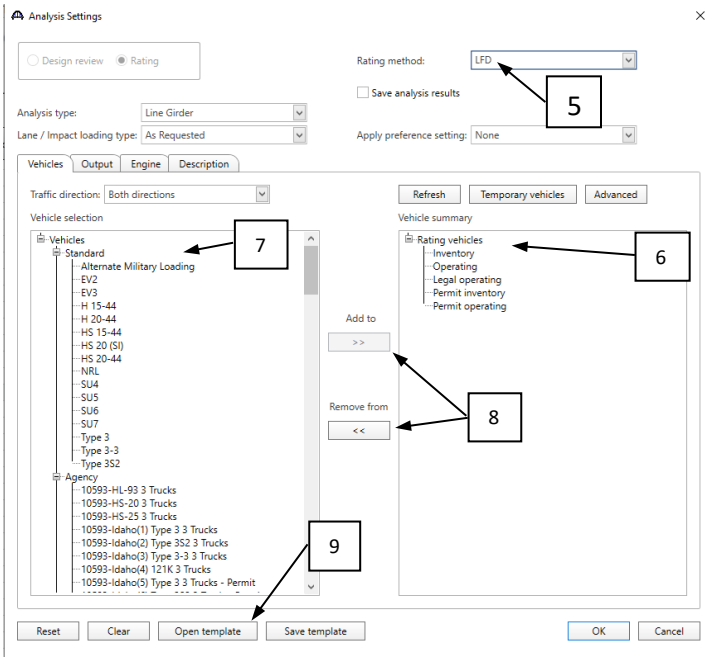


Analysis Settings window:

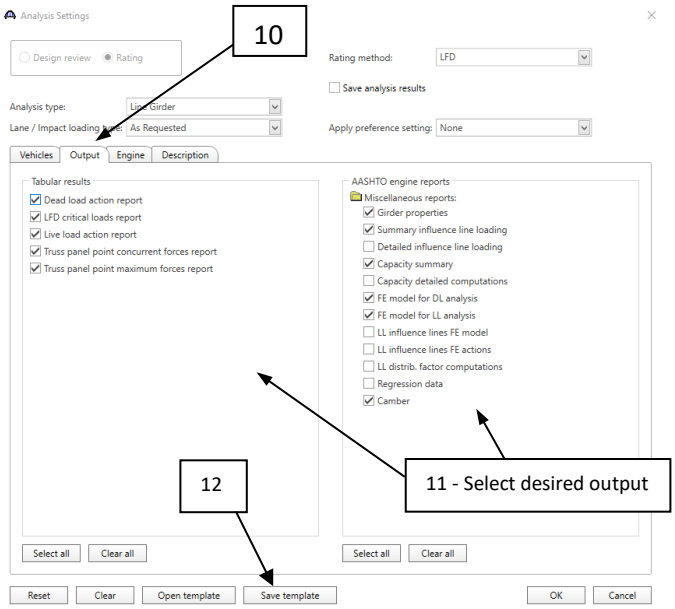
5. Select a rating method from the dropdown box in the top right area of the screen. This example is for LFD, but the same steps can be used for Member Alternative, ASD, and LRFR.



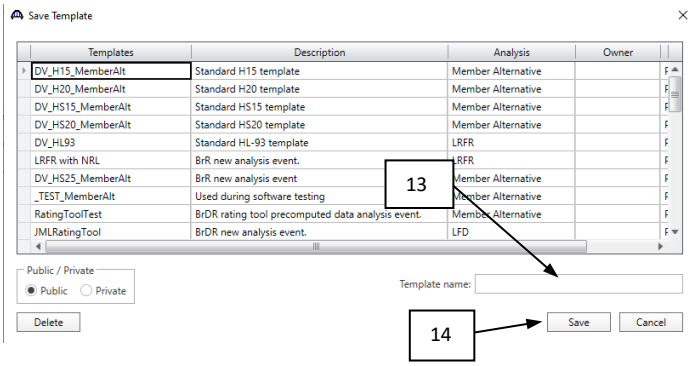
6. Click on the type of rating for the rating vehicle you will select next.
7. Select a particular vehicle from the *Vehicle Selection* menu.
8. Use the *Add to >>* and *Remove from <<* buttons to add or remove vehicles from the different rating methods.
9. Or select a premade template using the *Open template* button at the bottom of the screen.



10. Select the *Output* tab in the *Analysis Settings* window.
11. Select desired *Tabular results and AASHTO engine reports*.
12. If a new template has been created, select the *Save template* button at the bottom of the screen. Be careful not to save a premade template.



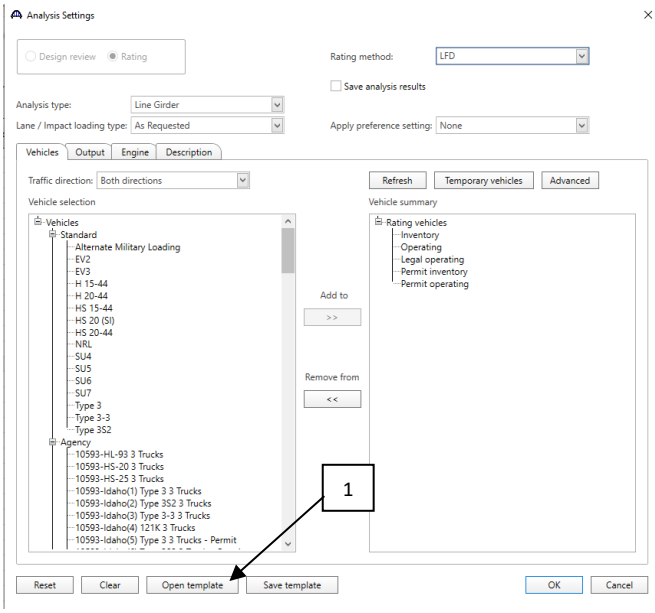
13. If saving a new template, type a name for the template in the *Template name* field.
14. Select the *Save* button.



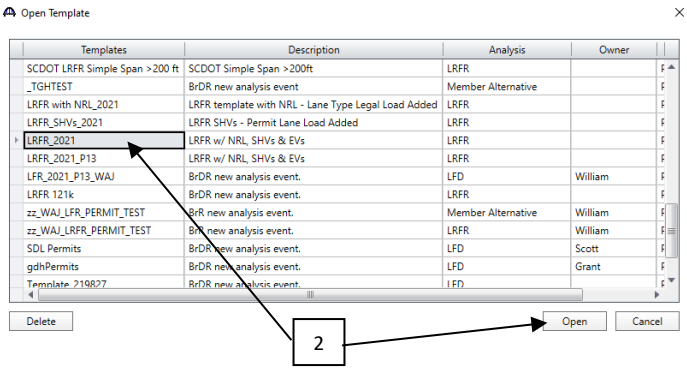
<u>ENTERING LANE TYPE LEGAL LOAD FOR LRFR</u>

To address the live loads required by MBE 6A.4.4.2.1a, the following settings should be used in BrR.

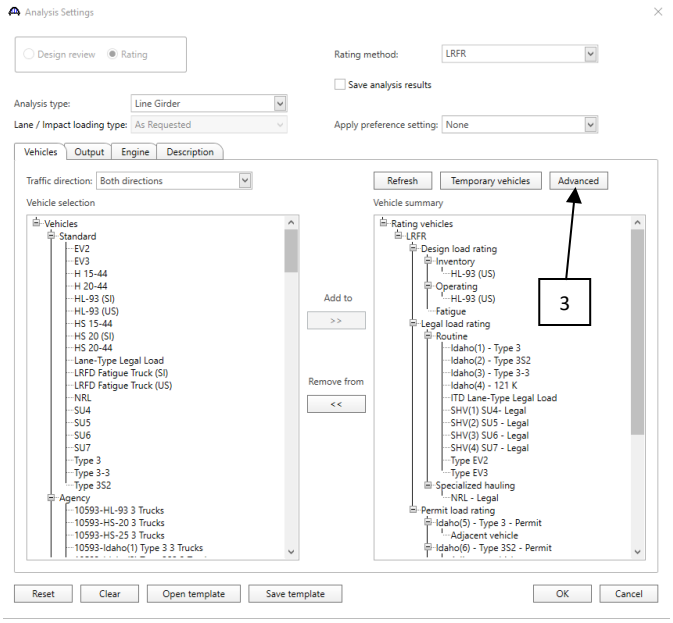
1. On the *Analysis Settings* window, select *Open template.*



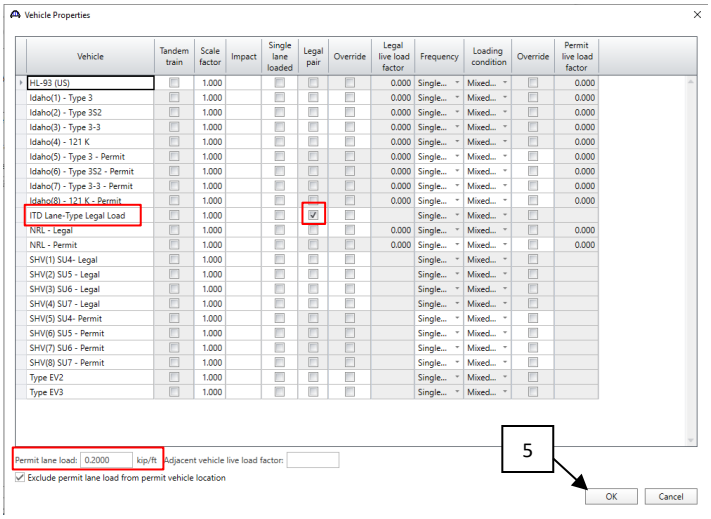
2. For internal ITD staff, select *LRFR_2021* template and click *Open.*



3. Click *Advanced.*

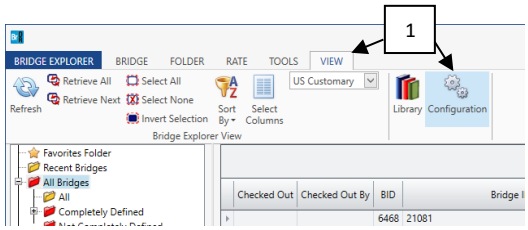


4. Make sure that the *Legal pair* box is checked under the *ITD Lane-Type Legal Load* truck and that the *Permit lane load* is 0.2 kip/ft.
5. Click *OK*.



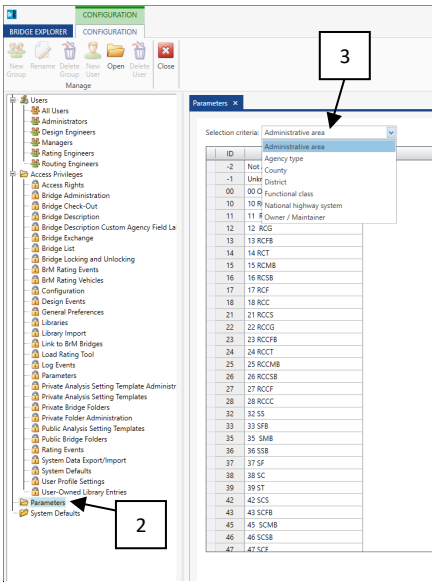
ITD STANDARD PARAMETERS AND SYSTEM DEFAULTS

1. Click on the *Configuration* icon on the *VIEW* toolbar at the top of the screen.



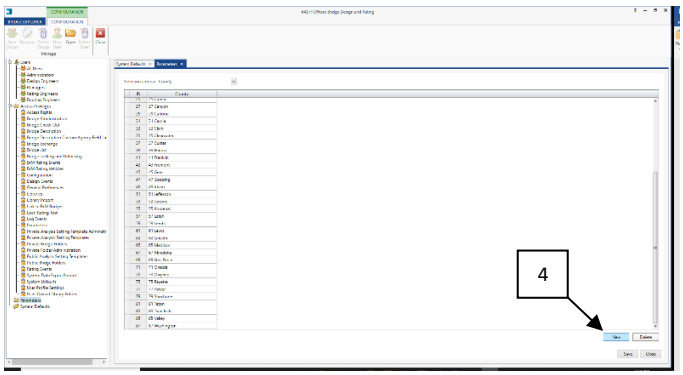
2. Double click on the *Parameters* folder in the *Manage* tree on the left side of the screen.
3. Choose the selection criteria from the dropdown list near the top of the screen.

Once the selection criteria is chosen, elements can be created and/or deleted.

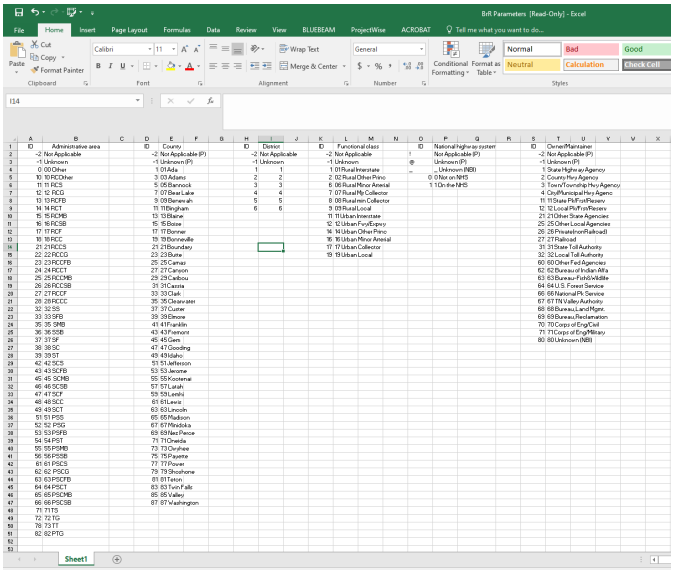


Adding ITD Counties, Districts, etc.

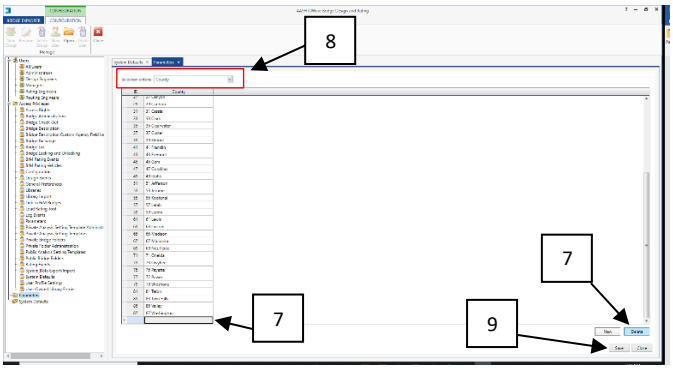
4. Click *New* to add a blank record.



5. Open the Excel file provided by the ITD Load Rating Engineer titled *BrR Parameters*.
6. Copy the ID and name data in the Excel file columns and paste it into the corresponding BrR selection criteria field.



7. Delete any extra blank records you may have created by placing your cursor anywhere in the blank row and selecting the *Delete* button.
8. Repeat for each selection criteria; Administrative Area, County, District, Functional Class, National Highway System, and Owner / Maintainer.
9. Select the *Save* button.

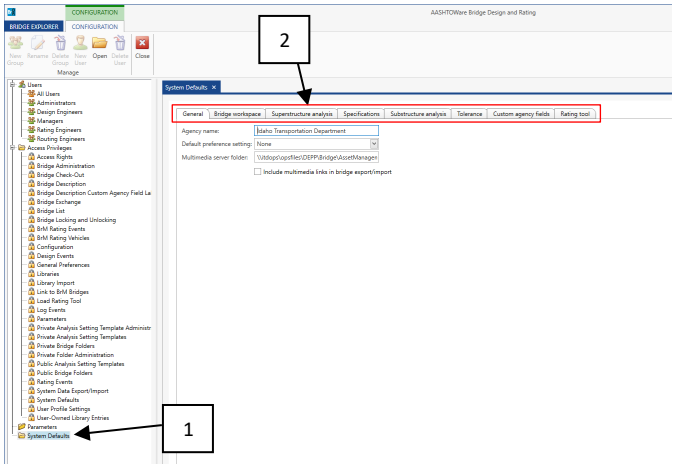


System Defaults

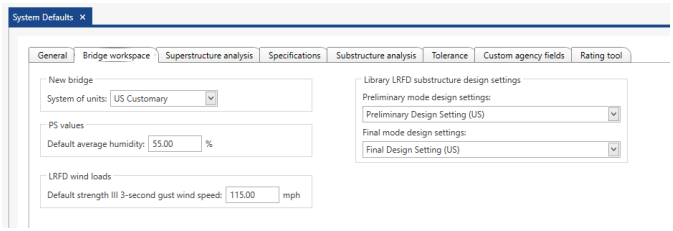
1. Double click on the *System Defaults* folder in the *Manage* tree on the left side of the screen.
2. Select the desired tab near the top of the screen.

Once the desired tab is selected, edits can be made and saved.

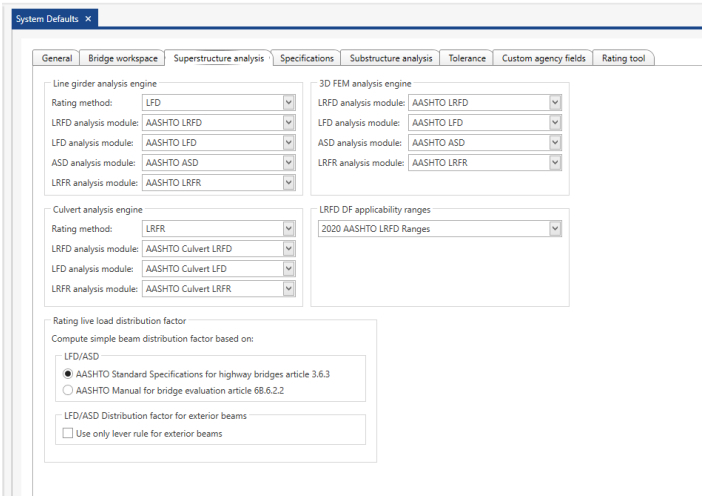
Screenshots of ITD's standard defaults are below excluding the *General* tab, which is shown to the right.



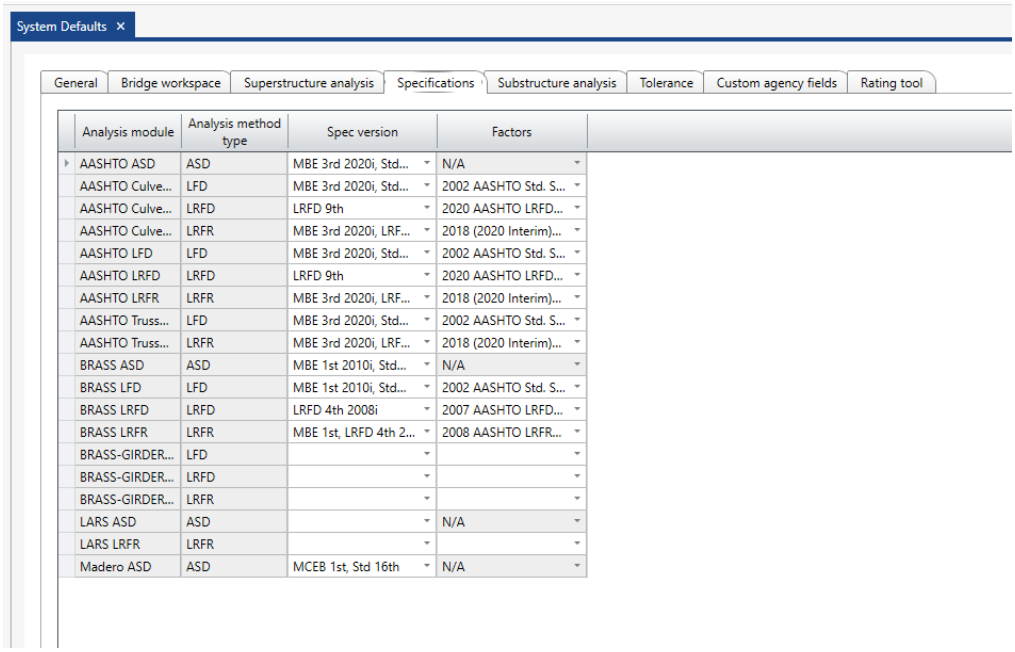
Bridge Workspace



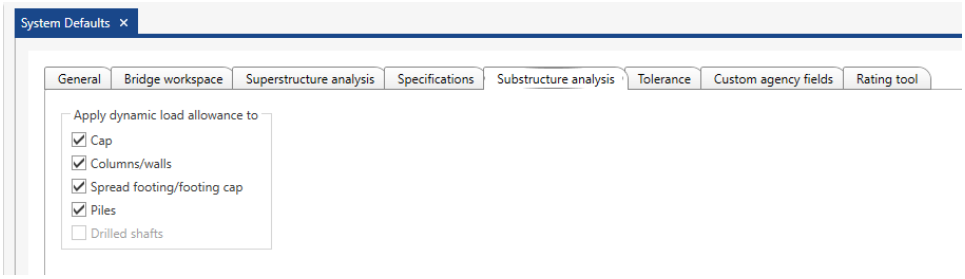
Superstructure analysis



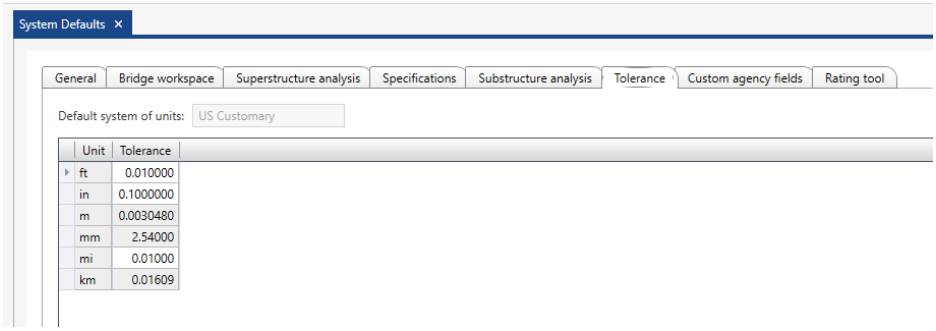
Specifications



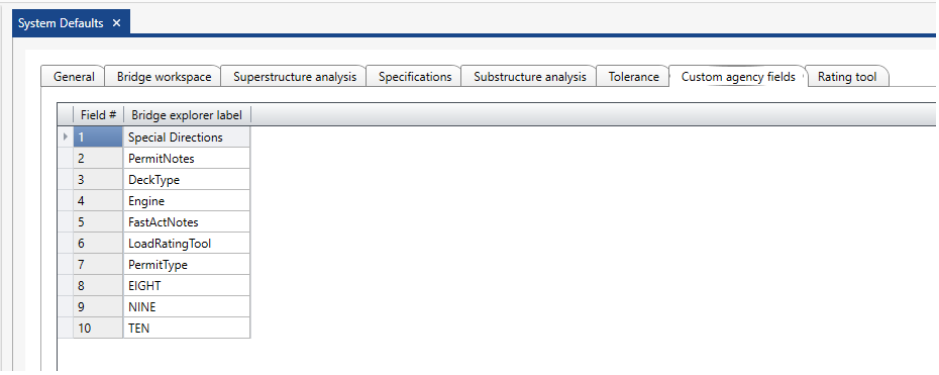
Substructure analysis



Tolerance



Custom agency fields

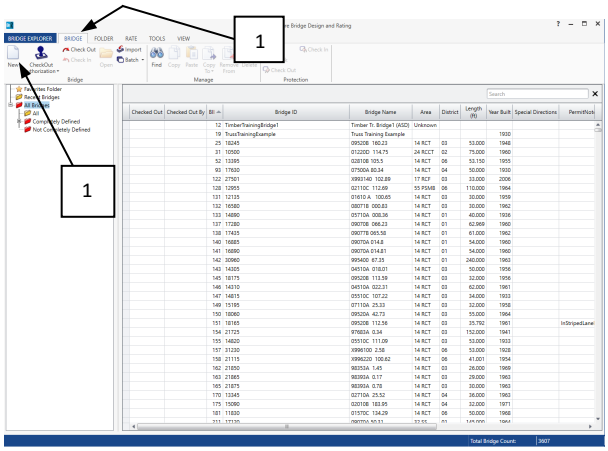


CREATING A NEW BRIDGE IN *BrR

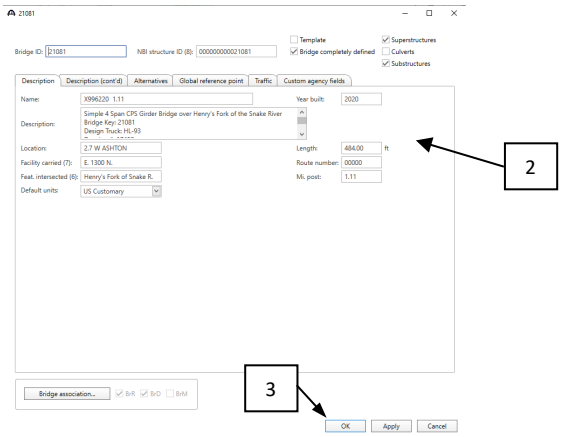
CREATING A NEW BRIDGE

*Note: All instructions and screenshots were made using BrR version 7.1.1.

1. Click on the *New* icon on the *BRIDGE* toolbar at the top of the screen.

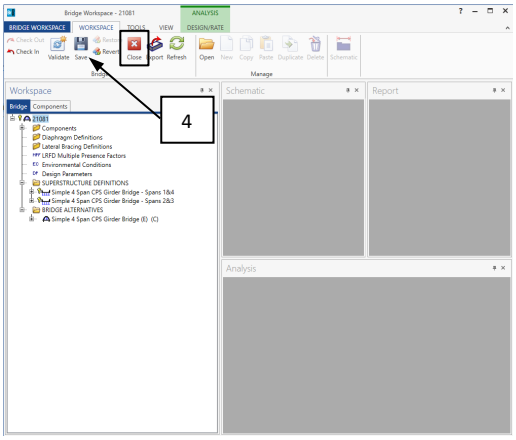


2. Fill the information on the *Bridge ID* field, *NBI structure ID* field, *Description* tab, *Description (cont'd)* tab, *Global Reference point* tab, *Traffic* tab, and *Custom agency fields* tab and check the appropriate boxes per the instructions in Appendix 6.3.3 *BrR Description Data*. Note that the *Bridge ID* and *NBI Structure ID* must be unique numbers that are not already in the database.
3. Select the *OK* button.



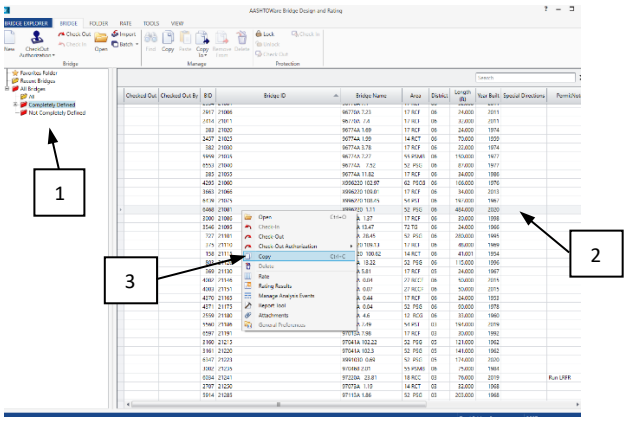
4. You will now see a bridge workspace tree, ready for data input. Click on the *Save* icon on the *WORKSPACE* toolbar at the top of the screen.

You have now created a bridge from scratch and have saved it to your database. You may complete your data input now, or exit (click on the red *X* button on the *WORKSPACE* toolbar) and return in the future to complete your input.

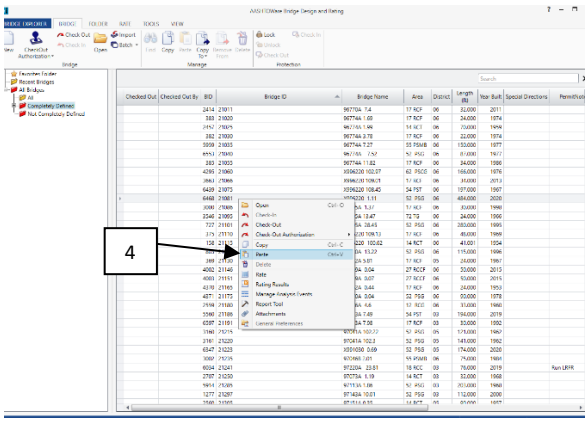


CREATING A NEW BRIDGE FROM A COPY OF AN EXISTING BRIDGE

1. Select desired folder on the left side of the screen.
2. Highlight the bridge you would like to copy.
3. Right click on the mouse and select *Copy*.

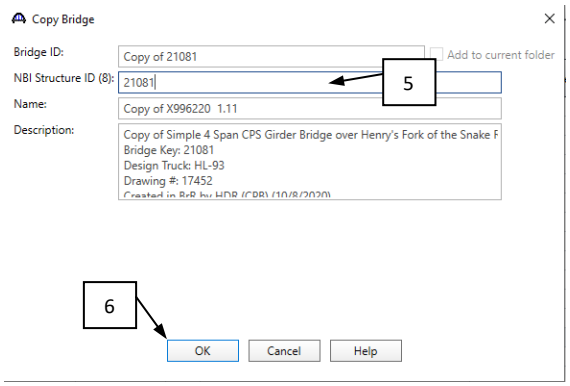


4. Right click on the mouse and select *Paste*.



5. Modify the *Bridge ID* and *NBI Structure ID* for the new bridge.
6. Select the *OK* button.

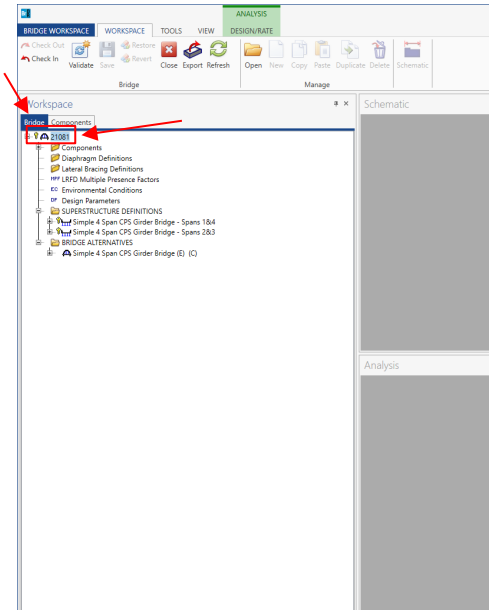
The copy has been saved and will now appear in Bridge Explorer and can be modified. Make sure to uncheck "Bridge completely defined" for the new copy.

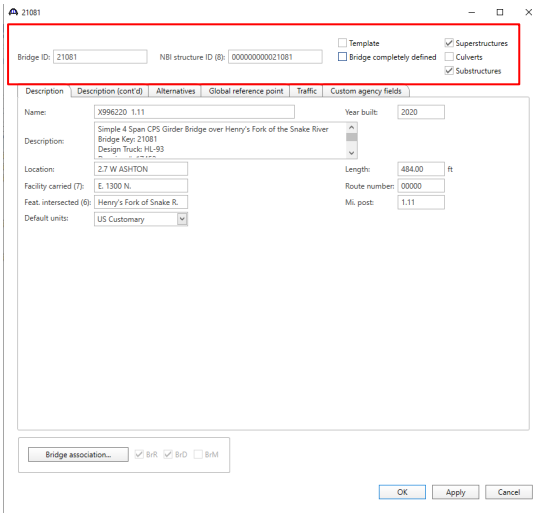


***BrR DESCRIPTION DATA**

*Note: All instructions and screenshots were made using BrR version 7.1.1.

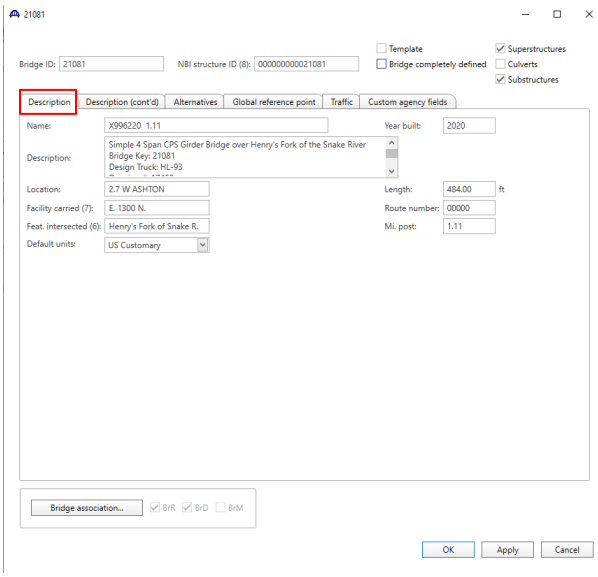
The following guidance is what ITD requires for BrR load ratings. The Structure Inventory and Appraisal (SI&A) summary will be required to fill in all the required information. The SI&A can be obtained by contacting the ITD Load Rating Engineer. If the rating is for a structure that has not yet been built, the SI&A will not exist. In this case, the load rater can fill in the information they do know, making a note on the Load Rating Summary form that the missing information is to be filled in when the structure is inventoried by the ITD Bridge Inspector.

In the "Bridge" tab, double click on the bridge information tree which will pop up the bridge information window.	

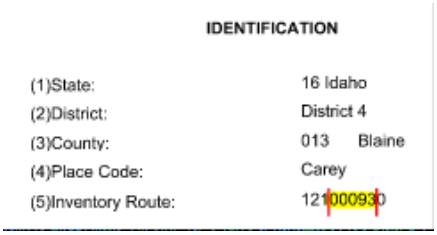
Header Information • *Bridge ID:* Enter the bridge key for the structure. • *NBI Structure ID (8):* Enter the bridge key for the structure with as many leading zeros as the field will allow. • *Bridge Completely Defined:* <u>Do not check this box.</u> This box is to be checked by the ITD Load Rating Engineer when the bridge is processed.	

Description Tab

- *Name:* Enter the structure name from the SI&A (or enter "New Bridge" if bridge has yet to be inventoried).
- *Location, Facility Carried, Feature Intersected, Year Built, Length, and Mile Post:* Enter data from the SI&A, when available.
- *Route Number (5):* Input digits 4-8 of the 9 digit Inventory Route number found on the SI&A.
- *Description:* Enter the following 5 pieces of information in the field:
  - A one sentence description of the bridge. Include if the structure is simple or continuous, the number of spans, the type of bridge structure (see below for structure type abbreviations), and the feature it spans, for example; Simple 4 Span CPS Girder Bridge over Henry's Fork of the Snake River.
  - Bridge Key: Enter the bridge key number.
  - Design Truck: Enter the design truck listed on the plans.
  - Drawing #: List the drawing number.
  - Created in BrR by [ITD or Consultant name] [rater name] (date of analysis)
  - Checked by [ITD or Consultant name] [checker name] (date of check)



BrR Route Number



Description Tab

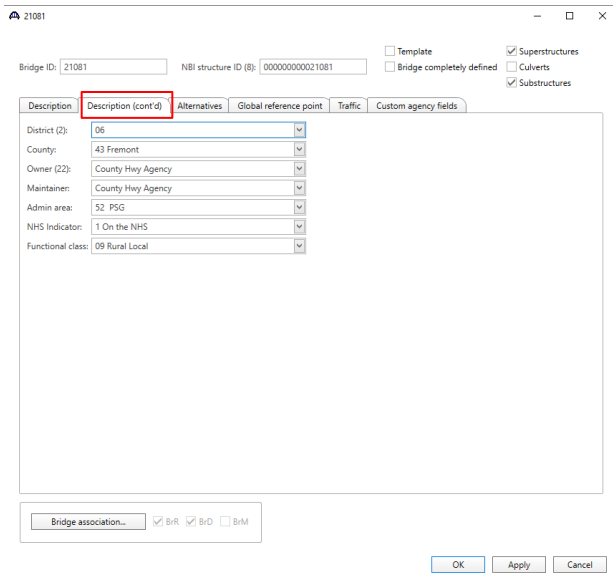
- *Structure Type Abbreviations* are to be included in the bridge description.

RC	Reinforced Concrete
RCF	Reinforced Concrete Frame
CPS	Composite Prestressed Concrete
PSC	Prestressed Concrete
SS	Structural Steel
CSC	Composite Steel Concrete

Description (cont'd) Tab

- *District (2):* Enter data from SI&A field (2) under "Identification".
- *County:* Enter data from SI&A field (3) under "Identification."
- *Owner (22):* Enter data from SI&A field (22) under "Classification."
- *Maintainer:* Enter data from SI&A field (21) under "Classification".
- *Admin Area:* Enter the Admin Area based on the codes given on the next page.
- *NHS Indicator:* Enter data from SI&A field (104) under "Classification."
- *Functional Class:* Enter data from SI&A field (26) under "Classification."

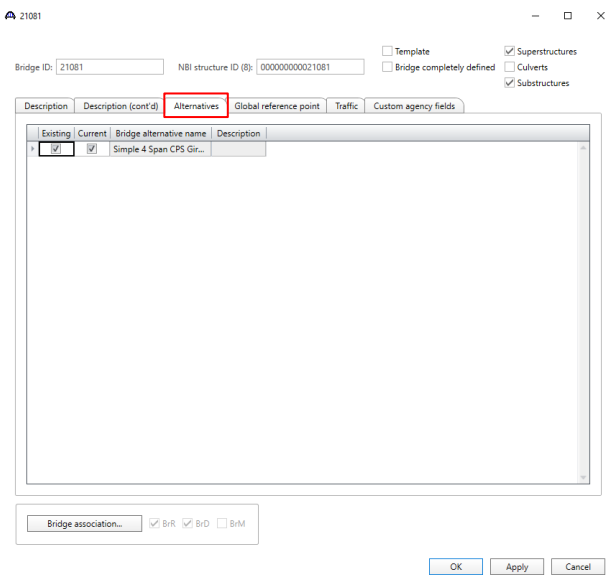
Note: Menus will need to be created by the user for these items. Please refer to Appendix 6.1.1 *BrR Setup* for instructions on how to create menus.



ID	Admin Area	First Number	Description	Second Number	Description
11	11 RCS	1	Concrete	1	Slab
12	12 RCG	2	Conc Contin	2	Stringer / Girder
13	13 RCFB	3	Steel	3	Gird. - Floorbeam Syst
14	14 RCT	4	Steel Contin	4	Tee Beam
15	15 RCMB	5	PS Conc	5	Multiple Box Beam
16	16 RCSB	6	PS Conc Contin	6	Single / Spread Box
17	17 RCF	7	Timber	7	Frame
18	18 RCC			8	Culvert
21	21 RCCS			9	Truss
22	22 RCCG				
23	23 RCCFB				
24	24 RCCT				
25	25 RCCMB				
26	26 RCCSB				
27	27 RCCF				
28	28 RCCC				
32	32 SS				
33	33 SFB				
35	35 SMB				
36	36 SSB				
37	37 SF				
38	38 SC				
39	39 ST				
42	42 SCS				
43	43 SCFB				
45	45 SCMB				
46	46 SCSB				
47	47 SCF				
48	48 SCC				
49	49 SCT				
51	51 PSS				
52	52 PSG				
53	53 PSFB				
54	54 PST				
55	55 PSMB				
56	56 PSSB				
61	61 PSCS				
62	62 PSCG				
63	63 PSCFB				
64	64 PSCT				
65	65 PSCMB				
66	66 PSCSB				
71	71 TS				
72	72 TG				
73	73 TT				

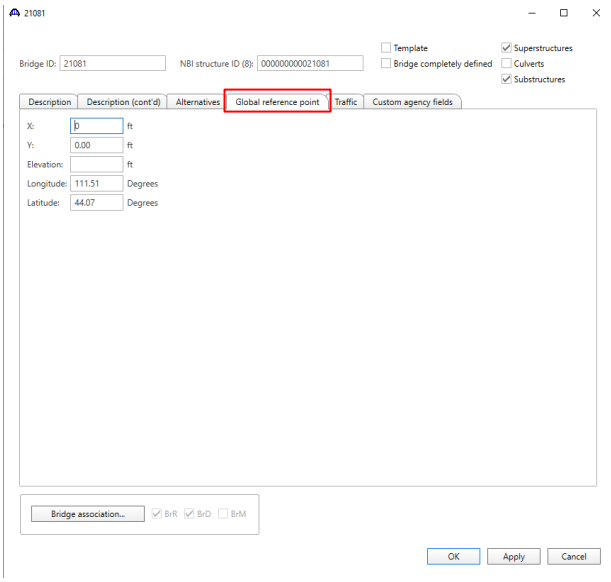
Alternatives Tab

There will be nothing on this tab until a bridge Alternative is created, further down the tree. Once a bridge alternative is created this tab will automatically populate. The rater does not need to do anything with this tab.



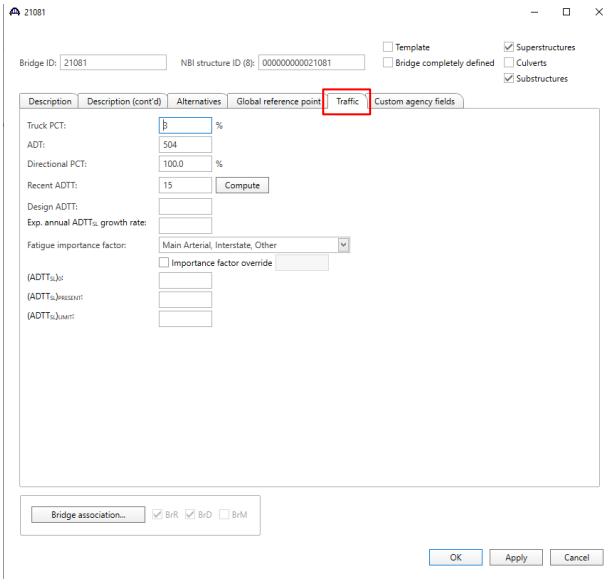
Global reference point Tab

- *X:* Leave at default (0.00)
- *Y:* Leave at default (0.00)
- *Elevation:* Leave blank
- *Longitude (17):* Input value from SI&A in degrees.
- *Latitude (16):* Input value from SI&A in degrees.
- Leave Longitude and Latitude blank if bridge has yet to be inventoried.



Traffic Tab

- *Truck PCT:* Enter data from SI&A field (109) under "Age and Service" or CAADT percentage per the plans for the year built for a bridge that has yet to be inventoried.
- *ADT:* Enter data from SI&A field (29) under "Age and Service" or AADT per the plans for the year built for a bridge that has yet to be inventoried.
- *Directional PCT:* Enter 100%
- *Recent ADTT:* Click the *Compute* button to have BrR calculate this value using the above data.
- *Design ADTT:* Use the same value as Recent ADTT



Custom agency fields Tab

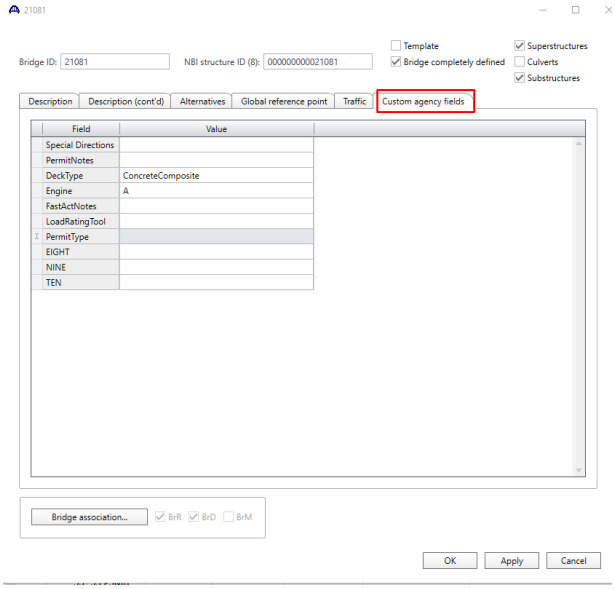
Enter the Deck Type and Engine Abbreviation based on the following tables:

Deck Type
ConcreteComposite
ConcreteNonComposite
ConcreteMono
ConcreteComp&Non
Conc&GluLam&NailLam
NoDeck
CulvertModule
LineGirderw/EH
LineGirderNoEH
LineGirder(RCFArch)
Plank
NailLaminated
NailLam.&Conc.
GlueLaminated
W-BeamRail
SteelGridFilledWithConcrete
SteelGrid
SteelChannels
SteelAngle
CorrugatedMetal
Corr.&Conc.

Engine Abreviation	Meaning
A	AASHTO
B	Brass
M	Madero
A & M	AASHTO and Madero
B & M	Brass and Madero
B & A	Brass and AASHTO

Under FastActNotes, enter the text from the options below, if applicable:

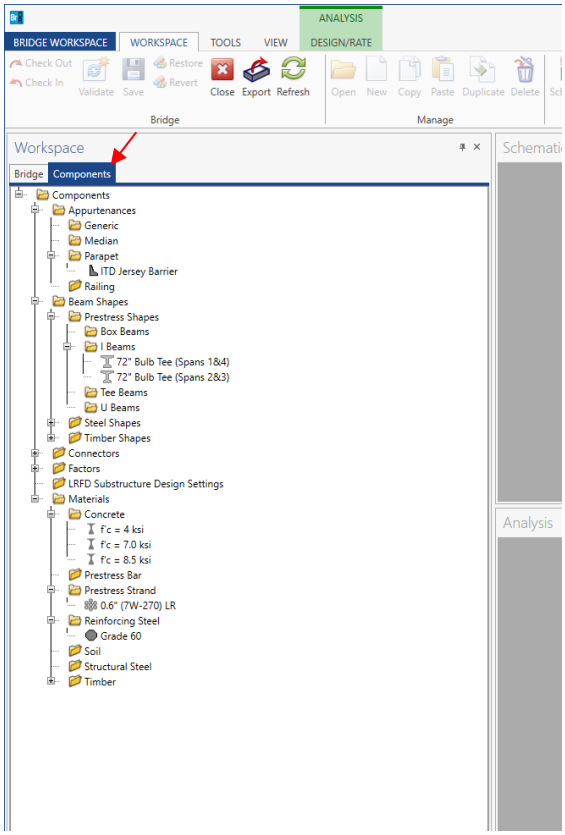
- EV2<1.0
- EV3<1.0
- EV2<1.0; EV3<1.0



In the "Components" tab

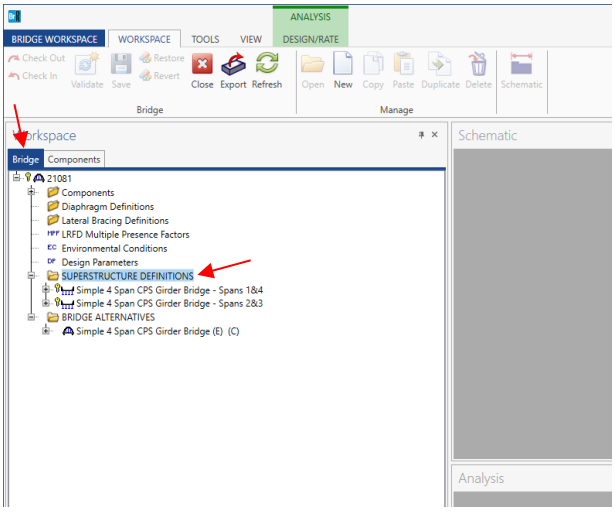
- Enter the name of *Materials* as listed below:
  - *Structural Steel:* f_y = X ksi
  - *Concrete:* f'_c = X.X ksi
  - *Reinforcing Steel:* Grade XX or Grade XX Epoxy
  - *Prestress Strand:* Use standard name that is copied from the library
- Enter the name of *Beam Shapes* as listed below:
  - Use the name that comes standard from the library if the shape is copied from the library.
  - If the shape is not available to be copied from the BrR beam shape library, use the name given to the girder on the plans.

Enter the name of *Appurtenances* as shown. Make the name descriptive of the appurtenance.
Examples: 3-Tube Curb Mount Rail, W-Beam Rail, Combination Rail, ITD Jersey Barrier, 42" Single Slope Parapet, Concrete Median Barrier

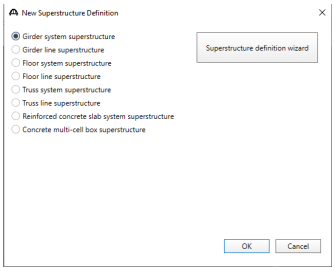


Back to the "Bridge" tab

Double click on the words *SUPERSTRUCTURE DEFINITIONS* to create a new superstructure.

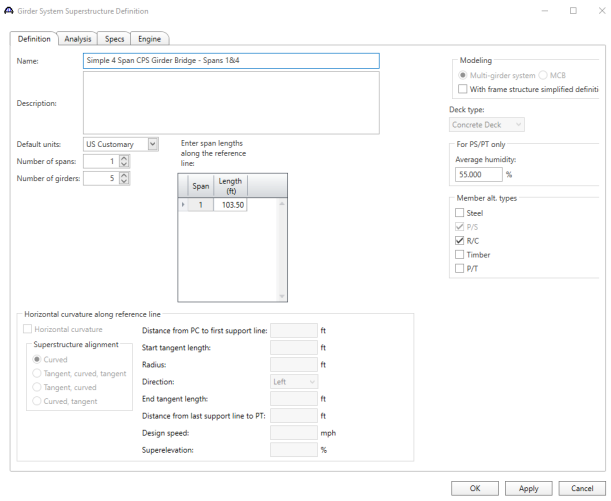


Select appropriate superstructure definition from the menu.

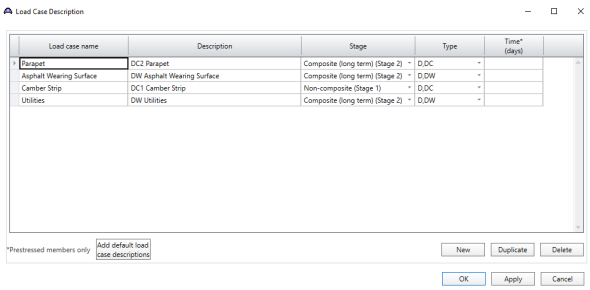


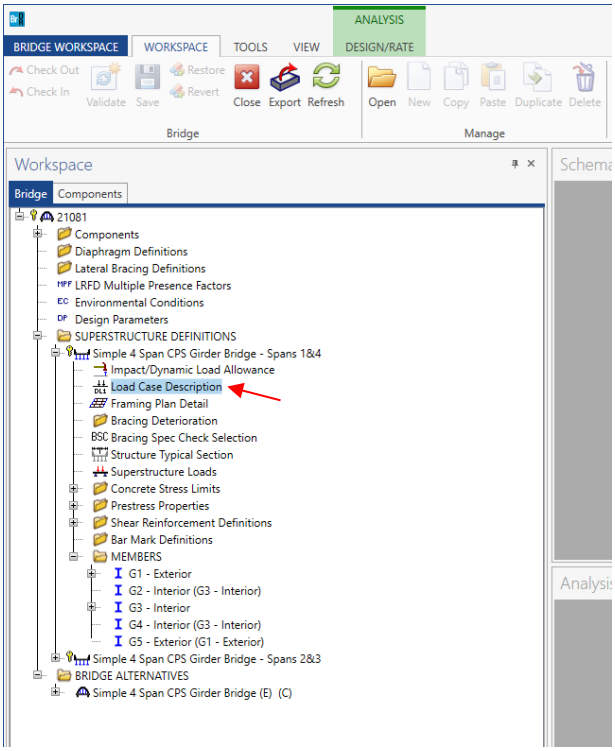
- Enter the *Name* as a short sentence which has the following information:
- Simple or continuous
- Number of spans
- Type of structure
  - RC: Reinforced concrete
  - RCF: Reinforced concrete frame
  - PSC: Prestressed concrete
  - CPS: Composite prestressed concrete
  - SS: Structural steel
  - CSC: Composite steel
- If spans are different, what span(s) is/are the superstructure modeling
- Enter span information
- Click *OK*

BrR will generate the members from the data input.



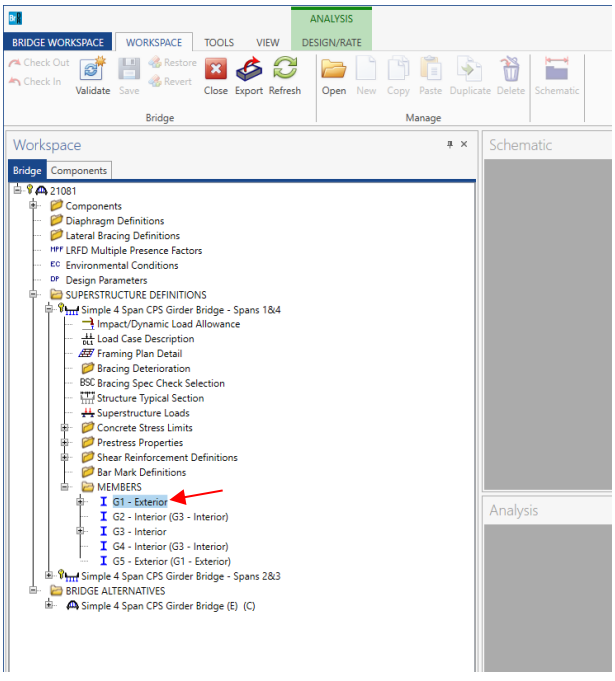
Describe the load cases in more detail than just DC or DW.



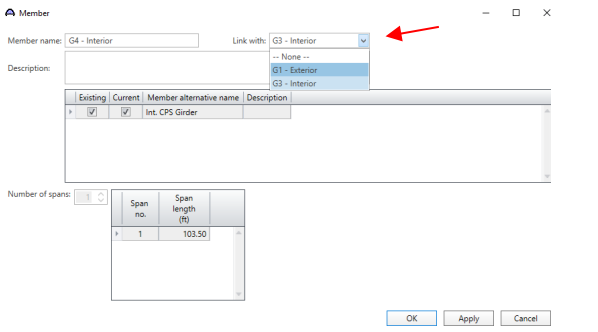


Double click on each unique member to name and describe.

- Add a short description behind the girder ID to identify more clearly. This description will be used in the Member Rating Results.
- Examples:
  - G1 – Exterior
  - G2 – Interior
  - G2 – Interior under Median
  - G5 – Exterior under Sidewalk

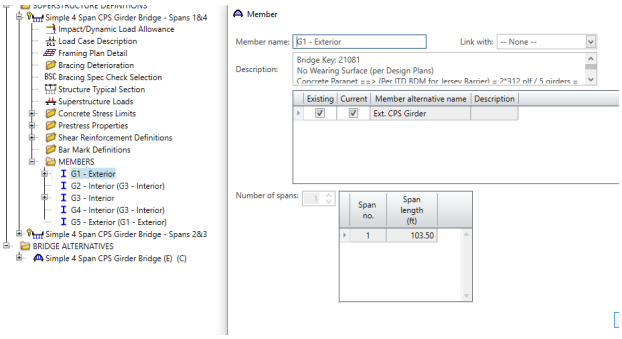


Link members with similar configurations and loading using the dropdown list shown.



Member Description

- Enter *"Bridge Key"* followed by the bridge key number on the first line of the description.
- Show calculations for dead loads to that member, effective width calculations, girder information, live load distribution factors if they vary from BrR calculated values, prestressed losses, etc.



Member Description – Example for a Prestressed Girder:

```
Bridge Key: 21081
No Wearing Surface (per Design Plans)
Concrete Parapet ==> (Per ITD BDM for Jersey Barrier) = 2*312 plf / 5 girders = 0.125 klf
Camber Strip ==> [(7.5")(1/3) + [(0.5") + (37"/2)(0.06)](2/3)](37")(0.150 kcf) = 0.138 klf
Diaphragm ==> [(7.75'- 7")(5') - (3")(9.5")](6")(0.150 kcf)/2 = 1.336 kips
Utilities ==> (Assume std. wt. 6" steel pipes filled with water. Increase wt. 10% to account for misc. w
  = (1.10)(2)[(18.97 plf) + (6.065")^2/4(PI)(62.4 pcf)]/5 girders
  = 0.014 klf
Effective width (LFR): b'/2 = (7"+2"+2")/2 = 5.5" || 6ts = 6*(8"-0.5") = 45" || L/4 = 1242"/4 = 310.5"
  ==> OH - b'/2 = 42" - 5.5" = 36.5" < 6ts so = 36.5"
  ==> SPC/2 - b'/2 = 93"/2 - 5.5" = 41" < 6ts so = 41"
  ==> OH-b'/2 + SPC/2-b'/2 + b' = 36.5" + 41" + 11" = 88.5"
  ==> min[88.5", 310.5"] = 88.5"
Effective Width (LRFR):
  ==> OH + SPC/2 = 42" + 46.5" = 88.5"
72" Prestressed Bulb Tee Girder w/ 24 - 0.6" Low Relaxation Strands
Losses per plans = 37.2 ksi
Final Prestress Working Force per beam = 860.88 kips
```

Member Description – Example for a Steel Girder with Metal Decking:

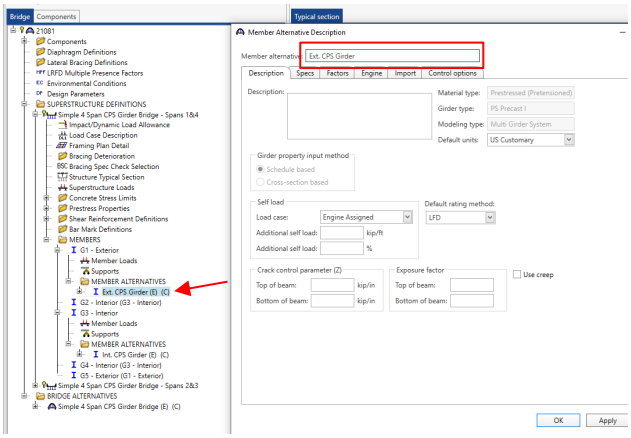
Bridge Key: 20293
7" Granular Wearing Surface (2019 Report; Assume 2.75" granular above 4.25" metal deck)
==> (2.75")(0.140 kcf)(4.333') = 0.139 klf
Metal Decking (12"x4.25", 9 gauge) ==> [10.5 psf + (4.25")(6"/12")(0.140 kcf)](4.333') = 0.153 klf
Diaphragm (Increase weight 10% to account for misc. weight)
==> (1.10)[(4.333')(35 plf) + (2)(20")(8")(0.375")(0.490 kcf)/2] = 0.186 kips
LLDF Shear (LRFR) ==> One-Lane: (1.2)(4.333'/4.333')/2 = 0.600 Lanes
Multi-Lane: (0.5)(4.333'+4.333' - 4')/4.333' = 0.538 Lanes
LLDF Moment (LRFR) ==> One-Lane: 4.333/9.2 = 0.471 Lanes
Multi-Lane: 4.333/9.0 = 0.481 Lanes
W33x130 Steel Girder (Increase weight 5% to account for misc. weight)

Member Description – Example for a Reinforced Concrete Frame:

Bridge Key: 11905
7" Asphalt and 19" Granular Wearing Surface (2021 Report)
Live Load Surcharge (LFR) = 2' / 1.3 = 1.538'
Live Load Surcharge (LRFR) = 2.0'
LFR Horizontal Earth Pressure was modeled by adjusting the lateral soil pressure per Art. 3.22.
Max. lateral soil pressure = (1.3)(55 pcf) = 71.5 pcf.
Min. lateral soil pressure = (0.5)(55 pcf) = 27.5 pcf.
LRFR Horizontal Earth Pressure modeled by applying an At-rest lateral earth pressure coefficient equal to 55 pcf
divided by the soil unit load: 55 pcf/125 pcf = 0.44.

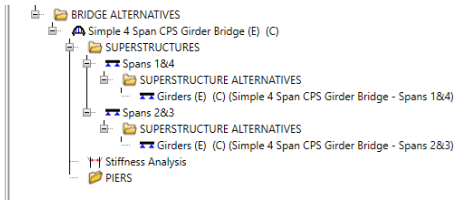
Member Alternative Description

- Include the type of girder (ie RC, CPS, PSC, SS, CSC, etc.)



Bridge Alternative

- Give a very general description of the structure.
- *Superstructure:* Identify the span and material. This description will be listed in the Structure Rating Results & the Member Rating Results.
- *Superstructure Alternative:* Give a simple name (i.e. girders) and link to the appropriate superstructure definition.



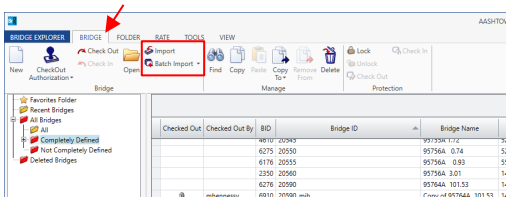
IMPORT OR EXPORT A BRIDGE IN *BrR

IMPORT

*Note: All instructions and screenshots were made using BrR version 7.1.1.

Batch import can be used for importing one bridge or many at the same time.

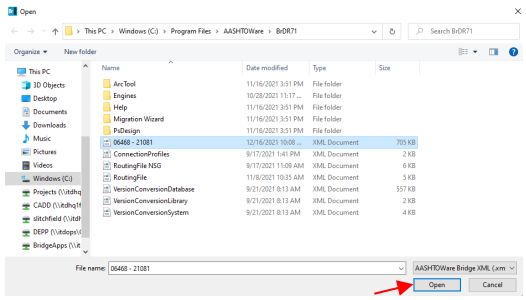
- From the *BRIDGE* toolbar, click on the *Batch Import* button at the top of the screen.



- Browse to the location of your AASHTOWare Bridge XML files, highlight them, and click *Open*.

If the import was successful, the bridge is now in the database and will show up in bridge explorer.

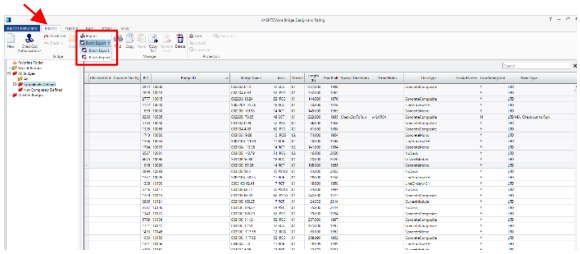
Note: One of the most common reasons a bridge will not import is if there is already a bridge in the database with the same Bridge ID.



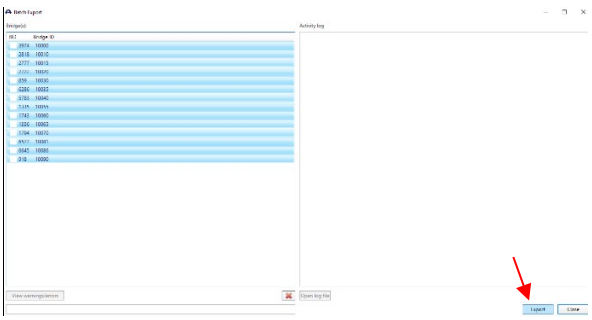
EXPORT

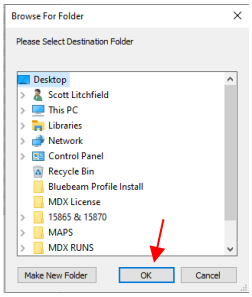
Batch export can be used for exporting one bridge or many at the same time.

- From the *BRIDGE* toolbar, highlight the bridges to be exported, click on the *Batch Import/Export* dropdown, and select *Batch Export*.



- From the *Batch Export* Window, select the bridges to be exported and click *Export*.

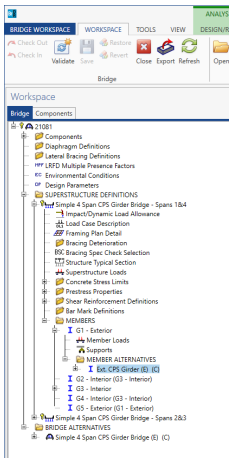
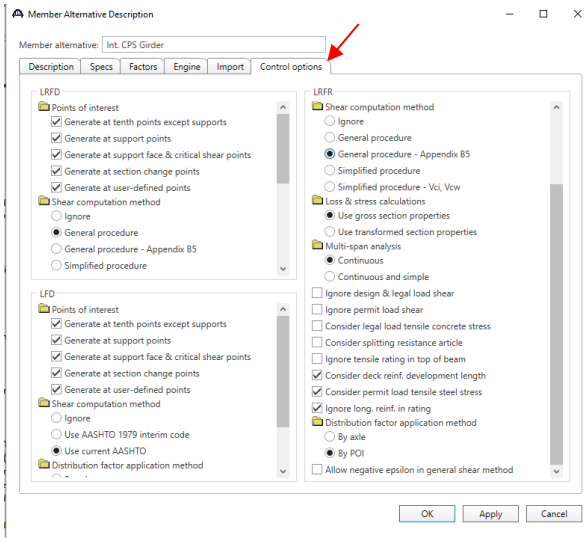


• Browse to desired location and click *OK*. The file is now in xml format. It may be imported into another BrR database, copied, or attached to an e-mail.	

ITD MODIFICATIONS TO *BrR STANDARD SETTINGS

*Note: All instructions and screenshots were made using BrR version 7.1.1.

Obtain the current control option settings from the ITD Load Rating Engineer. For prestressed girders, check shear at the legal and permit level and tensile steel stress at the permit level for LRFR ratings.

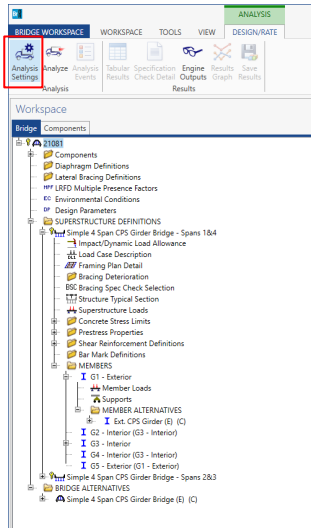
• Double click on each member alternative.	
• Select the *Control Options* tab • Under the LRFR title, check "Consider permit load tensile steel stress". Run the bridge with this control option checked. • Look at the results in Specification Check Detail under 6A.5.4.2.2.2 Permit Load Rating. Check to see if M is less than Mcr such that the reported permit load ratings are based on fs = fpe. When this is happening, all of the permit vehicles will most likely have the same rating factor. • If the permit ratings are based on fs = fpe, re-run the bridge with "Consider Permit Load Tensile Steel Stress" unchecked and report these results on the LRFR LRS that is submitted. • Re-check "Consider Permit Load Tensile Steel Stress" when you submit the xml file.	

ANALYZE AND VIEW *BrR RESULTS

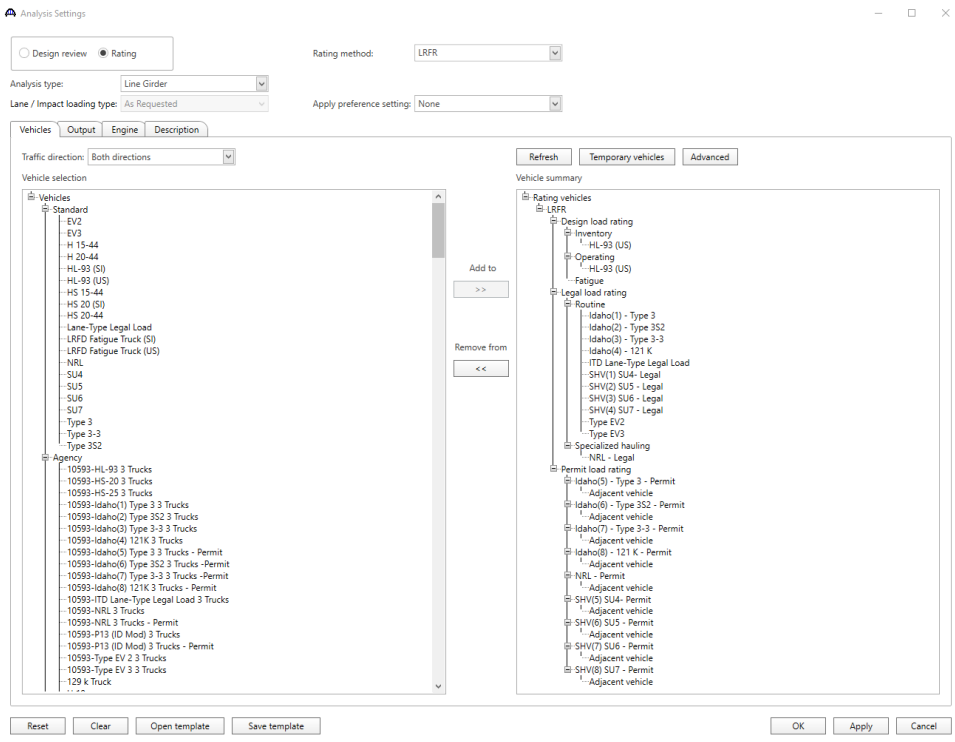
*Note: All instructions and screenshots were made using BrR version 7.1.1.

Run Analysis

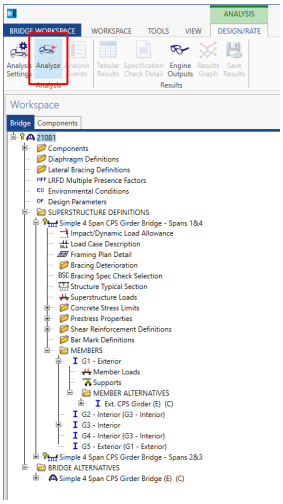
Analysis Settings



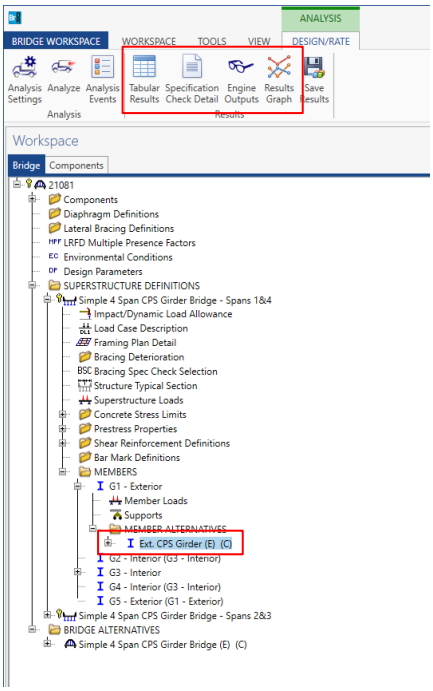
Configure analysis (using LRFR as an example)



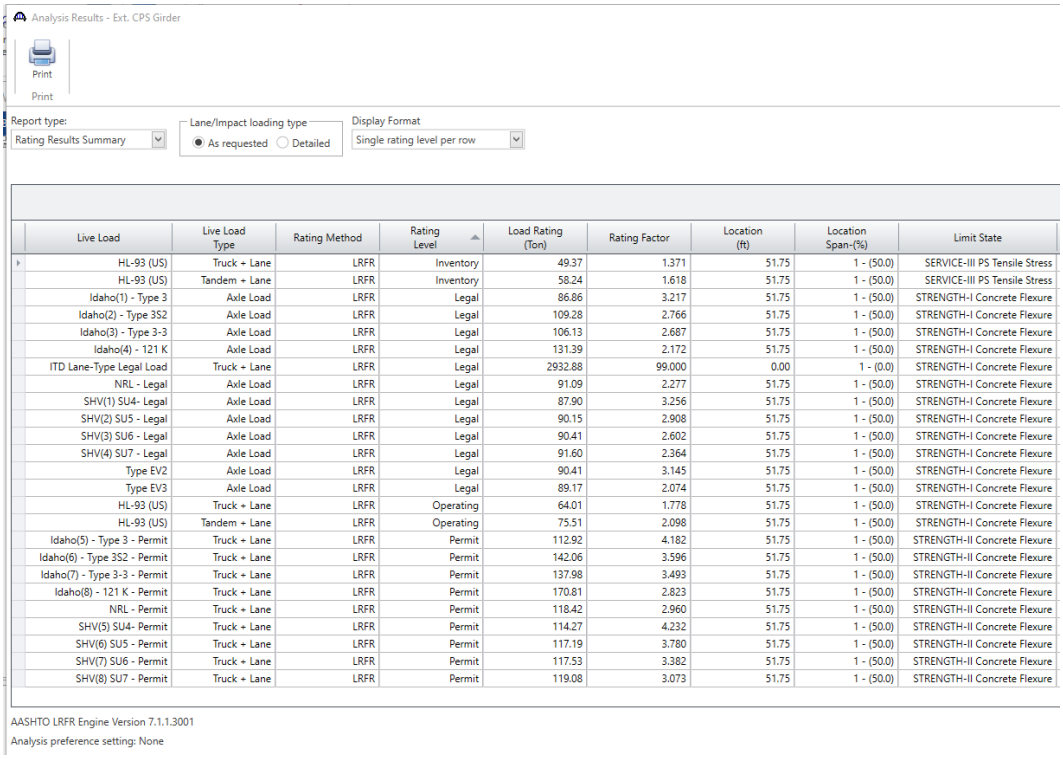
Analyze



Highlight member alt. with (E) (C) after its name and click on the appropriate icon at the top of the screen



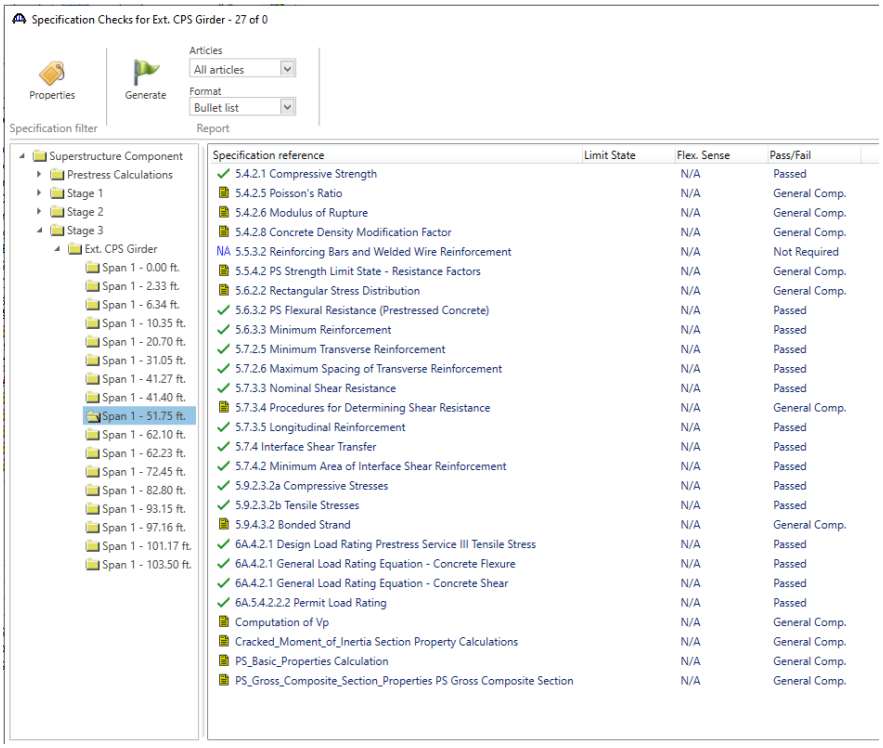
Tabular Results



Live Load	Live Load Type	Rating Method	Rating Level	Load Rating (Ton)	Rating Factor	Location (ft)	Location Span-(%)	Limit State
HL-93 (US)	Truck + Lane	LRFR	Inventory	49.37	1.371	51.75	1 - (50.0)	SERVICE-III PS Tensile Stress
HL-93 (US)	Tandem + Lane	LRFR	Inventory	58.24	1.618	51.75	1 - (50.0)	SERVICE-III PS Tensile Stress
Idaho(1) - Type 3	Axle Load	LRFR	Legal	86.86	3.217	51.75	1 - (50.0)	STRENGTH-I Concrete Flexure
Idaho(2) - Type 3S2	Axle Load	LRFR	Legal	109.28	2.766	51.75	1 - (50.0)	STRENGTH-I Concrete Flexure
Idaho(3) - Type 3-3	Axle Load	LRFR	Legal	106.13	2.687	51.75	1 - (50.0)	STRENGTH-I Concrete Flexure
Idaho(4) - 121 K	Axle Load	LRFR	Legal	131.39	2.172	51.75	1 - (50.0)	STRENGTH-I Concrete Flexure
ITD Lane-Type Legal Load	Truck + Lane	LRFR	Legal	2932.88	99.000	0.00	1 - (0.0)	STRENGTH-I Concrete Flexure
NRL - Legal	Axle Load	LRFR	Legal	91.09	2.277	51.75	1 - (50.0)	STRENGTH-I Concrete Flexure
SHV(1) SU4- Legal	Axle Load	LRFR	Legal	87.90	3.256	51.75	1 - (50.0)	STRENGTH-I Concrete Flexure
SHV(2) SU5 - Legal	Axle Load	LRFR	Legal	90.15	2.908	51.75	1 - (50.0)	STRENGTH-I Concrete Flexure
SHV(3) SU6 - Legal	Axle Load	LRFR	Legal	90.41	2.602	51.75	1 - (50.0)	STRENGTH-I Concrete Flexure
SHV(4) SU7 - Legal	Axle Load	LRFR	Legal	91.60	2.364	51.75	1 - (50.0)	STRENGTH-I Concrete Flexure
Type EV2	Axle Load	LRFR	Legal	90.41	3.145	51.75	1 - (50.0)	STRENGTH-I Concrete Flexure
Type EV3	Axle Load	LRFR	Legal	89.17	2.074	51.75	1 - (50.0)	STRENGTH-I Concrete Flexure
HL-93 (US)	Truck + Lane	LRFR	Operating	64.01	1.778	51.75	1 - (50.0)	STRENGTH-I Concrete Flexure
HL-93 (US)	Tandem + Lane	LRFR	Operating	75.51	2.098	51.75	1 - (50.0)	STRENGTH-I Concrete Flexure
Idaho(5) - Type 3 - Permit	Truck + Lane	LRFR	Permit	112.92	4.182	51.75	1 - (50.0)	STRENGTH-II Concrete Flexure
Idaho(6) - Type 3S2 - Permit	Truck + Lane	LRFR	Permit	142.06	3.596	51.75	1 - (50.0)	STRENGTH-II Concrete Flexure
Idaho(7) - Type 3-3 - Permit	Truck + Lane	LRFR	Permit	137.98	3.493	51.75	1 - (50.0)	STRENGTH-II Concrete Flexure
Idaho(8) - 121 K - Permit	Truck + Lane	LRFR	Permit	170.81	2.823	51.75	1 - (50.0)	STRENGTH-II Concrete Flexure
NRL - Permit	Truck + Lane	LRFR	Permit	118.42	2.960	51.75	1 - (50.0)	STRENGTH-II Concrete Flexure
SHV(5) SU4- Permit	Truck + Lane	LRFR	Permit	114.27	4.232	51.75	1 - (50.0)	STRENGTH-II Concrete Flexure
SHV(6) SU5 - Permit	Truck + Lane	LRFR	Permit	117.19	3.780	51.75	1 - (50.0)	STRENGTH-II Concrete Flexure
SHV(7) SU6 - Permit	Truck + Lane	LRFR	Permit	117.53	3.382	51.75	1 - (50.0)	STRENGTH-II Concrete Flexure
SHV(8) SU7 - Permit	Truck + Lane	LRFR	Permit	119.08	3.073	51.75	1 - (50.0)	STRENGTH-II Concrete Flexure

AASHTO LRFR Engine Version 7.1.1.3001
Analysis preference setting: None

Specification Check Detail



Specification reference	Limit State	Flex. Sense	Pass/Fail
5.4.2.1 Compressive Strength		N/A	Passed
5.4.2.5 Poisson's Ratio		N/A	General Comp.
5.4.2.6 Modulus of Rupture		N/A	General Comp.
5.4.2.8 Concrete Density Modification Factor		N/A	General Comp.
5.5.3.2 Reinforcing Bars and Welded Wire Reinforcement		N/A	Not Required
5.5.4.2 PS Strength Limit State - Resistance Factors		N/A	General Comp.
5.6.2.2 Rectangular Stress Distribution		N/A	General Comp.
5.6.3.2 PS Flexural Resistance (Prestressed Concrete)		N/A	Passed
5.6.3.3 Minimum Reinforcement		N/A	Passed
5.7.2.5 Minimum Transverse Reinforcement		N/A	Passed
5.7.2.6 Maximum Spacing of Transverse Reinforcement		N/A	Passed
5.7.3.3 Nominal Shear Resistance		N/A	Passed
5.7.3.4 Procedures for Determining Shear Resistance		N/A	General Comp.
5.7.3.5 Longitudinal Reinforcement		N/A	Passed
5.7.4 Interface Shear Transfer		N/A	Passed
5.7.4.2 Minimum Area of Interface Shear Reinforcement		N/A	Passed
5.9.2.3.2a Compressive Stresses		N/A	Passed
5.9.2.3.2b Tensile Stresses		N/A	Passed
5.9.4.3.2 Bonded Strand		N/A	General Comp.
6A.4.2.1 Design Load Rating Prestress Service III Tensile Stress		N/A	Passed
6A.4.2.1 General Load Rating Equation - Concrete Flexure		N/A	Passed
6A.4.2.1 General Load Rating Equation - Concrete Shear		N/A	Passed
6A.5.4.2.2.2 Permit Load Rating		N/A	Passed
Computation of Vp		N/A	General Comp.
Cracked_Moment_of_Inertia Section Property Calculations		N/A	General Comp.
PS_Basic_Properties Calculation		N/A	General Comp.
PS_Gross_Composite_Section_Properties PS Gross Composite Section		N/A	General Comp.

Results Graph (Moment, Shear, Axial, and Deflection diagrams)

Span	Location	Distance	MDL-s1- Load Case 1 - Self Load(Stage 1:D,DC)	MDL-s1- Load Case 2 - Member Dist'd Loads(Camber Strip:Stage 1:D,DC)	MDL-s1- Load Case 3 - Exterior Diaphragm Loads(Stage 1:D,DC)	MDL-s1- Load Case 4 - Concrete Deck Load (Stage 1:D,DC)	MDL-s1- Load Case 5 - PS Transfer Forces (Stage 1)	MDL-s2- Load Case 1 - Member Dist'd Loads(Utilities:Stage 2:D,DW)	MDL-s2- Load Case 2 - Parapet Loads (DC2:Stage 2:D,DC)
1	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	2.33	2.33	92.75	16.29	3.12	87.05	-1,465.25	1.65	14.71
1	10.35	10.35	378.83	66.52	13.83	355.51	-1,625.91	6.75	60.07
1	20.70	20.7	673.47	118.26	27.67	632.02	-1,833.34	12.00	106.79
1	31.05	31.05	883.93	155.22	41.50	829.53	-2,040.76	15.75	140.17
1	34.50	34.5	935.37	164.25	46.11	877.81	-2,109.91	16.66	148.32
1	41.27	41.27	1,009.14	177.21	46.11	947.04	-2,245.60	17.98	160.02
1	41.40	41.4	1,010.20	177.39	46.11	948.03	-2,245.60	18.00	160.19
1	51.75	51.75	1,052.29	184.79	46.11	987.54	-2,245.60	18.75	166.87
1	62.10	62.1	1,010.20	177.39	46.11	948.03	-2,245.60	18.00	160.19
1	62.23	62.23	1,009.14	177.21	46.11	947.04	-2,245.60	17.98	160.02
1	69.00	69	935.37	164.25	46.11	877.81	-2,109.91	16.66	148.32
1	72.45	72.45	883.93	155.22	41.50	829.53	-2,040.76	15.75	140.17
1	82.80	82.8	673.47	118.26	27.67	632.02	-1,833.34	12.00	106.79

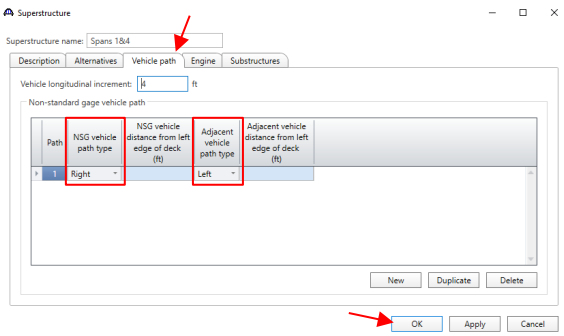
Turn what you view on and off by checking the boxes at the left of the popup window.

Running A Non-Standard Gage (NSG) Vehicle in *BrR

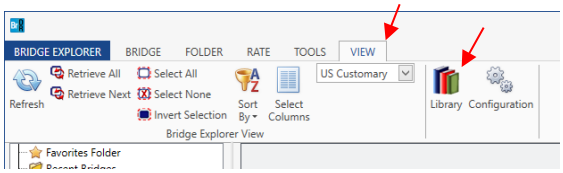
*Note: All instructions and screenshots were made using BrR version 7.1.1.

- Open bridge file.
- Open superstructure alternatives.
- Select the *Vehicle Path* tab.
- Select *"Right"* for the *NSG vehicle path type* column and select *"Left"* for the *Adjacent vehicle path type* column.
- You may put more than one path here, however, the analysis time is reduced if you only run the path you intend to use.
- Click *OK*, and save and close the bridge file.

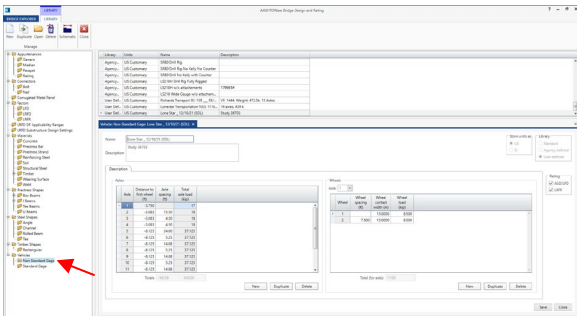
Note: Make sure only superstructure system definitions are under bridge alternatives, NSG cannot be run on line girders.



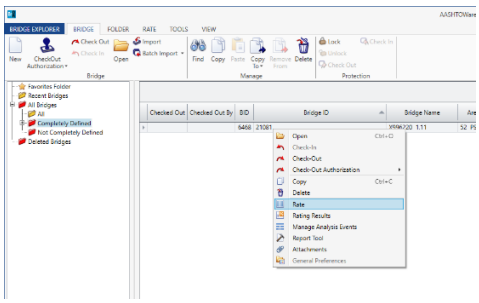
Select *Library* from the *VIEW* toolbar.

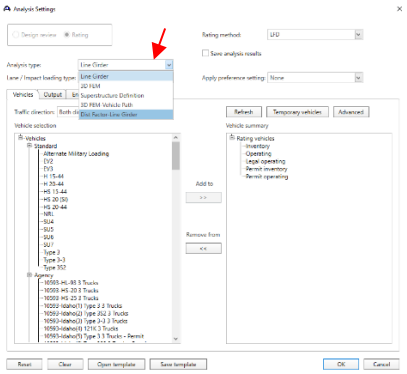
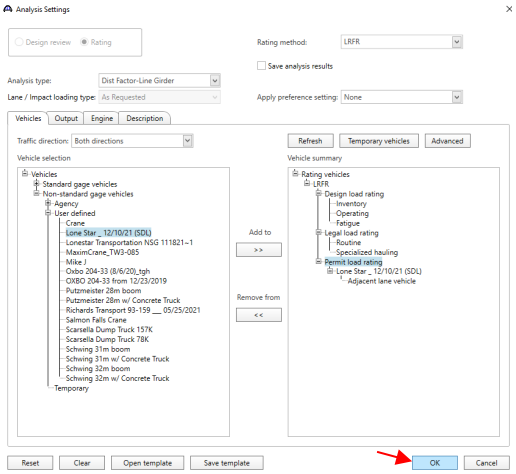


Select *Non Standard Gage* under Vehicles on the left side of the screen to add a new or edit an existing NSG vehicle. Press F1 to see detailed instructions on how to enter a NSG vehicle.



Right click on the desired bridge on click *Rate*.



In the *Analysis Settings* window, select *Dist Factor-Line Girder* from the *Analysis type:* dropdown.	
Move desired NSG truck over to desired rating analysis and select *OK*.	

ITD Quality Assurance Checklist for BrR (formerly Virtis) Load Ratings

Quality Assurance Name:_____

Date:_____

- ❑ Fill in "Submittal Date" under LR tracking sheet
- ❑ Print any items in decision log that pertain to bridge
- ❑ Load Rating Summary (LRS) is dated: LFR rev. 3/1/2021 LRFR 3/18/2022

Bridge Key #_____

DateRec._____

Rater_____

Submittal Group_

_____

ASR LFR LRFR

Run BrR File.
Do the results match the load rating summary?

No

Yes

Bridge Factor/Route Color/Truck

Existing_____

New_____

Permit Route Local

Compare new bridge factor with existing bridge factor

Return to rater for correction

Requested Corrections

Greater than 100 difference

Existing Rating

New Rating

Investigate

Less than 100 difference

Open file and validate. Error messages?

New rating incorrect

New rating appears correct

Yes

No

Processing Checklist

- ❑Make sure district, county, traffic, and lat. long. Fields are filled in under description.
- ❑Fill in Admin Area
- ❑Fill in Custom Agency Fields (see next page)
- ❑Check "Bridge Completely Defined" in BrR file.
- ❑Put LRS & Calcs under LRS_CAL folder & Link in BrR.
- ❑Fill in Load Rating tracking sheet. (Date QA Complete).
- ❑E-mail inspector if field verification needed on LR assumptions.

Check file for applicable items:

- ❑Wearing Surface
- ❑Design Truck
- ❑Rating by: Checked by:
- ❑Span Lengths correct
- ❑LRFR Service III PS Factors
- ❑Prestress losses input correct
- ❑Diaphragm, stiffener, splice wts.
- ❑IRF for design veh. close to 1.0

BrM BrR

Incorrect

Correct

Process

- ❑Fill in Load Rating tracking sheet. (Date to Patty & Method).
- ❑Give to Patty
- ❑Check BrM (formerly Pontis) for updated rating
- ❑Retire old BARS files if necessary
- ❑Check factor list for update rating date
- ❑Verify links in BrR file
- ❑NSG vehicle path = Right, with Adj. Vehicle = Left
- ❑Remove Check Out Authorizations
- ❑Fill in Date in BrM in Tracking Sheet

Input for ITD Custom Agency Fields

Example Special Directions
CheckOutToRun
WB Travel Only
ReadNotes
PostTensionedSlab
EB Travel Only
Do No Run File
Webs
HighFillOnUS20;LLNegligible

Example Permit Notes
HasInStripedLaneFile
~#min.RunTime
OnlyRunsLRFR
Curved5SpanContinuous
I.C.RampControls

Deck Type
ConcreteComposite
ConcreteNonComposite
ConcreteMono
ConcreteComp&Non
Conc&GluLam&NailLam
NoDeck
CulvertModule
LineGirderw/EH
LineGirderNoEH
LineGirder(RCFArch)
Plank
NailLaminated
NailLam.&Conc.
GlueLaminated
W-BeamRail
SteelGridFilledWithConcrete
SteelGrid
SteelChannels
SteelAngle
CorrugatedMetal
Corr.&Conc.

Engine Abreviation	Meaning
A	AASHTO
B	Brass
M	Madero
A & M	AASHTO and Madero
B & M	Brass and Madero
B & A	Brass and AASHTO

ID	Admin Area
11	11 RCS
12	12 RCG
13	13 RCFB
14	14 RCT
15	15 RCMB
16	16 RCSB
17	17 RCF
18	18 RCC
21	21 RCCS
22	22 RCCG
23	23 RCCFB
24	24 RCCT
25	25 RCCMB
26	26 RCCSB
27	27 RCCF
28	28 RCCC
32	32 SS
33	33 SFB
35	35 SMB
36	36 SSB
37	37 SF
38	38 SC
39	39 ST
42	42 SCS
43	43 SCFB
45	45 SCMB
46	46 SCSB
47	47 SCF
48	48 SCC
49	49 SCT
51	51 PSS
52	52 PSG
53	53 PSFB
54	54 PST
55	55 PSMB
56	56 PSSB
61	61 PSCS
62	62 PSCG
63	63 PSCFB
64	64 PSCT
65	65 PSCMB
66	66 PSCSB
71	71 TS
72	72 TG
73	73 TT

Input for BrR Admin Area

First Number	Description	Second Number	Description
1	Concrete	1	Slab
2	Conc Contin	2	Stringer / Girder
3	Steel	3	Gird. - Floorbeam Syst
4	Steel Contin	4	Tee Beam
5	PS Conc	5	Multiple Box Beam
6	PS Conc Contin	6	Single / Spread Box
7	Timber	7	Frame
		8	Culvert
		9	Truss

ITD LOAD RATING REANALYSIS PROCEDURE & CHECKLIST

Bridge Key: _____

Approved Procedure Date: 12/3/18

Justification for Reanalysis:

- □ Reanalysis Box Checked by Inspector _____ on _____ during:
  - □ Routine Inspection
  - □ Special Inspection
  - □ In-depth Inspection
  - □ Damage Inspection
- □ Investigation into Load Rating Due to _____

Date Reanalysis Performed: _____

Reanalysis Performed By: _____

□ Pull Hard Folder and Print this "Reanalysis Procedure and Checklist" (printer friendly)

□  Reanalysis Procedur...

STEP 1: Reconcile Existing LRS and BrR Model

NEW LOAD RATING FORM

- □ Make a folder under your ITD Loading Rating AccountY:\Load Rating\LR Re-analysis\Working Folder with Bridge Key (e.g. 12345).
- □ Pull a New Form Y:\Load Rating\Forms\Autopopulate Forms and place in your folder.
  - □ LFR -- LFR_LRS_Rev_10-24_2018(autopopulate)
  - □ LRFR -- LRFR_LRS_Rev_10_24_2018(autopopulate)
- □ Relabel new form as Bridge Key (e.g. 12345_LRS_LFR(autopopulate)).
- □ Autopopulate the Header information. (The directions is in the <Autopopulate Instructions> tab of the file.)
- □ Verify the information is consistent with the current inspection report.
- □ Verify BrR Version is Current. If not correct.

NEW BrR MODEL

- □ Go to BrR and make copy of model in Completely Defined Folder in BrR. Place your initials behind the model name. (e.g. 12345_JML)
- □ Check out the new file (copied file with the raters initial) - leave the original file unchanged
- □ Uncheck the "Bridge Completely Defined" box in the root folder in the BrR file tree.
- □ Save the file, exit, and check the file back in.
- □ Make changes to the newly created file in the "Not Completely Defined" folder in BrR's Bridge Explorer

STEP 1: Reconcile Existing LRS and BrR Model (CONT'D)

CHECK EXISTING LRS SHEET

- □ Pull existing LRS calc sheet Y:\Load Rating\LRS_Calcs and place in your folder.
- □ Relabel it as OLD (e.g. 12345_LRS_OLD).
- □ Copy the "Remarks" from the original summary sheet to the New Form summary sheet (New Form).
- □ BrR Version Used For Existing LRS Calc Sheet _____
- □ BRIDGE FACTOR = _____

CHECK EXISTING BrR MODEL

- □ Run the new model using "HS20_MemberAlt" Alternative.
- □ BrR Verison Used with Existing BrR Model 6.8.2
- □ Place the Operating and Inventory "Rating Factor" results into the new form.
- □ BRIDGE FACTOR = _____

FACTOR Difference = _____

If < 100 And No Concerns By Engineer Then Accept BrR Model and Go to Step 2.
OTHERWISE

MODEL ACCURACY CONCERN

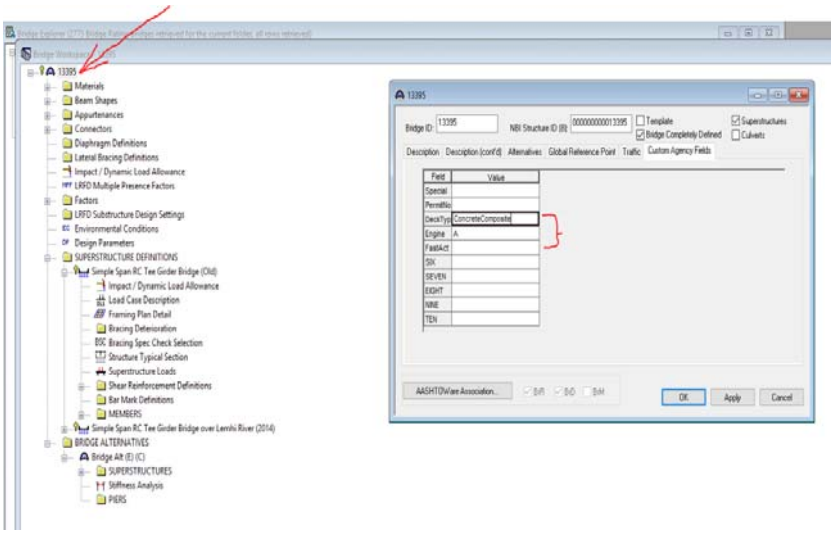
If there is reason to believe the file may not be accurate (change in bridge factor > 100, No QA documentation is on file, etc.), check the key elements of the bridge in the BrR file are consistent with the plans/shop drawings.

- □ Typical Section
- □ Framing Plan
- □ Diaphragm locations
- □ Deck thickness is accurate
- □ Wearing Surface current inspection report
- □ Girders
  - □ Prestressed Girder - type, prestressing layout, shear stirrup location
  - □ Steel - Flange sizes, web size, general location plate break
  - □ Reinforced Concrete - girder dimensions are accurate, area of reinforcement at each location, general location of reinforcement changes
  - □ Timber - Beam size, stresses
- □ Girder connection with the deck (Composite or Non-composite)
- □ Main Loads are accurate, minor loads seem reasonable
- □ Material properties (Concrete Strength, Steel Strength, Prestress Forces (losses), Timber Stresses, etc)

EXISTING BRIDGE FACTOR _____

STEP 2: Admin Updates to BrR File

- □ Verify the Engine is noted correctly in the "Custom Agency Fields" in the root folder of the BrR tree (ie. "A" for the AASHTO Engine).
- □ Add the deck type information in the "Custom Agency Fields" in the root folder of the BrR tree.
- □ Check if traffic information is consistent with BrM
- □ Check to see that load cases are specific and defined. (e.g. not DW, DC)



Deck Type
ConcreteComposite
ConcreteNonComposite
ConcreteMono
ConcreteComp&Non
Conc&GluLam&NailLam
NoDeck
CulvertModule
LineGirderw/EH
LineGirderNoEH
LineGirder(RCFArch)
Plank
NailLaminated
NailLam.&Conc.
GlueLaminated
W-BeamRail
SteelGridFilledWithConcrete
SteelGrid
SteelChannels
SteelAngle
CorrugatedMetal
Corr.&Conc.

STEP 3: Make Reanalysis Changes

UPDATE BrR File

- □ Update the file to match the current condition based on the latest bridge inspection report - concentrate on the items that made the re-analysis necessary.
    - □ member notes
    - □ loads
    - □ distribution factors
    - □ Update to AASHTO Engine (Complete Engine Conversion Using Engine Conversion Checksheet if Needed.)
    - □ Change Deck for Structural Overlay.
    - □ Etc.

- □ Rerun Model Result Using g "HS20_MemberAlt" Alternative.
- □ Open up the New LRS Calc Sheet Made From Step 1 and Overwrite Operating and Inventory "Rating Factor" Results with New Load Rating Factors.

NEW BRIDGE FACTOR _____
NEW BRIDGE COLOR _____

Difference Between New Bridge Factor and Old Bridge Factor _____
Does the Bridge Color Change? _____
Does any Posting Value Change? _____

- □ Go to UPDATE LRS below if:
    - □ If Bridge Factor Change is < 300 and
    - □ If Bridge Color is not changed
    - □ If Posting is not Changed

- □ If any of the criteria above is not met
    - □ Evaluate Warnings
    - □ Verify Model Accuracy (See Step 1)
    - □ Discuss the impact of the bridge with BAM Engineer
    - □ Provide Justification _____

UPDATE LRS

- □ Update the Inventory and Operation Rating tables with controlling Results.
- □ Update the Special Haul Vehicle Operating Ratings table if the NRL Operation factor is less than 1.0.
- □ Update the Emergency Vehicle Operating Ratings table if the Bridge is on a FAST ACT route. On the Interstate or within a 1 mile radius of the Interstate Interchange.

STEP 4: Document Engineering to LRS Sheet

□ **{Use these notes for Re-analysis due to a rehabilitation project}**

The Load Rating was modified by ITD (input name or initials) on MM/DD/YYYY. Updates addressed changes in the structure from the rehabilitation project KN ##### as requested in the MM/DD/YYYY bridge inspection. Updates include:

*Concrete Overlay adding 1.0" additional structural thickness to the deck.
*Removal of 0.5" of asphalt overlay.

□ **{Use these notes for Re-analysis due to a deterioration}**

The Load Rating was modified by ITD (input name or initials) on MM/DD/YYYY. Updates addressed deterioration documented in the MM/DD/YYYY bridge inspection. Updates include:

*Reduced the {area if the top flange}{Number of prestress strands}{timber section dimensions} by {xx%}{by xx strands} in Girder ##.
*Reduced the number of prestress strands by xx strands in Girder ##.
*Reduced the timber beam dimensions by xx% { or by xx-inches} in Girder ##.
*Included the deck analysis based on deck condition code of 4 or less.

□ **{Use these notes for other cases}**

The Load Rating was modified by ITD (input name or initials) on MM/DD/YYYY. Updates include:

*Increased the wearing surface from xx-inches to xx-inches as documented in the MM/DD/YYYY bridge inspection.
*Updated the analysis type from the BRASS engine to the AASHTO engine.

□ **{Add this note to communicate to the Inspector and Owner Via. Inspection Report. Patty will copy this information from LRS directly to the inspection report} Example:**

*ITD INSPECTION COMMUNICATION (copied to inspection report)

"Load Rating Re-Analysis Notes - Interior girder G2 is the governing member. ITD understands owner retained Don with Vander Boegh Engineering, PLCC for the design of a retrofit repair to interior G2 in an effort to provide additional flexural capacity thereby reducing the load restriction. It is understood from Don that this repair work remains unfinished. Thus the revised Rating does not reflect retrofit repair. The rating does now include the 2017 reported additional 1.5-inches of asphalt (3.5-inches total).

x

STEP 5: Document Engineering to BrR

□ **In Dialog Box under BRIDGE KEY**
{Use these notes)
The Load Rating was modified by ITD (input name or initials) on MM/DD/YYYY. Updates to address reanalysis due to _____. See Superstructure Definition for Details.

□ **In Dialog Box under the SUPERSTRUCTURE DEFINITIONS**
(copy from Step 4)

□ **In Dialog Boxes Under Individual MEMBERS**
(modify as needed)

STEP 6: Process Load Rating

- □ Move Old Load Rating Summary Form (LRS) from ITD workspace to the retired folder. Y:\Load Rating\LRS_Calcs\Retired
- □ Put the new summary form into the LRS_Calcs from ITD workspace into load rating folder. Y:\Load Rating\LRS_Calcs
  - □ Make pdf of any supplemental calculations (can also use the native file) into the LRS_Calc folder. Y:\Load Rating\LRS_Calcs
    - □ If the calcs only add to existing supplemental calcs, add them to the end of existing file.
    - □ If the calcs replace the existing supplemental calcs, rename the old calc with a "_OLD" at the end and move them to the Retired folder. Y:\Load Rating\LRS_Calcs\Retired

- □ Create a PDF of the new Load rating Summary form.
  - □ Name the files as follows:
    - □ LFR -- #####_MMYY_LRS_LFR
    - □ LRFR -- #####_MMYY_LRS_LRFR
    - □ Allowable Stress -- #####_MMYY_LRS_ASR
    - □ Engineering Judgement -- #####_MMYY_LRS_EJ, for the appropriate.
    - □ New LRFR Bridges -- #####_LRS_LRFRandLFR".
      - □ In the PDF of new LRFR Bridge, put the LRFR summary first followed by the LFR summary.
  - □ The pdf for metal culverts will be placed in the MetalCulverts folder instead of the LRS_Calcs folder. Y:\Load Rating\LRS_Calcs\MetalCulverts
  - □ Save the pdf into the BrM_Links (Modify name to include the date). Y:\Load%20Rating\LRS_Calcs\BrM Links

- □ Send Patty and email with a hyperlink to PDF in the BrM Link folder in the body of the email.
  - □ Use "##### LRS" in the subject line.
  - □ Do not change the files name after submitting to Patty so it does not break the link in BrM.

- □ Update the tracking sheet <Date to Patty> column (Excel column 'BO') with the new date the file was sent to Patty.
  - □ Add the following comment in the <Comments> column (Excel column 'BV'):
    - □ Original BrR in BrM {original MM/DD/YY}; updated from {input general description of changes} by {input initials} on MM/DD/YY.
  - □ Delete the <DATE In BrM> date (Excel column BQ)

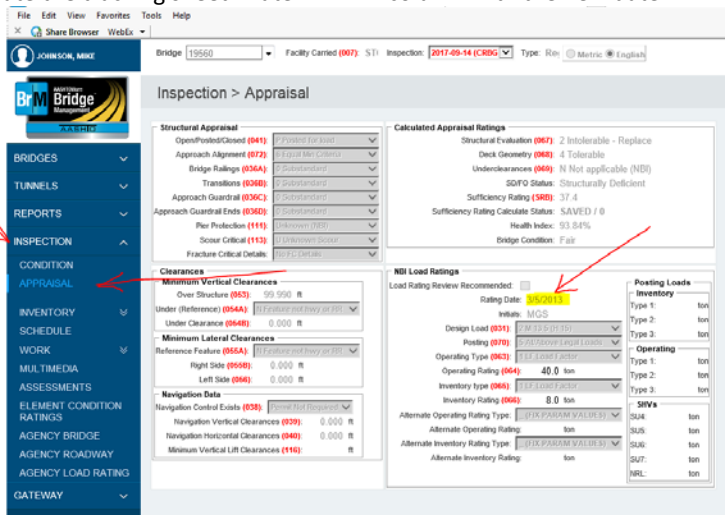
- □ Rename the **original** BrR file and delete
  - □ Change the Bridge ID and NBI Structure ID to "#####_OLD".
  - □ Uncheck the "Bridge Completely Defined" box
  - □ Close, save, and check the file in
  - □ In the BrR "Not Completely Defined" folder, right click on the file and delete.

- □ Rename the **new** BrR file.
  - □ Change the Bridge ID to "#####" and NBI Structure ID to "0000000000#####".
  - □ Check the "Bridge Completely Defined" box
  - □ Close, save, and check the file in

STEP 6: Process Load Rating CONT'D

- ☐ Keep file at desk until Patty publishes the new factor list (typically quarterly).
  - ☐ Use the factor list of verify the rating factors and tonnages submitted match the factors on the list.
  - ☐ Let her know of any discrepancies
  - ☐ Check the appraisal tab in BrM for the date it was put into BrM.
    - ☐ Update the tracking sheet "Date IN BrM" column with the new date.

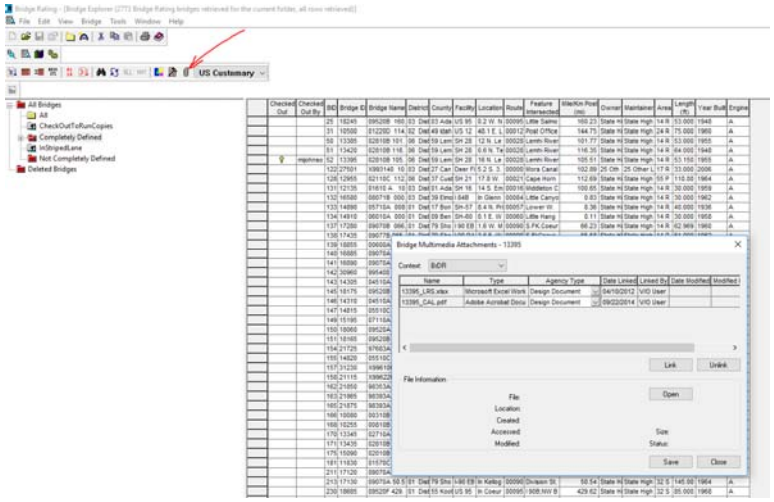
☐



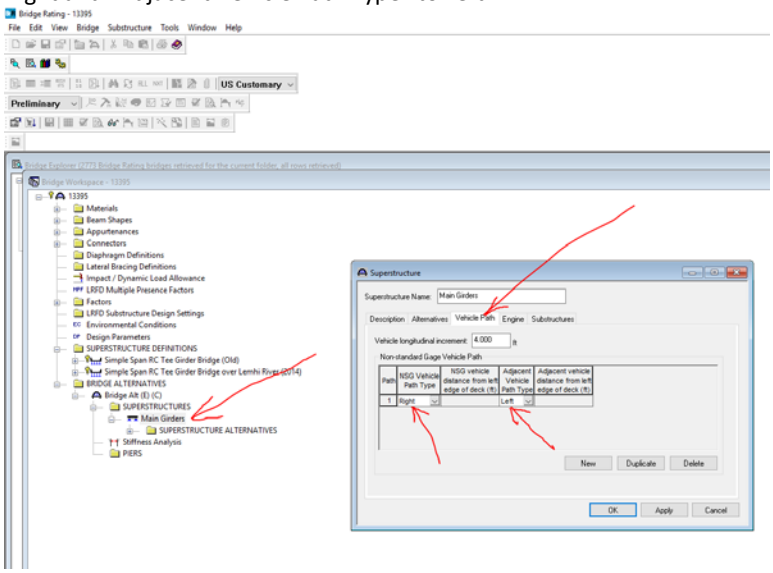
- ☐ File the folder in Hardfile (In the future, this will be in the Electronic File).
  - ☐ Put a copy on the new LRS form into the file.

- ☐ Verify the links in BrR
  - ☐ Check out the file - click on the paperclip in the BrR ribbon - Verify the Documents attached

☐



STEP 6: Process Load Rating CONT'D

- ☐ Update the non-standard gage defaults in the "Bridge Alternative"
  - ☐ Bridge Alternative > SUPERSTRUCTURE - Open the "Vehicle Path" tab - Chant the "NSG Vehicle Path Type" to Right and "Adjacent Vehicle Path Type" to Left
  - ☐ 

- ☐ Remove Checkout privileges for anyone who should not have them.
  - ☐ Right Click on the bridge in Bridge Explorer > Checkout Authority > By Bridge
  - ☐ Uncheck the necessary people